

WRITING ENGINEERING REPORTS

Writing is one of the most important tools available to an engineer. The final report of any project is not just a formality. It is a primary product of the effort and is often the basis to evaluate the reporter's professional abilities. The report is also a service to those who need information. Requirements for style, purpose and organization can differ greatly; the format required for one report may not be appropriate for another. They have, however, certain characteristics in common. Once submitted, the report should stand on its own. Reports are circulated, reviewed and filed. During this process it is subject to critical analysis by many readers. Report writing is one of the primary professional responsibilities of the practicing engineer.

The guidelines provided here should help show you how to organize and write an engineering report for this course.

General Considerations

When writing a report on a subject that is new to the author, there is often a tendency to use the report as a study tool and to write about much of what was learned in class or from reading. Such writing is more appropriate for a review or a term paper than a report.

Before starting to write a report, make sure to define the goal and scope. It is common to find a report that inadequately addresses the main point(s) of the problem or topic. The report should be as short as possible while still retain all the relevant matter. How well one provides the relevant matter depends on the scope of the project and on one's ability to extract only those items that need to be reported. ***The value of the report depends not on its length but on its accuracy and utility for its readers.***

Format

Each section of the report has a specific function and minimum requirements must be met by the writer. If each section is written so that it performs its intended function, the final report will be a clearly and efficiently written report.

There is a separate cover sheet that should clearly identify the report by title, author, class, date, and report number. Be sure to include the names of any partners if appropriate.

Title

Choose a Title that will stand on its own. A reader should be able to assess the main point of the report from the title alone. It should be concise, clear and interesting. Since titles will be different, be sure to include the Report # on your cover page.

Introduction

The Introduction should describe the purpose and scope of the report. The remainder of the report should be tied to this section. Generally, first introduce the reader to the overall problem and topic, then mention the specific areas addressed in the report. There is generally no need to write an extensive introduction section in this course. One to two paragraphs should suffice.

Procedure or Methods

The function of this section is to describe how the author(s) went about answering the "question" problem posed in the Introduction. Solution procedures should be described. Describe the type of data that each procedure is supposed to provide and what part of the "question" it helped answer. Describe how, what and/or why you did what you did to come up with your results.

Results

This section should use text to describe data and results from the methods. Results can be presented in tables and/or figures. Include small tables directly after the text that refers to them; place larger tables and figures on the next page following the page where they are first mentioned in the text or in an appendix. Each table column should be labeled with units of measurement given in parenthesis below the label. Do not list units next to individual values in each table cell. All tables and figures should have an identifier (Table 1, Figure 2, etc.) and a title. Figures should be neatly and carefully plotted with a computer, and axes must be properly labeled and scaled. Raw data and sample calculations are normally placed in an appendix but appendix material must be organized and synthesized so that the material stands by itself – a reader only needs to read the appendix to understand what is contained within it. Use the appendix to also comment on the accuracy and uncertainty of results.

Discussion

The purpose of the discussion section is to communicate what was learned and how the results lead to the conclusions. The results are discussed in terms of what they show about the final solution and what they mean in the context of the goal of the study or experiment. The discussion forms the bridge between the observations and what they ultimately mean to the reader. While the previous sections showed that one knows how to come up with an answer, the discussion should show analytical ability and capability to interpret the results to obtain the solution.

Conclusions

The conclusion section is a concise statement of the key final results and their significance. It should answer the "question" posed in the introduction using only material presented in earlier sections.

References

The reference list should include only those books, articles, reports, and other technical literature that are referred to in the report. Each reference must have a citation in the text and each citation must have a reference! Use the American Society of Civil Engineers' (ASCE) [citation](#) and [reference](#) styles to format citations and references. You may use another professional engineering society's reference style so long as the style is consistently applied.

Appendix

The appendix section is available for raw data, sample calculations, list of symbols, computer printouts, and program code. This information must be organized and synthesized into text, figures and tables so that the appendix is understandable, readable, and stands by itself (without the report or the other appendices so that the reader could pluck off the appendix and deliver it

separately as its own mini report). Each appendix should have an identifier (Appendix A, Appendix B, Appendix C, etc.), a name, and descriptive text to explain the contents. Label the tables and figures in the appendix according to the appendix label so that the report can unambiguously refer to them (Table B1, Figure B1, Figure B2, etc. for the first table and two figures in Appendix B).

Additional Comments

Appearance

Spelling, grammar and neatness are important components of report writing. Word processing or typing is required. Tables and graphs should be well organized and clearly labeled. They should be able to stand as separate entities. Scaling of graphs should be done in such a manner that the graph is not crowded in a corner or on the side but covers a major part of the sheet. The divisions on the graph paper should coincide with whole numbers of the units plotted along the axis. The use of S.I. units is encouraged.

Do not copy the full calculator readout in your report but only significant figures. If you have measured a length as 3.43 mm in your calculations you divide this by three, then your calculator displays 1.14333333, but at most 1.14 is significant!!

Style

You must follow an engineering writing style convention for the overall report and the text, figures, tables, appendices, references, and citations within it. Conforming to a style ensures broad readability by both engineers and non-engineers and is a marketable skill to future employers. Use the American Society of Civil Engineers [style](#) (Table 1).

Table 1. Components of the ASCE Writing Style

Style component	URL for full description
Mathematics and equations	http://www.asce.org/Content.aspx?id=29603
Figures	http://www.asce.org/Content.aspx?id=29601
Tables	http://www.asce.org/Content.aspx?id=29596
Citations	http://www.asce.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=29606&libID=29541
References	http://www.asce.org/Content.aspx?id=29605

Deadlines

Know and meet the deadline to complete the report. Timeliness is a key responsibility of a practicing engineer. The instructor does not accept late course work (someone else won the bid/contract).

KEEP YOUR REPORT SHORT BUT COMPLETE.

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