Semester : II

Course : Introduction to civil engineering

Course Instructor : Aryada Deshpande

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Unit 3

BUILDING DRAWING

Introduction

Drawing is the language of engineers, which conveys the idea of the engineer about shape, structural arrangements to the builders. Construction drawing is commonly produced in the form of detailed architectural floor plans, elevations, or sections. It is a process of imagining the details of a building to be built , which is planned for maximum utility and aesthetically good appearance.

Importance of building drawing

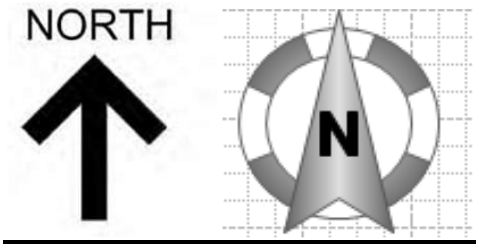
Building drawing plans are used by clients, architects, engineers (structural engineers, site engineers, mechanical engineers, electrical engineers) and other professionals involved in the construction of the structure to help carry out their individual tasks systematically and efficiently. Building drawing plans contain important details about dimensions, sizes of rooms and structural elements as well as material specifications. These details are very important for the civil engineer to carry out the work more precisely. They also serve as document proofs for any legal works pertaining to the buildings. Hence building plans become important as they:

1. Define the spaces and its functional relationships
2. Helps the client better understand and visualize engineers' and architects' ideas and perspective.
3. It forms a piece of communication between the client, architect, engineer and the contractor and creates better understanding of the project.
4. Illustrates places of openings(doors and windows)
5. Specifies the type of finishes
6. Includes utilities like stairs, elevators, mechanical room etc
7. Helps the structural engineer to analyse and design the structural framework.
8. Also helps the engineer to prepare bills and quantity estimates.
9. Drawing plans are also prepared for plumbers to provide the required plumbing services.

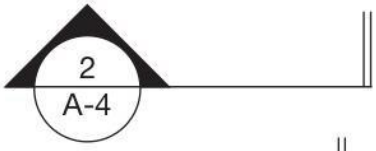
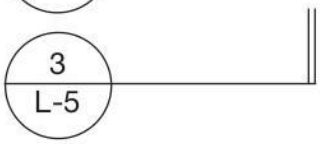
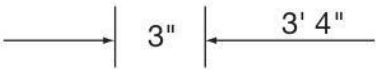
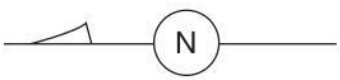
10. Electrical drawing plans are used by the electricians to plan and provide electrical units for power supply at the mentioned points as per the plan and requirements of the client.
11. Site plans and location plans helps the engineer to locate important points required for construction and also helps to map out the plan for construction work to start.

SYMBOLS USED IN BUILDING DRAWING

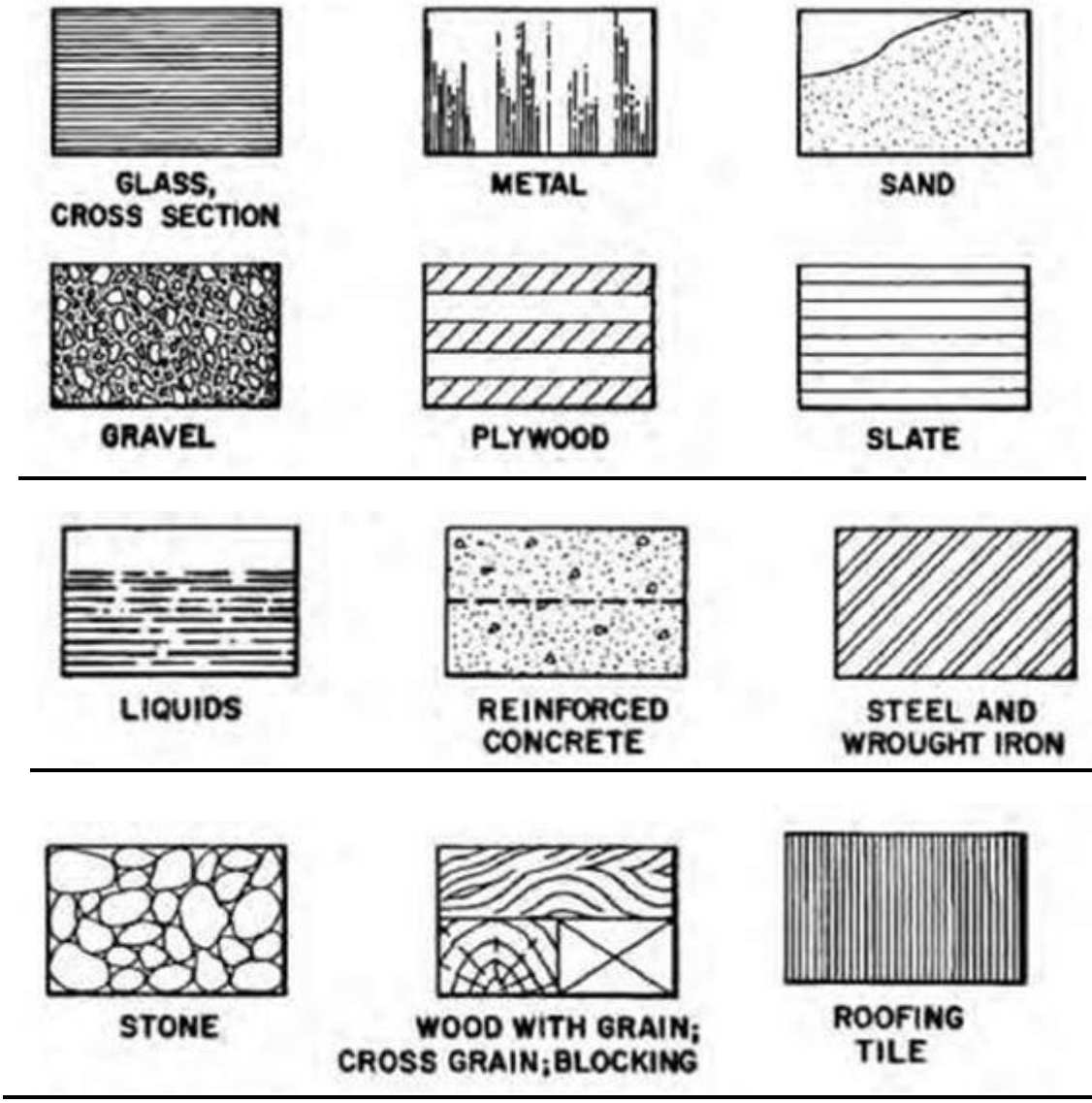
NORTH DIRECTION SYMBOLS

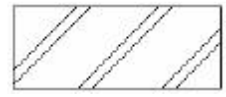


PLAN SYMBOLS

Symbol	Definition
	Wall section No. 2 can be seen on drawing No. A-4.
	Detail section No. 3 can be seen on drawing No. A-5.
	Building section A-A can be seen on drawing No. A-6.
	Main object line
	Hidden or invisible line
	Indicates center line
	Dimension lines
	Extension lines
	Symbol indicates center line
	Indicates wall suface
	Indicates north direction

MATERIAL SYMBOLS

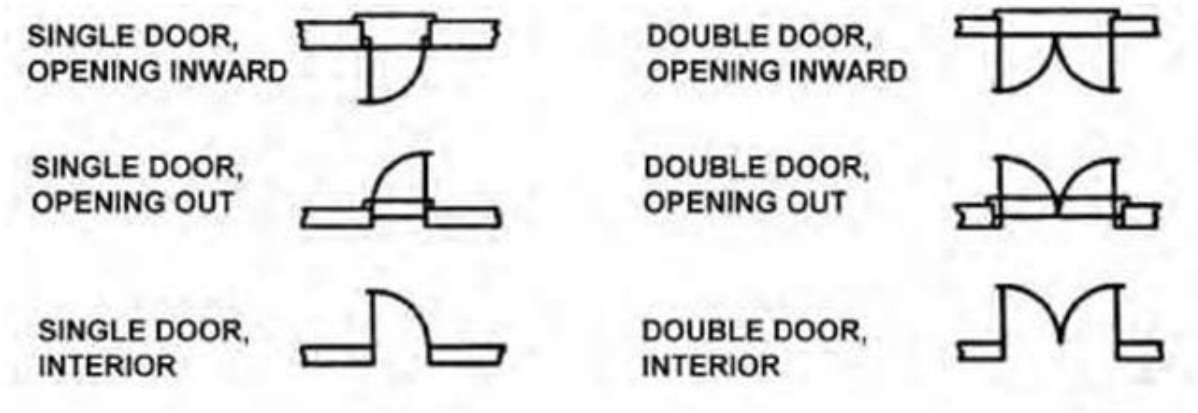




BRICK MASONRY

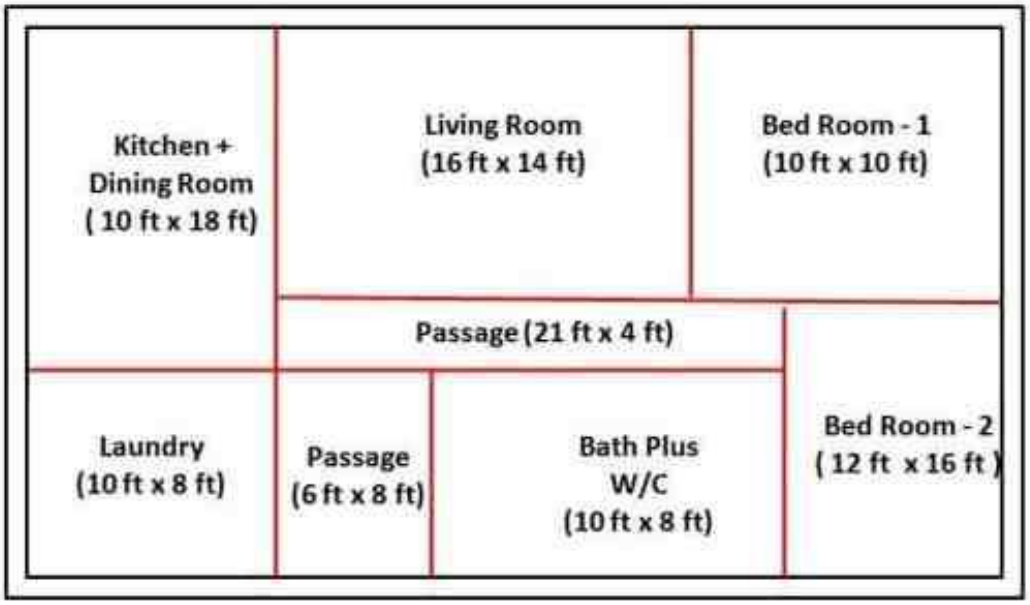
STONE MASONRY

TYPICAL DOOR SYMBOLS

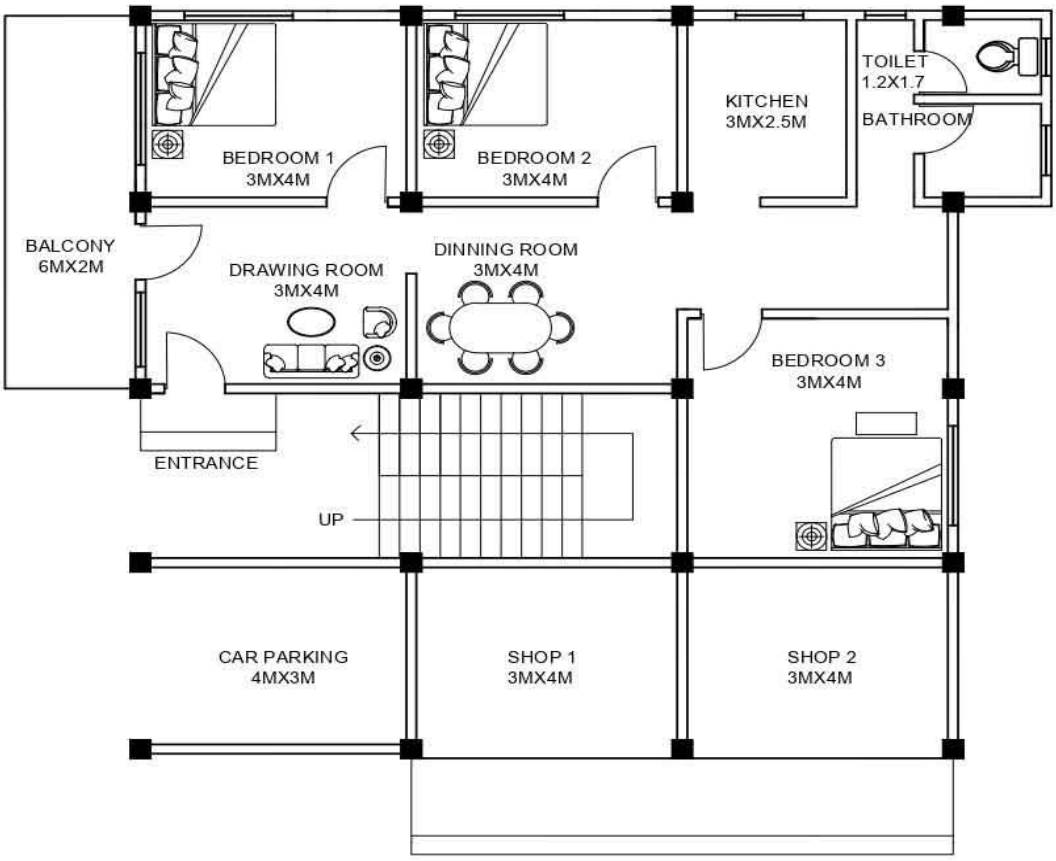


REQUIREMENTS OF GOOD DRAWING : Drawing should be clear, simple and clean. It should agree with the actual measurements by the accurately drawn scaled measurements. Exact information should be provided in order to carry out the work at site without scaling for missing measurements. Sufficient space should be provided between the views so as to mark the dimensions without crowding. Only minimum notes to support the drawings should be indicated in the drawings.

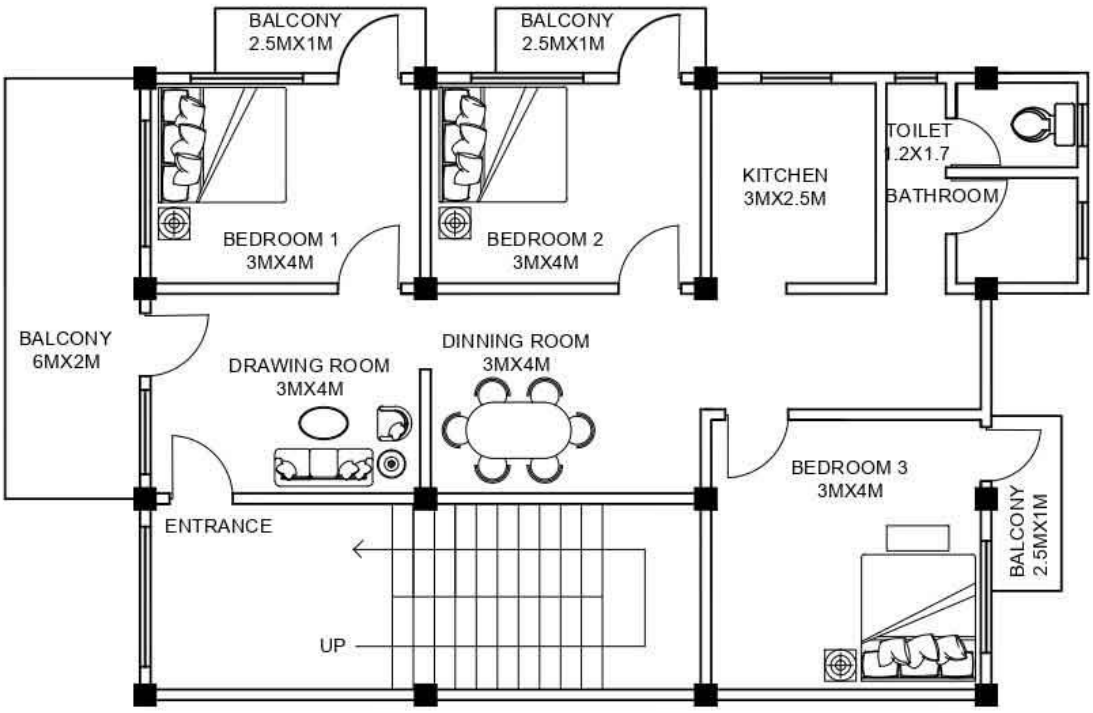
1. LINE PLAN : Line diagram or a single line plan is the sketch generally not drawn to particular scale. The relative positions of all elements like rooms, doors, windows are clearly shown inside to inside. It only depicts the inner dimensions (length and breadth) of various rooms without taking the thickness of walls into consideration. From the given specifications, the thickness of wall in super structure shall be taken to draw the fully dimensioned plan to a convenient scale.



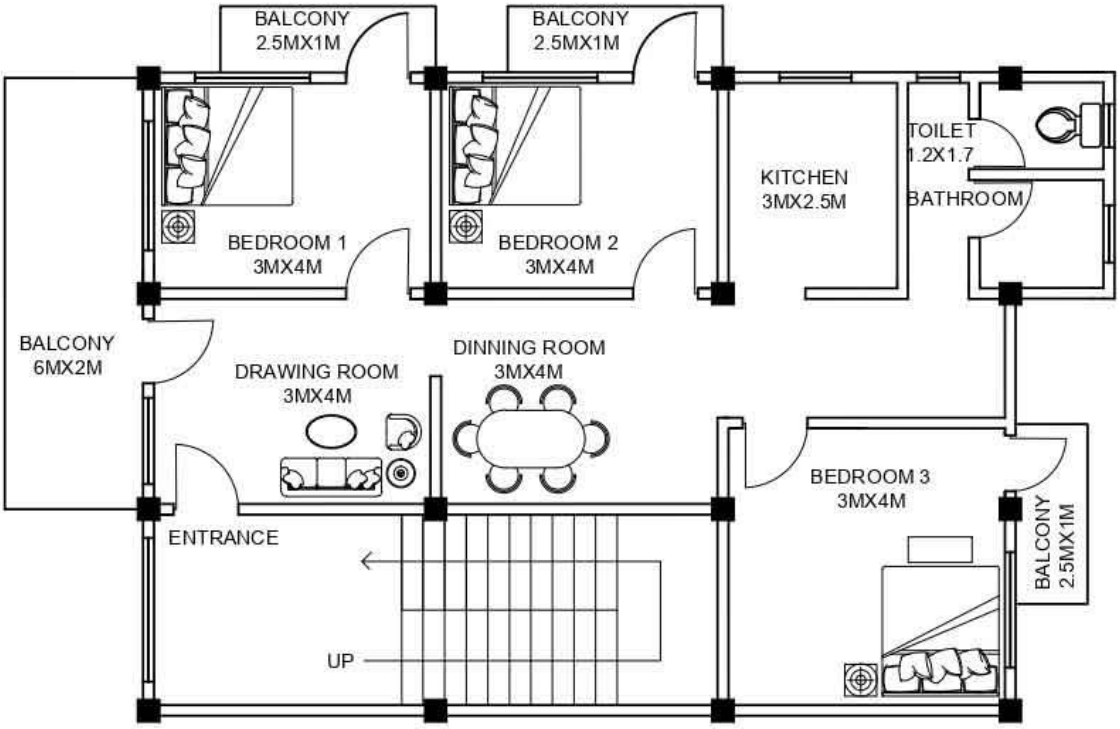
2. FLOOR PLAN : A floor plan is a technical drawing to scale, showing a view from above, of the relationships between rooms, spaces and other physical features at one level of a structure. Dimensions are usually drawn between the walls to specify room sizes and wall lengths. Floor plans may include details of fixtures like sinks, water heaters, furnaces, etc. Floor plans may also include notes for construction to specify finishes, construction methods, or symbols for electrical items. A plan is a common method of depicting the internal arrangement of a three-dimensional object in two dimensions. For renovation and alteration projects, the drawings must clearly distinguish between existing, new, and demolished or removed construction. Walls and partitions must be shown at an appropriate width for the scale used**.** Floor Plan Drawings provide a "bird's-eye view "of the different floor levels of the project.



GROUND FLOOR PLAN



1st FLOOR PLAN



2nd FLOOR PLAN

Semester : II

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3. ELEVATION

Elevation or front view is the outward view of a completed building along any side of the building. When a building is seen by standing in front of it, the view that can be viewed is known as front elevation. Similarly backside view is called rear elevation or from any side of it which is known as side elevation. Building Elevation Drawings show the exterior views of the building, for each building face. The drawings show height relationships and exterior finish information. A Building Elevation Drawing is required for each building face. For most renovation or alteration projects, Building Elevations Drawings would not be required. If the project involves substantial alterations to the building exterior, Building Elevation drawings will be required.

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4. SECTION

Section is also known as vertical section and sectional elevation or cross section.
It is imagined that a finished buildings is cut vertically along a line so that the building is separated into two portions along the imagined vertical plane right from top of the building to the lowest part of foundation. The view that can be seen while travelling along this imaginary vertical plane when looking towards left is drawn to the same scale as that adopted for the plan. The line, which is drawn on the plan to indicate the section, is called sectional line and represented by A-B or X-X. The arrow heads shall be marked to indicate the way in which the sectional view is to be drawn. The necessity of the section is to indicate all the vertical dimensions like, foundation details, basement, details of flooring, height of super structure, sizes of doors, windows, cupboards, other openings, thickness of roofing, width and depth of parapet wall, lintels and other details. All these details are required to calculate the quantities of items of work and to execute the process of construction.

5.SITE PLAN

A Site Plan Drawing identifies buildings and other features in relation to property boundaries. It must identify existing buildings, structures, and features on the property, and the changes to the property created by the proposed project. Alterations, Renovations, or Change of Use to a building may determine the need for existing site features to be identified and/or altered (e.g. parking, loading spaces, & fire access routes). If site feature information is required, or if features are altered, the information must be shown on a Site Plan Drawing. Some of the information for a Site Plan Drawing can be found on the property survey. If a survey is not available, accurate information must be obtained for the Site Plan Drawing.

Minimum information requirements for Site Plan Drawings include

1. Title, Scale, and North Arrow
2. Street Name, Address, and Legal Description
3. Abutting streets and lanes
4. Property lines and dimensions
5. Rights-of-way and easements
6. All existing buildings and structures (indicating shape and dimensions)
7. Proposed construction (indicating shape and dimensions)
8. Setbacks to all property lines from existing and proposed building and structures
9. Separation distances between all buildings and structures
10. Any building structures to be removed

11. New/existing driveway locations and size
12. New/existing vehicle aisles and dimensions
13. New/existing parking stalls and loading spaces (size, locations, and numbers)
14. New/existing sidewalks and curbs
15. Fire access routes and hydrant locations
16. Barrier-free access (ramps, landings, and curb cuts)
17. Site plan control agreement requirements (if applicable)
18. Well and septic tank/field location (if applicable)
19. Site grading elevations (existing and proposed

Importance of Site Plan:

1.It gives idea of the site.
2. It gives details of building site with respect to road and adjoining plots.
3. It gives idea direction of plot facing ie East-west or North-south.
4. It gives margins from boundary of plot.
5. It gives size of plot.
6. It gives location of water supply line, drainage line, manhole and water tank

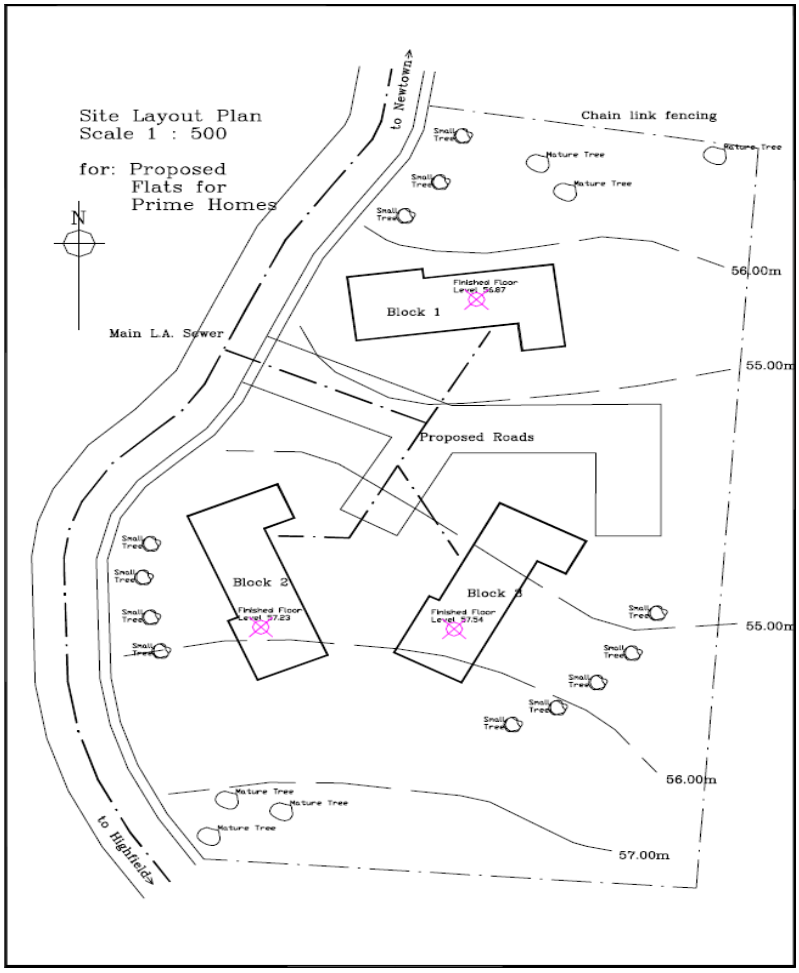

Fig. Site plan

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6.LOCATION PLAN

A location plan provides an illustration of the proposed development in its surrounding context. This enables the planning authority to properly identify the land to which the application refers, and is typically based on an up-to-date Survey (or similar) map. The plan will typically illustrate the following:

- Roads and/or buildings on adjoining land.
- The site boundaries.
- Land necessary to carry out the proposed development
- Any other land owned by the developer that is close to or adjacent to the site

A location plan is different to a site plan. A site plan is specifically focused on providing more detail of the development within the site boundaries, whereas a location plan provides the details of proposed developments in context of the surroundings.

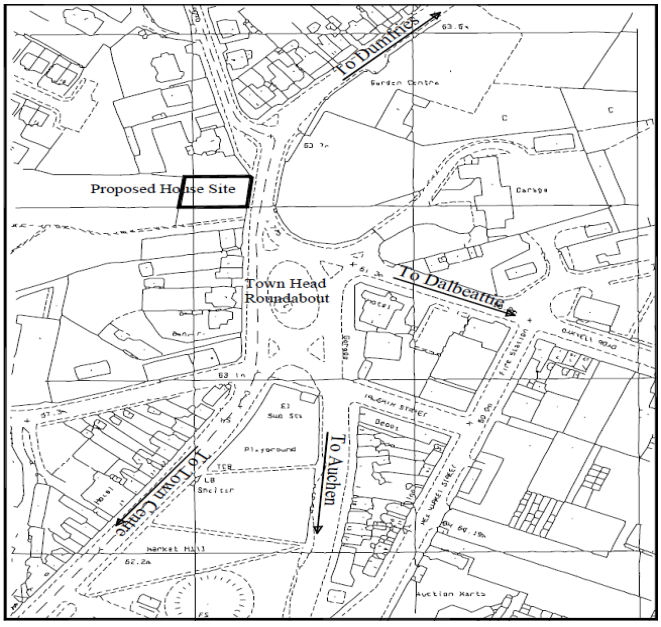

Fig. Location plan

Padre Conceição College of Engineering, Verna, Goa

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GENERAL CONSTRUCTION NOTES

Purpose of writing Construction notes:

1. Type and specifications of material which is to be used is mentioned in construction note.
2. To know the dimensions of components shown in drawing.
3. To know the types of doors and windows and ventilators and their sizes
4. To know the depth of foundation, plinth height, floor height, sill height etc.
5. To know details of chajja projection, slab projection and plinth projection etc.
6. Any special work or treatment to be given in mentioned in construction notes.