Guidelines for Writing Work Term Reports

Department of Civil and Environmental Engineering
University of Waterloo

Ver. 1 - October 2002
Ver. 2 - July 2004
Ver. 3.0 - December 2010
Ver. 3.1 - January 2013
Ver. 3.2 - February 2013
Ver. 3.3 – July 2013

200 University Avenue West
Waterloo ON N2L 3G1

July 15, 2013

Dr. Jeff West
Associate Chair, Undergraduate Studies
Department of Civil and Environmental Engineering
University of Waterloo
Waterloo ON N2L 3G1

Dear Dr. West:

This report, entitled "Guidelines for Writing Work Term Reports," was prepared for the Department of Civil and Environmental Engineering. The purpose of this report is to provide guidelines for Civil and Environmental Engineering students to follow in their work reports.

One requirement for professional accreditation is evidence of the ability to communicate effectively both orally and in writing. Accordingly, students are expected to use the work reports to improve their report-writing and English skills. The guidelines specify the manner in which the reports are to be presented.

Under the direction of Professor Eric Soulis, I am employed by the department as a marker of the style and grammar quality of work term reports.

This report was written entirely by me and has not received any previous academic credit at this or any other academic institution. I would like to thank Professor Soulis and Clayton Morgan for assisting me during the preparation of the report. I received no other help with the report.

Sincerely,

(signature)

Barb Trotter
ID# 00 000 000

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Preface to Version 3.3

Version 3.3 of the CEE Work Report Guidelines reflects several changes as part of an extensive review and renewal of the work reports as a teaching and learning tool in the Department of Civil Engineering. This review process, initiated in early 2013, included a consultation with CIVE, ENVE and GEOE Class Representatives during the winter 2013 term, as well as a series of recommendations and proposed changes developed by a Task Group of four CEE Faculty members. Some of the changes were implemented in the Spring 2013, with others to be implemented in the Fall 2013 term. The changes will be widely communicated to students through their class representatives. This version of the Guidelines represents the expectations and requirements as of the Fall 2013 term.

Original Authors and Departmental Revisions

The original authors of the CEE Work Report Guidelines are:

> Barbara Trotter
> Ric Soulis
> Clay Morgan

The CEE Work Report Guidelines are maintained by the CEE Department. Revisions have been completed by:

> Jeff West, David Brush, Victoria Vlasic, July 2013

Summary

The ability to communicate effectively both orally and in writing is an essential component of professional accreditation for civil engineers. Therefore, the Department of Civil and Environmental Engineering at the University of Waterloo provides an opportunity for undergraduate students to improve their skills in this area and uses work reports as one vehicle for practice and evaluation.

This document provides guidelines for the use of students who are submitting work reports. It illustrates and explains the required format, style, and structure of a work report and lists applicable deadlines. The guidelines contain examples of the components of a report, an outline of the required contents, and an explanation of common grammar errors and ways to correct them. The guidelines are presented in the form of a report.

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1. Introduction

The background, purpose, and scope of these guidelines are outlined in this section to provide students with a model to follow in their reports.

1.1 Background

Communication through technical writing can be a significant component of many civil, environmental and geological engineering jobs since an engineering report is often the primary deliverable resulting from civil, environmental and geological engineering practice. Furthermore, an important component of all accredited Canadian engineering undergraduate programs is that "Provision must be made to develop each student's capability to communicate adequately, both orally and in writing" (Canadian Engineering Accreditation Board, 1993). The development of communications skills has always been emphasized in the Department of Civil and Environmental Engineering at the University of Waterloo. That is, effectively preparing résumés, writing technical reports, and developing oral presentation skills are stressed throughout the undergraduate program.

The Department of Civil and Environmental Engineering requires that each student submit three work term reports that receive a grade of satisfactory or better. All reports are submitted to the class professor. The reports are evaluated for formatting, written communication and technical content. All work term reports should contain engineering analysis, engineering design, or both. At least two of the reports must contain substantial technical content that reflects systematic exposure to engineering analysis and/or design during a work term. Further discussion of engineering analysis and design expectations is provided in Section 1.3.1.

These guidelines are provided to help students prepare professional-quality reports. Correct formatting, style, and grammar are addressed, and examples are provided. These guidelines themselves are an example of a properly organized and formatted report. However, because they are instructional, they differ significantly from a report. Some sections of the guidelines are written in second person, which is not appropriate in an actual work report. They do not contain the technical analytical content required in a work report and do not have a Conclusions section or a Recommendations section.

The requirements are detailed to help you become familiar with the many elements that constitute a well-designed report. The amount of detail required may seem tedious at first, but it is all part of gaining the confidence of both the thorough and the casual reader. The guidelines are also intended to be a useful reference throughout your career. Most major employers have their own style requirements, but in their absence, these guidelines will suffice.

This document is living and evolving. We would appreciate any feedback, particularly suggestions for the addition of items that would be of general interest. Please direct your comments to the Associate Chair, Undergraduate Studies, or to the Coordinator of the Work Report Program.

1.2   Purpose of a Work Term Report

Work reports are an important part of a work term experience. They encourage employers to give students well-defined reportable assignments and tasks and encourage students to apply classroom material to real world applications. The specific objective is to teach the elements of technical communication, in particular, the structure and design of an engineering analysis or

design report. The objective includes not only help with the mechanics of report writing, such as citations and headings, but also assistance for creative writers to simplify their writing styles and direct help for marginal writers to enhance their writing skills.

1.3   Scope of a Work Term Report

1.3.1   General

All work term reports must contain enough technical material to reflect systematic exposure to engineering analysis, engineering design, or both, during a work term. A work term report should include more than just a simple description of information that has been observed or calculated.

An engineering analysis report must contain a critical assessment of the quality and reliability of the information; it should also assess the significance of the information with respect to the engineering problem discussed in the report.

To satisfy the engineering design requirement, a report should identify a problem, describe alternative solutions to the problem, analyze and evaluate the alternative solutions, and recommend one of the solutions. Engineering design is much more than technical analysis: it includes economic analysis and, in some cases, an analysis of the environmental and social impacts.

Reports written for employers are often inadequate for direct submission as work term reports. For example, geotechnical site investigation reports are normally written to provide clients with

foundation recommendations, and such reports may not contain design calculations or an analysis and an evaluation of alternatives. Environmental engineering site reports usually record observations of contaminant levels, and they do not contain an analysis or an interpretation of the observations. Reports of this type may form the basis for suitable work term reports provided that they include acceptable engineering analysis and/or design.

Another example of a report that is normally unacceptable as a work term report is a user's manual for a computer program. However, a work term report is acceptable if it describes the overall structure of a program, the theory on which it is based, the limitations of the theory and the program, and the results of an application of the program.

Occasionally, the work term experience may not yield a suitable topic for a work term report. If this is the case, a student may base the work term report on a literature review. A report of this type should cite a range of references, provide a critical review of these references, and synthesize them into a commentary on the state of the art of the particular technical area. The report must contain significant analytical or engineering design content.

1.3.2   Confidential Reports

All work reports submitted to the CEE Department are considered confidential academic documents. This means that your work report and associated records are kept in a private and secure location, a limited number of academic personal have access to the report, and the marked report will be returned directly to you.

Work reports are processed by a CEE staff member, marked in detail by one CEE faculty member or senior graduate student, and possibly reviewed by the work report coordinator. Outstanding work reports are reviewed by the work report coordinator and several faculty members for consideration of faculty awards. An award winning report is recognized by publishing the student name, report title, and employer name.

The content of a work report remains confidential within the CEE department (usually only the marker knows the detailed content) provided that the report adheres to the policies and standards of practice of the University of Waterloo, Faculty of Engineering, and the Professional Engineers of Ontario. In the event of a possible policy or standard violation, the work report coordinator will review the report and consult the appropriate academic or professional authority.

1.3.3   Audience

The general principle of good writing is that the text should be easily comprehensible to the reader. Work reports should be written so that a faculty reviewer can readily understand them. The writer should not explain the meanings of routine scientific, mathematical, and engineering terms. If the topic of a report is specialized, it may be appropriate to include a glossary at the end of the report.

2. Administration

2.1 Term Requirement

Work term reports must be submitted during specific academic terms (Table 1) and form part of the academic program for the corresponding term. On all grade reports and transcripts, the three work term reports are identified as WKRPT 200, WKRPT 300, and WKRPT 400 as appropriate. Work reports are named according to the academic term in which they are submitted, not the work term. Work terms, on the other hand, are associated with the academic term immediately preceding the work term. For example, the Civil 3A work report is normally related to the 2B work term.

Table 1 Required Work Term Report Submissions

Report	Environmental & Geological	Civil
WKRPT 200	2B	3A
WKRPT 300	3A	3B
WKRPT 400	4A	4A

2.1.1 Marking

Work reports are due on the second Tuesday of the school term. A hardcopy is due to the CEE Undergraduate Office by 4:30 pm on the second Tuesday of the term. A CEE Work Report Evaluation Form with completed student information, report title, and employer name must be included with the hardcopy submission (latest version posted on CEE website and Learn). In addition, a softcopy must be uploaded to Learn.

The marking process begins with CEE Administrative Coordinators recording work report information (student information, report title, and employer) for each submission. The Work Report Coordinator then assigns reports to CEE faculty members or graduate students for marking. The markers grade all components of the report according to the CEE Work Report Evaluation Form. The form evaluates formatting, communications and technical content using five categories: exemplary, good, satisfactory, developing and poor. The categories for communications and technical contact are then assigned a grade of A+ or A for exemplary, B for good, C for satisfactory, Resubmit for developing, and Fail for Poor. The formatting categories are assigned grades of CR for exemplary, good and satisfactory, Resubmit for developing, and Fail for poor. The form also includes a technical content inventory which categorizes the technical content as Engineering Science and Engineering Design.

The overall report grade is determined by weighting the communications grade by 60% and technical content grade by 40%.

Markers provide feedback by writing comments in the report, on the back of the form or by attaching a separate sheet. In future terms (planned for Fall 2013), students will meet with the marker to receive the marked report and discuss the results.

You may be required to correct and resubmit your report. Resubmission is not a failure; it is an opportunity to respond to the marker feedback, and if necessary seek extra help, to improve your report. Formatting and communications resubmits will be supported by a group tutorial and individual sessions during the term. Technical content resubmits will be supported by the marking faculty member or graduate student.

If the report is still unacceptable after resubmission, it is recorded as failed. This failing grade can be cleared if you submit either a corrected or a replacement report in a later term.

2.1.2 Recognition

The best report from each class receives the Sandford Fleming Foundation Award for excellence in written communication. The first prize winner receives a cash award and certificate. The second and third place winners receive a certificate.

3. Formatting and Style

Many methods for formatting reports are acceptable in different contexts. However, many companies, journals, and government agencies require that reports follow specific formulas. These guidelines illustrate the formatting instructions required by the Department of Civil and Environmental Engineering. The report is checked for correct and consistent formatting and style. This section explains the details of the components that the markers look for.

3.1 Appearance

Appearance is important in the business world, so the report should look professional. Any photocopied material should be clearly legible and aligned with the margins. Handwritten page numbers and labels are unacceptable because they give the impression of casual writing, which detracts from the report. These guidelines provide an example of the required format.

3.1.1 Font and spacing

Reports should be typed using double (2X) line spacing. The use of a 12-point Times Roman or similar font is recommended. Bold type should not be used to emphasize words within the text, although bold used for headings is acceptable.

Except for the Summary, the Table of Contents, the Lists of Tables and Figures, and the References, you should not start each section on a new page. That is, beginning with the Introduction, each section should follow immediately after the previous one. Large blank spaces should not be left between sections of the main body. However, if the text is block formatted with no indentation of the first lines of the paragraphs, as these guidelines are, an extra space should be inserted between paragraphs.

Work term reports should be printed on white paper only. It is preferable to print the reports as single-sided, as this gives the marker more room to add comments on your report. However, if you prefer, double-sided printing may be used.

3.1.2 Margins and Page numbers

A minimum width of 25 mm should be used for the top, bottom, and right margins. A slightly wider (maximum 30 mm) left-hand margin should be used to allow for binding. All text should be aligned with the left margin, except for indented quotes.

Pages must be numbered. The numbers can be located at the top or bottom of the page and can be placed in the middle of the page or in the right-hand corner. However, numbering must be

consistent throughout the report. Pages for the introductory sections of a report should be numbered using lower-case Roman numerals. The first page to be numbered with an Arabic numeral is the first page of the Introduction section. Sample page numbering for the introductory pages are found in Section 5.6.

3.2 Length of Reports

The text of the main section of work term reports, from the beginning of the Introduction to the beginning of the Conclusions, should be within the range of 3000 to 5000 words, excluding tables and figures. Reports that are shorter or longer than this size may be rejected.

4. Other requirements

4.1 Software and Spell-check

Work term reports should be prepared on computer software that is accessible to the author during an academic term so that corrections may be readily undertaken. The use of an electronic spell-checker is expected. Note, however, that the Canadian version is expected if it differs from the U.S. version.

4.2 Standard International Units

The International System (SI) of units should be used throughout the report. If the British (or Imperial) system of units is used during the work term, then SI equivalents must be quoted in parentheses immediately following the Imperial units.

5. Structure

Work term reports should be organized in the following sequence:

Front Cover –(no page number)

Letter of Submittal – no page number

Title Page – considered to be i, but not indicated

Summary (or Executive Summary) – page ii

Acknowledgments (optional) – page iii if included

Table of Contents – page iii or iv, depending on whether acknowledgements are included

List of Tables – page iv or v, depending on the length of the list and whether

acknowledgments are included

List of Figures – page iv or v, depending on the length of the list and whether

acknowledgments are included

List of Appendices (if appropriate) – page iv or v, depending on the length of the list and

whether acknowledgments are included

Main Section – beginning with the Introduction, page 1

Conclusions

Recommendations (optional)

References

Glossary (optional)

Appendices (optional)

5.1   Front Cover

Figure 1 illustrates the information required on the front cover: the title, the employer, the author's name and affiliation, and the date (e.g., December 2010 rather than December 22, 2010). The front cover may be enhanced with relevant graphics; however, it is important to maintain a clean and uncluttered appearance.

**Alternative Highway Alignments
for the Kitchener-Guelph Corridor**   ] Title of
                                           the report

Smith Engineering Consultants   ] Name of the
                                     employer

by

John Doe   ] Name, year and
                              program of the
2A Civil Engineering   student

August 2000   ] Month and year
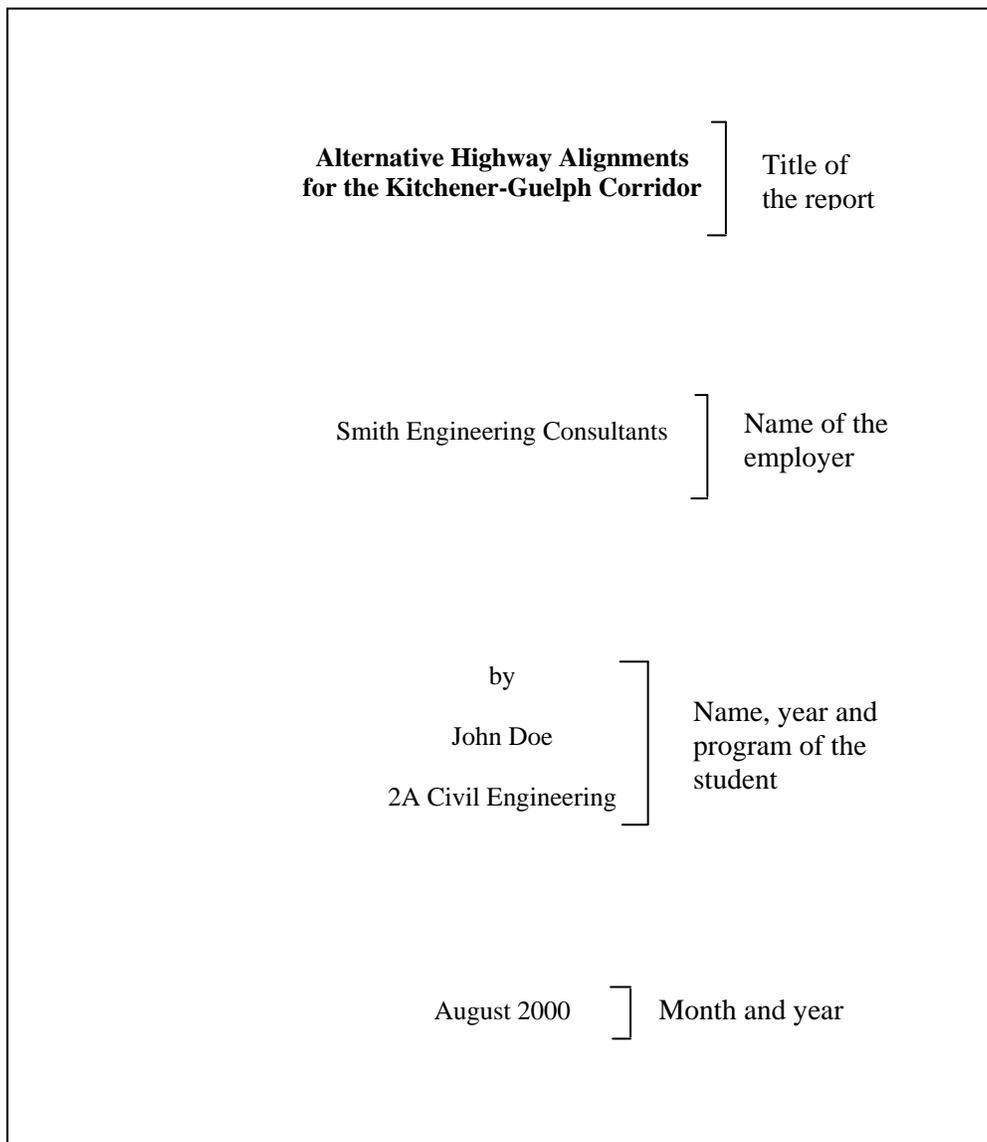
Figure 1 Layout of the front cover of work term report

5.2   Letter of Submittal

The letter of submittal should adhere to standard business letter format rules and should be dated and addressed to the incumbent Associate Chair, Undergraduate Studies (Figure 2). Unless you are using company letterhead, your home address should be included at the top of letter, followed by the date and addressee. The addressee's information should match exactly what would appear on the envelope. In a formal business letter, the correct punctuation after the salutation is a colon, e.g., "Dear Sir:."

The letter should identify the title of the work report being submitted, the company for which you worked, your immediate supervisor, the number of the report (i.e., second, third, etc.), and a declaration that the report was written by you and has not received academic credit at the University of Waterloo or any other academic institution. The letter of submittal must be signed.

5.3   Title Page

The title page should contain the same information as the front cover but must not contain graphics, illustrations, etc.

1000 King Street North
Kitchener, ON N2M 2T8

December 22, 2010

[Designation/Name of Associate Chair, Undergraduate Studies e.g. Dr. Jane Doe]
Associate Chair, Undergraduate Studies
Department of Civil and Environmental Engineering
University of Waterloo
Waterloo, ON N2L 3G1

Dear Dr. [Surname of Associate Chair, Undergraduate Studies]:

This report, entitled "Alternative Highway Alignments for the Kitchener-Guelph Corridor," was prepared as my 2B Work Report for Smith Engineering Consultants. The purpose of this report is to evaluate the impact of three potential highway-routing schemes for the proposed Highway No. 7 realignment project slated for completion in 2015. This report is my second of four work reports required by the Department of Civil and Environmental Engineering at the University of Waterloo.

Smith Engineering Consultants is an engineering consulting firm with its head office located in Kitchener. The firm provides municipal and environmental engineering services and specializes in the planning and design of transportation-related projects. The firm has been involved in previous high-profile alignment projects in Ontario.

Throughout my work term, I was employed in the Environmental Division. Managed by Mr. Bill Smith, P.Eng., the division is involved primarily with the analysis of large transportation-related projects that may have an adverse environmental impact.

This report was written entirely by me and has not received any previous academic credit at this or any other academic institution. I would like to thank Mr. Smith for assisting me during the preparation of this report. I would also like to thank Ms. Kim Manners, P.Eng., for proofreading my report and providing valuable comments that greatly improved the appearance of the final report. I received no other help with the report.

Sincerely,

(signature)
John Doe
ID# 99 000 000

Figure 2 Sample letter of submittal

5.4   Summary

The Summary section is one of the most difficult components of a technical report to write well. The real aim of the Summary is to convey the main points of a report to senior management personnel who do not usually become involved in technical details. For this reason, it is sometimes labeled Executive Summary. It should be written last and must be written in full sentence form. The Summary may be thought of as a mini-report of about 250 words (3-4 paragraphs) that must be able to be read and understood in isolation from the main report (Figure 3). It must not exceed one page and should include the following:

1. the scope and purpose of the report (including background/rationale);

2. the technical approach taken, which might include a discussion of the alternatives considered and the major technical findings; and

3. the principal conclusions and recommendations.

It must not include

1. tables and figures or

2. a direct reference to tables, figures, and sections contained in the main report.

5.5   Acknowledgments

You may wish to acknowledge the contributions made to the report by others. For example, your work term supervisor may have helped you with the problem definition and supplied references.

You may use the letter of submittal to acknowledge the help you received, or you may include a separate section for that purpose. The Acknowledgements should be written in a formal manner although they can include some text that expresses personal sentiment, e.g., "I gratefully thank my supervisor for her guidance."

Summary

The Regional Municipality of Waterloo is presently examining three potential routing schemes for the proposed realignment of Highway No. 7 between Kitchener and Guelph.

Route A incorporates a complete reconstruction and upgrade of Highway No.7 along the existing corridor. Route B involves a parallel alignment located north of the existing right-of-way. Route C consists of a new highway alignment located south of the existing highway alignment. This report presents an evaluation of these alternative highway corridor routes. An environmental impact assessment and a preliminary cost-benefit analysis are included for each route.

Route B, the least expensive highway alignment, would result in the destruction of approximately 200 ha of an existing wetland complex. Route C represents a compromise between Routes A and B. Realignment of the highway corridor south of the existing alignment would minimize the loss of wetland and prime agricultural land, but the current design would be considerably more expensive to construct and operate.

Based on the findings of this study, further consideration of the proposed highway Routes A and C is recommended.

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Figure 3 Sample summary page

5.6   Table of Contents

The Table of Contents lists all the main sections of your report and any subsections that have headings (Figures 4, 5). The Title Page is understood to be page i, but it is not listed in the Table of Contents. The Table of Contents is also not listed.

Care should be taken to ensure that each entry in the Table of Contents refers to the correct page number of your report. You should use a dotted line to assist the reader's eye in scanning from the heading to the page number.

If the Table of Contents is so long that the List of Tables and List of Figures occur on a separate page or pages, they should be listed in the Table of Contents with an appropriate page reference (Figure 4). If they fit on the same page as the rest of the Table of Contents, then they do not have a page reference (Figure 5).

If your report has no more than three appendices, you may list them individually with each title as part of the Table of Contents. If your report has more than three appendices, they should be listed separately in a List of Appendices that should follow the List of Figures. In that case, the page where the List of Appendices is located is referenced in the Table of Contents with a lower case Roman numeral page number.

TABLE OF CONTENTS

Page

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Figure 4 Sample of a Table of Contents with more than three appendices and lengthy lists of tables and figures

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

iii

Figure 5 Sample Table of Contents with only three appendices and brief lists of tables and figures that fit on the same page as the Table of Contents

5.7   Main Section

The main body of the report should be divided into a number of major sections (1, 2, 3…) and minor subsections (1.1, 1.2, 1.1.1, 1.1.2, etc.) that impose an appropriate structure on the material. A chapter structure is inappropriate for a report consisting of less than 5000 words (i.e., 20 pages at 250 words/page). The hierarchy of headings should be limited to a maximum of three levels. These guidelines provide an example of this three-level structure. Lists should be presented using a consistent structure, such as the one used in these guidelines.

The first component of the main section must be the Introduction. The purpose of the Introduction is to provide background and rationale for the report and establish the general scope, significance, and context of the problem addressed by the report. The Introduction should conclude with a brief statement that conveys information about the contents of the body of the report.

The next part of the main section should provide a detailed technical description of the problem, any potential solutions to the problem, an analysis of any alternative solutions, and, finally, the justification for the solution selected. Providing more detailed suggestions about the structure of the main section is difficult because it varies substantially with the nature of the problem described and analyzed. The guiding principle is that the main body should proceed from a general statement of the problem to the particular technical justification of the course of action being recommended.

5.8   Conclusions and Recommendations

5.8.1   Conclusions

The Conclusions should contain only statements that follow logically from the content of the report. The aim of the Conclusions is to reinforce the findings of the report. New information should not be added to the Conclusions. The Conclusions should not refer directly to components of the main body of the report, nor should they contain tables, figures, or references. For example, "The temperature effects, analyzed on page 6 showed that ...." is unacceptable. Bulleted or numbered lists are acceptable but must have an introductory sentence.

5.8.2   Recommendations

The Recommendations contain statements about additional work that might be required. For example, "Insufficient data were available for this study to establish conclusively the temperature effects, and a sequence of laboratory strength tests is recommended."

A conclusion is required for your Work Report; however, the recommendations are often omitted. Conclusions and Recommendations can be combined into one section.

6. Tables, Figures, Appendices, and Equations

6.1 Tables and Figures

Tables and figures are very important for presenting data, graphs and visualizations in technical reports. It is common for readers to refer only to the tables and figures, which therefore require special attention. For example, tables and figures should have titles that are self-explanatory. Thus, the titles often need to be more than one sentence. Explanatory tables and figures should be incorporated into the text as soon as possible after the paragraph in which they are first cited, and each one must be mentioned in the text preceding it. If a figure requires a full page, it should follow immediately after the page containing the first reference to it.

The following types of tables and figures should be placed in the appendices:

1. tables and figures that contain only background information;

2. bulky tables and figures; and

3. large repetitive collections of tables and figures, such as results from repeated tests. In this case, one insightful example should be incorporated into the text, and the rest should appear as an appendix.

Refer to tables and figures with a capitalized whole word not with an abbreviation. You should not use the word "see." For example, "The results can be expressed in a graph (Figure 1)."

Tables and figures can be numbered consecutively throughout the report (1, 2, 3, 4, etc.) or numbered consecutively within each section (1.1, 1.2, 2.1, 2.2, etc.). Headings or captions for tables are placed above the table while those for figures are placed below the figure. Tables and figures that are a full page and that are landscape oriented should be positioned with the top of

the page in the binding. Figure 6 illustrates the placement of a table with an appropriate caption within the text of a report. The figure includes both the text of the sample report and the placement of the table after the text.

Figure 7 illustrates the layout of a page containing a graph or plot. The figure includes both the text of the sample report and the position of the figure. Labeling the axes with either standard terms or ones that have been defined in the text is important, and these labels should include the units of measurement. The symbols used to plot different functions on the same graph should be clearly differentiated, and they should be identified in a legend or in the figure caption. They should also be consistent from graph to graph if more than one graph is used. As well, the font size used on graphs should be readable.

The source of the data or information presented in a table or figure must be properly cited if you did not create or obtain the data or information yourself. Similarly, the reuse of a figure or photograph from another source must also be cited. Guidance on citations and references, including formatting, is provided in Section 7.0.

It is expected that the three highway alignment**s** would result in different levels of usage by local motorists. Table 1 lists the preliminary traffic volume projections for each alternative.

Table 1. Anticipated Daily Traffic Volumes

Routing Alternative	Year 2005	Year 2025
A	45,000	52,000
B	40,000	47,000
C	55,000	63,000

Figure 6 Example of a table included in a work report. It should be noted that the table is presented immediately after it is first introduced in the text.

Figure 13 illustrates the observed streamflow recessions for three drainage events. After the cessation of all stormwater input, the streamflow from the wetland take**s** the form of a long, well-behaved recession lasting several weeks before the next significant precipitation event occurs.
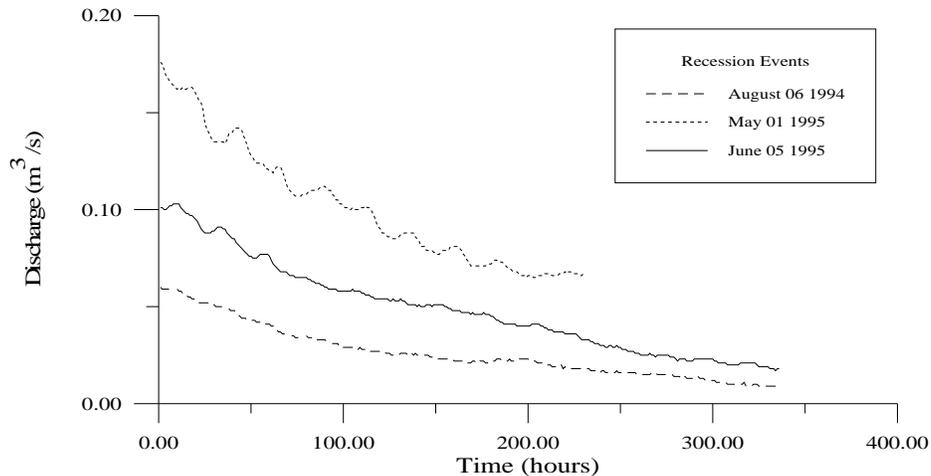
Figure 13 Streamflow recessions at the study site

Figure 7 Example of a figure included in a work report

6.2   Appendices

The appendices of a report are intended for long tables, bulky maps, detailed descriptions of analytical procedures, and other such material that might be used as resource materials by others. Routine specifications and codes that are readily available elsewhere should not be included in appendices. Appendices should be structured systematically with titles that reflect the content.

6.3   Equations

Equations that are referred to later in the text should be numbered with right-justified Arabic numerals in parentheses. Equations may be numbered consecutively throughout the report (1, 2, 3, 4, etc.) or consecutively within each section (1.1, 1.2, 2.1, 2.2, etc.). Figure 8 illustrates the typical placement of an equation within a report.

To estimate the volume of lake sediment that must be excavated, an average of the cross-sectional areas between the lake transects was computed using

$$V_T = \frac{1}{2}\left(A_A + A_B\right)L_1 + \frac{1}{2}\left(A_B + A_C\right)L_2, \tag{1}$$

where V_T is the total volume of lake sediment to be excavated; A_A, A_B, and A_C are the cross-sectional areas at sections A-A, B-B, and C-C, respectively; and L_1 and L_2 represent the distances between cross-sections A-A and B-B and B-B and C-C, respectively.

Figure 8 Example of an equation layout in a work report

7.   Citations and References

Citations and references are meant to give authority to the contents of the report and to direct the reader to more details. For simplicity and clarity, the list of references is limited to publications that are cited specifically in the text or used as sources for tables and figures. General references not cited in the report should not be included in the reference list.

An important principle in citing published literature is that an individual reading a report should readily be able to obtain the reference materials. As much as possible, avoid citing obscure papers, course notes and personal communications, for example, as these may not be accessible to a reader of a report. You can give credit to these sources of information in your letter of submittal or the acknowledgments.

There are several alternative styles of documentation. This work report follows the American Psychological Association (APA) style, which is summarized in both Hacker (1996) and Buckley (2003). These books also include discussions of citations and references. These books are available in the University of Waterloo Bookstore or the library. Other references are available in section PE 1408 of the Dana Porter Library. Appendix A of these guidelines also contains explanations and examples of common grammar errors. Appendix B contains copies of the overhead transparencies used by Barb Trotter in her lectures about common grammar errors. Appendix C is a checklist of sample errors that your computer can help you find.

The following report excerpts (in italics) demonstrate common examples that show how references to literature should be cited in the text and incorporated in the reference list.

7.1   Journal Papers

Lafontaine (1988) has measured wind loads on very tall exhaust stacks in the mining areas of the Sudbury region.

or

Several authors have measured wind loads on tall exhaust stacks in the mining areas of the Sudbury region (Lafontaine, 1988; Yung, 1982), and these measurements have been used to establish design wind loads.

The reference list would then contain the following:

Lafontaine, P.W. (1988). Wind load measurements on smelter exhaust stack in   the Sudbury region. *Journal of Wind Engineering*, 17(5), 171–183.

Yung, F. S. (1982). Drag coefficients for large structures. *Journal of Structural Engineering*, 21(3), 99-103.

Italics are used to emphasize the document title used in a library search because authors of individual papers published in journals are not listed in library catalogues.

7.2   Books

McCarthy (1988) describes the analytical method that is most commonly used for slope stability analysis of the marine clays in the St. Lawrence Valley.

The reference list would then contain the following:

McCarthy, D.F. (1988). *Essentials of Soil Mechanics and Foundations: Basic Geotechnics*. Prentice Hall, Englewood Cliffs, NJ.

7.3 Technical Reports

Geometric design standards for major arterial roads are specified by the Ontario Ministry of Transportation (Highway Design Branch, 1992).

The reference list would then contain the following:

Highway Design Branch. (1992). *Geometric Design Standards for Ontario.* Ministry of Transportation of Ontario, Downsview, ON.

7.4 Electronic Sources

Electronic sources are relatively new, and many suggestions for methods of referencing them are available. The department has selected the following guidelines. The important consideration is that the reader needs to be able to access your sources. Items are to be cited in the text with the author and date as usual. For example,

Nutall (1999) has published a different opinion of MP3.

This item would appear in the list of references as follows:

Nutall, C. (25 September 1999). It's on MP3 but I like it. http://news.bbc.co.uk/hi/english/sci/tech/newsid_443000/443086.stm (retrieved 9April 2000).

The objective of referencing is to direct the reader to the original source. The URL and the search engine with key words are used to locate the new reference. If the author is not identified, use the name of the company or organization that posted the web site. Use the date last updated as the date of publication. If there is no date listed, use the date you accessed the site. The date of access is important to include in any case because the web page may have changed since you used it, and the reader may not be able to find the information without knowing the date.

7.5   References for Figures and Tables

All data, figures, diagrams, photographs and tables that are not your own must be cited. Even figures, diagrams and tables that you modify or adapt from another source must be cited accordingly. Failure to properly cite material that is not your own may result in a violation of academic integrity for plagiarism.

The reference or citation for the figure, photograph or table should be placed within the figure or table caption. Examples are shown in Figure 9, Figure 10 and Figure 11. The references cited in your figure/table captions must be included in your list of references, and should formatted in the same manner as described in Sections 7.1 through 7.4 depending on the reference type.

Proper citation of material that is not your own is essential in all situations. It should be noted that formal publication of your work, for example in a book, journal paper or conference proceedings, may also require you to obtain copyright permission from the original publisher or author of the source material, even when that material is properly cited. Guidelines for copyright requirements will be specified by the book, journal or conference publisher.
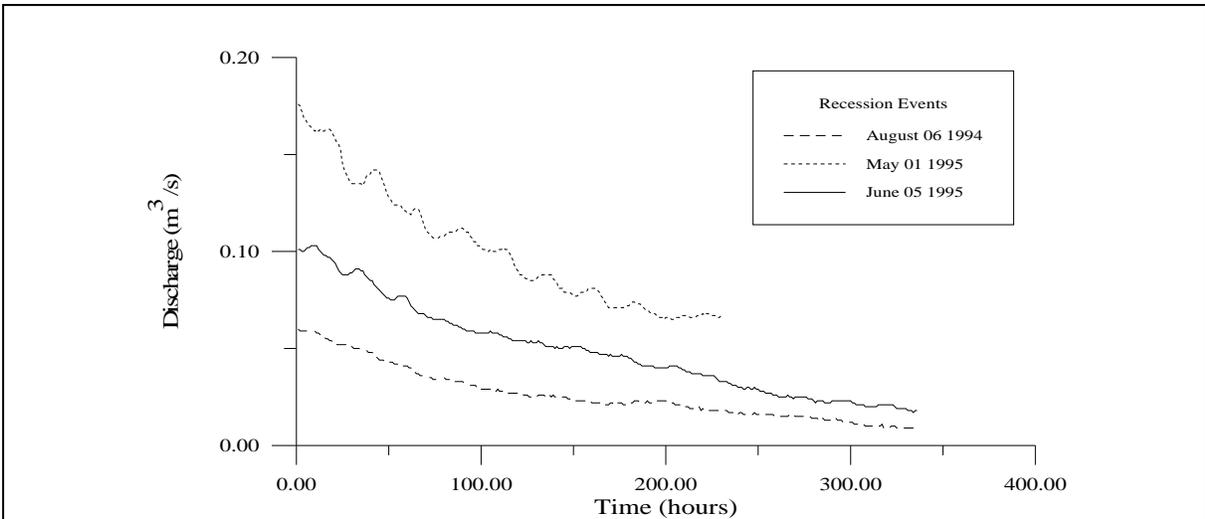
Figure 15   Streamflow recessions at the study site (Smith et al., 2009)

Figure 9 Example of a citation for a figure and data taken from a published source
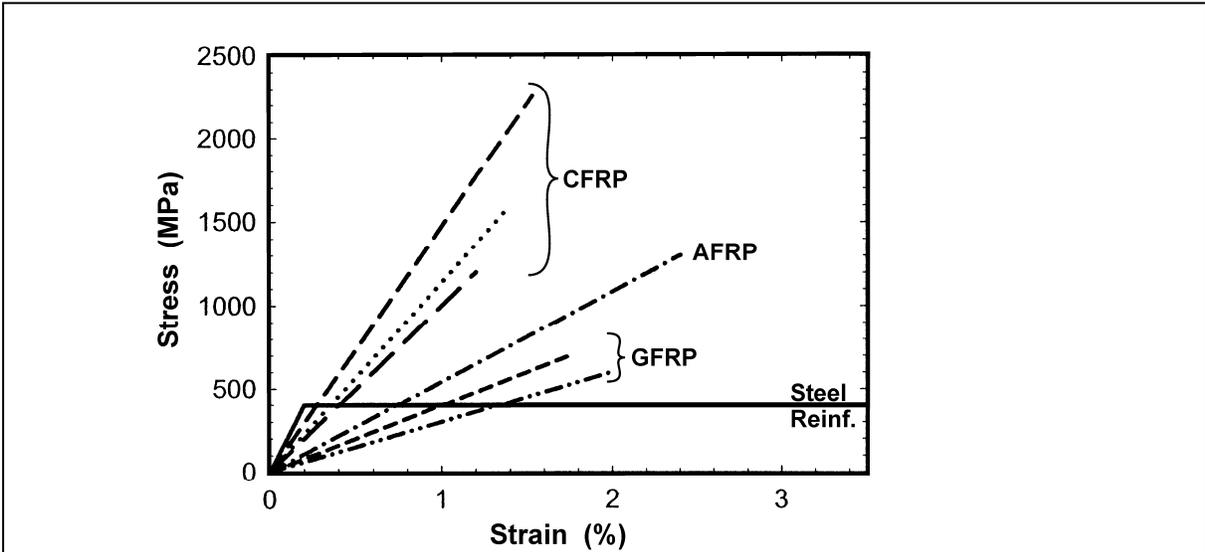
Figure 18 Comparison of typical stress-strain behaviour for various FRP bars (adapted from ISIS Canada, 2006)

Figure 10 Example of a citation for a figure adapted from a published source

Table 2   Qualitative comparison of FRP reinforcement types (ISIS Canada, 2006)

Criterion	Carbon FRP	Aramid FRP	Glass FRP
Tensile Strength	Very Good	Very Good	Very Good
Modulus of Elasticity	Very Good	Good	Adequate
Long-term Behaviour	Very Good	Good	Adequate
Fatigue Behaviour	Excellent	Good	Adequate
Alkaline Resistance	Very Good	Good	Adequate
Price	Highest	High	Lowest

Figure 11 Example of a citation for a table taken from a published source

8.   Glossary

If a glossary is needed, it should follow the last reference page. If your report involves

particularly specialized vocabulary, include a glossary of terms; otherwise, it is unnecessary.

References

Andrews, G.C. and Ratz, H.C. (1996). *Introduction to Professional Engineering* (5th ed.). University of Waterloo, Waterloo, ON.

Buckley, J. (2003). *Checkmate: A Writing Reference for Canadians*. Nelson Canada, Scarborough, ON.

Canadian Engineering Accreditation Board. (1993). *1993 Annual Report*. Canadian Council of Professional Engineers, Ottawa, ON.

Hacker, D. (1996). *A Canadian Writer's Reference* (2nd ed.). Nelson Canada, Scarborough, ON.

Appendix A - Common Grammar Errors

Explanation of symbols used for marking work report grammar

For additional information, see indicated sections of Buckley's *Checkmate* and Hacker's *A Canadian Writer's Reference*

ab – avoid abbreviations in a formal report

You may use i.e., e.g., and etc., as well as abbreviations for units of measure. All other words should be used in full, such as the names of days of the week, months, streets, provinces, etc.

ACR – define acronyms the first time you use them

If the acronym is a commonly understood term, such as PC or LAN, you may use it without defining it. A useful guideline may be whether all instructors and students in the Faculty of Engineering would know the term. When you de74fine an acronym, use the complete words first, followed by the acronym in parentheses. You may then use the acronym alone in the remainder of the report.

Correct –   Ministry of Transportation (MOT)

ad – adverb or adjective error – Buckley/Hacker G4

Adjectives describe nouns; adverbs describe verbs, adjectives, and other adverbs.

Incorrect – Drive slow. ("Drive" is a verb and must be modified by an adverb. "Slow" is an adjective.)
Correct –   Drive slowly.

agr – faulty agreement–Buckley/Hacker – G1, G3

Subjects and verbs must agree in number; pronouns must agree in number and gender with the nouns they refer to.

Incorrect – The statistical information about the three companies <u>are</u> listed on the Internet. ("Information" is the subject of the verb and is singular; therefore, the verb must be singular.)
Correct –   The statistical information about the three companies <u>is</u> listed on the Internet.

Incorrect – Each user sat at <u>their</u> own terminal. (The pronoun "their" is plural and cannot stand for a singular noun – "user.")
Correct –   Each user sat at <u>his or her</u> own terminal.
             The <u>users</u> sat at <u>their</u> respective terminals.

art – article (a, an, the) **missing or article not required – Buckley B1, Hacker T1**

Articles are complex in English; however, the most common article error**s** are the use of a singular, countable noun without an article and the use of "the" incorrectly. Countable nouns are ones that have a plural form and therefore can be counted, such as books, tables, hats, etc.; by contrast, non-countable nouns have only a singular form, such as information, software, music, etc. A singular countable noun must be preceded by an article, "a" or "an" for general and "the" for specific nouns.

Incorrect – Experiment must be conducted.
Correct –   An experiment must be conducted. (general singular)
             The experiment was successful. (specific singular)
             Experiments must be conducted. (general plural)

awk – awkward wording within the sentence

Generally, the sentence does not work and needs to be rewritten. Usually, the sentence does not correctly convey its intended meaning.

cap – capital letter error – Buckley M3, Hacker S3

Generally, generic terms are not capitalized, and specific proper names are. Be consistent throughout the report in capitalizing technical terms. Do not overuse capitals. Capitals are used to emphasize the relative importance of words, so the use of too many capitals detracts from the purpose of capitalization.

In titles, nouns, verbs, adjectives, and adverbs are capitalized, while articles, prepositions, and conjunctions are not.

comp – incomplete or inexact comparison – Buckley S6-c, Hacker E2-c

Do not use a comparative, e.g., "more" or "better," by itself. Specify more than what or better than what, or use the absolute form rather than the comparative.

Incorrect – The results show that method A is better.
Correct –   The results show that method A is better than method B.
             The results show that method A is very good.

Make comparisons between like items – you may have to insert "that of" or "those of."

Incorrect – Waterloo's engineering program is better than Western. (The program is compared to the university.)
Correct –   Waterloo's engineering program is better than <u>that</u> at Western. (The two engineering programs are compared)

cont – no contractions in a formal report

Use "cannot," "do not," "is not," etc. Do not use "can't," "don't," or "isn't."

cs – comma splice – Buckley G6, Hacker G6

Two independent clauses (complete thoughts) cannot be joined by a comma alone; use a period, a semi-colon, or a comma and a conjunction. Be especially careful with "however" and "therefore."

Incorrect – The experiment was a success, however, the model has no practical applications.
Correct – The experiment was a success; however, the model has no practical applications.
    The experiment was a success. However, the model has no practical applications.
    The experiment was a success, but further options need to be explored.

dm – dangling modifier – Buckley S1-e, Hacker E3-e

A dangling modifier is often the "ing" form of a verb with no "doer" specified. Make sure that whenever an action is implied in a descriptive phrase the noun described is the "doer" of the action.

Incorrect – By replacing the sewer system, the life of the infrastructure would be prolonged.
    (The life is not doing the replacing.)
Correct – By replacing the sewer system, the city will prolong the life of the infrastructure.
    If the sewer system is replaced, the life of the infrastructure will be prolonged.

Look for sentences that begin with "When doing …," "By doing…," "While doing…," etc. If you rewrite the sentence without the "ing," you have a better chance of avoiding a dangling modifier.

frag – sentence fragment – Buckley G5, Hacker G5

A sentence must be a complete thought, not a piece of a thought.

Incorrect – When the company decided to implement the proposal.
Correct – When the company decided to implement the proposal, many of the managers objected.

fs – fused sentence – Buckley G6, Hacker G6

Two independent clauses (complete thoughts) cannot be joined without punctuation. Use a period, a semi-colon, or a comma and a conjunction.

Incorrect – Method A is preferable to method B it costs less.
Correct – Method A is preferable to method B; it costs less.
    Method A is preferable to method B. It costs less.
    Method A is preferable to method B, and it costs less

h – hyphen missing or not required – Buckley M2, Hacker S2
If two or more words that are not adjectives are used together as one "made-up" adjective that says "what kind of" and they appear before the noun, they are hyphenated. If they appear after the noun, they are not hyphenated.

Correct – The Bombshelter is an on-campus pub.
    The Bombshelter is a pub on campus.
    A state-of-the-art computer is expensive.

Exception: Adverbs that end in -ly are not hyphenated.

Correct –   a well-regarded professor
            a highly regarded professor

mixed – mixed construction - Buckley S3, Hacker E5

Mixed construction indicates a sentence that contains elements that do not sensibly fit together. You cannot begin with one grammatical plan and switch without warning to another.

Incorrect – The results ranged between 300 to 500. "Between" is followed by "and." "From" is
            followed by "to."
Correct –   The results ranged between 300 and 500.
            The results ranged from 300 to 500.

Note that "is when," "is where," and "the reason is because," are not acceptable.

Incorrect – The reason the experiment failed is because the temperature was not controlled.
Correct –   The experiment failed because the temperature was not controlled.

mm – misplaced modifier – Buckley S1-c, Hacker E3-b

A modifier is an adjective (describes a noun) or an adverb (describes a verb, adjective, or other adverb) or groups of words that function as adjectives or adverbs. They are placed next to the words they describe.

Incorrect – The regulations set by the Ministry of the Environment for controlling effluent
            overflow are not strict enough. (It is not the environment that is for controlling the
            effluent overflow.)
Correct –   As set by the Ministry of the Environment, the regulations for controlling effluent
            overflow are not strict enough.

Particularly watch the word "only" and other restrictors that need to be placed immediately before the words they restrict.

Correct –   He only walked on the road. (This sentence indicates that the only <u>action</u> he was
            doing was walking.
            He walked only on the road. (This sentence indicates that the only <u>place</u> he was
            walking was on the road.)

om – omitted word

p – error in punctuation – Buckley 5P, Hacker P

, – comma required – Buckley P1, Hacker P1

no , – no comma – Buckley P2, Hacker P2

; – semi-colon error – Buckley P3, Hacker P3

: – colon error – Buckley P4, Hacker P4

' – apostrophe error – Buckley P5, Hacker P5

par or ¶ – new paragraph needed – Buckley W3, Hacker C3

A paragraph should be about only one topic. The initial sentence, called the topic sentence, should indicate the subject of the paragraph. When you change topics, you need to change paragraphs.

pass – ineffective passive – Buckley U4-c, Hacker W4-c, G2-h

In active voice, the subject of the sentence is the "doer" of the action, and the object is the receiver of the action. In the passive voice, the subject of the sentence is the receiver of the action, and the "doer" is the indirect object, usually after "by." The active voice is considered to be more effective writing than the passive because it is shorter and it specifies at the beginning of the sentence who is doing the action. In business and technical writing, very often you wish not to specify the "doer**,**" and the impersonal passive is permitted. The "doer" is not specified. However, if the doer is specified – usually after "by"– then you can put the sentence into the active voice.

Active   –   The engineer solved the problem. (use)
Passive –   The problem was solved by the engineer. (avoid)
Impersonal passive – The problem was solved. (use)

pl – plural form of the noun is required or is incorrect

This error is often connected with the article error. If the noun is countable, that is, if it has a plural form, you must not use it in the singular without an article; however, you may pluralize the noun rather than adding the article.

Incorrect **–** Report from the ministry indicated the required changes.
Correct **–**   The (or A) report from the ministry indicated the required changes.
              Reports from the ministry indicated the required changes.

prep – incorrect or missing preposition

Prepositions are connecting words. They have a noun or a pronoun as an object and form phrases that function as either adjectives or adverbs. The preposition used in any particular sentence is determined by idiom, that is, by custom over time.

Incorrect **–** The department decided to publish an analysis on the problem.
Correct –   The department decided to publish an analysis of the problem.

red – redundant – Buckley U2-a, Hacker W2-a

An important goal in technical and business writing is brevity. Redundant words repeat the meaning already stated.

Incorrect – Various different sources all provided the same statistics.
Correct –   Various sources provided the same statistics.

ref – error in pronoun reference/vague reference – Buckley G3-b, Hacker G3-b

Each pronoun must refer clearly to only one noun. "This," "that," and "which" are pronouns. When these words are used to indicate whole sentences or paragraphs, the error is called a vague reference. You can correct a vague reference by adding a noun.

Incorrect – Method A produces better results if the temperature is monitored. This must be carefully supervised.
Correct –   Method A produces better results if the temperature is monitored. This process must be carefully supervised.

rep – repetitive word choice – Buckley U2-b, Hacker W2-b

shift – distracting shift in tense or person – Buckley S2, Hacker E4

Maintain consistent tense. Stay in third person – he, she, it, they, nouns. Do not use "we" or "you."

S.I. – Provide the S.I. equivalent

sp – misspelled word

Use the spell-checker.

t – error in verb tense – Buckley G2-f, Hacker G2-f

Maintain consistent tenses. Consistent does not mean identical; it means that you write your report from one perspective with respect to time. It must be clear to the reader whether the project has not yet begun, whether it is in progress, or whether it has been completed. Statements that are universally true, such as the law of gravity, are always in the present tense. The present tense is also used to discuss the contents of the report.

Incorrect – This report will discuss the options available to the company.
Correct –   This report discusses the options available to the company.

vb – incorrect form of the verb – Buckley/Hacker G2

Use the grammatically correct forms of verbs.

Incorrect – The experiment run correctly.
Correct –   The experiment ran correctly.
             The experiment was run correctly.

w – wordy – Buckley U2, Hacker W2

Be concise. Eliminate unnecessary words.

Incorrect – In order to correct the problem, the company hired an expert due to the fact that the
             process was complex.
Correct –   Because the process was complex, the company hired an expert to correct the
             problem.

wc – word choice is incorrect, too informal, or too vague – Buckley U3, Hacker W1, W3,
**   W4**

Use correct, formal, standard language that the reader is expecting. Avoid vague words, such as
"things" or "do something." Check the specific examples in section B5 of Appendix B.

// faulty parallelism – Buckley S5, Hacker E1

Items in balanced expressions and lists require consistent grammatical structure.

Incorrect – It is easier to hit the computer than determining the problem. (not parallel – "to hit" is
an infinitive; "determining" is a participle.)
Correct –   It is easier to hit the computer than to determine the problem.
             Hitting the computer is easier than determining the problem.

? – unclear, or error in general usage, but the marker wonders whether it is correct for
**   technical purposes**

Appendix B - Barb Trotter's Lecture Notes

Part A. Good Practice

▪ **Use the Civil Engineering Guidelines.**

▪ **Use the specified order of pages and sections.**

▪ **Use the specified format for title/cover page.**

▪ **For the letter of submittal, use standard business letter format and address your letter to the incumbent Associate Chair, Undergraduate Studies.**

▪ **Tables and Figures**

1. Reference in preceding text – use the full word and capitalize it.
   Figure 1. Do not say "see" – it's redundant and second person.
2. Position in text – tables and figures should follow a.s.a.p. after being mentioned in the text, i.e., the next paragraph or the next page.
3. Position of headings – Table – top
   Figure – bottom
4. Landscape-oriented tables and figures – the bottom of the table or figure is at the outside edge of the page.

▪ **Do not put headings or the lead-in to a list by themselves at the bottom of a page. They belong with their sections.**

▪ **Use S.I. units or give the S.I. equivalent in parentheses.**

▪ **For References, use the method specified in the guidelines.**

▪ **Aim for a professional appearance.**

▪ **If you use block format with all lines left justified, you'll need to insert an extra space between paragraphs because some final lines in paragraphs extend to the right margin, and the reader cannot discern the beginning of a new paragraph.**

▪ **Use present tense to discuss the contents of the report.**

> This report will analyze the effects of temperature on concrete. (avoid)
> This report analyzes the effects of temperature on concrete. (use)

▪ **The summary, conclusions, and recommendations sections must not be longer than 1 page each. In fact, combining the conclusions and recommendations into a single 1-page long section is preferable. The goal is brevity.**

The conclusions section should contain
1. no new information, arguments, or discussion
2. no tables or figures
3. no references to sections in the body of the report
4. no repetition of the introduction or background information

▪ **References**
1. Include only sources referred to in the report - it's not a bibliography.
2. Use the method of citation specified in the Civil Engineering guidelines, the American Psychological Association (APA) system.
3. Put items in alphabetical order.
4. For electronic sources, include the date accessed. Follow the format specified in the Civil Engineering Guidelines.

Part B. Grammar Tips: Avoiding Common Errors

B.1   Dm – dangling modifiers

Present participles (going, doing, being, using, programming), when used without a form of the verb "to be," pretend to be either nouns or adjectives.

Noun – Studying is hard work**.**
Adjective – Hoping to win the jackpot, Tom bought a lottery ticket.

"Hoping" modifies the subject of the main clause in the sentence – Tom. Tom is also considered to be the "doer" of the action of hoping.

When it is not clear what the participle or adjective phrase modifies, it is called a **dangling modifier**. For example,

Incorrect – Deciding to join the Navy, the recruiter enthusiastically pumped Joe's hand.
Incorrect – Upon seeing the barricade, our car screeched to a halt.
Incorrect – Though only sixteen, the University of Waterloo accepted Mark's application.

Strategies for correcting dangling modifiers

Example 1. Walking home that evening, **the moon** lit our way. (Dangling – the moon can't walk.)

Correct by stating the doer of the action.

While **we** were walking home that evening, the moon lit our way.

Correct by making the subject the doer of the action.

Walking home that evening, **we** found our way lit by the moon.

Correct by rewriting.

We walked home that evening with the moon lighting our way.
That evening, the moon lit our way home.

Example 2. When purchasing software, cost should be the primary consideration. (Dangling – cost isn't purchasing the software.)

Correct by using the impersonal passive:

When software **is purchased**, cost should be the primary consideration.

Example 3. By taking careful measurements, the problem was solved. (Dangling – the problem didn't take the measurements.)

Correct by using a gerund (participle used as a noun):

Taking careful measurements solved the problem.

Other examples:

While employed at ABC Company, my research was devoted to concrete. (Dangling – the research wasn't employed.)

While I was employed at ABC Company, my research was devoted to concrete.

To receive a rebate, a report must be filed. (Dangling – the report doesn't receive a rebate.)

For the company to receive a rebate, a report must be filed**.**

B.2   Commas and Other Punctuation

Commas are structural indicators – they set off the "extra bits" in a sentence.

1. Put a comma after introductory word groups, that is, words, phrases, or clauses that appear before the subject of the main clause.

Incorrect – For any location within the drawing information applicable to the case must be specified.
Correct – For any location within the drawing, information applicable to the case must be specified.

2. Use a comma before descriptive elements at the end of a sentence, such as a participial phrase.

The new system regulated many of the city's facilities, including sewers.

3. Use commas around parenthetical expressions inserted in the middle of a sentence.

My professor, Dr. Smith, likes us to stay awake in class.

4. Use commas to indicate non-restrictive elements – extra information.

For camp, the children needed clothes that were washable. ("…that were washable" is restrictive.)
For camp, the children needed sturdy shoes, which were expensive. ("…which were expensive" is extra; "sturdy" is the restrictive part.)

5. Do not put a comma between two items joined with a conjunction unless the items are independent clauses.

The engineer and the accountant worked overtime. (a+b)y
The engineer worked overtime and complained about it. a (x+y)
The engineer worked overtime, and the accountant complained about it.

Incorrect – The river runs beside the road and the power plant and the dam are nearby.
Correct –   The river runs beside the road, and the power plant and the dam are nearby.

6. Put a comma after the second last item in a series.

Civil engineers write interesting reports about concrete, traffic, and pipelines.

7. Do not put one comma between the subject and its verb.

Incorrect – The main concern about implementing the proposal, is the cost.

There can be two commas between the subject and its verb.

The book, which I had already read, was on the table.

8. cs – comma splices

These are the choices for joining two independent clauses:
;
. T
, and (or another conjunction)

9. Conjunctive adverbs: however, therefore

> **If they appear between two complete sentences, they are punctuated either with a semi-colon or with a period:**

I read a report about sidewalks; however, I do not understand what the alligators are doing with the polygons.

The concrete did not slump. Therefore, the sidewalks will not have alligator cracks.

> **If they appear within one complete sentence, they are punctuated with commas as follows:**

The load, however, was calculated incorrectly.

10. : -- colon

> **" :"** means **and that is**
>   or
>   **and they are**

> **You should not place a colon between a verb and its completion or between a preposition and its object.**

The reasons are
    1.
    2.
    3.

The reasons are the following:
    1.
    2.
    3.

The report was written by
    1.
    2.
    3.

The equation is
    $a=b$
where a and b are variables

The equation is as follows:
    $a=b$
where a and b are variables

11. ; – semi-colons have only two uses

a) A semi-colon has the same weight as a period. It needs an independent clause (complete sentence) on either side. Use it when the two ideas are closely connected.

I never use semi-colons; I don't know where to put them.

b) **In a list of three or more items, if at least one item has internal punctuation, separate the items with semi-colons.**

> The electives were English; Sociology; Sexuality, Marriage and the Family; and Economics.

B.3   mm – misplaced modifier

Modifiers (adjectives and adverbs) are placed next to the words they modify. "Only" is a restrictor, which is like a multiplier and restricts whatever comes immediately after it. The position of "only" in the following sentences changes the meaning according to where it is placed.

a   + b   + c + d
He walked on the road.

a   +   2b   + c + d
He only walked on the road.

a   + b   + c   + 2d
He walked on the only road.

a   + b   + 2c + d
He walked only on the road.

2a   +   b   + c + d
Only he walked on the road.

The same rules apply to other restrictors – primarily, just, mainly, etc.

Too many modifiers:
> The **general manager** decided to implement the policy recommended by the Engineering Department that would reduce the cost of the project to gain a competitive edge.

> To gain a competitive edge, the general manager implemented the cost-reducing policy recommended by the Engineering Department.

Expressions of time, place, and purpose that modify the entire sentence should be placed at the beginning of the sentence.

B.4   h – hyphens

> The Bombshelter is an on-campus pub.
> The Bombshelter is a pub on campus.

> We saw three big gray whales. (no hyphens)

> I bought a state-of-the-art computer.

> An old car repairman – the man is old
> An old-car repairman – the cars are old

set up, back up, log on, etc:

When each of the above terms is used as a verb, it is two words. If used as a noun or adjective, it is one word or hyphenated. For example,

He set up the computer system.
The computer set-up (or setup) works very well.

B.5   Wc – word choice

▪   **because/as**

"As" can be used to mean "because" as long as there is no possibility that it will be misinterpreted to mean "while."

> The process is implemented as the container becomes very hot. (ambiguous)

When in doubt, use "because" or "while."

▪   **Affect/effect**

Affect is usually a verb. "A" for action word.
Effect is usually a noun. th<u>E Ef</u>fect

> The results of the experiment were affected by the effects of humidity and temperature.

▪   **i.e. = that is = the whole set**
     e.g. = for example = a subset

> The weather, i.e., atmospheric conditions…
> The weather, e.g., rain and snow…

Note that both abbreviations are followed by a comma – they are parenthetical.

▪   **if/whether**
     Do not use "if" when you mean "whether."
     "If" implies one condition; "whether" implies two.

> I wonder whether it will rain.
> If it rains, we will cancel the picnic.

▪   **allow for = make allowance for; allow = permit**

     Do not add the "for" if the sentence works without it.

The calculations allowed for the weight of the snow.
The system allowed users to log on.

- **as well as = in addition to**

  Do not use "as well as" where "and" will do.

Incorrect – The company needed to reduce its emissions of chlorine, carbon monoxide as well
  as ozone.
Correct – The company needed to reduce its emissions of chlorine, carbon monoxide, and
  ozone.
  The company needed to reduce its emissions of chlorine and carbon monoxide as
  well as that of ozone.

- **that**

ensure that, provide that, recommend that, etc.

These words are followed by a direct object – a noun or a noun clause.
If the object is a clause, it should begin with the word "that" to indicate that a verb follows.

Incorrect – To ensure an accurate description of events is presented, she reads the reports
  carefully.
Correct – To ensure that an accurate description of events is presented, she reads the reports
  carefully.

Incorrect – Everybody knows a turkey and some mistletoe help to make the season bright.
Correct – Everybody knows that a turkey and some mistletoe help to make the season bright.

- **Recommend**

  Do not use an infinitive after recommend.

Incorrect – It is recommended to publish this report.
Correct – It is recommended that the report be published.

- **Do not begin a sentence with "also." Use "in addition" or "furthermore" or place the
  "also" within the sentence.**
- **"Data" is to be used for the plural only.
  Use "datum" for the singular.**
- **"As such" does not mean "therefore." "Such" is a pronoun that must stand for a noun.
  Ask, "As what?" If the answer is not the noun immediately preceding the sentence, use
  "therefore."**

Incorrect – The project is behind schedule. As such, it will not be completed in time for
        inspection. **(Such does not refer to schedule)**
Correct –   The project is behind schedule. Therefore, it will not be completed in time for
        inspection.
Correct–   The project is a government-funded initiative. As such, it requires government
        approval. **(Such does refer to initiative)**

B.6   Constructions Tips

- **/ slash**

Do not insert spaces on either side of a slash.

Incorrect – The guidelines specify the ways to treat tables and / or figures.
Correct –   The guidelines specify the ways to treat tables and/or figures.

- **Mixed constructions**

Be careful to use the correct combination of words in expressions.

      not only…but also

      between…and
      from…to

      The values range between 6 to 10. (incorrect)
      The values range from 6 to 10.

      Note that "–" is a substitute for "to". Thus, "6–10" is the same as "6 to 10".

- **Countable nouns**

**Countable nouns are expressions of individual units, such as marbles. They have a plural
form.**

**Non-countable nouns, such as information or software, are lumps. They cannot be used in
the plural. Different words accompany countable and non-countable nouns:**

      an **amount** of work, but a **number** of employees
      fewer calculations, but **less** knowledge

Input, software, and impact are not countable and may not be used in the plural.

- **w – wordy**

Be concise. Do not use more words than you need to state the meaning clearly. Do not use vague words, such as "some," "a lot," "things," "do something," etc. Avoid the use of "there is" or "there are" and "it" as an indefinite pronoun.

> All the beams were designed based on the species of wood being Douglas fir. (wordy)
>
> All the beams were designed for Douglas fir.
>
> It is good practice to check the results. (wordy)
>
> Checking the results is good practice.

- **agr – agreement**

The verb must agree in number with the subject.

> The concrete slumps. The engineer's shoulders slump.

Note that a compound subject is plural.

Incorrect – A westbound left-turn lane and an eastbound acceleration lane **is** proposed.
Correct –   A full assessment of the present conditions and a complete cost estimate **are** required.

Incorrect – A **pronoun** must agree with the noun **they** stand for in number and gender.
Correct –   A **pronoun** must agree with the noun **it** stands for in number and gender.

Incorrect – Each **user** sat at **their** own terminal.
Correct –   Each **user** sat at **his or her** own terminal.
             The **users** sat at **their** respective terminals.

- **art – article**

non-countable nouns – ones that are a lump and have no plural form, such as information, justice, etc.

countable nouns – ones that are individual units and have a plural form, such as hats, books, etc.

The articles rules, for countable nouns only, follow:

	Singular	**Plural**
Specific	the	the
General	a/an	no article

You can't say   hat (incorrect)
You must say   a hat
          or   hats
          or   the hat(s)

The noun "of something" is specific; therefore, it usually needs the definite article.

The University of Waterloo – not University of Waterloo

- **awk – awkward**

A word cannot have more than one function in one sentence.

Incorrect – In the construction industry provides a major job market.

"Industry" cannot be both the object of the preposition "in" and the subject of the verb "provides."

Don't use a pronoun to state the subject twice.

Incorrect – In the construction industry, **it** provides a major job market.
Correct –   The construction industry provides a major job market.

Make sure that the pieces of your sentence fit together precisely.

   1. It would be best to find potential tenants and what use they plan for the warehouse.
            (incorrect)
                     2   (**a**   +
      [It would be best to find] [potential tenants] [and] [what use
            b   )
      they plan for the warehouse.]

   2(a+b) – both the 2a and the 2b must work. You can't say "find what use they plan…"
   You have to say "find out what use they plan…"

       It would be best to find potential tenants and to determine the use they plan for the
       warehouse.

       It would be best to find potential tenants and to determine their planned use for the
       warehouse.

   2. Replacing the floor will make the entire floor stronger and will last longer. (incorrect)

                     2   **a**   +
      [Replacing the floor] [will make the entire floor stronger] and

b
[will last longer.]

It isn't the replacing that will last longer–it's the floor. The 2b doesn't work.

Replacing the floor will make the entire floor stronger, and a new floor will last longer.

<div style="text-align:center">a   b</div>

3. Self-cladding is [the most efficient], [one of the most cost-
<div style="text-align:center">c   y</div>
effective,] and [most aesthetically pleasing] option.

(a+b+c)y – by doesn't work because you can't say "one of the most cost-effective option"– it needs to be "options."

Self-cladding is the most efficient and most aesthetically pleasing option; it is also one of the most cost-effective solutions.

Watch "required." Sometimes the meaning is ambiguous because "required to" means "has to."

Incorrect – The new equipment was required to begin the process. (The equipment didn't have to begin the process.)
Correct –   The new equipment was required in order to begin the process.

Count the separate items in a list and make sure you put an "and" between the last two complete items.
<div style="text-align:center">1   2</div>
The site was examined with respect to [geology], [hydrology],
<div style="text-align:center">3</div>
[types and distribution of contaminants.] (incorrect)

a+b+[(c+d)y] – the last item in the list is the whole phrase "types and distribution of contaminants."

The site was examined with respect to geology, hydrology, and types and distribution of contaminants.

- ▪ **ref – pronoun reference**

A pronoun stands for a noun – he, she, it, they, this, that, these, those, etc. A pronoun stands for one noun, and it must be very clear which noun the pronoun stands for.

Incorrect – The manager considered the result of the experiment and the opinion of the researcher. He determined that it should be the deciding factor.
Correct –   He determined that the researcher's opinion should be the deciding factor.

Always put a noun with the word "this."

Incorrect – This means that you must be careful when you use pronouns.
Correct –   This rule means that you must be careful when you use pronouns.

- ▪ **// parallel structure**

Balanced expressions, such as ones with "and," "or," "not only…but also," and comparisons, and items in a list should all have the same grammatical structure. Parallel structure avoids jarring the reader and also provides a navigational tool to clarify how the sentence fits together.

> She is responsible for stocking merchandise, all in-store repairs, writing orders for delivery, and sales of computers.
> > (not parallel **–** 2 participles and 2 nouns)

> She is responsible for stocking merchandise, repairing items in the store, writing orders for delivery, and selling computers. (parallel)

> It is easier to hit the computer than determining the problem. (not parallel – one infinitive and one participle)

> Hitting the computer is easier than determining the problem. (parallel)
> It is easier to hit the computer than to determine the problem. (parallel)

B.7   lists

- ▪ **Both of the following formats are correct:**

  Example – **no punctuation**
  The study of engineering will help you
  - ▪ think clearly
  - ▪ solve problems
  - ▪ find a job

  Example – **commas and a period**
  The study of engineering will help you
  - ▪ think clearly,
  - ▪ solve problems, and
  - ▪ find a job.

- ▪ **If one of the items in the list contains internal punctuation, the items must be separated by semi-colons.**

Example – **internal punctuation**

The study of engineering will help you
- think clearly;
- solve difficult, complex problems; and
- find a job.

- **If the items in the list are complete sentences, semi-colons or periods can be used.**

  Example – **complete sentences in a list**

  The study of engineering will help you in the following ways:
  - you will learn to think clearly;
  - you will increase your problem-solving abilities;
  - you will have a better chance of finding a job.

  The study of engineering will help you in the following ways:
  - You will learn to think clearly.
  - You will increase your problem-solving abilities.
  - You will have a better chance of finding a job.

- **If the items in the list are very long, the lead-in should be a complete sentence with a period.**

  Example – **long list items**

  The study of engineering will help you in the ways described in the following sections.

Appendix C - Proofreading Checklist

Use the "find" function on your computer to check for the following:

1. **This** – Is it followed by a noun, that is, "this something"? If not, insert a noun.

2. **However, therefore** –

   Is it between two complete thoughts? If so, it needs a semi-colon or a period before it.

   Is it in the middle of one complete thought? If so, it needs a comma before it.

   Note that a comma usually follows these words.

3. **Allow for** – Can you remove the "for"?   If so, do it.

4. **Only** – Do you want it to restrict the word that immediately follows it?

5. **'t** – Check for contractions. If there are any, change them to the complete words.

6. **Between** – Is it followed by "and" and not "to"?

7. **By** – Is the sentence in the passive voice with the "doer" specified? If so, change it to active voice.

8. **You/your, we/us/our** – Change to third person.

9. **In order** – If it is at the beginning of a sentence, delete it.

10. **Data** – Is it plural? If not, use datum.

11. **If** – Is there one condition or two possibilities? If two, use "whether."

12. **Its, it's** – "it's" is a contraction of it is or it has. The possessive form is the one without the apostrophe.

13. **As such"** – Does the such refer to a noun? That is, can you ask, "As what?" and the answer is a noun immediately preceding the sentence? If not, and if you're using "as such" to mean "therefore," change it to "therefore."

14. Any other errors that you know you repeat. Look for a common word or group of words to check for.

Appendix D – Writing Tips

Writing Tips

1. Reports should be double-spaced and use 12-point Times New Roman font.

2. The summary, conclusion, and recommendations should be no longer than one page each.

3. Always introduce a table or figure with a sentence or two before it is inserted.

4. Write in the third person. For example, rather than writing "I think …", write "The author thinks …"

5. Read your writing out loud whenever possible, especially the introduction. This will help you hear the clarity of your writing.

6. The three major parts of your report are the introduction, the body, and the conclusion. Think about these three parts resembling a diamond. Both tips of the diamond (the introduction and the conclusion) should be short and precise. The body of the report is the widest part of the diamond where you support the precise points from your introduction.

7. You do not have to write a work report chronologically from start to finish. Maybe you will choose to start working on the body of your paper first, or you will write your introduction last. The point is, start with the parts you feel most confident writing about and then build everything around it.

8. Finish writing your report well before the deadline so that you have time to process and edit what you have written. It is much more manageable to write a page or two every day for a few weeks, rather than writing the entire report the day before the deadline.

9. Reference all ideas, data, tables, and figures that are not your own. All references should be in APA format.

10. Do not rely on a thesaurus; if you do not understand the meaning of a word, it would be best not to use it in your report. Stick with a vocabulary you are comfortable with, even if it is simple.

11. Avoid using contractions. For example, use "do not" rather than "don't".

12. When you write about your work term, use the past tense.

13. Write your conclusions and any scientific truths in the present tense.

14. You need only use the future tense if some part of your project is still ongoing.