Building Engineering
2016-2017
information booklet master track
NB The official course and examination regulations are always decisive. These can be found at Legal Position/Regulations/TER/Civil Engineering and Geosciences on www.studenten.tudelft.nl.
This booklet is published by the MSc Building Engineering track of the faculty of Civil Engineering of the Delft University of Technology. The booklet is meant as a guiding document for (future) Master students Building Engineering at this faculty.

With this guiding document an overview is given of the possibilities within the Master variant. At the same time it helps the student to choose courses and make a planning for the Master’s phase.

In addition to this information booklet it is advised to visit the website of Building Engineering: www.be.citg.tudelft.nl This website publishes an overview of the courses and MSc thesis projects and, when applicable, adjustments in the curriculum. For actual information you are advised to enrol for the Master Building Engineering group on blackboard. On www.studyguide.tudelft.nl you can find more detailed information on courses.

July 2016
Contents

Introduction ................................................................................................................................... 5
Chapter 1: General information Building Engineering ................................................................. 7
Chapter 2: General programme for the Building Engineering Track ........................................... 11
Chapter 3: Specialisations ............................................................................................................ 17
Chapter 4: Graduation at Building Engineering ......................................................................... 25
Chapter 5: Related institutions .................................................................................................... 30
Chapter 6: Useful addresses and telephone numbers .................................................................. 31
Buildings are an important part of human society. From the moment that humans changed their lifestyle from nomadic to settling, buildings have become a necessity; a necessity that has been growing in complexity ever since. Where the first human beings simply needed a roof over their head and relied on farm animals and fire to keep them warm, there the modern human requires light, space, climate control. Furthermore, modern man requires a greater variety of buildings, churches to football temples, offices to train stations, etc. Buildings with ever increasing complexity and ever increasing scale.

This is where the Building Engineer comes into play. The Building Engineer plays a vital role in making a building work. The complexity of all the different functions that a building fulfills needs to be analyzed and controlled. With a broad background followed by a specialisation, the Building Engineer can assume different roles such as structural engineer, façade engineer, building manager, building services engineer, etc. This way the complexity of the project is brought back to the essential human needs: comfort and protection.

This booklet is a guide for students interested or participating in the Building Engineering Master variant.

Chapter 1 gives a short introduction into Building Engineering backgrounds and an overview of future possibilities. Chapter 2 is a practical chapter with information on the curriculum of the Building Engineering Master variant. The two specialisations within the Building Engineering track are discussed in Chapter 3, including curricular demands. The practicalities surrounding the Master’s thesis, which concludes the Master’s education, are found in Chapter 4. In Chapter 5 an important institution related to the Building Engineering track at this faculty is introduced: the student’s association U-base. Chapter 6 concludes with useful addresses and telephone numbers.
Chapter 1: General information Building Engineering

1.1 The Dutch building industry

With 58 billion euros in 2015, approximately 10% of the gross national product, the turnover of the building industry is clearly an important part of the Dutch economy.

Yearly turnover of the Dutch building industry in 2015:
(source: Verwachtingen bouwproductie en werkgelegenheid 2016, EIB)

<table>
<thead>
<tr>
<th>Category</th>
<th>Turnover (€ billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>€ 16 billion</td>
</tr>
<tr>
<td>Utility buildings</td>
<td>€ 15 billion</td>
</tr>
<tr>
<td>Maintenance building</td>
<td>€ 10 billion</td>
</tr>
<tr>
<td>Civil structures and external contracting</td>
<td>€ 17 billion</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>€ 58 billion</strong></td>
</tr>
</tbody>
</table>

Building Engineering students will usually work in the field of utility buildings. The domain of (utility) buildings can be subdivided into the following categories:

**Relation with people:**
- Offices
- Hospitals
- Schools
- Sports stadiums
- Shopping centres
- etc.

**Relation with infrastructure:**
- Stations
- Parking garages
- Airports
- Seaports
- Communication towers
- etc.

**Relation with processes:**
- Industrial buildings
- Clean room facilities
- Power plants
- Waste processing plants
- Aircraft hangars
- etc.
1.2 Roles

Building projects are becoming increasingly complex both in functions as in technology and process. The result is that an integral approach is desired more and more. The role of the Building Engineer in this process is focused on technology and process, while the architect is mostly focused on function and aesthetics. However, to create a successful building it is necessary to continuously use an integral approach and consideration.

1.3 Working field

Many of the Building Engineering graduates will start working in the construction industry. There are different roles that can be assumed by building engineers in different parts of the building process as well as in different types of companies. After graduation both national and international career opportunities are available. Possible working fields:

- Building contractors
- Real estate developers
- Institutional investors
- Architectural/ Engineering firms
- Consultancies
  - Building Services firms
  - Façade consultancies
- Construction firms of large companies and institutions
- Engineering services government
- Research institutes (e.g. TNO)
- Educational institutes (e.g. TU Delft)
1.4 The Building Engineering Track: preparation for the working field

The Master of Science programme of Civil Engineering comprises the following eight tracks:

- Structural Engineering
- Building Engineering
- Hydraulic Engineering
- Water Management
- Transport and Planning
- Coast and Marine Engineering and Management
- Geo-Engineering
- Geoscience and remote sensing

Within the track Building Engineering the student can choose the specialisations given in chapter 3.

The MSc track ‘Building Engineering’ provides a broad curriculum. This includes all important aspects throughout the entire building cycle, from initial planning through the phase of use and onwards to redevelopment and demolition. The focus is on the technical and structural functions of buildings. However, the principles of architectural design are also examined. After all, in practice civil engineers will often work together with architects. It is therefore important for you to be familiar with each other’s fields of expertise. If for instance a building’s supporting structure is visible then together with an architect a solution needs to be found which is attractive in both structural and architectural terms.

The main difference with the Master track Structural Engineering lies in this integral focus on structures, where Structural Engineering focuses more on materials and mechanics.

In order to make a useful contribution to the design of buildings, a building engineer must have knowledge that includes the following fields:

- Structural solutions
- Structural and building services engineering
- Materials
- Building physics
- Finishing techniques
- Building organisation and management
- Building costs

This knowledge is acquired in a two-year programme which is designed to help you graduate as a highly expert engineer with a practical perspective. Following graduation your knowledge and experience will make you suited for a wide range of professions.
2.1 General programme Civil Engineering Master

The official documents on regulations for exams and graduation give a general scheme applicable for all Master tracks. This scheme is given in Figure 2.1. This is presented in a convenient arrangement in Figure 2.2.

In the scheme it is visible that all tracks of the Civil Engineering Master programme have one course in common. This is the course on ethics (WM0312CT), or its equivalent CIE4510.

Then there is an obligatory part for all Building Engineering specialisations, part b1. For Building Engineering is has been tried to compose a mix between a decent common basis with room for specialisation. Therefore 5 courses are obligatory for all BE students. These courses can be found in Figure 2.2.

Then there is an obligatory part dependent on which specialisation is chosen (part b2). Within the Building Engineering Master Track two different specialisations can be followed:

- Building Technology & Physics
- Structural Design

The reason for using specialisations in the Building Engineering track is to improve the transparency within all possibilities to choose from. Furthermore it gives an identity in relation with graduation and future possibilities within the study programme which aids both students and external professionals. The layout of the specialisations can be found in Chapter 3.

In addition to the general program of Building Engineering and its specialisation it is possible to acquire an annotation on Integral Design & Management (contact: dr. van Nederveen), Technology in Sustainable Development (tudelft.nl/tido) or Entrepreneurship (dce.tudelft.nl). Furthermore, annotations on Urban Planning & Engineering and The Infrastructure Planning and Environmental Engineering are available.

N.B. The program overview can also be obtained from www.studyguide.tudelft.nl
Article 3 – The composition
1. The study programme tracks are compiled in the following way:
a. 4 credits: the subject Philosophy, Technology Assessment and Ethics for CT (WM0312CIE) or the subject Climate Change: Science & Ethics (CIE4510)...
b. 56 credits: track-linked subjects belonging to the chosen track. The track-linked subjects may be subdivided into those that are general track-linked subjects (the common compulsory block) and those that belong to a specialisation as stipulated in Articles 5 to 11 or a free specialisation.

Track-linked credits, exceeding 56 credits, will be considered as credits achieved for electives mentioned under c.

c. 20 credits as follows: (Not for Building Engineering students, see Article 6 subsection 1)
* 20 credits electives. The student has to choose 10 credits offered in conjunction with the degree course.

For the other credits the student may choose:
- all subjects offered in conjunction with the degree course,
- all subjects offered in conjunction with other Master's degree courses at a Dutch university,
- the specialisation subjects included in the list “keuzelijst specialisatievakken” as intended in Article 3 of the Implementation Regulations for the Bachelor’s degree course in Civil Engineering at Delft University of Technology, as far as they are considered to be convergence subjects,
- interfaculty Master’s-level electives at Delft University of Technology with a “WM-code” to a maximum of 6 credits.

Before any other subjects can be studied the approval of the board of examiners is required.

OR
* two of the possibilities listed below:
  - 10 credits: Internship (CIE4040-09)
  - 10 credits: Multidisciplinary Project (CIE4061-09) [note: for BE this is AR0026 MEGA]
  - 10 credits: electives. What is determined above for the other electives is similarly applicable.
  - 10 credits: Additional Master Thesis Project (CIE5050-09). The Additional Master Thesis Project may or may not be related to the Master Thesis Project mentioned under d but it may, in any case, be separately distinguished.

d. 40 credits: a track-linked Master Thesis Project (CIE5060-09). The Master Thesis Project consists of a final project, a thesis, a summary of the thesis and a final presentation. The project is subject to a strict planning and time table; specific dates and deadlines need to be set for the evaluation(s) and the final presentation of the project. The planning will be monitored by the graduation coordinator.
Students who have not done CTB3345 will have to do CIE3345 (BPh and Facades) as a compulsory elective.

Figure 2.2: The layout of the Building Engineering Master's Track

Delft University of Technology 2016-2017
2.2 Traineeship (c1)

One of the optional subjects in the MSc programme is the internship. The internship lasts for at least 8 weeks and is awarded 10 ECTS as standard. The aim is that in the course of your internship you become familiar with the technical, social and organisational aspects of civil engineering as a practical profession. All information can be found at the internship office at room 2.73 of Civil Engineering or at www.citg.tudelft.nl/stagebureau.

2.3 Enrollment courses at Faculty of Architecture

For courses at the faculty of Architecture (AR-code) students should register at http://bis.bk.tudelft.nl. Deadlines are:
- beginning of June for period 1 and 2
- beginning of December for period 3 and 4

2.4 The multi-disciplinary project

In the Building Engineering programme the multi disciplinary project is substituted by the inter-facultary project AR0026 - MEGA [12]. Therefore students can not opt for the fourth year Master’s project (CIE4061-09).
2.5 AR0026 - MEGA (c2)

This course, that is organized in close cooperation between the faculties of Architecture and Civil Engineering, deals with the specific management, architectural, economic and technical aspects accumulated in a MEGA Building. Therefore students join small multidisciplinary groups and design a complex building, for instance a high rise structure. By investigating the several disciplines and by integrating them in a collective design, students learn to work together in a group and learn to take and evaluate decisions to reach an optimized an integrated design. The target is to produce a collective concept acting as a professional multidisciplinary design team. A realistic program, situated on a plot will determine the design target.

During the course, consultants of each discipline support the groups. Furthermore, usually a well-known designer is invited to give consults to all groups and give a lecture about his or her own work in practice.

In 2016-2017 MEGA is given in period 4.

For more information contact Karel Terwel, room 1.54 Stevin II.
Chapter 3: Specialisations

Introduction

As mentioned in Chapter 2, the Building Engineering Track has 2 different specialisations:

- Building Technology & Physics
- Structural Design

These specialisations will be discussed in this chapter. Each specialisation will be dealt with in three pages. The first page discusses the goals of the specialisation and the second page gives the course schedule. In the course schedule the specialisation-linked courses are stated.
3.1 Building Technology & Physics

Even more than the load-bearing structure, the appearance and the interior climate define the way users enjoy the building. In the specialisation Building Technology & Physics you will gain insight in all techniques that contribute to this.

Building Technology allows an engineer to translate the wishes of the architect into reality. This means determining which materials will be used for the finishing of the building and also ensuring that a sustainable building is constructed. You need to know about building components, material properties, building physics, maintenance properties and the repairability of materials and of technical installations in buildings. Since the façade is one of the most technically demanding and challenging components of a building, the emphasis for a building technologist lies on façade design and construction.

Building Physics is the science of designing high performance buildings that are durable, comfortable, energy efficient, affordable and healthy. To avoid or solve many building problems, a unique mix of heat and mass transfer physics, acoustics, material science, construction technology, human physiology, and engineering analysis and design must be applied.
<table>
<thead>
<tr>
<th>credits</th>
<th>course [credits]</th>
<th>period</th>
</tr>
</thead>
<tbody>
<tr>
<td>b2. 25 ECTS</td>
<td>specialisation linked courses. AR0531 Innovation and Sustainability [6]</td>
<td>p1</td>
</tr>
<tr>
<td></td>
<td>AR0115 Technoledge Façade Design [6]</td>
<td>p2</td>
</tr>
<tr>
<td></td>
<td>CIE5131 Fire Safety Design [3]</td>
<td></td>
</tr>
<tr>
<td>14 ECTS</td>
<td>free electives</td>
<td></td>
</tr>
</tbody>
</table>

Legend

- **S**: start education
- **education period**
- **recommended education period**

Delft University of Technology 2016-2017
Program Building Technology & Physics

<table>
<thead>
<tr>
<th>Sem.</th>
<th>1st period</th>
<th>2nd period</th>
</tr>
</thead>
</table>
| 1    | Semester 1.1  
CIE4202 Architectural History of Buildings [4 ECTS]  
CIE4240 Forensic Structural Engineering [3 ECTS]  
AR0531 Innovation and sustainability [3 ECTS]  
CIE5981 Forms of Collaboration [4 ECTS] | Semester 1.2  
CIE4215 Façade design plus [3 ECTS]  
CIE5100 Repair & Maintenance [4 ECTS]  
CIE5131 Fire Safety Design [3 ECTS]  
ID4010 Design Theory and Methodology [3 ECTS]  
AR0531 Innovation and sustainability [3 ECTS] |
| 2    | Semester 2.1  
AR0115 Technoledge Façade Design [6 ECTS]  
CIE4225 Adv & Applied Building Physics [6 ECTS]  
Free electives [2 ECTS] | Semester 2.2  
WM0312CT Ethics [4 ECTS]*  
AR0026 MEGA [12 ECTS] |
| 3    | Semester 3.1  
Electives [15 ECTS] | Semester 3.2  
Start Final Thesis [10 ECTS]  
Electives [5 ECTS] |
| 4    | Semester 4.1  
Final Thesis [15 ECTS] | Semester 4.2  
Final Thesis [15 ECTS] |

* or CIE4510 Climate change: science and ethics in p2 [4 ECTS]
3.2 Structural Design

The design phase of buildings involves not only structural experts and architects but, increasingly, structural designers as well. These ‘designing engineers’ act as a bridge between architects and the structural experts who focus on verification of standards, dimensioning and detailing. The Structural Design specialisation has been created in response to this development.

The main difference with the master track Structural Engineering lies in this integral focus on structures, where Structural Engineering focuses more on materials and mechanics.

Building Engineering has a broader approach, integrating different disciplines such as building services, architecture, etc. For Structural Engineering the approach is more elementary on the principle of mechanics and knowledge of materials.
<table>
<thead>
<tr>
<th>credits</th>
<th>course [credits]</th>
<th>period</th>
</tr>
</thead>
<tbody>
<tr>
<td>b2. 29 ECTS</td>
<td><strong>specialisation linked courses.</strong></td>
<td>p1 p2 p3 p4</td>
</tr>
<tr>
<td>CIE4115</td>
<td>Steel Structures 2 [4]</td>
<td>S</td>
</tr>
<tr>
<td>CIE4190</td>
<td>Analysis of Slender Structures [4]</td>
<td>S</td>
</tr>
<tr>
<td>CIE3109-09</td>
<td>Structural Mechanics 4 [4]</td>
<td>S</td>
</tr>
<tr>
<td>CIE3150</td>
<td>Concrete Structures 2 [4]</td>
<td>S</td>
</tr>
<tr>
<td>CIE5251-09</td>
<td>Structural Design, Special Structures [5]</td>
<td>S</td>
</tr>
<tr>
<td>CIE4281</td>
<td>Building Structures 2 [4]</td>
<td>S</td>
</tr>
<tr>
<td><strong>choose one out of two below:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIE4110</td>
<td>Timber and Timber Structures 1 [4]</td>
<td>S</td>
</tr>
<tr>
<td>CIE4285</td>
<td>Structural Glass [3]</td>
<td>S</td>
</tr>
</tbody>
</table>

*if one or more of the courses above has been done in BSc, they can be replaced by:*

<table>
<thead>
<tr>
<th>credits</th>
<th>course [credits]</th>
<th>period</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIE4121</td>
<td>Steel Structures 3 [4]</td>
<td>S</td>
</tr>
<tr>
<td>CIE4125</td>
<td>Structural Design - Case Steel, Timber or FRP [3]</td>
<td>S S S S</td>
</tr>
<tr>
<td>CIE4140</td>
<td>Structural Dynamics [4]</td>
<td>S</td>
</tr>
<tr>
<td>CIE4160</td>
<td>Prestressed Concrete [4]</td>
<td>S</td>
</tr>
<tr>
<td>CIE5124</td>
<td>Timber and Timber Structures 2 [4]</td>
<td>S</td>
</tr>
<tr>
<td>CIE5131</td>
<td>Fire Safety Design [3]</td>
<td>S</td>
</tr>
<tr>
<td>CIE5125</td>
<td>Steel Bridges [4]</td>
<td>S</td>
</tr>
<tr>
<td>CIE5127</td>
<td>Concrete Bridges [4]</td>
<td>S</td>
</tr>
<tr>
<td>CIE5148</td>
<td>Computational modelling of structures [4]</td>
<td>S</td>
</tr>
</tbody>
</table>

10 or 11 ECTS | free electives from one of the above courses.
**Program Structural Design**

<table>
<thead>
<tr>
<th>Sem.</th>
<th>1st period</th>
<th>2nd period</th>
</tr>
</thead>
</table>
| 1    | Semester 1.1  
CIE4202 Architectural History of Buildings [4 ECTS]  
CIE4240 Forensic Structural Engineering [3 ECTS]  
CIE4190 Analysis of Slender Structures [4 ECTS]  
CIE5981 Forms of Collaboration [4 ECTS] | Semester 1.2  
CIE4215 Facade design plus [3 ECTS]  
CIE4281 Building structures 2 [4 ECTS]  
ID4010 Design Theory and Meth [3 ECTS]  
Electives [4 ECTS] |
| 2    | Semester 2.1  
CIE3109-09 Structural Mechanics 4 [4 ECTS]  
CIE3150 Concrete Structures 2 [4 ECTS]  
CIE5151-09 Structural Design, Special Structures [5 ECTS]  
CIE4285 Structural glass* [3 ECTS] | Semester 2.2  
WM0312CT Ethics [4 ECTS]**  
AR0026 MEGA [12 ECTS] |
| 3    | Semester 3.1  
Timber structures [4 ECTS, 1.2]*  
CIE4115 Steel Structures 2 [4 ECTS]  
Free electives [7 ECTS] | Semester 3.2  
Start Final Thesis [10 ECTS]  
Electives [5 ECTS] |
| 4    | Semester 4.2  
Final Thesis [15 ECTS] | Semester 4.2  
Final Thesis [15 ECTS] |

* Timber structures 1 or Structural glass has to be chosen  
** or CIE4510 Climate change: science and ethics in p2 [4 ECTS]
Chapter 4: Graduation at Building Engineering

Introduction

The Master’s thesis finalises the Master’s study at the university. During the graduation period not only the graduation work itself is important, but also the organisation of the graduation as a whole. The organisation of the Master’s thesis is considered an important part of the graduation and is the sole responsibility of the student.

This chapter tries to give an overview of all the steps that need to be taken within the graduation period. The build-up of the chapter is related to the graduation scheme shown in Figure 4.1. In addition, students are advised to consult the CIE-0 form, which provides information on the graduation procedure (studenten.tudelft.nl)

Chairman Graduation Committee

Chair of Building Engineering is prof. Nijsse. Students Building Engineering, in search for a graduation chair, can consider, in addition to prof. Nijsse, any other CitG professor as chairman of their graduation committee. Prof. van de Dobbelsteen, Buys and Luscuere (Faculty of Architecture) are allowed to be chairman of students in the specialisation Building technology and physics.
Output TU Delft

Figure 4.1: Flow chart for graduation at Building Engineering (see also form: CIE-0)

Within four weeks: approval Master’s Thesis project

Completed:
- BSc. Exam
- 65 ECTS master
- Subsidiary Program (HBO-schakelprogramma)

Timeline

At the latest 20 working days prior to the graduation presentation

Completed:
- 120 ECTS in MSc. according to specialisation

Hand in Final Report (5 days prior to graduation presentation)

When applicable: hand in Withdraw Form (CIE-4) at SSC O&S when not finished

Deregister from studylink in the month of graduation

Fill our form: Application Start MSc. Thesis (CIE-1) and hand in at the faculty Service Point (SSC O&S)

Meeting professor about subject and graduation committee

Meeting graduation coordinator about subject, process and Master Examination Programme

Fill out form: Master Examination Programme (CIE-2) and hand in to coordinator

If necessary: hand in information of external examiner at graduation coordinator

When applicable: send changes in Master Examination Programme (CIE-2a) to coordinator

Hand in Application Form MSc. Degree (CIE-3) at SSC O&S

When applicable: hand in information of external examiner at graduation coordinator

When applicable: hand in Withdraw Form (CIE-4) at SSC O&S when not finished

Hand in Final Report (5 days prior to graduation presentation)

Deregister from studylink in the month of graduation

Completed:
- BSc. Exam
- 65 ECTS master
- Subsidiary Program (HBO-schakelprogramma)
# 4.1 Start of the Master’s thesis project

The first step in starting on the final project is to visit the graduation coordinator. For Building Engineering this is Karel Terwel, r. 1.54 Stevin II. Together the official part of the graduation will be set-up, this is the left hand column in Figure 4.1. One can start the MSc thesis as soon as the BSc and 65 ECTS in the MSc. are completed.

*Finding a subject*

At the same time a graduation subject needs to be found. It is a good idea to discuss this with a number of teachers and professors, where own input is very much appreciated. The graduation subject needs to be approved in concordance with the graduation professor.

A graduation subject at Building Engineering can be:
- Research focussed
- Design focussed

In practice a combination of the two is most common.

To help the student to find a graduation subject it is also advised to look at previous subjects, summaries can be found at [www.be.citg.tudelft.nl](http://www.be.citg.tudelft.nl).

Other important resources are PhD. students, fellow students. When searching for a subject take into account your interests, strengths and weaknesses and ideas about a future career.

*Graduation project at company*

Companies also often have interesting challenges for graduating students. In these cases it is common to have a person from the company to take place in the graduation committee. Graduating at a company and the appointment of an external graduation committee member has to be approved by the graduation coordinator on behalf of the board of examination. If you are interested in this, please contact K.C. Terwel on this.

*Graduation committee*

The chairman of the graduation committee is the graduation professor or a member from scientific staff (Assistant or associate professor) from CITG. The committee itself depends completely on the subject, but must consist of at least three persons from the Delft University. One of these three persons has to be from outside the Building Engineering department.

Furthermore, one or two members from outside the university can be added. The composition of the committee is a combined task of the graduation professor and the student.
**Cooperation**

It may be interesting to cooperate in one of the research fields (of the PhD students) of Building Engineering:

**SAFE**
- Structural design and safety/ Forensic Engineering

**SMART**
- Structural glass
- Free form concrete and High rise in prefab concrete
- Computational design (BEMnext)

**SUSTAINABLE**
- Reuse of existing buildings

**Forms**

All forms mentioned in Figure 4.1 can be found on the faculty website (studenten.tudelft.nl, go to CiTG, Forms) and at the Service Point of the faculty. The following forms are available:

- CIE-0: 'Procedure Graduation’
- CIE-1: 'Application Start MSc. Thesis’
- CIE-2: 'Master Examination Programme’
- CIE-2a: 'Master Examination Programme-assessment committee’ (use only to inform about changes in CIE-2)
- CIE-3: 'Application Form MSc Degree’
- CIE-4: 'Withdraw Form’ (if applicable)

4.2 Course of the graduation project

The **Start Meeting** is the first official meeting of the complete graduation committee. At this meeting the student presents a detailed work plan for the entire project. The work plan is a result of preliminary research by the student into the chosen subject and is put down in concordance with the graduation professor.

Typically, the Start Meeting is followed by two **Interim Meetings** to monitor the progress of the project. The time between the meetings is approximately 2/3 months. Additional meetings can be set up when necessary. Obviously there is regular contact with individual committee members between meetings, for instance once per 2 weeks.

At the **Final Meeting** a green light is given to proceed to finishing the project. The date for the Final Presentation is set here as well.

The **Judgement Meeting** takes place directly before the Final Presentation. At this meeting the student is absent and the committee will judge the project as a whole. After the following **Final Presentation** the final mark is established.
4.3 Finalizing the Master’s Thesis

In order to graduate a number of aspects needs to be taken into account. First, there is a number of deliverables and second, the official judgement criteria that are used by the graduation committee.

Deliverables
The following deliverables are obligatory:

- Hard copy of the final report for each committee member
- A4 announcement/ invitation for presentation
- Upload full report to repository* in .doc or .pdf format

Judgement criteria
The Master’s Thesis is judged on the following 5 aspects:

1. Scientific Approach (25%)
   - Theoretical profundity
   - State of the art description and literature study
   - Scientific argumentation (hypothesis testing)
   - Quality of experimental work or design
   - Creativity: new ideas

2. Quality of result/product (25%)
   - Scientific reflection and judgement
   - Utilisation of result/product
   - Extension/generation of methods
   - Quality of abstract
   - Amount of work

3. Behavioral competencies (20%)
   - Initiative and/or own contribution
   - Responsibility
   - Communicative skills
   - Independency

4. Quality of written presentation (15%)
   - Structure and consistency
   - Acknowledgement of sources/quotations
   - English proficiency

5. Quality of oral presentation and defence (15%)
   - Speaker quality
   - Clarity and structure of presentation
   - Quality of presentation material
   - Answering of questions

*) For more information on this, see the building engineering website or contact mrs. van der Schaaf at Stevin II 1.52
Chapter 5: Related institutions

U-BASE Association

U-BASE association is the student association of Building Engineering and Structural Engineering.

The main objective of the U-BASE is to introduce students to the business environment of civil engineering and the building and structural engineering practice in particular. To achieve this, we create and stimulate relations between students, the university and the building industry by organizing several activities:

- Excursions to companies and interesting building projects several times a year;
- Study tours abroad once a year: the last few years the U-dispuut visited Moscow & St Petersburg, Shang Hai, New York, Hong Kong, Chicago, Tokyo and Singapore;
- Symposia, workshops and guest lectures;
- By publishing a magazine the ‘U-profiel’.

For more information on the U-BASE visit us for a cup of coffee at room 1.35 Stevin II or go to:

www.u-base.org
## Contacts Building Engineering

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
<th>Telephone</th>
<th>E-mail</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor (only on Fridays)</td>
<td>Prof. Ir. R. Nijssse</td>
<td>+31 (0)15 27 81512</td>
<td><a href="mailto:R.Nijssse@tudelft.nl">R.Nijssse@tudelft.nl</a></td>
<td>Stevin II 1.36</td>
</tr>
<tr>
<td>Graduation coordinator Structural Design</td>
<td>dr. ir. K.C. Terwel</td>
<td>+31 (0)15 27 81512</td>
<td><a href="mailto:K.C.Terwel@tudelft.nl">K.C.Terwel@tudelft.nl</a></td>
<td>Stevin II 1.54</td>
</tr>
<tr>
<td>and Building Technology &amp; Physics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internship coordinator BE and SE</td>
<td>ir. L.J.M. Houben</td>
<td>+31 (0)15 27 84917</td>
<td><a href="mailto:L.J.M.Houben@tudelft.nl">L.J.M.Houben@tudelft.nl</a></td>
<td>Stevin II 2.27</td>
</tr>
<tr>
<td>Internship office</td>
<td></td>
<td>+31 (0)15 27 81174</td>
<td><a href="mailto:stagebureau-cit@tudelft.nl">stagebureau-cit@tudelft.nl</a></td>
<td>HG 2.73</td>
</tr>
<tr>
<td>Secretary</td>
<td>Mrs. J.M. van der Schaaf</td>
<td>+31 (0)15 27 83990</td>
<td><a href="mailto:J.M.vanSchaaf@tudelft.nl">J.M.vanSchaaf@tudelft.nl</a></td>
<td>Stevin II 1.52</td>
</tr>
<tr>
<td>U-BASE</td>
<td></td>
<td>+31 (0)15 27 83042</td>
<td><a href="mailto:info@u-base.org">info@u-base.org</a></td>
<td>Stevin II 1.35</td>
</tr>
</tbody>
</table>
Building Engineering

Faculty of Civil Engineering and Geosciences
Delft University of Technology
Stevinweg 1
2628CN Delft
The Netherlands