



WHAT IS YOUR
PRIME GOAL?

announcements

PEOPLE IN THE NEWS

Stan Adkerson, Production Manager received a “Prime Example” Award for exemplary work and dedication.

Melissa Dion, Project Designer received a **Customer Service Award** at Prime’s annual awards ceremony.

Ray Layson accepted the position of **Senior Designer** in the Site Development Department.

Clayton Milligan was recognized as **Project Manager of the Year** at Prime’s annual awards ceremony.

Greg Schunck, PE joined the Site Development Department as **Project Manager**.

Matt Williamson, EIT accepted the position of **Project Engineer** in the Site Development Department.

CIVIL 3-D: MORE SALEABLE LOTS, FEWER CONSTRUCTION EXPENSES

In keeping with its commitment to provide site designs that offer maximum profit for clients, Prime Engineering is incorporating Autodesk’s recently released Civil 3-D software package into its site development process. Civil 3-D’s state-of-the-art design tools allow Prime’s designers to explore multiple site layout options in a compressed timeframe, giving clients the design that provides the **greatest number of lots at the lowest construction cost**.

Civil 3-D, a recently released site development software release from Autodesk, is arguably the industry’s most effective value engineering tool since the advent of CAD. The latest generation of the company’s Land Desktop software suite, Civil 3-D provides considerable benefits in terms of construction cost and overall design feasibility during the preliminary design process.

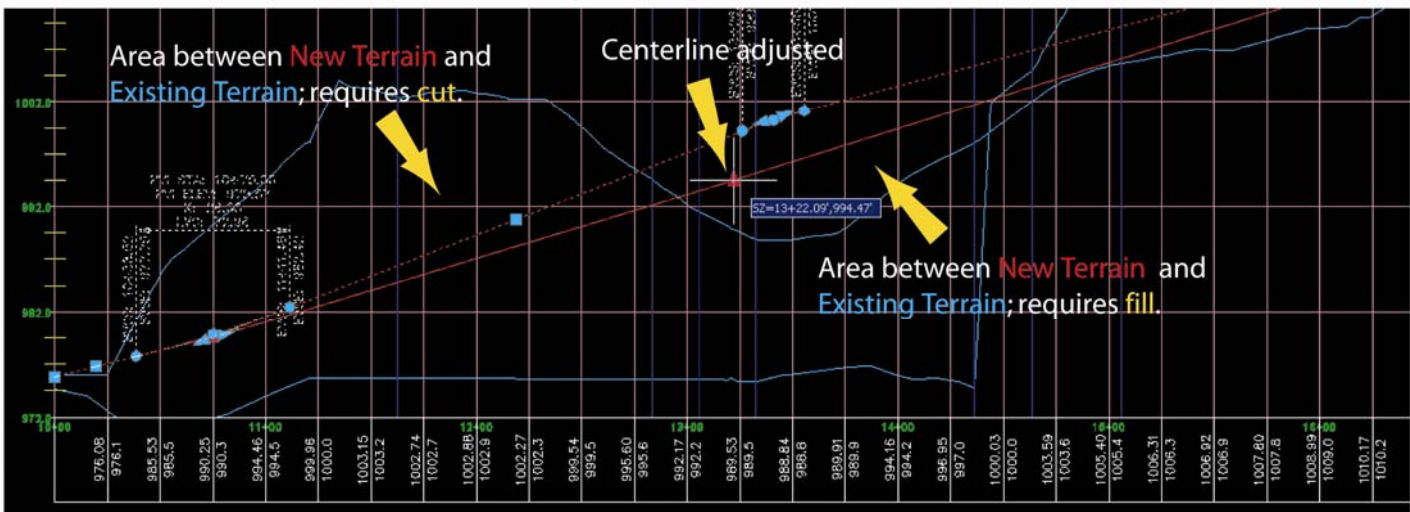
Civil 3-D’s advanced design engine and automated calculation tools vastly simplify a site designer’s primary task: optimizing a site layout to **maximize the number of saleable lots while simultaneously accounting for factors affecting construction costs**. Doing so allows developers to realize greater returns on their initial investment costs.

Ray Layson, currently a Senior Designer with Prime Engineering and a former Autodesk Registered Consultant, says, “**Civil 3-D allows you to do more ‘what-ifs.’** The more ‘what-ifs’ you try out, the quicker you can make the right decisions and the better your design will be. This means that even if clients’ engineering costs are slightly higher, they end up saving a considerable amount of money overall.”

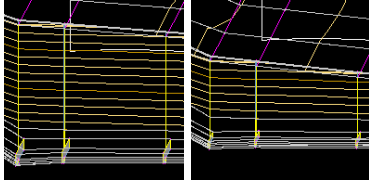
These ‘what-ifs,’ or alternative scenarios, allow Prime’s designers to evaluate common development issues that significantly impact developers’ bottom line. **Development issues that influence construction costs include earthwork balancing, retaining wall height, and amount of rock to be removed.**

When designing a site, it is financially prudent to balance the amount of “cut” (soil excavated from terrain above the desired site slope) with the amount of “fill” (soil used to level out low-lying areas under the desired slope). If more soil is cut from elevated terrain than can be used to fill low-lying terrain, the excess soil must be hauled away at cost to the developer. Conversely, if the volume of cut soil isn’t enough to fill the depressed areas, extra soil has to be brought in – again, at cost to the developer.

Key: — Existing Terrain — New Terrain



Civil 3-D allows a designer to make instantaneous adjustments to cut-and-fill volume, maximizing the site’s cost efficiency.



Civil 3-D also revolutionizes the site design and development processes. For example, as the grading centerline is adjusted, Civil 3-D automatically recalculates the height of the retaining wall.

While performing this task, Prime Engineering designers take into account a second issue: the retaining walls that stabilize and support the site. Retaining walls are priced by the square foot, so it is important for a designer to minimize retaining wall heights. A grading line that provides an optimal cut-and-fill ratio might necessitate retaining walls so high, and therefore expensive to build, that developers end up paying more than they would on a "less efficient" cut-and-fill design.

Designers must also strive to minimize the amount of rock excavation, which is expensive to blast and move. Additionally, in conjunction with these cost-driven evaluations, the designer must keep in mind other concerns, such as local, county, and state codes that mandate certain site requirements.

Without this tool, each component of a complex site (e.g., stormwater systems, piping, grading, etc.) is designed using a different design program. Because these programs are not integrated with each other, changes made to one component of the design are not reflected in the rest of the design.

For example, the calculations used to establish the heights of retaining walls are not linked to those used to engineer the cut-and-fill work. Therefore, when a designer makes an adjustment to the grading line, the designer must also make painstaking and labor-intensive manual revisions to the retaining walls, lot layout, and rock ratio. The designer then has to recheck the design against slope limitations mandated by the local municipality, among many other requirements.

With Civil 3-D, revisions to any one site feature automatically update all other site features. Change a grading line to test cut-and-fill cost, and the retaining wall height instantly recalculates. Revise a road centerline, and the program instantly calculates the cost of removing adjacent rock. Draft a centerline exceeding slope limitations, and the program immediately warns the designer of this fact.

Construction Savings Examples

- ◆ Eliminating 20,000 cubic yards of haul/borrow material = approximately **\$240,000 in savings**
- ◆ Shortening a 500-foot retaining wall from 20 feet to 15 feet = approximately **\$60,000 in savings**
- ◆ Eliminating 1000 cubic yards of rock removal = approximately **\$27,000 in savings**

Mr. Layson explains: **"The software model permits dynamic calculation and balancing of cut-and-fill volumes – finding the optimal amount of earth moved versus the height of the property's retaining walls.** While doing this, we are also able **to maximize the number of saleable lots, minimize the amount of rock that needs to be removed, and adhere to municipal slope limitations.** All of these tasks can be performed at once, on the computer, with the results of each change immediately calculated for the entire site."

It is not an exaggeration to say that Civil 3-D is poised to transform the site development industry. By taking a commanding lead in utilizing the industry's most advanced design software, Prime Engineering ensures that its clients experience tomorrow's site design, today.

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