

**THIRD SEMESTER DIPLOMA EXAMINATION IN
CIVIL ENGINEERING — OCTOBER, 2016
BUILDING PLANNING AND DRAWING**

[Time : 3 hours

(Maximum marks : 100)

[Note :—1. Question No. II is compulsory.

2. Missing data can be suitably assumed.
3. A2 size drawing sheet to be supplied.]

PART — A

(Maximum marks : 15)

Marks

I Answer the following questions in one or two sentences. Each question carries 1½ marks.

1. Define the term cluster.
2. Specify the minimum and maximum size of bath room as per NBC.
3. Define floor area ratio.
4. Discuss the exit requirements of a stair case as per NBC.
5. Write the minimum land area of electrical sub station.
6. Write the requirements of doors and windows.
7. Differentiate between clear span and effective span.
8. Give the conditions regarding setback for commercial building.
9. Write down the classifications of buildings.
10. How the plinth area of a building is calculated ? (10×1½ = 15)

PART — B

(Maximum marks : 85)

II (a) Prepare the line plan for a residential building to suit for a plot of 17.3 × 20m size based on the rules and regulations of KMBR, should contain the following facilities :

- (i) Drawing and dining — 24m²
- (ii) Bed rooms (2 nos.) — 42.4m²
- (iii) Kitchen — 12m²
- (iv) Verandah — 9.6m²
- (v) Porch — 14m²
- (vi) Toilets — 7.6m²

A road 6m width passing along the 20.5m side of the plot, which is in the North-South direction.

25

(b)

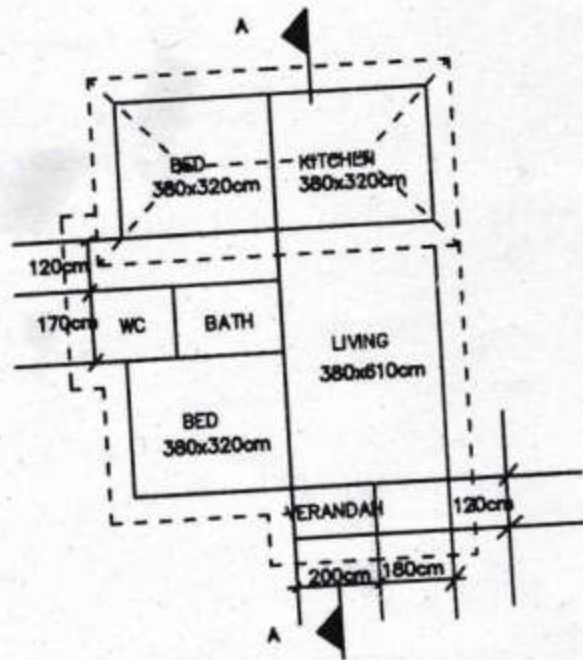


Figure (I)

The line plan gives the arrangement of room of a residential building. Prepare its (i) Plan (ii) Section along AA

- Details :
- (i) Bed concrete for foundation, PCC, 1 : 5 : 10 — 70cm × 15cm
 - (ii) R.R. masonry in cm 1 : 8 for foundation and basement — 40cm × 60cm and 30cm × 50cm.
 - (iii) Superstructure, 1 brick wall in cement mortar 1 : 6, 360cm height for tiled portion and 300cm for terraced portion.
 - (iv) RCC M20 grade, 10cm thickness.
 - (v) Details of tiled roofing :

Roofing with MP tiles
Ridge — 5cm × 15cm
Common rafter — 7cm × 10cm
Collar — 7cm × 10cm
Wall plates — 10cm × 7cm
Eave board — 1.5cm × 12cm.

All other data such as position and size of doors, windows, ventilators can suitably be assumed.

III Draw to a suitable scale the elevation and sectional plan of a panelled door with given details :

- Size of door — 100cm × 210cm, 2 leaves
- Door frame — 9cm × 7cm
- Style — 9.5cm × 3.5cm
- Top rail — 9.5cm × 3.5cm
- Lock rail — 9.5cm × 3.5cm
- Bottom rail — 9.5cm × 3.5cm
- Panel — 1.6cm thick.

OR

(15+15 = 30)

IV Draw the elevation of a close couple roof showing all details :

- Wall thickness — 30cm
- Clear span — 4m
- Tie joist — 4cm × 15cm
- Ridge — 8cm × 20cm
- Rafter — 5cm × 12.5cm
- Eave projection — 60cm
- Wall plates — 15cm × 10 cm.

15

V Draw the half sectional elevation along the centre line of the road of a slab culvert designed for a road way across a stream with the following details.

- Clear span — 2.5m
- Abutment in PCC 1 : 5 : 10, trapezoidal section, water face vertical.
- Top width 45cm, bottom width 90cm, foundation PCC 1 : 5 : 10, 120cm wide and 45cm deep.
- Square return walls 450cm length from the earth face of abutment top.
- Water way lined 20cm thick, stone pitching.
- Deck slab 30cm thick RCC, M20 grade, with bearing of 25cm on abutment.
- Provide parapets and railing etc. suitably.
- Top level of culvert slab — +100.00m
- Top level of stone pitching — +97.24m
- Base of foundation of abutment — +95.85m

15

OR

VI Prepare an electrical service plan. The positions of various electrical fittings and connections should be clearly indicated in the line plan given in figure (I).

15

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TED (15)-3014

TIME: 3 HOURS

(REVISION-2015)

MAX.MARK:100

1. PART A

1. A group of 3 or more self- contained dwellings comprising either attached or detached dwellings or any combination thereof which are configured in compact clusters, including zero lot line set back subdivisions, townhouses or terraced dwellings not served by a common entrance.

2. Area shall not be less than 1.50 sq.m. With either side not less than 1.1m, carpet area of a latrine shall not be less than 1.10 m² with one side not less than 1.0 meter.

Provided that the area combined bathroom and latrine shall be not less than 2.2 square meters with one side not less than 1.1m.

The height of bathroom shall be not less than 2.20m.

3. The floor area ratio (FAR) is the relationship between the total amount of usable floor area that a building has, or has been permitted for the building, and the total area of the lot on which the building stands. This ratio is determined by dividing the total, or gross, floor area of the building by the gross area of the lot.

4. The width of fire escape staircase shall be not less than 75 cm, the width of fire escape stair tread shall be not less than 15 cm. the height of the fire escape stair riser shall not exceed 19 cm, and the number of riser not exceed 16 per flight of stairs. Travel distance on each floor shall not exceed 30 meters for every occupant.

6. The main function of doors in a building is to serve as a connecting link between internal parts and to allow free movement to the outside of the building. Windows are generally provided for proper ventilation and lighting and their number should be determined to the requirements.

7. Effective span means the center to center distance between any two adjacent supports. Clear span means the clear distance between two adjacent supports.

8. The minimum setback in front – 12m.

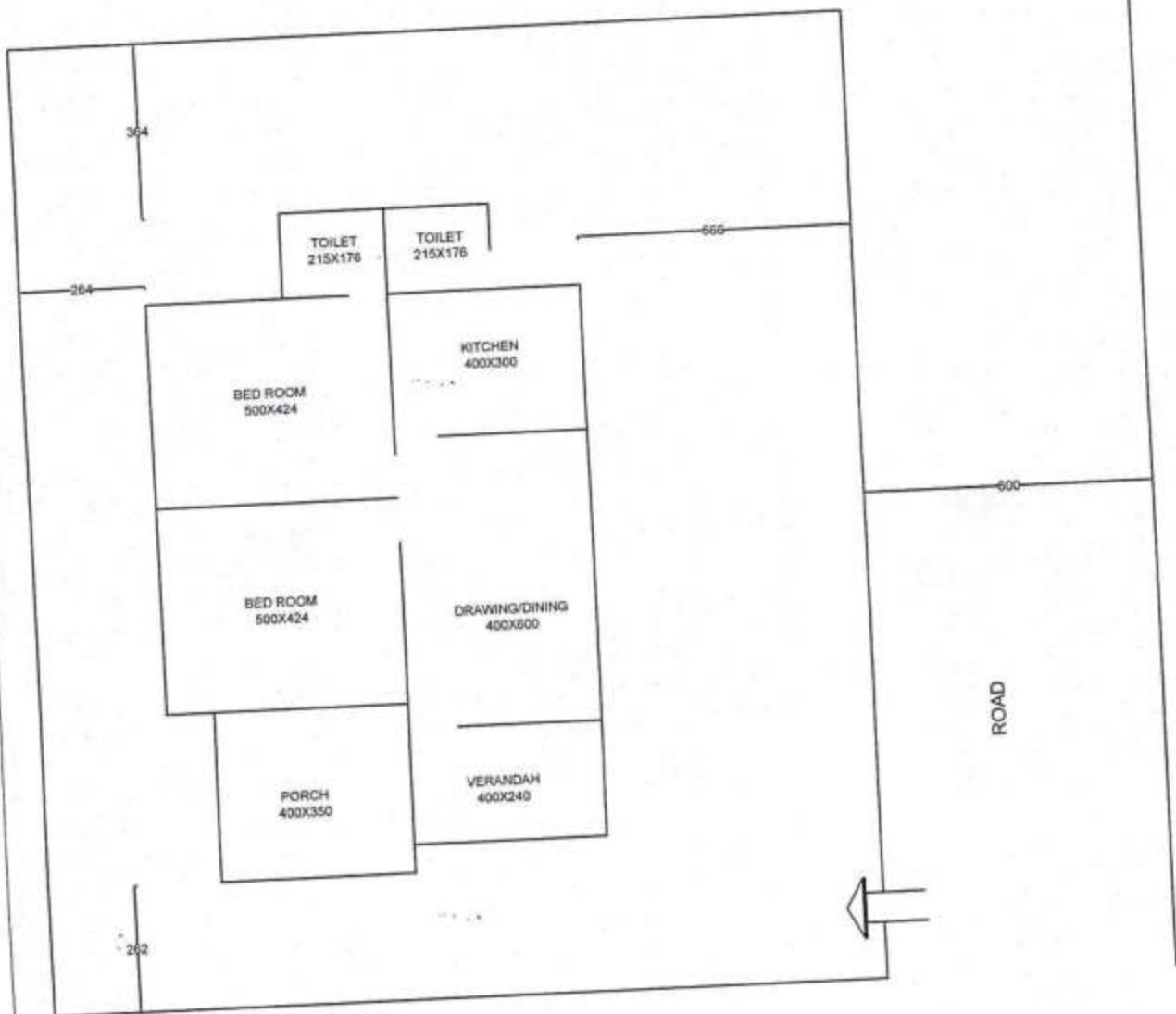
The minimum setback in rear – 3m.

The minimum set back on each side – 6m.

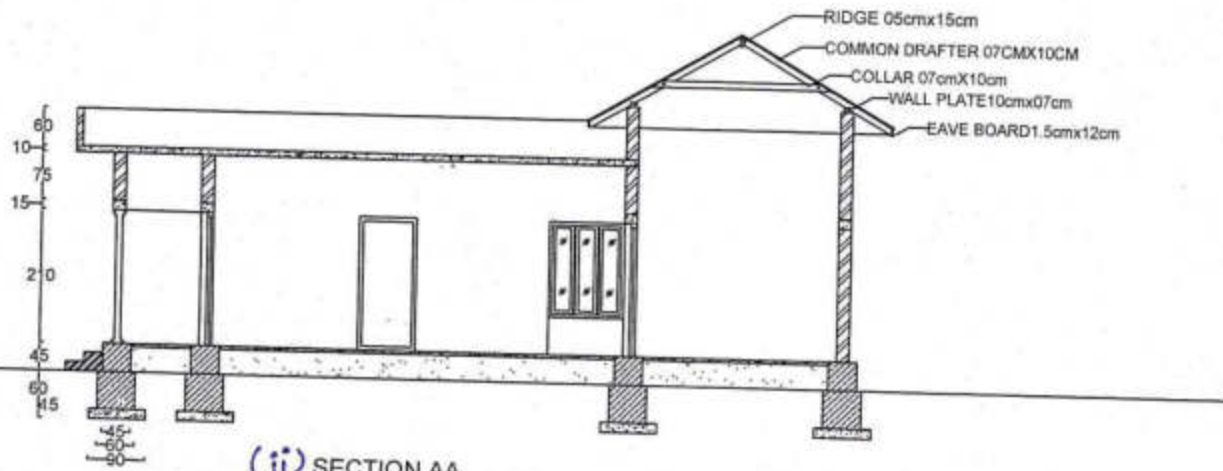
Maximum ground coverage – 40%

9. Residential buildings, educational buildings, institutional buildings, assembly buildings, business buildings, merchantile buildings, industrial buildings, storage buildings, hazardous buildings.

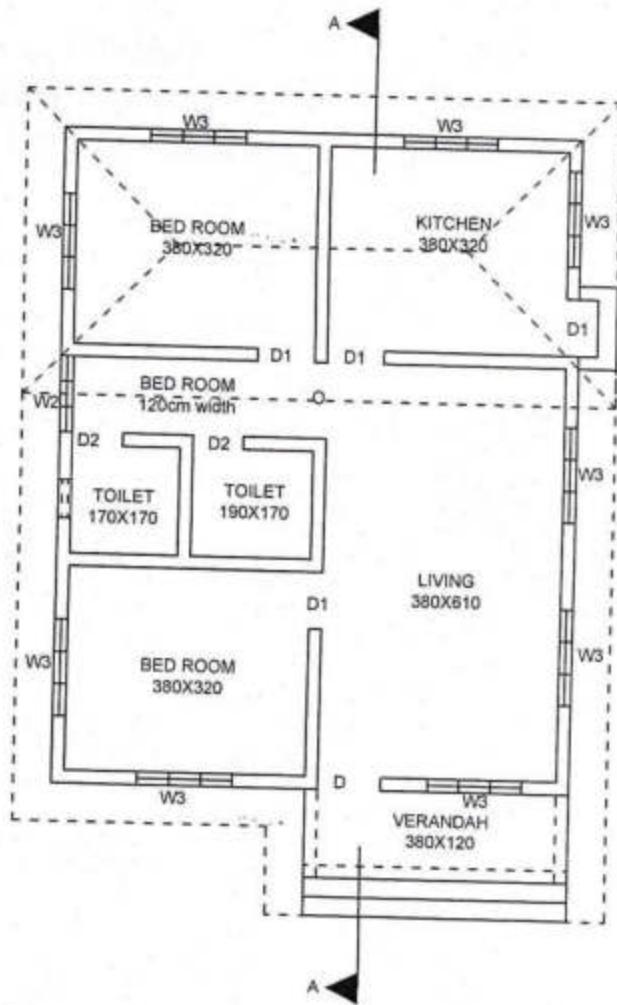
10. Plinth area built-up covered area of a building measured at floor level at any storey. Plinth area is calculated by taking the external dimensions of the building at the floor level excluding plinth offsets, if any courtyards, open areas, balconies, cantilever projections are not included in plinth area. Supported porches (other than cantileverd) are included in the plinth area.



LINE PLAN

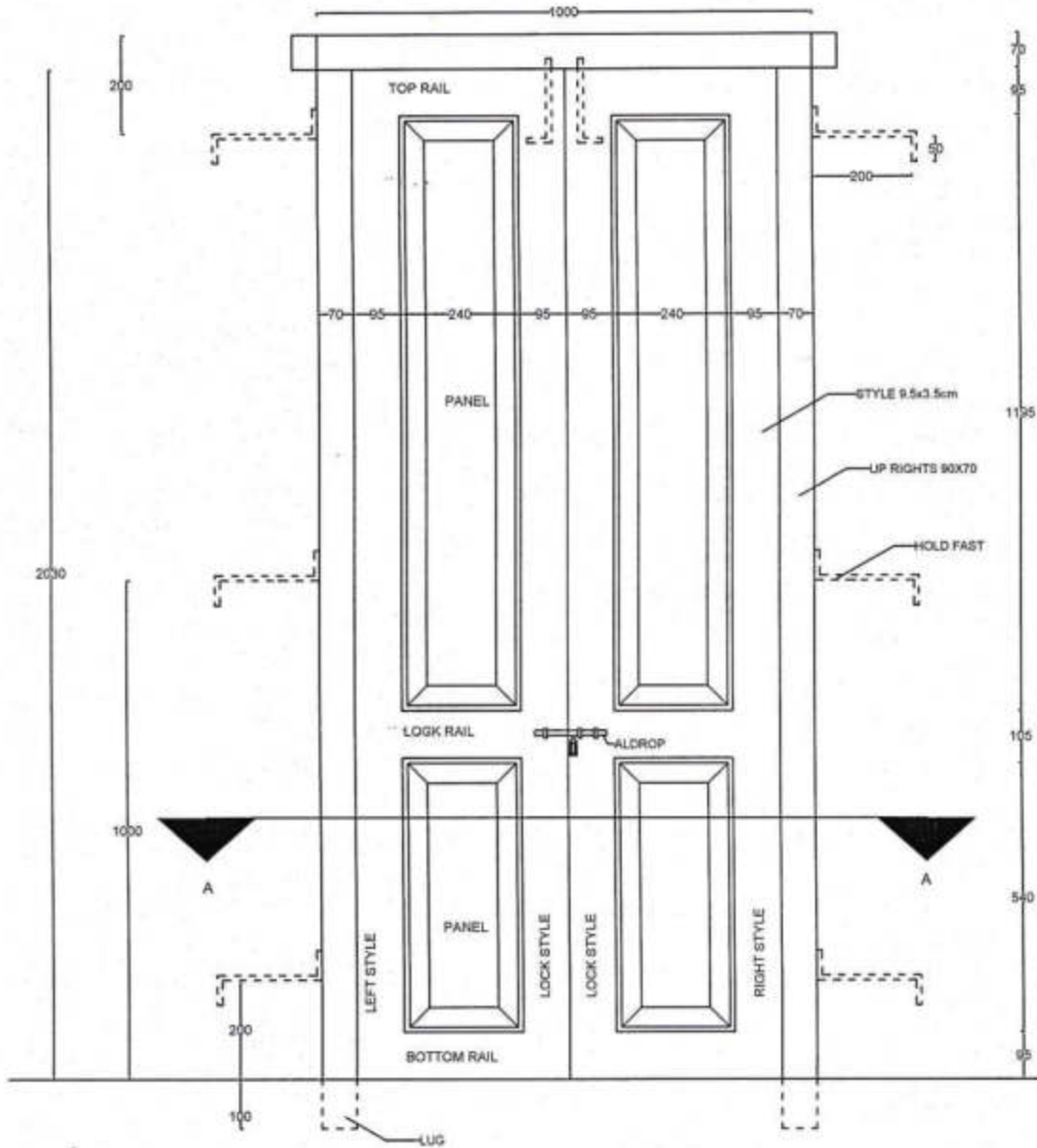


(i) SECTION AA

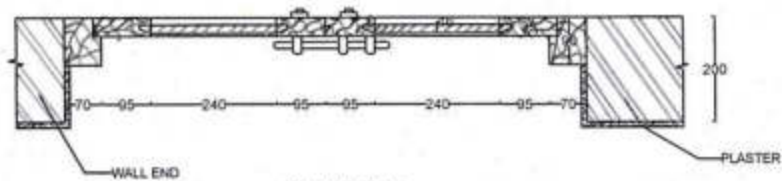


(i) PLAN

INDEX			
MARK	ITEM	SIZE	NOS
D	DOOR	100X210	1
D1	DOOR	90X210	4
D2	DOOR	80X210	2
W2	WINDOW	150X150	1
W3	WINDOW	120X150	9
V	VENTILIATOR	100X60	1
O	OPENING	120X210	1

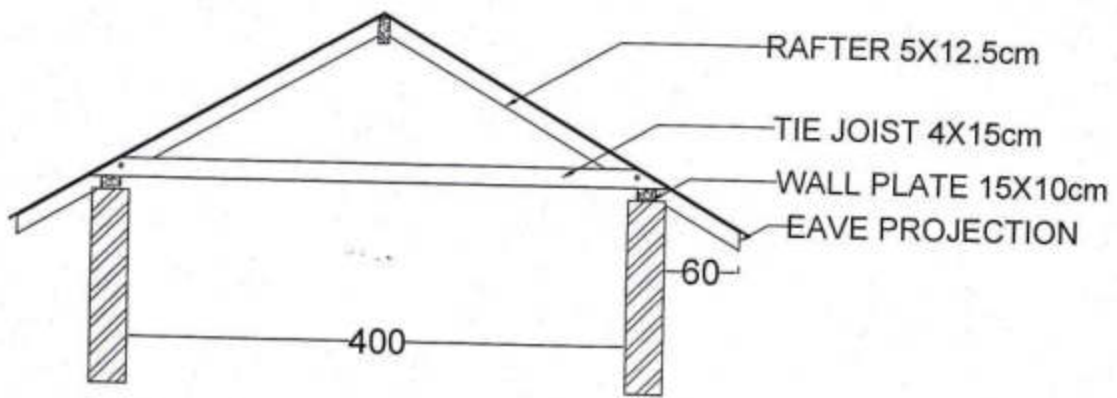


ELEVATION



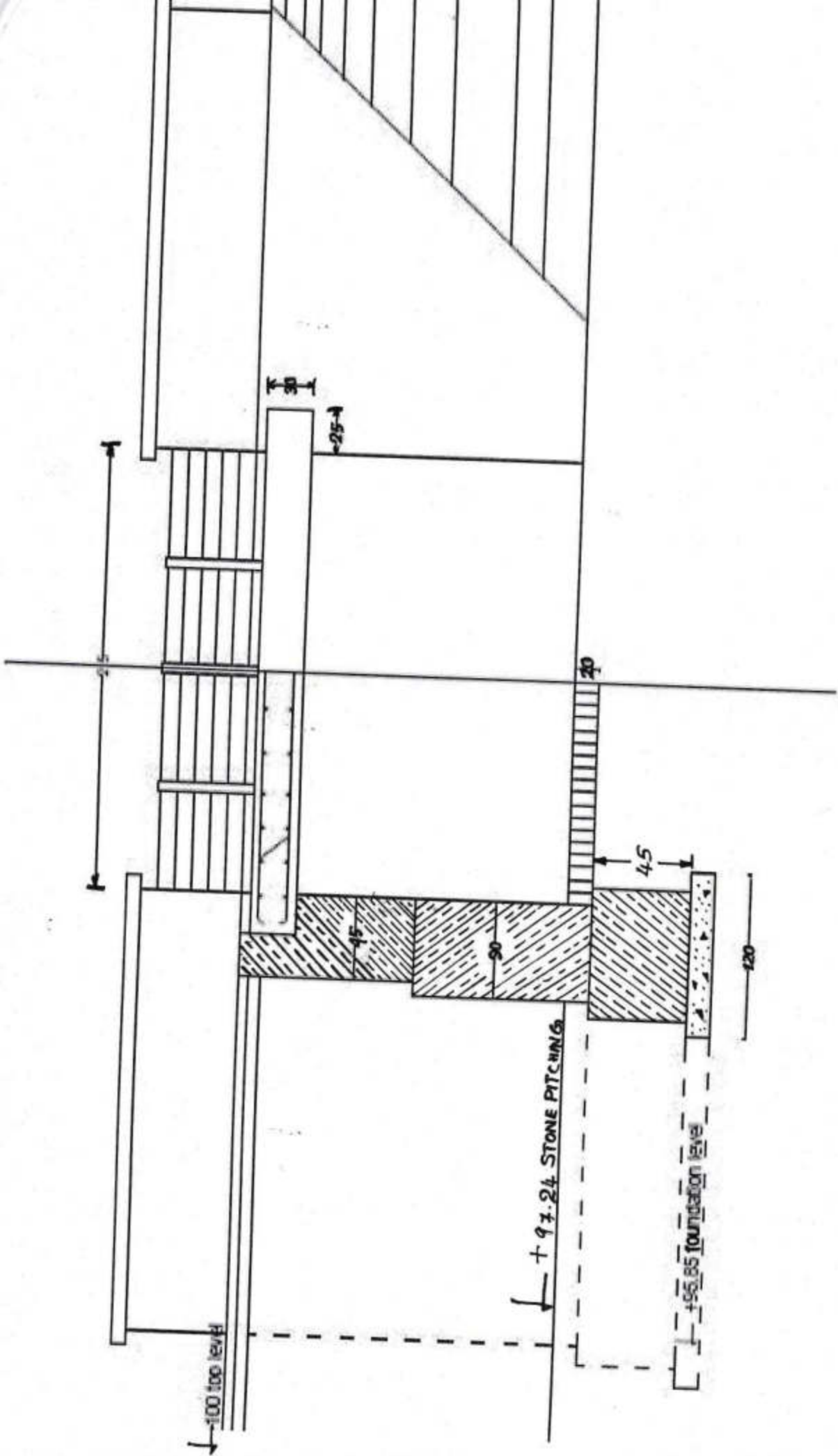
SECTION AA

IV

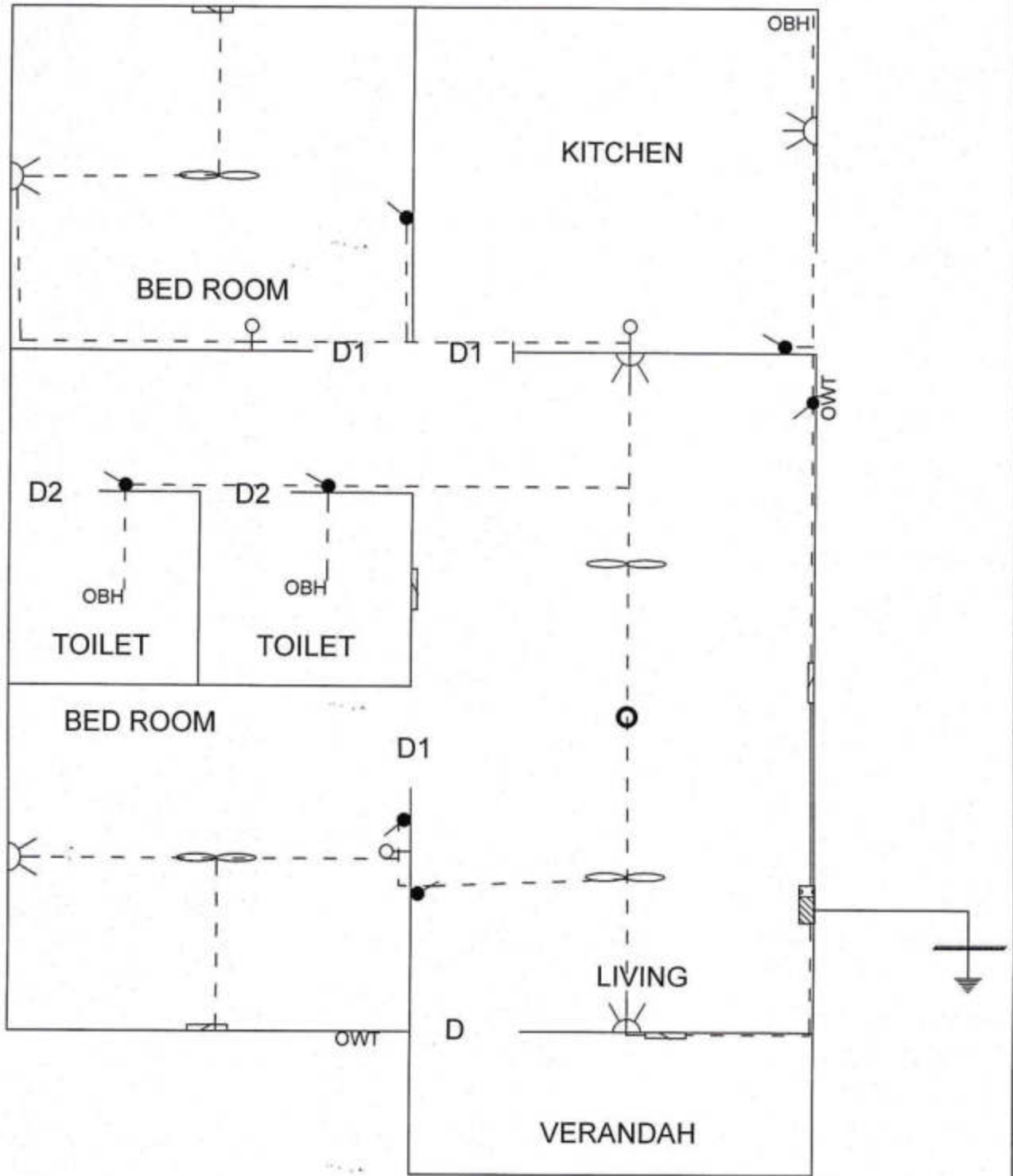


CLOSE COUPLE ROOF

V



HALF SECTIONAL ELEVATION



ELECTRICAL SERVICE PLAN