UNIVERSITY OF SOUTH AUSTRALIA
SCHOOL OF NATURAL & BUILT ENVIRONMENTS

PROGRAM(S): **Bachelor of Construction Management & Economics/ Diploma in Built Environment**

COURSE: **BUILDING ESTIMATING 1N (10262)**

EXAMINATION: **Internal Exam, Semester 1, 2004**

DURATION: **3 Hours of Exam time preceded by 10 minutes of Reading time, a total of 3 Hrs 10 Mins.**
For ENTEXT students 10 minutes of Reading time plus 3.5 Hours of Exam time, a total of 3 Hrs 40 Mins.

EXAMINER: **Sam Baroudi, Tel. 8302 2234**

EXAM REVIEWED BY : **Tim O'Leary**

INSTRUCTIONS TO CANDIDATES:

- This exam is worth 50% of the total course marks
- All questions are of equal value.
- **Attempt <u>ALL</u> five (5) questions.**
- **<u>State any assumptions made.</u>**
- No reference materials are allowed. Calculators allowed.

NOTES FROM EXAMINER:

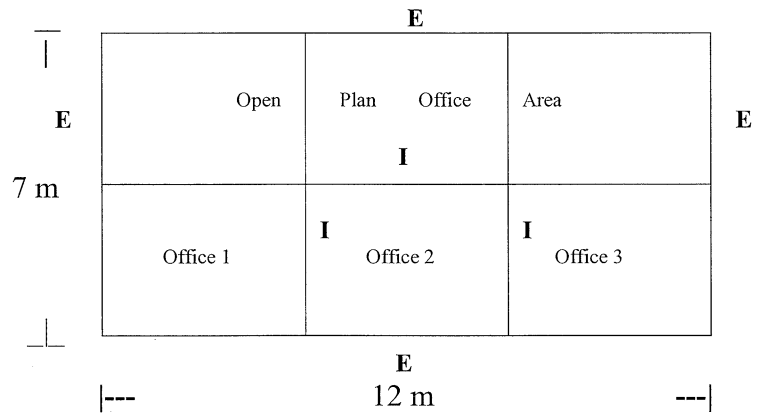
Question 1 **(20 Marks)**

You have been made the chief building estimator within a major construction company. It is your intention to provide the estimating department with new directions towards successfully winning work for the company. Provide an outline of all the various ideas, tactics and techniques you intend to use to ensure the competitive costing of all building works that are being tendered for. Ensure you provide explanations to why you think they will be effective.

Question 2 **(20Marks)**

Provide a cost estimate for the construction of a raft slab as indicated below by a line diagram in plan view. The raft slab is 12 metres long by 7 metres wide with internal beams equally spaced and a slab above. Allow for all necessary items to complete the concrete works, as typically would be required, using this diagram and the information offered below. Assume the line diagram dimensions are generally to the outer edges of the footing and the internal beams are indicated by their centrelines. Calculate your estimate assuming a level compacted basecourse platform will be provided by others. Show all methodology and calculations as appropriate.

Note that all excavated spoil should be removed from site to the local dump by use of a hired bobcat and tipper (ie truck) with a 5 cubic metre capacity.



- The concrete footing beams are:
  External (E) 500mm wide by 700mm deep with 3 xY12 reinforcing bars top and bottom lapped 900mm at joins and W6 ligatures at 900mm centres.
  Internal (I) 300mm wide by 500mm deep with 3 xY12 reinforcing bars top and bottom lapped 900mm at joins and W6 ligatures at 900mm centres.

- The floor slab is 100mm thick with F72 fabric reinforcing.

- All concrete is N20 strength grade.

<u>Rates</u>

- Concrete Works - N20 concrete supply $125/cubic metre, Y12 reinforcing bars $18/6m length, W6 ligatures $7 each, fortecon $80/ 50sq.m roll, machine hire required $60/hour, labour required $30/hour, bobcat $50/hour, tipper $60/hour, dump fees $100/load. Nominate prices for any items that you feel may be required but are not given.

Question 3 **(20 Marks)**

Refer to Question 2 and price brick veneer construction (ie. brickwork and timber frame only) to suit the same line diagram. Note that the wall height is 2.7 metres to the eaves and travels along the perimeter of the raft slab. All sundry items should be allowed in it's construction. The brickwork has only one standard door opening into the building and 1200mm x 1200mm windows with sills in each grid section (ie. 6 off). For the purposes of pricing the internal wall frame assume the top half of the line diagram is open plan with the bottom half split into three offices as indicated with a standard doorway in each. Show all methodology and calculations as appropriate.

- Brickwork is standard faced with rolled joints.
- Timber members - top/bottom plates 70x45, studs/all other 70x35.
- Bracing panels - 2.7m x 1.2m masonite.

Rates

- Face Brickwork - supply $700/1000 bricks, laying $950/1000 bricks, mortar & sundries $100/1000 bricks, laying brick sills $15/lineal metre, lintels $23 each.
- Carpentry works - 70x45 timber $3.50/m, 70x35 timber $2.75/m., masonite sheeting 2.7m x 1.2m $15/sheet, carpentry labour $40/hour.
- Nominate prices for any items that you feel may be required but are not given.

Question 4 **(20 Marks)**

As the building estimator pricing the works on a hospital project you must consider all cost implications to the project noting your company has not had previous experience in this type of work. The proposed hospital is valued at approximately $6 million dollars, is expected to take 12 months to complete and is being built on a site that may have rocky subsurface conditions . You have been given 3 weeks to submit a tender to a client that is known to be very difficult to work with. Also note that the company has had limited success in recent times and is in need of the work. Answer the following questions in regard to this case.

a) What means could you use to discover any other tenderers and their identities? What type of assessment can be made once you know which other companies are tendering the project?

b) A supervisor is to be priced into the project. They are required full-time for the full period of the works plus an additional 3 months to tidy up any loose ends. Their annual salary is $60,000 not including superannuation payments of 9% and workcover payments of 4% which must be made. What overall amount should be allowed in the tender for supervision? Show all calculations.

c) You have been asked by senior management to comment on the profit margin that should be applied to this project. What would your response be and give reasons why.

d) What should your tender submission or letter include as standard items in regard to this project. Give examples.

Question 5 **(20 Marks)**

Discuss only four (4) of the following issues in relation to the estimation of building works. Questions are of equal value and answers should be kept separate to each other. Clearly indicate which questions are being answered.

a) What is the difference between a provisional cost sum and a prime cost sum giving an example of each?
b) What do you understand by the term "tender package" in respect of subcontractors? Give examples.
c) Distinguish between a contract (ie. client) contingency and a builder's contingency as applied to the costing of buildings and why are they sometimes necessary?
d) How can computers and estimating software assist in the costing of building works?
e) Make comparisons between the occupations of a building estimator and a quantity surveyor.
f) What is a project cost summary? Format a typical example of one.

END OF QUESTIONS