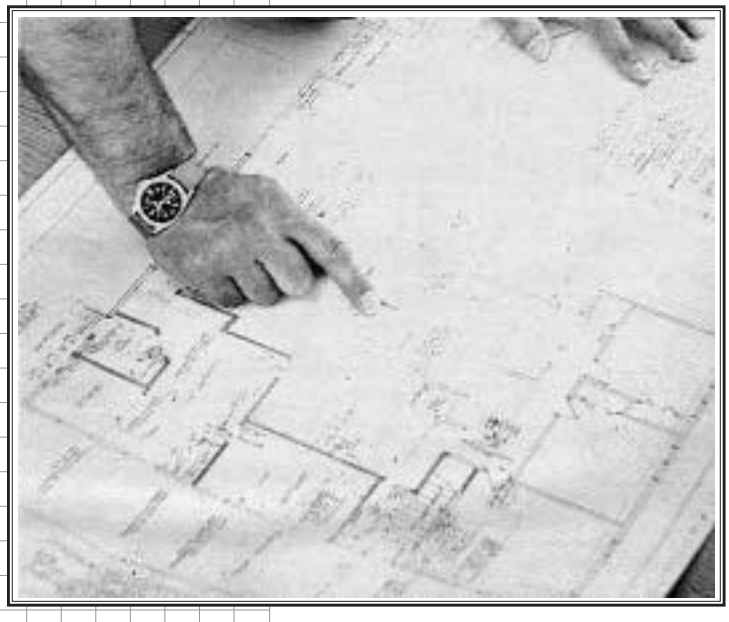
Blueprint Reading Tips

To glean all the necessary facts from a set of drawings, you need to read between the lines. Here's what to look for and where to find it.

by Brad Cruickshank



Since a set of construction drawings is the chief means by which designers communicate their ideas to builders, understanding them is vital for anyone estimating or laying out a construction job. Builders can eliminate errors and much of their frustration in dealing with blueprints by paying close attention to a few trouble spots. Since I design 70% of the projects my construction company builds, I have some insight into both points of view.

Perhaps the single most important rule in reading blueprints is to study the drawings as a set. Drawings usually appear in the order in which they are needed: first the floor plans, then sections and elevations, and finally the details. The progression is from the general to the specific, from the smallest scale to the largest scale, and from the ground to the roof.

If you can't find everything you need on one sheet, follow the trail of references through each sheet in the set of plans. A window located over a door or high on a wall, for example, cannot be easily indicated in a plan view, which is an aerial view of what the building would look like if it were cut horizontally about halfway up the walls. This kind of information requires an elevation, which is referenced from the floor plan but is actually located on a subsequent sheet. The elevation may, in turn, refer to sections and large-scale details located still further back in the set of drawings. But don't let this fool you: The drawings at the back end of the drawing set often hold the most important information about how a building goes together. To get the whole picture, you have to look everywhere.

By following the annotations in the series of drawings in this article, you will see how a set of blueprints is organized, how the different types of drawings are related, and some of the things to look for to avoid mistakes.

Version Control

Building from an outdated drawing creates the same problems as misreading an updated one. When revisions are made after construction begins, they are usually identified on the original drawing and individually numbered and dated. This is actually preferable to producing a clean drawing, because the altered portions catch your eye and you don't have to scour every square inch of every sheet to find discrepancies.

Many designers, however, don't carry a revision through to all the sheets. Under time pressure, they simply make the change in what they consider to be the most obvious place — usually the first drawing in which it will logically be encountered. Always assume that you will have to trace revisions through the whole set of plans.

Alignment

On large, complicated construction projects, like multistory hotels, builders use a series of clear overlays so that structures which overlap each other or pass through several floors of a building can easily be checked for alignment. Most CAD drawings accomplish the same thing on the computer screen. Unfortunately, residential construction drawings prepared for use in the field are produced on opaque pieces of paper and must be cross-checked to ensure that building components do not interfere with each other. For example, look for components that run from the basement all the way through to the roof, such as columns, bearing walls, chimneys, and DWV lines. Also, staircases are sometimes short on headroom, as are some second-floor spaces where the exterior walls are shorter than 8 feet.

Dimensions

Omissions. Too many dimensions can clutter a plan so much that it is sometimes virtually unreadable. Occasionally a critical dimension is inadvertently omitted, but more often some dimensions are deliberately left out, not only to conserve space, but to reduce the chances of confusing a dimension line with a building line. Another reason dimensions are omitted is to ensure that layout begins in a certain place, such as a particular corner or wall. In

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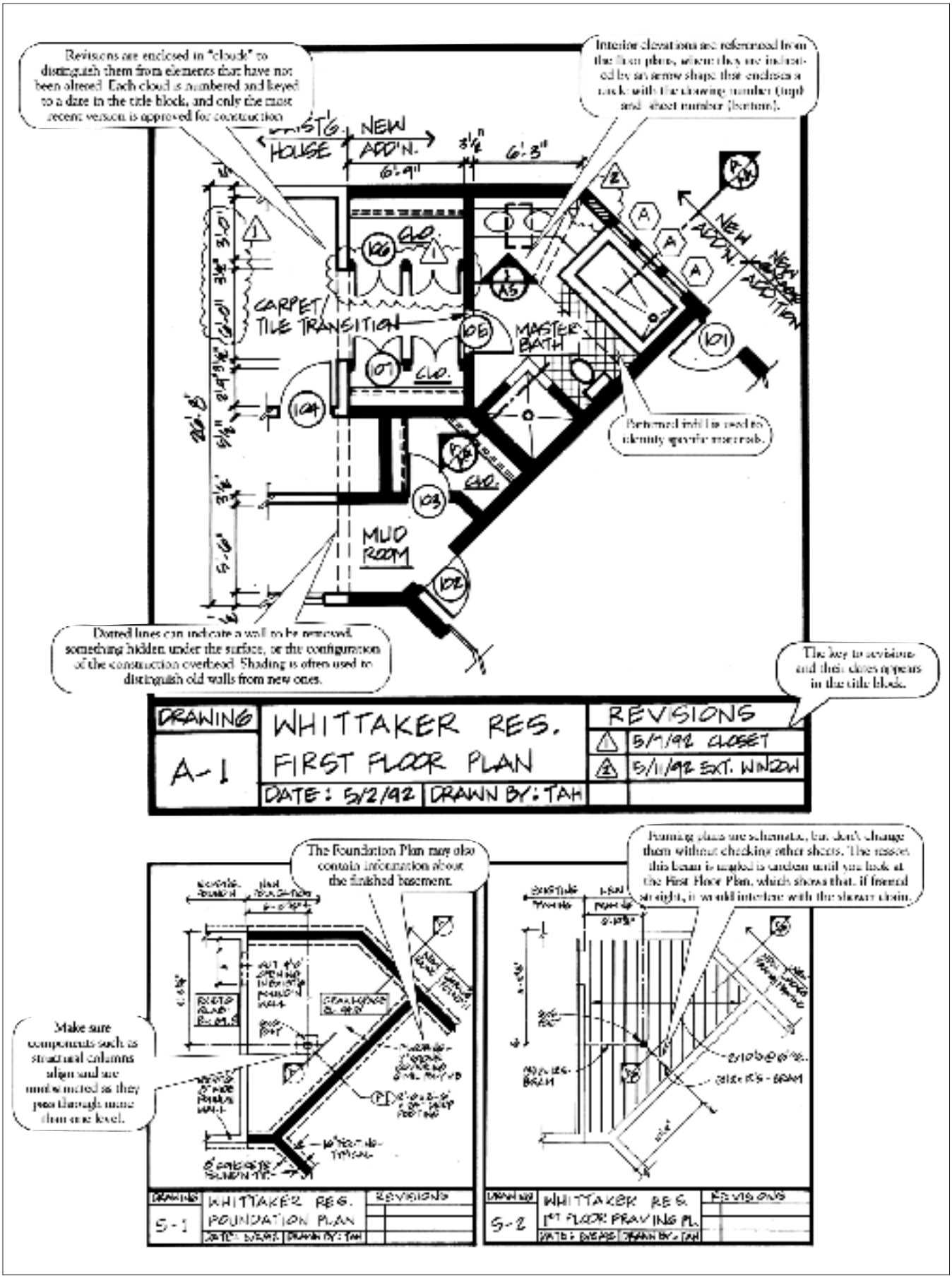
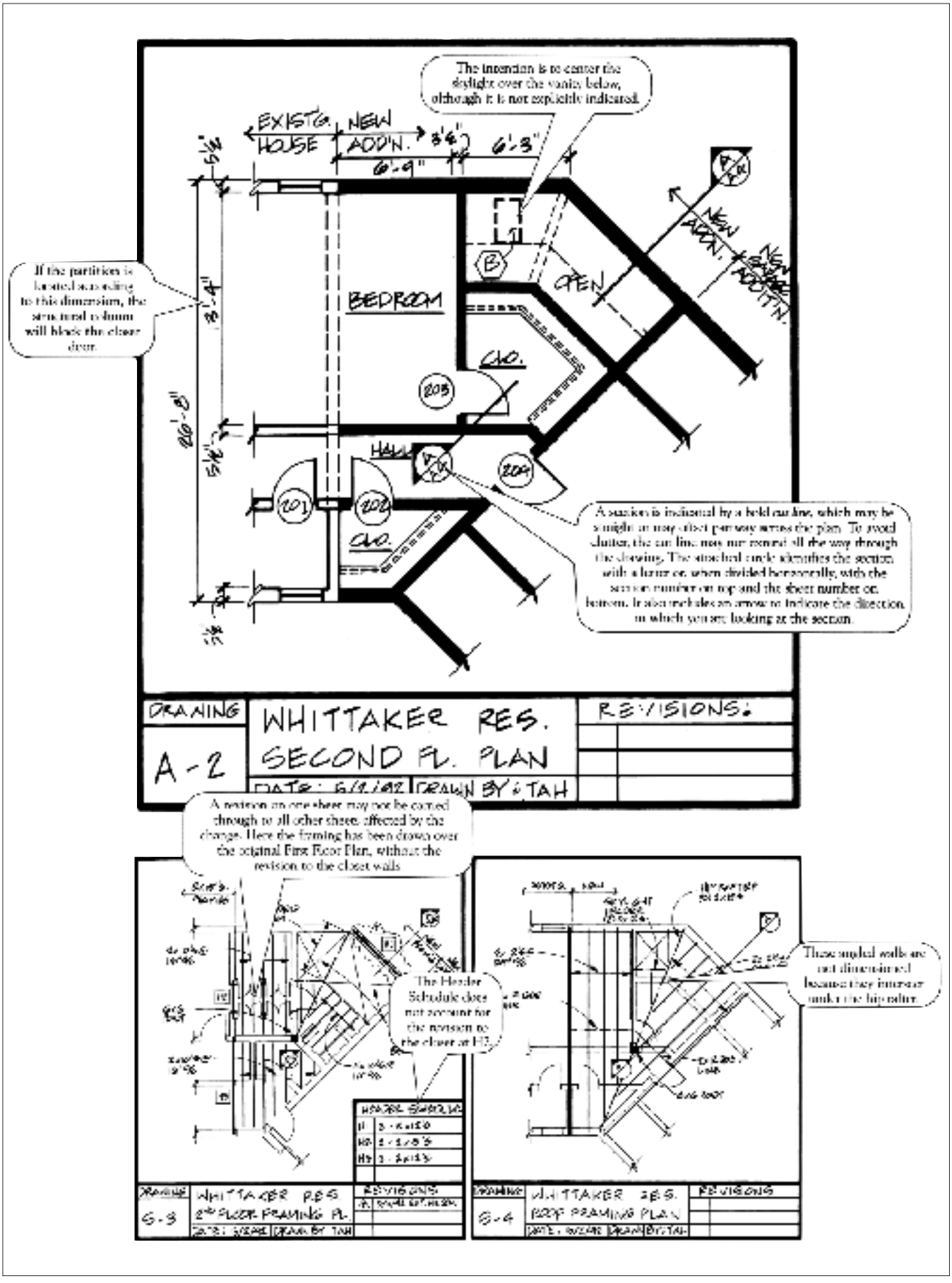
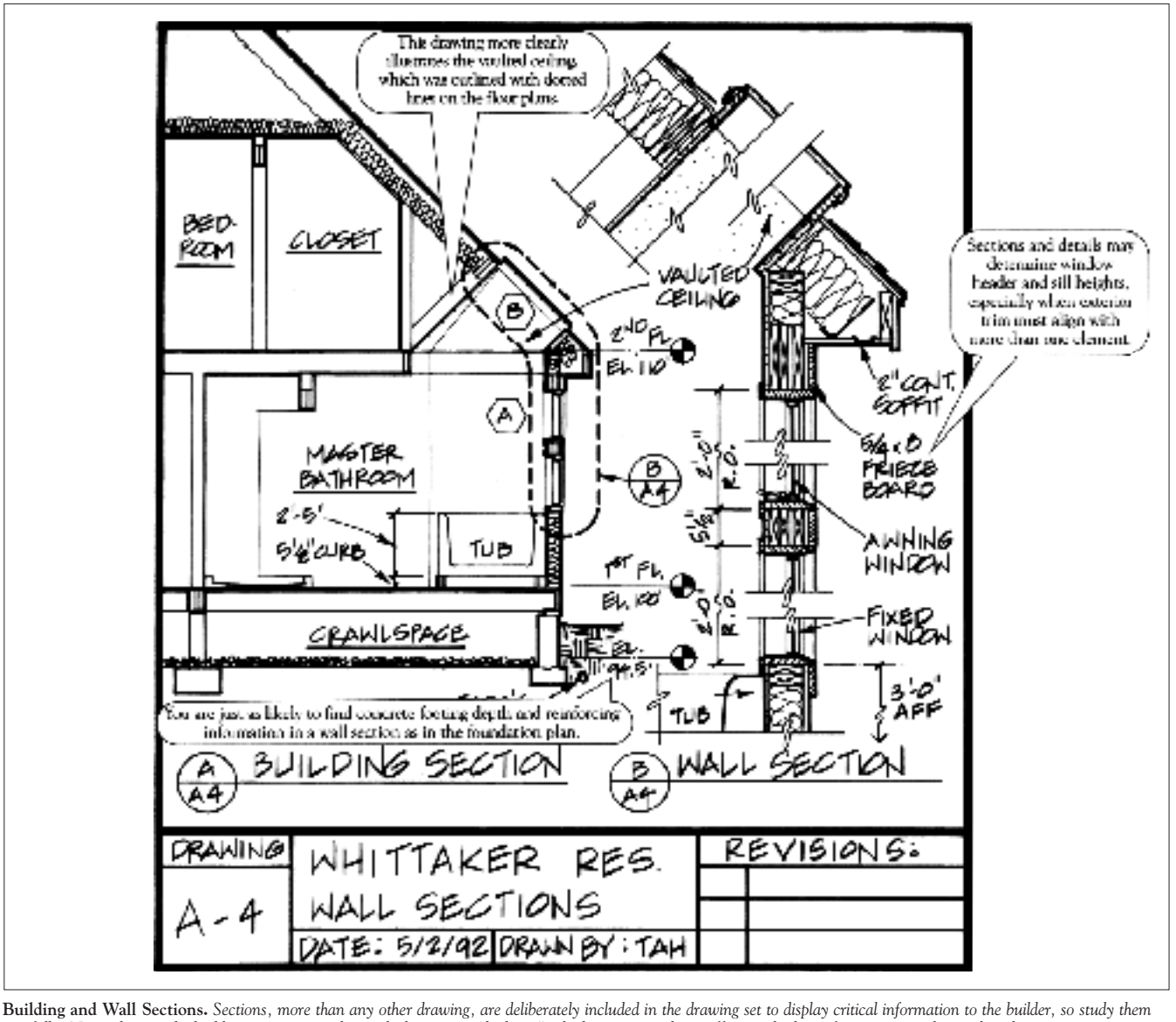


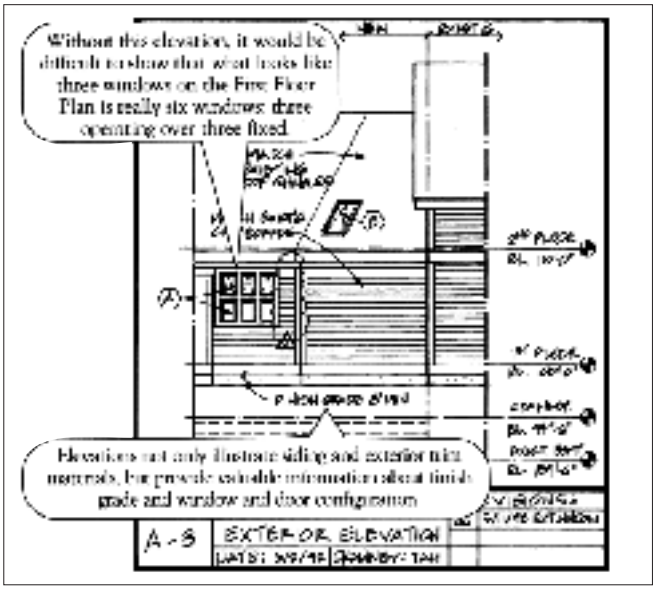
Foundation and First Floor Plans. *Besides illustrating the location of walls and partitions, plan views reference other sheets in the drawing set using a variety of symbols to indicate section cuts, interior and exterior elevations, and window and door schedules.*



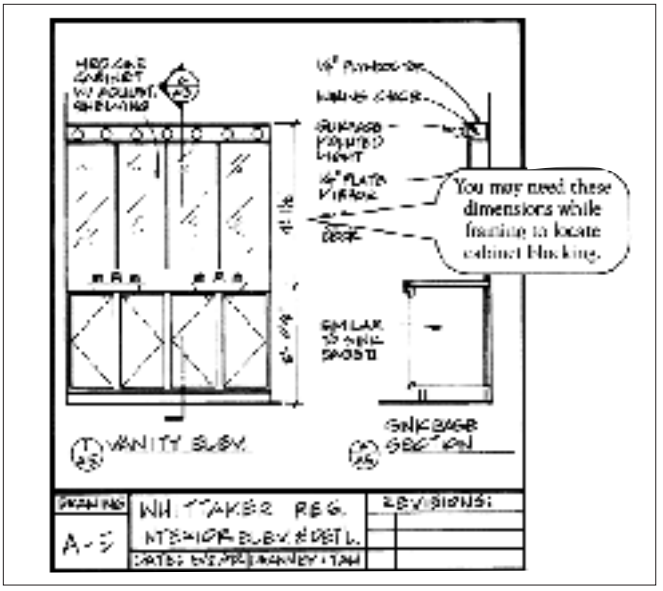
Second Floor and Roof Plans. *Framing plans that are drawn over floor plans make it easy to spot structural elements that interfere with each other.*



Building and Wall Sections. *Sections, more than any other drawing, are deliberately included in the drawing set to display critical information to the builder, so study them carefully. Note where in the building a section is taken, which way it is "looking," whether it is straight or offset, and what information it is designed to show.*



Exterior Elevations. *Exterior elevations indicate siding materials, exterior trim, final grade, the relative heights of floors and eaves, and window and door locations. If the designer intends for window and door heads to align, this is where it would be shown.*



Interior Elevations. *Interior elevations show interior wall features, such as finish surfaces, baseboard, wainscot, and ceiling molding. They are especially useful in areas like kitchens and baths where there is a lot of cabinetry and other built-in casework.*

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other words, the designer provides dimensions starting in the place where layout should begin. In most cases, the missing dimensions are at the end of the layout line and can be derived.

Errors. Outright mistakes do occur, however. For example, a series of dimensions along a layout line may not tally up to the overall dimension. But this doesn't mean you have to shut down the job while you straighten out the problem. First check other sheets that may give dimensions for the same part of the building and see if you can figure out how the error was made. If you're still in the dark, find the dimensions that are constrained by other components, like door and window openings, cabinet dimensions, or fixture clearances, and lay them out first. Make up for the arithmetic differences in places where they will matter least.

Reference point. Sometimes it's easier to locate a building component by aligning or centering it on some other part of the building. This is especially true of walls that meet at odd angles or where windows and doors are equidistant from adjacent corners or walls. These kinds of instructions always take precedence over actual dimensions.

Interpretation

Time, space, and budget constraints often make it impractical to detail every possible trim or finish condition. Designers use a number of shortcuts to make up for this, but they require extra attentiveness on the part of the builder. For example, a drawing labeled "typical"or "similar" means the designer has thought through one instance of a condition that is reproduced throughout the structure. But the builder has to search the plans for every occurrence since it is possible that subsequent occurrences will differ substantially from the version shown.

Another example, common in renovation, is an instruction to "match existing." This saves the designer the trouble of making a schematic drawing of something that is already physically present on site.

In both cases, you may have to make some assumptions about the designer's intentions. Whenever you're asked to make up for missing drawings, use the information that *is* provided as a clue to what the designer is trying to achieve. The ruling principle is consistency. For example, if window and door heads are aligned in one location, they should probably be aligned in all locations.

Occasionally during the design process, something is so obvious that it is overlooked. For example, the skylight in the sample drawings is not located by dimension. But it makes sense to center it over the vanity below, even though this is not explicitly indicated. ■

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