

UNIVERSITY OF SOUTH AUSTRALIA
SCHOOL OF THE NATURAL AND BUILT ENVIRONMENTS

PROGRAMS: **Bachelor of Construction Management & Economics &
Diploma in Built Environment**

COURSE: **CONSTRUCTION SCIENCE 1 (CIVE 1003)**

EXAMINATION: **Semester 1, 2005**

DURATION: **10 mins. of reading time followed by 2½ hours of exam time.
Note that ENTEXT students are allowed 10 minutes
additional time per hour of exam time. In this case 25
minutes of additional time.**

EXAMINER: **Stephen Pullen Tel. 22753**

INSTRUCTIONS TO CANDIDATES:

- This exam is worth 50% of the total course marks.
- Attempt all questions.
- *All questions are of equal value.*
- No reference materials are allowed.
- State any assumptions made.
- Diagrams are recommended where appropriate.

Question 1

a) Sort the following terms into three groups where the terms in each group have a similar meaning:

Modulus of elasticity, cube strength, three point testing, modulus of rupture, cross breaking strength, compressive strength, Young's modulus, bending strength, rigidity, flexural strength, crushing strength, stiffness.

7 marks

b) Specify three advantages of radial sawn timber compared with conventionally sawn timber.

6 marks

c) Glass is weak in tension due to its brittle nature and susceptibility to surface defects. Describe in detail one glass product which has been developed to overcome this problem.

7 marks

Question 2

Explain the principles of one stage and two stage movement joints using diagrams to supplement your answers. State the advantages/disadvantages of both.

11 marks

Question 2 (continued)

Name the common types of elastomeric sealants in commercial use.
Draw a section through a typical one stage movement joint where the maximum anticipated movement is $\pm 2\text{mm}$ and the movement accommodation factor of the sealant is $\pm 12\frac{1}{2}\%$. Specify typical dimensions.

9 marks

Question 3

What are brick growth and salt damp? Explain clearly the possible results of these two phenomena and ways of avoiding these effects.

20 marks

Question 4

You are based at a construction site where a large concrete floor slab is to be poured over a period of several days. You have been asked to make quality control records (ie: check lists) of any factors which may affect the final quality of the floor. The records will also act as a means of investigating any suspect areas (when fully hardened). Make a list of factors you will check and comment on why each factor is relevant.

20 marks

Question 5

Nominate four types of cement-based non shrink grouts explaining the mechanisms by which they work. Provide some examples of where cement based grouts would be used. Describe a non cement-based grout and the circumstances where you would recommend it.

20 marks

END OF QUESTIONS