# Report Writing and Structure Guide

Edmund Pickering ei.pickering@qut.edu.au

February 26, 2020

Document Version: 1.3

The latest version of the style guide can be found at http://www.edmundpickering.com/resources/ or via email mailto:ei.pickering@qut.edu.au.

# List of Contributors

Kinds thanks to the following contributors for providing their time, knowledge, and experience in the production of this guide.

- Christopher From
- Edmund Pickering
- Mark McDougall
- Nathan Pember
- Sarah Barns
- Timothy Bodisco

I care about the quality of this document. Please let me know if you find any typos or errors. Also, I am always looking for new contributors, if interested, let me know.

# Contents

1	Intr	oduction: How to use this guide	1				
<b>2</b>	The	Basics	1				
	2.1	Report Structure	1				
	2.2	Golden Rules	2				
	2.3	Sections of a report	3				
		2.3.1 Letter of Transmittal	3				
		2.3.2 Cover Page	3				
		2.3.3 Executive Summary	4				
		· · · · · · · · · · · · · · · · · · ·	4				
			4				
			4				
			4				
		•	4				
			5				
			5				
		,	5				
			5				
3	Lan	guage and plain English	6				
4	Por	ort Elements	8				
4	4.1		8				
	4.1	Figures					
	4.3	Tables					
	4.4	Units and Numbers					
	4.5		0				
		•					
5		natting 1					
	5.1	Text Alignment					
	5.2	Section Numbering					
	5.3	Page Numbering, Headers and Footers					
	5.4	Citations and In-text Referencing	2				
6	Wo	rd Tools for Speedy Typesetting 1	<b>2</b>				
	6.1	Styles & Automatic Heading Numbering	2				
	6.2	Automatic Table of Contents	3				
	6.3		3				
	6.4	<u> </u>	3				
	6.5		3				
	6.6		3				
	6.7		4				
7	Assumptions and Errors						
	7.1	-	4				
	7.2	Discussion of errors					

8 Conclusion 15

Not all reports require a TOC. If you're including one just to make your report longer, you may wish to reconsider. In this document, its length potentially does not justify a TOC, however the large number of section headings may.

# List of Figures

this document.

1	Band-pass filtered pressure signal at 2000 rpm, full load on neat diesel	
	fuel (this is a good figure, note the descriptive caption and easy to	
	$interpret\ information)$	9
2	Pressure vs crank-angle (this is a poor figure, the caption isn't de-	
	scriptive, scales and axes are hard to read, useless legend)	9
3	Become familiar with and use automatic styling and section numbering	12
4	Automatic table of contents, citations, and captions	13
5	Centering an equation in Word using a table	13
6	Page breaks, section breaks, etc	14
7	Format page numbers	14
$\mathbf{List}$	of Tables	
1	Appropriately descriptive caption	10
Not all 1	reports will require a list of tables. If you just have one or two tables this maybe redundant, as	in

# 1 Introduction: How to use this guide

Report writing is a fundamental skill of the engineering profession. Engineers are constantly required to record and distribute knowledge and findings from their work - reports are one of the main tools for doing this. A good report will flow naturally and lead the reader without unnecessary jumps and pauses in logic. Key to this is having a logical structure and format, as well as avoiding any cues which will cause the reader to pause and question your work.

This guide has been developed to aid in the development of high quality reports. In this, the standard conventions for high quality reports will be detailed, such as structure, formatting, and the use of figures, tables and other similar tools. Furthermore, tips and trick for report writing in Word will be shared. To maximise the quality of your reports, it is recommend you read this guide and understand its content. If you have any further question, ask you tutor.

Remember, this is just a guide. There is no one single way to write a report. Use your best judgement. A good report will be consistent and logical.

### 2 The Basics

### 2.1 Report Structure

The general flow of sectioning in a report is as follows:

- Front matter
  - Letter of Transmittal (optional)
  - Cover Page
  - Executive Summary (optional)
  - Table of Contents
  - List of Figures (optional)
  - List of Tables (optional)
  - List of Equations (optional)
- Body
  - Introduction
  - Other body headings
  - Conclusion
- Back matter
  - References
  - Appendix (optional)

This is the general report structure, vou can modify this to suit your needs. You don't need all these sections. Remember, you're the one who knows what you want to say, make an informed decision on the appropriate structure for your work.

Depending on the length and context on the report, some of these headings can be neglected (e.g. letter of transmittal, list of tables). As the author, it is up to you to make intelligent decisions on how to best present your work.

#### 2.2 Golden Rules

Above all else, these are the golden rules of report writing and formatting. Following or breaking these rules will have large impacts on how your report is perceived, read, and overall the grade it receives.

- Consistency: One of the most obvious signs of a report which hasn't received the care and attention it deserves is a lack of consistency. This is immediately noticeable and commonly manifests as a change of heading format, table themes, or figure styles.
- Informative and concise: Don't waffle, write want you want to say directly and without ambiguity. Your audience is reading your work to gain information; deliver that information as quickly and efficiently as possible (as engineers we care about efficiency). Think about how much pain it would cause your marker if they are constantly faced with needlessly long sentences and paragraphs.
- Language: Third person, professional, correct, and don't exaggerate. Avoid contradictions (these can commonly appear if you are sloppy with your language).
  - Don't use complex words for the sake of using complex words. Aim for simple, efficient and correct language. Don't be a sesquipedalian (see, this sentence isn't wrong, but I doubt many of you know the meaning of sesquipedalian).
  - Only use words you understand and your reader will understand. If you're one to use a thesaurus to find fancy words, ensure you know the correct meaning before using it.
- Audience: Consider your target audience. In many cases your target audience will be other engineers (or someone with basic engineering understanding). In these cases you don't need to define or explain concepts which would be common knowledge (e.g. what is a stress-strain diagram). Consider the types of wording and terms your target audience would be familiar with. Consider the familiarity your audience has of your report's topic, for example if you're writing a report about a bridge design, ensure you detail the project first before you detail your solution. (A good rule of thumb is to assume your audience is a fellow engineer with similar knowledge to yourself, but who isn't familiar with your project or work.)

• Flow: Your report should flow and have a logical order. Information should be presented as needed.

A cynical take on report writing is that the reader should be able to read your report and not have an original thought You should tell them exactly what to think and when to think it, giving the required information and no more. Every time the reader pauses to think, it detracts from the flow of the report.

It is also common that your work may be being read by non-engineering professionals, in such cases modify your language and style to suit.

- One idea per paragraph: Each paragraph should consist of a single concise idea or message. If you have multiple ideas in a paragraph you should consider splitting the paragraph. Remember a paragraph should have at a minimum three sentences (opening, body, closing (and linking to next paragraph)).
- Text should always follow a heading: Never have a heading immediately followed by a figure or tables. You should always have text which introduces the section, figure, or table. The only caveat to this if a heading being immediately followed by a subheading (and even in this case it can detract from your work).

### 2.3 Sections of a report

The many sections of a report are often misused. For clarification, common sections of a report are discussed below.

#### 2.3.1 Letter of Transmittal

A letter of transmittal is exactly as its name would suggest, a letter attached to the front of a report when it it being transmitted. Traditionally, these where used when mailing a report, generally the letter should say what is contained (i.e. the report), why they are receiving it, and what they should do with it. A letter of transmittal can be informal and very simple (just a few sentences) or can be formal and detailed. A letter of transmittal can also be in the form of an email with the report attached.

ed. an email with ed. an attached document, your

You probably regularly use

a letter of

transmittal.

When you send

are effectively

writing a letter

of transmittal.

An example of a simple letter of transmittal is shown below.

Dear Mr Smith,

As discussed, please find attached the draft version of our report on agricultural pesticide usage and its impact on sea turtle embryonic development. Specifically can you peruse the section of pesticide run-off (Section 2.3) and check for factual accuracy. Once you are happy with this we will send the report up the chain.

Kind Regards, Edmund Pickering

### 2.3.2 Cover Page

The key to a good cover page in simplicity; as a bare minimum you should include a title and your name (and student number). Make life easier for your tutor however and include a title (and possibly subtitle), name, student number, subject, group number, group members, tutorial and tutor. You can, and are encouraged to, make your titles page 'pretty,' however ensure the aesthetic matches your report.

Ensure your cover page details are correct (if you spell your tutors name incorrectly they will cry).

### 2.3.3 Executive Summary

The executive summary is a summary of your entire report, it is intended to be read in lieu of reading the report. One should be able to read the executive summary (without the report) and know the key details of the report. Not all reports require an executive summary, only those too long to be read in full (considering your audience). Think about your main report audience (potentially your boss) and what will be most important for them to know. Generally the executive summary should include a summary of the problem, methodology and solutions/conclusions.

An abstract is used in scientific articles.
A report has an executive summary, a scientific article has an abstract.

- The problem summary provides context to the section. Your reader may not be familiar with your work or with the topic of the report, and as such needs to be informed. Ensure to cover key problem information.
- In the methodology, the general approach(s) taken should be detailed. Any key techniques, considerations, or decisions should be included.
- The solution summarises the outcomes, results, or conclusions of the report. You should also mention major limitations or errors of you solution.

#### 2.3.4 Table of Contents

Include a table of contents if the length of your report justifies it. Ensure it is neat and fits the aesthetic of the report. When using Word ensure all your bookmarks match and are updated.

#### 2.3.5 List of Figures

As like the table of contents, include as required and ensure it fits the aesthetic.

#### 2.3.6 List of Tables

As like the table of contents, include as required and ensure it fits the aesthetic.

#### 2.3.7 List of Equations

As like the table of contents, include as required and ensure it fits the aesthetic. List of equations are less common but can sometimes be useful.

### 2.3.8 Introduction

As its name suggests an introduction should introduce the report, as a general rule the introduction should start broad and become more specific as it progresses and as you narrow the scope and provide context to the later sections of the report. In general an introduction should answer the following questions:

- What are you going to talk about in the report? The broad topic of the report.
- What are you trying to do with the report topic? The purpose/aim/direction of the report.

- What specifically are you going to cover in the report? The scope of the report, this should also include any limits to what you are going to cover.
- What is the necessary background information to understand the following report content? This should be any relevant information to provide a clear understand of later report content, it should include any relevant theories or methodologies that will be applied.

After the introduction the reader should know exactly why the report was produced, what the report will/wont cover, as well as any relevant background information. The reader should also have a broad understanding of how the report will address its objective.

#### 2.3.9 Other Body Headings

Any relevant subheadings of the report.

#### 2.3.10 Conclusion (and Recommendations)

Conclusions can be awkward and hard to write. A good conclusion should bring the report to a close and tie up any loose ends. Generally in the conclusion you should summaries your report; restate the purpose of the report, state any important information from the body, state any outcomes, results or final statements. Remember the conclusion is likely the last part of your report someone will read and as such will sit in their memory, consider what you want the reader to think about when they put down your report. You may also change the title of this section to other similar headings such as *Recommendations*, *Summary*, etc.

2.3.11 References

Your list of references should be at the start of your back matter; this should exist on its own page. Note, this is a list of references, not a bibliography. A bibliography is a list of works from which your work derives (a bit like a list of further reading). A list of references directly lists the sources of your work. Ensure your list of references follows a standard acceptable format.

#### 2.3.12 Appendix

The appendix should include any supporting content to the report. This would include items such as full data sets, code or full sets of calculations. If information is required in the report, but is not directly relevant, or is of a length/size which would detract from the report body, it should be placed in the appendix. If content is to be included in the appendix it must be referred to in the body of text and be relevant to the section where it was referred. The standard formatting rules apply, including captions on tables, figures and equations and a paragraph providing context to the appendix (it isn't sufficient to just dump data in the appendix, it must be formatted like the rest of your report).

There is nothing wrong with starting a conclusion with 'in conclusion.' It isn't pretty, it can definitely be improved upon, but if you are really struggling to write your conclusion it may help.

# 3 Language and plain English

Getting the language right can be one of the largest challenges of report writing. Generally, language should be concise and to the point. One advantage is that concise language will results in an shorter and simpler report.

Generally, a report should be written in *plain English*. This is English which is simple and easy to understand. Dr Lynn Dicks developed a superb series of rules on plain English which are summarised below, these can also be found in following video: https://youtu.be/Mn7f5tsgjx8. Please note, I am essentially copying Dr Lynn Dicks ideas here, she is the original author.

- Rule 1 Put the important message at the start: As an example, consider the sentence, Milk, bread and cheese are the things you need to buy. This sentence is hard to read because the reader must read the entire sentence, because they know what's important (it's a list of things to buy). Instead, put the important thing first You need to buy milk, bread and cheese. This applies to sections, paragraphs and sentences.
- Rule 2 Write short sentences
- Rule 3 One sentence, one idea
- Rule 4 Vary the rhythm: Just like listening to a monotonous person is painful, reading a monotonous report is also painful. Varying you sentence length (e.g. add some very short sentences) can help break up the writing and make it more enjoyable to read.

Consider the section: A feature of today's concern is the attempt to understand the complexities surrounding scarcities, involving a number of different dimensions of scarcity, of the interactions between these different dimensions and between the different scarcities themselves. A better understanding of the complexities surrounding scarcities and how they are linked is essential to ensuring that decisions are made that are conducive to the emergence of a more sustainable world. Two sentences (35 and 32 words), total of 67 words.

This is complex to read, it has long sentences, multiple ideas per sentence, and no rhythm. Instead, this can be rewritten as: Understanding the complexity of scarcities is an important concern today. Global scarcities interact. Lack of land and lack of food are strongly linked, for example. Scarcities have different dimensions, which also interact. Changes in the amount of food per person depend on the number of people and what each person eats. We need to understand such complexities, to help make decisions that lead to a more sustainable world. Six sentences (10, 3, 12, 7, 19, 17 words), total of 68 words.

The rewritten form has a much nicer rhythm by varying sentence length.

• Rule 5 – One paragraph, one idea

• Rule 6 — Avoid nominalisation: Normalisation is the process of turning a non-noun (e.g. verb, adjective or adverb) into a noun. Often, people use nominalisation because it sounds 'smart,' really it just makes your text hard to read.

Generally, nominalisation can be identifies by the use of the suffixes, for example:

- -ion as in evaluate (verb) to evaluation (noun).
- -ness as in careless (adjective) to carelessness (noun).
- -ty as in difficult (adjective) to difficulty (noun).

Nominalisation has two problems, it makes our writing less active, and it makes our sentences longer.

#### Consider the sentences:

- The *evaluation* of possible dam failure mechanisms is a challenge.
- The *carelessness* of engineering practice was high, leading to dam failure.
- The difficulty of dam maintenance should not reduce reliability.

By removing the nominalisation, the sentence is shorter and easier to read.

- Evaluating possible dam failure mechanisms is a challenge.
- Engineering practice was *careless*, leading to damn failure.
- Dam maintenance is difficult but should not reduce reliability.
- Rule 7 Avoid jargon: Jargon is language specific to your field. It can be
  efficient when communicating within your field, but can be a major barrier for
  out-of-field readers. Use jargon only when it is efficient and beneficial. For
  example phytophagous refers to plant eating insects, this is jargon which can
  be easily avoided. However, arthropod refers to a complex set of ideas, and
  cannot easily be replaced.
- Rule 8 Avoid long words: If a word can be replaced by a shorter and simpler word, replace it! A good example is the word *utilise*, which is a 7 letter word which means exactly the same and *use*. Consider the example *Inexpensive apparatus was utilised*, which means the same as *Cheap equipment was used*.
- Rule 9 Don't be afraid of repetition: Repetition can add rhythm to your writing. On the other hand, over use of repetition can be boring.
- Rule 10 Avoid over use of acronyms: Acronyms can be useful as the shorten writing, as example 3D is simpler than three-dimensional. Common acronyms are good to use. If you use too many uncommon acronyms, the reader won't be able to remember them all.

- Rule 11 Cut out redundant words: You shouldn't have words which
  don't add meaning. If you can remove a word, while maintaining the meaning,
  you should remove the word.
- Rule 12 Use active voice: An engineering report should be written in third person, but you can still use active voice.
  - In passive voice: The girder was attached to the frame using large rivets.
  - In active voice: Large rivets attached the girder to the frame.

Active voice makes the sentence shorter and easier to read.

# 4 Report Elements

The following section will provide details on key report elements. These are paragraphs, figures, tables, and units and numbers.

### 4.1 Paragraph

The purpose of a paragraph is to present a single set of ideas in a coherent section of the report. The new paragraph signifies that one idea has been concluded and the next has begun. The paragraph should present one main idea (the theme), followed by examples of any smaller ideas the explain or prove the main idea of the paragraph.

The structure of a paragraph can be split into three general sections, the topic sentence, supporting sentences and the concluding sentence. The topic sentence is the first sentence of a paragraph and introduces the broad theme of the paragraph. The supporting sentences then elaborate and explain the topic sentence further, developing the theme presented in the topic sentence. The concluding sentence is the last sentence of the paragraph and should concisely end the paragraph and allow a transition to following paragraph as required.

# 4.2 Figures

Figures are of great significance in a report, they can provide context, succinctly present information, or provide detail too complex for sentences. Good use of figures will add greatly to your work, however their poor use will detract and make your work appear unprofessional. Before adding a figure to your report ask yourself what benefit does it add.

The caption of a figure should appear below the figure and be appropriately descriptive. Figures should be referenced in text. Figures should generally be centred and be in line with text (i.e. don't use the the 'wrap' option in Word). Figure 1 below shows good application of these conventions while Figure 2 doesn't. Figure 2 isn't neat, it is poorly labelled, and it is complex to read.

In Word, always have figures 'in line with text' this will avoid any challenges with images 'jumping' during formatting. You should never use the 'magazine look' where your text encircles your figure. When referring to a figure in text it often isn't enough to just point to the figure, you should tell the reader how they should use this figure. A good example of this could be as follows. As is shown in Figure 1 the pressure fluctuations approximately doubled between 364° and 368°.

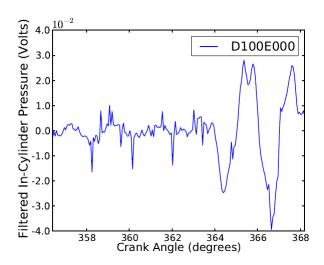


Figure 1: Band-pass filtered pressure signal at 2000 rpm, full load on neat diesel fuel (this is a good figure, note the descriptive caption and easy to interpret information)

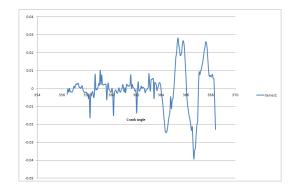


Figure 2: Pressure vs crank-angle (this is a poor figure, the caption isn't descriptive, scales and axes are hard to read, useless legend)

### 4.3 Tables

Tables should be neatly presented and easy to read. The caption for a table should appear above the table. Tables, like figures, should be appropriately referenced in text. Formatting of tables should be consistent with the rest of the works.

Consider table 1 below, the table is neat, and its aesthetic matches with that of the document. The caption is located above the table and is appropriately descriptive.

Refer to figures and tables prior to them appearing in text. It is good practise to also tell the reader what they should be looking for in the figure or table.

Table 1: Appropriately descriptive caption

Team	Р	W	D	L	F	Α	Pts
Manchester United	6	4	0	2	10	5	12
Celtic	6	3	0	3	8	9	9
Benfica	6	2	1	3	7	8	7
FC Copenhagen	6	2	1	3	5	8	7

#### 4.4 Units and Numbers

When writing units and numbers the following conventions should be followed:

- Generally numbers less than 10 should be written as text. This can be applied flexibly to ensure consistency in format and style.
- A space should be present between a number and unit (e.g. 10 mm → correct, 10mm → incorrect).
- Exceptions to the spacing rule are % and ° symbols (eg 10% or 10°C not 10 % or 10 °C).
- Remember the golden rule of consistency.

### 4.5 Equations

If an equation is used to calculate a parameter within your report (and is not a common equation such as Newton's second law), then it is absolutely necessary that the equation is included in you report (and all equation variables are defined). Given that maths is one of the main communication tools of engineers, it is important the equations are neat and well defined. Generally in an engineering report it is acceptable to define an equation within or separate to your text.

For short and simple equations it is acceptable to include the equation in-line with text. This is generally used when an equation isn't critical to the reader. Be warned that when an equation is in-text it can be hard for the reader to find. As an example, "The hydraulic diameter of a channel is calculated as  $D_H = 4A/P$  where A and P are the channel area and perimeter respectively."

Alternatively, equation can be defined between paragraphs, in such cases equations should be centred and numbered to the right. An example of this is shown below in Equation 1 where x is the lateral dimension, y is the vertical displacement, E is the Young's modulus, I the second moment of area, t is time and  $\mu$  is the mass per unit area.

$$\frac{\partial^2}{\partial x^2} \left( EI \frac{\partial^2 y}{\partial y^2} \right) + \mu \frac{\partial^2 y}{\partial t^2} = 0 \tag{1}$$

Alternatively, equations can also flow with the text such as in. For example, the dyanimcs of a beam can be describe by

$$\frac{\partial^2}{\partial x^2} \left( EI \frac{\partial^2 y}{\partial y^2} \right) + \mu \frac{\partial^2 y}{\partial t^2} = 0 \tag{2}$$

where x is the lateral dimension, y is the vertical displacement, E is the Young's modulus, I the 2nd moment of area, t is time and  $\mu$  is the mass per unit area.

Finally, it is a preference that the terms of an equation are defined in the text. However, as an alternative variables can be directly defined below the equation such as in Equation 3 below.

$$\frac{\partial^2}{\partial x^2} \left( EI \frac{\partial^2 y}{\partial y^2} \right) + \mu \frac{\partial^2 y}{\partial t^2} = 0 \tag{3}$$

where

x is the lateral dimension y is the vertical displacement E is the Young's modulus I the 2nd moment of area t is time  $\mu$  is the mass per unit area

# 5 Formatting

## 5.1 Text Alignment

As with this report, justified text is preferred. Left-align text is acceptable however reduces the aesthetic.

# 5.2 Section Numbering

Dependent upon length, section headings in engineering reports should be numbered. This makes referring to sections simple, and aids in the flow of a report. Headings prior to the report body aren't numbered (i.e. Executive Summary, Table of Contents, List of Tables). Automatic section numbering can be easily implemented in Word (see Section 6.1).

### 5.3 Page Numbering, Headers and Footers

The page number should be included in the footer of the report, left, right or centre alignment are all fine. In high quality reports, any page number before the introduction should be Roman numerals (e.g. i,ii, iii, iv, v) and the introduction will start on page one.

### 5.4 Citations and In-text Referencing

As required, you don't need to cite common knowledge, can choose any appropriate standard, numbered methods such as IEEE are popular.

# 6 Word Tools for Speedy Typesetting

Word has many in-build tools which will dramatically speed up you report writing. As a rule of thumb, if you are repeating any laborious manual task, there will be an automatic tool. Learn to use these and be familiar with them. This section will detail some of the more common tools as well as some useful tips.

### 6.1 Styles & Automatic Heading Numbering

Numbering your sections will add to a professional looking report. Generally, a short report may not need to be numbered, but for most reports in engineering numbering will be beneficial. When writing your report, become familiar with automatic styles (Figure 3, A), utilising this you can change the properties of one styles, and have it automatically updated through your document (right click  $\rightarrow$  modify). Furthermore, if you use automatic styling you can can utilise automatic numbering (Figure 3, B).

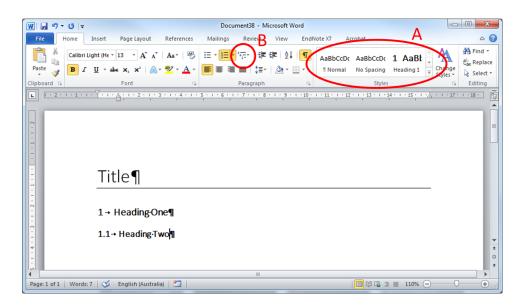


Figure 3: Become familiar with and use automatic styling and section numbering

#### 6.2 Automatic Table of Contents

When you utilise automatic heading styles (Section 6.1) you can automatically insert a table of contents (Figure 4, A).

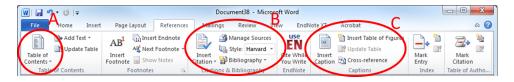


Figure 4: Automatic table of contents, citations, and captions

### 6.3 Automatic Referencing

Word has an automatic citation tool (Figure 4, B), while it isn't perfect, for most reports it is adequate. Avoid making errors in referencing by using the automatic tool. Again, numbered styles (such as IEEE) are generally preferred in engineering, however any formal style is acceptable (unless specifically stipulated). If your installation of Word does not include IEEE you can add it from http://bibword.codeplex.com/releases/view/19764.

Use F9 to update a reference, to update all references first select all your text (Crtl+A).

### 6.4 Automatic Lists of Tables, Figures, Equations, etc

You can automatically insert captions via the captions tool (Figure 4, C) or by right clicking on a figure, table, equation, etc. Once you have inserted a caption you can automatically insert a list of figures, tables, equations, etc.

# 6.5 Simple Equation Formatting

Generally equations should be numbered. In Word, the simplest way to number equations is to place them in a three column table (with clear borders). This allows for both the equation to be centred, and the numbering to be right-justified. An example of this is shown in Figure 5.

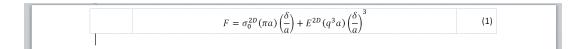


Figure 5: Centering an equation in Word using a table

### 6.6 Page Breaks, Section Breaks, etc.

This is a small bugbear, but learn to use various breaks (Figure 6). If you are using multiple returns/enters to go to a new page, you're doing it wrong. These also become extremely useful when you start to modify your page setup (e.g. adding landscape pages, or modifying page numbering).



Figure 6: Page breaks, section breaks, etc

### 6.7 Modifying Page Numbers

If you seek to impresses, and you should, your front matter should be numbered with Roman numerals while the body should be traditionally numbered. Place a section break (new page) in before your introduction and then follow Figure 7 to change the front matter to Roman numerals.

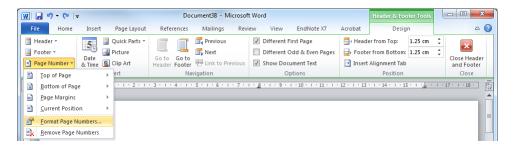


Figure 7: Format page numbers

# 7 Assumptions and Errors

Assumptions and errors are often an area poorly discussed in reports, as such this becomes an area you can make your work stand out. It is important to recognise the limitations of your work, failure to do so will cause an intelligent reader to question what you're hiding. When discussing errors and assumptions it isn't enough to just list them, rather you should consider whether the assumption or error is significant and what impact it will have. Furthermore when discussing assumptions and errors ensure what your discuss is meaningful, don't was your time and your audiences time by discussing trivial factors.

Don't waste time discussing trivial assumptions and errors.

# 7.1 Discussion of Assumptions

When discussing assumptions it isn't sufficient to just state the assumption, you should justify why this assumption is valid, and the explore the impact of this assumption. An example is shown below.

- Describe the assumption: During modelling the influence of drag was neglected.
- Justify the assumption: Drag becomes insignificant at low velocities and small drag coefficients (small areas), as such the impact of drag on a basketball is likely low.

• Explore the impact: By neglecting drag a slight over estimate of distance will occur.

### 7.2 Discussion of errors

When discussing errors follow the same basic process as with assumptions, during which bear in mind the following points:

- A list of errors is not sufficient. Engineers need to be able to understand errors, their significance, and their impact.
- Avoid trying to define your error by a *catch all* term (e.g. human error, measurement error). These don't tell the reader anything.
- Errors need to be genuine. Discussing trivial errors is a waste of time (e.g. Brisbane gravity is 9.79 m/s<sup>2</sup>, discussing this however would generally be meaningless because it is such a small error).
- Human error is not an error, this means you did something wrong! What would your boss say if you said human error? Instead, think about what the actual error was (for example: Reactant B was added too early to the solution causing an increased reaction time).
- Like human error, measurement error is not an error, it doesn't tell the reader anything.
- Rounding error is not a significant source of error (except in complex computer simulation). If you have significant rounding error you should fix this.
- Discuss the error, it's cause, and it's impact.
- Ensure the errors you discuss are relevant and significant
- Consider all aspects of your work.
- If possible, attempt to quantify errors.

## 8 Conclusion

Good report writing is a key skill of an engineer, you should constantly strive to improve and develop your report writing. This guide details the standards and conventions of high quality reports and provides various tips. It should always be noted that this is only a guide and you may wish to modify the structure and style to suit your needs. Above all else ensure your work is professional, concise, and consistent. Ensure you follow the golden rules.

Your conclusion should be an appropriate length for your work. There is nothing wrong with a short conclusion, but ensure it meets the requirements of a good conclusion.