

THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY
THE DEPARTMENT OF ARCHITECTURE AND CONSTRUCTION MANAGEMENT
FIRST SEMESTER EXAMINATION
FIFTH YEAR BACHELOR IN BUILDING
BL 501 – QUANTITY SURVEYING & ESTIMATING 4

Room: L2
Date: Thursday 10th June, 2021
DURATION: 3 Hours
Time: 12:50 – 16:00 pm

Instructions to Candidates

1. You have 10 minutes to read the paper. Do not begin writing during this time.
2. Fill in the Attendance Slip with your name and student I.D. number now
3. There are six (6) pages to this exam paper including drawing attachment.
4. **There are four (4) Questions** and you are to **answer all questions**.
5. ALL ANSWERS MUST BE WRITTEN IN THE ANSWER BOOK (S) PROVIDED
6. Each question must be answered starting on a New Page.
7. Notes and Textbooks are not allowed in the Test Room.
Only materials allowed and to be brought in by students are;
 - Calculators
 - Pens, biros and pencils

WRITE YOUR NAME AND IDENTIFICATION NUMBER CLEARLY ON THE FRONT PAGE. DO IT NOW!

TOTAL MARKS = 100 MARKS

Question 1:

[10 x 4marks]

Take of the quantities of the following items of work listed below from the drawing attached;

- | | |
|---|----------------|
| A. Excavate strip footing from natural ground level to reduce level..... | M ³ |
| B. Backfill beds ≤ 250mm thick with hardcore materials..... | M ² |
| C. Backfill sides of strip footing ≥ 250mm thick with hardcore materials..... | M ³ |
| D. 25mPa plain concrete to strip footing and slab (1:2:4)..... | M ³ |
| E. 400 x 200 x 200mm thick concrete blockwall with outside joint pointed (1:4)..... | M ² |
| F. 15mPa concrete filling to blockwall (1:3:6)..... | M ³ |
| G. 250 x 25 F11 HWD fascia boards fixed to roof framing..... | M |
| H. 125 x 50 F11 HWD rafters @ 600mm fixed to roof framing..... | M |
| I. 75 x 50 F11 HWD purlin @ 600mm centres fixed to roof framing..... | M |
| J. 12mm plysheet to ceiling and soffit linings..... | M ² |

Question 2:

[10 x 1mark]

Create an Abstract for the listed items of work in Question 1

Question 3:

[10 x 4marks]

Buildup the unit rates for the listed items of work in Question 1

Question 4:

[10 x 1mark]

Create and complete the sample Bills of Quantities (BOQ) for the items of work

Data to build up the Unit Rates

Ground Works

Hand Excavation

Labour:

1 x Tradesman @ K5.00/hr assisted by 6 x Labourers @ K3.60/hr

Output: (refer to Table 1)

Profit and on-cost: 10%

Backfill

Materials:

Hardcore materials or similar delivered to site cost K50.00/m³

Waste to materials, 10%

Labour:

1 x Tradesman @ K5.00/hr assisted by 6 x Labourers @ K3.60/hr

Output: (refer to Table 2)

Profit and on-cost: 10%

Concrete Works

Materials: (refer to Table 3)

40kg cement per tonne cost K300.00 includes delivery to site

Sand/m³ cost K40.00 delivered to site

Aggregates/m³ cost K50.00 delivered to site

Waste to all materials, 10%

Unloading + stacking, K2.00

Labour:

1 x Tradesman @ K5.00/hr assisted by 6 x Labourers @ K3.60/hr

Labour Output: (refer to Table 4)

Plant 10/7 mixer rate: K30.00/hr

Plant output: (refer to Table 4)

Profit and on-cost: 10%

Masonry

Cost to deliver 100 blocks includes delivery to site cost K350.00

Waste to concrete blocks, 10%

Materials for mortar: (refer to Table 4)

40kg cement per tonne cost K300.00 includes delivery to site

Sand/m³ cost K40.00 delivered to site

Waste to sand, 5%

Unloading + stacking, K2.00

2 x Blocklayer @ K5.00/hr assisted by 3 x Labourers @ K3.60/hr

Labour Output: (refer to Table 5)

Profit and on-cost: 10%

Filling in Masonry walls

Materials: (refer to Table 3)

Price of 40kg cement per tonne cost K300.00 includes delivery

Sand/m³ cost K40.00 delivered to site

Aggregates/m³ cost K50.00 delivered to site

Waste to all materials, 10%

Unloading + stacking, K2.00

2 x Blocklayer @ K5.00/hr assisted by 3 x Labourers @ K3.60/hr

Labour Output: (refer to Table 5)

Profit and on-cost: 10%

Woodworks

Materials:

125 x 50 timber cost K850.00/100m includes delivery
 75 x 50 timber cost K600.00/100m includes delivery
 250 x 25 timber cost K450.00/100m includes delivery
 12mm plysheet (size 2.4m x 1.2m) cost K250.00/sheet includes delivery
 Nails to fix at 2.5kg @ K30.00/10kg includes delivery
 Waste to all materials, 10%
 Unloading + stacking, K2.00

Labour:

1 x Tradesman @ K5.00/hr assisted by 2 x Labourers @ K3.60/hr
 Labour Output: (refer to Table 5)
 Profit and on-cost: 10%

Tables

Table 1: Hours to Excavate 1 m³ by hand for Ordinary Soil

| Depth stage (m) | To excavate and get out | To throw the soil out | To clear the sides | Totals Hours |
|-----------------|-------------------------|-----------------------|--------------------|--------------|
| ≤1.0 | 2.4 | 0.0 | 0.0 | 2.4 |
| > 1.0 to ≤2.0 | 2.4 | 1.4 | 1.4 | 5.2 |
| > 2.0 to ≤ 3.0 | 2.4 | 2.8 | 1.4 | 6.6 |
| > 3.0 to ≤4.0 | 2.4 | 5.2 | 1.4 | 8.0 |

Table 2: Hours to Backfill 1 m³ by hand for Ordinary Soil

| | |
|----------------------------------|------|
| Filling hardcore in beds ≤ 250mm | 1.15 |
| Filling hardcore in beds > 250mm | 1.30 |

Table 3: Approximate quantities of dry materials required per m³ of fully compacted concrete

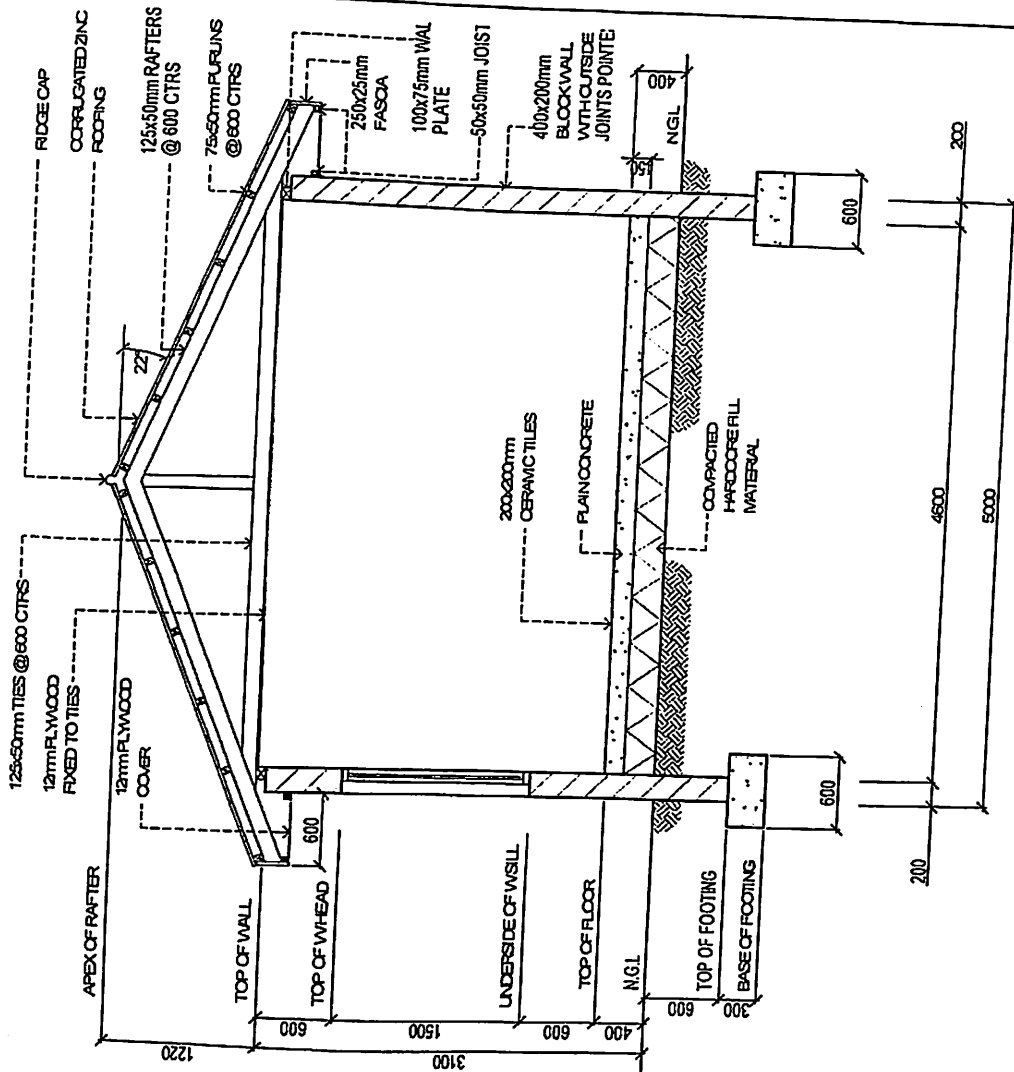
| Nominal mixes By Volume (20mm Aggregates) | Cement (Tonnes) | Sand (m ³) | Aggregates (m ³) |
|---|-----------------|------------------------|------------------------------|
| 1 : 3 : 6 | 0.22 | 0.45 | 0.90 |
| 1 : 2 : 4 | 0.32 | 0.43 | 0.86 |

Table 4: Approximate quantities of dry materials required per m³ of mortar

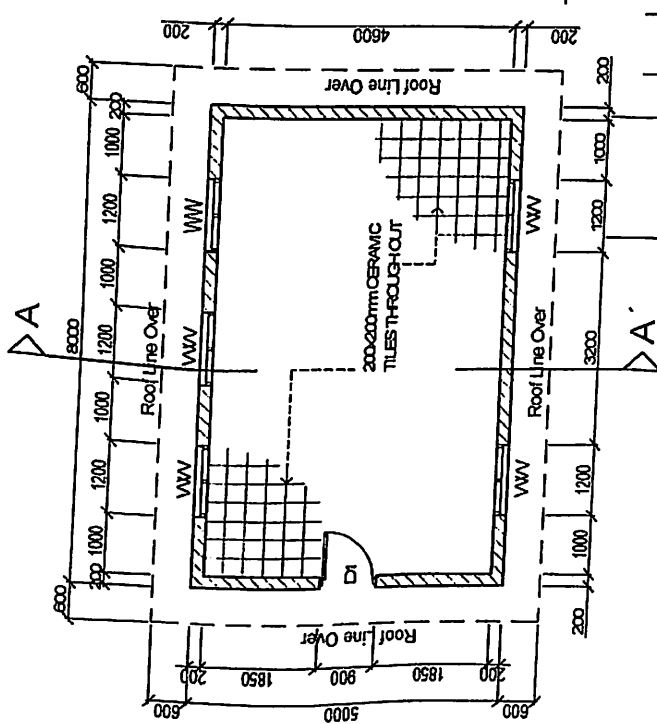
| Composition By Volume | Cement (Tonnes) | Sand (m ³) |
|-----------------------|-----------------|------------------------|
| 1:3 | 0.50 | 1.00 |
| 1:4 | 0.40 | 1.12 |

Table 5: Labour / Plant Outputs

| Concrete works | | Woodwork | |
|--------------------|---------------------|-------------------|-----------------------|
| | Outputs | | Outputs |
| Mixing | K5.20/hr | 125 x 50 | 0.24hr/m |
| Transporting | K4.40/hr | 75 x 50 | 0.27hr/m |
| Placing | K5.50/hr | 250 x 25 | 0.20hr/m |
| 10/7 mixer (plant) | 4m ³ /hr | 12mm plysheet | 0.20hr/m ² |
| Masonry works | | Filling in blocks | |
| | Outputs | | Output |
| Laying of blocks | 0.8m ² | Corefilling | 1.2m ² /hr |
| Pointing of blocks | 2.5m ² | | |



SECTION A-A
SCALE 1:100



D1 = SIMPLE FLUSH DOOR IN 100x50mm HW
 FRAME DOOR SIZE 2100x600mm
 WW= 100x50mm WINDOW FRAMES FIXED TO
 TO THE WALL DIRECTLY WITH 10x6 SOCKET
 BLADES LOUVER FRAMES

FLOOR PLAN
SCALE 1:100

PAPUA NEW GUINEA
 UNIVERSITY OF TECHNOLOGY
 DEPARTMENT OF ARCHITECTURE & CONSTRUCTION MANAGEMENT

PROJECT TITLE
SAMPLE DRAWING

LECTURER:
MR. POMOSO

COURSE STREAM:
CONSTRUCTION MANAGEMENT