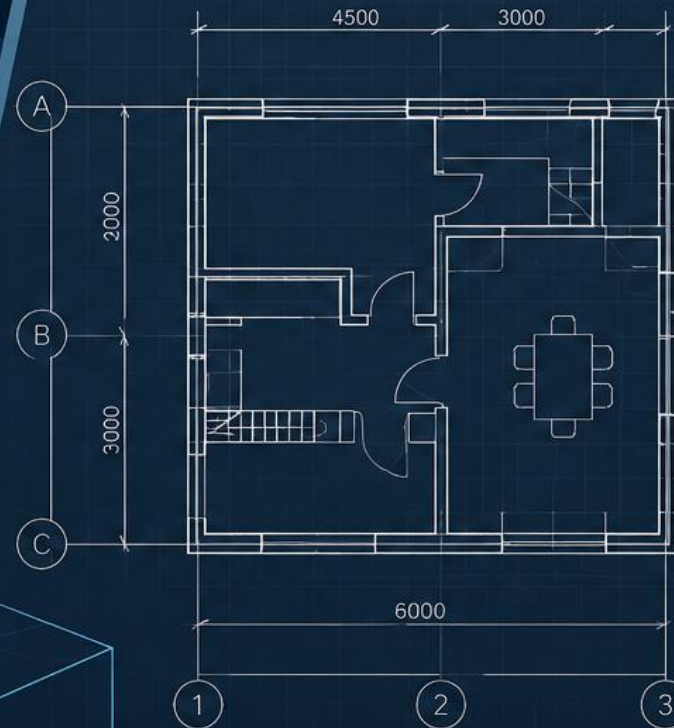


UNIT 1 AUTOCAD FUNDAMENTALS



NOTES

- 1. Introduction to CAD
- 2. AutoCAD Interface
- 3. Drawing Setup (Units & Limits)
- 4. Coordinate Systems (Absolute, Relative, Polar)
- 5. Mouse & Keyboard Shortcuts



UNIT 2 DRAWING TOOLS

AUTODESK
AUTOCAD®



NOTES

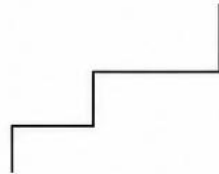
- 1 Line
- 2 Polyline
- 3 Circle
- 4 Arc
- 5 Rectangle
- 6 Polygon
- 7 Ellipse
- 8 Spline
- 9 Construction Line
- 10 Point & Donut

1 Line



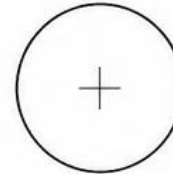
Draws straight line segments.

2 Polyline



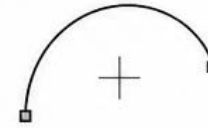
Creates connected line segments.

3 Circle



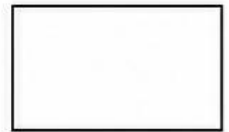
Creates a circle from center point.

4 Arc



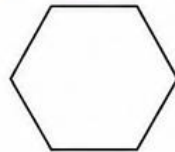
Creates an arc with specified points.

5 Rectangle



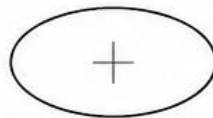
Creates a rectangle using two corner points.

6 Polygon



Creates a regular polygon with specified sides.

7 Ellipse



Creates an ellipse or elliptical arc.

8 Spline



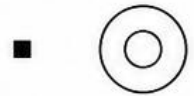
Creates a smooth curve through points.

9 Construction Line

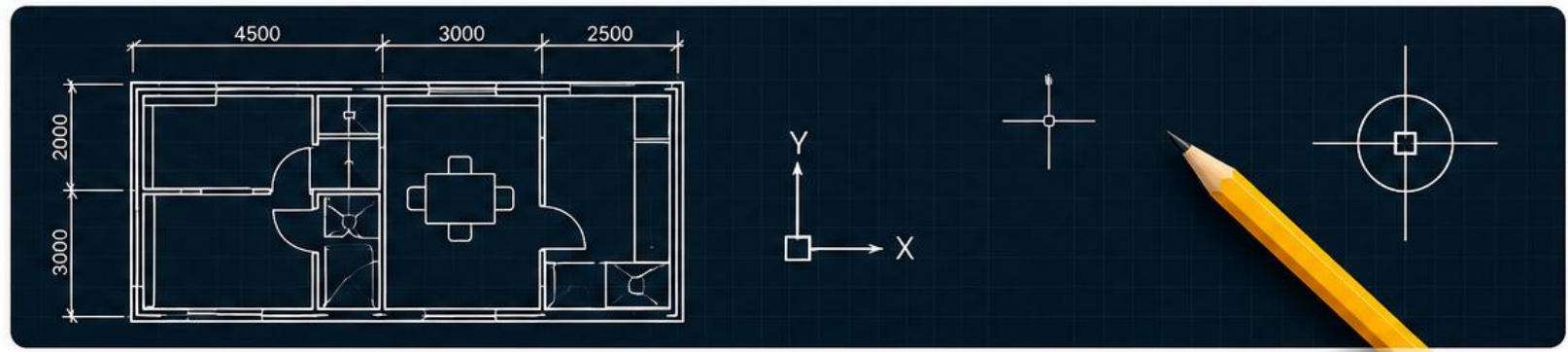


Creates infinite construction lines.

10 Point & Donut



Creates point objects and donut shapes.



UNIT 3

MODIFY TOOLS

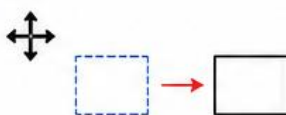
AUTODESK
AUTOCAD®



NOTES

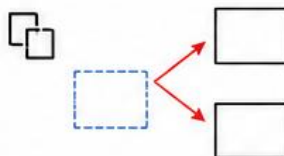
- 1 Move
- 2 Copy
- 3 Rotate
- 4 Mirror
- 5 Scale
- 6 Stretch
- 7 Offset
- 8 Trim
- 9 Extend
- 10 Fillet
- 11 Chamfer
- 12 Explode
- 13 Join
- 14 Break

1 Move



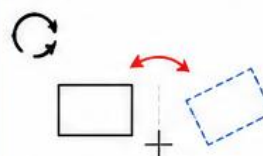
Moves selected objects from one location to another.

2 Copy



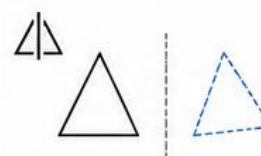
Creates a copy of selected objects at a specified distance.

3 Rotate



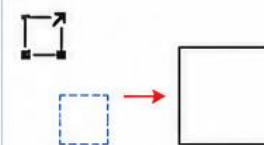
Rotates objects around a base point by a specified angle.

4 Mirror



Creates a mirror image of objects about a specified axis.

5 Scale



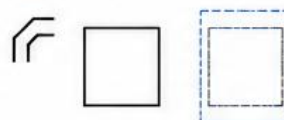
Increases or decreases the size of objects proportionally.

6 Stretch



Stretches objects by moving grips or using a window.

7 Offset



Creates concentric circles, parallel lines, or parallel curves.

8 Trim



Trims objects to meet the edges of other objects.

9 Extend



Extends objects to meet the edges of other objects.

10 Fillet



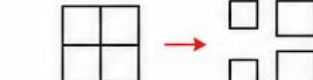
Rounds and fillets the edges of objects.

11 Chamfer



Bevels the edges of objects at a specified distance or angle.

12 Explode



Breaks complex objects into their component objects.

13 Join



Joins multiple objects into a single object.

14 Break



Breaks objects at a specified point.



TIP: Modify tools help you edit and refine your drawings quickly and accurately, saving time and improving productivity.



UNIT 4

LAYERS & OBJECT PROPERTIES

AUTODESK
AUTOCAD®



NOTES

1. LAYERS

Layers help you organize your drawing objects. You can control the visibility, color, linetype and lineweight of objects easily using layers.

2. OBJECT PROPERTIES

Object Properties control the appearance and behavior of objects such as color, layer, linetype, lineweight, transparency and more.

BENEFITS OF USING LAYERS

- Organize drawing elements
- Improve drawing efficiency
- Control object visibility
- Simplify editing and modifications
- Prepare drawings for plotting with ease



TIP:

Always create and use layers before you start drawing. It keeps your drawing clean and professional.

1. LAYERS MANAGER

Current layer: 0									
Search for layer									
	S.	Name	On	Freeze	Lock	Color	Linetype	Lineweight	Plot
	✓	0				white	Continuous	0.25 mm	
	2	WALL				red	Continuous	0.50 mm	
	2	DOOR				green	Continuous	0.25 mm	
	3	WINDOW				blue	Continuous	0.25 mm	
	4	DIMENSION				yellow	Continuous	0.18 mm	
	5	HATCH				magenta	HIDDEN	0.25 mm	
	6	TEXT				cyan	Continuous	0.18 mm	

COMMON LAYER PROPERTIES

	On / Off	Turns layer visibility on or off.
	Freeze / Thaw	Hides or shows all objects on a layer.
	Lock / Unlock	Locks objects on a layer to prevent unwanted changes.
	Color	Sets the color for objects on a layer.
	Linetype	Defines the line pattern of objects.
	Lineweight	Sets the thickness of objects.
	Plot	Controls whether objects in the layer will be plotted.

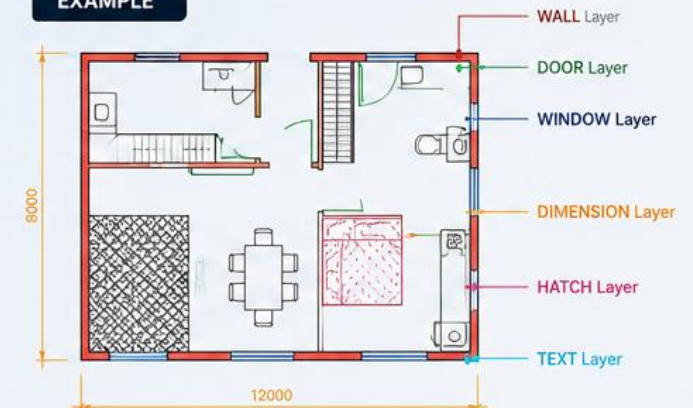
2. OBJECT PROPERTIES PALETTE

PROPERTIES	
No selection	
General	
Color	ByLayer
Layer	0
Linetype	ByLayer
Linetype scale	1.0000
Lineweight	ByLayer
Transparency	ByLayer
Thickness	0.0000

PROPERTIES EXPLAINED

Color	Sets the color of the selected object.
Layer	Displays the layer of the selected object.
Linetype	Sets the linetype of the object.
Linetype scale	Controls the linetype pattern scale.
Lineweight	Defines the thickness of the object.
Transparency	Controls the transparency level.
Thickness	Sets the thickness for 2D/3D objects.

EXAMPLE



BEST PRACTICES



Create meaningful layer names.



Use appropriate colors for clarity.



Lock layers that are completed.



Freeze layers you are not working on.



Turn off layers that are not needed for plotting.

UNIT 5

ANNOTATION & DIMENSIONS



AUTODESK
AUTOCAD®



NOTES

Annotations and dimensions provide important information on drawings. They help communicate design intent clearly and accurately.

TOPICS COVERED

- 1 Text (Single Line & Multiline)
- 2 Dimension Styles
- 3 Linear Dimension
- 4 Aligned Dimension
- 5 Angular Dimension
- 6 Radius Dimension
- 7 Diameter Dimension
- 8 Arc Length Dimension
- 9 Leader
- 10 Tables
- 11 Tolerances
- 12 Center Mark & Center Line



BENEFITS

- Improves drawing communication
- Provides precise measurements
- Enhances professional quality
- Ensures construction accuracy

1. TEXT

SINGLE LINE TEXT



Creates a single line of text.

MULTILINE TEXT (MTEXT)

AutoCAD is used to create accurate and detailed drawings.

Creates multiple lines of text within a paragraph.

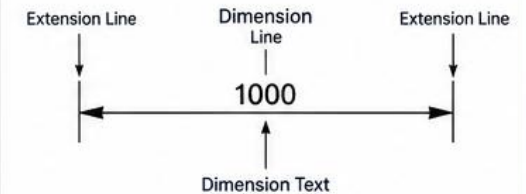
2. DIMENSION STYLES

Dimension styles control the appearance of dimensions.

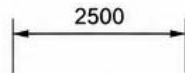
DIMENSION STYLE ELEMENTS

Text Height	Height of dimension text
Arrow Size	Size of arrowheads
Extension Line Offset	Offset from the object
Gap from Dim Line	Gap between text and line
Precision	Number of decimal places
Units	Format of measurement

COMMON DIMENSION TERMINOLOGY

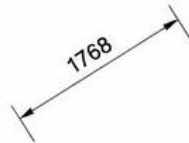


3 LINEAR DIMENSION



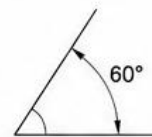
Measures horizontal or vertical distance.

4 ALIGNED DIMENSION



Measures distance parallel to the object.

5 ANGULAR DIMENSION



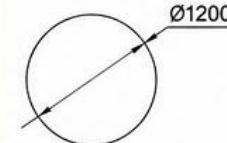
Measures the angle between two lines.

6 RADIUS DIMENSION



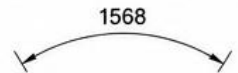
Dimensions the radius of an arc or circle.

7 DIAMETER DIMENSION



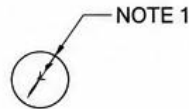
Dimensions the diameter of a circle.

8 ARC LENGTH DIMENSION



Measures the length of an arc.

9 LEADER



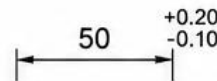
Adds a note or annotation to an object.

10 TABLES

ITEM	DESCRIPTION	QTY
1	COLUMN	4
2	BEAM	6
3	SLAB	1

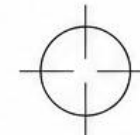
Organizes data in rows and columns.

11 TOLERANCES



Specifies allowable variation in measurements.

12 CENTER MARK



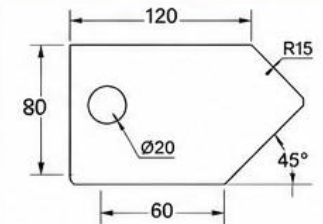
Marks the center point of a circle or arc.

CENTER LINE



Indicates the center or axis of symmetry.

EXAMPLE ON DRAWING



BEST PRACTICES



Use consistent text height throughout the drawing.



Use proper dimension style for all drawings.



Place dimensions outside the object where possible.



Avoid overlapping dimensions and text.



Always check dimensions before final plotting.

UNIT 6

BLOCKS & ATTRIBUTES



AUTODESK
AUTOCAD®



NOTES

Blocks help you save and reuse objects in your drawing. Attributes store information in blocks, making drawings smarter and easier to manage.

TOPICS COVERED

- 1 What is a Block?
- 2 Creating a Block
- 3 Inserting a Block
- 4 Editing a Block
- 5 Block Types
- 6 Attributes
- 7 Creating Attributes
- 8 Attribute Definition
- 9 Attribute Extraction
- 10 Block with Attributes
- 11 Editing Attributes
- 12 Import / Export Blocks
- 13 Block Libraries

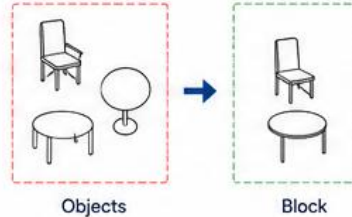


BENEFITS

- ✓ Saves time by reusing objects
- ✓ Ensures consistency
- ✓ Easy updates across drawings
- ✓ Reduces drawing file size
- ✓ Better project management

1 WHAT IS A BLOCK?

A block is a collection of objects combined into a single named object. It can be inserted multiple times in a drawing.



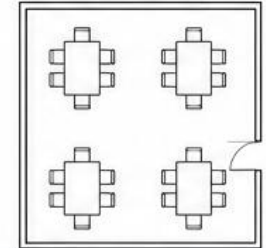
2 CREATING A BLOCK

- 1 Select the objects.
- 2 Type BLOCK or B.
- 3 Enter a name for the block.
- 4 Pick a base point.
- 5 Choose objects (already selected).
- 6 Click OK.

3 INSERTING A BLOCK

- 1 Type INSERT or I.
- 2 Select the block name.
- 3 Specify insertion point.
- 4 Set scale.
- 5 Specify rotation angle.
- 6 Click OK.

EXAMPLE



4 BLOCK TYPES

TYPE		DESCRIPTION
Internal		Created in the current drawing and stored within it.
External		Stored in a separate file (.dwg) and inserted into drawings.
Anonymous		AutoCAD generated blocks (e.g., hatch, arrays).
Dynamic		Blocks with parameters and actions to control visibility, size, shape, etc.

5 ATTRIBUTES

Attributes are text information attached to a block. Each attribute has a tag and value.

PROJECT	ABC BUILDING
DRAWN BY	AKV
DATE	10-07-2025
SCALE	1:100

6 CREATING ATTRIBUTES

- 1 Type ATTDEF.
- 2 Select a location.
- 3 Enter Tag name.
- 4 Enter Prompt.
- 5 Set default value.
- 6 Choose text style and height.
- 7 Click OK.

ATTRIBUTE TERMS	DESCRIPTION
Tag	Unique name of the attribute.
Prompt	Question shown when block is inserted.
Default Value	Value displayed by default.
Mode	Invisible, Constant, Verify, Preset, Lock position.

7 ATTRIBUTE EXTRACTION

Extracts attribute data from blocks into a table.

	A001		A002
	A003		

TAG	VALUE
TAG	A001
TAG	A002
TAG	A003
...	...

Use DATAEXTRACTION or EATTEXT.

8 BLOCK WITH ATTRIBUTES

PROJECT	
DRAWN BY	
DATE	
SCALE	

Block Definition

PROJECT	RESIDENCE
DRAWN BY	AKV
DATE	10-07-2025
SCALE	1:100

After Insertion

9 EDITING ATTRIBUTES

Use EATTEDIT or double-click on the block to edit attribute values.

Enhanced Attribute Editor

Tag:	PROJECT
Value:	RESIDENCE
Tag:	DRAWN BY
Value:	AKV
Tag:	DATE
Value:	10-07-2025
Value:	1:100

OK Cancel Help

10 IMPORT / EXPORT BLOCKS

- Import blocks from other drawings using INSERT.
- Export blocks to a separate file for reuse in other projects.

11 BLOCK LIBRARIES

- Create a dedicated folder for common blocks.
- Build a block library for standard elements like doors, windows, furniture, symbols, etc.
- Use TOOL PALETTES to organize blocks.

BEST PRACTICES



Use meaningful block names.



Create blocks on 0 layer.



Always set a logical base point.



Use consistent attribute tags.



Update blocks regularly.



Remove unused blocks and purge drawings.

UNIT 7

HATCH & GRADIENT



AUTODESK
AUTOCAD®



NOTES

Hatch and Gradient tools are used to fill enclosed areas or selected objects with patterns, colors, or gradients to enhance clarity and presentation of drawings.

TOPICS COVERED

- 1 What is Hatch?
- 2 Hatch Types
- 3 Creating a Hatch
- 4 Hatch Pattern
- 5 Editing Hatch
- 6 Hatch Settings
- 7 Gradient Fill
- 8 Editing Gradient
- 9 Associative Hatch
- 10 Remove Hatch
- 11 Hatch Transparency
- 12 Hatch Origin
- 13 Hatch in Layout
- 14 Best Practices

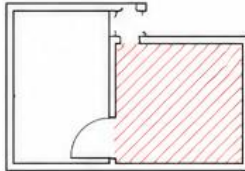


BENEFITS

- ✓ Improves drawing readability
- ✓ Highlights areas and materials
- ✓ Enhances visual presentation
- ✓ Saves time in manual shading
- ✓ Professional drawing output

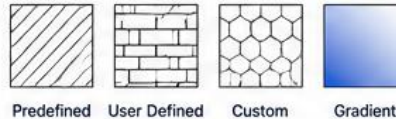
1 WHAT IS HATCH?

Hatch is used to fill enclosed areas or selected objects with a pattern, solid color, or gradient.



2 HATCH TYPES

- Predefined: Uses named patterns.
- User Defined: Uses custom patterns.
- Custom: Uses user created patterns.
- Gradient: Uses color transitions.

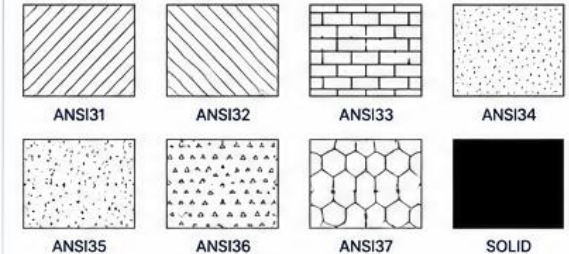


3 CREATING A HATCH

- 1 Type HATCH or H.
- 2 Select the boundary (pick points inside).
- 3 Choose pattern or color.
- 4 Set scale, angle and other options.
- 5 Click OK.

4 HATCH PATTERN

Commonly used hatch patterns:



5 EDITING HATCH

- 1 Select the hatch.
- 2 Use grips to modify boundary.
- 3 Change pattern, scale, angle or color.
- 4 Click OK.

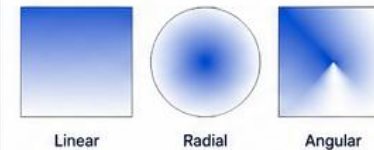


6 HATCH SETTINGS

Pattern	Select hatch pattern.
Scale	Controls pattern size.
Angle	Sets direction of pattern.
Spacing	Adjusts pattern spacing.
Color	Sets hatch color.
Background Color	Color behind the hatch.
Hatch Origin	Sets reference point.

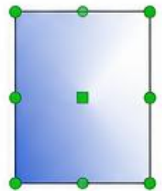
7 GRADIENT FILL

Fills an area with a gradual transition between two or more colors.



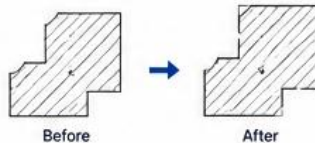
8 EDITING GRADIENT

- 1 Select the gradient.
- 2 Use grips to adjust colors and direction.
- 3 Modify type, angle, center or tint.
- 4 Click OK.



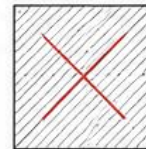
9 ASSOCIATIVE HATCH

Associative hatch automatically updates when the boundary or object is modified.



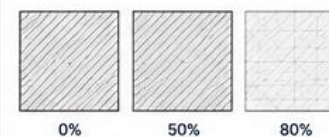
10 REMOVE HATCH

- 1 Select the hatch.
- 2 Press Delete key or use ERASE.



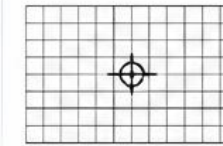
11 HATCH TRANSPARENCY

Controls the transparency of the hatch to show underlying objects.



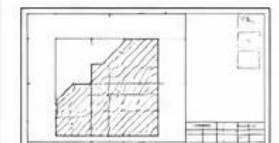
12 HATCH ORIGIN

Sets the base point for hatch pattern.



13 HATCH IN LAYOUT

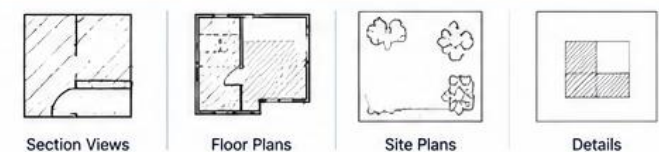
Hatches can be created in paper space for detailed presentation.



14 BEST PRACTICES



USE CASES



UNIT 8

LAYOUT, VIEWPORTS & PLOTTING



AUTODESK
AUTOCAD®



NOTES

Layouts help you present your drawings on sheets with titles, scales, borders and annotations. Viewports display model space views in paper space at different scales.

TOPICS COVERED

- 1 What is Layout?
- 2 Layout Tabs
- 3 Page Setup Manager
- 4 Viewport
- 5 Creating a Viewport
- 6 Viewport Properties
- 7 Viewport Scale
- 8 Viewport Lock
- 9 Title Block & Border
- 10 Annotations in Layout
- 11 Plot (Print)
- 12 Plot Settings
- 13 Plot Preview
- 14 Export to PDF / DWG

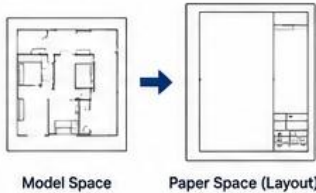


BENEFITS

- ✓ Professional drawing presentation
- ✓ Multiple scales on one sheet
- ✓ Better documentation
- ✓ Accurate plotting and printing
- ✓ Saves time and improves workflow

1 WHAT IS LAYOUT?

A layout is a sheet in Paper Space where you arrange views, dimensions, text, title block and other annotations for printing.



Model Space

Paper Space (Layout)

2 LAYOUT TABS

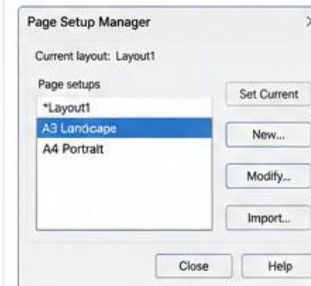
Use layout tabs to create and switch between different sheets.



- Model – for designing
- Layout1, Layout2... – for printing

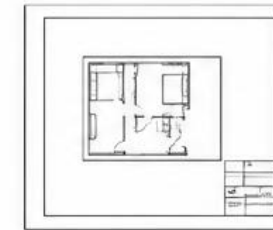
3 PAGE SETUP MANAGER

Define printer, paper size, plot area, scale and other plot settings.



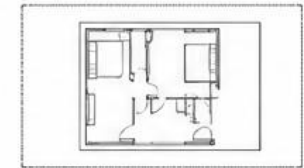
4 VIEWPORT

A viewport is a window in layout that shows a view of model space at a specific scale.



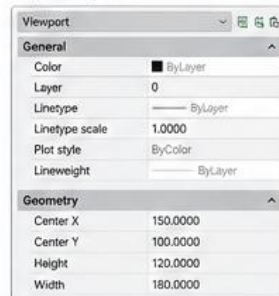
5 CREATING A VIEWPORT

- 1 Go to Layout tab.
- 2 Click MVIEW or use MV command.
- 3 Draw a rectangle for the viewport.
- 4 The view of model space appears inside.



6 VIEWPORT PROPERTIES

Control viewport display using Properties palette.

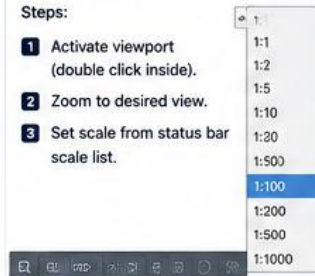


7 VIEWPORT SCALE

Set the scale of the view inside the viewport.

Steps:

- 1 Activate viewport (double click inside).
- 2 Zoom to desired view.
- 3 Set scale from status bar scale list.



8 VIEWPORT LOCK

Lock the viewport to prevent accidental changes.

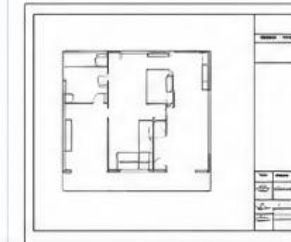
Steps:

- 1 Activate viewport.
- 2 Click the padlock icon in status bar.



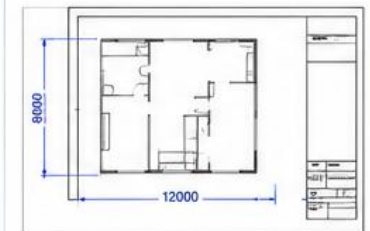
9 TITLE BLOCK & BORDER

Insert title block and border to provide drawing information.



10 ANNOTATIONS IN LAYOUT

Add text, dimensions, leader, tables, symbols and other annotations in paper space.



11 PLOT (PRINT)

Plot your drawing to paper or file.

Options:

- Print to Printer
- Publish to PDF
- Save to DWG/DXF



Printer



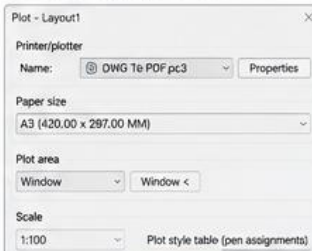
PDF



DWG

12 PLOT SETTINGS

Set plotter, paper size, plot area, scale, lineweights, and more.



13 PLOT PREVIEW

Preview your drawing before printing to avoid errors.



14 EXPORT TO PDF / DWG

Export layout to PDF or shareable DWG file.

Steps:

- 1 Go to Output tab.
- 2 Select PDF or DWG.
- 3 Choose location and save.



PDF



DWG

BEST PRACTICES

- Use standard sheet sizes (A4, A3, A2).
- Keep title block consistent.
- Use proper scales for clear readability.
- Lock viewports after setting scale.
- Always preview before plotting.
- Use lineweights for better output.

UNIT 9

ARCHITECTURAL DRAWING PROJECT



AUTODESK
AUTOCAD®



NOTES

In this project, you will create complete architectural drawings from a given plan. It includes planning, drawing, annotating, dimensioning, and plotting in AutoCAD.

PROJECT DELIVERABLES

- ✓ Floor Plan (2D)
- ✓ Elevations
- ✓ Sections
- ✓ Door & Window Schedule
- ✓ Area Calculation
- ✓ Title Block
- ✓ Plot to PDF / DWG

TOPICS COVERED

- 📐 Planning & Drawing
- 📁 Layers & Linework
- 📏 Dimensions & Annotations
- 🔤 Hatch & Text
- 📋 Blocks & Schedules
- 🖨️ Layouts & Viewports
- 🖨️ Plotting & Output



BENEFITS

- ✓ Builds real-world drafting skills
- ✓ Understand drawing standards
- ✓ Improves accuracy and detailing
- ✓ Prepares for professional projects
- ✓ Creates a strong portfolio

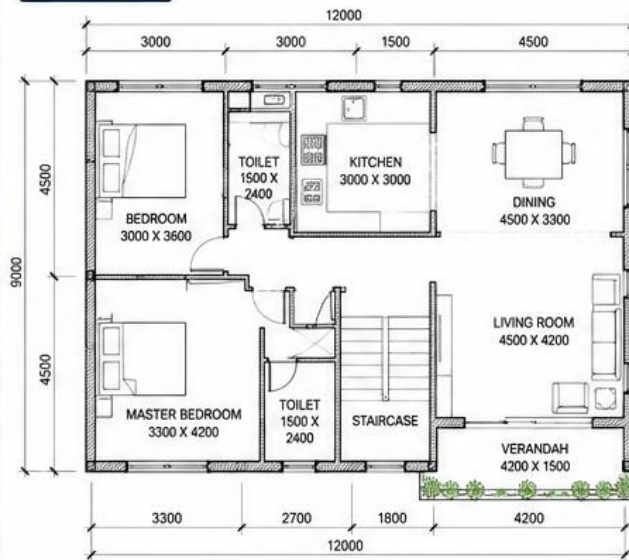
PROJECT WORKFLOW



PROJECT OVERVIEW

	Project Type	Residential Building
	Drawing Type	Architectural
	Software	AutoCAD
	Units	Millimeters (mm)
	Scale	As Indicated
	Deliverables	PDF, DWG

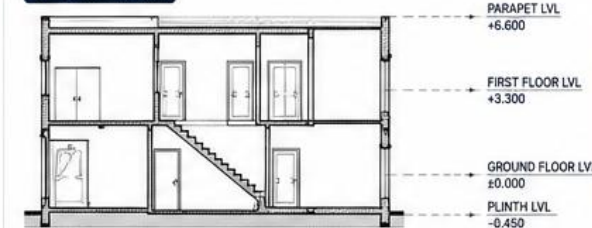
1. FLOOR PLAN



2. FRONT ELEVATION



3. SECTION A-A



4. DOOR & WINDOW SCHEDULE

TYPE	SIZE (mm)	DESCRIPTION	QTY.
DOORS			
D1	1000 X 2100	MAIN DOOR	01
D2	900 X 2100	ROOM DOOR	06
D3	750 X 2100	TOILET DOOR	02
WINDOWS			
W1	1500 X 1200	SLIDING WINDOW	04
W2	1200 X 1200	SLIDING WINDOW	02
W3	600 X 900	VENTILATOR	02

5. AREA STATEMENT

BUILT-UP AREA	108.00 SQ.M.
VERANDAH AREA	6.30 SQ.M.
TOTAL AREA	114.30 SQ.M.

6. LAYOUT & VIEWPORTS (PAPER SPACE)



7. PLOTTING OUTPUT



Plot to PDF



Save as DWG

BEST PRACTICES



Use proper layers and lineweights.



Maintain accurate dimensions.



Use standard text styles and sizes.



Apply hatches for better clarity.



Lock viewports before plotting.



Check plot settings before printing.

UNIT 10

STRUCTURAL DRAWING PROJECT



AUTODESK
AUTOCAD®



NOTES

In this project, you will create complete structural drawings including plan, sections, elevation, structural details, reinforcement details, and schedules using AutoCAD.

PROJECT DELIVERABLES

- ✓ Structural Plan
- ✓ Sections & Elevation
- ✓ Foundation Plan
- ✓ Column Schedule
- ✓ Beam Schedule
- ✓ Slab Reinforcement Details
- ✓ Structural Details
- ✓ General Notes
- ✓ Title Block
- ✓ Plot to PDF / DWG

TOPICS COVERED

- 📐 Structural Planning
- 📏 Dimensions & Grids
- 🏗 Columns, Beams & Slabs
- 🔧 Reinforcement Detailing
- 📐 Sections & Elevations
- 📊 Schedules & Tables
- 📝 Annotations & Details
- 🖨 Plotting & Output



BENEFITS

- ✓ Develop real structural drafting skills
- ✓ Understand structural standards
- ✓ Improve accuracy and detailing
- ✓ Prepare for professional projects
- ✓ Build a strong project portfolio

PROJECT WORKFLOW

1 REQUIREMENT



Understand client requirements, structure type, materials and standards.

2 PLANNING



Prepare grid layout and structural planning.

3 MODELING & DRAFTING



Draw structural plan using proper layers, line types and settings.

4 DETAILING



Add reinforcement details, sections and connection details.

5 ANNOTATION



Add dimensions, notes, symbols and callouts.

6 SCHEDULES



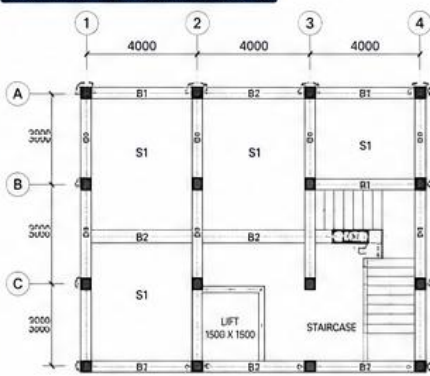
Prepare all schedules and tables.

7 LAYOUT & PLOT



Create layouts and plot to PDF or DWG.

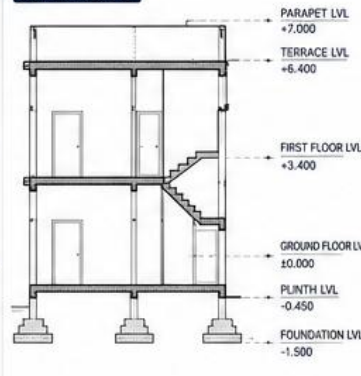
1. STRUCTURAL PLAN (FIRST FLOOR)



2. FRONT ELEVATION



3. SECTION A-A



4. COLUMN SCHEDULE

MARK	SIZE (mm)	MAIN BARS	TIES	REMARKS
C1	300 X 450	4 - 20Ø	8Ø @ 150 c/c	G+1
C2	300 X 450	4 - 20Ø	8Ø @ 150 c/c	G+1
C3	230 X 300	4 - 16Ø	8Ø @ 150 c/c	G+1
C4	230 X 300	4 - 16Ø	8Ø @ 150 c/c	G+1

5. BEAM SCHEDULE

MARK	SIZE (mm)	MAIN BARS	STIRRUPS	REMARKS
B1	230 X 450	2 - 20Ø (T) 2 - 20Ø (B)	8Ø @ 150 c/c	G+1
B2	230 X 350	2 - 16Ø (T) 2 - 16Ø (B)	8Ø @ 150 c/c	G+1
B3	230 X 300	2 - 16Ø (T) 2 - 16Ø (B)	8Ø @ 150 c/c	G+1

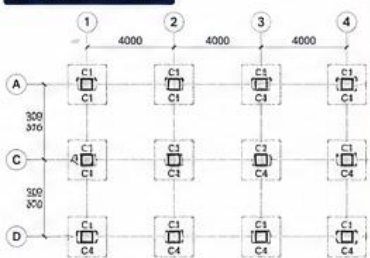
6. SLAB SCHEDULE

MARK	THICKNESS	SHORT SPAN	LONG SPAN	REMARKS
S1	125 mm	10Ø @ 150 c/c	10Ø @ 150 c/c	ALL FLOORS

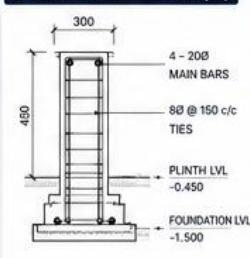
11. GENERAL NOTES

- All dimensions are in millimeters unless specified.
- Concrete Grade: M25 unless specified.
- Steel Grade: Fe500.
- Clear cover: 25mm for beams & slabs, 40mm for columns.
- Do not scale the drawing. Follow written dimensions.

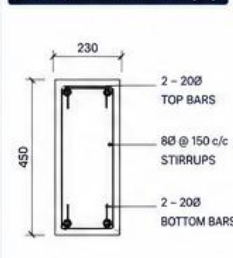
7. FOUNDATION PLAN



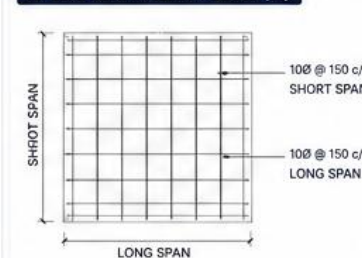
8. TYPICAL COLUMN DETAIL (C1)



9. TYPICAL BEAM DETAIL (B1)



10. SLAB REINFORCEMENT DETAIL (S1)



12. TITLE BLOCK

PROJECT TITLE RESIDENTIAL BUILDING (G+1)	DRAWN BY AKV
	CHECKED BY AKV
DRAWING TITLE STRUCTURAL PLAN, SECTIONS & DETAILS	DATE 10-07-2025
	SCALE AS INDICATED
	DWG NO. ST-01
	REV. AKV ENGINEERING SERVICES

13. PLOTTING OUTPUT



Plot to PDF



Save as DWG

BEST PRACTICES



Use proper layers and lineweights.



Maintain accurate dimensions.



Follow standard reinforcement details.



Prepare clear schedules and tables.



Check drawings before plotting.



Plot with correct scale and settings.

UNIT 11

CIVIL DRAWING PROJECT



AUTODESK
AUTOCAD®



NOTES

In this project, you will create complete civil drawings including site plan, road plan & profile, sections, drainage details, and schedules using AutoCAD.

PROJECT DELIVERABLES

- ✓ Site Plan
- ✓ Road Plan & Profile
- ✓ Cross Sections
- ✓ Drainage Plan & Details
- ✓ Quantity Calculation
- ✓ Schedules & Tables
- ✓ General Notes
- ✓ Title Block
- ✓ Plot to PDF / DWG

TOPICS COVERED

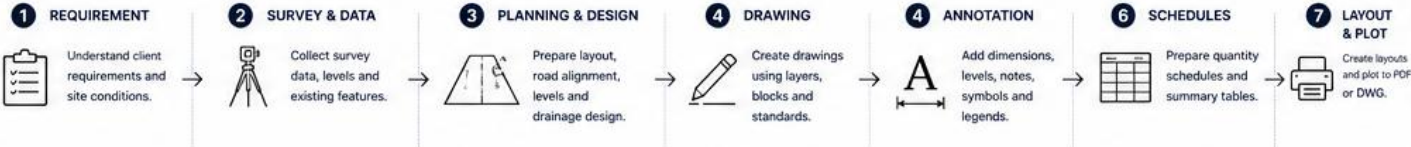
- 📐 Civil Planning & Layout
- 📊 Contours & Levels
- 🛣️ Road Design (Plan & Profile)
- 📐 Cross Sections
- 🚰 Drainage Design
- 🔍 Details & Annotations
- 📊 Schedules & Tables
- 🖨️ Plotting & Output



BENEFITS

- ✓ Develop real-world civil drafting skills
- ✓ Understand design standards
- ✓ Improve accuracy and detailing
- ✓ Prepare for professional projects
- ✓ Build a strong project portfolio

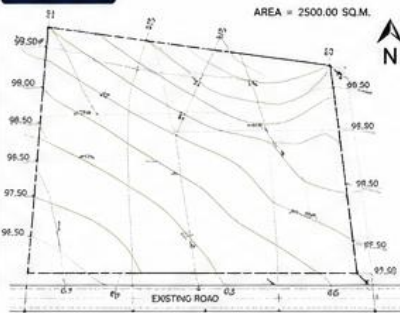
PROJECT WORKFLOW



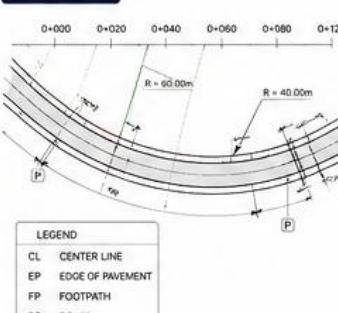
PROJECT OVERVIEW

Project Type	Residential Layout
Drawing Type	Civil
Software	AutoCAD
Units	Millimeters (mm)
Scale	As Indicated
Codes Followed	IRC, IS Codes
Deliverables	PDF, DWG

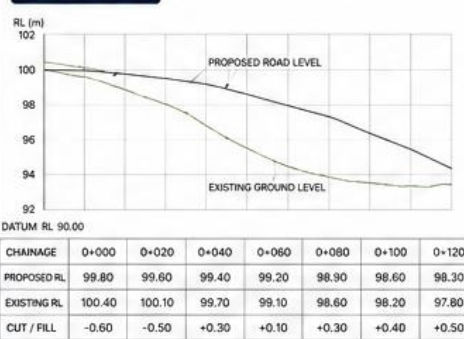
1. SITE PLAN



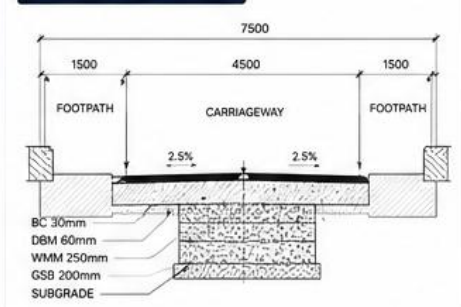
2. ROAD PLAN



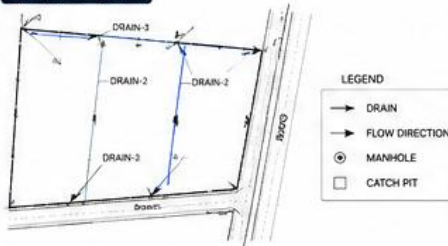
3. ROAD PROFILE



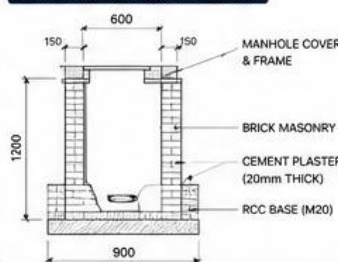
4. TYPICAL CROSS SECTION



5. DRAINAGE PLAN



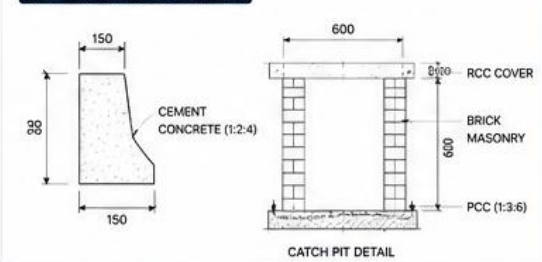
6. DRAINAGE DETAIL (MANHOLE)



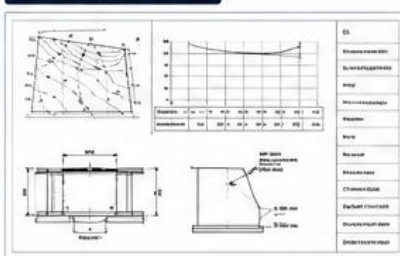
7. QUANTITY SUMMARY

ITEM DESCRIPTION	UNIT	QUANTITY
Earthwork in Excavation	Cu.M.	1250.00
PCC (M10)	Cu.M.	45.60
WMM (250mm)	Cu.M.	102.40
DBM (60mm)	Cu.M.	24.60
BC (30mm)	Cu.M.	12.30
Kerb Stone	Rmt.	125.00
Manhole (1.2m dia)	No.	08
Catch Pit	No.	12

8. MISCELLANEOUS DETAILS



9. LAYOUT (PAPER SPACE)



10. PLOTTING OUTPUT



11. TITLE BLOCK

PROJECT	RESIDENTIAL LAYOUT PROJECT
DRAWING TITLE	SITE PLAN, ROAD PLAN, SECTIONS & DETAILS
DRAWN BY	AKV
CHECKED BY	AKV
DATE	10-07-2025
SCALE	AS INDICATED
DWG NO.	C-01
REV.	00

BEST PRACTICES



Use proper layers and linewidths.



Maintain accurate levels and coordinates.



Follow standard symbols and legends.



Use correct scales and plot settings.



Prepare all schedules and tables.



Check plot before final printing.

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SPECIFIED. LEVELS ARE IN METERS.

UNIT 12

FABRICATION DRAWING PROJECT



NOTES

In this project, you will create fabrication drawings for a structural steel member including details, dimensions, BOM, cut list, and connection details using AutoCAD.

PROJECT DELIVERABLES

- ✓ Fabrication Drawings
- ✓ Member Details
- ✓ Connection Details
- ✓ Cut List / BOM
- ✓ Weld Details
- ✓ Bolt Schedule
- ✓ General Notes
- ✓ Title Block
- ✓ Plot to PDF / DWG

TOPICS COVERED

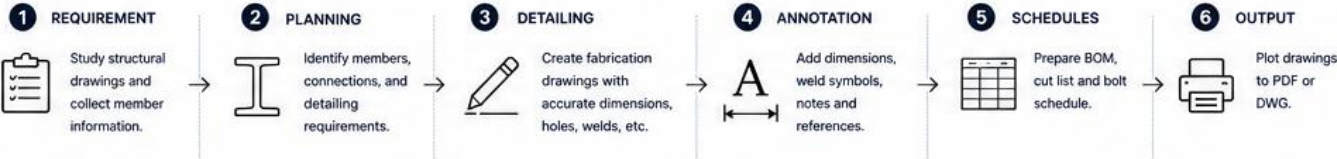
- Icon Fabrication Drawing Standards
- Icon Steel Member Detailing
- Icon Connections & Welds
- Icon Dimensions & Tolerances
- Icon Bill of Materials (BOM)
- Icon Cut List & Bolt List
- Icon Annotations & Symbols
- Icon Plotting & Output



BENEFITS

- ✓ Industry-ready fabrication skills
- ✓ Understand steel detailing standards
- ✓ Improve accuracy and productivity
- ✓ Prepare for fabrication industry
- ✓ Build a strong project portfolio

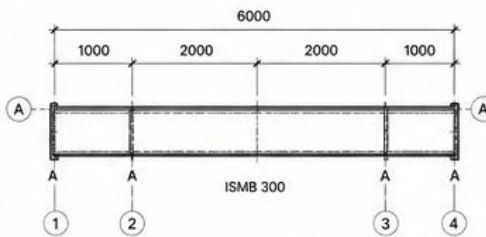
PROJECT WORKFLOW



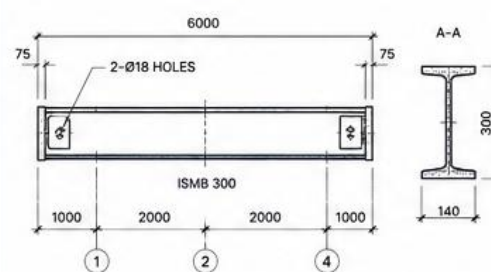
PROJECT OVERVIEW

Project Type	Structural Steel Fabrication
Drawing Type	Fabrication Drawing
Software	AutoCAD
Units	Millimeters (mm)
Scale	As Indicated
Standards	IS 800:2007, IS 2062:2011
Deliverables	PDF, DWG, DXF

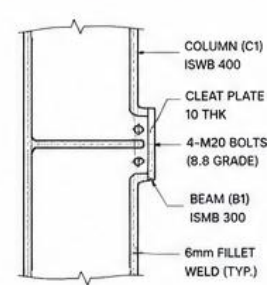
1. GENERAL ARRANGEMENT



2. MEMBER DETAIL (BEAM-B1)



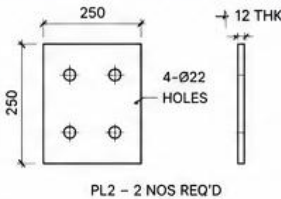
3. CONNECTION DETAIL (B1 TO C1)



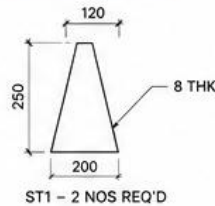
4. BILL OF MATERIALS

MARK	DESCRIPTION	SECTION	LENGTH (mm)	QTY.	WEIGHT (kg)
B1	BEAM	ISMB 300	6000	1	497.0
C1	COLUMN	ISWB 400	3500	1	557.0
PL1	CLEAT PLATE	10 THK	250	2	9.8
PL2	END PLATE	12 THK	250	2	11.8
TOTAL WEIGHT					1075.6 kg

5. END PLATE DETAIL (PL2)



6. STIFFENER DETAIL (ST1)



7. CUT LIST

MARK	DESCRIPTION	SIZE	LENGTH (mm)	QTY.
B1	ISMB 300	—	6000	1
C1	ISWB 400	—	3500	1
PL1	CLEAT PLATE	10 THK	250	2
PL2	END PLATE	12 THK	250	2
ST1	STIFFENER	8 THK	250	2

8. BOLT SCHEDULE

BOLT DIA.	GRADE	TYPE	QTY.	USE
M20	8.8	HEX	8	B1 TO C1 CONNECTION

9. WELD DETAILS

WELD TYPE	SIZE	LENGTH	REMARKS
	6 mm	AS PER DRAWING	ALL WELDS 6mm FILLET (TYP.)

10. GENERAL NOTES

- ALL DIMENSIONS ARE IN MILLIMETERS.
- ALL WELDS ARE 6mm FILLET WELD U.N.O.
- ALL HOLES ARE 22mm DIA U.N.O.
- ALL BOLTS ARE M20, 8.8 GRADE U.N.O.
- SHOP PRIMER TO BE APPLIED AFTER FABRICATION.
- FOLLOW IS 800:2007 AND IS 2062:2011.

11. LEGEND & SYMBOLS

SYMBOL	DESCRIPTION
	FILLET WELD
	HOLE
	CENTER LINE
	SECTION LINE

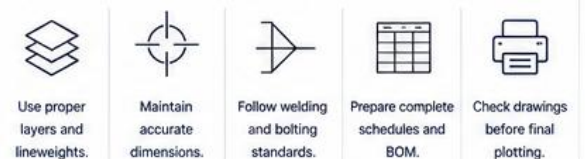
12. TITLE BLOCK

PROJECT	FABRICATION DRAWING PROJECT
DRAWING TITLE	FABRICATION DETAILS, BOM & SCHEDULES
DRAWN BY	AKV
CHECKED BY	AKV
DATE	10-07-2025
SCALE	AS INDICATED
DWG NO.	FD-01
REV.	00
AKV ENGINEERING SERVICES	

13. PLOTTING OUTPUT



BEST PRACTICES



NOTE: ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SPECIFIED.