

## Optimize Performance with Analysis and Visualization

Evaluate more what-if scenarios earlier in the design process to help get higher-quality designs faster.

### Stormwater Analysis and Simulation

Design and analyze stormwater systems with integrated simulation tools for collection systems, ponds, and culverts. Help reduce post-development runoff, and prepare reports to support LEED stormwater quantity and quality requirements.

Evaluate more design alternatives, including innovative green best management practices to create a more environmentally sensitive and visually appealing design. Prepare accurate construction documents, including hydraulic and energy grade lines, to assist in validating design and ensuring public safety.

AutoCAD Civil 3D includes three integrated extensions for stormwater hydraulics and hydrology:

**Hydraflow Storm Sewers Extension**—a full-featured, easy-to-use storm sewer design and analysis package.

**Hydraflow Hydrographs Extension**—a comprehensive solution for watershed analysis and detention pond designs.

**Hydraflow Express Extension**—a collection of powerful calculators to help solve everyday hydraulics and hydrology challenges.

### Geospatial Analysis and Mapping

AutoCAD Civil 3D includes geospatial analysis and mapping capabilities to support engineering-based workflows. Analyze spatial relationships between drawing objects. Extract or create new information by overlaying two or more topologies. Create and use buffers to select features within the specified buffer distance of other features. Create detailed maps using publicly available geospatial information to assist with site selection and better understand design constraints at the proposal stage of a project. Create robust mapping exhibits to assist with due diligence, help develop better stormwater strategies, and meet LEED requirements for sustainable design.

### Sustainable Design

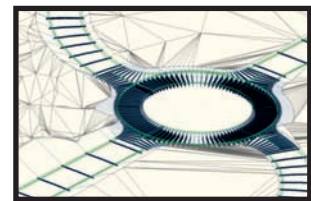
AutoCAD Civil 3D software helps make every project more sustainable. When the engineer has a robust model of the site conditions and design constraints and the power to evaluate alternatives, more innovative and environmentally sensitive designs can be considered. AutoCAD Civil 3D includes tools to assist with many aspects of recognized sustainability initiatives, such as LEED®, by providing analysis to study linkage, project orientation, stormwater management alternatives, and more.

### Visualization

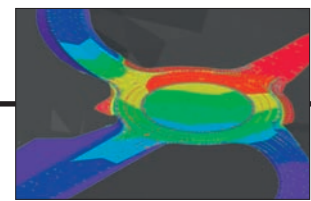
Create powerful visualizations that give stakeholders an opportunity to experience the project before it is real. Produce visualizations directly from the model for several design alternatives to better understand the impact of the design on the community and the surrounding environment. Make photorealistic renderings of your models using Autodesk® 3ds Max® software. Publish the model to Google Earth for even greater understanding of the project in true context.



One model. One change. Multiple updates. All automatic.



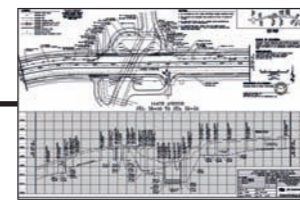
**Model.** Use the intelligent and dynamic tools to quickly make a design change at any stage of the project.



**Analysis.** Make better-informed decisions and choose design alternatives based on analytical and performance results.



**Visualization.** Quickly and efficiently produce visualizations that remain in sync with design changes as they are made.



**Documentation.** The model automatically reflects any changes to drafting and annotation throughout the project.

With AutoCAD Civil 3D, we can spend more time on design and less time worrying about drafting—improving the overall quality of the service we provide to our clients.

—Mike Matsumoto  
President and CEO  
SSFM International

Do More.  
Change the world in 3D.

**AutoCAD®**

Civil 3D® 2010



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## A Powerful Building Information Modeling Solution for Civil Engineering

AutoCAD Civil 3D software supports an integrated process focused on a coordinated digital model from design, analysis and documentation to construction.



### AutoCAD Civil 3D for Transportation

The AutoCAD Civil 3D model can be used by transportation professionals to help streamline processes in all stages of a roadway design project. In conceptual design, analysis tools can be used to more quickly identify problems and probable impacts for various scenarios. In final design, project data, including horizontal and vertical geometries, drainage features, utilities, and right-of-way, are connected to each other and to the documentation, allowing for last-minute design changes to be more quickly synchronized with highway plans production. Powerful visualizations and simulations can help predict what the road will look like and how it will perform. The final design model can be directly consumed during construction, making the process of delivering 3D models to contractors for automated machine guidance.

### AutoCAD Civil 3D for Land Development

AutoCAD Civil 3D software provides tools that the land development professional can use to provide their clients with more profitable and sustainable alternatives. Conceptual design tools allow the engineer to work through several design options with intelligent data that previously would have been compiled from maps, taking days instead of minutes. Land planning work that previously was done strictly in 2D can now be done more effectively in less time while truly understanding the site through 3D analysis. The engineer can balance the scope of the development with environmental constraints regarding stormwater management issues, aesthetic concerns, and construction costs. Once the final design is chosen, the construction documents are easily created from the BIM model.

### AutoCAD Civil 3D for Environmental

Environmental engineers can use the power of BIM in all stages of their projects. Large areas can be more effectively mapped and studied by importing and analyzing geographic information system (GIS) data. Topography can be imported from a variety of sources to build surface terrain models for watershed analysis and more. Environmental design projects can utilize grading and corridor modeling tools to create channels, streams, ponds, embankments, and dams. The model can then be dynamically labeled for construction documents. Realistic visualizations help communicate the intent of the project to clients, government agencies, and the public.

## Benefit from Tools Purpose-Built for Surveying and Design

Help streamline project workflows by automating time-consuming modeling and design tasks.

### Conceptual Design

Pull in aerial imagery and terrain models from the Google Earth™ application; import geographic information system data such as road centerlines and wetlands boundaries; and then use the purpose-built design tools to lay out preliminary road and lot designs—all without hiring a survey crew.

### Surveying

Survey functionality is fully integrated, so you have a more consistent environment for all tasks, including direct import of raw survey data, least-squares adjustment, editing of survey observations, and automated creation of survey figures and surfaces. Most important, the result—points, survey figures, and surfaces—can be used throughout the design process.

### Surfaces

Build surfaces from traditional survey data, such as points and breaklines. Utilize large data sets from aerial photogrammetry, and digital elevation models by taking advantage of the surface reduction tools. View the surface as contours or triangles, or create powerful elevation and slope banding analysis. Study water flow over the surface and build watershed catchment maps. Use surfaces as a reference for creating profiles, sections, grading plans, and corridors, maintaining dynamic relationships to source data.

### Grading

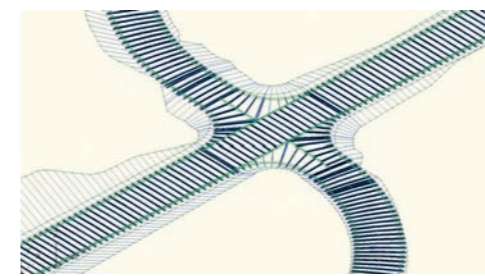
Team members can use the powerful daylighting and grade projection tools to generate surface models for any type of grading projection. You also get easy-to-use graphical and tabular grading manipulation tools for use in the development of surfaces or surfaces.

### Parcel Layout

Generate parcels by converting existing AutoCAD® entities or by using flexible layout tools to automate the process. The software uses a topology to manage parcels so that a change to one parcel is automatically reflected in neighboring parcels. Advanced layout tools include options for measuring frontage at an offset and laying out parcels by minimum depth and width.

### Corridor Modeling

Corridor modeling combines horizontal and vertical geometric constraints with customizable cross sectional components called subassemblies to create a dynamic model of roads and other transportation systems. Use the included subassemblies—ranging from travel lanes, sidewalks, and ditches to complex lane components—or create your own to match any conceivable design standard.



### Automated Intersection Modeling

Build interactive intersection models that dynamically update, so you can focus on optimizing the design and know the production drawings and annotations will always stay up to date.

### Criteria-Based Geometric Design

Quickly lay out plan and profile alignment geometry with design criteria based on AASHTO standards or standards customized for clients' needs. Design constraints alert users when standards violations occur, providing immediate feedback so necessary modifications can be made.

### Pipes

Use rules-based tools to lay out sanitary and storm drainage systems. Make changes to pipes and structures using graphical or numerical input, and conduct interference checks. Plot and complete final drafting of the pipe network in plan, profile, and section views, and share pipe network information, such as material and size, with external analysis applications.

### Earthwork Calculations

More quickly process earth volumes between your existing and proposed surfaces using composite volume or average end area methods. Use the Autodesk civil engineering solution to generate mass haul diagrams for analyzing the distance over which cut and fill can balance, the amount of material to be moved, the direction of movement, and the identification of borrow pits and dump sites.

### Quantity Takeoff Analysis

Extract material quantities from corridor models, or assign material types to lightposts, landscaping, and more. Run reports, or utilize built-in pay item lists to generate bid-ready contract documents. Make better decisions about the cost of the project earlier in the design process with accurate quantity takeoff tools.



## Deliver High-Quality Construction Documentation

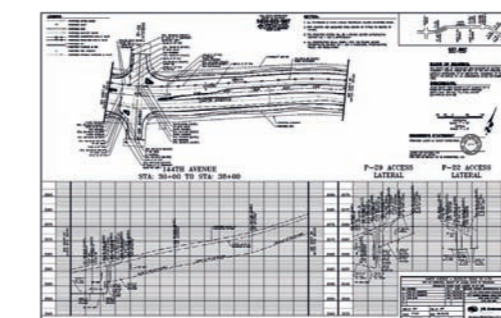
Help enhance productivity and deliver more consistent construction documentation that remains synchronized with the model.

### Production Drafting

Automatically generate production plans such as fully annotated section sheets, profiles, grading plans, and more. Most important, drafting can be generated across multiple drawings by using xrefs and data shortcuts. The result is a workflow that enables production sheets to use a single instance of the model. And if the model changes, you can more quickly synchronize all production sheets to reflect the update.

### Plan Production

A comprehensive tool assists with the layout of plan and profile sheets. Fully integrated with the AutoCAD Sheet Set Manager, the Plans Production wizard automates the layout of sheets and matchlines along alignments, and generates plan and profile sheets based on the layout. The finished product is a series of drawing sheets ready for final annotation and plotting.



The map books functionality lays out sheets across your project while generating key maps and legends for your entire sheet set. This capability is ideal for laying out utility maps, grading plans, or even cross-section sheets.

### Drafting Styles and Standards

The software provides country-specific CAD styles to control many aspects of drawing display. Colors, linetypes, contour increments, labeling, and much more are fully controlled by styles.

### Annotation

The software's annotation is derived directly from design objects or through external references, and updates automatically when the design changes. It also automatically responds to changes in drawing scale and view orientation so if you rotate or change the plot scale within different viewports, the labels update instantly.



### Reporting

AutoCAD Civil 3D software provides flexible, real-time, and extensible report generation directly in the software. And, because the data is derived directly from the model, reports can more easily be updated, providing quick feedback as design changes are made.

Proj	Sheet	Description	Quantity	Unit	Material	Material	Material	Material
011-1000	011-1000	Gravel	100	cu yd	Gravel	100	cu yd	Gravel
011-1000	011-1000	Asphalt	50	sq yd	Asphalt	50	sq yd	Asphalt
011-1000	011-1000	Concrete	20	cu yd	Concrete	20	cu yd	Concrete
011-1000	011-1000	Earth	1000	cu yd	Earth	1000	cu yd	Earth
011-1000	011-1000	Gravel	100	cu yd	Gravel	100	cu yd	Gravel
011-1000	011-1000	Asphalt	50	sq yd	Asphalt	50	sq yd	Asphalt
011-1000	011-1000	Concrete	20	cu yd	Concrete	20	cu yd	Concrete
011-1000	011-1000	Earth	1000	cu yd	Earth	1000	cu yd	Earth
011-1000	011-1000	Gravel	100	cu yd	Gravel	100	cu yd	Gravel
011-1000	011-1000	Asphalt	50	sq yd	Asphalt	50	sq yd	Asphalt
011-1000	011-1000	Concrete	20	cu yd	Concrete	20	cu yd	Concrete
011-1000	011-1000	Earth	1000	cu yd	Earth	1000	cu yd	Earth
011-1000	011-1000	Gravel	100	cu yd	Gravel	100	cu yd	Gravel
011-1000	011-1000	Asphalt	50	sq yd	Asphalt	50	sq yd	Asphalt
011-1000	011-1000	Concrete	20	cu yd	Concrete	20	cu yd	Concrete
011-1000	011-1000	Earth	1000	cu yd	Earth	1000	cu yd	Earth

## Better Coordination

With AutoCAD Civil 3D, you work from the same consistent, up-to-date model—so your team stays better coordinated throughout the project, from survey to construction documentation.

### Data Shortcuts and References

With data shortcuts and xrefs, project members can share model data such as surfaces, alignments, and pipes, working off the same instance of a design object for multiple design tasks. Annotation can also be generated from the data shortcuts or directly through an xref to help ensure that production drafting remains in sync.

### Advanced Data Management

For companies looking for advanced data management, the addition of Autodesk® Vault technology enhances data shortcut functionality with advanced change management, version control, user permissions, and archive control.

### Design Review

Today, the engineering process is more complex than ever. Design review often involves team members who are not CAD software users yet are vital to the project. Publishing to DWF™ file format allows you to digitally extend design review to your team.

### Multidiscipline Coordination

The ability to import Autodesk® Revit® Architecture software building shells into AutoCAD Civil 3D enables civil engineers to use information such as utility connection points, roof areas, building entrances directly from the architects. Similarly, transportation design engineers can pass information such as profiles, alignments, and surfaces directly to the structural engineers, to assist in the layout of bridges, box culverts, and other transportation structures in Autodesk® Revit® Structure 2010 software.