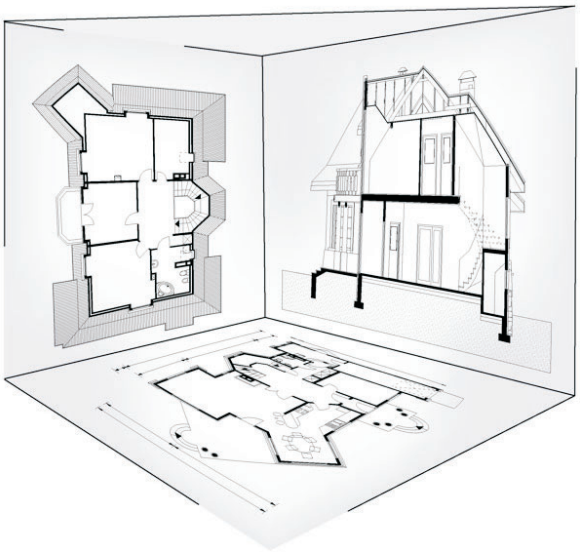
The Meaning of Lines

LINES are able to communicate every aspect and detail of a building or object. The meaning of lines in technical drawings is standardized to communicate information without text. Lines and hatch patterns are used in elevations and plans to designate objects or forms that may be hidden from view. You can also use the lines to identify building materials and to show depth.



Objective:

Use the appropriate lines types, weights, and hatch patterns on technical drawings.

Key Terms:

acetate
balsa
basswood
centerlines
chipboard
dashed lines
foam core
halftone line weight
hatches
heavy line weight
hidden lines
light line weight
line type
line weights
medium line weight
solid lines

Understanding the Meaning of Lines

You make every drawing one line at a time. Each line is drawn to represent an element of the building or a desired material, and each line has a weight designation. Line weight is the thickness of a line. Heavier line weights indicate a more prominent (noticeable) element or building material.

The ground line, outline of a building, and outline of a section cut are the thickest lines. For example, the lead for mechanical pencils is sold in various sizes to accommodate line weights. You can use multiple leads in the pencil to achieve consistency.

BUILDING MATERIALS

The type of line you use reveals certain material aspects. Therefore, you need to be accurate in your selection and be consistent in your line use.

Line Types

Line type is the pattern of the line. In an elevation drawing, lines, line weights, and hatch patterns are used to represent different building materials. You use the line to represent an object or a material within the building. Lines are used to define the outline of a material or to suggest a reference point for locating an object.

Solid Lines

Solid lines are continuous lines used to represent visible lines. They can represent the outline of doors or the line of the panel in the door.

Hidden Lines

Hidden lines are marks composed of dashes and show items behind an object. For example, you use hidden lines to show the extent of a material beyond the line of sight.

Dashed Lines

Dashed lines are marks shown in a pattern of longer dashes than those of hidden lines. Dashed lines are used to show items above. For example, dashed lines can represent the outline of a canopy.

Centerlines

Centerlines are marks composed of a pattern of a line and dashes. You use them as a reference point to designate the center of an object. In a structural drawing, centerlines are used to designate column centerlines. Centerlines may be used to designate the mounting height for objects.

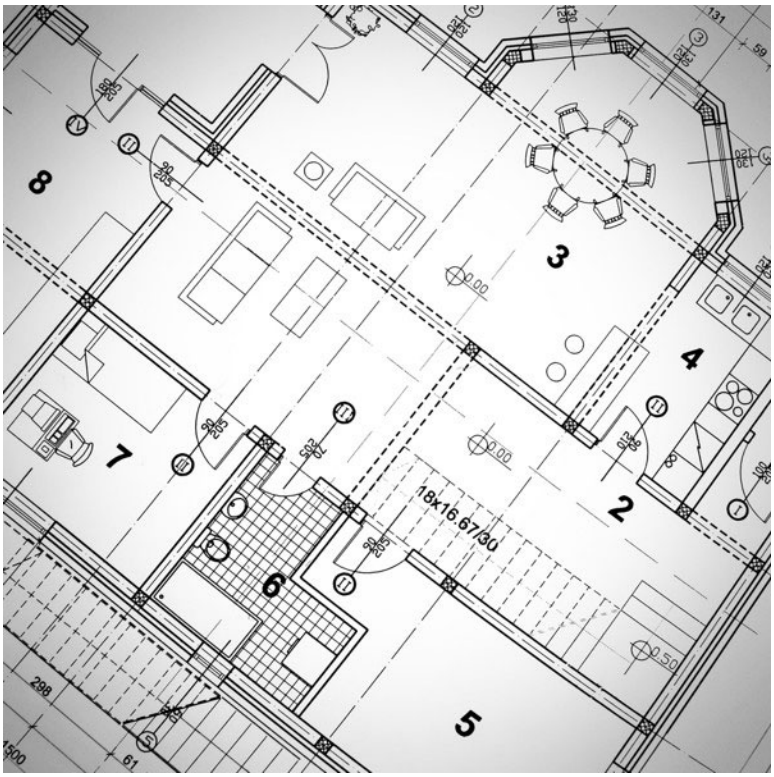


FIGURE 1. Knowing what each line type means and how to use them properly helps you understand technical drawings, such as this portion of an architectural project.

FURTHER EXPLORATION...

ONLINE CONNECTION: Drawing Detail Lines and Components

When you use the correct line types and weights, your drawings are easy to read and understand. The lines communicate all the information you need to know about a drawing. So it is important to use the correct line types. To learn more about how to use lines and hatches in your drawings, watch the "Drawing Detail Lines and Components" video at https://www.video2brain.com/en/lessons/drawing-detail-lines-and-components.

Line Weights

Line weights are the thickness of the lines. Thicker lines are considered heavier. The number of line weights used in an elevation may vary from elevation to elevation. If simplified, the line weights can be divided into these thicknesses:

- A **light line weight** is a thickness used to show details within a material. In a section cut, the wood grain and wood blocking details would be drawn at a light line weight.
- A **medium line weight** is a thickness used to indicate the outline of a material. In a detail cut through a 2 × 4 wood stud, a medium line weight is used for the outline of the stud and a light line weight shows the block mark or wood grain.
- A **heavy line weight** is a thickness reserved to show the outline of an entire detail or element. It can be used for the line of grade or for a prominent feature on a building elevation.
- **Halftone line weight** is any line weight in a grey scale. Use it to indicate patterns within a material. On an elevation, this line weight can be used to indicate brick joints or shingles.

FIGURE 2. Several line weights are used to designate features of this building elevation drawing.

HATCHES AND MODEL MATERIALS

Hatches are patterns used to designate different building materials. Use them to designate glass, steel, brick, lawn, concrete, wood, stone, and other materials.

Model materials used for the base of the model (e.g., walls, site contours, and floors) include foam core, chipboard, cardboard, balsa, and basswood.

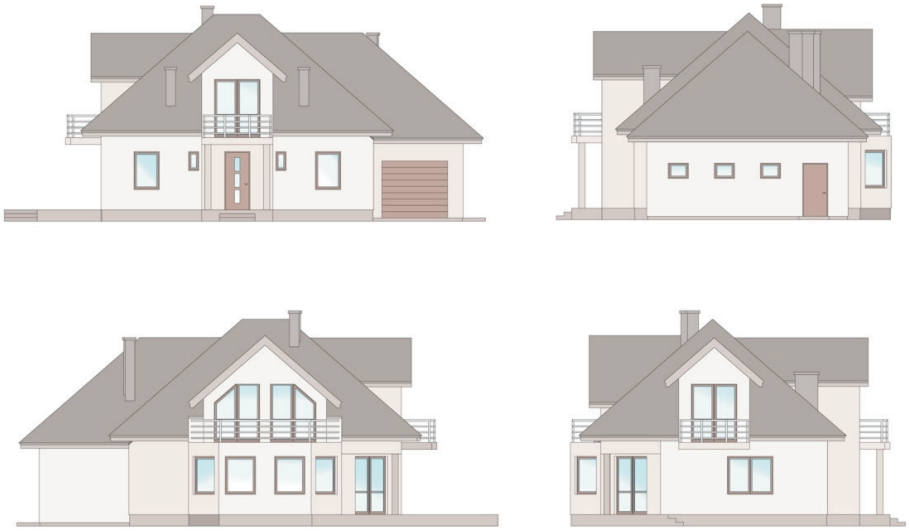


FIGURE 3. Hatch patterns are useful to designate a range of building materials, as seen in these elevation drawings.

Foam Core

Foam core is foam faced with paper—in varying thicknesses—on both sides. The paper and foam are available in a variety of colors, and it is an easy material to use. Use a sharp blade to cut the foam core material.

Chipboard

Chipboard is a thick, grey pulp board in one- and two-ply thicknesses. It is harder to cut than form core because it is solid. In some cases, this makes it a more accurate building material.

Cardboard

Cardboard is a material made from cellulose (wood pulp) and is similar to paper, but it is thicker. Cardboard can be used for specific functions on a model. It is not that common to use it on the building, but you can use it as the base of a model or for other functions around a site model.

Balsa and Basswood

Balsa and **basswood** are lightweight, easy-to-cut woods used for model building. Balsa wood is much lighter and softer than basswood, so it is possible to cut it with a blade. Often a special saw blade, designed for model making, is used to cut thicker basswood products.

Materials That Add Detail to a Model

- Lawn material is typically made from sheet moss.
- Wood material is generally balsa or basswood.
- Brick material may be score lines cut in any material, or any material may be faced with a brick appliqué to model a brick look.
- Glass material is generally a type of **acetate**—a clear plastic film that mimics glass, but it is less expensive.
- Metal material elements of a building design have numerous options, such as lightweight sheet metal, metal tubing, and balsa painted a steel color.

Summary:

Each line has a line weight or thickness. In an elevation drawing, lines, line weights, and hatch patterns are used to represent different building materials. Lines are also used to define the outline of a material or to suggest a reference point for locating an object. Common line types are solid, hidden, dashed, and centerlines. At a minimum, drafters and designers use light, medium, heavy, and halftone lines.

Architectural drawings use hatches (patterns) to designate building materials. Use hatches to designate glass, steel, brick, lawn, concrete, wood, stone, and other materials. Model materials used for the base of the model (e.g., walls, site contours, and floors) are foam core, chipboard, cardboard, balsa, and basswood. You can add additional materials for details.

Checking Your Knowledge:

1. Which lines, composed of dashes, show items behind an object?
2. What is the typical number of line weights used in a drawing?
3. Describe the use of halftone line weights.
4. What is acetate? How is it used in model building?
5. What are hatches? How are hatches used in drawings?

Expanding Your Knowledge:

Plan a visit to a local engineering or architectural office to learn more about the use of lines and materials. These professionals use line types, weights, and hatches each day to develop drawings that communicate everything needed to construct a building. Bring one of your drawings to the visit, and ask for a critique. Ask for tips to make your drawing a "better communicator."

Web Links:

AutoCAD—Line Weights

http://www.youtube.com/watch?v=hoqqZKigrOo

Basic Types of Lines

https://www.wisc-online.com/learn/career-clusters/business-management-and-administration/eng16004/basic-types-of-lines-used-in-engineering-drawings

Line Types and Their Application

http://www.en.technisches-zeichnen.net/technical-drawing/basics-01/lines.php

Line Weights

http://knowledge.autodesk.com/support/revit-products/troubleshooting/caas/CloudHelp/cloudhelp/2015/ENU/Revit-Customize/files/GUID-35EF0EF0-9E1B-42E9-AB53-FC94F9AD8C97-htm.html

Line Type Definitions

http://www.cadsetterout.com/drawing-standards/line-type-definitions/