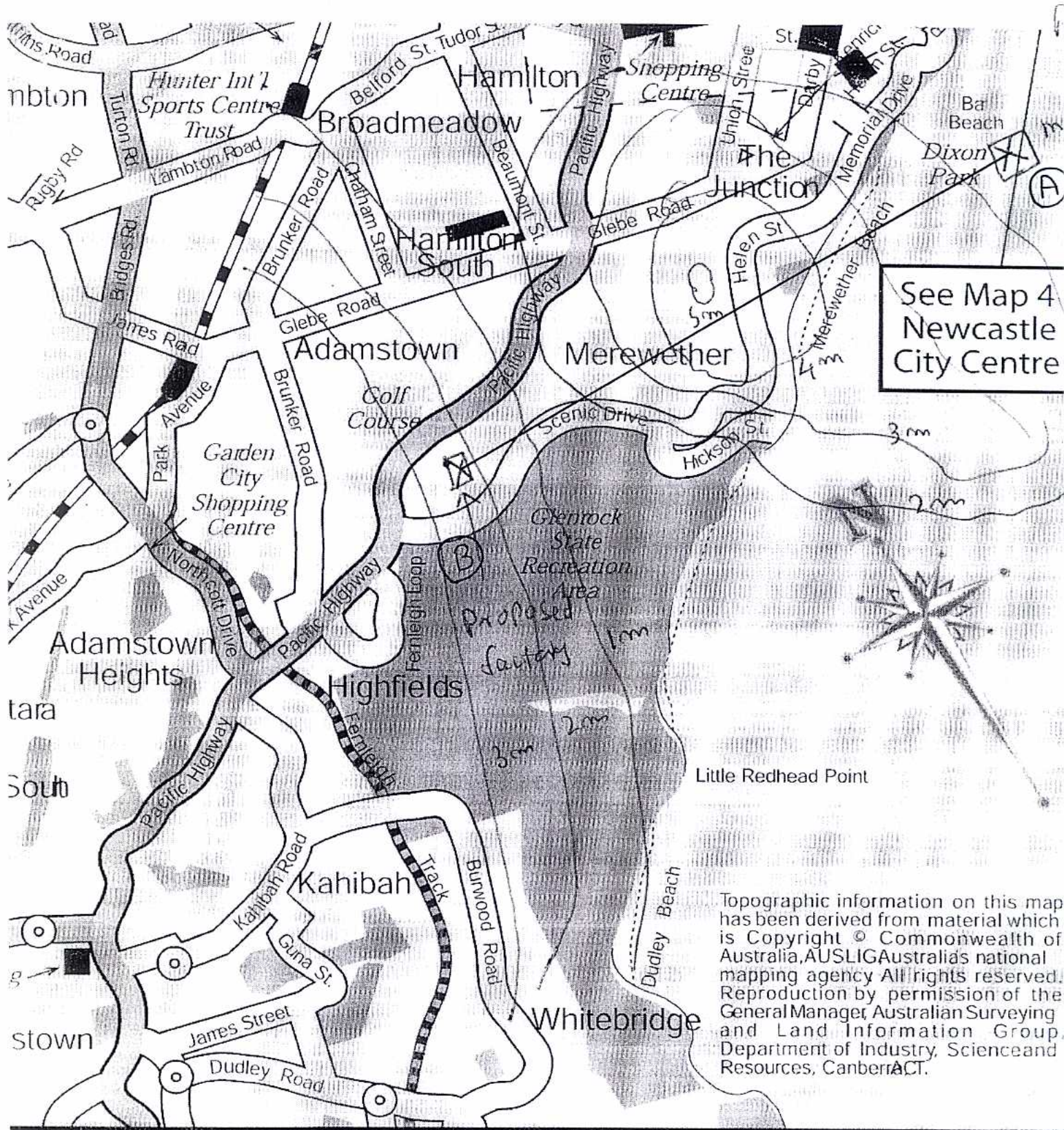


Question 1



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TRANSMISSION LINE DESIGN

Scale 1:2500

Da

TRANSMISSION LINE DESIGN

SCALE 1:2500

Question 2

Scale 1 : 1250

Proposed
factory

Proposed
factory

Road

Road

Road

12.5m

43.75m

25m

75m

25m

25m

37.5m

25m

6.25m

(A)

(B)

Question 3

Scale 1:1250

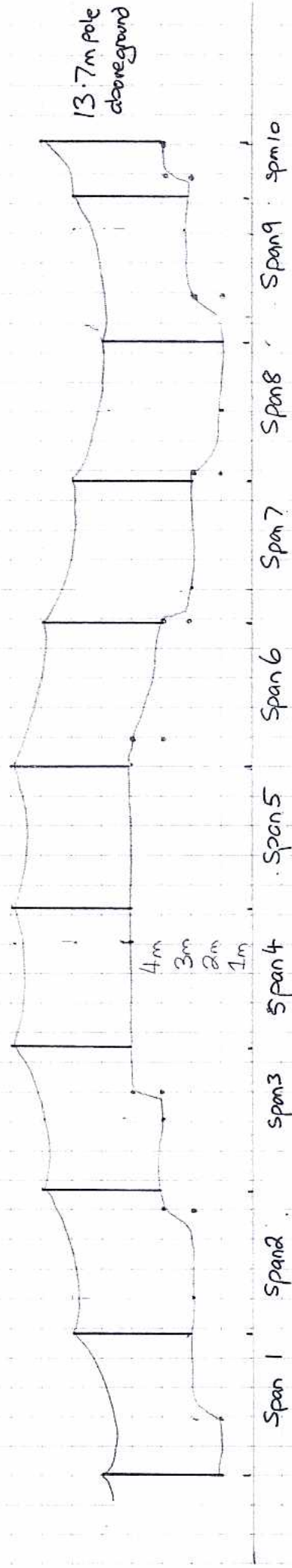
Number of Poles

Total length of Line route +1

Span

$$\frac{281.25}{30} + 1$$

11 poles



$$\begin{array}{r} \text{Span 1-9 all 30m} = 270\text{m} \\ \text{Span 10} = 11.25 \\ \hline 281.25 \end{array}$$

Question 4

Assumptions:

A three phase 11KV overhead rural line is to be erected between point A & B. Point B being a proposed factory. The route of the wooden pole line is straight & the soil resistance to movement is good. Standard pin insulators are used.

- line average sag is 2.7m
- highest building on route 10m
- max conductor design sag 1m

$$\text{Ground Clearance} = 2.7 + 10 = 12.7\text{m}$$

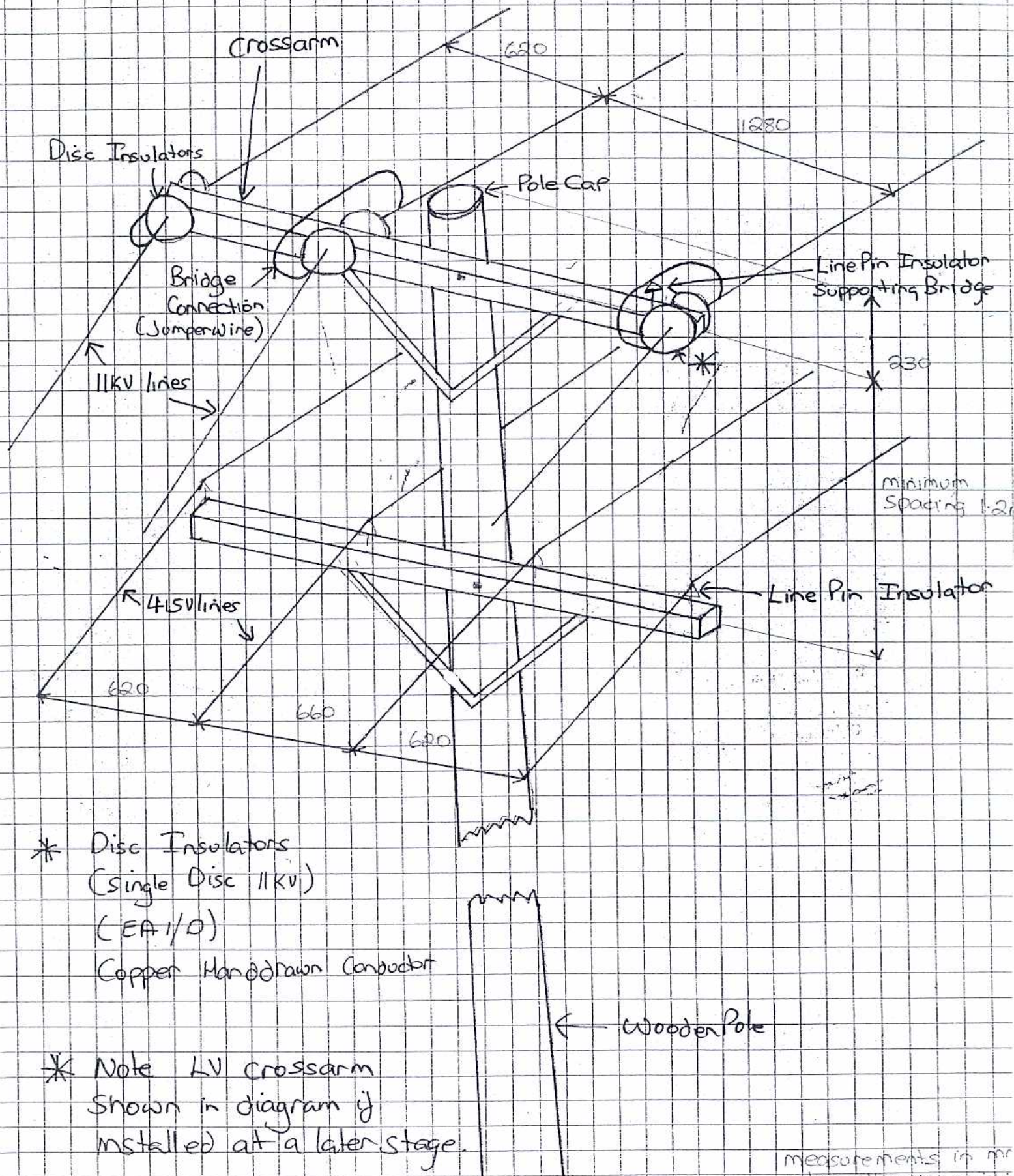
$$\text{Total Length of Pole above ground} = 2.7 + 1 + 10 = 13.7\text{m}$$

$$\begin{aligned}\text{Pole Planning Depth} &= 0.6 + (0.1 \times \text{Pole length above ground}) \\ &= 0.6 + (0.1 \times 13.7) \\ &= 0.6 + 1.37 \\ &= 1.97\text{m}\end{aligned}$$

$$\begin{aligned}\text{Total length of Pole} &= \text{Pole Planning Depth} + \text{Pole length above ground} \\ &= 1.97 + 13.7 \\ &= 15.67\text{m (at least)}\end{aligned}$$

Table 1 of handbook 2.2 says for public streets, alleys or roads required clearance over specified items must be at least (20') 6.1m.

Question 5



Question 6

Size of Conductor

$$\text{Current} = \frac{\text{MVA} \times 10^3}{\sqrt{3} \times \text{line vdt}} = \frac{2 \times 10^3}{\sqrt{3} \times 33} = 34.99 \text{ A}$$

Referring to AS 3008.1.1.1998 table 20 Column 2 Row 2
38 A requires a 6 mm^2 conductor.

Question 7

$$\text{Weight of Conductor} = \frac{\text{CSA of Conductor } \text{mm}^2}{100} \times 1 \text{ m length} \times \text{density} \times 9$$

of conductor

$$F_G = \frac{6 \times 8.89 \times 1 \times 9.81}{1000} = 0.523 \text{ N/m}$$

Assuming Windload = 500 pa

$$= 500 \times \frac{6}{1000} \times 1$$

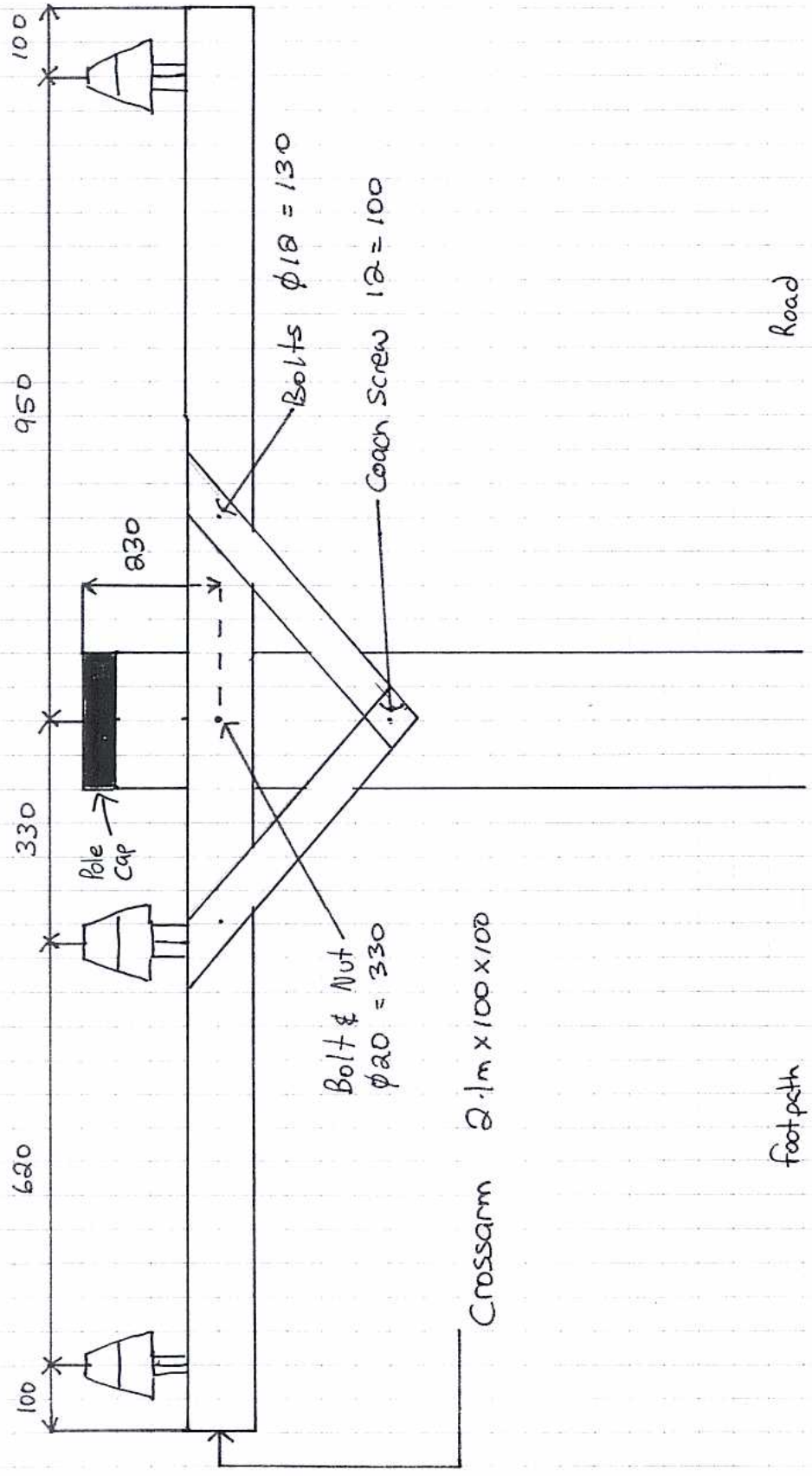
$$F_W = 3 \text{ N/m}$$

$$\begin{aligned} W &= \sqrt{F_G^2 + F_W^2} \\ &= \sqrt{3^2 + 0.523^2} \\ &= 3.0 \text{ Nm} \end{aligned}$$

Assume: Safety factor 3.5
tension greater than 650V 6840

$$SAG = \frac{WL^2}{8T} = \frac{3 \times 30^2}{8 \times \frac{6840}{3.5}}$$

$$= \frac{2700}{15,634}$$

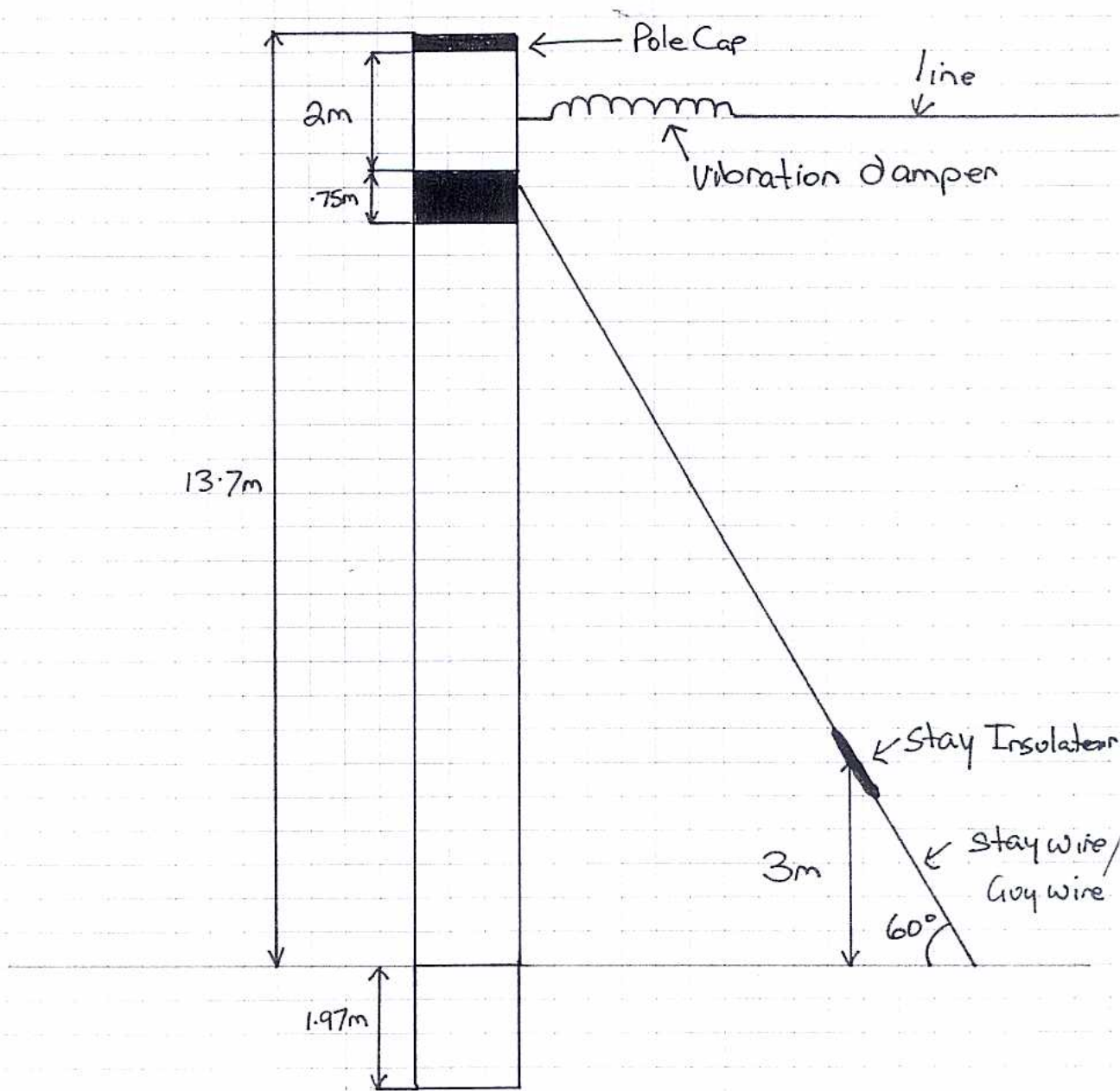


Dimensions are in millimetres unless otherwise stated

Question 8

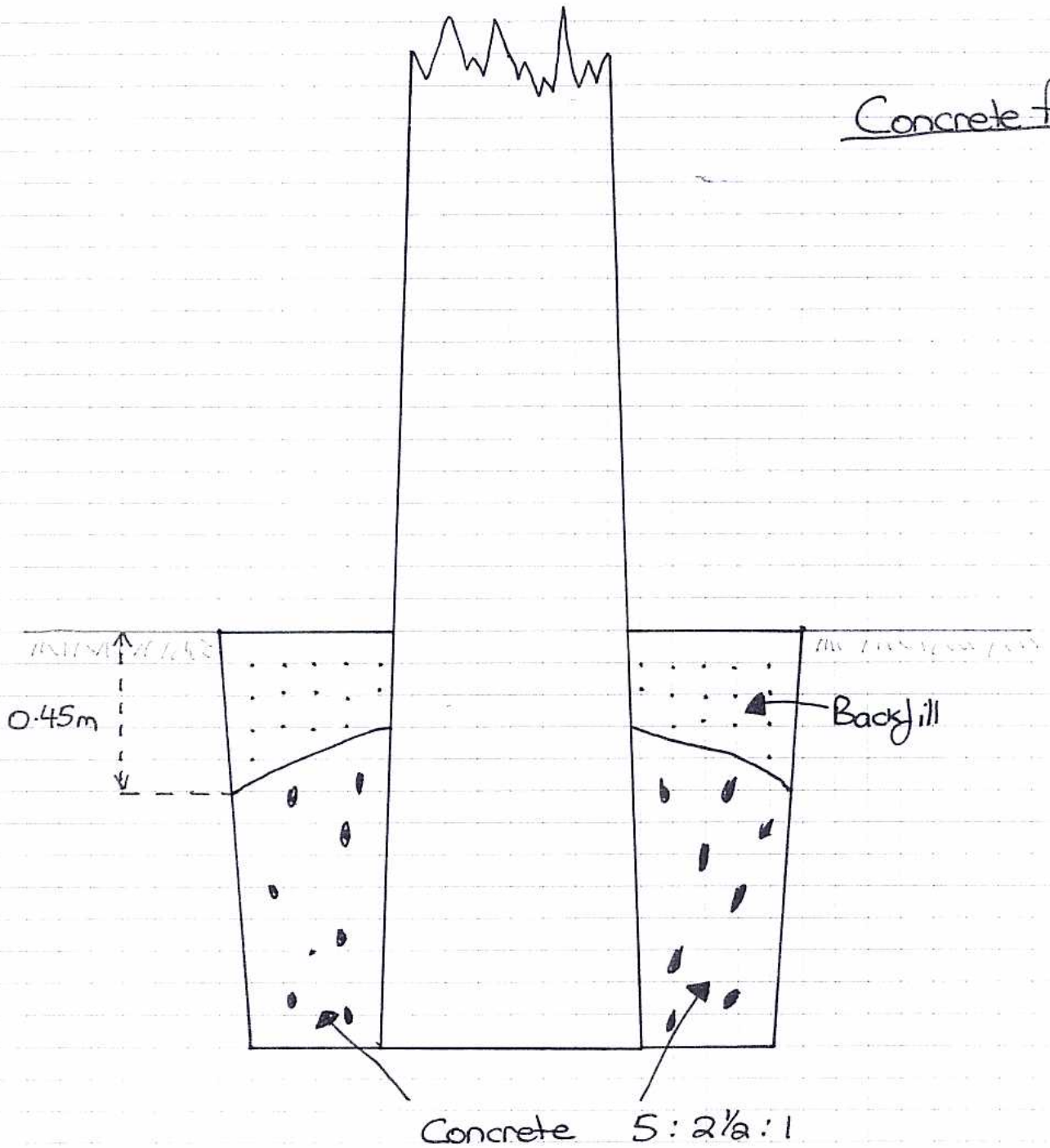
Question 9

Scale 1m = 10mm



Question 10

Concrete footing



Question 11

- All pole framing materials must be delivered to worksite.
- All structures are assembled.
- All holes are dug.
- The setting rig is set. Set pole & hold it until backfill crew can screw it.

Question 12

- Woodpoles
- Crossarm with suitable measurements
- Pin Insulator
- Copper conductor cable
- Concrete
- Guy-Wire
- Anchor - Concrete
- Digging Instruments



Question 13