Paper title: Spatial Design Systems and Technology
Paper Number: 224.371
Project: 1_Part A_Working Drawings & NZS3604
Hand-in Date: 27th September 5pm as a PDF via Stream (more info to come), bound A3 print out & 1:20 sectional model (MUST BE HANDED IN ON TIME REFER PAPER OUTLINE) you will lose marks if handed in late

Introduction: This project asks you to produce a set of preliminary working drawings of your studio project [altered STATES] and a 1:20 sectional model showing timber framed construction according to NZS3064.

Printed drawings currently serve as the primary means of communication for constructing buildings, interior spaces, joinery, furniture, etc. Working drawings are scaled, detailed, and accurate representations of a space or object and its construction specifics. Construction drawings need to follow established architectural graphic conventions to allow easy and correct understanding of proposed design intentions. You will construct the working drawing set on either Vectorworks, Revit or ArchiCAD.

CAD and BIM (building Information Modeling) techniques are contributing to a major change in the way spatial design is designed, communicated and constructed. The mode of BIM drawing mimics construction of a 3D object, rather than former 2D representational techniques. Advanced printing and cutting technology is now allowing for larger items to be formed directly from the CAD medium, with research continuing into 1:1 printing directly to site. Through digitally modeling your building for your working drawings you will also be able to produce a laser cut sketch model for Studio.

NZS3604 is the New Zealand Standard for Timber Framed Buildings. You will demonstrate an understanding of this Standard through both your working drawing set, and a 1:20 sectional model. This model needs to accurately represent the construction of a section of your building, including correctly sized and spaced timber framing.

Aim: Introduce the fundamentals of setting up a CAD and BIM standard and producing a set of working drawings. Also (for studio): translation of BIM files to a physical model.
Brief: This assignment is structured into 2 parts.

You will start by setting up Vectorworks/Revit/ArchiCAD, using classes and layers (or equivalent). Then draw a 3D model of your proposed building, which then will be used to create the plans and sections, etc. Working drawings are often used as part of the design process, they are a great way to check design ideas work/fit within the requirements of the project.

The Set should contain, but is not limited to:

**Cover Sheet**

Site Plan

Floor Plan

Elevations

Sections

Details

Part one [drawing]: Once your 3D CAD model of your building is underway, set out each sheet with a basic layout of content. Before the mid-semester break, put together a 50% check set to be handed in for comments and red-lining.

Part one [model] – for Studio: Once your CAD model is built, work with a copy of your digital model to prepare a file for a laser cut model. Cut and assemble model as required. Given that the model is small scale, consider what material to edit, what to maintain. Consider the function of the model – the communication of primary spatial idea/s and language. You are to decide what material(s) to use.

Part two [drawing]: After the break, continue drawing and integrate redline information once your check set is returned. Do a final check of document prior to issuing the set as a printed document, and digital copy.

Part two [model]: Building your CAD model should have given you a good understanding of the building’s construction. Demonstrate this in a 1:20 scale model of a 2m deep section of your building. This model should be built using appropriate materials and should show accurate timber frame construction.

**Project Requirements:**

A set of Preliminary working drawings of your studio project.

A 1:20 sectional model showing construction to NZS3604.

A small laser cut model to scale (for Studio).

As well as a printed, bound copy of your drawings, and your 1:20 model, you will provide digital copies of your drawings in the following format:

371_p2_lastname_firstname_dwg_07.pdf
Assessment: The project will be assessed to the extent that it:

- Investigates architectural graphic communication
- Creatively explores digital media and its relationship to traditional architectural graphic processes
- Demonstrates understanding of timber framed structure
- Effectively and coherently communicates design intent and structural understanding through both drawings and models

Feedback will be given after completion of the project.

Learning Outcomes: The student should be able to:

- Confidently use computer applications introduced in this project
- Apply computer application skills gained to inform design process and design presentation
- Understand the requirements of working drawings
- Understand and reference NZ Building Standards

Procedure and Timetable:

week 1  
**Wed. 17th Jul** 10B01
Project intro – basic timber framed building, drawing sets

Independent study:
- have a go using VW/Revit/ArchiCAD,
- choose which one you want to work on
- set up file & start drawing model
- lay out existing drawing set (plan, elevations)

week 2  
**Wed. 24th Jul** 10B01
NZS3604, timber framed building structure

Independent study:
- complete NZS3604 quiz on Stream
- add timber framing into your CAD model
- add a section showing framing to your drawing set (consider line weights and conventions)

week 3  
**Wed. 31st Jul**
Complete existing drawing set for hand in by **Friday 5pm**

week 4  
**Wed. 7th Aug**
p1B – Building Code Check – intro

week 5  
**Wed. 14th Aug**
continue work on Building Code report & drawing set for proposed design

week 6  
**Wed. 21st Aug**
continue work on Building Code report & drawing set for proposed design
Friday 5pm – hand in 50% check set & report draft

Study break

week 7  
**Wed. 11th Sep** 10B01
1:20 sectional model

week 8  
**Wed. 18th Sep** 10B01
Amend drawings from red-lining
Revise BC report if necessary

**week 9**  
**Wed. 25th Sep** 10B01
Final check, finishing touches to report, drawings & sectional model

**Final hand in 5pm Friday 27th September**

**References:**

**Recommended Reading:**


**Websites:**

Vectorworks: [http://www.nemetschek.net/](http://www.nemetschek.net/)