

## Session 42

**Bruce Dana**

FL. Dept. of Transportation

### *FDOT Electronic Project Delivery*

#### **Topic Description**

This session will cover the basic tools / processes associated with Electronic Delivery, including new enhancements expected to be released with the forthcoming Maintenance Release 3 to the Electronic Delivery toolset. We will also offer some tips to help ease the Electronic Delivery process. Also encouraged is an active question /answer session.

#### **Speaker Biography**

Bruce Dana, PE has been with FDOT for more than 19 years. He is currently responsible for coordination of CADD support and software development for the FDOT Engineering / CADD Systems Office in Tallahassee.

# Electronic Delivery

Engineering / CADD  
Systems Office



Designing For More Than Bridges and Roads



## Successful? Someone is...

### April '06 – October '06

- 203 projects (as of 6/28/06) with plans on CO server for those letting months (and October '06 may not all be in yet?)
- 54 of those projects indicated a revision (DeltaNDX.htm present)
- 31,127 plan sheets (PostScript format only)



Designing For More Than Bridges and Roads

# Plan sheet errors discovered (ED or otherwise) 1st Quarter 2006

Error counts in electronic plan sheets discovered after District submittal, and during review by Central Office plans processing staff

District	Projects Let	Total Sheets	Sheets with Errors	% Errors
1	18	1,081	30	2.8%
2	9	1,300	97	7.5%
3	7	925	0	0%
4	12	2,164	7	0.3%
5	11	541	0	0%
6	7	792	22	2.8%
7	9	1,546	2	0.1%
Totals	<b>73</b>	<b>8,349</b>	<b>158</b>	<b>1.9%</b>



Designing For More Than Bridges and Roads

# Plan sheet errors discovered (ED or otherwise) 2nd Quarter 2006

Error counts in electronic plan sheets discovered after District submittal, and during review by Central Office plans processing staff

District	Projects Let	Total Sheets	Sheets with Errors	% Errors
1	18	3,077	55	1.8%
2	13	2,089	15	0.7%
3	16	4,021	0	0%
4	10	1,695	0	0%
5	19	2,322	4	0.2%
6	7	696	14	2.0%
7	15	9,968	328	3.3%
<b>Totals</b>	<b>98</b>	<b>23,868</b>	<b>416</b>	<b>1.7%</b>



## Tasks

## Tools

- Creating Projects (Use *Electronic Delivery Indexer*)
- Creating Files (Use *Create File/Project* application)
- *Sheet Navigator* (Very important – Key to successful electronic delivery)
- Indexing / Journaling (Use *Electronic Delivery Indexer*)
- Signing / Sealing / Securing (Use *PEDDS*)
- Making Subsets (Use *SetMaker*)
- Revisions (Use *Sheet Navigator, EDI, Project Delta*)
- Strung Projects (Use *StrungProject* application)
- Printing (Use *qSheet*)
- Project Quality Control Checks (Use *FileChecker*)



Designing For More Than Bridges and Roads

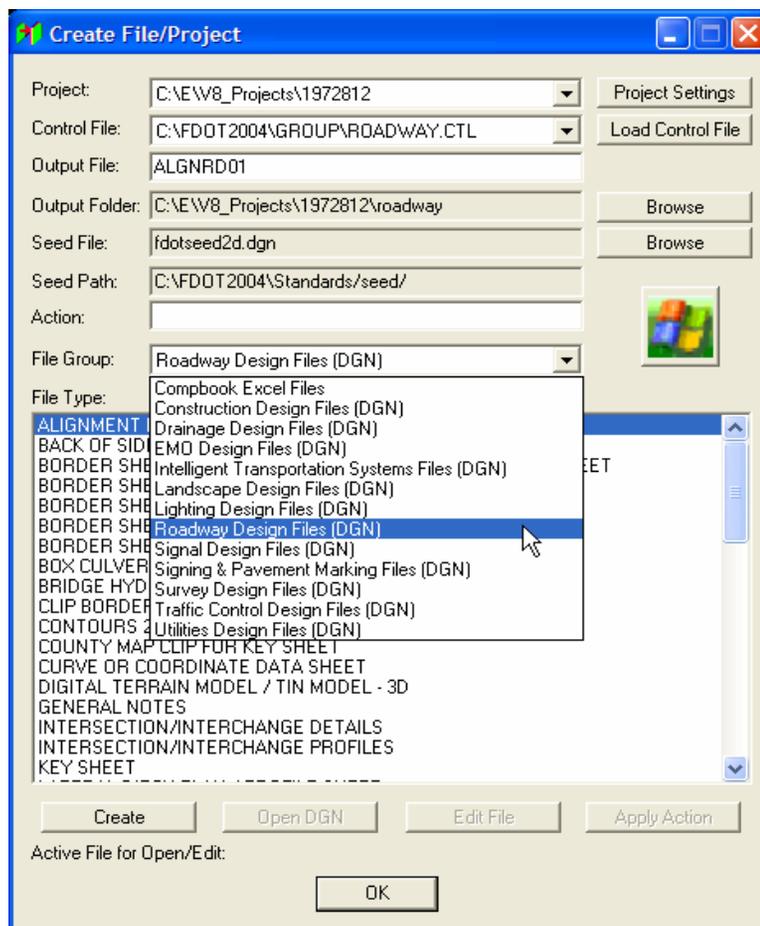
## Programs in Electronic Delivery Suite

- ***Electronic Delivery Indexer (EDI)***
- ***Create File/Project***
- ***Sheet Navigator***
- ***PEDDS (Professionals Electronic Data Delivery System)***
- ***SetMaker***
- ***Project Delta***
- ***Strung Project***
- ***FileChecker***
- ***qSheet***



Designing For More Than Bridges and Roads

# Create File/Project



This utility is available on the FDOT2004 SiteMenu in MicroStation under the \Utils pulldown, and the FDOT2004 folder Icon on your desktop.

It is used to help create the proper file names for various file types used in the design process.



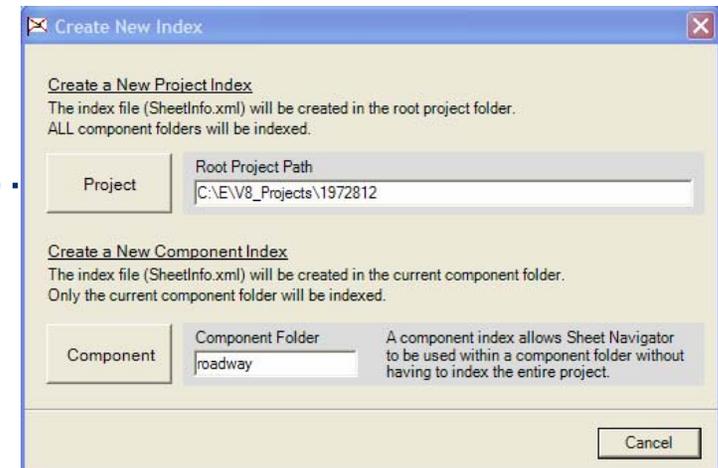
## *Sheet Navigator*

- Sheet Navigator (Sheet Edit function) should be used to assign the required Sheet Information to each of the Component Set
  - Required for successful indexing of project (Sheets) by EDI
  - Required for successful creation of Plot Files (PostScript Files) by EDI
- Possible Issues (for projects converted from V7 to V8)
  - Border Sheet References not recognized
  - Some Sheet Fields not recognized
  - All boils down to symbology, typically



# Sheet Navigator

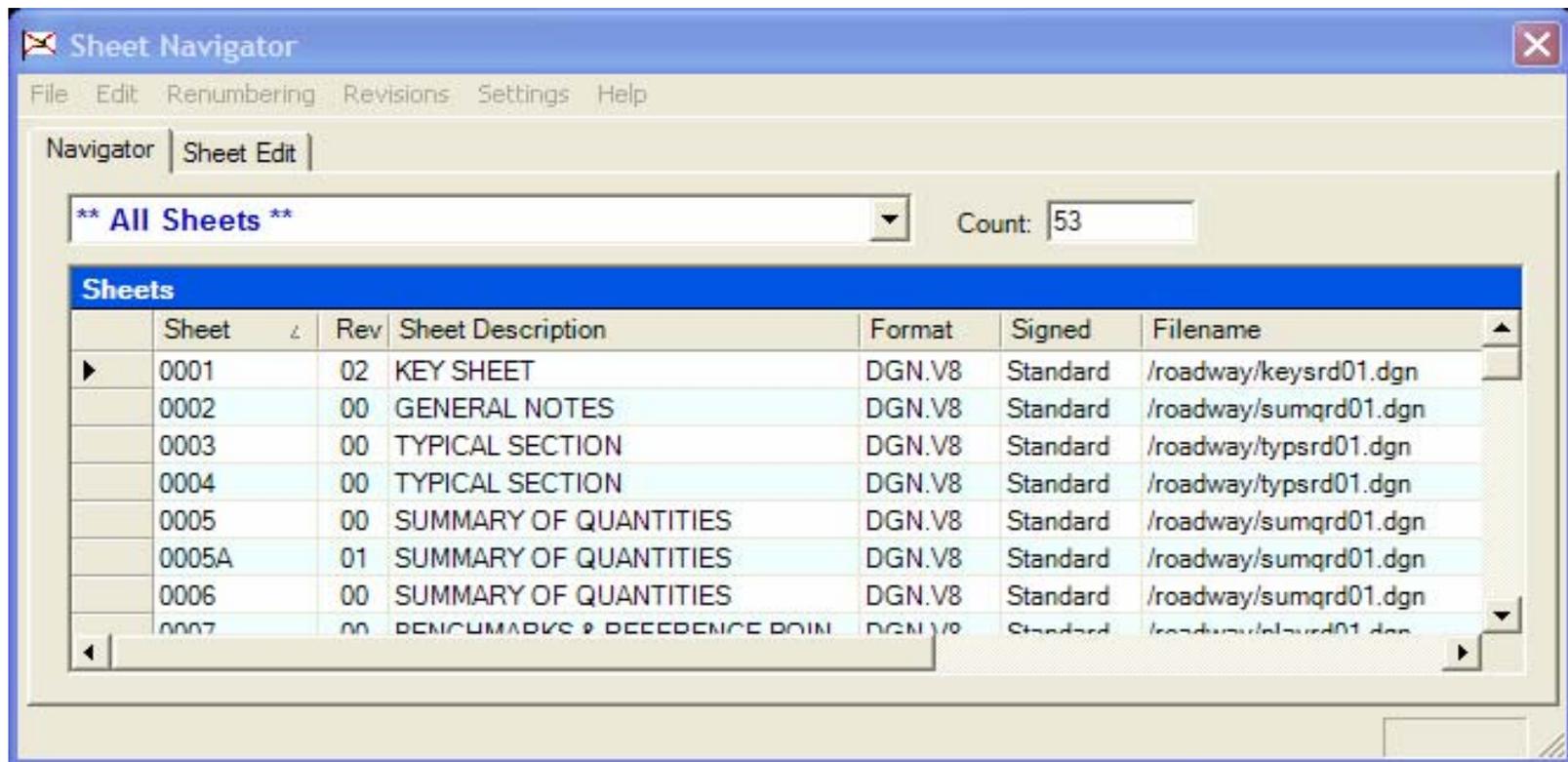
- Sheet Information Index - It is in your best interest to create and maintain a Sheet Information Index File (**SheetInfo.xml**)
  - Allows you to “Navigate” Sheets
  - Required for Sheet Renumbering, Batch editing, etc.
- Remember... Some items to remember when creating the Sheet Information Index File (**SheetInfo.xml**)
  - Created via Sheet Navigator Only!
  - No update function; just File>New...
  - Component level indexes available





Designing For More Than Bridges and Roads

# Sheet Navigator



[SheetInfo.xml](#) is presented on the application's Navigator tab, and is used to select files (sheets) during batch edit / renumbering functions or navigate between design files. [SheetInfo.xml](#) is created using the *File > New* pulldown.



Designing For More Than Bridges and Roads

# Sheet Navigator

The screenshot shows the 'Sheet Navigator' application window with the 'Sheet Edit' tab selected. The interface includes a menu bar (File, Edit, Renumbering, Revisions, Settings, Help) and two tabs: 'Navigator' and 'Sheet Edit'. The 'Sheet Edit' tab contains several input fields and buttons:

- Sheets:** A list box containing '0001'.
- Sheet Number:** Text box with '1'.
- Financial Project ID 1:** Text box with '197281-2-52-01'.
- County 1:** Dropdown menu with 'POLK' selected.
- Road Number:** Text box with '37'.
- Financial Project ID 2:** Empty text box.
- County 2:** Empty dropdown menu.
- Sheet Description:** Text box with 'KEY SHEET' (text is red).
- Project Description:** Empty text box.
- Sheet Type:** Dropdown menu with '05-ROADWAY PLANS' selected.
- Revision:** Dropdown menu with '02' selected, and checkboxes for 'Allow Plot' (checked) and 'Obsolete' (unchecked).
- Sheet Component:** Text box with 'PRIMARY COMPONENT'.
- Digital Signature Note:** Dropdown menu with 'Standard' selected.
- Buttons:** 'Add Engineering Record Cell', 'View Engineering Record Text', 'View Boundary Coordinates', 'Reload', 'Refresh', and 'Save'.

\*Note: Fields in red are saved as attribute data only, because no matching text elements were found

The Sheet edit tab displays information about sheets found in the open design file. Non-red fields may be edited in this interface for those items on the sheet. If it doesn't show up here, EDI will not see it either !



## Electronic Delivery Indexer

- **Index.xml** - This is the primary project data file used by EDI. Contains “attribute” metadata about files in the projects.
- **EDIProject.edi** - This is a file used by EDI which contains Plans component data and EDI’s settings for the project. This is a binary file maintained by EDI throughout the Indexing process.
- **ProjectIndex.xml** - This is XML output used to define a simple index of the plans sheets. This file is used by downstream Electronic Delivery processes.
- **ProjectFiles.htm** - This is an html report containing a simple files index, including comments made about files. ProjectFiles.htm is generated to display all project files in a “user-friendly” form.



Designing For More Than Bridges and Roads

## Electronic Delivery Indexer

- It is recommended that the project index (**ProjectIndex.xml**) be updated frequently
  - Don't wait until just before the submittal is due
- Timing is everything - to reduce the amount of time required to complete the indexing process, consider the following:
  - Mine attributes at the File and Folder level (not necessary to process the entire project for just few file changes)
  - Perform indexing batch functions during a period of limited access (e.g. lunch)
- It is recommended that Sheet PostScript Image Files (**\*.ps**) be created/updated as the changes to the MicroStation design files occur
  - Don't wait until just before the submittal is due to discover you have plotting problems



Designing For More Than Bridges and Roads

# Electronic Delivery Indexer

EDI v2.0 : Input File - C:\E\V8\_Projects\1972812\EDIProject.edi - [Index Editor - ProjectIndex.xml]

File View Index Tools Window Help

Sheet	File Path	Component	Discipline	Description	Source	Date Modified
1	keysrd01_r01.PS	Roadway Plans	roadway	KEY SHEET	.\roadway\keysrd01.dgn	5/11/2006 9:18 AM
2	sumqrd01.PS	Roadway Plans	roadway	GENERAL NOTES	.\roadway\sumqrd01.dgn	
3	typsrd01.PS	Roadway Plans	roadway	TYPICAL SECTION	.\roadway\typsrd01.dgn	
4	typsrd01.PS	Roadway Plans	roadway	TYPICAL SECTION	.\roadway\typsrd01.dgn	
5	sumqrd01.PS	Roadway Plans	roadway	SUMMARY OF QUANTITIES	.\roadway\sumqrd01.dgn	
5A	00010005Asumqrd01_r01.PS	Roadway Plans	roadway	SUMMARY OF QUANTITIES	.\roadway\sumqrd01.dgn	4/26/2006 4:05 PM
6	000100060sumqrd01.PS	Roadway Plans	roadway	SUMMARY OF QUANTITIES	.\roadway\sumqrd01.dgn	
7	000100070playrd01.PS	Roadway Plans	roadway	BENCHMARKS & REFERENCE POI...	.\roadway\playrd01.dgn	
8	000100080planrd01.PS	Roadway Plans	roadway	Revised - PLAN SHEET	.\roadway\planrd01.dgn	
9	000100090planrd01.PS	Roadway Plans	roadway	PLAN SHEET	.\roadway\planrd01.dgn	
10	000100100planrd01_r01.PS	Roadway Plans	roadway	PLAN SHEET	.\roadway\planrd01.dgn	5/11/2006 9:18 AM
11	000100110planrd01.PS	Roadway Plans	roadway	PLAN SHEET	.\roadway\planrd01.dgn	
12	000100120planrd01.PS	Roadway Plans	roadway	PLAN SHEET	.\roadway\planrd01.dgn	
13	000100130planrd01.PS	Roadway Plans	roadway	PLAN SHEET	.\roadway\planrd01.dgn	
14	000100140planrd01.PS	Roadway Plans	roadway	PLAN SHEET	.\roadway\planrd01.dgn	
15	000100150planrd01.PS	Roadway Plans	roadway	PLAN SHEET	.\roadway\planrd01.dgn	
16	000100160rdxsrd04.PS	Roadway Plans	roadway	CROSS SECTIONS	.\roadway\rdxsrd04.shg	
17	000100170rdxsrd04.PS	Roadway Plans	roadway	CROSS SECTIONS	.\roadway\rdxsrd04.shg	
18	000100180rdxsrd04.PS	Roadway Plans	roadway	CROSS SECTIONS	.\roadway\rdxsrd04.shg	
19	000100190rdxsrd04.PS	Roadway Plans	roadway	CROSS SECTIONS	.\roadway\rdxsrd04.shg	
20	000100200rdxsrd02.PS	Roadway Plans	roadway	CROSS SECTIONS	.\roadway\rdxsrd02.shg	
21	000100210rdxsrd02.PS	Roadway Plans	roadway	CROSS SECTIONS	.\roadway\rdxsrd02.shg	
22	000100220rdxsrd02.PS	Roadway Plans	roadway	CROSS SECTIONS	.\roadway\rdxsrd02.shg	
23	000100230rdxsrd02.PS	Roadway Plans	roadway	CROSS SECTIONS	.\roadway\rdxsrd02.shg	
24	000100240rdxsrd02.PS	Roadway Plans	roadway	CROSS SECTIONS	.\roadway\rdxsrd02.shg	

Edit Index Items

File Path: .\roadway\eng\_data\000100010keysrd01\_r01.PS \*Sheets displayed in red, do not exist or are revised.

Sheet Number: 1 Component: 01 Roadway Plans  Override Sort

Description: KEY SHEET  Show Sort Index

Source Path: .\roadway\keysrd01.dgn

Project index - C:\E\V8\_Projects\1972812\ProjectIndex.xml



## Electronic Delivery Indexer – for MR3 ??

- New output file naming option for plots (NN\_sheetnumber\_dgnname.PS) where NN is component ID
  - Use for new projects only, due to impact a revision could make on current Project Delta application. Note EDI2 for MR3 can handle mixed naming now, but impacts effect Project Delta!
- Integrate Project Browser's reporting functionality into EDI  
Sheetndx.htm, Project.PDF, ProjectRevN.PDF
- Retire Project Browser after MR3???
- Add additional Journal templates for macro text inserts for MR3 (need your input on what should be included!)
- EDI-Lite – A re-worked/improved interface with less stuff. Reverts back to Rich Text Journaling. Working to eliminate need for Index.XML and EDIProject.EDI

Note these are *anticipated* enhancements!

# PEDDS



Designing For More Than Bridges and Roads

Filename	Signatory	Qualifier	Signed/Selected	File Last Modified	Index Sheet Number	Project Index Description
000100940culvertdet1.ps	John Kuretski	*		2005/03/21 10:4:56	94	CONCRETE BOX CULVERT
000100950culvertdet2.ps	John Kuretski	*		2005/03/21 10:4:58	95	CONCRETE BOX CULVERT
000100960culvertdet3.ps	John Kuretski	*		2005/03/21 10:4:58	96	CONCRETE BOX CULVERT
000100970culvertdet4.ps	John Kuretski	*		2005/03/21 10:5:00	97	CONCRETE BOX CULVERT
000100980culvertdet5.ps	John Kuretski	*		2005/03/21 10:5:00	98	CONCRETE BOX CULVERT
000100990culvertdet6.ps	John Kuretski	*		2005/03/21 10:5:02	99	CONCRETE BOX CULVERT
000700010keysheet.ps	John Kuretski	*		2005/04/07 14:4:38	B-1	INDEX OF SHEETS
0007001000710-2of2.ps				2005/04/07 14:4:02	B-10	TRAFFIC RAILING MEDIAN BARRIER - (32" F SHAPE) INDEX NO. 710 (DRAWING 2 OF 2)
0007001100800.ps				2005/04/07 14:4:12	B-11	PEDESTRIAN/BICYCLE RAILING INDEX NO. 800
0007001200820-1of2.ps				2005/04/07 14:4:16	B-12	ALUMINUM PEDESTRIAN/BICYCLE BULLET RAILING DETAILS INDEX NO. 820 (DRAWING 1 OF 2)
0007001300820-2of2.ps				2005/03/21 10:4:24	B-13	ALUMINUM PEDESTRIAN/BICYCLE BULLET RAILING DETAILS INDEX NO. 820 (DRAWING 2 OF 2)
0007001400900s-1of2.ps	John Kuretski	*		2005/05/03 17:3:10	B-14	APPROACH SLABS (FLEXIBLE PAVEMENT APPROACHES) INDEX NO. S-900 (DRAWING 1 OF 2)
0007001500900s-2of2.ps	John Kuretski	*		2005/03/30 09:5:52	B-15	APPROACH SLABS (FLEXIBLE PAVEMENT APPROACHES) INDEX NO. S-900 (DRAWING 2 OF 2)
0007001601000.ps				2005/03/21 10:4:30	B-16	SKREW DETAILS FOR TRAFFIC RAILING BARRIERS, PARAPETS AND TRAFFIC SEPARATORS INDEX NO. 1000
0007001701200-1of2.ps				2005/03/21 10:4:36	B-17	LIGHT POLE PILASTER INDEX NO. 1200 (DRAWING 1 OF 2)
0007001801200-2of2.ps				2005/03/21 10:4:38	B-18	LIGHT POLE PILASTER INDEX NO. 1200 (DRAWING 2 OF 2)
0007001901300.ps				2005/03/21 10:4:38	B-19	STANDARD BAR BENDING DETAILS INDEX NO. 1300

MR2 release of PEDDS (version 2.5.3) introduces Landscape Architects, Registered Architects, and Interior Designers as Signatories. Version 2.5.4 reads [ProjectIndex.xml](#) to display sheet / description data to aid in file selection for S/S



Designing For More Than Bridges and Roads

## Revisions (what programs?, what files?)

### File in Original Delivery

ProjectIndex.xml  
Sheetndx.htm  
Project.pdf

### Files in Revised Delivery

ProjectIndex.xml (made contemporary)  
Sheetndx.htm (made contemporary)  
Project.pdf (made contemporary)  
Deltandx.htm  
ProjectRev1.pdf

ProjectIndex.xml

– created by **Electronic Delivery Indexer** application (EDI)

Sheetndx.htm

– created by **Project Browser** application, uses ProjectIndex.xml as input

Project.pdf

– created by **Project Browser** application, uses ProjectIndex.xml as input

Deltandx.htm

– created by **Project Delta** application, difference between ProjectIndex.xml from original delivery and revised delivery, uses ProjectIndex.xml(s) as input

ProjectRev1.pdf

– created by **Project Browser** application, contains only the revised plan sheets, uses Deltandx.htm as input

\*\* Of these files, for a revision, only Deltandx.htm and Projectrev1.pdf are selected in the **Setmaker** application to create the revision subset, and provided the Contractor in the current practice



# FileChecker

- This program is being used as a “Black Box” and that is not a correct way to operate...
- Every report contains the following admonition:

Please Note: This report flags suspected inconsistencies in an Electronic Delivery project, but does not replace a thorough technical review by a qualified professional or eliminate the responsibility of the user. A report with few or no status errors is a good sign, but does not guarantee an error free project. Likewise a report with many status warning or errors cannot be assumed to indicate an invalid project. The user or reviewer of this report must carefully consider the standards applicable to the project at the time of development.



Designing For More Than Bridges and Roads

## *Training Available?*

- Online Resources
  - Quick Clips videos  
<http://www.dot.state.fl.us/ecso/downloads/clips/>
  - Training Guides  
<http://www.dot.state.fl.us/ecso/main/fdotcaddtraining.htm>
  - Publications
    - FDOT CADD Manual
    - FDOT CADD Production Criteria Handbook
  - Presentations
    - Many presentations by FDOT staff posted on ECSO website
    - FLUG website also has presentation and training data
    - <http://www.flugsite.com/Presentations.cfm>



# Tips – worth the cost of attending !

- Don't wait until the 11<sup>th</sup> hour to do Electronic Delivery operations...keep your ED data up-to-date
- Edit the cell library to modify the plan sheet border (i.e. for company logo) A cell is just a model in a V8 DGN file. Don't mess with anything else!
- Avoid using special characters ampersand (&), quotes (“ and ’) and greater than / less than ( < and >) in sheet descriptions too
- **NEVER** edit an .htm or .xml from Electronic Delivery with Microsoft Word ! Use a text editor or dedicated editor.
- **NEVER** move indexed files around to different directory folders after you have generated your Index and delivered your project
- Electronic Delivery batch operates against all your project files, over and over...Save yourself lots of time and frustration by copying your project to your local hard drive (use XCOPY) and working there (Xcopying back to the server when you are done with the desired operations). Your local hard drive is many times faster and more secure copying files than your network. XCOPY has options to only copy changed files (suggestion): *XCOPY source destination /D /E /V /I /Y*
- Your project is only as good as the last time it was backed-up



# Live Demo – Original Electronic Delivery

- 1) Create a new project (in **EDI**)
- 2) Create an Original Electronic Delivery for project 1972812
  - Briefly Show **Sheet Navigator** interface
  - Build Sheet Navigator Index "*SheetInfo.xml*"
  - Mine the Plans data for Electronic Delivery (using **EDI2**)
  - Plot the Plan Sheets to **postscript image files** (using **EDI2**)
  - Show adding a scanned PDF sheet (using **EDI2**)
  - Create the Sheet Index "*ProjectIndex.xml*" (using **EDI2**)
  - Create the Files Report "*ProjectFiles.htm*" (using **EDI2**)
  - Create Sheet index Report "*SheetNDX.htm*" (using **ProjectBrowser**)
  - Create Composite "*Project.pdf*" (using **ProjectBrowser**)
  - Sign/Seal sheets /Secure the project (using **PEDDS**)
  - Create "Plans and Specs" data subset (using **SetMaker**)
  - Print plans sheets as necessary (using **qSheet**)



## Live Demo – Revised Electronic Delivery

### 3) Create Revised Electronic Delivery for 1972812 in the *VRevision\_1* Folder

- Make backup copy of Original project as secured and delivered
- Create Revision 1 for Keysheet and Sheet 10 in *PLANRD01.DGN* (in **SheetNavigator**) updating "*SheetInfo.xml*"
- Update the Index "*ProjectIndex.xml*" for the Revision 1 (in **EDI2**)
- Plot the Revised Sheets (in **EDI2**)
- Create a contemporary Files Report "*ProjectFiles.htm*" (using **EDI2**)
- Create the Revision Report "*DeltaNDX.htm*" (using **Project Delta**)
- Create contemporary Sheet Index Report "*SheetNDX.htm*" (in **ProjectBrowser**)
- Create contemporary Composite "*Project.pdf*" (using **ProjectBrowser**)
- Create Revised Composite "*ProjectRev1.pdf*" (using **ProjectBrowser**)
- Sign/Seal revised sheets with new signatory, and re-secure project (in **PEDDS**)
- Create Delivery subset (in **SetMaker**)