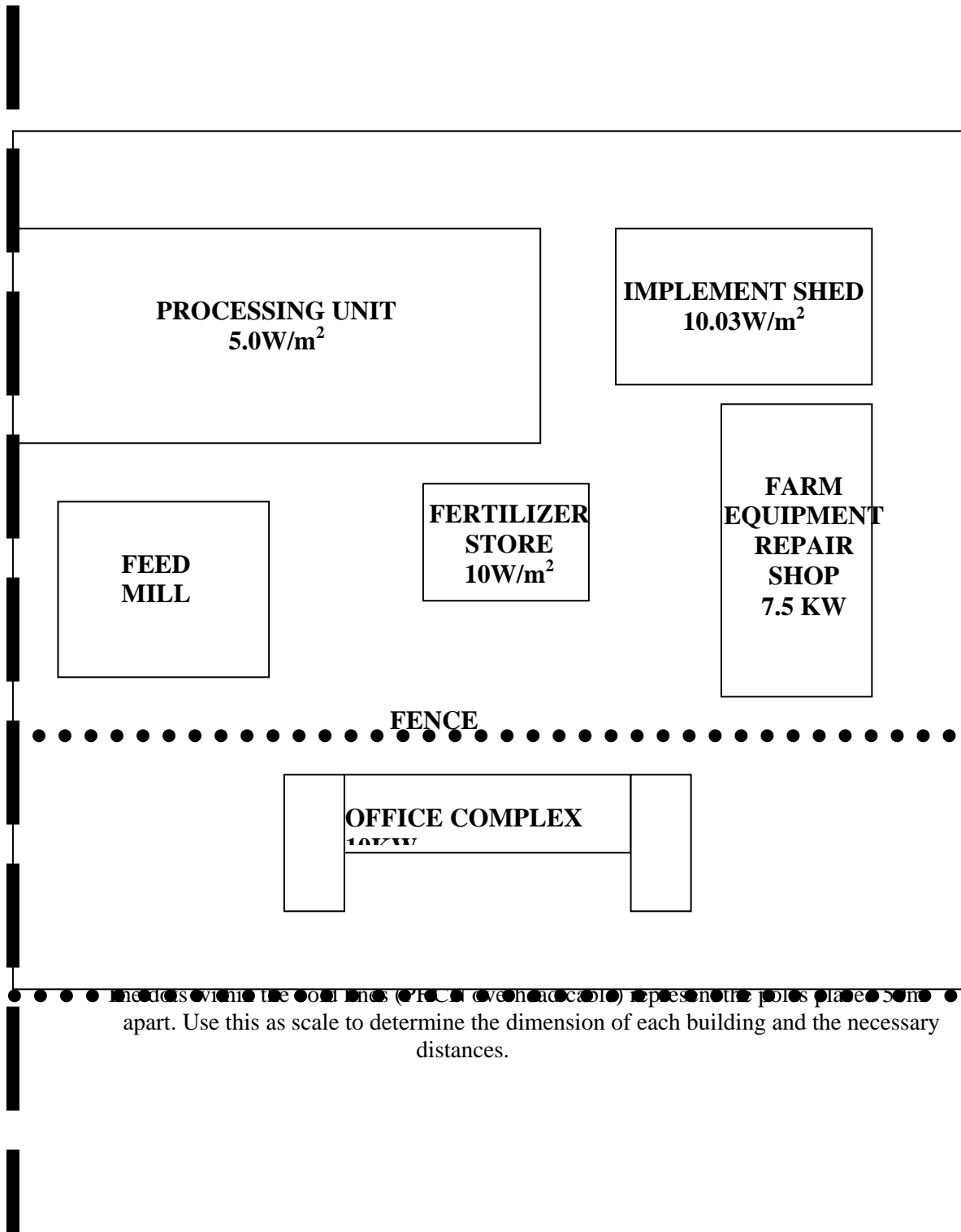


- a. The Farmstead layout shown in Figure 1 with the total connected loads for each unit indicated is the layout design developed by the UNAAB AGENG Consultancy Unit for an integrated farm for production and processing of selected arable crops for export. This is to be sited in all the states of the federation.

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a. Steps to take in designing for the main service switch

- (i) List the full load (Current/Wattage) for each building or service point
- (ii) Obtain the TCL and convert to PML using the approved/recommended %
- (iii) Single out the largest load from (ii)
- (iv) Add the other PML and divide by 2 i.e half the sum of the remaining PML
- (v) Add (iii) and (iv) to obtain PML for the entire farmstead
- (vi) Choose the appropriate wire size for this load having known the length of run

Select a service switch equal to a step higher

b. If the length of run to the Service entrance meter (M) is 180m from any of the main PHCN overhead cable, calculate the wire size required for supply to the service meter. Measure the length of the path of run from the meter to each building and the feeder wire size required for each of the building. Assume 90% of the TCL is the PML in each of the building and the local service voltage supply is 240V.

Probable meter location

From the figure, X and Y being the coordinates of each structure are read and the TCL calculated for each as follows

$$TCL (W) = TCL (W/m^2) \times Area (m^2)$$

Unit	Length of run measured (2 marks)	TCL (KW) (1 mark)	Current (A) TCL/240 (2 marks)	PML (90% TCL) (2 marks)
Office	150	10	41.6	9.00
Feedmill	100	25	104.16	22.50
Store	50	24	100	21.60
Workshop	200	7.5	31.2	6.75
Implement Shed	200	72.22	300.9	64.99
Livestock Unit	50	26.4	110	23.76
TOTAL		219.49		197.54
Total PML excluding the largest				83.61

Length of run up to the meter = 180m

Total electrical load = 219.49A

For a length of run of 180m and current of 219.49A,

wire size = wire guage 000 by interpolation from Table 11B

Unit	Length of run	Load	Wire size read
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	measured		from Table 11B (2 marks)
Office	150	41.6	4
Feedmill	100	104.16	2 ^a
Store	50	100	6 ^e
Workshop	200	31.2	6
Implement Shed	200	300.9	300M
Livestock Unit	50	110	6 ^e