Guidelines on Design Report Writing

(Prepared by Dr. Sam C. M. Hui)

1. Introduction

A report is the formal writing up of a practical experiment, project or research investigation. It has clearly defined sections presented in a standard format, which are used to tell the reader what you did, why and how you did it and what you found and developed. Reports differ from essays because they require an objective writing style which conveys information clearly and concisely. Reports for building design projects have specific technical information which must be presented in an effective manner using various methods (such as drawings, diagrams, schedules, lists, figures and tables).

Technical reports present facts and conclusions about your designs and other related issues. Typically, a technical report includes research about technical concepts as well as graphical depictions of designs and data. A technical report also follows a strict organization. This way, when other people read what you write, they can quickly locate the information that interests them the most.

2. Structure of Technical Reports

Most reports include the following sections:

- **Title Page** – tell the reader the nature of your project
- **Abstract** or **Executive Summary** – a self-contained summary of the whole of your report
- …[Table of Contents]
- **List of Figures & List of Tables** – assist readers in locating your figures and tables
- **Introduction** – sets the scene for your report
- [**Report Main Body**] – varies depending on your approach and design ideas
- **Conclusions** – what are the most important ideas coming out of the report
- **References** – details of work you have referred to in your report
- **Appendices** – material that is relevant to your report but that would disrupt its flow if it was contained within the main body

The main body of the report may be divided into multiple chapters or sections as the case may be. You may have different sections which delve into different aspects of the design problem. The organization of the report here is work or problem specific. For example, major building services systems may be used as the logic for the different chapters/sections.

3. Report Formats

A technical report can contain information in a variety of forms, such as text, figures and tables. Choosing different means of representation can give visual balance to the document, for example by breaking up long sections of text with tables or figures. In cases where several options are available for representing a particular piece of information, you can choose appropriately to make the document a less daunting prospect to the reader. In most cases, however, the appropriate choice of medium is dictated by the type of information to be communicated.

3.1 Figures

"A picture tells a thousand words." There is great substance in this statement, and nowhere more obvious than in technical reports. Use figures liberally to communicate specific results (diagrams, sketches or graphs) and show an overview of the system being described through block diagrams, charts, etc. The authors should ensure that each figure has a number and a title, so that it can be referenced from the text.

3.2 Tables

Tables are an excellent means of giving an overview of numerical results or providing information in a form which lends itself to comparison. Again, ensure that each table has a number and a title, so that it can be referenced from the text.

Water usage in Milan and Barcelona

	Milan		Barcelona	
	Number of households(x1000)		Number of households(x1000)	
Water usage m^3	2005	2010	2005	2010
0 - 499	6	12	3	5
500- 999	18	33	26	58
1000 - 1499	256	289	301	348
1500 - 1999	231	255	298	303
2000+	124	137	200	195

3.3 Text

Text is the 'filler' and provides the bridge between the figures, tables and references. You should try to write a clear, informative, and thoughtful description and critique of what you did. It is essential for you to identify and explain interesting and important design concepts and phenomena. In addition, briefly comment on the engineering aspects of your work: what problems or constraints did you face, what design options are available, what decisions did you make, what are the consequences of these decisions, and what teamwork you have achieved?

4. Design Information

Building services and architectural designs are creative processes which involve the activity of translating ideas, proposals and statements of needs and requirements into precise descriptions of a specific product. The design tends to evolve through a series of stages at which the solution is increasingly designed at greater levels of detail, moving from broad outline concept through to fine detail.

In order to clearly present the design ideas, you must consider the specific types of design information appropriate to your project and try to organize them in a logical and systematic way. Common types of building design and building services engineering information include:

Graphical information:

- Site conditions and environment (diagrams/photos on site access, circulation, surroundings, climate, etc.)
- Architectural design drawings (site plan, floor plan, elevations, sections)
- Building services design conceptual diagrams or sketches
- Schematic diagrams and technical drawings for building services systems
- Plant room location and services distribution plans
- Conceptual utility connection diagrams
- Conceptual zoning and coordination diagrams

Writing and description:

- Design objectives, requirements (the client, local regulations, authorities) and design criteria
- Initial design calculations (load estimation and assessment, basic assumptions)
- System descriptions, design concepts, and evaluation of options
- Cost implications, project duration, and construction programme

No report is perfect, and definitely not on the first version. Well written reports are those which have gone through multiple rounds of refinement. This refinement may be through self-reading and critical analysis, or more effectively through peer-feedback.

References

Bownass, D. A., 2001. *Building Services Design Methodology: A Practical Guide*, Spon Press, London & New York.

Engineering Technical Reports [Colorado State University] http://writing.colostate.edu/guides/guide.cfm?guideid=88