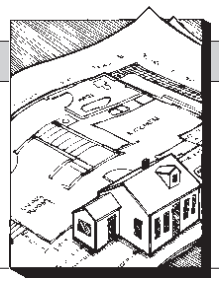


Understanding Architectural Drawings

by Gordon F. Tully

The verb "plan" denotes several things, two of which interest us here. One is making a map of a horizontal surface, such as the ground or the floor of a building; the other is deciding how things should go together. These two meanings come directly from two Latin words from which "plan" is derived: *plantare,* meaning to fix in place, and *planum,* meaning level ground.

Architects tend to use "plan" in the specific sense of a floor map, while the average home owner tends to refer to the more general idea of a spatial description. In the vernacular, "drawing up the plans" includes everything necessary to document a house, including design, details, sections, elevations and specifications—the plan is identified with the whole house.

In fact, if houses are compact boxes of some known configuration (such as a bi-level ranch or a Cape Cod), the floor plan and the specifications for certain building components and finish materials are the only elements necessary to define the house completely. Everything else follows from common building practices and code requirements.

Sections

More complex or unique designs require more definition. Plan views are in fact cross sections (or simply "sections") cut through the building horizontally about three to four feet off the floor, looking down. To describe a building, many other sections are required.

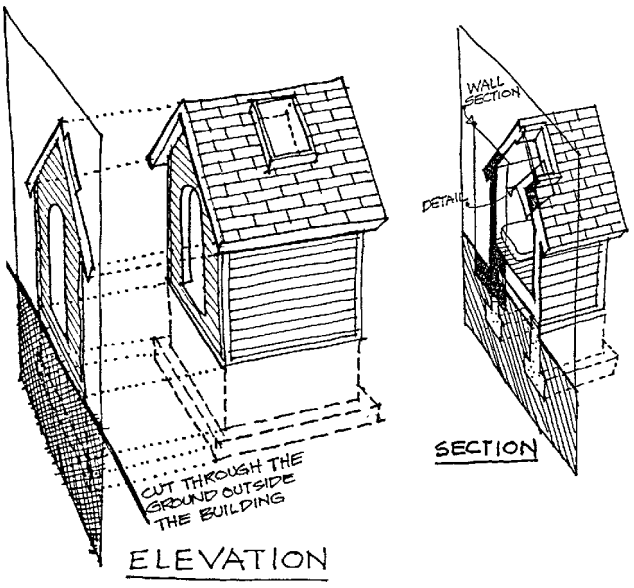
Vertical sections that are cut through the ground parallel to and outside of a wall are called elevations. These define the exterior finishes and trim, the location of windows and doors, and the overall appearance of the outside. Vertical sections cut through the building are called building sections (or merely "sections") and are of great interest in relating the structure to the interior spaces.

Details of construction are also sections. They cut through key assemblies and are shown at a large scale (usually an eighth or a quarter of actual size). A partial section through a wall from the foundation to the roof at 1/16 or 1/4 actual size is called a wall section and often is the basic description of a building's construction.

Many other special section cuts are needed to define any complex project. Interior finishes and cabinetwork are drawn on interior elevations, which are portions of building sections showing only the wall surface bounded by floor, sidewalls and ceiling, as if it were a picture.

A complex ceiling is described by an ingenious drawing called a reflected ceiling plan. This shows the outline of the ceiling plane exactly as it would appear if it were reflected from a mirror laid on the floor. Compared to a real picture of the ceiling, drawn as if you were lying on your back, the advantage of the reflected plan is evident—ceiling elements are superimposed on the corresponding plan location below.

In an architectural plan, everything visible below the cut taken three or four feet above the floor is drawn solid, and interesting things overhead are shown with dotted lines. Nothing below the floor is drawn. A foundation plan is drawn as an ordinary architectural plan, except that hidden things *below* the ground or floor slab are shown dotted.



Structural and Mechanical Plans

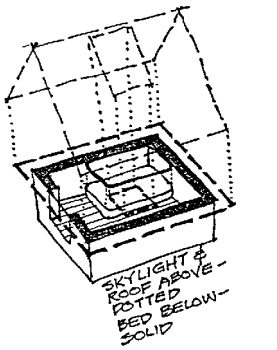
Structural and mechanical plans are quite different. In a structural framing plan, the structural "sandwich" of the floor along with anything of structural interest directly *below* the floor sandwich is drawn solid, while structural posts and walls rising above the floor plate are shown dotted. This makes sense because the structure is the series of posts, beams and plates that separate spaces from each other.

Don't work out every detail in the early stages of a design while sketching at 1/8" to the foot.

In a mechanical plan, the piping or ductwork *within the space is* drawn solid, including anything overhead. The section in effect is cut at the floor above, looking down as if the floor were transparent. This makes sense when you consider that the plumbing and sheet-metal subcontractors are working within an already-constructed building shell.

Site Plans

Finally, there are a variety of drawings that describe the site and the location of the building on the site. While they can be drawn at any convenient scale, they often are drawn at "engineering" scales (like 1/10" to a foot). These are sections cut through the air above the building or site; they normally don't look like sections unless they cut through something very tall.



drawings by Gordon Tully

Look at the Whole

The floor plan by itself is not a complete description of a house. A plan makes no sense unless it is related to sections, elevations, site drawings, details and interior drawings. Except in the case of the "formula" house, all these various descriptions of the building must be considered together in the proper sequence.

By this I mean two things. First, don't work out every detail in the early stages of a design while sketching at 1/8" to the foot. Likewise, don't refine the floor plan and building sections later on without knowing how the details go together.

Second, consider all the different aspects of a building together. Start with the plan, then try out a couple of building forms (use sketch models or perspectives) around the plan, making changes until some combination shows promise. Next, sketch the elevations and cut a section to see how things look inside. Work out the rest of the plans if the building has more than one floor. Repeat this process until everything works at a small scale, then move up in scale and do it again.

This iterative process in sequential stages of increasing detail is so familiar to architects that we often forget to mention how useful it is. Amateur designers invariably work a plan over until it is limp and gasping for air, never once stopping to consider what is happening in the sections, elevations and structure. It is a case of misidentifying the plan with the whole thing.

Despite all of this, the plan remains the heart of the design. But why? Why can't you design a building using vertical sections? Why are maps almost always plans? Next month I will try to cast some light on this issue in a discussion of the science of house planning. ■

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Six months ago, I began this series with an article on Colonial houses, intending to move briskly through the basic issues of house design and then seeing how things stood. It soon became apparent that there was a lot to talk about. *New England Builder* liked the idea of a column, and I liked the idea of writing about houses at some length.

My plan now is to go once through the basic issues of house design, then to look at some details—staircases, exterior wall finishes, chimneys and others (there is no end to the number of topics!)—interjecting case studies along the way to illustrate my points. This month's article begins a series on planning houses.

Your letters and comments are welcome. Let me know what you would like me to cover.

—Gordon F. Tully