

OHDOT CADD WorkSpace Basics

For OpenRoads Designer CONNECT Edition with the OHDOT CADD Standards

Prepared by:

The Ohio Department of Transportation, Office of CADD and Mapping Services



OHDOT CADD WorkSpace Basics

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OpenRoads Designer CE- 2021 Release 1 Update 10 - Version 10.10.01.03

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1 Introduction

Course Prerequisites

This training course is intended to familiarize ODOT personnel involved in the production of highway construction plans using Bentley's OpenRoads Designer CONNECT Edition (ORD) software with the OHDOT CADD Standards in the ProjectWise Environment.

This training course is intended for ODOT personnel currently working in a plan production capacity. This course does not cover MicroStation or OpenRoads software operation. It is assumed the user is familiar with the following CADD related functions:

- Proficient with basic Windows 10 operations
- Accessing ProjectWise and opening Design Files
- MicroStation basics, including the following:
 - Creating Files
 - Seed Files
 - o Cells
 - Editing Text
 - Plotting
 - Reference Attachments
 - o Models
 - o Annotation Scale
 - o Etc...

CPD Credit

No CPD credits will be issued for this class.

Course Outline

The following topics are covered in the class:

- ProjectWise
- OHDOT CADD Standards Overview
- WorkSets
- ORD Interface
- MicroStation Design Files
- Creating Design Files
- Sheet Design Files and Sheet Cells
- Title Sheet Applications
- General Notes Sheets
- General Summary
- Summary Tables with AutoTable
- Sheet Cross References
- Project Indexer
- Print Organizer

ODOT CADD Standards and Support

The OHDOT CADD Standards for ORD are maintained and distributed by the ODOT Office of CADD and Mapping Services.

http://www.dot.state.oh.us/Divisions/Engineering/CaddMapping/CADD_Services/Pages/default.aspx

CADD Standard Manual

The <u>OHDOT CADD Engineering Standards</u> manual is available in Adobe Acrobat PDF format on the ODOT Website. From the CADD Support website listed above, choose the Standards Manuals link on the left side of the page.

https://www.dot.state.oh.us/Divisions/Engineering/CaddMapping/CADD_Services/Standards/Pag es/Manuals.aspx

CADD Support Request Form

Support for Bentley OpenRoads Survey is the responsibility of the Office of CADD and Mapping Services. Support questions can be sent to the CADD Support staff using the following form:

https://odot.formstack.com/forms/cadd servicerequest

OhioDOT CADD Wiki Page

The CADD Support Wiki page, hosted in the Bentley Communities, is the go-to source for ODOT's training and support content.

https://communities.bentley.com/communities/user_communities/ohio_dot_consultants/w/ohio dot---wikis

 Training Resources 	OhioDOT - Wikis
Upcoming Events	
> Training Guides	The following wiki topics are provided as a reference by OhioDOT's Office of CADD & Mapping Services
 Supplemental Videos 	
 Custom Applications 	Training Resources
> OhioDOT CADD Users	this wiki contains information on the available training guides as well as includes several helpful videos on various topics
Group Meetings	Installation Solutions
> Ohio DOT Webinars	this wiki contains articles related to solutions to installation problems
 Installation Solutions 	Programming
> Programming	 this wiki contains articles related to programming for Bentley's products

Design Resource Refence Center (DRRC)

ODOT's Design Resource Reference Center is a centralized online reference center to help locate online or printed material. Additionally, several mailing lists are available to keep you informed about updates to ODOT standards. Visit the Design Resource Reference Center at the following URL:

http://www.dot.state.oh.us/drrc/Pages/default.aspx

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Bentley CONNECTION Client

Bentley Connect licensing requires user to log into their Bentley account to secure a software license.

Konnection Client – E	x u
Bentley	- 1
ß	Î
Email Address eric.thomas@dot.ohio.gov	
Forgot password? New User? Register Now	Ţ

ODOT users will log in using your ODOT email address. The password is automatically applied using your ODOT password.

Contact your District CADD Administrator if you are unable to log into your Bentley account.

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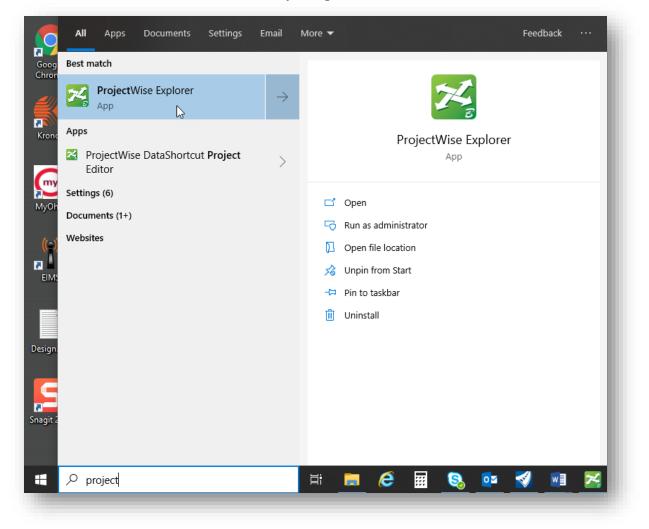
2 ProjectWise

ProjectWise, Bentley's engineering project collaboration software, is used to manage, share, and distribute engineering project content. ProjectWise integrates with Bentley applications and other products including Microsoft Office.

As ODOT migrates to OpenRoads Designer (ORD), all internal projects started using ORD will be housed in ProjectWise.

ProjectWise Explorer

ProjectWise Explorer is used to access project information stored in ProjectWise. The application is accessed from the Windows Start Menu, or by using the Windows Search function as shown below.



Data Sources

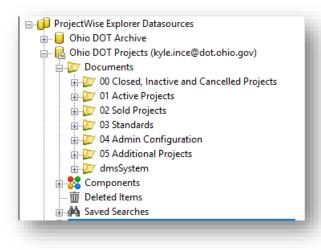
ODOT's ProjectWise environment is configured with three main **Datasources** as described below:

ProjectWise Explorer CONNECT Edition		- 🗆 ×
Datasource Folder Document Dave's Reports OHDOT Propagate Folder Qualities F Window Help	PDF Print, Split, Merge, Stamp Vie	ew Tools
🖺 😪 🕾 🚔 🗛 💁 📅 🇱 🧱 🎯 🛒 🗛 - Search 🔍	~ >	₽ ₽ ₽
🕴 🗣 👻 🚽 🔀 🚽 Address 🔂 pw:\\Ohio DOT Projects		~ ,
ProjectWise Explorer Datasources	🔚 List 🕒 Spatial	
🗄 🗝 Ohio DOT Archive	Name Description	
i 🔂 Ohio DOT Projects (John.Drsek@dot.ohio.gov)		
]	
User John.Drsek@dot.ohio.gov authenticated by STS (https://ims.bentley.com/). Manni Mon 2:51 PM		7:13 AM:

- Ohio DOT Archive
 - o Read Only repository for completed plan sets
- Ohio DOT Projects
 - This is the active projects directory (replaces the "I drive")
 - All ODOT projects using Bentley CONNECT Software (ORD) will be housed here
- Ohio DOT Training-Testing
 - o "Sandbox" area for training and testing which mirrors the active projects directory
- Ohio DOT Training/Testing
 - Old Data source, should not be used!

The Ohio DOT Projects Datasource

The Ohio DOT Projects Datasourse is organized into sub-folders as shown below.



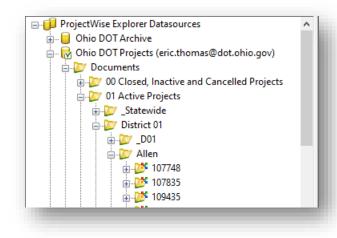
OHDOT CADD WorkSpace Basics

- 00 Closed, Inactive and Cancelled Projects
 - \circ $\;$ Archive of project data that is completed, or cancelled
- 01 Active Projects
 - Active PID projects
- 02 Sold Projects
 - Project Data location when project is in construction
- 03 Standards

•

- CADD Standards, Help Documents, Templates, etc.
- 04 Admin Configuration (Hidden if you are not an administrator)
 - Access control models and other ProjectWise configuration documents
- 05 Additional Projects
 - Area where projects without a PID may be worked on using OHDOT standards

The **01** Active Projects folder is organized by District, County, and PID as shown below.



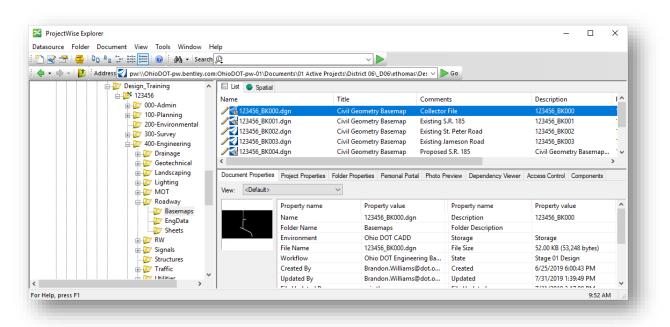
The _D## folder is used for District-wide projects

An ODOT project is referred to as a "WorkSet" in the ProjectWise environment.

Opening Files with ProjectWise

To access the files in a WorkSet, select the **Ohio DOT Projects** data source from the ProjectWise Explorer dialog and browse to the location of the desired project.

Files are opened by double-clicking on the file name in the *ProjectWise Explorer* dialog. The file is opened with the associated program. Right-click on a file name and choose **Open With** to select the default program for a given file type.



The icons to the left of the file name are described below:

L L	
1	File has Read/Write access
0	• The user can check out the file for revisions. While the file is checked out locally, the
	file on the server is locked to other users.
	File has Read Only access
	• This symbol means the user can read the file but cannot edit the file. The user can view the file, but it remains available (and unlocked) to other users.
	File is Checked Out by you (others see the Locked symbol)
•	• A copy of the file has been sent to your local working directory for editing. The file
	remains locked to other users until you check the file back in.
0	File is Locked
	• The file is being accessed by another user (Checked Out or Exported) and is not
	available. Users can still open the file as Read Only.
	File has been Exported by you (others see the Locked symbol)
	• Files are typically exported to a local folder and then worked on outside of
	ProjectWise. When finished, the files are then Imported back into ProjectWise.
<u> </u>	File is in Final Status
V	• No changes are allowed. This is an archived file status.

When a file is opened from *ProjectWise Explorer*, the file is copied to your local computer and is locked on the server. Other users can view the file but cannot edit the file while it is checked out by another user.

Changes to the file are not reflected on the server copy until one of the following actions is preformed:

- 1. The file is closed and checked back in to the server using the **Check In** option
- 2. The server copy is updated by choosing File> Update Server Copy in ORD

CADD Standards

ProjectWise maintains a copy of the CADD Standards on the local computer. Once downloaded, this provides faster access to the CADD Standards as compared to accessing the standards from a remote server location.

The first time you open a file from a WorkSet in ProjectWise, the CADD Standards are copied form the ProjectWise server to the local computer. Copying all of the CADD Standards locally does take a few minutes, but copying a complete set of the CADD Standards is a one-time process the first time a user opens a file from ProjectWise on the computer. Once the CADD Standards have been copied to the local computer, ProjectWise keeps the local copy of the CADD Standards in up to date by comparing the local copy to the server copy when a file is opened and only downloads new or changed files.

Working Directory

ProjectWise maintains a local folder for each WorkSet and the files that you access in the project. The first time you open a file from a specific WorkSet, you will see the create working directory dialog shown below.

rojectivi	se Explorer X
•	c:/users/kince/appdata/local/bentley/projectwise/workingdir/ ohiodot-pw.bentley.com_ohiodot-pw-01/kyle.ince does not exist. Do you want to create it? Click No to browse for a different folder.
	Yes No Cancel

Select **Yes**. ProjectWise copies the necessary files to your local hard drive, called the **Working Directory**. It contains temporary copies of the document files that you checked or copied out from a ProjectWise server.

Opening Multiple MicroStation Design Files

Double-clicking on a file name opens the selected file. By default, ProjectWise does not allow the user to open multiple design files simultaneously. If a MicroStation design file is currently opened, the software forces the user to close the current design file.

Multiple files can be opened with ProjectWise as follows:

- To open a second file for write access (assuming the file is not locked by another used), hold down the Shift key while double-clicking a file name
- To open a second file for read access, right-click the file and choose Open as Read-Only

Closing Files

After completing work on a document, in a supported application, ProjectWise will provide options for checking the document back into the server.

comment		
Name	Title	Comments
✔ 🚮 123456_KM001.dgn	Civil 3D Modeling Basem	S.R. 185 Corridor M
_	_D06 \ethomas \Design_Training \:	123456\400-Engin
older: 01 Active Projects\District 06 Create new version during Check In ersion:	∖_D06\ethomas\Design_Training\	123456\400-Engin

- Check In
 - Upload any document changes from your local copy to ProjectWise and mark the file available to other users.
- Update Server Copy
 - Updates any changes to ProjectWise but keeps the file checked out. (Also, under File
 > Update Server Copy)
- Free
 - Checks the document back into ProjectWise, but ignores any local document changes. This command also purges the document from your local working directory.
- Close
 - Dismisses the *Check In* window with no changes. The document remains checked out to you.

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Additional ProjectWise training resources

This section serves as a brief introduction to ProjectWise. The Office of CADD and Mapping Services provides additional training materials for ProjectWise online from the CADD Support Wiki Page.

https://communities.bentley.com/communities/user_communities/ohio_dot_consultants/w/ohio_dot---wikis/47088/projectwise

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3 OHDOT CADD Standards Overview

WorkSpaces

OpenRoads uses a **WorkSpace** to define the CADD Standards for a particular **WorkSet**. A **Workspace** is a custom ORD environment or configuration. By selecting a workspace, you are customizing ORD for a specific discipline, project, or task. The workspace contains pointers to the CADD standards, DGN libraries, cell libraries, seed files, symbology resources, etc. necessary for the project.

ODOT maintains a custom WorkSpace for Open Roads Designer as described below.

When you access an ODOT project through ProjectWise Explorer, you are entering a managed workspace environment. The CADD Standards are defined for ODOT projects and do not need to be specifically selected by the user.

ODOT's CADD Standards for Bentley CONNECT products are housed within ProjectWise in the following location:

Ohio DOT Projects > 03 Standards > CADD Standards > CONNECT_Config > WorkSpaces

Two WorkSpace that have been configured for ODOT Standards are available, **OHDOTCEv1** and **OHDOTCEv2**, as described below.

CADD standards for ORD are maintained by the Office of CADD and Mapping Services.

The OHDOTCEv1 WorkSpace

The OHDOTCEv1 WorkSpace has been superseded by the OHDOTCEv2 WorkSpace. This WorkSpace is provided to allow users to complete projects that were started with this WorkSpace. New projects are all configured to use the OHDOTCEv2 WorkSpace.

The OHDOTCEv2 WorkSpace

With the September 24, 2021 update to the ODOT CADD Standards, ODOT has released the OHDOTCEv2 WorkSpace. This workspace differs from the previous version primarily with the fonts that are used for plan production.

In the previous version, font Aerial was used for the annotation of both existing and proposed items. This made it difficult to differentiate between existing and proposed annotations. With the OHDOTCEv2 workspace, ODOT is moving to using font Calibri Italic for proposed items and font Calibri Light for existing items.

The ODOTCEv2 WorkSpace also removes the old Drainage and Utilities dgn library from the standards.

Projects started with the OHDOTCEv1 WorkSpace should normally be completed using that WorkSpace. As new projects are started, the OHDOTCEv2 WorkSpace should be used.

When projects are created, the WorkSet is associated with the WorkSpace. ODOT's users do not need to do anything to select the appropriate WorkSpace for a project. The associated WorkSpace is automatically loaded when a design file is opened.

The **WorkSpace** that is assigned to a **WorkSet** can be reviewed in ProjectWise by right-clicking on the WorkSet folder name and choosing the **Properties** option.

General	Statistics	Resources	Properties	View	From the <i>WorkSet Area</i>
Audit Trail	Participants	ProjectWise F	Project	WorkSpace	Properties dialog, select the
Vork Space type	Managed			~	WorkSpace tab to review the
evel ass <u>o</u> ciation	ns: Object & In	herited		~	assigned WorkSpace as show
省 Predefined					at left.
Global	hio DOT MicroStatio	n Configuration : (inhe	rited from the d	atasource	In the ODOT environment,
Application				<u>v</u>	users are not permitted to
Customer	(C)				change the WorkSpace that is
🌱 Organizatio 🍘 Work Spac					
боно 🍅	TCEv02 : Load Ohio	DOT Connect Edition	v2 Workspace,	Sets _US	assigned to a WorkSet. Contac
🌱 Work Set/F 📹 Role	Project				the ProjectWise administrato
🝯 User					if the WorkSpace needs to be
					changed for a particular
					WorkSet.
٢				>	
-	ble configuration blo	ck associations from th	e parent to	>	
Allow inherita		ck associations from th		_	
Allow inherita propagate to		ck associations from th ild objects ciations on all child obj		_	

The assigned WorkSpace can also be reviewed within a design file be selecting **File > Settings > Configuration > About Configuration**.

Exercises in this manual use the OHDOTCEv2 WorkSpace.



OHDOT CADD Engineering Standards Manual

This training guide makes reference to several sections of the CADD Manual. In all cases, the CADD Manual supersedes the information presented in this training guide. It is the responsibility of the designer to familiarize themselves with the content of the manual. A link to the OHDOT CADD Standards manual is provided in the <u>CADD Standards and Support</u> section of this manual.

OHDOT Compatibility with Older Projects

The OHDOT Standards were specifically developed for MicroStation CONNECT Edition and OpenRoads Designer CONNECT Edition. These CADD Standards are not compatible with projects currently under development using the legacy ODOTcadd Standards with PowerGEOPAK SelectSeries 10 or earlier.

Due to these incompatibilities, it is recommended that users complete existing projects using Bentley's Select Series 10 software with the legacy ODOTcadd Standards.

ODOT Project Configuration and Directory Structure

The **OHDOT CADD Engineering Standards Manual**, **Section 302** defines the required directory structure to be used on all ODOT projects. The folder structure has been updated for the OHDOT CADD Standards with input from all 12 Districts. The folder structure is to be used for all new projects started with ORD and ProjectWise.

See <u>Chapter 4</u> for more information on the new folder structure and an ODOT program used to create new projects.

Design File Names

The **<u>OHDOT CADD Engineering Standards Manual</u>**, **Section 304 File Naming Conventions**, defines the standard MicroStation design file names to be used on all ODOT projects.

ODOT provides an application to assist with the creation of MicroStation design files using the ODOT file naming convention and folder structure. See Chapter 5 for more information.

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4 WorkSets

A WorkSet is used to house the files for each individual ODOT design project. WorkSets serve the following purpose:

- Used to store all related project information
- Define the folder structure for the project
- House project specific CADD Standards

WorkSet Creation

ODOT provides a custom application that is used to create new WorkSets. The application is available in the following location within ProjectWise:

Ohio DOT Projects > Documents > 03 Standards > CADD Standards > CONNECT_Config > WorkSpaces > OHDOTCEv02 > Standards > Applications > OHDOTCreateWorkSet.exe

OHDOT WorkSet Creation Tool	- 🗆	×
Help		
WorkSpace Info		<u>^</u>
✓ ProjectWise ohiodot-pw.bentley.com:ohiodot-pw-01(Ohio DOT Training/Testing)		
WorkSpace Loc:		
Mode		
Create Modify		
Create for Plan File Only		
WorkSet Template:		
P Create WorkSet inside Loc:		
Project Info		
Non-PID		
PID:	Can't be nothing	
GCS: No GCS	Ŷ	
Connected Project: 🗸 Create Connected Project Users to Add		
Externals:	Add/Modify Externals	
WorkSet Survey Folders		- 11
300-Survey	•	
WorkSet Engineering Folders		5
400]-Engineering	•	
Structure Folders		
Create WorkSet		
Results		

The application is also available from the ORD ribbon by selecting **OhioDOT > Apps > OHDOT Create WorkSet**.

For complete documentation of this application, choose the **Help** menu to review the PDF documentation, or view a video demonstration of the application.

When the WorkSet is created, projects that have been assigned an ODOT Project Identification Number (PID) are created in the **Ohio DOT Projects > 01 Active Projects** data source in ProjectWise.

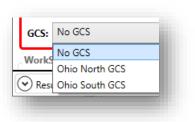
Projects that do not yet have a PID number assigned but may be assigned a PID number at a future date are created in the **Ohio DOT Projects > 05 Additional Projects** data source.

Geographic Coordinate Systems (GCS)

One of the key settings is the definition of the **Geographic Coordinate System** (GCS). The GCS is used to define the coordinate location of the design file contents on the earth's surface. Once that position is established, the design can be easily coordinated with other data for which the geographic location is known.

The **OHDOT_CreateWorkSet** application has three settings to define the GCS as shown at right.

- Options for projects mapped to the Ohio North or Ohio South State Plane zones are supported.
- Select the **No GCS** for projects that will use a custom coordinate system for ground coordinates.



When the WorkSet is created, the selected GCS is applied to the Seed files that are created for the WorkSet. See the <u>WorkSet Seed Files</u> section for more information.

If the **No GCS** option is selected, it is necessary to define the custom coordinate system for each of the seed files. This is normally done by the District Survey personnel. See the OHDOT ORD Survey Training documentation for more information.

If you are unsure which GCS option should be used, contact the District Survey Operations Manager before creating the WorkSet.

WorkSet Folder Structure

All ODOT projects use a standard folder structure for the WorkSet. An Excel file detaining the intended usage for each folder can be found in the ODOT Standards in the following location:

Ohio DOT Projects > 03 Standards > CADD Standards > CONNECT_Config > WorkSpaces > OHDOTCEv02 > Standards\OHDOT Utilities\Documentation\ CONNECT_Project_Folders.xlsx

A summary of the folders typically used for ORD design and drafting is included below.

300-Survey

300-Survey\Basemaps\

Used to store survey and existing basemap design files.

DGN Files:

- BA Aerial Mapping
- BC Aerial and Ground Combined
- FB Ground Survey Basemap
 - No Alignments
 - o No Right-of-Way
 - No Parcels
 - No Exceptions!
- FD New file for field terrain models
- PC New file for Point Cloud data

Retired Files:

• BE - No longer used for ORD Projects

Notes:

- By default, ODOT's Roadway personnel have readaccess to the 300-Survey folder and sub-folders
- Designers will reference the Survey information. Any changes that are required by the design personnel must be coordinated with Survey
- New folders can only be created at the bottom level folders.

000000_OHDOT_Template
200-Environmental
i⊒[⊅ 300-Survey
🖃 💯 SurveyData
🖃 💯 Images
Aerial
→ Aerial → Diagonal Sectors → Diagonal Sectors → DifficeData
🖃 💯 Research
Deeds
💯 RWPlans
💯 SurveyPlats
👜 💯 400-Engineering
🕀 💯 500-RealEstate
⊕ 💯 600-Contracts
⊕ 💯 800-Construction
💯 900-Accounting
999-Scratch

400-Engineering

Each discipline specific folder in the 400-Engineering folder has three sub-folders as shown at right.

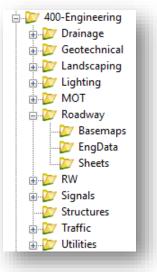
- Basemaps
 - Used to store ORD basemap design files.
 - o Users are not permitted to create sub-folders
- EngData
 - Used to store engineering data related to the Discipline folder
 - Users are permitted to create sub-folders
- Sheets
 - Used to store ORD sheet design files
 - Users are not permitted to create sub-folders

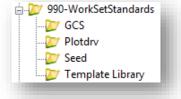
Notes:

• ODOT's Surveyors have read/write access to the 400-Engineering folder and sub-folders

990-WorkSetStandards

CADD Standards specific to a project are stored in the 990-WorkSet Standards folder. When a new project is created in ProjectWise, WorkSet specific CADD Standards are placed in these folders as detailed below:





- GCS
 - This folder contains the DTY file defining the Geographic Coordinate System in the case where a custom scale factor is defined for the project. The DTY file is copied from the OHDOT CADD Standards and is named "######_Custom.dty" using the PID number for the project.
- Plotdrv
 - This folder contains the PSET file for the WorkSet. The file is copied from the OHDOT CADD Standards into this folder. The copied file is renamed "######.pset" using the PID number.
- Seed
 - Seed files are copied from the OHDOT CADD Standards and renamed using the PID number for the project.
 - These seed files are defined using the appropriate Geographic Coordinate System when the WorkSet is created.
 - \circ $\;$ The Design seed files are renamed with the ODOT PID Number.
 - The Drawing and Sheet seed files are not renamed with the PID number. It is necessary to maintain generic names for these two seed files for the ORD sheet clipping process
- Template Library
 - The OHDOT_Templates.itl file is copied from the OHDOT CADD Standards into this folder. The copied file is renamed "######_templates.itl" using the PID number.

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WorkSet Seed Files

A seed file is an empty MicroStation design file that is used as a template for the creation of new design files. ODOT provides seed files within the OHDOT CADD Standards that have been configured specifically to meet ODOT requirements.

When new WorkSet is created, the seed files located in the OHDOT Standards are copied to the 990-WorkSetStandards\Seed folder and are renamed according to the PID number as detailed below.

File Name	Model	Intended Use
######_DesignSeed2d.dgn	Design	Used to create 2d basemap design files
######_DesignSeed3d.dgn	Design	Used to create 3d basemap design files
OHDOT_DrawingSeed2d.dgn	Drawing	Used as the seed file for the Drawing Model in the
		ORD Sheet Clipping process
OHDOT_SheetSeed2d.dgn	Sheet	Used as the seed file for the Sheet Model in the ORD
		Sheet Clipping process

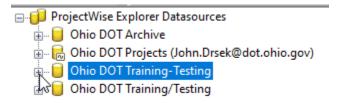
Notes:

- ###### = The PID number for the project
- Each seed file contains only one model as listed in the table above

Exercise: Accessing the Training WorkSet

For this training class a copy of the training WorkSet has been created within ProjectWise for each student. In this exercise, we will review the content of the WorkSet.

- Open ProjectWise Explorer
- Clicking on the expander button will automatically sign you into the datasource (as long as your signed into CONNECTION Client, if not CONNECT Client will launch).



• You can also right click on the datasource to get the following options. Note that Log In as.. will open the log in dialog shown below, Authentication should always be set to Bentley IMS.

		a-Testing	
	E Log In	sting	
	Log In as		
	Refresh		
🔀 ProjectWise	Explorer Log In		×
Datasource:	Ohio DOT Training-Testing	~	Log in
Authentication:	Bentley IMS	\sim	Cancel
User Name:			
Password:			

- Browse to the sample project location provided by the instructor.
- Take a few minutes to review the folder structure and files. This is the WorkSet that will be used for the remaining exercises.

Notes about the training WorkSet:

- This is not a complete project. The WorkSet contains files specifically for the training and does not represent a completed project.
- The CADD Standards manual supersedes the example files

5 ORD Interface

Ribbon Interface

ORD presents the user with a modernized ribbon interface, much like the various Microsoft Office products. Learning the ribbon is relatively easy but it will take a little time for users to get familiar with the new command layout.

- Open **ProjectWise Explorer** if it is not currently open
- When prompted, sign into ProjectWise as shown below

🔀 ProjectWise	Explorer Log In			×
Datasource:	Ohio DOT Training-Testing	~	Log in	
Authentication:	Bentley IMS	\sim	Cancel	
User Name:				
Password:				

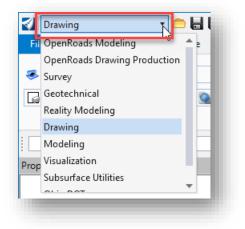
• Browse to the sample project to open the file listed below

..\78086\400-Roadway\Basemaps\78086_BK001.dgn

The ORD interface is organized by **WorkFlows**, **Tabs**, and the **Backstage**. Each is described below.

WorkFlows

The **WorkFlow** is selected by a drop-down menu in the upper left corner of the ORD interface.



The **WorkFlows** present the various ORD commands logically organized according to a task. For example, the **Drawing** workflow contains command that are used for typical MicroStation drawing tasks.

The most commonly used drawing functions are available in the other workflows, as described below.

Tabs

When a **Workflow** is selected, the various commands are organized into **Tabs** like the example below.

File Home	Terrain Geometry	Site Layout	Corridors	Model Detailing	Drawing Produ	ction	Drawing	View				
None 30 ▼ 300	▼ Default ▼ 🕎 0 ▼ 🕥 0	▼ ▼] 4_ 0 ▼	Explorer	Image: Contract of the second seco	Element Selection	Reports	-¢- Civil Analysis •	Corridor Reports *	Asset Manager	Terrain Import •	Import Geometry *	Import Export IRD to IFC
	Attributes			Primary	Selection	м	odel Analysi	s and Repor	ting		Model Import/	/Export

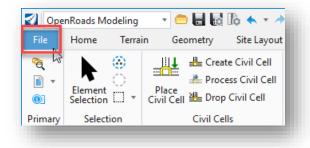
Each tab groups like commands into a logical organization of the various tools.

Note: Most WorkFlows contains a Drawing tab with commonly used MicroStation drawing tools.

BackStage

The ribbon contains command that are used for ORD and MicroStation related drawing and design tasks. Tools that are not drawing related, such as **Plotting**, **Design File Settings**, **User Preferences**, etc. are in the "**BackStage**" area.

To access the **BackStage**, select the **File** command at the upper-right of the ORD user interface.



The **BackStage** contains a list of commands at left, along with a list of recently opened design file, as shown below:

$\overline{\mathbf{e}}$	123456_BK001.dgn [2D - V8 DGN] - OpenRoads Designer CONNECT Edition
New	Open
Open	Recent Files for 123456
Save Save As	123456_BK001.dgn C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\123456\400-Engineering\Roadway\Basemaps\ Modified: 12/17/2019 1:15:47 PM Size: 413 KB
Save Settings	123456_FB001.dgn C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\123456\300-Survey\Basemaps\ Modified: 12/16/2019 10:10:11 AM Size: 944 KB
Send Mail Close	123456_XS001.dgn C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\123456\400-Engineering\Roadway\Sheets\ Modified: 12/12/2019 1:36:21 PM Size: 1064 KB
Tools	123456_BU001.dgn C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\123456\400-Engineering\Utilities\Basemaps\ Modified: 12/12/2019 1:29:24 PM Size: 1107 KB
Settings Properties	123456_GP001.dgn C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\123456\400-Engineering\Roadway\Sheets\ Modified: 12/12/2019 1:12:54 PM Size: 441 KB
Print	123456_KM001.dgn C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\123456\400-Engineering\Roadway\Basemaps\ Modified: 12/12/2019 11:51:14 AM Size: 1155 KB
Export	123456_BR001.dgn C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\123456\400-Engineering\RW\Basemaps\ Modified: 12/12/2019 11:10:48 AM Size: 378 KB
Publish i-model Help	123456_DesignSeed2d.dgn C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\123456\990-WorkSetStandards\Seed\ Modified: 12/12/2019 11:04:56 AM Size: 247 KB
Feedback	
Exit	Browse

All the functions available from the **BackStage** are not covered in this introductory class. Two of the most commonly accessed functions are listed below.

User Preferences

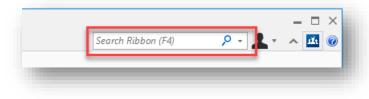
User Preferences are accessed from the **BackStage** by selecting **Settings > User > Preferences**.

Design File Settings

Design File Settings are accessed from the **BackStage** by selecting **Settings > File > Design File Settings**.

Search Ribbon

The **Search Ribbon** key-in field, which is located at the top-right of the ORD user interface, is useful to quickly find a desired command as you learn the ribbon interface without manually searching the ribbon.



As you key-in the name of a command, the Search Ribbon function will show a list of commands matching the text string as it is entered. An example is shown below.

Most Recently Used

commands matching the key-in entry are displayed at the top.

Floating the cursor over one of the results will expand the item to list the various places in the ORD interface where the command can be found.

Click on the command name, without expanding the list, to run the command.

Click on the command location, with the list expanded, as shown at left, to navigate to the appropriate **Tab** in the ribbon.

× place × - 2 - ^ 🗷 🥝
Most Recently Used (1)
Place Fence Geotechnical→Home→Selection→Fence Tools Drawing→Home→Selection→Fence Tools <u>Modeling→Home→Selection→Fence Tools</u>
Ribbon (46)
Place Fence
😴 Place Horizontal Temporary Dimension
3 Place Vertical Temporary Dimension
👑 Place Civil Cell
III Place Table
A Place Note
Show all results
. <u>Show Details</u>

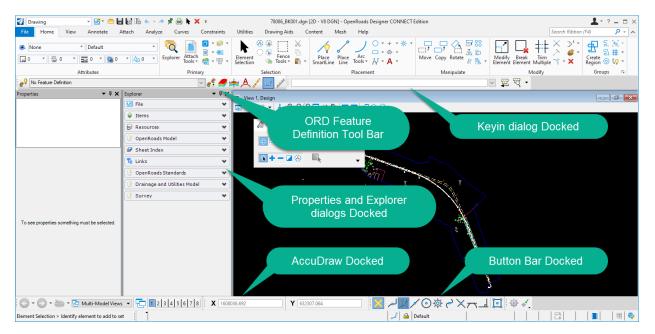


OHDOT WorkSpace Customizations

The OHDOT CADD Standards include several customizations to the ORD Interface. These customizations are summarized below.

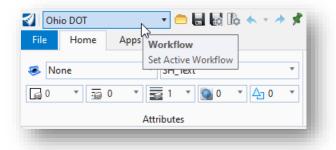
General WorkSpace Customizations

The dialog boxes shown below have been configured as defaults for ORD in the OHDOT WorkSpace.



The Ohio DOT WorkFlow

Various applications that have been developed by ODOT are available from the Ohio DOT WorkFlow, which is selected from the WorkFlow menu at the upper left of the ORD interface.



The Ohio Dot Workflow includes the following three tabs:

Home

This is provided to give access to some commonly used Bentley tools without the need to change to a different Workflow

Apps

This tab provides access to the various ODOT custom applications

Links

The Links tab contains several links to commonly used CADD related resources and support pages

The Home Tab

Each WorkFlow in the ORD interface includes a Home tab. The Home tab for the OHDOT WorkFlow is shown below.

File Home	Apps Links					
≶ None ⊒0 ▼ ⊡ 0	▼ Default ▼ 👿 0 ▼ 💽 0	▼ ▲ 0 ▼	C Explorer	Attach Tools *	Element Selection	Depression Copy Rotate Nove R
	Attributes (A)			Primary (S)	Selection (Q)	Manipulate (W)

The first three groups, **Attributes**, **Primary**, and **Selection** are the same for the **Home** tab on each of the available WorkFlows.

The Apps Tab

The Office of CADD and Mapping Services has developed several custom applications that are used in the plan production process. A list of the available applications, with a brief description of their function, is provided below. See the documentation for each application for more information on how each of them functions.

OHDOT Create WorkSet This stand-alone application is used to create new WorkSets using the ODOT folder structure, for both ProjectWise and non- ProjectWise users.	OHDOT Create WorkSet
OHDOT Project Indexer Stand-alone application used to assist the user to create a project index file in Excel and a ZIP file for electronic deliverables.	OHDOT Project Indexer
OHDOT Zip Verifier This stand-alone application is used to verify the contents of the zip file containing the CADD files for an electronic delivery has all of the files specified in the Project Index.	OHDOT Zip Verifier
OHDOT Create Design Files The application is used to create design files for the active WorkSet. The files are created and named according to ODOT	OHDOT Create Design Files

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Standards, using the ODOT folder structure. The application is used for both ProjectWise and non-ProjectWise users.	
OHDOT Sheet Manager	
This MicroStation add-in application is used to manage all the sheet attributes, such as the page number, sheet title, etc., for the various ODOT plan sheet borders.	OHDOT Sheet Manager
OHDOT Sheet Cells	
Used to place sheet borders according to ODOT standards	OHDOT Sheet Cells
OHDOT Place Agency Cell	OHDOT Sheet Cells
Used to place the configured Agency Cell on previously	OHDOT Place Agency Cell
generated sheet cells.	
OHDOT Cross Refs	CHDOT Cross Refs
This application is used to create and update sheet cross-	
reference text in a MicroStation file. The current version of the	
application does not function in the ProjectWise environment.	
OHDOT SCD List	
This application is used to place, manage, and update the Standard Construction Drawing list and Supplemental	Title Sheet
Specification list on an ODOT title sheet.	OHDOT SCD List
	🐣 OHDOT Title Sheet Map
OHDOT Title Sheet Map	OHDOT Title Sheet Map - DGN Version
Used to generate a title sheet map that can be saved as a separate file and added to the title sheet.	
OHDOT Title Sheet Map – DGN Version Used to generate a title sheet map that uses DGN elements and	
places them directly within the dgn file.	
OHDOT Balloon	
This MicroStation Visual Basic Application is used to place	- V
balloon references on the plan sheets and typical section sheets.	онрот
	Balloon
OHDOT Signs This MicroStation Visual Basic Application is used to place	70
existing and proposed sign information on ODOT plan sheets.	W
	OHDOT Signs

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OHDOT Plan Notes MicroStation Visual Basic Application used to place standard plan notes on an ODOT General Notes sheet.	OHDOT Plan Notes
OHDOT DU Item Type Sync App used for setting up/updating drainage and utilities annotation.	OHDOT DU Item Type Sync
OHDOT Text Masking	A
OHDOT Add This MicroStation Visual Basic Application is used to add selected numeric text elements to place the total in the file at a user specified location	+
OHDOT Dirt Calc This application is used to measure areas and end widths on completed cross sections to assist the user to generate cross section seeding and earthwork quantities.	
OHDOT Property Line Marker This MicroStation Visual Basic Application is used to place a property line marker or ownership marker along the selected curvilinear element.	
OHDOT Get View Rotation This MicroStation Visual Basic Application returns the view rotation angle for the selected view window.	9
OHDOT Pavt Marking	=
OHDOT Geotechnical Report This MicroStation Visual Basic Application is used to generate a comma separated (CSV) file containing a list of the soil boring points found in the specified ORD Survey Field Book.	OHDOT Geotechnical Report
OHDOT gINT Conversion This MicroStation Visual Basic Application is used to convert soil boring graphics exported from gINT into a DXF file to meet the CADD Standards required by the Geotechnical Drafting Guide.	OHDOT gINT Conversion
OHDOT gINT Summary Converter	OHDOT gINT Summary Conv



OHDOT Rebar Chart This MicroStation Visual Basic Application is used to generate a rebar summary chart.	OHDOT Rebar Chart
OHDOT Existing Pipes This MicroStation Visual Basic Application is used to draw drainage pipes between to ORD Survey Points.	CHDOT Existing Pipes
OHDOT Rotate Survey Symbols This MicroStation Visual Basic Application is used to rotate selected ORD Survey points relative to a selected curvilinear element.	😋 OHDOT Rotate Survey Sym
 OHDOT Geometry Points ORD Geometry and Survey point reporting tools OHDOT Monument Report C# application is used to assist in filling out the monuments sheet of the ODOT Survey Master excel file. 	 Reports OHDOT Geometry Points OHDOT Monument Report

The Links Tab

Several links for various support resources are provided within OpenRoads on the **Links** tab in the **Ohio DOT WorkFlow**, which is selected from the WorkFlow menu at the upper left of the ORD interface.

🖉 Ohio DO	Г		- 😑	🖶 🛃 🕼 🐟 - 🥕 📌 🚔) 🗙 😑
File Ho	me	Apps	Links		
🖉 OhioDOT	CADD V	Nebpage	12	OhioDOT CADD Support Re	OhioDOT DRRC
🜌 OhioDOT	CADD V	Viki Page	៧	OhioDOT CADD YouTube	🖉 Bentleys ORD Wiki
🗖 OhioDOT	CADD (Communi	ty 应	OHDOT CADD MANUAL	
				Links	

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6 MicroStation Design Files

This chapter discusses the way ODOT uses MicroStation design files with the OHDOT Standards.

Standard Design File Names

The **<u>OHDOT CADD Engineering Standards Manual</u>**, **Section 304 File Naming Conventions**, defines the standard MicroStation design file names to be used on all ODOT projects.

Example file name: 78086_BK001.dgn

- The standard design file names are to be used on all ODOT projects.
- Using the <u>OHDOT Create Design Files</u> application ensures that the file names and folder structure requirements are met.

Basemap and Sheet Design Files

For ODOT purposes, a MicroStation design file is typically used as either a **Basemap** design file, or a **Sheet** design file.

- **Basemap** design files are used to draw plan, profile, and cross section information for your project in real world dimensions.
- Sheet design files are used to assemble the plan sheets for the project.

In either case, the only real difference between a Basemap and a Sheet design file is the **Model** that is used within the design file to contain the information.

Basemaps and Sheets Sub-Folders

Basemap and Sheet design files are stored in separate folders for easier access when attaching reference files. For example, if the Right-of-Way designer wishes to reference the drainage basemap in his sheets he only needs to search the \400-Engineerng\Drainage\Basemaps folder for the drainage basemap rather than sort through all the sheet design files since they are contained in the \400-Engineering\Drainage\Sheets folder.

Several basemap design files may be used depending on the project complexity. The ODOT CADD Standards allow for multiple basemap design files for each unique discipline (drainage, lighting, mot, roadway, signals, etc...).

Models

A MicroStation design file is composed of one or more drawing areas called a **Model**. When users draw or place elements with MicroStation tools, the elements are added to the active Model.

- Design files can contain multiple models. Think of each model as a separate design within a design file.
- A Model can be either 2D or 3D. The same design file can contain both 2D and 3D models.
- 3D models can be referenced to 2D models, and vice-versa.

• Each Model is a completely independent drawing area and has its own set of eight views, reference attachments, etc.; however, all models within the same DGN use the same color table, fonts, line styles, etc...

MicroStation provides three types of models:

- **Design** This model type is used for creating design geometry that can be either 2D or 3D. By default, **Design** models have a black background.
- **Drawing** This model type is used to reference the design models clipped to the limits of a sheet, and to place annotations, dimensions, and other callouts that will be referenced to a sheet model. A drawing model is always a 2D model. By default, **Drawing** models have a gray background.
- **Sheet** The Sheet model is most commonly used to assemble the plan sheets for the project by referencing one or more of the drawing models and placing the sheet border in the sheet model. By default, **Sheet** models have a white background.

The Models Dialog

The *Models* dialog is used to manage and switch between models in the current MicroStation design file.

The Models icon is available on the Home tab in several of the WorkFlows within ORD.



When the icon is selected, the dialog shown below is opened.

🗇 Mod					_		\times
P) (💾 🔲 🌱 🗙					
Туре	2D/3D	Name ^	Description	*	Design Fil	e	
G		000072_GP001			C:\CONN	E\0000	072_GP0
		000072_GP001 [Drawing]			C:\CONN	E\0000	072_GP0
D		000072_GP6			C:\CONN	E\0000	072_GP0
<							>

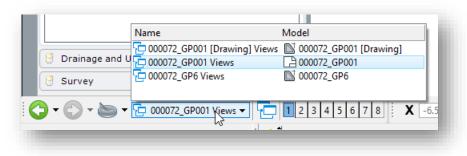


OHDOT CADD WorkSpace Basics

When a new MicroStation design file is created using one of the ODOT seed files, there is only one model contained in the file. The example above shows models that were generated using the ORD sheet clipping process.

To work with another model in the design file, you must activate it. Double-clicking the model name within the *Models* dialog box makes the model active.

Alternatively, you can use the **View Groups** window to rapidly switch between models as shown below.



The name of the active model is also displayed in the **View** window title bar as shown below.



ODOT's use of Models

Models are used for ODOT plan preparation as follows:

- **Basemap** design files are used to draw the plan view graphics for the entire project in real world dimensions. The **Design Model** is used for this information.
- **Sheet** design files are used to assemble the plan sheets for a project. The plan sheet information is drawn in a **Sheet Model**.
- Sheet design files that are generated with ORD will use all three model types as follows:
 - A **Design** model is used to reference the various basemaps that will be shown on the completed sheets.
 - Multiple **Drawing** models are used to refere the **Design** model, and all its references. Each **Drawing** model is clipped to the limits that will be shown on the completed sheets. All annotation is placed in the **Drawing** model.
 - Multiple **Sheet** models are used to place the sheet borders and reference the **Drawing** models.

See ODOT's ORD Training material for more information on sheet clipping using the ORD tools.

In previous versions of ODOT's seed files, the seed files contained two models, a design model and a sheet model. With the OHDOT Standards, each seed file contains only one model. This change was made to accommodate the way the ORD Software uses the seed files to create sheets.

Design Model

When a new file is created using the <u>seed files</u> defined for the Workset, ######_DesignSeed2d or ######_DesignSeed3d files, the new file will contain only one model, the default design model named "Design". The design model is used for creating all design geometry in real-world dimensions.

- All basemap information is drawn in the default "Design" Model using real world dimensions at a 1:1 scale.
- All Line Styles and Cells drawn in the basemap design model shall be drawn at a scale of one (1). The Annotation Scale parameter is used to set the display size of cells, custom linestyles, text, and dimension elements.

Drawing Model

Drawing models are used in the ORD sheet clipping process. The drawing model contains references to the design model. These references are clipped to the limits that will be shown on the completed sheets. The intended workflow is for all sheet annotation to be placed in the drawing model.

Sheet Model

When a new file is created using the **OHDOT_SheetSeed2d** seed file, the new file will contain only one model named "Sheet". The sheet model is used to assemble plan sheets for plotting and PDF generation.

Based on the type of sheet to be built (title sheet, schematic sheet, etc.), a sheet border cell is placed in the "Sheet" model from the **OHDOT_Sheets.cel** cell library by use of the **OHDOT Sheet Cells** application.

If the user is manually assembling sheets, the design graphics are typically referenced from the basemap design file(s) to the sheet model. These references are then clipped, and annotations are added as needed. The "Sheet" model then contains a graphic representation of the final plan sheet and is ready to be plotted.

If the user is assembling sheets using the ORD sheet clipping process, the workflow is different using the Drawing Model for annotations and references to various Design models, and using the Sheet model to place sheet borders and to refence the Drawing model. See ODOT's ORD training material for more information.

Using Multiple Sheet Models

The **<u>OHDOT CADD Engineering Standards Manual (OHDOT)</u>**, **Section 303** contains information on the use of multiple models for ODOT projects.

In general, it is not permissible to use multiple models in a Basemap design file other than the models that are automatically generated using Bentley's OpenRoads Corridor Modeling tools. For example, it is not permissible to create a Basemap design file with one model containing the proposed plan view information and another model containing the proposed landscaping information. If the landscaping information is needed in a separate model it should be housed in a separate design file as defined in the ODOT CADD Standards.

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- ODOT allows only one plan sheet per sheet model in a sheet design file.
- Plan sheets of a like type can be separated into separate design files, or alternately separate sheet models within one design file.
- Multiple sheet models may be used within a sheet design file for multiple sheets of the same type. For example, it is not permissible to create a model for the General Notes and another model for the Typical Sections within the same design file.

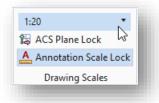
Model Annotation Scale

The Model **Annotation Scale** sets the proper display scale for all annotations placed in a Design, Drawing, or Sheet model. Any Text, Dimensions and Cells that are placed in the model are referred to as Annotations in MicroStation.

The **Annotation Scale** value can be set in the **Properties** dialog, or by use of the **Drawing Scales** group in the ribbon menu.

The Drawing Scale parameters are available in several WorkFlows within the ORD interface.

- Drawing > Utilities > Drawing Scale
- OpenRoads Modeling > Drawing > Drawing Scales
- OpenRoads Modeling > Drawing Production > Drawing Scales
- Survey > Drawing > Drawing Scales
- Survey > Drawing Production > Drawing Scales
- Subsurface Utilities > Drawing > Drawing Scales
- Subsurface Utilities > Drawing Production > Drawing Scales



The **Annotation Scale** parameter is a multiplier that is applied to the base size of an element when the element is placed. This allows elements to be displayed correctly at a variety of plotting scales.

Cells and Annotation Scale

When placing cells in the design, the **Annotation Scale** setting is used to control the size of the cells placed in the design. The **X Scale** and **Y Scale** parameters should always be set to a value of 1 as shown below.

	751.00	
Active Cell:	TELPP .	
Active <u>A</u> ngle:	00°00'00.0"	÷
<u>X</u> Scale:	1.000000	1
<u>Y</u> Scale:	1.000000	
	Place as Shared Cell	2
		Lock : ON
		Scale : 20.000000 :

Cells should always be placed in the design with the **Annotation Scale Lock** toggled on as shown at left.

The **Annotation Scale** value is applied to the cell to determine the display size of the element within the file.

If the annotation scale is changed, the display of the cells is dynamically adjusted to reflect the changed value.

Some of the ODOT cells have been defined using the real-world dimensions of the item that they represent and cannot be scaled with the annotation scale setting. For example, pavement markings are placed at their real-world size and are not scaled according to the current **Annotation Scale** value.

In the example below, the cell **PMRTP** is placed at its actual size and is not scaled by the annotation scale parameter even though the annotation scale lock parameter is toggled on.

Active <u>C</u> ell: Active <u>A</u> ngle:		 •		
X Scale:	1.000000		_	
Y Scale:	1.000000		A	
	Place as Shared	Cell		
			•	

Cells that are defined using their real-world dimensions are referred to as **Physical** cells.

Cells that represent the location of an item, but not the actual size (such as a mailbox or telephone pole) are referred to as **Cosmetic** cells and are scaled by the annotation scale parameter.

The cell definition itself within the cell library defines whether the display of the cell is affected by the annotation scale parameter.

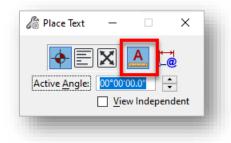


Text Styles and Annotation Scale

When placing text in the design, a **Text Style** is used to define several parameters for text placement, including the text height, width, justification, font, line spacing, etc. The ODOT WorkSpace provides several test styles used in plan production as defined below.

MicroStation's **Annotation Scale** parameter is used to define the size of the text as placed in the design file relative to the intended plotting scale for the completed sheet. The Text Styles define the base text size for annotation. ODOT's standard text styles are defined with a base size of 0.14 master units. This size is equivalent to a 10-point font on the completed plan sheets.

When placing text, ensure the **Annotation Scale Lock** is toggled on as shown below.



With the **Annotation Scale** parameter toggled on, text is placed in the file using the current annotation scale value as a multiplier.

The base size (0.14) is multiplied by the current Annotation Scale value to define the height, width, and line spacing of the text as placed in the file. Changing the annotation scale will resize text elements. This applies to text contained in reference attachments.

OHDOTCEv1 Text Styles

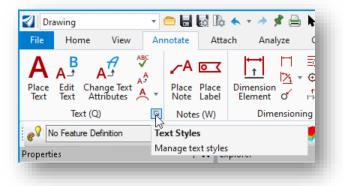
Text Styles in the ODOTCEv1 WorkSpace are defined with font Arial for all of the text styles. There is no differentiation between annotations of existing and proposed plan features.

OHDOTCEv2 Text Styles

With the OHDOT_v2 WorkSpace, ODOT is moving away from using font Aerial as the primary font for plan production use to fonts Calibri and Calibri Light. This was done to provide clear differentiation between labels for existing and proposed items. Existing items are annotated with Font Calibri Light. Proposed items are annotated with font Calibri Italic.

The text styles in the ODDOTCEv2 WorkSpace have been renamed to accommodate these changes.

The available Text Styles can be reviewed by selecting the icon in the lower right corner of the Text group, as shown below.



The Text Styles dialog shown below is opened.

M Text Styles - P_Slanted-Normal LS=0.50 (A	active : Style (none))		- 🗆 🗙
St <u>y</u> le Vi <u>e</u> w			
E - 📮 🖥 🗗 🗗 📲 🤾 🖍	X		
Text Styles	General Spacing Under/Ove	rline Background Adva	nced
Style (none)	Font: 啦 Calibri		olor: 🔳 0 👻
P_Slanted-Normal Fixed Spacing	Justification: Left Top	▼	old
P_Slanted-Normal LS=0.50	Height: 0.140		alics
P_Slanted-Normal LS=0.50 Masked			Inderline
P_Slanted-Normal LS=0.75	Width: 0.140		Verline
P_Slanted-Normal LS=1.00	Slant: 0°0'0"		-
P_Slanted-Sub Title			ractions
P_Slanted-Title D Straight Normal Fixed Spacing		V	ertical
P_Straight-Normal Fixed Spacing P_Straight-Normal LS=0.50		F	ull <u>J</u> ustification
P Straight-Normal LS=0.50 Masked			
P Straight-Normal LS=0.75			
P_Straight-Normal LS=1.00			
P_Straight-Sub Title			
P_Straight-Title			
© Title			
🛇 Title-Main			
S Title-Sub			
SX_Straight-Normal Fixed Spacing			
X_Straight-Normal LS=0.50	P Slanter	d-Normal	LS=0.50
X_Straight-Normal LS=0.50 Masked			
St X Straight-Normal I S=0.75			

The text styles in the OHDOTCEv2 WorkSpace are defined for use with various ORD software annotation functions as described below.

• Text styles named with the prefix "**P**_" are used for the annotation of proposed items. These text styles are defined to use the font Calibri with the Italics option toggled on.

P_Slanted-Normal LS=0.50



• Text styles named with the prefix "X_" are used for the annotation of existing items. These text styles are defined to use the font Calibri Light with the Italics option toggled off.

X_Straight-Normal LS=0.50

• Text styles named with the prefix "~**P_Label**" "~**X_Label**" are used in various ORD annotation definitions and are not typically used when placing text. The tilde (~) character was added to the prefix so that these text styles sort last in the list.

Text Symbols (Special Characters)

Engineering documents commonly use special characters for annotations such as a Center Line (CL) or Baseline (BL) character. These characters are not defined in a standard True Type font such as Calibri. ODOT's WorkSpace provides symbol fonts used to define these common engineering characters.

To insert a symbol in the text, simply select if from the **Favorite Symbols** list when placing text using the **Place Text** command.

죃 Text Editor S Slanted-Normal LS=0.50 - f(x)Tr Arial \sim A1 0.140 B Favorite Symbols All Symbols Plus/Minus Degree Baseline 7 Centerline Flow Line Property Line Font: Tr OHDOTSymbols B Code Point: 0xE0A6

The **Favorite Symbols** defined in the **OHDOTCEv1** WorkSpace are shown below:

The available special characters have been expanded for the OHDOTCEv2 WorkSpace to include options for the annotation of existing and proposed features, as shown below.

A Text Editor			_		×
♥ P_Slanted-Normal LS=0.50 、 ⓓ ▲ ▲	🔇 ▼ ☆ ▼ ƒ(x) 🛱 Calibri ~ A‡ 0.1	14 🛛 🕶 🗆	BI	U	
<u></u>	Favorite Symbols All Symbols			• •	1 • •
	Plus/Minus	^			- 8
	Degree				- 8
					- 1
	P-Baseline				- 8
	P-Centerline				- 8
	P-Flow Line				- 8
	P-Property Line X-Baseline				- 8
	X-baseline X-Centerline				- 8
	X-centenine	•			- 8
	+ Font: Tr Calibri				- 8
	Code Point: 0x00B1				- 8
					- 8
		_		_	_

- Characters have been defined for the annotation of existing items using a straight symbol based on font Calibri Light and named with an "X-" prefix
- Characters have been defined for the annotation of proposed items using a straight symbol based on font Calibri Italic and named with an "P-" prefix

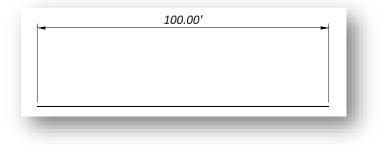
Select **All Symbols** to display all of the symbols available in the selected font. The special characters that have been defined for the OHDOTVEv2 WorkSpace are shown below.

Ŧ			ols mbol			5							
			1/2	1/3	2⁄3	1/4	3⁄4	⅓	⅔	⅔	4∕5	1/6	5⁄6
1⁄8	3⁄8	5⁄8	7⁄8	1/16	⅔16	5/16	7/16	%	11/16	¹³ %6	¹⁵ /16	¤	C
°C	°F	Ę	PL	Æ	Æ	Μ	Ø	∇	√	»—	∜	∞	≈
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-	-	5		5	-			•					
	Πu	nico	de Na	ame:									



Dimension Styles

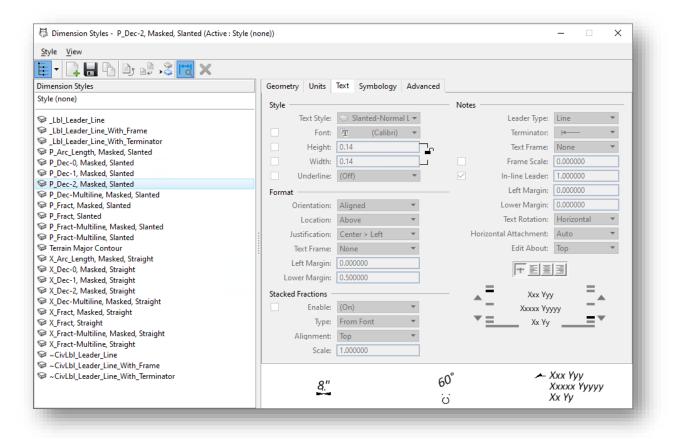
Dimension Styles are used to define the default parameters for use on ODOT plans. These parameters include settings for the dimension lines, arrow heads, and text styles. An example of a linear dimension using the OHDOTCEv2 Standards is shown below.



The available dimension styles can be reviewed by selecting the **Manage dimension styles** icon in the lower left of the **Dimensioning** group as shown below.

		iotate Atta	ch Analyze Curves	Constraints	Utilities Di	awing
A A A A A A A A A A A A A A A A A A A	A F	A OC	Dimension Element of P ≠ E	Place Table	$ \begin{array}{c} \bullet & \circ^{\theta} \circ^{-} \\ \bullet & \circ \\ \end{array} \\ \begin{array}{c} \text{Section} \\ \text{Callout} \end{array} \end{array} $	→ Pla Activ
Text (Q)	ra i	Notes (W)	Dimensioning (E)	Tables (R)	Detailing (T) 🕞	Ce
No Feature Definition			\$ 4 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Dimension St	tyles	

The *Dimension Styles* dialog is opened.



The settings above list the Dimension Styles available in the OHDOTCEv2 WorkSpace.

The following dimension styles are defined for ORD annotation functions and are not intended to be selected by the user when placing dimensions:

- _lbl_Leader_Line
- _lbl_Leader_Line_With_Terminator
- Terrain Major Contour
- ~CivlLlb_Leader_Line
- ~CivilLbl_Leader_Line_With_Frame
- ~CivilLbl_Leader_Line_With_Terminator

Like text and cells, MicroStation dimension elements are placed using the **Annotation Scale** parameter.

When placing dimension elements, the **Annotation Lock** should be toggled on as shown at right.

OHDOT CADD WorkSpace Basics

When a dimension is placed in the file, the text is placed at the height and width defined for the dimension style (typically 0.14). The initial size is then multiplied by the current **Annotation Scale** value to determine the displayed size of the text element.

Changing the current **Annotation Scale** value will change the display size of the dimension element appropriately.

Dec-2, Mas	ked, Slanted 🝷 📎	و
<u>A</u> lignment:	Drawing	▼
Location:	Automatic	~
	🖬 🛠 🏣	

Custom Line Styles and Annotation Scale

Just like text, cells, and dimensions, ODOT's custom line styles are placed in the design file using a base scale value appropriate for a 1:1 scale drawing which is then multiplied by the **Annotation Scale** for the intended plotting scale.

When curvilinear elements are drawn using a custom line style, the scale value set in the *Line Styles* dialog is used to determine the initial placement size of the custom line style.

Select File > Settings > File > Line Style Settings to access the *Line Styles* dialog shown below.

Names	^	Width
fenceex		Origin: 0.000
gateex		<u>E</u> nd: 0.000
shrublt		True Width
stream		
treelt		<u>S</u> cale factor: 0.000000
(Border)	*	Shift: None 🔻
\400-Engineerin	g\Roadw	vay\Sheets\123456_GP001.dgn

The **Scale Factor** item is used to set the initial placement value. If this item is toggled off, as shown at left, a value of 1 is assumed.

- ODOT's Custom Line Styles have been created at a 1:1 scale so they are scaled to the appropriate sheet scale.
- Some of the custom line style definitions are defined as **Physical** line styles, representing real world dimensions and are not scaled when placed, while others are **Cosmetic** representations of elements used to designate the location of the feature, but not the size.

For example, the custom line style for a pavement marking lane line is defined at the actual dimensions of the dash and gap lengths. When the lane line graphics is placed, the current annotation scale value does not impact the length of the dash and gap. Conversely, the

 $\mathbf{\Sigma}$

custom line style for a fence line is scaled by the annotation scale parameter to be readable on the plan.

The definition of the custom line style itself, within the line style library, defines whether an individual line style represents a cosmetic or physical element.



Exercise: Models and Annotation Scale

In this exercise we will explore how the annotation scale is set in the survey basemap and how it can be controlled by the reference file attachments independently from the value set in the survey file.

- Open ProjectWise Explorer if it is not currently open
- When prompted, sign in to ProjectWise as shown below

🔀 ProjectWise	Explorer Log In			×
Datasource:	Ohio DOT Training-Testing	\sim	Log in	
Authentication:	Bentley IMS	\sim	Cancel	
User Name:				
Password:				

• Browse to the sample project to open the file listed below

..\IntroToMicroStationTraining\78086\300-Survey\Basemaps\78086_FB001.dgn

There are a few things to note about this file:

- This is a Survey file. If you are not a member of the Survey group, the file is opened Read-Only
- This file was generated using the OpenRoads Survey tools and is a 3D file.
- The Terrain Model, which represents the existing ground surface, is an element in the design file
- The terrain model is linked to the survey graphics. Editing the design file graphics can result in unwanted edits to the terrain model. Therefore, it is suggested that the designers do not make graphical edits in the survey file without consulting the survey personnel.

The graphics contained in a Survey basemap generated with the OpenRoads Survey tools are Annotation Scale aware. Changing the annotation scale value will change the display size of cells, text and the custom line styles in the file.

Take the following steps to observe the annotation scale behavior:

- ✓ Change the current annotation scale value to 1:50. Note the changes to the design file graphics.
- ✓ Open the Geometry Basemap from the following location:

..\IntroToMicroStationTraining\78086\400-Engineering\Basemaps\78086_BK001.dgn

- ✓ Review the attached references.
 - From the **Drawing** Workflow, select **Home > Attach Tools > References** to open the *References* dialog.
 - The Survey Basemap design file, 78086_FB001.dgn, is already attached as a reference file. In the *References* dialog, right-click on the survey basemap and choose the **Settings** option. The *Attachment Settings* dialog shown below is opened.

引 Attachment Propert	ies: 78086_ftt%01.dgn	×
File Name:	PW_WORKDIR:d0289248\78086_FB001.dgn	<u>B</u> rowse
Full Path:	\eric.thomas\d0289248\78086_fb001.dgn	
<u>M</u> odel:	Design 👻	
Logical Name:		
Description:	Global Origin aligned with Master File	
Detail Scale:	1:20 👻	
Sc <u>a</u> le (Master:Ref):	1.000000000 : 1.000000000	
Named Group:	▼.	
Revision:	•	
Le <u>v</u> el:		
Nested Attachments:	No Nesting Vesting Depth:	0
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	<u>о</u> к	Cancel

The **Global LineStyle Scale** option is used to control how line styles are displayed for the selected reference attachment. In the example above, the reference attachment is set to **Master**. This setting allows the active design file to control the annotation scale appearance of the cells, text, linestyles, and dimension elements in the reference attachment. Choose the **Cancel** button to close the dialog without making any changes.

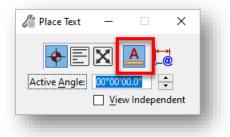
✓ Change the Annotation Scale setting to 1:10 in the active file. The display of the text, cells, and custom line styles is changed independently of the setting defined in the original Survey basemap.

Next, we'll place text to illustrate how the annotation scale is applied to the text elements.

- ✓ Change the active level to **SC_Scratch1**
- ✓ Select the Place Text command (Drawing > Annotate > Place Text) to place some text in the design file.

Text Editor			-	- 🗆	×
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- ✓ Select the P_Slanted-Normal LS=0.50 text style from the drop-down list in the upper left of the *Text Editor* dialog. The font defaults to Calibri Italic with a text size of 0.14.
- ✓ In the tool settings dialog, ensure the **Annotation Scale Lock** is toggled on as shown below.



- Place multiple text elements in the file.
- After placing the text, change the annotation scale value (**Drawing > Utilities > Drawing Scale**). Notice that the text elements are scaled about the individual element's origin. Depending on the annotation scale value, this may result in overlapping text elements.

Next, we'll place a few cells in the file.

✓ Select the Place Active Cell command (Drawing > Home > Placement > Place Active Cell)

Cells are stored in a library. ODOT maintains several libraries in the CADD Standards.

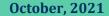
✓ Select the Browse button, to the right of the Active Cell key-in field, to browse ODOT's cell libraries.

The *Cell Library* dialog, shown below, is opened.

C Place Active Ce	ell —		×
Active <u>C</u> ell:			
Active <u>A</u> ngle:	00°00'00.0"	-	
X Scale:	1.000000		
<u>Y</u> Scale:	1.000000		A
	Place as Shar	ed Cell	
	✓ <u>True Scale</u>		-
<u>Mirror</u> :	Horizontal	-	
<u>Interactive</u> :	Scale and Rotate		
Elatten:	Тор	-	
Scale			
	Multi-line Of		
	Dimension V	alues	
	Annotations		
	Association		

- ✓ Select the **File** menu to view a list of the cell libraries that are available in the OHDOT CADD Standards. The cells are separated into discipline specific libraries.
- ✓ Select the OHDOT_Symbols cell library from the list to view the cells that are available in the library.

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- ✓ Place the following cells in the DGN, making sure the **Annotation Scale Lock** is toggled on.
 - AC AIR CONDITIONER EX
 - BBQ STATIONARY BARBEQUE GRILL EX
 - MBP MAIL BOX PR
 - PMLT PVT MRK LEFT-THRU TURN ARROW EX
- ✓ After placing the cell, change the annotation scale value (Drawing > Utilities > Drawing Scale).

Notice that the cells AC, BBQ, and MBP are scaled about the individual element's origin. These cells are defined to represent the location of the feature, but not the actual size of the feature. The cells are scaled to maintain readability on various plan sheets at different scale values.

The cell PMLT is an example of a cell that is created using the real dimension of the cell and will always be displayed at its actual size.

Lastly, we'll draw a few lines in the file using a custom line style.

- ✓ Set the active level (Drawing > Home > Attributes > Level) to the levels below and draw a line or line string (Drawing > Home > Placement > Place SmartLine) on each level.
 - RD_X_Fence
 - PM_X_Lane_Line
- ✓ After the graphics have been drawn, change the annotation scale value (Drawing > Utilities > Drawing Scale)

The lines drawn on the PM_X_Lane_Line level are not scaled. Pavement marking lines are an example of a line style type that has been defined using its actual dimensions and therefore is not scaled when the annotation scale value is changed.

The fence line is scaled as the annotation scale value is changed. The "X" symbol displayed along the fence line, and the spacing, is scaled to be readable at a variety of plan scales, but does not represent the physical location of fence posts.

- ✓ Change the annotation scale setting back to **1:20** at the completion of this exercise.
- ✓ Exit OpenRoads by selecting **File > Exit**.
- ✓ When prompted, check the file back in to ProjectWise.

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7 Creating Design Files

ODOT's CADD Standards specify the use of multiple design files for a typical ODOT project to federate the data so that it can be accessed by multiple users simultaneously. Each design file for the WorkSet is given a unique name according to the ODOT CADD Standards. Additionally, when a new file is created, there are several parameters that must be properly defined for ODOT projects, summarized below:

- Seed files are used as a template for new files as the files are created. The seed files set various parameters according to the ODOT CADD Standards as well as project specific standards. When creating new design files, users must ensure that the correct Seed File is used for the new design file (2D, 3D) using the appropriate Geographic Coordinate System (GCS) for the project
- As new files are created, care must be taken to ensure that each file is created in the appropriate sub-folder within the OHDOT folder structure
- Files must be named according to the ODOT CADD Standards. See the <u>CADD Engineering</u> <u>Standards Manual (OHDOT)</u>, Section 304 for more information.
- Annotation Scale is set appropriately for the content
- The **Title** and **Comments** file properties can be used to provide information about the design file contents

OHDOT Create Design Files

ODOT provides a custom application to assist with the creation of MicroStation design files using the proper file naming convention and assigning the various parameters detailed above. The program can be accessed from the OHDOT WorkFlow by selecting **Ohio DOT > Apps > OHDOT Create Design Files**.



Information about the program can be accessed by selecting the **Help** icon in the upper right corner of the dialog. Before creating design files, we'll discuss a few of the items in the bullet list above.

Seed Files

When the WorkSet is created, seed files are created for the WorkSet in the following folder:

..\990-WorkSet Standards\Seed\

These seed files are defined with the GCS for the project and are to be used when creating design files for the WorkSet. The OHDOT Create Files application defaults to the correct seed file for each design file type (Basemap or Sheet) that is created.

Title and Comments Properties

The **Title** and **Comments** file properties may be used by ODOT personnel to add additional information about the design file contents that can be displayed in ProjectWise Explorer. The use of these properties is optional.

The file properties are assigned when a design file is created using the **OHDOT Create Design Files** application and can also be assigned manually in MicroStation.

To edit the file properties in MicroStation, select **File > Properties** to access the *Properties* dialog shown below. Select the **Extended** tab to review or edit the **Title** and **Comments** properties.

Properties		▼ ₽>	×
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	2		
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Manager			Ш
Client			Ш
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Comments	SR 185		Ш
Keywords	511 105	_	Ш
			Ш
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Grid		*	H

The **Title** property is typically used to define the file type.

The **Comments** property is typically used to define the file contents.

These properties can be reviewed from the ProjectWise Explorer dialog as shown below.

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atasource Folder Document View Tools Window					
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⊕ 💯 Geotechnical ⊕ 💯 Landscaping ⊕ 💯 Lighting	Desument Proper	~			
⊕ Geotechnical ⊕ Landscaping ⊕ Lighting ⊕ MOT	Desument Proper	Property name	Property value	Property name	Property value
Geotechnical ⊕ ∑r Landscaping ⊕ ∑r Lighting ⊕ ∑r MOT ⊕ ∑r Roadway ↓ ∑r Basemaps ↓ ∑r EngData	Desument Proper	Property name Name	Property value 78086_BK001.dgn	Property name Description	
Geotechnical Ge	Desument Proper	Property name Name File Name	Property value 78086_BK001.dgn 78086 BK001.dgn	Property name Description Version	Property value Civil Geometry Basemap PR.
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The order of the headings (**Name**, **Description**, etc.) can be modified by dragging the heading to the preferred order. In the example above, the **Title** and **Comments** fields have been moved adjacent to the **Name** field.

The **Title** and **Comments** fields can also be reviewed by changing the **View** parameter, located in the center of the dialog, to **DGN** as shown above.

Exercise: OHDOT_CreateFiles

In this exercise we'll create new design files for the sample project using the OHDOT_CreateFiles application.

- Open ProjectWise Explorer if it is not currently open
- When prompted, sign in to ProjectWise as shown below

🔀 ProjectWise	Explorer Log In			×
Datasource:	Ohio DOT Training-Testing	~	Log in	
Authentication:	Bentley IMS	\sim	Cancel	
User Name:				
Password:				

• Browse to the sample project to open the file listed below

..\ IntroToMicroStationTraining\78086\400-Engineering\Basemaps\78086_BK001.dgn

✓ Open the OHDOT Create Design Files application (Ohio DOT > Apps > OHDOT Create Design Files)

nt Folde												
- Filter	s —]	Engineering Fold	Structure Folder:	PID:			1	
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		Shee				Survey Folder:	Wall Folder:	10000	001	In The Inclocation		
						300-Survey∖ ∽	Roadway\ v					
Create	Category	Туре	Description	Code	# of Files	Base Folder	Folder	File Name	File Suffix	Comments	Scale	Seed
\checkmark	Roadway	Sheet	Title Sheet	GT	1	400-Engineering\	Roadway\Sheets\	78086_GT	001	S.R. 72 Relocation	1:1	OHDOT_SheetSeed2d.dgn
	Roadway	Sheet	Schematic Plan	GB	0	400-Engineering\	Roadway\Sheets\	78086_GB		S.R. 72 Relocation	1:20	OHDOT_SheetSeed2d.dgn
	Roadway	Sheet	Typical Sections	GY	0	400-Engineering\	Roadway\Sheets\	78086_GY		S.R. 72 Relocation	1:5	OHDOT_SheetSeed2d.dgn
~	Roadway	Sheet	General Notes	GN	1	400-Engineering\	Roadway\Sheets\	78086_GN	001	S.R. 72 Relocation	1:1	OHDOT_SheetSeed2d.dgn
✓	Roadway	Sheet	General Summary	GG	1	400-Engineering\	Roadway\Sheets\	78086_GG	001	S.R. 72 Relocation	1:1	OHDOT_SheetSeed2d.dgn
	Roadway	Sheet	Maintenance Data	GJ	0	400-Engineering\	Roadway\Sheets\	78086_GJ		S.R. 72 Relocation	1:1	OHDOT_SheetSeed2d.dgn
	Roadway	Sheet	Sub-Summary	GS	0	400-Engineering\	Roadway\Sheets\	78086_GS		S.R. 72 Relocation	1:1	OHDOT_SheetSeed2d.dgn
	Roadway	Sheet	Calculations/Computations	GC	0	400-Engineering\	Roadway\Sheets\	78086_GC		S.R. 72 Relocation	1:1	OHDOT_SheetSeed2d.dgn
	Roadway	Sheet	Plan and Profile or Plan	GP	0	400-Engineering\	Roadway\Sheets\	78086_GP		S.R. 72 Relocation	1:20	OHDOT_SheetSeed2d.dgn
	Roadway	Sheet	Profile	GF	0	400-Engineering\	Roadway\Sheets\	78086_GF		S.R. 72 Relocation	1:20	OHDOT_SheetSeed2d.dgn
	Roadway	Sheet	Quantity Table	GQ	0	400-Engineering\	Roadway\Sheets\	78086_GQ		S.R. 72 Relocation	1:1	OHDOT_SheetSeed2d.dgn
	Roadway	Sheet	Superelevation Table	GE	0	400-Engineering\	Roadway\Sheets\	78086_GE		S.R. 72 Relocation	1:1	OHDOT_SheetSeed2d.dgn
	Roadway	Sheet	Pavement Details	GA	0	400-Engineering\	Roadway\Sheets\	78086_GA		S.R. 72 Relocation	1:20	OHDOT_SheetSeed2d.dgn
	Roadway	Sheet	Intersection/Interchange Details	GI	0	400-Engineering\	Roadway\Sheets\	78086_GI		S.R. 72 Relocation	1:20	OHDOT_SheetSeed2d.dgn
	Roadway	Sheet	Guardrail/Barrier Details	GR	0	400-Engineering\	Roadway\Sheets\	78086 GR		S.R. 72 Relocation	1:20	OHDOT SheetSeed2d.dgn

✓ Under the **Filter** group at the talk of the dialog, select the **Roadway** category and the Sheet option. The dialog is updated to display only Roadway Sheet file types.

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- October, 2021
- ✓ Under the Defaults category at the top of the dialog, key in a default comment of "S.R. 72 Relocation".
- ✓ Toggle on the Create option for the following file types:
 - Title Sheet
 - General Notes
 - General Summary
- ✓ Select the Create Files item to create the files. Note the file names and the folder where the files are created.

Next, we'll create some drainage sheets for the example project.

- ✓ Change the filters, at the top left portion of the dialog, to display **Drainage Sheets**.
- ✓ Create the files listed below. Pay attention to the **Scale** setting.
 - Schematic
 - Notes
 - Sub-Summary
 - Quantity Table
- ✓ Note the folder that is used for the drainage files is not the same folder location that was used for the general Roadway files.
- ✓ This completed this exercise. Exit OpenRoads by selecting **File > Exit**.
- ✓ When prompted, check the file back in to ProjectWise.



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8 Sheet Design Files and Sheet Cells

Sheet borders for ODOT plans are defined as MicroStation Cells. These cells are contained in the following cell library:

...\OHDOTCEv2\Standards\cell\OHDOT_Sheets.cel

With the OHDOT CADD standards, three major changes have been made to ODOT's plan sheet borders:

- The title block information has been simplified to use less parameters
- The look of the sheets borders has been modernized for electronic viewing
- MicroStation Item Types replace the use of Tags for the title block information

These changes provide significant enhancements to the way ODOT manages the sheet title information.

An example of the OHDOT Title Sheet cell is shown below.

		ST	ATE C	DF OHIO		FEDERAL PROJECT NUMBER
	DEF	PARTMEN	TOF	TRANSPO	RTATIO	
						PROJECT DESCRIPTION
						EARTH DISTURBED AREAS
						PROLACT ANYTH MUSICIPANULA ANA _ ACHUS ESTAINTEE CONTACTOR EATH-DISTUREED AREA _ ACRES NOTICE OF WIENT EATH-DISTURBED AREA _ ACRES
		INDEX OF SHEETS:				LIMITED ACCESS
LOCATION MAP						THIS WIPRONEMENT IS ESPECIALLY DESIGNED FOR
LATITUDE LONGITUDE	J					THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY DR FREE MAY BY ACTION DF THE
	-					DIRECTOR IN ACCORDANCE MITH THE PROVISIONS OF
PORTION TO BE IMPROVED						SEC710W 8511.02 DF. 7HE CHRO REVISED CODE
IN 76 HS TATE HIGH MAY						
FEDERAL ROUTES					=	
STATE REPORTS						2019 SPECIFICATIONS
OTHER ROADS						THE STANDARD SPECIFICATIONS OF THE STATE OF
						THE STANLARD SPECIFICATIONS OF THE STATE OF OVID, DEPARTMENT OF TRANSPORTATION, INCLUDING
DESIGN DESIGNATION						SUPPLEMENTAL SPECIFICATIONS LISTED IN THE
CURRENT ACT (20_)						PLANS AND CHANGES LISTED IN THE PROPOSAL SHALL
DESIGN YEAR ADT (20.)						GOVERN 7HIS IMPROVEMENT.
DESIGN HOURLY VOLUME (20)						
LINEC/ICINAL UIS INIBUITON						•
7RUCKS (24 HOUR B&C)						
CESTLAY SPEED						
LEGAL SPEED						
NHS PROJECT						
	ENGINEER'S SEAL					
DESIGN EXCEPTIONS	ENGINEER'S SEAL.					
DESIGN ENCEPTIONS						
ADA DESIGN WAIVERS						
		STANDA	ARD CONSTRUCTION	DN DRAWINGS		PECIAL WISIONS
UNDERGROUND UTILITIES						
Contact Two Working Days	SIGNED.					
Before You Dig				·		
	ENGINEER'S SEAL.					
				+		
QNID#11, 8-1-1, or 1-600-362-2784						APPHÖYEL
LALL MARINE REAL MELTING			_			DATE DISTRICT DEPUTY DIRECTOR
			-			
PLAN PHILIPANEZ BY:						
						DRECTOR, DEPARTMENT OF
	SIGNED.					

Placing Sheet Cells

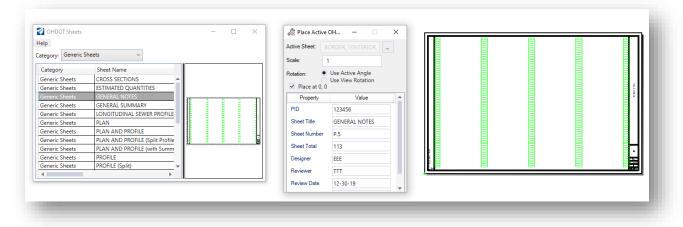
Sheet cells are placed in a sheet design file. The sheet design files are created using the **OHDOT Create Design Files** application as detailed in <u>Section 7</u> of this document.

When the sheet design file is created, the current release of the **OHDOT Create Design Files** application does not place a sheet border in the file. Users must place the sheet border using the **OHDOT Sheet Cells** application.

🖉 Ohio DOT 🛛 👻 🚍 I	io lo 🛧 🔹 🥕	🗲 🚍 🗙 🗧
File Apps		
OHDOT OHDOT OHDOT Create WorkSet Project Indexer		OHDOT Sheet Manager OHDOT OHDOT OHDOT OHDOT OHDOT OHDOT Cross Refs ³
Projects	Files	Sheets

Cells that have interior components, such as the title sheet, are split into two separate cells: one for the border and one for the interior. Placement of the sheet cell border and interior is facilitated by use of the **OHDOT Sheet Cells** application.

In the example below, a General Note sheet border is placed with the interior cell defining the note columns. The parameters for the various sheet title block attributes are entered in the *Tool Settings* dialog as shown below.



The OHDOT sheet seeds files, which are used as the seed file when the sheet design file is created, is configured with the **Show Sheet Boundary** parameter set to a value of **True**. The boundary can be used for the sheet border placement by snapping to the lower left corner of the boundary. In the example above, the sheet is placed at the (0,0) coordinate location using the **Place at 0,0** option.

For more information about the application, chose the **Help** option.

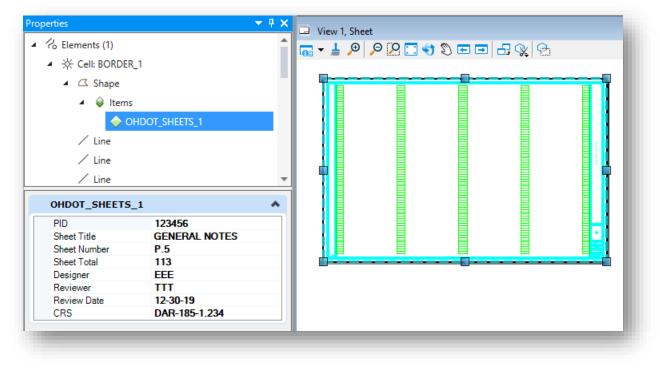


MicroStation Item Types

Item types are a user defined set of properties used to describe an object or element. Item types are assigned to elements in the MicroStation file. The OHDOT sheet border cells use Item Types to define the values for sheet parameters, such as the Sheet Title, Sheet Number, Sheet Total, etc.

Most ODOT users are unfamiliar with MicroStation Item Types. This section will present some general information about item types and how they are defined and assigned. For additional information, see the MicroStation online help.

In the OHDOT implementation, the item types are assigned to the cut-line element of a sheet cell. In the example below, the sheet border is selected, and the Item Type named "**OHDOT_SHEETS_1**" is selected in the *Properties* dialog. The parameters for the item type are edited in the *Properties* dialog.



February, 2022

In the OHDOT sheet borders, the Item Type definition is always attached to the sheet cut line shape element. This shape element is always the first element in the cell, as shown above. Changes made to the **Items** in the **Properties** dialog are immediately reflected in the design.

An example of the item types in the title block is shown at right.

IMPORTANT! Item Types should never be edited as text elements. Always edit the item types using the properties dialog as shown above.



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The Design Agency Cell

The Design Agency portion of the sheet is intended for the company logo.

For ODOT users, the cell **ODOT_ZEPHYR** contained in the OHDOT_Sheets cell library is used. This cell is automatically placed with the sheet border when using the OHDOT Sheet Cells application. For sheets generated using OpenRoads tools, the agency cell must be manually placed in the sheet border.

Plans prepared by consultants should use their company logo and never the ODOT logo. The configuration variable DESIGN_AGENCY_CELLNAME may be defined to specify the name of the cell to be used for the company logo. See the OHDOT Sheet Cells documentation for more information.

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9 Title Sheet Applications

The OHDOT WorkFlow includes three applications specific to the title sheet as shown below. Each application is briefly described below. See the online help for each application for more information.

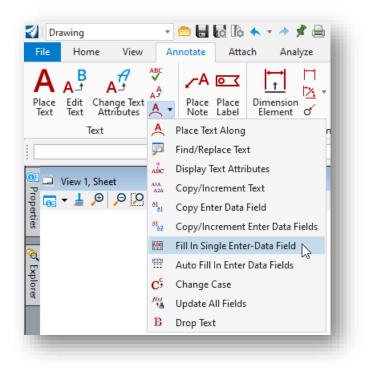


SCD List

The title sheet cell includes data entry fields to enter the Standard Construction Drawing, Supplemental Specifications, and Special Provisions data as shown below.

STANDARD CONSTRUCTION DRAWINGS SUPPLEMENTAL SPECIFICATIONS											CIAL ISIONS
 AND 0 1000 0 10 10											

Data can be manually entered into data entry fields by use of the **Fill in Single Enter-Data Field** or the **Auto Fill In Enter Data Fields** commands as shown at below.



The **OHDOT SCD List** application is used to place the Standard Construction Drawing, Supplemental Specifications data as text elements on top of the data entry fields.

The application provides a pick list of the available Standard Construction Drawings and Supplemental Specifications as shown on the following page.

()

Standard Construction [Drawings v2020.04.16		×
SCD List Updated Augus	st 13, 2020		
Designers are responsible	to verify the plans reflect t	he current SCD/SS date(s) p	prior to submitting final
Pavement Drainage	Roadway Bridge	Traffic (HL) Traffic (MI	I) Traffic (TC) Traffic (
▼ BP-4.1, 7/19/13	MGS-2.4, 7/19/19	RM-2.1, 7/19/13	LA-1.1, 10/15/10
BP-5.1, 1/18/19	MGS-3.1, 1/19/18	RM-3.1, 7/20/18	LA-1.2, 1/16/09
BP-7.1, 7/17/20	MGS-3.2, 1/18/13	RM-4.1, 1/17/20	
BP-9.1, 1/18/19	MGS-4.1, 1/20/17	RM-4.2, 4/17/20	
F-1.1, 7/19/13	MGS-4.2, 7/19/13	RM-4.3, 7/18/14	
F-2.1, 7/20/18	MGS-4.3, 1/18/13	RM-4.4, 7/19/19	
F-3.1, 7/19/13	MGS-4.5, 1/18/13	RM-4.5, 7/21/17	
F-3.2, 7/18/14	MGS-5.2, 7/15/16	RM-4.6, 7/19/13	
F-3.3, 7/19/13	MGS-5.3, 7/15/16	RM-5.1, 7/18/14	
F-3.4, 7/19/13	MGS-6.1, 1/19/18	RM-5.2, 1/18/19	
MGS-1.1, 1/19/18	MGS-6.2, 7/19/19	RM-6.1, 7/18/14	
MGS-2.1, 1/19/18	GR-6.3, 1/20/12	RM-7.1, 7/18/14	
MGS-2.3, 7/18/14	RM-1.1, 7/18/14	RM-7.2, 7/15/05	
UDTIONS I	016 Spec Year 019 Spec Year Show D	etails Clear	Read Place

After selecting the desired drawing and specifications, the data is placed in the design by snapping to the origin up the upper left data entry field as shown below.

n.		STA	ANDARD
BP-3 .1	<u>01/17/</u> 20	<u>MT-10</u> 1.60	<u> 1/17/</u> 20
		<u>MT-10</u> 5.10	<u>1/17/</u> 20
<u>DM-1.1</u>	<u> </u>		
<u>DM-3.1</u>	<u>1/18/</u> 13	<u>TC-41.</u> 20	<u>10/18/</u> 13
<u>DM-4.</u> 2	<u> </u>	<u>TC-42.</u> 20	<u>10/18/</u> 13
<u>DM-4.</u> 3	<u>1/15/</u> 16	<u>TC-52.</u> 20	<u>7/20/</u> 18
<u>DM-4.4</u>	<u>1/15/</u> 16		

See the help document for more information on the operation of this application.

Title Sheet Map

There are two title sheet map applications available on the Ohio DOT menu. One application generates a PNG file for the map with the location based on the project information in ODOT's TIMS database. The second version uses DGN based maps to generate the project map for the title sheet.

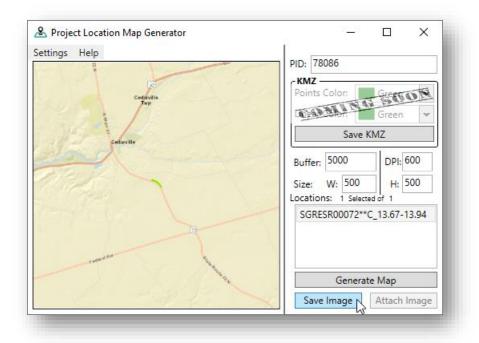
Why are there two applications to place a title sheet map?

ODOT has used a DGN based title sheet map application for several years. These maps were generated with software that ODOT no longer uses and have not been updated for well over 10 years. With no feasible way to update the county map DGN files, the PNG version was developed to use up to date mapping. ODOT now has a process to update the old county map DGN files and has added an updated version of the old application to the interface.

Each application is acceptable for ODOT plans and is a matter of user preference.

Title Sheet Map – PNG Version

The OHDOT Title Sheet Map application is used to generate a PNG file for the title sheet map. When the application is selected, the dialog shown below is opened.



The **PID** number is used to enter the ODOT PID number for the project.

After the PID number is entered (use the TAB key) the application searches ODOT's TIMS database for the specified PID number.

The project locations are listed in the **Locations** portions of the dialog.

Select the location from the list and then pick the **Generate Map** button to view a map. The **Buffer** value is used to increase the image beyond the extent of the project.

Select **Save Image** to save a PNG file of the project map. We recommend saving the image in the 400-Enginieering\EngData\ folder.

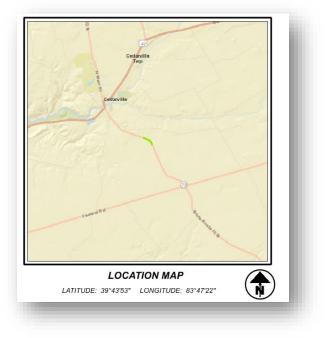
After saving the image, the image is displayed on the title sheet map by attaching the PNG file as a reference attachment. The References tool is available in several locations within the ribbon menu. When attaching the reference, set the filter for the file type to **All Files (*.*)** as shown below.

	Name		Date modified	Туре	Size			
	🗋 CLP_S072ລ	xml	9/22/2020 10:08 AM	XML Document	4 KB			trainer.
Quick access	Profile Info	p.txt	9/22/2020 2:04 PM	Text Document	1 KB			CV-AL
	📄 ProjectLoc	ationMap.png	10/13/2020 9:47 AM	PNG File	149 KB			aland manual
		nwork Quantities Report.doc	9/23/2020 11:05 AM	Microsoft Word 9	35 KB			The states of th
Desktop		nwork Quantities Report.xls	9/23/2020 11:04 AM	Microsoft Excel 97	35 KB			Perfect 1
-		Area Volume Report.doc	9/23/2020 11:02 AM	Microsoft Word 9	24 KB			
Libraries	🖻 SR 72 Volu	mes Report.doc	9/23/2020 11:03 AM	Microsoft Word 9	98 KB			
								Attachment Method
This PC								Interactive
This PC								
Network								
Network								
	File name:	ProjectLocationMap.png				~	Open	
	Files of type:	All Files (*.*)				~	Cancel	
	•	Save Relative Path					Options	

Once attached, the image itself is placed at the 0,0 coordinate in the design file and is very small. Use the **Reference** tools to move and scale the image.

An example of the map after it has ben moved into position and scaled is shown at right.

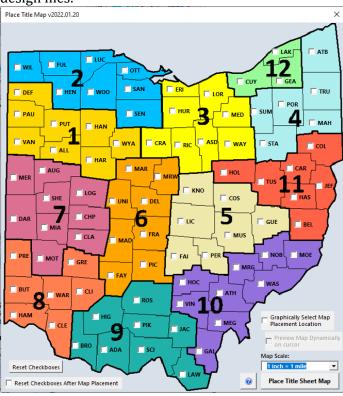
For more information on the Reference tool, see the MicroStation online help.



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Title Sheet Map - DGN Version

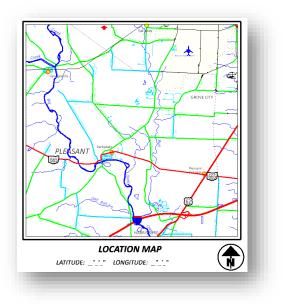
A new version of the title sheet map application is available with the OHDOT CADD Standards published in November, 2021. This version uses an updated version of the Ohio County Maps design files.



When the application is loaded, the dialog shown at left is opened.

Select the desired county(s) from the Ohio Map. Choose the **Place Title Sheet Map** button to initiate the process. The selected county(s) are attached as a reference with a bounding box dragging on the cursor to select the map area. Once selected, the map is copied to the title sheet.

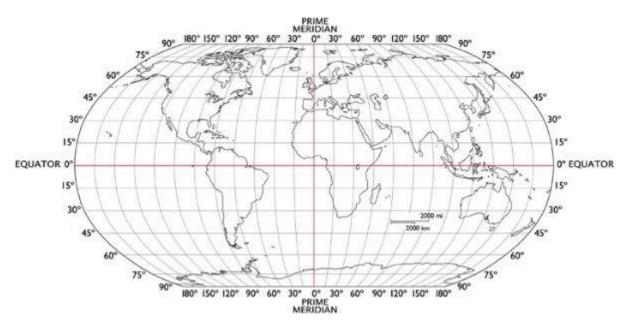
An example of the map is shown below.





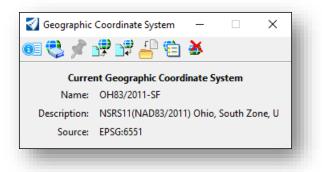
Latitude, Longitude Coordinates

Latitude and longitude coordinates are shown on the title sheet according to the **Location and Design Manual – Volume 3, Section 1302.8**.

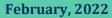


Latitude (northing) and longitude (easting) coordinates can be displayed in OpenRoads if a Geographic Coordinate System (GCS) has been defined in the file by taking the steps below:

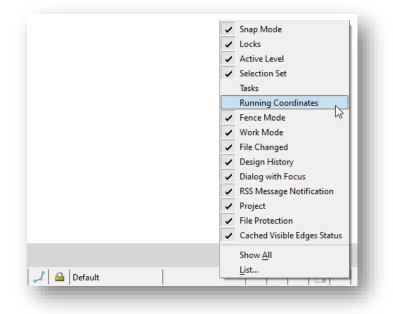
- ✓ Open a design file with a GCS defined. The Geometry Basemap (BK) design file is a good file to use for this purpose since the alignment in formation is drawn in this file.
- ✓ Verify that a GCS has been assigned by selecting Utilities > Coordinate System from the Drawing WorkFlow. A GCS should be defined like the example below. If no GCS is defined, contact the District Survey Operations Manager.



The **Running Coordinates** display is used with an Auxiliary Coordinate System (ACS) to display the latitude and longitude coordinates.



✓ Turn on the running coordinates display by right-clicking in the bottom-right portion of the OpenRoads window as shown below

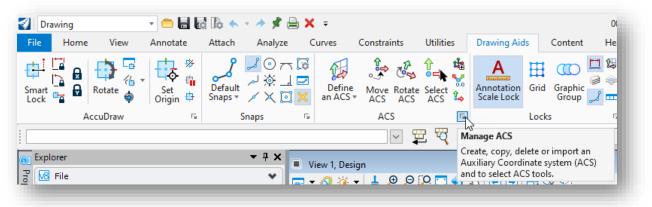


The coordinates of the cursor position are dynamically displayed as the cursor is moved in the ORD view window.



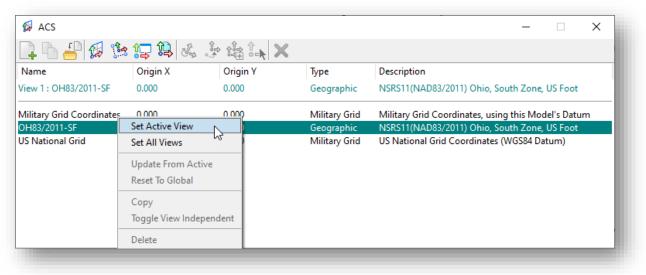
To display latitude and longitude coordinates, an ACS using the current GCS must be defined.

✓ Select the Manage ACS icon as shown below





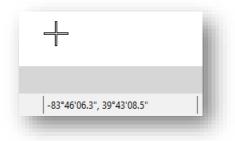
✓ The ACS dialog is opened as shown below. Right-click the GCS that is defined for the file and choose the Set Active View option. Close the dialog.



✓ Left-click the running coordinates display and choose the ACS Position option as shown below.

	✓ Position
	Delta
	View Delta
	Distance
	ACS Position
1	ACS Delta
1612096.4	31, 628480.483

As the cursor is moved in the view window, the ACS coordinates are displayed in Longitude (easting), Latitude (northing) format as shown below.



Move the cursor to the approximate center of the project to get the latitude and longitude coordinate values that are to be shown on the title sheet.

Exercise: Title Sheet Applications

This exercise will use the tools documented in this section to create the title sheet for the sample project.

Part 1: Title Sheet Border Cell

The title sheet design file was created in the previous chapter. The file is created in the following location:

- Open ProjectWise Explorer if it is not currently open
- When prompted, sign in to ProjectWise as shown below

🔀 ProjectWise	Explorer Log In			×
Datasource:	Ohio DOT Training-Testing	~	Log in	
Authentication:	Bentley IMS	~	Cancel	
User Name:				
Password:				
				:

• Browse to the sample project to open the title sheet design file listed below

..\ IntroToMicroStationTraining\78086\400-Engineering\Sheets\78086_GT001.dgn

- ✓ Use the OHDOT Place Sheet Cells application (Ohio DOT > Apps > OHDOT Sheet Cells) to place the title sheet border. The sheet can be placed at the 0,0 coordinate by toggling the Place at 0,0 option on, or by snapping to the sheet boundary in the sheet model.
- ✓ When placing the border, enter the following information for the Item Type values:

Property	Value
PID	78086
Sheet Title	TITLE SHEET
Sheet Number	P.1
Sheet Total	55
Designer	Your Initials
Reviewer	The Reviewers Initials
Review Date	Today's Date
CRS	GRE-72-13.67

ategory: Generic S	Sheets ~		Scale:	1	
Category Generic Sheets Generic Sheets	Sheet Name PROFILE PROFILE (Split)	*	Rotation: Place at 0, 0	Use Active Angle Use View Rotation	
Generic Sheets	SANITARY PROFILE		Property	Value	
Generic Sheets	SCHEMATIC PLAN		PID	78086	
Generic Sheets	SPILL PREVENTION CONTROL AI			70000	
Generic Sheets	SUBSUMMARY		Sheet Title	TITLE SHEET	
Generic Sheets	SUPERELEVATION TABLE		Sheet Number	P.1	
Generic Sheets	TITLE SHEET			•	
Generic Sheets	TYPICAL SECTIONS		 Sheet Total	0	
			Designer	XXX	
4		•	Reviewer	XXX	
	r		Review Date	MM-DD-VV	-

Part 2: Title Sheet Map

Using this chapter as a guide, generate a title sheet map for the project with PID number 78086.

- ✓ If using the PNG option:
 - save the map in the 400-Engineering\EngData\ folder
 - Attach the map as a reference and then move it and scale it using the reference tools.

Part 3: Title Sheet SCD List

Use the OHDOT SCD List application (**Ohio DOT > Apps > Title Sheet > OHDOT SCD List**) to place various standard construction drawing and supplemental spec data on the title sheet.

Part 4: Latitude and Longitude Coordinates

Using this chapter as a guide, get the latitude and longitude coordinates for the sample project.

- ✓ Open the Alignment design (400-Engineerng\Roadway\Basemaps\78086_BK001.dgn) file to record the latitude and longitude values for the title sheet.
- ✓ Open the Title Sheet design file (400-Engineerng\Roadway\Sheets\78086_GT001.dgn) and edit the Latitude and Longitude values.

The text in the cell can be edited by use of the **Edit Text** command without the need to drop the interior cell into separate components.

After completing the exercise, close the design file and check the file back in to ProjectWise.

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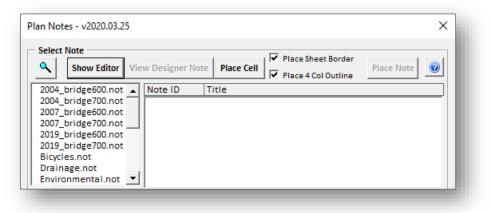


10 General Notes Sheets

ODOT provides a custom application to assist the user with the task of generating the General Notes sheets. The application can be found in the Ohio DOT WorkFlow in the Plan Preparation section as shown below.

🖉 Ohio DOT		• 🔞 • 😑	- 👌 🔓 🔸	· 🥕 🎽 🛤 🖡	× 🗶 후					
File Home	Apps	Links								
OHDOT Create WorkSet	OHDOT Project Indexer	OHDOT Zip Verifier	OHDOT Create Design Files	OHDOT Sheet Manager	 OHDOT Sheet Cells * OHDOT Cross Refs Title Sheet * 	OHDOT Balloon	70 OHDOT Signs	OHDOT Plan Notes	OHDOT DU Item Type Sync	A 🖊 🕂 🕤
	Projects		Files		Sheets			Plan Prepa	ration	

The dialog shown below is opened.



The available note files, selected form the left side of the dialog, are read from the ODOT Website. The dialog operation is explained by selecting the Help icon in the upper right.

Exercise: General Notes Sheets

The general notes sheet design file was created in a previous chapter. Take the following steps to add the sheet border cell and place general notes in the file.

- Open ProjectWise Explorer if it is not currently open
- When prompted, sign in to ProjectWise as shown below

🔀 ProjectWise	Explorer Log In			×
Datasource:	Ohio DOT Training-Testing	~	Log in	
Authentication:	Bentley IMS	\sim	Cancel	
User Name:				
Password:				

• Browse to the sample project to open the file listed below

Ohio DOT Projects\Documents\06 Training Projects*Class Date\User Name*\ IntroToMicroStationTraining\78086\400-Engineering\Sheets\78086_GN001.dgn

- ✓ Use the **OHDOT Place Sheet Cells** application to place the general notes sheet border
- ✓ The sheet can be placed at the 0,0 coordinate by toggling the Place at 0,0 option on, or by snapping to the sheet boundary in the sheet model.

🜍 OHDOT Sheets	_	- 🗆	×	Place Active	0 —	\times
Help				Active Sheet:	ORDER_1/INTERIOR	
Category: Generic Sheets ~				Scale:		
Sheet Name CROSS SECTIONS ESTIMATED QUANTITIES					Use Active Angle Use View Rotation	
GENERAL NOTES		н н		Property	Value	
GENERAL SUMMARY				PID	78086	
LONGITUDINAL SEWER PROFILE PLAN				Sheet Title	GENERAL NOTES	
PLAN AND PROFILE				Sheet Number	P.0	
PLAN AND PROFILE (Split Profile) PLAN AND PROFILE (with Summary Table Area			i	Sheet Total	55	
PROFILE				Designer	AAA	
PROFILE (Split)				Reviewer	BBB	
				Review Date	10-12-20	
						► 1

• When placing the border, enter the following information for the Item Types:

Property	Value
PID	78086
Sheet Title	GENERAL NOTES
Sheet Number	P.0
Sheet Total	55
Designer	Your Initials
Reviewer	The Reviewers Initials
Review Date	Today's Date
CRS	GRE-72-13.67

The sheet border is placed in the file along with a 4-column outline that is used as a guide for placing notes.

✓ After placing the sheet border in the file, use the OHDOT Plan Notes application (Ohio DOT > Apps > Plan Preparation > OHDOT Plan Notes) to place the general notes for the project.

The dialog shown at left below is opened. The **Show Editor** button was selected in the example below. Select the **Help** icon for more information.

Select Note Hide Editor View Designer Note Place Cell	Dinco Noto		
2019_bridge600.not Note ID Title 2019_bridge700.not GI01 ROUNDING Bicycles.not GI02A UTILITIES Environmental.not GI02A UTILITIES Gi02A UTILITIES GI02A Gi02B UTILITIES GI02A Gi02A UTILITIES GI02A Gi02A UTILITIES GI02A Gi04 CONSTRUCTION NOISE SI04 Note Editor Construction NOISE Sterions, Even THOUGH OTHERWISE SHOWN. OTHERWISE SHOWN. Sterions, Even THOUGH OTHERWISE SHOWN G.44 Øld Title Block Placemere		THE ROUNDING AT SLOPE BREAKPOINTS SHOWN ON TI SECTIONS APPLIES TO ALL CROSS-SECTIONS, EVEN TH OTHERWISE SHOWN.	



✓ Use the application to place the following notes in the design file. When placing the notes, snap to the green guide lines to place each note like the example above.

Note File	Note ID
General.not	G101 ROUNDING
General.not	G102A UTILITIES – Note the utility information can be edited in the
	Plan Notes dialog before placing the note.
General.not	G106 WORK LIMITS
Drainage.not	D107 FARM DRAINS

✓ Continue placing additional notes as desired

Common Question: What if I need more than one note sheet?

- OHDOT CADD Standards specify only one sheet per model.
- Additional models can be created in the DGN file for additional sheets

Take the following steps to create an additional sheet model for the notes:

OHDOT CADD WorkSpace Basics

- ✓ Open the Models dialog (Drawing > Home > {Primary > Models)
- ✓ Select the Create New Model icon. The Create Model dialog, shown at right, is opened.
- ✓ Using the settings at right, be sure set the **Type** to **Sheet** and to enter in a unique **Name** for the new model to be created.
- ✓ Select **OK** to create the new model.
- ✓ After creating the new model, place the General Notes cell and add some notes to the sheet.

This completes this exercise.

✓ Exit ORD and check the file back in to ProjectWise.

Type:	Sheet 👻 2D 👻	
Seed Model:	<not seed="" using=""></not>	
<u>N</u> ame:	Sheet 2	
Description:		
<u>R</u> ef Logical:		
Line Style Scale:	Annotation Scale 🔹	
	Auto-Update Fields	
Annotation Scale —		
A	1:1 👻	
	Propagate	
Sheet Properties —		
	Add To Sheet Index	F
Sheet Number:	000	
Sequence Number:	0	
	Show Sheet Boundary	
Border Attachment:	(none) 👻	
Size:	OHDOT 22x34 🗸	
Origin:	X: 0.000000 Y: 0.000000	
Rotation:	0°0'0"	
Cell Properties		
Ability to Place:	As <u>C</u> ell	
	As Annotation <u>C</u> ell	
Cell Type:	Graphic 👻	
	Create a <u>Vi</u> ew Group	
	<u>O</u> K Canc	el

October, 2021

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11 General Summary

The General Summary is a table that lists all the pay items (items of work) and their quantities for a project. It also breaks down the quantities to what sheets they come from as well as what funding split. Pay items are referred to as item codes and have

https://www.dot.state.oh.us/Divisions/ConstructionMgt/OnlineDocs/Pages/2019-Online-Spec-Book.aspx

The standardized list of currently available item codes can be found in the item master. The item master is typically updated daily, and the latest item master can be downloaded from the below link in either an excel or pdf format.

https://www.dot.state.oh.us/Divisions/ConstructionMgt/Estimating/Pages/Item-Master.aspx

A given item code is formatted with three parts, the Item Number, Units of measurement (English or Metric), and item extension. The format is explained below

[IN][U][IE]

Item Number [IN] = three-digit number that corresponds with a section in the S&MS. **Units of measurement [U]** = E for English or M for metric (currently only English units are used) **Item Extension [IE]** = five-digit number.

Example Item code: 441E10100

Item Number = 441 Units of measurement = E for English Item Extension = 10100 The item master specifies the units, description, and special instructions (if any) for this given item as; Unit: CY (cubic yards) Description: ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (446), PG70-22M Special Instruction: None

The C&MS is updated every 3 years. A project is sold under a specific update of the C&MS. This is commonly referred to as the spec year. Currently the spec year is 2019. This means there is a 2019 C&MS and a 2019 item master.

To help streamline the creation of a General Summary table and reduce user errors, a template excel file has been created. The file can be found within the OHDOT workspace at the following location.

\..\OHDOT\Standards\OHDOT Utilities\GenSum\CTY-PID-GENSUM.xlsm Exact location varies depending on given site configuration OhioDOT ProjectWise DataSource Location: pw:\\ohiodot-pw.bentley.com:ohiodot-pw-

<u>02\Documents\03%20Standards\CADD%20Standards\CONNECT_Config\WorkSpaces\OHDOTCE</u> <u>v01\Standards\OHDOT%20Utilities\GenSum\</u> This excel file should be copied into your workset in the

\..\[PID]\400-Enginering\Roadway\EngData\

folder or equivalent location.

This General Summary Excel file is required to be filed with your project.

For in depth details of how to fill out the general summary excel file please see this youtube playlist

https://www.youtube.com/watch?v=kLaZYdUbTHQ&list=PLdyShNRgZlb4S1QpyT0V9mxBs82Qz1 1KU

The General Summary excel file has also been set up to generate the general summary table but extracting all the pay code and quantity data from sub-summaries. For in depth details of how to use this automated GenSum feature see this youtube playlist.

https://www.youtube.com/watch?v=UlsFW9ivtCk&list=PLdyShNRgZlb4qz8vNV5GaYyLMv3sJHmG 0

Standard Summary Excel Files

In addition to the template general summary excel file, there are also several template excel files for sub-summaries sheets. They can be found within the OHDOT workspace at the following location,

\..\OHDOT\Standards\OHDOT Utilities\GenSum\Standard_Excel_Summaries\

Exact location varies depending on given site configuration

OhioDOT ProjectWise DataSource Location: <u>pw:\\ohiodot-pw.bentley.com:ohiodot-pw-</u> <u>02\Documents\03%20Standards\CADD%20Standards\CONNECT_Config\WorkSpaces\OHDOTCE</u> <u>v01\Standards\OHDOT%20Utilities\GenSum\Standard_Excel_Summaries</u>

 SubSummary_Full_Pavement.xlsx

 SubSummary_Half_Pavement.xlsx

 SubSummary_Full_xlsx

 SubSummary_Half.xlsx

 SubSummary_Full_Pavement_Markings.xlsm

 SubSummary_Full_Pavement_Markings.xlsm

 SubSummary_Full_Signing.xlsx

 Structure_Est_Quantity-Multi.xlsx

 Wall_Est_Quantity-Single.xlsx

 Structure_Est_Quantity-Single.xlsx

 SubSummary_Flipped.xlsx

These summary sheets are also set up for the automated GenSum feature mentioned above. The formulas within these excel files will display a given item code's description by linking to a copy of the item master contained within the item master addin. To ensure these links are valid and not broken the Fix Links button in the Item Master Addin should be used. See the following section for my details.

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Item Master Excel Addin

The Item master Excel Addin is an Excel addin that you can install. Once installed it will add an ODOT tab within Excel Ribbon as imaged below.

File	Home	Insert	Page Lay	vout F	ormulas	Data	Review	View	Developer	Help	ProjectWise	ODOT
Search Ite Master	m Refresh	₩ Auto-Fix ₩ Fix Links Ø Info		Combine Data	O Preferences	P Help	TextToLi	nk				- 1
	ltem M	laster	Es	stimating	Options	Help	TextToLi	nk				

This addin loads any time excel is open (you don't need to open the gensum or a specific summary excel file). this allows for easy and quick access to the item master. It also provides a way for summary sheets to pull data about item codes (like description) and display them via formulas. This removes the need to type out item descriptions.

The important thing to remember is that each summary excel file is specifically linked to the item master addin. This link can break (especially if the excel files are being passed around). To ensure the links are valid the Addin contains a fix links button which will handle fixing any broken links.

For more information see this YouTube video

https://www.youtube.com/watch?v=3nLDWu3IhJg&list=PLdyShNRgZlb4qz8vNV5GaYyLMv3sJHm GO&index=2

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12 Summary Tables with AutoTable

After your excel tables are created AutoTable can be used to convert that excel sheet into MicroStation graphics. We have set up AutoTable to follow our OHDOT CADD standards. The standard row height at 1:1 scale should be .28. all the excel files mentioned in the pervious section are set up to achieve this standard.

In order for AutoTable to scale things correctly the user MUST run a batch file to set the Auto-Table settings correctly. This batch file can be found within the OHDOT workspace at the following location,

\..\OHDOT\Standards\Cadig\AutoTableStandards\AutoTableSetup_CONNECT.bat Exact location varies depending on given site configuration

OhioDOT ProjectWise DataSource Location: <u>pw:\\ohiodot-pw.bentley.com:ohiodot-pw-</u> <u>02\Documents\03 Standards\CADD</u> <u>Standards\CONNECT_Config\WorkSpaces\OHDOTCEv01\Standards\Cadig\AutoTableStandards\</u>

Unfortunately, batch files cannot be run from within ProjectWise. If the Workspace is within ProjectWise then export the file and run it locally.

These Auto-Table settings are specific to the logged in user on that given computer. So, if another user logs into the same machine they will also have to run this batch file.

In order to create an autotable you must start from OpenRoads Designer and select the Create AutoTable button.



This will launch excel with the AutoTable tab.

AutoS	Save (<u>Off</u>)	8 9							B	look1 - Excel
File	Home	Insert	Page Layout	Formulas	Data	Review	View	Developer	Help	AutoTable
Finish	Range Optic Import									
	AutoTable									

Now from this instance of excel (the instance with the AutoTable Tab) you can open other excel files, for example a gensum or one of the standard excel summary files.

The most common use would be to select the range of cell you want to bring into MicroStation and select the Range Import button.

After selecting the Range Import button the table will be created in MicroStation and floating on your cursor where you can data point to place the table. This table is a static link to the excel file. the Update AutoTable button can be used to update the MicroStation graphics with any changes made to the excel file. the Edit AutoTable button can be used to open the excel file for edit.

Note that the AutoTable will place unrotated at a 1:1 scale. If any rotation or scaling is needed, then that can be done after its placed using the MicroStation Modify tools like Rotate and move.

There are also some excel template files that are sized correctly to fit within the sheet border cell. These excel templates do not have any advanced formatted like that summary excel files mentioned in the previous section. There is no link to the item master in these files. Typically, these excel templates are for tables that don't contain item codes. They can be found within the OHDOT workspace at the following location,

\..\OHDOT\Standards\Cadig\Templates\ Exact location varies depending on given site configuration

OhioDOT ProjectWise DataSource Location: <u>pw:\\ohiodot-pw.bentley.com:ohiodot-pw-</u> <u>02\Documents\03%20Standards\CADD%20Standards\CONNECT_Config\WorkSpaces\OHDOTCE</u> <u>v01\Standards\Cadig\Templates\</u>

13 OHDOT Sheet Manager

The Sheet Manager is used to manage the sheet title block data (Item Types) for all of the sheets within the WorkSet.

The application is accessed by selecting **Ohio DOT > OHDOT Sheet Manager** from the OpenRoads ribbon. In the example below, a sheet design file has been selected with the sheet attributes displayed to the right.

VorkSet Folder:								
lode: Single File	Edit							
ngineering Folder:	All	~ Disci	pline Folder: All		v			
Folder	SubFolder	File Name	Sheet Title	Model Name	Number	Property	Value	
400-Engineering	Roadway	728+55.21.dgn	CROSS SECTIONS	728+55.21	P.0	Title Property	Roadway Title Sheet Sh	
400-Engineering	Roadway	729+50.00.dgn	CROSS SECTIONS	729+50.00	P.0			
400-Engineering	Roadway	730+50.00.dgn	CROSS SECTIONS	730+50.00	P.0	Comments Pro		
400-Engineering	Roadway	732+00.00.dgn	CROSS SECTIONS	732+00.00	P.0	PID	78086	
400-Engineering	Roadway	733+50.00.dgn	CROSS SECTIONS	733+50.00	P.0	Sheet Title	TITLE SHEET	
400-Engineering	Roadway	735+00.00.dgn	CROSS SECTIONS	735+00.00	P.0	Sheet file		
400-Engineering	Roadway	736+50.00.dgn	CROSS SECTIONS	736+50.00	P.0	Sheet Number	P.1	
400-Engineering	Roadway	78086_GB000.dgn	SCHEMATIC PLAN	Plan 1 [Sheet]	P.2	Sheet Total	55	
400-Engineering	Roadway	78086_GG001.dgn	GENERAL SUMMARY	Sheet	P.10			
400-Engineering	Roadway	78086_GT001.dgn	TITLE SHEET	Sheet	P.1	Designer	AAA	
400-Engineering	Roadway	78086_GY001.dgn	TYPICAL SECTIONS	Sheet	P.4		Update Values	

This application is used to review and edit the value of the MicroStation item type elements in the sheet title block for a selected design file. Select the **Help** icon for complete documentation.

Exercise: OHDOT Sheet Manager

In this exercise, we'll look at the various modes of operation for the **OHDOT Sheet Manager** application.

Part 1: Single File Edit

- Open ProjectWise Explorer if it is not currently open
- When prompted, sign in to ProjectWise as shown below

🔀 ProjectWise	e Explorer Log In		×
Datasource:	Ohio DOT Training-Testing	~	Log in
Authentication:	Bentley IMS	~	Cancel
User Name:			
Password:			

• Browse to the sample project to open the title sheet design file listed below

..\IntroToMicroStationTraining\78086\400-Engineering\Sheets\78086_GT001.dgn

- ✓ Open the Sheet Manager application by selecting Ohio DOT > Apps > OHDOT Sheet Manager from the OpenRoads ribbon
- ✓ Select the **Single File Edit** option

The sheets can be sorted using the **Engineering Folder** and the **Discipline Folder** lists.

✓ Select the Schematic Plan from the file list. The parameters for the sheet border are listed in the dialog.

Define the following values for the Schematic Plan sheet:

- PID: 78086
- Sheet Title: SCHEMATIC PLAN
- Sheet Number: P.2
- Sheet Total: 55
- Designer: Enter your initials
- Reviewer: Enter initials for the reviewer
- Review Date: Enter today's date in MM-DD-YY format
- Scale2: 50
- Scale3: 100
- Scale4: 200
- CRS: GRE-72-13.67

Select the **Update Values** button to apply the values. The Sheet Cell in the file is updated with the new values.

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- ✓ After updating the values, open the Schematic Plan design file to verify that the items type data for the sheet was updated.
- ✓ You do not need to be in the file to edit the parameters. Select another file from the list, the General Notes file for example. Assign the parameters for the sheet and use the **Update Values** button to write the values to the file.

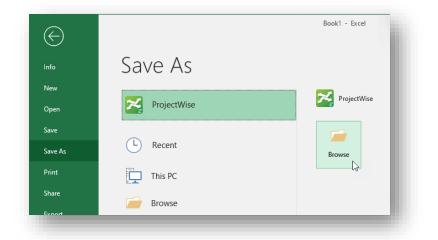
Part 2: Export to Excel

The **Export to Excel** mode is used to read the Sheet attributes and write the values to an Excel file. The Excel file can be edited and saved, and then re-read to update the sheet files to match the parameters as defined in the Excel file.

- ✓ Open the Sheet Manager application by selecting Ohio DOT > Apps > OHDOT Sheet Manager from the OpenRoads ribbon
- ✓ Select the **Export to Excel** option
- ✓ Choose the **Export Displayed Data to Excel** option. Excel is opened with the exported data.
- ✓ Edit the fields in Excel to enter the following values for the files:

PID:	78086
Sheet Total:	55
Designer:	Enter your initials
Reviewer:	Enter initials for the reviewer
Review Date:	Enter todays date in MM-DD-YY format
CRS:	GRE-72-13.67

- ✓ Update the page numbers for the plan and profile sheet design files to pages P.14 to P.18
- After making the edits, choose File > Save As from the Excel menu
 Choose ProjectWise > Browse

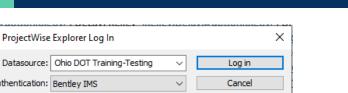


• You are prompted to enter your ProjectWise credentials. Select the **Training/Testing** Datasource and the **Bentley IMS** Authentication as shown below.

🔀 ProjectWise Explorer Log In

Authentication: Bentley IMS

User Name: Password:



- When prompted, select the **No Wizard** option for the document creation wizard. 0
- Save the document to the **400-Engineering**\Roadway\EngData\ folder for the 0 training data. Name the file as shown below.

=older		Save
EngData	Select	Cancel
Document		Current
Name:	Sheet_Manager.xlsx	
Description:	Sheet_Manager.xlsx	
File Name:	Sheet_Manager.xlsx	
Format:	Excel Workbook (*.xlsx) Format	
Application:	Department:	

✓ When prompted, check the file into ProjectWise by selecting the **Check In** option.

Part 3: Import from Excel

The Import from Excel mode is used to read the contents of an Excel file generated by the Export to Excel mode to update the sheets using the values for the title block items as defined within the Excel file.

- ✓ Open the Sheet Manager application by selecting **Ohio DOT > OHDOT Sheet Manager** from the OpenRoads ribbon
- ✓ Select the **Import from Excel** option
- ✓ Choose the **Update Displayed Data from Excel Import** option. Select the Excel file from the dialog like the example below.



Select Sheet Manager Excel File	×
Folders 400-Engineering 400-Engineering Geotechnical G	Documents Image: Sheet_Manager.xlsx Image: Sheet_Manager.xlsx List Documents by Application Microsoft Excel
	OK Cancel

As the data is processed, each design file is opened, updated, and then checked back in to ProjectWise.

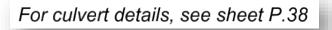
When complete, the results can be reviewed by selecting the **Results** button at the bottom of the OHDOT Sheet Manager dialog.

- ✓ Toggle the Sheet Manager to the Single File Edit mode. Select a few of the files at random to verify that the item type information has been updated.
- ✓ After reviewing a few of the sheet design files, close the Sheet Manager application
- ✓ This completes this exercise. Close the design file and check it back in to ProjectWise.



14 Sheet Cross-References

The OHDOT Sheet Cross References application is used to create updatable fields for sheet call outs, like the example below:



Notes:

- The cross reference is added as a MicroStation Field to the end of a user selected text string that has been previously placed in the DGN file.
- The cross reference is generated by reading the Sheet Item Types from a selected DGN file.
- The text string can be edited after the cross reference has been generated as long as the field is not deleted.

Exercise: Assigning a Cross-Reference

- Open ProjectWise Explorer if it is not currently open
- When prompted, sign in to ProjectWise as shown below

🔀 ProjectWise	Explorer Log In		×
Datasource:	Ohio DOT Training-Testing	~	Log in
Authentication:	Bentley IMS	\sim	Cancel
User Name:			
Password:			

• Browse to the sample project to open the design file listed below

Ohio DOT Projects\Documents\06 Training Projects*Class Date\User Name*\ IntroToMicroStationTraining\78086\400-Engineering\Sheets\78086_GP003.dgn

This file was generated using OpenRoads Designer to create the plan and profile sheets. The file contains two drawing models, one for the plan and one for the profile, as well as a sheet model containing the completed sheet. Annotations, such as the cross-reference text, are placed in the plan view drawing model, not in the sheet model.

• After opening the design file, change the active model to the plan view drawing model.

The models in the file can be reviewed and activated by choosing **Drawing > Home > Primary > Models**.

🗇 Moo	dels			
P.) 🗊 (🖆 🔲 🍸 🗙		
Туре	2D/3D	Name ^	Description	
		78086_GP103	PLAN AND PROFILE SHEET SUB-TITLE	
		78086_GP103 [Drawing]		
		78086_GP108		
		\square		

• Activate the plan view drawing model by double-clicking the model name (78086_GP1.3 (Drawing) in the **Models** dialog.

The model can also be selected from the View Groups dialog, which is docked in the lower left of the interface.

Format	MU	Name	Model
Master Unit			
Master Unit L		78086 GP103 Views	T8086_GP103
Sub Unit Sub Unit Labe	Inche "	78086_GP108 Views	78086_GP108
	<u> </u>	🔁 78086_GP103 Views 🔻 Ⴀ	1 2 3 4 5 6 7 8

- Use the **Place Text** command (**Drawing > Annotate > Text > Place Text**) to place the following text in the DGN. Before placing the text, consider the following:
 - What level should be used to place the text?
 - Which Text Style should be used?
 - Is the Annotation Scale lock toggled in on the Place Text tool settings?
 - Where should I place the text in relation to the completed sheet?

A Text Editor	- 0	×
\bigcirc P_Slanted-Normal LS=0.50 \checkmark $\textcircled{D}_{T} \stackrel{ABC}{\checkmark} (S) \checkmark (f(x))$ $\textcircled{T} Calibri $ $\land \downarrow 0.14$ $\bigtriangledown \checkmark B$	ΙU	
2	1. T. S. S.	
For Culvert Details, See Sheet:		
		- 1
		- 1
		- 1
		- 1
		- 1
		- 1
		_

After placing the text, open the OHDOT Sheet Cross References application (Ohio DOT > Apps > Sheets > OHDOT Cross Refs)

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OHDOT Cross References Tool	– 🗆 ×
Help	
New Link Mode	Update Active File Bulk Update
Select Text Element	
Set Up New Link	
🕑 Results	

- Choose the **Select Text Element** button and then select the text previously placed. The text string is displayed in the dialog.
- Choose the **Set Up New Link** button. This Link Setup dialog is opened as shown at right.
- Choose the **Browse** button to select the Culvert Detail Design file, located in the following folder:

..\78086\400-Engineering\ Drainage\Sheets\78086_DC001.dgn

- The file contains multiple models. Choose the **Culvert (Sheet)** model from the list.
- Choose the **Select** button to open the **Property Selector** dialog, shown at right.
- Select the **Sheet Number** property, and then choose the **OK** button.
- On the *Link Setup* dialog, choose the **OK** button to add the selected Property to the text string.

The cross reference is added as a field to the end of the text string. The text string can be edited as long as the field is not deleted.

🚮 LinkSetup	_		×
P File:			
Model:		-0	~
Select Property:			
Property Value:			
OK		Cancel	

引 LinkSetup	_		×
₽ File: pw:\\ohiodo	ot-pw.b	entley.co	milita
Model: Culvert [Sheet	t]		~
Select Property: Sh	eet_x0	020_Nu	mber
Property Value: P.3	38		
ОК		Cancel	

Note that the cross references application also contains functions to update all of the cross references in the active file, or to bulk update multiple files in the WorkSet. See the application documentation for more information.

• This completes this exercise. Exit ORD and check the file back into ProjectWise when prompted.

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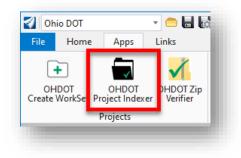
15 Project Indexer

The **Project Indexer** application is used to generate a Microsoft Excel file containing information about the project that is passed in to the construction contractor. The Excel file documents the WorkSet design files with a description of each file, along with information about the alignments, terrain models, survey data, and 3D models.

In addition to the Excel file, the **Project Indexer** is used to generate a ZIP file containing the files for the plan submission.

Both the Excel file and the ZIP file are required for plans submitted to the Department. See the **ODOT Guidelines for Electronic Deliverables** document for more information.

Within OpenRoads, the program is accessed from the Ohio DOT WorkFlow by selecting **Ohio DOT > Apps > OHDOT Project Indexer**, as shown below.



The program can also be launched external to OpenRoads from the following locations in ProjectWise Explorer:

03 Standards\CADD Standards\ CONNECT_Config\WorkSpaces\OHIODOTCEv02 \Standards\ Applications\Project_Indexer.exe

When the program is accessed, the dialog shown at right is opened.

See the application help for more information.

Project Indexer					×
)					
Surfaces	Info Files	Survey	-	Models	
Project Info	Basemaps	Sheets	Ali	gnments	
	t Index O Update	Existing Project Ind	lex 🔿 C	reate ZIF	? file
Project Folder:					
Project Name:					1
riejeernamer					
Use Sheet Name fr	om Sheet Model Prope	rties for Desc	Search Pro	oject Files	;
					_

Exercise: Project Indexer

Part 1: Project Index Excel File

Take the following steps to generate the project index file for the sample project.

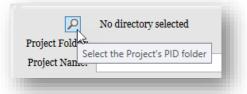
- Open **ProjectWise Explorer** if it is not currently open
- When prompted, sign in to ProjectWise as shown below

🔀 ProjectWise	Explorer Log In			×
Datasource:	Ohio DOT Training-Testing	~	Log in	
Authentication:	Bentley IMS	\sim	Cancel	
User Name:				
Password:				

• Open the title sheet design file listed below, or any other DGN file in the WorkSet.

Ohio DOT Projects\Documents\06 Training Projects\Class Date\User Name\ IntroToMicroStationTraining\78086\400-Engineering\Sheets\78086_GT001.dgn

- ✓ Open the Project Indexer application by selecting Ohio DOT > Apps > OHDOT Project Indexer.
- ✓ From the **Project Info** tab, select the **Create New Project Index** option
- ✓ Select the PID folder for the WorkSet by choosing the selection button.



✓ When prompted, select the **Ohio DOT Training-Testing** Datasource using the **Bentley IMS** authentication as shown below.



🔀 ProjectWise	Explorer Log In		×
Datasource:	Ohio DOT Training-Testing	~	Log in
Authentication:	Bentley IMS	\sim	Cancel
User Name:			
Password:			

✓ Select the PID folder for the sample project from your training file location:

..\IntroToMicroStationTraining\78086

- ✓ Enter the Project Name of **GRE-72-13.67**
- ✓ Select Search Project Files. The application opens Microsoft Excel, which will be populated with the WorkSet information using the Project Indexer. Ihe *Project Indexer* dialog is populated with information from the selected WorkSet.

Each tab on the *Project Indexer* dialog is used to enter information that is then copied to the appropriate tab in the Excel file.

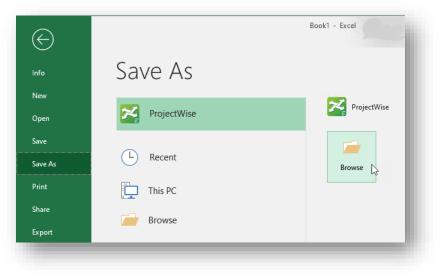
- ✓ Select the **Basemaps** tap in the *Project Indexer* dialog. A list of the basemap design file found in the WorkSet is listed along with a description.
- ✓ Edit the descriptions as necessary.
- ✓ After making edits, select the files that you wish to list in the Excel file like the example shown below

oject Info Basemaps Sheets Alignmo	ants Surfaces Inic	Files Survey 3D Models	
File Name		File Desc	Clear Selection
\400-Engineering\Roadway\Basemaps	78086_BK001.dgn	Civil Geometry Basemap PROPOSED SR 72	
\400-Engineering\Roadway\Basemaps	78086_KD001.dgn	Civil Digital Terrain Model Basemap SR 72 PRISMOIDAL VOLUMES	
		Civil 3D Modeling Basemap PROPOSED SR 72	
		Civil Superelevation Basemap PROPOSED SR 72	Select the
\400-Engineering\Drainage\Basemaps			Basemaps that
\400-Engineering\RW\Basemaps\7808		Right-of-Way Basemap Existing RW	are to be placed/
\400-Engineering\RW\Basemaps\7808	6_BR002.dgn	Right-of-Way Basemap PROPOSED RW	replaced or appended in the
			project's index.
			Place/Replace
			 Append
			O Append

✓ Select the Place Basemap Info button. The data is populated in the Excel file like the example below.

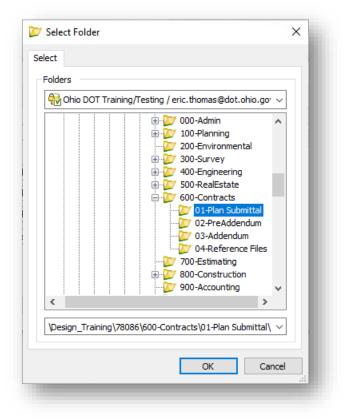
File	Home	Insert	Page La	ayout	Formulas	Data	Review	View	Developer	Add-ins	Help	LOAD TEST	Project	Wise	Team	Q Tell r	me 🕑	ŝ
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- ✓ Select the Sheets tab in the *Project Indexer* dialog. Select the Sheet files that you wish to list in the Excel file and then choose the Place Sheet Info button.
- ✓ Continue working through the tabs on the *Project Indexer* dialog to add info to the Excel file.
- ✓ Save the Excel file in location show below.
 - Choose File > Save As in Excel. Then choose the ProjectWise > Browse option as shown below.



- ✓ When prompted, log into ProjectWise. Choose the **No Wizard** option.
- ✓ Choose the **600-Contracts****01-Plan Submittal** folder as shown below.





The project index file is named according to the **<u>ODOT Guidelines for Electronic Deliverables</u>**, section 5.1.

✓ Name the file **78086_ProjectIndex.xls**

Folder 01-Plan Subr	nittal - Plan Submittal Select	Save
Document	Jeicu	Cancel
Name:	78086_ProjectIndex.xlsx	
Description:	78086_ProjectIndex xlsx	
File Name:	78086_ProjectIndex.xlsx	
Format:	Excel Workbook (*.xlsx) Format	
Application:	Department:	

✓ After saving the file, close Excel and check the file in to ProjectWise

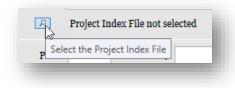
Part 2: Create the ZIP file for the WorkSet

Take the following steps to create a ZIP file for the WorkSet

✓ From the *Project Index* dialog, select the **Create ZIP file** option

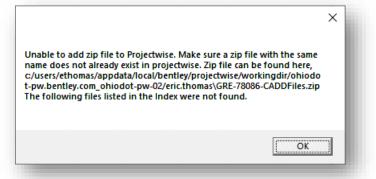
Surfaces	Info Files	Survey	. · · · ·	Models				
Project Info Basemaps Sheets Alignments								
Create New Project Index O Update Existing Project Index Create ZIP file								
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-o1\Documents\01 Ac								
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Project Folder:	78080							
Project Folder: Project Name:								
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Project Name:	GRE-72-13.67 Project Index File not se		Create 2	ZIP File				

✓ Choose the Select the Project Index File button to select the project index file that was created in part 1 of this exercise.



- ✓ Enter the **PID** #: 78086 and the **Main County**: GRE
- ✓ Select the Create ZIP File button. The selected Project Index file is opened to read the contents to generate the ZIP file.
- ✓ Close the Project Index Excel file and check it in to ProjectWise after the process has completed.

NOTE: As of this writing, the current version of the Project Indexer does not save the ZIP file because the folder structure has changed and the application has not been updated to reflect this change. This will be addressed in a future update.



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16 Print Organizer

Printing Multi-Page PDF Files: Process Overview

The **Print Organizer** is a MicroStation utility for printing and reprinting a set of design files, models, or Project Explorer links. The files that are to be printed are saved as a print set file (.pset).

The steps to create and print a multi-page PDF are summarized below:

- Select File > Print > Print Organizer to launch the application.
- The *Print Organizer* dialog will default to the last print driver that was used when the application was opened.

The current print driver is listed at the bottom right of the dialog as shown below. You can click on the name of the print driver to select a different driver.

Untitled.pset - Print Organizer				_		
File Edit View Tools						
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彦 Untitled	Name	File Name	Model	View Group	View	
	<					>
			😑 OHDOT	PDF.pltcfg 0 iten	ns (0 selected)	

The OHDOT WorkSpace provides several Print Drivers, listed below.

OHDOT.pltcfg

Select this print driver to print full size or quarter size plan sheets.

OHDOT_L.pltcfg

This print drive is used to print letter size (8.5" x 11") plan sheets.

OHDOT_PDF.pltcfg

Select this print driver to create a multi-page PDF file

OHDOT_PDF_Color.pltcfg

Select this print driver to create a multi-page PDF file in color

OHDOT_PDF_Levels.pltcfg

Use this print driver to create a multi-page PDF with levels. Note: The resulting PDF file size can be quite large when using this option.

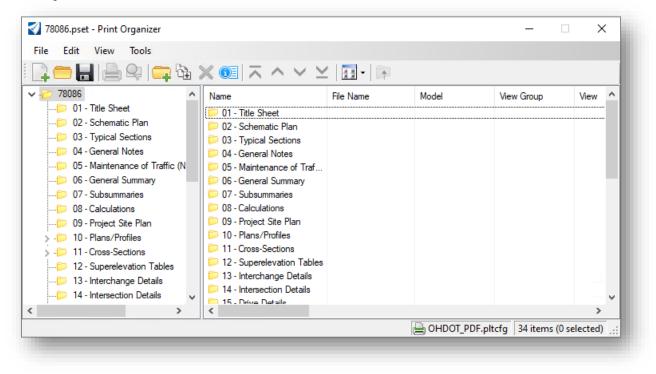
• Select the PSET file

The application uses a PSET (.pset) file to organize the prints into various categories that are used to create bookmarks withing the PDF print set. When a project is created using the **OHDOT Create Workset** utility, a .pset file is created for the project. The file is named using the PID number for the project and is located in the following folder:

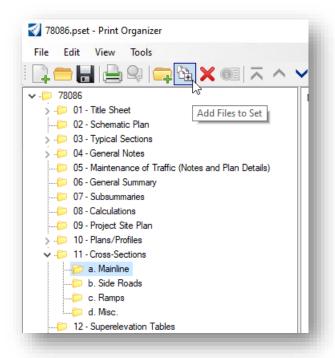
\#####\990- WorkSet Standards\Plotdrv\#####.pset

Where ###### = the PID number.

The PSET file is prepopulated with folders to organize the design files that will make up the print set as shown below.



• Add the design files that will be included in the print set to the *Print Organizer*. This is accomplished by selecting the folder and then using the **Add files to Set** icon.



In the example at left, files will be added to the **11- Cross Sections > a. Mainline** folder.

When the **Add Files to Set** button is selected, the *Create Print Definitions* dialog shown below is opened. This dialog is used to select the file(s) to add to the print set under the currently selected folder.

Note: Only Sheet models from the selected file(s) are included in the print set. Design and Drawing models are not included in the print set.

reate Print Definitions	×
nput Files	
pw:\\ohiodot-pw.bentley.com:ohiodot-pw-04\Documents\06 Training Prc	Add Remove
< >	
rint Definition Creation Options	
Print style name: Manually Specified Options	Browse
ОК	Cancel

After selecting the file(s) to add to the print set, choose the Browse button to define a Print Style for the added files.

Several print styles are available in the OHDOT Standards. If you do not select a print style, the default style will be applied. As files are added to the print set, the Sheet Model properties are read to get the **Description** value, which is used for the sheet name in the print set. The **Description** property is populated with the **Sheet Name** and the **Sheet Sub-Title** when the **OHDOT Sheet Manager** application is used.

In the example below, the name for each cross-section sheet, as read from the model **Description** property, is assigned as shown. This name is used as the bookmark name in the completed PDF file for the plan set.

🕞 🗸 📁 11 - Cross-Sections	
a. Mainline	
CROSS SECTIONS S.R. 72 STA. 720+50 TO STA. 721+00	
CROSS SECTIONS S.R. 72 STA. 721+50 TO STA. 722+50	
CROSS SECTIONS S.R. 72 STA. 723+00 TO STA. 724+00	
CROSS SECTIONS S.R. 72 STA. 724+50 TO STA, 725+50	
CROSS SECTIONS S.R. 72 STA. 726+00 TO STA. 727+00	
CROSS SECTIONS S.R. 72 STA. 727+50 TO STA. 728+50	
CROSS SECTIONS S.R. 72 STA. 729+00 TO STA, 729+50	

• After adding all the sheet design files to the **Print Organizer**, choose the **Print** icon to create a PDF file for the print set.

Tips:

- The PDF is created from the folder that is currently selected in the Print Organizer dialog. Be sure to choose the top-level PID number folder before choosing the Print command to create a PDF for the entire plan set.
- Only the folders that have been populated with design files in the **Print Organizer** are displayed as bookmarks in the completed PDF. Unnecessary folders can be deleted in the Print Organizer if desired.
- Folders may be renamed if desired, keeping in mind that the folder names will be included in the PDF as bookmarks.

The *Print* dialog is shown on the following page.

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6
Printer Setup
pies
umber of copies: 1
mas\78086\950-Reviews\78086.pdf
OK Cancel

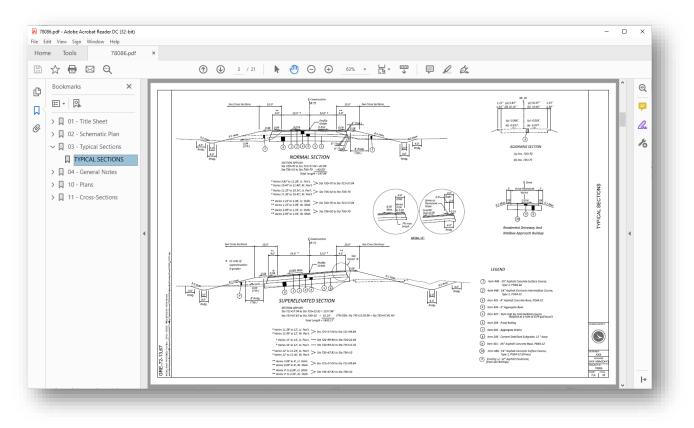
Choose the Destination path for the PDF. The PDF is typically saved to the following folder within the WorkSet:

\#####\950- Reviews\#####.pdf

Where ###### = the PID number.

• The completed PDF is organized by the order of the folders and files listed in the Print Organizer dialog. Bookmarks for each folder in the plan set that contains a file are created for the PDF file as shown in the example below.

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After the PDF file has been generated, be sure to save the PSET file settings. Choose File > Save from the *Print Organizer* dialog to save the PSET file.

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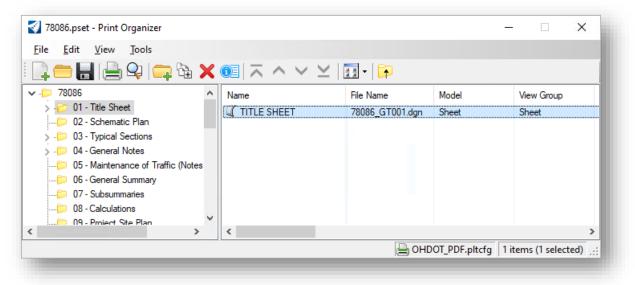
Updating a Print Set

A previously saved PSET file can be opened and reused to generate a new set of prints, or a new PDF file as needed.

- The PSET file contains a "snapshot" of the design file settings at the time the print set was created.
- The PSET file is not dynamically linked to the design files and must be updated if any changes have been made to the design files settings, such as turning on or off levels, or changing the view attribute settings, since the time the PSET file was created.
- It is not necessary to update the PSET file to capture any changes to the elements drawn in the design files since the time the PSET for was created.

Take the following steps to update individual sheets in print set:

- Start **Print Organizer** by selecting **File > Print > Print Organizer**.
- Open the PSET file.
- From the *Print Organizer* dialog, select file to update.



• From the *Print Organizer* dialog, select **Edit > Properties**, or the **Properties** icon, to access the *Modify Properties* dialog shown on the following page.

- Select the **Advanced** tab.
- Toggle on the **Update from design file** option.

	HEET Proper		D							
ain	Advanced	Fence	Display	Levels	Referenc	es				
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Jpdat	te Options –									
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			2							
									_	
								OK		Cancel

- Choose **OK** to initiate the process. The PSET is updated by reading the selected file.
- After the PSET has been updated, proceed to print the files or create a new PDF as necessary.

Take the following steps to update all the sheets in print set:

- Start **Print Organizer** by selecting **File > Print > Print Organizer**.
- Open the PSET file.
- From the *Print Organizer* dialog, select the top level PID folder. On the right-side of the dialog, select all of the folders as shown below.

Page 122

File Edit View Tools			
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 70086 1 - Title Sheet 2 - Schematic Plan 3 - Typical Sections TYPICAL SECTIONS 4 - General Notes GENERAL NOTES 05 - Maintenance of Traffic (Notes and Plan Details) 06 - General Summary 07 - Subsummaries 	Name □ 01 - Title □ 02 - Sche □ 03 - Typic □ 04 - Gene □ 05 - Maint □ 06 - Gene □ 07 - Subsur □ 08 - Calcular □ 09 - Project	ations	Details)

• Right click on one of the folders and choose the **Properties** option.

Iodify Properties Main Advanced Fence Display Levels References		× From the <i>Modify</i> Properties dialog,
WorkSpace: OHDOTCEv02	er quality factor: 100.0 🗼	 select the Advanced tab. Toggle on the Update from design file option as shown at left. Select OK to initiate the process.
 Print monochrome raster as-is Brightness: 0.0 + Contrast: 0.0 + PDF Property Publishing		_
Property filter file:	·	
Update Options Update from design file Update \$\lambda_{\screen}\$ Update \$\lambda_{\screen}	te print definition name	
	OK Cancel	

Exercise: Creating a Multi-Page PDF with Print Organizer

Using this chapter as a guide, create a multi-page PDF file for the sample project.

- Open **ProjectWise Explorer** if it is not currently open
- When prompted, sign into ProjectWise as shown below

🔀 ProjectWise Explorer I	Log In			×
Datasource: Ohio DOT	Training-Testing	\sim	Log in	
Authentication: Bentley IN	IS	\sim	Cancel	
User Name:				
Password:				

• Open the title sheet design file listed below, or any other DGN file in the WorkSet.

..\IntroToMicroStationTraining\78086\400-Engineering\Sheets\78086_GT001.dgn

- ✓ Open the **Print Organizer** application by selecting **File > Print > Print Organizer**.
- ✓ The currently selected print driver is listed at the lower right of the dialog. Select the desired print driver by clicking on the name of the current print driver. For this example, we will use the **OHDOT.pset** file.
- ✓ From the Print Organizer dialog, select File > Open to open the PSET file from the following location:

...\78086\990- WorkSet Standards\Plotdrv\78086.pset

- ✓ Populate the PSET dialog with the design files for the project. Make sure to import the design files into the proper sub-folders within the *Print Organizer* dialog.
- ✓ Create the PDF file.
- ✓ After reviewing the PDF, close the PDF file.
- ✓ Save the PSET file
- ✓ Close OpenRoads and check the design file back into ProjectWise
- ✓ Close ProjectWise Explorer. This concludes the exercise.