Some Title

some subtitle

Kandidatarbete inom Civilingenjörsprogrammet

GUDJÓN ÓLAFUR GUDJÓNSSON
JÓN GRÉTAR HÖSKULDSSON

Department of Civil and Environmental Engineering
Division of Structural Engineering
Concrete Structures
CHALMERS TEKNISKA HÖGSKOLA
Göteborg, Sverige 201X
Kandidatarbete 201X:XX
Kandidatarbete inom Civilingenjörsprogrammet

GUDJÓN ÓLAFUR GUDJÓNSSON
JÓN GRÉTAR HÖSKULDSSON

Department of Civil and Environmental Engineering
Division of Structural Engineering
Concrete Structures
CHALMERS TEKNISKA HÖGSKOLA
Göteborg, Sverige 201X
Kandidatarbete 201X:XX
ISSN 1654-4676
Department of Civil and Environmental Engineering
Division of Structural Engineering
Concrete Structures
Chalmers tekniska högskola
SE-412 96 Göteborg
Sverige
Telefon: +46 (0)31-772 1000

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

Omslag:
City Tunnel Diaphragm Walls, TEMP pic

Chalmers Reproservice
Göteborg, Sverige 201X
SAMMANFATTNING

Here goes the text for the Abstract

Nyckelord: Permanent Diaphragm Walls, Diaphragm Walls, Functional Requirements
Some Title secondary language
some subtitle secondary language
Bachelor’s thesis in Building and Civil Engineering
GUDJÓN ÖLAFUR GUDJÓNSSON
JÓN GRÉTAR HÖSKULDSSON
Department’s name in secondary language
Division’s name in secondary language
Research group’s name secondary language
Chalmers University of Technology

ABSTRACT

This is the abstract text in the secondary language

Keywords: keywords in, secondary, language
INNEHÅLL

Sammanfattning i

Abstract ii

Innehåll iii

Förord vii

Akronymer ix

Ordlista ix

Nomenklatur ix

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
1.9 Acronyms . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2
1.10 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
4.2 Tables . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 5

Referenser 7

Bilaga A Your first Appendix 9

Bilaga B Your second Appendix 9

CHALMERS, Department of Civil and Environmental Engineering, Kandidatarbete, 201X:XX iii
Figurer

4.1 Functional requirements for Buildability. .................................................. 4
4.2 This is the caption text that goes into the table of contents. ...................... 5
4.3 Examples of analytical functions. ............................................................... 5

Tabeller

4.1 An ugly table. ......................................................................................... 6
4.2 A beautiful table. ................................................................................. 6
FÖRORD

Here goes the text for the Preface.
Akronymer

FEM  Finite Element Method. 2

Ordlista

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

Nomenklatur

Subscripts
b  aggregate  
c  cement paste  
cr  crack  
el  elastic  
l  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)

Roman capital letters
w  crack width (m)

Miscellaneous
·  bar denotes macroscopic quantity  
⟨*⟩  homogenized quantity  
∥  parallel  
⊥  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 och Norén (2006, Chapter 2)
- Harryson, 2014
- Harryson
- "Interview on functional requirements for permanent diaphragm walls"
- Box, Hunter och 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 \texttt{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.

\begin{equation}
\sigma = E\varepsilon
\end{equation}

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

\begin{align}
A &= Bx \\
\epsilon + D + \frac{2}{\phi} &= \sqrt{B}
\end{align}

and here is how to suppress numbering of equations

\begin{equation}
\sigma = E\varepsilon
\end{equation}

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 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.

1.9 Acronyms

Define your acronymes in \texttt{notation.tex}. Finite Element Method, FEM, Finite Element Method (FEM).

1.10 Glossaries

A glossaries can be useful to include for words that the reader is assumed to have no prior knowledge of. You define your glossaries in \texttt{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:

\[ \sigma = 100 \text{mpa} \]
\[ \sigma = 100 \text{Mpa} \]

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 × 10\(^{-5}\) m\(^3\), 10 kN and 10 g m\(^{-2}\) 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. Your should avoid levels below this one.
4 Graphics

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.
Fig. 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.

Fig. 4.3: Examples of analytical functions.

### 4.2 Tables

Table contents is placed above the table. Vertical lines in tables should be avoided at all cost. Compare the two tables below:

**Table 1:**

<table>
<thead>
<tr>
<th>X</th>
<th>Y1</th>
<th>Y2</th>
<th>Y3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
</tr>
</tbody>
</table>

**Table 2:**

<table>
<thead>
<tr>
<th>X</th>
<th>Y1</th>
<th>Y2</th>
<th>Y3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
</tr>
</tbody>
</table>

---

**CHALMERS, Department of Civil and Environmental Engineering, Kandidatarbete, 201X:XX**
Table 4.1: An ugly table.

<table>
<thead>
<tr>
<th>Animal</th>
<th>Description</th>
<th>Price ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>gnats</td>
<td>gram</td>
<td>$13.65</td>
</tr>
<tr>
<td></td>
<td>each</td>
<td>.01</td>
</tr>
<tr>
<td>gnu</td>
<td>stuffed</td>
<td>92.50</td>
</tr>
<tr>
<td>emu</td>
<td></td>
<td>33.33</td>
</tr>
<tr>
<td>armadillo</td>
<td>frozen</td>
<td>8.99</td>
</tr>
</tbody>
</table>

Table 4.2: A beautiful table.

<table>
<thead>
<tr>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal</td>
</tr>
<tr>
<td>Gnat</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Gnu</td>
</tr>
<tr>
<td>Emu</td>
</tr>
<tr>
<td>Armadillo</td>
</tr>
</tbody>
</table>

Tables 4.1 and 4.2 provide the same information. However, Table 4.2 is much easier to read simply because it is typeset differently. As you can tell, the vertical lines in Table 4.1 do not help the reader in separating the different columns. Notice how the top and bottom horizontal lines in Table 4.2 are thicker than the two other lines in order to mark the beginning and end of the table. The following guidelines apply to tables:

- Avoid vertical lines.
- Minimize the need for horizontal lines.
- Avoid creating boxes around the items in the table.
- Units should be places in the column heading.
- The caption of a table should be printed above the table, as opposed to under (as for figures).
Referenser


A  Your first Appendix

The contents of your appendicies go here.

B  Your second Appendix

The contents of your appendicies 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.