

# **DOTWise 3.1 & Plans Production**

**Plans, Plotting, DOTWise**

9/14/2012

State of Indiana

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## Contents

1.	Welcome to INDOTWise 3.1 .....	10
2.	INDOTWise 3.1 .....	12
2.1	Requesting ProjectWise Access via ITAP (INDOT Technical Application Pathway) .....	12
2.1-1	Access to your Applications .....	12
2.1-2	ITAP Overview: .....	12
2.1-3	Request a new ProjectWise Account .....	13
2.1-4	Request Additional Roles .....	16
2.2	ProjectWise Folder Structure.....	17
2.2-1	Overview: .....	17
2.2-2	Project folders: .....	17
2.2-3	Other folders (Non-District Folders): .....	19
2.3	ProjectWise Security Overview .....	19
2.3-1	Overview: .....	19
2.3-2	Consultant Access.....	20
2.4	DOTWise Project Creator .....	20
2.4-1	Requesting Application Access via ITAP .....	20
2.4-2	Using the DOTWise Project Creator.....	23
2.5	Auto-Logins for Integrated Applications.....	29
2.5-1	Overview: .....	29
2.5-2	Enabling Auto-Login .....	29
2.6	Productivity Enhancements.....	32
2.6-1	Utilization of the Data Warehouse .....	32
2.6-2	Changes to the workflow .....	32
2.7	Project Properties.....	32
2.7-1	Overview: .....	32
2.7-2	Modifying Custom Properties .....	35
2.8	Creating New Documents.....	36
2.8-1	Creating Documents from ProjectWise Seed Files .....	36
2.8-2	Importing Documents Into ProjectWise .....	39
2.8-3	Creating folders and Moving Documents .....	41
2.8-4	Save and/or Save As .....	43
2.9	Interfaces: The Plan Production Environment.....	45

2.9-1	Document Properties.....	45
2.9-2	__PROJECT INFORMATION .....	45
2.9-3	__SIGNATURE.....	48
2.9-4	REVISIONS .....	48
2.9-5	DESIGNED/DRAWN/CHECKED BY.....	49
2.10	Title Block Integration .....	49
2.10-1	Overview: .....	49
2.10-2	Title Sheet Integration Cell Library.....	50
2.11	ProjectWise Interfaces and Special Character Integration .....	54
2.12	Revised Template Sheet Models .....	56
2.12-1	Overview: .....	56
2.13	Searching.....	56
2.13-1	Search Form and Search Builder .....	56
2.13-2	Performing a Search on Document Attributes .....	56
2.13-3	Saved Searches .....	59
2.14	Custom Folders .....	61
2.14-1	Using Custom Folders.....	61
2.15	Applications without ProjectWise Integration.....	63
2.15-1	Working with Non-Integrated Applications .....	64
2.16	The ProjectWise Managed Workspace .....	72
2.16-1	Managed Workspace Export .....	72
2.16-2	Working with the workspace .....	73
2.16-3	MicroStation and files with SignCAD Fonts .....	74
2.16-4	MicroStation, File -> Open and Workspace Reloads .....	74
2.16-5	Local Document Organizer .....	74
3.	MicroStation and V8i Interface .....	75
3.1	What's New in MicroStation V8i.....	75
3.1-1	Application Window Layout Changes.....	75
3.1-2	Tasks dialog.....	76
3.1-3	Dockable Dialogs .....	78
3.1-4	Tasks.....	82
3.1-5	Workflows .....	84
3.1-6	INDOT Dialogs, Tasks and Workflows .....	85

3.2	User Interface Enhancements.....	92
3.2-1	Drag and drop support.....	92
3.2-2	Right click context menus based on named expressions .....	94
3.2-3	Show / hide support in Tasks dialog .....	94
3.2-4	Show/hide support in status bar .....	95
3.2-5	Coordinates display in status bar.....	95
3.2-6	Locks dialog.....	95
3.3	Models Enhancements .....	96
3.3-1	View different models from the same file in each view .....	96
3.3-2	Project Explorer integration in Models dialog.....	97
3.3-3	Models dialog displays the sheet name .....	99
3.4	Menu Changes .....	100
3.4-1	File menu changes.....	100
3.4-2	Element menu changes.....	100
3.4-3	Settings menu changes .....	100
3.4-4	Tools menu changes.....	100
3.4-5	Utilities menu changes .....	101
3.4-6	Help menu changes .....	101
3.4-7	Application menu .....	101
3.5	Text Enhancements .....	101
3.5-1	Text Style dialog enhancements .....	101
3.5-2	Word Processor enhancements .....	103
3.5-3	Using Fonts.....	103
3.5-4	Edit Text tool retains text settings.....	104
3.5-5	Find/Replace Text supports data fields.....	104
3.6	References Enhancements .....	104
3.6-1	Activate reference for in-place editing.....	105
3.6-2	References support active model annotation scale .....	106
3.6-3	Detail scale .....	106
3.6-4	Synchronize with saved view.....	106
3.6-5	Drawing title .....	106
3.6-6	Change Attachment Orientation.....	107
3.6-7	Reference Detail Scale .....	107

4.	Plotting.....	107
4.1-1	PDF Support Only .....	107
4.1-2	Attaching Plot Drivers.....	107
4.1-3	HP Plot Queue Settings.....	108
4.2	Design Scripts and Settings Files.....	110
4.2-1	Overview: .....	110
4.3	Creating an Electronic Signature .....	111
4.3-1	Creating a .pdf of your Signature .....	111
4.3-2	Creating an Electronic Certificate .....	117
4.3-3	Combining the Electronic Components .....	124
4.4	Using Electronic Signatures.....	127
4.4-1	Overview: .....	127
4.4-2	“Signing” sheets within the plan set.....	128
4.4-3	Placing the Graphic Representation of a Signature on Multiple Sheets .....	129
4.4-4	Electronically Signing the Plan Set.....	132
4.4-5	Verification of Signatures .....	134
5.	InRoads and ProjectWise.....	135
5.1	InRoads Standards and Seed Files.....	135
5.1-1	XIN File .....	135
5.1-2	INDOT Specific Preferences .....	135
5.1-3	ITL File.....	136
5.1-4	Cell libraries.....	136
5.1-5	Plans Production .....	136
5.1-6	InRoads DGN Seed Files.....	137
5.2	Working with InRoads .....	138
5.2-1	ProjectWise.....	138
5.3	Starting InRoads.....	140
5.4	Opening, Closing and Saving InRoads Files from ProjectWise.....	140
5.4-1	Opening Existing Files.....	140
5.4-2	Saving New Files .....	142
5.4-3	Closing Files.....	142
5.4-4	InRoads/ProjectWise Organizer .....	144
5.5	Setting Up InRoads .....	144

5.5-1	Attaching the XIN.....	144
5.5-2	Attaching the Cell Library.....	145
5.5-3	Project Defaults/.RWK Files.....	145
5.5-4	Enabling Application Add-Ins/Variable Manager.....	147
5.5-5	Variable Manager.....	149
5.5-6	MicroStation and InRoads Status Bars .....	149
6.	Using InRoads .....	150
6.1	Global Scale Factors .....	150
6.2	Referenced Base Drawings .....	153
6.3	Reference Windows .....	154
6.4	Text Drawings .....	155
6.5	Creating Base Drawings .....	156
6.5-1	Creating the Existing Plan Drawing.....	156
6.5-2	Creating the Existing Contour Drawing.....	160
6.5-3	Creating the Proposed Plan Drawing.....	164
6.5-4	Attaching Explan as a Reference File to Prplan .....	170
6.5-5	Adding the Proposed Profile to the Prplan Base Drawing .....	175
6.5-6	Adding the Proposed Vertical Alignment .....	178
6.6	Sheet Layout and Creation (Plan Profile Sheets).....	179
6.6-1	Plan and Profile Generator.....	179
6.6-2	Sheet Creation.....	180
6.6-3	Cutting Sheets.....	191
6.6-4	Publishing Sheets to ProjectWise .....	198
6.7	Annotation and Text Drawing Cleanup .....	200
6.7-1	Setting Up an Annotation Drawing.....	200
6.7-2	Adding Horizontal Alignment Annotation .....	201
6.7-3	Adding Horizontal Curve Set Annotation.....	203
6.7-4	Adding Profile Annotation .....	205
6.7-5	Station Offset Feature Annotation .....	211
6.8	Additional Sheet Types .....	219
6.9	Adding Other Base Drawings to Sheets.....	220
6.9-1	Combine multiple drawings into one base drawing.....	220
6.9-2	Move to same coordinates system as Prplan.dgn .....	220

6.9-3	Graphically Importing Existing Right of Way .....	220
6.10	Cross Sections.....	224
6.10-1	Cross Section DGN.....	224
6.10-2	Surface Properties .....	225
6.10-3	Cross Section Creation .....	226
6.10-4	Cross Section Annotation .....	231
6.10-5	Update Cross Sections.....	232
6.10-6	End Area Volumes .....	233
6.10-7	Cross Section Notes.....	233
6.10-8	Other Cross Section Functions.....	233
6.10-9	InRoads RW Modeling and Cross Section Tips (courtesy H. Brown).....	235
6.11	InRoads Performance Tips .....	253
1.	Appendices .....	255
1.1	Appendix A - Accessing CAD Support Help Site.....	255
1.1-1	Overview: .....	255
1.2	Appendix B - Naming Conventions.....	256
1.2-1	InRoads DTM Names .....	256
1.2-2	MicroStation Drawing Names.....	257
1.3	Appendix C - MicroStation Libraries.....	263
1.3-1	DGN Library .....	263
1.3-2	Text Styles.....	263
1.3-3	Dimension Styles and Settings .....	265
1.4	Appendix D - MicroStation Advanced References.....	266
1.4-1	Models .....	266
1.4-2	Drawing Scale.....	268
1.4-3	Reference Files and Models.....	270
1.4-4	Levels.....	277
1.4-5	Design File Settings .....	279
1.4-6	Seed Files - (Template Documents).....	283
1.4-7	Structure of a V8 Design File.....	283
1.4-8	Cell Libraries.....	284
1.5	Appendix E - True Scale Linestyles.....	285
1.6	Appendix F - DOTWise 3.1 Changelog .....	288

1.6-1	MicroStation Resources .....	288
1.6-2	InRoads Resources .....	294
1.6-3	InterPlot Resources.....	294
1.6-4	ProjectWise.....	295

## **1. Welcome to INDOTWise 3.1**

### *A Message from CAD Support*

#### ***Why did we make these changes/alterations?***

After our initial deployments of INDOTWise versions 1.0 and 2.0, CAD Support has focused the last two years on the switch to InRoads from MX Roads. Due to the scope of these changes, this document is intended to roll up all the enhancements to the CAD Workspace, ProjectWise and InRoads suites into a single document.

Since the initial releases of INDOTWise 1.0 and the 2.0 update, we've completely jumped through 3 minor releases of both MicroStation and InRoads, along with 2 versions of ProjectWise. While this document won't show every new item, we will hit on the major productivity enhancements. Please keep in mind that this document is not a replacement for Fundamentals training on each of these products, and can be supplemented with the use of each products online Help file.

We want to impart to you *\*why\** things are, as much as *\*how\** certain tools work or what buttons to click to perform a particular operation.

The focus of this document is to answer the question, "What has changed in CAD and where can I find all the needed information to take advantage of those changes?" The answer is simple: Right Here in this document.

If for any reason, you believe that the information provided in this document is not accurate or clearly explained-please do not hesitate to let us know. We will make every effort to make it right.

Thanks,

Scott Robison  
Jason Kuhn  
Greg Carrie  
Chris Martin



## 2. INDOTWise 3.1

### 2.1 Requesting ProjectWise Access via ITAP (INDOT Technical Application Pathway)

#### 2.1-1 Access to your Applications

You can access ITAP via the INDOT Intranet at <http://intranet.indot.state.in.us/>. Then selecting the ITAP link to the right of the page as shown below will take you into the interface.

Michael B. Cline, Commissioner

Welcome to the Intranet - Your Source for Information

INDOT VALUES: Respect · Teamwork · Accountability · Excellence

BUSINESS INFORMATION & RESOURCES

- Business Applications
- Business Systems Information
- Business Tools
- District & Division Information
- Employee Resources
- Internet & Intranet Links
- Operations Field Information
- PeopleSoft Applications

SCHEDULING & RESERVATIONS

- Audio / Video / Webinar
- Book a Conference Room
- Pool Vehicle (PVMP)

News

(Posted Aug. 27, 2012) Last week, Commissioner Michael B. Cline and other executive staff visited the LaPorte District as part of their annual district visits. They were excited to get reacquainted with dedicated district workers. meet new district employees and present Heavy Equipment Operator Mike Clemans with the winner's certificate in earning first place for the LaPorte District's Safety Truck Roadeo.

For details and more photos, [click here](#).

[Archived Messages](#)

[Read news releases](#)

Wednesday, Aug. 29, 2012

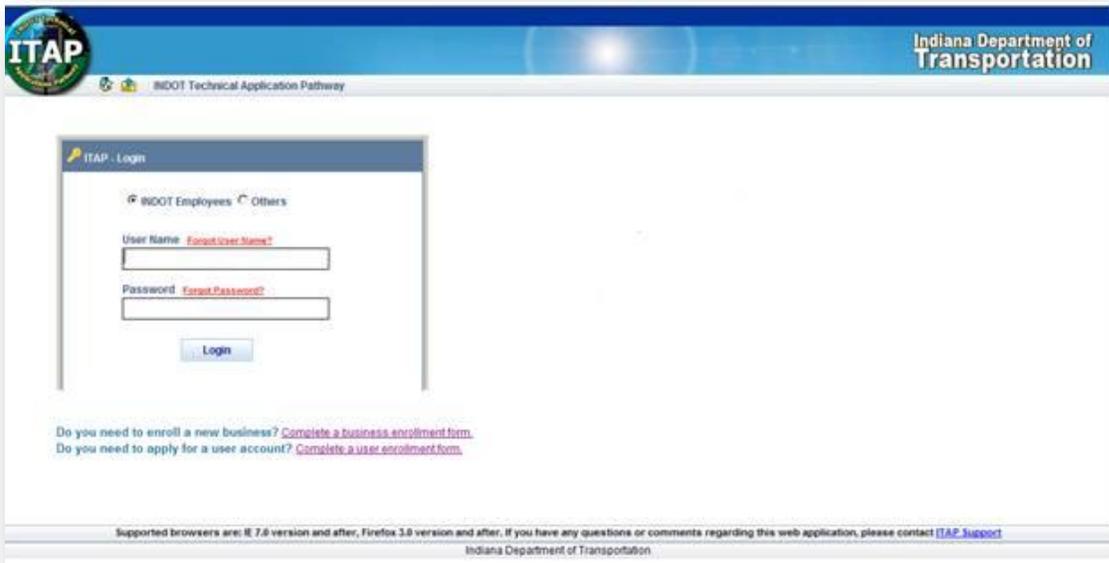
QUICK LINKS

- Communications
- Employee Development
- Employee Safety
- Human Resources
- INDOT Answers
- INDOT Internet
- INDOT Mission, Goals, Values
- ITAP
- Land Records System (LRS)
- SharePoint Directory
- SPMS
- Work Management System
- Webmaster

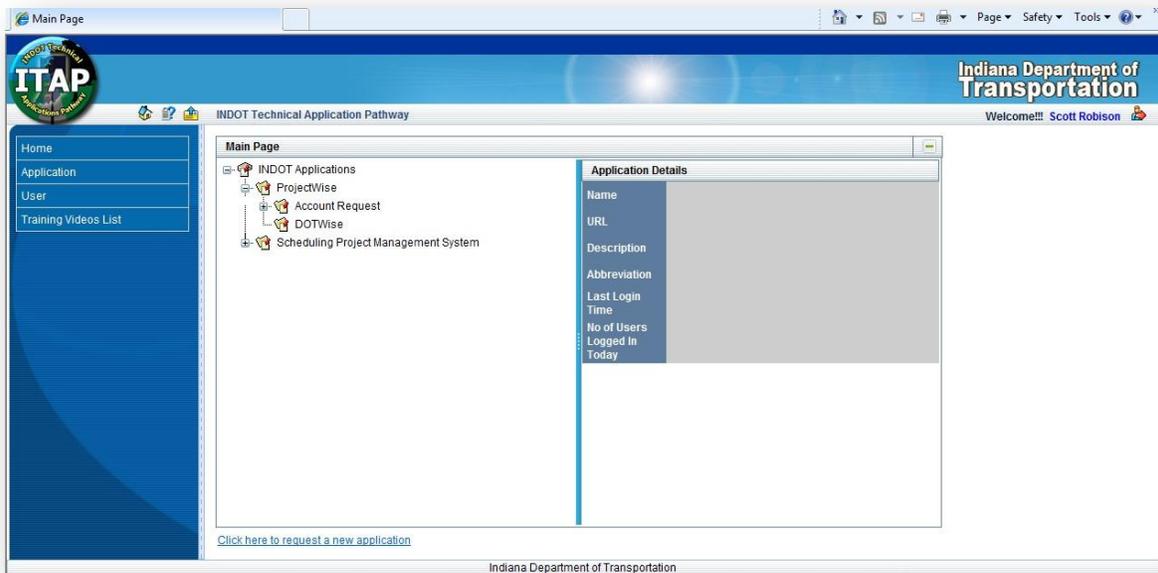
Click Here for all Helpdesk Support

#### 2.1-2 ITAP Overview:

- The Home Main Page provides a list of a user's approved applications with application details, a link to request access to additional INDOT applications and a link to request additional roles for some applications. (Click Help icon at top left of page for additional instructions)
- If you had never previously logged in to ITAP you will be asked to login to via the ITAP Login screen and enter a valid **User Name** and **Password** and click on the **Login** button. (same login and password and used to login to your computer)



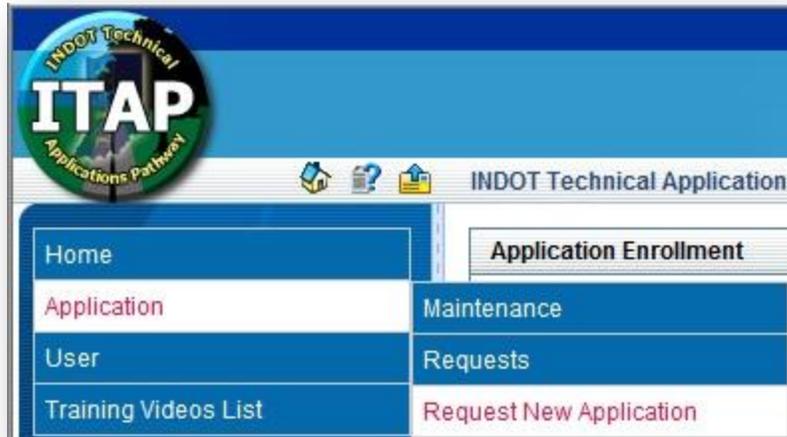
- If you have already used ITAP in the past and enrolled or logged in for access to other applications they will shown on your main page when you click the ITAP link. It should look very similar to this screen.



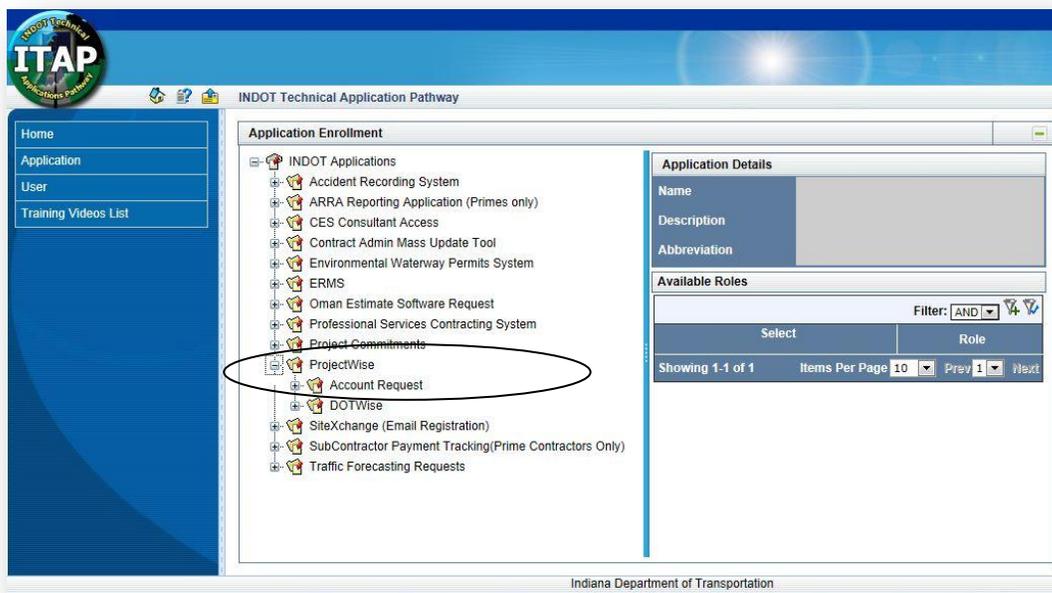
### 2.1-3 Request a new ProjectWise Account

To request access to ProjectWise and select a Role or Group you will start out by going to the following location:

- Select Application-Request New Application



- Select ProjectWise-Account Request



You will then be given the option to pick a Role/Group to which you will request access to. It will appear in the bottom right corner and has multiple pages of roles. Be sure to click next if your group is not listed on the first page.

Available Roles	
Select	Role
<input type="checkbox"/>	Environmental Group
<input type="checkbox"/>	Consultant Review Group
<input type="checkbox"/>	Planning Group
<input type="checkbox"/>	Planning Group
<input type="checkbox"/>	Design Group
<input type="checkbox"/>	Environmental Group
<input type="checkbox"/>	Geotechnical Group
<input type="checkbox"/>	Hydraulics Group
<input type="checkbox"/>	Pavement Engineering Group
<input type="checkbox"/>	Project Manager Group

Filter: AND [v] [v]

Showing 1-10 of 18 Items Per Page 10 Prev 1 Next

Submit

- You will select the group or groups to which you belong and Click on the Submit button to submit the request or click Cancel to return the Main Page panel.
- An email request will be sent to your supervisor for approval. Once he/she approves the request an email will be sent to CAD support (CAD Support will then create an account for you in ProjectWise and may also contact you to see that you have the software installed on your machine). You will get a notification email back once you have been approved access.

If the **Submit** was successful the **Message** below displays, click on the **OK** button. Once the request is approved or denied an email will be sent to the users email.



If a previously submitted request has not been approved or denied the **Message** below displays, click on the **OK** button.



#### 2.1-4 Request Additional Roles

To request an additional role(s) for one of your approved applications, click on the link, "[Click here to request additional roles](#)" in the Application Details panel to display the View/Edit Roles panel. You may be changing groups or need access temporarily to work on a project. This will require the same approval process as when initial enrollment occurs.

In the View/Edit Roles panel, to request a Role, click on the Checkbox under Select next to the Role name. A checkmark that is grayed out indicates that particular role is already assigned.

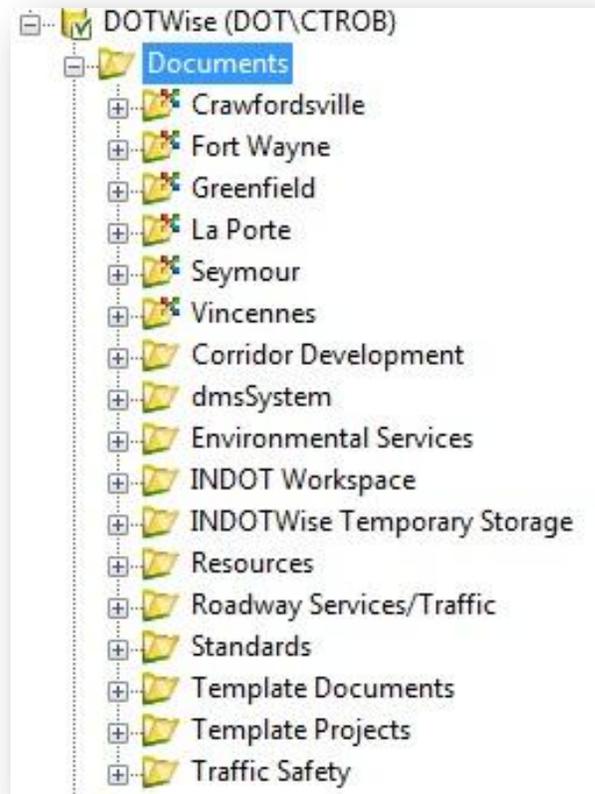
**Click on the Submit button to submit the request or click Cancel to return the Main Page panel.**



## 2.2 ProjectWise Folder Structure

### 2.2-1 Overview:

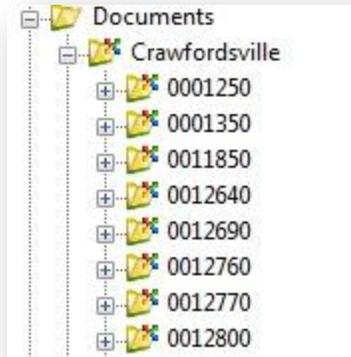
To maintain standardization, avoid duplication, and provide a better workflow, a Location: Designation Number (abbreviation Des. No. will be used throughout remainder of document) based project structure would best suit INDOT's workflow. As shown in the image below, when Documents is expanded, there will be a listing of all the District locations, as well as other folders that will be discussed later.



The DOTWise Root Folder Structure

### 2.2-2 Project folders:

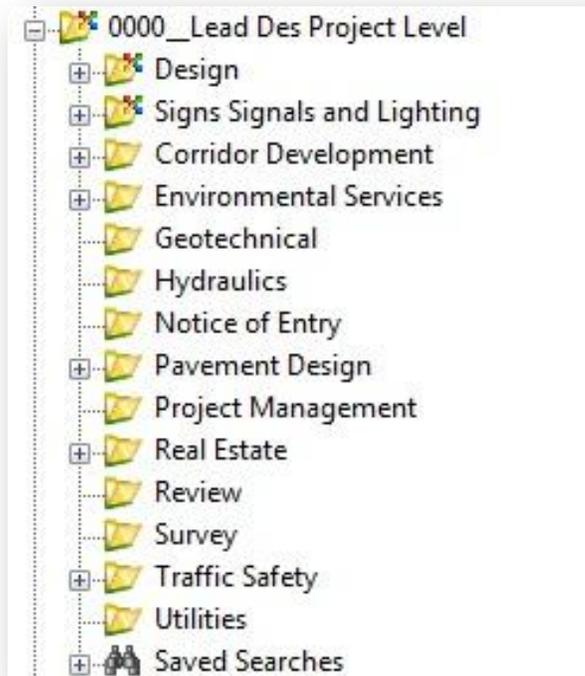
Expanding any district folder will display a list of any Des. No. that has been requested under that location. The route number and/or description will be displayed in the description field. To accommodate new features in development, the Lead/Baby Des. No. folder structure has been eliminated, and all Des. Nos. are directly under their relevant district folder.



### District w/Des. No.

Each group/discipline will have their folder structure directly under the District\Des. No. These structures are created as needed via the DOTWise Project Creator.

In the following illustration, a Project containing all currently included disciplines is shown. Depending on what stage of the project workflow you're currently in, it's possible that very few of these folders will exist at this time, and will be added later in the project development process.



### Project w/Disciplines

### **2.2-3 Other folders (Non-District Folders):**

**Corridor Development** – This group’s data is stored in this location prior to being associated to a Des. No. A corridor development folder also exists under a Lead Des. No when the data is associated to a project.

**Environmental Services** – In addition to the Environmental Services group folder under the Location: Des. No., there is also this folder which will contain all Non-Des. No. projects that is exclusive to Environmental Services.

**INDOT Workspace** – Location of the new Managed Workspace files that used to be located on the X: drive, this also includes the location of InRoads resource files such as the XIN, Drafting Notes, and cell libraries. Unless specifically directed, resources from this folder should not be used.

**INDOT Temporary Storage** – Data in the folder has been imported into ProjectWise, but has not yet been moved to the appropriate project location. This folder is not visible unless your discipline has data within it.

**Resources** – This folder takes the place of the previous Common folder. All groups will have their own folder for documents which pertain to their groups operation. The CAD Support group has also created a Design Information folder containing informational documents (formerly DSInfo).

**Roadway Services/Traffic** – This folder contains Roadway Services/Traffic data that does not apply to a Des. No.

**Standards** – The Standards group folder is directly under the Documents folder due to their differing workflow.

**Template Documents** – Contains INDOT specific document templates and seed files. These are used throughout the document creation process as needed. Specific procedures for using these documents can be found throughout this book.

**Traffic Safety** – This group’s data is stored in this location prior to being associated to a Des. No. A Corridor Development folder also exists under a Lead Des. No when the data is associated to a project.

## **2.3 ProjectWise Security Overview**

### **2.3-1 Overview:**

The DOTWise ProjectWise Datasource adheres to a strict security model, providing inner discipline security, while providing all INDOT users the ability to review other data as necessary. In addition to these security features, there are additional settings that are used administratively in order to provide rapid support and file restorations, should the need arise. These settings are as follows:

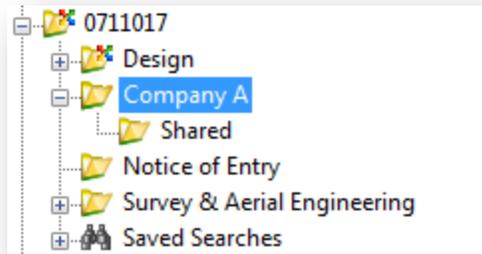
1. Projects will be created by the DOTWise Project Creator.
2. Users will not have folder delete privileges; this will aid in CAD Support’s and IOT’s ability to process restores in a timely fashion.
3. Document delete privileges will be assigned at management discretion.

4. Users will no longer be able to adjust the security settings of template folders/projects created by the DOTWise Project Creator.
5. District and central office now share a common security group. Data access and rights are based on need and positional responsibilities.

There is no longer a distinction between central office and district users. For example, instead of a central office Environmental Services group, and a separate group in each district, all Environmental Service users have the same rights across all locations and projects. This is to increase collaboration between locations with a minimal need for security adjustment.

### 2.3-2 Consultant Access

At this time, DOTWise access has been made available to the INDOT consultant community via ITAP (Section 2.1). Throughout the project lifecycle, it will be quite possible that at the root of the Des. No. to see folders named after various consultant firms. A project containing a consultant folder would look like the following:



**Des. No. with Consultant Folder**

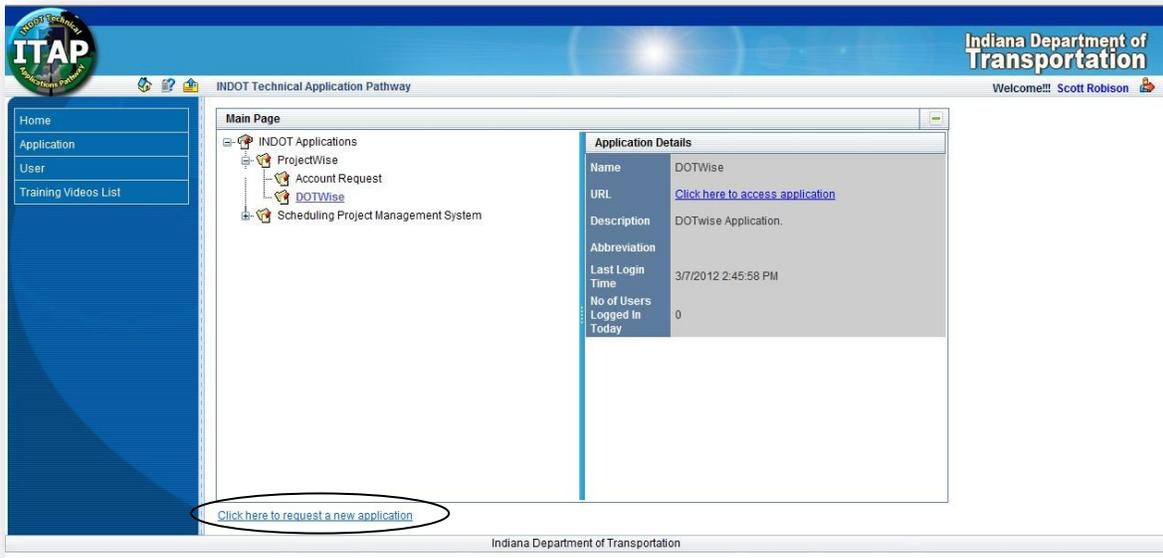
Any instance where a consultant is placing data into our datasource the following conditions will apply:

1. The folder will be named with the consultants name.
2. The consultant will only be able to see the data placed in their folder or the Shared sub-folder.
3. All INDOT Users will be able to see all consultant data.
4. The shared folder is provided for all INDOT users to place data they need to share back to the consultant (copies are recommended). Only the intended consultant will see this data.

## 2.4 DOTWise Project Creator

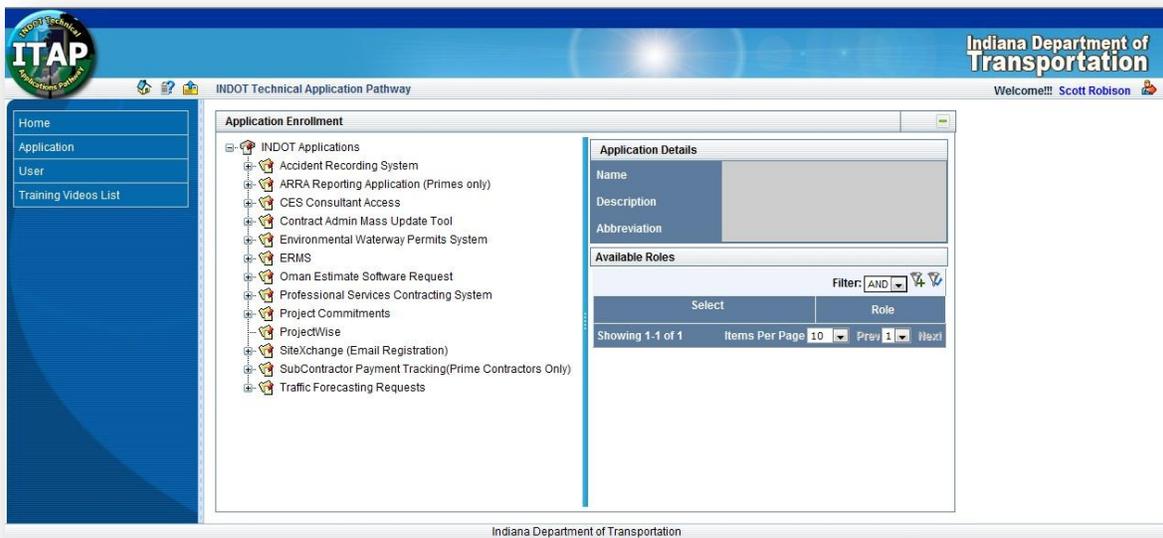
### 2.4-1 Requesting Application Access via ITAP

The Home Main Page provides a link to request access to additional INDOT applications.

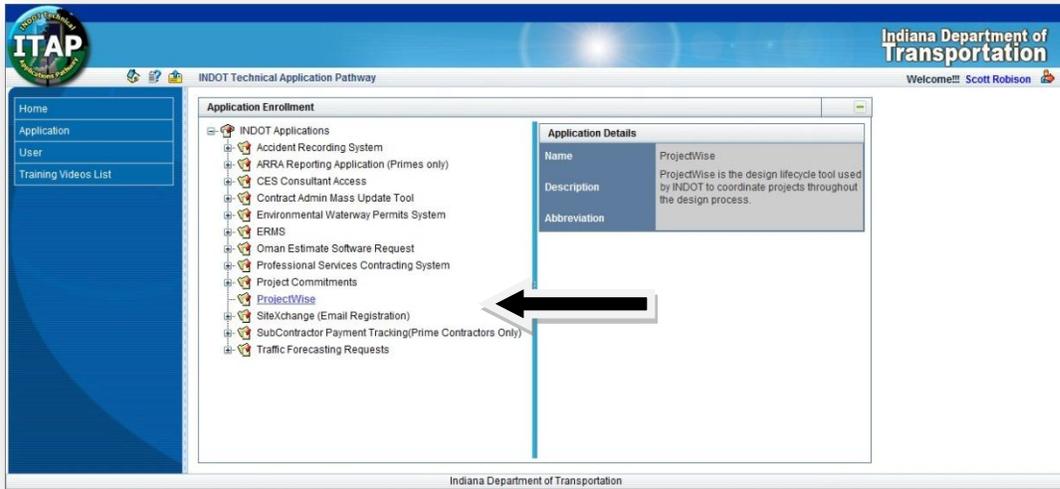


Click on the link for [Request New Application Instructions](#)

Selecting Request New Application from the ITAP Menu or the link “Click here to request access to new application” from the ITAP Home Page will display the Application Enrollment panel.



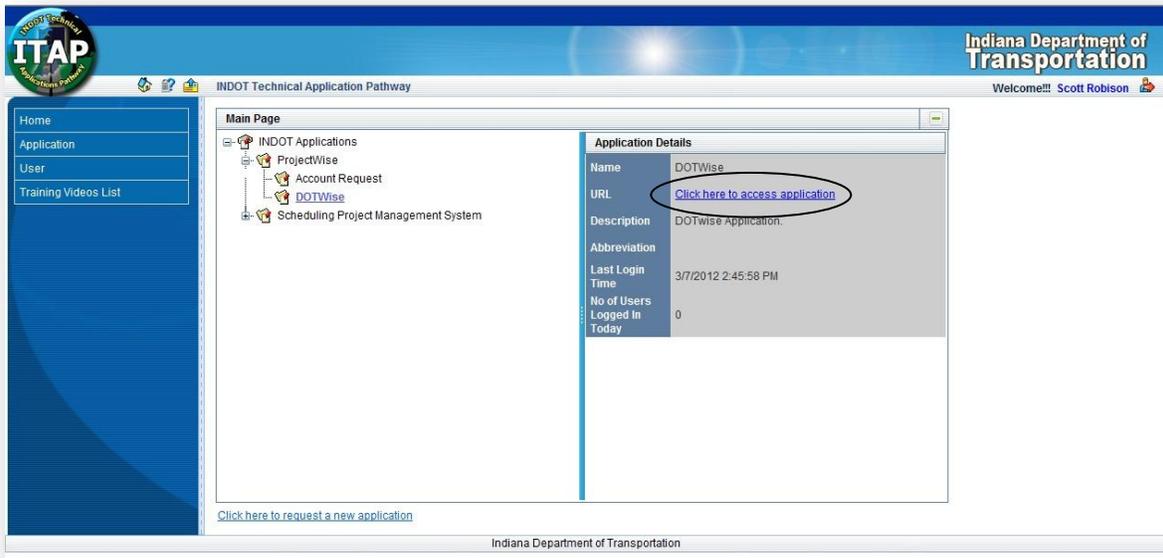
In the Application Enrollment panel, select one of the INDOT Applications from the left side of the panel. Select ProjectWise-DOTWise then the Submit button.



- An email request will be sent to your supervisor for approval. Once he/she approves the request an email will be sent to CAD support granting access to the Project Creator Web Interface.



Upon approval- You will have an active link under ProjectWise/DOTWise as shown below:



If you have additional questions about roles please refer back to 2.1-2 and 2.1-3 or

To access Online Help click on the  at the top of the screen.

To contact ITAP Support click on the  icon at the top of the screen.

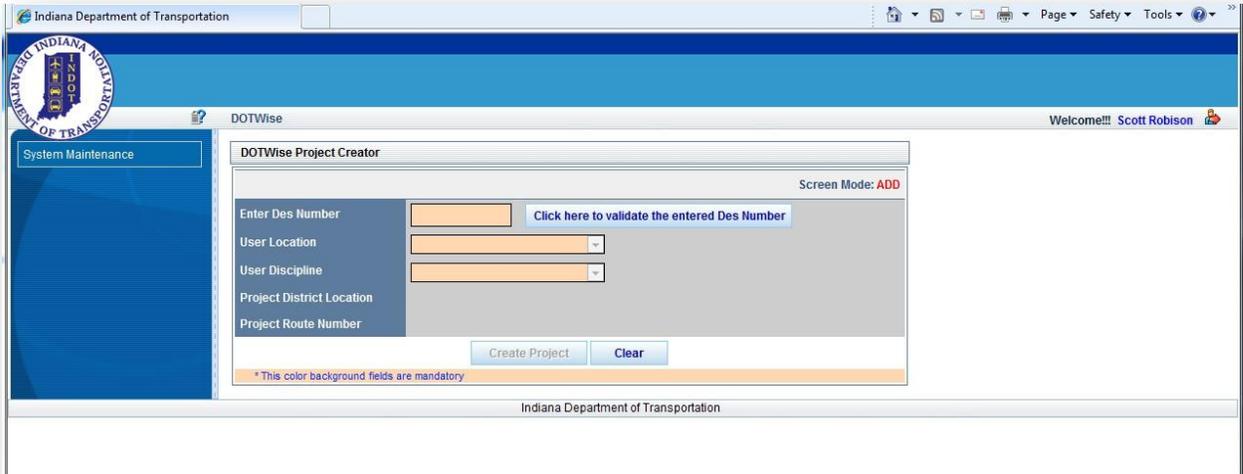
A new window will open with the Project Creator interface when the link is selected. This will be covered in the next section.

### 2.4.2 Using the DOTWise Project Creator

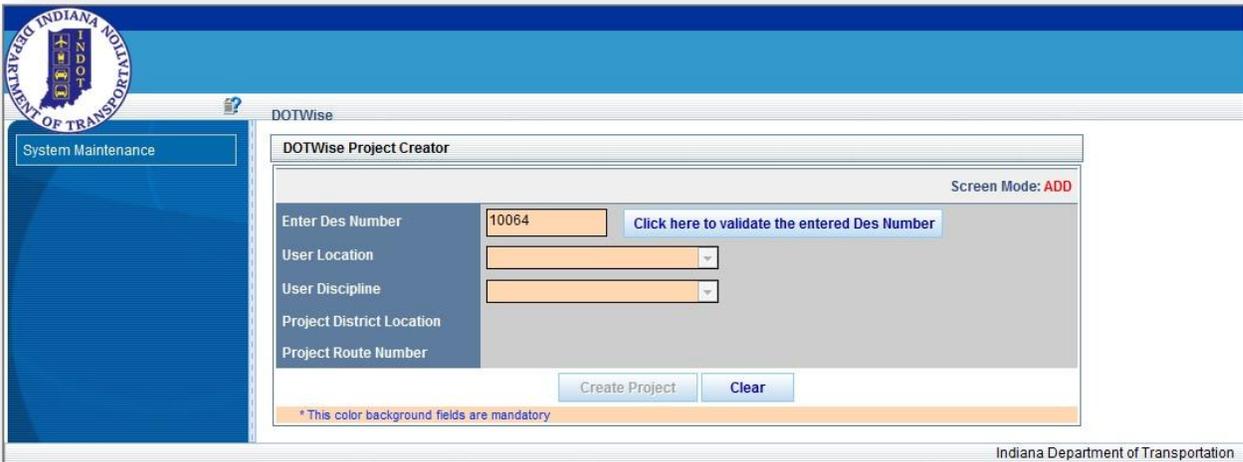
The DOTWise Project Creator tool allows internal and external users the ability to create ProjectWise projects without modifying the underlying security model.

Located at and accessed via ITAP link as shown on previous page.

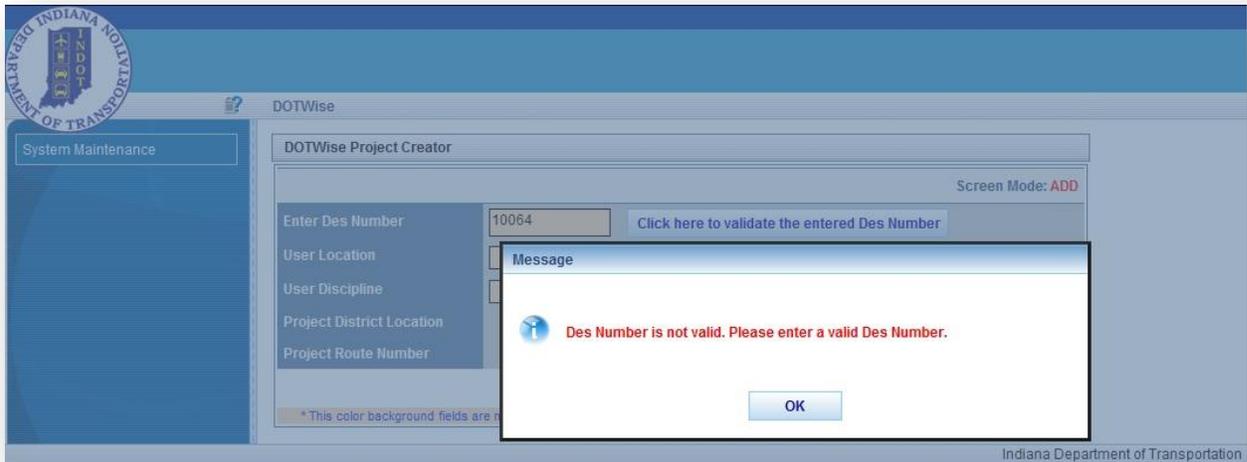
<https://entapps.indot.in.gov/dotwise/INUsers.aspx>



- To create a ProjectWise project, enter a Des Number for the project and click the **Validate Des Number** button.

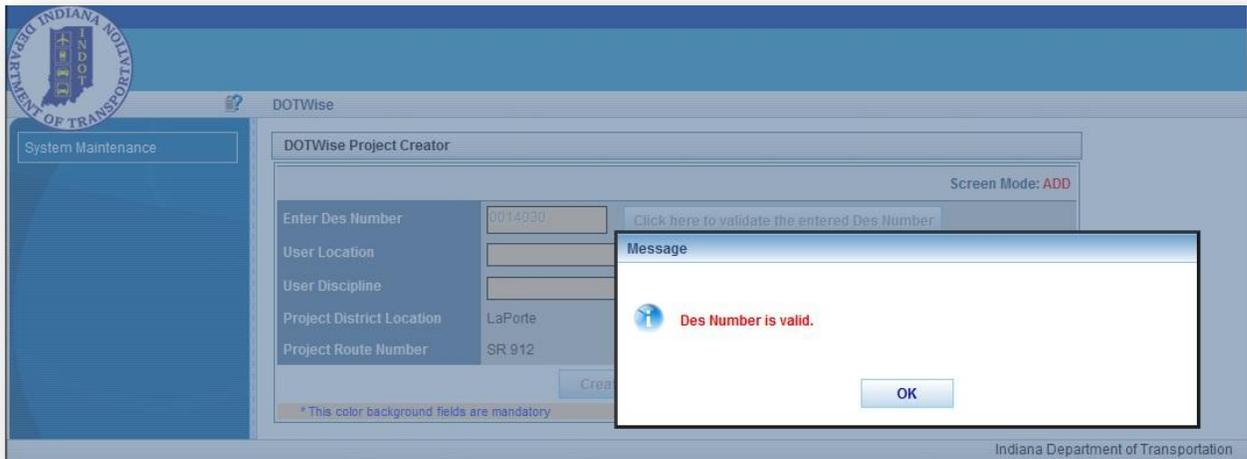


The application will check to see if the Des Number is a valid Des Number or not. If the Des Number entered is not a valid Des Number, a message will be displayed stating that the Des Number entered is not valid

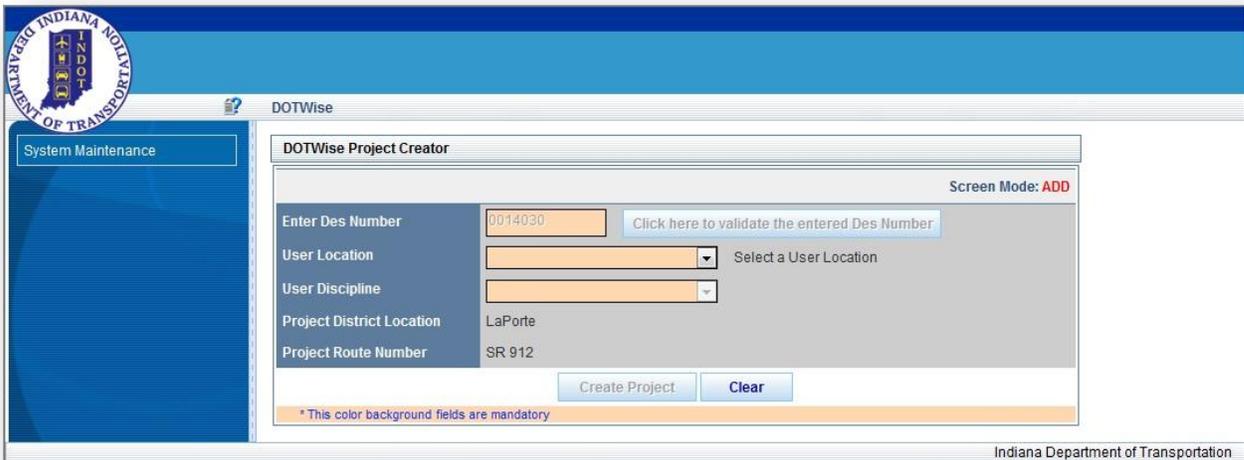


- Clicking the OK button will allow you to change the Des Number to a valid Des Number.

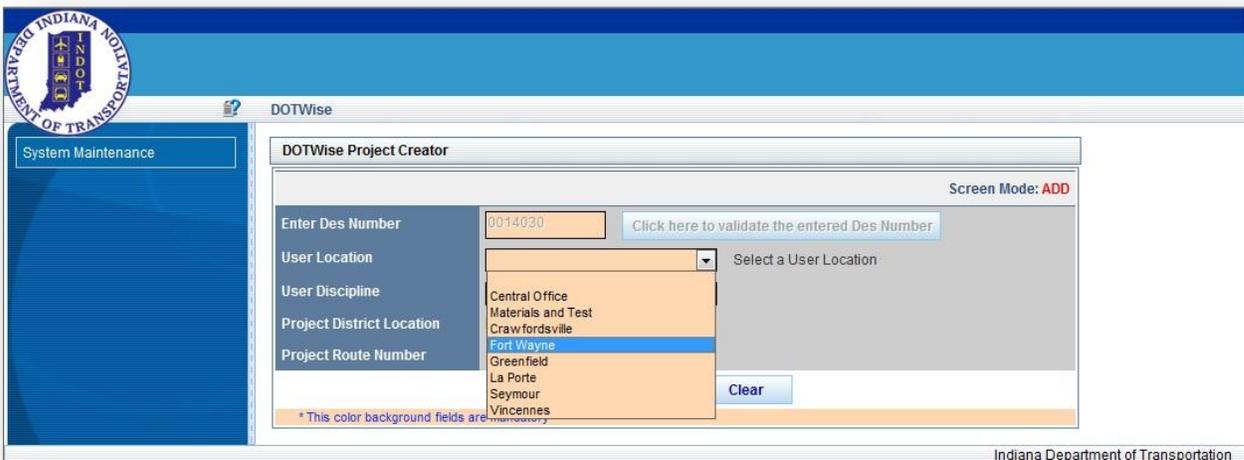
If a valid Des Number is entered, a message will be displayed stating that the Des Number is valid.



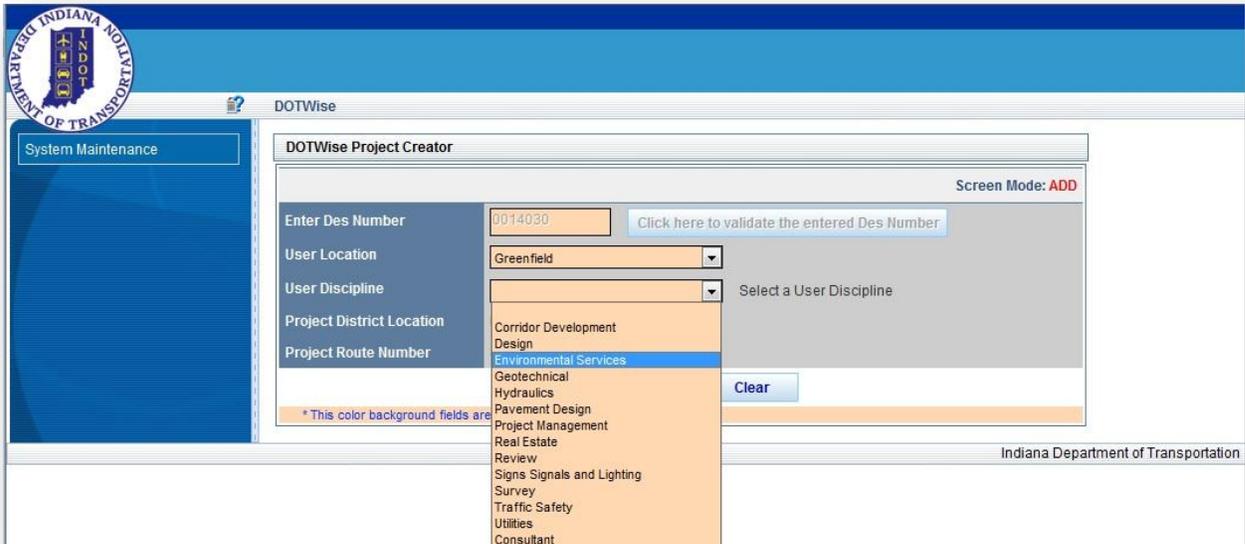
Click the OK button and you will see that the **Project District Location** and **Project Route Number** values are displayed on the form. You will also notice that the User Location dropdown list is enabled. You will also see that the Create Project button is enabled.



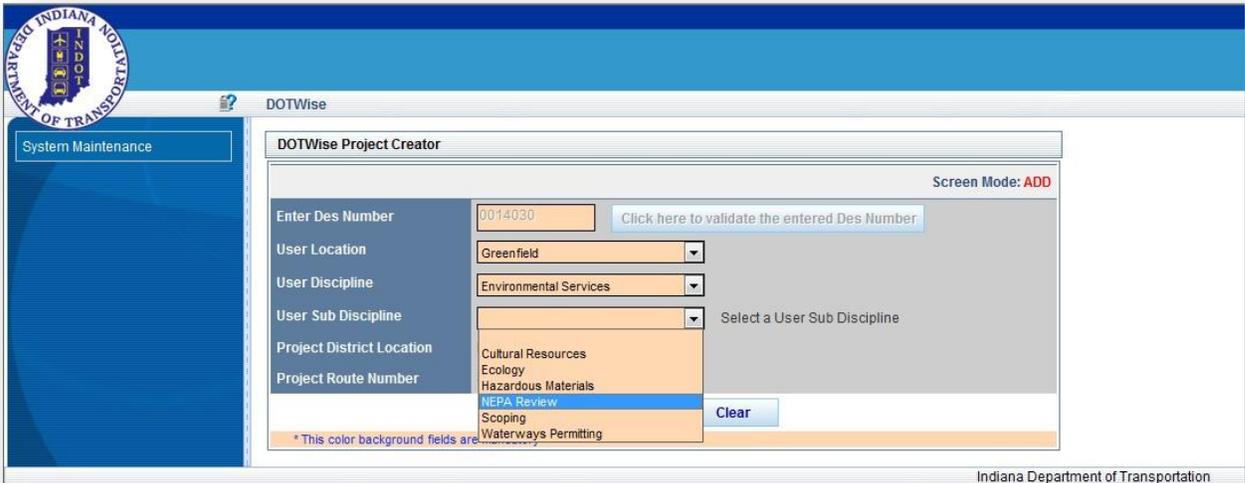
- Select a User Location from the User Location dropdown list. (Be sure to select the location where you physically reside and not where the project is being built) This will ensure the files are stored locally to where you are working). The Project District location is defined by data from SPMS.



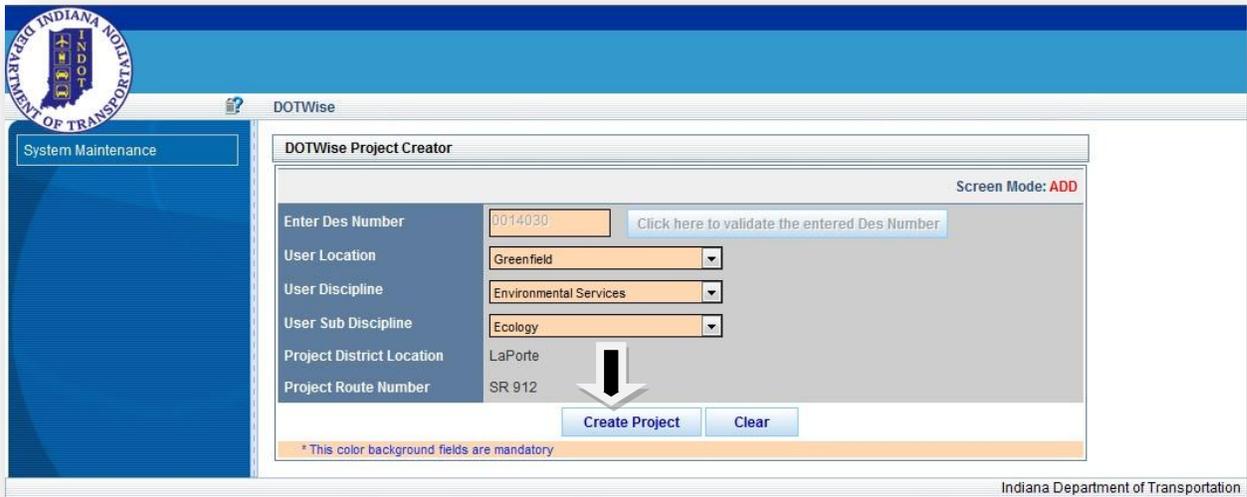
- The User Discipline dropdown list will then become enabled. Select the User Discipline in which you are working.



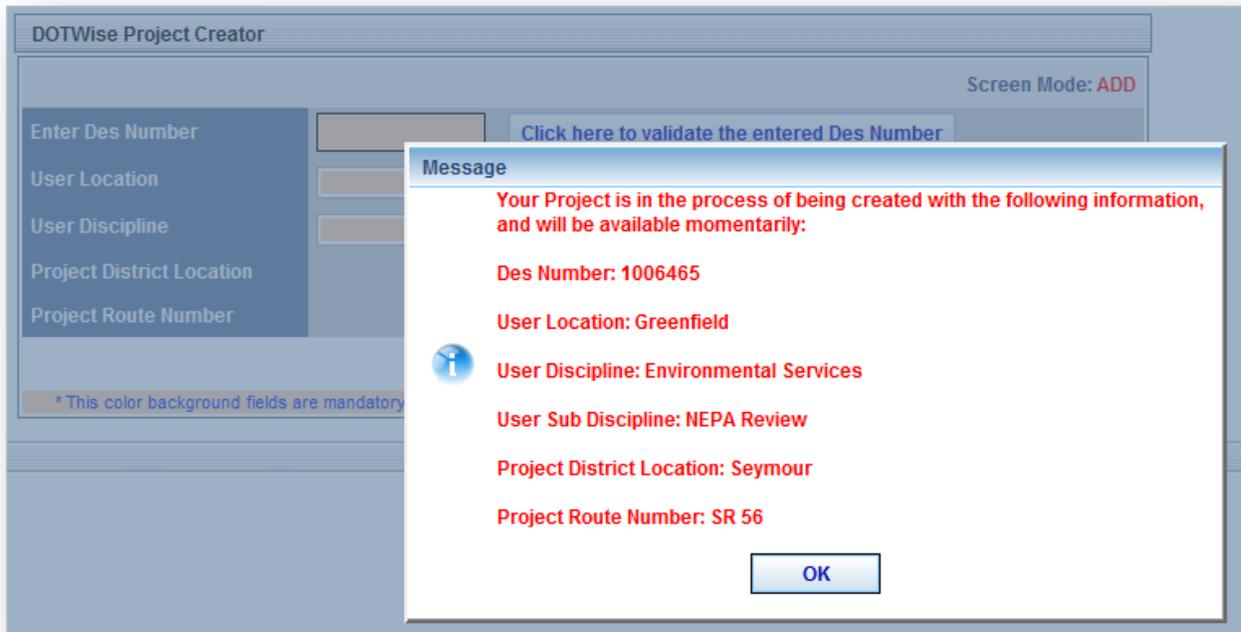
- If Environmental Services is selected, a User Sub Discipline dropdown list will become visible. If this case you will need to select a User Sub Discipline. If a User Discipline other than Environmental Services is selected, the User Sub Discipline dropdown list will not be visible and you are ready to create the project.



- To create the project, click the **Create Project** button.



*A confirmation message will appear showing that the project is in the process of being created. You will also see the project information. There may be a small delay (1-2 minutes) before project shows in ProjectWise.*



- Click the **OK** button to start a new project from the beginning.

## 2.5 Auto-Logins for Integrated Applications

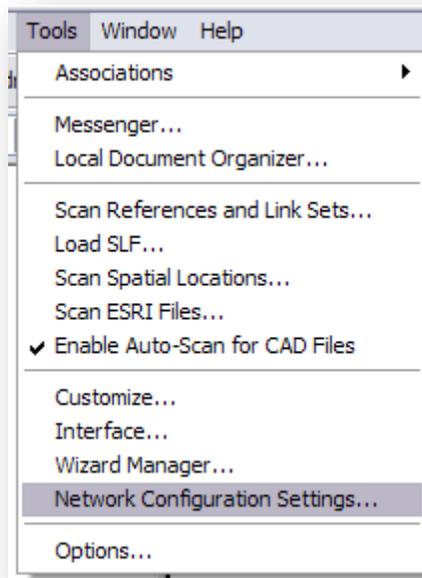
### 2.5-1 Overview:

New to V8i ProjectWise is the ability to have integrated applications such as MicroStation or Microsoft Office automatically login to ProjectWise with your user credentials. In prior versions, when attempting to use one of these applications from the desktop, you would be prompted for your login information prior to being able to communicate with ProjectWise. This new feature removes that step and allows you direct access without being prompted.

### 2.5-2 Enabling Auto-Login

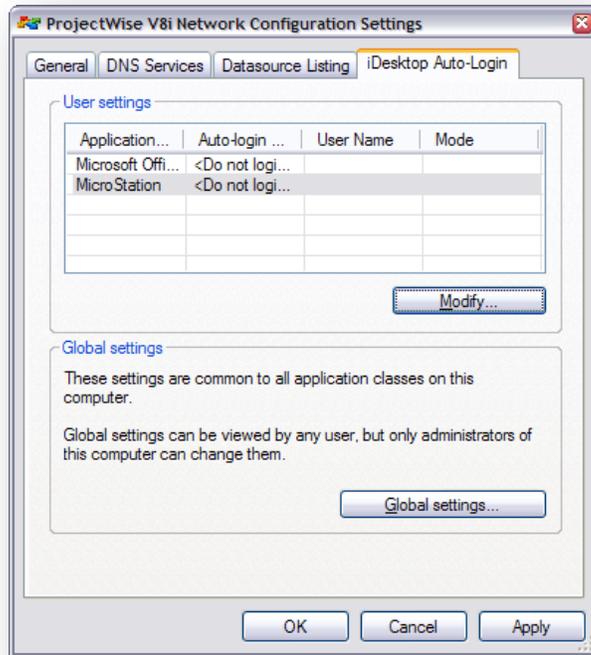
To enable this feature...

1. In ProjectWise Explorer, go to the “**Tools > Network Configuration Settings...**” option. This will present you with the network settings for your ProjectWise Client.



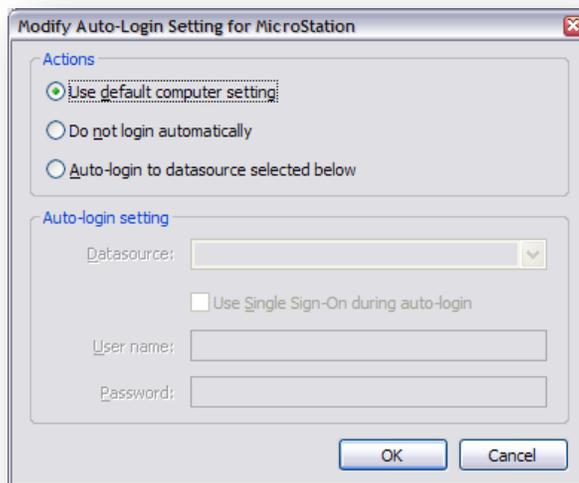
### Network Configuration Settings

2. On the displayed panel, we're concerned with the 4th tab, **iDesktop Auto-Login**. This panel shows all the integrated applications that ProjectWise has found on your machine.



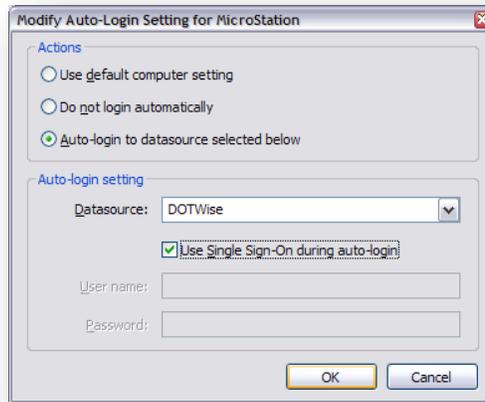
### IDesktop Auto-Login

- To enable the automatic login to your Datasource, you will need to adjust the following. First, highlight the application you wish to have auto-login. Then select the Modify button. This will present the following dialog.



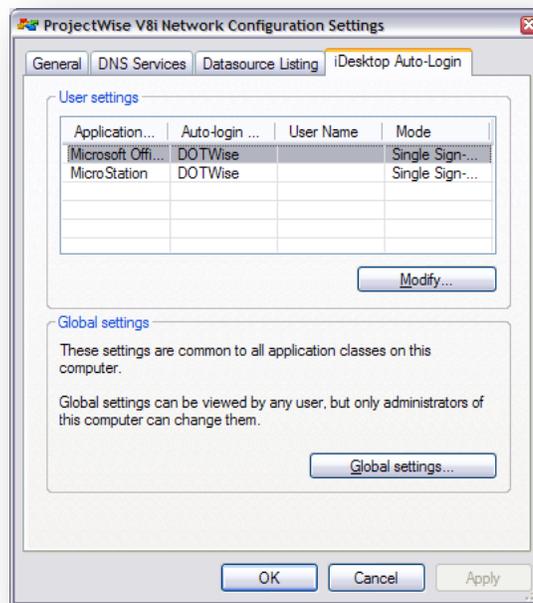
### Application Auto-Login Settings

- At this time, you will want to adjust your settings as shown. These settings will cause your client to automatically login your application to the DOTWise datasource with your user credentials.



### Enabling Single Sign On

- Finally, select OK and repeat these steps are necessary to configure auto-login for any additional applications. When completed, you're dialog will look similar to the following:



### Auto-Logins Enabled

- When completed, select OK and close any remaining windows for the Network Configuration settings.

## 2.6 Productivity Enhancements

### 2.6-1 Utilization of the Data Warehouse

The Data Warehouse is INDOT's internal data repository with the vast majority of Project related information provided by the many systems within the agency. Several departments within MIS at INDOT (GIS, CAD, and SPMS) have worked as a team to ensure that the information provided within the Data Warehouse is correct and updated in a timely manner. By bringing all the data these systems provide together, ProjectWise can use this data in a variety of ways in both the CAD environment (populate Title Sheets) and also within ProjectWise interface (project properties).

### 2.6-2 Changes to the workflow

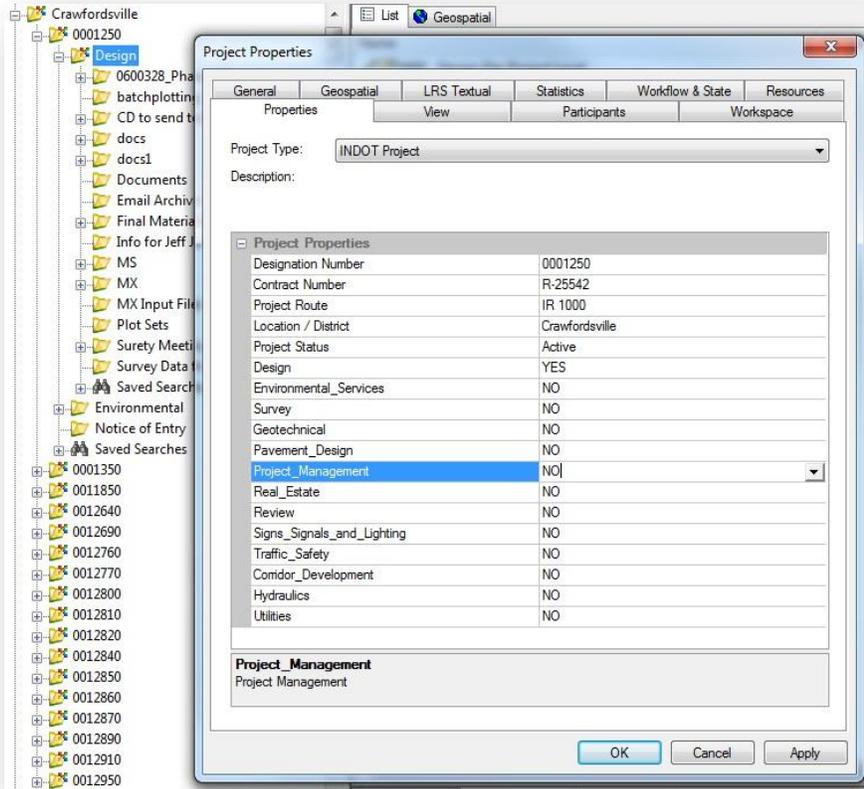
- **Separate Environments:** There are now specific Environments for each area of a project. As described below, this allows us to streamline the data available to each work group. (Environmental Services and Plan\_Production)
- **Documents Properties to populate sheet models:** One of the major changes in Version 2.0 of the INDOTWise workspace was the shift from populating sheet models with project properties to using document properties to perform this function. The major factor in this change is the fact that it allows users to utilize searches based on document attributes. This functionality has not changed for this release.
- **Similar Interfaces:** Through the use of environments, we were able to minimize the number of interfaces available while still providing the customization needed between different work groups.

## 2.7 Project Properties

### 2.7-1 Overview:

As discussed previously, projects will be created via the DOTWise Project Creator. After the project is created, project properties will be editable by the person(s) responsible for the project. There are a few variables that are populated using the data warehouse in the project properties. Others will need to be populated by the responsible parties.

**Note 1:** *All items populated using the Data Warehouse are driven by the Designation Number. If the Designation Number changes, all information will change along with it.*

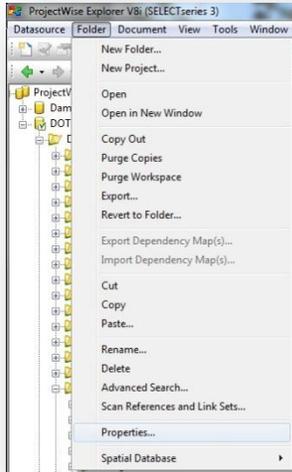


## INDOT Project Properties

**Note 2:** Contract Number, Survey Book, Project Number and Bridge File information is still populated in INDOT border sheets using Project Information. Please make sure that this information is populated in the “Design” Project Properties dialog box.

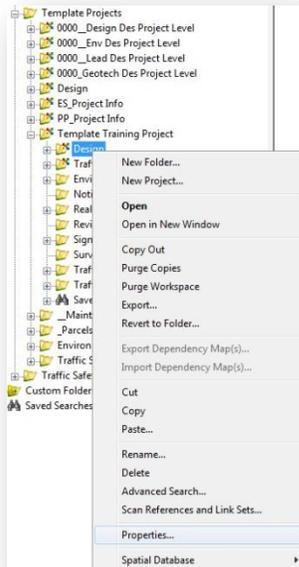
**Note 2a:** At the time of the writing of this manual, the functionality to populate some of the above described Project Properties does not exist and they will have to be keyed into the Project Properties dialog box.

To access the Project Properties dialog box, highlight your project by left mouse clicking on your project in the datasource tree in ProjectWise explorer. Then in the ProjectWise Explorer toolbar, click **Folder > Properties**.



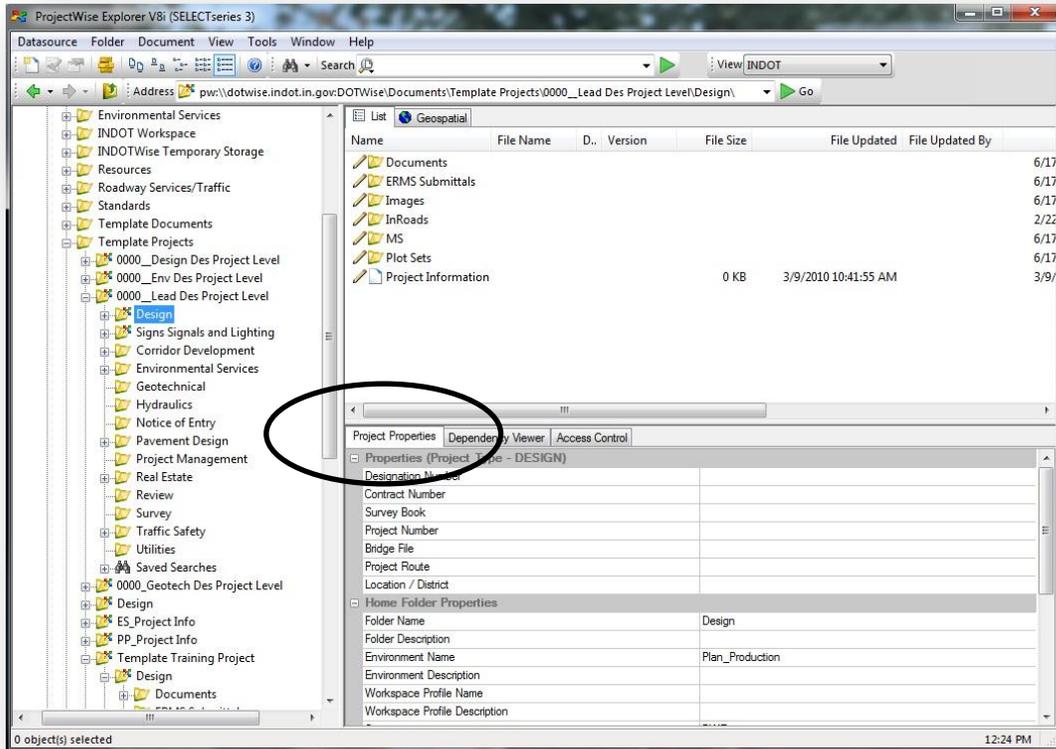
### Folder Properties Menu Item

The **Project Properties** dialog box can also be accessed by right clicking on the project in the datasource tree.



### Folder Properties Rt. Click Menu

To simply view your current project properties, left click on your project in the datasource tree. Your Project Properties will be displayed in the Properties window located in the bottom right portion of the ProjectWise Explorer.

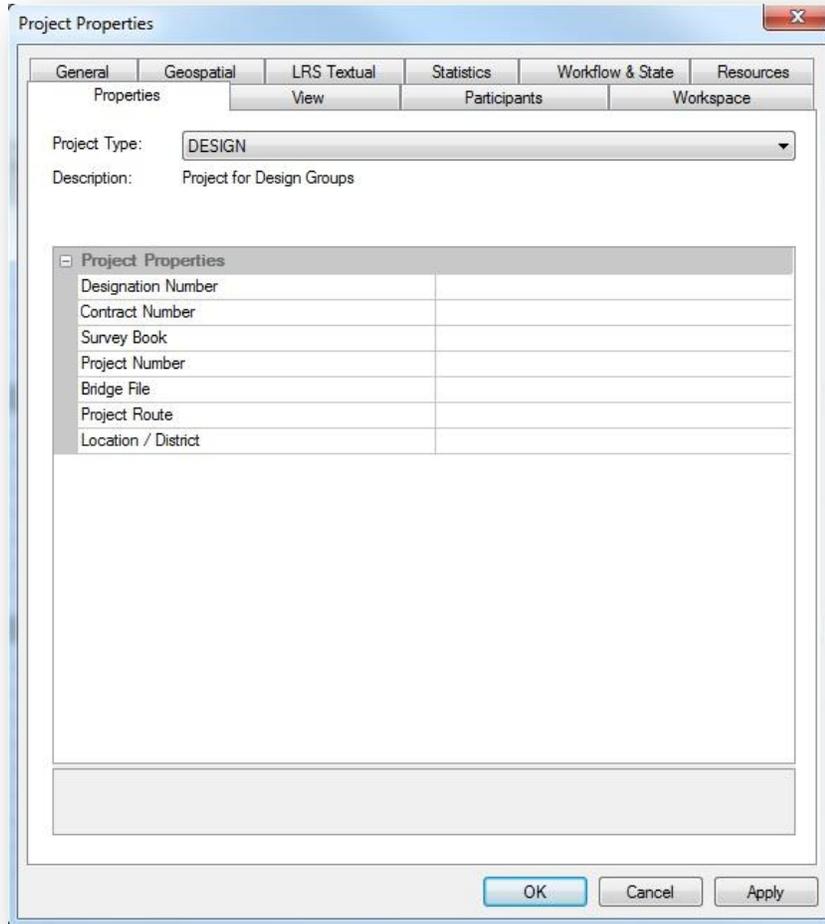


## Project Properties Tab

For a complete description of the Project Properties dialog box, and the various tabs contained within, please see the sections titled “Folder Properties” and “Project Properties” in your Bentley Institute, *ProjectWise V8i (Select Series 3) User Essentials* manual or under the *Help>Contents* menu in ProjectWise.

### 2.7-2 Modifying Custom Properties

You can add or edit the custom project properties at any time via the *Properties tab* on the *Project Properties* dialog box.



### Project Properties

Any of the items under this tab, including the Project Type can be edited by either entering text or in certain cases, by using the pre-populated pull down menu.

You will notice that within the project properties, there are 4 different instances of Project Number. The first instance (shown in the figure above) populates the border sheet of every document in the project (formerly populated using the Tinfo – Sheet Population Tool). The next three populate the middle portion of the title sheet. Due to the way ProjectWise performs it was not possible to use only one instance within the project properties to populate both the border sheets and the Title Sheet.

## 2.8 Creating New Documents

The creation of new documents is covered in the Bentley Institute Course Guide via BLN Titled *ProjectWise V8i (Select Series 3) User Essentials*.

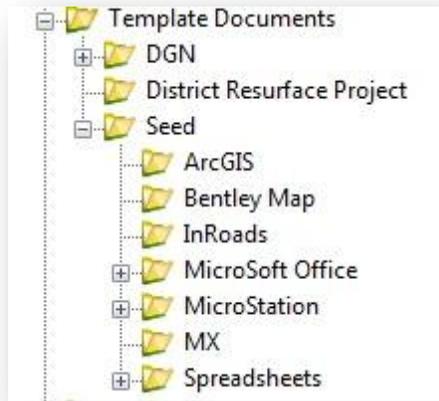
### 2.8-1 Creating Documents from ProjectWise Seed Files

When creating a new document within the INDOT Workspace, the user will need to know a few items:

- The location of the Template Documents (Documents\Template Documents\Seed).

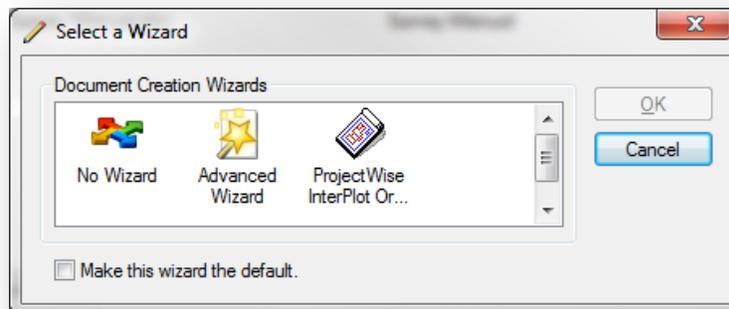
- The type of document creation wizard (Advanced or No).
- The location where the file needs to go.

**Note:** These steps apply for any document created from a pre-existing file in the ProjectWise datasource, including those for MicroStation, Office or otherwise.



### Template Documents

With the template documents located, we need to start the document creation process. With the folder you'd like to create the document in, either Rt. Click in the document panel and select New -> Document, or access this from the Document window. If you've previously defined a wizard, you may be shown a blank document panel; for this example however, the assumption will be made that no default wizard has been set. Upon starting the New -> Document command, you will be prompted with the following dialog:

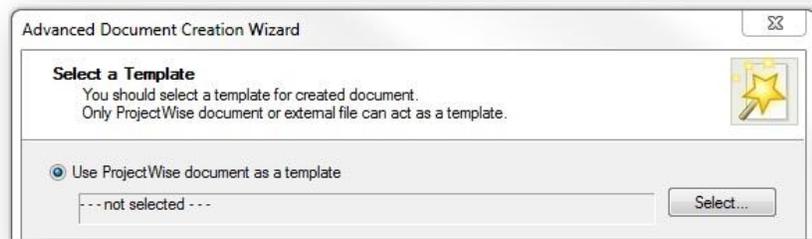


### Document Creation Wizards

Select the option for Advanced Wizard, which will begin the **Advanced Document Creation Wizard** and the accompanying steps.

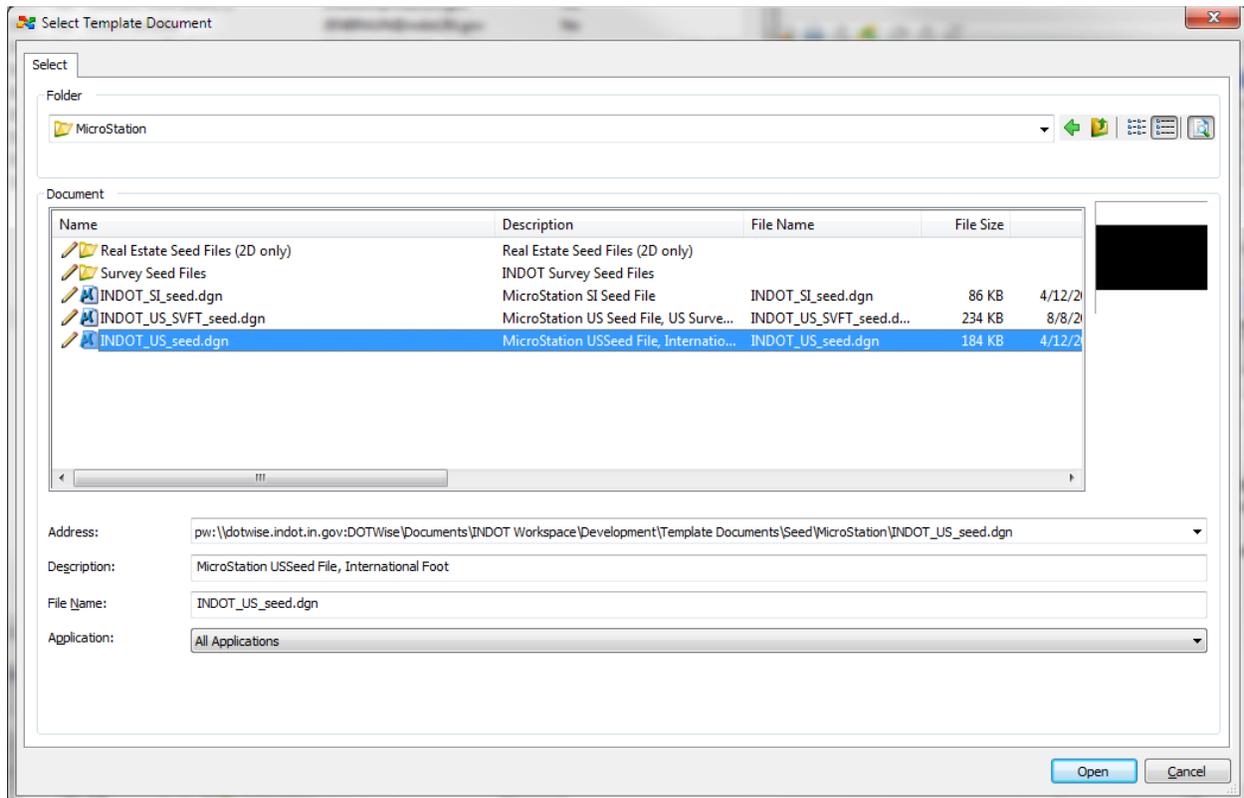
**Note:** It is highly advised that the user **NOT** check the "Make this wizard the default checkbox".

On the Select a Template dialog box, enable the *Use ProjectWise document as a template* radio button, and then click Select.



### Advanced Document Creation

Then, in the folder selection area of the following dialog box, navigate to *Template Documents\Seed\MicroStation*, and select one of the available DGN seed files.



### Selecting a Template Document

The following can also be found via the BLN Bentley Institute Course Guide Titled *ProjectWise V8i (Select Series 3) User Essentials*.

“A ProjectWise template is the same as a Microsoft template, or a seed file in MicroStation. It is a file that is copied to create a new document. You can use a document stored in ProjectWise or a document that resides outside ProjectWise as a template.”

With that being said, there have been **Template Documents** created within ProjectWise for most of the integrated applications/programs used at INDOT. These include Microsoft Office, MicroStation, ProjectWise Plot Organizer and the Microsoft Excel spreadsheet tables that are pasted as links into MicroStation.

**Note:** Be sure to give the proper file extension for the document you are creating.

<b>Example File Extensions</b>	
<b>File Type</b>	<b>Extensions</b>
MicroStation	.dgn
ProjectWise InterPlot	.ips
Adobe PDF	.pdf
Microsoft Word	.doc or .docx
Microsoft Excel	.xls or .xlsx

## 2.8-2 Importing Documents Into ProjectWise

During the course of a project, it is inevitable that you will acquire documents that are not contained within ProjectWise. Importing a Document into your ProjectWise Project can be accomplished a couple of different ways.

You may receive these documents via email, or CD/DVD, or they may reside on a network server.

### 2.8-2a Drag and Drop

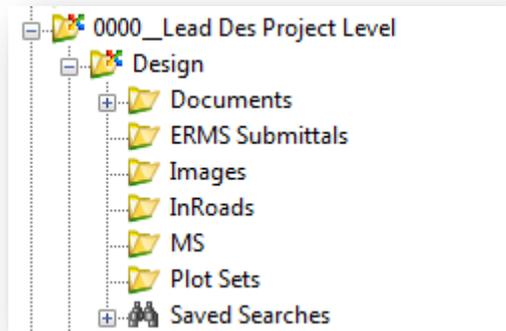
The simplest method for moving a file or files into ProjectWise is to simply use the Microsoft Windows method of dragging the file from their current location and dropping it into the appropriate project folder in your ProjectWise Explorer.

1. Using Windows Explorer, navigate to any document you wish to place into ProjectWise
2. Select the files as shown in the example.

Name	Date modified	Type	Size
Practice - Templates.rwk	2/23/2010 2:58 PM	RWK File	1 KB
SR 2067 Bypass.alg	4/28/2011 9:06 AM	Cogo Classic Doc...	13 KB
SR 2067 Bypass.dgn	5/3/2010 1:03 PM	Bentley MicroStati...	1,222 KB
SR 2067 Bypass1.alg	4/28/2011 2:59 PM	Cogo Classic Doc...	5 KB
Template Standards.itl	4/28/2011 2:58 PM	ITL File	23 KB

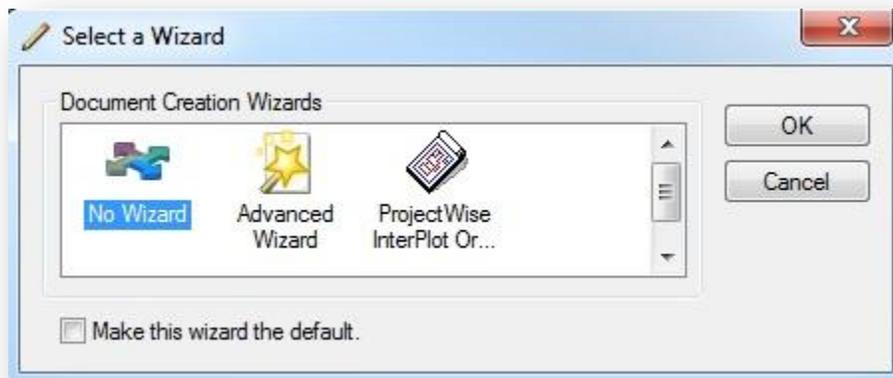
Selecting Files in Windows Explorer

- Using Microsoft Windows methodology, drag the selected files and drop them into the appropriate folder of your project.



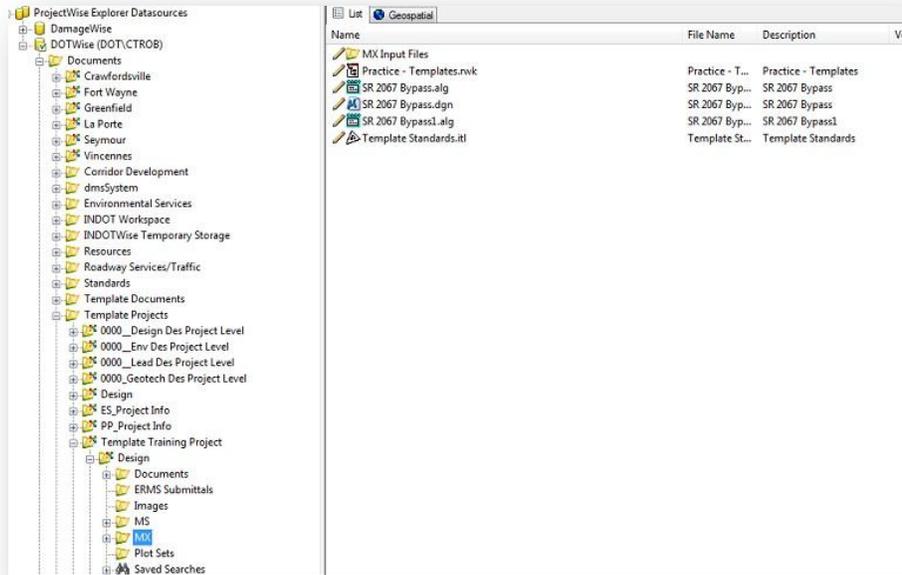
### ProjectWise Project

- Since the documents have already been created, you may select No Wizard in the Select a Wizard dialog box. Click OK.



### Document Creation Wizard Selection

- After processing, the files should appear in the Documents folder of your Project in ProjectWise Explorer. If they don't appear during the import process, you may need to refresh your view either by using the View > Refresh command, or by using the F5 key on the keyboard.

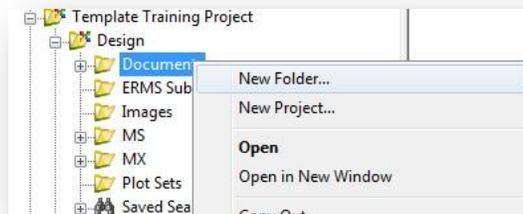


### Files Imported into ProjectWise

**Note:** When dragging and dropping files into ProjectWise, you're only making a copy of these documents in the ProjectWise datasource. If you no longer need the copies you imported, you can delete them at this time.

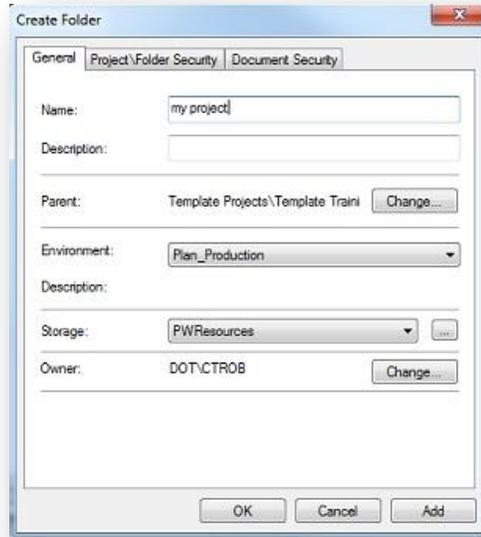
### 2.8-3 Creating folders and Moving Documents

1. In the data source tree of ProjectWise Explorer, in your project, right click on the Documents folder and select New Folder.



### Creating New Folders

2. In the Create Folder dialog box, name the folder. You may leave the Description field blank.



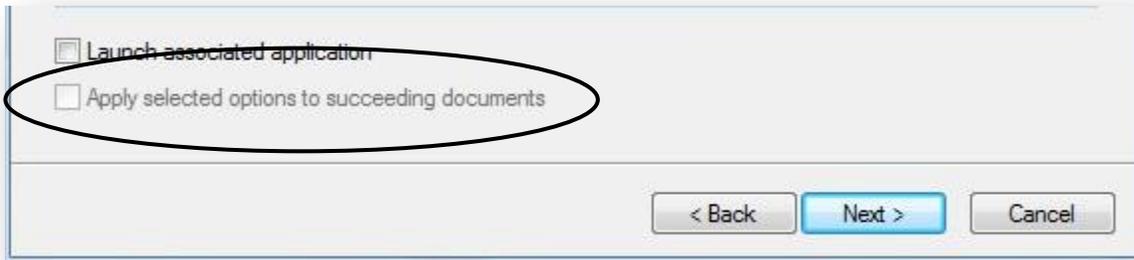
### Create Folder Dialog

3. Highlight a file then drag it from the Documents window to the Data source tree, and drop it into the folder you created.
4. In the Select a Wizard dialog box, Select No Wizard and click OK. The document will be copied, not moved to the new location.
5. Now highlight any other files and drag them from the Document Window to another folder in the Data source Tree.
6. This time, in the Select a Wizard dialog box, select Advanced Wizard and click OK.



### Wizard Selection Dialog

7. Take the defaults by clicking Next until you get to the Create a Document dialog box.
8. Enable Apply selected option to succeeding documents by clicking in the radio button, then click Next.



### Apply Selected Options to Succeeding Documents

9. Click Finish.
10. Notice that the documents have been Copied, not moved into that folder.

#### 2.8.4 Save and/or Save As

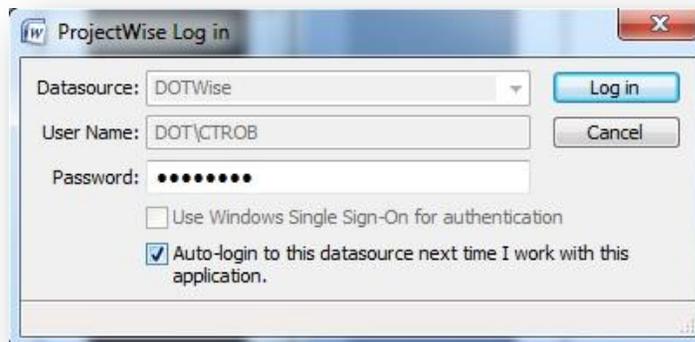
Should you create a document, such as a word or excel document, on your computer without 1st creating it in ProjectWise. You can use the Save and Save As commands to save that document into ProjectWise.

1. Start Microsoft Word or Excel from your **Start > All Programs** menu.
2. Place some text in the document.
3. In the Microsoft Word menu bar, click **File > Save**, or **File > Save As**.
4. You should get the ProjectWise Login dialog box. Place the following information in the corresponding data fields. Click Log In.
5. Alternatively, you can select the **Use Windows Single Sign-On for authentication** option.

Datasource: DOTWise (this should be populated in the pull down)

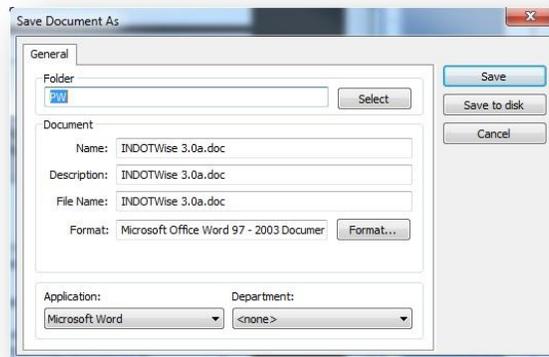
User Name: dot\*your INDOT username*

Password: *your INDOT password*

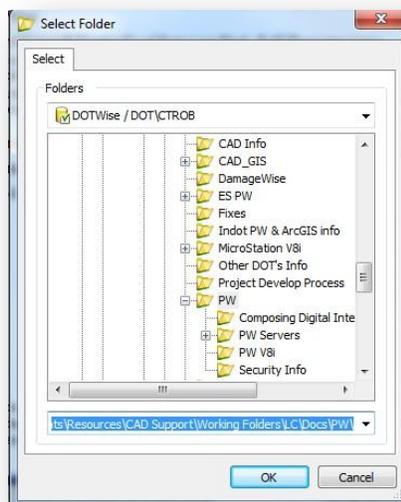


### External Application ProjectWise Login

6. In the Select a Wizard dialog box, select No Wizard and click OK.
7. In the following Save Document As dialog, click Select and navigate to the folder in your project where you want to save the document.



### External Application ProjectWise Save As Dialog



### Save As Folder Selection

8. Fill in the remainder of the dialog boxes in the Save Documents As dialog box. For ease of navigation, we suggest that you put the extension on the Document name as well as the File Name. The application window should be automatically populated. The Department drop down is optional.
9. Click Save.

**Attention:** Upon importing a CAD document (DGN, DWG, etc.) with references into ProjectWise Explorer you will want to run the Reference Scan on the file(s) that you imported. Further

information on the Reference Scan tool can be found in the ProjectWise V8i (Select Series 3) User Essentials course and your Help>Contents of ProjectWise.

## 2.9 Interfaces: The Plan Production Environment

The Environments and Interfaces discussed in the following chapters are intended to be in a constant state of improvement. Therefore if you require an addition or change at any time, please channel those requests through the proper personnel so that we may attend to them in a timely manner.

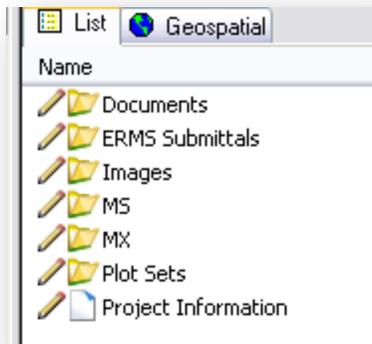
**Helpful Hint:** By setting your interface before you create a new document, you can complete that interfaces task during the document creation process.

### 2.9-1 Document Properties

As with the Project Properties, there is information in the Document Properties that is populated utilizing the information contained in the Data Warehouse. As mentioned earlier, this information is driven by the Designation Number which is entered in the Project Properties.

### 2.9-2 \_\_PROJECT INFORMATION

Each project within DOTWise will contain a non-associated (no extensions, For Information Only) document labeled **“Project Information.”** This document, along with the **\_\_Project Information** interface, can be used to view information that was retrieved using either the SPMS system or by going to the Management Information Portal (MIP).



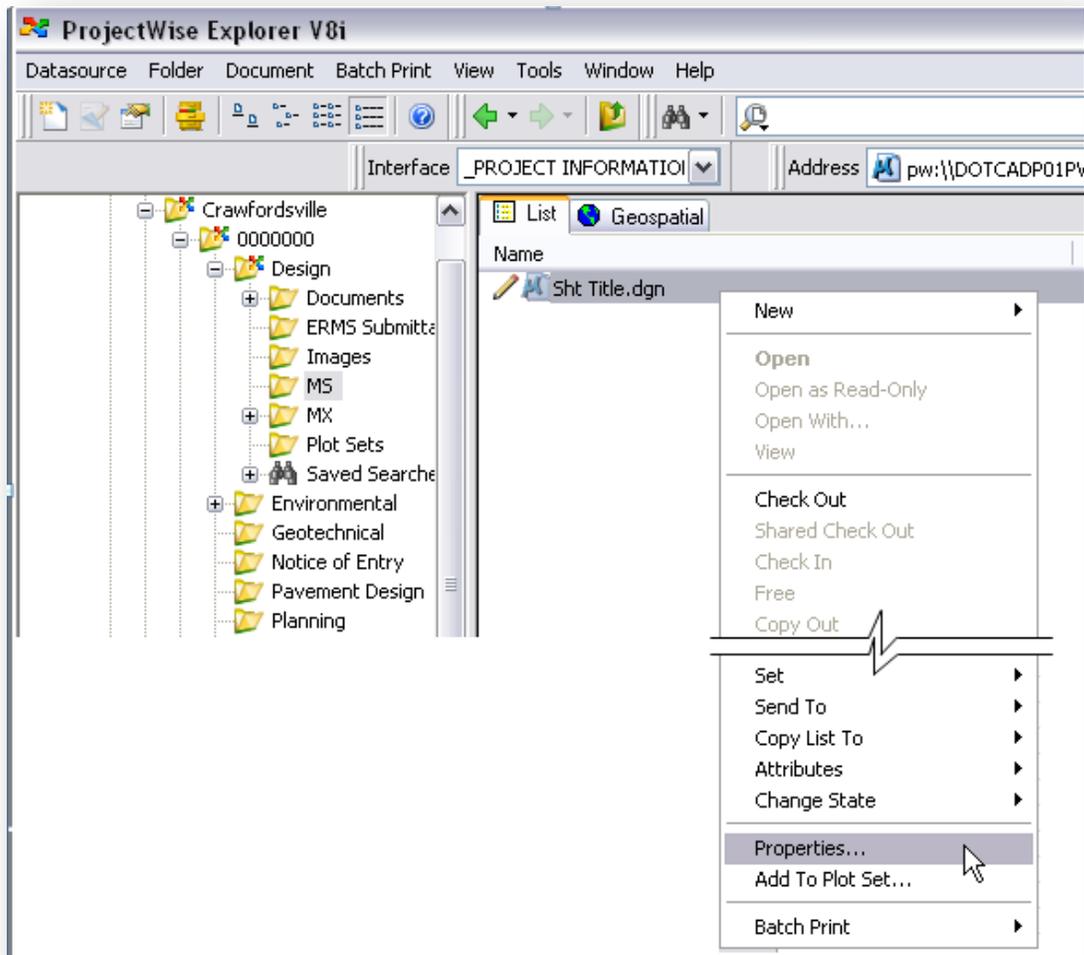
### Design Folders w/Project Information Document

In the **Plan\_Production** Environment however, the **\_\_Project Information** interface can and should be used for much more than just reporting information that can be accessed in other locations.

#### 2.9-2a \_\_PROJECT INFORMATION Interface, Attributes Tab (Universal Title Sheet)

The Universal Title sheet is intended for use with **ALL** Title sheets. As was the case with the previous release of INDOTWise, a Null response is accepted. This means that if you do not have information for a certain field in the interface, then it is acceptable to leave that field blank. (Example: Bridge information on a Roadway project)

To access the Universal Title sheet, set your Interface to **\_\_Project Information** and go to the properties of the applicable file. (Hint: The shift bar is a shortcut to document properties.)



### Opening Document Properties

On the **Document Properties** dialog, select the **Attributes** tab.

**Universal Title Sheet**

**PLAN TYPE** \_\_\_\_\_

DESCRIPTION: Intersection Improvement

LOCATION: At CR 300S (Township Line Rd), 1.0 mile N of US 40

AREA ENG. COUNTY. NO. \_\_\_\_\_

PLANS PREPARED BY: Kristine M. Thomas PHONE NUMBER 317-233-2064

PROJECT ROUTE SR 267

FROM RP TO RP AT RP

10+62 10+84 \_\_\_\_\_

PROJ. NO. CONST	GROSS LENGTH	BRIDGE LENGTH
1294018	0.22	0
PROJ. NO. PE	NET LENGTH	RDWY LENGTH
1294018	0.22	0.22
PROJ. NO. RW	MAX. GRADE	TOTAL_LENGTH
1294018	1.56	0.22

BRIDGE FILE \_\_\_\_\_

STRUCTURE NO. \_\_\_\_\_

SPEC DATE	COUNTY	SURVEY BOOK	DESIGNATION
2010	Hendricks		0012850
LATITUDE	LONGITUDE	CONTRACT	PROJECT
N 39°43'07.	W 86°23'58.	R-31222	

A.A.D.T. 2014 10550 V.P.D.

A.A.D.T. 2034 13535 V.P.D.

D.H.V. 2034 950 V.P.H.

DIRECTIONAL DIST. 50 %

TRUCKS 9

7 % D.H.V.

DESIGN SPEED: 45 M.P.H.

PROJ. DES. CRIT.: 3R (NON-FREEWAY)

FUNC. CLASS.: PRINCIPAL ARTERIA

RURAL / URBAN: URBAN (SUBURBAN)

TERRAIN: LEVEL

ACCESS CONTROL: NONE

Save Undo Close |< < 45/104 > >|

### The Universal Title Sheet Interface

This interface has been created with the intention that it should serve every title sheet in use by INDOT Design. This includes 24" x 36" Roadway and Bridge Title sheets, as well as the 8.5" x 11" Title sheets.

#### **2.9-2b** **PROJECT INFORMATION Interface, More Attributes Tab (Project Information)**

The **More Attributes** tab provides some of the information that would otherwise be found in the MIP or SPMS. This is provided for your convenience. However there are a few fields to take note of.

Attribute	Value
Project Status:	Active
Sponsored By:	Indiana Department of Transportation
Designed By (Agency):	Crawfordsville District
Letting Start Date:	2013-10-23 00:00:00
Letting Finish Date:	2014-01-15 00:00:00
Program Class:	Normal Project
City Boundary:	
Urbanized Area:	Not Applicable
District Location:	Crawfordsville
Sub District Location:	Cloverdale Sub
Program Manager:	Mark Albers
Project Manager:	Elle Dieckmeyer
Project Mgr. Email:	edieckmeyer@indot.in.gov
Project Mgr. Phone:	7653615270
Land Acq. Code:	4439
# Of Parcels:	29
Transportation System:	On Federal Aid
Stage 1 Design:	
Stage 2 Design:	
Stage 3 Design:	
Final Contract Documents	
Document File Name:	pw:\DOTCADP01PW.indot.state.in.us:DOTWise\Documents\Crawford
Update Project Info	

### More Attributes

**Document File Name:** This is provided as an additional resource for INDOT users to cut and paste the document file name into a problem report.

**Update Project Info:** The More Attributes tab is set up in such a manner that all fields should update automatically. However, there may be a time that the user wishes to make sure he or she has the most current information. In that case, simply select “**UPDATE**” in the editable field (pull down), then select “**Save**” from the dialog box.

### 2.9-3 \_\_SIGNATURE

Use of the \_\_SIGNATURE interface is discussed in Chapter 4 of this manual

### 2.9-4 REVISIONS

The REVISIONS interface has not changed and is still used in the same manner as the previous release.

### 2.9-5 DESIGNED/DRAWN/CHECKED BY

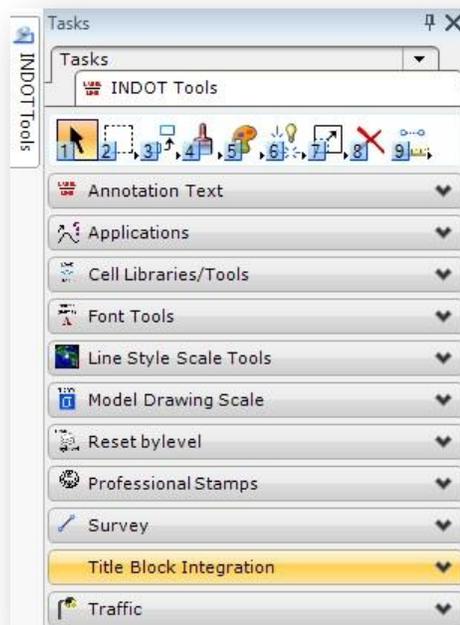
Due to the ability to create multiple sheets in one .dgn, the Title Block Integration for this interface has been removed from the INDOT sheet models. However, we have provided a methodology for using this interface, for those that wish to take advantage of this functionality. By default, some of the InRoads sheets do contain this functionality, so please verify whether or not your file has these fields prior to replacing them.

## 2.10 Title Block Integration

### 2.10-1 Overview:

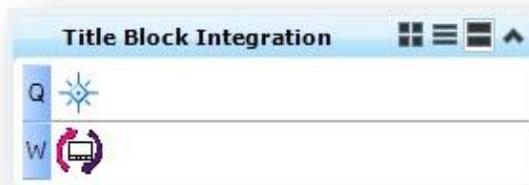
Due to the move from using Project Information to populate our title blocks to using document interfaces, there has been a new task bar developed in MicroStation to allow for use of some of our Title Block Integration cells (tag sets).

The new task bar is titled *Title Block Integration* and can be found under the INDOT Tools workflow:



### Task Navigation – Title Block Integration

The Title Block Integration task bar consists of only two tasks.



## Title Block Integration Tools

- **Attach Cell Library:** This attaches the “*Title Sheet Integration*” cell library which in turn contains 5 cells for use with the various interfaces available.
- **Update Title Block:** This updates all title block information driven by document interfaces.

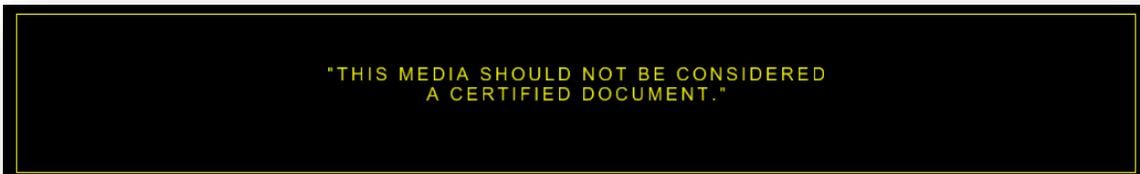
### 2.10-2 Title Sheet Integration Cell Library

The Title Sheet Integration Cell Library consists of 5 cells. The orientation of these cells is set so that the lower right corner of the large “D” size sheets.

PLAN SHEETS	
\$PAGE_NUM\$	of \$TOTAL_PAGES\$
PROJECT	
\$PROJ_NO\$	
Title Sheet Integration.cell placement point	

### 2.10-2a elect\_sig\_box

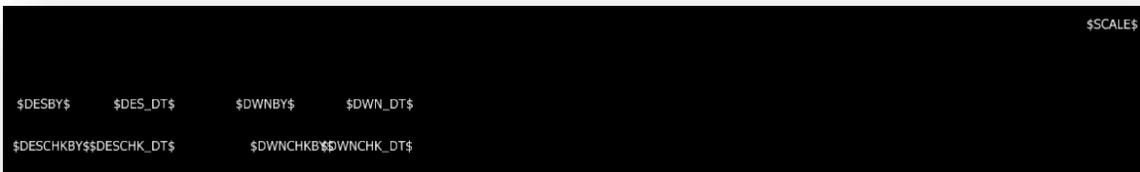
The elect\_sig\_box cell is intended to be used with electronic signatures. The process of utilizing electronic signatures is discussed in detail in Chapter 4.



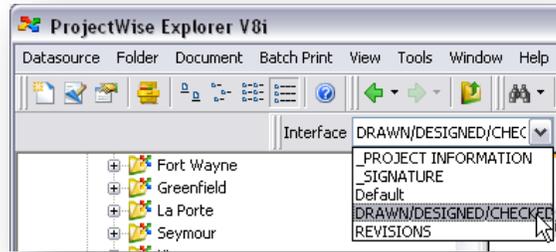
## Signature Placeholder

### 2.10-2b checkedby

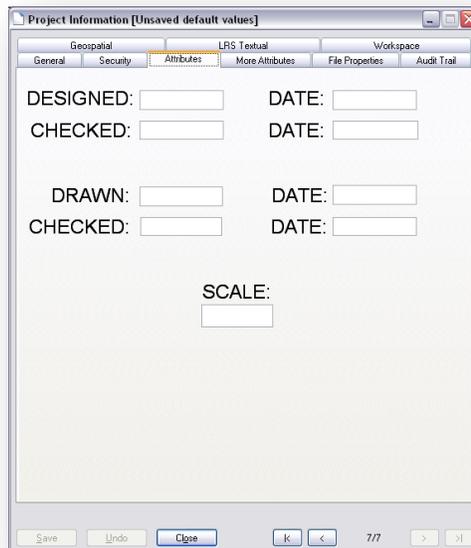
The checkedby cell is intended to be used with the *DRAWN/DESIGNED/CHECKED* interface and the *Plan Production* environment within ProjectWise.



## Drawn By/Checked By Cells



### Drawn By/Checked By Interface Selection



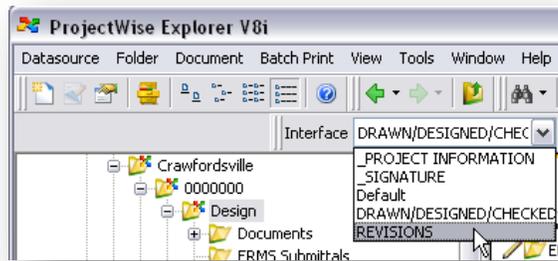
### Drawn By/Checked By Interface

#### 2.10-2c Revisions

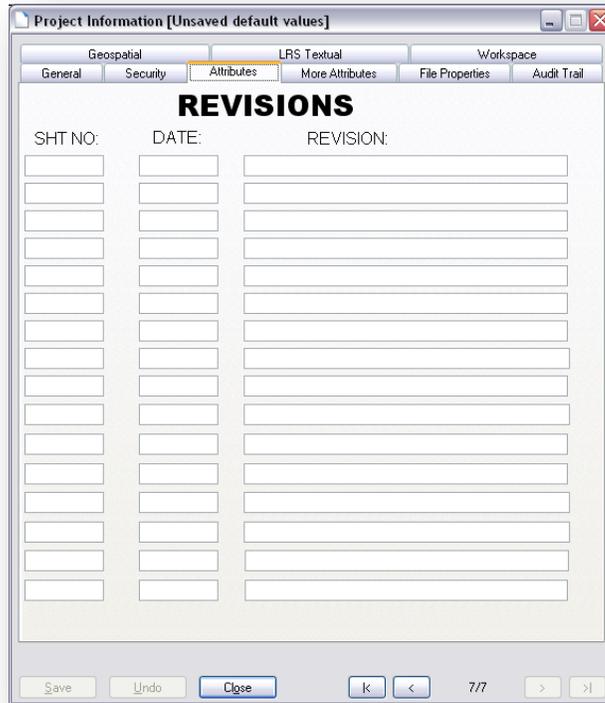
The revisions cell is intended to be used with the **REVISIONS** interface and the **Plan Production** environment within ProjectWise.

\$sht1\$	\$date1\$	\$rev1\$
\$sht2\$	\$date2\$	\$rev2\$
\$sht3\$	\$date3\$	\$rev3\$
\$sht4\$	\$date4\$	\$rev4\$
\$sht5\$	\$date5\$	\$rev5\$
\$sht6\$	\$date6\$	\$rev6\$
\$sht7\$	\$date7\$	\$rev7\$
\$sht8\$	\$date8\$	\$rev8\$
\$sht9\$	\$date9\$	\$rev9\$
\$sht10\$	\$date10\$	\$rev10\$
\$sht11\$	\$date11\$	\$rev11\$
\$sht12\$	\$date12\$	\$rev12\$
\$sht13\$	\$date13\$	\$rev13\$
\$sht14\$	\$date14\$	\$rev14\$
\$sht15\$	\$date15\$	\$rev15\$
\$sht16\$	\$date16\$	\$rev16\$

### Revisions Cell



### Revisions Interface Selection



### Revisions Interface

#### 2.10-2d *sht\_num*

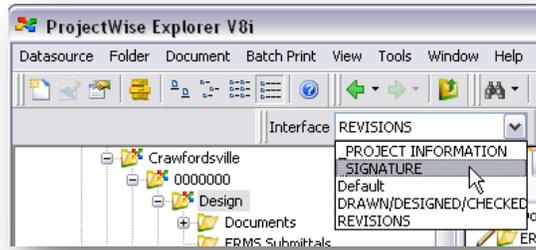
The sht\_num cell is intended to be used with the automatic page numbering feature available through ProjectWise InterPlot Organizer

#### 2.10-2e *signature*

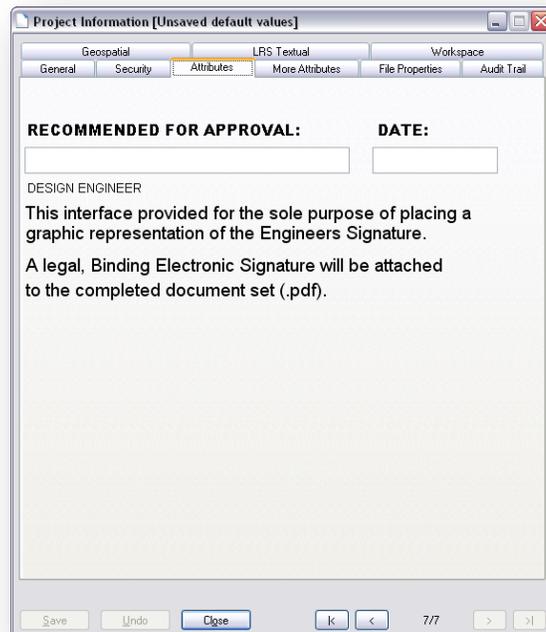
The signature cell is intended to be used with the \_SIGNATURE interface and the Plan Production environment within ProjectWise. Further instructions on the use of this feature are in Chapter 4 of this manual.



### Signature Cell



### Signature Interface Selection



### Signature Interface

**WARNING:** With the exception of the sheet\_num cell, all of the cells contain tag sets with very distinctive names. Placement of the cells in sheet models that already contain these tags, or placing duplicate cells in sheet models, may result in these cells not working. If you have issues of this type please contact CAD Support via a Help Desk ticket.

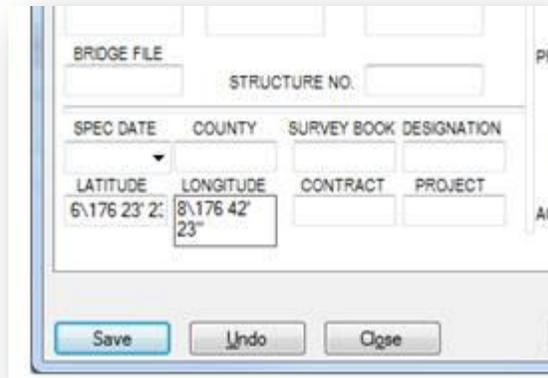
#### 2.11 ProjectWise Interfaces and Special Character Integration

With this release of the CAD Workspace, non True Type fonts are no longer available for use in the CAD Environment except for the SignCAD fonts. With this change, the procedure for using special characters has changed and Windows special characters will now be used..See the table at the end of this section for a listing of windows special characters that may be of interest. Some font, such as Tahoma and Arial will now be using their true type definitions. This may be distinguished in the interface by the font name being preceded by a TT instead of the Bentley B symbol.

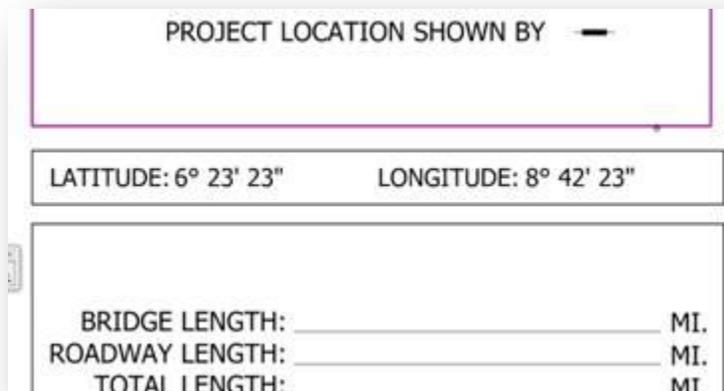
One area of interest is the use of the Universal Title Sheet interface in ProjectWise to place the Latitude and Longitude on an INDOT Title Sheet.

To do so, simply place the phrase “\176” immediately following the numerical entry for the amount of degrees.

Example: For 6 degrees 23 minutes and 23 seconds you would type 6\176 23’ 23” as seen in the illustration below.



MicroStation will then process the “\176” and place the degree symbol in its place as shown below.



### Special Characters

<i>Symbol</i>	<i>Ascii</i>	<i>Description</i>
°	\176	Degrees
±	\177	Plus or minus
¼	\188	Fraction: One Fourth
½	\189	Fraction: One Half
¾	\190	Fraction: Three Fourths

## 2.12 Revised Template Sheet Models

### 2.12-1 Overview:

To reduce duplication and ease navigation, we have split up sheets\_eng.dgn into two separate files.

**D size\_sheets.dgn:** All 24 x 36 (D size) sheet models now reside in this design file.

**Ltr\_sheets.dgn:** All 8.5 x 11 (letter size) sheet models now reside in this design file.

In addition to separating the large format sheet models from the smaller ones, MicroStation's ability to convert units on the fly has allowed for the metric versions of these sheet models to be removed.

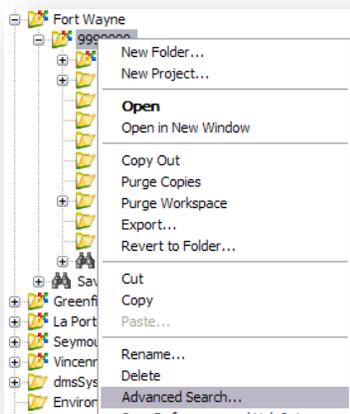
## 2.13 Searching

### 2.13-1 Search Form and Search Builder

As with the previous version of ProjectWise, searching plays an important role in interacting with your documents on a day to day basis. Searching via the Search Form or Search builder has not change significantly in this version. (Information from the *ProjectWise V8i (Select Series 3) User Essentials* course is still applicable.)

The largest change to searching in this version deals with the new interfaces being provided for attribute data. As shown in the previous chapter, a large amount of document attribute data is being processed automatically out of SPMS. In order to search for this data, we will need to use the Search Form with the appropriate Environment and Interface selected.

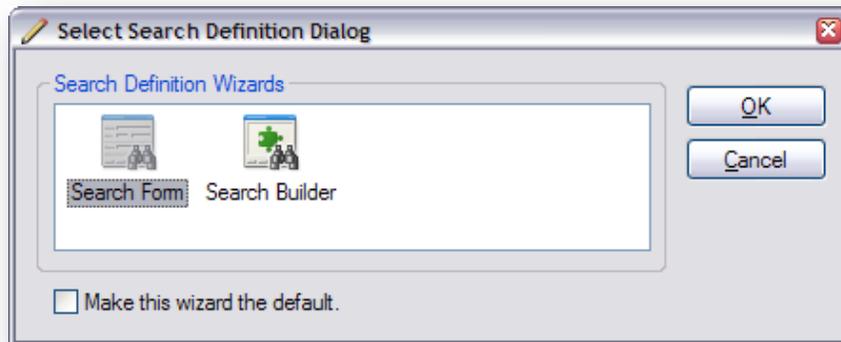
### 2.13-2 Performing a Search on Document Attributes



#### Starting an Advanced Search

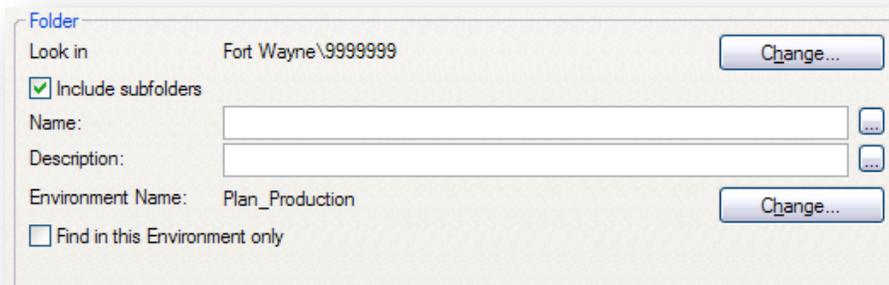
1. Select your folder via a right-click and navigate to **Advanced Search**:
2. You will then be prompted for the search method you would like to use. For this example, we will be using the **Search Form**. You could also select the **Search Builder** should you prefer to perform your search in a different method. At this time, you may also define one of the

methods as your default search style. Should you need to change this setting, you may adjust the options under **Tools > Wizard Manager** and selecting the Search Definition Tab.



### Selecting a Search Type

3. Once in the Search Form, you will need to define the Environment you're searching in. This is done by adjusting the Environment Name area in the Folder portion of the panel. In the following illustration, we are showing a selection being performed on documents in the Plan\_Production environment. It is NOT required that you toggle "Find in this Environment only" for these searches, however it is recommended. Should an identically named attribute be present in a different environment and have information that is the same as what you've searched on, it will be returned as a valid result.



### Folder and Environment Definition

Search by Form - DOTWise

General | **Attributes** | More Attributes | File Properties | Full Text | LRS Textual

### Universal Title Sheet

**PLAN TYPE** [Dropdown]

DESCRIPTION: [Text Field]

LOCATION: [Text Field]

PLANS PREPARED BY: [Text Field] PHONE NUMBER: [Text Field]

PROJECT ROUTE [Text Field]

FROM RP [Text Field] TO RP [Text Field] AT RP [Text Field]

PROJ. NO. CONST	GROSS LENGTH	BRIDGE LENGTH
PROJ. NO. PE	NET LENGTH	ROWY LENGTH
PROJ. NO. RW	MAX. GRADE	TOTAL LENGTH

BRIDGE FILE [Text Field] STRUCTURE NO. [Text Field]

A.A.D.T. [Text Field] V.P.D. [Text Field]

A.A.D.T. [Text Field] V.P.D. [Text Field]

D.H.V. [Text Field] V.P.H. [Text Field]

DIRECTIONAL DIST. [Text Field] % [Text Field]

TRUCKS [Text Field] % D.H.V. [Text Field]

DESIGN SPEED: [Text Field] M.P.H. [Text Field]

PROJ. DES. CRIT.: [Text Field]

FUNC. CLASS.: [Text Field]

RURAL / URBAN: [Text Field]

TERRAIN: [Text Field]

ACCESS CONTROL: [Text Field]

SPEC DATE [Text Field] COUNTY [Text Field] SURVEY BOOK [Text Field] DESIGNATION [Text Field]

LATITUDE [Text Field] LONGITUDE [Text Field] CONTRACT [Text Field] PROJECT [Text Field]

Look For [Add OR Group] [Clear] [Saved Search]

[OK] [Cancel] [Apply]  Show results in new window

Searching Title Sheet Attributes

Search by Form - DOTWise

General | Attributes | **More Attributes** | File Properties | Full Text | Geospacial | LRS Textual

Origin #: [Text Field]

KIN #: [Text Field]

Lead Project? [Text Field]

Associated DES Nos. [Text Field]

Project Status: [Text Field]

Sponsored By: [Text Field]

Designed By (Agency): [Text Field]

Letting Start Date: [Text Field]

Letting Finish Date: [Text Field]

Program Class: [Text Field]

City Boundary: [Text Field]

Urbanized Area: [Text Field]

District Location: [Text Field]

Sub District Location: [Text Field]

Program Manager: [Text Field]

Project Manager: [Text Field]

Project Mgr. Email: [Text Field]

Project Mgr. Phone: [Text Field]

Land Acq. Code: [Text Field]

# Of Parcels: [Text Field]

Transportation System: [Text Field]

Stage 1 Design: [Text Field]

Stage 2 Design: [Text Field]

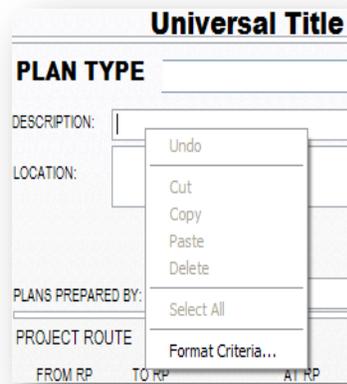
Look For [Add OR Group] [Clear] [Saved Search]

[OK] [Cancel] [Apply]  Show results in new window

Searching More Attributes

- Once you've selected the environment you'd like to search with, you will then navigate to the Attributes or More Attributes tab (This is dependent on the environment your documents use, further information provided in the first section of this document.) at the top of the Search Form. On this panel, you will see the attribute layout for the environment. For this example, we're looking at the INDOT Universal attribute layout for Plan\_Production.

**Note:** Unlike the document attribute panel, the Search Form version of this panel has no locked fields. This is to allow you the ability to search on any field available and retrieve documents that have the information you need.



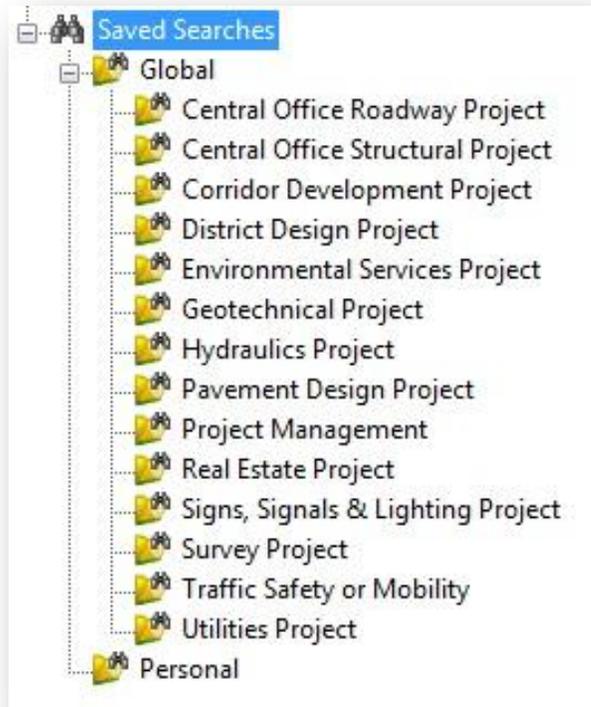
### Format Criteria for Searches

At this point, you will then be able to search for documents using any available field on the Attribute Panel. As a reminder, you can use Format Criteria on any field in order to perform more intelligent searches. You can do this by right-clicking any field as shown and selecting **Format Criteria**:

As you complete the setup of your search, you may then execute the search, or proceed to save it and re-use it as necessary. The default behavior for saved searches is to associate them with the project you're currently working in. Should you wish to adjust this, you will need to browse to the ROOT level in the location browser. This will allow you to save your own personal searches that are not associated to a specific project.

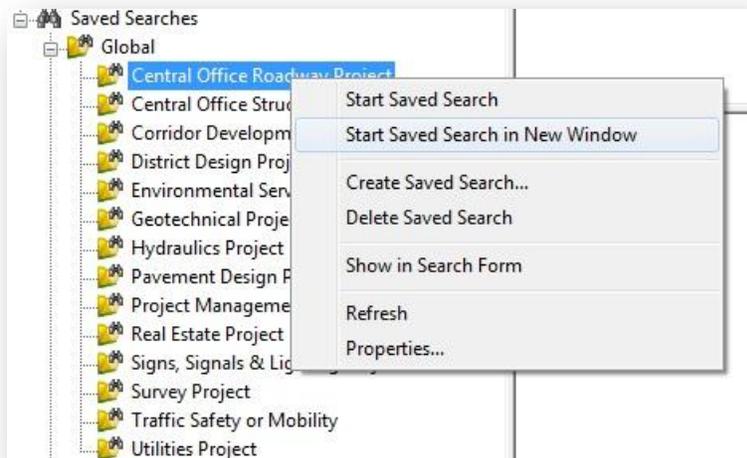
### 2.13-3 Saved Searches

Within ProjectWise, pre-configured saved searches are now being provided. At the district level, Saved Searches that relate to each Discipline are provided; such as Survey, Design, etc. Under each Des. No., searches are provided for a variety of document types and time last modification times. These are basic searches over the entire project but will allow for a quick access to information within.



### District Level Saved Searches

**Note:** When performing saved searches, we recommend you push the output to a new window. You can do this by right clicking on the saved search and selecting **Start Saved Search in a New Window** as shown:



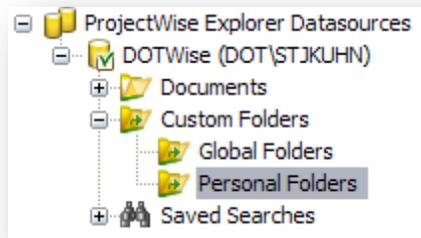
### Running a Saved Search to a New Window

This will provide a secondary window with your search results allowing for the ability to browse both the datasource and your search at the same time.

## 2.14 Custom Folders

With the current folder structure being used in ProjectWise, all users will see the full list of active projects across the agency. In order to ease browsing through this data to get to the project you need, *Custom Folders* have been enabled for your use.

In your document tree you will see an entry for Custom Folders underneath the Documents folder:



### Custom Folders

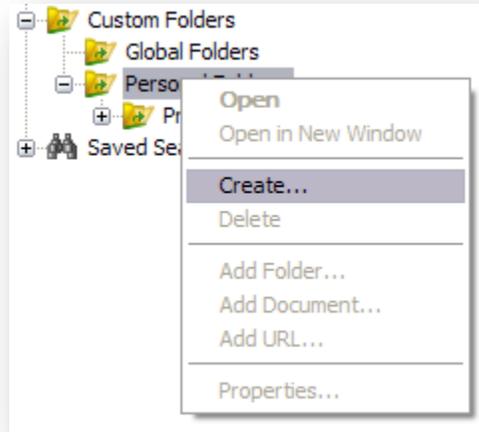
The Custom Folders can be thought of as a “Favorites” for ProjectWise. By using these folders, you can virtually bookmark your project in the datasource allowing for fast access without the need to drill into the datasource to find it. When linking to documents or full projects within the datasource, all data in that location is virtually linked back to the location of files/projects in ProjectWise. As this is a live link to the original data, all rights in regards to folder/document creation/deletion apply.

**NOTE:** *If you delete a document in your custom folders, it will delete it from the data source if you have the document delete rights.*

The following steps will walk you through the steps of creating a set of Custom Folders and linking to your data.

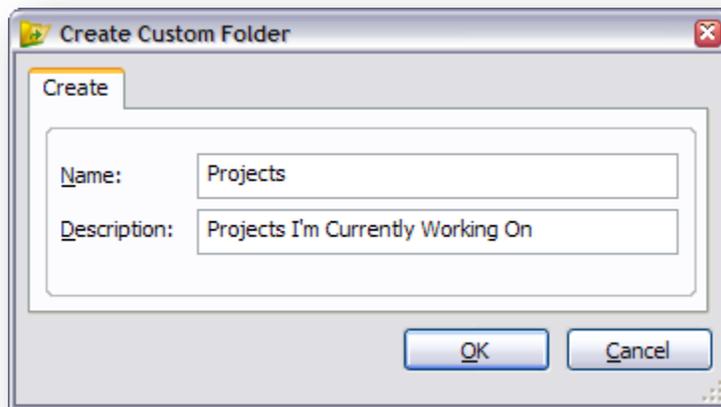
#### 2.14-1 Using Custom Folders

1. In ProjectWise, navigate to the Custom Folders and expand them. Right click on *Personal Folders* and select create:



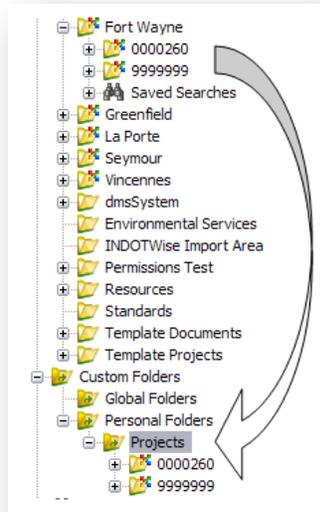
### Creating a Custom Folder

2. When prompted, create your personal folders. Some possible custom folders you may wish to have are for active projects, region projects, or for resource documentation.



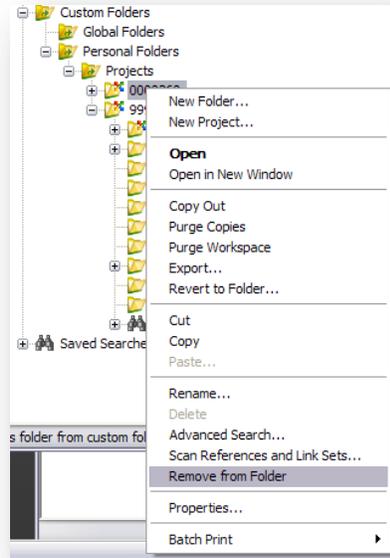
### Creating a Custom Folder

3. Once you've created your folder, it shows up under the Personal Folders in ProjectWise. This folder is one only you can see, so each person will need to setup their Custom Folders however benefits them the most.
4. At this point, you're now ready to begin populating your Custom Folder. You do this by dragging and dropping anything you'd like into the Custom Folder of your choosing. This will create a live link to your data.



### Dragging a Folder/Document into Custom Folders

- Should you wish to remove any link from your custom folder, right click on the project/file and select **Remove from Folder**. This will remove the link without modifying your data. Any other method of deletion/removal will delete your data depending on your permission levels.



### Removing an Item from Custom Folders

## 2.15 Applications without ProjectWise Integration

As has been discussed, ProjectWise provides a managed environment for working with your documents and data. It achieves this through a combination of file operations and application

integration with applications such as MicroStation, ProjectWise InterPlot, and Microsoft Office Applications. The user experience with these applications is almost transparent as the direct application integration allows the user to open/modify/save files directly to and from the ProjectWise datasource.

What happens with applications that are not integrated though? This section will explain the events that happen and procedures that will need to be taken to work with a small subset of the applications that are used by Production during the Project Lifecycle.

Currently, there are a few non Bentley applications that are being used at INDOT that do not have native ProjectWise integration (i.e. MathCAD, SignCAD). If you have questions about a particular application you are using and its integration with ProjectWise contact CAD support.

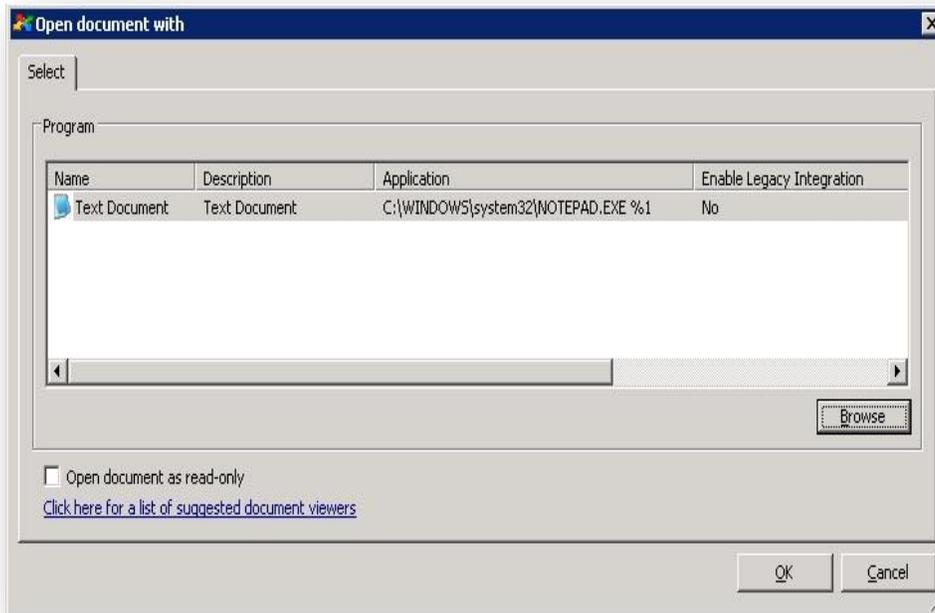
As these programs lack ProjectWise Integration, you may have to perform additional steps to retrieve your data and then work with it. In the following sections we will discuss the options available to work with these types of data.

### **2.15-1 Working with Non-Integrated Applications**

ProjectWise allows the end user to work with applications that are not integrated two ways. The first way is by providing a semi-managed/integrated environment. In this instance, ProjectWise relies on the file extension to guess what application the file should be opened in.

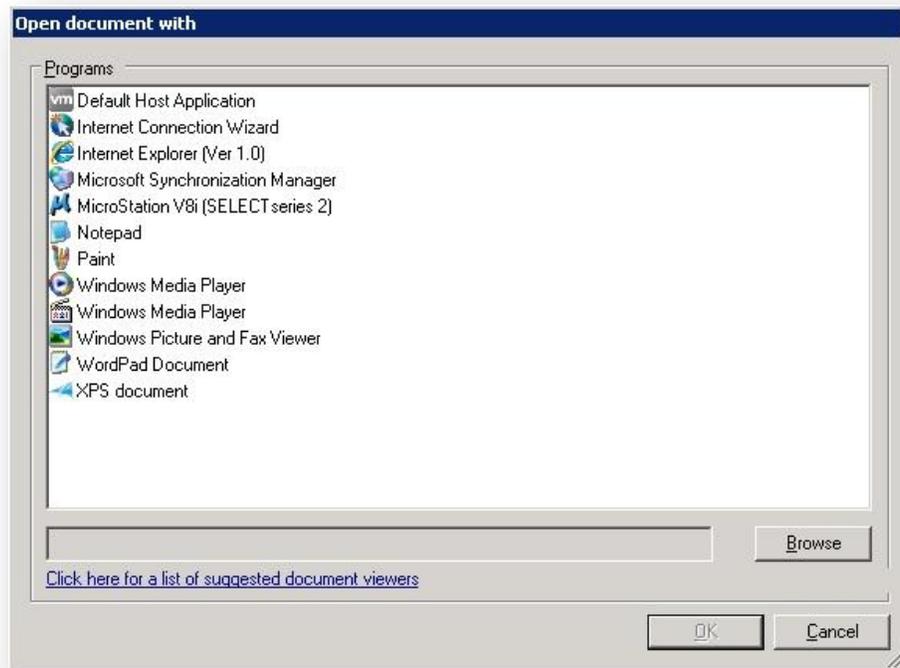
**Warning:** *The following procedure only works with single files. Applications that rely on more than one file, or a master file and multiple data files will need to be handled in a different manner which is discussed later in this section.*

For example, we'll examine the behavior of .log files. Outside of ProjectWise, when a .log file is opened, it will automatically start Notepad, as Windows Explorer knows that this is the application that should be used. In the ProjectWise environment, you will see similar behavior. When a .log file is opened from the ProjectWise environment, you will be prompted with the following:



### Open Document With Dialog

ProjectWise communicates with Windows Explorer to check what application it should open the file with. In the case of .log files, ProjectWise finds that Windows Explorer wants to open the file with Notepad, so it makes the same assumption. This is not static behavior however. As shown in the previous illustration, ProjectWise first prompts you via the "Open Document With" window. This document will show all of the available options with which a file can be opened and you may then choose the desired application. Additionally, you are also provided a Browse button; you may manually define the application you wish to open the file with. The applications listed in this option are a list of commonly available applications on the computer you're working at.

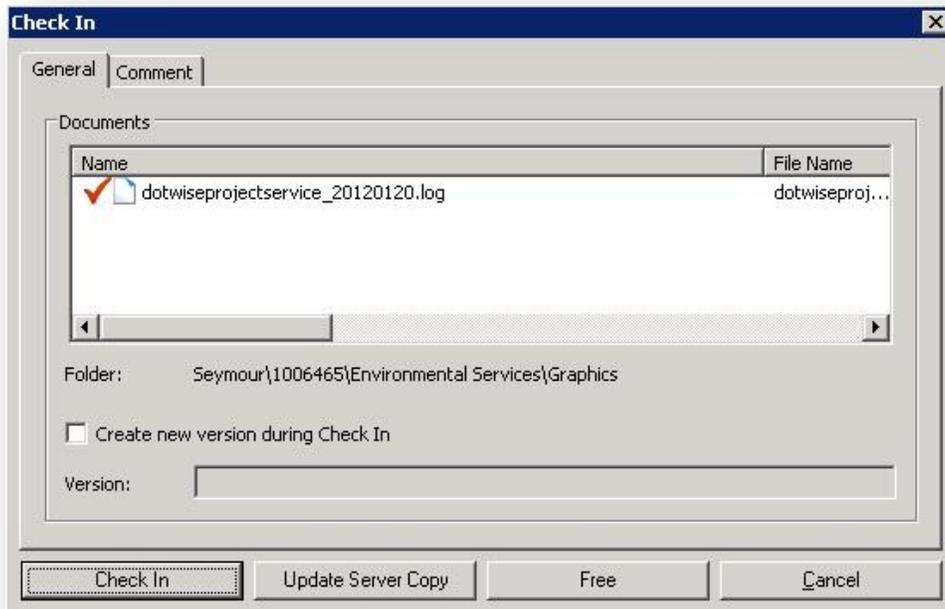


### Selecting an Application to Open With

Once satisfied with the application selected to open the file, you may then work with it normally.

While working in the application, you will notice some differences from working in an integrated application. In a non-integrated application, when you perform save/open operations, you will not receive the ProjectWise dialog windows, but rather, the standard Windows Explorer ones. This will also be true for any file operation command that would prompt you with similar options such as an import/export, an attachment, or a link.

As you complete work with the file, you are then ready to check the document back in. ProjectWise remembers the application that opened the file and maintains knowledge of its status as you're working on them. When you've completed work, you will need to save your file, and then exit the application. As the application closes, ProjectWise will see that work on the file has completed and will then prompt you to check the file in.



### Document Check In

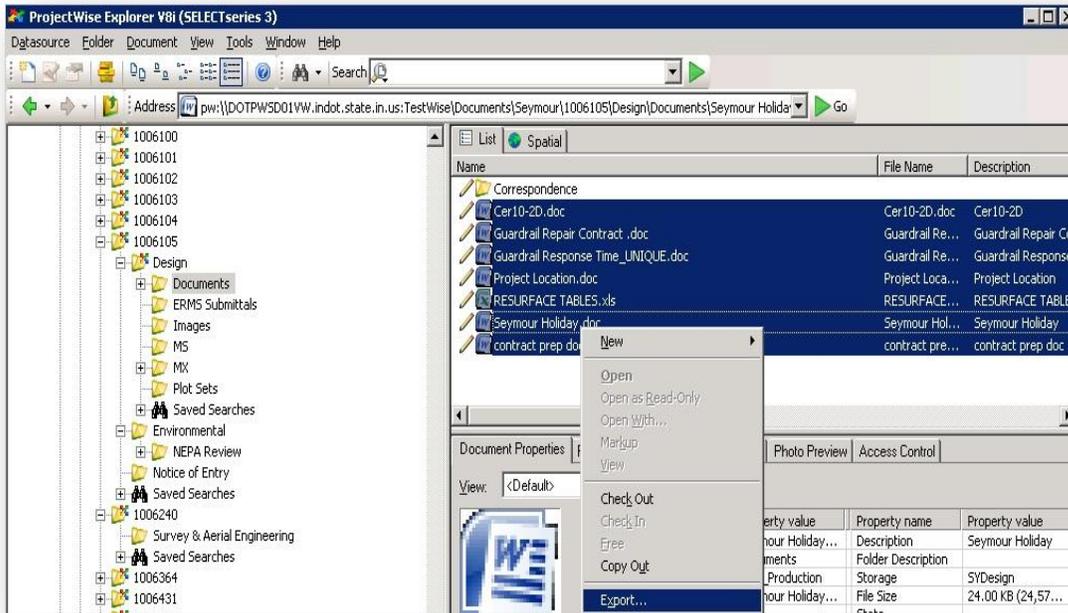
It should be noted, that this will only happen when the application is closed, as ProjectWise only maintains knowledge of the application and not the file operations (Save As, File -> Close, etc.) performed within it.

#### **2.15-1a Working with Documents of an unknown type or multiple files**

As shown in the prior example, ProjectWise is very flexible in maintaining control over applications when working with single files. For applications that rely on multiple files, a master file and additional data files, or a single file that does not have an application association; a different procedure is required.

For files that match the preceding criteria, you will need to use the document export tools within ProjectWise. The document export process is a ProjectWise managed process that places files in a location of your choosing, while maintaining knowledge of these files for re-import at a later time.

For this example, you can use any small group of files. To start the export process, select the files you wish to export and select the Export option by right clicking on the files, or selecting the option from the Document menu.

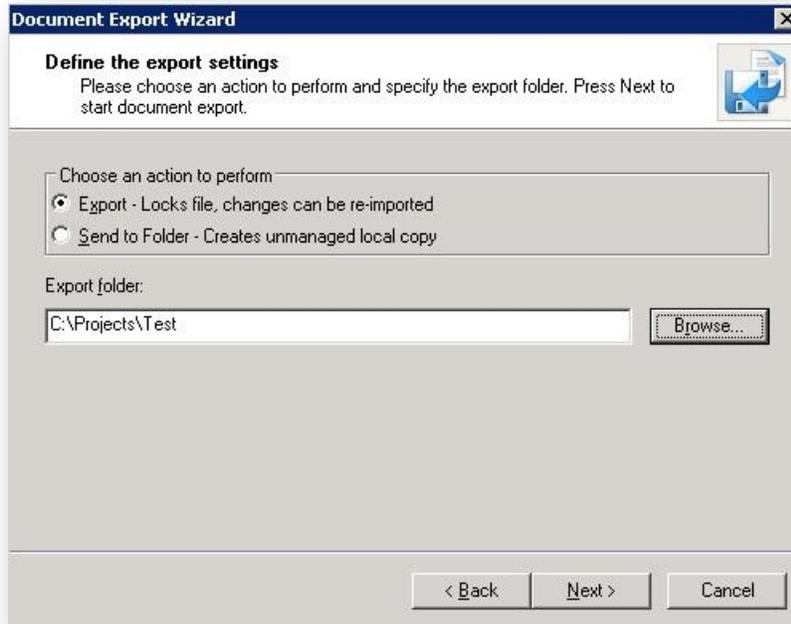


### The Document Export Command

This will start the ProjectWise Document Export Wizard; the first panel is information and may be skipped. On the second panel, you are prompted to select the method with which you'd like to retrieve your document. The two options presented are **Export** and **Send to Folder**. To maintain a semi-managed environment, we will be selecting the Export option as it allows ProjectWise to maintain knowledge of the exported file and allows for later re-import. The Send to Folder option should only be used when you want to create an unmanaged copy; which causes ProjectWise to only make a copy of your file locally with no method of re-import.

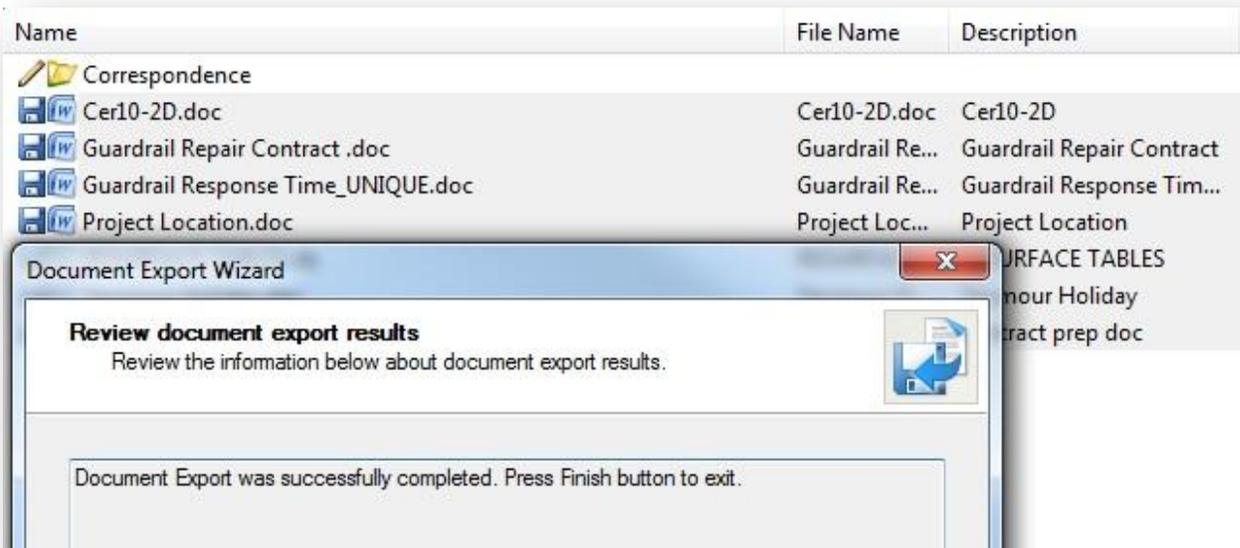
On this panel, you also need to select the folder where you'd like to export the files. When selecting this location you must make sure that you select a location that is consistent and predictable. If you do not specify locations in this manner, the potential for data loss exists, or the possibility of overwriting data. For the example shown here, the path of C:\Projects\DesNo\_SR has been chosen. During production use, this would translate into the Des. No. and route of the project you are exporting files from. This gives you an easily identifiable container to place your files while working on them.

Once you're satisfied with the export location, you may then select the Next button.



### Document Export Wizard

The documents will be exported from ProjectWise and their icons will change to denote that they are exported.



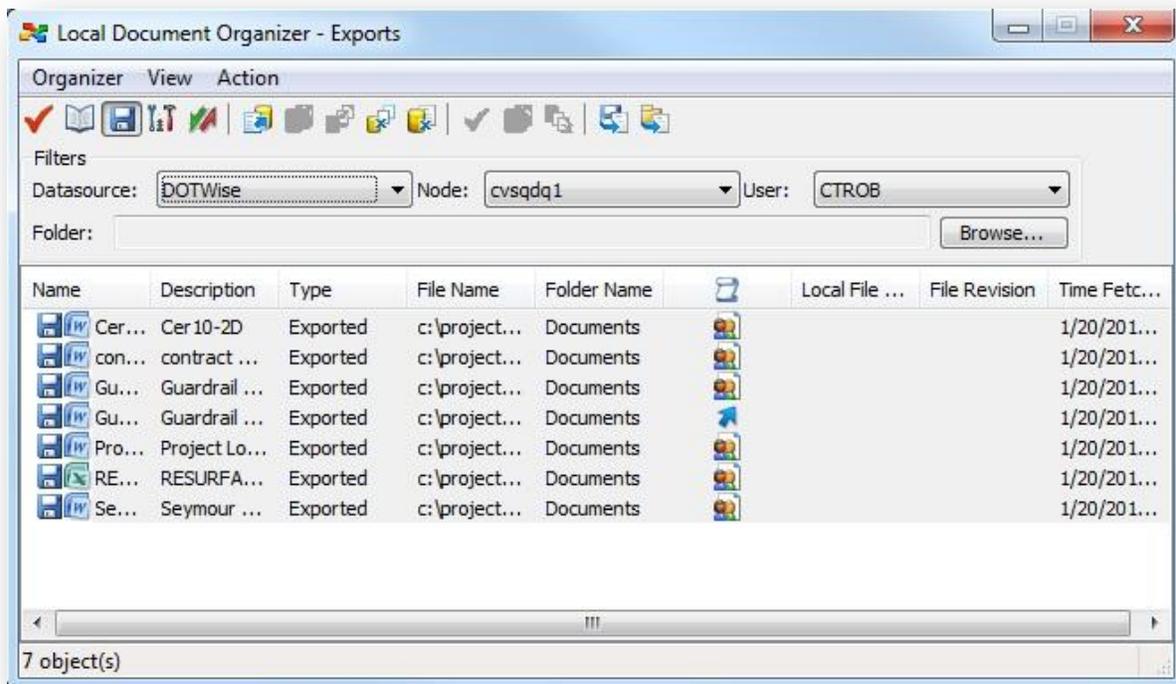
### Completed Document Export

You're now free to work on the files how you normally would outside of ProjectWise. As the files are not being opened within ProjectWise, no automatic prompts for check in will be shown. Also, in the event your files exported are DGNs, it is probable that the appropriate libraries are unavailable

Upon completion of working with your files, you will then need to re-import the documents back into the datasource. To perform this step, you may either use the Local Document Organizer, or highlight an exported document and select Import from the Document/right-click menu. **To provide the utmost data security, and flexibility in data sharing, it is recommended that you re-import your data daily.** In the event of PC hardware problems, this will prevent large amounts of data and work loss, along with making the most up-to-date copies of your data available for use by other members of the project.

The single document Import process behaves as though you're checking in the file that was exported. You will be prompted to add meaningful comments during the check-in process as you are with other documents.

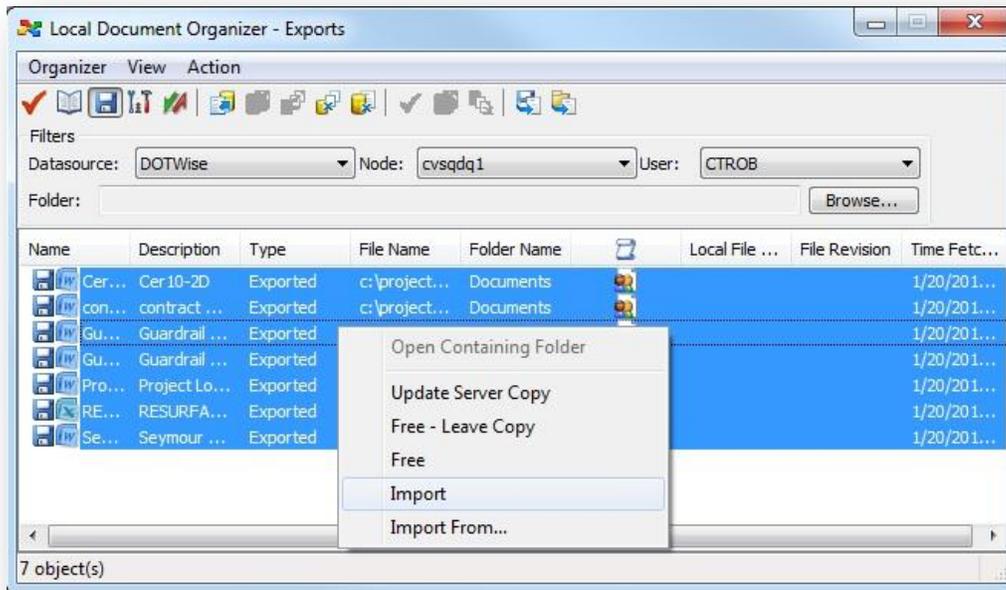
To re-import your data, you will use the Local Document Organizer that is a component of ProjectWise Explorer. This can be found under the **Tools -> Local Document Organizer**. You will be presented with the following window:



### Local Document Organizer

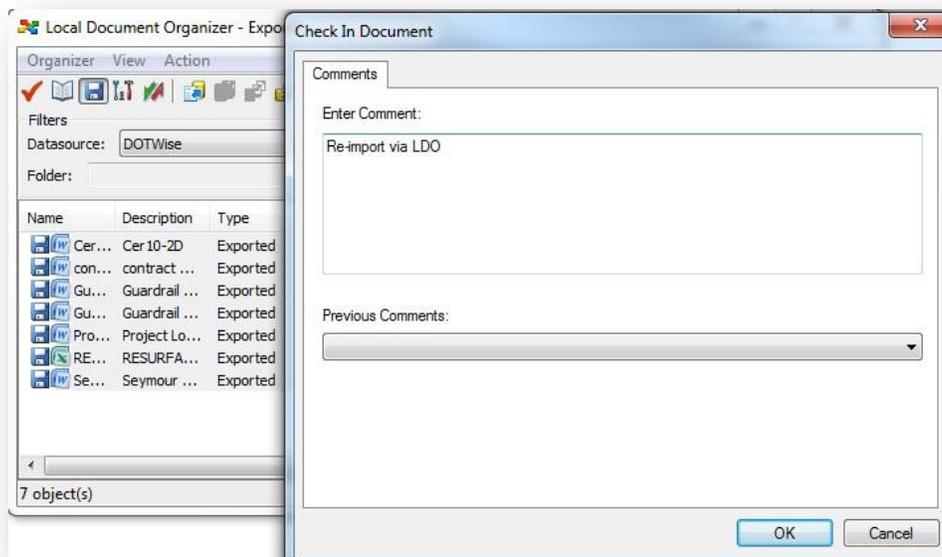
This tool defaults to having only Checked Out documents shown. You will **change the filter to the Exports (floppy disk)** option as shown in the prior image. To ease the re-import process, it is suggested that you sort your exported documents by file name. This will make sure that all

documents in that location are together. To re-import the documents, you then need to **select all of the files that you'd like to re-import and right-click on them**. Select the **import** option as shown.



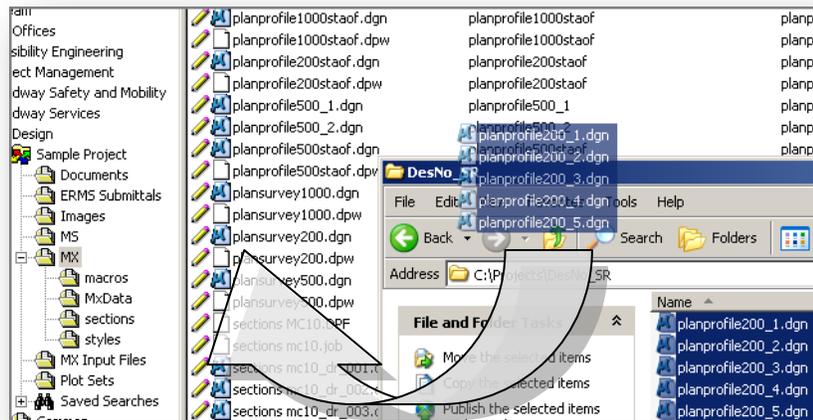
### Import Menu Item

Once you've selected the import option, you will be prompted to enter any relevant comments pertaining to this operation. Relevant comments include any operations you may have performed.



### Document Check In

This will re-import and remove any documents that you initially exported prior to working with your data. Any new files will remain in the designated location on your PC. To bring these newly created documents into ProjectWise, you will need to open the export location on your PC in Windows Explorer, and select the remaining files (no subfolders) and drag and drop these files into the necessary folder for your project in ProjectWise.



**Drag and Drop of New Files**

**The Document Export Process: Things to remember!**

- Make sure you export your documents to a consistent and predictable location.
- Re-import your data daily, it is your responsibility to maintain your most recent data.
- Do not move exported files, as ProjectWise only retains information regarding these files when they are in their exported locations. Moving these files presents the potential for data loss.

**2.16 The ProjectWise Managed Workspace**

The Managed Workspace is a feature of ProjectWise that allows MicroStation workspace files to be managed within the ProjectWise environment. Benefits of doing this are that all workspace files are located and administered in a single location. This allows for the rapid deployment of updates and changes; while allowing flexibility in what and how workspace resources are accessed.

Like the plotting resources (such as pen tables, design scripts and settings files); the managed workspace will take the place of X:\ drive locations for CAD resources. Eventually the X:\ drive will disappear.

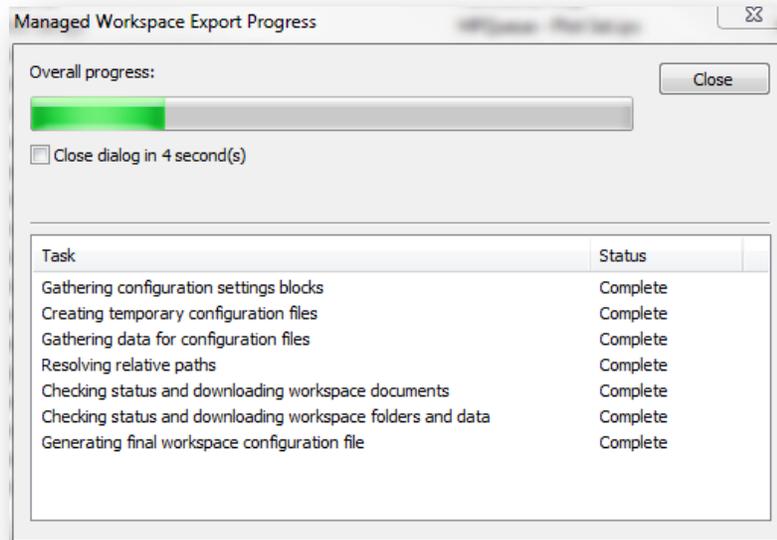
As this is just a location change for the workspace, end user impact should be minimal; and with few exceptions, no changes should be particularly evident.

**2.16-1 Managed Workspace Export**

The managed workspace attaches itself to any document opened by a MicroStation based application (MicroStation, Bentley View, Redline, etc.) from within ProjectWise. In particular, you can

expect the managed workspace to be active when viewing/editing DGNs, DWGs, DXFs or any other file ProjectWise opens with MicroStation.

After the workspace has been enabled for your account, you will see the following dialog when opening CAD files from DOTWise:



### Managed Workspace Export Dialog

This is the Managed Workspace Export Progress dialog, and it shows the status of ProjectWise placing the workspace in your working folders. The first time you open a CAD file after the workspace has been initialized, this dialog will take a short amount of time to download all the relevant files and configure your workstation for the first time.

Subsequent file opens will reduce the amount of time required for the export to complete as once the files have been downloaded, ProjectWise will only update them if there's been a change at the server. This ensures that you always have the most up to date workspace files available.

#### 2.16-2 Working with the workspace

Day to day use of the workspace has not changed in a visible manner. All tool boxes, macros, and symbology resources have been updated to automatically be available when you access your files. Areas where you may see differences are in the file paths where items such as cells are being attached from, or where you're initially directed to attach other resources.

Cells in particular are a load on demand resource for the workspace. They are not copied out the first time you run the workspace, but are loaded when you access their icon in the toolbox. At this time, you may see a slight hesitation as ProjectWise is downloading the appropriate file to your PC. After this initial install, it will load instantly unless there's been a change to the file that causes it to be re-downloaded.

Everything else will be exactly the same as it was on the X:\ drive just without the need to be connected to the X:\ drive.

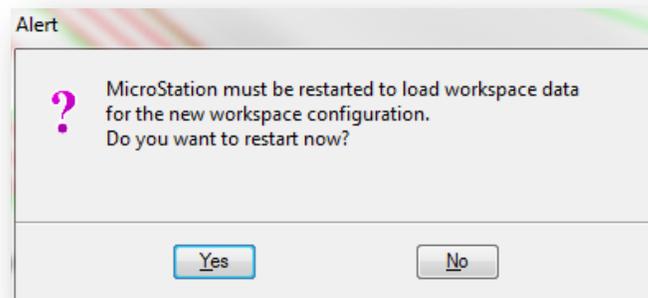
### 2.16-3 MicroStation and files with SignCAD Fonts

As SignCAD is no longer producing usable MicroStation integration and it will not integrate with ProjectWise, SignCAD fonts are no longer provided as a default feature of the workspace as they are not part of the standard resource set.

If you have documents with SignCAD fonts and need these enabled for your document, please contact CAD Support via the Help Desk Assistant and include the path of the file you need them enabled on. As these are unsupported and are being phased out, requests to add these fonts to entire directories will not be available in the interest of minimizing their use going forward.

### 2.16-4 MicroStation, File -> Open and Workspace Reloads

When opening files from the File -> Open command in MicroStation, you may be prompted with the following dialog:



### Managed Workspace Prompt when Switching Files

This dialog denotes that there's a difference between the workspace you currently have loaded and the workspace options for the file you're attempting to open. When this message appears, the user needs to exit MicroStation and check the current document in, then open the next document from ProjectWise to cause the workspace to be reloaded with the appropriate resources. Alternatively, the user can select Yes and MicroStation will close and reopen immediately with the new workspace loaded. Due to how the workspace is attached to your account, you will see this message when changing files from either the recent files list or by using File -> Open.

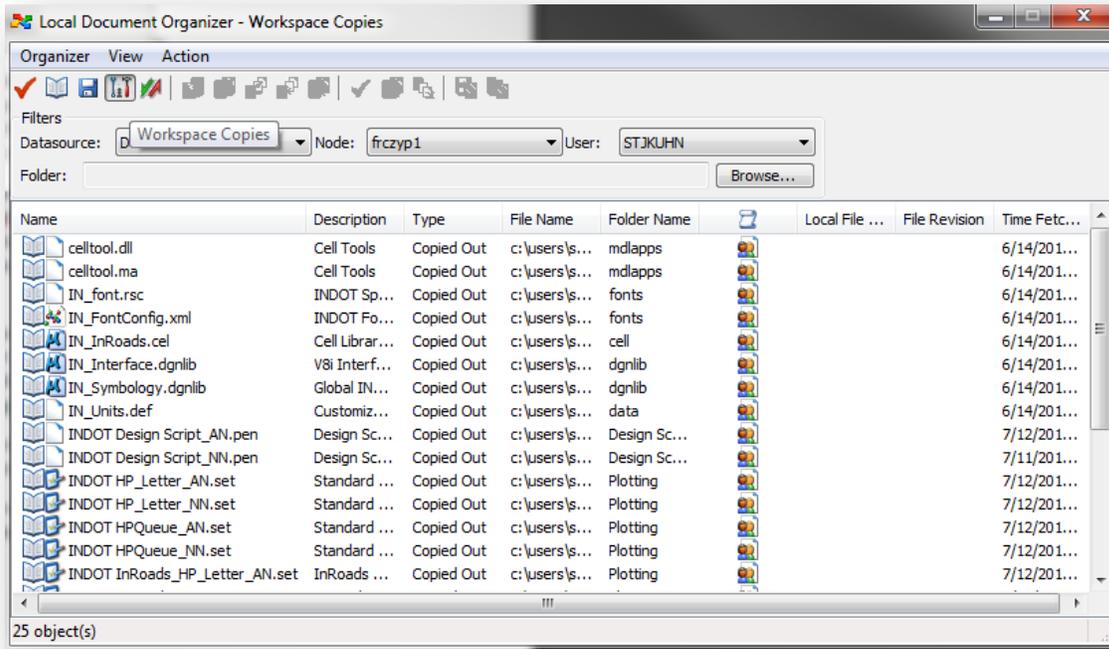
If you select No on this dialog, MicroStation will continue to function with the existing workspace features loaded, which may not include the resources you're looking for such as the SignCAD fonts.

### 2.16-5 Local Document Organizer

As the managed workspace copies files to your local machine, ProjectWise will allow you to manage these through the Local Document Organizer. It's highly recommended that you not remove the workspace documents from your PC unless directed by CAD Support. ProjectWise will handle the updating and export of documents "as needed" behind the scenes to provide a seamless experience.

If you do purge these files, the first time you open a CAD file, ProjectWise will re-download the workspace, providing a slight delay similar to the first time it's used.

Should CAD Support request you purge your workspace copies, go to the Local Document Organizer (Tools -> Local Document Organizer... from the ProjectWise Explorer menu). On the Local Document Organizer tab, select the button for Workspace Copies as shown:



### Local Document Organizer

This window functions similarly to the Copies option, in that you can only Purge or Refresh these documents. Check out will be unavailable as these are administered by the CAD Support staff. Should they request you purge your workspace copies, select all entries in this window and either right-click and select Purge Copy or perform the same option from the Action menu.

## 3. MicroStation and V8i Interface

### 3.1 What's New in MicroStation V8i

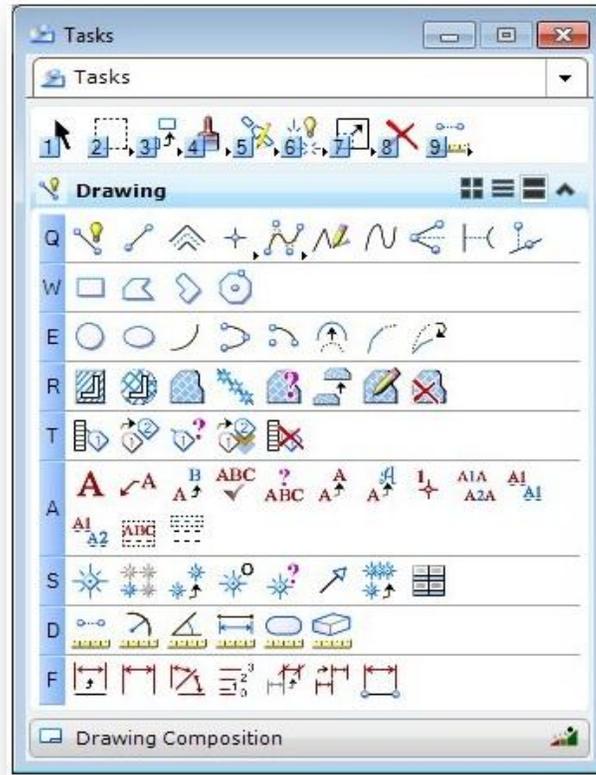
Since our last DOTWise document/training we have changed versions of MicroStation and have transitioned from MicroStation XM to MicroStation V8i SS2. With that transition MicroStation has taken on a few interface changes and added a few new tools along with deleting a few and even changed how some of them function. Our goal in this chapter is to provide you with a guide to those changes.

#### 3.1-1 Application Window Layout Changes

The default application window layout in this edition differs from the XM Edition in the following ways:

The **Tasks dialog** is the default task navigation interface. This dialog is docked to left-hand edge of the application window.

The Main task is embedded in the Tasks dialog.



## Task Navigation

### 3.1-2 Tasks dialog

Used to view the Task List and to select the tasks, workflows, and tools with which you need to work.

The size of the icons in the Tasks dialog is set in the Preferences dialog. You also can choose to show or hide Navigation icons. In the default setup, tools from the Main toolbox have been integrated into the Tasks dialog in a Main task.



### The Drawing Task

You can **dock** the Tasks dialog to the left or right edge of the application window. By default the Tasks dialog is docked to the left edge of the application window, and the active task is the Drawing task.

You can resize, minimize, dock, undock, open, and close the Tasks dialog. You can open a workflow in a separate instance of the Tasks dialog.

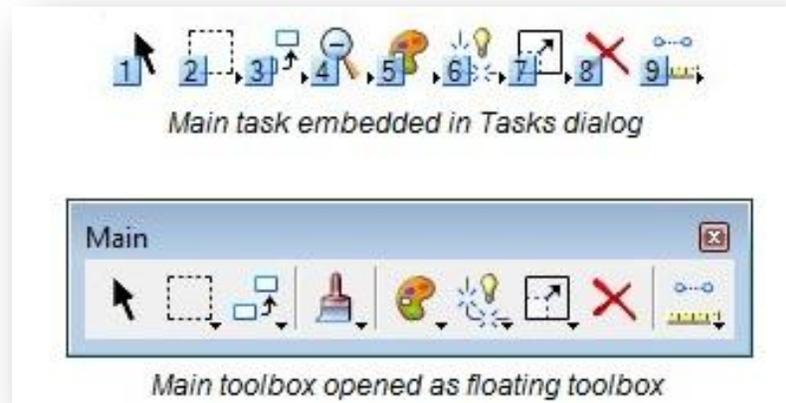
If you have position mapping turned on, the keys are displayed next to the tools in the Tasks dialog. When the position mapping keys have focus, they appear on a dark background. When they do not have focus, they appear on a light background.

If you hide tools while viewing tasks in the Tasks toolbox or in views, these tools will be hidden in the Tasks dialog.

#### 3.1-2a Main toolbox

The Main task is used to select general usage element selection, manipulation, and modification tools.

The Main task, containing tools from the Main toolbox, is open when you start the program for the first time. By default, tools from the Main toolbox appear as a Main task in the Tasks dialog, which is docked to the left-hand edge of the application window. The Tasks dialog can be undocked or docked to the right-hand edge. Right-clicking in the Main task and selecting Open 'Main' as Toolbox opens the toolbox as a floating toolbox.

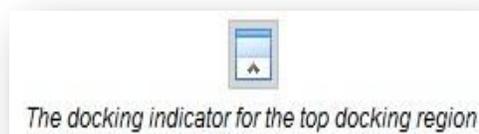


### 3.1-3 Dockable Dialogs

To gain more screen space, there are many dialogs that you can dock to the edges of the MicroStation application window.

#### 3.1-3a To dock a dockable dialog

1. Select a dockable dialog's title bar.
2. Drag the dialog over one of the docking indicators that appears in the center of the screen or along the edges of the application window.



3. As soon as you begin to drag a dockable dialog, a transparent block representing the dialog is attached to your pointer, and moves with the pointer until you release the mouse button.
4. Place the pointer over one of the docking indicators. This highlights the available docking region along the corresponding edge of the application window.
5. Release the mouse button. The dialog is docked within the selected docking region, and is displayed in its entirety.

#### 3.1-3b To turn on Auto Hide for a docked dialog

1. Dock a dockable dialog to an edge of the application window.

2. Click the Auto Hide (pushpin) icon in the upper-right corner of the docked dialog. The docked dialog disappears from view, and a roll-out tab appears in its place along the same edge of the application window.



### **3.1-3c To turn off Auto Hide for a docked dialog**

1. Place the pointer over a docked dialog's roll-out tab.
2. While the dialog is displayed, click the Auto Hide icon. The dialog is re-docked along the same edge of the application window.



### **3.1-3d To undock or float a docked dialog**

Double-click the title bar of a docked dialog. The dialog returns to the position in which it was last floating.

### **3.1-3e To re-dock a floating dockable dialog**

Double-click the title bar of a floating dockable dialog which has been docked at least once. The dialog returns to the location where it was last docked.

### **3.1-3f To close a docked dialog**

If the dialog is docked, simply click the dialog's Cancel icon (next to the Auto Hide icon). or if Auto Hide is enabled, first pause the pointer over a docked dialog's roll-out tab, then while the dialog is displayed, click the dialog's Cancel icon, or Simply enter the key-in that is normally used to close the dialog.

If you close a dialog while it is docked, and later click the icon or enter the key-in that normally opens the dialog, the dialog will open again to the position it was last docked.

If a dialog is docked when MicroStation exits, it will be docked in the same position the next time you start the product. **List of dockable dialogs**

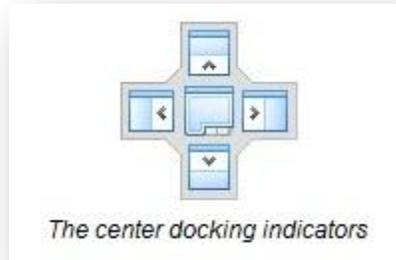
The following is the list of dockable dialogs, and which edges they can be docked to:

- Tool Settings window (left or right)
- Element Information dialog (left or right)
- Project Explorer dialog (left or right)
- Link Sets dialog (left or right)
- Tasks dialog (left or right)
- Markups dialog (left, right, top, or bottom)
- Item browser (left or right)
- Details dialog (left, right, top, or bottom)
- Feature Manager dialog (left or right)
- References dialog (top or bottom)
- Raster Manager dialog (top or bottom)
- Models dialog (top or bottom)
- Saved Views dialog (top or bottom)
- Level Manager dialog (top or bottom)
- Level Display dialog (left, right, top, or bottom)

The way in which you dock one of these dialogs is different from the way in which you dock a toolbox.

### **3.1-3h Using Docking Indicators**

As you drag a dockable dialog, docking indicators appear on the screen. These docking indicators indicate which edges of the application window the selected dialog can be docked to. In most cases, a dockable dialog can only be docked either horizontally or vertically, however some dialogs, like the Level Display dialog, can be docked both horizontally and vertically.



If the selected dialog can be docked horizontally, then the docking indicator at the center of the screen will have arrows that point toward the top and bottom edges of the application window, and matching docking indicators appear along the top and bottom edges. If the selected dialog can be docked vertically, then the docking indicator at the center of the screen will have arrows that point toward the left and right edges of the application window, and matching docking indicators appear along the left and right edges.



You can release the dialog over any of these arrows, and the dialog will be docked to the corresponding docking region. While it is mostly a matter of preference whether you use the docking indicator at the center of the screen or the ones at the edge of the application window, there is a slight difference in the two.

Using the center docking indicators will position the dialog so that it takes up the remaining free space along the length of the selected edge of the application window. For example, if there is already a dialog that is docked vertically on the left edge of the application window, then dropping a horizontally docking dialog over the center docking indicator, pointing toward the top edge of the application window, will dock the dialog so that it fits in the remaining space along the top edge.

Using the docking indicators at the edges of the application window let you decide where specifically along the selected edge you want to dock the dialog. For example, if there is already a dialog docked to the left edge, you can use the edge docking indicators to select whether you want to dock the new dialog on top of the existing dialog, or to the left or right of it, or above or below it.

If are moving a dockable dialog, and there are no dockable dialogs currently docked to the edge of the application window that the selected dialog can be docked to, then the center controls will not display.

### 3.1-3i Other dialogs that can be docked

The following dialogs are also dockable; however their docking behavior follows the standard docking behavior for toolboxes:

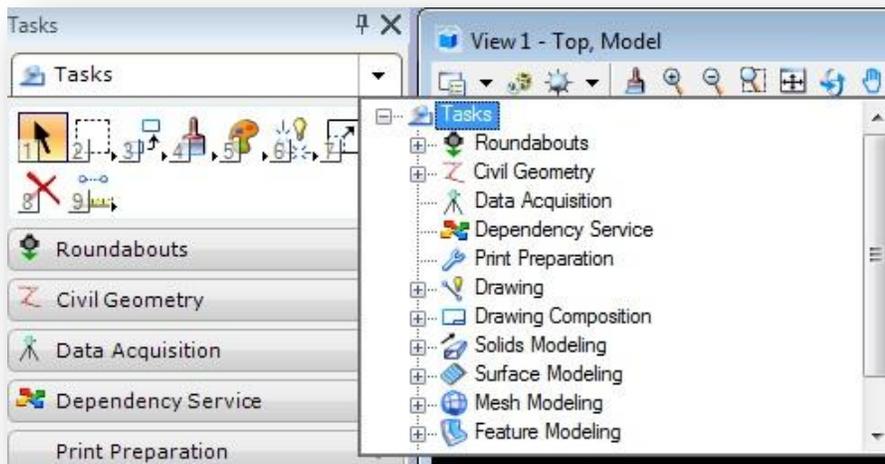
- Key-in window
- View Groups window
- AccuDraw window
- Drawing Scale window
- Snap Mode button bar

### 3.1-3j Dialogs that are docked by default

When you start MicroStation for the first time and open a file, certain dockable dialogs are already docked. This is because the product delivers a docking preference file that defines which dialogs are docked by default, and where. As you make changes to the location of docked dialogs, that information is saved in your personal docking preference file, rather than in the delivered default docking preference file.

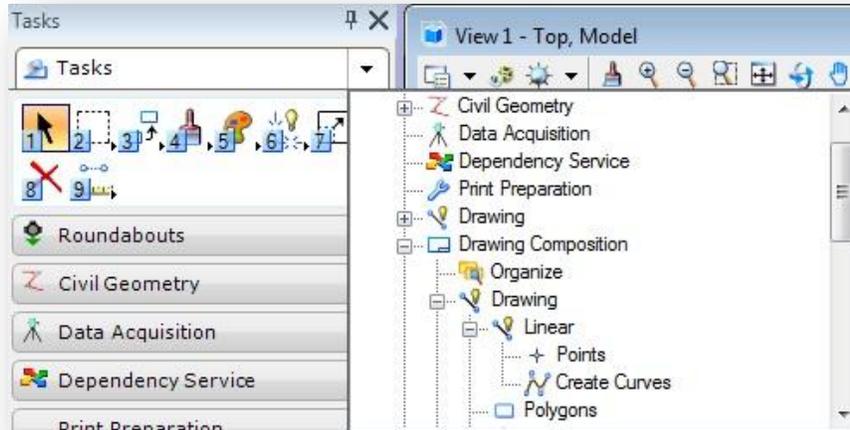
### 3.1-4 Tasks

Clicking this task displays all tasks in a hierarchical tree. Clicking a task in the tree expands the task, making it the root task, and hides the other tasks.



#### Task Navigation Flyout Menu

Once a subordinate task has replaced Tasks as the root task, clicking the task's tab displays all tasks in a hierarchical tree. Clicking Tasks in the tree resets Tasks as the root task.



### Any Task can be selected as the Root Task

#### 3.1-4a Main task tools

In the default setup, tools from the Main toolbox have been integrated into the Tasks dialog in a Main task. You can hide the Main task tools in the Tasks dialog by clearing the Show Main Task Tools check box in the Task Navigation category of the Preferences dialog. You also can customize the Main task tools.

#### 3.1-4b Task Tabs

Clicking the down arrow on a task's tab expands the task so you can see the tasks and tools in it. Clicking the up arrow collapses the task and hides them.

You can click the icons on a task's tab to view the tools in one of several layout modes:

- Icon Layout mode
- List Layout mode
- Panel Layout mode (the default)

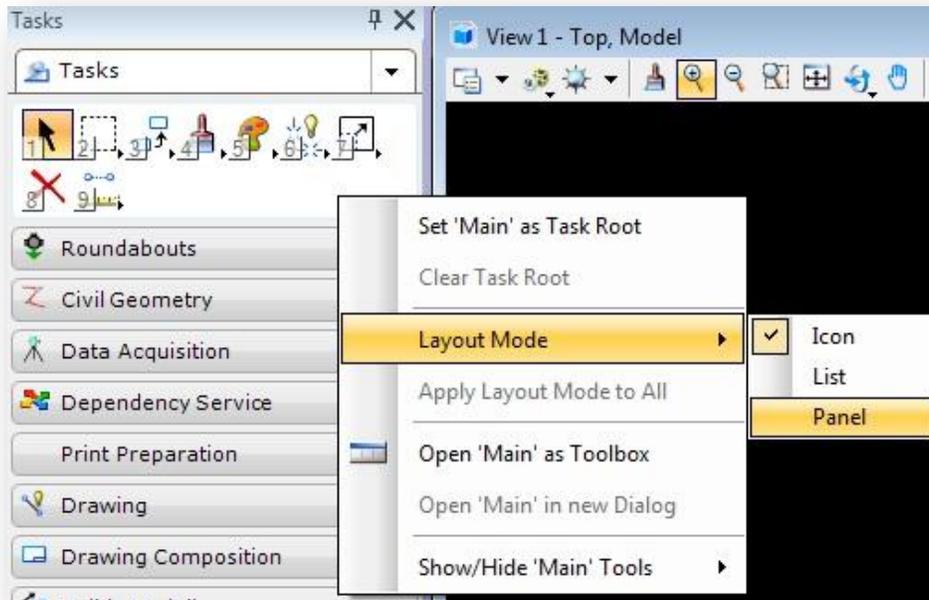
The icon belonging to the first tool in a task is displayed on the task's tab. You can select a different icon for the task in the Customize dialog.

In the default setup the following tabs are visible:

- Drawing task
- Drawing Composition workflow
- Solids Modeling task (3D only) – contains tools commonly used for solids modeling.
- Surface Modeling task (3D only) – contains tools commonly used for surface modeling.
- Mesh Modeling (3D only) – contains tools commonly used for mesh modeling.
- Feature Modeling task (3D only) – contains tools commonly used for feature modeling.
- Visualization task (3D only) – contains tools commonly used for visualization.
- Animation task (3D only) – contains tools commonly used for animation.

### 3.1-4c Pop-up menu for the selected task

Right-clicking a task presents a list of settings for the task.



#### Task Layout Options

- Set as Task Root – The selected task becomes the root task, which moves it to the top of the Tasks dialog and hides the other tasks.
- Clear Task Root – Resets the task so that is no longer the root task.
- Layout Mode > Icon – Displays the tools as icons only.
- Layout Mode > List – Displays the tools' icons, position mappings, and names.
- Layout Mode > Panel – Displays the tools' position mappings and icons.
- Apply Layout Mode to All – Applies the current task's layout mode to all tasks.
- Open as Toolbox – Opens the selected task as a toolbox.
- Open in new Dialog – It must be a workflow and must have child tasks in it in order to open it in a separate dialog. When the Tasks dialog is docked, the new dialog appears on a separate tab at the bottom of the Tasks dialog.
- Display Help – Available only if a help topic is linked to the selected custom tool, task, or workflow. Opens the help topic.
- Show/Hide Tools > (Tools' names) – Allows you to show or hide individual tools.
- Show/Hide Tools > Show All – Shows all of the tools.
- Show/Hide Tools > List – Lists the tools in a dialog in which you can choose which to show or hide them.

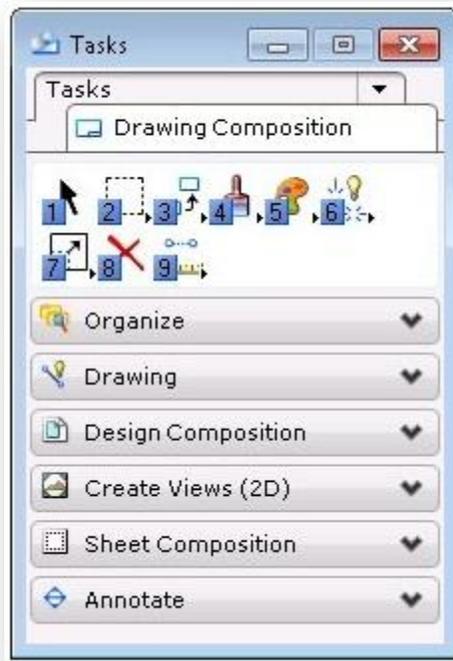
### 3.1-5 Workflows

A workflow can consist of one or more tasks. In most cases a workflow consists of a collection of tasks organized in the order that you will use them to complete a project or job. Each task contains

the tools you need to complete the task. The Drawing Composition workflow is delivered with MicroStation.



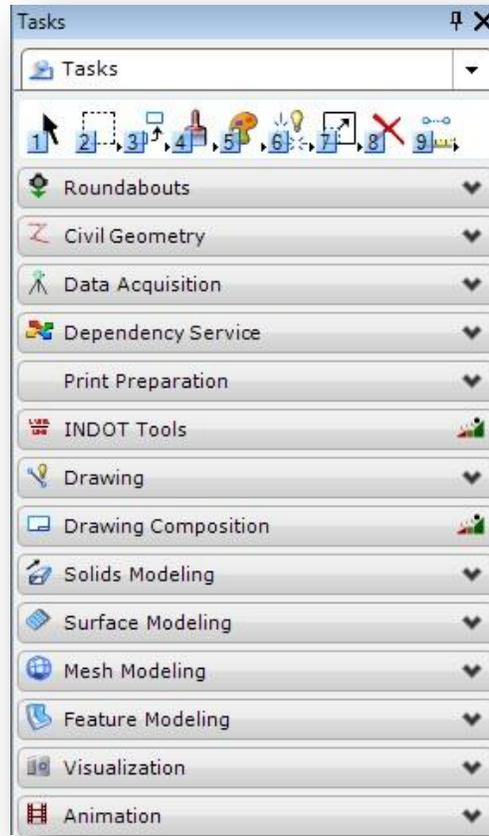
Workflow icon



The Drawing Composition Workflow

### 3.1-6 INDOT Dialogs, Tasks and Workflows

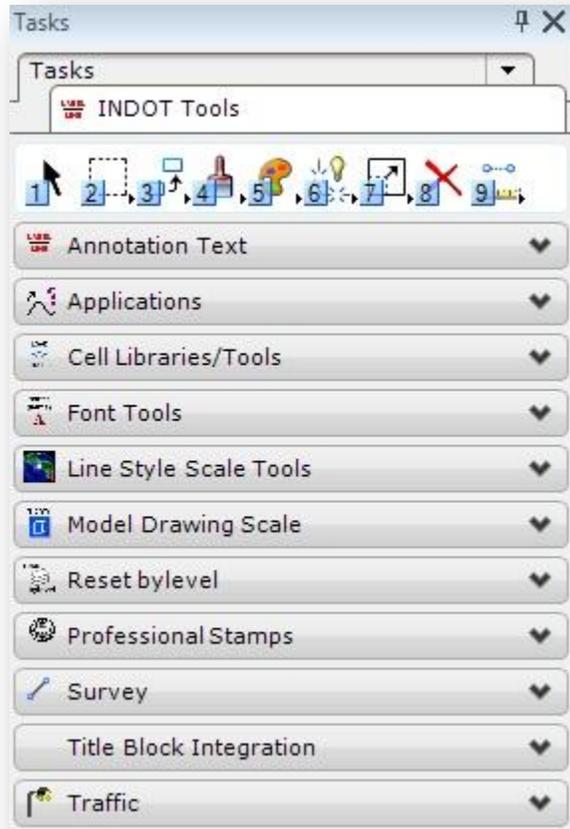
A new .dgnlib will accompany this document that has many new and exciting changes and enhancements that leverage the latest version of MicroStation. We (CAD Support) have taken a few steps to organize the task navigation section of the Application Window to make it more user friendly and INDOT specific. Via the managed workspace in ProjectWise, when a .dgn file is opened the Task Navigation will appear as follows: (See INDOT Tools)



### Task Navigation with INDOT Tools

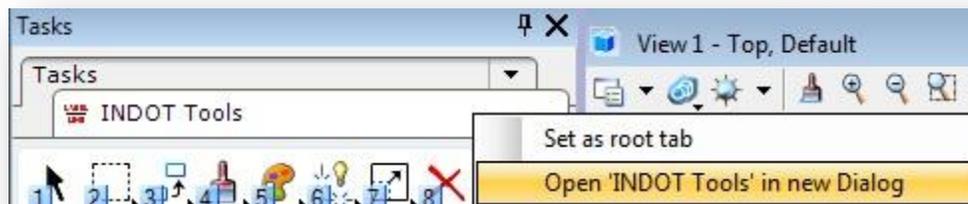
#### **3.1-6a**    *INDOT Tools Workflow*

This new INDOT Tools workflow has separated the INDOT specific applications, tools, tasks and dialogs. Once activated (by selecting) it will appear as in the following image:



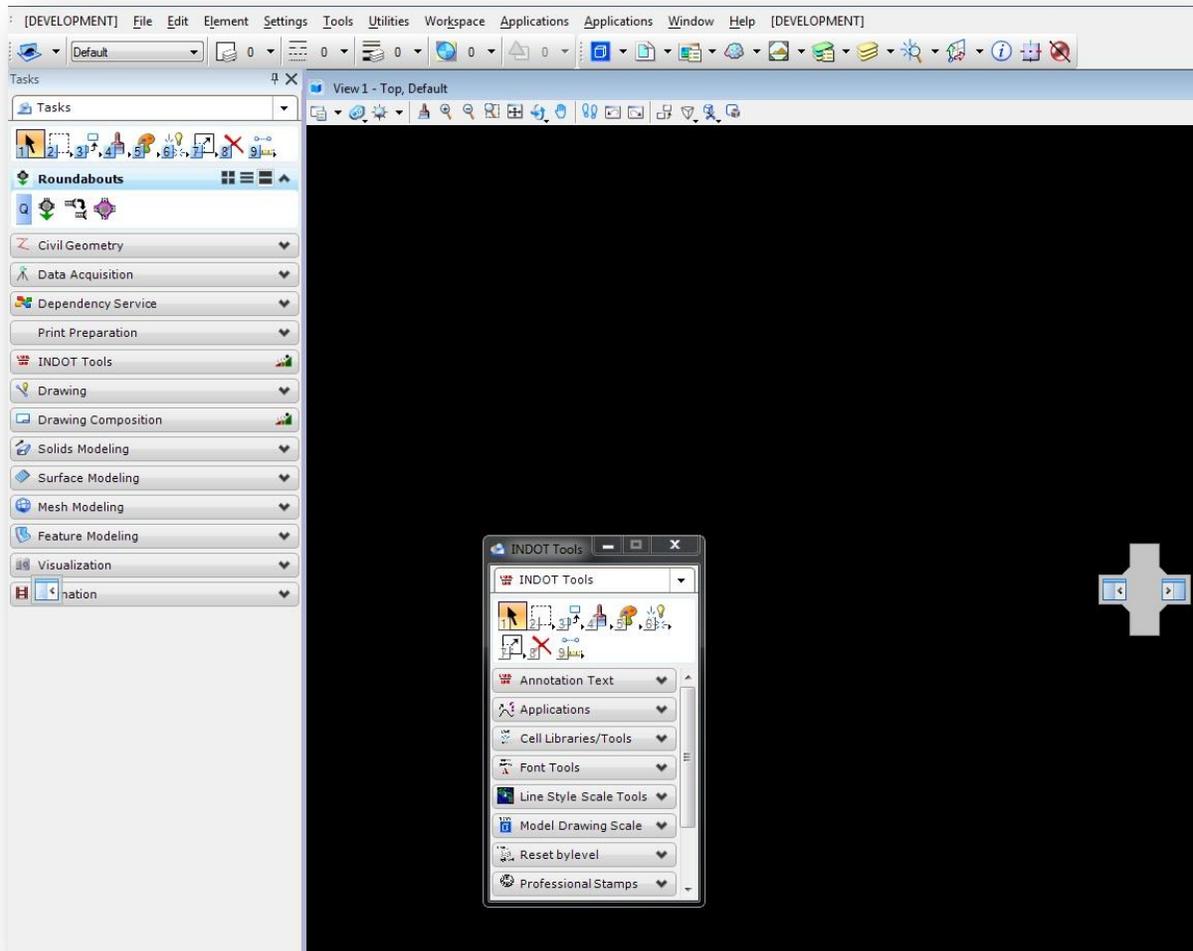
### The INDOT Tools Workflow

1. Right mouse click in the INDOT Tools tab and select Open 'INDOT Tools' in a new Dialog and you will be provided a separate dialog containing these tools.



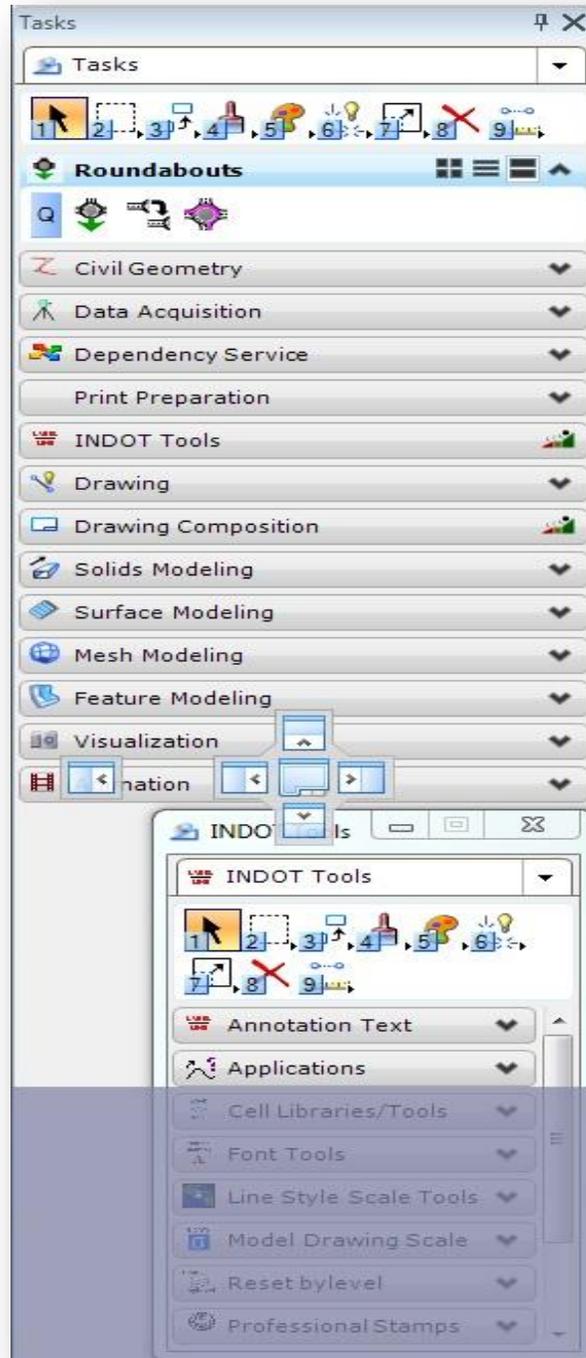
### Opening INDOT Tools Separately

This will allow you to dock it as a separate dialog below the existing Main Tasks dialog.



### Docking the INDOT Tools Workflow

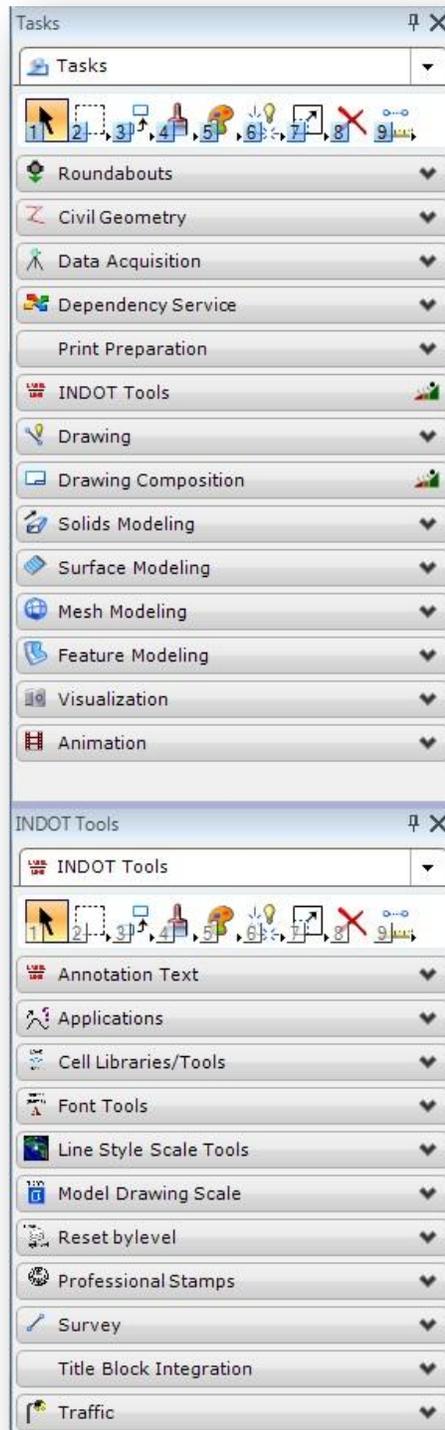
2. Using the docking indicators, select the bottom arrow to place the new INDOT Tools dialog below the other Tasks dialog.



### Split Task/Workflow Docking

3. Clicking this task displays all tasks in a hierarchical tree. Clicking a task in the tree expands the task, making it the root task, and hides the other tasks.
4. Once a subordinate task has replaced Tasks as the root task, clicking the task's tab displays all tasks in a hierarchical tree. Clicking Tasks in the tree resets Tasks as the root task.

5. It will then appear as shown, giving you access to both dialogs, but keeping them specific and separate.



### Docked/Combined Workflows

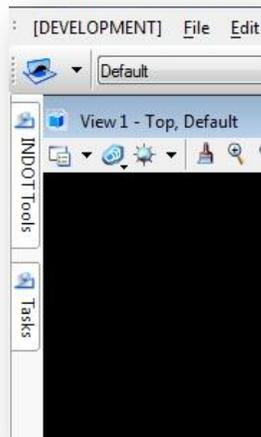
The other option is to use The Auto Hide (pushpin – icon) pointing down, hiding each of the task dialogs off to the left of the screen. The pushpin will then point left.



**Docked**

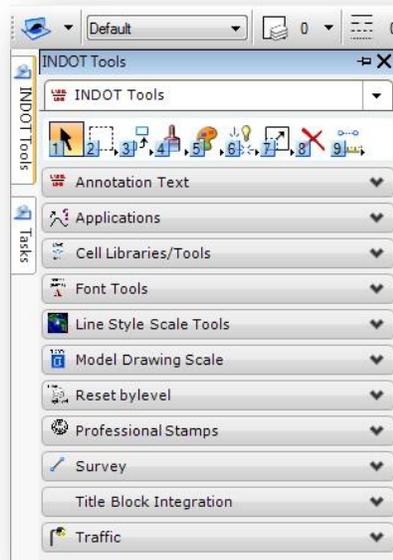


**Hidden**



**Un-Pinned Tasks**

When you hover over the tools you wish to use/see they will appear as shown in the following picture:



### Task Flyout

If you wish to place/dock the tasks dialog back out in the application window again, click on the pushpin as it points left and make it point down by selecting it.

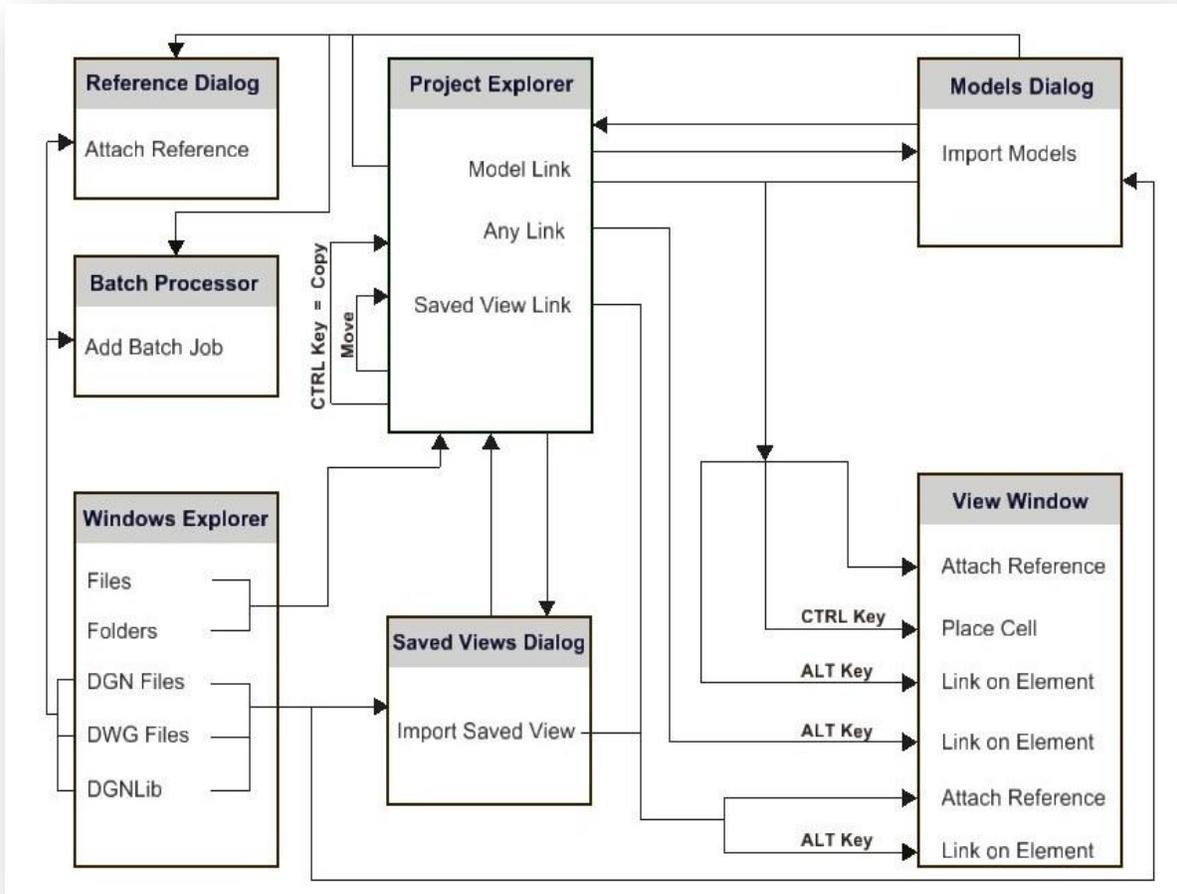
## 3.2 User Interface Enhancements

The addition of drag and drop support, the ability to customize right-click menus and the Tasks dialog, and three new ways to customize the status bar make the interface easier to use.

### 3.2-1 Drag and drop support

As of MicroStation V8i (SELECTSeries 1), additional drag and drop functionality has been added.

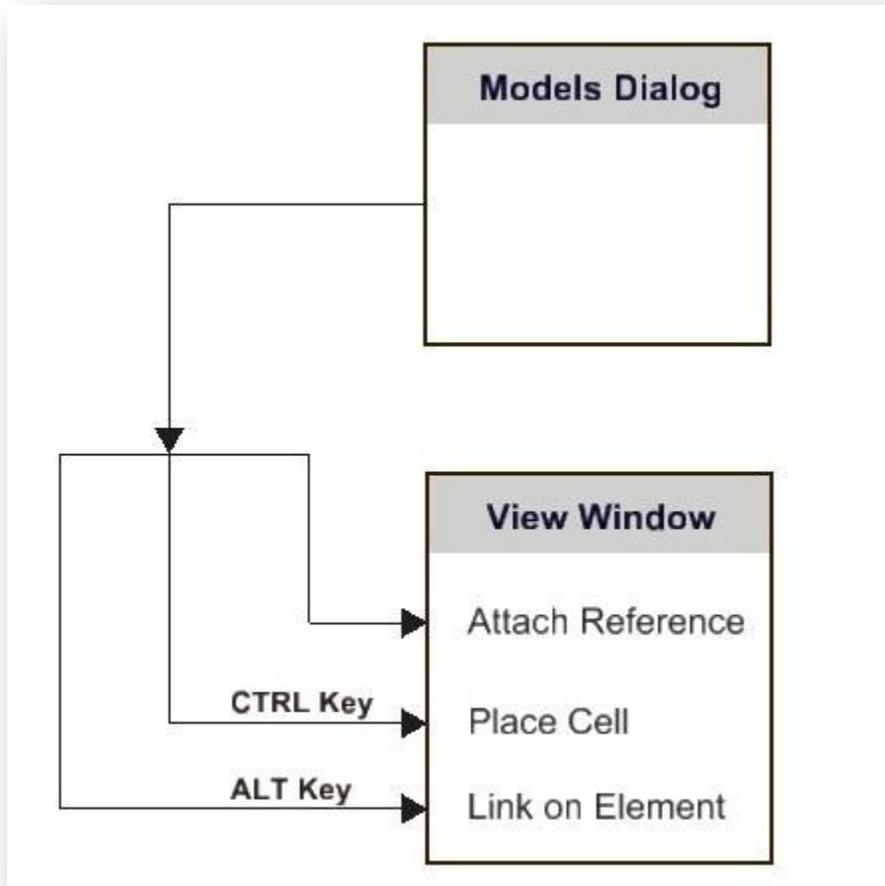
**Note:** *Not all functionality will be available when working within ProjectWise.*



### MicroStation Native Drag and Drop Operations

Some of the possible drag and drop operations are:

- Drag and drop models from the Models dialog to the Project Explorer dialog
- Drag and drop a saved view from the Saved Views dialog to the Project Explorer dialog
- Drag and drop files and folders from Windows Explorer to the Project Explorer dialog
- Drag and drop links from the Project Explorer dialog to a view window
- Drag and drop links within the Project Explorer dialog
- Drag and drop saved views from the Saved Views dialog to a view window
- Drag and drop models from the Models dialog to a view window
- Drag and drop DGN, DWG, and DGNLIB files from Windows Explorer to the Saved Views dialog
- One common use of the drag and drop feature is between the Models dialog and a view window.



### Drag and Drop Functions with Command Modifiers

#### 3.2-2 Right click context menus based on named expressions

When customizing right-click context menus and menu items (*Workspace > Customize > Context Menus* tab), you can show or hide and enable or disable them based on tests created in the Named Expressions dialog. For example, you can create a right-click menu item that will be visible only when you are working on a sheet model by setting the menu item's Show/Hide Test property to "IsSheetModel." Or you can create a right-click menu item that will be visible but enabled only when you are working on a sheet model by setting the menu item's Enable/Disable Test property to "IsSheetModel." You can determine where the context menu or context menu item will be placed in the right-click menu by setting its Priority field.

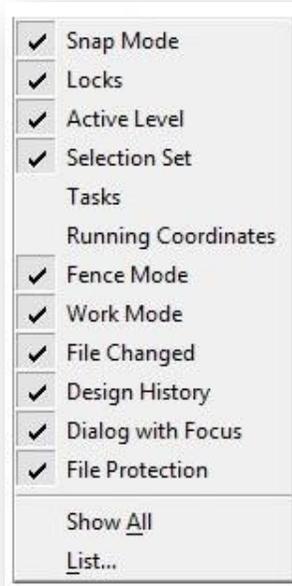
#### 3.2-3 Show / hide support in Tasks dialog

Right-clicking a task in the Tasks dialog opens a menu that allows you to show or hide the following:

- Show/Hide Tools > (Tools' names) — Allows you to show or hide individual tools.
- Show/Hide Tools > Show All — Shows all of the tools.
- Show/Hide Tools > List — Lists the tools in a dialog in which you can choose which to show or hide them.

### 3.2-4 Show/hide support in status bar

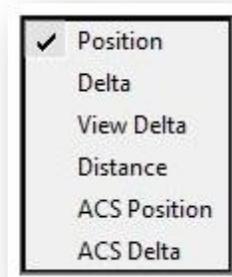
Right-clicking in the status bar opens a menu allowing you to show or hide sections of the status bar.



Status Bar Options

### 3.2-5 Coordinates display in status bar

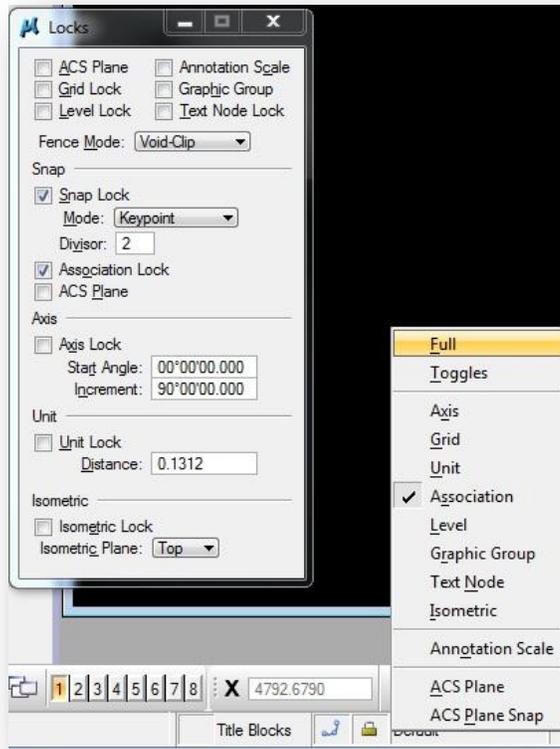
Right-clicking in the Running Coordinates section of the status bar turns on the coordinates display. As you move your cursor, the coordinates of your current position display according to the active Tentative Point Mode. When you left-click, a menu displays six options. The Delta modes show the X, Y, and Z displacement from the last data point. The Distance modes show the distance and direction from the last data point.



Coordinate Formats

### 3.2-6 Locks dialog

Left-clicking the Locks icon on the status bar and selecting Full on the popup menu opens the Locks dialog.



Locks Dialog and Menu

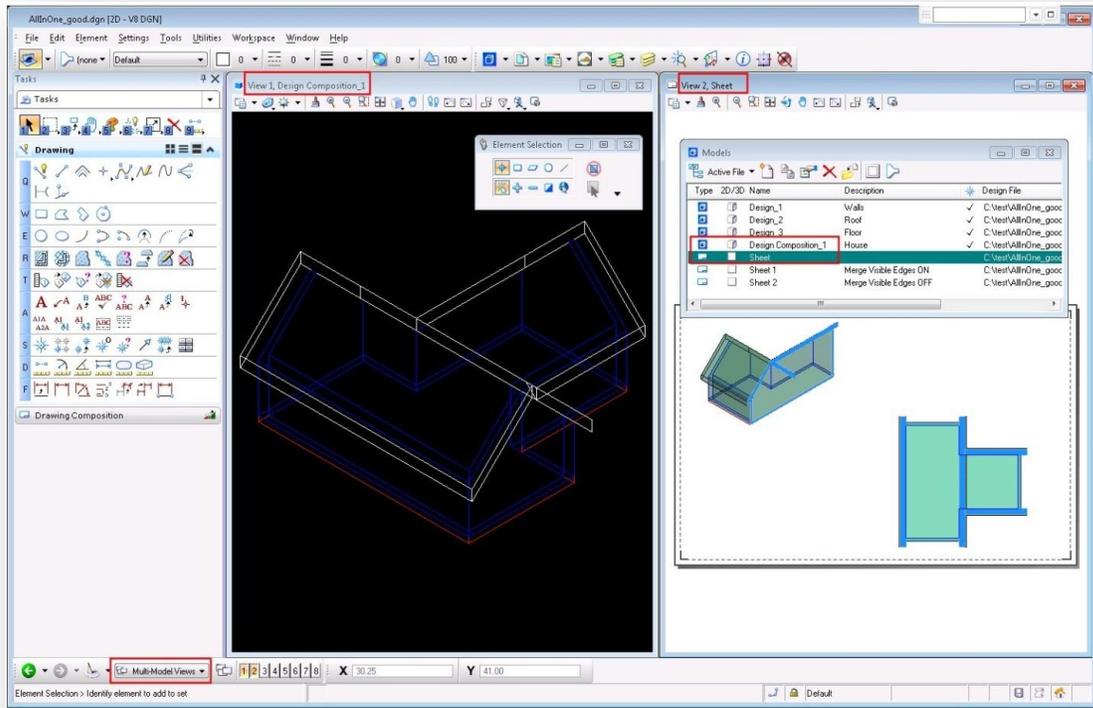
### 3.3 Models Enhancements

The enhancements to Models include additional viewing capabilities, Project Explorer integration with the Models dialog, and sheet name display in the Models dialog.

*Models have additional new features in MicroStation V8i (SS1 and SS2).*

#### 3.3-1 View different models from the same file in each view

You can view more than one model from the same file in separate views. In the example below, notice that the “Multi-models View” view was created and the titles of the two views match two separate models in the Models dialog.

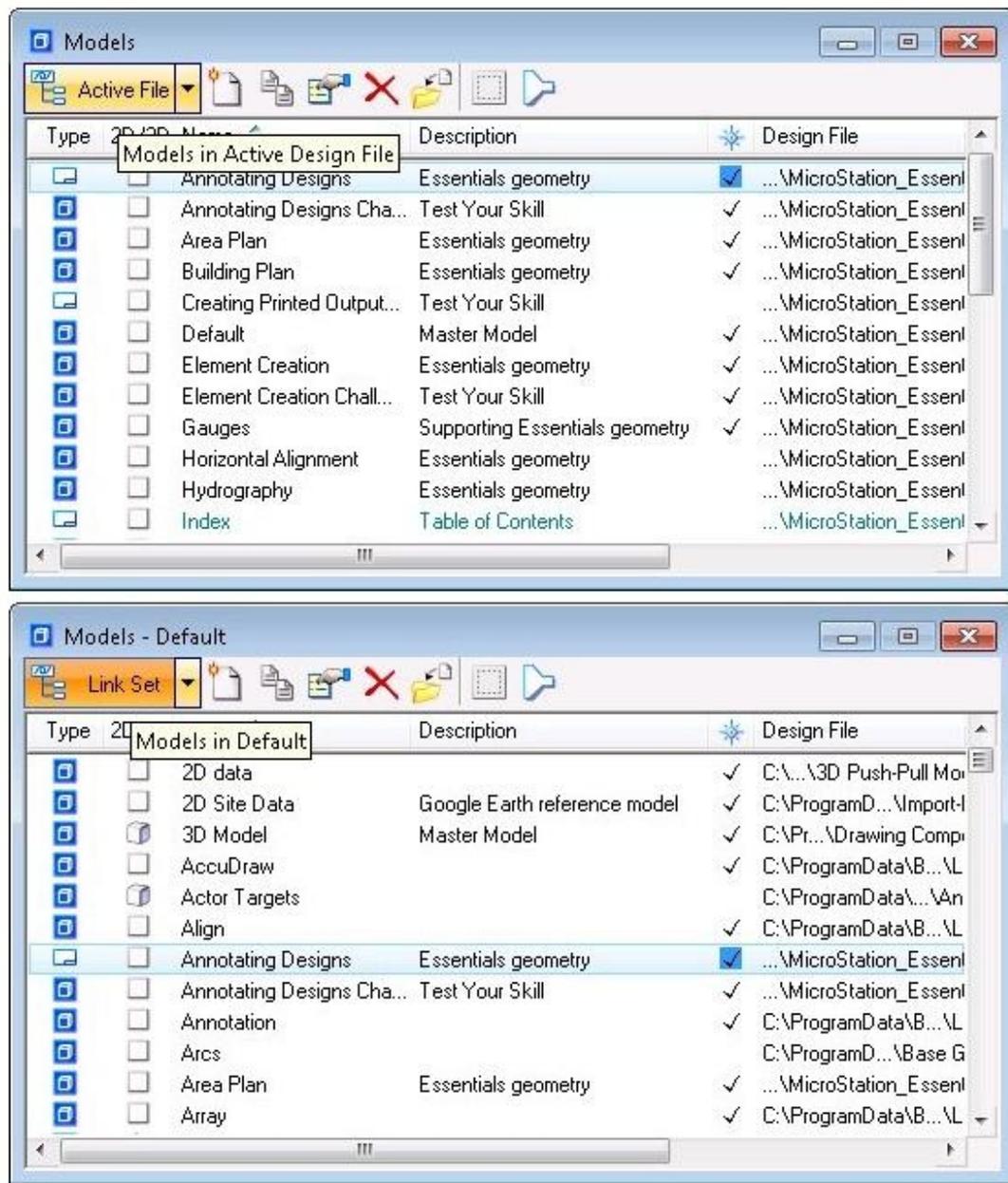


## Multiple Model Display

### 3.3-2 Project Explorer integration in Models dialog

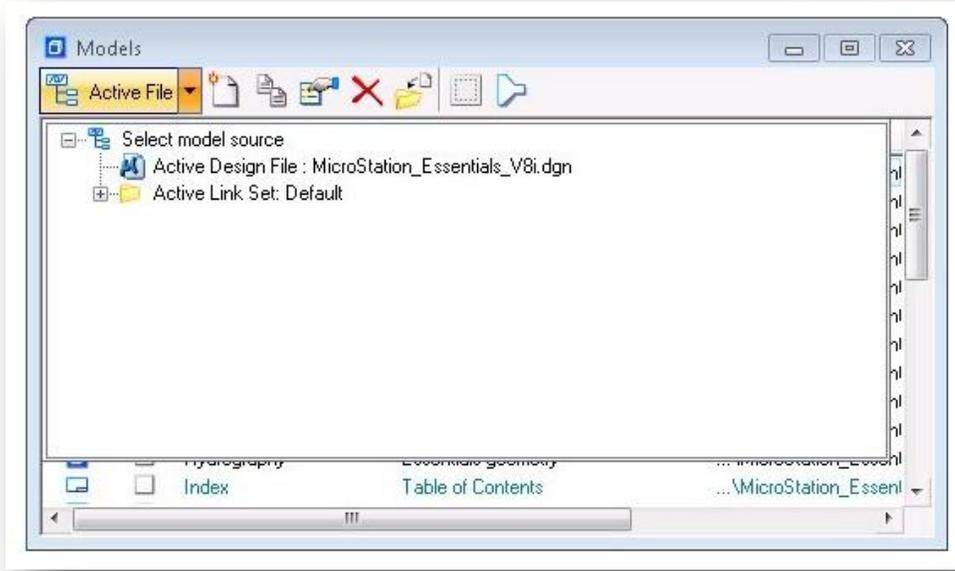
An icon has been added to the Model Manager dialog. The icon puts the dialog into one of two modes:

**Active File Mode:** Shows the current source of the models. If set to Active File, the models are in the master file. If set to Link Set, the models are in Project Explorer.



### Active Files/Link Set Models

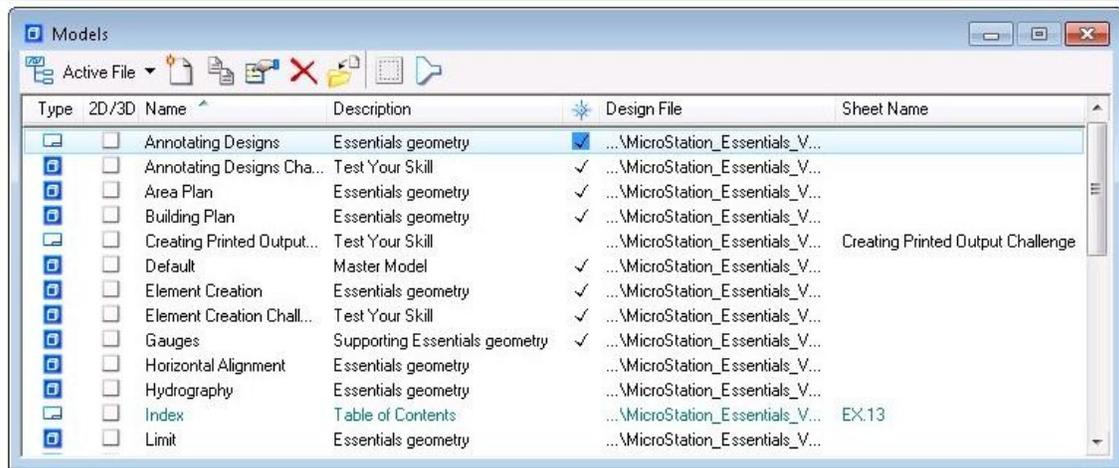
**Link Set Mode:** Shows a Project Explorer layout, allowing you to select an active file or folder from the active project in Project Explorer.



### Active File Model Options

#### 3.3-3 Models dialog displays the sheet name

The Sheet Name column has been added to the Models dialog in support of sheet sequencing. The sheet name should match the corresponding sheet link name in Project Explorer. If the two get out of sequence (that is, the sheet link name was changed in Project Explorer or in the Model Properties in the Model dialog), the new sheet name can either be pushed out from Project Explorer to the model or pulled from the model back to Project Explorer so they are synchronized.



### Models with Sheet Names

## 3.4 Menu Changes

The following sections list changes in the menu structure. The Edit, Workspace, Window, and Help menus are unchanged.

### 3.4-1 File menu changes

- Selecting Import > CAD Files opens the Import dialog.
- Selecting Export > SVG opens the Export SVG dialog.
- Selecting Export > Maxwell Scene opens the Maxwell Export Settings dialog.
- As of MicroStation V8i SELECTSeries 1, exporting to Maxwell Scene has been replaced by exporting to Luxology Scene.
- Selecting Export > OBJ opens the OBJ Export Settings dialog.
- Batch Print is removed and has been replaced by Print Organizer. Selecting Print Organizer opens the Print Organizer dialog.
- Selecting File > Publish i-model opens the Publish i-model dialog.
- Selecting Export > Luxology opens the Create Luxology File dialog, which is used to export the .lzo file.
- Selecting File > Point Clouds opens the Point Clouds dialog.

### 3.4-2 Element menu changes

- Detailing Symbol Settings is removed. It is replaced by Detailing Symbol Styles, which opens the Detailing Symbol Styles dialog. In this dialog you can create and edit detailing symbols.
- Selecting Element Templates opens the Element Templates dialog, which in the previous edition was accessible in the Customize dialog.

### 3.4-3 Settings menu changes

- Selecting Display Styles opens the Display Styles dialog.
- Locks > Depth Lock is removed. It is no longer used.
- The Rendering submenus have been reorganized. Selecting Rendering > Settings opens the Render Settings dialog.
- Selecting Rendering > Maxwell Materials opens the Maxwell Material Settings dialog.
- As of MicroStation V8i SELECTSeries 1, Maxwell Materials rendering has been replaced by Luxology Rendering.
- Snaps > Tangent From has been renamed Tangent Point.
- Snaps > Perpendicular From has been renamed Perpendicular Point.
- Rendering > Light Setup is removed. The Light Setups and Light Manager dialogs have been consolidated into a new Light Manager dialog, which is opened by selecting Rendering > Light Manager.

### 3.4-4 Tools menu changes

- The Tools menu has been reorganized. All toolboxes are accessible from the Tools menu. Each tool appears in only one toolbox.
- You can select tools and view controls directly from the Tools menu.
- For example to select the *Scale* tool, select Tools > Manipulate > Scale. To open the Manipulate toolbox, select Tools > Manipulate > Open as Toolbox.

- The Main submenu returns to provide more convenient access to child toolboxes of the Main toolbox.
- The Geographic submenu provides access to geographic tools.
- The Clash Detection menu item provides access to the Clash Detections toolbox.
- The Point Clouds menu item provides access to the Point Cloud toolbox.

#### 3.4-5 Utilities menu changes

- The Render menu item's submenus have changed. The submenus are View, Fly Through, Solar Study, Animation, and Luxology.
- Selecting Named Expressions opens the Named Expressions dialog.
- The Generate Section menu item is removed.
- The Install Fonts menu item is removed.
- The Render > View menu item is removed.
- The DWG > Audit menu item is removed.
- The DWG > Recover menu item is removed.

#### 3.4-6 Help menu changes

- Selecting Help > Quick Start Guide (PDF) opens the MicroStation Quick Start Guide.

#### 3.4-7 Application menu

- No significant changes
- Due to inconsistencies with AutoTrack, SignCAD, and InRoads; multiple Application menus may appear.

### 3.5 Text Enhancements

Text enhancements include the ability to change case by a selection set or fence. The Advanced tab allows for comparisons between styles. Word Processor updates include an insert field, subscript and superscript icons and right-click operation to change the case. The Edit Text tool retains its text settings and the Find/Replace Text tool supports data fields. Change case by selection set or fence.

This tool is used to change the case of a piece of text. Case change options include Upper Case, Lower Case, Title Case, and First Capital. This tool also supports text selection via a fence.



Change Text Case

#### 3.5-1 Text Style dialog enhancements

For information on INDOT Specific fonts, please see Appendix C (pg 263)



## Text Style Differences

Text Styles dialog in Differences mode

### 3.5-2 Word Processor enhancements

Three new icons have been added to the Text Editor – Word Processor dialog.

The Insert Field icon opens the new Field Type Picker dialog, used to select the type of field to be created. See Placeholder fields for more information.



### Text Functions

The Superscript icon allows you to create text with superscript by typing in the text, clicking the superscript icon, then typing in the number. The Apply Changes to all Text check box must be toggled off to place superscript.



### Superscript Text

The Subscript icon allows you to create text with subscript by typing in the text, clicking the subscript icon, then typing in the number. The Apply Changes to all Text check box must be toggled off to place subscript.



### Subscript Text

#### 3.5-2a Right-click to change case

The Change Case > Upper Case and Change Case > Lower Case menu items have been added to the right-click menu of the Text Editor – Word Processor dialog.

### 3.5-3 Using Fonts

MicroStation supports three types of fonts: True Type, RSC (MicroStation Resource Font) and SHX (AutoCAD Fonts).

### **3.5-3a True Type Fonts**

Many TrueType fonts are delivered with Windows, and many more are available from various vendors for free or for purchase. *TrueType is an industry standard format supported by MicroStation.* In general, this is the recommended font type for use in MicroStation. TrueType fonts also include full Unicode support (note: not all TrueType fonts contain characters for all languages). TrueType fonts are always filled, and therefore do not provide good support for “stick” fonts (as opposed to SHX and RSC fonts).

### **3.5-3b RSC (MicroStation Resource Font)**

This font format is MicroStation-specific, and RSC fonts are stored in MicroStation resource (.rsc) files. A single resource file may contain several RSC fonts. RSC fonts have a number and a name, but only one font by a given number can be used at a time during a MicroStation session. If multiple RSC fonts share the same number, the last one to be loaded is the font assigned to that number in a given session. RSC fonts are locale-encoded, but support more than 255 characters (e.g. for some Asian languages). The code page of RSC fonts is specified in the font configuration file. If you use font characters for symbols, use RSC fonts rather than TrueType fonts.

*Due to various compatibility issues, and lack of customization tools, RSC other than those provided with SignCAD are no longer available for use in the INDOT Workspace.*

### **3.5-3c SHX (AutoCAD Fonts)**

MicroStation supports AutoCAD’s font format (including normal SHX fonts, SHX Unifonts, and SHX Bigfonts). You should use SHX fonts only when you must ensure AutoCAD compatibility, and TrueType fonts are not a viable option. SHX Unifonts are the current standard, and allow a single font (and font file) to contain characters in the entire Unicode range. Older SHX fonts only support up to 255 characters, and thus require a paired SHX Bigfont to support languages with more than 255 characters (e.g. Asian languages). In MicroStation, specifying a paired SHX Bigfont is optional, and is recommended if you require characters that cannot be provided by the base SHX font.

If AutoCAD is installed, MicroStation searches for SHX fonts in AutoCAD’s Fonts directory (the “Fonts” folder in the installation directory of the most recently used version of AutoCAD). With or without AutoCAD, MicroStation searches the directories specified by MS\_FONTPATH, as well as the same directory as the design file requesting the font.

DWG Export: AutoCAD natively supports SHX fonts, and no special export is performed.

### **3.5-4 Edit Text tool retains text settings**

In the past, the Edit Text tool would change the active settings whenever you edited a piece of text. This behavior has been changed so settings revert to the previous settings when the Edit Text tool is closed. This change affects the active settings only and not the text styles.

### **3.5-5 Find/Replace Text supports data fields**

The Find/Replace Text tool can now find and replace text in enter data fields.

## **3.6 References Enhancements**

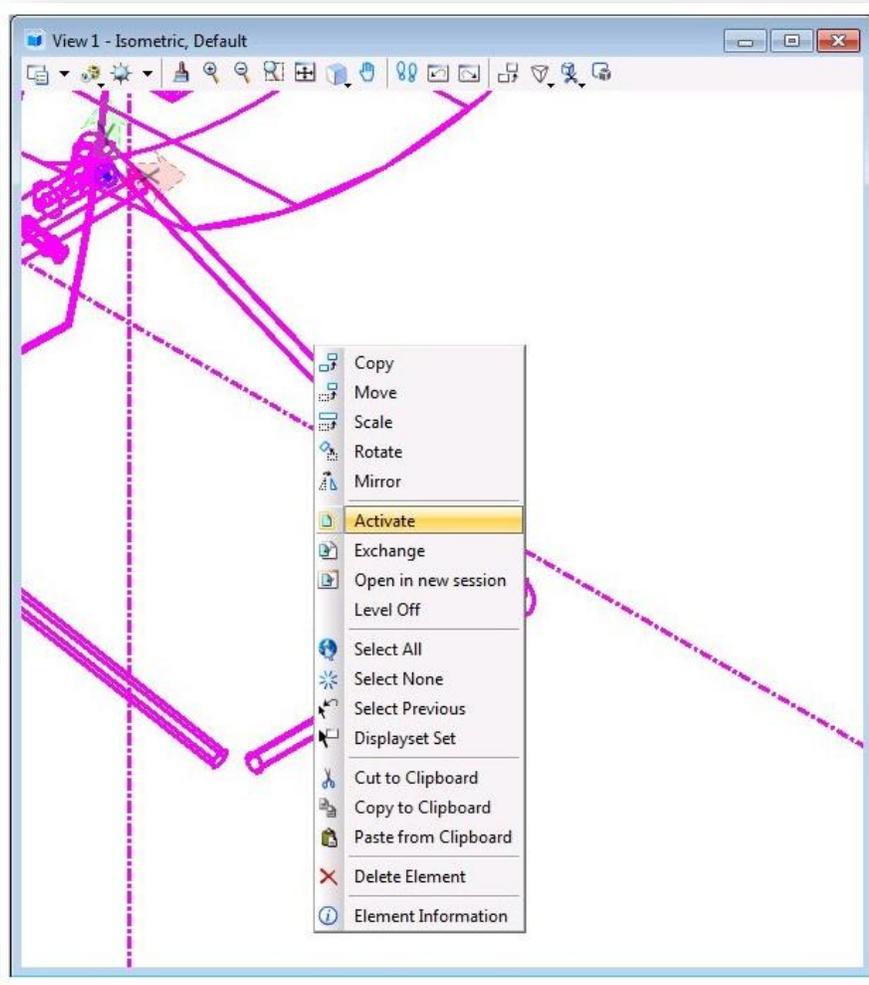
A major enhancement to references is the ability to edit a reference from within the active model.

In addition, the active model's annotation scale applies to annotations in references.

*References have additional new features in MicroStation V8i (SELECTSeries 1).*

### 3.6-1 Activate reference for in-place editing

A new capability lets you edit a reference in-place. That is, you can edit a reference from within the active model. To do this you first must activate the reference.



### Reference Activation

When a reference is activated:

- Only operations on the activated reference are permitted.
- By default, all elements in references above the activated reference in the file hierarchy, as well as the active model, are displayed with an override color. You can control whether or not an override color is used, and what the color is.

- If you activate another reference, the currently activated reference is automatically deactivated.
- The reference is locked so that it cannot be edited in another session.
- DGN library data, such as levels and level filters, is not available in an activated reference file.

### 3.6-2 References support active model annotation scale

In the past you may have added annotations to design models that are referenced into sheets. You also may have added annotations directly on the sheet. If the annotations were too small, you would have changed the model's annotation scale, but that would have affected only the annotations directly on the sheet. The annotations in the reference were not changed. Therefore, the only way you could change the annotations was to exchange into the reference and scale them.

Now the active model's annotation scale applies to annotations in references, too. If you change the scale of the annotations on the sheet, the scale of the annotations in the references changes as well.

To make a reference's annotations use the active model's annotation scale, you must turn on this option. In the References dialog there is a new column named Use Active Annotation Scale. If this column is not visible, right-click in the column headings and turn it on. To turn on this option for a reference, click in this column to make a check mark appear.

### 3.6-3 Detail scale

Detail scale helps you represent the Master:Ref scale in terms of the sheet scale. For example, if your sheet scale (annotation scale) is  $1/8" = 1'$  and you want to place a detail reference of scale  $1/4" = 1'$ , simply pick the new scale from the Detail Scale combo box. It automatically computes the Master:Ref scale as 2:1.

### 3.6-4 Synchronize with saved view

When you attach a saved view, you can specify that the display of the reference should always be synchronized with the original saved view. In the Reference Attachment Settings dialog, turn on the Synchronize with Saved View check box.

In order to change the appearance of a reference, you have to modify the saved view that it is synchronized with. This is to ensure fidelity of display properties such as view attributes, level masks, clip volume, display styles and others.

When synchronized, the reference location is also realigned. Specifically, when the reference is synchronized with the saved view, the reference center and saved view center remain aligned. You can see the effect of this in two ways:

In an unsynchronized state, the reference is first shifted and then synchronized.

When synchronized, the saved view center is changed; for example, the saved view is stretched.

### 3.6-5 Drawing title

When attaching a reference on a sheet, you can optionally create a drawing title. A drawing title describes a drawing on a sheet. If there are four references on a sheet (top, front, right, and

isometric), you create four drawing titles to demarcate the four references. It plays a crucial role in automatically linking call-outs across sheets. Properties such as Name, Detail Scale, and Identifier are displayed in the call-outs in the form of fields.

### **3.6-6 Change Attachment Orientation**

In this edition you can change the orientation of the reference attachment by clicking the reference's Orientation column in the References dialog.

### **3.6-7 Reference Detail Scale**

When attaching a reference (a design or drawing model) into a sheet model, the referenced model's annotation scale is applied as the detail scale, and the Reference Scale (Master:Ref Scale) is calculated from the referenced model's annotation scale and the active model's annotation scale.

## **4. Plotting**

Plotting has not changed much since version 2.0. This document will include some procedures/enhancements that may have previously been taught and passed out. We feel that it is important to keep these up to date and relevant. The most significant enhancement to plotting is the streamlining of the procedure used to take advantage of Electronic Signatures in Adobe Acrobat. Other enhancements include the use of a standardized print queues to better control the quality of the printed product as well as the use of .pdf as the finished plotted product.

All of the enhancements to the plotting environment are a product of countless hours of research based on the lessons CAD Support has learned over previous releases of the workspace and best practices in place within INDOT and other agencies.

### **4.1-1 PDF Support Only**

Due to the number of different plotter and printer configurations currently available across all INDOT locations, CAD Support is now using a single driver/multiple plotter setup for exporting files to PDF. As PDF is largely becoming the standard format for the publishing of documents to ERMS and for transport across the agency, CAD support has found that this method will allow better control for the consistency of plots, while maintaining the flexibility to send the completed PDF to any preferred hardcopy device (printer/plotter).

### **4.1-2 Attaching Plot Drivers**

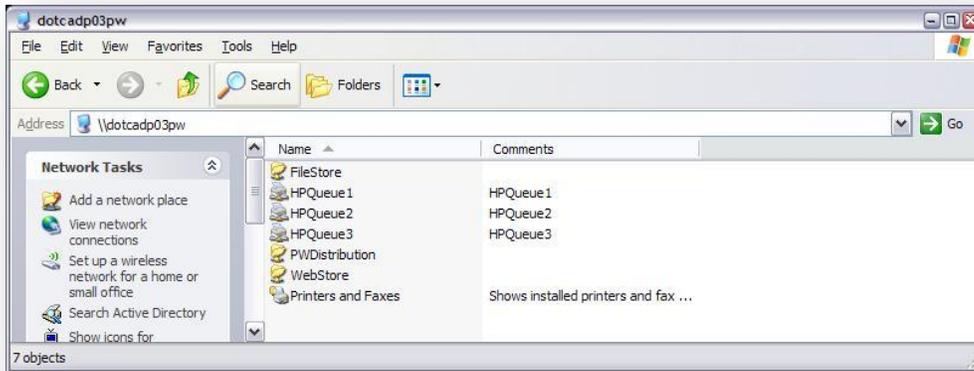
All files plotted from IPLOT or ProjectWise InterPlot Organizer will be plotted using one of 3 PDF plot queues. Those 3 plot queues can be attached from the following location

DOTCADP03PW

You will need to type the following into the address bar... \\DOTCADP03PW\

At this location, there will be 3 separate plot queues for your use.

- HPQueue1
- HPQueue2
- HPQueue3



### DOTCADP03PW HP Queues

Each of which can be selected by simply double clicking on the queue in your windows explorer. You may use any of these plotters, as all are configured the same. Multiple queues are provided so as to better accommodate any load issues.

#### 4.1-3 HP Plot Queue Settings

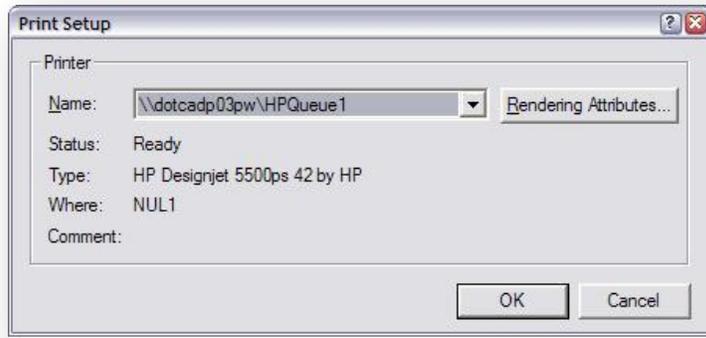
It has been found that using HP based drivers for the 5500ps plotters has provided a more efficient and reliable plot creation engine than the OCE. As such, there will be some changes to the plot creation workflow to take into account the small differences in form sizes and procedures required to get comparable output to the OCE plot queues.

The most important difference between the two units, are the form sizes. Please see the following table to find a size comparison that will equate the most common OCE based form sizes to the new HP queue.

<i>OCE Form</i>	<i>HP Form</i>
Oce D+ 24x36 in	Oversize: Arch D
Oce B+ 12x18 in	Oversize: Arch B
Oce B 11x17 in	Oversize: ANSI B (Tabloid)

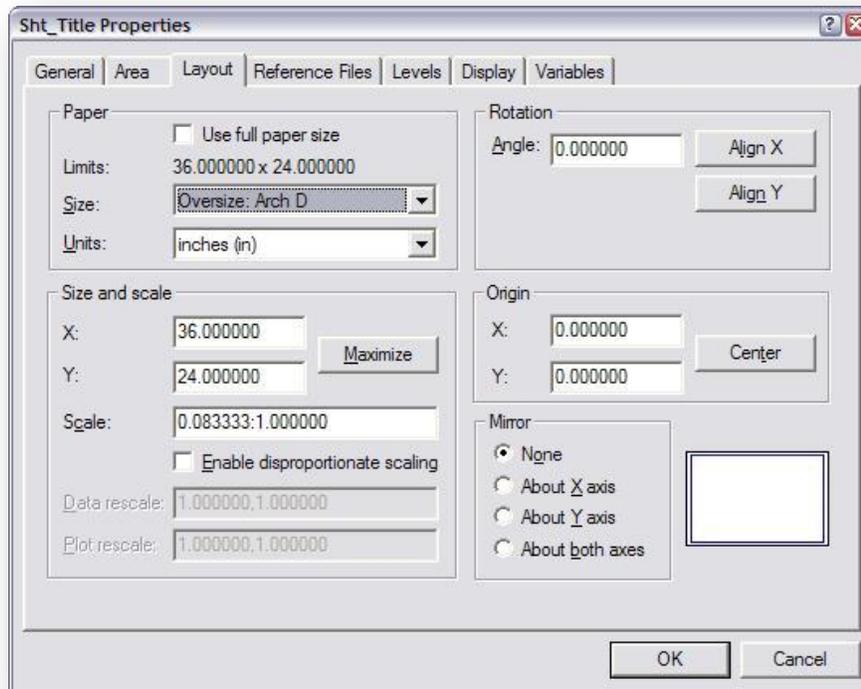
.set files will be provided to appropriately setup these form sizes for a wide variety of prints. Should a manual adjustment be necessary, the following adjustments will need to be made.

Under the File -> Print Setup menu option, make sure your printer is defined as one of the HPQueues.



### Print Setup

This will make the HP form sizes available for selection on the plot properties dialog. When viewing the properties of a plot, all of your prior settings will be the same including .set files (unless re-applying the new ones), plot area, pen tables, etc. The changes that will need made are on the Layout tab.



### Iplot Properties

The changes for using the HP forms are as follows:

1. Make sure you've selected the appropriate form size from the comparison chart earlier in this section.

2. Do NOT check “Use full paper size”. HP Forms have a built in margin factor that will cause the scaling of your prints to be incorrect. By disabling the full paper size setting, it will recognize only the printable area which is consistent with the old OCE forms.
3. All other settings should remain the same. There may be specific adjustments that need to be made on a per-sheet basis.

## 4.2 Design Scripts and Settings Files

### 4.2-1 Overview:

Because of the greater functionality of design scripts, INDOT will no longer use pen tables to define properties of plot sets. Design scripts allow for all of the functionality of pen tables in addition to allowing for more precise pen weights, screening, etc.

Also as a further integration into ProjectWise, all Design Scripts and Plot Settings files have been stored in ProjectWise. This insures that all users have access to the most up to date file(s) at all times.

All ProjectWise InterPlot Organizer settings files are located within ProjectWise at the following location.

<pw:\\dotwise.indot.in.gov:DOTWise\Documents\Resources\Plotting\>

- INDOT HPQueue\_AN.set to be used with Electronic Signatures and Auto Page Numbering (for use with the HP Plot Queues for full size sheets).
- INDOT HPQueue\_NN.set; to be used with Electronic Signatures and no Page Numbering (for use with HP Plot Queues for full size sheets).
- INDOT HP\_Letter\_AN.set; to be used with Electronic Signatures and Auto Page Numbering (for use with HP Plot Queues, and letter size sheets).
- INDOT HP\_Letter\_NN.set; to be used with Electronic Signatures and no Page Numbering (for use with HP Plot Queues, and letter size sheets).

The Design scripts can be found in the “*Design Scripts*” folder directly under the Plotting folder. These will be automatically attached when one of the previously listed .set files are used.

In addition to the above .set files, you will also find a comparable version of the .set to be used with sheets cut from InRoads (ex. INDOT InRoads\_HPQueue\_AN.set) . These sheets do not follow the standard convention of being cut to true sheet models with paper border, rather they are adjusted differently. To compensate, an exterior boundary set to transparent has been created for these borders. These .set files use this shape as the plotting extents for InRoads sheets. Other than that difference, these .set files should be used and configured in the exact same manner as previously shown. It’s highly recommended that the .set files be attached at the time of plot creation to allow all instances of a level name to be found and taken into account. Not doing this may cause lplot to find the incorrect instance of a plot shape in a given file and not return the plot expected.

All INDOT design scripts (.pen files) perform the following functions and are automatically attached by the previously listed .set files:

- Sets pen thicknesses
- Applies 60% screening (Gray Scale) on Cross Section Grid Lines
- Substitutes Printer name, File Name and/or date
- Addresses Electronic Signature field

INDOT Pen Table\_BW.tbl is automatically attached by the .set files as well, and controls the color table for finished prints. Please note that all these resources are tailored to use with the DOTWise system and are for the creation of PDF output only.

### 4.3 Creating an Electronic Signature

The use of Electronic Signatures through Adobe Acrobat has been in place at INDOT for quite a while; however we have taken steps to automate this process using ProjectWise InterPlot Organizer. To ensure the security of the Electronic Signatures, INDOT will now be acting as a verification service for the Electronic Signatures.

Furthermore, CAD Support has inquired through the legal department of the Indiana Department of Transportation and has received approval from the following to move forward with the use of Electronic Signatures to sign plans at INDOT.

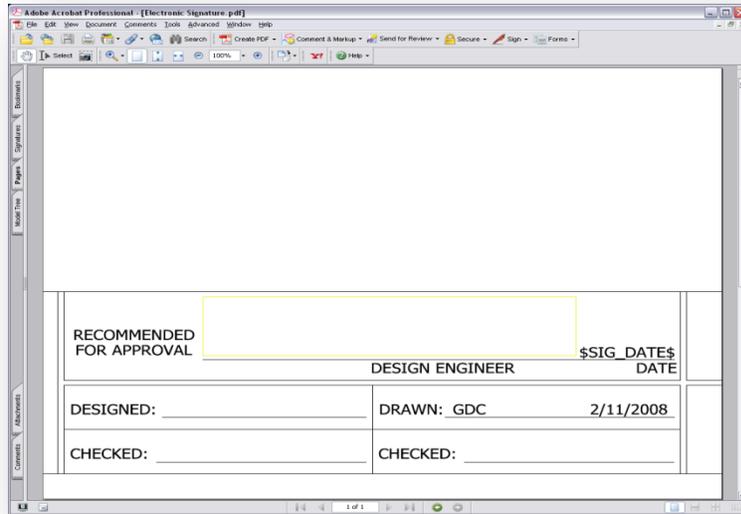
- INDOT Legal department
- Indiana State Board of Accounts
- Indiana Professional Licensing Board

#### 4.3-1 Creating a .pdf of your Signature

**Note:** Before starting this process, you will need to determine where your Digital ID should be saved in a secure location that only you have access to. One suggestion would be in your My Documents folder. This will ensure that your Digital ID will be available to you as long as you are logged into the DOT domain.

You will need to locate an INDOT photocopier that also scans images for this next exercise. One that also sends the scanned image to you via email would be a best case scenario.

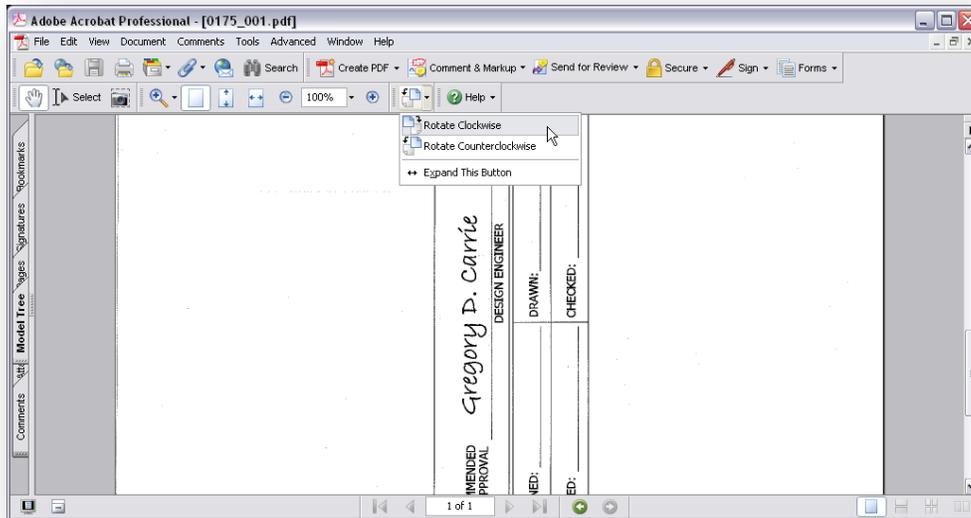
1. Navigate within ProjectWise to ... **\Documents\Resources\Design Information\Electronic Signatures\Electronic Signature.pdf**. (This folder contains the sheets on 8.5" x 11" paper that you use to scan your signature.)
2. Open (read only) Electronic Signature.pdf (This is an 8.5" x 11" print of the signature area on a large format (D+ 24" x 36") border sheet.



### PDF Electronic Signature Template

Notice the faint yellow line in the signature area. Your signature must be contained entirely within this area. (Your signature should not cross the line above “DESIGN ENGINEER”.

- Print the .pdf onto an 8.5” x 11” sheet of paper, and then sign the printed piece of paper as you would sign a contract document. Remembering to keep your signature within the now very faint box described in the previous step. Some additional suggestions are:
  - Use a black pen, blue doesn’t always cooperate in gray scale situations and can contribute to poor contrast with the finished product.
  - Use a fine point marker or felt tip pen. Both will give the actual signature some weight that will transfer better when inserted/cropped/scaled.
  - Exaggerate the size of your signature. This will also assist in visibility when it is inserted/cropped/scaled.
- 3. Locate a printer/copier with scanning and emailing capabilities. Then scan and email the paper with your signature to yourself.
- 4. Open the .pdf that you previously scanned/emailed using Adobe Acrobat. If you do not have Adobe Acrobat, you will need to locate a machine with this installed. Please contact your supervisor and security coordinator should you require this software.
- 5. You may have to rotate the image so that it is orientated properly. This can be accomplished using the Rotate View tool in Adobe Acrobat.



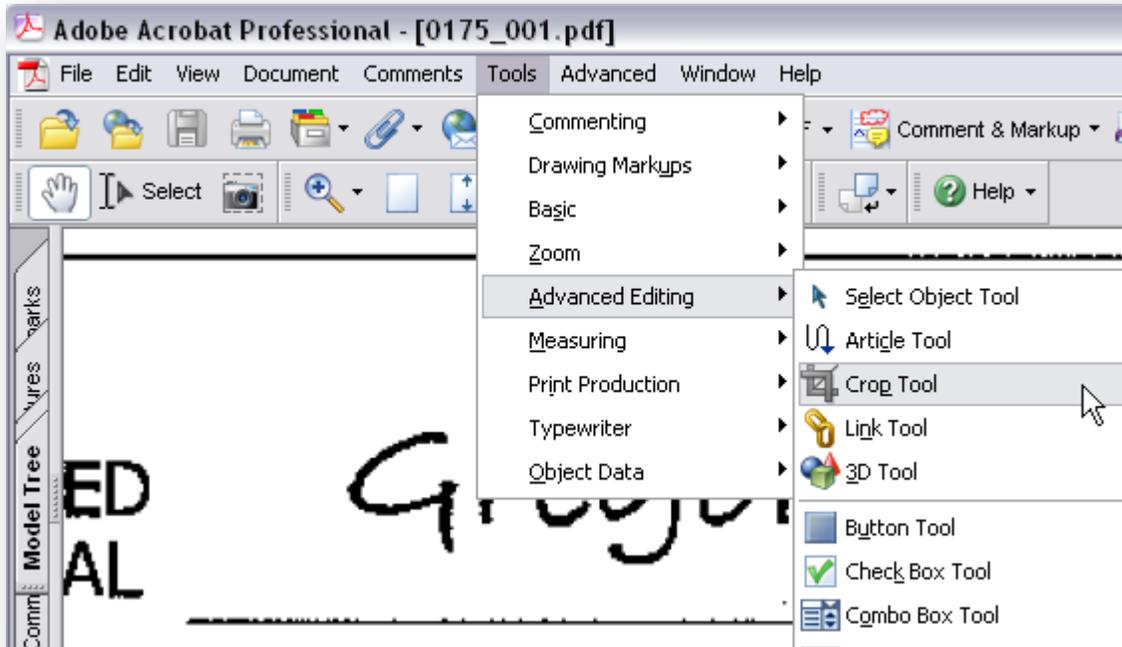
Scanned PDF Signature

- Using the zoom tools, make your signature just large enough that you see it, and a portion of the surrounding data. As shown below.



Scanned PDF Signature

- In Adobe Acrobat Reader in the menu bar, go to *Tools > Advanced Editing > Crop Tool*.



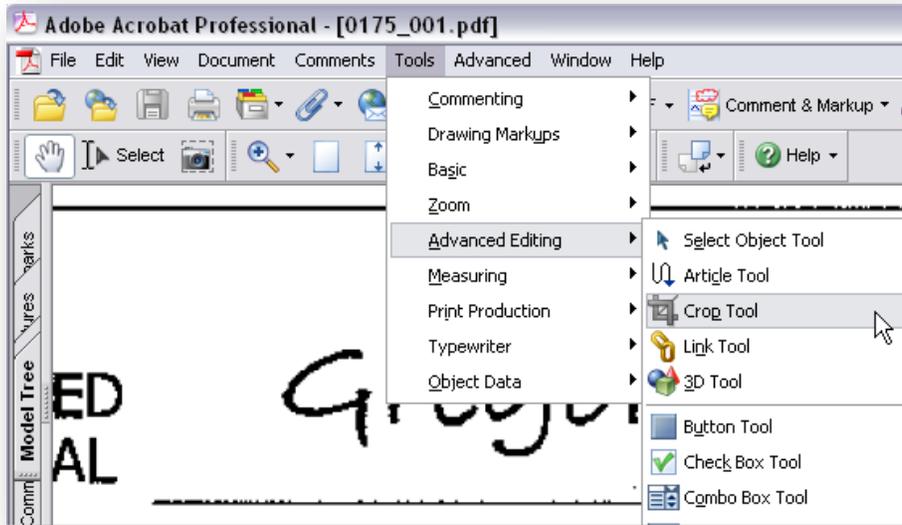
### Cropping the PDF Signature

8. Draw a box around your signature by left clicking the mouse button and dragging the mouse. Try to get as close to the outline of the previously mentioned “faint yellow line” as shown in an earlier step in this exercise. Do not cross any of the elements in the border sheet.



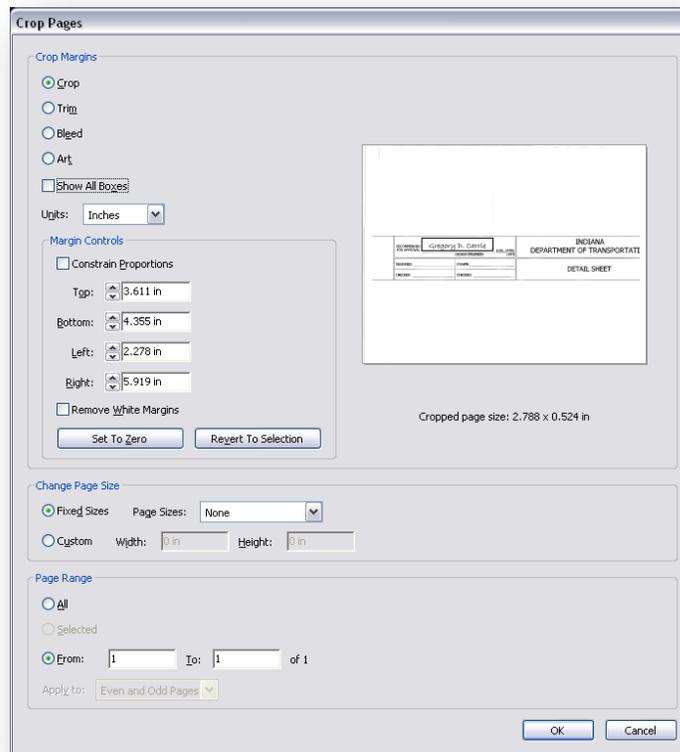
### Cropping the PDF Signature

9. In Adobe Acrobat Reader in the menu bar, go to *Tools > Advanced Editing > Crop Tool*.



### Cropping the PDF Signature

10. This will open the Crop Pages dialog box. Make sure that all of your options match those illustrated below except the margins which may differ for all users.



## Cropping the PDF Signature

11. Click Ok.

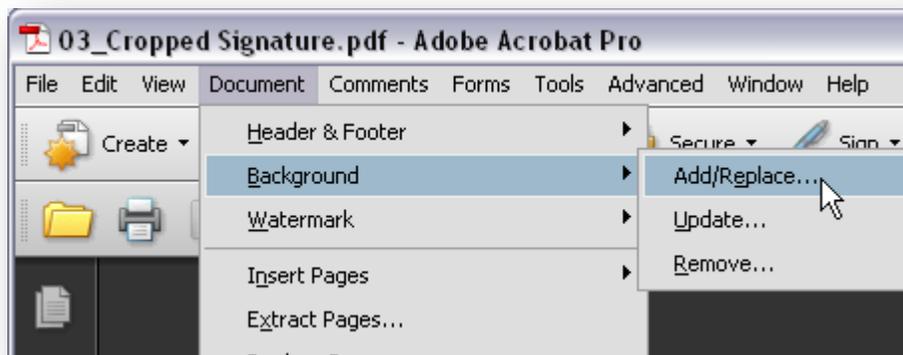


## The Finished PDF Signature

12. Save the file making sure to place it in a location that meets the criteria listed in the note at the beginning of this series of exercises.

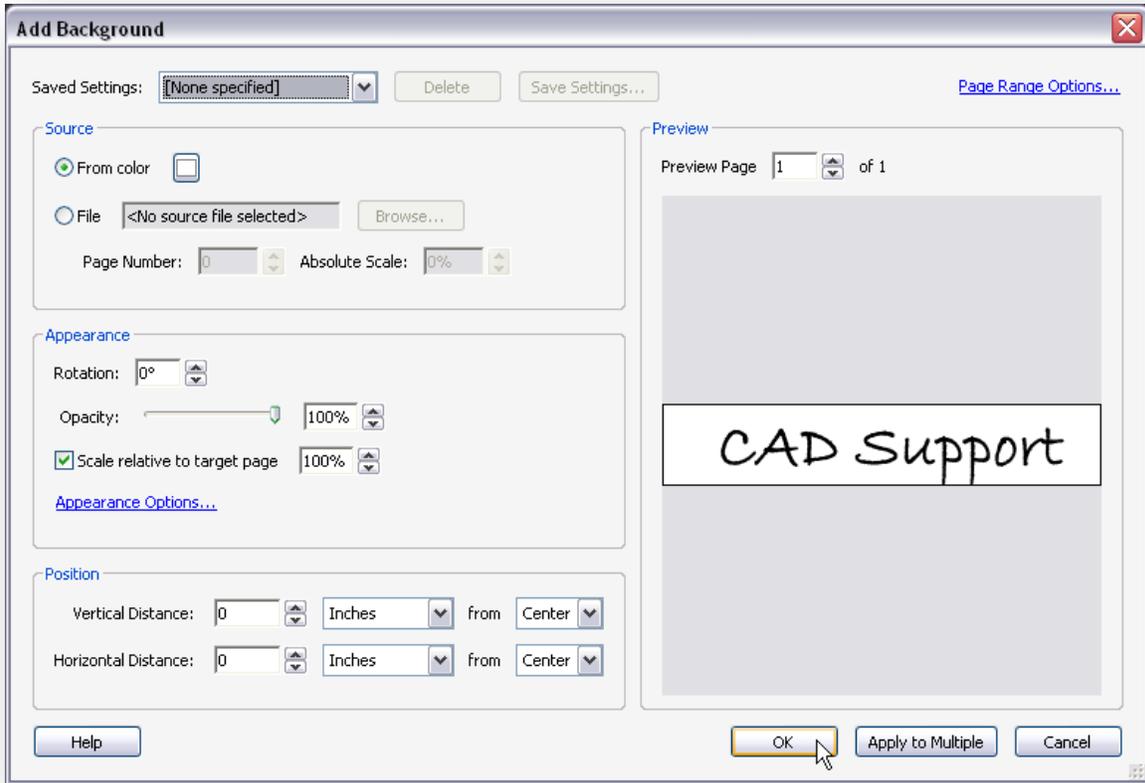
**Note:** When using Adobe Acrobat Professional 9, you will need to make sure that the background is turned on so that the electronic signature will cover the "this media not considered a certified document" text that is in the signature block on the border sheets.

13. In Adobe Acrobat Professional 9 select **Document > Background > Add/Replace**



## PDF Signature Background

14. Then, taking the default settings, click OK on the Add Background dialog box.

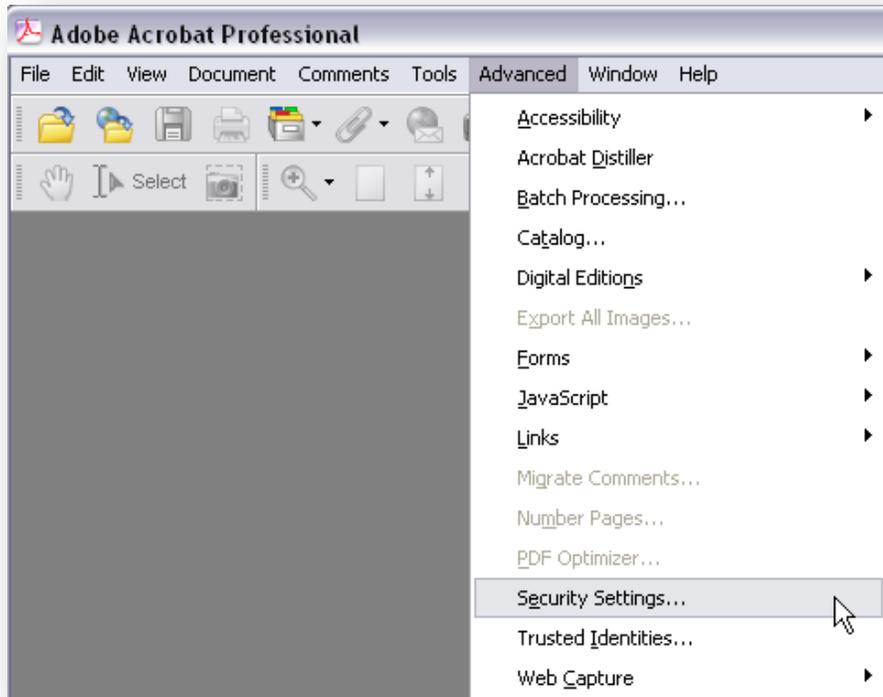


## PDF Signature Background

### 4.3-2 Creating an Electronic Certificate

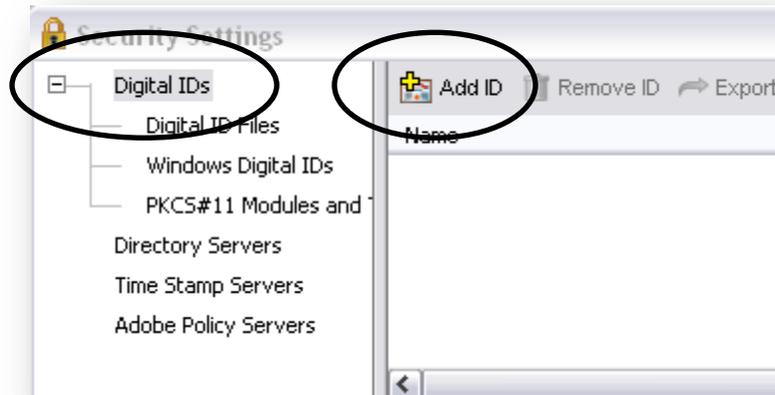
Once you have created a .pdf version of your signature, you then need to create a secure certificate to use to manage your signature. Once created, the certificate will be stored by you in a secure location and you will be required to send the CAD Support staff a version of your certificate so that we may store it in a secure location in ProjectWise, should there be a need to either verify your signature or replace a lost (deleted) local copy. This can be done using either Adobe Acrobat Professional or Acrobat Reader

1. In the Adobe Acrobat Professional tool bar select **Advanced > Security Settings**.



### Creating the Electronic Signature

2. In the left column of the Security Settings dialog box select Digital ID, and then click Add ID.



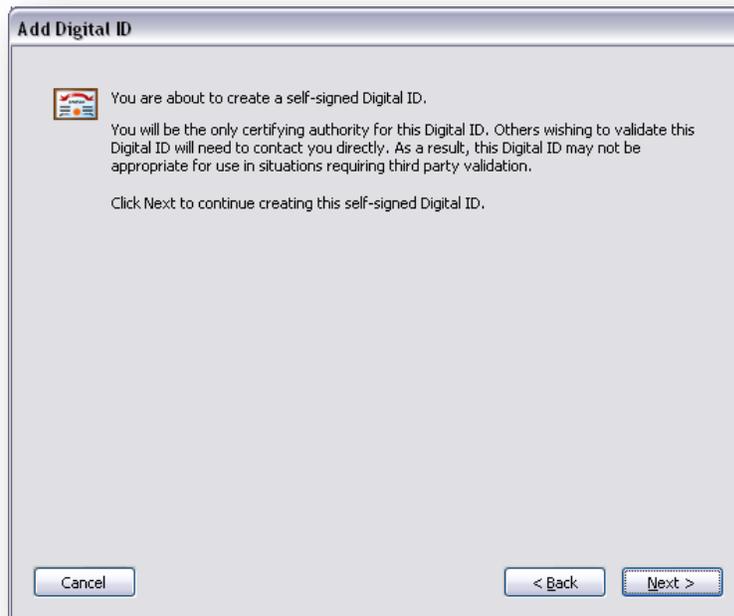
### Creating the Electronic Signature

3. In the Add Digital ID dialog box, select Create a Self-Signed Digital ID, then select the Next button.



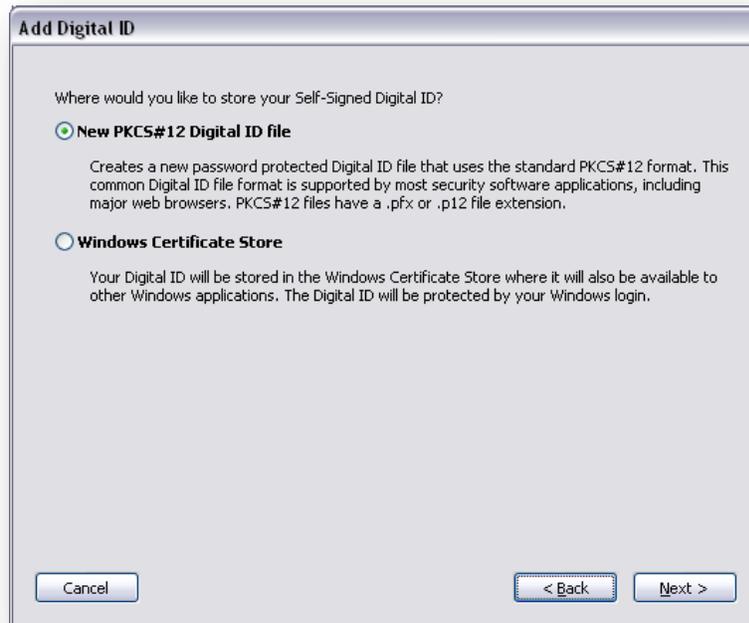
### Adding the Digital ID

4. Select next in the following dialog box.



### Adding the Digital ID

5. Select the New PKCS#12 Digital ID File and then select the Next button.



### Adding the Digital ID

6. Fill out the dialog with the appropriate information. The Organization Unit should be your District and Division. (i.e..... CO – Roadway Services, CO – Structural Services, Vincennes Design, Seymour Design...)

**Add Digital ID**

Enter your Identity information to be used when generating the Self-Signed Certificate.

Name (e.g. John Smith): Gregory D. Carrie

Organizational Unit: CO - CAD Support

Organization Name: INDOT

Email Address: gcarrie@indot.in.gov

Country/Region: US - UNITED STATES

Enable Unicode Support

Key Algorithm: 1024-bit RSA

Use Digital ID for: Digital Signatures and Data Encryption

Cancel < Back Next >

### Adding the Digital ID

- Now you will need to save the Digital ID. Make sure to place the file into a location that meets the criteria described in the note at the beginning of this series of exercises. When saving the PFX file (Digital ID), make sure you use the following file naming convention. Date is necessary in the event another Digital ID is created in the future. The Adobe version is important for compatibility reasons.

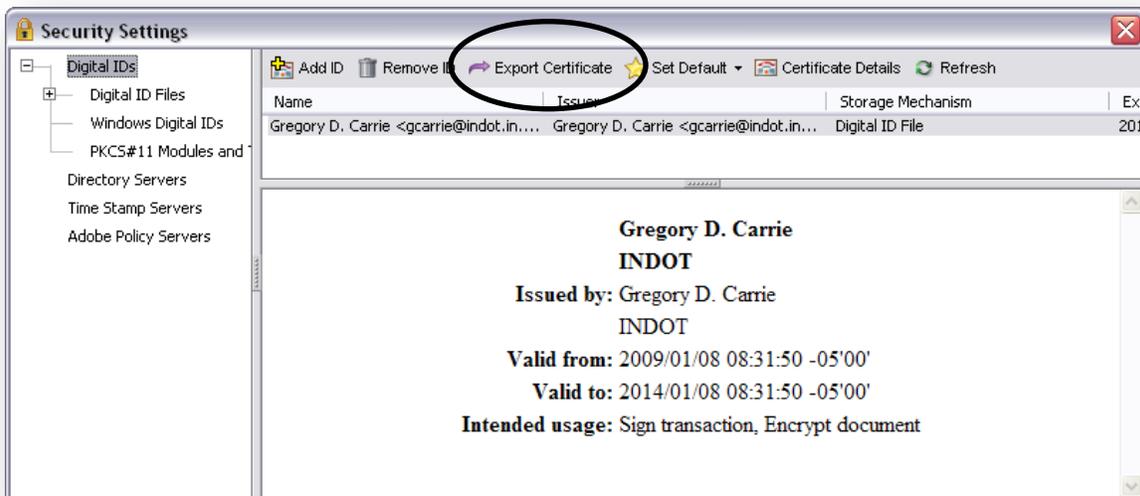
*Userid\_YYYYMMDD\_ver.pfx [gcarrie\_20090108\_v7prof.pfx]*

You will need to create a password that you will use every time you apply your Digital ID. Don't forget your password or you will need to create a new Digital Id. The password has to be a minimum of 6 characters and it is case sensitive.



### Adding the Digital ID

8. Select Finish.
9. Now, highlight your name and select the Export Certificate option. The file created in this can be used to validate your Digital ID.



### Exporting the FDF File

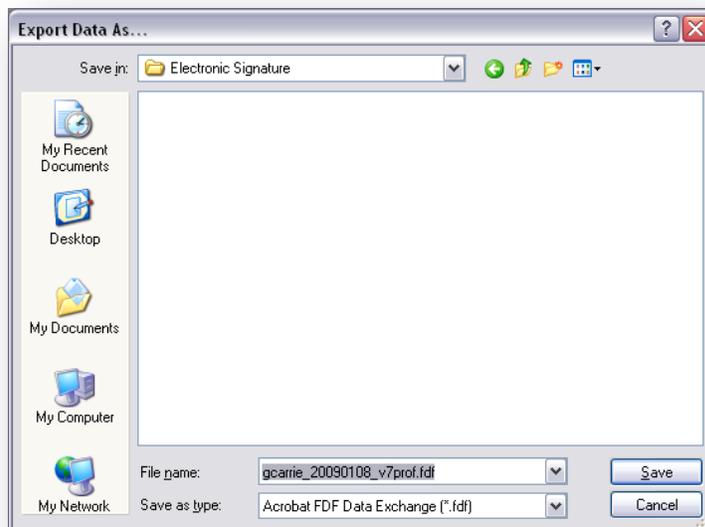
10. Select the Save the data to a file option and click Next.



### Exporting the FDF File

11. When saving the exported file, make sure that the path is to the same location as your Digital ID. The Save As type should be set to Acrobat FDF Data Exchange. Be sure to use the same naming convention that was used for the Digital ID.

*UserId\_YYYYMMDD\_ver.fdf [gcarrie\_20090108\_v7prof.fdf]*



### Exporting the FDF File

12. Now that you have created a certification file to validate your Digital ID, you will need to email that .fdf file to Greg Carrie (gcarrie@indot.in.gov). INDOT will then be the holder of this file to validate any contract plans that you have signed electronically. The .fdf file will be kept in a secure location within ProjectWise where it cannot be altered in any way.



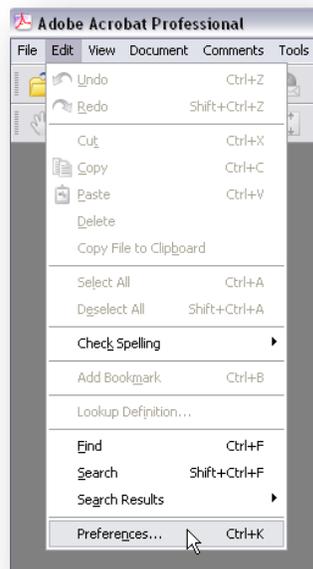
### Exporting the FDF File

**Note:** If you would like for CAD Support to store a copy of the .pdf of your signature, make sure to forward a copy of the .pdf at the same time that you send the copy of your .fdf file.

#### 4.3-3 Combining the Electronic Components

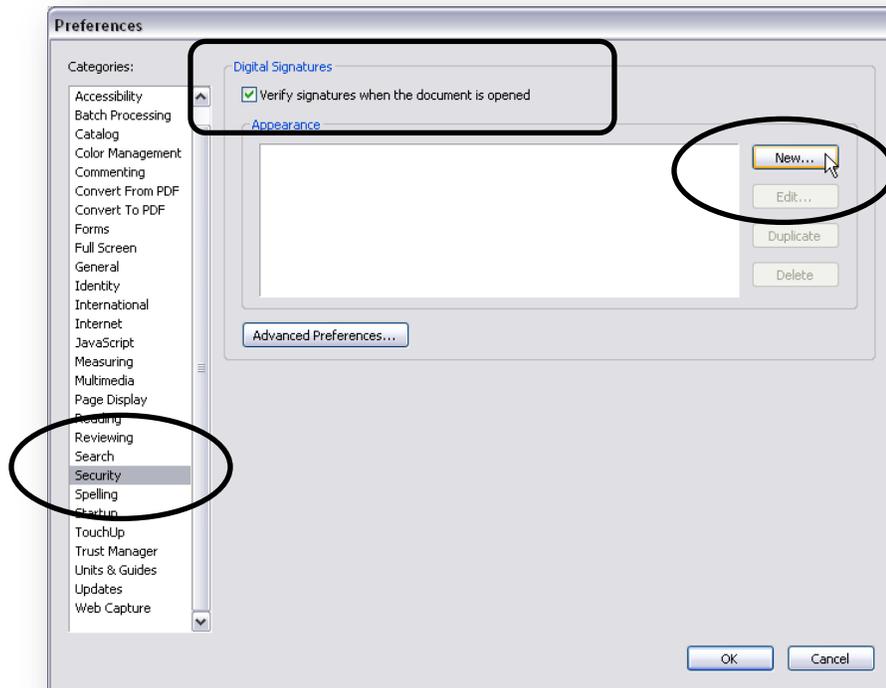
Now, using either Adobe Acrobat Professional or Adobe Acrobat Reader, you will need to combine your Signature and Certificate.

1. In the Adobe menu bar click **Edit > Preferences**. This opens the Preferences dialog box.



### Combining the PDF & FDF Signatures

2. In the Categories: column, select Security. Enable “Verify Signatures when the document is opened”, then select New...



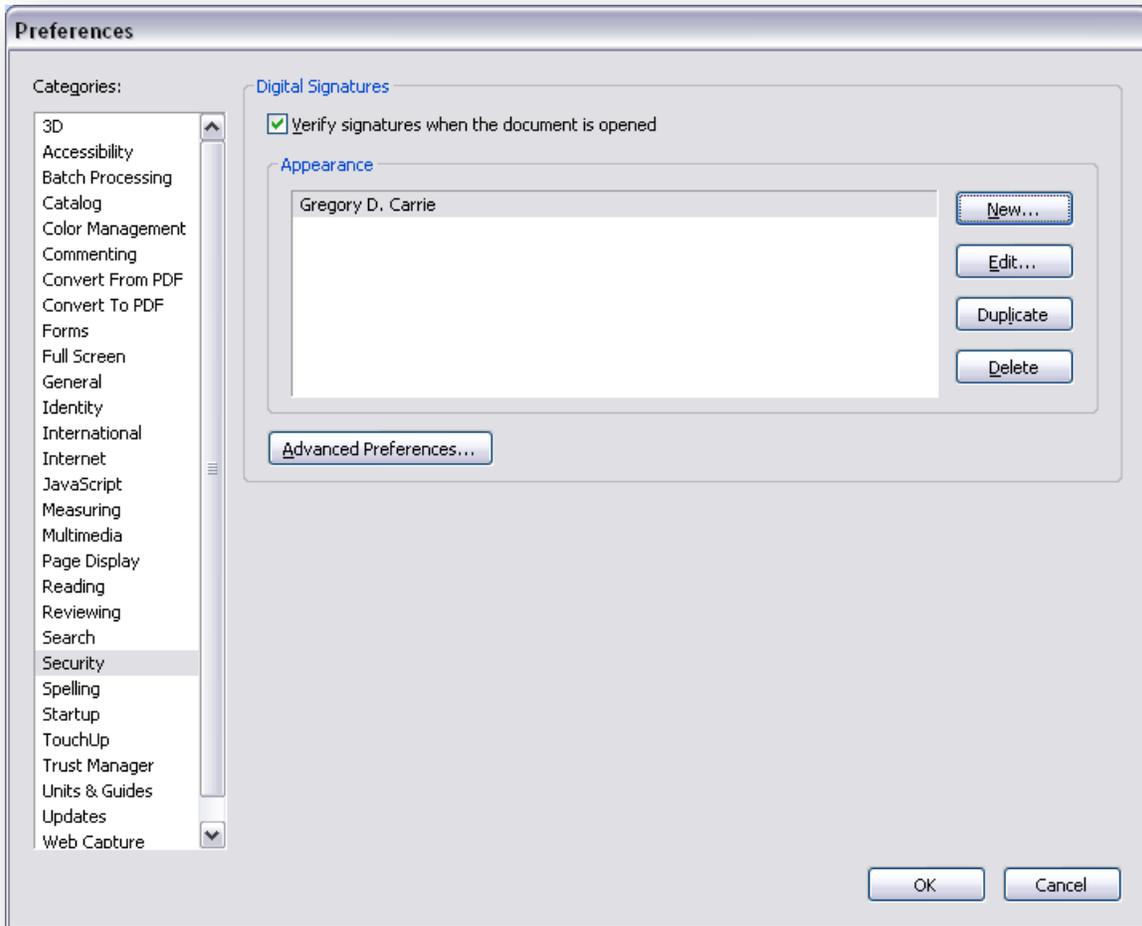
### Combining the PDF & FDF Signatures

3. This opens the Configure Signature Appearance dialog box. Configure this dialog as described below.



### Combining the PDF & FDF Signatures

- **Title:** Use the name that you use in your signature.
  - **Configure Graphic:** Select Imported Graphic and select the File button. Browse to the location that you stored the .pdf of your signature.
  - **Configure Text:** Disable all! We will use the functions of IPLOT to fill in the date.
  - **Text Properties:** Use the default selection.
4. Now you have created you Electronic Signature. Click the OK button.



### An Available Electronic Signature

Discussion on how to use this Electronic Signature will be discussed in the Enhanced Plotting section of this document.

**Note:** If you would like for CAD Support to store a copy of the .pdf of your signature, make sure to forward a copy of the .pdf at the same time that you send the copy of your .fdf file.

## 4.4 Using Electronic Signatures

### 4.4-1 Overview:

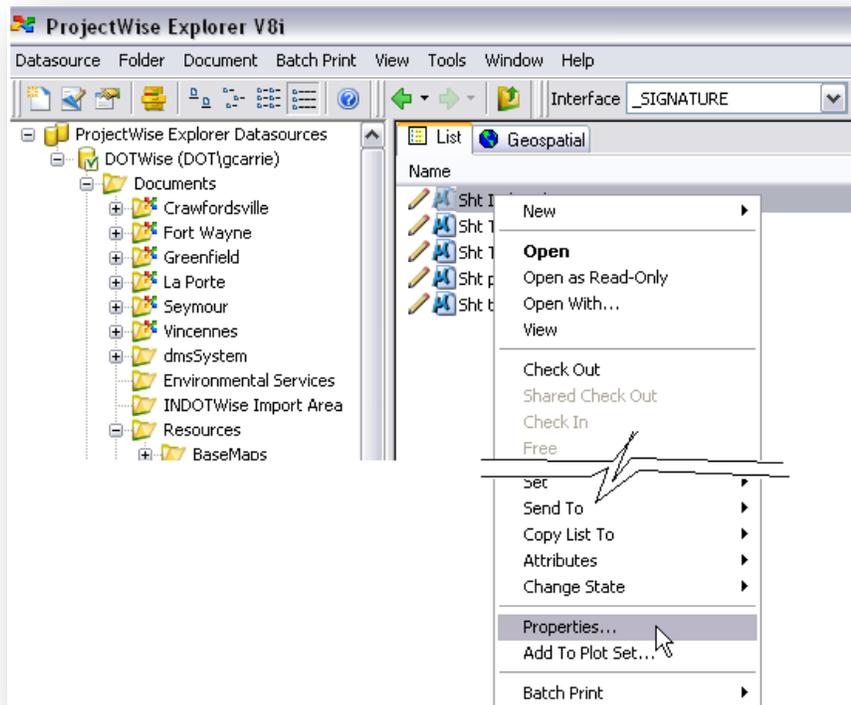
As mentioned at the front of this chapter, the use of Electronic Signatures has been approved and is in use by INDOT. Note that the Electronic Signature is not placed on every sheet in the document but is used to electronically sign and seal the entire plan set. If, after placing the Electronic Signature any page within the .pdf plan set is altered in any way, the Electronic Signature will appear with a broken indicator.

#### 4.4-2 “Signing” sheets within the plan set

Per the approval INDOT has received, it has been determined that a graphic representation of the Engineers signature responsible for each sheet within a plan set is acceptable. Therefore an interface has been provided for the purpose of signing the sheets within a plan set. This can be done either individually or as a group function.

##### *Placing the Graphic Representation of a Signature on individual Sheets:*

1. In ProjectWise Explorer, Set your interface to \_Signature
2. Select the properties of the MicroStation file that you want to place the Graphic Representation in.



#### Setting Document Properties

3. Select the Attributes Tab of the Document Properties dialog Box and place the Name of the Responsible Engineer and the Date.



#### \_\_Signature Interface in ProjectWise

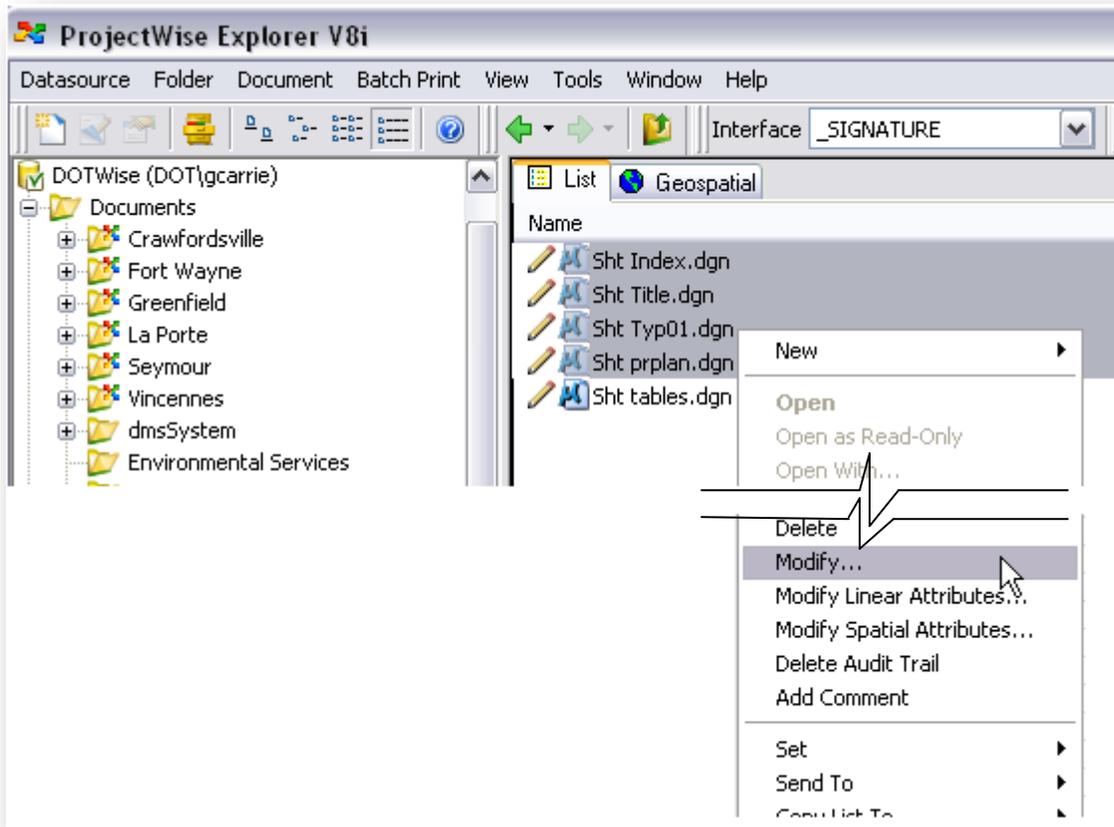
4. The Graphic Representation of the signature will be placed on the sheet model using a script type font.



#### Printed PDF Signature (prior to Signing)

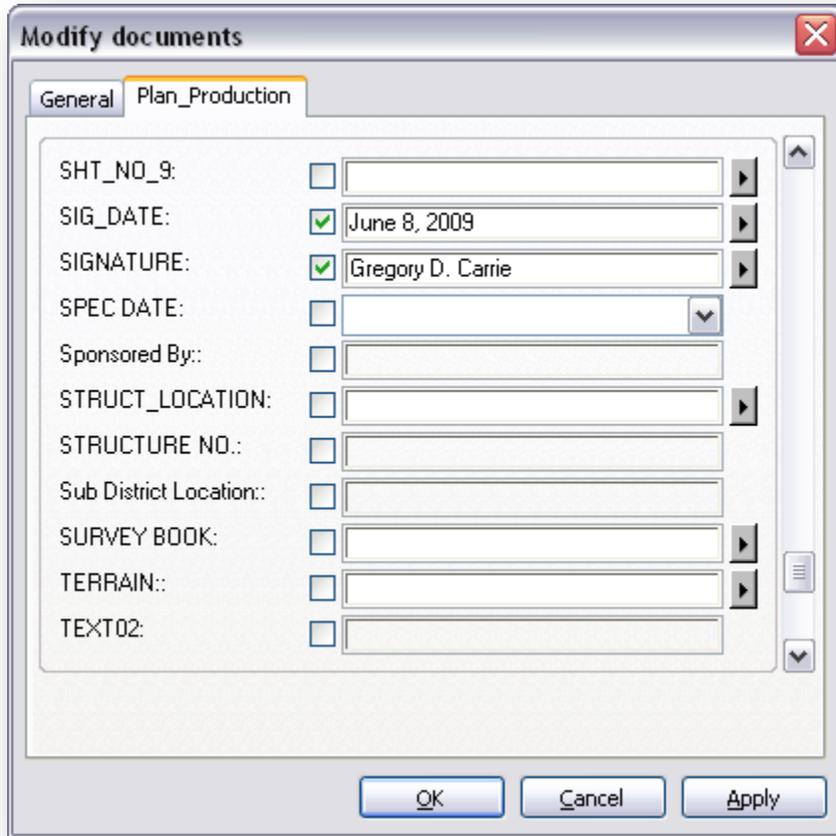
#### 4.4-3 Placing the Graphic Representation of a Signature on Multiple Sheets

1. In ProjectWise Explorer, Set your interface to \_Project Properties
2. Select the properties of the MicroStation files that you want to place the Graphic Representation in.



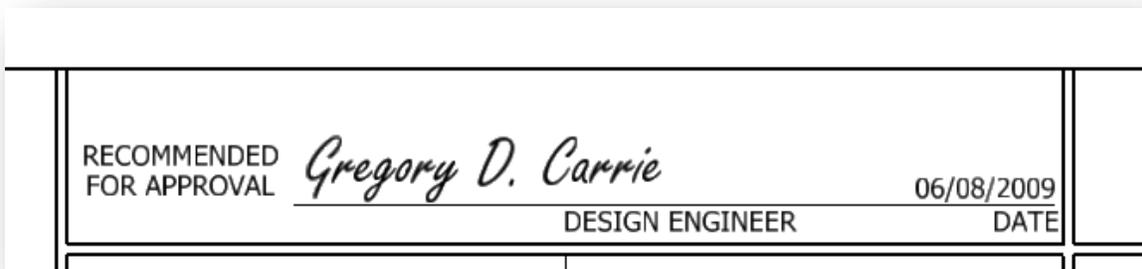
### Modifying Multiple Document Properties

3. Select the Plan\_Production tab on the modify documents dialog box and scroll down to the entries for "SIG\_DATE" and "SIGNATURE".



### Modifying Multiple Document Properties

4. Place the name of the Responsible Engineer and date, and then select apply.
5. The Graphic Representation of the signature will be placed on the sheet models using a script type font.



Printed PDF Signature (prior to Signing)

#### 4.4.4 Electronically Signing the Plan Set

The plan set (.pdf) will be signed using the Responsible Engineer's Electronic signature after the plot had been created using ProjectWise InterPlot Organizer. This is accomplished by using one of the new design scripts provided.

1. Create your plot set (.ips file) using one of the design scripts discussed in section 4.4 of this document.
2. Export the .pdf file and open using either Adobe Acrobat Professional or Adobe Acrobat Reader.
3. Open the Title Sheet and notice in the "Certified by" area, text stating that "THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT". This text is in place to ensure that the reviewer knows that the plan set has not yet been signed by the responsible engineer. This text is in place on both the letter size and 24" x 36" title sheets.



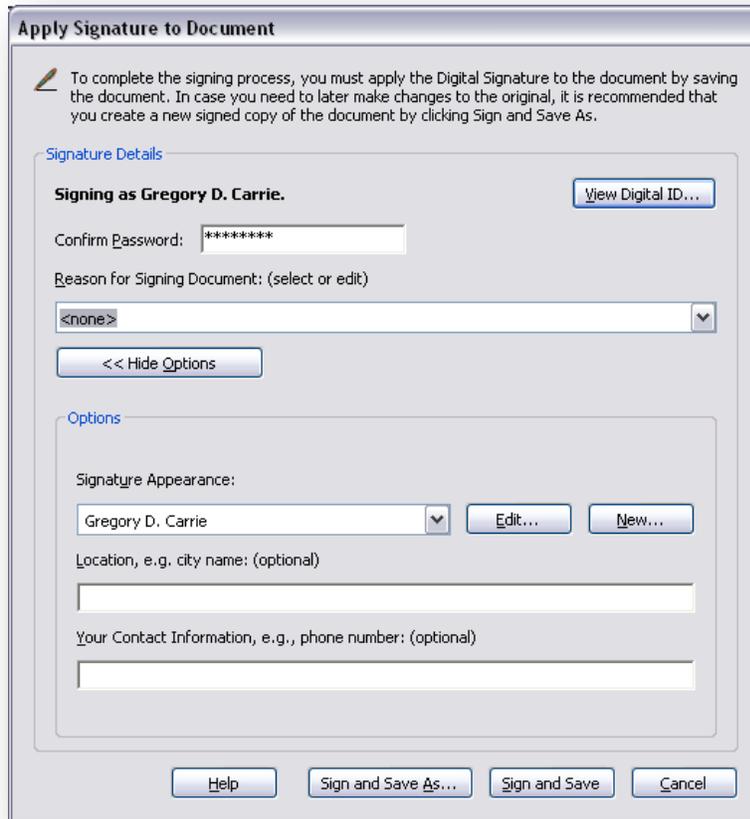
#### Unsigned PDF Document

4. To electronically sign the plan set, the responsible engineer can simply left mouse click on the colored tab above the text mentioned in the last step. This should activate the This Document Is Not Certified dialog. To sign the document select "Continue Signing".



#### PDF Document Signing

5. This will activate the "Apply Signature to Document" dialog box. Fill this form out as you see fit. Then after using the password that you chose when you created your Digital ID (4.2 step 7), select Sign and Save.

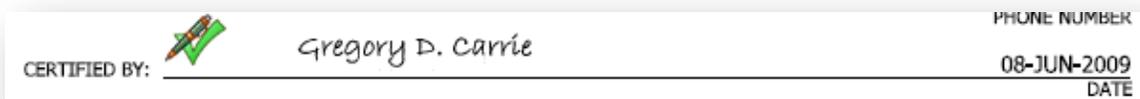


### Applying the Electronic Signature

6. The “Apply Signature to Document” dialog is activated. Select OK and review your signature on the plan set.



### Signature Confirmation



## A Finished Electronic Signature

7. Notice that the date is populated when the .pdf is created from ProjectWise InterPlot Organizer.

### **4.4-5 Verification of Signatures**

If the need to verify a signature arises, CAD Support will be able to provide the appropriate files for verification.

## 5. **InRoads and ProjectWise**

Unlike MX, InRoads is fully integrated with both MicroStation and ProjectWise. As such, CAD Support is now able to provide InRoads configurations, and template files within the managed ProjectWise environment. Throughout the document, specific functionality of InRoads with ProjectWise will be called out and expanded on in a workflow specific manner.

### 5.1 **InRoads Standards and Seed Files**

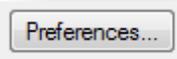
This section will discuss the location of INDOT specific InRoads standards and seed files for use with the application. All InRoads files except DGN seed files will be found under folders within the following ProjectWise path pw:\\dotwise.indot.in.gov:DOTWise\Documents\INDOT Workspace\InRoads\.

#### 5.1-1 **XIN File**

The INDOT configured XIN file can be found in under the **XIN** folder and is named INDOT.xin. This file contains many of the INDOT specific customizations for the look and feel of features such as topographical items, alignments, profiles, etc. It also contains preferences for a wide variety of functions including stationing, curve sets, cross sections, and plan and profile sheets along with many other INDOT specific functions.

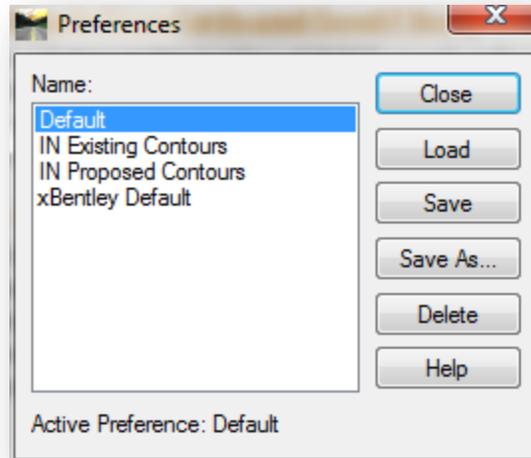
#### 5.1-2 **INDOT Specific Preferences**

Within the XIN, there are numerous tools that have preferences configured for items and functionality specific to INDOT. When you see the following button when using an InRoads tool, it is recommended to check within and see if there's an INDOT specific setup:



**Preferences Button**

When inspecting the preferences, you may see a wide variety of preferences for differing situations. The following illustration shows the preferences defined for the View Contours tools:



### View Contours Preferences

The naming convention for preferences is as follows:

- Default - A predefined preference. For many tools, this may be setup to be the same as the most commonly used INDOT preference.
- IN ... - An INDOT specific preference.
- IN PW ... - An INDOT specific preference requiring a connection to DOTWISE to use.
- xBentley Default - The default preference as defined by Bentley, in most cases this should not be used.

#### 5.1-3 ITL File

At the current time, there are no configured InRoads templates specific to INDOT. As feedback is received on default templates, they will be provided under the [RM Templates](#) folder. Currently, CAD Support has provided the template library that was configured for use with the Advanced Roadway Designer course as an example for prospective point naming and usage scenarios.

#### 5.1-4 Cell libraries

All INDOT cells for use with InRoads can be found under the [Cells](#) folder. There are currently two cell libraries in use under this folder:

- INDOT Aerial Engineering InRoads Cell Library.cel
- INDOT\_InRoads.cel

The first library is used by the Aerial Survey group for topographical collection. The second library is used by standard survey and design for the display of point features in the topographical surface.

#### 5.1-5 Plans Production

The files located under [Plans Production](#) are used in the creation of cross sections and sheets created using the Plan and Profile Generator. Discussion of these files will be expanded with their usage in the Plans Production workflow.

### 5.1-6 InRoads DGN Seed Files

InRoads functions differently from MX in that any DGN or model in a DGN can be a container for InRoads elements at any time. As such, the first item required when starting an InRoads project is the appropriate unit DGN seed file. For consistency, these files are located with the rest of the INDOT specific ProjectWise seed files. These can be found at  
pw:\\dotwise.indot.in.gov:DOTWise\Documents\Template Documents\Seed\InRoads\.

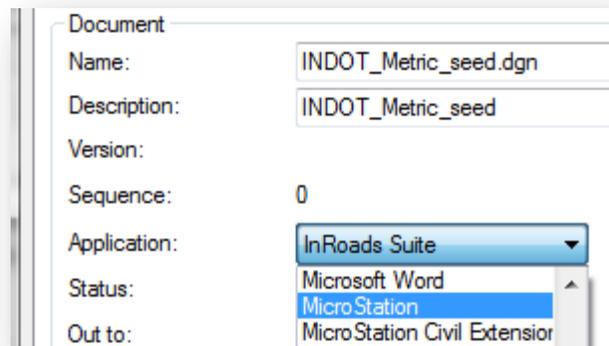
At the root of this location, 3 seed files have been provided, corresponding to the various units of measurement used in INDOT. These are:

- INDOT\_US\_SVFT\_seed.dgn
- INDOT\_US\_seed.dgn
- INDOT\_SI\_seed.dgn

As InRoads is compatible with the US Survey Foot standard and Survey has requested its availability, US seed files are provided in both Survey Foot (INDOT\_US\_SVFT\_seed.dgn) and International Foot (INDOT\_US\_seed.dgn) varieties.

As with MX, these files are configured with Design History disabled to remove compatibility errors caused by the rapid display and deletion of elements during the design process.

Finally, as InRoads is integrated with ProjectWise, these seeds are configured with their application association set to InRoads Suite causing the full InRoads application to launch when the files are checked out and opened. To disable this functionality, perform a Document -> Properties (Space Bar shortcut) on the document in ProjectWise. When presented with the document properties panel, you can then adjust the application association as shown:



**ProjectWise Application Association**

## 5.2 Working with InRoads

### 5.2-1 ProjectWise

#### 5.2-1a Project Creation

The first step in working with InRoads and ProjectWise is the creation of your project. At this time, the MX folder in the Design project template has been replaced with an InRoads folder. As always if your project does not yet have a design folder, or has an MX folder currently, and you'd like the InRoads folder, please request the project/folder created through a help ticket. The remainder of your folder structure under the design project remains the same at this time.

#### 5.2-1b Survey Provided Files

When starting an InRoads project, you can expect having access to the following InRoads and MicroStation files and a brief synopsis of each:

1. Des #\_SRxx Control Points.fwd – InRoads survey book with control points
2. Des #\_SRxx LCRS Plat.dgn – MicroStation plat DGN
3. Des #\_SRxx Survey Alignment.alg – InRoads Survey Alignments
4. Des #\_SRxx Survey Surface.dtm – InRoads DTM of Survey processed features
5. Des #\_SRxx Survey Surface Boundary.dtm – InRoads DTM of Survey Boundary
6. Des #\_SRxx Survey.xin – InRoads XIN, specific to the processed data
7. Des #\_SRxx Topo.dgn – MicroStation DGN of topographical features
8. Des #\_SRxx Topo.fwd – InRoads DTM containing the processed Survey

To begin a project, it's recommended to copy the DTMs and ALG that Survey provides into your Design\InRoads folder in ProjectWise. These are the base files you'll start your project from and should be available in a read-write location as you will be directly interacting with them.

With these files copied into your project, it's suggested to rename the ALG to Des #\_SRxx Design Alignment.alg. This will alleviate confusion and specifically denote that this file is for the proposed alignments while maintaining the collected information from the Survey alignment.

#### 5.2-1c Base Drawing Creation

Unlike MX, no files other than a DGN are required to station an InRoads Project. Using the advanced document creation wizard, you can create your base drawings using the unit appropriate seed file as noted in Section 5.1-6. Like MX, the INDOT base drawing naming convention will still be used.

Project information will be organized into several base drawings. The information is separated based on categories of information included. These base drawings are the locations for all line work. Most base drawings will be created while in InRoads in MicroStation. By using MicroStation referencing tools, a base drawing can be enhanced to view other base drawing information as a backdrop.

Please refer to **Appendix B - Naming Conventions** for a summary of base drawings. Below is a list of Standard Base Drawings to be used at INDOT and descriptions of their contents. Other names are possible based on project needs.

#### **Standard Base Drawings (InRoads created)**

<i>Drawing Names / Logical Names</i>	<i>Descriptions / Reference Descriptions</i>	<i>Examples</i>
Survey Alignment	Survey Centerline	Survey Alignment.dgn
Survey Section Corner	US Government Section Corners	Survey Section Corner.dgn
Survey Contours	Survey Existing Contours	Survey Contours.dgn
Survey Topography	Survey Existing Topography	Survey Topography.dgn
Survey Triangulation	Existing Triangulation	Survey Triangulation.dgn
Explan scale	Design Existing Topography	Explan 20.dgn Explan 50.dgn Explan 100.dgn
Excont scale	Survey Existing Contours	Excont 20.dgn Excont 50.dgn Excont 100.dgn
Prplan scale	Proposed Design Strings	Prplan 20.dgn Prplan 50.dgn Prplan 100.dgn
Prcont scale	Proposed Contours	Prcont 20.dgn Prcont 50.dgn Prcont 100.dgn
RW Existing scale	Existing Right of Way	RW Existing 20.dgn RW Existing 50.dgn RW Existing 100.dgn

If your project is anticipated to require multiple scales, it is desirable to create multiple base drawings at those scales. Creating the multiple scaled drawings is easily done by creating a new plan display titled appropriately for the scale to be created, and then displaying the appropriate models at the desired scale. Some examples of scales and various usages are presented below.

Using this procedure makes it extremely easy to vary the scale of a sheet by simply picking the base drawings that have the desired scaling when referencing into the MicroStation drawings. From this point forward, only a 1" = 50' scale will be used in this documentation, the scale will vary with projects, and other scales can be developed using the same procedures are described.

## US

<i>Scale</i>	<i>Typical Uses</i>
1" = 20'	Construction details and other detail drawings.
1" = 30'	Bridge Layouts
1" = 50'	Most common scale used in plan and profile sheets and plan drawings.
1" = 100'	Pavement marking plans, and other miscellaneous sheets.

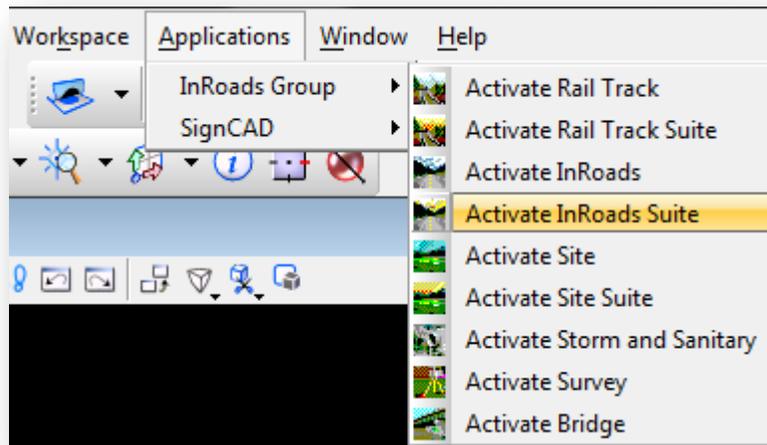
## Metric

Scale	Typical Uses
1:200	Construction details and other detail drawings.
1:500	Most common scale used in plan and profile sheets and plan drawings.
1:1000	Pavement marking plans, and other miscellaneous sheets.

### 5.3 Starting InRoads

At this point, you should now have your ProjectWise project, and a base sheet created. If using the seed files as defined with InRoads as the application association, you may Check Out/Open the file directly from ProjectWise, which will start both MicroStation and InRoads Suite.

If you changed the application association for the DGN seed file to MicroStation, you will need to Check Out/Open the file which will only start MicroStation. Once in MicroStation, you will then need to start InRoads Suite. To do this, go to the MicroStation Applications menu (due to an inconsistency with AutoTrack and SignCAD, multiple Application menus may appear) and select InRoads Group -> Activate InRoads Suite as shown in the following illustration:



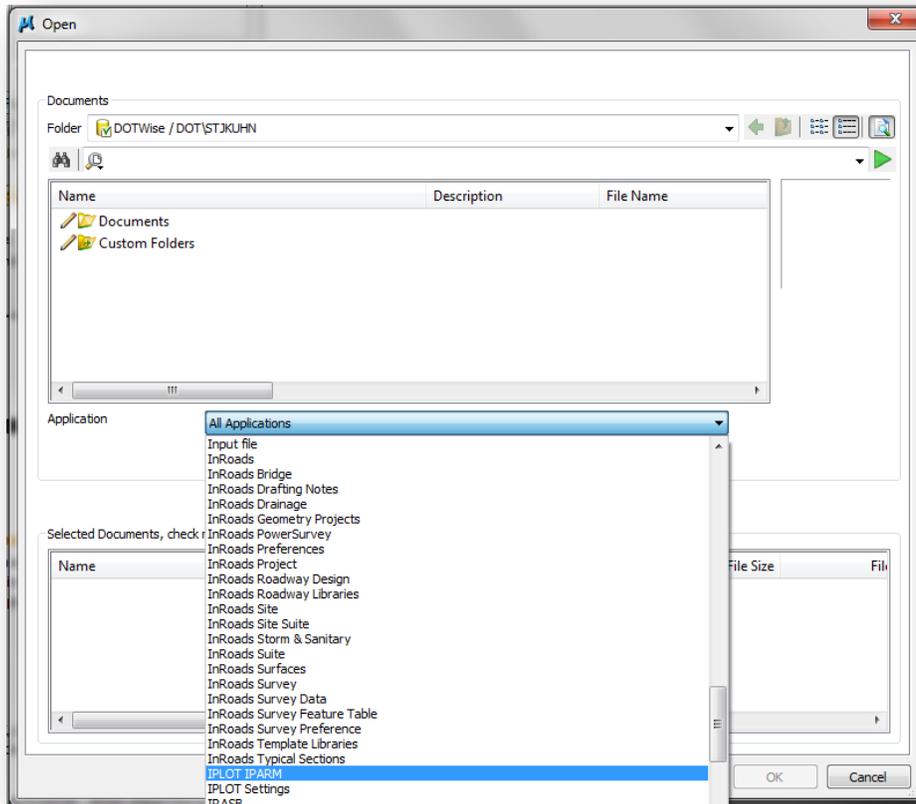
#### Starting InRoads in MicroStation

### 5.4 Opening, Closing and Saving InRoads Files from ProjectWise

With the integration of InRoads and ProjectWise, procedures for Opening, Closing, and Saving files in InRoads differs from these functions as shown in training. As with MicroStation and other integrated applications, standard Open and Save dialogs are replaced with ProjectWise integrated dialogs with extended functionality.

#### 5.4-1 Opening Existing Files

Opening files from within InRoads uses the standard ProjectWise Open dialog as shown:



### InRoads Filetypes in ProjectWise

To ease finding appropriate file types, the preceding illustration shows the available file types that have been defined in the ProjectWise environment. The following applications correspond to these common InRoads files types:

- InRoads Drafting Notes - .dft
- InRoads Drainage - .sdb
- InRoads Geometry Project - .alg
- InRoads Preference - .xin
- InRoads Project - .rwk
- InRoads Roadway Design - .ird
- InRoads Survey Data - .fwd
- InRoads Template Libraries - .itl

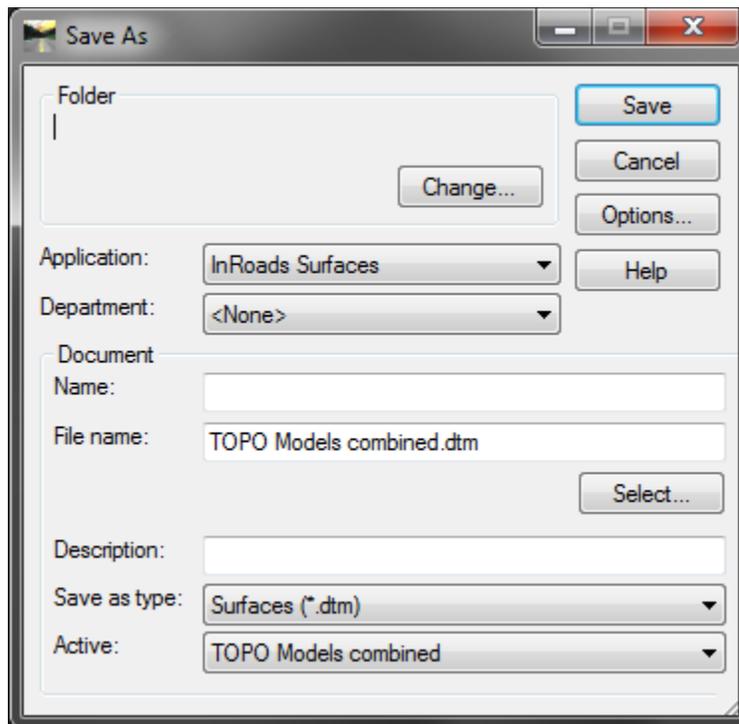
Additionally, you may selectively open files in a read only mode by adding them to the lower portion of the open dialog and enabling the check box for open read only:

Selected Documents, check mark for read-only		
Name	Description	File Name
<input type="checkbox"/> Existing RW.dtm	Existing RW.dtm	Existing RW.dtm

### Adding Files to an Open list/Read Only

#### 5.4-2 Saving New Files

When performing a Save for the first time, or a Save As on an existing file, you will be presented with an InRoads/ProjectWise specific Save As dialog, as shown below:



InRoads/ProjectWise Save As Dialog

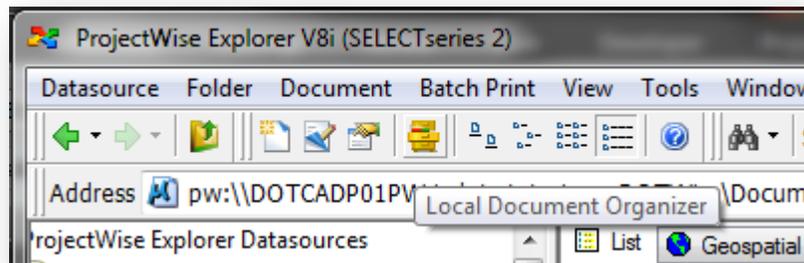
All ProjectWise Save dialogs require you to define your project folder, document name, file name, and description. It's still recommended that you maintain the same naming at least for the document and file names. Also, it's very important to make sure the application is appropriately set to the InRoads filetype you're attempting to save, as the dialog does not assume the filetype you're saving.

#### 5.4-3 Closing Files

When closing files from within InRoads, the behavior is slightly different from other integrated applications. Due to how ProjectWise functions and InRoads works within MicroStation, there is no automatic prompt for check in, or automatic updating to the ProjectWise datasource. It's recommended that when you've saved your files and have closed InRoads, that you use the

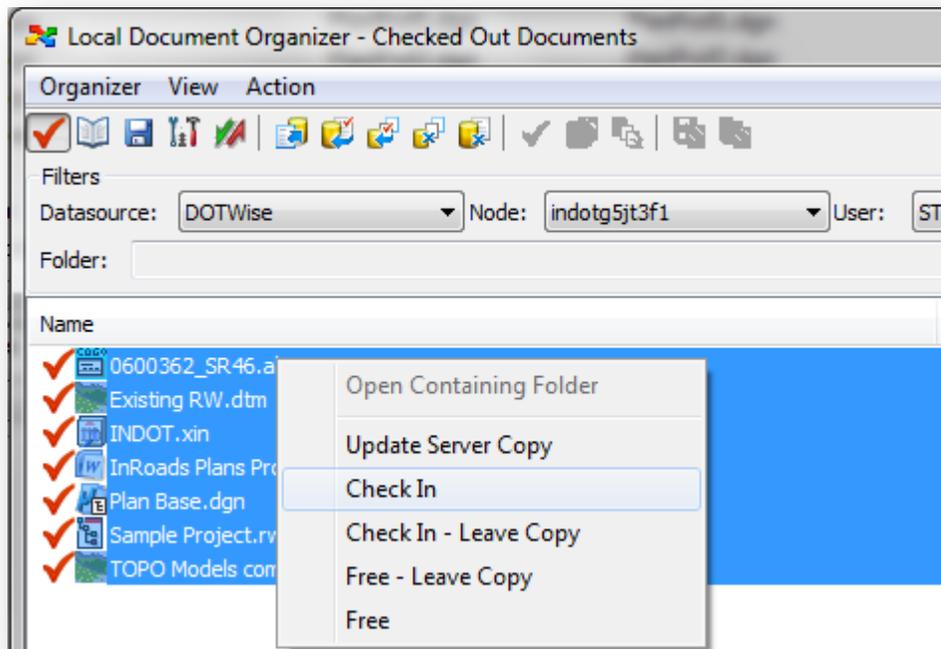
ProjectWise Local Document Organizer to check the remainder of your files in. You will be prompted to check-in your DGN per the standard functionality, but it's probable that you have any number of additional InRoads files open that also need checked in.

You can do this by opening the Local Document Organizer from ProjectWise:



### Local Document Organizer Button

With the Local Document Organizer open, you can then browse to the check out option, and then select all of the files you need to check in. Once selected you can right click on the highlighted files and perform a check in as shown:

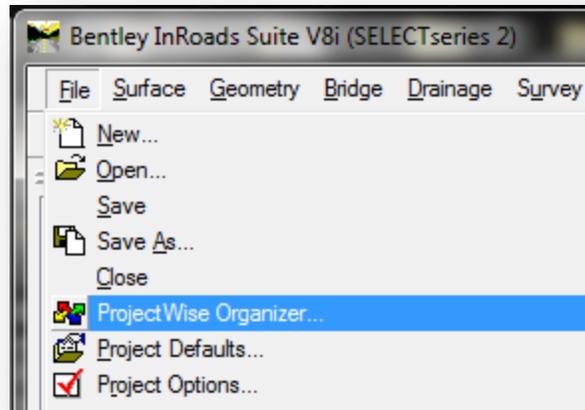


### Local Document Organizer Mass Check-In

It's recommended that each check in be accompanied by good comments to allow quick review of anything that may have been done.

#### 5.4.4 InRoads/ProjectWise Organizer

Within the InRoads environment, there is an additional shortcut to the ProjectWise Local Document Organizer and it can be found under the InRoads Explorer -> File -> Document Organizer menu item:



#### Local Document Organizer in InRoads

This is a self contained version of the Local Document Organizer and it acquires application focus from InRoads/MicroStation, preventing you from working within the application.

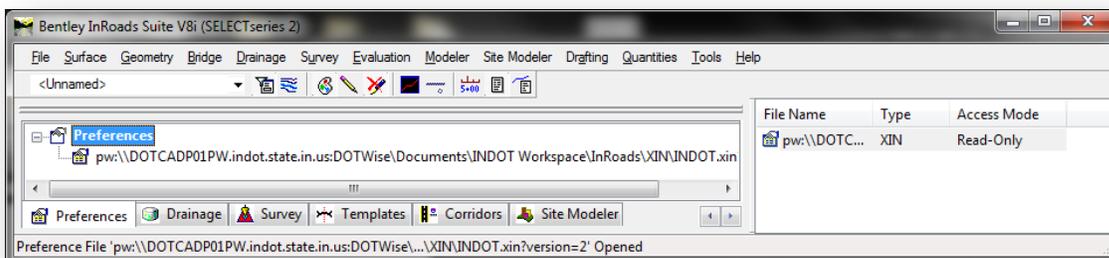
While you're working on the existing files and making/saving changes, you will want to use this tool to update your server copies frequently as not to lose any data.

### 5.5 Setting Up InRoads

Once you have started InRoads in your base drawing, you will need to setup InRoads to point to the INDOT XIN file, cell library and enable application add-ins used with our configuration.

#### 5.5-1 Attaching the XIN

To attach the XIN, select File -> Open from the InRoads Explorer. When presented with the ProjectWise open dialog, browse to Documents\INDOT Workspace\InRoads\XIN and select the INDOT.xin file. This file will be read only at this location. If you would prefer an editable copy to store your own preferences in, you may want to copy this file to your project and open it from that location instead. Once opened, your InRoads Explorer should look similar to the following:

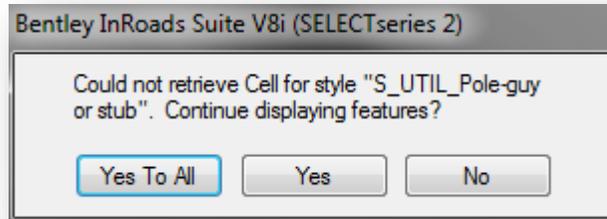


## INDOT.XIN Attached

If you attached from a local project copy, the path will reflect the XIN location, and the Access Mode will display Read-Write indicating that you can write changes to the XIN file you've selected.

### 5.5-2 Attaching the Cell Library

With the XIN attached, you may need to attach the cell library prior drawing any features. If you receive the following error when attempting to draw features:



## Cell Library not Attached

InRoads is indicating that it cannot find the appropriate cells for your features.

To attach the cell library, use the MicroStation Cell Library tool (MicroStation -> Element -> Cells menu option) and browse to Documents\INDOT Workspace\InRoads\Cells and select INDOT\_InRoads.cel. At this time it is recommended that you save the settings for your file prior to continuing (MicroStation-> File -> Save Settings).

**Note:** ProjectWise automatically attaches this cell library on startup via the Managed Workspace. Instances of this error will only occur if you're working disconnected from ProjectWise.

### 5.5-3 Project Defaults/.RWK Files

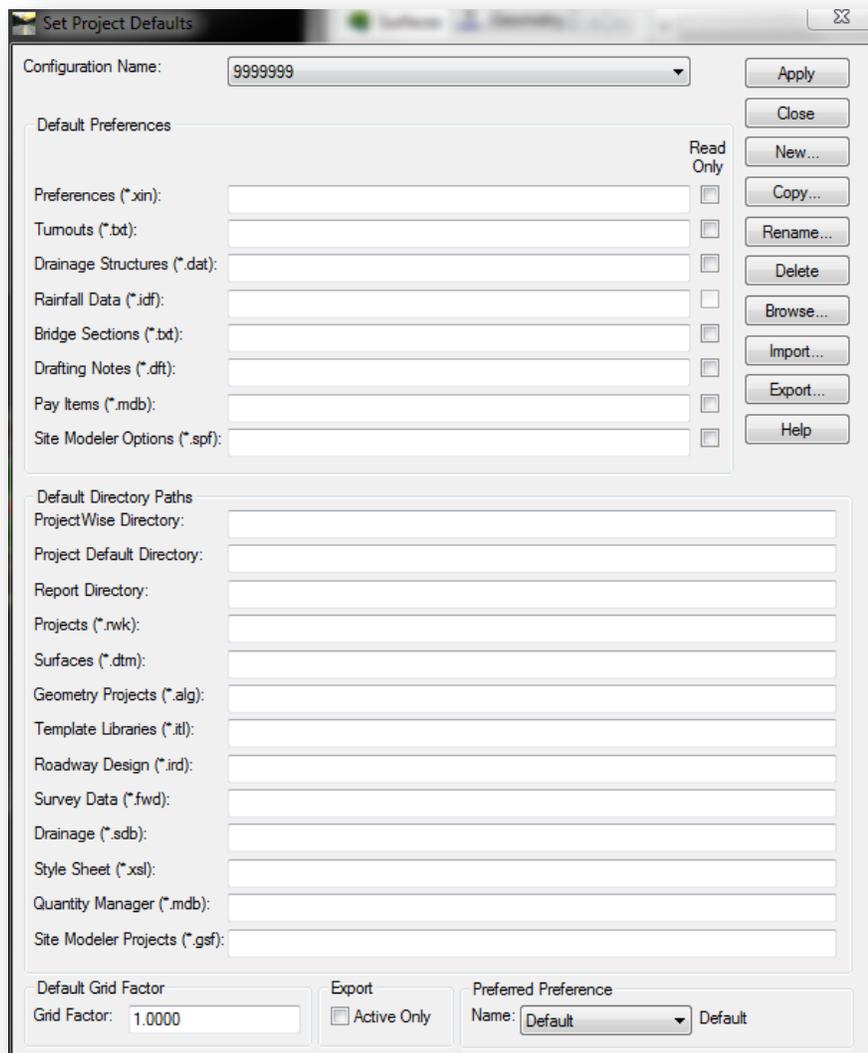
As the InRoads training courses demonstrate, Project Defaults and .RWK files both provide substantial benefit when opening, saving and closing your files. The full functionality of these tools has been maintained in InRoads in ProjectWise, however there are some slight differences in what dialogs are displayed when working with these. First, you will examine Project Defaults.

The Project Defaults (InRoads Explorer -> File -> Project Defaults) can be used to pre-open specific InRoads configuration files, while pre-defining paths to save to when creating new surfaces, alignments, corridors, etc.

The top half of the dialog, the Default Preferences section, allows you to pre-open InRoads configuration files such as the .XIN preferences, .DFT drafting notes, and various drainage configuration files. The lower half allows you to define project specific paths for InRoads file types, so that when performing Opens/Save/Save As functions, your default path will take you directly to the folder location specified on your Project Defaults.

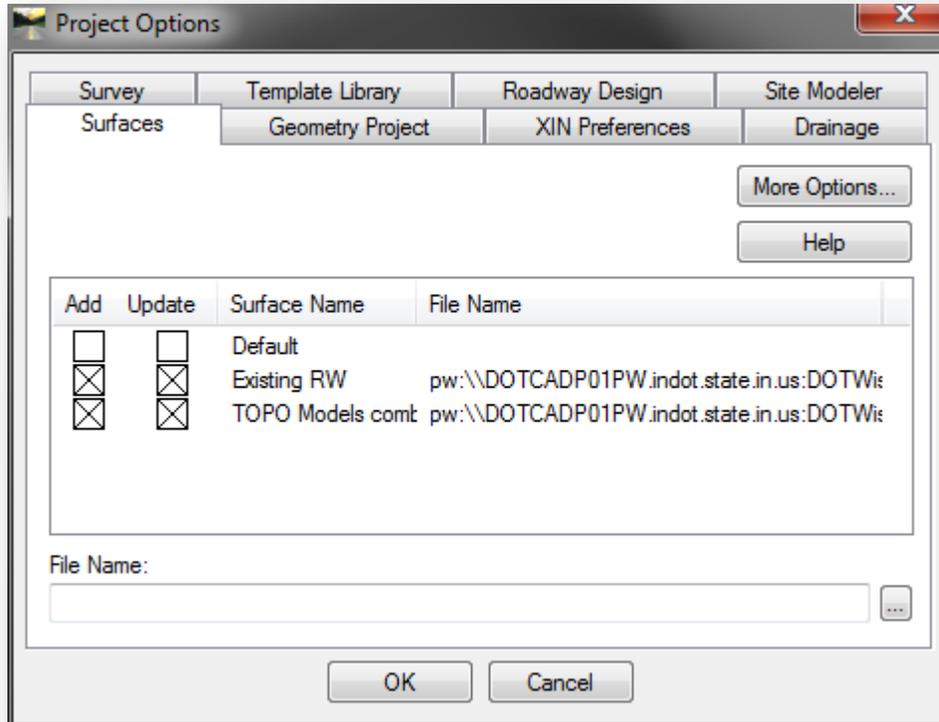
Additionally on this panel, you can define a default preference for all panels that you may interact with. Due to the number of different preferences available in the INDOT.XIN, it's recommended that

you leave this setting at Default as shown. In many cases, the default preference is configured to use a commonly scaled INDOT setup.



### InRoads Project Defaults

For more granular control of the files you open and save, you will want to use the .RWK project files. The .RWK will allow you to define specific files that you'd like to open/update with the project file. The initial Save dialog is the same as the InRoads with ProjectWise save dialog shown in Section 5.4-2. By selecting the Options button this panel, you will be presented the standard .RWK dialog for adding/updating files. Further discussion of .RWK files can be found in the Bentley InRoads Road Fundamentals documentation.

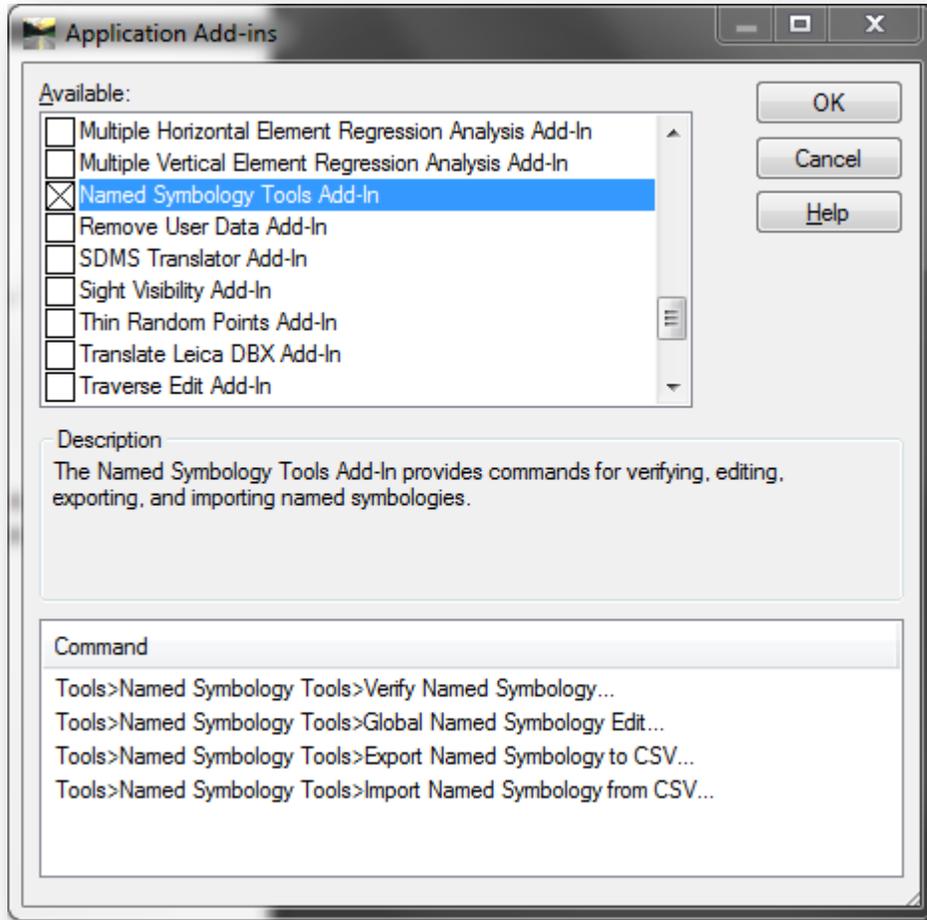


## RWK File Saving Options

### 5.5-4 Enabling Application Add-Ins/Variable Manager

Not all tools within InRoads are immediately available in the base configuration. There are numerous application add-ins that are disabled but are extremely useful for day to day usage. These can be accessed via the InRoads Explorer -> Tools -> Application Add-Ins menu option.

The following menu is then presented:



### InRoads Application Add-ins

The upper portion of the application add-in dialog presents a list of available application add-ins. The lower portion of the dialog shows where the commands for the add-in can be found. To enable an application add-in, select the check box to its left.

Of the available application add-ins, it will be necessary to enable the following:

- Global Scale Factors Add-In – Enables the global scale factor tool for resizing of InRoads symbols, linestyles and text

Additional useful add-ins may also be enabled such as:

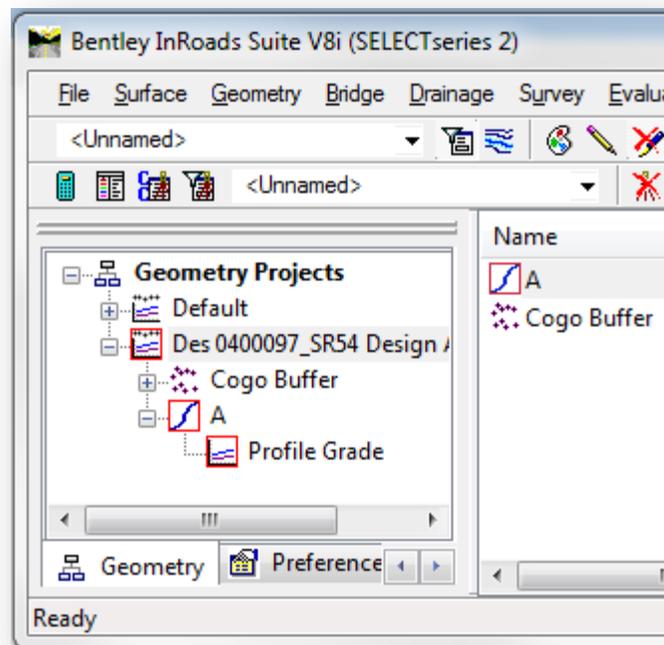
- Active Project Settings Add-In – Used to select active surfaces, alignments, etc. without activating them from the InRoads Explorer
- Copy Preference Add-In – Enables the tools for copying preferences and styles from one XIN to another.
- Horizontal and Vertical Elements Add-In – Alignment creation tools similar to the element method alignment tools in MX.

### 5.5-5 Variable Manager

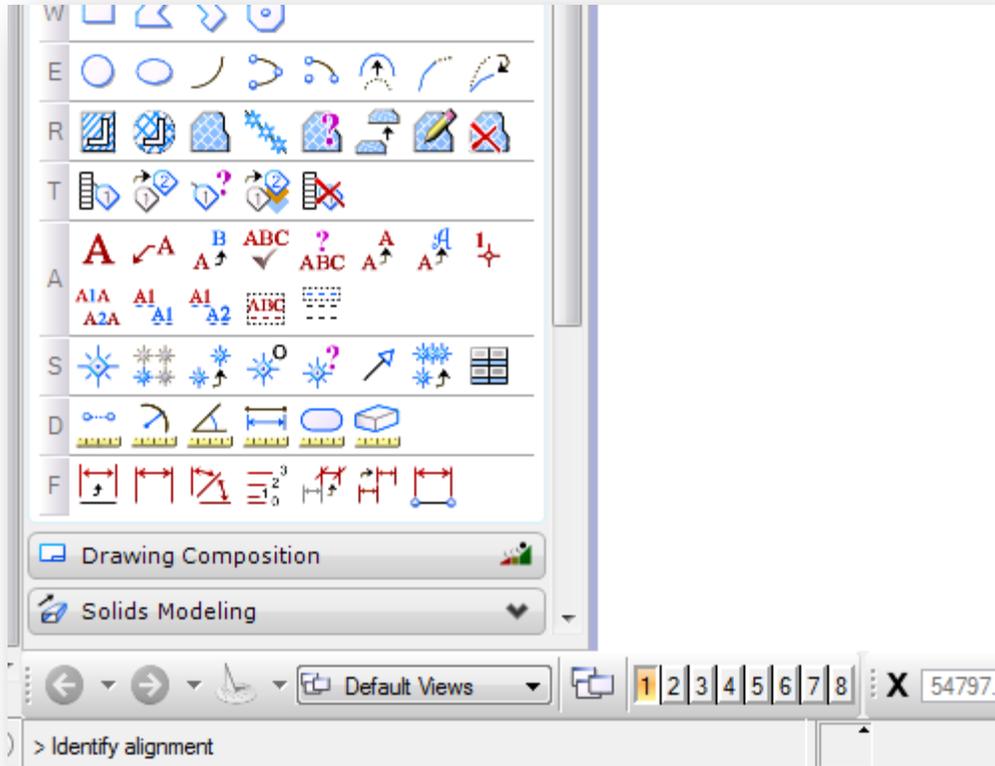
Variable Manager, enabled through the Application Add-Ins, includes a number of additional application customization. Once enabled, to access Variable Manager, you to go to the InRoads Explorer -> Tools -> Variable Manager. As these are more situation and usage specific tools, it is recommended you contact support before using them.

### 5.5-6 MicroStation and InRoads Status Bars

One convention that requires monitoring while using InRoads is the location of statuses that InRoads uses to prompt for input, or provide information. As it has a high degree of integration with MicroStation, InRoads will use both its own status bar; and depending on the active function, it may use the MicroStation status bar. Below are an example of each form of output and the location it can be found.



InRoads Status Bar (Lower left corner of InRoads Explorer)



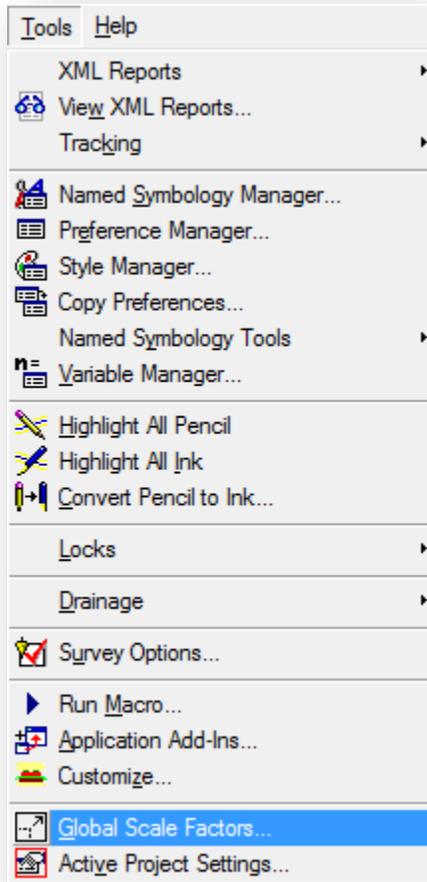
MicroStation Status Bar (Lower left corner of MicroStation Application)

## 6. Using InRoads

The following sections discuss the usage of InRoads for INDOT Plans Production purposes.

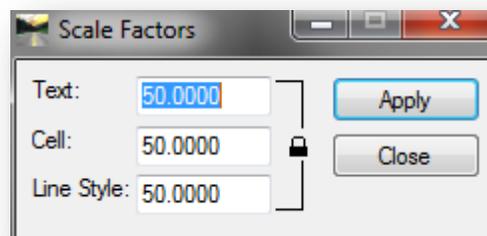
### 6.1 Global Scale Factors

Due to differences on how InRoads interacts with linestyle scaling, it is no longer advantageous to use Annotation Scale for the display of features in InRoads. The functionality InRoads uses for scaling is an option referred to as Global Scale Factors. As noted in Section 5.5-4, you will need to enable this tool via the Application Add-Ins dialog. When enabled, you will be presented a new menu option under the InRoads Explorer -> Tools -> Global Scale Factors:



### Global Scale Factors

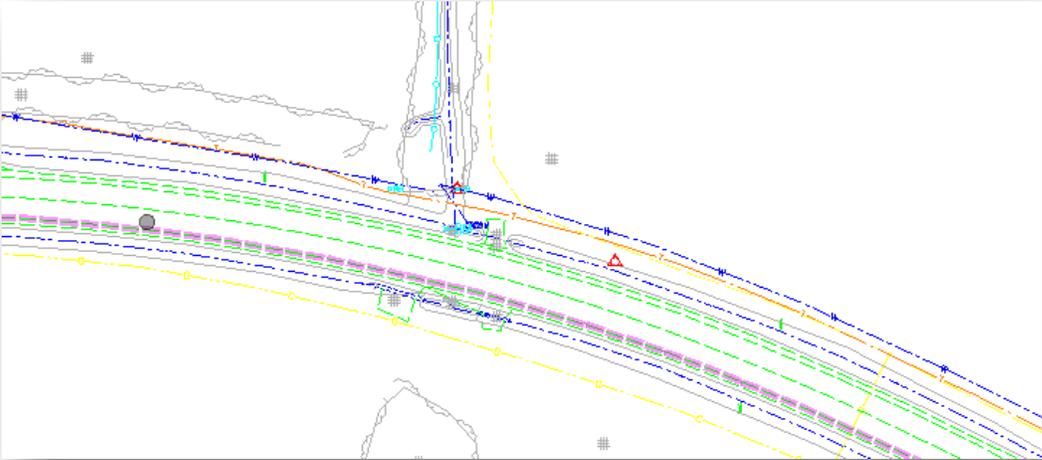
The Global Scale Factors tool presents a small dialog box similar to the MicroStation Annotation Scale dialog:



### Global Scale Factors

This tool allows for the scaling of many InRoads elements including features, annotation text, and cell sizes. Throughout the Plans Production process, you will want to use these tools to create base and text drawings of specific scales.

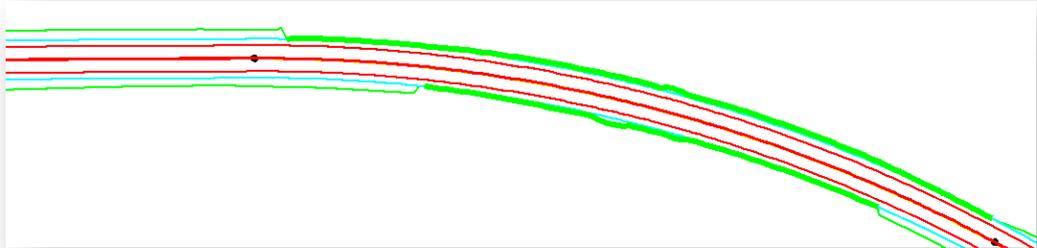
Included below are samples of some of the most common standard base drawings.



Explan 50



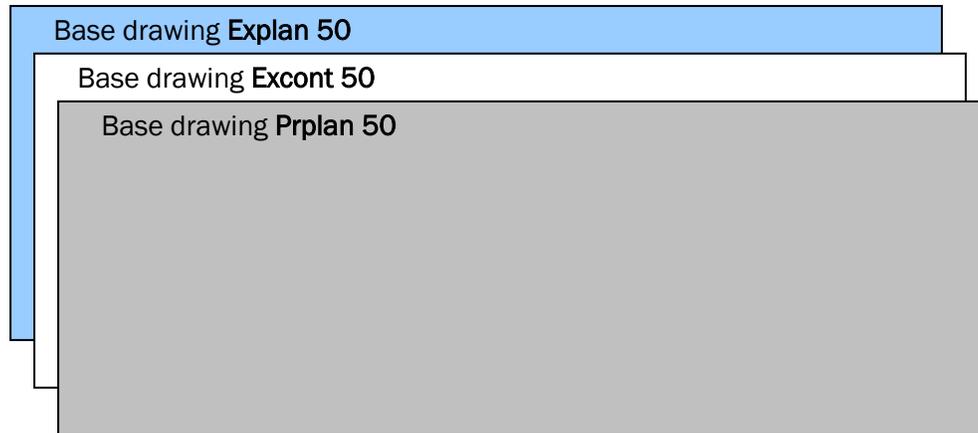
Excont 50



## Prplan 50

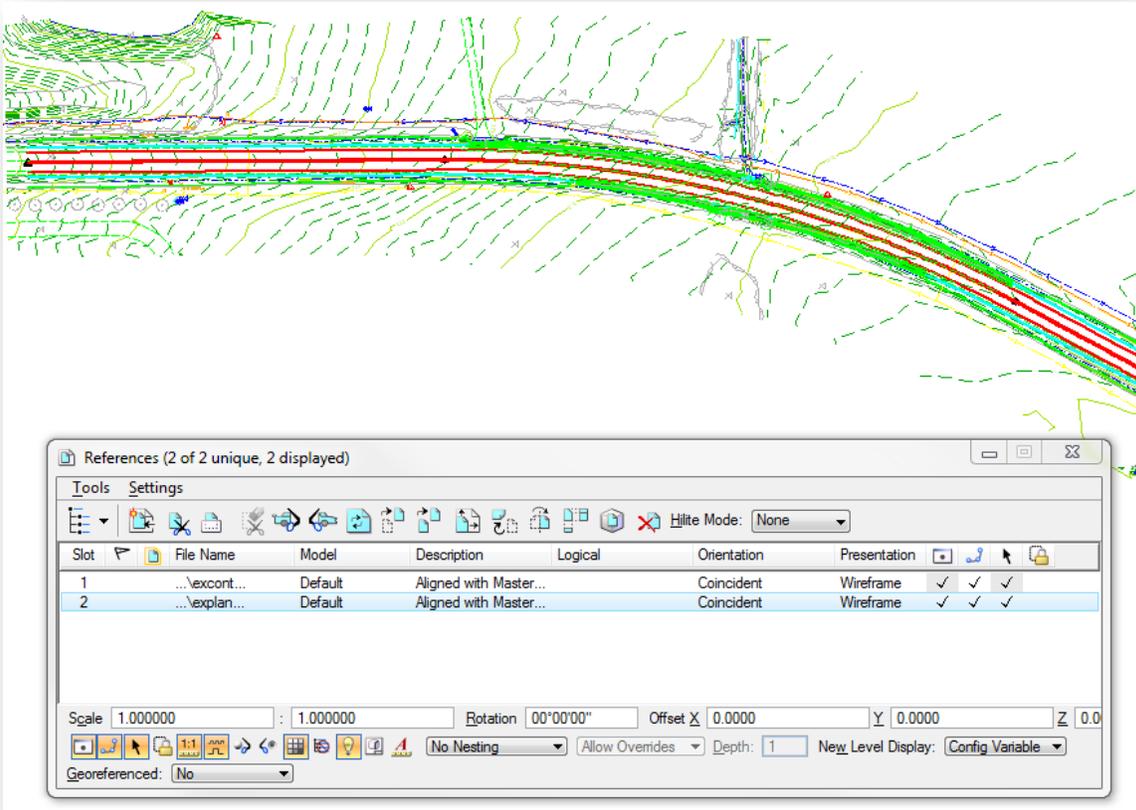
### 6.2 Referenced Base Drawings

The base drawings listed above can be easily referenced together. The only possible difficulty might be differences in coordinate systems between the files. This may be resolved using MicroStation tools. This problem is not likely unless you have drawings (MicroStation or AutoCAD) with information from sources outside of INDOT. Despite this problem, it can be fixed. The following figure displays how base drawings are placed together.



**Conceptual view of Base Drawings Referenced Together**

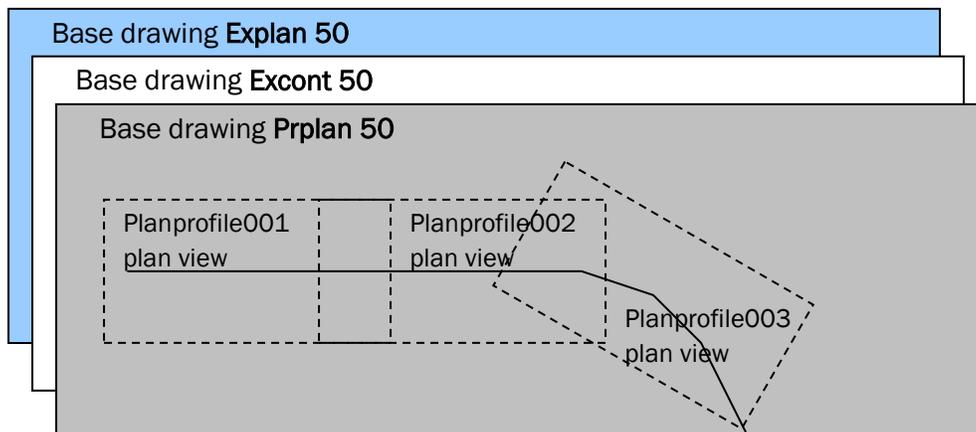
This figure displays a view with Prplan set as the active drawing and with both Explan and Excont drawings referenced into Prplan. The actual results would look like the illustration below.



Prplan 50 with Explan 50 & Excont 50 as references

### 6.3 Reference Windows

The base drawings will have reference window views that show through to all of the base drawings. The tools contained in the Plan and Profile Generator are used to create plan profiles, bridge layouts, construction details, and other drawings. The following figure displays how reference windows with multiple base drawings are placed together.



## Base Drawings Referenced Together with Reference Windows.

The above figure displays a view with Prplan set as the active drawing and both Explan and Excont drawings referenced into Prplan. The addition to the figure is how reference windows are included, which is accomplished by using the Plan and Profile Generator.

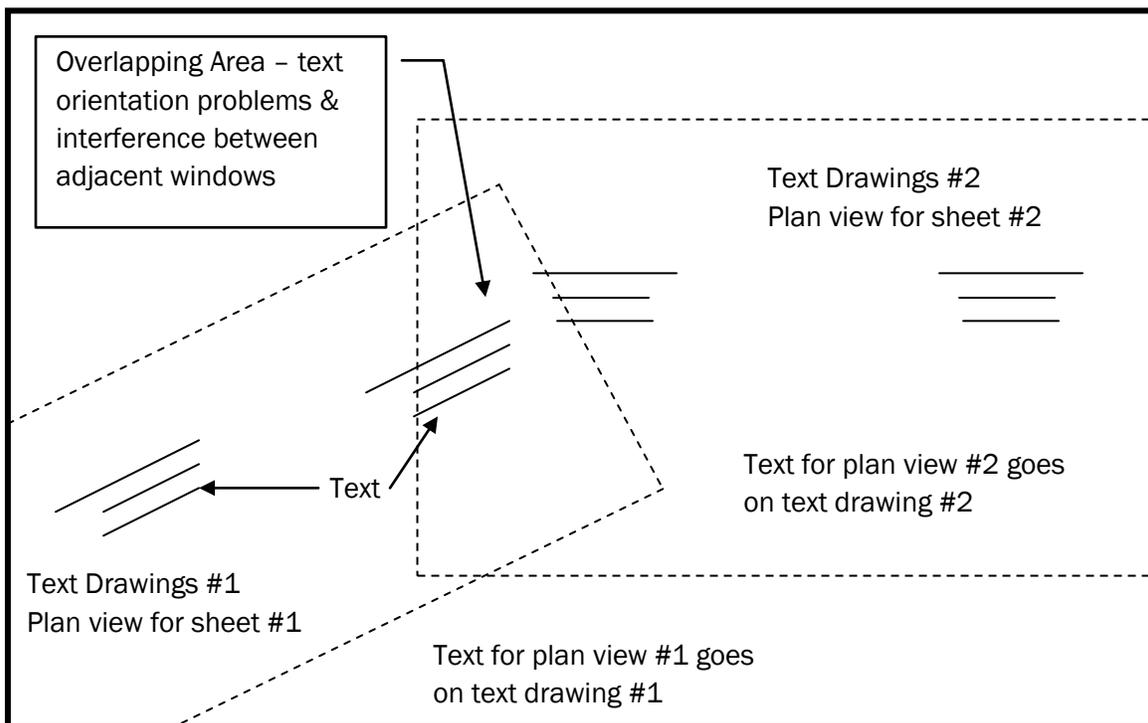
Each of the plan views represents a plan view area that is clipped into a given plan profile drawing. These same concepts apply to both plan and profile views.

Construction details, Bridge Layouts, and other drawings use the same principles for each type of drawing but with different view sizes and layouts for each.

InRoads will create saved drawings utilizing base drawings and then apply saved reference windows to each respectively based on the type of drawing and scale selected.

### 6.4 Text Drawings

A common CAD technique is the incorporation of text drawings. Text drawings are CAD drawings that only contain text elements. These text drawings facilitate drawing file organization and make plan set creation easier. When these text drawings are referenced together with base drawings and other drawings, they form composite drawings representing finished sheets. One major advantage of these drawings is that they eliminate problems with text orientation and overlap. The problem is related to the two possible locations to place text annotation on a set of drawings, in the base drawings and in the sheet (text) drawings. Annotation placed in the base drawings is usually oriented with North being up. This causes annotation to be readable only from one orientation. Text could be rotated for each window, but this does not fix problems occurring in overlapping plan areas. See the following figure.



## Problem with Overlapping Text Area

As seen in the above window, orientation of text in the overlap area is a problem. The preferred method for text placement is in the reference view text drawing. These reference view text drawings are the plan profile drawings, Bridge Layouts, construction detail, or other drawings. The practical result of this is each drawing is a text drawing with no line work drawn in it. For the most part, the only elements which reside in the sheet (text) drawings are text elements.

Please note editing done on text drawings in overlapping areas will not be reflected in adjacent areas without editing each adjacent sheet.

The InRoads Plan and Profile Generator automatically creates sheet text drawings for plan profiles, Layouts, Construction Details, and other InRoads created sheets. The saved plan profiles, Layouts, and Construction details are essentially composite drawings made up of references for border, existing topography, proposed design, etc. with reference windows clipped to match the size of the border. These saved sheets are ready to accept text and are text drawings.

It is also recommended that text drawings be used with cross section drawings. When used with cross sections they are created as blank drawings that will then have the border and cross section referenced in. This technique helps to preserve manual annotations on cross sections. Please note that these drawings will need created manually.

Annotations on the base drawings can be copied to each sheet. On each requisite sheet the annotations can be moved, modified, and rotated as needed. In order to prevent duplicate text coming from the base drawings, annotations can be changed to construction elements with the change element attributes tool in the base drawing. Constructions can then be turned off in each text drawing while they will remain in the base drawings. Use of save settings is important with these operations. This will allow the sheet drawings to have construction elements turned off, prohibiting duplication.

### 6.5 Creating Base Drawings

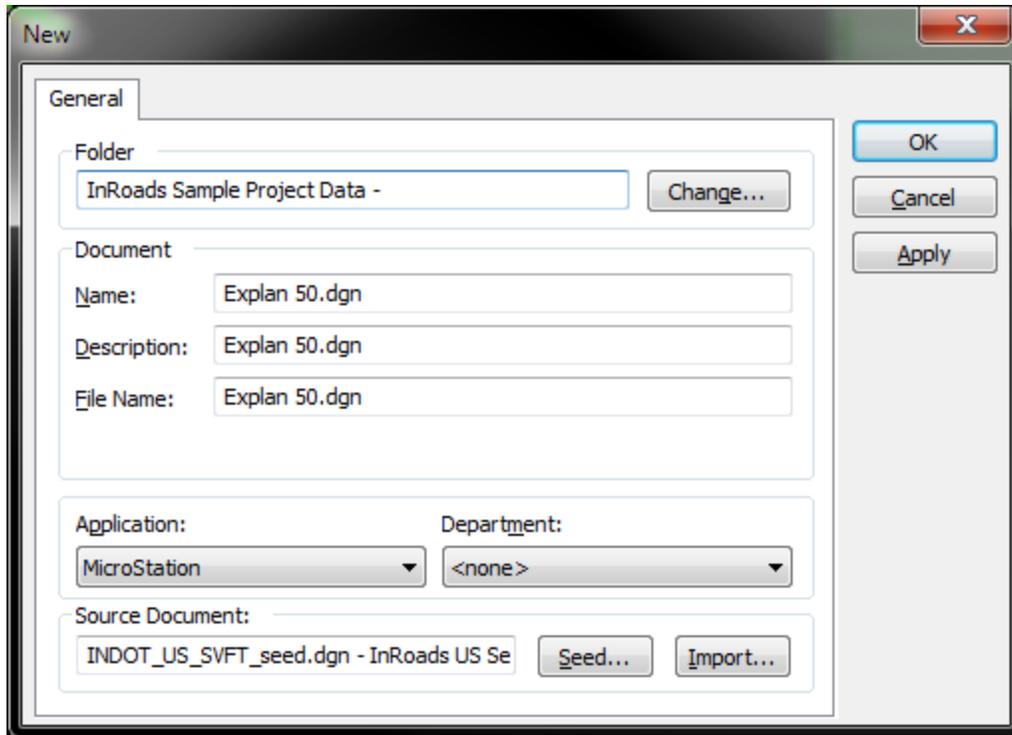
For the following procedures, it is assumed that the end user already has opened their surfaces and alignments as needed.

#### 6.5-1 Creating the Existing Plan Drawing

*Note: The following exercises are based upon a production drawing example.*

Use *MicroStation* -> *File* -> *New* to *create* the drawing *Explan 50*.

This will create and open a .dgn with this name in the folder you specify in the New Document dialog.

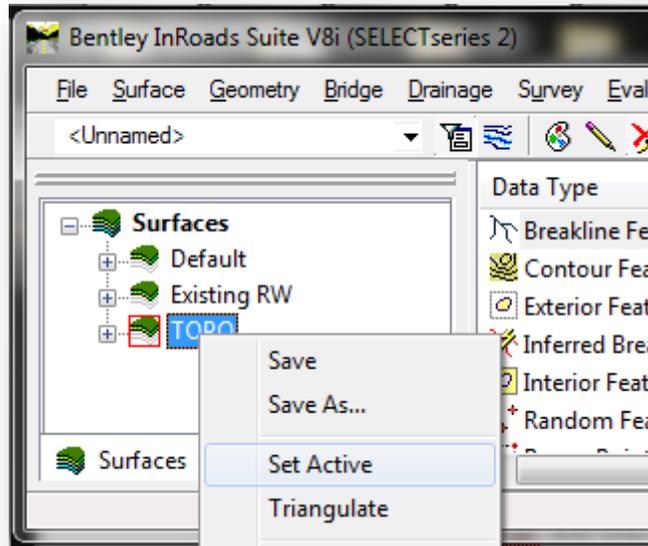


**The New Document, No Wizard dialog**

Click OK – a blank drawing is opened, and a new MicroStation/InRoads drawing is created.

Additionally, you may create these base drawings externally of MicroStation/InRoads using the document creation wizards and tools in ProjectWise as discussed in Section 5.2-1c.

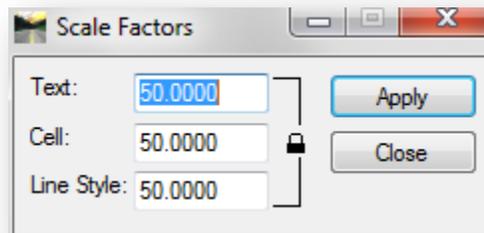
Make sure your TOPO surface is your active surface in the InRoads Explorer; you can do this by highlighting the relevant surface and right clicking on it. When prompted, select **Set Active** as shown in the following illustration:



### Activating a Surface

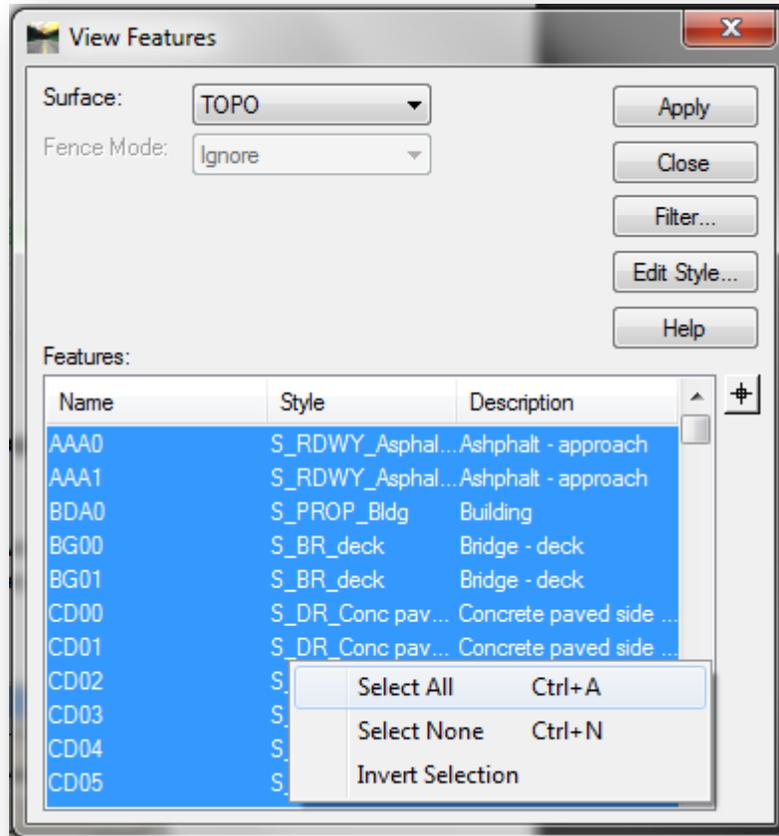
When active, the surface icon will be shown with a red box around it.

Once activated, you will then need to define your global display factors. At this time, go to **InRoads Explorer -> Tools -> Global Scale Factors** and set the scale appropriately for your base drawing. The following illustration shows the values necessary for a 50 scale drawing:



### Global Scale Factors

To display the TOPO features, you will then need to display the features. You can do this by going to the **InRoads Explorer -> Surface -> View Surface -> Features...** menu item. You will then be provided the following dialog:



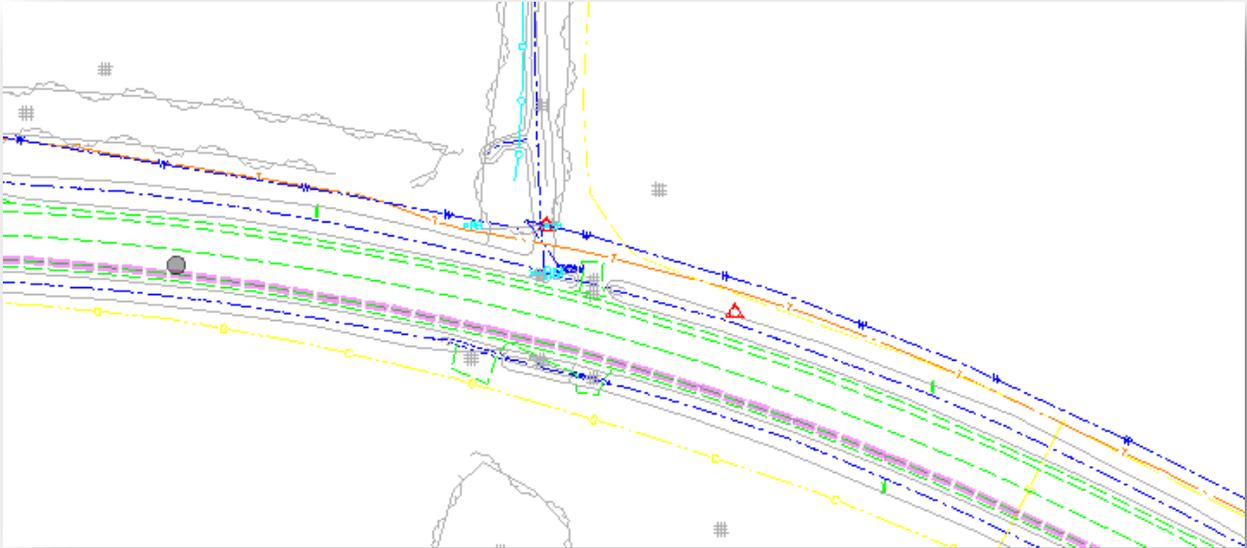
### View Features Dialog

Like the majority of the surface tools, this list is filterable and allows for the selection of All, None or an Inverted selection set from directly within the dialog. For the TOPO, select all features and select Apply, which will have InRoads display the topographical features in your DGN. You may need to do a fit view command to see the elements drawn.

**CAD Menu -> File -> Save Settings** at this point to retain the information, additionally, you may use the Ctrl+F hotkey combination.

#### **Optional Steps:**

This process could be repeated for **1"=20'** and **1"=100'**. These scales are anticipated to be utilized in some plan sets.

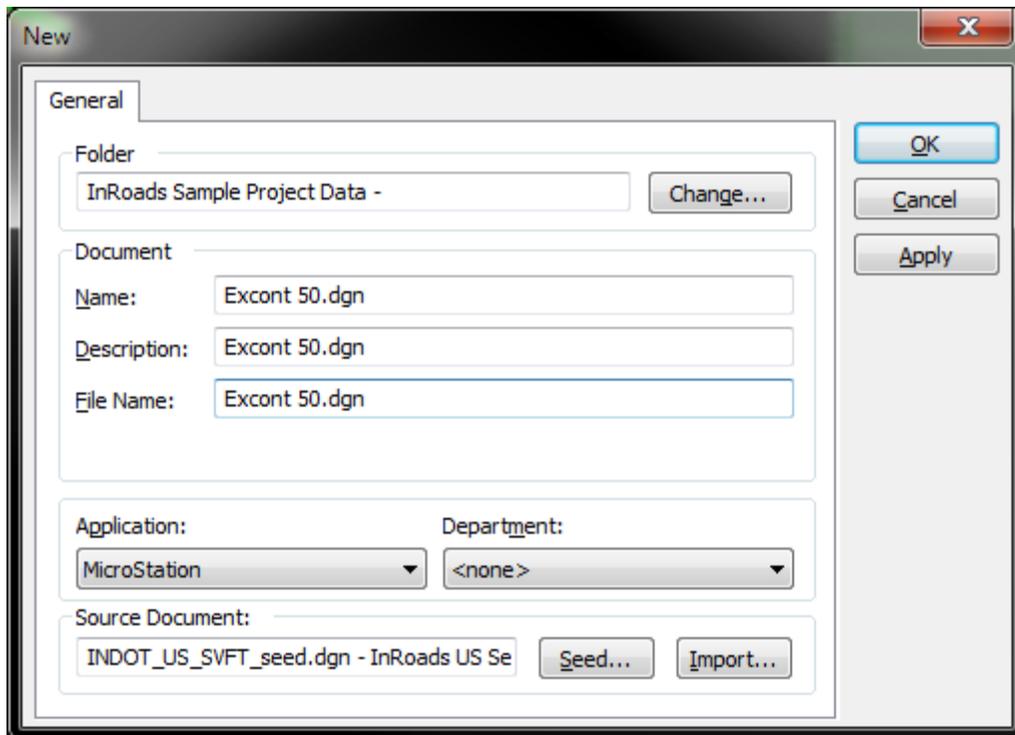


Topo surface as displayed in Explan 50

### 6.5-2 Creating the Existing Contour Drawing

Use *MicroStation* -> *File* -> *New* to create the drawing *Excont 50*.

This will create and open a .dgn with this name in the folder you specify in the New Document dialog.

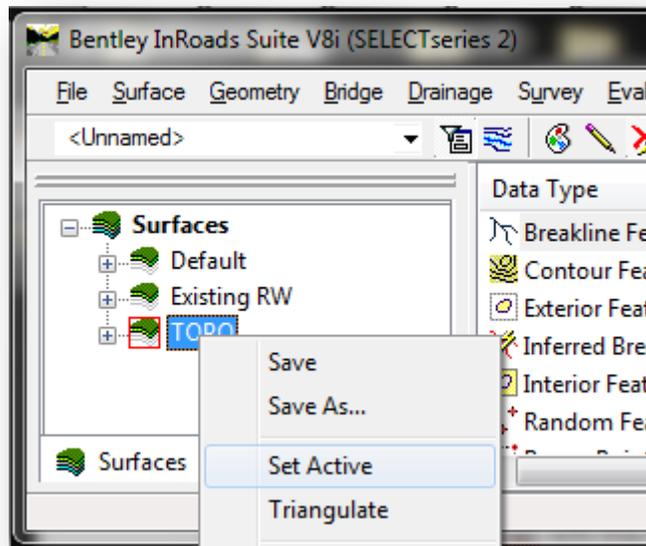


The New Document, No Wizard dialog

Click OK – a blank drawing is opened, and a new MicroStation/InRoads drawing is created.

Additionally, you may create these base drawings externally of MicroStation/InRoads using the document creation wizards and tools in ProjectWise as discussed in Section 5.2-1c.

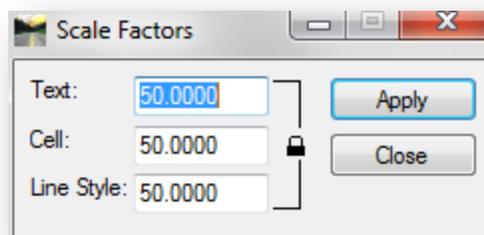
Make sure your TOPO surface is your active surface in the InRoads Explorer; you can do this by highlighting the relevant surface and right clicking on it. When prompted, select **Set Active** as shown in the following illustration:



### Activating a Surface

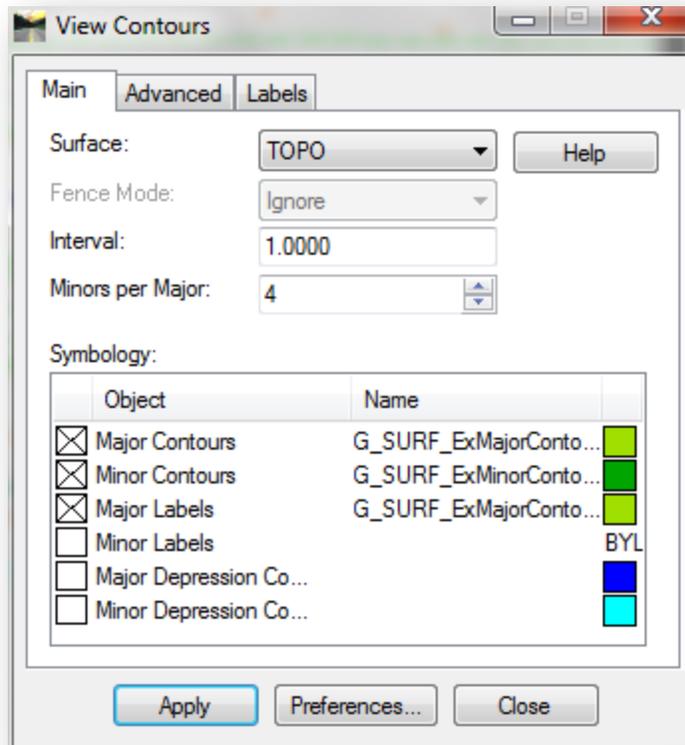
When active, the surface icon will be shown with a red box around it.

Once activated, you will then need to define your global display factors. At this time, go to **InRoads Explorer -> Tools -> Global Scale Factors** and set the scale appropriately for your base drawing. The following illustration shows the values necessary for a 50 scale drawing:



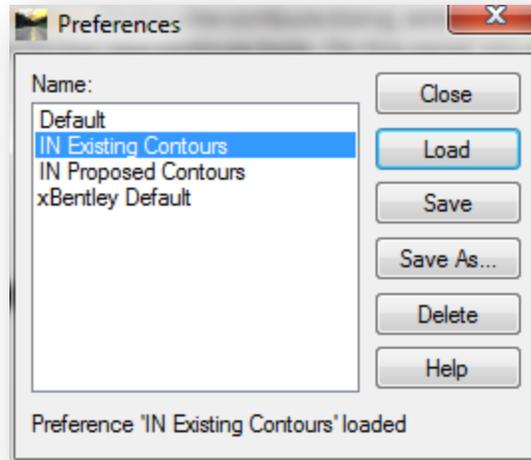
### Global Scale Factors

At this time, you can display the contours. To access this tool, go to the *InRoads Explorer* -> *Surface* -> *View Surface* -> *Contours...* menu item. You will then be presented the following dialog:



**View Contours Dialog**

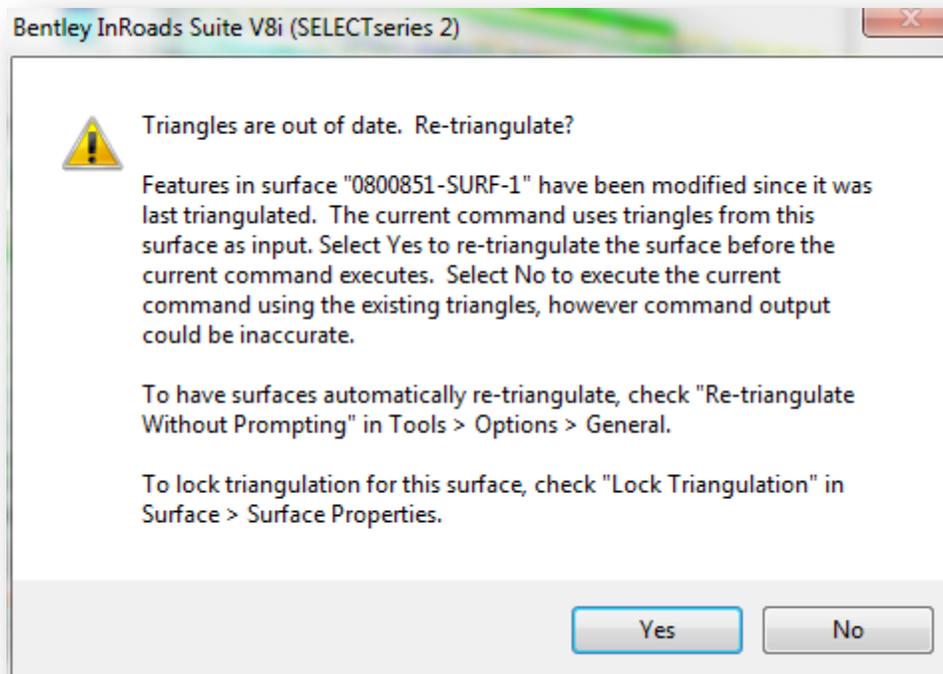
To display the existing contours, you will first need to verify that you're using the preference for *IN Existing Contours*. On the view contours dialog, select the Preferences... button. This will display the Preferences for the view contours tools. On this panel, you will need to select IN Existing Contours and select Load. You will be given notification at the bottom of the panel that the preference has been loaded and is now set. This is shown in the following illustration:



### Selecting and Loading IN Existing Contours Preference

Once loaded, you can close the preferences dialog. On the View Contours dialog, you can then select Apply and close. Your existing contours will then be displayed in the DGN.

Depending on the stage of your project (most likely during the design phase) and the operations you may have recently performed, you may be prompted with the following dialog:

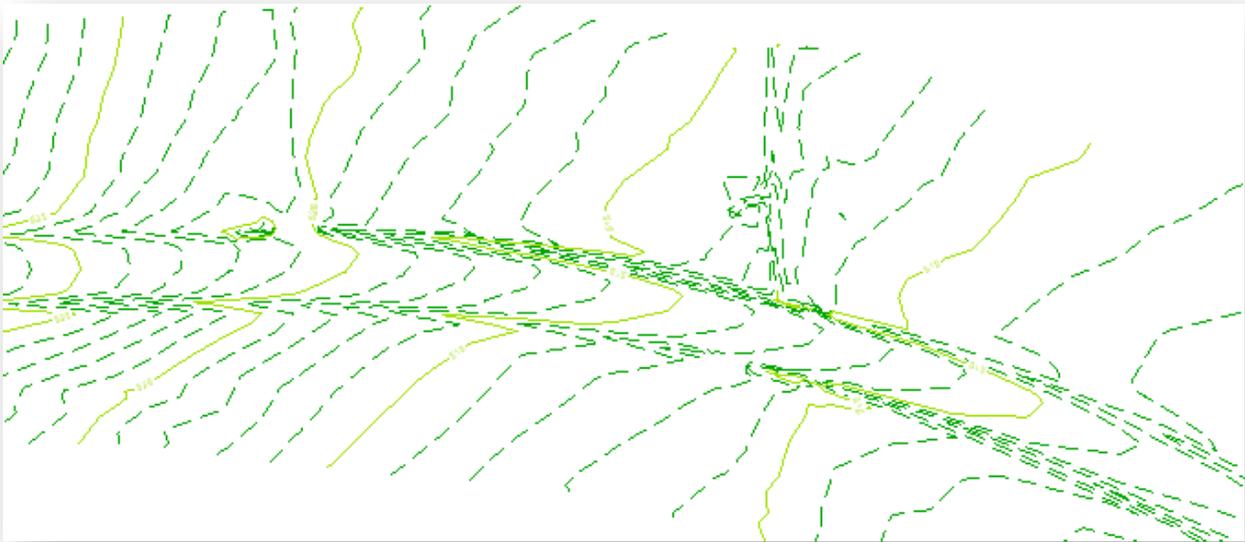


### Triangulation Notification

This dialog is an alert that your triangulation is no longer up to date. As the warning notes, you can continue your current operation without updating the triangles. This will use the existing triangulation which may be out of date and provide in-accurate information. Note that this warning can be triggered by any surface function that is attempting to use the triangulation to display graphics.

**Optional Steps:**

This process could be repeated for **1"=20'** and **1"=100'**. These scales are anticipated to be utilized in some plan sets.



**Contours as displayed in Excont 50**

At this point, it is desirable to add any other base drawings in the same manner as used for **Explan** and **Excont**. These could include proposed contours (**Prcont**), existing right of way (**RW existing**), or any other drawing needed.

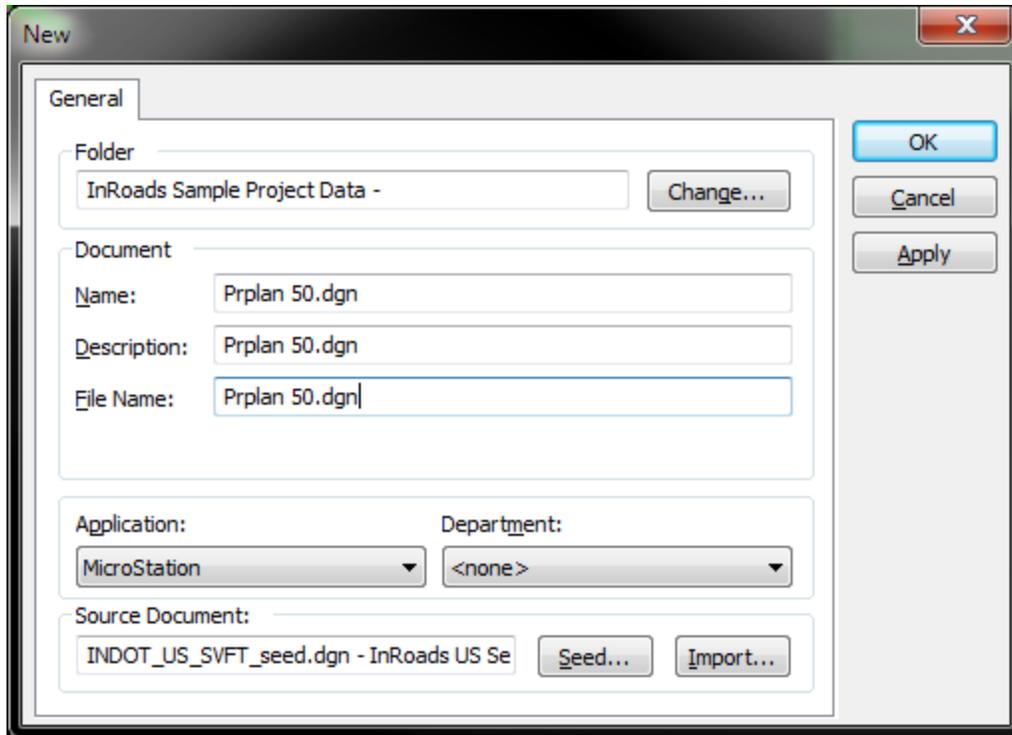
*Not all of these drawings will need to be referenced into the Prplan base drawing prior to creating any sheets (plan profiles, layouts, construction details, etc). All that is required is an alignment to orient the sheets.*

Next you will create the proposed plan drawing **Prplan**.

**6.5-3 Creating the Proposed Plan Drawing**

Use **MicroStation -> File -> New** to **create** the drawing **Prplan 50**.

This will create and open a .dgn with this name in the folder you specify in the New Document dialog.

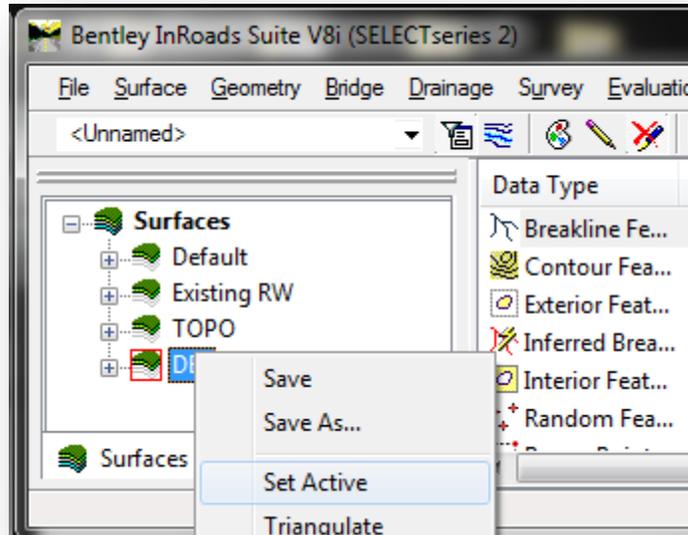


**The New Document, No Wizard dialog**

Click OK – a blank drawing is opened, and a new MicroStation/InRoads drawing is created.

Additionally, you may create these base drawings externally of MicroStation/InRoads using the document creation wizards and tools in ProjectWise as discussed in Section 5.2-1c.

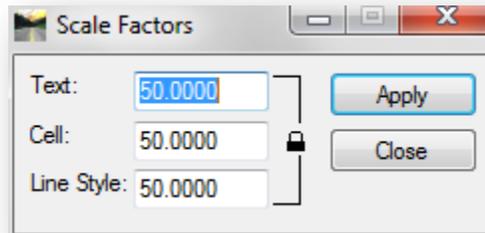
Make sure your proposed design surface is your active surface in the InRoads Explorer; you can do this by highlighting the relevant surface and right clicking on it. When prompted, select **Set Active** as shown in the following illustration:



### Activating a Surface

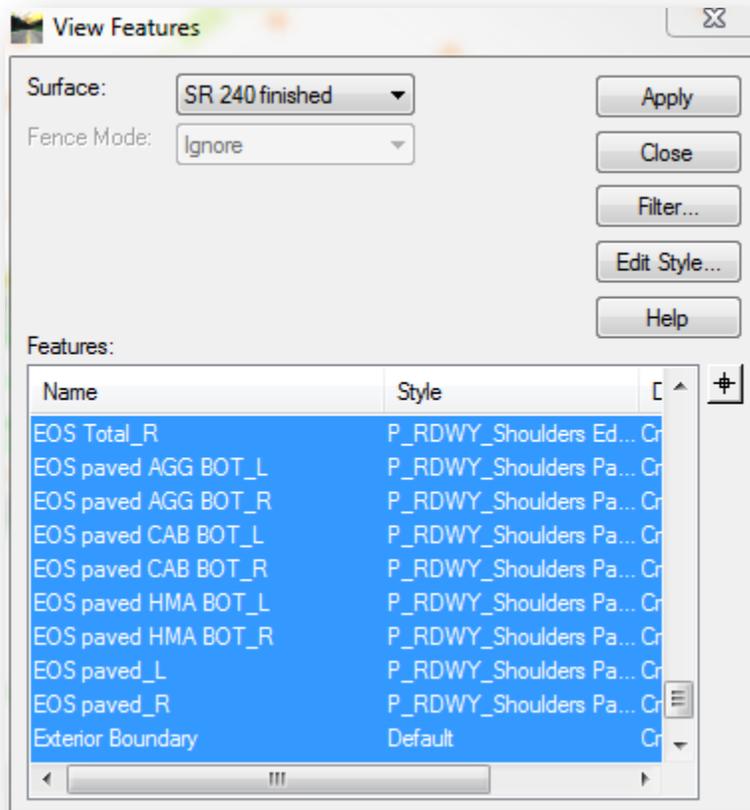
When active, the surface icon will be shown with a red box around it.

Once activated, you will then need to define your global display factors. At this time, go to *InRoads Explorer* -> *Tools* -> *Global Scale Factors* and set the scale appropriately for your base drawing. The following illustration shows the values necessary for a 50 scale drawing:



### Global Scale Factors

To display the DES features, you will then need to display the features. You can do this by going to the *InRoads Explorer* -> *Surface* -> *View Surface* -> *Features...* menu item. You will then be provided the following dialog:



### View Features Dialog

Like the majority of the surface tools, this list is filterable and allows for the selection of All, None or an Inverted selection set from directly within the dialog. For the DES, select all features and select Apply, which will have InRoads display the proposed features in your DGN. You may need to do a fit view command to see the elements drawn.

**CAD Menu -> File -> Save Settings** at this point to retain the information, additionally, you may use the Ctrl+F hotkey combination.



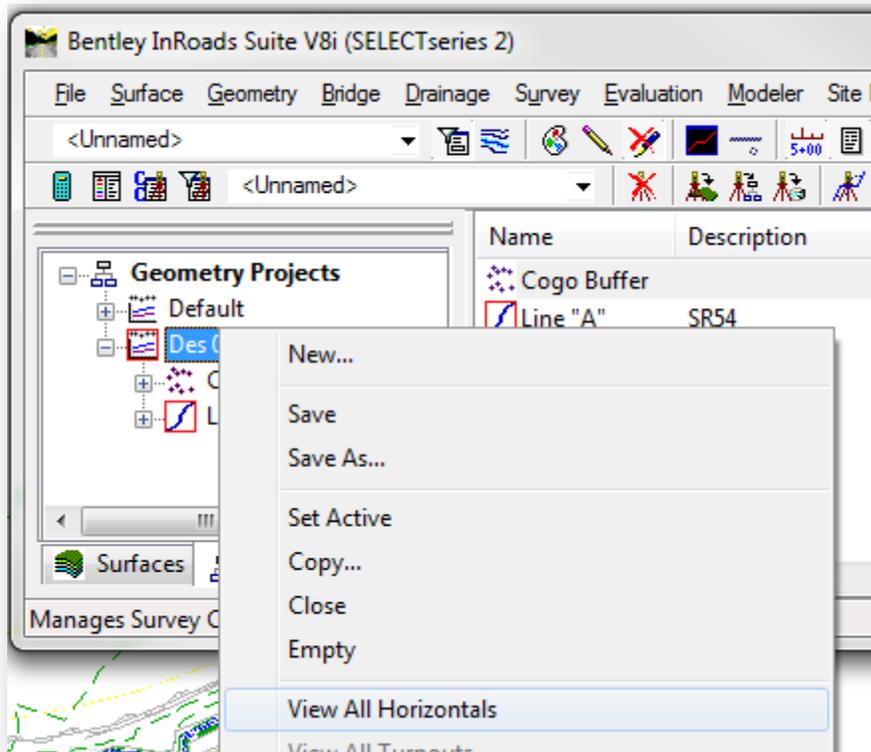
## PRPLAN model as displayed in Prplan 50

### 6.5-3a Displaying Alignments

Since InRoads requires you to use alignments to layout sheets and display annotation, you will display each alignment. Also, you want to have sheets laid out beyond the project limits to show incidental construction limits and some of the existing survey beyond. Differing from MX however, is the ability of the Roadway Modeler to allow templates to cover specific station ranges, making the need for shortened alignments unnecessary.

To display the alignments, you can perform 1 of 3 methods. The first is quick display of all horizontal alignments via the InRoads Explorer.

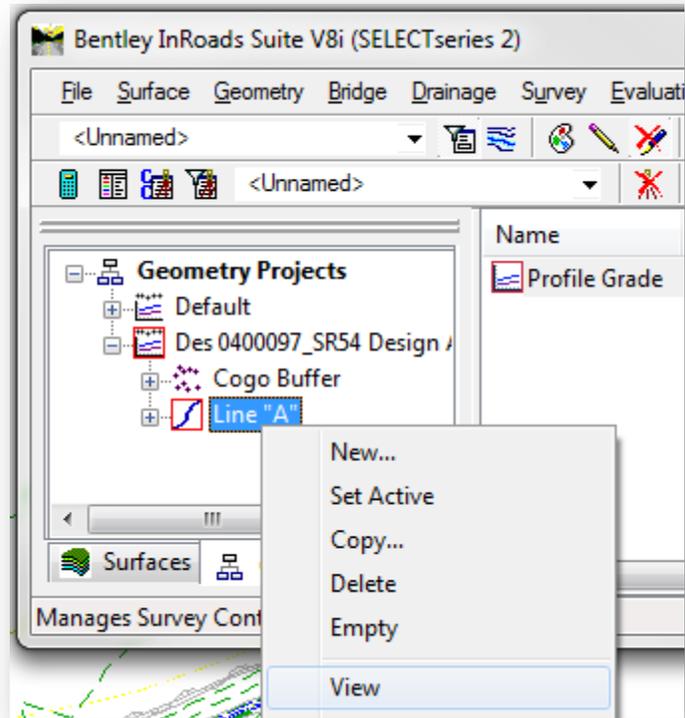
To display the alignments in this fashion, right click on the name of your geometry project on the InRoads Explorer's Geometry tab and select **View All Horizontals** as shown:



### View All Horizontal Alignments

This will have InRoads display all horizontal alignments defined in your geometry project.

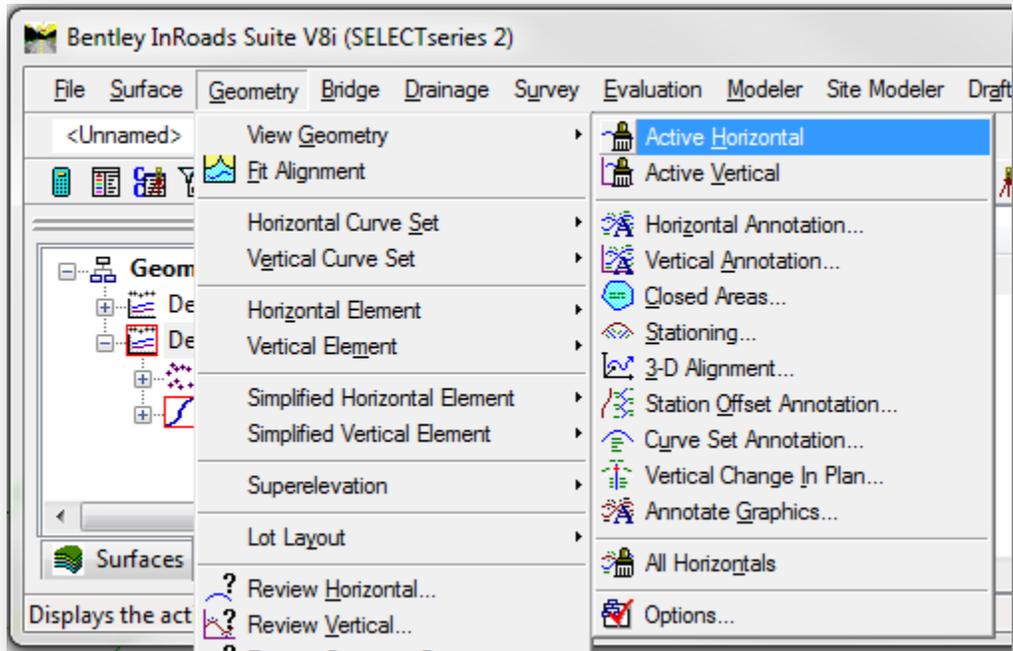
The next method is displaying a single horizontal alignment from the InRoads Explorer. As in the previous example, you will need to browse to the Geometry tab and expand your project so it shows the horizontal alignment you'd like to display. You will then right click on the alignment and select **View** as shown:



### Viewing a Single Horizontal Alignment

This will display only the selected horizontal alignment in your DGN.

The final method is displaying the active horizontal alignment from the InRoads Explorer -> Geometry -> View Active Horizontal menu item.



### View Active Horizontal

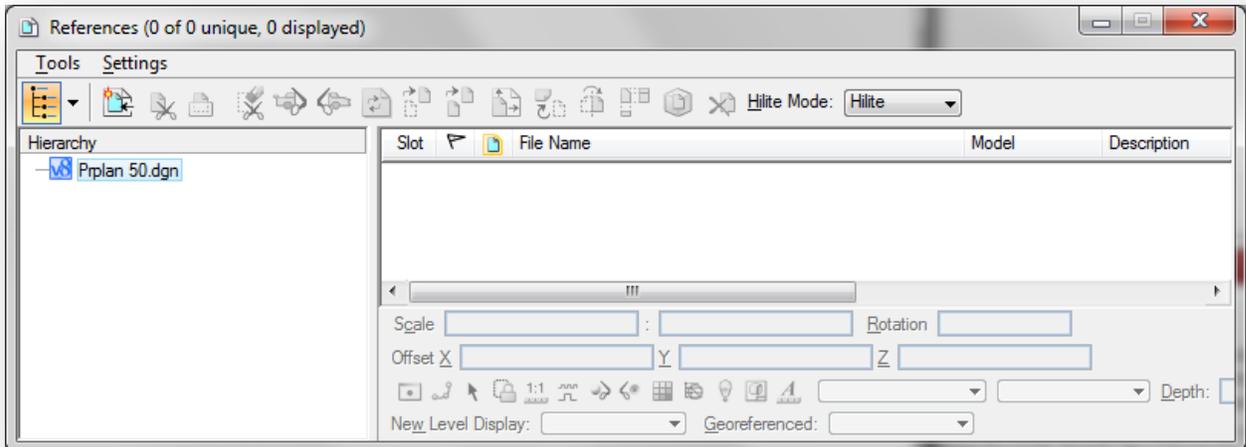
This will display the currently active InRoads horizontal alignment in your DGN.

You will now reference the Explan 50, Excont 50, and any other base drawings into Prplan 50.

#### 6.5-4 Attaching Explan as a Reference File to Prplan

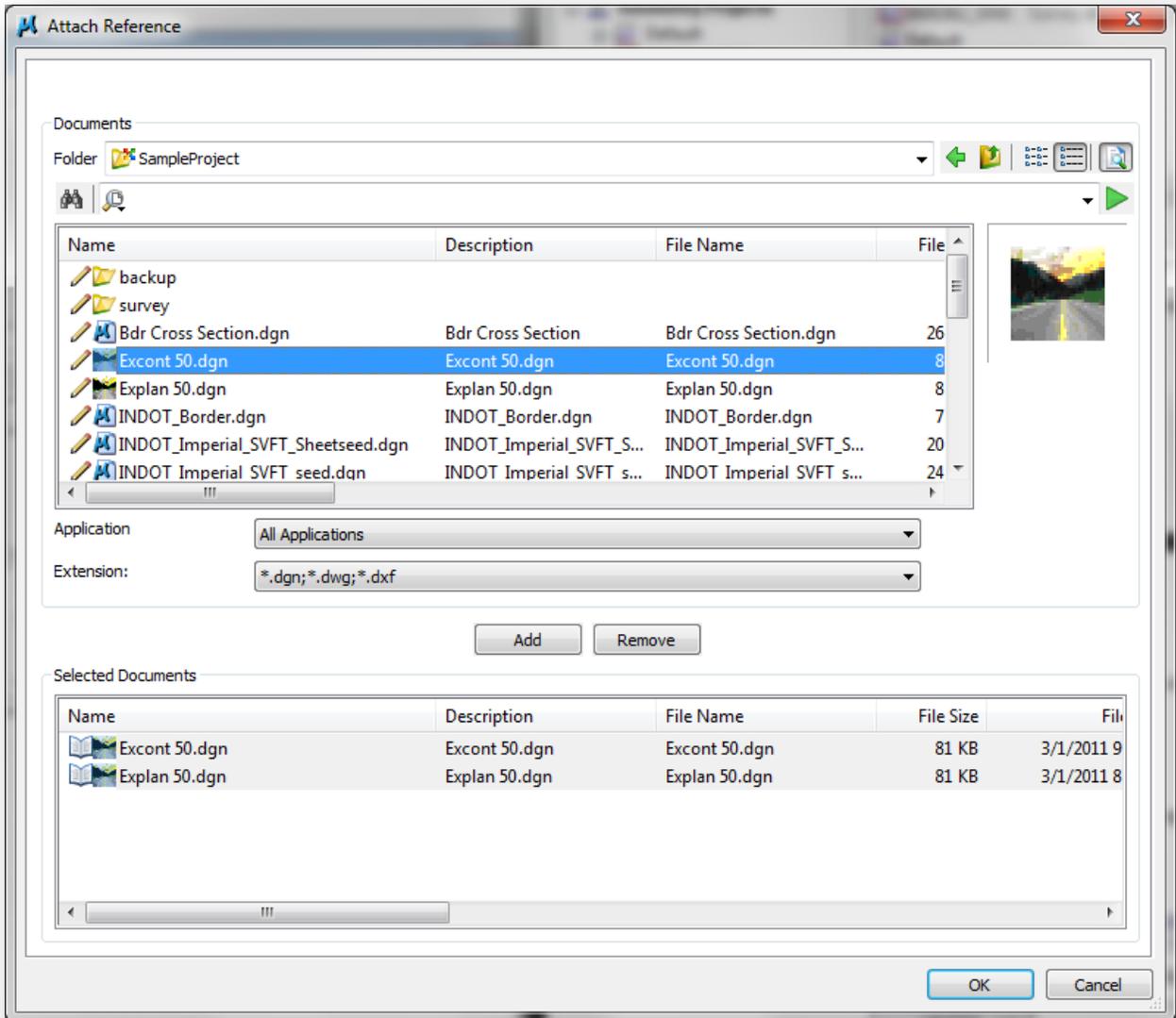
Since you will be using MicroStation commands for these procedures, you will look at the ProjectWise specific method of attaching files. Due to functionality differences with ProjectWise and MicroStation, the previous method of drag and drop attachment will not work from within ProjectWise.

To attach your files, select **File ->Reference** from the MicroStation menu.



### The References Dialog

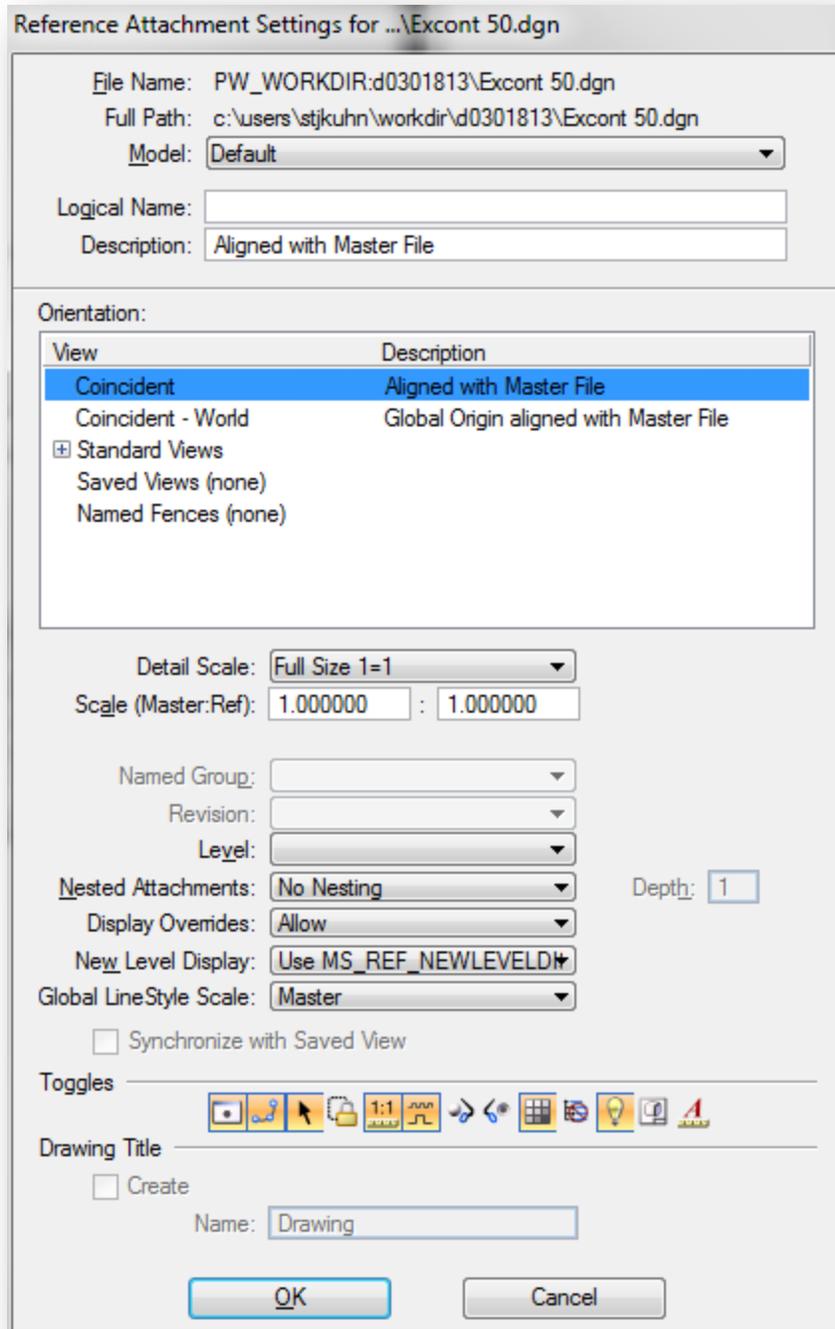
From the References dialog, select **Tools -> Attach...**



### The ProjectWise Attach Reference Dialog

From the **Attach Reference** dialog, you can select multiple files to attach and add them to the **Selected Documents** section for attachment at the same time. Once you have the documents you'd like to attach selected, select the OK button.

You will then be presented the Reference Attachment Settings window as shown:



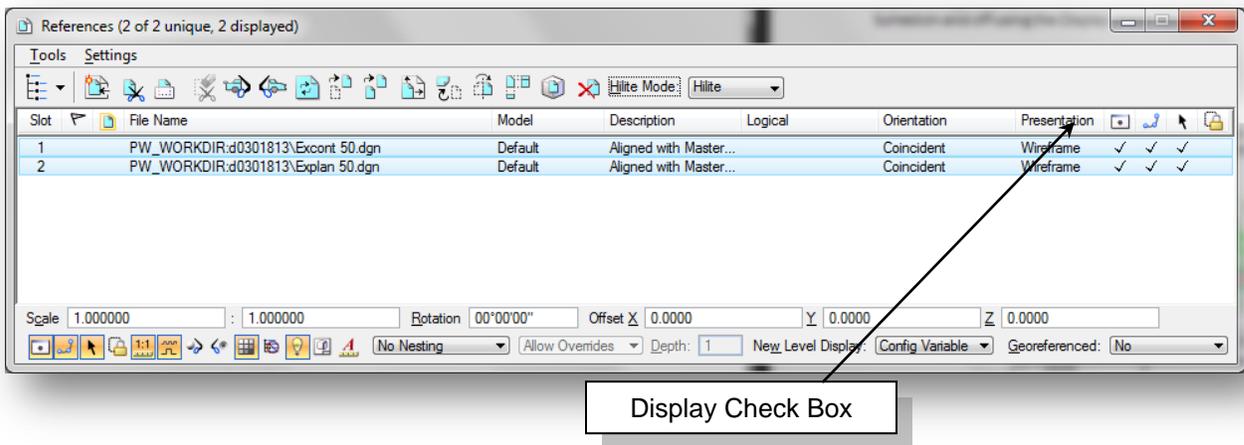
### The Reference Attachment Settings Dialog

The settings shown on this example are the ones you will want to use. Since you're no longer using Annotation Scale, the Global Linestyle Scale adjustments are no longer need. Coincident attachment will orient the files one directly over the other, and finally, the scale will be 1:1 as all elements should be full size at this time.

You will be presented this dialog for each of the files that you will be attaching to your file.

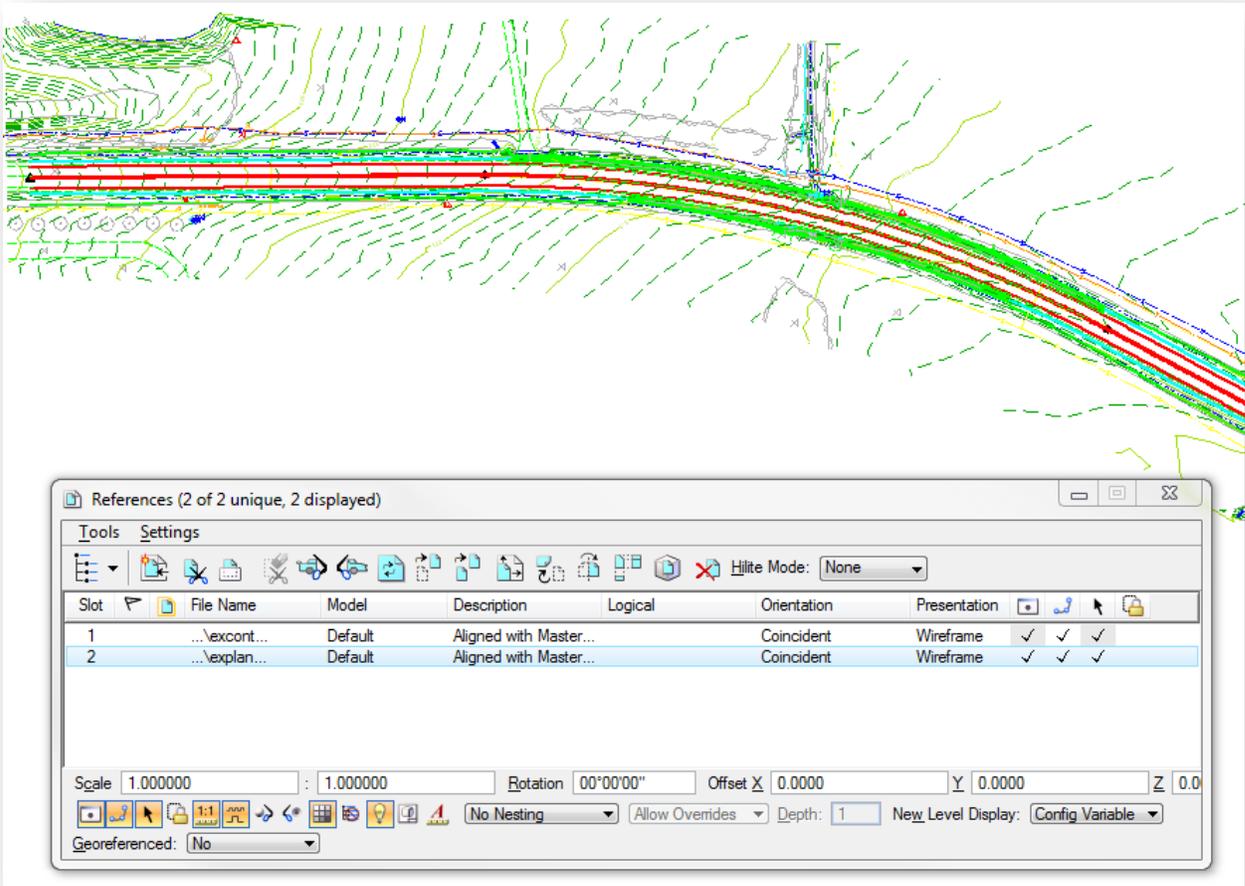
Suggested logical names and descriptions are indicated in **Appendix A** in the section on MicroStation Drawing Names under Standard Base Drawings. Variations on logical name and descriptions can be required at the user's discretion based on non standard project data. Once attached, you may modify the attachment's logical name by double left-clicking on the attachment and modifying its attachment settings.

Explan 50.dgn appears in the References panel. Another option available is the display can be turned on and off using the Display check box.



Reference Dialog with References Attached

The results should look like this.



Prplan 50 with reference files Explan 50 and Excont 50 displayed

**Optional Steps:**

This process could be repeated for **1"=20'** and **1"=100'**. These scales are anticipated to be utilized in some plan sets.

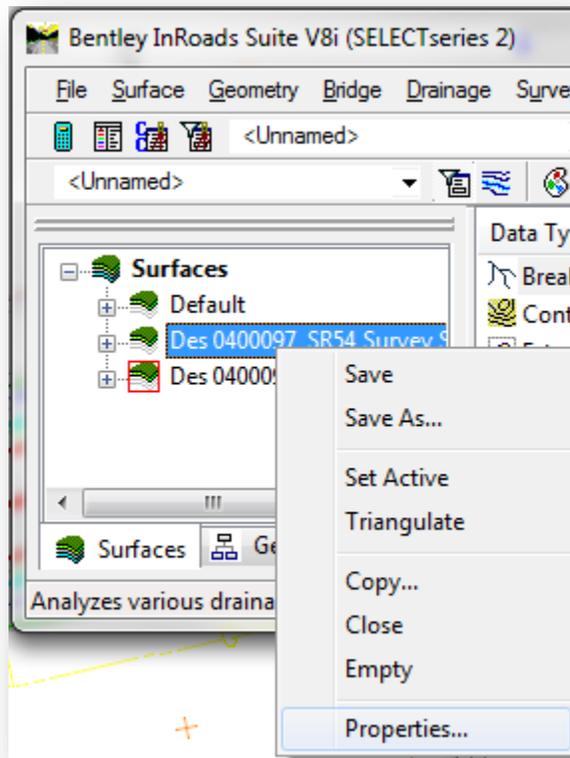
Repeat the above procedure for each base drawing created.

**6.5-5 Adding the Proposed Profile to the Prplan Base Drawing**

With the switch to InRoads, there are a new set of procedures required to create and display your profiles in your DGN. The tools you'll be using in this section are on the InRoads Explorer menu under **Evaluation -> Profile and Geometry -> View Geometry** and **Evaluation -> Profile -> Create Profile**.

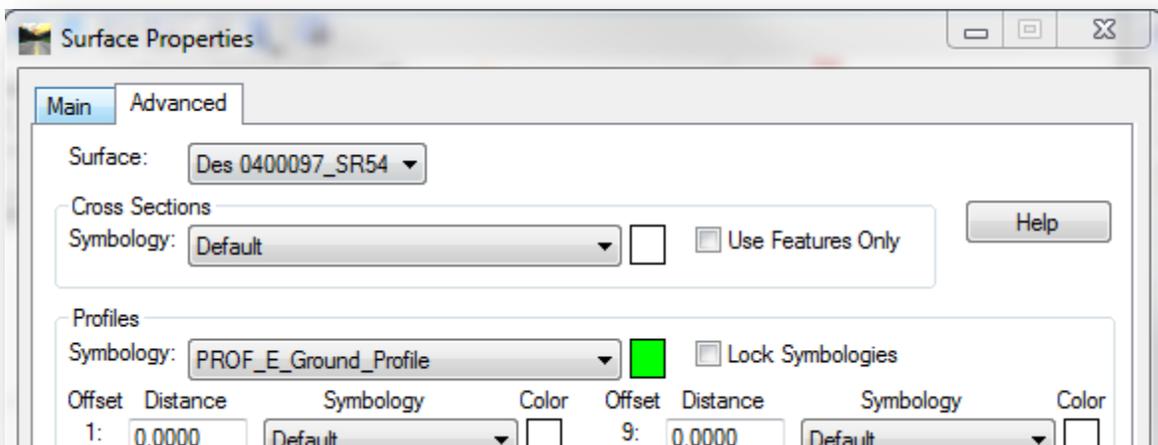
Unlike MX, it's not required to have a profile displayed in order to begin the plan profile sheet creation process. The process for creating a profile during the sheet creation process will be discussed later in this document. This section will investigate the methods to create and view a profile for the purposes of creating/editing proposed profiles.

First, you need to adjust the symbology display for our surface so it displays properly in profile view. To do this, right click on your Survey Surface and select Properties.



### Surface Properties

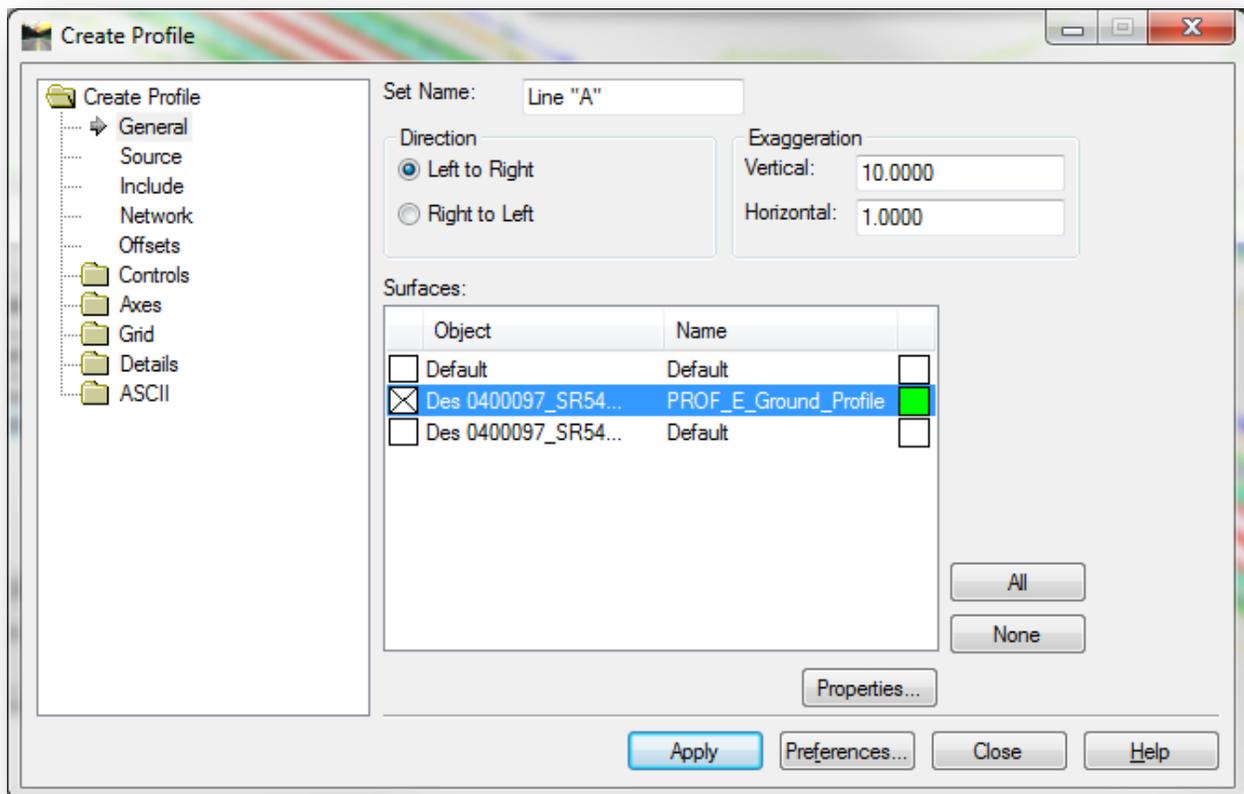
This will give you the Surface Properties dialog; in particular, you want to look at the Advanced tab. At this time, you're concerned with the Profiles portion of the dialog. Shown in the following illustration, you can see that the Survey Surface has been set to PROF\_E\_Ground\_Profile.



## Profile Symbology

With this set, you can apply this to your surface. Note that your surface will need to be editable for this to be saved.

Next is the creation of the profile. For this, access the profile creation tools through the **Evaluation -> Profile -> Create Profile** menu item. This will start the Create Profile dialog as shown below:



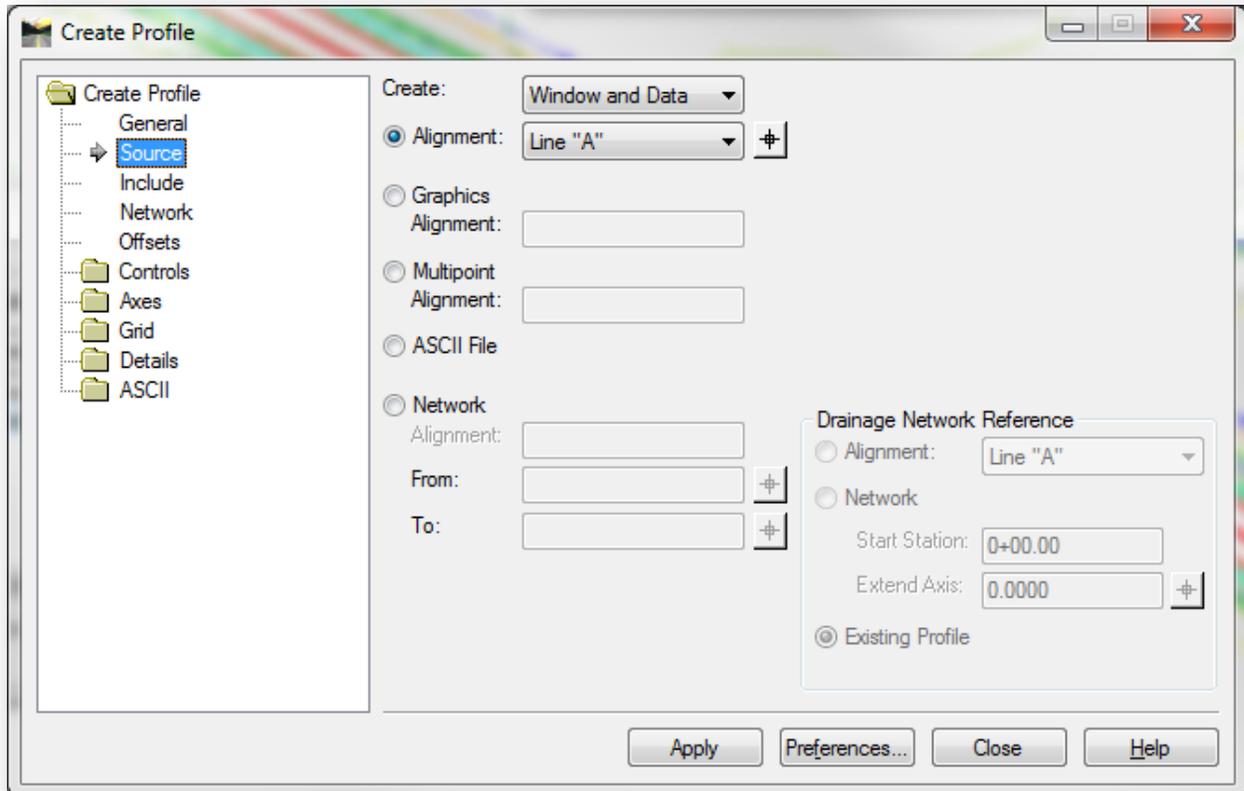
### Create Profiles dialog/General Tab

On this dialog you can control all features related to how a profile looks when completed. Like other InRoads functions, there are INDOT customized preferences available to draw up your profile, adhering to agency standards.

For the purposes of this review, you'll only examine the tabs that must be configured when using one of the INDOT preferences, first, the General tab.

Shown above, the General tab controls profile direction, included surfaces, and exaggeration. As with MX, one must select the appropriate TOPO surface so that it displays appropriately along with setting the scale appropriate exaggeration.

The Source tab shown below, is where one inputs the alignment they would like their profile cut along.



### Source Tab

One needs to define the Horizontal Alignment that is being used in this instance. In addition to this functionality, one can define graphical elements, interactive point selections, ASCII text, and drainage networks to create a profile along.

These are the required items for creating profiles. In addition to the existing surface profile, the additional tabs provide functionality to include crossing and project features, drainage features, etc. Many of these tabs also have settings for scaling, sizing, and symbology for the various profile elements, many of which have default values provided by the preferences.

Once satisfied with the profile settings, select Apply and place the profile following the input prompts for placement.

#### 6.5-6 Adding the Proposed Vertical Alignment

With the profile now displayed, you can add proposed vertical alignments. Should you be creating a new vertical alignment, you will need to use the tools under the **Geometry** menu using the **Vertical Element** and **Vertical Curve Set** tools.

To add a proposed vertical alignment to an existing profile, one can use the **Geometry -> View Geometry -> Active Horizontal** menu item. Alternatively, as long as the existing profile is drawn up,

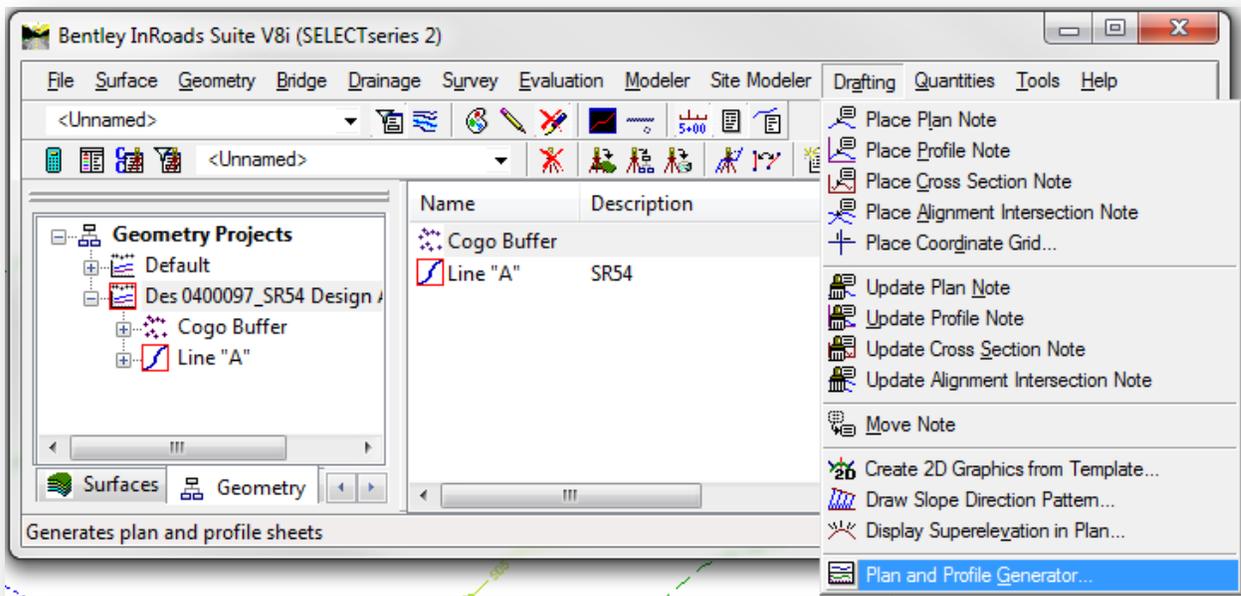
one can right click on the desired vertical alignment and select **View**. This will display the selected vertical alignment on the existing profile.

## 6.6 Sheet Layout and Creation (Plan Profile Sheets)

The following section discusses the various functions included in the Plan and Profile Generator. This will include reviewing some of the differences between creating a profile using the previously discussed method, and how Plan and Profile Generator will create its own for use during the sheet cutting process. For further reference on this tool and its functionality, please refer to the Bentley InRoads Plans Production course via the Bentley Learn Network.

### 6.6-1 Plan and Profile Generator

While in the prplan.dgn, open the Plan and Profile Generator from the **Drafting -> Plan and Profile Generator** as shown in the following illustration:



### Plan and Profile Generator

This will present the Plan and Profile Generator window. With the sheer number of options available in this tool, it is highly advised that one use the preferences that are provided. These correspond to the INDOT standard sheets. As there are numerous preferences available, please refer to the following table for a listing of the preferences and their function. For all preferences listed as IN PW, please note that these are configured to attach the appropriate border from within the ProjectWise system.

Default	Default Preference, settings are configured the same as IN PW Plan Profile 50 Scale
IN PW Bridge Layout XX Scale	INDOT Bridge Layout sheet, available in 30 and 50 scales
IN PW Dbl Plan XX Scale	INDOT Double Plan sheet, available in 10, 20,

	30, 50, and 100 scales
IN PW Plan XX Scale	INDOT Plan only sheet, available in 10, 20, 30, 50, and 100 scales
IN PW Plan Profile XX Scale	INDOT Plan Profile sheet, available in 20, 30, 50, and 100 scales
INPWPlanProfileXXScaleLargePlan	INDOT Plan Profile sheet, available in 20, 30, 50, and 100 scales
xBentley Default	Original, as shipped Bentley Default preference

To illustrate the most extensive sheet cutting path, you will review the process for cutting a 50 scale Plan Profile sheet.

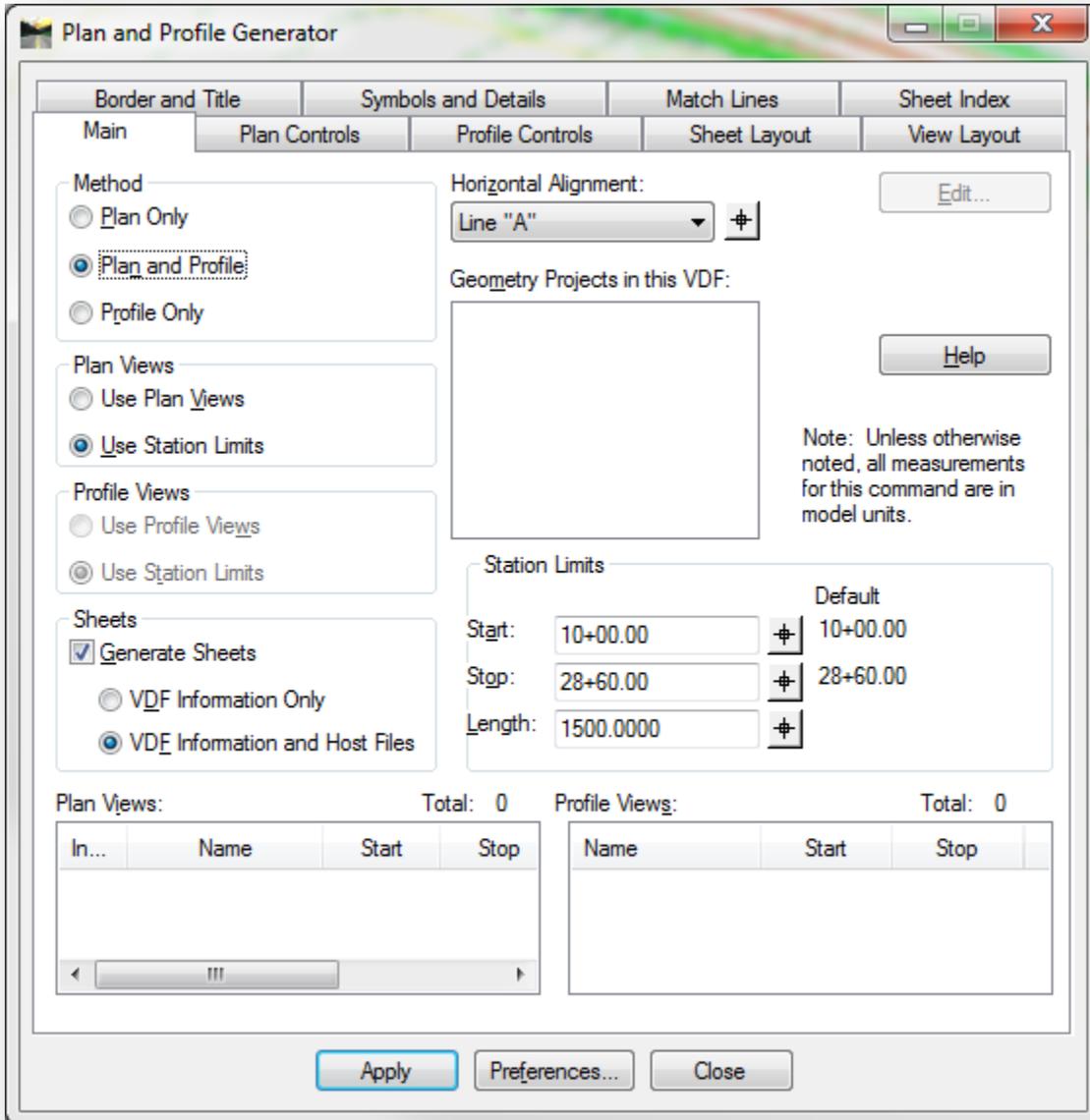
### 6.6-2 Sheet Creation

Like numerous other InRoads tools, Plan and Profile Generator defaults to using the active geometry project and subsequent horizontal and vertical alignments. One can either pre-activate each alignment prior to opening the tool, or they can interactively select these items from within the Plan and Profile Generator.

**Note:** *The various text and symbology functions within the Plan and Profile Generator all respect the values in the Global Scale Factors add-in. For the correct display of these elements, make sure that Global Scale Factors are consistent with the scale sheet being cut.*

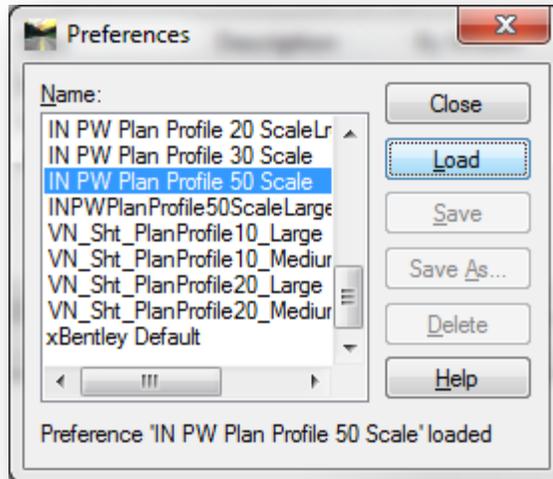
**Note:** *In order for InRoads to place the appropriate symbology for the north arrow and additional cells located on the sheet such as the title block text integration cell, please check that INDOT\_InRoads.cel is attached from pw:\\dotwise.indot.in.gov:DOTWise\documents\INDOT Workspace\InRoads\Cells\*

When first starting the tool, the following window will be displayed:



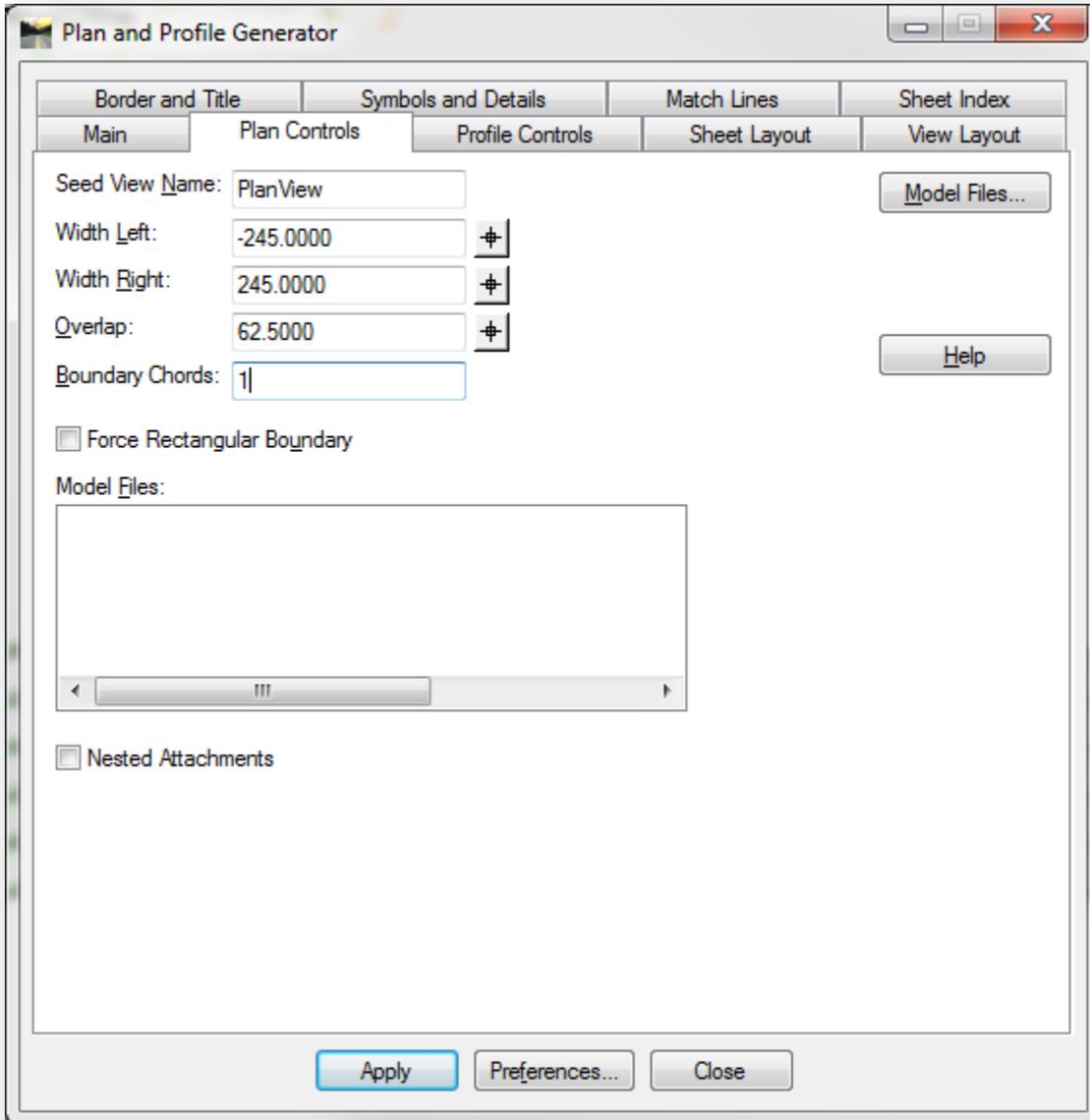
### Plan and Profile Generator Main Tab

With this tab displayed, you'll start by loading the appropriate preference for a 50 scale plan profile sheet.



### Loading IN PW Plan Profile 50 Scale

With the preference loaded, you can now start reviewing the options that are loaded for an INDOT specific sheet. For specific information on each of these settings, please refer to the online help in the software, or the InRoads Plans Production course guide.

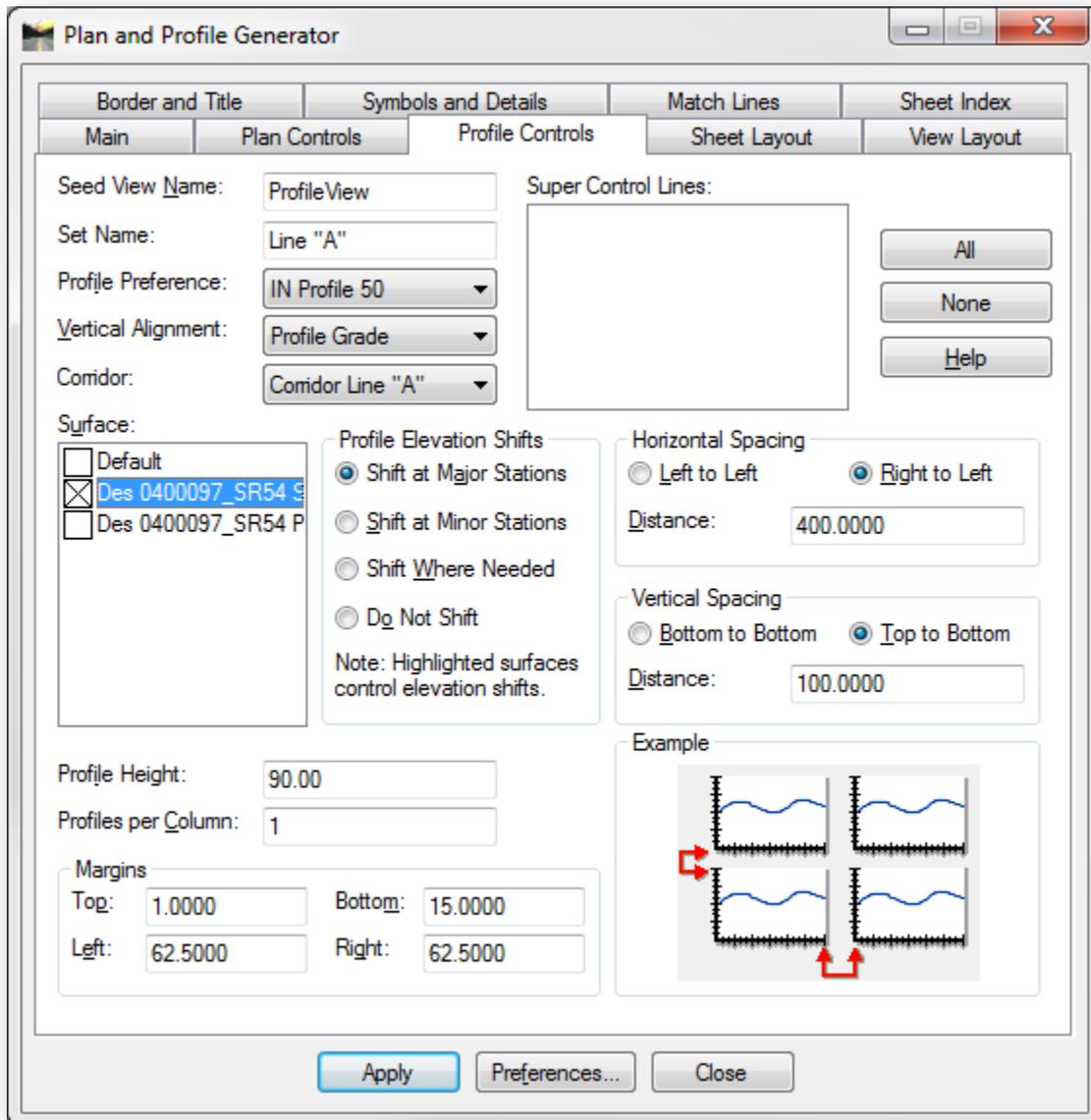


### Plan Controls Tab

For the features on this tab, the preference defines the seed view name, the left and right widths and the sheet overlap. You can attach your additional base drawings (Excont, Explan) by attaching these in the Model Files portion of the dialog. If you maintain the attachments to Prplan and do not attach files with this tool, you will need to adjust your reference settings to enable Live Nesting via the Nested Attachments button. Both are suitable methods, where possible, nested attachments have been enabled though, to remain consistent with earlier procedures from MX.

Nested Attachments

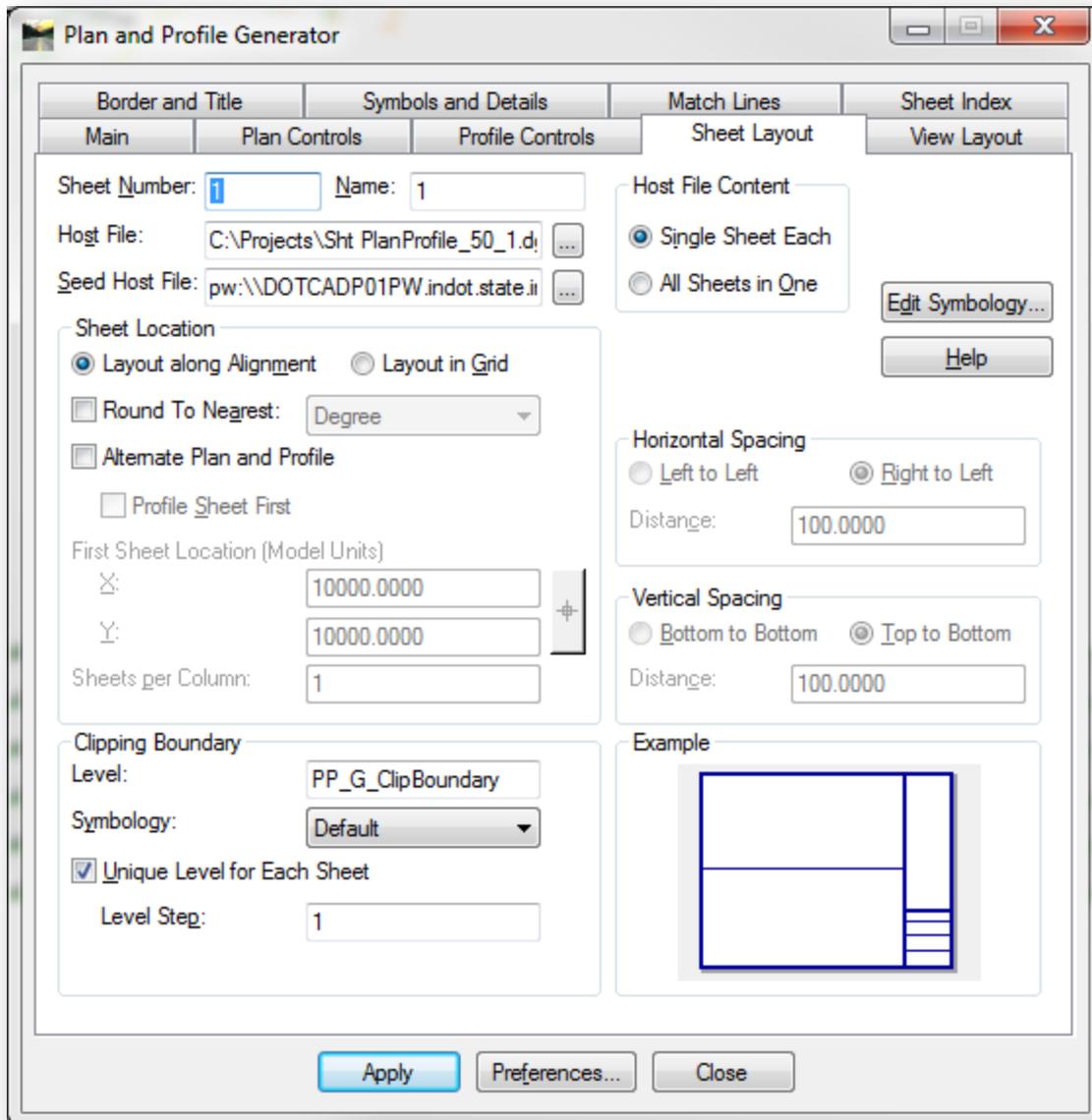
## Nested Attachments



### Profile Controls Tab

On this tab, customized values from the preference are the profile height, horizontal and vertical spacing, and the left and right margins. Additionally, the Profile Preference is set to the IN Profile 50 consistent with this layout. An item to note, no vertical alignment is defined. Should the sheet be

cut with these settings as is, the profile will only display the existing surface along the horizontal alignment.



### Sheet Layout Tab

The first item on this tab defined is the Sheet Number and Name. These are incrementing numbers and used in the Sheet Index for reviewing sheets. It should be noted that any value defined in these fields is only for reference in the Plan and Profile Generator and do not influence the naming of the sheet DGN files.

The Host File is the name of the first finished DGN from the sheet cutting process. Additional sheets are named sequentially from the last character of the file name. In the above example, the name is

Sht PlanProfile\_50\_1.dgn, each additional sheet would be Sht PlanProfile\_50\_2.dgn, \_3.dgn, etc. Also, the preference defaults for the process of cutting a set of test sheets. As such, the file path has been set to the local C:\Projects\ folder. This has been done to alleviate issues with the cutting and re-cutting of sheets into ProjectWise. Sheets should be cut into this location until the desired end result is achieved at which point the sheets can be cut directly into the appropriate project path in ProjectWise.

The Seed Host File is the MicroStation seed file that InRoads will use as a base sheet when creating, clipping and bordering the references. This file will be copied and renamed each time a new sheet is cut.

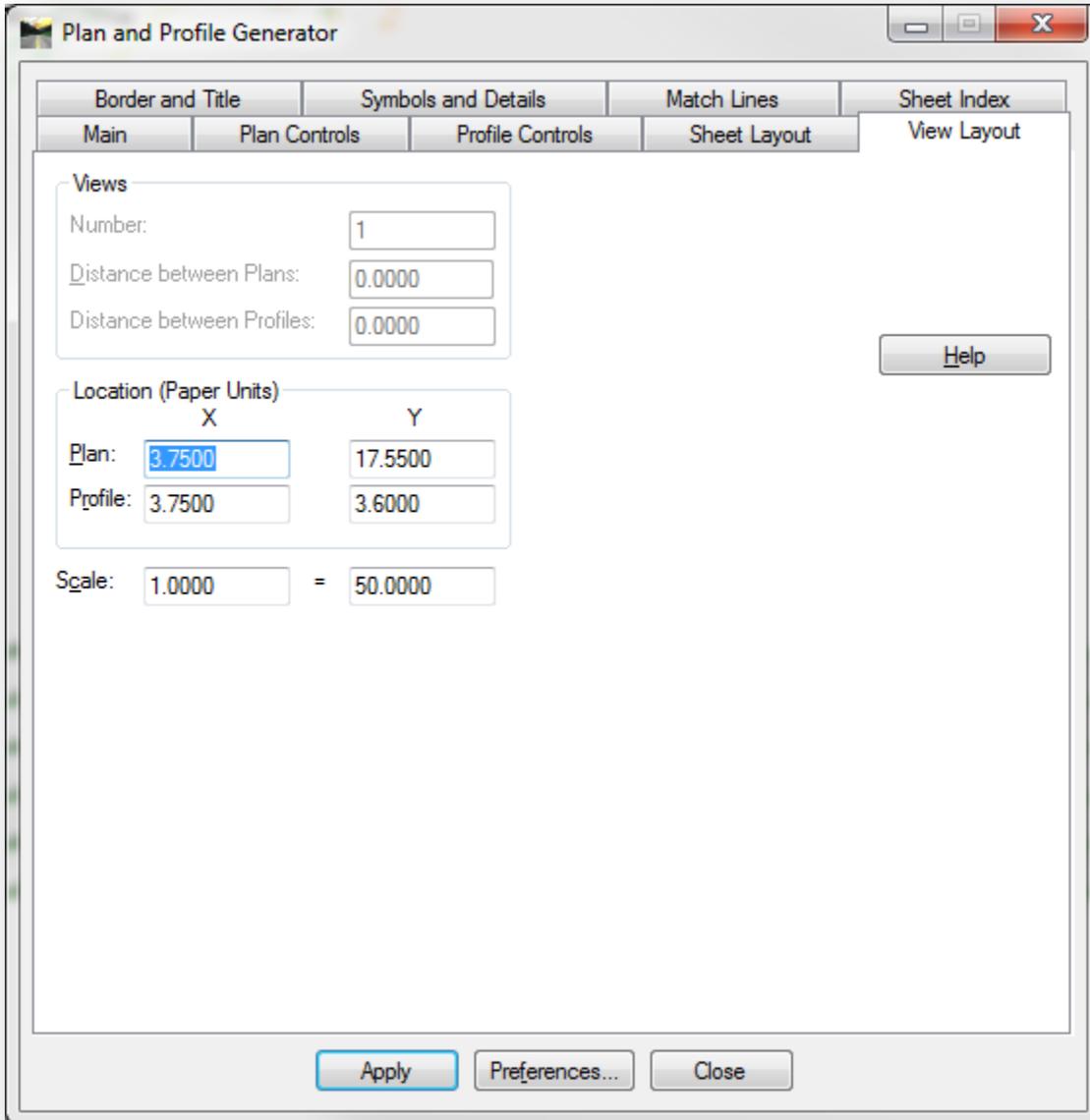
The clipping boundary is an element that follows the end of the clipped reference for both the plan and profile. This feature is enabled and also enumerated to coincide with the names of the sheets for quick referencing to adjust annotation that may need to carry through from the base sheets.

Host File Content defines how the finished sheets are provided when cut. Single Sheet Each places each cut sheet into a separate DGN which is the normal convention. All Sheets in One places to the border and references next to each other in a single DGN and is dependent on the Sheet Location setting.

Sheet Location determines how the sheets are aligned when cut. The default behavior is to place the sheets along the alignment. One can adjust these to show up in a grid view as well. If Layout in Grid is selected, the Horizontal and Vertical Space items become available.

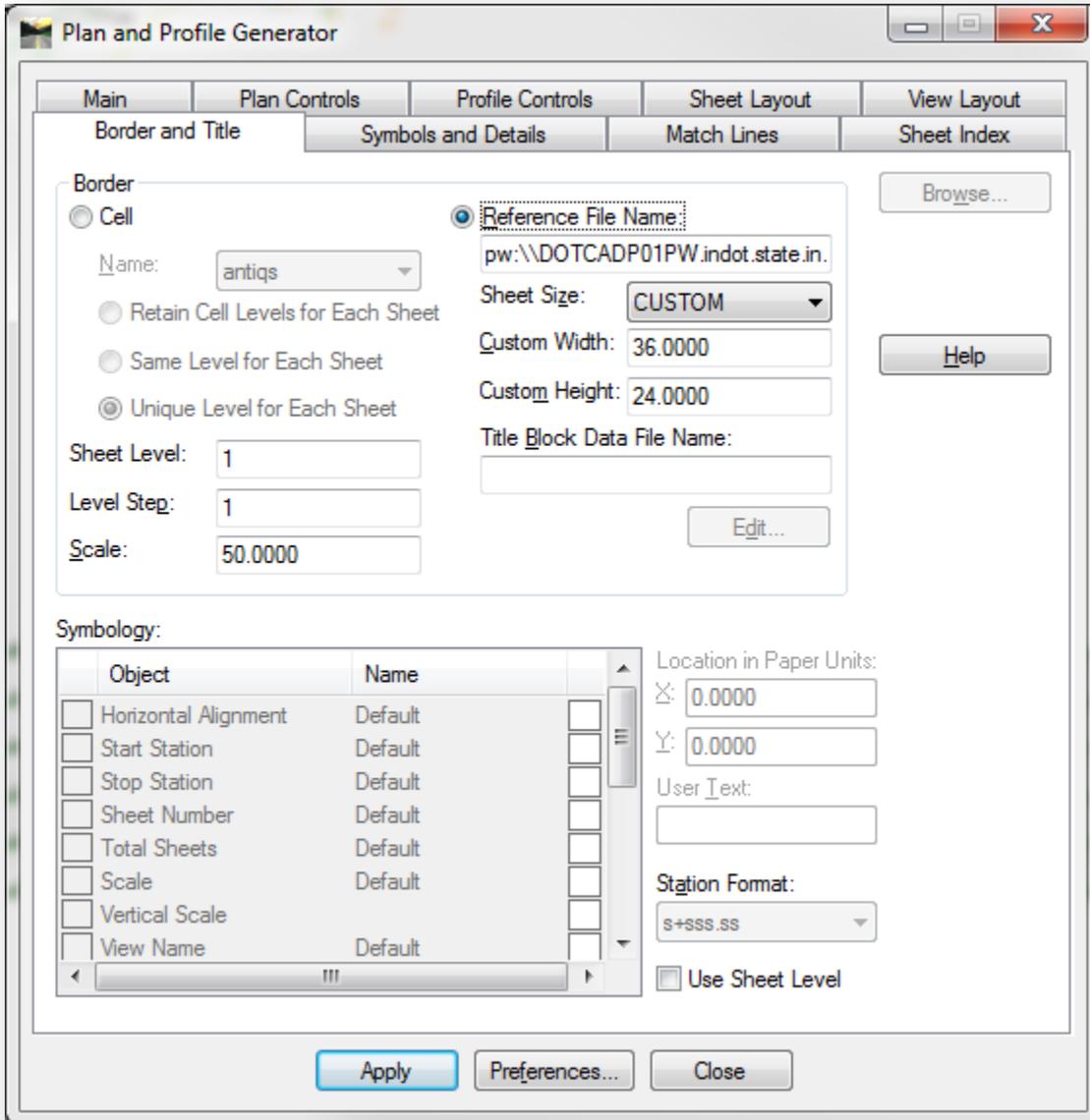
**Note:** *Unlike MX, sheets in InRoads are laid out along the alignment in the INDOT preferences. When viewing the finished sheets, InRoads does rotate the view to appear aligned with the border, however if one adjust the view rotation, the border and references will adjust their rotation and will appear rotated at the appropriate angle.*

**Also,** *if All Sheets in One is selected and used, the borders and references will be cut along the alignment and will appear overlapped similar to the Plan Layout tool that was available in MX.*



### View Layout Tab

On this tab, one will find the values used to determine how the plan and profile line up on the sheet. When cutting INDOT sheets, these should not be adjusted from the values loaded with the preference. Also, the Scale value should be consistent with the scale of the sheet being cut.

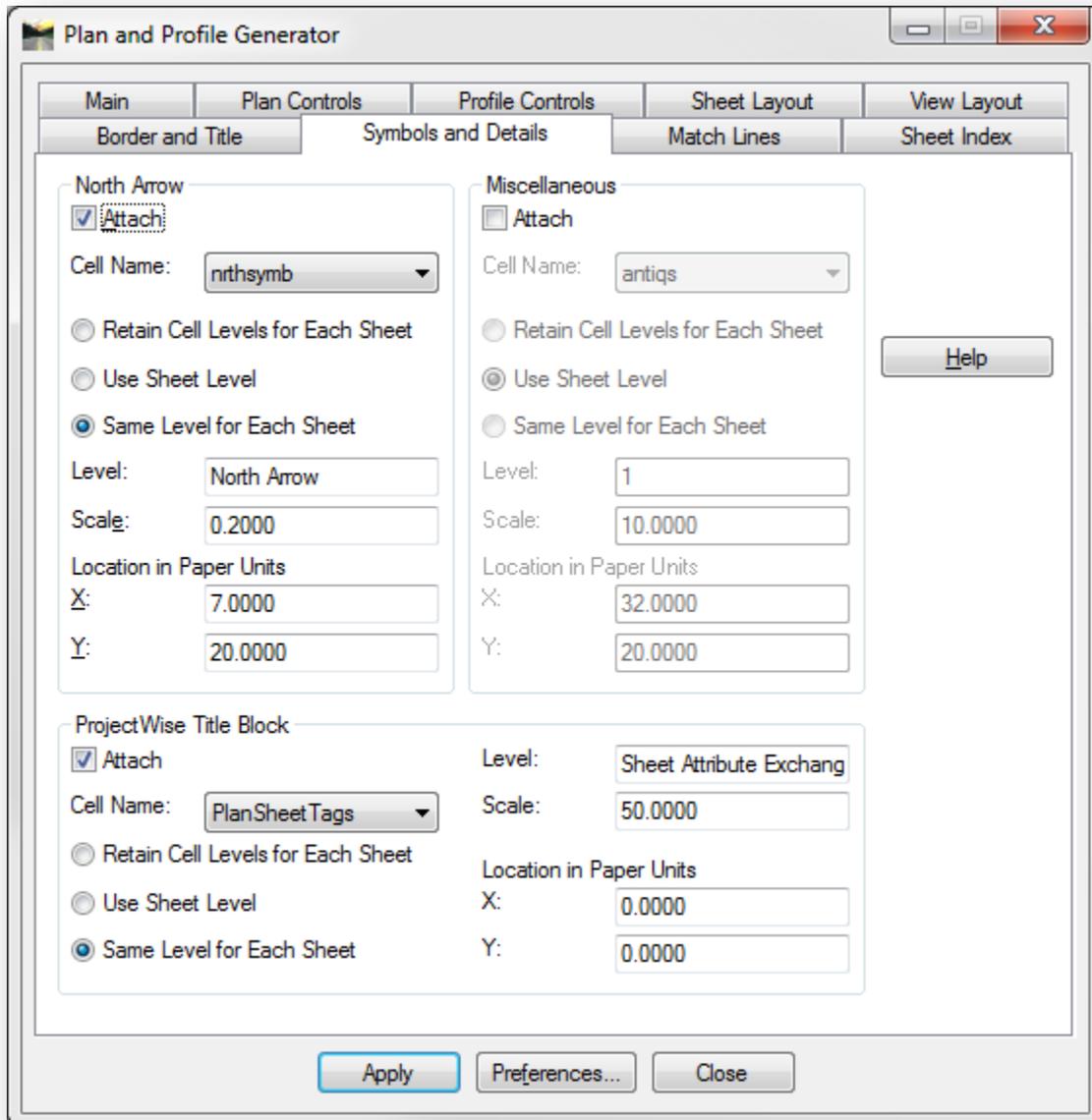


### Border and Title Tab

The values customized on this tab are the Scale, Reference File Name, and Custom Width and Height. As with the scale value on the previous panel, this should be consistent with the scale value of the sheet being cut.

The Reference File Name is the name of the appropriate border for the sheet being cut. In this example, the border is INDOT\_Border.dgn, and can be found in ProjectWise. This is preset in the preference and should not be adjusted.

The Sheet Size should be set to CUSTOM to enable the Custom Width and Height options. As shown, the 36 x24 is the standard size for a full size INDOT sheet.



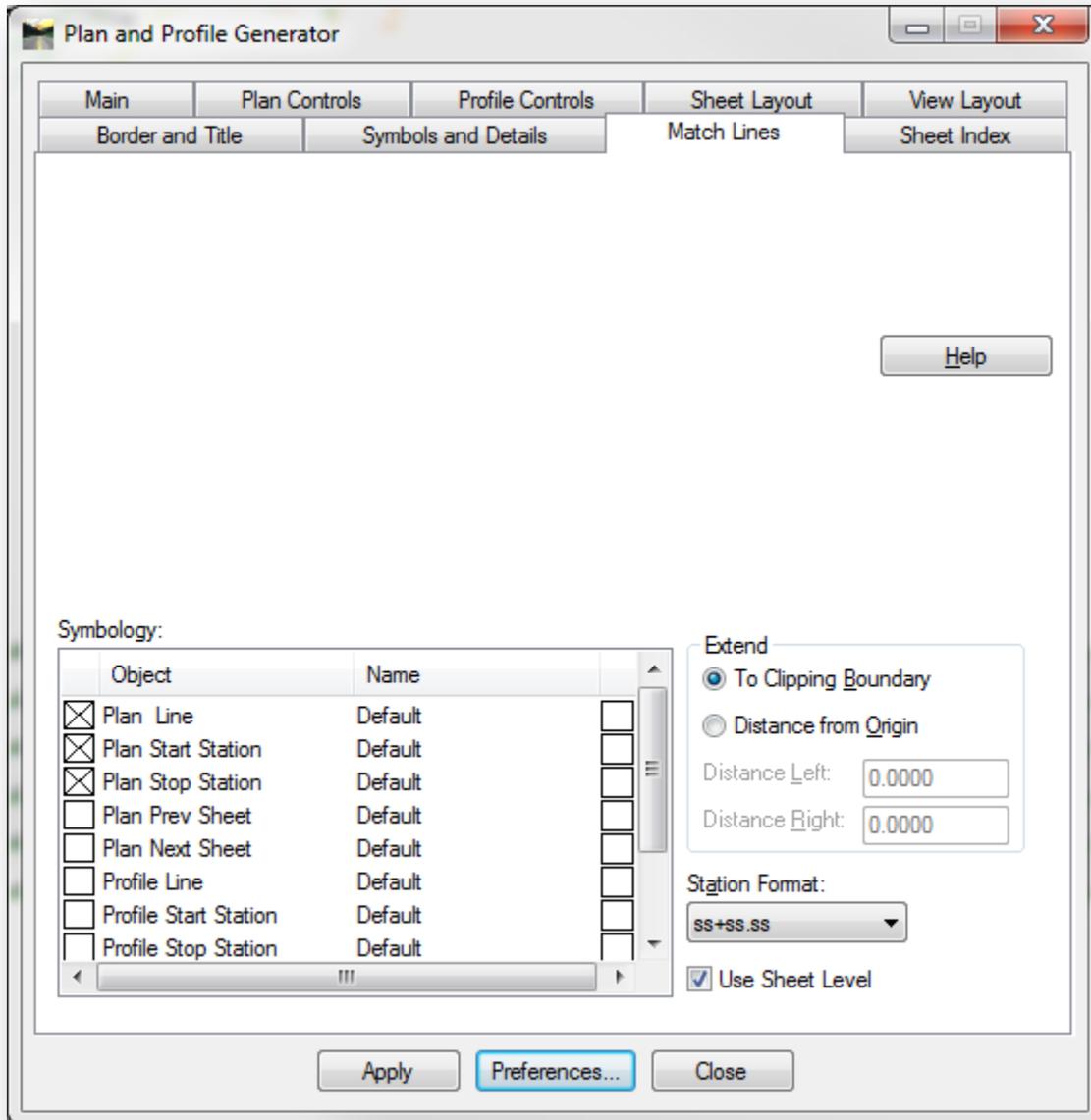
### Symbols and Details Tab

On this tab, the North Arrow, and ProjectWise Title Block are enabled.

This tab is where having the INDOT\_InRoads.cel attached is of paramount importance. Without the cell library attached, the default values of the cell names for both features will be antiquis if the cells are not attached, and upon sheet creation, the incorrect cell will be placed.

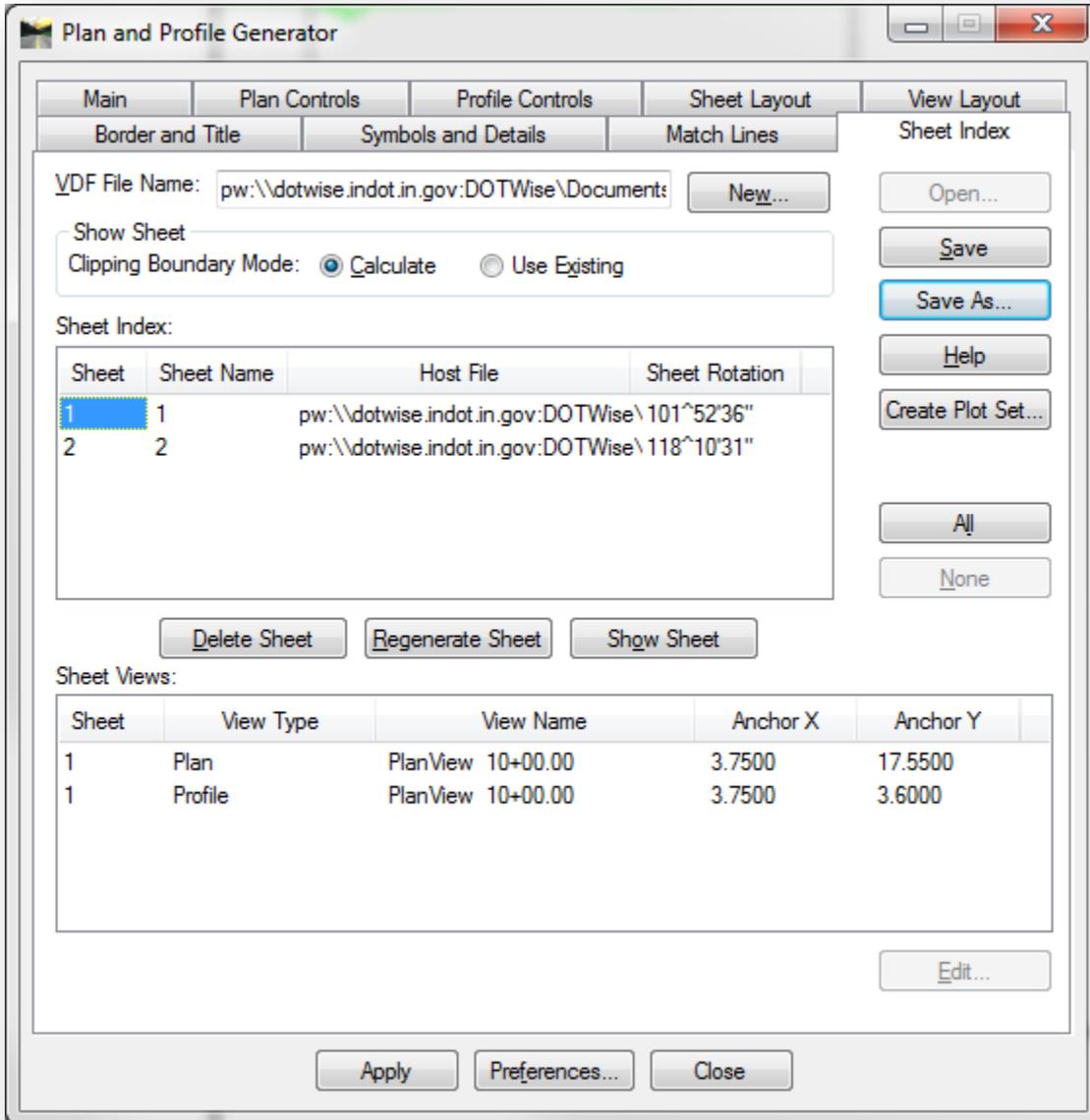
The North Arrow is enabled, and given a defined scale, and location on the cut sheet. It is place on the same level as the sheet border and can be moved as necessary.

Unlike MX, the high level of ProjectWise integration is evident in the inclusion of the ProjectWise Title Block option on this tab. This cell is placed automatically when the sheets are created, and should not be modified in any way for the title block integration to function properly.



### Match Lines Tab

On the Match Lines tab, the Start and Stop stations and linear indicator are all enabled, along with the placement of the station at the match lines.



### Sheet Index Tab

This tab becomes populated once sheets have been cut and are ready to be reviewed. Further discussion of the features on this tab will be covered later in this section once the sheet cutting process is complete.

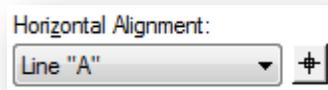
#### 6.6-3 Cutting Sheets

At this point, you've reviewed the preferences and the information that is pre-populated on each tab of the Plan and Profile Generator. For the next example, you'll be looking at a three sheet plan profile set and run the steps required to cut the sheet. This procedure will follow the process provided in the Bentley InRoads Plans Production course guide. To recap this process:

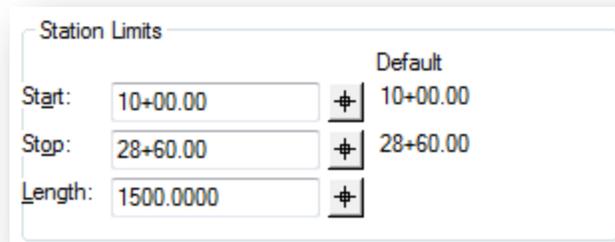
1. Start Plan and Profile Generator and select a preference
2. Set horizontal alignment and station limits
3. List model files
4. Define vertical alignments and surface for profiles
5. Set the host file
6. Set the title block data
7. Set plan views
8. Set profile views based on plan limits
9. Save the VDF file

1. As noted previously, start the Plan and Profile Generator from the **Drafting -> Plan and Profile Generator** menu item. With the generator loaded, select the Preferences... button and select IN PW Plan Profile 50 Scale.

2. With the preference loaded, navigate to the Main tab. Select the appropriate horizontal alignment that sheets should be laid out along. This can be preset with the active Horizontal Alignment, or can be picked interactively.



With the Horizontal Alignment selected, the Station Limits will default to the full extents of the alignment. If you want to cut a different station range; adjust the start and stop accordingly. The Length should be left alone, as this is a predefined value determined by the scale and stored in the preference. The full extents will be used in this example.



3. List Model files on the Plan Controls tab. This tab will be populated automatically with the name of the base drawing currently open. If additional files such as the existing contours or additional base drawings are not included in this list, the live nesting for each base drawing reference in the finished sheet (normally Prplan 50.dgn) may need enabled. Additionally, the Live Nesting toggle on this panel can be enabled as well.

4. Now that you have a horizontal alignment and associated vertical alignment, you can define the profile information on the Profile Controls tab. In the following illustration, one can see the

appropriate Profile Preference that coincides with the scale of our finished sheet is enabled. Additionally, the appropriate Vertical Alignment has been selected. Finally the Corridor section is filled out. This will only show when a corridor with super elevation is defined for the selected alignment.

A screenshot of a software dialog box with the following fields and values:

Seed View Name:	ProfileView
Set Name:	Line "A"
Profile Preference:	IN Profile 50
Vertical Alignment:	Profile Grade
Corridor:	Comidor Line "A"

Next, in the Surface section, you've selected the surface representing your TOPO model with its associated triangulation.

A screenshot of a software dialog box titled "Surface:" containing a list of surface options:

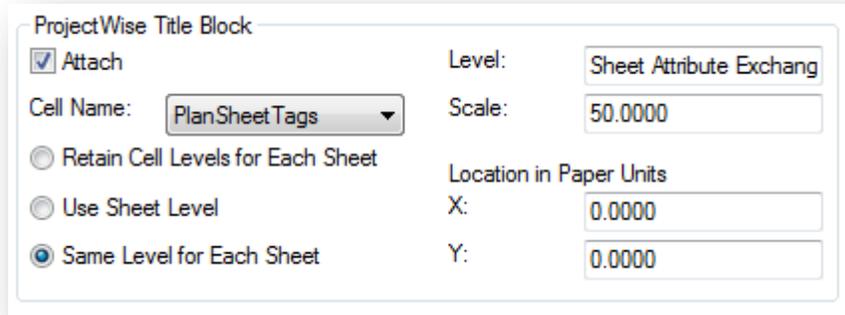
- Default
- Des 0400097\_SR54 S
- Des 0400097\_SR54 P

5. For the next item, the Host File needs defined. Navigate to the Sheet Layout tab. With the InRoads/ProjectWise integration, our Seed Host File will be located in ProjectWise, and is preset in the preference. The Host File itself can be placed in either on the local PC for test cuts, or in ProjectWise for finished sheets.

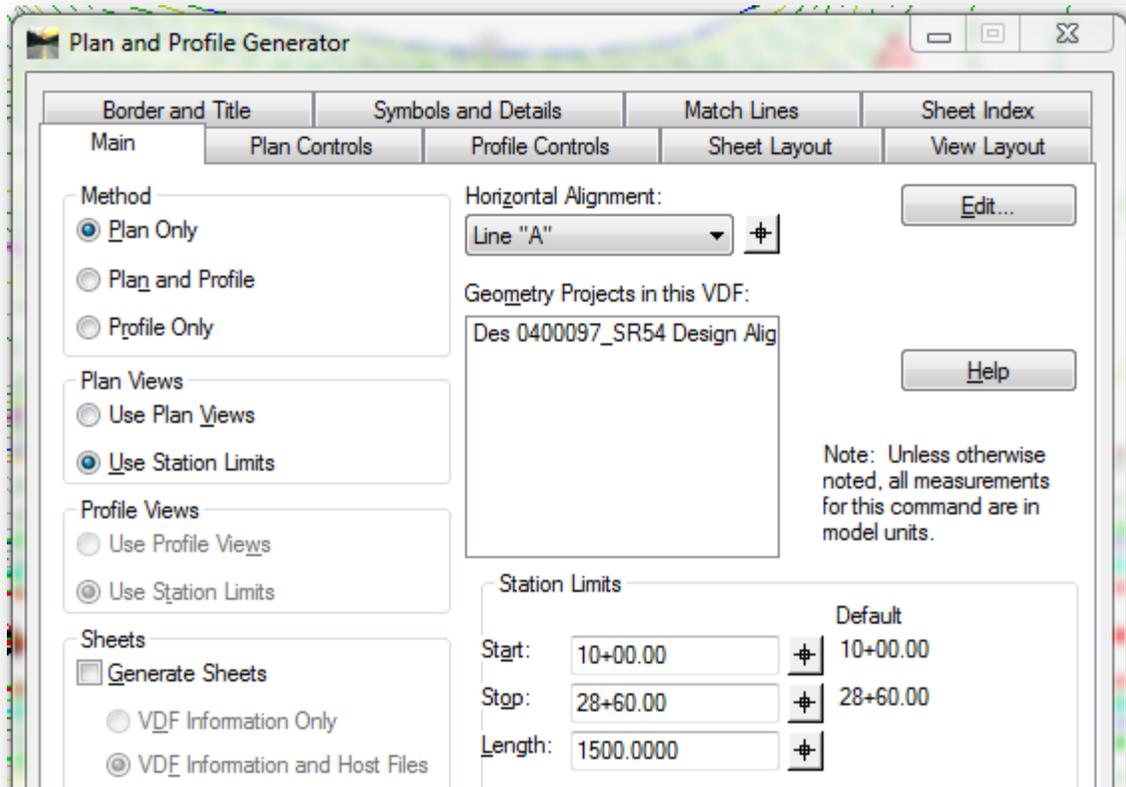
A screenshot of a software dialog box showing two file path fields:

Host File:	C:\Projects\Sht PlanProfile_50_1.d
Seed Host File:	pw:\\dotwise.indot.in.gov:DOTWis

6. In a diversion from the InRoads Plans Production course guide, this step six leads to the Symbols and Details tab to verify that the ProjectWise Title Block is enabled. This is defined in the preference, however if you see a cell name other than PlanSheet Tags, verify that your cell library is attached and re-start the Plan and Profile Generator and reload the appropriate preference.



7. The next step is to define the plan views. Navigate back to the Main tab. Set the Method to Plan Only, and then enable the Use Station Limits option. Make sure that Generate Sheets is disabled, and finally verify that Station Lock (**Tools -> Locks -> Station**) is disabled as well. When appropriately configured your panel should look like the following:



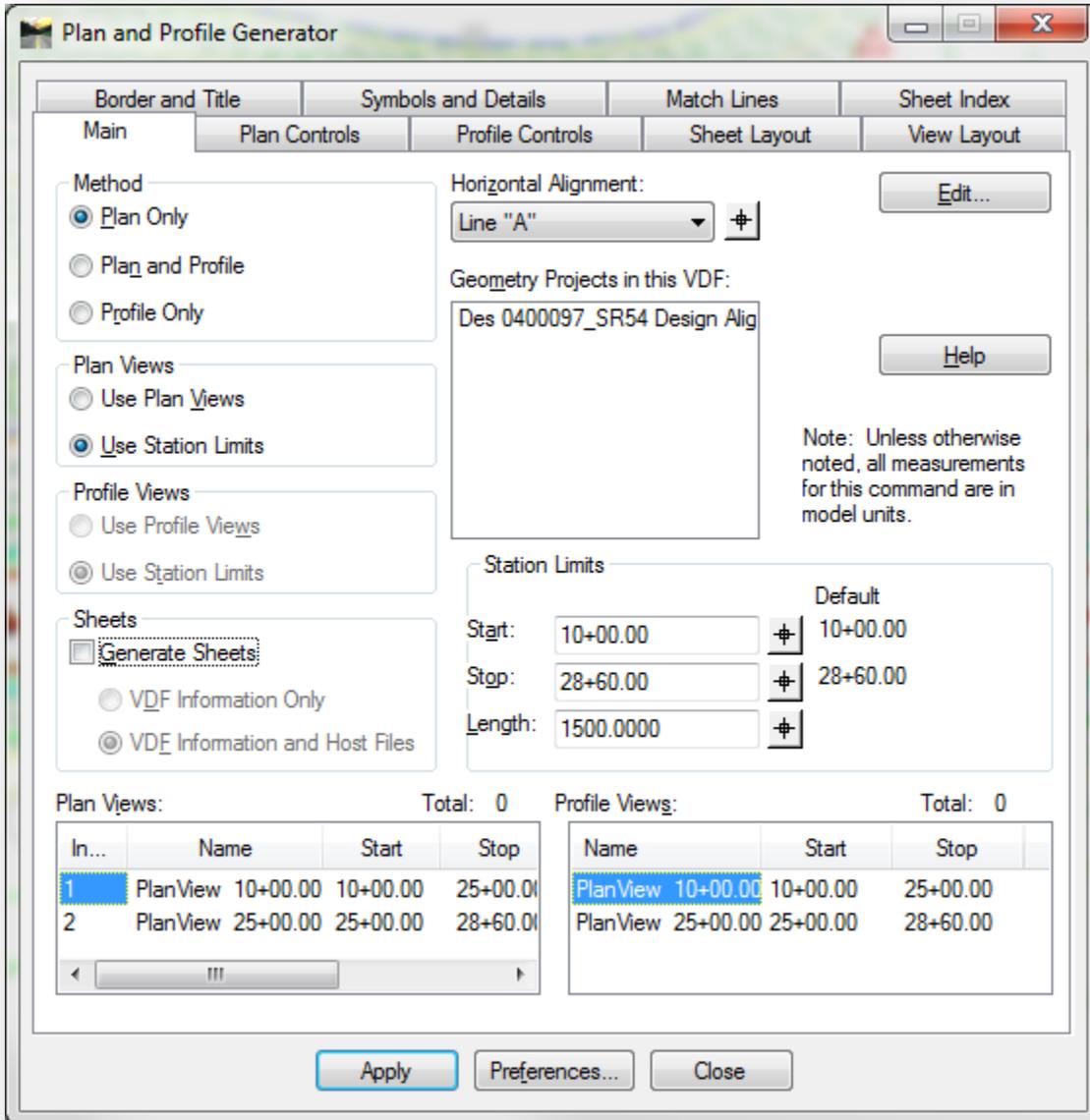
Now, select Apply, and note the information populated in the Plan Views region of the tab.

Plan Views:				Total: 0
In...	Name	Start	Stop	
1	PlanView	10+00.00	10+00.00	25+00.00
2	PlanView	25+00.00	25+00.00	28+60.00

By defining our plan views in this way (with station lock off, and not generating the sheets) the first sheet in the set is ensured to be a complete sheet. If station lock is on, the potential for a partial first sheet exists in order to start subsequent sheets on an even station. Station Lock should remain disabled through the next step.

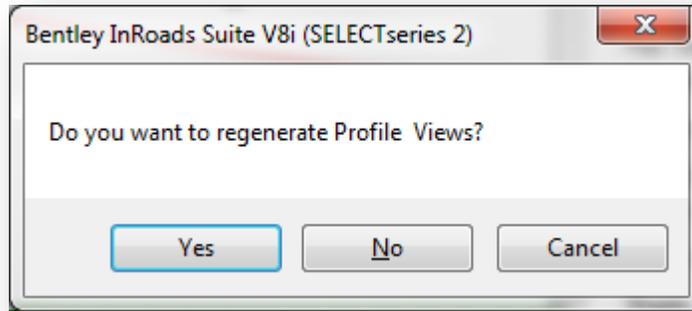
8. With the plan view stationing defined, one can now look at defining the coincident profile views. As discussed earlier in this document, a profile drawn up using the **Evaluation -> Profile -> Create Profile** tools is not usable by the Plan and Profile Generator. Due to this, InRoads will prompt you to regenerate and replace your profile as part of the sheet creation process.

Again, on the Main tab, the Method needs adjusted. Set this to Plan and Profile. Then change the Plan Views to Use Plan Views. This will have InRoads create the profiles and sheets using the same per sheet station ranges as you just defined in the previous step. Finally, the Generate Sheets option needs enabled. When the tab looks similar to the following, select Apply to create the sheets:



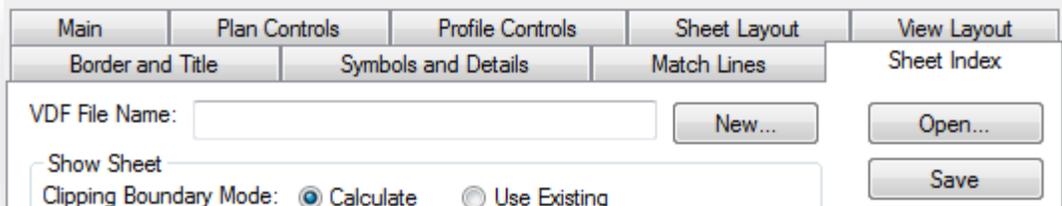
After hitting Apply, InRoads will prompt in one of two ways. If there is no existing profile created by Plan and Profile Generator, you will receive a notification in the lower left corner of the MicroStation window prompting for the location to place these new profiles.

If there's a series of pre-existing profiles, InRoads will prompt to regenerate and replace the existing ones. If this is the case, the following dialog will be shown:



If Yes is selected InRoads will create a completely new set of profiles along with any required adjustments to the layout range and location. If No is picked, InRoads will prompt for a location, but will not re-create the profiles.

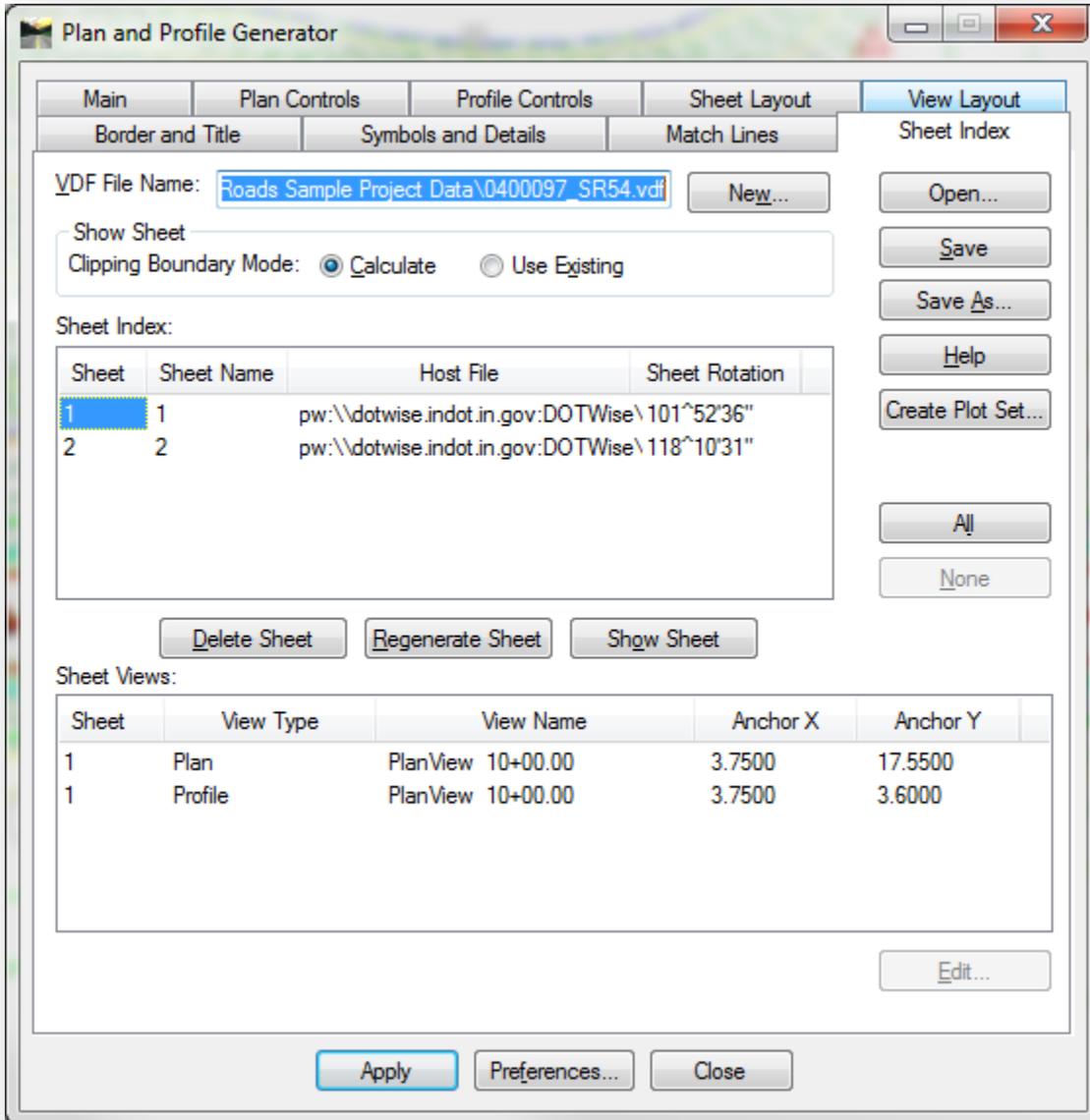
9. With the sheets completely created at this point, one can now create a VDF file. Navigate to the Sheet Index tab. The very first area is where this file is defined:



To create a new VDF, select the Save/Save As option from the right side of the tab. This will provide either a ProjectWise or Windows Save dialog depending on where InRoads was started from. Navigate to the project location, and provide a file name, then select Save. This will place a copy of the VDF in the location specified. With the VDF saved, one can reload this file in order to re-cut, or review sheets already cut, similar to opening an APL file in MX.

**Note:** In order to preserve finalized sheet layouts, do NOT select the New... button. This will prompt to save the existing VDF and clear out any sheet information in the Plan and Profile Generator that has been filled in since the last VDF save.

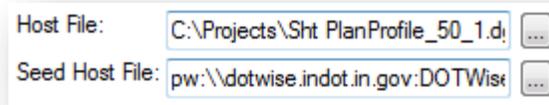
At this point, the Sheet Index should be completely populated with data regarding the finished sheets. The functionality of this page allows for the fine adjustment of sheets, removal of unnecessary sheets, regeneration of sheets, or the ability to browse between sheets.



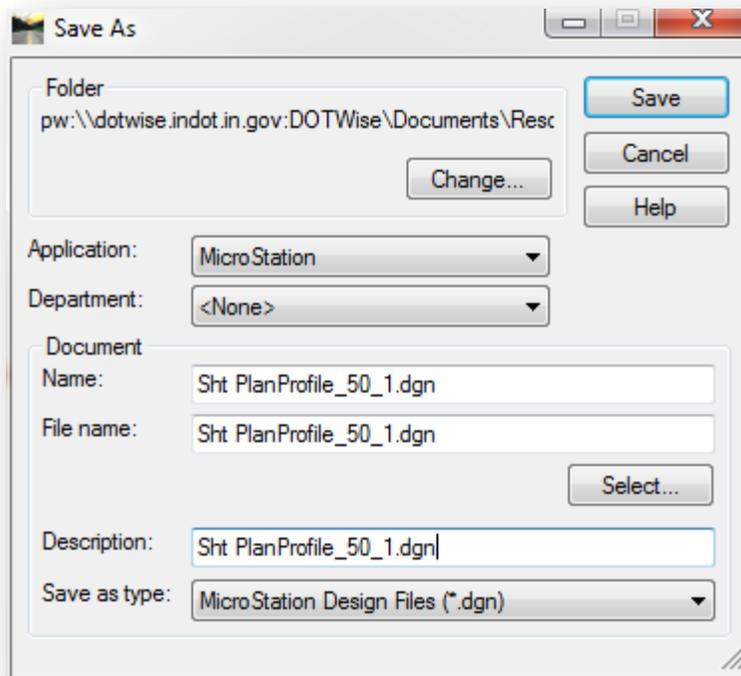
#### 6.6-4 Publishing Sheets to ProjectWise

The previous example runs through the creation sheets to a non-ProjectWise location. For this section, ProjectWise will be the location where the sheets are published. All steps are exactly the same, except for step 5, which is where the change to publish to ProjectWise is made.

From the IN PW PlanProfile 50 Scale preference, the Host File defaults to the C:\Projects path, outside of ProjectWise:



To change the location where the files are saved, select the browse button at the end of the Host File line and you will be presented with an InRoads/ProjectWise Save As dialog where the appropriate path can be selected. The completed Save As window is shown below:



Like other ProjectWise file functions, it's highly recommended to keep the Name, File name, and Description consistent. The Host File line will now show the ProjectWise path that was specified:



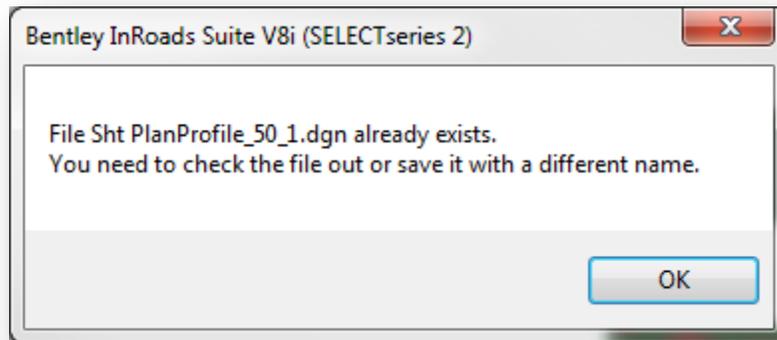
Once the sheets have been created, the Sheet Index tab will now show the following information in the Sheet Index section now show the appropriate ProjectWise paths:

Sheet Index:

Sheet	Sheet Name	Host File	Sheet Rotation
1	1	pw:\dotwise.indot.in.gov:DOTWise\ 101^52'36"	
2	2	pw:\dotwise.indot.in.gov:DOTWise\ 118^10'31"	

In addition to creating the files, InRoads will also make sure the new sheets are checked out.

In the event you receive the following dialog, make sure that sheets you're either recreating or editing are checked out.



## 6.7 Annotation and Text Drawing Cleanup

In this section, you will review the process of adding various annotations to InRoads drawings, and the process of cleaning this data up after it's been created. Most of the procedures for clean up are performed via basic MicroStation; these procedures have been carried over from the previous MX documentation as they are still relevant.

### 6.7-1 Setting Up an Annotation Drawing

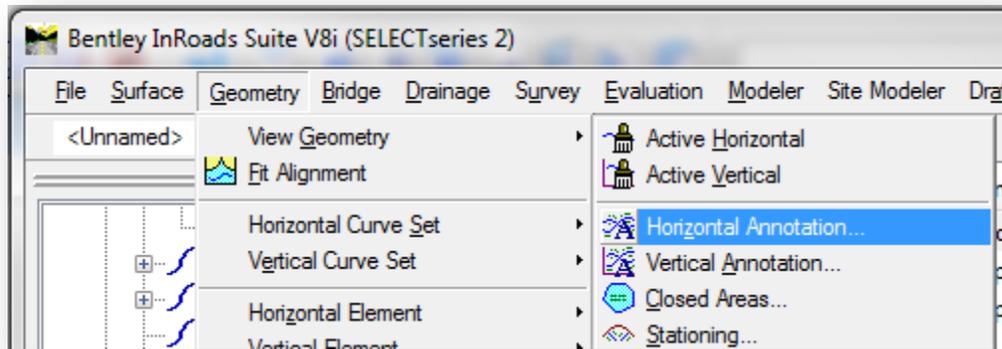
All plan view annotation will be drawn in a new drawing in InRoads. The new drawing of the alignment annotation should be called *Annotate alignment <Alignment Name> <Scale>.dgn*. If you have multiple alignments that you wish to have annotated, you will need to repeat all of the following steps for each string in a new plan display with similar naming. PlanProfile sheets will need to have been created in order to properly align the text for these other M-string annotations.

Using standard ProjectWise functionality, create a new DGN in the project path named Annotate alignment <Alignment Name> <Scale>.dgn (Ex. Annotate alignment LineA 50.dgn). Make sure to use the same seed file location, with the same base drawing units (metric, US or US survey foot).

### 6.7-2 Adding Horizontal Alignment Annotation

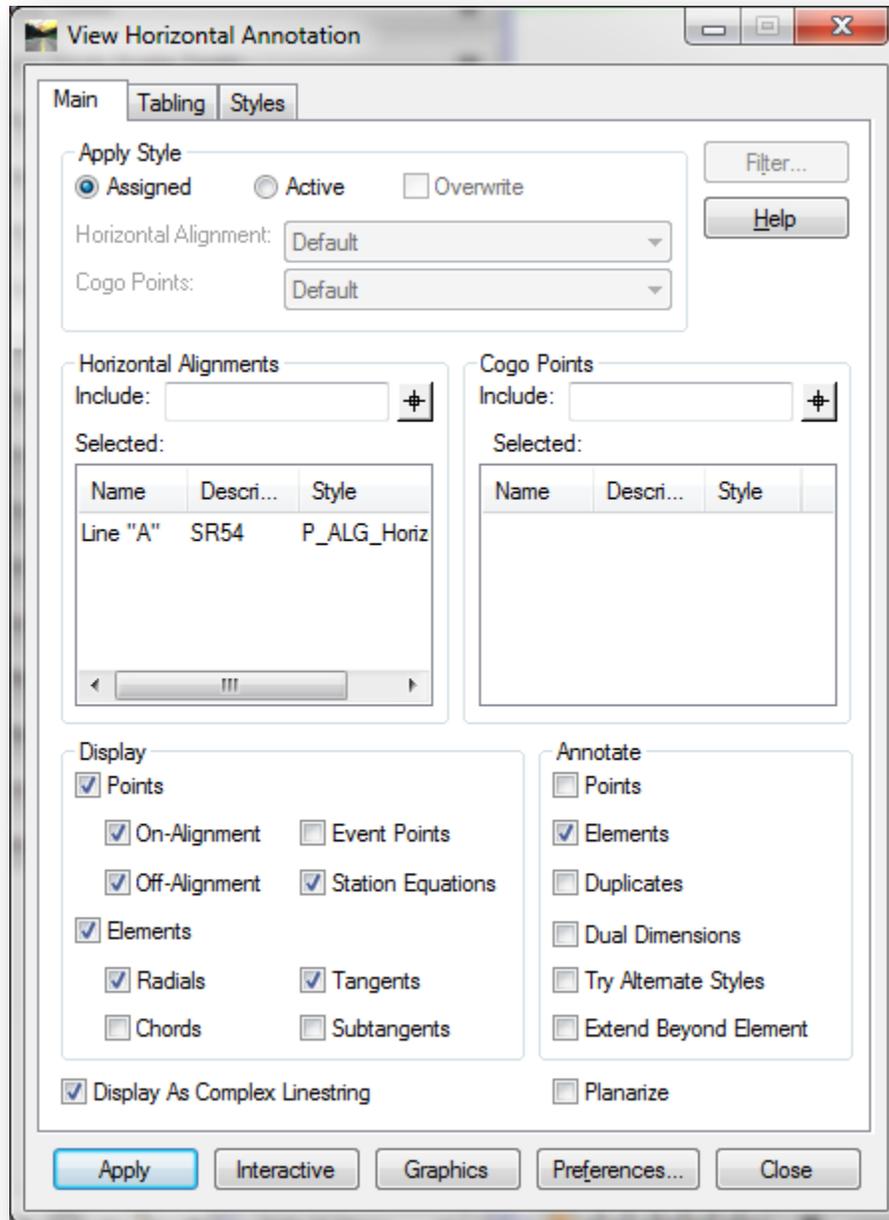
Unlike MX, InRoads does not integrate the alignment annotation commands into the alignment/profile creation tools. In order to annotate your profile, you need to first have a horizontal alignment for horizontal annotation purposes; and a vertical alignment and profile for vertical annotation purposes.

With a horizontal alignment drawn in the display (*Geometry -> View Geometry -> Active Horizontal*), navigate to *Geometry -> View Geometry -> Horizontal Annotation*.



Horizontal Annotation Menu Location

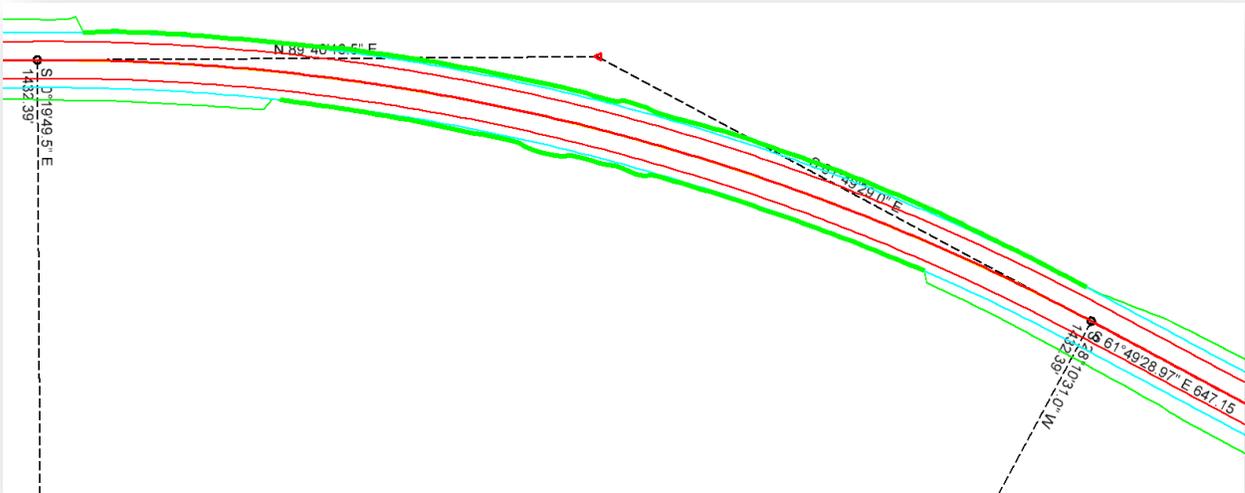
This will present the View Horizontal Annotation tools.



### View Horizontal Annotation

In order to use this tool, one should first load the INDOT specific preference, and then select their alignment. To select the alignments that should be annotated, select the graphical selector under the Horizontal Alignments portion of the Main tab. You will then be prompted to select the alignment to annotate.

With the alignment now listed in the Horizontal Alignments section, select Apply. This will place annotation on the alignment listed. Note that InRoads will allow the annotation of multiple horizontal alignments at the same time, as long as they are in the same active geometry project.



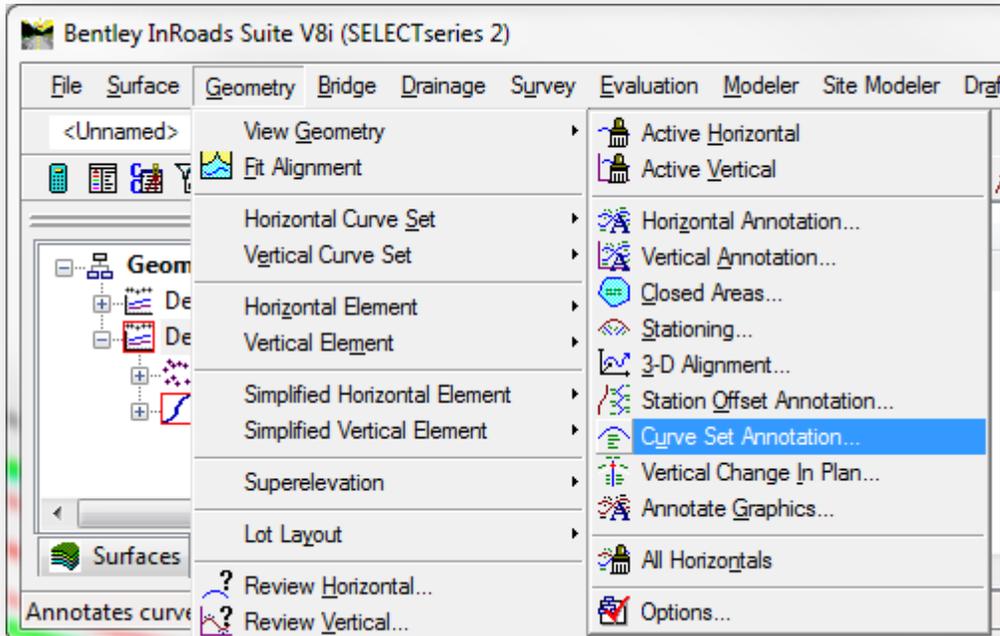
### Horizontal Annotation Sample

Due to the methodology that InRoads uses for text placement in conjunction with Styles and Named Symbologies, you may see results similar to the previous illustration. In this instance, you will note that on a right hand curve, the Bearing and Radius values are upside down when related to final sheet placement (legible from left to right when view in landscape or right hand portrait). Therefore, you must clean these annotations manually prior to plan completion.

#### 6.7-3 Adding Horizontal Curve Set Annotation

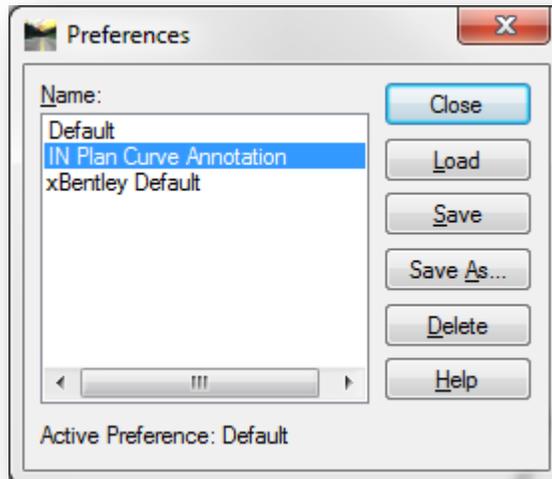
Unlike MX, which had all annotation features as part of a single tool, InRoads splits the various annotation functions in to numerous tools, providing a higher degree of customization and additional flexibility. This change in application can be found in the placement of horizontal curve annotation. As shown in the previous section, horizontal annotation for bearings, distances, radii, etc can be found in the View Horizontal Annotation tools. Curve annotation is placed by a separate tool called **Curve Set Annotation**.

This tool is found under **Geometry -> View Geometry -> Curve Set Annotation**.



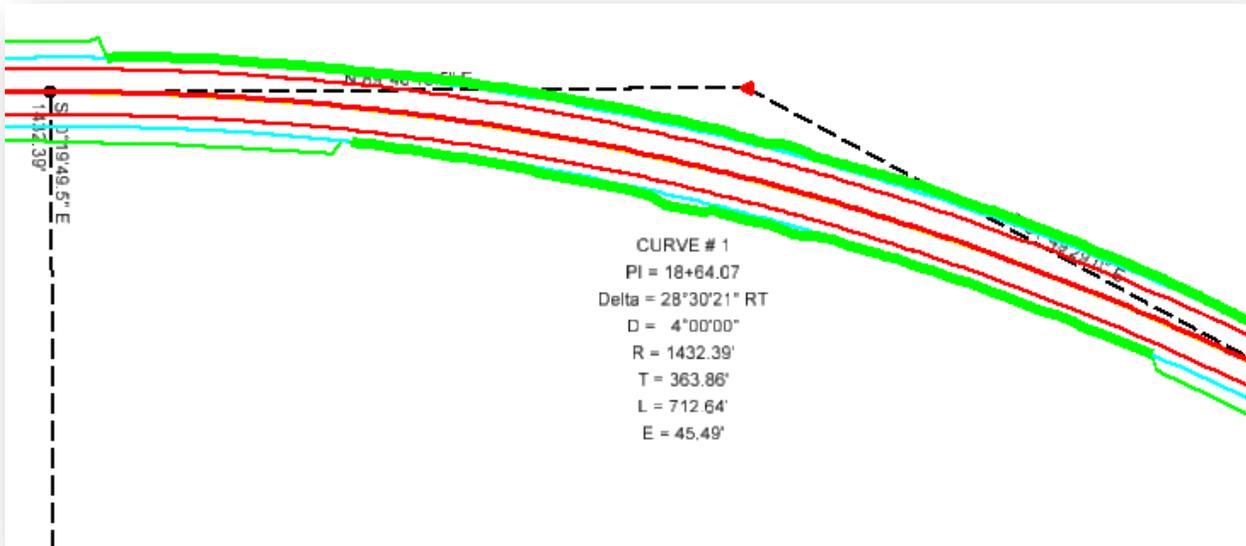
### Curve Set Annotation Menu Location

Similar to other InRoads tools, the Curve Set Annotation tool will open with the active horizontal alignment selected. With this preset, verify that the correct preference is loaded. INDOT customized preferences are provided.



### Curve Set Annotation Preferences

With the preference loaded, make any necessary adjustments then select Apply. This will place the curve annotation at the center of the curve. This will need moved as part of plan clean up.



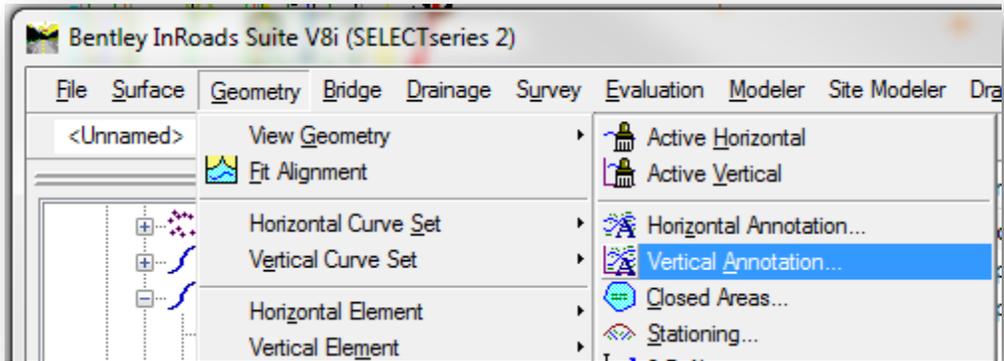
**Finished Curve Set Annotation**

#### **6.7-4 Adding Profile Annotation**

To add vertical annotation, a similar process will be followed only using the vertical versions of the tools used previously. Unlike the previous steps for adding horizontal annotation, profiles and profile annotation cannot be placed without the final cut profile displayed. Since your sheets will be cut from Prplan 50.dgn, your profile will be displayed and annotated in this drawing.

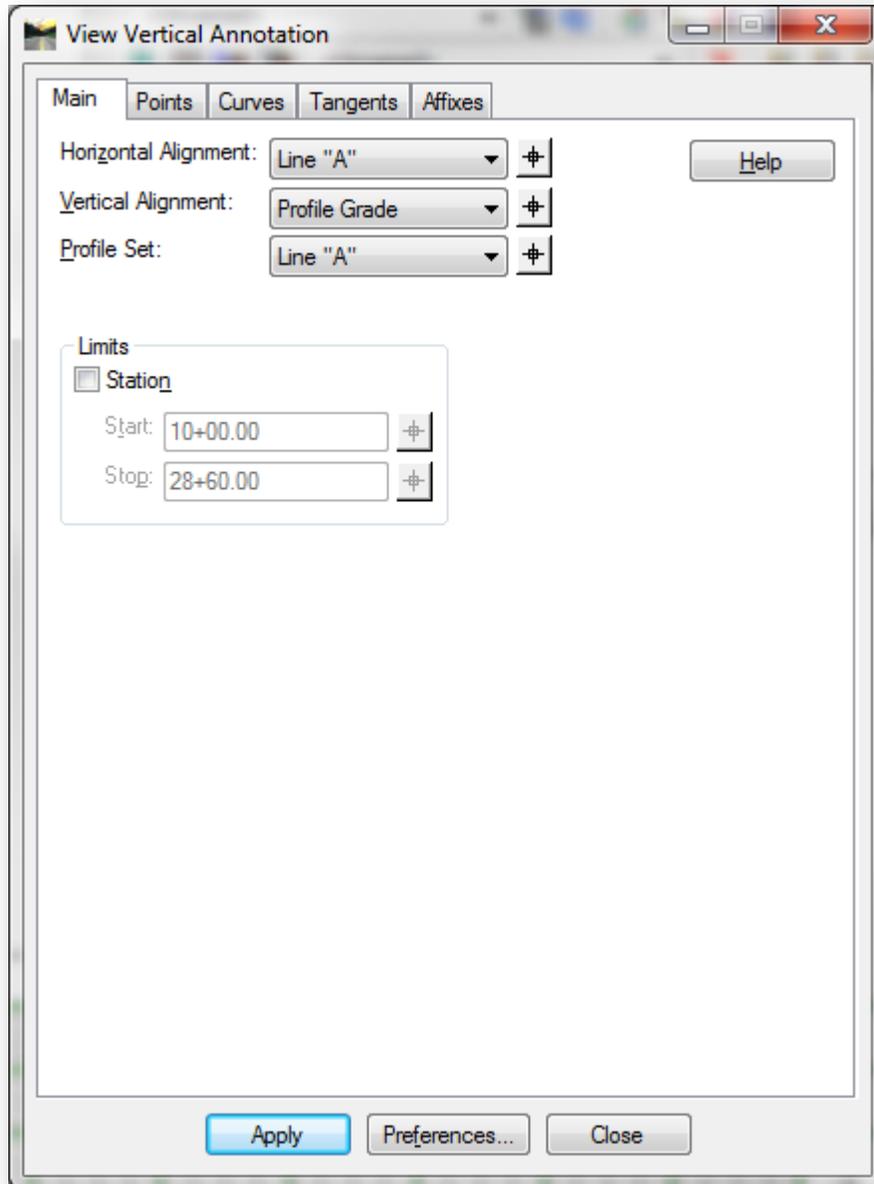
**Note:** Remember that a vertical alignment and its associated annotation cannot be created without a pre-existing profile. Please refer to Section 6.5-5. Additionally, for annotation to properly carry through nested references, one must make sure that annotations are placed on the appropriate split profile created by the Plan and Profile Generator.

With the existing profile and proposed vertical alignment drawn on it (**Evaluation -> Profile -> Create Profile** and **Geometry -> View Geometry -> Active Horizontal**), navigate to **Geometry -> View Geometry -> Vertical Annotation**.



### Vertical Annotation Menu Location

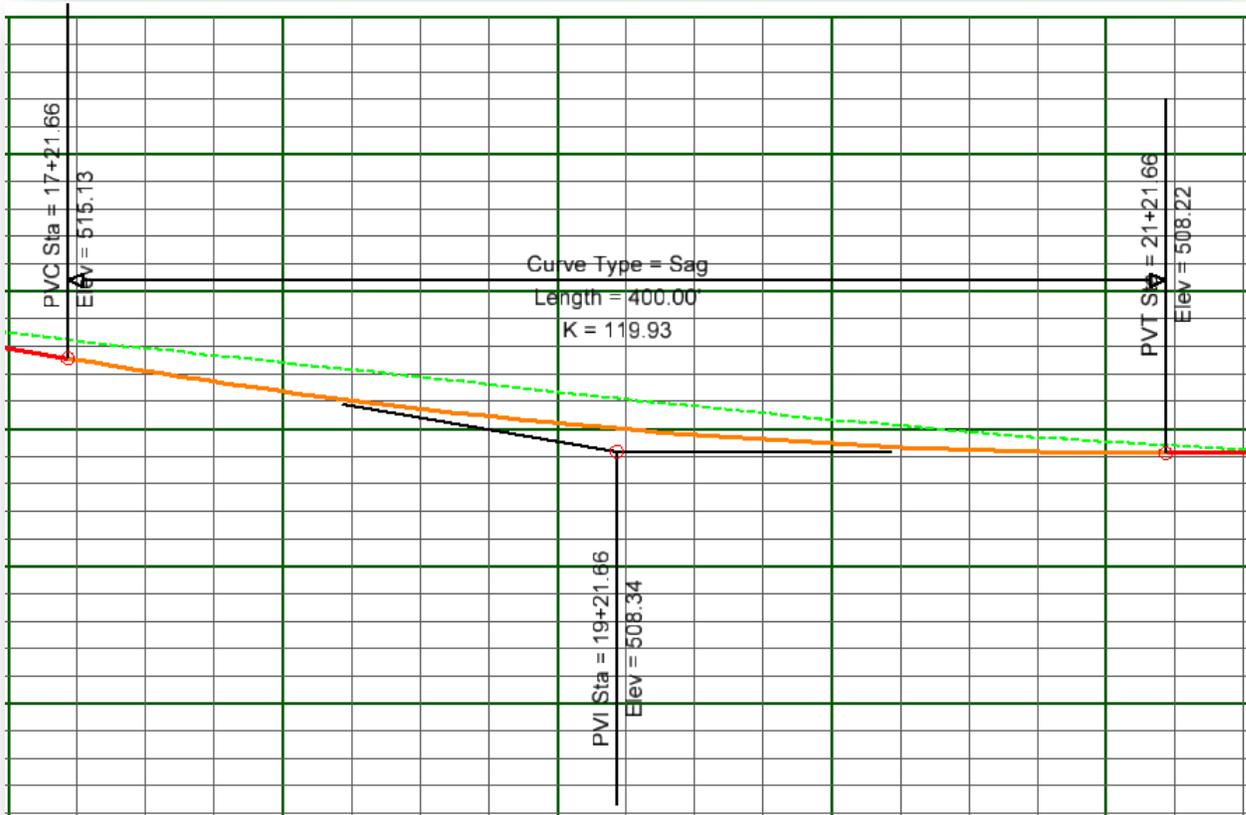
This will open the View Vertical Annotation tools.



### View Vertical Annotation

In order to use this tool, one should first load the INDOT specific preference, and then select their alignment. To select the alignments that should be annotated, select the graphical selector under the Horizontal Alignments portion of the Main tab. You will then be prompted to select the alignment to annotate.

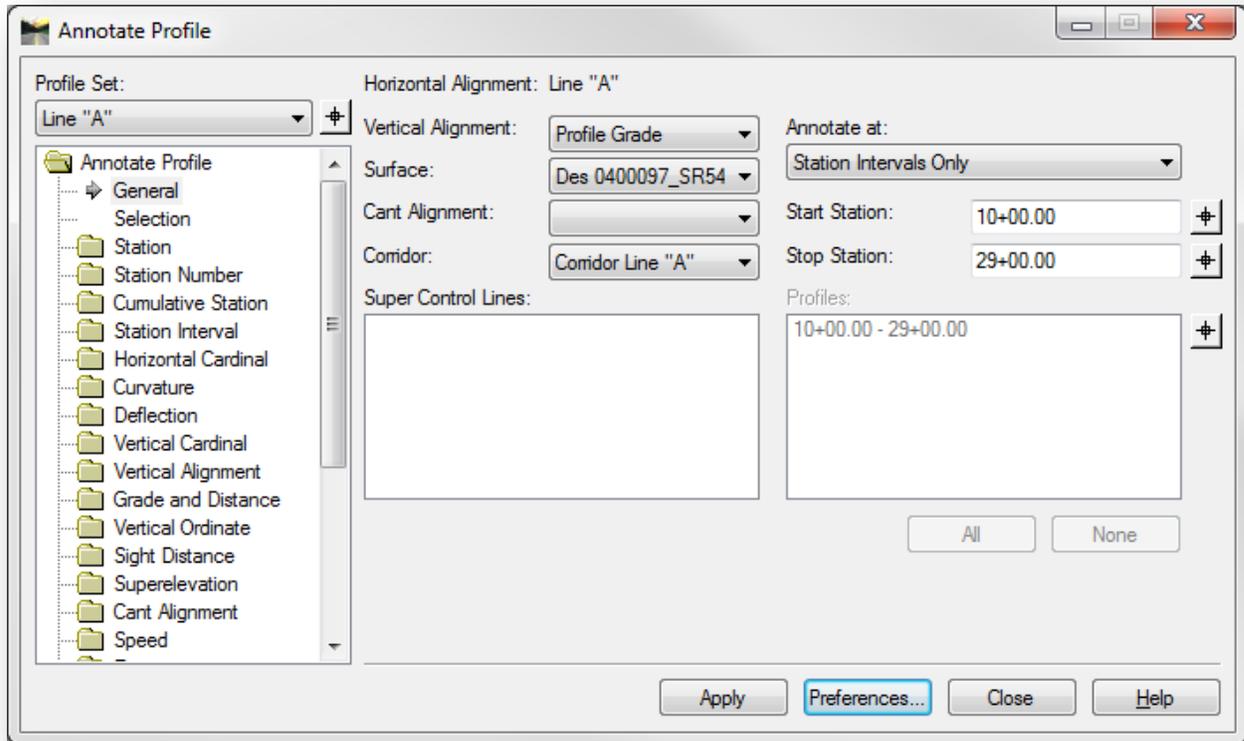
As shown in the previous screen capture, you must define the appropriate horizontal, vertical and profile set to place your alignment on. Additionally, there is an INDOT specific annotation preference to display the appropriate information in the correct format.



### Vertical Annotation Sample

Unlike MX, the basic geometry annotation tools only provide annotation for the actual alignment features of the profile, which does not include the existing and proposed elevation annotations. These features are annotated by a separate set of profile annotation tools.

To add the elevations, one needs to use the tools located under *Evaluation -> Profile -> Annotate Profile*. Much like the vertical alignment annotation tools, an existing profile must exist before you're able to annotate the information. A preference has been created, adhering to INDOT annotation standards, and is named *IN ProfileElevations*.



### Profile Annotation Panel

Selecting the appropriate Profile Set, Vertical Alignment and Surface will allow InRoads to appropriately annotate the profile elevations. When annotating multiple portions of a profile set (finished profiles cut for plan profile sheets), it is necessary to make sure that the relevant station ranges are selected in the Profiles are of the General section as shown below:



## Existing/Proposed Profile Elevation Annotation

### 6.7-5 Station Offset Feature Annotation

Next is the placement of Station/Offset annotation. This will provide the appropriate station offset and feature names at the location of the feature in the plan view. Unlike DCRRepo and Geometric Annotation with MX, this does not place the text at the edges of the plan view, so additional clean up using MicroStation functionality will be required. This example will provide the necessary steps to adjust and move the annotations appropriately.

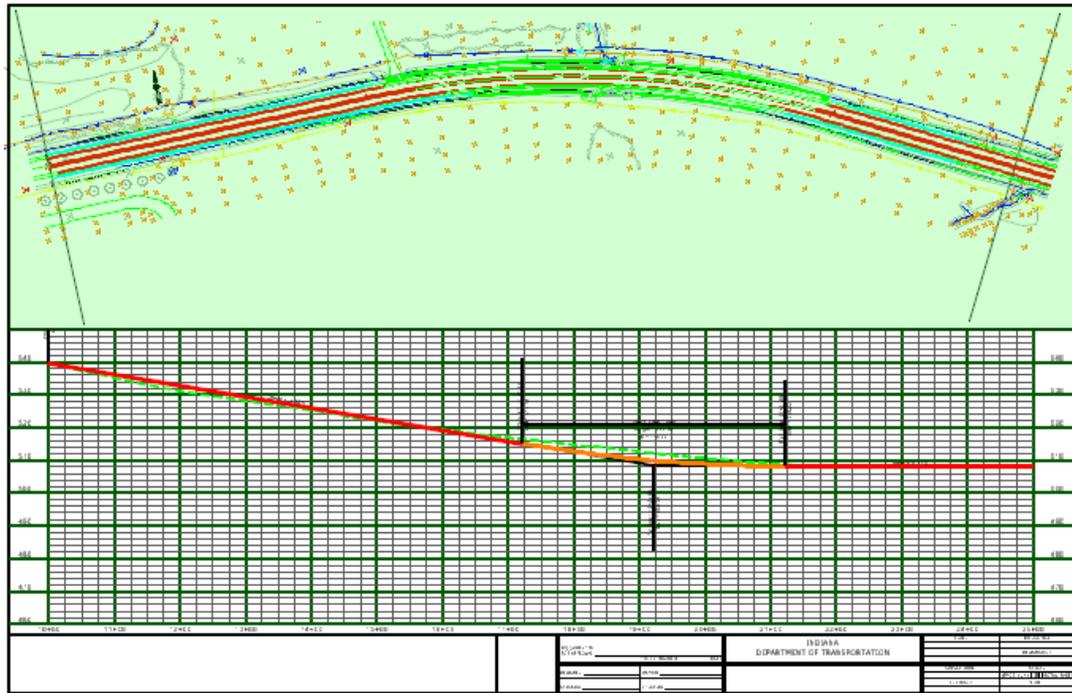
Unlike MX, InRoads will scale and rotate the border along your alignment. With this change, it's to your advantage to place your annotations directly on the cut sheet, leveraging the rotation of the border and view to align them. With this being the more flexible and direct method of placing annotation on our sheets, this will be the example you use going forward.

Alternatively, you can a drawing created specifically for this kind of annotation and for each alignment. This will require creating a new drawing within InRoads called **Annotate station offset <Alignment Name> <Scale>.dgn**. Using standard ProjectWise functionality, create a new DGN in the project path named Annotate station offset <Alignment Name> <Scale>.dgn (Ex. Annotate station offset mcac 50.dgn). Make sure to use the same seed file location, with the same base drawing units (metric, US or US survey foot).

If you have multiple sheets or for your second method, M-strings, that you wish to annotate about, you will need to repeat all of the following steps for each sheet/string in a new plan display with similar naming. For both methods, make sure that your Survey Surface DTM file is open and active for use with the Annotation tools.

#### 6.7-5a Feature Annotation

With your drawing opened, you can now look at using the **Surface -> View Surface -> Annotate Feature...** tool to place the station and offset of your survey features. This tool, along with many others in the InRoads Suite, allows you to specify a fenced area that you'd like to work within or outside of. As shown in the following screen capture, place a fence over the plan portion of your DGN, which is denoted by the shaded block.

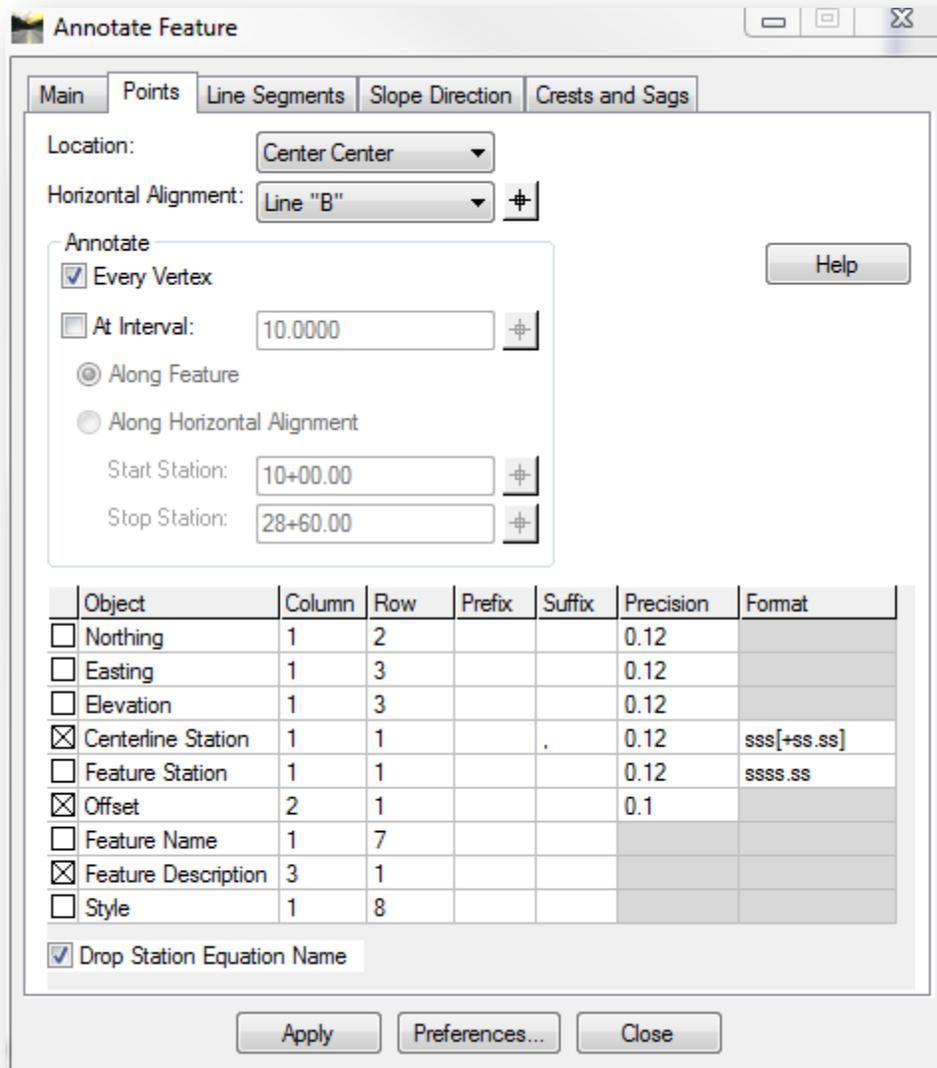


### The Plan View Highlighted

Remember, the color of this shading is dependent on the Mode of the fence that you've placed, in the above example, the block was placed with an Inside Fence Mode. For the purposes of the InRoads tools that use this functionality, the actual fence type isn't important, as each tool allows you to define how InRoads should respect the fence.

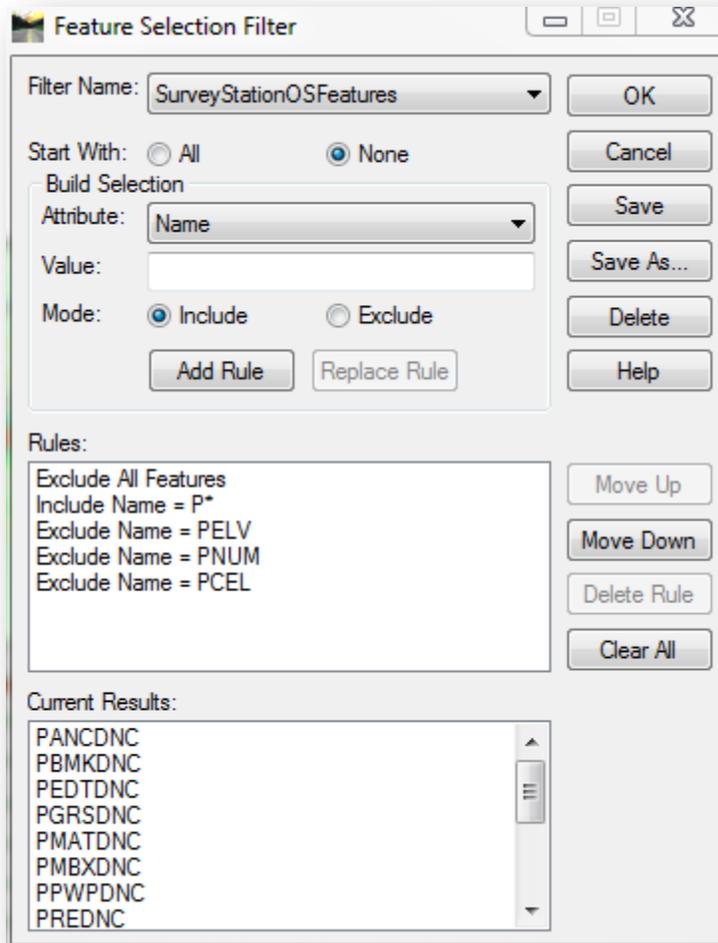
With your plan area now highlighted, start the **Feature Annotation** from the **Surface -> View Surface** menu. This tool can place various pieces of annotation relative to your survey surface features and their type, be it a point or linear feature. Some examples that both will annotation are the Feature Name, Description and Style. Point features (which you will look at for Station/Offset annotation) include items such as Northing, East, and Elevation, and the selected station of a Centerline. Linear features will annotate items such as Length, Bearing and, Slope.

Of particular interest, we want to examine what is included for point features using the IN Survey Sta Offset preference. Select the Preferences button and load this preference at this time. For your Station/Offset annotation, you'll see that on the Points tab Centerline Station, Offset and Feature Description are all enabled, along with the precision and format being adjusted accordingly. These items will all be annotated with respect to the features Default Text style setting.



### Annotate Features/Points Tab

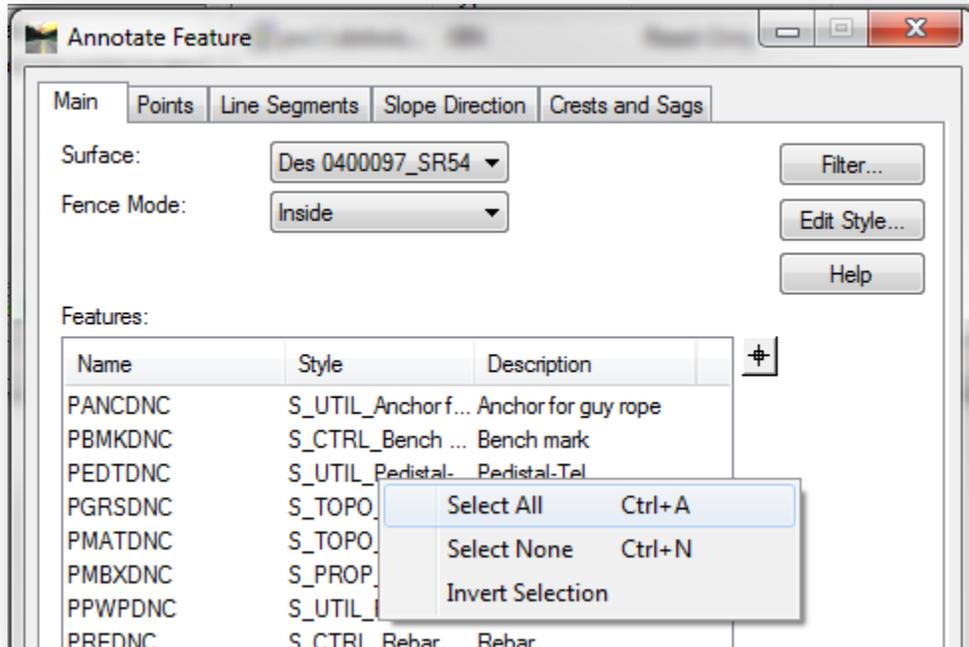
To limit the features being annotated, you'll use a pre-made filter to assist in the selection of your items. On the Main tab of the Annotate Feature dialog, select the filter button. On the filters, you want to use the SurveyStationOSFeatures filter option as shown.



### Station Offset Filter Settings

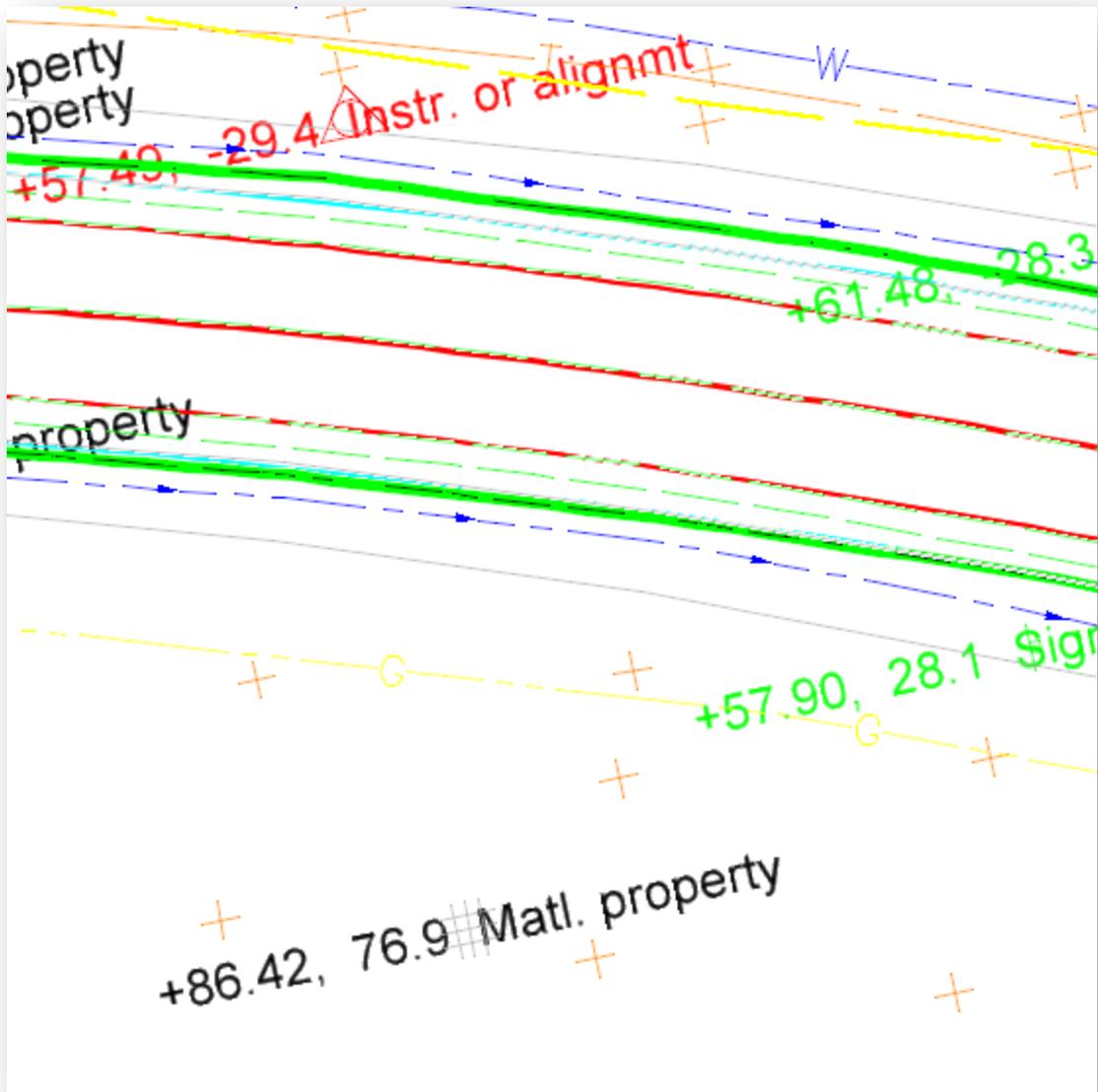
With the filter selected, you'll see your list of features to shrink greatly to only those point features that are allowed through the filter. Be aware that should you not have any features show up, you may have the wrong surface selected, so verify that the Survey Surface is selected on the main tab.

Next, you need to set the fence mode. With your fence around the plan view of the sheet, make sure the Fence Mode is set to inside. This will restrict annotation to only being placed on features that exist in this fence; anything that falls outside it will not be included. Finally, you need to select our features by right clicking in the Features: area and selecting all.



### Selecting All Features

All other settings have been set appropriately with the Preference loaded earlier in the exercise. Go ahead and select Apply at this time,

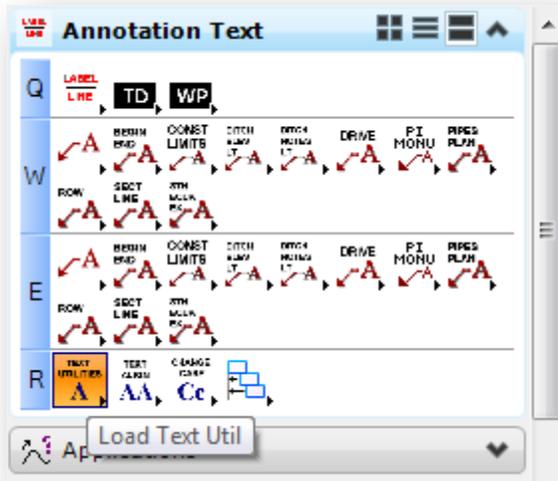


### Example Annotations

#### 6.7-5b Feature Annotation Clean Up

Unlike DCRepo and Geometric Annotation, InRoads does not provide capabilities to automatically align annotations to the border as shown in the previous example. In order to get the annotations placed appropriately, you will need to look at using standard MicroStation tools.

First you need to enable the TextUtil tools. These can be found under Annotation Text on the Task Navigator.

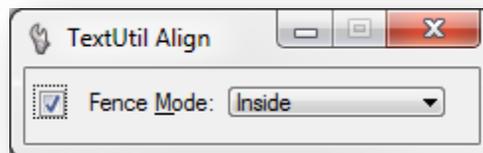


### TextUtil Task Button

By loading the TextUtil tools, you will now have access to the TextAlign tool that is found next to the TextUtil button on the Task Navigator. Just as you placed a MicroStation fence over the plan view to place our annotations, you will do the same thing, as TextAlign will use this fence as a limiting factor in what text to rotate. TextAlign also uses the active angle relative to your view. In this instance, you want to use an active angle of 90 degrees.

To set the active angle, you can use one of three methods; the first is to set it under the Active Angle leaf of the **Settings -> Design File** menu item. The second is via the MicroStation key-in AA=90. Finally, the active angle can be set by invoking any tool that uses this value in its configuration such as the Rotate tool.

With the active angle and fence set, and the TextAlign tool started, set the tool configuration as shown.



### TextAlign Settings

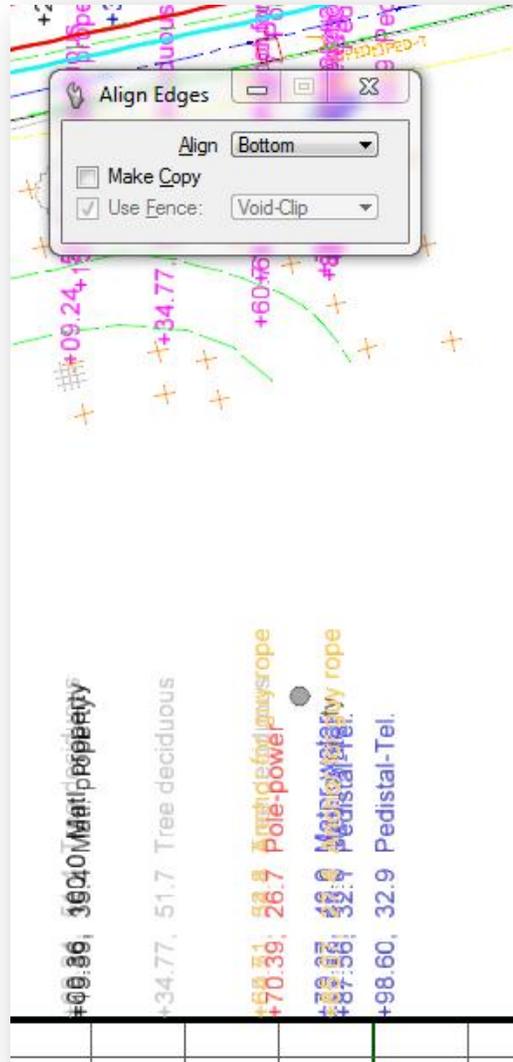
When ready, select a data point any place in your MicroStation view. Almost all plan text should now be rotated 90 degrees and aligned properly with the frame. Some annotations may not have been picked up in the fence however, so these should be aligned by selecting them individually (these are normally along the edges of the plan view where the fence would have crossed but not included them). Finally, remember, should any additional text have been placed prior to these annotations,

it's likely they too will have been rotated, so be careful when selecting what text you're rotating. Depending on the situation, it may be to your advantage to use the MicroStation Element Selection tools to have more discreet control over the text you're selecting for alignment.

With the text now rotated appropriately, you'll now begin the process of moving our text to the edges of the plan view. For this, we will be using the Align Elements by Edge tool which can be found either under the Main tools, or has been included as part of the Annotation Text task for convenience. To use this tool, first select the annotations you'd like to move either to the top or the bottom.

This tool will work with multiple items selected, so it is very easy to adjust the alignment of numerous annotations at once. Using the MicroStation Element Selection tools, select some of your annotations to one side of the alignment. As shown in the following illustration, you'll see that element below the alignment have been selected. For the Align Edges tool in this instance, you'll want to have the Align option set to bottom and then when prompted, select the top gridline of the profile which will align all the text to it.

For elements above the alignment, the same procedure is used, however the Align should be set to top, and the top edge of the border should be selected to align those items to that element. As this only pushes the annotations to the edge of the sheet, overlap is still an issue and additional clean up may be needed to separate annotations that are overlapping.



Align Edges

## 6.8 Additional Sheet Types

Similar to MX, you can create a wide variety of sheets from the InRoads Plan Profile Generator. The process you've stepped through for the Plan Profile sheets can be applied to these other sheet types such as Bridge Layouts, Large Plan sheets, and Double Plan sheets; all of which have preferences created for their setups.

Be aware that the Station Offset annotation procedure that you've examined will not work properly when annotating double plan sheets as the sheet rotation is not the same. In this instance, you will need to create an intermediary text drawing and annotate the features in that file instead of directly on the sheet. This procedure is identical to that which we performed previously, however both the base drawing and the frames must be referenced to achieve the appropriate text alignment.

## 6.9 Adding Other Base Drawings to Sheets

Other base drawings such as Existing Right of Way can be added to InRoads created sheets such as Plan Profiles, Layout sheets, and etc. The user must first obtain right of way drawings from whatever sources are available. For most projects, the existing right of way information will come from Route Survey Plat drawings and these should exist in the same coordinate system for any new projects and will line up automatically. (These are provided by your Surveyor). Other sources may include CAD drawings from Real Estate consultants (following complete abstracting and title searches). Throughout this section, Existing Right of Way drawings are referenced as being created. The same processes work for adding any additional information to the sheets.

Depending on your surveyor, it is entirely possible that you may receive your Existing Right of Way in InRoads native surface features, or as alignments. Be aware you may still have to graphically convert either of these data types into the other for the purpose of cross section display (Right of Way must be a surface feature if you wish for it to display on cross sections).

### 6.9-1 Combine multiple drawings into one base drawing

If you have more than one existing right of way drawing for your project, you will want to combine all of the drawings into one. Reference the drawings into each other. If the drawings do not line up automatically, you will need to move the files based on corresponding coordinates present in both drawings. Next copy the reference files into the base drawing. Repeat procedure if you have multiple files to copy in.

When you have completed the above steps, the desired result is one combined existing right of way drawing.

### 6.9-2 Move to same coordinates system as Prplan.dgn

In order for the combined existing right of way drawing to be used in the plan profile sheets, the elements must exist in the same coordinate system. To accommodate this, you will reference in the Prplan drawing. If the drawings do not line up automatically, you will need to move the files based on corresponding coordinates present in both drawings.

The resulting existing right of way drawing is now ready to be added into other proposed drawings.

### 6.9-3 Graphically Importing Existing Right of Way

As the procedures necessary vary depending on the source of your Right of Way data, you will examine a few of the more common methods for importing this data and working with it in InRoads and making it available to others.

Data which is graphical in nature can be converted to a format InRoads will interact with. MicroStation, AutoCAD, and DXF files are all supported for this process. Utilizing the File import tools available allows vector graphics data to be converted to geometry, or surface features. Often-times the largest barrier to conversion is the sheer volume of data in the CAD file provided. Disseminating the contents requires patience and organization.

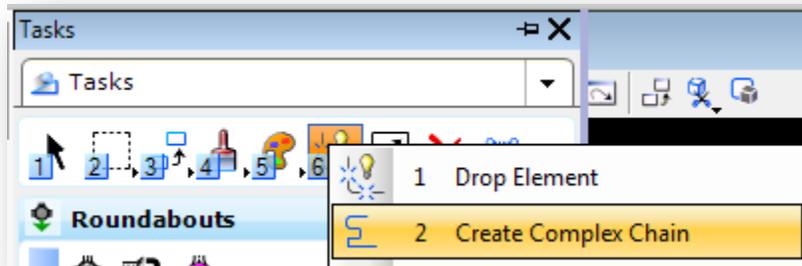
In both instances, be aware that the element must be drawn up graphically, as there is no direct translation method from Surface Features to Geometry Alignments.

### 6.9-3a Importing to Geometry

Using an existing CAD file provided by either Survey or a Consultant, you will convert the vector graphics representing Right of Way elements to InRoads Geometry. If data provider is an INDOT employee, then the file is accessible through ProjectWise from the design folder structure. Files provided by external consultants can be imported to a convenient location in ProjectWise by dragging and dropping. Select no wizard for the creation option.

First you need to reference and possibly merge your data into our base drawing (alignments can be imported from reference elements). Attach your file using either the **MicroStation -> File -> References** menu item, or by the Reference toolbar button. With the references dialog open, attach the file containing your right of way. This may be the LCRS Plat provided by survey or another file provided by a consultant. Note that the file you attach may have additional data displayed that you do not wish to import. Should this be the case, you can use your level display to disable the levels of features you don't wish to display.

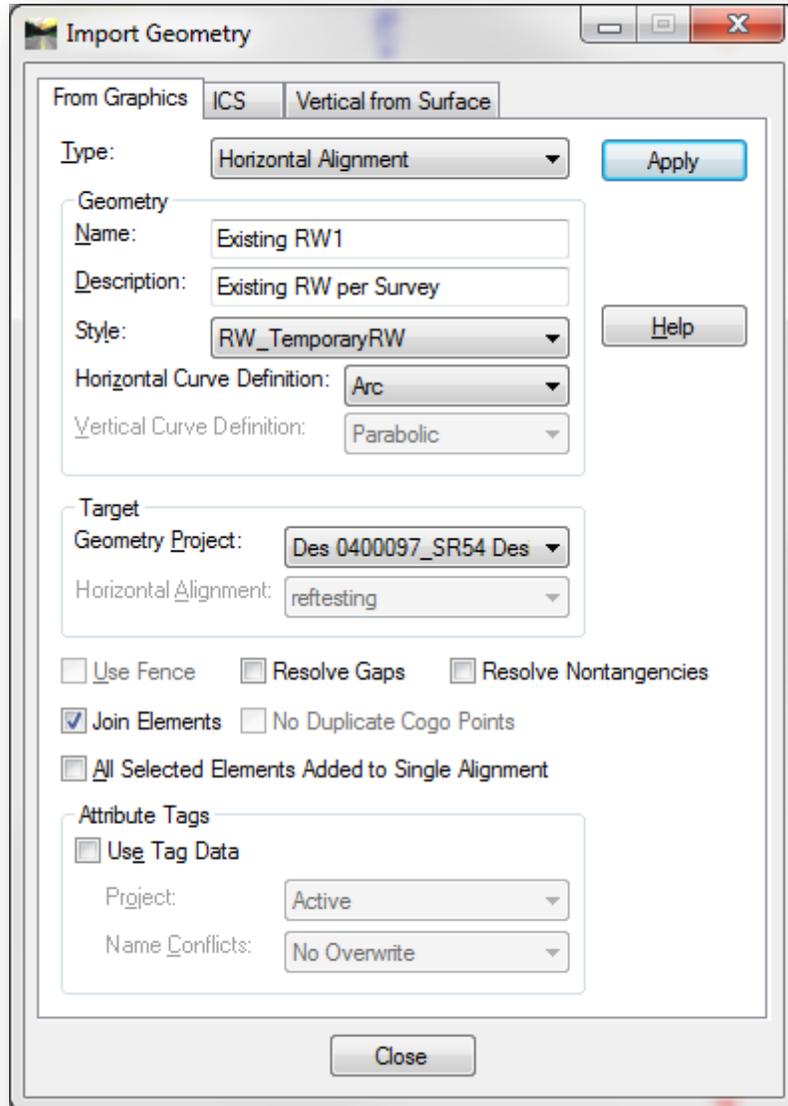
At this point you will no doubt recognize the Right of way elements in the drawing. Elements can be converted to InRoads Geometry. Careful inspections of right of way elements may show elements that have been constructed segmented and are not joined. For convenience in later operations, you may wish to join them to be continuous. To join these elements using MicroStation, use the Create Complex Chain tool. Create Complex Chain will generate a new chain from the selected elements on the active MicroStation level. Because you don't want the level of the element to change, first match the attributes of the element you are chaining.



#### Create Complex Chain

Selection of elements is possible utilizing Element Selection or Select by Element Attributes. Note: element selection window selections around elements are suggested alternately the "select all" (world icon) will add all elements to selection sets (even levels turned off). Elements may be converted one at a time, however for speed of conversion, you will convert by level. Different data may require various methods.

With your elements selected, you can now import them into Geometry features. For this, you will use the **File -> Import -> Geometry** menu item on the InRoads Explorer. On this panel, you will want to define settings similar to the following illustration. Of particular note, notice the Style selected, and make sure that you use good naming so each feature you include is clear.



### Import Geometry

With your settings configured, you can now select Apply to begin the import. During the import process, InRoads will enumerate the name of the alignments, should you have more than one distinct item selected (Existing RW1, Existing RW2, RW3... etc.). At this time, you can either delete any graphics merged in from the references or detach your referenced file depending on the method used. Then, you can redisplay the alignments from InRoads Geometry menu.

#### 6.9-3b Importing to a Surface

Again, you will be starting with existing data provided in the same manner as the Geometry import. As such, the steps preceding the actual import process are the same.

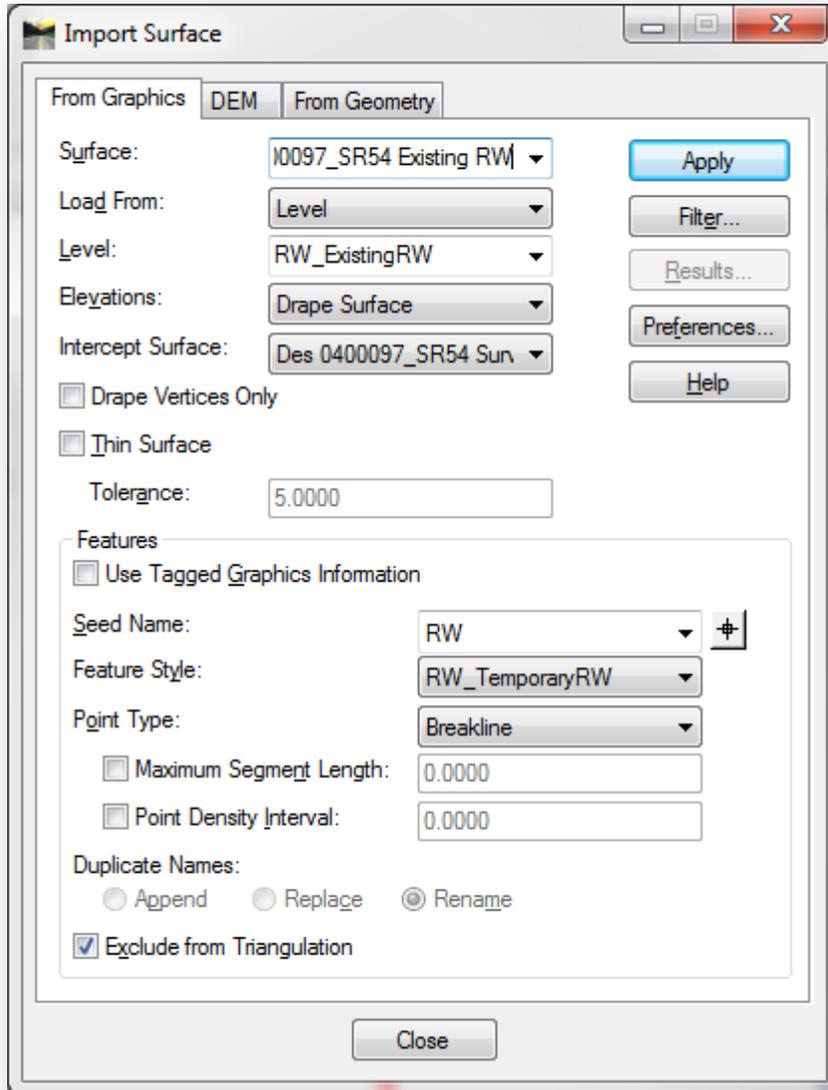
With the data prepared, you can now look at importing the graphics into Surface Features. This time, you'll use the **File -> Import -> Surface** menu item on the InRoads Explorer. On this panel, you will want to define settings similar to the following illustration. On this panel, you have a few more options that require adjustment than in the Geometry panel.

First, you need to define where you'd like your new features to be created. As you can add the new features to existing cross sections, you'll create a new DTM names Des XXXXXX\_SRXX Existing RW.dtm. With this defined, you need to determine what you're loading the data from; particularly for internal data you'll be able to use the Level option, as any existing RW should be on the RW\_ExistingRW level. This could vary however, depending on the source of your data; and could possibly require that you potentially use the Single Element or Fence options.

Next, you need to determine how the elevations of the RW lines will be determined, which will influence their display on the cross sections. To adjust these appropriately, make sure your Elevations are set to Drape Surface, and that your Intercept Surface is set to your projects Survey Surface. This will drape the feature over the existing triangulation and display the features properly on the cross sections.

Finally, you need to define the style these features should be imported as. As you can see, you've defined our import to use a seed name of RW, and place the imported features into the RW\_TemporaryRW style, with a point type of Breakline which is being excluded from the triangulation.

With these settings, you can go ahead and select Apply and the features will be created in a new DTM. Make sure you save this DTM back to ProjectWise so it's available later when you'd like to display the Right of Way features on your cross sections.



Import Surface

## 6.10 Cross Sections

With InRoads, both existing and proposed cross sections are created and modified through the use of the Cross Section tools found under the *Evaluation -> Cross Section -> Cross Sections...* menu item on the InRoads Explorer. Note that should a substantial number of Cross Sections be created, it's recommended that these be created in a new DGN to help increase performance when working out of a base drawing.

### 6.10-1 Cross Section DGN

InRoads cuts cross sections one of two ways, either in a horizontal row in your currently active model, or into individual sheets in your currently active DGN. Included in the new InterPlot set files for plotting, both methods are supported for final output, however from a workflow perspective its

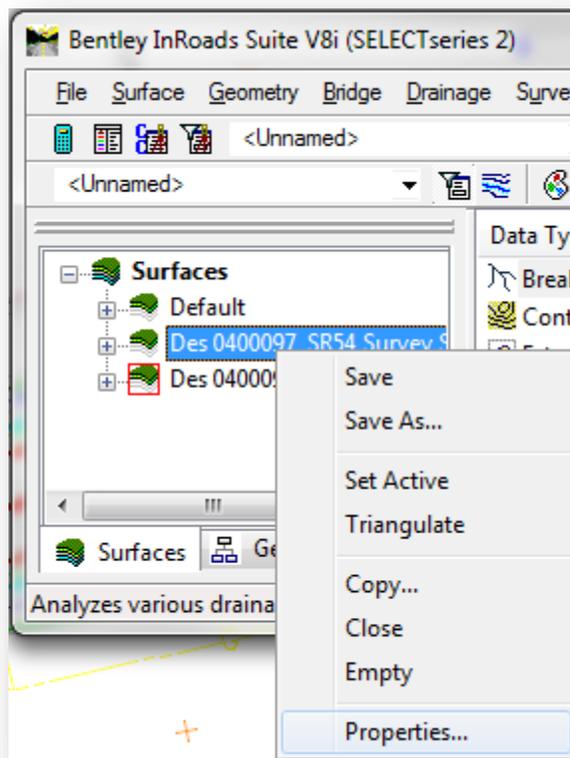
recommended to cut sections to the current DGN/model throughout the development process and then cut your final sections to a new DGN in your project. While examining the following steps, you will be looking at them in the context of final cross sections. Using the following naming suggestions, create/open a DGN named for your proposed sections.

<b>Cross Section Drawings</b>		
<b>Drawing Names</b>	<b>Descriptions</b>	<b>Examples</b>
exSections_LineA	Existing Sections along Line "A"	exSections_LineA.dgn
prSections_LineA	Proposed Sections along Line "A"	prSections_LineA.dgn

Remember, prior to cutting your sections, you must adjust your Global Scale Factors to match the scale of the preference you select. I.E. if you use the 10 scale cross section preference, all your global scale factor values should also be set to 10. If you leave your global scale factors at a different value, you will have issues with linestyle and text scaling.

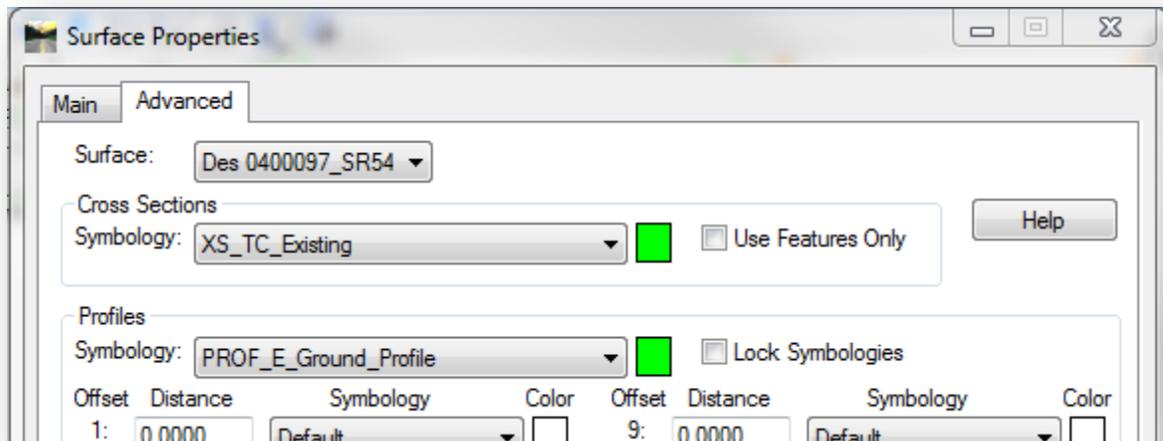
### 6.10-2 Surface Properties

Prior to creation our Cross Sections however, we do need to make some adjustments to our surfaces so they display appropriately in section view. First, we'll set our existing surface to the appropriate style. To do this, right click on your Survey Surface in the InRoads Explorer.



Surface Properties

As you did with the Profile settings earlier, go to the Advanced tab of the Surface Properties dialog, this time concerning ourselves with the Cross Section area of the dialog. For this, you'd like to set the Symbology area to XS\_TC\_Existing.



### Cross Section Symbology

For your proposed surface, you will perform the same steps only setting your Symbology to XS\_TC\_Design.

#### 6.10-3 Cross Section Creation

With the surface symbologies now appropriately configured, you can start the Cross Section tools from *Evaluation -> Cross Section -> Cross Sections....* These tools will be used for the creation, modification and updating of both existing and proposed Cross Sections.

##### 6.10-3a Cross Section Preferences

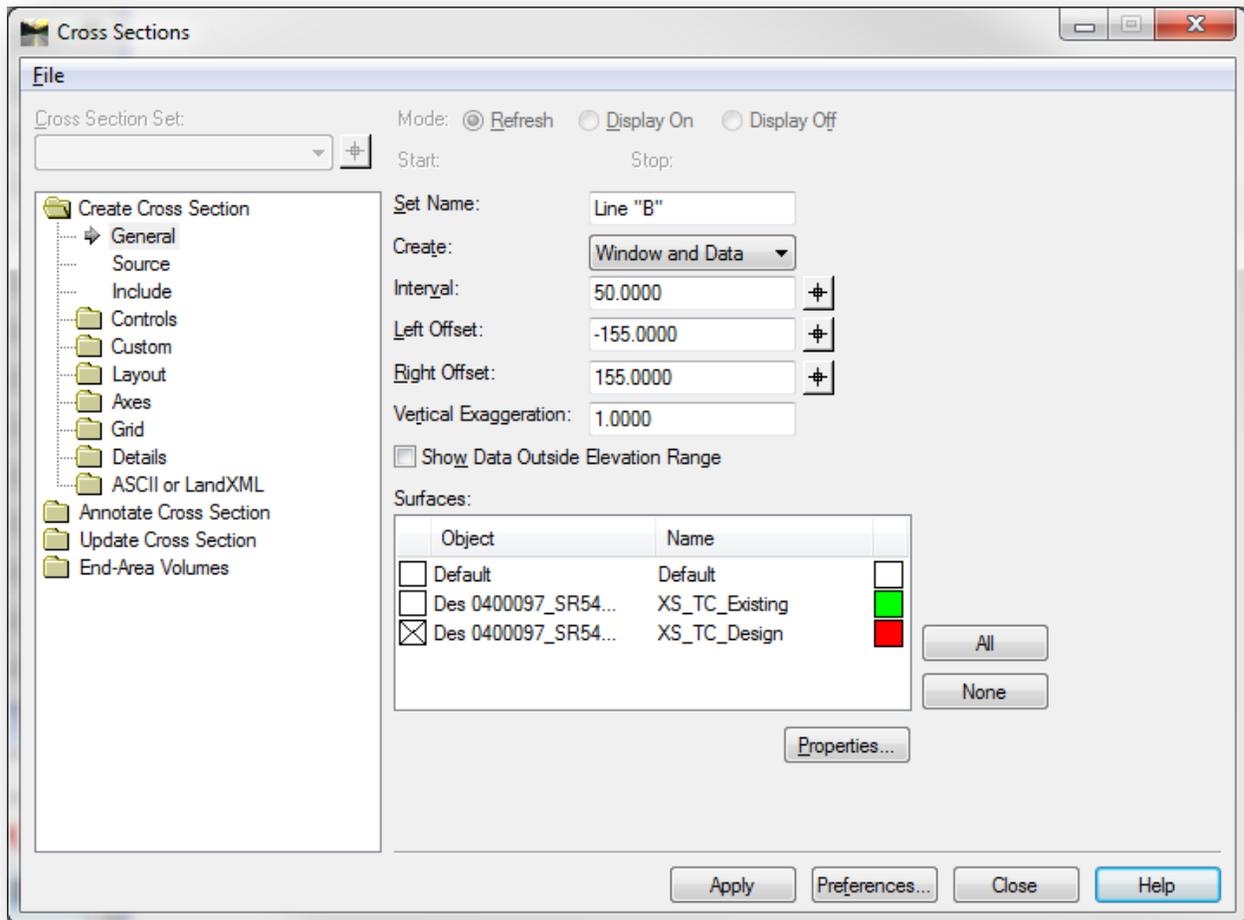
Like other InRoads tools, INDOT customized preferences are available for use with Cross Sections. These preferences do have one major difference in function, in addition to the usual scaling differences. For each scale, there is a regular version and a "Sheets" version. When using the regular preference, all cross sections will be placed in a horizontal row in the currently active model in your DGN file. If the "Sheet" version is selected, each Cross Section sheet will be placed in its own model in the active DGN. For the purposes of the following examples, you'll look at the settings used in the IN PW XSec 10 Scale Sheets preference. Be aware that when cutting directly to the DGN, it you will be recreating a new section set each time; when cutting to Models, previous versions of the sections will be deleted if a new name is not selected.

##### 6.10-3b The General Tab

With the 10 Scale preference loaded, you'll examine many of the settings that are pre-configured for use in this scale. First, look at the General leaf.

The General Tab contains settings such as the Section Set Name, what features should be created, the interval between sections, the left/right offsets, the vertical exaggeration and what surfaces are displayed. These settings are preset via the use of the Preference, except the Set Name, and the

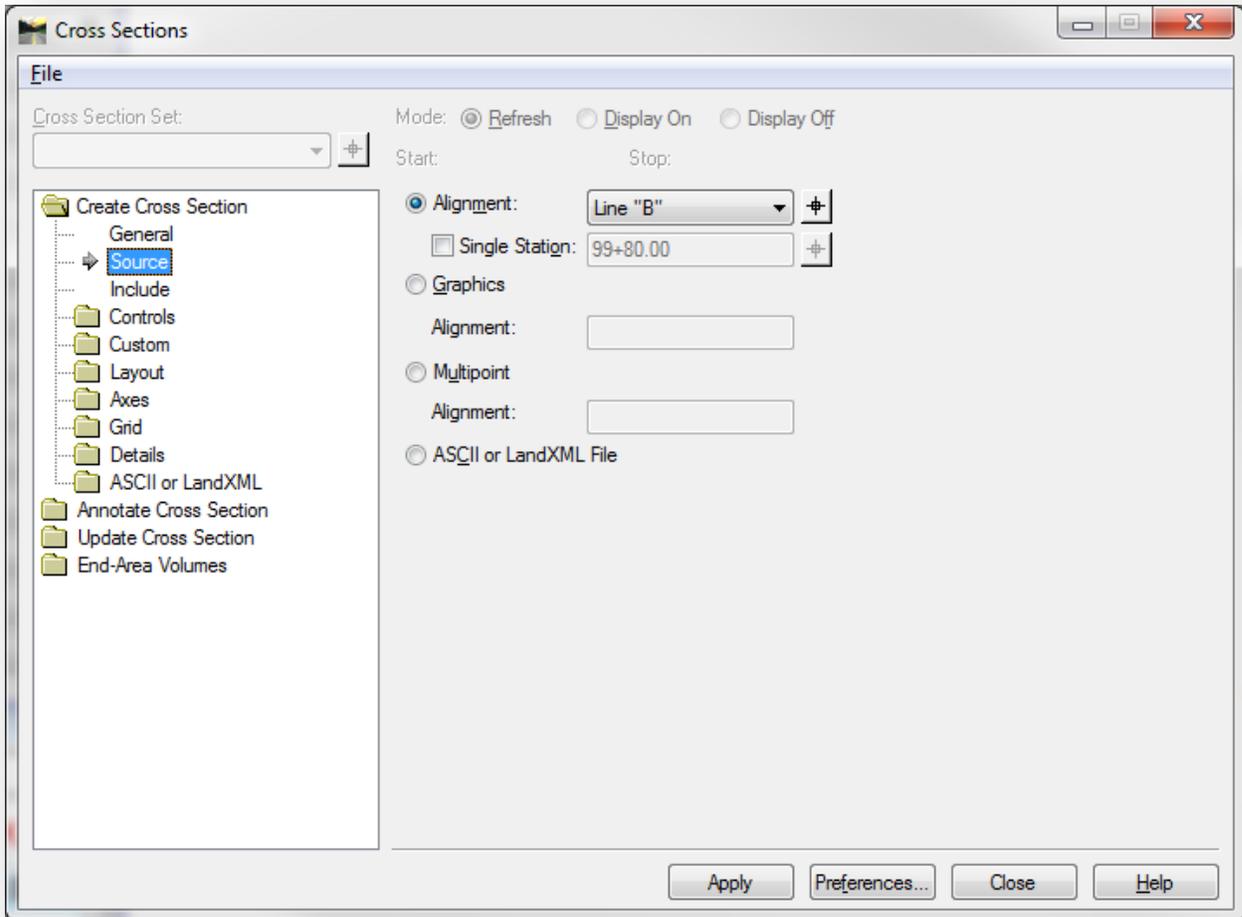
Surfaces included. The Set Name can be set one of two ways, the first being it assumes the name of the active Horizontal Alignment set via the Source leaf or it can be keyed in directly. The surface enabled will coincide with the active Surface, as well as allowing you to pick any additional surfaces. For existing sections, you would only select your survey surface, for proposed cross sections, you would select both your survey and proposed sections.



### Cross Sections – General Leaf

#### 6.10-3c The Source Leaf

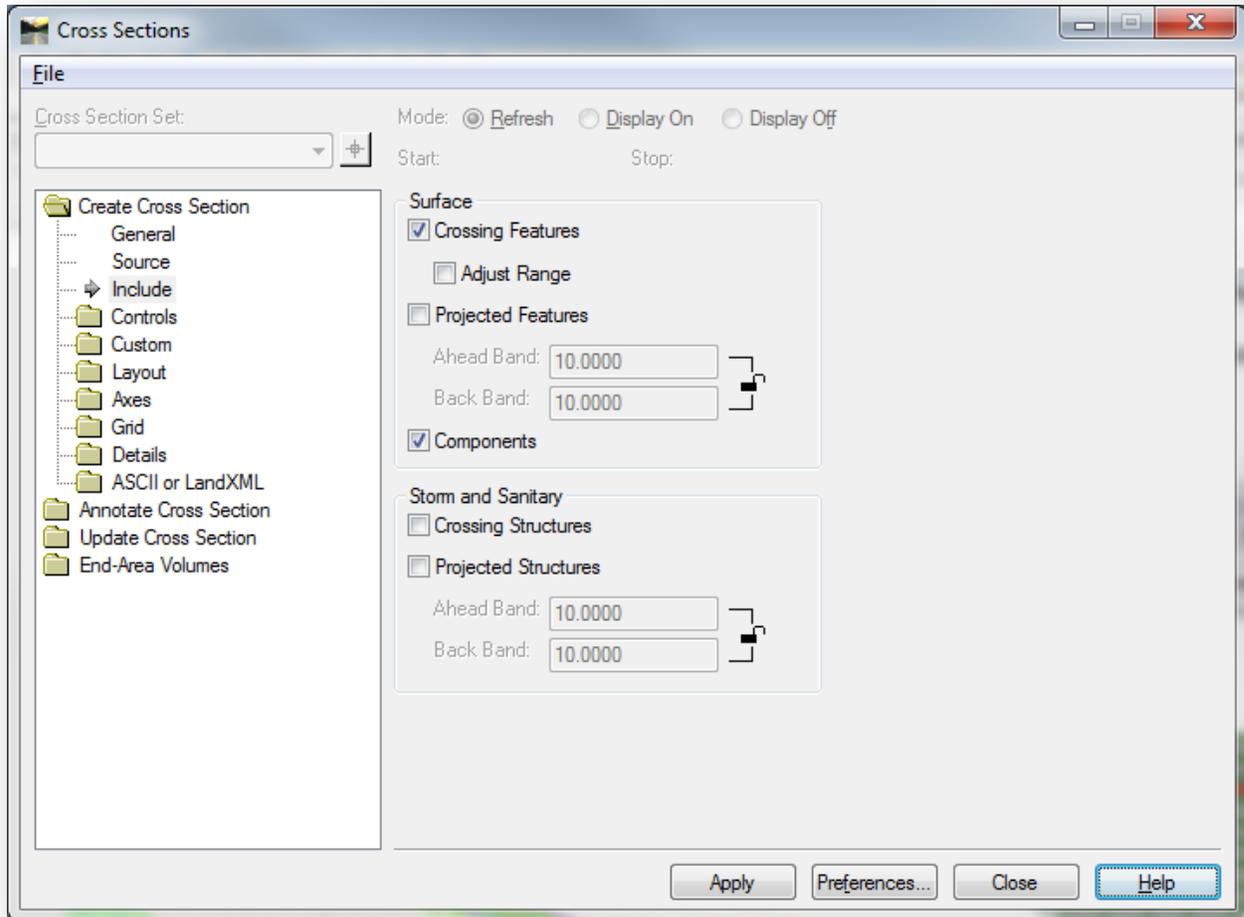
The Source leaf allows you to select the item you'd like to use to cut your sections along. Of the methods available, the most often used will be a horizontal alignment in your ALG file. You could also use any linear graphic element, a multipoint selection of points, or a coordinate list provided via text file or LandXML. In the following example, you'll see that a Horizontal Alignment, Line "B", has been selected. This would also reset the Set Name to the same name as the alignment selected.



## The Source Leaf

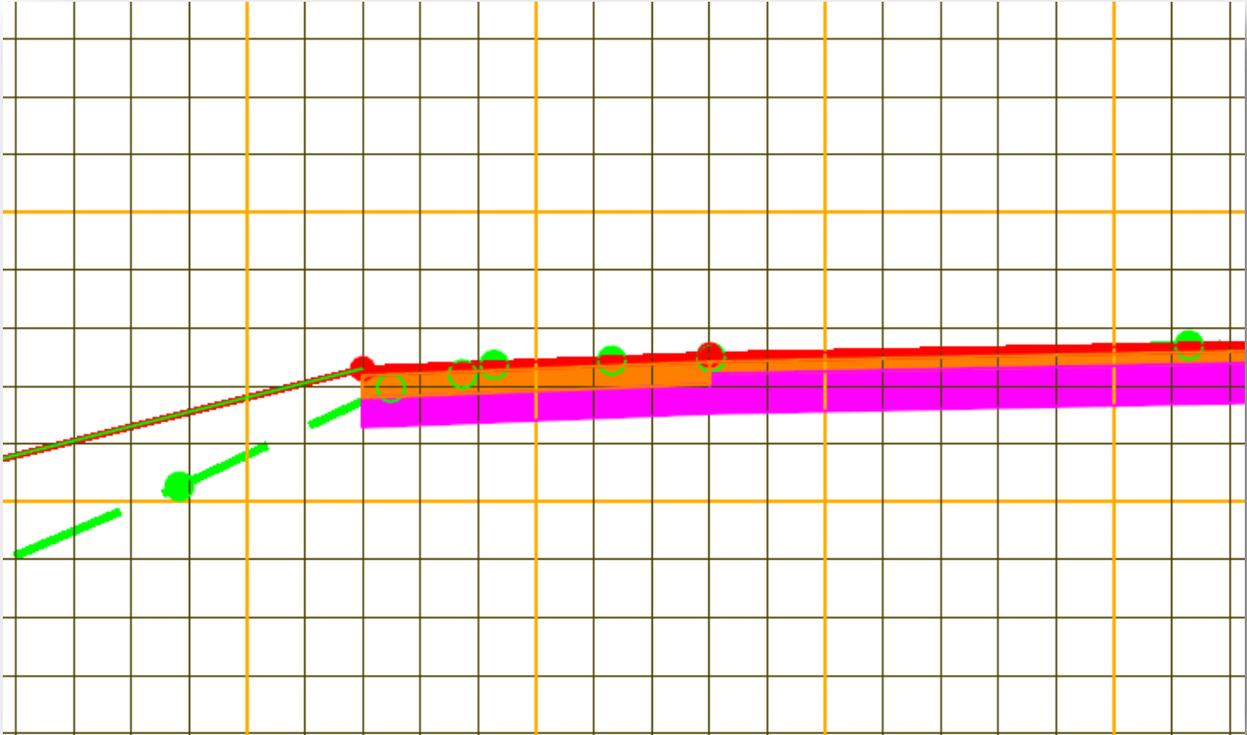
### 6.10-3d The Include Leaf

The features on this leaf are used in the event you wish to show crossing surface features, or those that are from the InRoads Storm and Sanitary utilities. As defined in the preference, features such as guardrails, Obstruction Free Zones, Right of Way, and some drainage structures will be displayed as crossing features on your section.



### The Include Leaf

In addition to showing crossing features, this tool can also interpret and display projected features that while not at your current section, may be within a band defined by the Ahead and Back Band dialogs. These give you the flexibility to show items either before or after the current station's section based on a distance you define. The Components toggle specifies how components from Roadway Designer are displayed when showing your proposed sections. While enabled, each pavement layer or component you have in your template will be displayed as their individual features in the cross section.



### Cross Sections with Components Enabled.

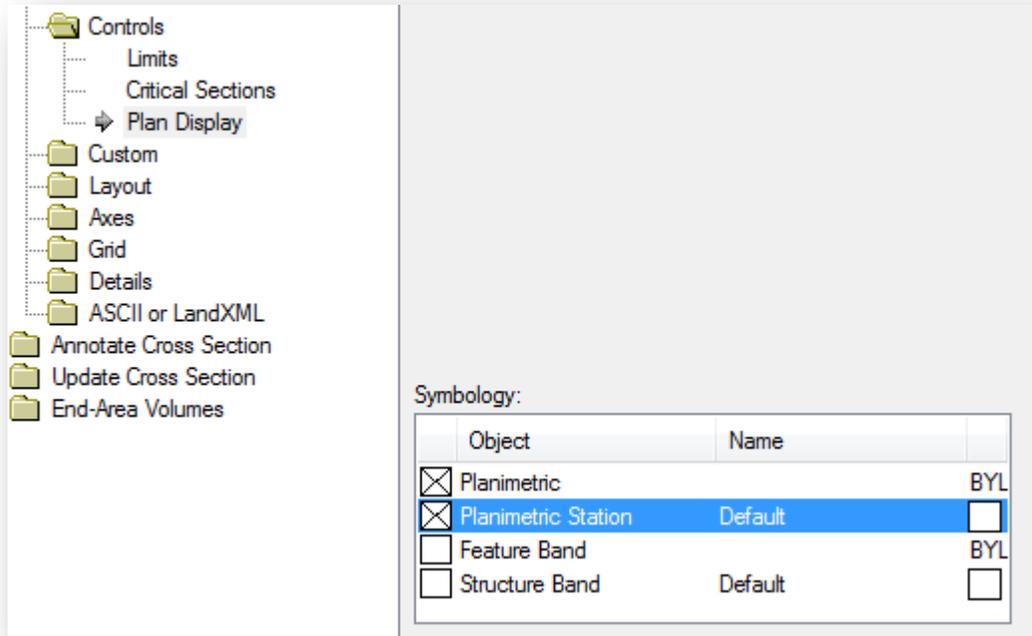
In the previous illustration, you can see the proposed design with the components enabled. For these features to be filled in, you must enable Fill in your MicroStation View Attributes.

As with the surface features, the Storm and Sanitary features behave in the same way in regards to selection and the banding for projected features.

#### 6.10-3e *The Controls Leaf*

The items in the Controls Leaf allow us to define the station range of the sections. The default is for the entire length of the selected alignment. In addition to this, the Critical Sections sub-item allows for the creation of sections at a series of pre-defined InRoads points.

Should you need to display the section cut lines in the plan view, navigate to the Plan Display option and enable the Planimetric and Planimetric Stations options as shown.



### Plan View Section Items

#### 6.10-3f The Custom Leaf

The Custom tools allow for the definition of custom section ranges within your section set as a whole. For instance, you can define a station range within your set that has a smaller interval, or instead of being perpendicular to the alignment, is skewed with different offsets should you need to include more information. For these custom sections, you can also define whether or not crossing and projected features are included, independently of the full set definition.

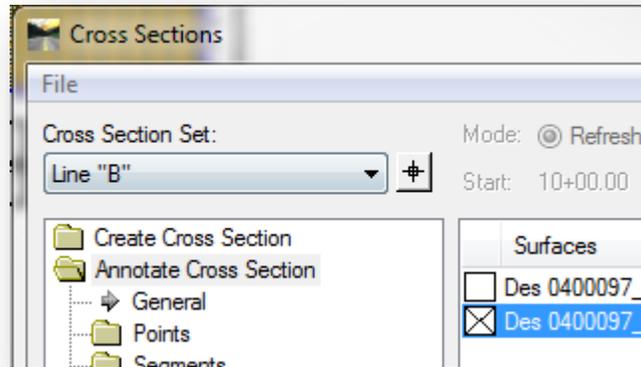
#### 6.10-3g Everything Else

The remaining items under the Create Cross Section Leaf are all predefined using INDOT standard values for sheet borders, grid values, etc. In most instances, these values can be left as is, as they come in from the appropriate preference. With all the settings defined, select Apply and InRoads will create the Cross Sections using the settings you've defined throughout this example.

#### 6.10-4 Cross Section Annotation

With a section set created, you'll now look at the annotation process. As you may have noticed in the previous section, there are additional leaves on the dialog from *Evaluation -> Cross Section -> Cross Sections....* This time, navigate to the Annotate Cross Section Leaf.

The first thing you should notice when activating this leaf is the Cross Section Set: option becomes active.



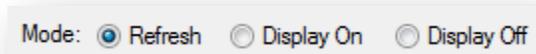
### Cross Section Set Active

In the instance that the DGN has multiple section sets defined, this will allow you to specify which section set you'd like to interact with. In most cases, you'll only need to select the surface you'd like to annotate, along with the corresponding Preference. This will appropriately define all the remaining features in the Annotate Cross Section tree. When you're satisfied with the setup, select Apply, and the annotation selected will be placed on your sections.

#### 6.10-5 Update Cross Sections

Unlike MX, InRoads allows for the modification of Cross Sections once they're created, as opposed to recreating a new section set. Under the Update Cross Section leaf, you'll briefly examine the options available and how they function in regard to adding or removing items from your sections.

Like the Annotate Cross Section leaf above, the Cross Section Set: is enabled when you select this leaf, however you also have the Mode: picker activate as well.



### Update Cross Section Mode

These modes control the context of what surfaces or features are shown when you select the various functions. To better explain, during the initial section set creation, you displayed both the Survey Surface and Design Surface. If you navigate to the Surfaces leaf, with the Mode set to Refresh, you'll see both surfaces listed. If you switch the Mode to Display Off, both are still displayed, but this time you'll select the Proposed Design surface and select Apply. At this time, you'll see the Proposed Design disappear and only show again if you go to the Display On Mode.

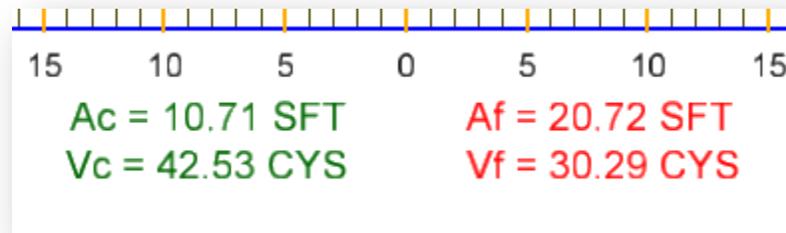
Using these Modes, you can add, remove or adjust the surfaces and features you have displayed in an existing cross section set, allowing a far higher degree of flexibility when working with these.

In addition, you can also adjust Crossing and Projected features, our station range.

### 6.10-6 End Area Volumes

To get End-Area Volumes displayed on the sections, you'll look at this feature's leaf in the Cross Sections tree.

Currently, this tool is configured to place this annotation below each related section. Along with your other cross section tools, you do have appropriately scaled preferences. For this example, you'll be placing the annotation using the EndAreaVolume10scale. With this Preference, all other items will be appropriately configured per INDOT standards. When ready, select Apply, and the annotations will be placed.



### End-Area Volumes

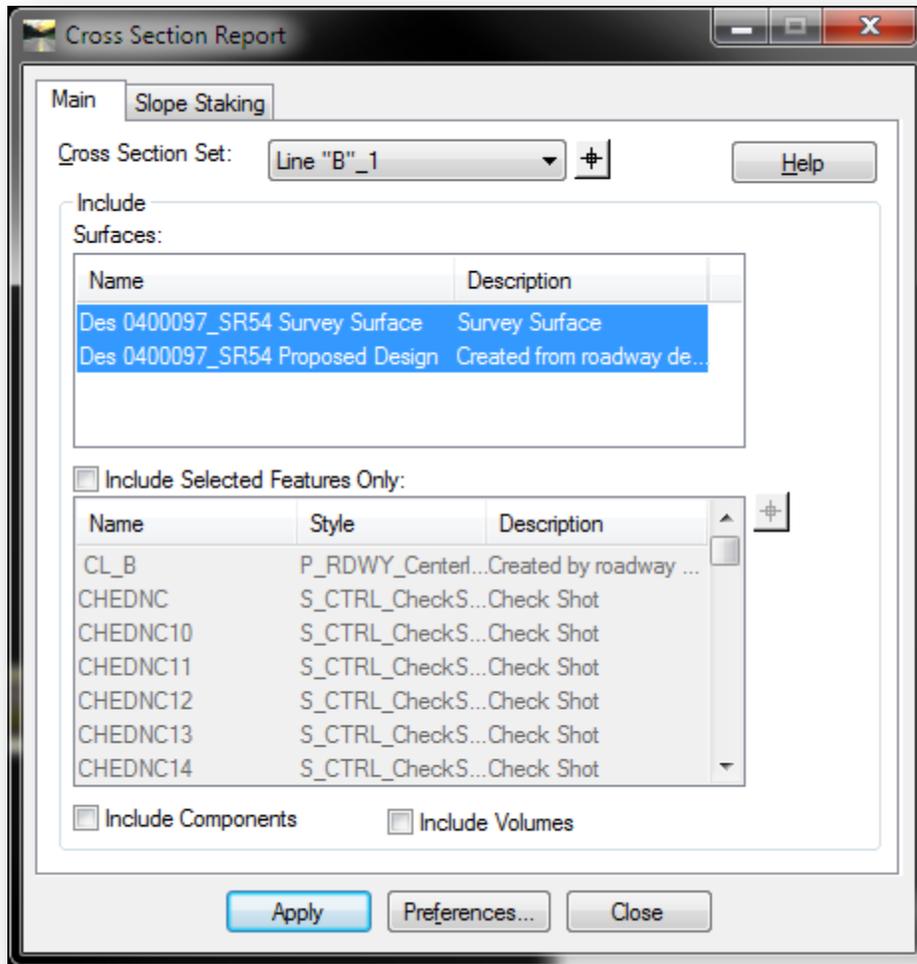
#### 6.10-7 Cross Section Notes

1. When creating sections, make sure you set your Global Scale Factors to match the scale of the Preference you've selected.
2. Be careful when working with the sections once they're created. Deleting or modifying parts of the sections can cause InRoads to lose the ability to identify and Annotate/Update your sections.
3. ProjectWise title block integration is enabled on these sheets and is immediately available if you create the sections in a DGN opened from ProjectWise. A new DGN that has not been checked in will display the placeholder tags until the file is checked in and re-opened.
4. When cross section components are displayed, these are closed shapes that can be measured for area at the scale drawn.
5. When annotating, make sure to use Pen Mode, and Delete Ink Lock to prevent annotations from being lost during additional runs of the Update/Annotate Sections commands.

#### 6.10-8 Other Cross Section Functions

##### 6.10-8a Cross Section Reporting

Unlike most reporting tools in InRoads, Cross Section Reports can be found with their corresponding toolset instead of under Tools -> XML Reports on the InRoads Explorer. These reports can instead be found under Evaluation -> Cross Section -> Cross Section Report. Once in the report tool, select your relevant surface(s) and select Apply.



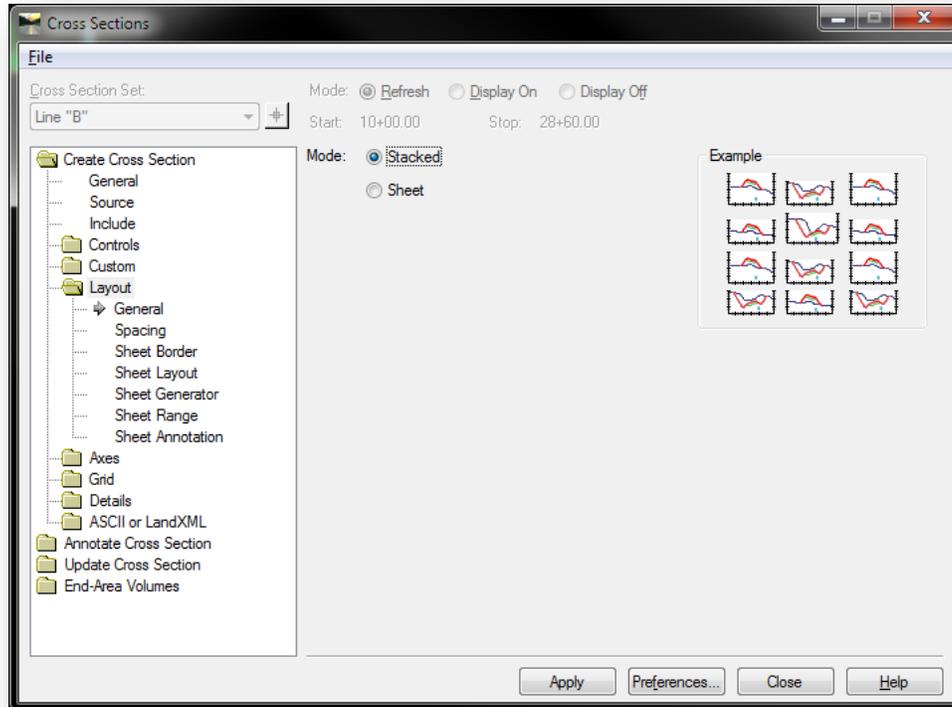
### Cross Section Report

On the report browser, the particular reports of interest will be under the Evaluation folder, and are CrossSectionPoints.xml and CrossSectionPointList.xml.

#### 6.10-8b Cross Section Troubleshooting

During the process of Cross Section creation, one of the most common issues is an error that specifies a section is out of range. This is most commonly caused by a section that is cutting through a surface that has triangulated features that are located at 0 elevation. In this instance might want to cut the sections without sheet borders in order to locate the item in question.

To cut sections without sheet border, navigate to the Layout leaf on the Cross Sections panel (Evaluation -> Cross Section -> Cross Section). Under Layout, select General. On this tab, select Stacked for the Mode.



### Cross Section Layout

This will allow InRoads to create all specified sections without limits on the horizontal extents and allow for the inspection of sections to locate the area where the triangulation may be an issue.

#### 6.10-9 InRoads RW Modeling and Cross Section Tips (courtesy H. Brown)

##### 6.10-9a Steps to Model Right-of-Way in InRoads Using Cogo Points:

1. Open the InRoads Geometry Project that will be used to store R/W Cogo Points and R/W alignments.
2. Create a Cogo Point for each R/W point using Geometry/Cogo Points/New. Select Station/Offset for the Define By field. Enter the desired point number in the Name field. For the Horizontal Alignment field, enter the alignment from which the R/W point is described. Enter the appropriate values in the Station and Offset fields. Leave the Elevation field as 0.00. For the Style field, select RW\_ProposedRW. Click Apply when finished. (Note: Example is for Permanent R/W on left side for US 231, Des. No. 0800856. See attached plan sheets.)

Define By:	Station/Offset	
Name:	200	
Northing:	0.0000	
Easting:	0.0000	
Elevation:	0.00	
Horizontal Alignment:	Line A revised Radi	
Station:	236+50.00	
Offset:	12.0000	
Elevation:	0.00	
Description:		
Style:	RW_ProposedRW	

3. For parallel R/W on curves, three points should be created at the following locations: beginning of parallel R/W on curve, curve center, and end of parallel R/W on curve. The same curve center point can be used for multiple arcs on the same curve.
4. After Cogo Points are created, they can be edited if needed using Geometry/Cogo Points/Edit.

**Edit Cogo Point**

Define By:

Name:

Northing:

Easting:

Elevation:

Horizontal Alignment:

Station:

Offset:

Elevation:

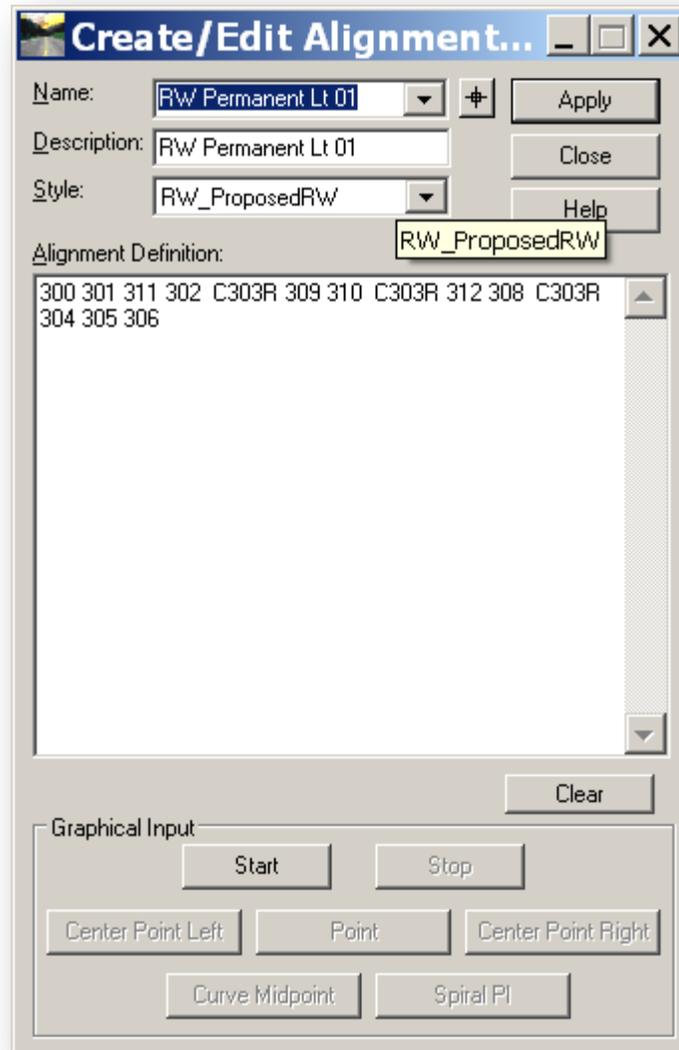
Description:

Style:

Shared Points

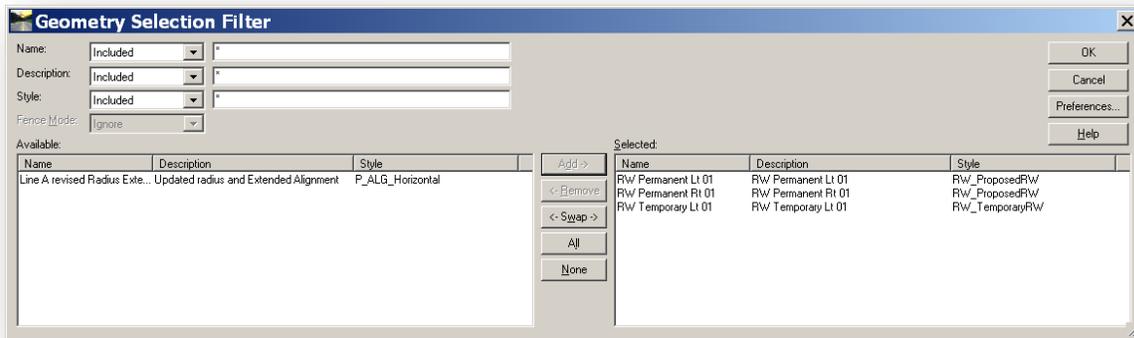
POB	Rw Permanent Rt 01
-----	--------------------

- After the Cogo Points have been created, create the alignment using Geometry/Utilities/Create Edit Alignment by Cogo Points. Enter the appropriate Alignment Name and Description in the Name and Description fields. Use the style RW\_ProposedRW (for permanent R/W) or RW\_TemporaryRW (for temporary R/W). In the Alignment Definition field, enter each point number separated by a space. For a point that represents a curve center, use the prefix “c” and suffix “l” (curve to the left) or “r” (curve to the right). In this example, point number 303 is the curve center for a curve to the right (Station = 449+26.05, Offset = 1432.44’). Click Apply when finished.

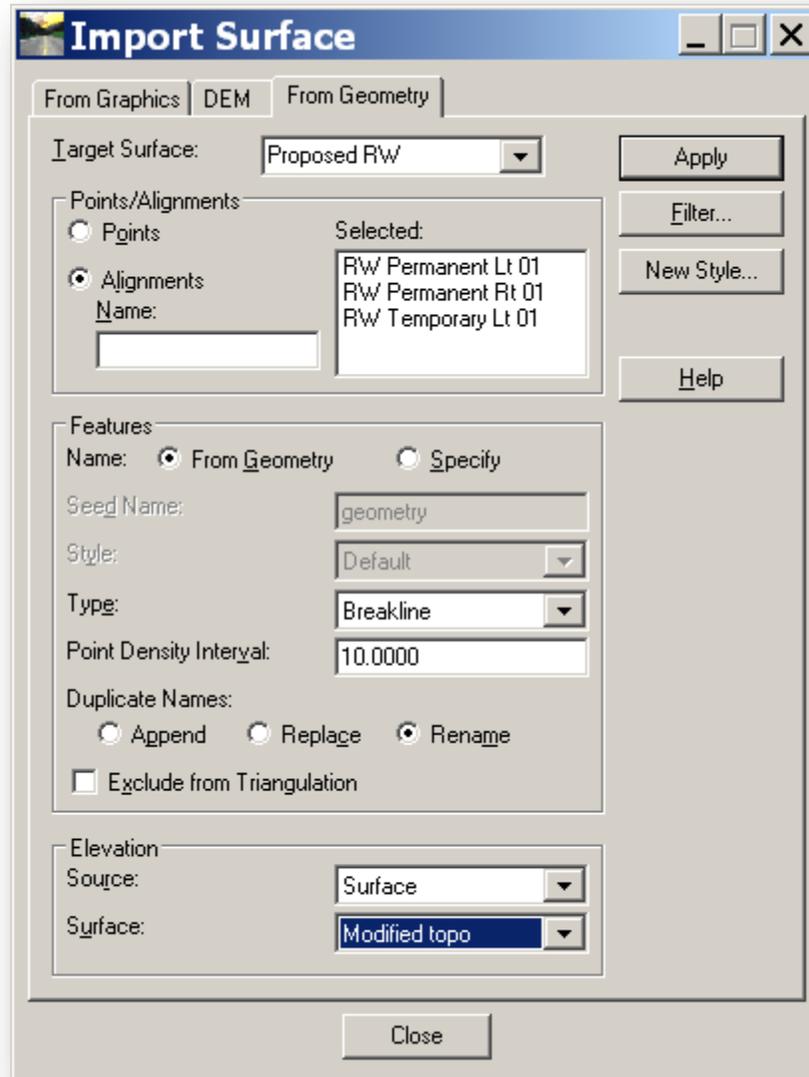


6. After the R/W Alignment is created, points can be added to or removed from the R/W alignment using Geometry/Utilities/Create Edit Alignment by Cogo Points.
7. Individual points can be edited after the alignment is created (refer to Step 4). The alignment will automatically be updated when a point on the alignment is edited. To edit points that are part of an arc for parallel R/W on curves, change the Alignment Definition to remove the “c” prefix and “l” or “r” suffix and click Apply (refer to Step 5). After the arc points are edited, the “c” prefix and “l” or “r” suffix should then be added again to the alignment description.
8. The R/W alignments can be drawn in plan view using Geometry/View Geometry/Active Horizontal. All horizontal alignments in a Geometry Project can be drawn using Geometry/View Geometry/All Horizontals. The linestyles can be changed using Microstation commands.
9. To show R/W on cross sections, R/W surface features need to be created from the R/W Alignments. The features can be created using File/Import/Surface/From Geometry. Set the

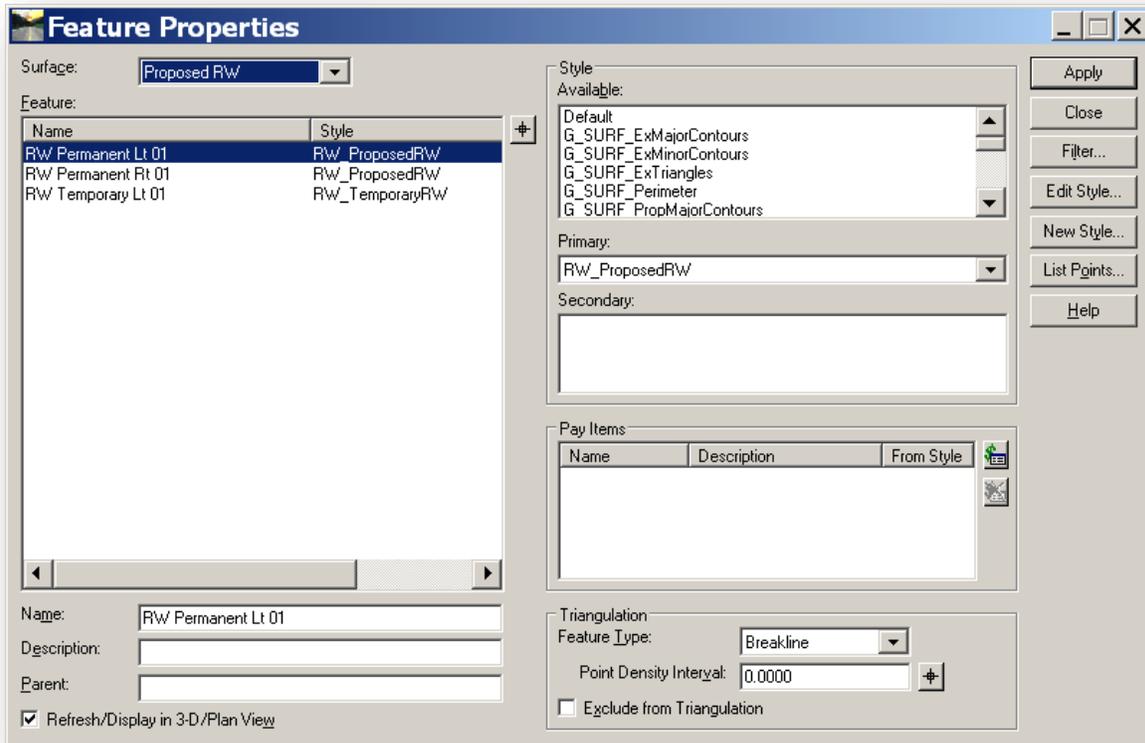
Target Surface to the surface that will be used to store R/W features. Check the Alignments radio button and use the Filter button (after clicking in the Alignment field) to select the alignments that will be used to create features. The Geometry Selection Filter panel is shown below.



- On the Import Surface panel, select the following settings in the Features section: Name = From Geometry, Type = Breakline, Point Density Interval = Value Selected by User (10.00 in this example), Duplicate Names = Rename, Exclude from Triangulation = unchecked. A lower Point Density Interval improves the accuracy of the elevations on the R/W features. In the Elevation section, select Surface in the Source field and select the Surface used to generate the R/W feature elevations in the Surface field. Click Apply when finished.



11. Check to ensure that the features have been created with the correct styles using Surface/Feature/Feature Properties.

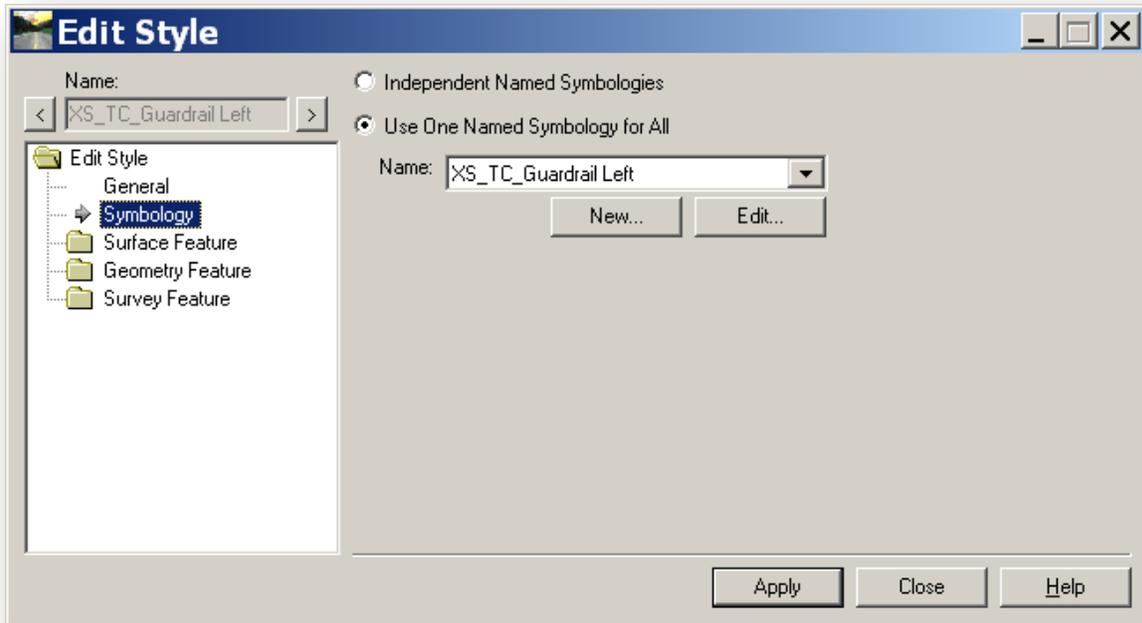


12. Triangulate the surface containing the right-of-way features using Surface/Triangulate Surface.

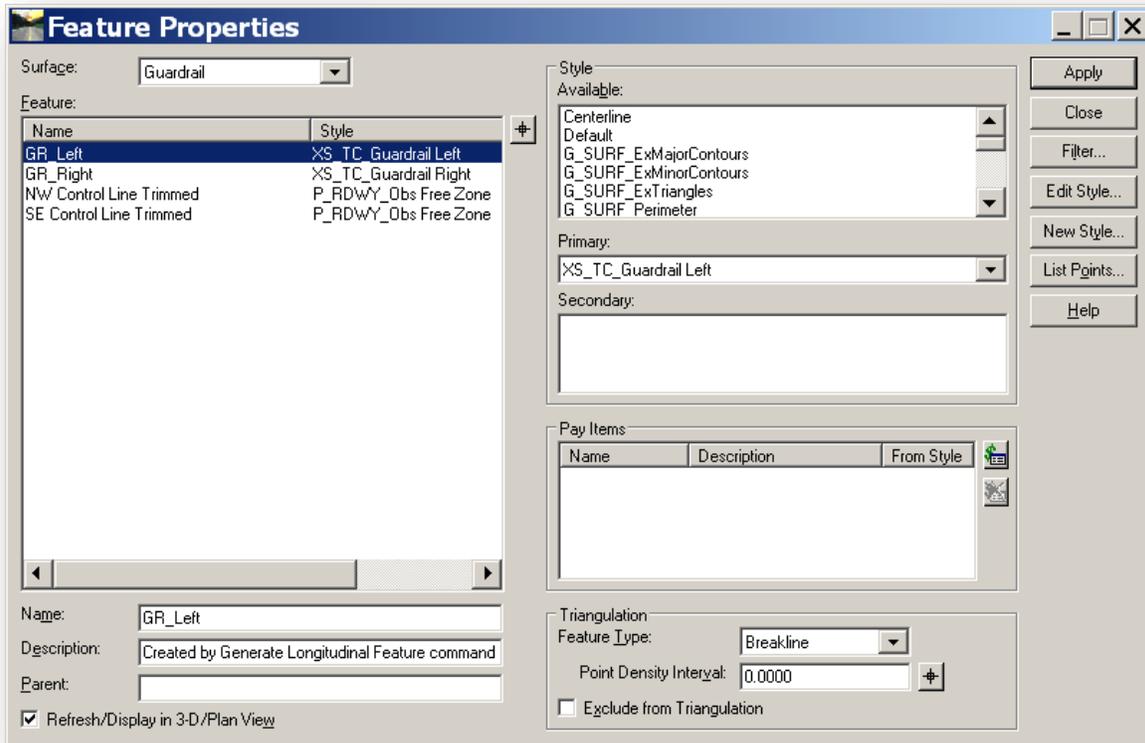
#### 6.10-9b Steps to Draw Points on Cross Sections as Cells:

**Note:** The following steps have been already performed on the INDOT.XIN file located at <pw:\dotwise.indot.in.gov:DOTWise\Documents\INDOT Workspace\InRoads\XIN\INDOT.xin>. These steps are included as reference only.

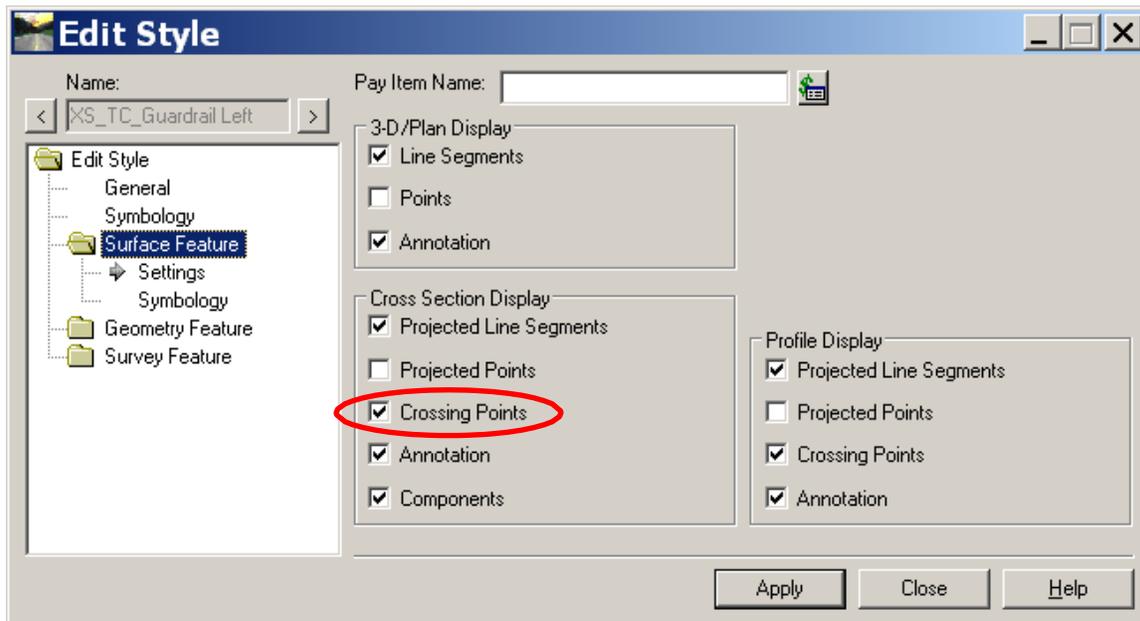
1. Named Symbology is used to define how cross section points are drawn. A Named Symbology is associated with a Style. If the Style does not already exist, create the Style using the Style Manager (Tools/Style Manager). The association between a Style and a Named Symbology is created using the Style Manager (Tools/Style Manager/Edit). In this example, we will use the existing Named Symbology XS\_TC\_Guardrail Left to draw the guardrail on the left side of the roadway.



2. When creating cross sections, the features to be drawn should have the appropriate Style and Named Symbology assigned to it. This can be checked using Surface/Feature Properties.

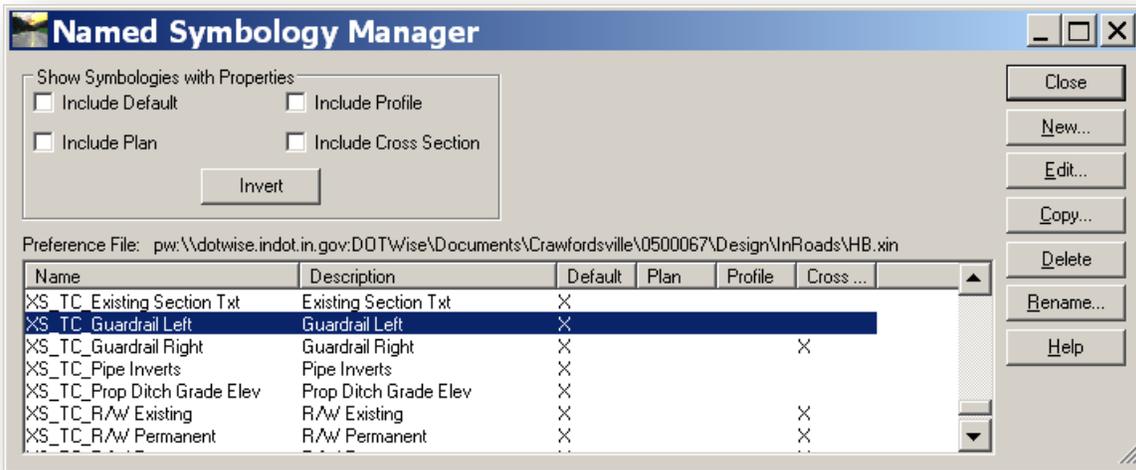


- The Style should also have Crossing Points enabled. This can be checked using Tools/Style Manager/Edit.

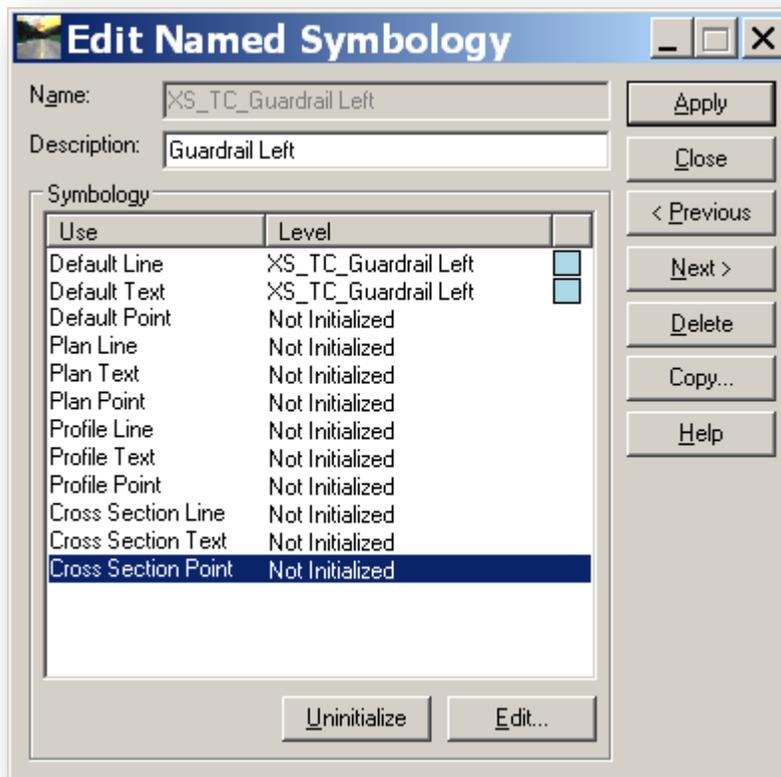


- Open the Named Symbology Manager using Tools/Named Symbology Manager.

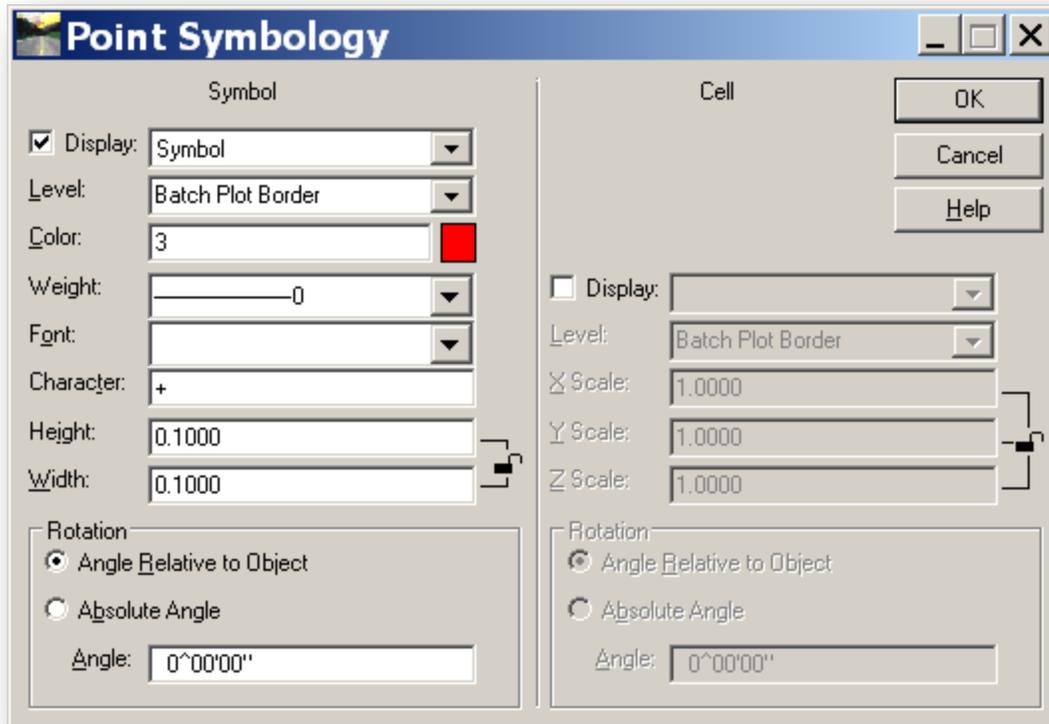
- Highlight the Named Symbology that you would like to edit. You can also select New to create a new Named Symbology.



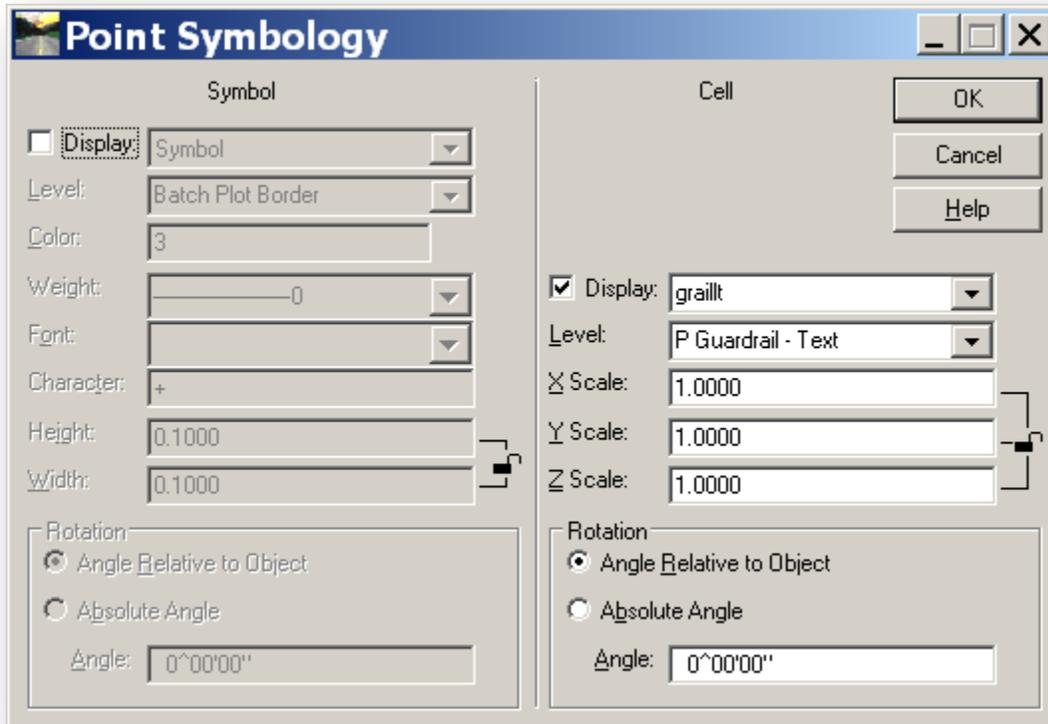
- Click Edit. The Edit Named Symbology panel opens. Highlight Cross Section Point and click Edit.



7. On the Point Symbology panel, first check Display under Symbol and select the desired color for the cell. Selecting the color is not available under the Cell option.



8. Uncheck Display under Symbol and check Display under Cell. Select the appropriate cell and Level Name for the feature. Click OK.

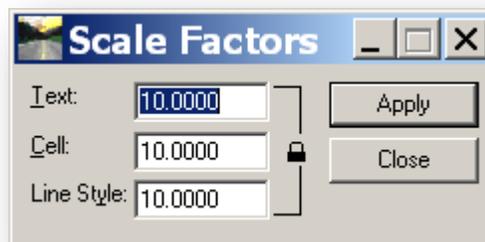


9. Click Apply and then Close on the Named Symbology Panel.
10. Create Cross Sections using Evaluation/Cross Section/Cross Sections/Create Cross Section. Ensure that the surfaces containing the features to be drawn as cells are selected to be drawn. Upon completion, the features for which Cross Section Point was initialized in the Named Symbology Manager should be drawn with the specified cells.

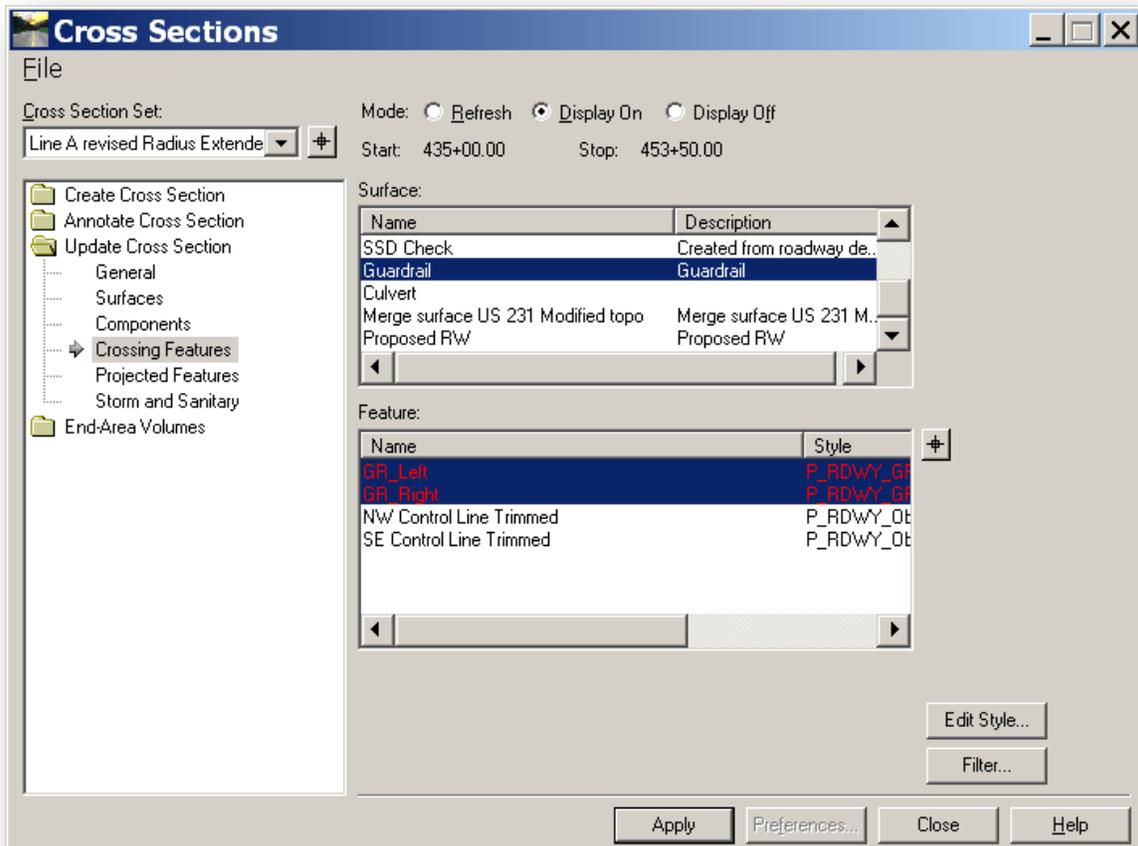
**6.10-9c Steps to Show Guardrail on Cross Sections:**

1. Ensure that the guardrail features have the following styles: Feature Type      Style:
 

Guardrail on Left Side	P_RDWY_GR Left
Guardrail on Right Side	P_RDWY_GR Right
2. Ensure that preference file INDOT.xin is loaded.
3. Ensure that Global Scale Factor is set to scale of cross sections



4. Create Cross Sections using Evaluation/Cross Section/Cross Sections/Create Cross Section. Ensure that the surface containing the guardrail features is one of the surfaces selected to be drawn. (Skip Steps 5 through 7 below if styles listed in Step 1 have been configured in the Named Symbology Manager to show cross section points as cells.)
5. Reset Global Scale Factor to scale of cross sections.
6. Select Update Cross Section Leaf. Select Crossing Features Leaf. Then select Surface and Feature Names for the guardrail features that you wish to add.



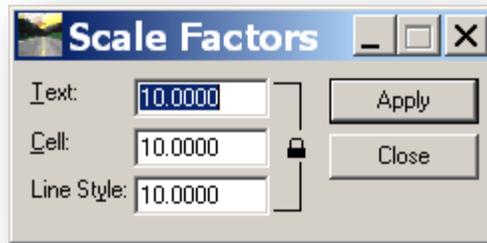
7. Select Apply.
8. Guardrail features should now be shown on the Cross Sections using the cells graillt and graillr. Open preference file INDOT.xin and reset Global Scale Factor if needed.

**6.10-9d Steps to Annotate Right of Way on Cross Sections:**

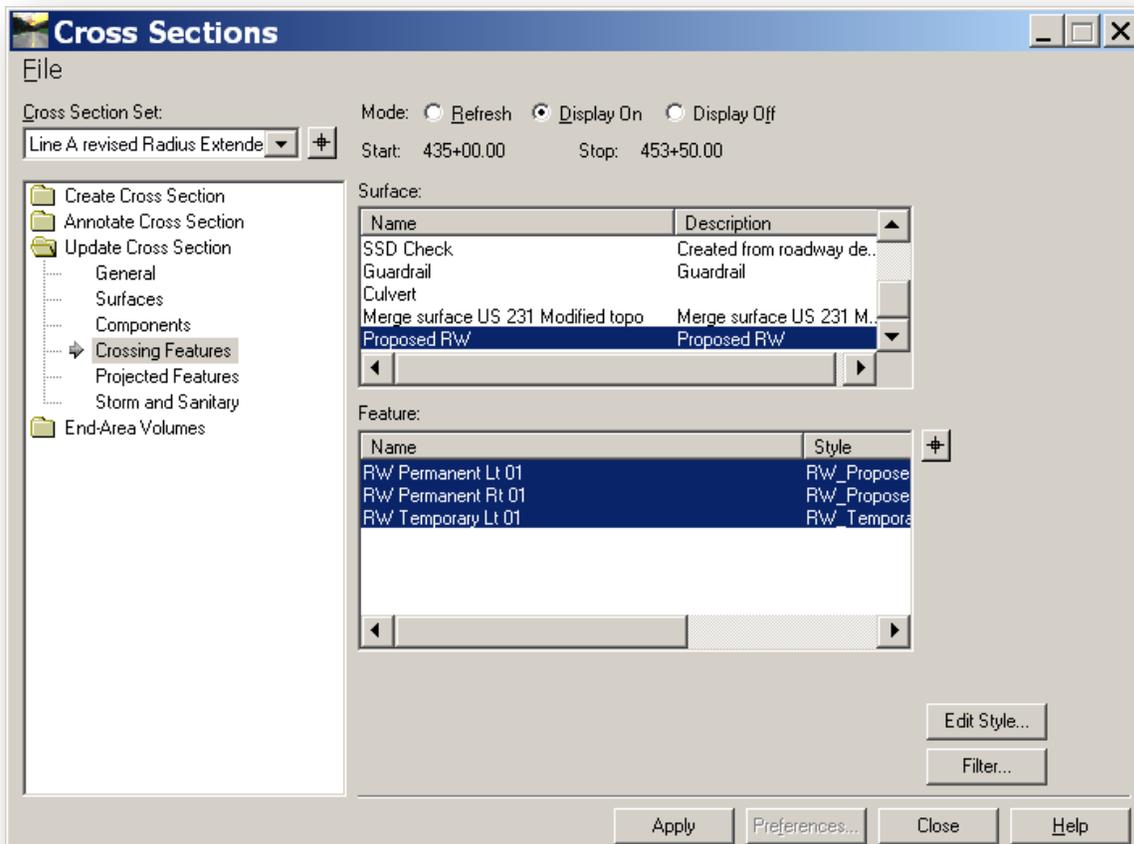
1. Ensure that the R/W features have the following styles: Feature Type Style

Existing R/W	RW_ExistingRW
Proposed Permanent R/W	RW_ProposedRW
Proposed Temporary R/W	RW_TemporaryRW

2. Ensure that preference file INDOT.xin is loaded.
3. Ensure that Global Scale Factor is set to scale of cross sections

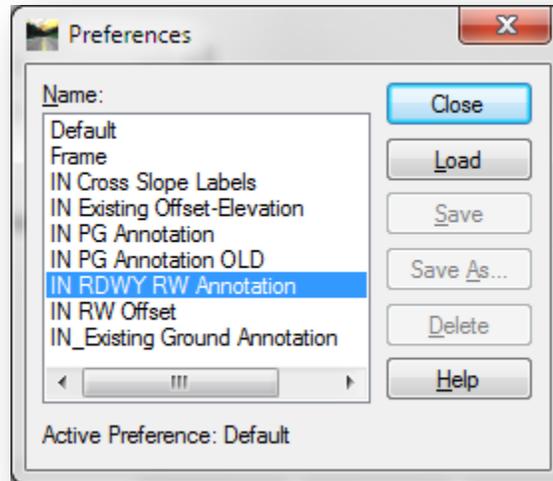


4. Create Cross Sections using Evaluation/Cross Section/Cross Sections/Create Cross Section. Ensure that surface containing the R/W features is one of the surfaces selected to be drawn. (Skip Steps 5 through 7 below if styles listed in Step 1 have been configured in the Named Symbology Manager.)
5. Reset Global Scale Factor to scale of cross sections.
6. Select Update Cross Section Leaf. Select Crossing Features Leaf. Then select Surface and Feature Names for the R/W features that you wish to add.

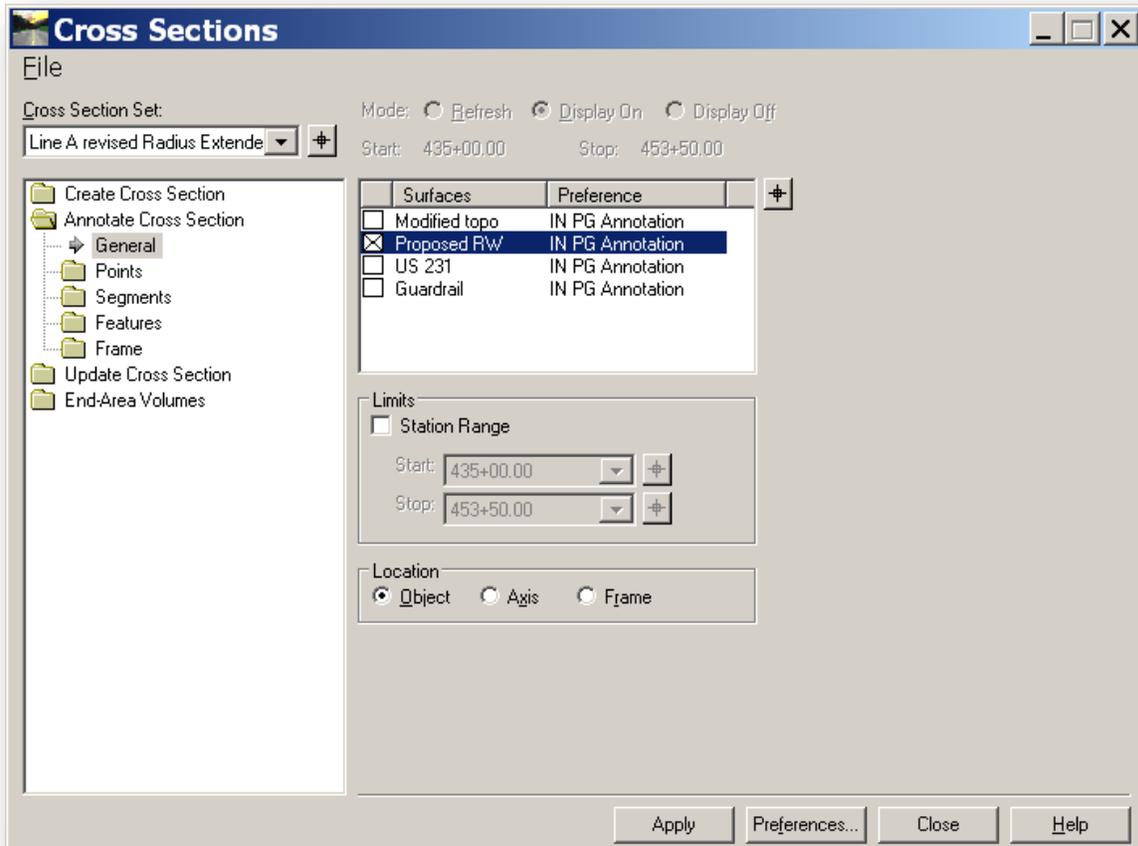


7. Select Apply.

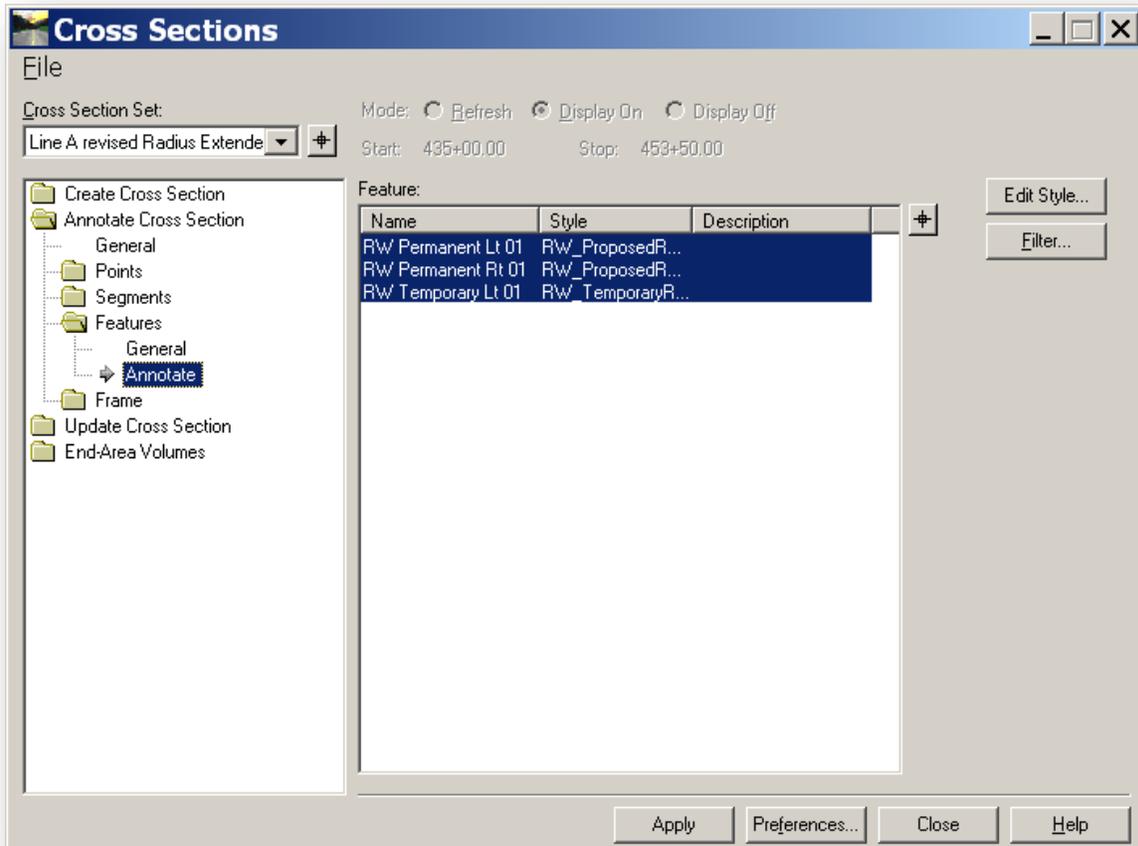
8. R/W features should be shown as cells. Reset Global Scale Factor if you have not already done so.
9. Select Annotate Cross Section Leaf. Select preference IN RDWY RW Annotation.



10. Select the surface containing the R/W features in the General Leaf.



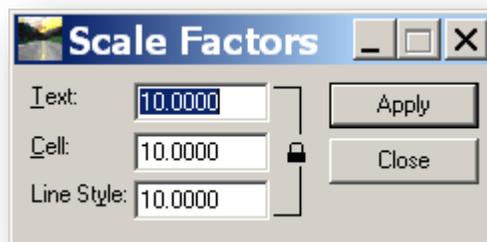
11. In the Features/Annotate Leaf, select the R/W features to be annotated.



12. Select Apply. When this step is completed, R/W offsets should be labeled.
13. Open preference file INDOT.xin and reset Global Scale Factor if needed.

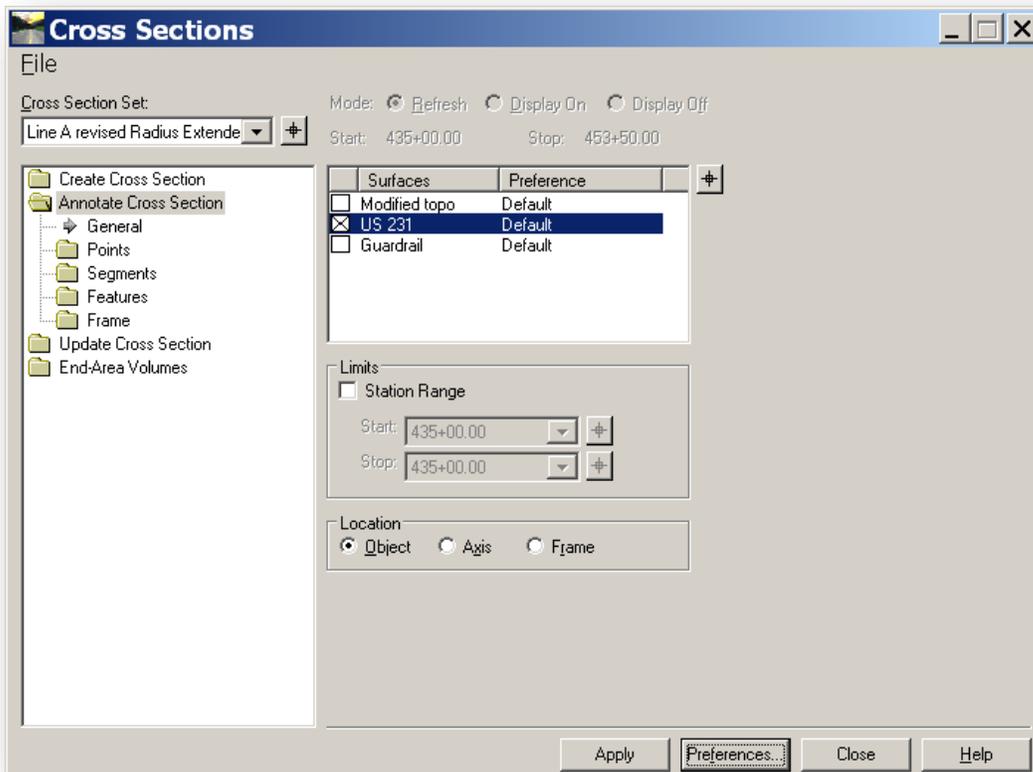
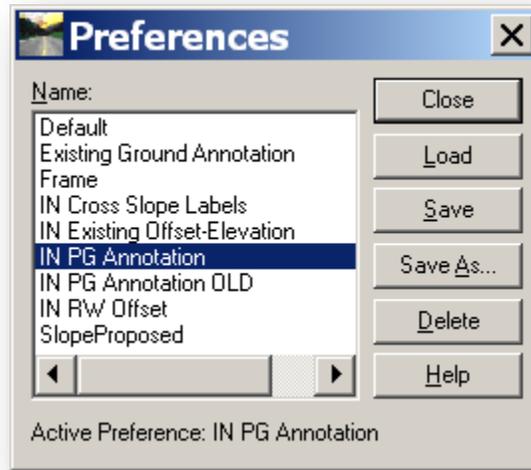
**6.10-9e Steps to Annotate Profile Grade on Cross Sections:**

1. Ensure that the feature representing the Profile Grade feature has Style: P\_RDWY\_Centerlines.
2. Ensure that Global Scale Factor is set to scale of cross sections

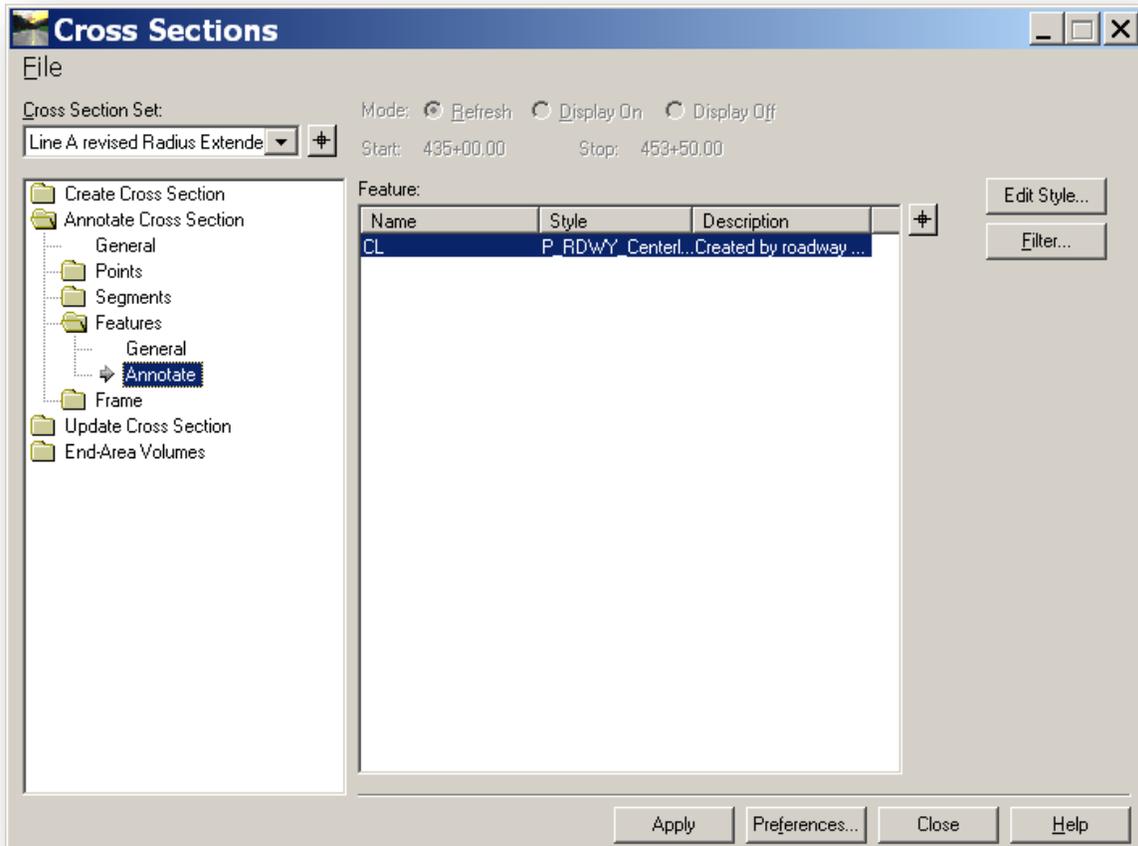


3. Create Cross Sections using Evaluation/Cross Section/Cross Sections/Create Cross Section. Upon completion, profile grade should be labeled with cell pgarro.

4. Select Annotate Cross Section Leaf. Load Preference IN PG Annotation. Select Design Surface on General Leaf.



5. Select Features/Annotate Leaf. Highlight Profile Grade feature.



6. Click Apply. Upon completion, profile grade elevations should be labeled.

### 6.11 InRoads Performance Tips

While working with InRoads, DGNs have a tendency to become bloated due to many of the automate processes that occur during day to day use of the software. To alleviate some of these issues that result in poor performance, these items should be tried prior to contacting CAD Support.

1. Make sure the appropriate seed files are being used. These files can be found at [pw:\dotwise.indot.in.gov:DOTWise\Documents\Template Documents\Seed\InRoads\](http://pw:\dotwise.indot.in.gov:DOTWise\Documents\Template Documents\Seed\InRoads\). These seed files are configured without Design History enabled to prevent the historical recording of subsequent display commands, and to maintain a manageable file size.
2. Compress DGNs regularly. Again, displaying items repeatedly can also build up in the DGN buffer, which can be alleviated by using the File -> Compress -> Design and Options items in MicroStation. It's advised to perform both types of compression, and enabling all features on the options panel, as each function removes cached items from the DGN.
3. After performing any plans production operations (plan profile sheets, cross sections, etc.) that place sheets in the base drawing, consider the following:
  - a. Detach any unneeded references (borders, etc.)
  - b. Delete and compress out any unneeded elements.

- c. Remove tag sets (Element -> Tags -> Define), highlight the each tag set and select Remove
4. Isolate long sets of cross sections, dispose of draft copies when possible.

By performing these operations throughout the design process, performance will be increased by minimizing the amount of data in a single DGN. Additionally, this will limit the number of instances of ProjectWise title block integration that must be resolved prior to a DGN becoming available to use once open.

# 1. Appendices

## 1.1 Appendix A - Accessing CAD Support Help Site

### 1.1-1 Overview:

The CAD Support SharePoint site has had some changes over the last few years. This site is where CAD Support has and will continue to provide needed information to our users. The Training Calendar, Support Personnel Contact Information, Important Links and also Announcements can be found on the main page. The site is fairly self explanatory and easy to navigate.

Located at:

<http://sharepoint.indot.in.gov/cadsite/default.aspx>

INDOT CAD Support

Home | INDOT Intranet | CAD Training Videos | InRoads Transition | Issues and Resolutions Tech Notes

View All Site Content

**Documents**

- FAQs/Manuals
- PEER Group Information

**Sites**

- Training Calendar
- InRoads Transition

**Links**

- Announcements

**Discussions**

- CAD Application Discussion

**Recycle Bin**

INDOT CAD Support Portal - Information, FAQs, Training, and other CAD related information

**Training Calendar**

INDOT CAD TRAINING

**CAD Support Personnel**

Last Name	First Name	Business Phone	E-mail Address	Notes	Job Title
Carr	Greg	234-0179	gcarr@indot.in.gov	Application Support-MicroStation-ProjectWise-Workspace, DamageWise	CAD Specialist / Analyst
Kuhn	Jason	234-2485	jkuhn@indot.in.gov	Application Support-MicroStation-MX, InRoads-Workspace-ProjectWise-Sharepoint	CAD Specialist/ Analyst
Robson	Scott	232-5179	srobson@indot.in.gov	Application Support-MicroStation-ProjectWise-Workspace, DamageWise	CAD Specialist/ Analyst

**Important Links**

- ACEC of Indiana
- American Society of Civil Engineers
- Bentley Learning Network
- BE Communities
- Bentley FAQ page
- CAD listserv
- Consultant Workspace
- GIS Page
- Map Insert Page
- Peoplesoft
- Real Time Traffic Info
- State Board of Registration for Professional Engineers
- Web Mail

**Announcements**

- InRoads Support** by Robson, Scott (INDOT) 1/3/2011 8:33 AM  
2.) InRoads Support - Due to the high volume of tickets, along with the continued number of courses being taught, we will be utilizing Bentley's Tech Support Group (TSG) to provide timely support for some issues. As we receive tickets, we may request...
- CAD Support 2011 Update** by Robson, Scott (INDOT) 1/3/2011 8:29 AM  
With a new year, comes some changes to how CAD Support will be able to serve you in the coming year. Any issues you have that aren't discussed here, please contact CAD Support with your questions.  
1.) Training Offerings - As was the case in...
- InRoads Training Schedule posted to InRoads Transition Calendar** by Robson, Scott (INDOT) 1/3/2011 8:27 AM  
This is subject to change. Please get with your Manager about signing up for the classes. Please be sure you can attend all classes with the group you sign up for.  
<http://sharepoint.indot.in.gov/cadsite/inroads/Lists/Calendar/Calendar.aspx>
- Vaulted emails in ProjectWise 0** by Robson, Scott (INDOT) 1/3/2011 8:27 AM  
Click Here for: Vaulted email instructions for ProjectWise
- Please make sure you are pointing to the new Plot Server out (INDOTgs) 0** by Robson, Scott (INDOT) 1/3/2011 8:27 AM  
All, you will need to update all your plot sets to use the HPQuest's provided on server: DOT\CAD\PS3PW, as instructed by your ProjectWise 2.0 update documentation. Information on attaching the new plotter definitions provided by the IOT is attached. If you...  
(More Announcements...)

CAD Support Website

## 1.2 Appendix B - Naming Conventions

Good naming is required to alleviate many problems when sharing data. The following are recommended names for various design resources.

**Note:** Throughout Appendix B, LineA is used to indicate a generic alignment

### 1.2-1 InRoads DTM Names

Uniform model naming is necessary to insure consistency between users and to allow for continuity when projects are passed from one designer to another, or when multiple designers work on the same project. The following list is compiled based on historically used models/surfaces at INDOT.

<b>DTM Name</b>	<b>Contents</b>
Des	Proposed design Strings
Des LineA	Proposed design Strings for line LineA
Des Alignments	Proposed Alignments
Des Culvert	Box & Three Sided Culverts Structures
Des Pipes	Drainage Culverts Structures
Des Drive	Drives (if separated from other design strings)
Des Subgrade LineA	Subgrade model for line LineA
Des TEMP RUNAROUND	Temporary Runaround Strings
Underdrain LineA	Underdrains
Hydraulic Surface LineA	Ditches
Sections LineA	Cross Sections for line LineA
Survey alignment	Alignments Created by Survey Unit
Volumes LineA	Volumes calculated along LineA
Topo	Existing Topography information from Survey (provided by the Survey Unit)
Topotria	Triangulated Topo model
Excont	Existing Contours (provided by the Survey Unit)
Prcont	Proposed Contour Models
Merge LineA	Model containing design strings from LineA and topo strings outside the limits of the design
<b>Alternate Naming, Used for larger more complex projects</b>	
Des Roads	Contains Proposed Design strings for all alignments
Des Final	Contains all proposed design strings with all gaps and editing completed
Merge Roads	Model containing design strings from all alignments and topo strings outside the limits of the design
Merge Final	Model containing design strings from all alignments and topo strings outside the limits of the design

**Note:** *Not every project will need every type of suggested model nor is the user restricted to only create the models listed above. Many additional temporary models can be created while using the GUI.*

### **1.2-2 MicroStation Drawing Names**

Note: Please abbreviate .dgn names as needed using the INDOT standard abbreviations

i.e. Sht – Sheet, MOT - Maintenance of Traffic,

**nn** is used to denote the drawing number for drawings with multiple sheet numbers 001, 002, 003, etc.

Tables begin on the next page:

<b>Description</b>	<b>Drawing File Name</b>	<b>Examples</b>
<b>Road Project</b>		
Title Sheet	Sht Title.dgn	
Drawing Index and General Notes	Sht Index.dgn	
Typical Cross Sections	Sht Typical nn.dgn	Sht Typical 07.dgn
Survey Route (Plat No. 1)	Sht Plat1 nn.dgn	Sht Plat1.dgn Sht Plat1 05.dgn
Survey Route Plat with Aerial Photography (Plat No. 3)	Sht Plat3 nn.dgn	Sht Plat3.dgn Sht Plat3 05.dgn
Geometric Tie-Up	Sht Geometric Tie nn.dgn	Sht Geometric Tie.dgn Sht Geometric Tie 01.dgn
Traffic Maintenance Details	Sht MOT nn.dgn	Sht MOT 02.dgn
Plan and Profile	Sht PlanProfile_scale_nn.dgn	Sht PlanProfile_50_01.dgn
Superelevation-Transition Diagram	Sht Super nn.dgn	Sht Super.dgn Sht Super 01.dgn
Details		
Construction Details	Sht Const Detail_scale_nn.dgn	Sht Const Detail_30_01.dgn
Intersection Details	Sht Intersection_scale_nn.dgn	Sht Intersection_30_01.dgn
Spot Elevation Details	Sht Spot Elev nn.dgn	Sht Spot Elev.dgn Sht Spot Elev 01.dgn
Channel Details	Sht Channel nn.dgn	Sht Channel 01.dgn
Geometric Details	Sht Geom Detail nn.dgn	
Right-of-Way Details	Sht ROW Detail nn.dgn	Sht ROW Detail.dgn Sht ROW Detail 01.dgn
Grading Plan	Sht Grading_scale_nn.dgn	Sht Grading_30_01.dgn
Drainage Details	Sht Drainage nn.dgn	Sht Drainage 01.dgn
Erosion and Sediment Control Details (plan view)	Sht TEC_scale_nn.dgn	Sht TEC_30_01.dgn
Retaining Wall Details	Sht Retaining Wall nn.dgn	Sht Retaining Wall.dgn Sht Retaining Wall 01.dgn
Wetland Mitigation Details	Sht Mitigation_scale_nn.dgn	Sht Mitigation_30_01.dgn
Traffic-Work Details		
Signs (if separate traffic-sign plans are not required)	Sht Signs nn.dgn	Sht Signs.dgn Sht Signs 01.dgn
Signals	Sht Signal_scale_nn.dgn	Sht Signal_30_02.dgn
Lighting (if separate lighting plans are not required)	Sht Lighting nn.dgn	Sht Lighting.dgn Sht Lighting 01.dgn
Pavement Markings	Sht Pvmt Markings_scale_nn.dgn	Sht Pvmt Markings_30_03.dgn
Road Summary Sheet	Sht Road Summary.dgn	

<b>Description</b>	<b>Drawing File Name</b>	<b>Examples</b>
<b>Bridge Project</b>		
Title Sheet	Sht Title.dgn	
Index	Sht Index.dgn	
Typical Cross Sections	Sht Typical Cross Sections.dgn	
Traffic Maintenance Details	Sht MOT nn.dgn	Sht MOT 02.dgn
Temporary Runaround Details	Sht Runaround_scale_nn.dgn	Sht Runaround_50_02.dgn
Road Plan and Profile	Sht PlanProfile_scale_nn.dgn	Sht PlanProfile_50_01.dgn
Superelevation-Transition Diagram	Sht Super nn.dgn	Sht Super.dgn Sht Super 01.dgn
Roadway Details (see Road Plan sheets)		
Traffic-Work Details (see Road Plan sheets)		
Soil Borings	Sht Borings TB nn.dgn	Sht Borings TB 01.dgn
Channel Change Layout	Sht Channel nn.dgn	Sht Channel 01.dgn
Layout	Sht Layout_scale_nn.dgn	Sht Layout_30_01.dgn
General Plan	Sht General Plan.dgn	
Structure Details	Sht Structure.dgn	
Abutment/Bent/Pier Details	Sht End Bent Details nn.dgn Sht Pier No x nn.dgn	Sht End Bent Details 02.dgn Sht Pier No 2 and 3 01.dgn
Framing Plan	Sht Framing Plan.dgn	
Structural Steel Details or Precast-Concrete Beam Details	Sht Beam Details nn.dgn	Sht Beam Details 01.dgn
Bearing Details	Sht Bearings.dgn	
Superstructure/Floor Details	Sht Superstructure nn.dgn	Sht Superstructure 02.dgn
Railing Details	Sht Railing Details.dgn	
Screeds	Sht Screed nn.dgn	Sht Screed 02.dgn
Reinforced-Concrete Bridge Approach Details	Sht Approach Slab Details nn.dgn	Sht Approach Slab Details 02.dgn
Bridge Summary	Sht Bridge Summary.dgn	
Road Summary	Sht Road Summary.dgn	
Pipe Materials	Sht Materials.dgn	
Cross Sections	Sht Xsec_scale_nn.dgn	Sht Xsec_50_03.dgn

<b>Description</b>	<b>Drawing File Name</b>	<b>Examples</b>
<b>Traffic-Signs Project</b>		
Title Sheet	Sht Title.dgn	
Index and General Notes	Sht Index.dgn	
Signing Plan	Sht Signing Plan.dgn	Sht Signing Plan01.dgn
Sign Layout	Sht Sign Layout.dgn	Sht Panel Sign Layout 01.dgn / Sht Sheet Sign Layout 01.dgn
Cross Sections	Sht Sign Cross Sections.dgn	
Sign Summary	Sht Panel Sign & Post Summary.dgn Sht Sheet Sign & Post Summary.dgn	Sht Panel Sign & Post Summary 01.dgn Sht Sheet Sign & Post Summary01.dgn
Footing Details	Sht Signal Footing Details.dgn	
Structural Details	Sht Structural Details.dgn	
<b>Signalization Project</b>		
Title Sheet	Sht Title.dgn	
Index and General Notes	Sht Index.dgn	
Signal Plan	Sht Signal Plan.dgn	Sht US 41 & SR 57 Signal Plan.dgn
Signal Details	Sht Signal Details.dgn	
<b>Lighting Project</b>		
Title Sheet	Sht Title.dgn	
Index and General Notes	Sht Index.dgn	
Lighting Plan	Sht Lighting Plan.dgn	
Cross Sections	Sht Lighting Cross Sections.dgn	
Lighting Details	Sht Lighting Details.dgn	

<b>Standard Base Drawings</b>		
Drawing Names / Logical Names	Descriptions / Reference Descriptions	Examples
Survey Alignment	Survey Centerline	Survey Alignment.dgn
Survey Section Corner	US Government Section Corners	Survey Section Corner.dgn
Survey Contours	Survey Existing Contours	Survey Contours.dgn
Survey Topography	Survey Existing Topography	Survey Topography.dgn
Survey Triangulation	Existing Triangulation	Survey Triangulation.dgn
Explan scale	Design Existing Topography	Explan 50.dgn Explan 100.dgn
Excont scale	Survey Existing Contours	Excont 50.dgn Excont 100.dgn
Prplan scale	Proposed Design Strings	Prplan 50.dgn Prplan 100.dgn
Prcont scale	Proposed Contours	Prcont 50.dgn Prcont 100.dgn
RW Existing scale	Existing Right of Way	RW Existing 50.dgn RW Existing 100.dgn
Annotate Alignment mcac scale	Proposed Alignment Annotation	Annotate alignment mcac 50.dgn Annotate alignment mcac 100.dgn
Annotate Survey Alignment mcac scale	Survey Alignment Annotation	Annotate survey alignment mcac 50.dgn
Annotate station offset mcac scale	Annotation of Survey points with station and offset	Annotate station offset mcac 50.dgn
Annotate survey points mcac scale	Annotation of Survey points	Annotate survey points mcac 50.dgn

<b>Standard Sheet Drawings</b>		
Drawing Names	Descriptions	Examples
Planprofile mcac scale n	Plan & profiles drawings	Planprofile mcac 50 001.dgn PlanProfile mcac 50 002.dgn PlanProfile mcac 50 n.dgn
Layout mcac scale n	Bridge layout sheet	Layout mcac 50 001.dgn Layout mcac 50 002.dgn Layout mcac 50 n.dgn
Const det mcac scale n	Construction details drawings	Const det mcac 50 001.dgn Const det mcac 50 002.dgn Const det mcac 50 n.dgn
Pvmt Markings scale n	Pavement marking details	Pvmt Markings 50.dgn Pvmt Markings 50 01.dgn Pvmt Markings 50 02.dgn Pvmt Markings 50 n.dgn
Runaround mcac scale n	Temporary Runaround plan profile drawings.	Runaround mcac 50 001.dgn Runaround mcac 50 002.dgn Runaround mcac 50 n.dgn
TEC det mcac scale n	Temporary Erosion Control details	TEC det mcac 50 01.dgn TEC det mcac 50 02.dgn TEC det mcac 50 n.dgn
Intersection Det scale n	Intersection details	Intersection det 50 n.dgn

For Sheets created by InRoads, the pertinent Plan Profile Generator Preference should set the default naming appropriately. If this name is incorrect, adjust as necessary.

For all of the above InRoads created sheets, the alignment name, scale, & sheet number indicates which alignment, scale, & sheet number is reflected. Following this convention will allow easy differentiation between alignments and scales.

## 1.3 Appendix C - MicroStation Libraries

### 1.3-1 DGN Library

A DGN library is a DGN file used to store:

- Text styles
- Dimension styles
- Levels (Filters)
- Models

These are shared within the workgroup as standards. A DGN library is sometimes referred to as a DGN lib (pronounced with a long 'i'). The recommended file extension for this file is \*.dgnlib. Cells/Models, dimension styles, levels, and text styles are created in a DGN library using MicroStation tools, the same way they are created in a DGN file. INDOT DGN libraries are now automatically attached as part of the ProjectWise Managed Workspace. Be aware that if you're not working out of ProjectWise, INDOT specific tools, levels, and customizations will not be available to you.

### 1.3-2 Text Styles

#### 1.3-2a What is a Text Style?

MicroStation supports text styles and provides an interface for constructing text using available system fonts and a wide variety of text attributes. A text style comprises a group of text attributes, such as font type, width, height, and color. Text styles enable you to place text within a model in a consistent and automated manner.

The following fonts are supported natively in MicroStation:

Traditional MicroStation fonts

TrueType fonts

AutoCAD Shape fonts (.shx)

*Tip1.* Fonts are not embedded in the DGN file.

*Tip2.* If a specific font is not found on the system, MicroStation substitutes font #127, Fast Font.

*Tip3.* If a Text Style changes in a Text Style library, Text Styles placed in DGN files prior to the change are not automatically updated in the DGN files. To update a DGN file to reflect the changes in the Text Style library, use the dgnlib update text styles from the text styles dialog.

#### 1.3-2b INDOT Text Styles

Text styles at INDOT have been changed in this new workspace to be more in line with their size and use rather than related to the section of INDOT as in previous workspaces. With the release of this version of the workspace, INDOT has now standardized on the use of Tahoma as the primary font used, except in limited circumstances.

You will notice that the Text Styles are now using only True Type fonts. This gives us more flexibility with Bold and Italics settings. The Bentley fonts will only be provided where necessary and will not be available for new projects. The following tables will show you the settings for each Text Style.

<b>Text Style Name</b>	<b>Font</b>	<b>Height (in.)</b>	<b>Width (in.)</b>	<b>Notes/Guidelines for Use</b>
<b>Text Styles for D-Size Plan Sheets</b>				
10 Point Text	Tahoma	0.10	0.10	May be used for table data.
10 Point Text (Existing Elevations)	Tahoma	0.10	0.08	(Italic, Color 222) Use for existing-grade elevations on grid of plan and profile view.
10 Point Text (Survey Text)	Arial Narrow	0.10	0.10	(Color 225) Use for selected survey text.
12 Point Text	Tahoma	0.12	0.12	Use for text callouts, dimensions, and notes. Minimum size for text placed on D-size plans other than text specified under 10 Point Text.
14 Point Text	Tahoma	0.14	0.14	Use for selected text on title block, view subtitles, and column headings in tables.
14 Point Text (Property Owners)	Bookman Old Style	0.14	0.14	Use for parcel-owner text only.
18 Point Text	Tahoma	0.18	0.18	Use for detail and section titles, and table titles on detail sheets.
30 Point Text	Tahoma	0.30	0.30	Use for selected text on title sheet of plans.
<b>Text Styles for Ltr-Size Plan Sheets</b>				
6 Point Text	Tahoma	0.06	0.06	May be used for table data, existing-grade elevations on grid of plan and profile view, and selected survey text.
7 Point Text	Tahoma	0.07	0.07	Use for selected text on title block, column headings in tables, and parcel-owner text.
7 Point Text (Survey Text)	Arial Narrow	0.07	0.07	(Color 222) Use for selected survey text.
9 Point Text	Tahoma	0.09	0.09	Use for text callouts, dimensions, notes, column headings in tables, and parcel-owner text. Minimum size for all text placed on letter-size plans, other than text specified under 6 Point Text.
12 Point Text	Tahoma	0.12	0.12	Use for selected text on title sheet of plans.
14 Point Text	Tahoma	0.14	0.14	Use for detail and section titles, and table titles on detail sheets.

**NOTES:**

1. All styles are set to 0.65 (exact) line spacing.
2. All styles are Center-Center justified initially.
3. All styles are non-bold and non-italic and should remain so unless indicated otherwise above.

(Values in the preceding chart are representative of a 1 to 1 scale)

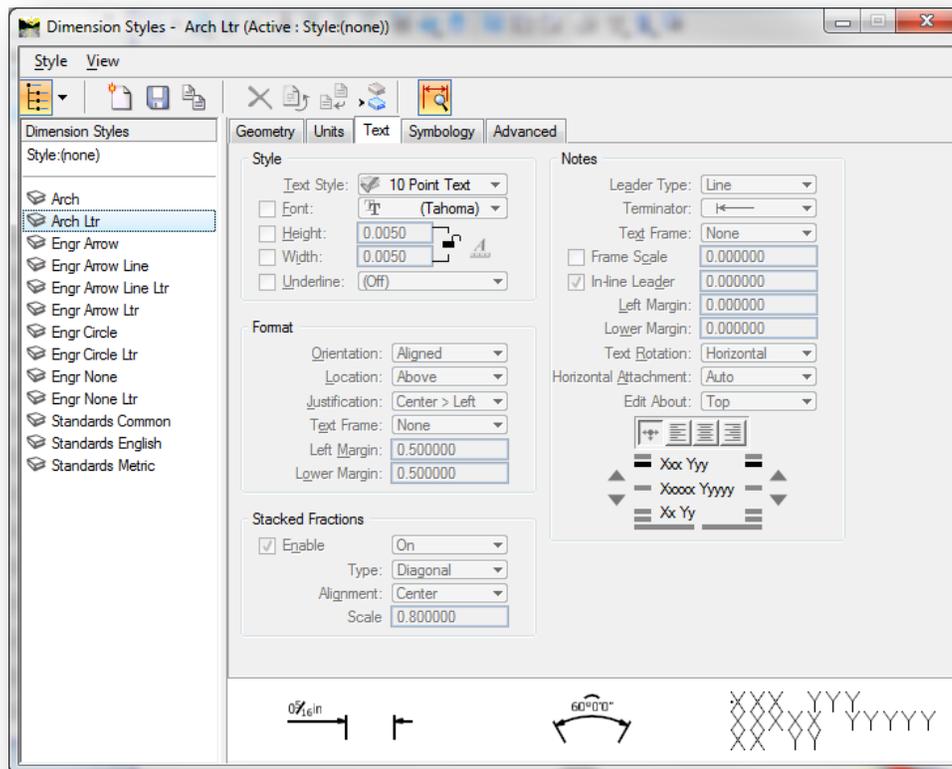
There are additional styles provided from the Bentley default configuration. These named styles come from the PrintPreparation.dgnlib and are not used in the INDOT workflow.

### 1.3-3 Dimension Styles and Settings

MicroStation dimension styles allow you to save dimension settings by name. This allows for greater unity between groups of dimensions in the file, as several different styles can be used for various models or portions of a model. Dimension styles are managed through the Dimension Styles Settings dialog box.

#### 1.3-3a INDOT Dimension Styles

As with Text Styles we have made significant changes to our Dimension Styles at INDOT. The first change you will notice is the Dimension Styles Settings dialog box is different. It gives the users more options and breaks the settings down into categories like Geometry, Units, and Text. There is also a preview window at the bottom allowing you to preview the style prior to using it. We have combined all of the old V8 Dimension Styles into 13 styles (4 for full size sheets, 4 for letter size sheets, 2 for architectural sheets, and 3 for standards drawings). These Dimension Styles relate to the size of text and are linked to the appropriate Text Style. The following tables will show you the settings for each Dimension Style.



Text Styles

<i>Dimension Style Name</i>	<i>Text Style</i>	<i>Units</i>	<i>Notes / Settings</i>
<b><i>Dimension Styles for D-Size Plan Sheets</i></b>			
Arch	12 Point Text	MU label-SU label, round to nearest 1/16	Arrow terminator, no text frame
Engr Arrow	12 Point Text	MU label, round to nearest 0.01	Arrow terminator, no text frame
Engr Arrow Line	12 Point Text	MU label, round to nearest 0.01	Arrow terminator, line text frame
Engr Circle	12 Point Text	MU label, round to nearest 0.01	Circle terminator, no text frame
Engr None	12 Point Text	MU label, round to nearest 0.01	No terminator, no text frame
<b><i>Dimension Styles for Ltr-Size Plan Sheets</i></b>			
Arch Ltr	9 Point Text	MU label-SU label, round to nearest 1/16	Arrow terminator, no text frame
Engr Arrow Ltr	9 Point Text	MU label, round to nearest 0.01	Arrow terminator, no text frame
Engr Arrow Line Ltr	9 Point Text	MU label, round to nearest 0.01	Arrow terminator, line text frame
Engr Circle Ltr	9 Point Text	MU label, round to nearest 0.01	Circle terminator, no text frame
Engr None Ltr	9 Point Text	MU label, round to nearest 0.01	No terminator, no text frame

NOTES:

1. All styles are set to use Working Units.
2. All styles are set to Dynamic Justify text notes.

*(Values in the above chart are representative of a 1 to 1 scale)*

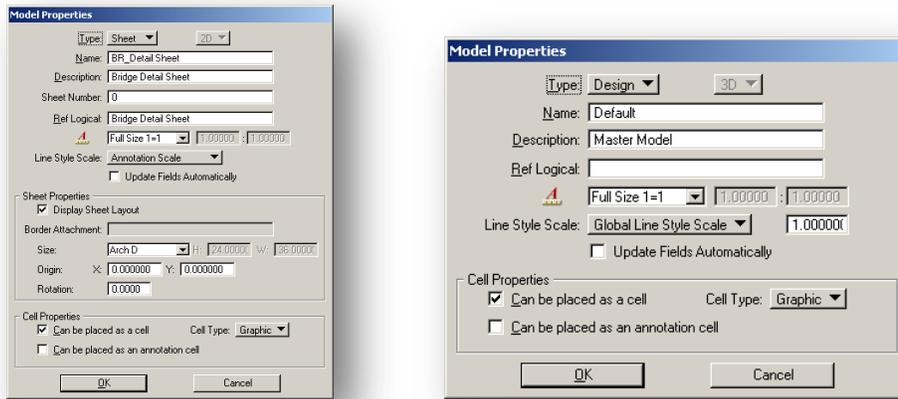
## **1.4 Appendix D - MicroStation Advanced References**

### **1.4-1 Models**

A Model gives you the ability to store multiple independent sets of design data within the same file.  
*(For additional information on models, see Chapter 6 of the V8 Update manual)*

*(See Appendix H for Model – Sheet Use chart and proper model names)*

## 1.4-1a Model Properties



Model Properties dialog box for Design (left) and Sheet (right)

### Type

Sets the model's type (Design or Sheet) and dimensionality (2D or 3D).

### Name

Sets the model's name.

### Description

Sets the model's description.

### Ref Logical

Sets the Reference Logical name for the model. The logical name identifies the model when the DGN file is attached to another file as a reference (see the Reference Attachment Setting dialog box).

### Annotation Scale

The Annotation Scale icon displays the status of the Annotation Scale lock: on or off. When placing text, the lock must be on to ensure that text is placed at the defined scale.

The option menu sets the scale for text and dimensioning in the model. You can select from a list of common scales, or select CUSTOM and input your own scale in the fields immediately to the right. Additional scales have been enabled in the Managed Workspace.

Switching to InRoads has changed philosophy in regards to the use of annotation scale. Any non-InRoads sheet will continue to use these tools, however those sheets generated either with the Plan and Profile Generator and those created from the Cross Sections tools are maintained a 1:1 scale with the borders scaled up to the data. In these instances, all features including linestyles are scaled independently of the Annotation Scale settings.

### ***Display Sheet Layout***

(Sheet Model only) If on, a sheet element will display in the new sheet model.

### ***Size***

(Sheet Models only) Sets the sheet size. Standard sheet sizes are available from the drop-down menu, or you can select Custom and input your own size values in the H and W fields. The H and W fields are disabled when a standard sheet size is chosen.

### ***Origin***

(Sheet Models only) Sets the origin of the sheet.

### ***Rotation***

(Sheet Models only) Sets the rotation angle of the sheet, measured in degrees counter-clockwise from the x-axis (horizontal).

### ***Can be placed as a cell***

If on, it is possible to place the model as a cell. (Should be checked by default)

### ***Cell Type***

Sets the cell type (Graphic or Point). This option menu is enabled only if Can be placed as a cell is on.

### ***OK***

Accepts the changes and closes the dialog box.

### ***Cancel***

Closes the dialog box without making any changes.

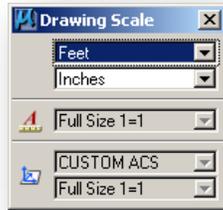
## **1.4-2 Drawing Scale**

The Drawing Scale window is used to adjust drawing scale settings. These settings are particularly relevant to the process of creating sheet models for drawing production.

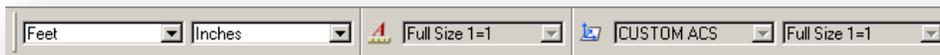
To open the Drawing Scale window, navigate to ***MicroStation > Settings > Drawing Scale.***

### ***Drawing Scale window***

The Drawing Scale window is a dockable window that contains controls for viewing and/or modifying working units, the annotation scale factor, and the Annotation Scale Lock.



**Drawing/Annotation Scale Dialog**



**Drawing/Annotation Scale Docked**

The units that display in the Master Units and Sub Units option menus can be customized by editing the file "units.def". The scale factors that display in the annotation scale option menu can be customized by editing the file "scales.def" (do not attempt to edit this file).

*The selection of controls displayed in the Drawing Scale window can be customized by right-clicking in the window. The technique is the same as that for showing and hiding tools in tool boxes.*

#### **Master Units (option menu)**

Sets the Master Units component of working units.

#### **Sub Units (option menu)**

Sets the Sub Units component of working units.

#### **Annotation Scale (option menu)**

Sets the annotation scale factor.

#### **Annotation Scale (Icon)**

Sets the Annotation Scale Lock. When this lock is on, the annotation scale is applied to any text that is placed in the model.

#### **Scaling Definitions**

The following charts represent the scales defined in the scales.def file.

*The scales in this chart are to be used on metric sheets or US sheets (straight ratio) as well as metric base drawings when setting the annotation scale.*

Scale Name	Scale Factor
Full Size 1=1	1:1
6"=1'-0"	2:1
3"=1'-0"	4:1
1 1/2"=1'-0"	8:1
1"=1'-0"	12:1
3/4"=1'-0"	16:1
1/2"=1'-0"	21:1
3/8"=1'-0"	32:1
1/4"=1'-0"	48:1
3/16"=1'-0"	64:1
1/8"=1'-0"	96:1
1/16"=1'-0"	192:1
1/32"=1'-0"	384:1
1"=10'	120:1
1"=20'	240:1
1"=30'	360:1
1"=40'	480:1
1"=50'	600:1
1"=60'	720:1
1"=100'	1200:1
1"=200'	2400:1
1"=300'	3600:1
1"=400'	4800:1
1"=500'	6000:1
1"=600'	7200:1
1"=1000'	12000:1

### 1.4-3 Reference Files and Models

With the emphasis of the use of Models at INDOT it is very important to understand how they are used and can be referenced within a dgn (self referencing) and to another DGN and back (Cyclical referencing).

#### 1.4-3a Using References

Elements in a reference display as though they were in the active model. Although you cannot manipulate the elements in a reference, you can snap to them and even copy them into the active model.

The most common usage of references is in the creation of design compositions. Design compositions are used by engineers and other technical professionals to communicate through the visual content of their designs.

To create a **design composition** using MicroStation, you build a design model consisting of a working collection of references used in the performance of particular engineering tasks. For example, you may attach as references a collection of survey points as a guide for placement of additional geometry. Reference attachments in a design composition are usually coincident.

It is sometimes convenient to refer to one part of a model while drawing in another area by attaching the active model to itself.

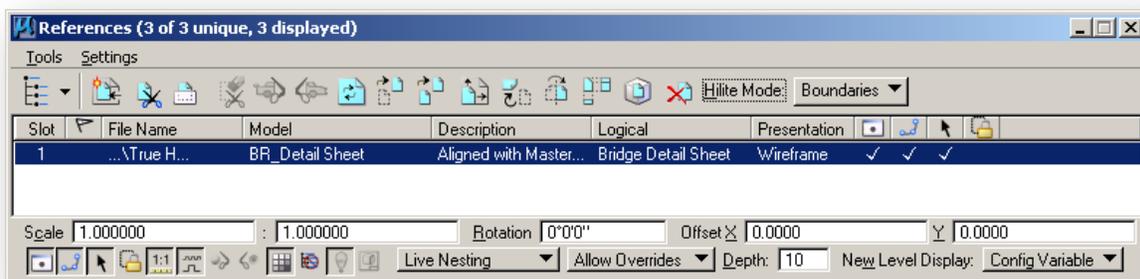
You can attach a redline file created using Bentley Redline to your model for reviewing purposes.

Another common usage of references is in the creation of drawings for publication. This task is called drawing composition. Whereas a design composition is typically contained in a design model, a drawing is composed in a sheet model. Attaching references

The most common way to attach a reference is to attach it coincidentally, which means that the coordinates of the referenced model's design plane and optionally its Global Origin are aligned with those of the active model, without any rotation, scaling, or offset.

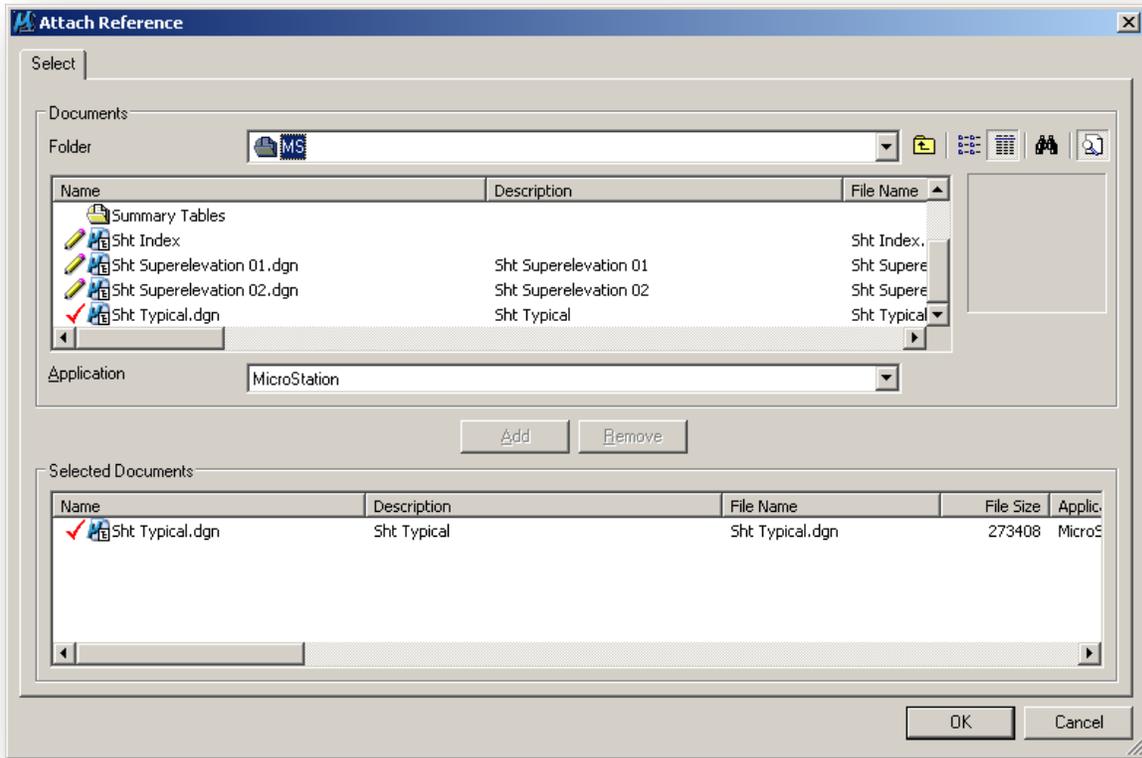
To attach a reference coincidentally

From the File menu, choose Reference. (The References dialog box opens.)



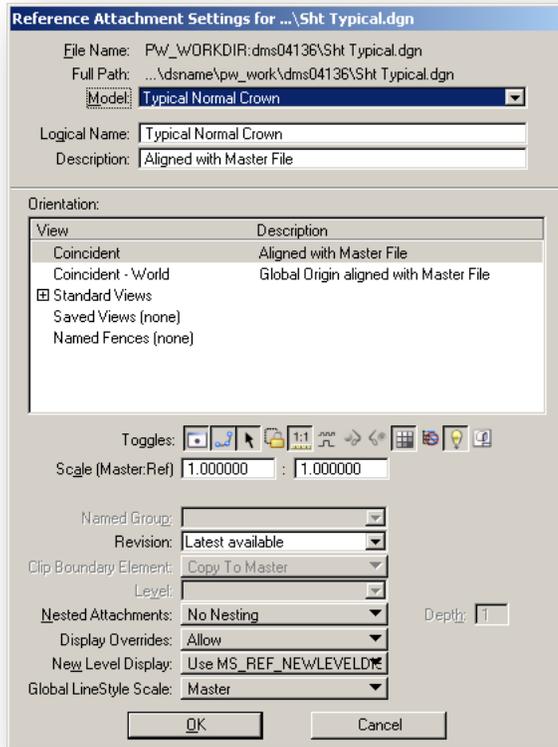
### References Dialog

1. From the dialog box's Tools menu, choose Attach. Or In the Reference dialog box, right-click in the list box and choose Attach from the pull down menu. (The Attach Reference dialog box opens.)



### ProjectWise Attach Reference Dialog

2. Select the DGN file that contains the model to attach as a reference and click ADD and then click OK. (The Attach Reference Settings dialog box opens.)



### Reference Attachment Settings

3. (Optional) From the Model option menu, choose the model to attach.
4. The default is the reference's master model.
5. (Optional) (*unless the selected model is already attached*) In the Logical Name field, key in a brief name for the attachment.
6. (Optional) In the dialog box's Description field, key in a description of the model.
7. To align the reference with the active model with regard to both Global Origin and design plane coordinates, select Coincident - World in the Orientation list box. This option is available only when referencing a model in a DGN file. Or To align the reference with regard to design plane coordinates only, select Coincident in the Orientation list box.
8. (Optional) In the Scale (Master:Ref) fields, define the ratio of the active model's Master Units to the referenced model's Master Units. For example:

To set	Left	Right
One active model master unit per referenced model master unit (the default).	1	1
Five active model master units per referenced model master unit.	5	1

*Since the same model can be attached many times, give the references logical names and descriptions that help you remember which reference is which.*

For further discussion on using reference manager please refer to Chapter 8 of the *Bentley Institute Course Guide, MicroStation V8 XM Edition User*.

Since the same model can be attached many times, give the references logical names and descriptions that help you remember which reference is which.

### 1.4-3b Working with nested references

When a MicroStation design file used as a reference has its own attachments, they become nested references. The links between these files can be maintained through many levels (depths) of nesting, so that if you open only one file, you can view the contents of many files. The individual references can be updated, and the changes will be shown in the master (or parent) file. When you attach a parent reference to your model and turn on live nesting, you can also control how many levels of nested references are attached to the model.

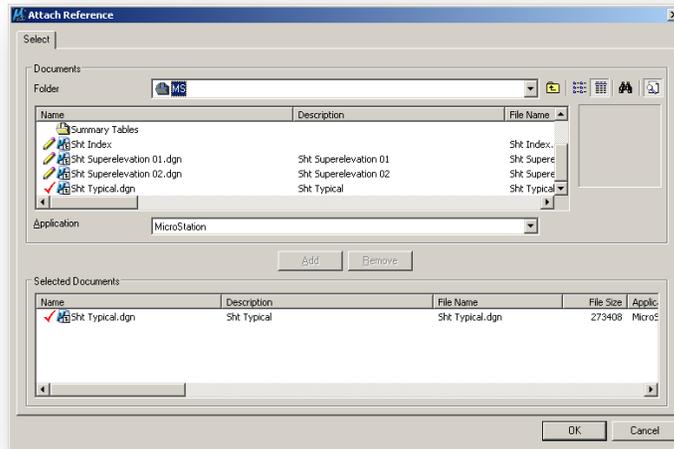
#### To attach a reference with live nesting

1. In the Primary tool box, click the References icon. (The Reference dialog box opens.)



#### References Dialog

2. In the dialog box's tool bar, select the Attach Reference tool. (The Attach Reference dialog box opens.)



### ProjectWise Attach Reference Dialog

3. Select the DGN file that contains the model to attach as a reference, and click OK. (The Attach References Settings dialog box opens.)
4. From the Nested Attachments options menu, choose Live Nesting.
5. The Nested Attachments options are only available when the selected model has reference attachments. When the Live Nesting option is on, the hierarchical structure of any nested references are maintained when attaching the parent reference to a model. In MicroStation, a nested attachment is displayed only if the child reference does not have its Ignore Attachment When Live Nesting setting turned on (in the Attachment Settings dialog box), and the parent reference has Live Nesting enabled.
6. In the Nest Depth field, enter a high value (for example, 10).
7. Set the depth setting to a high number to include even the most deeply nested references. Although the nested attachments will display in the view window, you will see only the parent reference in the References dialog box's list box.

#### **Nested Attachments**

Determines if referenced models attached to reference models (and, so on) are recognized when a model is attached to the active model.

- No Nesting — Models attached to the attached model are not recognized in the active model.
- Live Nesting — Models attached to the attached model are recognized in the active model.
- Copy Attachments — Models attached to the attached model copied into the active model.

When working in a DWG or DXF file, live nesting is always on, and there is no limit to nest depth. Therefore the Nested Attachments and Depth items are disabled. To control the display of nested attachments, use the Ignore Attachment When Live Nesting setting (on the Attachment Settings dialog box).

#### **Nest Depth**

Sets the number of levels of referenced models that are recognized. Models can have their own referenced models, which, in turn, can have more referenced models, and so on.

If Depth is set to 0, only the model is attached to the master model; referenced models in the referenced model are ignored.

MicroStation V8 includes the ability for live nesting of reference files. Essentially this means that referencing a file causes its children (and potentially their children) to be automatically referenced as well.

MicroStation allows two separate settings that control whether live nesting occurs. The first setting controls whether an attachment is displayed as a nested file. This setting is controlled through the "Ignore Attachment When Live Nesting" checkbox on the attachment settings dialog.

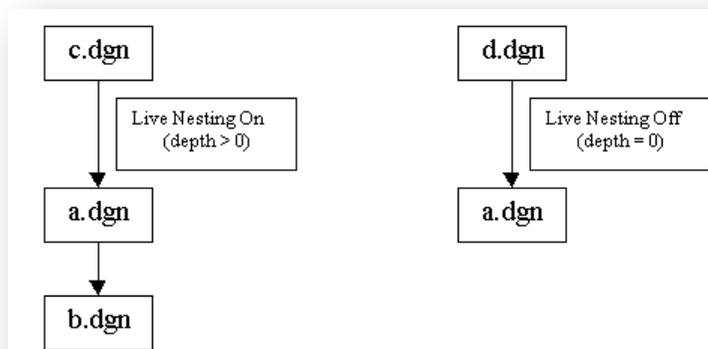
The second setting is subtly different than the "Ignore/Overlay" setting discussed above.

This setting controls whether children of a reference file are displayed at all and if they are displayed, the depth to which the children are nested.

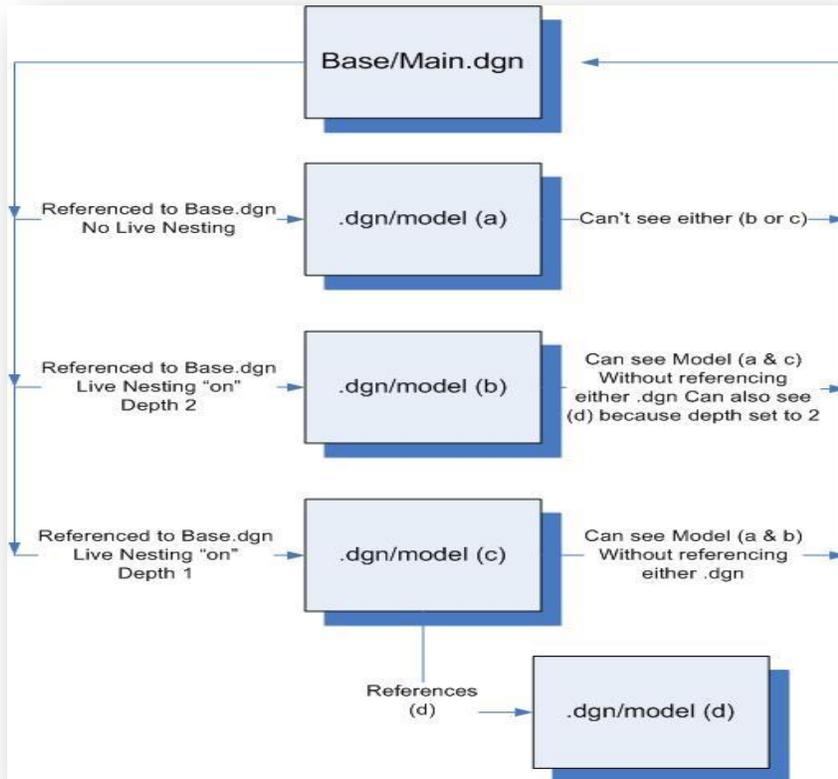
The difference is that the parent attachment controls whether the children are displayed rather than the children themselves controlling their nested display. In MicroStation, a nested attachment is displayed only if the child does not have its "Ignore When Live Nesting" setting on AND the parent has live nesting enabled.

At a quick glance it would seem that it would be possible to simulate MicroStation's parental control of nest depth by creating Overlays whenever a parent attachment disables live nesting. Unfortunately this is not possible. Consider the example below.

A MicroStation design file, a.dgn has a single reference, b.dgn that is attached as a standard attachment (not an overlay). In MicroStation it is possible to attach a.dgn as a reference and include the display of b.dgn (as in c.dgn) or to disable the display of children by turning off live nesting (as in d.dgn).



**Nested Reference Map**



**Circular Reference Map**

### 1.4.4 Levels

In the new unified workspace environment we have taken and combined the levels from all previous workspaces to eliminate redundancy and establish consistency throughout the agency. The total number of levels is now well over 650. Due to the large number of levels, Filters can be used to limit the level list to only those levels needed.

#### 1.4.4a Level Classifications

With the large number of levels that now exist in the INDOT CAD Workspace, a new level naming scheme has been created to assist in filter creation, and for consistent creation and categorization of levels.

Example: P\_RDWY\_Guardrail

- P\_ First Position Prefix, indicates that the level contains information related to Proposed work
- RDWY\_ Second Position Prefix, indicates that the level contains information related to Roadway Features
- Guardrail Brief Description, indicates that the level contains linework specifically related to Guardrail

The following table lists the new level classifications:

<i>First Position</i>	<i>Description</i>	<i>Second Position</i>	<i>Description</i>
G_	Ground Surface	SURF_	Surface Features
P_	Proposed	EW_	Earthworks Features
RW_	Right of Way	HY_	Hydraulics Feature
S_	Survey (TOPO)	RDWY_	Roadway Feature
XS_	Cross Section	ALG_	Alignment
CG_	COGO Points	BR_	Bridge Features
PROF_	Profile Features	CTRL_	Survey Control
ST_	Standards Drawings	DR_	Drainage Features
PP_	Plans Production	PROP_	Property Features
BD_	Border	RW_	Right of Way
		TOPO_	Topographical Features
		TRAF_	Traffic Features
		UTIL_	Utility Features
		G_	Graphical Feature
		TC_	Template Component
		E_	Existing Feature
		OBJT_	Object (Standards Only)
		ANNO_	Annotation (Standards Only)
		REFR_	Reference (Standards Only)
		TTLB_	Title Block (Standards Only)
		TXT_	Text
		SHT_	Sheet

#### **1.4-4b Level Filters**

Filters are a useful way to group associated levels for the purposes of viewing or not viewing as a group. For example, you might have a DGN file with several hundred levels. Within these levels could be filters for different disciplines such as Bridge and Traffic. Within Bridge there might be levels for proposed or existing elements. You could easily define a filter called Bridge that would show only levels that would be associated with Bridge work.

Filters can be named, saved, and recalled as needed or defined on-the-fly for immediate one-time viewing using the Filter Row in the Level Manager dialog box. Filters can be turned on or off using the Level Display dialog box. Filters can be used to turn on or off levels across a model and all of its attached models.

Levels can be filtered by a number of attributes such as filename, color, style, line weight, and level groups, to name a few. To display the levels that are defined in a filter select the Active Level filter button from the Attributes toolbar and select the filter of choice. This will display those levels only

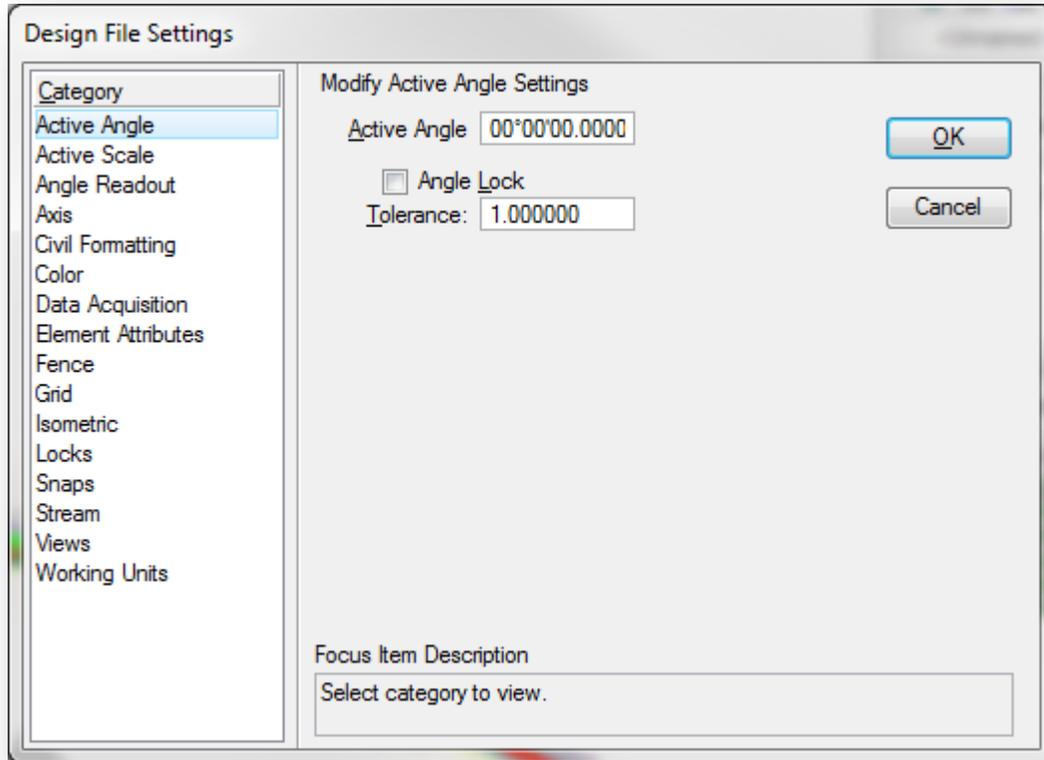
and turn off all other levels in the dgn. Note that the levels will not actually be turned on or off, but the ability to view them in the Level Display will be dictated by the filter selected.

DOTwise 3.1 now offers an updated set of filters for use within the CAD Workspace. Due to the updated level naming convention, levels are now filtered by categorization instead of rigidly defined level definitions. The following table explains the qualifications for the new filters:

<b>Filter Name</b>	<b>Description</b>
Bridge	Level name contains _BR_
Bridge - Existing	Level name starts with S_BR_
Bridge - Proposed	Level name starts with P_BR_
COGO	Level name starts with CG_
Cross Section Components	Level name starts with XS_TC_
Right of Way	Level name contains RW_
Right of Way - Existing	Level name starts with S_RW_
Right of Way - Proposed	Level name starts with RW_
Roadway	Level name contains _RDWY_
Roadway - Existing	Level name starts with S_RDWY_
Roadway - Proposed	Level name starts with P_RDWY_
Sheet Component	Level name contains BD_, PP_, XS_G_
Sheet Component - Border	Level name contains BD_
Sheet Component - Cross Section	Level name contains XS_G_
Sheet Component - Plans Production	Level name contains PP_
Standards	Level name starts with ST_
Survey	Level name starts with S_
Survey - Bridge	Level name starts with S_BR_
Survey - Drainage	Level name starts with S_DR_
Survey - Property	Level name starts with S_PROP_
Survey - Right of Way	Level name starts with S_RW_
Survey - Roadway	Level name starts with S_RDWY_
Survey - Surface	Level name starts with S_SURF_
Survey - Survey Control	Level name starts with S_CTRL_
Survey - TOPO	Level name starts with S_TOPO_
Survey - Traffic	Level name starts with S_TRAF_
Survey - Utilities	Level name starts with S_UTIL_
Triangulation and Contours	Level name starts with G_SURF_

### **1.4-5 Design File Settings**

Under Settings> Design File you will see the following screen



## Design Files

### ***Active Angle***

Sets the Active Angle — the angle, in degrees, used with tools that require an angle specification, including the Place Line, the Place Active Cell, the Place Text, the Rotate, and the Construct Array.

### ***Active Scale***

Consists of controls that are used to set the active scale factors and to toggle Scale Lock.

### ***Angle Readout***

Controls how coordinates are reported.

### ***Axis***

Consists of controls that are also available in the Locks dialog box. (Settings menu > Locks > Full)

Axis Lock: If on, each data point is forced to lie at an angle (or multiples of that angle) from the previous data point. The angle is specified by the (Axis) Increment relative to the (Axis) Start Angle.

### ***Civil Formatting***

Controls display of Civil Geometry functions and features.

### ***Color***

Consists of controls that are used to modify the color settings in the elements and the dynamic X pointer.

### ***Data Acquisition***

Defines Data Acquisition settings such as the active XIN in use, along with various file type operations. (Data Acquisition must be started for this panel to be active.)

### ***Element Attributes***

Color, line style, line weight, class, level, and fill.

### ***Fence***

Consists only of a control used to set the fence selection mode.

### ***Grid***

Consists of controls that are used to set Grid Lock and the grid's spacing and configuration.

### ***Grid Lock***

If on, each data point is forced to lie on the grid.

### ***Isometric***

If on, each data point is forced to lie on the Isometric Plane.

### ***Locks***

Consists of controls that are also available in the Locks dialog box.

**Text Node Lock:** If on, newly placed text is attached to empty text nodes, and you cannot place text if there aren't any empty text nodes.

**Level Lock:** If on, you can select elements only on the Active Level; you cannot manipulate elements that are not on the Active Level.

**Graphic Group:** If on, any manipulation performed on one member of a graphic group is automatically performed on all members.

If off, the member elements of a graphic group can be manipulated individually.

**Boresite:** (3D only) If on, you can select or snap to elements at any depth in the view cube.

If off, you can select (with a data point) only those elements that are at or very near the Active Depth. Still you can snap to elements at any depth.

ACS Plane: (3D only) If on, each data point is forced to lie on the Active ACS's xy plane ( $z=0$ ). Still you can snap to elements at any depth.

The Active ACS is set in the Auxiliary Coordinates System dialog box, which is opened by choosing Auxiliary Coordinates from the Utilities menu.

### ***Snaps***

Consists of controls that are also available in the Locks dialog box.

Association:

If on, an association point is created each time an element is snapped to: Dimensioning tools, the Place Multi-line tool, the Place Active Cell tool or Use Shared Cell.

ACS Plane Snap:

(3D only) If on, and AccuDraw is active, the first snap point is forced to lie on the Active ACS's xy plane ( $z=0$ ).

Depth Lock:

(3D Only) If on, each tentative point is projected along the view z-axis at the Active Depth.

### ***Stream***

Consists of controls that are used to set how data points are sampled while using the Place Stream Line String tool and the Place Point or Stream Curve tool.

Stream Delta:

Sets the minimum distance, in working units, between sampled points (vertices in the stream line string or curve).

When the distance between the pointer's location and the previously sampled point exceeds the Active Stream Delta, the point is sampled and the Tolerance, Stream Angle, and Stream Area are applied to see if a data point should be recorded.

Stream Tol(erance):

Sets the maximum distance, in working units, between recorded data points. The distance from the most recently recorded data point is checked for each sampled point. If that distance exceeds the active stream Tolerance, the sampled point is recorded as a data point.

### ***Views***

To edit Pixel width and Height in the corresponding view.

### ***Working Units***

The units in which the current dgn is working in.

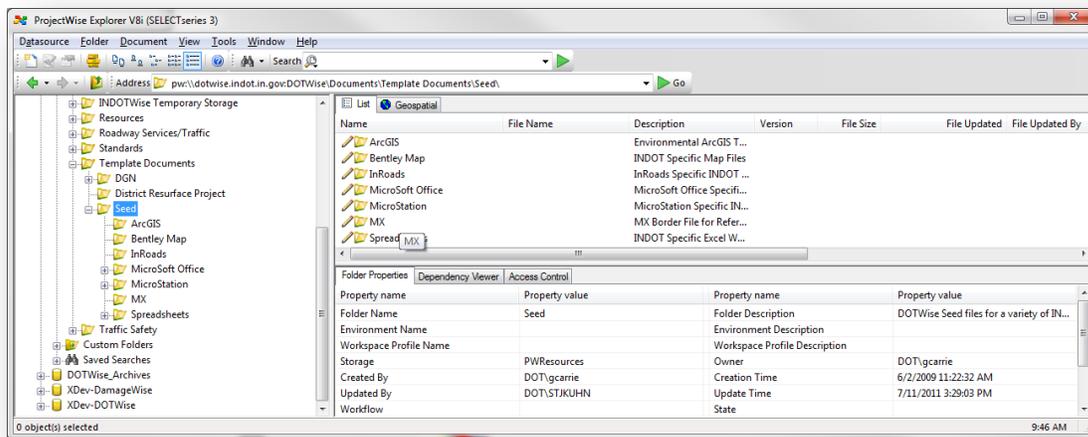
### 1.4-6 Seed Files – (Template Documents)

The following paragraph is quoted from the *Bentley Institute Course Guide* titled *ProjectWise V8 XM Edition User*.

“A ProjectWise template is the same as a Microsoft template, or a seed file in MicroStation. It is a file that is copied to create a new document. You can use a document stored in ProjectWise or document that resides outside ProjectWise as a template.”

All Seed files can be found under the [Template Documents\Seed](#) folder in ProjectWise. Each set of seed files (Template Documents) resides within a sub folder describing their specific use. (Example: MicroStation files are stored in the MicroStation folder).

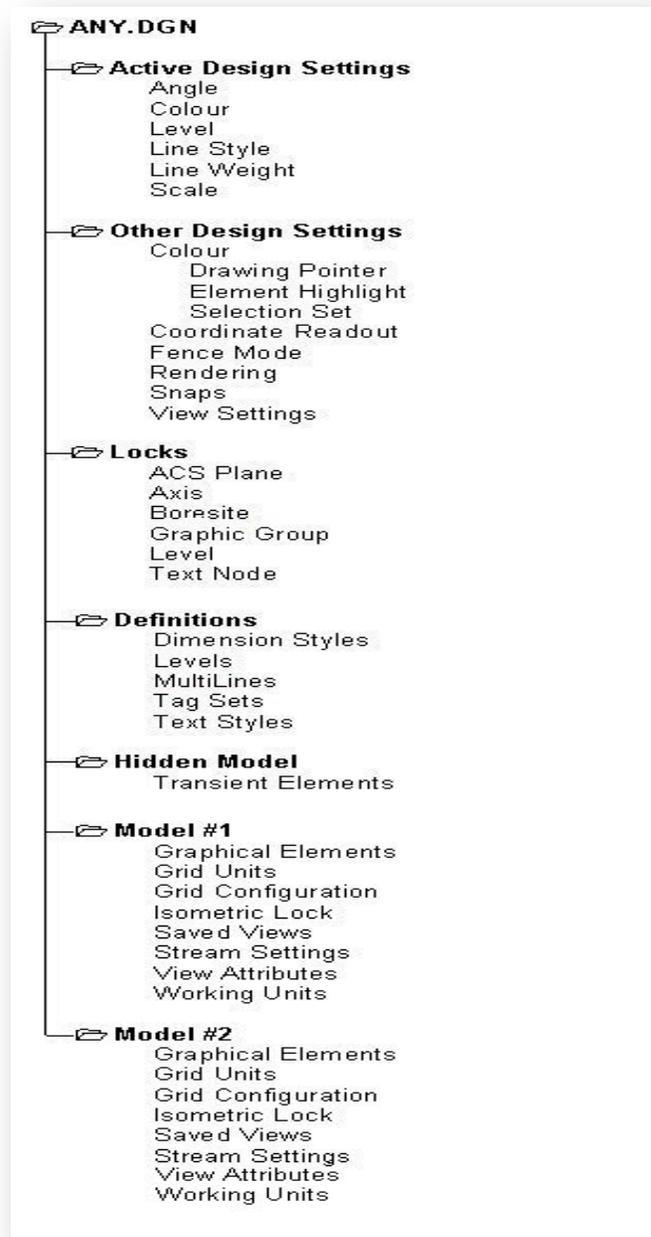
### *Documents\Template Documents*



### ProjectWise Template Documents

### 1.4-7 Structure of a V8 Design File

We’ve had a number of requests from users for a chart that kind of shows the “structure of a design file” for an understanding of which settings are stored globally and which are stored with the model. The following image is only intended for learning purposes and is *not* a technical representation of the design file structure.



## DGN Feature Map

### 1.4.8 Cell Libraries

With the move to a ProjectWise Managed Workspace, cells should no longer be directly referenced from outside MicroStation. All Cell Libraries can be found on the *Cell Libraries/Tools* task in the MicroStation interface.

## 1.5 Appendix E - True Scale Linestyles

To accommodate the usage of linestyles that were created for use at a 1:1 scale, workflow changes are required to use these linestyles and have them display properly. This document will explain the linestyles affected and the appropriate way to use these linestyles with the V8i workspace.

### *Linestyles Referred to in this Document*

The procedures in this document apply to a specific subset of linestyles available in the V8i workspace. Originally, these linestyles were created to measure exact sizes when drafted at a 1:1 scale. The affected linestyles are as follows:

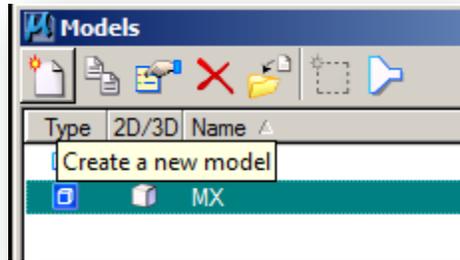
cl 4 lane undiv	ex. c & g - 8
cl left pass	ex. curb - 4
cl no passing	ex. curb - 6
cl passing	ex. curb - 8
cl right pass	exaggerated left pass
Crosswalk	exaggerated no passing
curb & gutter - 4	exaggerated right pass
curb & gutter - 6	RPM 40ft
curb & gutter - 8	RPM 80ft
curb - 4	skip turning
curb - 6	Skips
curb - 8	stop line
ex. c & g - 4	Striping
ex. c & g - 6	Suicide

### *Appropriate Usage of these Linestyles*

With changes made to linestyle scaling procedures, it is not possible to use these linestyles with annotation scaling. As these styles are already created to be true scale when drafted at 1:1, any additional multiplier selected by annotation scale will then proceed to distort the display of the linestyles by the scale selected.

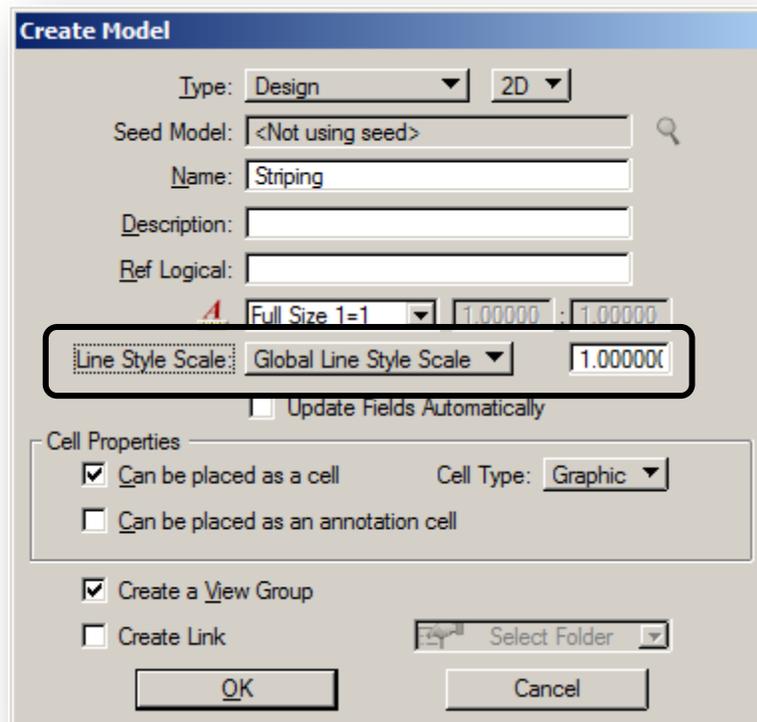
With these issues in mind, a new workflow has been developed to allow for continued usage of these linestyles while allowing the usage of Annotation Scale with all other linestyles.

To properly use these linestyles, they must be drafted separately from your base model. In your Model Dialog, you will need to create a new model.



### New Model Creation

For this model, the properties will need to be set as shown:



### Model Linestyle Scale Settings

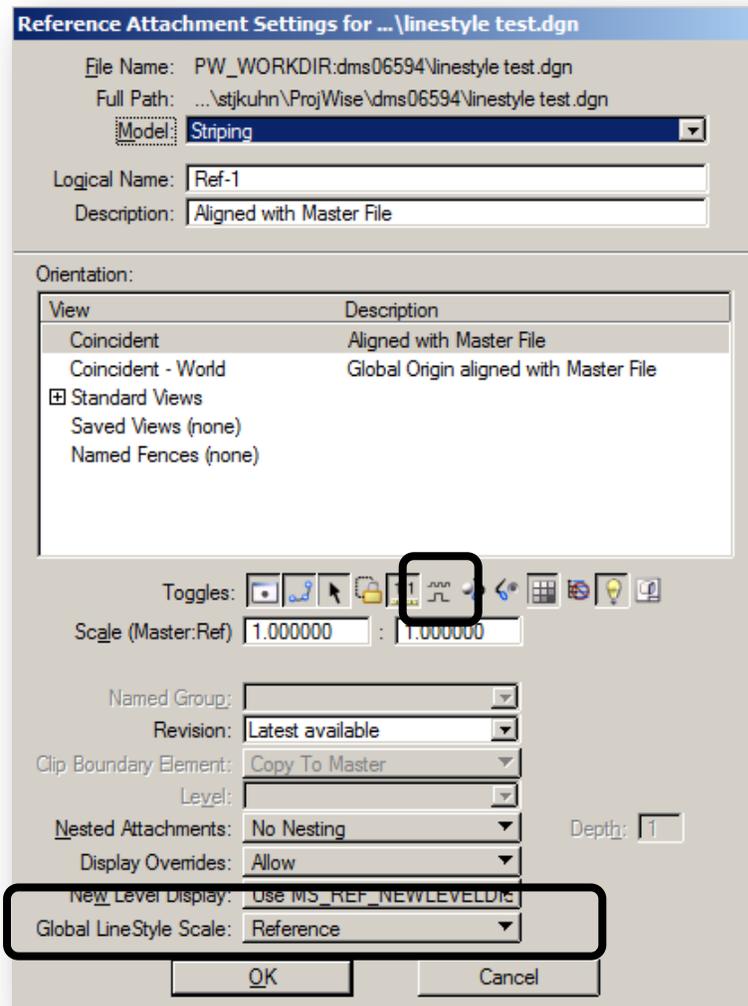
The most important setting for the model where these linestyles will be placed is the Line Style Scale. As these linestyles cannot use Annotation Scale, the model properties need to reflect the Line Style Scale as being set by “Global LinesStyle Scale” with a scale value of 1.0 as shown in the previous illustration. If these settings are not properly set, your model will not reflect the true scaling of these linestyles.

Once you have created this model, you will then need to reference your base drawing into this model. There are no specific settings required for the attachment of your base drawing. This is attached to

allow you to draft your striping and will not be plotted. At this point, you may begin drafting using these true scale linestyles.

As this model does not reflect the annotation scaling of your base drawing, you will then need to reference your true scale linestyle model into your drawing. When attaching this model, you will want the attachment to show the following settings to properly show the true scale linestyles.

### Reference Attachment Settings (Initial Attachment)

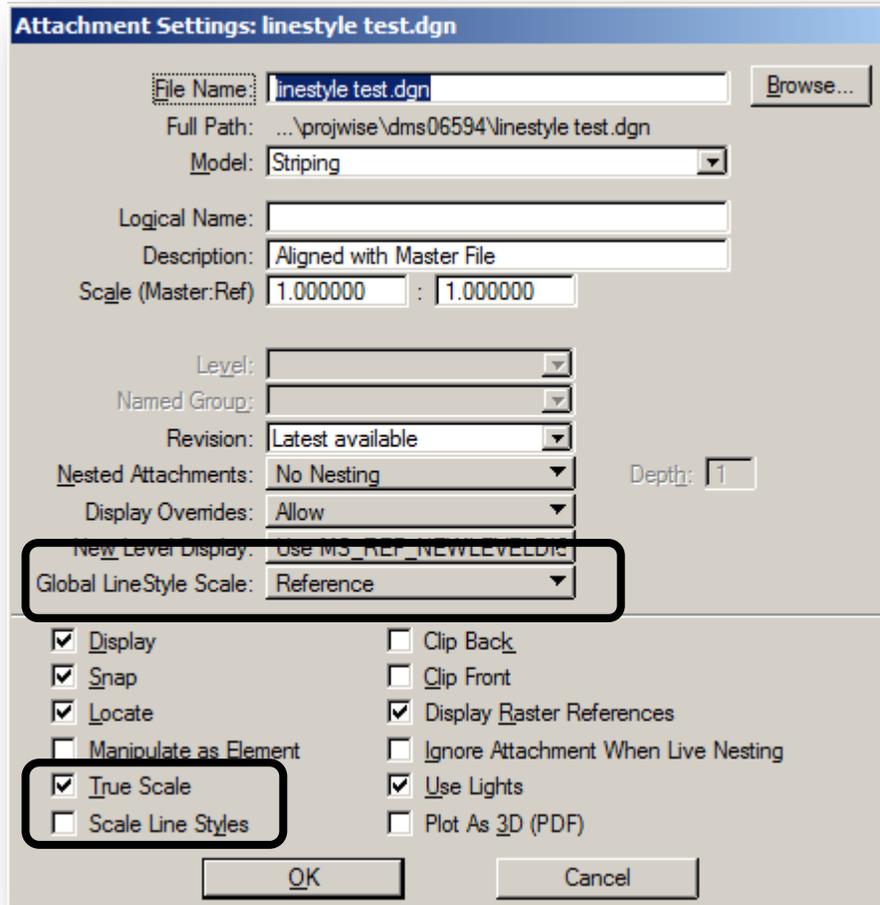


### Reference Attachment Settings

As shown in the prior illustration, you will want to make sure that the toggle for “Scale Linestyles by Reference Scale” is disabled, and that the “Global Linestyle Scale” is set to Reference. These settings will instruct MicroStation to show the linestyles in that reference attachment by their true scale as defined by the model.

If you do not set the prior settings when you attach your model, you will need to make sure the attachment properties are as illustrated on the following page:

### Attachment Settings (Attachment Properties)



### Reference Linestyle Scale Settings

As with the prior attachment settings, on this panel you will want to have “Global Linestyle Scale” set to reference, and have the option for “Scale Line Styles” disabled.

**Warning:** These settings are only to be used when the true scale linestyles are used. If these settings are used with any other models and references, they may provide undesirable scaling and display issues.

## 1.6 Appendix F – DOTWise 3.1 Changelog

### 1.6-1 MicroStation Resources

INDOT\_Font.rsc

- Has been removed to eliminate font conflicts with SignCAD resources and to further integrate common resources in the form of True Type fonts.
- For existing projects at 75% completion, these fonts will be re-enabled on request.

#### IN\_Symbols.cel

- Now includes cell versions of the special characters from the now depreciated Arial 141 font.

#### IN\_TablesLegendNotes.cel

- Updated DS\_ table cells to use Upper Case Tahoma titles, and Mixed Case for all other text

#### All Cell Libraries

- Adjusted all font instances to now use Tahoma instead of Arial, both True Type and Bentley 141.

#### IN\_Interface.dgnlib

- Help -> INDOT – INFO -> Map Insert Page now points to the new version
- All customized INDOT Tasks have been moved to an INDOT Tools Workflow Task
- Adjusted Annotation Templates to use new text levels

#### IN\_Symbology.dgnlib

- Adjusted Letter Size Dimension Styles to use 9 pt fonts.
- Adjusted Full Size Dimension Styles to use 12 pt fonts.
- Removed Special Character Text Styles.
- Various adjustments/fixes to Text/Dimension Styles for uniform appearance and usage.
- Added Silt Fence linestyle
- Updated Level Naming Convention for all levels
- Updated Standards Level Filter
- Renamed Levels
  - Text - Spec Year -> BD\_TXT\_Spec Year
  - Text –Notes ->BD\_TXT\_Notes
  - Text - Eng Units -> BD\_TXT\_Eng Units
  - Text - Spec Year 2008 -> BD\_TXT\_Spec Year 2008
  - Sheet Attribute Exchange -> BD\_SHT\_Attribute Exchange
  - Sheet Border -> BD\_SHT
  - Sheet Border – Frame -> BD\_SHT\_Frame
  - Sheet Border – Text -> BD\_SHT\_Text
  - Sheet Numbering -> BD\_SHT\_Numbering
  - Sheet Table Gridlines -> BD\_SHT\_Table Gridlines
  - Sheet Table Text -> BD\_SHT\_Table Text
  - Batch Plot Border -> BD\_Batch Plot Border
  - Border Title block Final Plans Electronic Seal -> BD\_Title block Final Plans Electronic Seal

- Title Block Integration -> BD\_Title Block Integration
- Signature and Date -> BD\_Signature and Date
- New Levels
  - BD\_SHT\_Legend
  - BD\_SHT\_Map Image
  - BD\_SHT\_Map Text
  - BD\_SHT\_North Arrow
  - BD\_SHT\_Text
  - E\_BR\_Joint
  - P\_ALG\_Horizontal
  - P\_ALG\_Horizontal -Text
  - P\_ALG\_Profile-Text
  - P\_ALG\_Stationing
  - P\_ALG\_Ticks
  - P\_ALG\_Vertical
  - P\_ALG\_Vertical -Text
  - P\_BR\_Approach Slab
  - P\_BR\_Backfill
  - P\_BR\_Barrier Delineator
  - P\_BR\_Bridge
  - P\_BR\_Bridge - Text
  - P\_BR\_Cofferdam
  - P\_BR\_Concrete Railing
  - P\_BR\_Concrete Railing Transition
  - P\_BR\_Crash Wall
  - P\_BR\_Deck Drains
  - P\_BR\_Elastomeric Brg Pad
  - P\_BR\_End Bent Drain Pipe
  - P\_BR\_Joint
  - P\_BR\_Leveling Pad
  - P\_BR\_Pier
  - P\_BR\_Piles
  - P\_BR\_Piles - Text
  - P\_BR\_Prestressed Beam
  - P\_BR\_Prestressing Strands
  - P\_BR\_Reinforcing Epoxy Coated
  - P\_BR\_Reinforcing Plain
  - P\_BR\_Screed Lines
  - P\_BR\_Steel Beam
  - P\_BR\_Steel Plate
  - P\_BR\_Steel Studs
  - P\_BR\_Structural Concrete
  - P\_BR\_Structural Steel
  - P\_BR\_Terminal Joint
  - P\_BR\_Text-Description

- P\_BR\_Text-Details
- P\_BR\_Text-Dimensions
- P\_BR\_Text-Notes
- P\_BR\_Text-Tables
- P\_BR\_Text-Titles
- P\_BR\_Wall Landscaped
- P\_BR\_Wall MSE
- P\_BR\_Wall Retaining
- P\_DR\_Casting
- P\_DR\_Catch Basin
- P\_DR\_Culvert
- P\_DR\_Headwall
- P\_DR\_Inlet
- P\_DR\_Manhole
- P\_DR\_Pipe
- P\_DR\_Pre Cast Structure
- P\_DR\_Pre Cast Structure - Text
- P\_DR\_Sanitary Sewer
- P\_DR\_Storm Sewer
- P\_DR\_Text
- P\_DR\_Text
- P\_DR\_Underdrain
- P\_DR\_Wingwall
- P\_EW\_Slope Toe
- P\_RDWY\_Bench Mark Information
- P\_RDWY\_Check Dam-Riprap
- P\_RDWY\_Check Dam-Straw Bale
- P\_RDWY\_Construction Limits
- P\_RDWY\_Construction Limits-Text
- P\_RDWY\_Construction Limits-Text
- P\_RDWY\_Curb Inlet Protection
- P\_RDWY\_Ditch Inlet Protection
- P\_RDWY\_Ditch Lining Limits
- P\_RDWY\_Ditch Profile Left
- P\_RDWY\_Ditch Profile Left-Text
- P\_RDWY\_Ditch Profile Left-Text
- P\_RDWY\_Ditch Profile Left-Text
- P\_RDWY\_Ditch Profile Right
- P\_RDWY\_Ditch Profile Right-Text
- P\_RDWY\_Ditch Profile Right-Text
- P\_RDWY\_Ditch Profile Right-Text
- P\_RDWY\_Drive Centerline
- P\_RDWY\_Drive Edge
- P\_RDWY\_Drive Shoulders
- P\_RDWY\_Drive-Text

- P\_RDWY\_Drive-Text
- P\_RDWY\_Erosion Control
- P\_RDWY\_Erosion Control-Text
- P\_RDWY\_Geotextile
- P\_RDWY\_Guardrail
- P\_RDWY\_Guardrail Profile-Text
- P\_RDWY\_Guardrail-Text
- P\_RDWY\_Mulching
- P\_RDWY\_Paved Ditch
- P\_RDWY\_Project Limits-Text
- P\_RDWY\_Project Limits-Text
- P\_RDWY\_Reference Points
- P\_RDWY\_Retaining Wall
- P\_RDWY\_Riprap
- P\_RDWY\_Riprap-Class 1
- P\_RDWY\_Riprap-Class 2
- P\_RDWY\_Riprap-Revetment
- P\_RDWY\_Riprap-Uniform
- P\_RDWY\_Sediment Basin
- P\_RDWY\_Sediment Trap
- P\_RDWY\_Seeding
- P\_RDWY\_Silt Fence
- P\_RDWY\_Slope Drain
- P\_RDWY\_Sodding
- P\_RDWY\_Station Equations-Text
- P\_RDWY\_Station Equations-Text
- P\_RDWY\_Text-Description
- P\_RDWY\_Text-Details
- P\_RDWY\_Text-Dimensions
- P\_RDWY\_Text-Notes
- P\_RDWY\_Text-Notes
- P\_RDWY\_Text-Tables
- P\_RDWY\_Text-Titles
- P\_RDWY\_Vegetative Filter Strip
- P\_TRAF\_Maintenance
- P\_TRAF\_Maintenance-Barrier Wall
- P\_TRAF\_Maintenance-Sign
- P\_TRAF\_Maintenance-Signal
- P\_TRAF\_Maintenance-Text
- P\_TRAF\_Pavement Marking Temp-Message
- P\_TRAF\_Pavement Marking Temp-White
- P\_TRAF\_Pavement Marking Temp-White Broken
- P\_TRAF\_Pavement Marking Temp-Yellow
- P\_TRAF\_Pavement Marking Temp-Yellow Broken
- P\_TRAF\_Pavement Marking-Crosswalk

- P\_TRAF\_Pavement Marking-Message
- P\_TRAF\_Pavement Marking-Stop Line
- P\_TRAF\_Pavement Marking-Text
- P\_TRAF\_Pavement Marking-White
- P\_TRAF\_Pavement Marking-White Broken
- P\_TRAF\_Pavement Marking-Yellow
- P\_TRAF\_Pavement Marking-Yellow Broken
- P\_TRAF\_Pavement Marking-Yellow Double
- P\_TRAF\_Sign
- P\_TRAF\_Signal
- P\_TRAF\_Text
- RW\_App Existing PL
- RW\_App Existing RW
- RW\_Coordinates-Text
- RW\_Coordinates-Text
- RW\_Description-Text
- RW\_Description-Text
- RW\_Existing RW
- RW\_Section Line-Text
- RW\_Section Line-Text
- S\_ALG\_Alignment-Text
- S\_ALG\_Ground Profile
- S\_ALG\_Ground Profile-Text
- S\_ALG\_Stationing
- S\_ALG\_Ticks
- XS\_TC\_Guardrail Left
- XS\_TC\_Guardrail Right
- Removed Level
  - P\_RDWY\_Right-of-Way

#### Seed Files

- US Files
  - Renamed all instances to INDOT\_US\_Seed.dgn
  - Set Master Units to Feet and label ‘
  - Set Sub Units to Inches and label “
- US Survey Foot Files
  - Renamed all instances to INDOT\_US\_SVFT\_Seed.dgn
  - Set Master Units to Survey Feet and label ‘
  - Set Sub Units to Survey Inches and label “
- Metric Files
  - Renamed all instances to INDOT\_SI\_Seed.dgn

#### US Drawing Spreadsheets

- All Text Changed to Tahoma

## D Size and Ltr size.dgns

- All fonts changed to Tahoma from Arial both True Type and Bentley 141
- Updated border levels to new naming convention

## Real Estate Seed Files

- Renamed all seed files to updated unitary conventions (SVFT, US, SI)
- Adjusted unitary labels
  - Survey Foot (') and Survey Inch (")
  - Foot (') and Inch (")
  - Meter (m) and Millimeter (mm)

## Survey Seed Files

- Renamed all seed files to updated unitary conventions (SVFT, US, SI)
- Adjusted unitary labels
  - Survey Foot (') and Survey Inch (")
  - Foot (') and Inch (")
  - Meter (m) and Millimeter (mm)

### **1.6-2 InRoads Resources**

#### INDOT.xin

- All fonts changed to Tahoma from Arial both True Type and Bentley 141
- Adjusted levels to new level naming scheme where needed
- New Preferences per Roadway Services
  - IN RDWY Profile Vert Annotation for use with Geometry -> View Geometry -> Vertical Annotation
  - IN ISD Profile 20 for use with Evaluation -> Profile -> Create Profile
  - IN RDWY RW Annotation for use with Evaluation -> Cross Section – Cross Sections, Annotate Cross Section leaf.
- Updated styles to include Cross Section point symbologies
  - P\_RDWY\_GR Left
  - P\_RDWY\_GR Right
  - RW\_Existing RW
  - RW\_ProposedRW
  - RW\_TemporaryRW
- Adjusted Horizontal and Vertical Alignment Styles to use P\_ALG\_Horizontal and P\_ALG\_Vertical levels for all alignment elements.

### **1.6-3 InterPlot Resources**

#### All .set files

- Updated to function with new level naming scheme.

#### All .pen files

- Adjusted screening of Cross Section Grid elements to 60% screening for increased visibility.

#### **1.6-4 ProjectWise**

##### ProjectWise Explorer

- Updated managed workspace to new resources
- Adjusted working directories to comply with new Windows 7 directory structure.
- Procedural adjustments for use of special characters with MicroStation integration