



CHALMERS
UNIVERSITY OF TECHNOLOGY



Some Title

some subtitle

Master's thesis in Civilingenjörsprogrammet

GUDJÓN ÓLAFUR GUDJÓNSSON
JÓN GRÉTAR HÖSKULDSSON

Department of Civil and Environmental Engineering
Division of Structural Engineering
Concrete Structures
CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 201X
Master's thesis 201X:XX

MASTER'S THESIS 201X:XX

Some Title

some subtitle

Master's thesis in Civilingenjörsprogrammet

GUDJÓN ÓLAFUR GUDJÓNSSON
JÓN GRÉTAR HÖSKULDSSON

Department of Civil and Environmental Engineering
Division of Structural Engineering
Concrete Structures
CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden 201X

Some Title
some subtitle
GUDJÓN ÓLAFUR GUDJÓNSSON
JÓN GRÉTAR HÖSKULDSSON

© GUDJÓN ÓLAFUR GUDJÓNSSON , JÓN GRÉTAR HÖSKULDSSON, 201X

Master's thesis 201X:XX
ISSN 1652-8557
Department of Civil and Environmental Engineering
Division of Structural Engineering
Concrete Structures
Chalmers University of Technology
SE-412 96 Gothenburg
Sweden
Telephone: +46 (0)31-772 1000

Colophon:

The thesis was created using \LaTeX 2_ε and biblatex and edited on www.sharelatex.com. The typesetting software was the T_EX Live distribution. The text is set in Times New Roman. Graphs were creating using PGFPLOTS and MS Excel. Figures were created using INKSCAPE.

Cover:

City Tunnel Diaphragm Walls, TEMP pic

Chalmers Reproservice
Gothenburg, Sweden 201X

Some Title
some subtitle
Master's thesis in Civilingenjörsprogrammet
GUDJÓN ÓLAFUR GUDJÓNSSON
JÓN GRÉTAR HÖSKULDSSON
Department of Civil and Environmental Engineering
Division of Structural Engineering
Concrete Structures
Chalmers University of Technology

ABSTRACT

Here goes the text for the Abstract

Keywords: Permanent Diaphragm Walls, Diaphragm Walls, Functional Requirements

Some Title second language
some subtitle second language
Master's thesis in Building and Civil Engineering
GUDJÓN ÓLAFUR GUDJÓNSSON
JÓN GRÉTAR HÖSKULDSSON
Department's name in second language
Division's name in second language
Research group's name second language
Chalmers University of Technology

ABSTRACT

This is the abstract text in the secondary language

Keywords: keywords in, second, language

CONTENTS

Abstract	i
Abstract	ii
Contents	iii
Preface	v
Acronyms	vii
Glossary	vii
Nomenclature	vii
1 Introduction	1
1.1 Background	1
1.2 Problem description	1
1.3 General aim	1
1.4 Method / Outline	1
1.5 Objectives	1
1.6 References	1
1.7 Cross-references	2
1.8 Equations	2
1.8.1 In-line math	2
1.8.2 Acronymes	2
1.8.3 Glossaries	2
2 Units	3
3 Section headings	3
3.1 Section	3
3.1.1 Subsection	3
4 Graphics	4
4.1 Plots	4
References	6
Appendix A Your first Appendix	7
Appendix B Your second Appendix	7
CHALMERS, Department of Civil and Environmental Engineering, Master's thesis, 201X:XX	iii

PREFACE

Here goes the text for the Preface.

Acronyms

FEM Finite Element Method. 2

Glossary

Polyhedron A solid in three dimensions with flat polygonal faces, straight edges and sharp corners or vertices.. 2

Nomenclature

Subscripts

b aggregate
c cement paste
cr crack
el elastic
I largest eigenvalue

Greek letters

κ largest equivalent strain (-)
 σ second order stress tensor (MPa)
 ε second order strain tensor (-)
 ω damage parameter
 ρ moisture concentration (kg/m³)

Roman lower case letters

n normal vector
h element size (m)

w crack width (m)

Miscellaneous

$\bar{\bullet}$ bar denotes macroscopic quantity
 $\langle \bullet \rangle_{\square}$ homogenized quantity
 \parallel parallel
 \perp perpendicular

Superscripts

M macroscale
s subscale

Roman capital letters

E fourth order stiffness tensor (MPa)
A surface area (m²)
E Young's modulus (MPa)
V volume (m³)

1 Introduction

This is a template!

1.1 Background

Write about the thesis background here.

1.2 Problem description

This is where you describe your problem.

1.3 General aim

By now you know what to do here :)

1.4 Method / Outline

...

1.5 Objectives

...

1.6 References

Your reference data should be contained in `references.bib`. Open the file using a text editor and look at its content. Your own references need to have the same structure! You cite a reference in these ways:

- (pre note Harryson, 2014, post note)
- Alén, Lindvall, Johansson, Magnusson, and Norén (2006, Chapter 2)
- Harryson, 2014
- Harryson
- “Interview on functional requirements for permanent diaphragm walls”
- Box, Hunter, and Hunter, 1978; Harryson, 2014; MATLAB, 2016
- Ridcully (2000)

1.7 Cross-references

Cross-references within your own thesis are taken care of by the package `cleverref`. Making a cross-reference to a figure is done in this way: Figure 4.1 (the name in the curly brackets could be anything).

1.8 Equations

Here is how to typeset equations in \LaTeX .

$$\sigma = E\varepsilon \tag{1.1}$$

and here is how to align several equations using the `&` symbol:

$$A = Bx \tag{1.2}$$

$$c + D + \frac{2}{\phi} = \sqrt{B} \tag{1.3}$$

and here is how to suppress numbering of equations

$$\sigma = E\varepsilon$$

and this is how to cross-reference to an equation: Equation (1.1).

1.8.1 In-line math

Use the `$`-symbol to typeset in-line math like so: $\sigma = E\varepsilon$. This is important because in-line math should be italicized. For example, if you want to write the symbol for Young's modulus, it needs to be done in this way: E , not: E. If the letter “E” is italicized, then it is a physical quantity, namely Young's modulus, whereas a normal “E” is just an E.

1.8.2 Acronyms

Define your acronyms in `notation.tex`. Finite Element Method, FEM, Finite Element Method (FEM).

1.8.3 Glossaries

A glossary can be useful to include for words that the reader is assumed to have no prior knowledge of. You define your glossaries in `notation.tex` and the reference to them like this: Polyhedron, Polyhedron and Polyhedrons.

2 Units

Units are typeset using the package `siunitx`. Most numerical values you will typeset have units, except e.g. strain. Here are two examples of badly typeset units:

$$\begin{aligned}\sigma &= 100\textit{mpa} \\ \sigma &= 100\textit{Mpa}\end{aligned}$$

The correct way looks like this:

$$\sigma = 100\text{ MPa}$$

The unit should *not* be italicized and should have a correct spacing between its numerical value. This is automatically taken care of by the package `siunitx`. Common units are typeset in this way: 10 m^2 , $10 \times 10^{-5}\text{ m}^3$, 10 kN and $10\text{ g m}^{-2}\text{ s}^{-1}$. The number goes in the first pair of curly brackets, and the unit in the second pair. Typesetting units *without* numerical value is done in this way: kN .

3 Section headings

Here is how you subdivide your thesis into different levels:

3.1 Section

This is a Section

3.1.1 Subsection

This is a Subsection.

Subsubsection

This is a Subsubsection. You should avoid levels below this one.

4 Graphics

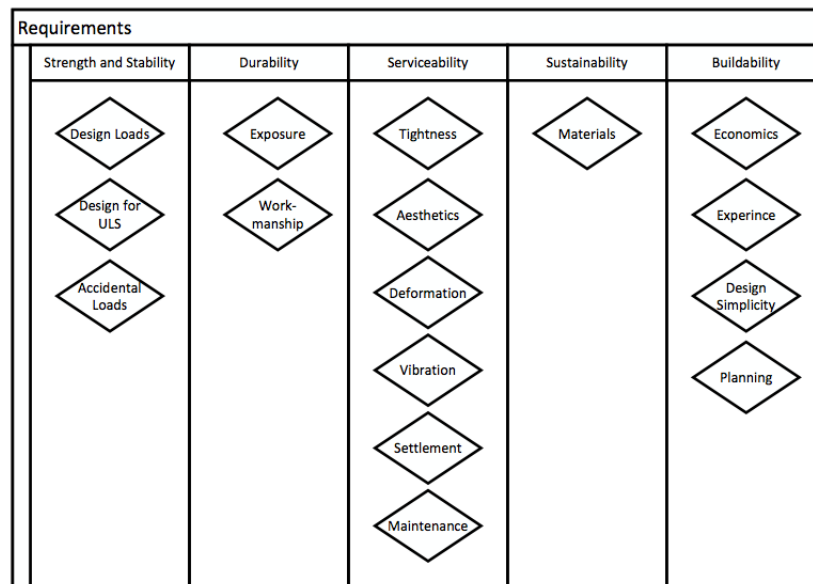
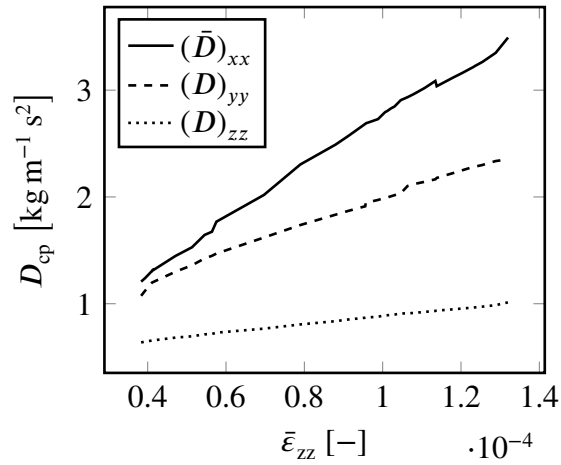


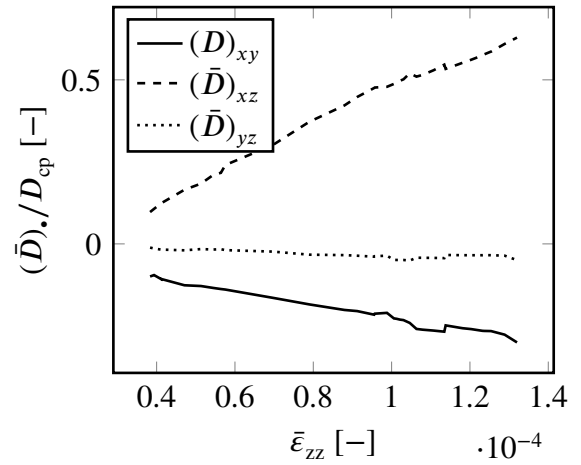
Figure 4.1: Functional requirements for Buildability.

4.1 Plots

Plots are preferably done using the package `pgfplots`. Below is an example given. The example also show how to put figures side-by-side in your document using the `\subfloat` command. Open `data.txt` in a text editor and have a look at its structure. The \LaTeX document reads the data from the text file and produces a plot. Axes are automatically scaled depending on the data range given in the text file.



(a) Diagonal components of \bar{D} .



(b) Off-diagonal components of \bar{D} .

Figure 4.2: Components of the macroscale diffusivity tensor, \bar{D} , as a function of macroscale strain. Numerical values are normalized with respect to D_{cp} .

You can cross-reference to each of the figures in this way: Figure 4.2a and Figure 4.2b. You can also plot analytical functions pgfplots as shown in Figure 4.3 below.

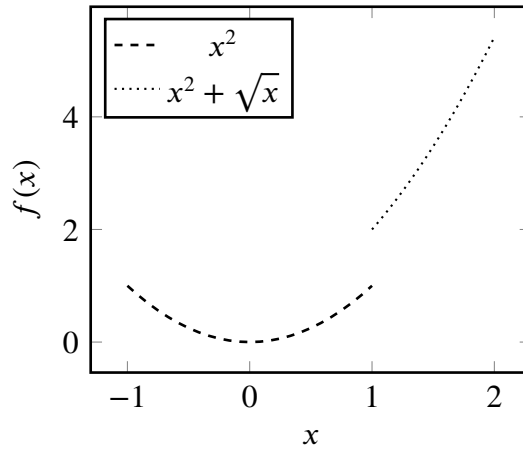


Figure 4.3: Examples of analytical functions.

References

- Alén, C., Lindvall, A., Johansson, M., Magnusson, J., & Norén, C. (2006). *Slitsmurar som permanenta konstruktioner, sbuf 11603, ("diaphragm walls as permanent construction")*. SBUF. (Cited on page 1).
- Box, G. E., Hunter, W. G., & Hunter, J. S. (1978). *Statistics for experimenters*. John Wiley and sons New York. (Cited on page 1).
- Harryson, P. (2014). *Interview on functional requirements for permanent diaphragm walls*. Trafikverket. (Cited on page 1).
- MATLAB. (2016). Design of experiments (doe). Retrieved February 3, 2016, from <http://se.mathworks.com/help/stats/design-of-experiments-1.html?refresh=true>. (Cited on page 1)
- Ridcully, M. (2000). *An introduction to crossbow hunting*. University Lecture, Unseen University. (Cited on page 1).

A Your first Appendix

The contents of your appendices go here.

B Your second Appendix

The contents of your appendices go here.

C Your third Appendix

If you want to append separate PDFs, you can do it in this way. Note that the page footer (including page numbering) is superimposed in the appended PDF.

Appended PDF