

The University of Melbourne
Semester Two
2005

Faculty of Architecture, Building and Planning

MARKING SUMMARY

QUESTION 1a _____/7 ½

QUESTION 1b _____/7 ½

QUESTION 1c _____/15

QUESTION 2 _____/5

QUESTION 3 _____/15

QUESTION 4 _____/10

QUESTION 5 _____/15

QUESTION 6 _____/10

QUESTION 7 _____/15

TOTAL _____/100

Subject Number: 702338

Student Number: _____

Subject Title: Construction Technology 3

Reading Time: 15 minutes

Exam Duration: 2 hours

This paper has 10 A3 pages

Authorised Materials:

The following items are authorised:

*Pens, pencils, erasers, scale rulers, whiteout, calculators.
No lecture notes or other written materials are authorised.*

Instructions to students:

Attempt all questions in this paper.

Allocate time to each question in accordance with the marks.

Instructions to invigilators:

No separate exam booklet is required.

Please collect this paper from each student.

This exam may be held in the Baillieu library

Question 1a

Steel framing systems

As an architect, you have been commissioned to design a *free standing warehouse*.

Your client requires the total volume of the storage area to be **15,000 m³** with a minimum height of **10 metres**.

A central **5 metre** wide forklift driveway is required along the middle of the warehouse to give access to storage areas on each side. The minimum width of the warehouse will therefore be **15 metres**.

In the space below:

- Sketch a likely floor plan for the design of the warehouse;
- Dimension the overall size of the building;
- Indicate the primary structural grid and secondary structural members using standard drawing conventions;
- Estimate and dimension the spacings between the primary structural members;
- Estimate and dimension the spacings between the secondary structural members used for the roof framing;
- Notate the names of the primary and secondary structural members used for the roof and roughly estimate their sizes.

Assumptions:

- Assume a steel framed structure on a level site.
- Assume parapet walls and metal tray deck roofing.

Marks

7 1/2 Marks

Question 1b**Roof drainage systems**

In the space below:

- Sketch the roof drainage system for the warehouse you have drawn in Question 1a
- On the plan, locate box gutters; downpipes; ridge(s); sumps and overflow outlets;
- Dimension the approximate size of the box gutters.

Assumptions:

- Assume a steel framed structure on a level site.
- Assume parapet walls and metal tray deck roofing.

Marks

7 1/2 Marks

Question 1c

Detailing

For the building you have designed, sketch in the space below typical details (at large scale) for the following:

- floor/wall junction.
- parapet wall/roof junction.

Notate these sketches indicating:

- the various components that make up the detail and their likely sizes; materials and support.
- how rainwater is collected and discharged from the roof to the in-ground stormwater drainage system.

Assumptions:

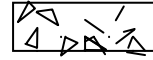
- Assume a concrete slab on-ground with 2 metre high concrete block dado infill walls between columns with metal cladding above to the top of the wall parapet

Marks

15 Marks

Question 2 Construction drawing standards

Most materials when drawn in section have a standard hatch/pattern which is used to represent them – for example concrete is shown as:



In the boxes, indicate the symbols used for:

- clay brick
- concrete block
- undressed timber
- dressed timber
- insulation materials

Marks 5 Marks

Question 3 ESD in construction techniques

In the space below:

- Nominate and explain **five** different examples of how ESD principles/objectives can be incorporated into building technology and the affect these have on the construction. For example - the use of salvaged timber from demolished buildings for structural members

Marks 15 Marks

Question 4

Construction processes

Over the past years the construction industry has evolved to maximise the use of prefabricated building components. Prefabricated components are manufactured off site, then transported to the site and incorporated in the building.

Give three examples of prefabricated building components used for the external building fabric.

1.

2.

3.

For one of the examples above, describe and sketch how these building components are usually fixed to the supporting structure.

Give three advantages for the use of *off site* prefabricated building components and explain these advantages

1.

2.

3.

Marks 10 Marks

Question 5

Building control regulations

A major part of the Building Code of Australia (BCA) is concerned with:

- the prevention of fires
- the detection of fires
- the control and suppression of any fires which occur

a) *Within buildings*, the prevention and control of fires are dealt with by requiring:

- certain building components to have minimum fire resistance and to have insulative qualities and stability if a fire occurs. (frl's)
- certain areas within larger and/or more complex buildings to be compartmentalised and separated from other areas.

In the space below, explain these requirements and how they operate in more detail

b) *External to buildings* fires are prevented from spreading between buildings by:

- a device called *fire source feature*.

In the space below, explain this term and how it affects the required fire rating of building components when in proximity to other buildings

c) *Fire suppression*

In the space below, list and describe the three methods recognised under the BCA to be used for the suppression of fires.

Marks 15 Marks

