Introduction

KCS Consultants are pleased to announce the release of the Civil Suite incorporating the Terrain, Water, GIS, Sewer, Road and Storm water design modules. The Civil Suite has been built on the foundation laid by the original Road, Sewer and Sewer Network programs, which have been used by Consulting Engineers, Municipalities and Contractors for around fifteen years, as well as the Terrain Modeler which was released in February 2004. The CAD and GIS functionality has been enhanced even further and the suite now also incorporates a Water Network Analysis module based on US EPANet engine and a Storm water module based on US EPA SWMM 5 engine.

This fully integrated suite of programs has now been released as the CIVIL SUITE at an unbelievably low price. Not only have these programs been integrated into one common interface but the functionality has been enhanced within each module as well. This integrated interface not only allows the designer to work with a DWG / DXF drawing natively (without the need for a separate CAD license or even converting a drawing to this format), but also includes the core Terrain model capable of handling approximate 22 000 000 points at unbelievable speeds, a Sewer model which effectively does around 99% of the work, and competent / comprehensive Road and Water design modules to round off the package.

The Civil Suite combines the Sewer, Roads and Water, Stormwater and Pipeline design programs with a powerful digital terrain modeling application which can perform basic survey point editing, multiple surface manipulation, triangulation, contouring, cut-fill volume calculations, platforming with embankments and is also able to generate TIN models from spot heights, while taking into consideration user specified break-lines in the modeling operations.

The user can also edit, manipulate and plot DWG drawings directly from within the program thereby obviating the need for a separate CAD license. 3D perspective views of a terrain model can also be generated using fish-net lines, shaded surfaces, thematic colouring and overlays.

The software can handle up to approximately 22 million points simultaneously using 10 surfaces. Strong emphasis has been placed on usability throughout the system, ensuring that users are productive with a short learning curve. The basic interface of the Terrain module is common to all modules of the Civil Suite.

Terrain Module

- Automatic triangulation of points
- Lightning fast processing including contouring, volumes, bank generation etc.
- Dynamic calculation of the volumes of material between any two surfaces
- Quantities according to SABS specifications
- Ability to exchange platforms between layers and to combine multiple platforms on different layers into one model.
- Extract longitudinal sections through any combination of surfaces
- Google Earth functionality built-in with geographic coordinate translator for coordinate transformations
- Converts random source data (in coordinate form) from ASCII yxz format. Multiple surfaces can be combined and/or subsets extracted to create new terrain models.
- Seamless integration of AutoCAD drawings allows editing and coordination of features accurately using the built in CAD editor.
- Supports LST and TOT survey files formats for interchanging data with other systems
- Custom filters for other binary and ASCII formats are available by arrangement.

CAD/ GIS Module

- Ability to read and write Arcview Shape Files (SHP, SHX, DBF)
- Point , Line and Polygon features supported
- Full support for raster images including BMP, TIF, JPG, MrSID and other Geo-referenced images
- Data capture modules available for sewer and storm water
- Standalone CAD engine
- Works natively with AutoCAD drawings
- Ability to open / edit latest DWG / DXF drawings
- Plotting / Printing support included
- Fully interactive CAD window visible in all modules
- Full model / paper space support
- Full Xref support for insertion of drawings within drawings
- CAD undo / redo support
- Full plotter / printer / PDF output supported
- Aerial photography supported in MrSID, TIFF and ECW formats, Geo-referenced images, Google Earth images
- CAD module visible across all design modules
Stormwater Module

- Based on US EPA SWMM 5.0 engine
- Interactive CAD drawing
- Aerial photography / Image support
- Exporting of node and link results to Arcview
- Exporting of results to Excel spreadsheets
- Allows sewer flow routing for master planning
- Flow routing engine supports both Sewer and Stormwater networks

Roads Module

- Up to 50000 individual chainages
- Up to 500 vertical curves
- Up to 500 horizontal curves
- Up to 450 profiles
- Up to 450 profile positions
- Up to 100 different cross falls
- Up to 20 different kerb types

The following sections list some of the user specified parameters, as well as the general inputs and outputs of the program.

- Road start / end coordinates, Road horizontal PI coordinates
- Radii of horizontal PI’s per TRH 17
- Road reserve width
- Ground levels (where not interpolated from a DTM)
- Road start / end level
- Profile details including road width, slopes to natural ground, sidewalk details, kerb types, construction layerwork thickness etc.
- Profile positions
- Cross falls
- Intersections with other roads
- Quantities for residential / township roads
- Supports gravel and surfaced roads
- Fully integrated with other design modules

One unique feature added recently is the ability to define a network of roads and incorporate the output of each individual road design into a merged Terrain surface. Should one road change, a new model is generated at the click of a button.

These new surfaces can subsequently be used for the designs of the sewer or stormwater longitudinal sections.

Current users include:
Makhetha Development Consultants, Intsika Yethu Local Municipality,
Nelson Mandela Metropolitan Municipality, Aurecon, Iliso, Izizwe,
Madan Singh Bester & Associates, Lukhozi Consulting Engineers,
BevServ, Vela VKE, MBSA Consultants
Africoast, Ndodana, KCS Consultants, Monde Consulting, CES (Germany)
to name but a few.

Currently over 160 licenses in circulation with approximately 350 users

For more information
Please contact us for more information or visit our web site and download the demonstration videos which have been placed there for you to grasp the capabilities of the Civil Suite.
**Sewer Module**

Specifications of overall network model:

- Up to 200 branches
- Up to 500 manholes
- Up to 500 constraints
- Up to 500 inflows
- Up to 3000 erf connections
- Up to 10 different pipes/types
- Specifications of branch lines:
  - Up to 75 manholes
  - Up to 75 crossings

These specifications imply that the largest model that can be designed is a pipeline network approximately 25000m in length (based on 500 manholes at an average spacing of 50m). This is for all practical purposes a network model which would normally be broken down into smaller, more manageable sub-networks. In the past 10 years no user has ever noticed these restrictions as they can accommodate virtually any network which can practically be designed.

**Water Module**

- Up to 50000 individual nodes / Up to 50000 individual pipes
- Based on US EPA Net engine / Results / input 100% compatible with Epanet
- Completed integrated with CAD and Terrain
- Exporting of node and link results to Arcview
- Exporting of results to Excel spreadsheets
- Integrated tools for tracking and fixing
- Support for multiple valves / pumps
- Modeling of time based demand patterns
- Modeling of time based pump curves
Screenshot of the Civil Suite:
Nelson Mandela Bay Metro - Water Network Master Planning

Screenshot of the Civil Suite:
Design of Surfaced Roads in Motherwell, Port Elizabeth. Road being designed shown in light blue with the terrain model shown in the background.

Screenshot of the Civil Suite:
Design of a Sewer Network for the Buffalo City Municipality

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