CIVIL ENGINEERING DRAWING

# PRACTICAL A

# AutoCAD and its commands:

# What is AutoCAD?

AutoCAD is a [commercial](https://en.wikipedia.org/wiki/Commercial_software) [computer-aided design](https://en.wikipedia.org/wiki/Computer-aided_design) (CAD) and [drafting](https://en.wikipedia.org/wiki/Technical_drawing) software application. Developed and marketed by [Autodesk](https://en.wikipedia.org/wiki/Autodesk). AutoCAD is used in the industry, by architects, project managers, engineers, graphic designers, city planners and other professionals.  It is used for a number of applications like creating blueprints for buildings, bridges, structural and mechanical components to name a few represented in both 2D and 3D designs depending on level of expertise.

# Commands used in AutoCAD

L (LINE)

It can be used for making simple lines in the drawing.

****CO (COPY)****

This command is used to copy object(s) in AutoCAD.

****TR (TRIM)****

This command is used for trimming a geometry.

****XL (XLINE)****

Using this command you can make infinite lines starting from the point of selection. When you trim or break this infinite line to a finite length it becomes a simple line geometry.

****ARC****

As the name suggests, this command can be used to make an arc in AutoCAD.

****EX (EXTEND)****

This command is used for extending lines in a geometry.

# Types of Staircase

Straight Stairs:

Straight stairs are stairs without any changes in direction.

L Shaped Stairs:

The L shaped stair is a variation of the straight stair with a bend in some portion of the stair. This bend is usually achieved by adding a landing at the transition point.

U Shaped Stairs:

U shaped stairs are essentially two parallel flights of straight stairs joined by a landing that creates a 180-degree turn in the walk line.

Spiral Stairs:

Spiral stairs follow a helical arc. They usually have a very compact design and the treads radiate around a central pole.

Curved Stairs:

Like spiral stairs, curved stairs follow a helical arc. However, they tend to have a much larger radius and typically do not make a full circle.

Exterior doors.

Interior doors.

Wooden or Timber doors.

Glass doors.

Steel doors.

PVC doors.

FRP doors.

Swinging doors.

Folding doors.

Sliding doors.

Revolving doors.

Pivot doors.

Panel doors.

Flush doors.

Louvered doors.

Wire gauzed doors.

# Types of Windows

Awning Windows:

Awning windows open out by pivoting from the top of the window sash, operated by a crank.

Casement Windows:

[Casement windows](https://www.thebalancesmb.com/triple-glazed-windows-844733) also open out (like awning windows) and usually pivot from side hinges. Many casements have fairly large glass panes to provide ample light that is uninterrupted by muntin bars or other framing.

Double-Hung and Single-Hung Windows:

Single-hung has a movable lower sash and a fixed upper sash, while double-hung has two movable sashes; the upper sash slides down.

Picture Windows:

They are often large glass expanses occupying the center portion of a wall to provide broad views and ample sunlight.

Slider Windows:

Slider windows slide open sideways. Like casements, they can offer clear views and ample ventilation, but they cannot be sealed as tightly as casements.

# Types of Paper Size;

Most printer users are probably already aware of ‘A size’ paper. These are the most widely used, and easily distinguishable paper sizes. These paper sizes are simple to understand, as they increase and decrease in successive order, with A1 being the biggest paper size and A10 the smallest.

|  |  |  |
| --- | --- | --- |
| **Paper Size** | **Width x Height (mm)** | **Width x height (inches)** |
| **A1** | 594 x 841 mm | 23.4 x 33.1 in |
| **A2** | 420 x 594 mm | 16.5 x 23.4 in |
| **A3** | 297 x 420 mm | 11.7 x 16.5 in |
| **A4** | 210 x 297 mm | 8.3 x 11.7 in |
| **A5** | 148 x 210 mm | 5.8 x 8.3 in |

NOTE: A4 paper is the most commonly-used for printing and measures

# Site Planning;

Site planning in [landscape architecture](https://en.wikipedia.org/wiki/Landscape_architecture) and engineering refers to the initial stage of the landscape and structural design process. It involves the organization of land use, access, climate, privacy, security, shelter, land drainage, and other factors. This is done by arranging the compositional elements of landform, planting, water, buildings and paving in [site plans](https://en.wikipedia.org/wiki/Site_plan). Also, site planning is the design and process of planning for a new development project.

**TEST A**

**Building and construction** steps involving any type of structure is not an easy task, it requires lots of cost and calculations. Although, building construction requires lots of time and is tedious work, yet its result is a permanent asset for us. Therefore, care should be taken in building construction process. Before planning building construction projects important aspects must be considered.

**PROCEDURE:**

**First of all, the plot of land is searched for and acquired in a location that is best suited for building construction processes, noting that it has all desirable facilities nearby after some appropriate site planning considering all factors affecting it.** It is the most important step in building construction.

After selecting proper land for building, personally create building designs or get help and advice from an architect, prepare the floor plans and building requirements, number of flats, rooms, based on the owner’s requirements and budget. Then after, determine the structural details of the reinforcements to be used.

 After, planning and structural detailing completed these details are transferred to the building estimator. The building estimator will estimate the material quantity, quantity of different items of work, and prepare an abstract sheet that shows the cost of building construction. Of course, after getting appropriate permissions from building and construction authorities.

Builders or contractors for construction must be chosen carefully as it is a major factor for securing building construction quality and timely construction of work. In the contract document, all the work-related details must be clearly stated. The contract document should cover layout and work details along with the payment methods, time scales and costs.

The construction site must is cleaned before the work is executed. This work involves the removal of roots of trees, debris and leveling ground area. Then the foundation of building ground is excavated with the help of excavating machines as per the building dimension specified in drawings.

After the foundation work is done ground beam formwork preparation is started and poured with concrete. Over the plinth beam, masonry work is started and space between foundation and plinth beam filled with soil. The columns are built up to slab level and the frame for further construction is prepared.

As column and beam framework is completed, masonry work is started with different materials such as bricks, concrete blocks, fly ash bricks, etc. according to building drawing. The lintel is constructed on the door and window to support the masonry work over it.

Then the formwork is started to construct slab resting on the column and beam. Over slab formwork, slab reinforcement is placed as per slab detailed drawing, after that door window frames are fixed at their specified position given in drawing.

# DIFFERENCES BETWEEN

# Architectural and civil engineering drawings

General civil drawings comprises many set of drawings of which architectural drawings and structural drawings have prime importance apart from several other drawings like fire fighting drawings, plumbing drawing, electrical drawings etc.,

Generally Architectural drawings are taken as basic drawings if there is any difference in drawings I mean any dimension etc., varying from one drawing to the other like dimension of a wall is varying in structural and architectural drawing construction is to be carried out as per architectural drawings. Except in very very minor cases which might occur in individual constructions where architectural drawings don't have significant importance i.e., they are not properly drawn.

Architectural drawings gives the external view or aesthetic view of the building or construction and provides the location of columns, walls, staircases and ducts etc.,

Keeping in view the location of columns and walls etc., as provided in the architectural drawing other drawings like structural, fire fighting, plumbing etc., are developed

In case of structural drawings along with architectural drawings the load bearing capacity of the soil and loading conditions like live load and dead load are considered and steel design such loading conditions are given with respect to Architectural drawings. In case o f footing drawings location of columns and nature of soil and load bearing capacity of soil are considered.

# Working and Presentation drawings

**A Working drawing** is a drawing or blueprint based on explanations. It is completed with a thorough plan and views (details, notes, and dimensions) to ensure the [product](https://knowtechie.com/tag/gadgets) construction or replication without any additional information. it is a scale drawing of an object to be made or structure to be built intended for direct use by the workman, WHILE **A Presentation drawing** is any of a set of design drawings made to articulate and communicate a design concept or proposal such as for an exhibition, review, or publication intended to explain a scheme and to promote its merits.

# BEME and BOQ

BOQ(Bill of Quantities) is a factored estimate of all the materials, equipment and workmanship required for all items of work in a building project.

BEME(**A Bill of Engineering Measurements and Evaluation)**  on the other hand is an accurate measurements of the materials, considerate judgement of workmanship involved and exact assessment of the equipment required to carry out every item of work involved in buildings, culvert, drains, bridges, raillines, canals, tunnels and other civil-structural facilities.

# Septic tank and soak away

**A Septic tank** is an underground chamber made of concrete, fiberglass, or plastic through which domestic wastewater flows for basic treatment. Settling and anaerobic processes reduce solids and organics, but the treatment efficiency is only moderate. Septic tank systems are a type of simple onsite sewage facility, WHILE **A Soakaway** is simply a hole dug into the ground, filled with rubble and coarse stone which allows surface water to percolate back into the earth close to where it falls. **Soakaway** construction is a low environmental impact solution to drainage because it uses few materials.