



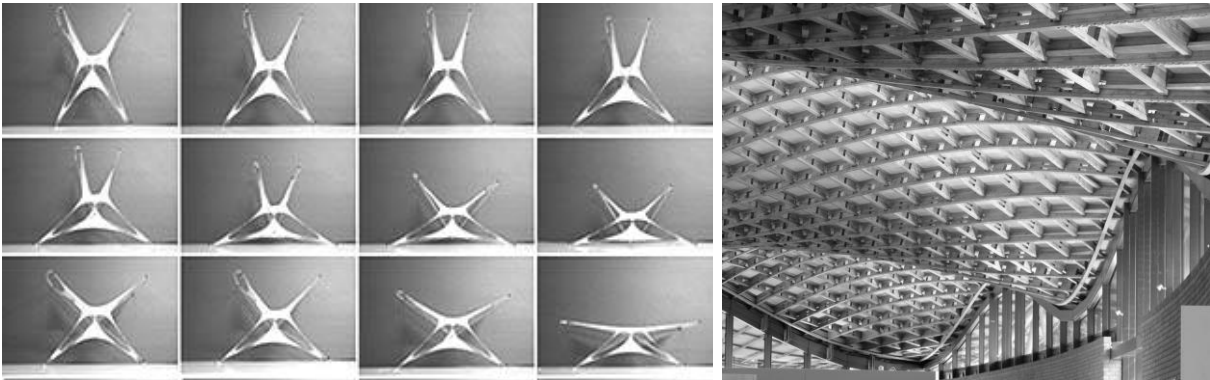
SCHOOL OF ARCHITECTURE, BUILDING & DESIGN

Centre for Modern Architecture Studies in Southeast Asia (MASSA)
Bachelor of Science (Honours) (Architecture)

BUILDING CONSTRUCTION 2 (BLD 60703/ARC 2513)

Project 2	: Understanding Forces in Building Construction
Marks	: 40% (GROUP + Peer Assessment)
Duration	: 5 weeks
Submission date	: 5 July 2017 - Week 13

Introduction



A building normally comprises of several different types of constructional systems, either due to its function or building code requirements. As designers, it is very important that you understand when and where each of the different type of constructional system is used. Today, tensile and grid shell construction methods are becoming widely used structures for building support. It provides the required load bearing resistance and aesthetics required by designers. Today, technological advancement is creating the path for innovations in building construction through exploration of materials, construction techniques and information technologies to produce more effective design approaches and features that will suit the designers' preferences, environment needs and etc..

Objectives of Assignment

The objectives of this project are as follows:

- To create an understanding of building components used and its assembly.
- To demonstrate good drawing skills in building details and how it reacts under loading and force.
- To be able to manipulate the selection of materials used and ensure its buildability.

Learning Outcomes

Learning outcomes assessed in this project include:

- Identifications of basic structural systems in construction
- Differentiate in terms of loads and forces acting on structural elements.
- Recognize and apply the implications of construction system in design.
- Analyse the issues of strength, stiffness and stability of structures including modes of structural systems, forces, stress and strain and laws of static.

Tasks - Methodology

Group Task

1. You are to propose a building (tensile/membrane construction or grid shell construction) and identify the structural systems used in the construction of the building of your choice.
2. Describe each structural system identified in terms of **Function, Material** and **Load Distribution**.
3. **Produce a model on an A3 base** showing the structural systems used in the above building. A detailed model showing appropriate constructional joints is **encouraged**.
4. **Suitable scale and material** to be used for the construction of the model shall depend entirely on you. However, do take note that quality and workmanship of the model produced will be considered in the assessment of this project.
5. You are then required to prepare **ONE (1) A2 size sheet**, utilizing both sides of the sheet. It includes, analysing the success or failure of the model together with the mitigating measures. You are also to include a brief introduction of the building, construction method from its sub-structure to super structure, modelling process as well as detailing of different parts of the buildings to show how it is constructed.
6. Students are encouraged to use annotated sketches / diagrams to explain the forces, structural movement experienced.
7. Additional to the above requirements, you will also need to manually draw **one (2) exploded axonometric construction detail**. This includes plan, elevation and section as key reference – printed.
8. The details must be complete with annotations, specifications as well as references to show your understanding on how the building is constructed.
9. Use **appropriate scale** for the detailing.
10. Photographs of the model and the process in making the model should also be incorporated into this A2 sized sheet.
11. The model and A2 sheet must be complete with title block format **with student's name, student ID and Tutor-In-Charge**.

Submission Requirement

- **1 (ONE) construction detail model** with suitable scales and materials to fit on an A3 size base.
- **1 (ONE) A2 size sheet** utilizing both sides (submitted in plastic envelope).
 - brief introduction of the building, modelling process, diagrams, photos and other relevant information deem necessary with regards to this exercise.
 - the exploded axonometric construction details – manually drawn with appropriate scale. Including relevant plan, elevation and section as key reference – printed, you can use from the references.
- Visuals / Photos used in the submission must be clear and well communicated.
- Sketches are meant to provide visual documentation and communication. Therefore sketches are required to be neat, clear and annotated.
- Assumptions can be made through reference from book/drawings. **DO NOT PLAGIARISE.**

Assessment criteria





The assessment for this assignment will be based on your :

- *Buildability and workmanship of the construction detail model.*
- *Creativity and clarity of ideas, materiality and richness of content both shown in the model and drawing presentation.*
- *Clarity of the information specified in the drawings.*
- *Quality of the documentation of visuals sketches, drawings and load and forces detailing of the construction elements.*
- *Clear visual and verbal communication of your understanding of the project.*
- *Appropriate and sufficient referencing*

Marking criteria

Marks shall be distributed as follows:

(1) Assessment Component (will be calculated to 40%)

Marking criteria	Marks %	Acquired TGC	Fail	Poor	Satisfactory	Good	Excellent
UNDERSTANDING OF DETAILS Ability to identify the functional requirements of the construction systems	40						
DETAILED SPECIFICATIONS GIVEN <ul style="list-style-type: none"> • Originality & practicality • Material attributes and method of construction. 	25						
EXPLODED AXONOMETRIC CONSTRUCTION DETAIL Ability to identify construction members and joints	15						
CLARITY AND NEATNESS OF PRESENTATION Quality / workmanship of the model produced.	10						
REFERENCE IN RELATION TO DESIGN REQUIREMENTS, BUILDING STANDARDS AND BY-LAWS	5						
PEER EVALUATION	5						

- 5% based on peer evaluation and instructor's evaluation on individual performance of a group member in a group

References

1. Chudley, R. 2006, *Construction Technology*. 4th edition. Pearson and Prentice Hall.
2. Lyons, Arthur, 2004. A. *Materials for Architects and Builders*. 2nd Edition. Oxford. Elsevier Butterworth-Heinemann
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4. Ching, Francis D.K. 1991. *Building Construction Illustrated*. New York. Van Nostrand Reinhold.
5. Simmon, H. Leslie, 2001. *Construction: Principles, Materials and Method*. 7th Edition. New York. John Wiley & Sons.
6. Zannos, Alexander. 1987, *Form and Structure in Architecture: The Role of Statistical Function*. Von Nostrand Reinhold Company, New York