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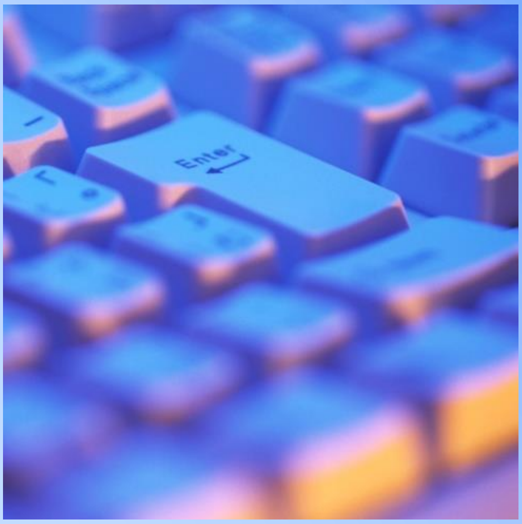

Write reports

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Edition 1 – April 2013

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Unit Resource Manual

Manufacturing Skills Australia Courses

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Forward your comments to:

BlackLine Design
blakline@bigpond.net.au
Sydney NSW 2000

Aims of the Competency Unit:

This unit of competency covers the skills and knowledge required to develop competencies in writing technical or non-technical reports that include some level of analysis and/or research.

Unit Hours:

18 Hours

Prerequisites:

Elements and Performance Criteria

1.	Identify report requirements	1.1	*Requirements* for a written *report* are identified and confirmed with appropriate persons.
		1.2	Information for the report is accessed according to workplace procedures.
		1.3	Information is assessed for currency, accuracy and relevance for inclusion in the report.
2.	Prepare and produce report	2.1	A structure and outline of the report are developed according to identified report requirements.
		2.2	The report is written using terminology appropriate to the reader and established *principles of report writing*.
		2.3	Findings and conclusions are based on factual analysis.
		2.4	Recommendations, alternatives/suggestions are given, and supporting evidence supplied, where required.
		2.5	Protocols, conventions and legal requirements related to acknowledgements and intellectual property are applied where necessary.
3.	Finalise and distribute report	3.1	The report is checked for accuracy and edited as required.
		3.2	The completed report is consistent with objectives and requirements.
		3.3	The report is copied, distributed and stored according to instructions and workplace procedures.

Required Skills and Knowledge

Required skills include:

- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents.
- following instructions
- checking and clarifying information
- sorting information/data
- assessing information/data for relevance
- using terminology and language appropriate to the target audience
- structuring and writing reports
- applying principles of report writing
- presenting findings and conclusions based on factual analysis
- making recommendations
- managing own time
- planning and sequencing information
- reviewing and editing

Required knowledge includes:

- principles of report writing
- report types and purposes
- structure, style and parts of a report
- use of language and expression in reports
- common pitfalls, such as ambiguity, truisms, tautology, verbosity, circumlocution etc.
- report numbering systems
- techniques for reviewing and editing
- importance and benefits of preparing reports appropriate for the intended audience
- referencing and the importance of acknowledging sources
- safe work practices and procedures

Lesson Program:

Unit hour unit and is divided into the following program.

Topic	Skill Practice Exercise
Topic 1 – Types of Reports	
Topic 2 – Preparation and Planning	
Topic 3 – Collecting and Handling Information	
Topic 4 – Writing and Reviewing the Report	
Topic 5 - Style Guide to Good Report Writing	
Topic 6 – Presentation of the Report	

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Topic 1 – Types of Reports

Required Skills:

- Identify different types of reports.
- Designate the sections required in a technical report.
- Referencing methods.
- Create a layout for a technical report.

Required Knowledge:

- Use of word processing or desktop publishing programs.
- Types of report writing.
- Layout of a report.
- Safe work practices and procedures.

A report may be defined as a formal document based on collection of facts, events and opinions and usually expresses a summarized and interpretative value of information.

Report writing is an important part of many professional and academic subjects. Reports play an increasingly important role in the workplace, where they are a crucial instrument in all business processes; they are also widely used in government, technology, health care, social services, and many other areas.

It can be defined as communication in which a person, who is assigned the work of report making, gives information to some individual or organization because it is their responsibility to do so; the word 'report' is derived from the Latin word – 'reportare' – means to bring back.

Reports can be classified as follows:

- Formal and Informal Reports
- Routine and special Reports
- Oral and written reports
- Informational and Analytical Reports

Types of Reports:

Formal Report:

A formal report is a document that is written following a fixed procedure and is used to describe an investigation and give results and recommendations based on the investigation. A formal report is used to investigate a problem or a need, find workable solutions, and make recommendations.

A formal report is prepared in a prescribed form; they are lengthy and can extend to hundreds of pages in length. Annual Reports, reports of companies, project reports and thesis are examples of formal reports.

Engineers and scientists write formal reports for many reasons, including the documentation of experiments and designs. An engineer or scientist working on the design of an airplane seat might write several formal reports. One formal report might propose a new design for the seat, while a second formal report might update the progress on the construction of a test seat. Yet another formal report might document tests performed on the design; still another formal report would assess whether the new design should replace the existing design. In this last report, all elements would be combined from the previous reports; note that this last report might appear as a research article, which is a special kind of formal report for a research audience.

Formal reports normally comprise of the Title, Summary, Introduction, Findings and Discussion, Conclusions and Recommendations.

Informal Report:

The distinctions between formal and informal reports are often blurred but can be defines as not requiring an abstract or references. An informal report is generally in the form of a person to person communication. It is a brief report of a specific business. Laboratory reports, daily production reports, and trip reports are.

Informal reports include various types of documents that may be considered distinct from a formal report. Typical examples of informal reports include problems and trips for investigations, Subject Review, Benchmarking and Inspection for Service Work, Project, Purchase and Organisation for Proposals, and Inquiries, Complaints and Suggestions from Action letters.

Routine Report:

A routine report is relatively simple while still retaining significant elements in the organisation's decision making process. The purpose of a routine report is to keep people informed on a worker's progress in performing and accomplishing their duties, production reports.

Routine reports are prepared and presented at regular intervals; they may be submitted annually, semi-annually, quarterly, monthly, weekly and daily

Special Report:

Special reports may be prepared and presented to convey special information related to an individual, occasion or problem. Enquiry report, research reports, thesis, dissertation are special reports.

Oral Report:

An oral report is a presentation of data in the form of face to face to communication either in a conference hall, meeting room, workplace office, or a remote construction/mining site. Reports of accidents, construction production, investigation and modifications to components, assemblies or processes, variations to work practices, instructional sessions are example of oral reports.

Analytical Report:

Analytical reports are the presentation of data/information with analysis or interpretation or recommendations. Analytical reports are often intended to convince the readers that taking a certain course of action or agreeing with a recommendation is practical and effective.

Typical examples are Project reports, Feasibility reports, Justification reports and market research reports are examples.

The Technical Report:

In Engineering, one of the major forms of communication is the technical report; this is the conventional format for reporting the results of research, investigations, and design projects. At educational institutions, reports are read by teachers, lecturers and tutors in order to assess a student's mastery of the subjects and their ability to apply their knowledge to a practical task. In the workplace, the reports will be read by managers, clients, and the architects, engineers and supervisors responsible for building from the designated designs. The ability to produce a clear, concise, and professionally presented report is therefore a skill needed to develop in order to succeed while studying and a career in a future workplace.

While reports vary in the type of information they present (for example, original research, the results of an investigative study, or the solution to a design problem), all share similar features and are based on a similar structure.

The basic structure of a report usually comprises of the following component; Title Page, Executive Summary, Table of Contents, Introduction, Body of the report with numbered headings, Conclusions, Recommendations, References and Appendices.

Title Page:

The Title Page gives the title of the report, the author's name and ID numbers (if any), department, date of submission.

The cover page can be dull and boring or made exciting with blending/contrasting images and company logo. The title of the report could be enhanced using a larger and bolder font while the author, department and date of submission could be enhanced with similar font properties.

The title of the report should indicate exactly what the report is about. The reader should know not only the general topic, but also the aspect of the topic contained in the report. Compare the following pairs of titles:

Bridge Analysis	vs.	Analysis of a Prestressed Concrete Bridge
Internet-based ATIS Information Systems	vs.	An Evaluation of Internet-based Automated Traveller

An example of a Title page is shown in the case study for the report entitled Preliminary Design of a Bridge on page 23.

Abstract or Executive Summary:

The Abstract or Executive Summary provides a brief overview of the subject matter, methods of analysis findings and recommendations; usually no more than half a page. It is not an introduction to the topic. The summary should outline all the key features of the report, including the topic, what you did and how you did it, and the main outcomes of your work. A busy manager who might not have time to read the full report should be able to get the gist of the whole report by reading the summary.

The summary:

- States the topic of the report.
- Outlines the approach to the task if applicable.
- Gives the most important findings of the research or investigation, or the key aspects of the design.
- States the main outcomes or conclusions.

The summary does NOT:

- Provide general background information.
- Explain why you are doing the research, investigation or design.
- Refer to later diagrams or references

An example of a Summary is shown in the case study on page 24.

Table of Contents:

The contents page sets out the sections and subsections of the report and their corresponding page numbers. It should clearly show the structural relationship between the sections and subsections. A reader looking for specific information should be able to locate the appropriate section easily from the table of contents. The conventions for section and page numbering are as follows:

- Number the sections by the decimal point numbering system:

1.0 Title of the first main section (usually the introduction).
    1.1 First subheading
    1.2 Second subheading
2.0 Title of second main section.
    2.1 First subheading.
    2.2 Second subheading.

2.2.1 First division in the second subheading.
2.2.2 Second division in the second subheading
3.0 Title of third main section

- Number all the preliminary pages in lower-case Roman numerals (i, ii, iii, iv, ...).
- The title page does not display the page number i however it is still classified as the first page therefore the second page has the number ii indicated. Preliminary pages are any which come before the introduction, including the summary and, where applicable, acknowledgements.
- All the following pages of the report are numbered with Arabic numerals (1, 2, 3, 4, ...). Thus the report proper begins on page 1 with the introduction, which is usually Section 1
- Provide a title in the table of contents to describe the contents of each appendix (Note: one appendix, two or more appendices); calling them Appendix 1 or Appendix 2 should be avoided.

An example of a Table of Contents is shown in the is shown in the case study on page 24.

Introduction:

The introduction provides the background information needed for the rest of the report to be understood and is usually half to three-quarters of a page in length. The purpose of the introduction is to set the context for the report, provide sufficient background information for the reader to be able to follow the information presented, and inform the reader about how that information will be presented.

The introduction includes:

- The background to the topic of the report to set the work in its broad context.
- A clear statement of the purpose of the report, usually to present the results of the research, investigation, or design.
- A clear statement of the aims of the project.
- The technical background necessary to understand the report; e.g. theory or assumptions.
- A brief outline of the structure of the report if appropriate, which may not be necessary in a short report.

An example of an Introduction is shown in the case study on page 25.

Body of the Report:

The body is main and longest part of the report, where the work is presented. The introduction and conclusions act as a frame for the body only: therefore all the details of the work (including a summarised version of material in the appendices) must be included here in the appropriate section. Careful thought and planning is required placing the sections in the correct order; the presentation of information should flow logically so that the reader can follow the development of the project. It is also essential that concise but informative headings and subheadings are designated so that the reader knows exactly what type of information to expect in each section.

The body of the report:

- Presents the information from the research, both real world and theoretical, or the design.
- Organises information logically under appropriate headings.
- Conveys information in the most effective way for communication:
  - Uses figures and tables.
  - Can use bulleted or numbered lists.
  - Can use formatting to break up large slabs of text.

Research type reports may include sections such as:

- Theory and/or modelling.
- Methods and materials used.
- Results and/or comparisons with theory and/or previous work.
- Discussion and analysis of material.

Design or feasibility type projects and reports may include sections such as:

- Problem identification.
- Alternative solutions.
- Analysis and avaluation of alternatives.

Headings in the Body of a Report:

All headings should be informative – Similar to the title, section headings should tell the reader exactly what type of information is contained in the section. The headings should be specific and content-focused rather than just labels; devising informative headings as opposed to label headings right from the planning stage helps to clarify exactly what is to be achieved in each section and subsection. Compare these pairs of headings:

Gas usage	vs.	Changes in gas consumption 2003 to 2010.
Production survey	vs.	Results of religious holiday production survey.

Examples of Informative and Uninformative headings are:

Informative.	*Uninformative.*
Overview of the Organisation	*The Organisation*
Communication within the Organisation	*Management*
Groups in the Organisation	
Management Style and Methods	

All headings must be consistent and parallel in structure – Meaning that should follow a similar grammatical form. Usually, it is not difficult to convert inconsistent headings to a common form. In the Consistent headings column, all headings use noun phrases and is the most commonly used format for section headings in an informational report.
In the following examples, each heading is structured differently:

Consistent headings.	*Inconsistent headings.*
Company Structure	*The Company Structure (noun phrase)*
Communication Channels	*Do the Communication Channels Work? (question)*
Group Participation	*Participating in Groups (gerund phrase)*
Development of an Effective Management Style	*How to Develop an Effective Management Sytle (instruction heading)*

Tables and Graphs:

Visual aids such as tables and graphs are a good method for displaying the contents of a report. In this context, they are also known as images, diagrams and maps for th e graphs. Tables and figures should be numbered in the order they appear; the first table should be called "Table 1", the second table "Table 2"; first graph should be called "Graph 1", the second figure "Graph 2", etc.

Tables and graphs must also have an explanatory text. Table numbers and table text should always be placed above the table while graph numbers and figure text are placed below the graph. The explanatory text is written in font size 10. Table and graph numbers (e.g. "Table 1") should be in bold. Table and graph text can be of different length, depending on how much information is required. Tables and graphs should also include a reference, so it is clear from where the table is retrieved; such references should be included in the reference list.

Table 2. Gradual spreading of sulphur emissions at some localities in Sweden (Ruudsten, 1992).

If tables and graphs are used, it is important that also in the running text, explain what is shown. Without any reference and explanation of the table or graph, the reader will not know in what context the table belongs; also, it is not certain that the reader will interpret the table in the same way as the author. A graph or a table can be very difficult to understand by many people without guidance; meaning that not every digit or variation in the chart curve has to be explained. Pointing at the numbers and variations relevant to the report should elicit simple conclusions.

In reference to a table or graph in the text, it is sometimes useful to also provide a page reference which is especially important if the table for some reason is placed elsewhere in the report, and is not directly connected to the reference in the text. References can be included in the sentence or in a parenthesis:

> *Graph 8 on page 6 shows how the sulphur content in the Swedish forests has increased during the 1990s.*

or;

> *The sulphur content in Swedish forests has increased by 10 % per year (see graph 8). At the beginning of the 1990s…*

Larger tables and graphs can be placed in an attachment. If a table that is less important is included, but is interesting for the content of the report, then it is placed in an attachment. Remember to also refer to tables and other information contained in the attachments. Any tables and graphs which are not referred to in the text must be deleted.

Images that are nothing but decoration should be removed. Such an image may appear on the title page though. A picture on the front will hopefully say something about the content of the report, and therefore there may be need to also refer to the more decorative images placed on the title page.

Equations:

Many engineering reports may require the inclusion of equations. The conventional style for presenting equations is as follows:

- Centre the equation on the page.
- Place the equation number in round brackets at the right-hand margin.
- In the text of the report, refer to the equations as either Eq. (1) or equation (1). Use whichever format you choose consistently throughout the report.

A good method for including equations (or formulae) is by using tables provided within many word processing programs or the insertion and linking to spreadsheet files.

Equations may need to be spread over 2 or more separate rows and/or columns; by judicial use of merging certain cells and justifying the text accordingly and using table border options, an acceptable appearance can be achieved. The following example shows the formula to determine the area of a circle using 1 row and 2 columns and then the formula transposed to determine the radius using a known area using 2 rows and 4 columns.

$$\text{Area} = \pi R^2$$

$$R = \sqrt{\frac{\text{Area}}{\pi}}$$

An example of the Body of a Report is shown in the case study on page 26.

Conclusions:

The purpose of a conclusion is to tie together, or integrate the various issues, research, etc., covered in the body of the paper, and to make comments upon the meaning of all of it. This includes noting any implications resulting from the discussion of the topic, as well as recommendations, forecasting future trends, and the need for further research.

The conclusion should:

- Be a logical ending to what has been previously been discussed; it must pull together all of the parts of the argument and refer the reader back to the focus outlined in the introduction and to the central topic. This gives the essay a sense of unity.
- Never contain any new information.
- Usually be only a paragraph in length, but in an extended essay (3000+ words) it may be better to have two or three paragraphs to pull together the different parts of the essay.
- Add to the overall quality and impact of the essay; this is the final statement about this topic; thus it can make a great impact on the reader.

The conclusion should not:

- Just sum up.
- End with a long quotation.
- Focus merely on a minor point in the argument.
- Introduce new material.

The Content of the Conclusion:

The conclusion may include:

- A summary of the arguments presented in the body and how these relate to the essay question.
- A restatement of the main point of view presented in the introduction in response to the topic.
- The implications of this view or what might happen as a result.

The Structure of the Conclusion:

Like introductions, it is best to keep to a simple structure.

Begin with a sentence that refers to the main subject that was discussed in the body in the essay. Make sure that this sentence also links to the preceding paragraph, or uses words such as In conclusion to signal that these are the final words on the subject.

A brief summary of the argument can then be given and the main reasons/causes/factors that relate to the question that has been asked to address identified. If there are two or more parts to the question, be sure to include responses to each part in the conclusion.

Finally, it is a good idea to add a sentence or two to reinforce the statement which was used in the introduction; this shows the reader that the issues have been addressed and gives a sense of unity the essay.

Additional elements that may be added include recommendations for future action and speculations on future trends. Generally, although a short pithy quote can sometimes be used to spice up the conclusion, the conclusion should be in the writer’s own words. Try to avoid direct quotations, or references to other sources.

Summary of the Structure:

- Link to previous paragraph: In conclusion…
- Brief summary.
- Identify main reasons/causes/factors.
- Reinforce the statement.
- Recommendations/speculation on future action.

An example of the Conclusion is shown in the case study on page 26.

Recommendations:

These are the suggestions for further action based on the conclusions. Not all reports will ask for recommendations. Some will have a section where both conclusions and recommendations are given. Recommendations are numbered as they normally follow sequentially. For example:

1. The damming of the Nepean Gorge between the confluence of the Warragamba and Nepean Rivers should proceed.
2. Damming of this area could lead to significant economic advantages.

An example of the Recommendations is shown in the case study on page 26.

References:

References to original sources for cited material should be listed together at the end of the paper; footnotes should not be used for this purpose. References should be arranged in numerical order according to the sequence of citations within the text. Each reference should include the last name of each author followed by their initials.

Books:

The title of a book should be in italics, and sentence casing with only the first word being capitalised, except for proper nouns and acronyms.

Sufficient information should be provided to enable identification of the place of publication, e.g. Craigie, NSW, will be more useful than simply Craigie as a town/city with the same name is located in New South Wales, Victoria and Western Australia. Abbreviations may be used as long as their meaning will be clear to the readership.

Standard Format:

Author/Editor, Initials, Year, *Title*, Edition (if not the first), Publisher, Place of Publication.

Single Author or Editor:

French, TE, 1943, *Engineering drawing*, 6th edition, McGraw-Hill, New York, USA.

Two or more Authors or Editors:

Giescke, FE, Mitchell, A, Spencer, IL, Dygon, JT, 1980, *Technical drawing*, 7th Edition, Collier Macmillan Publishers, London, UK.

No Author:

A dictionary of engineering and management, 5th edition, Collins, Sydney, NSW.

Government Publication:

See page 245 of the *Engineering process manual* for more information and examples.

Technical Report:

Pollard, MF and Miles, JM, 2012, *The science of technical drawings*, Technical report BU-113, Malbek Drafting Services, Sydney, NSW.

Journal Articles:

As with books, only the first word of an article title is capitalised, except for proper nouns or acronyms.

Journal names should be in *italics*, and the major words should be capitalised, ie. minor words such as 'of' and 'and' should not be capitalised.

Standard Format:

Author/s, Initials, Year, Title of the article, *Journal name*, volume, issue, article pages.

Single Author:

Munroe, CR, 1993, 'Managing dimensioning techniques', *Mastering detail drafting*, vol. 14, no. 3, pp 53-67.

No Author:

'Uses of visible and hidden outlines', 2012, *Drafting technical journal*, vol. 2, no. 1, pp 7-24.

E-books:

Electronic sources are generally referenced in the same manner as print works, with the addition of extra information such as the date of viewing, URL, or database name.

Long URLs may be broken at the end of a line after a punctuation mark. Do not insert a hyphen at the break as it could be read as part of the address information.

Standard Format:

Author/Editor, Initials, Year, *Title*, Edition (if not the first), Publisher, Place of Publication, date of viewing, Name of Database.

Whole Book:

Richard, VP, 1993, *Drafting 1 – basic drafting skills*, Hall Technical Resources, Melbourne, VIC.

Article/Chapter from an Electronic Book:

Wright, JR, Vesonder, GT, 2013, *Application of quality drafting skills*, Ideal Group Documentation, Cooktown, South Africa, viewed 16 March 2013, Books 9 x 3.

E-Journals:

Standard Format:

Author/s, Initials, Year, 'Title of the article', *Journal name*, volume, issue, article pages, date of viewing, Name of Database.

Journal Article from Online Full-Text Database:

Coda, AA, 2005, 'The myopia of technical drafting: the case for standard template properties', *Journal of templates*, vol. 2, no. 2/3, pp. 18-36, viewed 10 November 2009, Detail Drafting Resources.

Newspaper Article from the Internet:

Miller, AB, 2010, 'Standard text', *The Hawkesbury Gazette*, 16 September 2010, viewed 10 November 2009, <http://www.hawkesburygazette.com.au/business/standard text-254522414-47y2c.html>.

Internet/Web Sites:

If no author or authoring body is ascertainable, cite the work by title in both the text and the reference list (also see reference list example below):

- '...reports of metal fatigue in Boeing A380 Wing Struts (*Latest tests Boeing A380 wing struts* 2010)...'
- Care should be taken using sources for which the authorship/responsibility is not known. Similarly if the update or copyright date is not ascertainable:
- '...offers free website hosting for members (Detail Drafting Association)...'

Standard Format:

Author/s Date, last update or copyright date, *Page title*, description of document (if applicable), name of the sponsor of the page (if applicable), date of viewing, <URL>.

Professional Internet Site/Page:

National Library of Australia 2009, *Technical Drawing*, National Library of Australia, viewed 29 October 2011, <http://www.technicaldrawing.net/>.

Personal Internet Site/Page:

Smyth-Kimber, DSBJ, *A hypothesis of ship construction*, viewed 2 December 2011, <http://www.shipconstructiontechniques.net/>.

Films, Videos, Television and Radio Programs:

Standard Format:

Title, date of publication, format, Publisher, place of production/recording, day and month of broadcast if applicable. (Any further information such as special credits can come last)

Video Recording/Film:

You can draw, short film, Movietone Productions, Australia. Written and produced by Hugh Jackman and directed by Russell Crowe.

Television Program:

US Marines land drafting jobs in Australia, 2011, television program, SBS Television, Sydney, NSW, 11 August.

An example of the References is shown in the case study on page 26.

Appendices:

Appendices contain material that is too detailed to include in the main report and include articles such as detailed drawings, raw data sheets, extra or supplementary information or diagrams, maps of regions etc. The attention of the reader is directed to the appropriate appendix by indicating this briefly at the appropriate place in the report.

The conventions for appendices are as follows:

- Each appendix must be given a number (or letter) and title,
- Each appendix must be referred to by number (or letter) at the relevant point in the text.

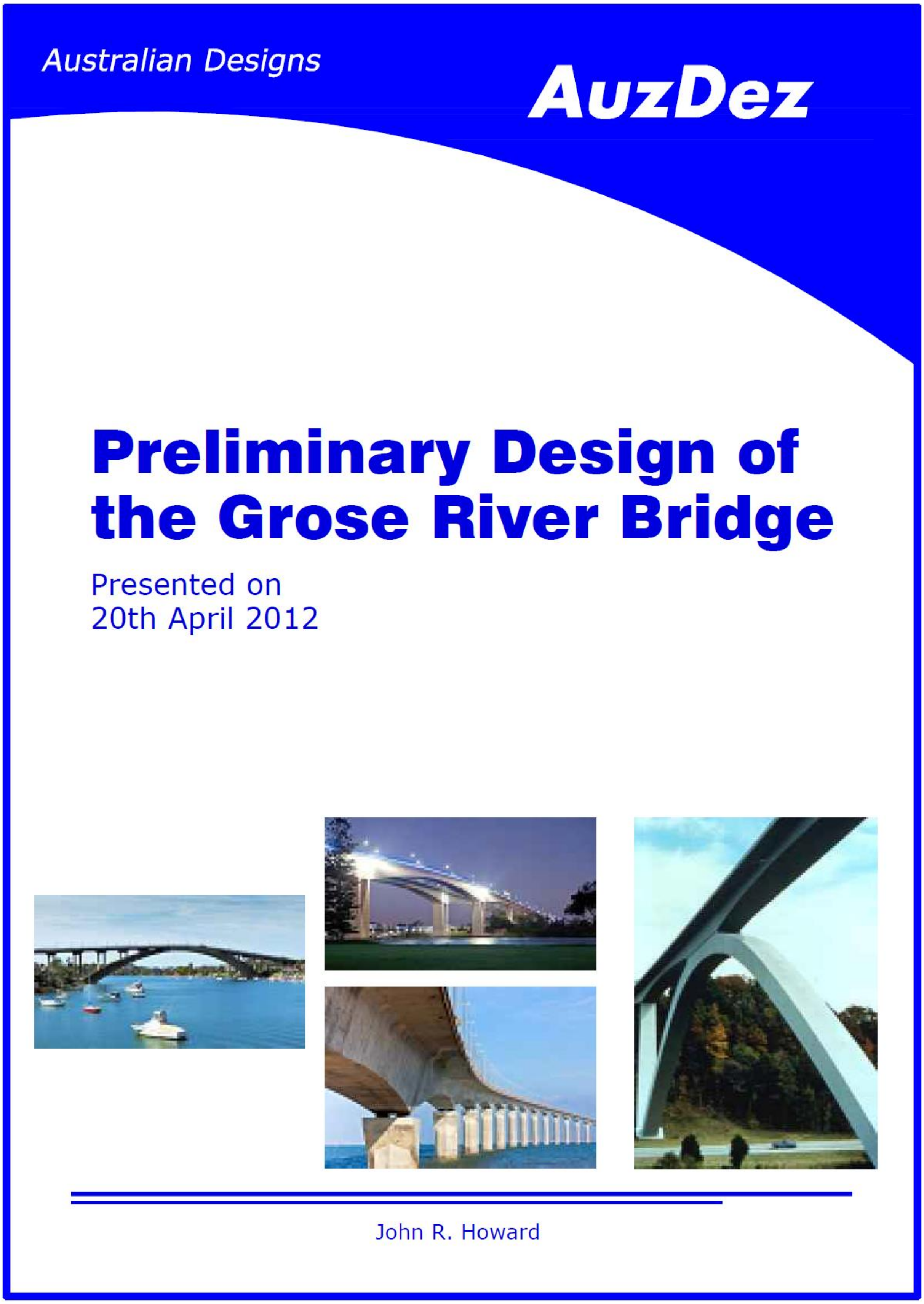
Examples of appendices are as follows:

- Water flow rates indicate that there is no significant change between 1998 and 2001. Comprehensive flow rate charts for the period 1998-2000 are included as Appendix 1.
- National Science Foundation Home page.

http://www.nsf.gov

- Go to Program Areas—Social, Behavioural, Economic Science.
- Go to Science Resources Statistics, then Featured Publications and look at Women, Minorities and Persons with Disabilities.
- Look at the appendices: Technical Notes and Statistical Tables.
- Note how tables are shown in Appendix 2: Statistical Tables.

An example of a list of Appendices is shown in the case study on page 26.



Australian Designs

AuzDez

Preliminary Design of the Grose River Bridge

Presented on
20th April 2012

John R. Howard

Summary:

This report presents a design for a bridge to be constructed on the Bathurst Freeway crossing the Grose River in the foothills of the Blue Mountains at Yarramundi. Two designs for the bridge were devised and then compared by considering the cost, construction and maintenance of each bridge. Design 1 is a super-T beam bridge while Design 2 is a simple composite I girder bridge. It is concluded that Design 1 is the better design being cheaper, easier to construct, more durable and easier to maintain.

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1. Introduction:

A dual carriageway bridge with two traffic lanes in each direction is to be constructed on the Bathurst Freeway crossing the Gross River in the foothills of the Blue Mountains at Yarramundi. The bridge is to span 550 metres between man-made compacted fill embankments, and is approximately 44 metres above the river surface, with a grade of 0.056 m/m.

This report presents two possible concept designs for the bridge. In evaluating these designs, the following criteria are considered: construction method, construction and maintenance costs, possible disruption to traffic during construction, the durability and the aesthetics of the bridge.

The two conceptual designs are presented in the form of sketches of the elevations and cross-sections of the structures.

2. Site Constraints and Design Requirements:

This chapter describes and explains the different site constraints and required design features for the Grose River Bridge.

2.1. Waterways and Flood Levels:

The Australian Standard for Bridge Design AS 5100 requires consideration of all flood events up to the 1 in 2000 year Average Recurrence Interval (ARI) flood ……..

2.2 Vertical Alignment:

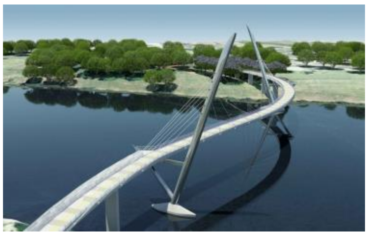
The Grose River Bridge will function as an active transport connection between Yarramundi and Bathurst. The vertical alignment ………………………

3. Design Objectives:

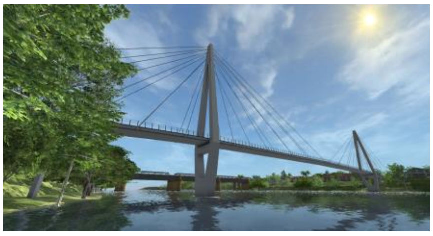
AuzDez invited two recognised urban design companies to develop designs for the Grose River Bridge based on the site constraints, engineering design requirements and design objectives discussed …………………..

4. Comparison Concept Designs:

AuzDez reviewed the two initial submissions and found them to be structurally viable and provided recommendations to the urban designers to modify …………………………



Design 1



Design 2

5. Preliminary Cost Estimates:

The NSW Government has announced funding of $20 million for the planning, design and construction of the new Grose River Bridge. For each option …………………………………….

Design 1	$18,450,000
Design 2	$20,250,000

6. Conclusion:

Two designs for the bridge to be constructed on the Bathurst Freeway across Grose River have been presented and discussed in this report. Design 1 is a super-T beam bridge and Design 2 is a simple composite I girder bridge. Both designs incorporate round piers on piled foundations, which are used because the soil conditions are unknown and possibly unstable. Design 2 has some advantages because it is made of steel and thus has longer spans and fewer piers

However, Design 1 is clearly the better design as the design requires minimal formwork in the construction of its concrete deck, it is relatively easy to erect and it maintains stability during transportation and construction. In addition, it is cheaper to build and more durable.

7. Recommendations:

1. Both proposed designs should be further developed with emphasis being placed on Design 1.
2. Modifications to Design 2 should include a reduced number of piers with longer spans.
3. Additional pedestrian walkways should be incorporated under the main carriageway.

8. References:

Branson, HW, 2007, ‘Tidal limits’, *Ebb-tide water flow rates*, vol. 1, no. 2, pp 7-9.

Hawkesbury City Library 2009, *Tidal Information*, Hawkesbury City Library, viewed 29 October 2011, <http://www.hcl.net.au/>.

9. List of Appendices:

Grose River water flow rates 2001. Comprehensive flow rate charts for 1887 to 2001 are included as Appendix 1.

Look at the appendices: Technical Notes and Statistical Tables.

Skill Practice Exercise:

Develop the layout for a report to be submitted at the end of the unit including all sections listed in Topic 1.

The report will be submitted at the end of the unit consisting of 1500 words and include images, charts (where applicable) and artwork while referencing all acquired data.

The report can be based on historical events, ancient or modern machinery and equipment, workplace situations, current news topics, or prominent persons.

Suggestions for the report are:

- Vehicle ferries throughout New South Wales.
- The effect of the drought on food production in Australia.
- Crossing of the Blue Mountains in 1812.
- Melbourne’s tram system.
- The Storey Bridge over the Brisbane River.
- Sinking of HMAS SYDNEY in World War II.
- Shackleton’s trek for survival in Antarctica
- Breakdown of apartheid in South Africa.
- Banning of ethnic headwear in France.
- Civil rights movement in America.
- Wright’s first steam engine.
- Henry Ford’s colour scheme for cars.
- Anorexia versus obesity in youth.
- Circumnavigation of the world by lone sailors.
- Responsibility of Australia to aide South Pacific nations.
- The demise of Australian cricket in 2013.

Alternatively, negotiate with your teacher a suitable theme or issue to base the report.