Visual Estimating

by Charles E. B. Hults

As an instructor of construction cost estimating, I've looked at 30 or 40 computer estimating packages over the last few years. Recently, I encountered a new product called CAD Estimator, developed by a former framing contractor. It caught my eye for two reasons: First, it takes a "visual" approach to cost estimating, which makes it easy to tell when you've left something out; and second, it produces material lists good enough to take to a lumberyard.

CAD Estimator's chief feature is its graphical interface, which is similar to a digitizer, except that it works not with paper drawings but with images that have been loaded into the computer. These can be CAD files, or photographs of a building or of blueprints taken with a digital camera or scanned.

To create an estimate, the first step is to "scale" the image by selecting two points horizontally and two points vertically and assigning a known distance. It's important to scale the images correctly, because an inaccurate scale will throw off all of the software's calculations.

Next, using the mouse and several drawing tools — Lines, Perimeters, Boxes, Circles, Joist, and Dots — you trace an area or length in the image, then assign the tracing to a formula that will calculate the quantity (see Figure 1). The "Lines" tool, for example, would work with a formula based on a linear-foot dimension; the "Dots" tool would produce a simple count — to total up the number of hold-down connectors, for instance. Because the tracing shows you where you've been, you can easily spot and correct mistakes.

Cad Estimator compiles takeoffs from successive images into an estimate for the total job. For example, an estimate for a one-room addition may require working with several separate images — a foundation plan, framing plan, floor plan, and exterior and interior elevations.

Formula Wizard

CAD Estimator formulas use the "digitized" input from each tracing to provide the values for variables such as linear feet (LF), square feet (SF), or wall area (WA). The result is a complete bill of materials you can take to the supplier.

Formulas can be created manually, but CAD Estimator provides a formula "wizard" that is much easier to use. For example, to estimate cubic feet of concrete needed for a 10x18-inch footing, you'd tell the wizard that "you know" the linear feet and "you want" cubic feet. The formula would ask for height and width dimensions, then generate the formula "LF*1.25." The Wizard can also make more complex calculations, such as quantities and lengths of joists, rafters, hips and valleys, and so on.

Assemblies. You can takeoff more than one item at a time by using an assembly. In CAD Estimator, an assembly is created by specifying a unique name, then adding the required material entries from the supplied database (which can hold up to 16,000 items). An assembly for an exterior wall, for example, might include not just plates

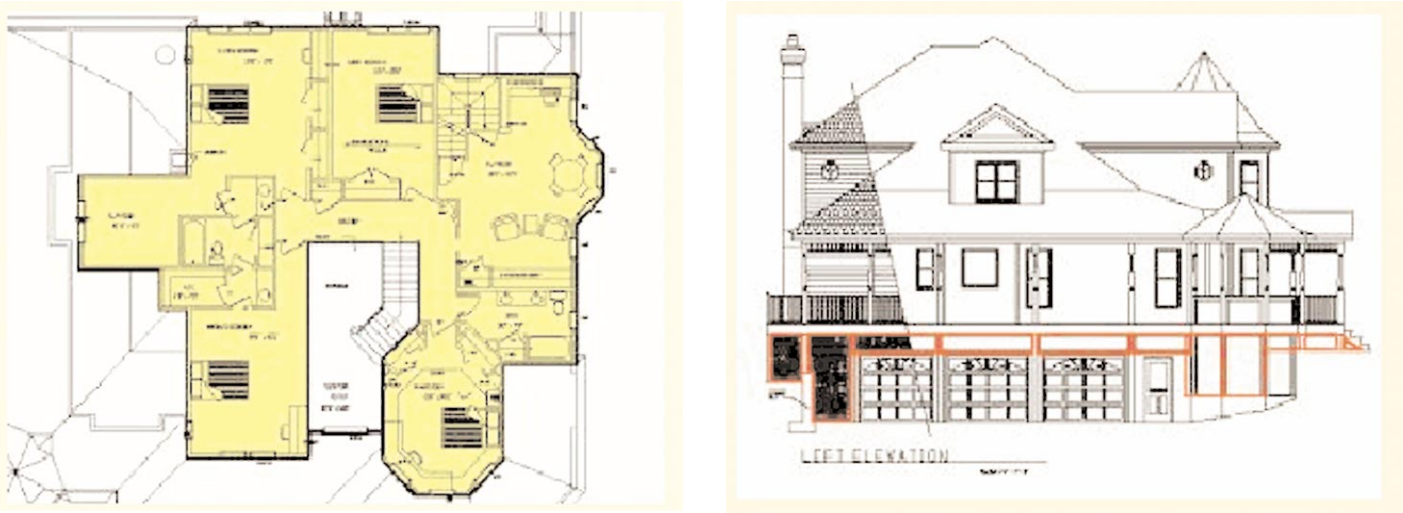

Figure 1. With CAD Estimator's built-in digitizer, material takeoff is a matter of using a mouse and a drawing "tool" to trace lines or enclose areas on drawings or photos that have been loaded into the computer. For example, the "Boxes" tool can be used to estimate subflooring (left) or siding (right).

and studs, but also sheathing, insulation, and drywall (Figure 2).

One of the most useful features of CAD Estimator assemblies is the ability to toggle items on and off. If you have two entries for drywall, for example — one for 4x8 sheets and one for 4x12s — you can select which one you want to use for a particular tracing.

Reports

CAD Estimator produces several useful reports. Among them is a "Summary" report that lists the takeoff from each tracing, with line items for total, tax, and profit; as well as a "Detailed" report that shows every individual item, along with information about which scanned drawing or photo the takeoff came from. A "Category" report will actually reproduce a thumbnail of the tracing itself (Figure 3), and a "Compiled List" report is a bill of materials that combines identical items into single line-item quantities. A "Visual Material List" shows where the material is to be used — a handy report to give to the crew to prevent the 2x12s that were supposed to be rafters from being hacked into blocking.

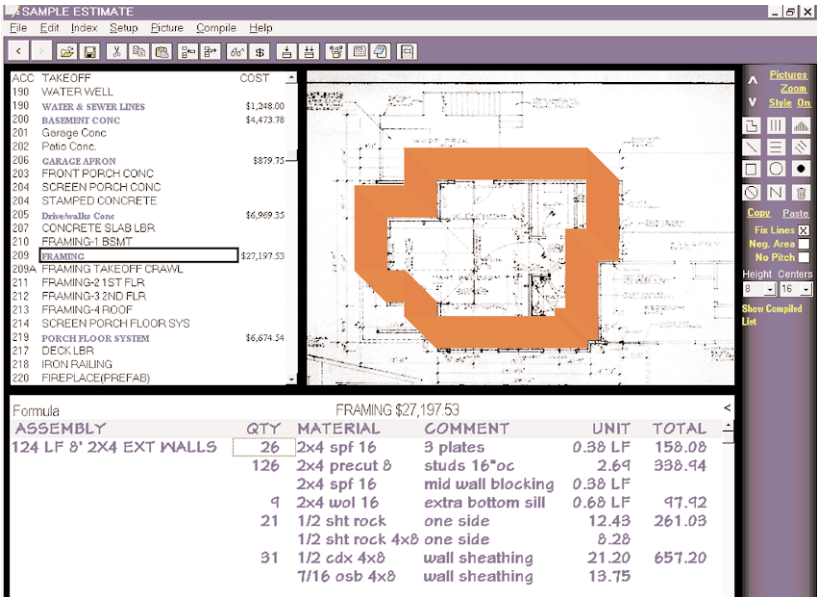

Figure 2. Using an assembly, a single tracing of the floor plan perimeter can generate quantities for plates, studs, sheathing, drywall, and other components. Assemblies are flexible, allowing the user to choose between similar materials — such as plywood or OSB sheathing, or two different sizes of drywall — at the time of takeoff.

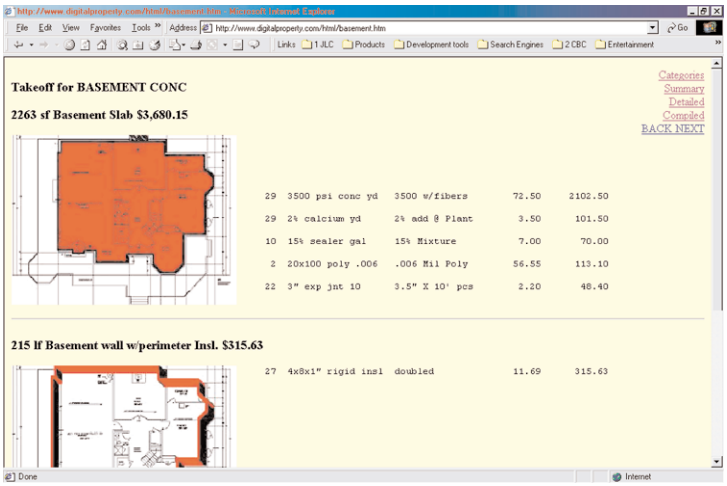

Figure 3. In addition to reports showing detailed or summarized costs, CAD Estimator can produce a complete audit trail of all takeoff calculations, including a graphic of every tracing.

Import/export. For contractors looking for an easy way to share estimates with clients or subs on the Internet or even by floppy disk, CAD Estimator can save all reports and tracings as Web-standard HTML files. The reports remain hyper-linked to the documents that generated them, along with thumbnails of the actual scanned image. All the viewer needs is a standard Web browser to view the reports.

Another plus for CAD Estimator is its ability to interact with other estimating packages on the market. For instance, it can serve as a digitizer for Timberline Precision Estimating, and can also import and export — pulling in cost data from R.S. Means, for instance, or exporting reports and data to spreadsheets and accounting systems like QuickBooks Pro.

Pricing and Requirements

CAD Estimator is unique — short of a full-blown CAD system that can produce estimates, there really isn't anything like it for residential or light commercial estimating. Since the program works with scanned images, you won't need to buy an expensive digitizing tablet. But you will need to invest in equipment to get drawings and photographs into the system. A number of options — Kodak photo CDs, electronic CAD files, a desktop scanner, a camcorder with a video capture card, or a digital camera — will get the job done, but any of this equipment will add to the $895 cost for the software.

You can find out more about CAD Estimator at www.digitalproperty.com or by calling Digital Property (914/986-5711).

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