McKim & Creed

Customer Success Story

AutoCAD® Civil 3D®

We copied corridors from the original Civil 3D model and switched out or tweaked the parts we needed to change for each of the five design options. The entire process took half the time it would have taken us with our previous 2D software.

—Randall Mattingly
Design Applications Manager
McKim & Creed

Stream restoration—in real time.

McKim & Creed boosts productivity with AutoCAD® Civil 3D®—Autodesk BIM software for civil engineers.

Doctors Branch Reference Stream – Existing Conditions (Courtesy of McKim & Creed, P.A.)

Project Summary

Established in 1978, McKim & Creed provides engineering, surveying, and planning services from offices throughout the southeastern United States. Its clients include local, state and federal government entities; developers; utility companies; universities; health care institutions; and other industries. McKim & Creed also has a longstanding commitment to the environment and sustainable design. In 2008 McKim & Creed ranked 147th on Engineering News-Record's list of the top 200 environmental firms in the United States. "As a firm, we are committed to helping our clients use energy, water, and other natural resources wisely and efficiently," says Randall Mattingly, design applications manager. To help achieve that goal, in 2006 McKim & Creed adopted AutoCAD Civil 3D BIM software. Purpose-built for civil engineers, Civil 3D enabled the firm's stormwater group to dramatically improve productivity, accuracy, and communication on the Doctors Branch stream restoration project in Wilmington, North Carolina.

The Challenge

In the early 1960s, Doctors Branch was a healthy coastal stream that provided habitat for a wide variety of plant and animal species. Over time, however, increased erosion resulting from nearby development carved out a canyon 12-feet deep and almost 20-feet wide—significantly degrading water quality. "It is threatening local properties and an adjacent sewer line," says Tim Schueler, PE, senior project manager with McKim & Creed. "In a few locations, the stream has actually cut into backyards and put homes in danger."

In reaction to citizen complaints, the city of Wilmington contracted McKim & Creed to design a new stream channel that will stabilize the existing stream banks, improve the health of the riparian corridor, and protect adjacent properties and utilities. "Our goal is to give the stream channel and banks a new, more stable geometry so they do not encroach any further," says Schueler. "We also anticipate reducing downstream pollution due to erosion by a factor of one-hundred."

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Civil 3D enabled McKim & Creed to produce a plan faster and with more accuracy than was possible before.

The Solution

The firm's first step was to take field measurements in order to establish accurate width-to-depth ratios and other important baseline data. Then, using Civil 3D, McKim & Creed built subassemblies and corridors, generated an accurate 3D model of the existing stream, and began work on a series of what-if scenarios for the city and local homeowners' association.

"We copied corridors from the original Civil 3D model and switched out or tweaked the parts we needed to change for each of the five design options," says Mattingly. "The entire process took half the time it would have taken us with our previous 2D software."

Another factor in the firm's productivity increase was its ability to use the BIM process to keep the data in the model consistent and reliable. "Every time we needed to shift an alignment or make some other change, Civil 3D automatically updated the entire model in real time," says Mattingly. "There was no need to rebuild constantly."

This type of instant feedback helped the team make better, more-informed decisions. "For example, during concept development, we noticed that erosion was gradually exposing the adjacent sewer line," says Mattingly. "Using Civil 3D, we could easily see how our design concepts would impact the pipe and whether or not they would cause problems." The team also published design data to Google Earth, enabling them to understand the plans in a larger context.

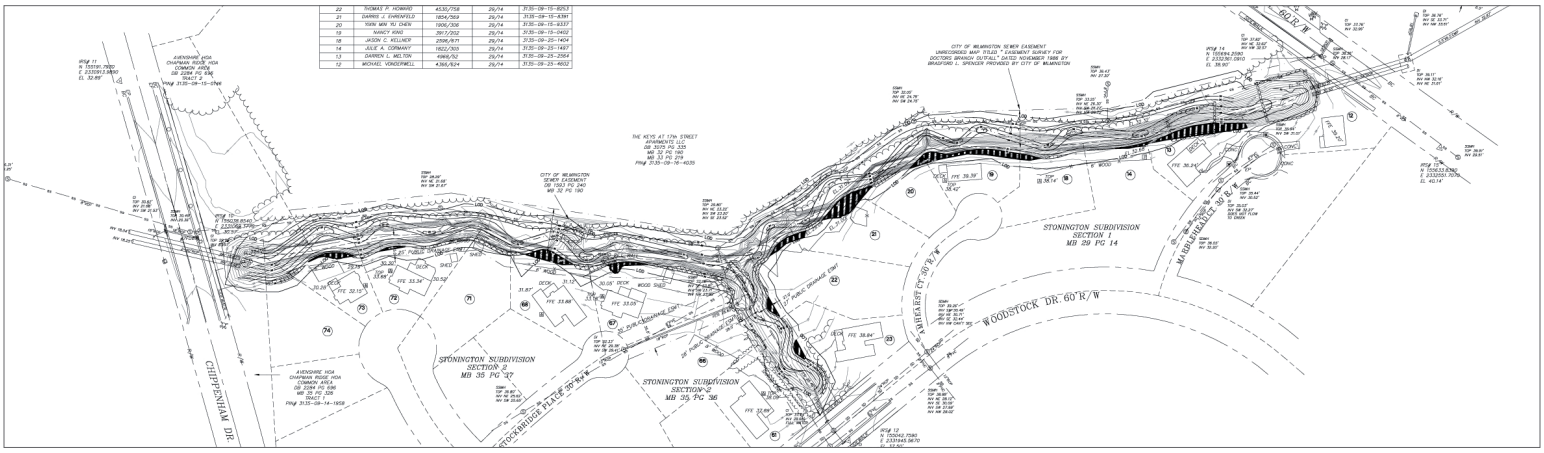
By presenting the concepts in 3D, McKim & Creed demonstrated exactly how the proposed grade would restore land lost to erosion. "It really helped Wilmington understand that we are not going to do anything that will negatively impact the community," says Mattingly. The Civil 3D model also enabled McKim & Creed to generate highly accurate cost information for the city.

The Result

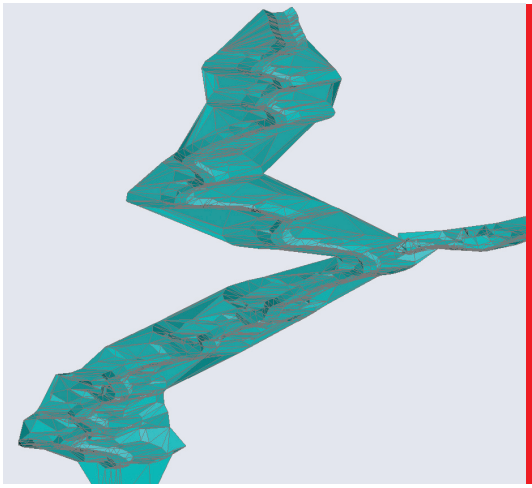
McKim & Creed has finished the initial design process and plans to begin construction in 2009 after obtaining the necessary feedback and approvals from the city and local homeowners' association. "We believe we will be able to give many of the homeowners some of their backyards back, while producing a new, healthy ecosystem that will grow as the stream develops," says Schueler.

As a firm, McKim & Creed has completed five projects with Civil 3D and has 13 more in progress. "Civil 3D is our software of choice for the future," says Mattingly. "After making sure that our standards are in place, we plan on doing a mass rollout. We are committed to it."

For more information about AutoCAD Civil 3D software, please visit www.autodesk.com/civil3d.



Plan Sheet mapping out reclaimed property for lot owners (Courtesy of McKim & Creed, P.A.)



Civil 3D helped us increase our productivity greatly by enabling us to knock out a good portion of the preliminary design with the corridors and subassemblies.

—Randall Mattingly
Design Applications Manager
McKim & Creed

On the left: 3D model brings design to life for all project stakeholders (Courtesy of McKim & Creed, P.A.)

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