



**CHALMERS**  
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# Some Title

some subtitle

Master's thesis in Civilingenjörsprogrammet

**GUDJÓN ÓLAFUR GUDJÓNSSON**  
**JÓN GRÉTAR HÖSKULDSSON**

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



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City Tunnel Diaphragm Walls, TEMP pic

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## ABSTRACT

Here goes the text for the Abstract

Keywords: Permanent Diaphragm Walls, Diaphragm Walls, Functional Requirements

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## ABSTRACT

This is the abstract text in the secondary language

Keywords: keywords in, second, language

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## PREFACE

Here goes the text for the Preface.



## NOMENCLATURE

In the notation table, if included, all variables occurring in the report (text, equations, figures or tables) are listed alphabetically. The variables should appear in the same format as later on in the report. Therefore, it may be wise to use the equation editor to write them, see also Section 1.5. In case of many variables, it is preferably to separate the table in “Roman upper case letters”, “Roman lower case letters”, “Greek upper case letters”, etc. Use the style “Notations” for lines with the explanations of the variables, but the style “Normal” for the table headings (and for one blank line before a new heading).

### **Roman upper case letters**

$A_{bc}$	Variable notation for something
$B_{cd}$	Variable notation for something



# 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:

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

## 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  $\text{\LaTeX}$ .

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

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

$$\sigma = E\epsilon$$

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:  $\sigma = E\epsilon$ . 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`.

## 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:  $10\text{m}^2$ ,

$10 \times 10^{-5} \text{ m}^3$ ,  $10 \text{ kN}$  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:  $\text{kN}$ .

## 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

Requirements				
Strength and Stability	Durability	Serviceability	Sustainability	Buildability
Design Loads	Exposure	Tightness	Materials	Economics
Design for ULS	Workmanship	Aesthetics		Experience
Accidental Loads		Deformation		Design Simplicity
		Vibration		Planning
		Settlement		
		Maintenance		

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  $\text{\LaTeX}$  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.

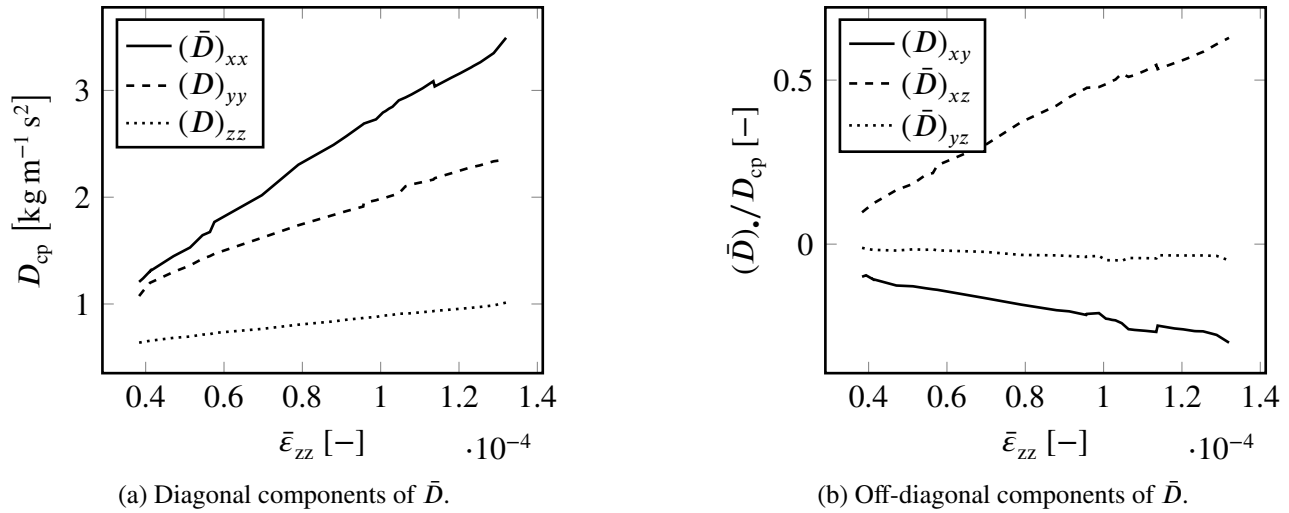


Figure 4.2: Components of the macroscale diffusivity tensor,  $\bar{D}$ , as a function of macroscale strain. Numerical values are normalized with respect to  $D_{cp}$ .

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.

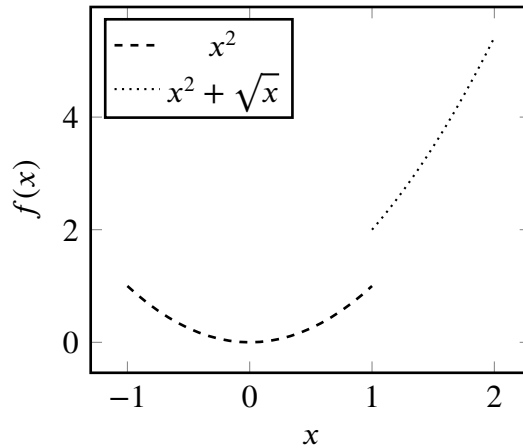


Figure 4.3: Examples of analytical functions.



# Bibliography

- 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).
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- 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)

## **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