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Win the Bidding Rat Race...by Using a Mouse

Software for bidding, estimating, and excavation management can give computer-savvy firms an edge.

By Janis Keating

Getting work is sometimes a rat race—the more bids you can make, the more likely one of those will be a “win.” However, the maze of traditional takeoff and estimating takes so many man-hours that not everyone can bid on all the jobs they might like. To gain an edge, some firms, instead of using a man for all that work, employ a mouse.

For most of its life, Atlas Excavating has used HeavyBid software made by Heavy Construction Systems Specialists (HCSS) in Houston, TX. “We’re ’21-year members,” says Casey Dillon, head estimator for West Lafayette, IN–based Atlas. “We first bought it when it was offered on DOS; they’ve kept us as customers ever since. We have a network version, so four estimators on different PCs can log in at the same time.”

As he grew up in the family business, Dillon doesn’t know “life before HeavyBid,” but he knows some who do. “I’ve heard old estimators say they quadrupled their output with this software,” he says.

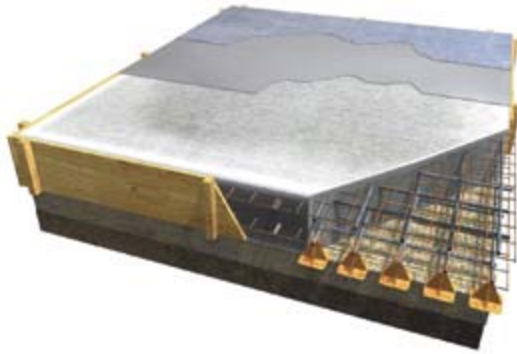
Many of Atlas Excavating’s 300 jobs per year are performed for municipalities: “We do excavating, for water and sewer pipes, and roads. However, about 25% of our business is highway work, and Indiana DOT requires that we submit electronic bids,” Dillon says. “Now I can’t imagine having to drive to Indianapolis to file bids—we can send them in electronically, 10 minutes before the bid closes.”

Dillon uses the program every working day and likes its ease of use. “You put in all labor and equipment rates, and then the crews, to build an activity code book to which you’ll refer when you make a bid. Because you know the crews, materials, and average production rates, you can make a bid very quickly, even after changing certain items on a job. HeavyBid also interfaces with our accounting program. We can export budgets with the click of a button.”

With similar projects, bids don’t have to be built from scratch: “We tweak data from similar bids,” he says. “We use our own histories, picking items one at a time if needed. HeavyBid is very database oriented. We can even compare ourselves to competitors by using the feature of ‘average bid prices.’ That also helps us get an idea of the size of a job; when we import the bid form from IN DOT, we get average unit prices from past bids.”

Knowing the size of a job—and what part of that job could be the company’s—allows Atlas to bid smarter. “My assistant downloads the bid forms, and I’ll tell her what we will bid on; we pick out which jobs we’ll go after. We aim for those that will be 100% our job but nothing less than us getting 75% of subcontractor work. Since the DOT site tells us what cost codes they’re opening for bids, that tells us which jobs we could do, what percentage of the job could be ours. Then we can only bid on the jobs we really want to go after.”

Businesses go where the work is, and Atlas bids on out-of-state jobs as well. “We do some Illinois, Ohio, and Kentucky jobs, too,” Dillon says. “Ohio and Illinois are also ‘easy-to-do’ DOT jobs. HeavyBid gives me all the states, so I can get the bid items they use on a regular basis—it’s right in there.”



Credit: Maxwell Systems
3D views allow users a virtual peek at construction.

HeavyBid's best quality? "I'm the most impressed with their tech support. We have their stickers on all our office phones. You pick up the phone and get a person who will help us fix everything—even stuff that isn't their product, like printers! Even at 2:30 a.m., someone will talk with me. During all my calls, I've never been able to stump them with a question. Their customer support is just amazing. They have classes and user group meetings during which they ask us, 'What do we need to fix?' Users will vote on an issue. If 50% of the users want it, HCSS will change the program. We also use HeavyJob for job costings, and some suggestions we've made have already been incorporated into the program. Even during Hurricane Ike, when Houston was getting hit, they stayed in business from remote offices and would get back to us on their cell phones. We've looked at other programs from time to time, but HCSS is still the best choice," Dillon concludes.

Making the Grading by Computer

"Doing grading estimating by hand is very time consuming, so we investigated software that could help us. What used to take several days now takes a few hours for the same end product. We used to do five a month, now we can do 50," says professional estimator Daniel G. Frondorf, principal and chief estimator for DG Frondorf and Associates in Cincinnati, OH. Frondorf is a member of the American Society of Professional Estimators, which is dedicated to the advancement of the profession of construction estimating.

Frondorf, who established his company in 1999, uses Maxwell Systems' Quest Earthwork and Cross Section in his work.

"I had been a construction estimator since 1994, and had worked for two excavating firms before going on my own. Before then I worked for the city of Cincinnati, in Zoning Plans. My company, a small four-person firm, does construction estimating work, and related technical services for contractors, architects, engineers, and construction managers. We work regionally, primarily. Most of the projects we work on are in Ohio, but due to the Net, we can work all over the country. Occasionally clients will want us to look at a projects onsite, but the bulk of our work is off the blueprints."

For the first two years, Frondorf's firm did all takeoffs by hand without computer assistance. "We've been using Quest Earthwork since 2001. Keep in mind, though, every project is a little different, no two are the same. Our primary clients are excavating or grading contractors, but we *can* use the software for exterior plumbing projects, et cetera. Earthwork enables us to do more work, and our clients to do more work, which has increased our sales."

His firm does not set the price for his clients, "...although the information we give them helps them do that. Clients bring us the information on the project, saying, 'Here's what we do well, can you do the background work?' Most of the specs for site work—the infrastructure, water lines, pavement, sewers, et cetera—come from the state's DOT, and the state's cities follow those guidelines. We have familiarity with ODOT's spec book; other states, we have to look up. For example, Indiana's spec book on gravel base is different than Ohio's. We have to know what to put in, referring to it by that state's spec book. But the software has nothing to do with it.

"The software helps us with number crunching," he continues. "Quest Earthwork is not a cost-estimating software; however, Maxwell *does* make a product like that. Earthwork creates a lot of graphical features, cross-sections, and grids. It takes what the engineer designed, and quantifies what has to be done. Earthwork will tell you how much cut and fill, how many square yards, the topsoil stripping depth. We also use Cross Section to reach our figures. Math is our strong suit; once our clients know the earthmoving information, they can use their estimating software to determine the cost. For example, let's say you want to wallpaper a room. Once I had your room measurements, I would tell you how much paper you need. You'd take that information to the store to purchase the paper."

How long does takeoff work require without software? "That process takes days," Frondorf says. "Earthwork allows us to give clients the raw information they need, in an easy-to-understand format." But the software cannot tell them *everything*. "One of the mysteries of earthwork is what can't we see. Clients get engineers to dig test holes, to find out what's there beneath the topsoil. We can take that information and let them know how many cubic yards of each type of soil, rock, et cetera."

Does his firm ever do cost estimating? "Sometimes, but we don't use Earthwork for that; it's a quantity-generating software. We prepare everything in Excel and a PDF file, and then clients enter that into their estimating software. If they use a Maxwell estimating product, yes, our Earthwork report will export right to that. However, most of our clients are smaller contractors without in-house estimating staffs. Our clients usually function as a subcontractor."

Frondorf likens himself and his staff to newspaper reporters. "But we report on a specific project," he says. "Our 'readers'

are our clients; we give them an 'article' on all the information on a project, which they can use to make decisions on what they can bid or charge. Every one of our contractors has their own set of specs, and they will still look at the site, but this gives them concise information. What we give them helps them visualize the job.

"Maxwell products are outstanding," he goes on. "We have done projects for designers; they ask us to compare schemes about what reduces cut and fill. For example, if they're thinking of using a retaining wall, doing so might make the excavation job faster or cheaper. We would have told them the amounts of soils to be moved, and the site owner might say, 'Putting in a retaining wall will save me \$3 million.' Most of these decisions are financial."

Maxwell software also has the ability to import AutoCAD files directly, saving significant time. "This feature allows the user to skip the manual digitizing required to create the contour lines on a grading plan. The difficulty with that is actually obtaining the AutoCAD files from the designer, architect, or engineer; many do not want to provide these to a third party—someone other than their client—for use in estimating and bid preparation, for fear of liabilities arising from such use," Frondorf explains.

James Sexton, product manager of Quest Estimating and Civil Products at Maxwell Systems, gives a brief background on his products. "Quest, launched in 1986, has evolved from a modest software program into a comprehensive takeoff and estimating solution used by thousands of contractors. Acquired by Maxwell Systems in 2007, Quest solutions are continually enhanced and backed by training and support."

Maxwell Systems Quest Earthwork, is the earth-measuring program in the product line and is designed for all contractors who measure cut and fill, including those involved in site work, grading and excavating, roadwork, heavy highway work, paving, and more.

"Earthwork does the math for you," Sexton says. "The user can measure cut-and-fill quantities by using a digitizer board—no need for calculators, protractors, or slide rules—or he can do digital takeoffs from PDF, JPG, et cetera. Once finished in Earthworks, the contractor can export all the data to Quest Estimator, adding quantities for the bid, getting costs, and so on. You can also create reports for bid day proposals and accounting packages. Estimator also exports to a payroll program. It's a powerful, complete solution."

Maxwell Systems products allow high levels of accuracy. "Using Quest, figures will be one-thousandth of an inch correct and obtained in record time. For example, let's say you're using slab assembly. The program will tell you how much concrete you'll need, how many people it will require to do the task, and give you a 3D view of the concrete slab you're building—and then you can open up the job for any changes identified.

"In addition, the program will remember any inputs and automatically pull relevant details. For example, let's say you do a lot of Wal-Marts in the area, and such stores require a 4-inch thick slab with gravel underneath. The program will know this and put it in for you. If you work regionally, you can make templates for different states and similar jobs. Want to know exactly what you'll need on site? Simply build a list assembly with the program."

Along with offering speed and accuracy, Quest Earthwork reduces the chance for surprises. "You can do core takeoffs and know there's going to be rock 12 inches down, clay at 2 feet, et cetera. Knowing this information gives crews a good estimate about hauling out what's there. You can also calculate the compression and swell factor of slate, sand, and other material. If you have to move 50 to 60 cubic yards of dirt with a dump truck and you don't have a swell factor in there, you won't be able to haul it away with the equipment you've brought; the swell factor requires a lot more trucks to get the job done."

On an average site, a good knowledgeable estimator might require two days to do takeoff by hand. With a Maxwell Systems solution, that time shrinks to a couple of hours. "On average, using our program, you'll get out five times the amount of bids you could usually do manually. Plus, the software can help contractors keep tabs on each job won and show overages, percentage of waste, and markups. You must know what it costs to do a job so you can be sure that your bids will allow you to make money. Maxwell Systems Quest solutions are designed to work the way contractors do, delivering speed and accuracy, and put a keen focus on productivity and profitability. We know that some contractors bid low to get the job, but that often puts profit out of reach, even when change orders come in. With Maxwell Systems takeoff and estimating software, contractors bid smart, bid accurately, and are better equipped to manage the jobs and control costs for optimal profit."

Maxwell Systems also provides solutions for construction business management, including American Contractor for general construction; Management Suite for subcontracting, specialty trade, and service; and StreetSmarts for heavy construction. These solutions allow contractors to manage financial accounting with improved operational efficiencies, cost reductions, and profitability.



Photo: Maxwell Systems
Quest Earthwork software, by Maxwell Systems, is designed for all contractors who need to measure cut-and-fill in record time, including sitework, grading and excavating, roadwork, paving, and more.

With end-to-end visibility of projects and the company overall, these solutions help contractors get a competitive edge and find long-term success.

Computers Calculate and Remind

Instead of swearing at the piles of paper and hours of calculations, some estimators swear by products from Yuba City, CA's SharpeSoft Inc. "It was all slide rules before, in the traditional way—pen, paper, calculating. Estimating took hours and hours of calculations," says Mark Scoccolo, manager of SCI Infrastructure LLC, of Pacific, WA. "Now we can do in one hour what used to take 20. We've been using SharpeSoft for 10 or 12 years; we now have more consistency on bidding. Also, there's less forgetting items."

Forgetting items? "The way this software is set up, you have an option to create a work package, say, for a water line. You will have areas for cost of materials, all the things needed for it, maybe even something that calculates costs for flushing the water system. With this software, the odds of you forgetting to add in those extra tasks are zero," he explains.

SCI operates in the western Washington market, so many of its projects have very similar specs. "I like the way SharpeSoft is set up. I work for a lot of public and private firms. Let's say I bid for the city. I can save that bid, and I can drag in similar items for that city for another bid. Yes, every city is different, but there are many common items. You can drag in the assembly for that city anytime. You really only have to bid them once, as you can copy over the same figures."

But figures can change, such as gasoline and diesel costs. "Pricing is volatile now; you can set a new price, and keep plugging in new prices—the system is very straightforward," Scoccolo, says. "We had to find a program that made the transition from paper to computer easy; with SharpeSoft Estimator, the math's all done for you. My staff finds it easy to use. We looked at a lot of programs, and we like SharpeSoft. It made the most sense to me. For one thing, the program was built by a guy who had been a contractor."

For most of his customers, Scoccolo still has to put all his bids on paper. "Smaller agencies can't take electronic bids. Washington DOT is setting up a way to take electronic bids, but it's not there yet. Now we take our information off the blueprints." However, in his own office, everything's on computer: "We run Viewpoint cost-accounting software, and SharpeSoft Estimator can import budgets, so you know how to make budgets for a particular job. We also use Field Reporter with this software. Crews can put in how things are progressing on the site. Right away, we can know if we're making money, and, if not, we can fix things, monitor production."

As the software allows them to make more bids, does that mean SCI has more "wins?" "Not necessarily. The selection of the job you bid makes more success; you have to play to your company's strength. The computer isn't going to tell you which jobs to bid; *you* have to know."

Getting the Dirt on Excavation Costs

When one's prime purpose is to move dirt, it's vital to know how much soil is there, how much must be moved to obtain grade, and, perhaps, the easiest way to accomplish this. Rifka Malik, CPESC-IT, of Monroe, NY-based OS Excavating, uses EarthWorks, produced by Albuquerque, NM's Trakware.

Malik appreciates how the software allows her to see the details, as she also monitors "the big picture" of each project. "I started in this company with the estimating, the negotiation with the jobs, and orchestrating all the shop drawings. My thought is: If you did the estimating right, half the job is done.

"Now I do estimating *and* project management. Since I started with the project from the beginning, I already know how this job will run. All the details are already at my fingertips; I take each project from takeoff to project management.

"It's interesting to hear how different companies do different things," she goes on. "I only do estimating,' some might say, whereas I do more of the whole process—quantity takeoff, estimating, and directing the project. When different people perform different parts of the project, it always seems like something's forgotten. Doing it my way helps you to remember everything.

"If there's a 'disconnect' between one person doing the quantity takeoff and a different person doing the estimating, many times important details don't get transferred. Not everything is on the drawings all the time. Sometimes you learn about

what needs to happen on a job by figuring it out according to other factors specified. I call it 'getting a feel for the job.' These are usually the things that don't get transferred over."

Sometimes the smallest oversights can produce the largest headaches. "I watch the details. For example, a straight run of pipe is easier to put in than one that requires a 45-degree bend. The hardest part of the business is the site work—it's so detailed and all underground. Core samples help; the site developer gives us the information, if they did do the borings. Of course, if you only take 20 borings in 400 acres there's a chance potential problems can be missed. By its very nature, many things on a site are unpredictable."

Malik has been using EarthWorks about two years. "In the short time we've used it, we've found it to be very user friendly. How does it compare to our previous procedures? In the past, I'd hire outside people to do takeoff, cuts and fills, et cetera.

"I decided one person should do it, since I'd get all these jumbled software reports from subcontractors. 'You have to enter it right to get the right information,' they'd say, and other excuses.

"I thought one day I should get a program myself and learn how to do it. Then I met an EarthWorks salesman. I told him, 'I don't have time to learn a program. I'm working 18 hours a day.' He said, 'I will come to your office; give me two hours of your time. If you don't think you can use it easily, I will give your money back.' After about an hour of us going through EarthWorks, I said, 'Here's your check. You can go home! I got it!'"

Anyone can use the program? "Well, of course you have to know how to read a blueprint," she chuckles. "I prefer inputting the data with the digitizing tablet. Take the blueprint to the board, you draw all your lines—the information's in the PC. Now Trakware also has onscreen takeoff; if you get a PDF of the blueprints, use your mouse to trace it—you don't need a tablet."

After she inputs such data as existing grades and the desired end results, "It [EarthWorks] will show where you'll be cutting, where filling, and I find out how much I take away. Are cuts and fills close to each other? You can ask for 3D for a topical map, or you can ask for a profile. I use all of that for different functions. When you're moving soil, the adage is 'up to 100 feet you might use a dozer.' Farther than that, you might want to dump soil into a truck and drive it across the site. By looking at those colored reports—the program colors cut-and-fill areas—it's so much easier to show us how we're going to do the job. If we get the job, I give those colored reports to the job supervisor, and he can do a better job."

Previewing the cut-and-fill portions can help save time and money. "Most jobs here are done in phases, because in New York you can't disturb more than 5 acres at one time, due to the Clean Water Act. But sometimes the phases are drawn 'wrong'—perhaps one phase is all cut, the other is all fill." In such instances, phases could be redrawn, to save money and time on the site, while also complying with the 5-acre rule.

Her work can also go where she goes. "You have to digitize a big portion, but then you can load it to your laptop. On a recent trip, I worked on the rest of the takeoff while on a plane."

Because the software allows her to recalculate easily, Malik does precisely that, often finding a better, cheaper way to do the job. "I like to value-engineer it: What if I raise the grade here, et cetera. Most engineers won't take cost into account, but I do. There was a recent project building eight senior family units, and not all buildings had full basements. I found that if the builder changed the cut-and-fill areas, maybe that was a cheaper way to do it. I like to look at projects differently, because now I don't have to recalculate it all by hand. If I change the grades a bit, do I have to haul as much away? With EarthWorks, I can look at five different scenarios in 10 minutes!"

Once she knows how much soil is on a site, and how to move it, Malik makes her estimate. "EarthWorks gives me a takeoff, then I put that data in my own program, made of Excel, to do the estimate. I input work crews' costs, et cetera, and then I know how much it will cost to put in so much pipe, plus how much our equipment costs."

How does she know the estimates for equipment, such as how much diesel fuel is used per hour? "We have Komatsu equipment, which has a computerized feature called Komtrax; it sends data to my computer, telling me how much diesel is in the machine, and it tracks the hours of use. With Komtrax you can also see if the machine is working too hard—maybe I should send out a bigger machine?"

"This tracking allows us to see how are we performing versus how we estimated: What was the weather? Was it raining? Who was on the site? I can find out the answers as to why the job isn't going per estimate. Maybe we can't do 250 linear feet of pipe per day; we only do 220. Having all this information makes me a better estimator."

Malik also uses EarthWorks when invoicing the customer. “As we bill by cubic yards of earth moved, my foreman tells me, ‘This is the area that was done.’ I take the original EarthWorks takeoffs, mark the perimeter, and it calculates the cubic yards moved. I don’t know if they designed it for that purpose, but that’s how I do it, so I know how to bill.”

OS Excavating also uses Trakware’s TrenchWorks program. “I love it even more than EarthWorks,” Malik says. “We’re not always just digging; a big part of our business is installing pipelines, and those are never a perfect, straight line. With TrenchWorks, first you get a bird’s-eye view: lines across the blueprint. Then you can look at the profile, which gives you all the clues of the job. Sometimes the pipes we put in will cross another line—sewer or water—and usually you have to truck in all the backfill materials. TrenchWorks will tell me how many tons I’ll need.

“For example, from bird’s-eye view, you see 1,000 feet of water line, dug at an average depth of 4 to 5 feet. To find how much backfill I need was tedious, especially if it’s done by hand or in Excel. Between the TrenchWorks digitizer and my inputting of the pipe and backfill material, the program will break down the actual figures for you. Like: So much of this pipe is laid at 2 to 4 feet; this much is set at 4 to 5 feet. TrenchWorks gives you a very accurate bedding and backfill quantity—if you input the data correctly, of course. If you were to hand-calculate, you’d have to rely on average depths, which will never be as accurate. With TrenchWorks, what used to take me 20 hours I can now do in five.”

Malik thinks almost anyone in the business can use Trakware’s products. “So many people are good at what they do, but not good at computers. However, EarthWorks is so simple. I can use the computer, but I don’t want to work so hard with the program. I want it to be simple, and EarthWorks is.”

Despite all the information these programs put at her fingertips, are there still unforeseen tie-ups on a site? “If we find protected species on the site, all work has to stop so we can report it,” she concludes.

Ron DiFuria, general manager of Dudley Construction Co. Inc. in Fort Wright, KY, also uses Trakware’s EarthWorks. “Before we had the program, I did takeoffs by hand. What used to take me 10 hours, now I can do in 20 minutes, especially when I import CAD drawings e-mailed from designers. It’s really great: Changes are much easier with the software. In the old days, it’d take a day to do the takeoff.”

DiFuria’s computer has a digitizing tablet, but “I try do most by CAD. Now EarthWorks also allows you to take it from a TIFF or PDF file, as long as the PDF hasn’t been artificially reduced. EarthWorks can read the drawings’ scale by the DPIs. What I like about EarthWorks is that I can zoom in and make sure I’m getting the right items on the drawings. I think the tablet takes much longer; sometimes people still send me drawings, and I have to trace them. I like the CAD feature better.”

EarthWorks not only calculates the total site, but it also will put the phases together, he says. “I get several sheets from a project, or different CADs. I can merge all those together on one screen and then break the project down in as many phases as needed. But the program won’t tell you the logic of the breakdown. No software will. That’s something you get from experience. If I do make an error when using the digitizer, if I have the computer’s speakers turned on, it will tell me the elevations.”

Dudley Construction is a site developer. “We don’t build structures. We do site clearing, excavation, and utilities. I need to know how much soil has to be moved.

“I use an Excel file for costing, but I take the figures from EarthWorks to make estimates. I can print out a color grid map—red is cut, blue is fill—it helps me ‘sell’ my jobs. I can tell the designer, ‘This is how I’m going to do it.’ Or I can give him a 3D map showing the contours of the site. If I’m looking at an unbalanced job—meaning, you have to take dirt away as well as bring it in—the program will help balance the job by showing how this soil can be moved and reused.” Balancing the site can save money, although “Pricing has a lot to do with the terrain you’re working in and the fuel efficiency of your machines.”

DiFuria loves the program. “I’ve used three other such programs, and EarthWorks is simpler to use. You can’t beat the accuracy, and the support Gregg [LaPore, Trakware’s owner] gives you. In the past, I’ve sent him a file, asking, ‘Why is this taking so long?’ That file took overnight to calculate. As it turned out, the designer had two files overlaid on each other, and the computer was calculating it twice! Trakware is always adding something to its software; that’s why I’m a beta tester for the company. I’ve recommended it to three other contractors in this area.”

Topics: [Operations](#), [Estimating](#)