Real-World Problems: Taming the Mighty Red River of the North with AutoCAD® Civil 3D®

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Civil Engineer

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Civil Technician

CL2455
Bill Neuhauser, P.E.

- Managed Design, Inc. 2005 -
  - Autodesk Reseller since 1988
  - Minnesota, Iowa, Wisconsin and the Dakotas
- Minnesota Technical and Community College – 2002-2005
  - Instructor - AAS Civil Techs
- Consulting firms 1990-2002
  - Registered Civil Engineer – P.E. (ND/MN)
  - CADDD Supervisor – LDT, Eagle PT, Geopak
  - CADDD Manager
- North Dakota State University – BS Civil Engineering
- AU Presenter – 5 years
Casey Bekkerus

- Ulteig Engineering, Inc. 2006 -
  - Offices in the Dakotas, Minnesota, Iowa and Colorado
  - 300 plus employees
  - Project Manager/Cadd Designer

  - Project Manager/Estimator

- Minnesota Technical and Community College – 2003-2005
  - AAS Civil Tech
  - Civil 3D since 2008
The cities of Fargo, ND, and Moorhead, MN, are divided by the Red River of the North because of major yearly flooding. To address this, a new six-mile earthen levee system that includes five separate interior drainage systems, five 100-year regional storm water retention basins, and five 5,000 GPM storm water pumping stations was designed. Due to the large scale of project and the issues that arose, Ulteig Engineers asked for the assistance of their current reseller, Managed Design. The issues pertaining to this project were file size, slow drawings, and issues around being able to have more team members help with the project. Managed Design was hired to come in during the project to help identify bottlenecks in the process. What will be shown and discussed are the results and the final product of implementing both composite surfaces and data shortcuts into their design process. You will be able to ask your questions to both the prime civil tech designer on the project and the corresponding application engineer from Managed Design.
Learning Objectives

At the end of this class, you will be able to:

- Learn the advantages of separating projects into separate drawings based on content.
- Learn how to name civil 3D objects for better project recognition.
- Understand the concept and process of using data shortcuts to both simplify and share your data.
- Learn how composite surfaces are used to link each phase together to ultimately create one total site surface for machine control.
Quick Project Overview – Fargo the Flood……..not Fargo the Movie!
How do we get there from here?
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</table>

**Flood Categories (in feet):**

- Major Flood Stage: 30
- Moderate Flood Stage: 25
- Flood Stage: 18
- Action Stage: 17

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**Grand Forks, ND**
Oakport Township
Civil 3D Projects 2009-2013
Oakport Township

North
70th Ave N.
HWY 75
Phase 3
Oakport Township

[Map of Oakport Township with marked locations]

- Lagoon
- Red River
- Wall St.
- 2nd Street
- 70th Ave. N
- North
- Red River
Explaining Phase 2 and 1b
Phase 1a - Folder schematic
Phase 4 - Aerial
Data Shortcuts in General:

- Explaining two different working folder schemes
- Data Shortcut’s Editor
Types of Files

1. **Topo** Files
   A. Existing survey data
   B. Aerials
   C. Plat and ROW drawings

2. **Design** Files
   1. Corridors
   2. Ponds
   3. Parking lots
   4. Anything created by Civil 3D

3. **Sheet** Files (Actual plans)
   1. Cover sheets
   2. General layouts
   3. Plan Profile
   4. Cross section sheets
File Naming:

Project Number_File Type_description

B1224-02_TOPO_plat.dwg
B1224-02_TOPO_xsite.dwg

B1224-02_DESIGN_pond1.dwg
B1224-02_DESIGN_corridor1.dwg
B1224-02_DESIGN_pond2.dwg

B1224-02_SHT_cover
B1224-02_SHT_gen_lay
B1224-02_SHT_storm
B1224-02_SHT_xsections
Civil 3D objects Naming:

Surfaces:
- EG1, EG2, Pond1 etc

Alignments
- Main_Ave_CL
- 2nd_ST_side_CL

Profiles
- Main_Ave_FG

Corridors:
- Main_Ave, Access_Rd1

Composite Surfaces
- C1 – EG1 with Main_Ave_TOP
- C2 – C1 with Pond1
- C3 – C2 with Access Road1 Top
Civil 3D Typical Surfaces:

Civil 3D Surfaces
  EG1

Grading Surfaces
  Pond1

Corridor Surfaces
  Main_Ave_TOP,
  Main_Ave_Datum,
  Access_Rd1_TOP
  Access_Rd1_Datum

Composite Surfaces
  C1 – EG1 with Main_Ave_TOP
  C2 – C1 with Pond1
  C3 – C2 with Access Road1 Top
  C1d – EG1 with Main_Ave_Datum
  C2d – C1d with Pond1
  C3d – C2d with Access Road1 Datum
### Sample Project - File, Folder and Surface naming

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<thead>
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<th>Drawing Name</th>
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<th>Object Name</th>
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### Sample Project - File, Folder and Surface naming (continued)

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*DS) Data shortcut into this drawing
*(o)-Originated in this drawing
You know you’re an Engineer…..if

- If your favorite TV show is "Big Bang" instead of "Baywatch,"
- If you need a spreadsheet to figure out who owes what for lunch,
- If you use a CAD package to design your son's Pine Wood Derby car
- If you have more toys than your kids
- If you can remember 7 computer passwords but not your anniversary
- If you've ever tried to repair a $5.00 radio
- If your lap-top computer costs more than your car
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- Donated by Cadapult Software Solutions
- Civil 3D and AutoCAD Map 3D books available at www.cadapult-software.com
Questions:
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