

UNIVERSITY OF SOUTH AUSTRALIA
SCHOOL OF GEOINFORMATICS, PLANNING & BUILDING

PROGRAM **Bachelor of Construction Management & Economics**
COURSE **BUILDING ESTIMATING 1N BUIL 2018 (10262)**
EXAMINATION: **Internal Exam, Semester 1 - June 2002**
DURATION: **3 Hours of Exam time preceded by 10 minutes of Reading time**
 Total time 3 Hrs 10 Mins.
EXAMINER: John Deans – Tel : 8302 2921 M : 0438 987 892

INSTRUCTIONS TO CANDIDATES:

- This exam is worth 50% of the total course marks.
 - All 8 main questions carry equal marks and should be answered.
 - Neatness and presentation will count up to 10% of the total marks.
 - No reference material is allowed in the examination.
 - A calculator is allowed.
 - Where applicable show all calculations and provide both total cost and rate build up.
-

Q1. Basic Definitions

Define and briefly describe each of the following :-

- a) Tender Documents
- b) Provisional Quantities
- c) Labour Constant
- d) Bulking
- e) Loss of Bulk
- f) All-in Labour Rate
- g) All-in Mechanical Plant Rate
- h) Bills of Quantities
- i) Head Office Overheads
- j) Preliminaries

Q2. Pre-Tender Site Visit Report

When a Building Contractor is preparing a Tender for a construction project, he should visit the site of the proposed project and obtain relevant information to enable him to prepare an accurate and fully informed Tender Price.

List **FIVE** items that you consider to be the most important and explain how they can affect the Tender Price. What item of equipment should the Builder take with him on the site visit?

Q3. Excavation and Earthworks

A Builder has been awarded a contract to construct a new multi storey car park in the City centre and a basement size 100m long x 35m wide x 6m deep is to be excavated. Due to very poor ground conditions the builder has to excavate an additional 2m in depth (8m total depth overall) and then backfill the additional excavation with selected imported fill, compacted up to the required 6m depth level.

- a) If the excavated material bulks 20% on excavation and weighs 1750 kgs/m³ after excavation, how many 15 tonne truckloads will be required to remove the excavated material to the tip?
- b) The selected imported fill weighs 1550 kgs/m³ before being compacted and will loose 15% of its volume after compaction, how many 10 tonne truckloads will be required to transport the fill material to the site?

Q4. Pricing of Concrete per m³ ready for placing

A ready mixed concrete supply is not available for a Builder so he has decided to mix the concrete on site using his own plant and labour.

What would be the cost of site mixed concrete per m³ at the mixer and ready for placing, assuming :-

- 1:2:5 Mix proportions by volume
- Cost of cement \$195/tonne (1.44t/m³) delivered to site
- Fine aggregate \$22/m³ delivered to site
- Coarse aggregate \$30/m³ delivered to site
- Add 50% for mixing shrinkage ie. 1/3 loss of bulk
- 500 litre concrete mixer costing \$30/hr and having an output capacity of 6m³/hr
- Gang of 2 labourers (\$20/hr) to load and operate the mixer
- Allow 1hr per tonne labourer to unload the cement bags
- Allow 5% for waste on all materials
- Allow 10% for OH&P

Q5. Pricing of Concrete Blockwork

Price the following BQ Item :-

100mm Concrete Blockwork in stretcher bond in 1:3 cement/sand (by volume) mortar.
500 m²

Basic assumptions :-

- Cement \$185 per tonne (1.44 t / m³) delivered to site
- Allow 1 hour labourer to unload cement
- Sand \$12 per m³ delivered to site
- Add 25% to mortar for shrinkage
- Mortar mixer cost \$25 per m³
- Concrete Blocks \$1300 per thousand delivered and unloaded on site
(allow 25 blocks per m² and 5% for cutting and waste)
- Blocklayer \$26.00 per hour All-in labour rate
- Labourer \$20 per hour All-in labour rate
- Labour ratio – 2 Blocklayers : 1 Labourer
- Allow 1.25 m³ of mortar per 100 m² of blockwork including waste
- Allow 55 hours Blocklayer per 100 m² of blockwork
- Allow Labourer to assist
- Allow 5% for waste on all materials
- Allow 10% for OH&P

Q6. Pricing of Roofing

Price the following BQ Item :-

Spanish terra cotta roofing tiles fixed to 50 x 25 timber battens at 350mm centres
75 m²

Basic assumptions :-

- Assume roof to be 15m long x 5m down slope
- Each roof tile covers a net roof area of 350mm x 250mm
- Spanish terra cotta roofing tiles \$685 per thousand delivered and unloaded on site
- 50 x 25 Timber batten delivered and unloaded on site per 100 m \$95
- Tile / batten nails 4kg/100m² at \$1.80 per kg
- Roofer to fix timber battens 2 hours per 100m
- Roofer to lay tiles 15 hours per 100m²
- Allow Labourer for 50% of Roofer time
- Roofer \$24 /hour All-in labour rate
- Labourer \$20 / hour All-in labour rate
- Allow 5% for waste on all materials
- Allow 10% for OH&P

Q7. Pricing of Carpentry

Price the following BQ Item :-

25mm Tongued and grooved jarrah flooring secret nailed to hardwood joists at 600 centres
125 m²

Basic assumptions :-

- 100mm wide o/a T&G floor board \$425 per 100m including delivery to site
- Net width of board after deduction for dressing and tongue 85mm
- Labourer to unload 0.95 hr per 100m
- Allow 0.25 kg nails per 1m² at \$2.50 per kg
- Carpenter to fix 45 hrs per 100 m²
- Carpenter \$27 /hour All-in labour rate
- Labourer \$22 / hour All-in labour rate
- Allow 5% for waste on all materials
- Allow 10% for OH&P

Q8. Pricing of Plasterboard Ceiling lining

Price the following BQ Item :-

16mm Plasterboard ceiling lining fixed to soffit of ceiling joists at 450 centres 35 m²

Basic assumptions :-

- 16mm Plasterboard 2.4m x 1.2m delivered and unloaded on site \$15.75 per board
- Allow fixing nails at 450 c/c at 400 No. per KG at \$3.00 per kg
- 1 Roll scrim (75m) delivered and unloaded on site \$12.00
- Allow board bond (base material) 0.15 kg / m at \$1.50 per kg
- Allow board finish (finish material) 0.10 kg / m at \$1.10 per kg
- Allow Plasterer (1) + Labourer (1) 28 hrs to fix per 100 m² including allowance for ceilings
- Plasterer \$26 / hour All-in labour rate
- Labourer \$20 / hour All-in labour rate
- Assume room size on plan 7m x 5m
- Allow 5% for waste on all materials
- Allow 10% for OH&P