ODOT CADD USERS GROUP • MARCH 6, 2019

OHIO DEPARTMENT OF TRANSPORTATION

WELCOME

Mark McCloud, CADD Services Manager

AGENDA

- Electronic Design Deliverables
- OpenRoads Designer Transition Plan
- Configuring OHDOT Workspace for CONNECT
- What to Expect in OpenRoads Designer
- Reducing Estimated Construction Costs by 30% Using OpenRoads Tools
- Autodesk Ohio State Kit Update
- Item Master Spec Year Changes to GENSUM
- Diving into ProjectWise at ODOT
- Q & A Panel

CPD CERTIFICATES

- Must be present to receive CPD certificate
- Register at the touch screen kiosk
- Certificates will be sent via email

CADD SERVICES

- Located in ODOT Central Office
- Division of Engineering
- Office of CADD and Mapping Services
- We research, develop, implement and maintain the engineering CADD standards for the Ohio Department of Transportation.

CADD SERVICES

- Our Web Site
  - http://www.dot.state.oh.us/Divisions/Engineering/CaddMapping/CADD_Services/Pages/default.aspx
- Bentley Communities
  - https://communities.bentley.com/communities/user_communities/ohio_dot__consultants/
- Support Request
  - https://odot.formstack.com/forms/cadd_servicerequest
- YouTube
  - https://www.youtube.com/channel/UCo-lOt5L4GHSDbSkKWPeWAw

ELECTRONIC DESIGN DELIVERABLES

Mark McCloud, CADD Services Manager

PREVIOUS STANDARDS AND PRACTICES

- Appendix E of the CADD standards manual
  - Electronic Submission Checklist
- L & D Volume 3 – Section 1503
  - CADD File Requirements for Design and Construction
- Plan Package Submittal Process
  - Does not include requirements for CADD files
  - No check of what CADD files are submitted
  - CADD files not seen as contract documents
  - For reference only

PREVIOUS STANDARDS AND PRACTICES

- Project Letting and Awarding
  - Contractors look for CADD files to assist in the bidding process
  - Sometimes can prevent Prebid questions
  - Contractors usually ask for the CADD files on awarded projects
  - CADD files are needed for Storm Water Population Prevention Plans(SWPPP) which is an EPA requirement

PREVIOUS STANDARDS AND PRACTICES

- Offices involved in tracking down CADD files
  - Districts
  - Consultants
  - Central Office Construction
  - Central Office Contracts
  - Central Office CADD Services

NEW STANDARDS AND PRACTICES

- Getting ready for 3D models
  - FHWA Every Day Count Initiative
  - Need to start getting digital files on current projects
- Electronic Design Deliverables Document
  - Document better defining what electronic files are required for ODOT project submission
  - Draft was available for review and comment in late 2017
  - Comments/questions collected and addressed (See FAQ)
  - Formally released April 30th, 2018
  - Guidelines for Electronic Design Deliverables

NEW STANDARDS AND PRACTICES

- Electronic Design Deliverables Document
  - Chapter 1 - General Information
  - Chapter 2 – CADD Files
  - Chapter 3 – Alignment Files
  - Chapter 4 – Surface Files
  - Chapter 5 – Engineering Data
  - Chapter 6 – Survey Files
  - Chapter 7 – Plan Set
  - Chapter 8 – 3D Models (to be updated)
  - Chapter 9 – Submission of Electronic Files
  - Chapter 10 – Filing Projects to Central Office (ODOT use only)

NEW STANDARDS AND PRACTICES

1503 CADD File Requirements for Design and Construction

1503.1 CADD Software Requirements

All projects requiring submittal of CADD files shall be developed using MicroStation and GEOPAK, or Autodesk, in accordance with the CADD Engineering Standards Manual and the project's scope of services. Although ODOT will accept CADD files developed using Autodesk software, no support, standards, documentation, or guidance of any kind with respect to design and delivery using Autodesk tools will be provided. For more information, see the ODOT CADD Engineering Standards Manual, Section 101.

1503.2 CADD File Requirements

Unlike electronic image files (i.e. PDF images) that are part of the contract documents, CADD files (i.e., basemap files) provided to contractors are for reference purposes only. In the event that there is a conflict between the CADD files and the bidding documents, the bidding documents shall take precedence.

CADD files, and a Project Index File, shall be provided in accordance with the requirements for Electronic Submittals described in the ODOT Guidelines for Electronic Design Deliverables, located on the Office of CADD and Mapping Services website, and included in the Final Plan Package submittal.

NEW STANDARDS AND PRACTICES

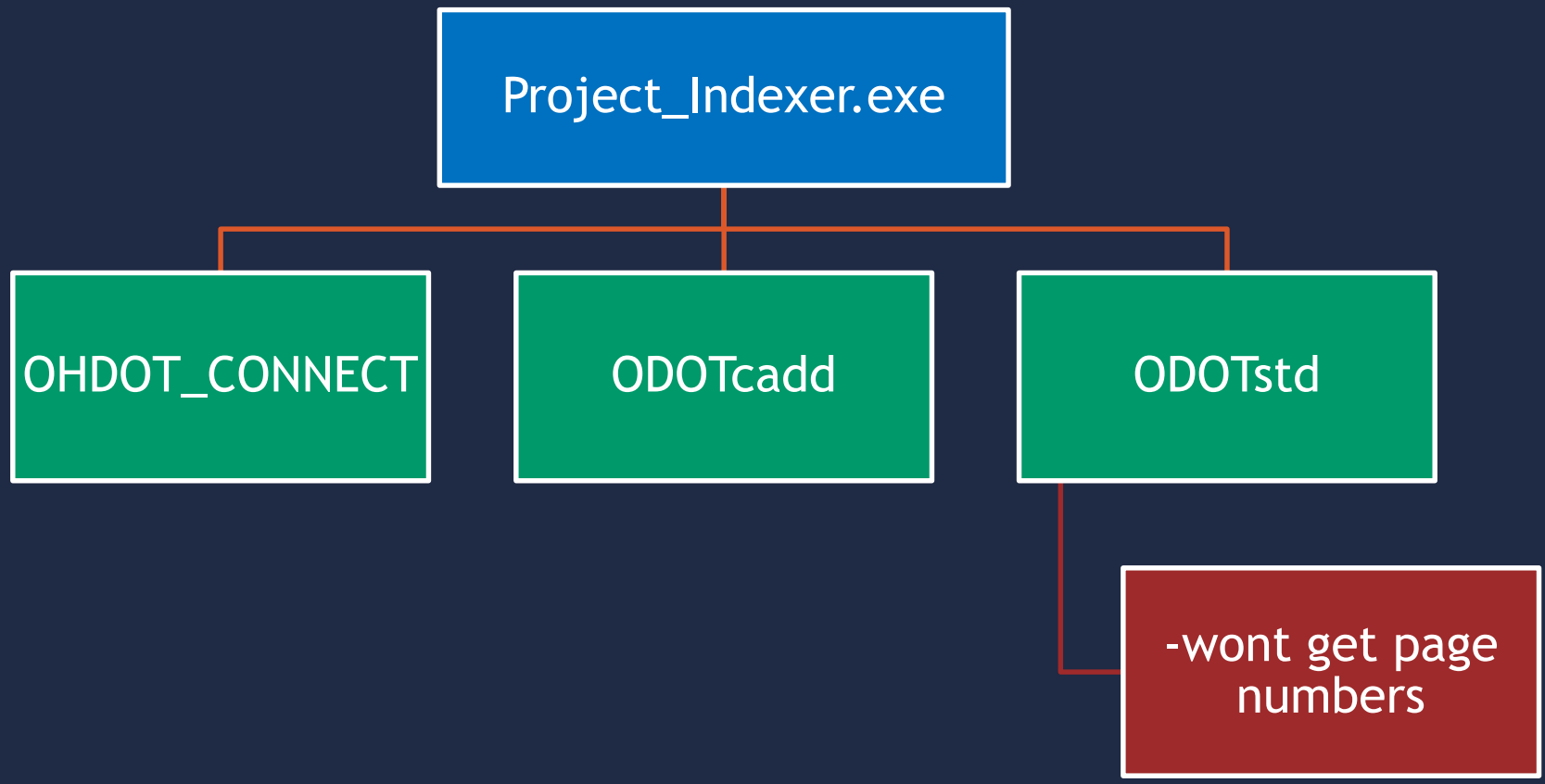
- Electronic Design Deliverables Document
  - Future updates will address any changes with ProjectWise Implementation
- Appendix E of the CADD standards manual has been removed
- Plan Package Submission Process
  - Includes requirements for CADD files
  - Automated check process for CADD files with email if not in compliance
- CADD files required for projects filing on or after July 30th, 2018

PROJECT INDEXER

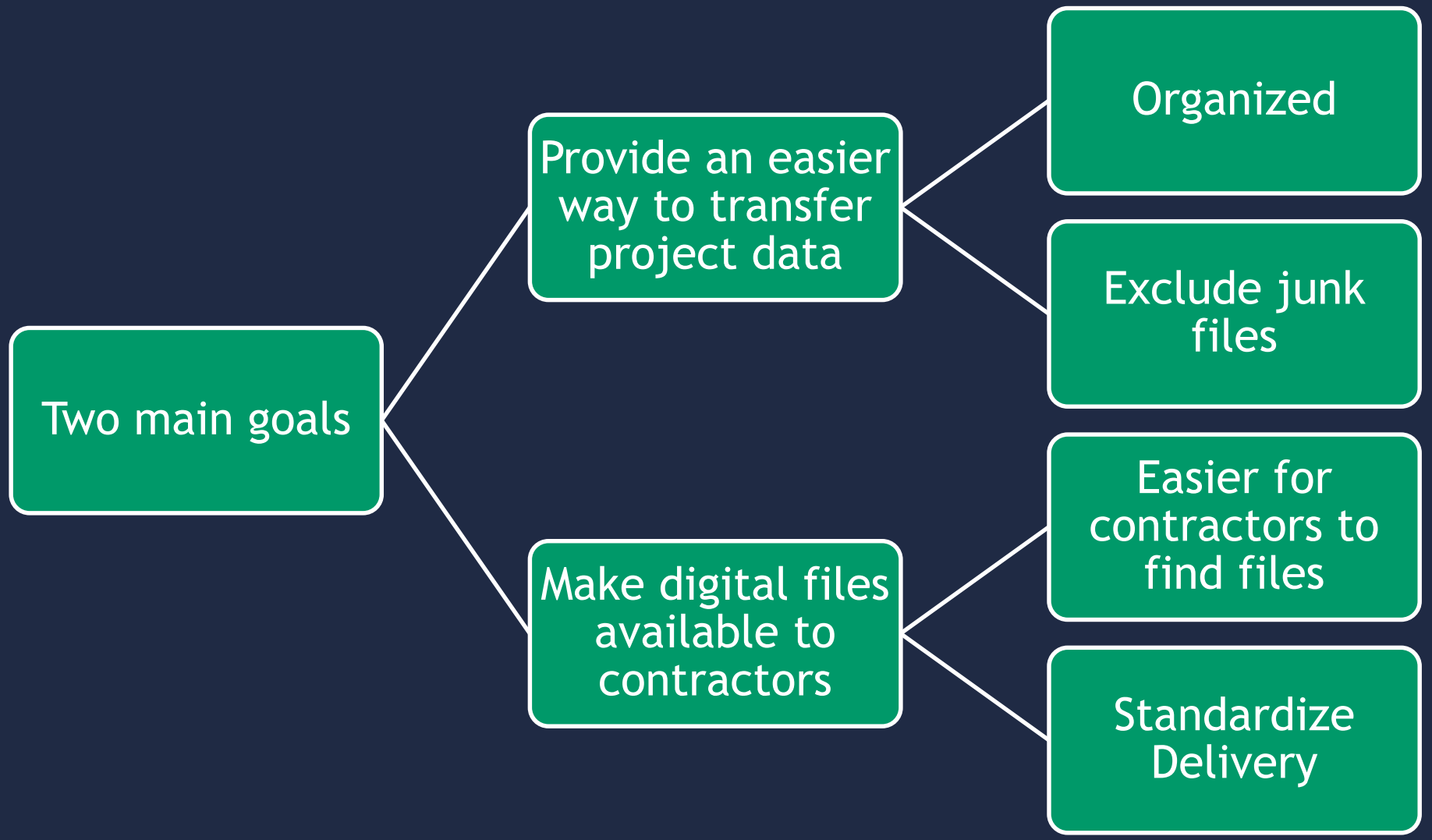
- Project Indexer Application
  - Used to organize and build the .ZIP file for project delivery
- YouTube Videos
  - Tutorials for using the Project Indexer application
  - https://www.youtube.com/channel/UCo-lOt5L4GHSDbSkKWPeWAw/feed

PROJECT INDEXER

Works with all versions of our CADD standards!!



PROJECT INDEXER



PROJECT DELIVERY

- Automated emailing system in place to ensure compliance
- Project manager will receive an email if files are missing
- Filtering setup for specific project types
  - No need for digital files (Bikeway, Mowing, Painting)
- July 30th, 2018 to present date
  - 189 projects with a 96% compliance

QUESTIONS

Last updated 3/25/2019

CADD MEETING • MARCH 6, 2019

OHIO DEPARTMENT OF TRANSPORTATION

OPENROADS DESIGNER TRANSITION PLAN

Rachel Lewis, P.E.
Administrator, CADD & Mapping Services

COMPONENTS OF THE PLAN

- Transition Summary/Plan
- Training Plan
- Communication Plan
- Waiver Process
- FAQ documentation

TRANSITION TIMELINE

- January – June 2019
  - Begin Pilot Projects
  - Train ODOT Surveyors & Begin using ORD for Survey for projects beginning after Jan. 1, 2020
  - Implement waiver process
- July 1, 2019
  - ORD training for ODOT engineers begins
  - Bentley discontinues SS1/SS2/Geopak
  - Bentley begins phase out of SS4 & Geopak

TRANSITION TIMELINE (CONTINUED)

- January 2020
  - All new projects in ORD
  - All projects filing after Dec. 31, 2021 either brought forward to CONNECT/ORD or waiver needs filed & approved
  - SS1/SS2 (V8istd/odotstd) discontinued & unavailable (V8istd/odotstd) – except where waivers were granted
  - Note: SS4/Geopak (odotcadd) still available for projects filing before Dec. 31, 2021 and projects waivered.
- July 2020
  - All waivers should be submitted by this date for proper resource planning. Call CADD office for waivers after this date.

TRANSITION TIMELINE (CONTINUED)

- January 2021
  - Bentley discontinues support for all non-CONNECT products (includes SS4/Geopak).
- January 2022
  - SS4/Geopak will be unavailable, except for users working on projects granted a waiver.
- January 2023
  - Department fully implemented.
  - Begin transition to 3D models.

TRAINING PLAN

- Surveyors are being trained April – May 2019
- Engineers will be trained July – December 2019
- Districts will have designated trainers and we will have a training support program for them
- Videos
- On-line/Skype training
- Bentley training tools.

COMMUNICATION PLAN

- Goals:
  - Keep stakeholders informed of project timeline and changes.
  - Provide opportunities for structured involvement and feedback from stakeholders.
  - Provide clear insight into any decisions needed or roadblocks.
  - Allow path for stakeholder acceptance.

COMMUNICATION PLAN

- Types & Frequency
  - Consultant CADD Meetings – 4/year
  - Emails
  - Notifications in ORD
  - Website – dedicated page for ORD Transition & Updates

    http://www.dot.state.oh.us/Divisions/Engineering/CaddMapping/CADD_Services/ORD-Transition/Pages/default.aspx
  - Presentations – as conferences become available

WAIVER PROCESS

- Open April 2019 – July 2020
- Please plan ahead!
- This process is to help us help you.
- Waivers should be submitted by the Districts.

WORKSPACE AND STANDARDS

- Workspace & Standards will be taken out of beta/draft and be available April 1, 2019
- New CADD standards manual will be released July 1, 2019.

PILOT PROJECTS

- We are looking for more pilot projects.

QUESTIONS

Last updated 3/25/2019

INTRODUCTION TO OHIO DOT CADD STANDARDS

OHIO DEPARTMENT OF TRANSPORTATION

GETTING STARTED

John Drsek P.E.
Office of CADD and Mapping Services

STANDARDS

- Ohio DOT has 3 different CAD standards.
- Each standard is set up with different configurations

OHDOT	ODOTcadd	ODOTstd
• In Beta • MicroStation Connect • OpenRoads Designer Connect	• MicroStation v8i SS4 • PowerGEOPAK v8i SS4	• MicroStation v8i • PowerGEOPAK v8i SS2 • Retired-No Longer updated

ODOTCADD & ODOTSTD CONFIGURATION

John Drsek P.E.

WHERE TO DOWNLOAD

ODOTstd

- Zip file
- ftp://ftp.dot.state.oh.us/pub/CADD/update/ODOTV8istd_Full.zip

ODOTcadd

- Executable
- ftp://ftp.dot.state.oh.us/pub/CADD/CADDSync/Links/ODOTcaddStandardsDownload.html

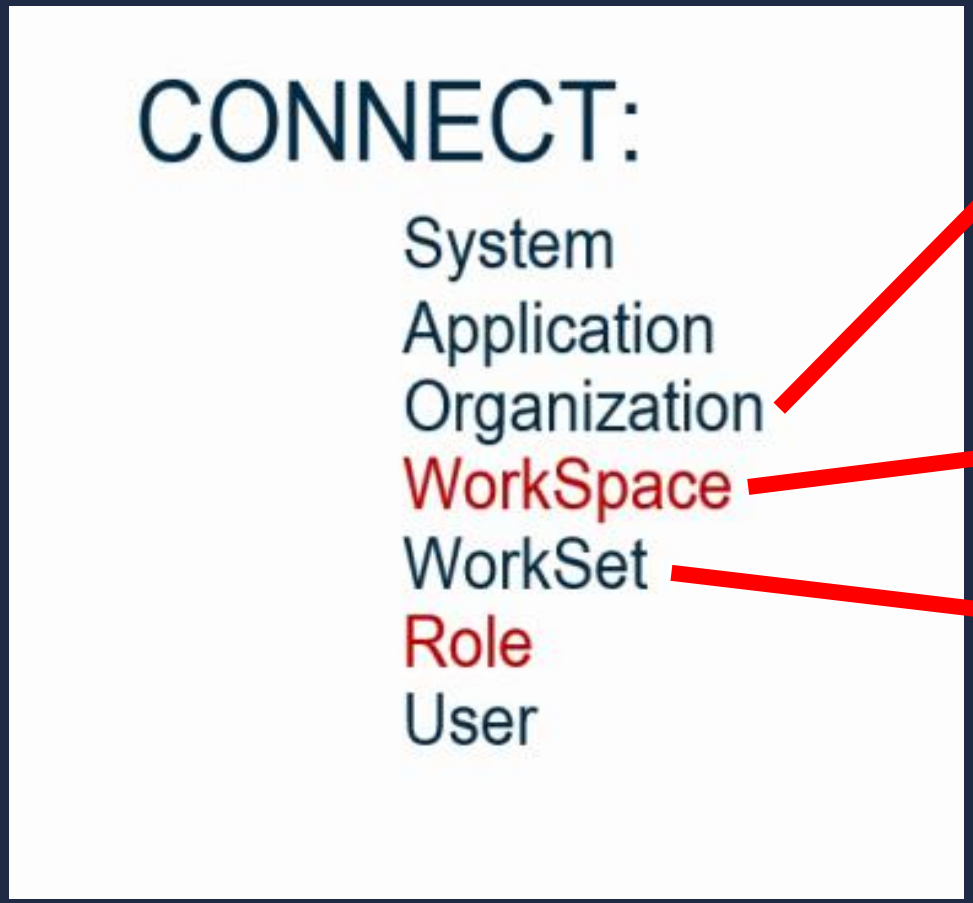
SETTING UP ODOTSTD & ODOTCADD STANDARDS

The ODOTcadd Standards includes a configuration tool that will configure the user for both ODOTcadd and ODOTstd standards!!

CONNECT CONFIGURATION

John Drsek P.E.

CONFIGURATION LEVELS

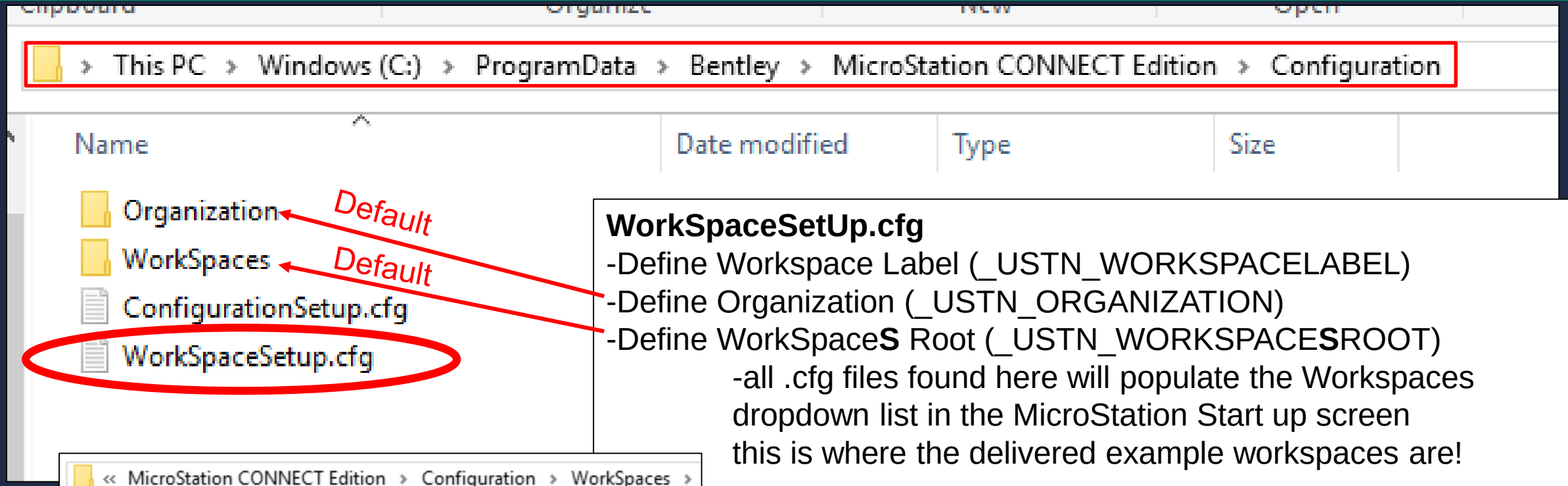


Not Touching: Intent is to leave this only for consultants to use.
-things that would be used across workspaces (gets loaded regardless of what workspace is selected)
-CAN NOT BE SET FROM WITHIN A WORKSPACE

DOT's each have their own workspace.

-Where the project files go (dgn, spreadsheets…)

WHAT DO THE CONFIGURATION FILES DO



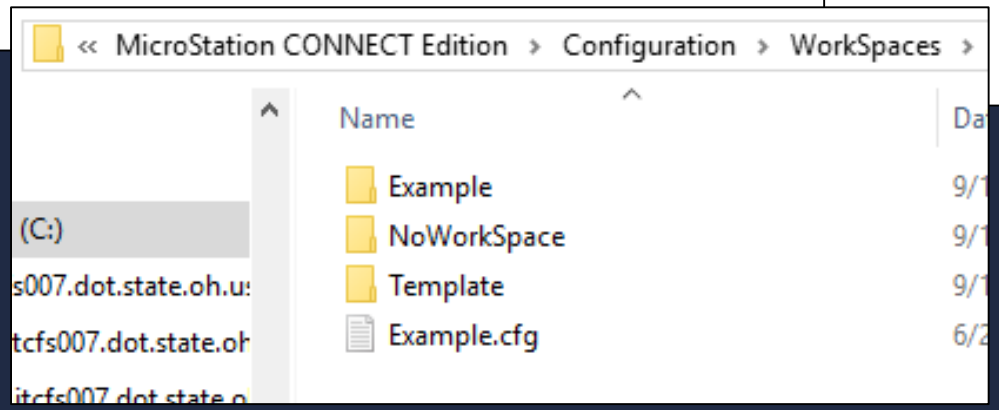
WorkSpaceSetUp.cfg

-Define Workspace Label (_USTN_WORKSPACELABEL)

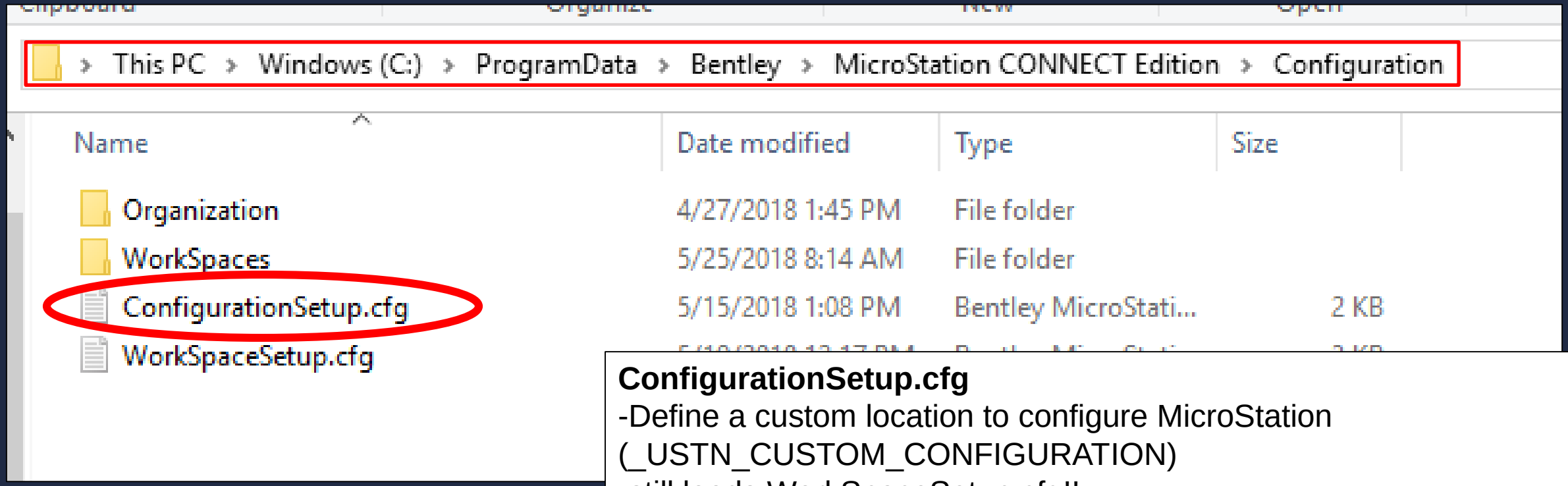
-Define Organization (_USTN_ORGANIZATION)

-Define WorkSpace**S** Root (_USTN_WORKSPACE**S**ROOT)

-all .cfg files found here will populate the Workspaces dropdown list in the MicroStation Start up screen this is where the delivered example workspaces are!



WHAT DO THE CONFIGURATION FILES DO



ConfigurationSetup.cfg
-Define a custom location to configure MicroStation (_USTN_CUSTOM_CONFIGURATION)
-still loads WorkSpaceSetup.cfg!!
-Can be set during installation

ConfigurationSetup.cfg - Notepad

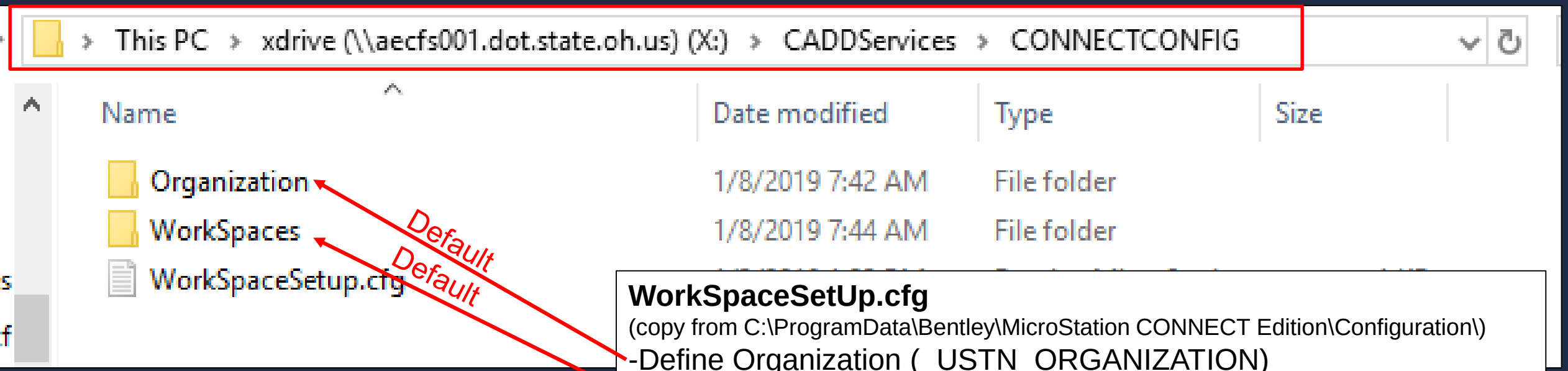
File Edit Format View Help

```
#  for Your Organization
#
# The main function of this configuration file is to allow user to specify
# the root Configuration directory to activate. The active Configuration
# directory is represented by _USTN_CONFIGURATION. By default, it points to
# the installed Configuration defined by _USTN_INSTALLED_CONFIGURATION,
# which can consist of example WorkSpaces and WorkSets.
# If your organization has its own Configuration directory, you can define
# _USTN_CUSTOM_CONFIGURATION to that directory path and use it as follows.
#
#_USTN_CUSTOM_CONFIGURATION = D:/.../MyConfiguration/
#_USTN_CONFIGURATION : ${_USTN_CUSTOM_CONFIGURATION}
#------------------------------------------------------------------------

#------------------------------------------------------------------------
# START: The section defines user selection at the time of installation.
# These lines are generated by installer.
[General]
_USTN_CUSTOM_CONFIGURATION= X:\CADDServices\CONNECTCONFIG\

[SetConfiguration]
%if !defined (_USTN_USER_CONFIGURATION)
%if defined (_USTN_CUSTOM_CONFIGURATION) && ($(_USTN_CUSTOM_CONFIGURATION) != "") && exists ($(_USTN_CUSTOM_CONFIGURATION))
_USTN_CONFIGURATION = $(_USTN_CUSTOM_CONFIGURATION)
%endif
%endif
```

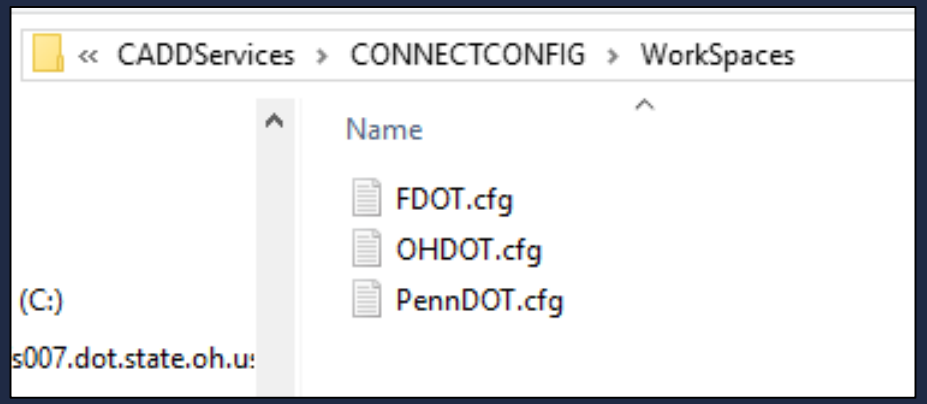
setting this to a network drive
-This means that setting this **one variable** is all that is needed to be done on the user/client side!!!
-Everything else is managed on the network!!

Windows (CRLF) | Ln 26, Col 52 | 100%

CUSTOM CONFIGURATION SETUP



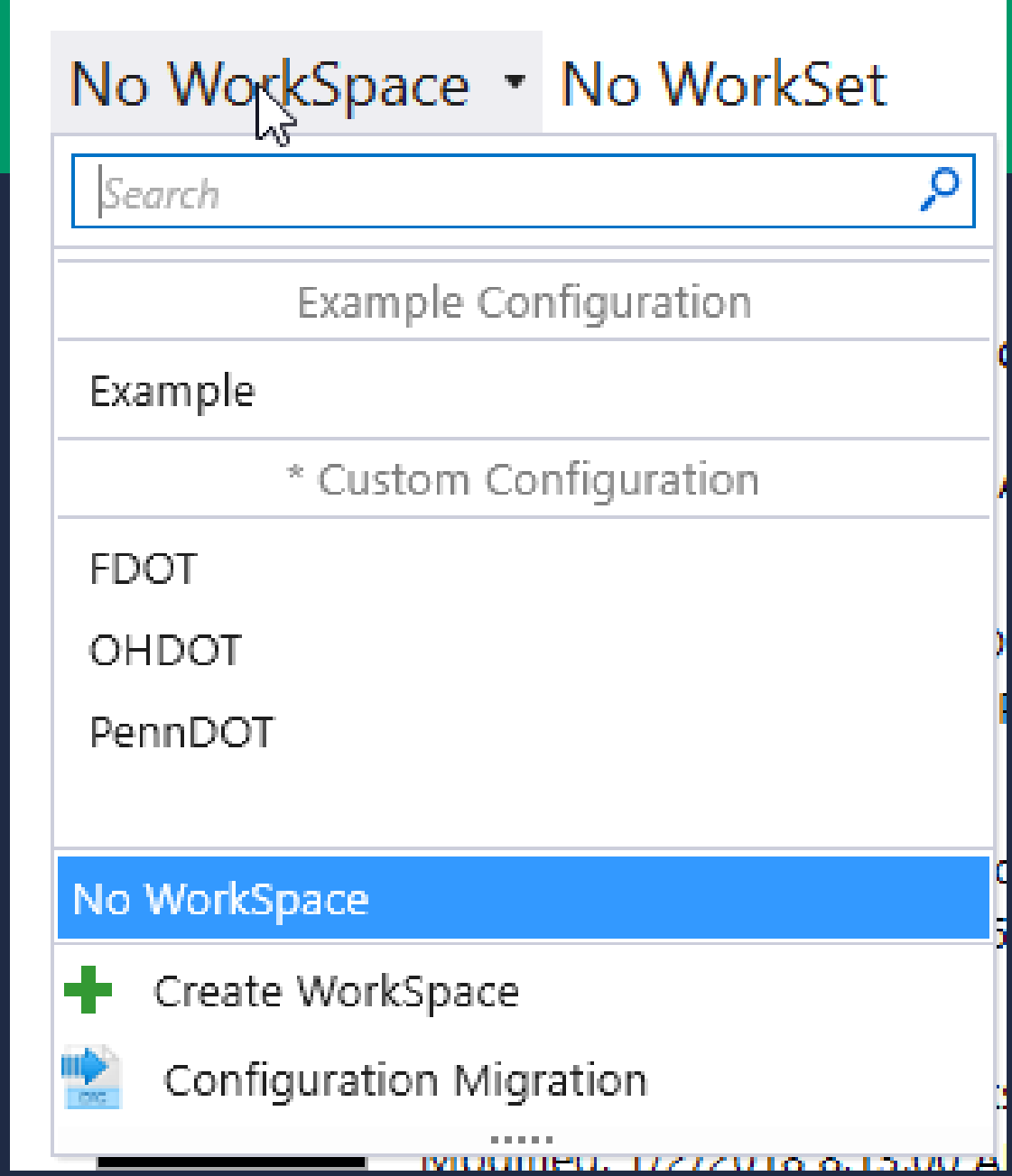
WorkSpaceSetUp.cfg
(copy from C:\ProgramData\Bentley\MicroStation CONNECT Edition\Configuration\)
-Define Organization (_USTN_ORGANIZATION)
-Define WorkSpace**S** Root (_USTN_WORKSPACE**S**ROOT)
-all .cfg files found here will populate the Workspaces dropdown list in the MicroStation Start up screen



RESULT

Making use of the Custom Configuration variable will add the Custom Configuration section shown to the right.

If DOTs set up their workspaces like this DOTs can ensure they don't stomp on each others workspaces and allow consultants to easily set up multiple Workspaces.



OHDOT.CFG WORKSPACE CONFIG FILE

- Does four things
  1. Sets the directory of the Workspace (_USTN_WORKSPACEROOT). This is how to achieve getting a workspace folder to a different location then the workspace config file!
  2. Sets the Workspace Standards directory (_USTN_WORKSPACESTANDARDS)
  3. Sets the Worksets directory (_USTN_WORKSET**S**ROOT)
  4. Calls the OHDOT_Workspace.cfg file in the Standards to set all the configuration variables for MicroStation. (makes it easier to update)

OHDOT'S WORKSPACE

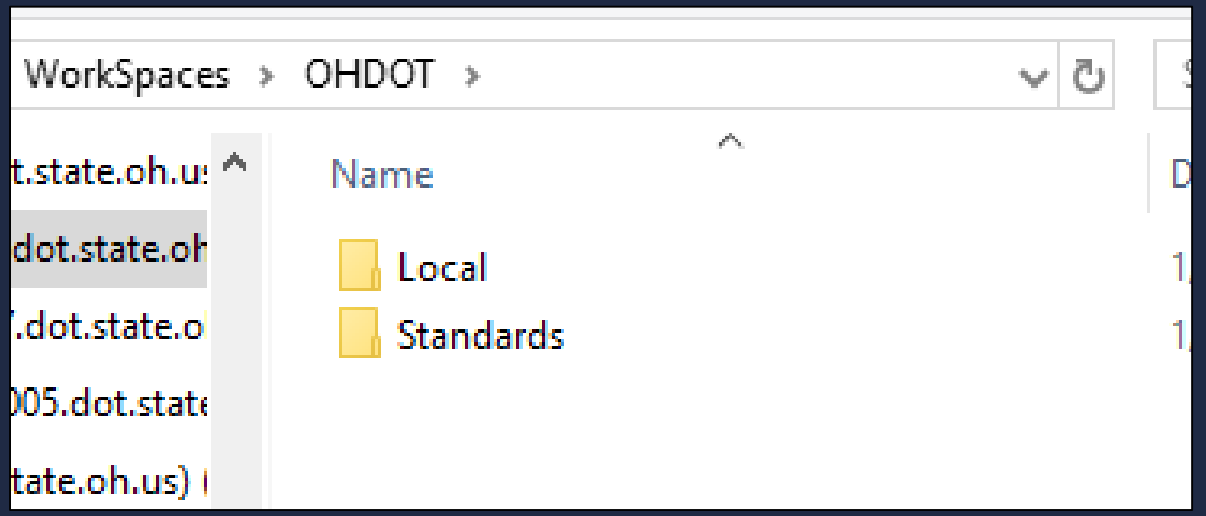
Inside our Workspace folder we have a Standards folder where all DOT standards are kept and a local folder.

The OHDOT.cfg calls a config file inside the standards folder that does all the work.

The Local folder is open to the office to put any customizations specific to OHDOTs workspace (different from organization level which would be across all workspaces)

That Config file also will run any config file found inside the Local/config/ folder.

Repeat same steps for ORD
NOT using CivilOrganization variable



WHERE TO DOWNLOAD

OHDOT_CONNECT

Install Options

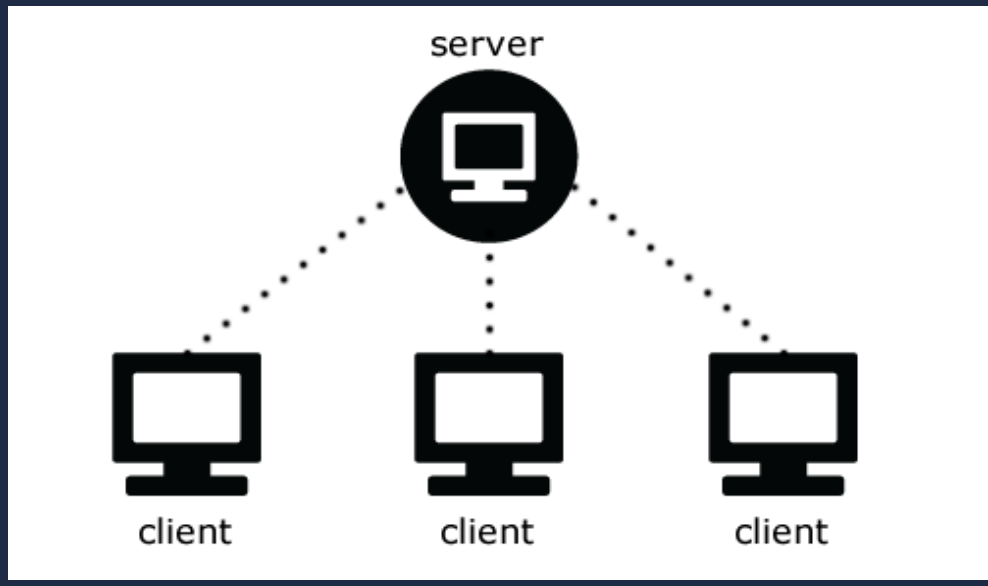
- Local:
  ftp://ftp.dot.state.oh.us/pub/CADD/CADDSync/OHDOT/OhioDOTCONNECTCADDStandardsInstaller_Local_v1003.exe
- Server/Client:
  ftp://ftp.dot.state.oh.us/pub/CADD/CADDSync/OHDOT/OhioDOTCONNECTCADDStandardsInstaller_Server_v1003.exe
  ftp://ftp.dot.state.oh.us/pub/CADD/CADDSync/OHDOT/OhioDOTCONNECTCADDStandardsInstaller_Client_v1003.exe
- ZIP file
  ftp://ftp.dot.state.oh.us/pub/CADD/CADDSync/OHDOT/Standards.zip
- ProjectWise Managed WorkSpace
  Coming Soon

OHDOT-INSTALLERS

Local Install

Custom Installers (.exe) to handle install/update/uninstall.
-can be run silently
-does all the configuration for the user
-Sync tool to synchronize standards at any time

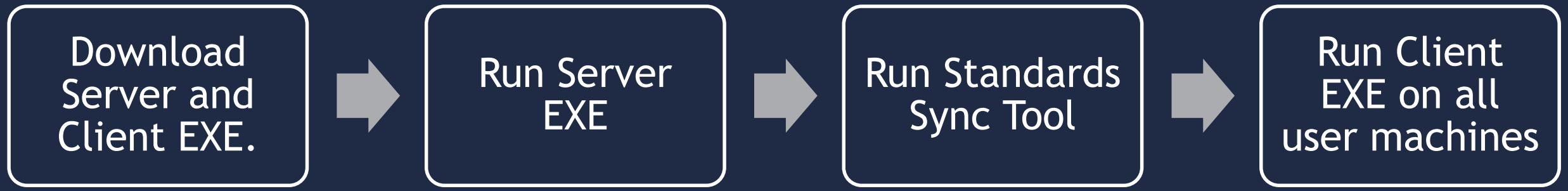
Server/Client Install



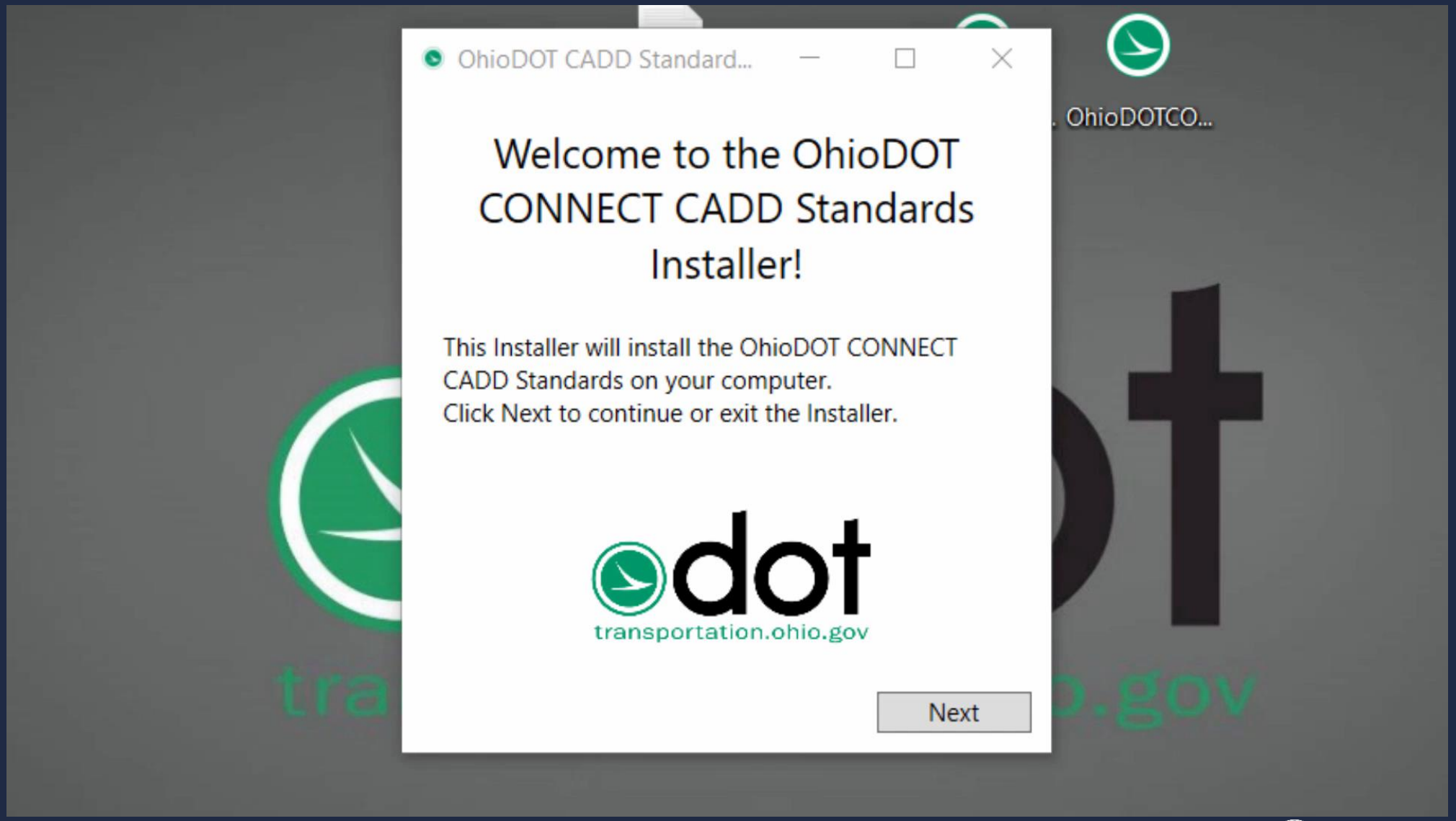
SET UP PROCESS

Local Setup

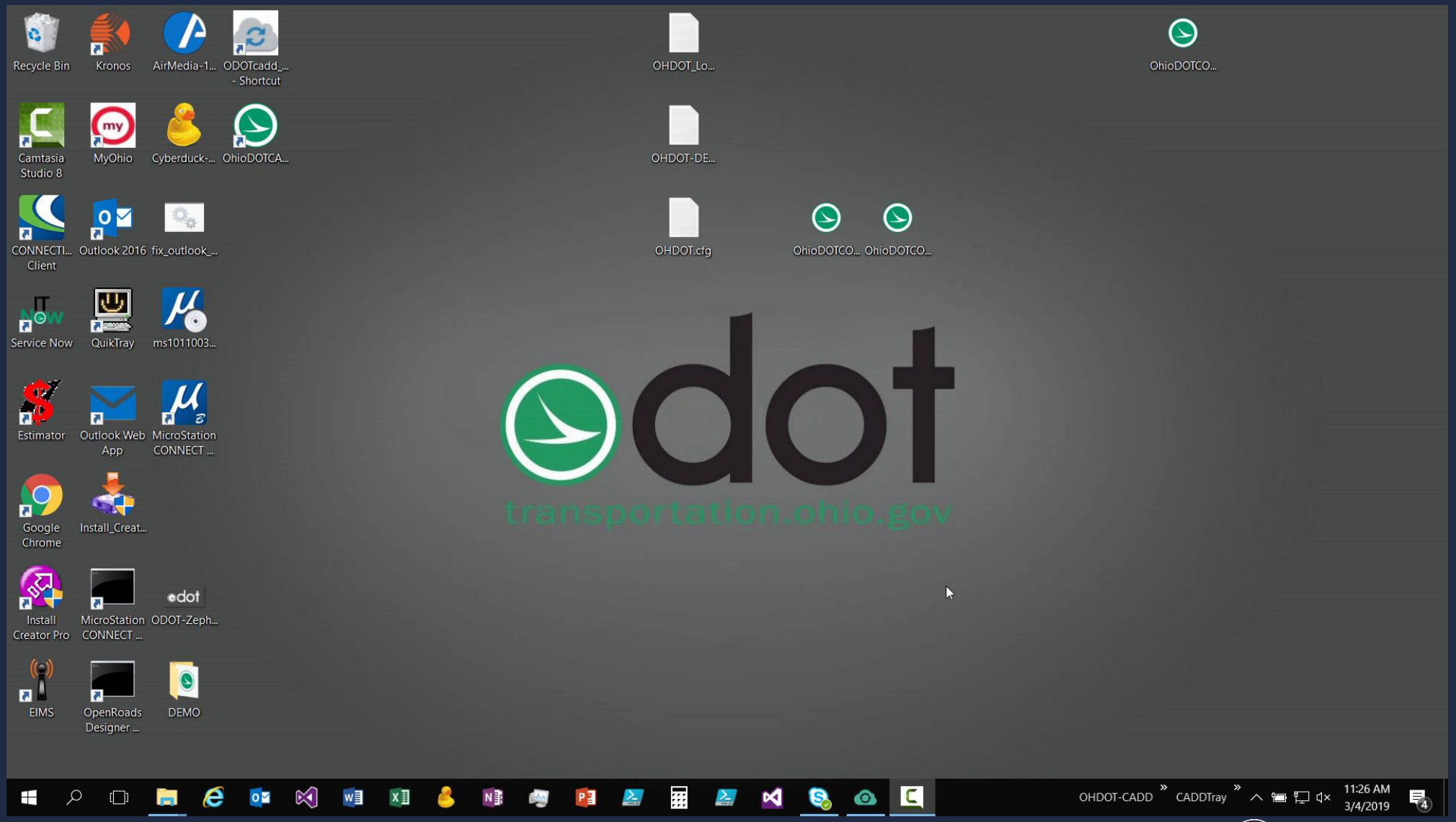
Server/Client Setup



DEMO - SERVER/CLIENT INSTALL - SYNC TOOL



DEMO – NOTIFICATION SYSTEM



OHIO DEPARTMENT OF TRANSPORTATION

WHAT DO THE INSTALLERS GIVE YOU

Local

- Sync Tool
- Notification System
- Start Menu Folder
- Installs ODOT Fonts
- Registry Keys for Google Analytics
- Sets Custom Configuration Directory
- Sets up OHDOT WorkSpace cfg file

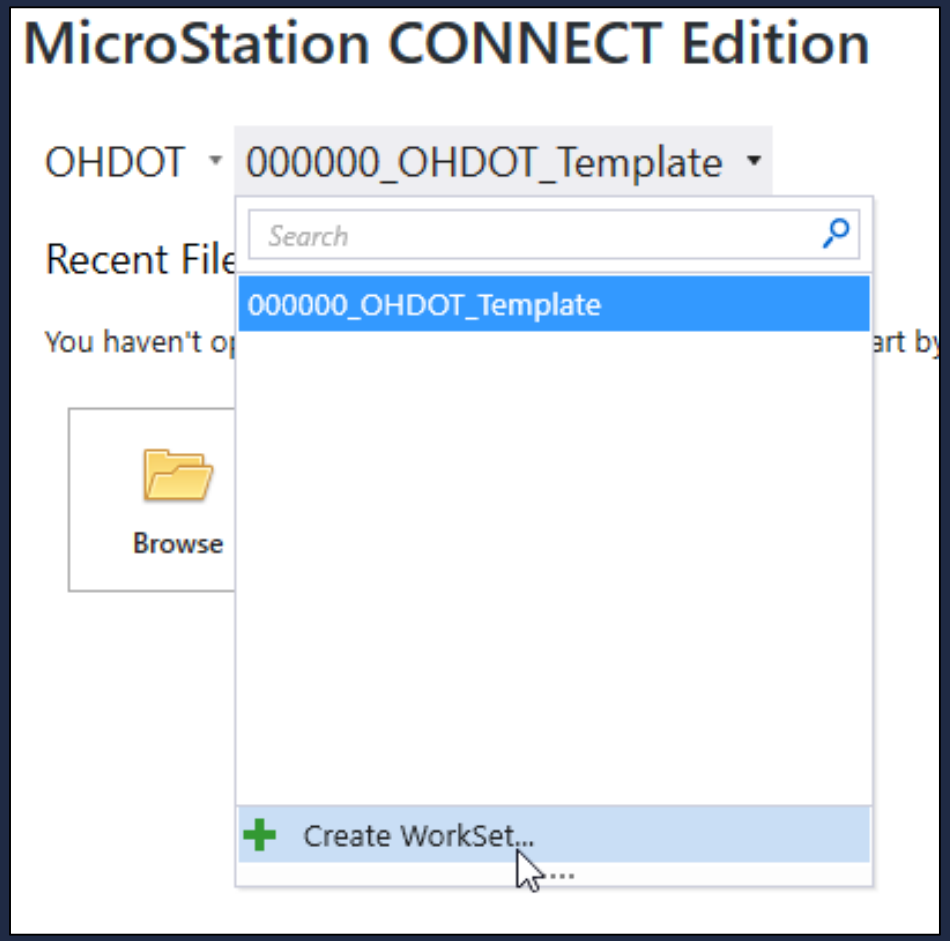
Server

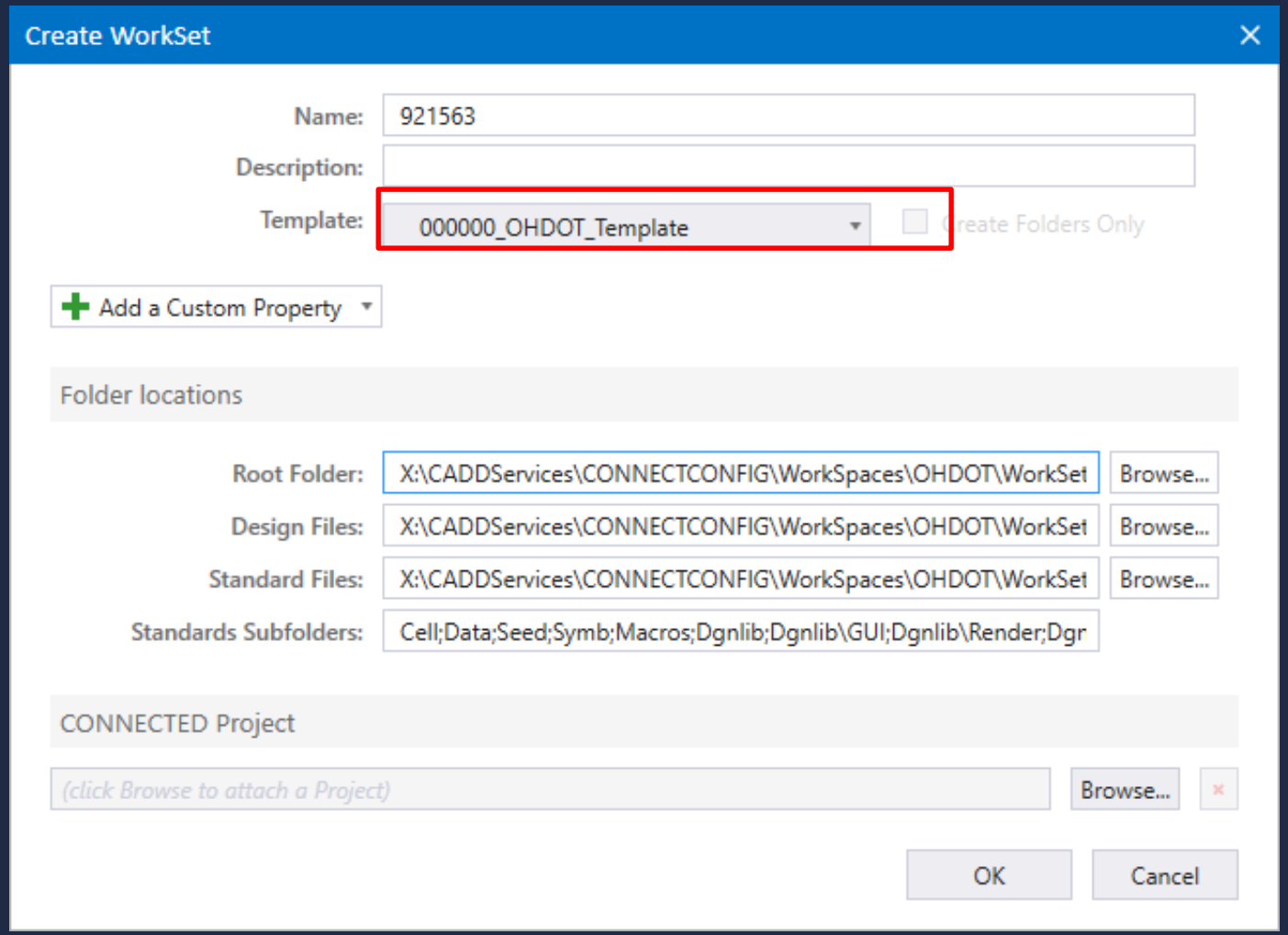
- Sync Tool
- Notification System
- Start Menu Folder
- Installs ODOT Fonts
- Registry Keys for Google Analytics
- Sets Custom Configuration Directory
- Sets up OHDOT WorkSpace cfg file

Client

- ~~Sync Tool~~
- Notification System
- Start Menu Folder
- Installs ODOT Fonts
- Registry Keys for Google Analytics
- Sets Custom Configuration Directory
- ~~Sets up OHDOT WorkSpace cfg file~~

CREATING WORKSETS





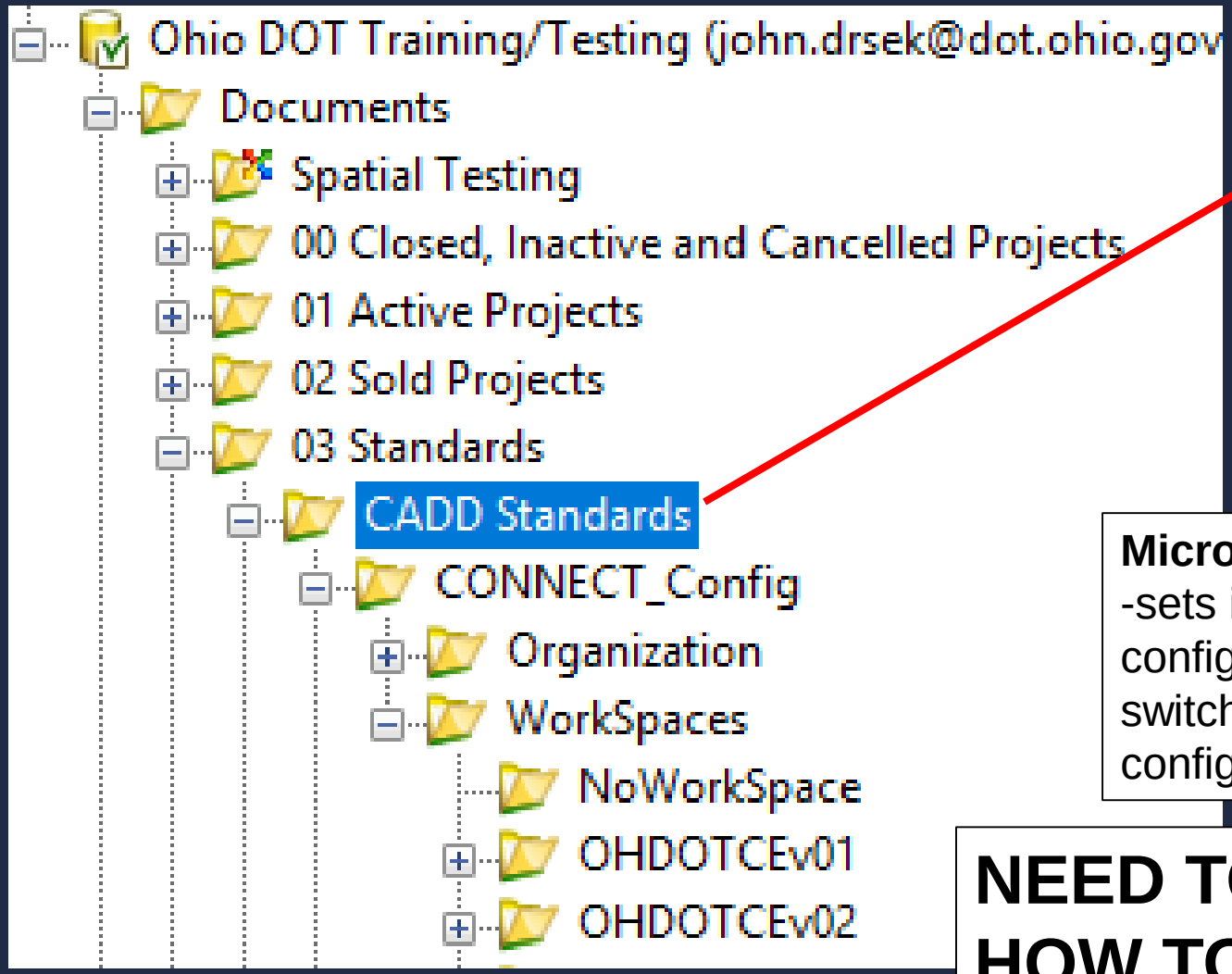
3RD OPTION FOR SETTING UP OHDOT STANDARDS

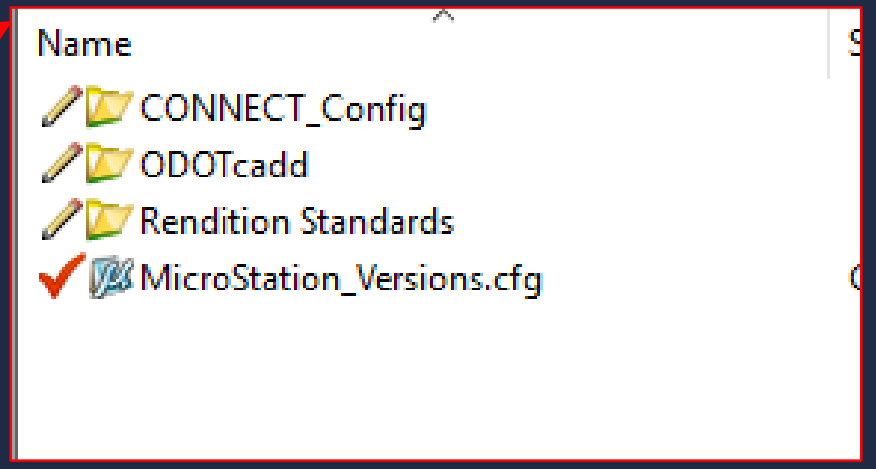
- ZIP File download of standards
- Your on your own
- No sync tool (Make sure Templates get updated)
- No Notification system for updates
- Auto-Opt in of Google Analytics
- Have to manually configure.
- Fonts are not installed.

CONNECT MANAGED WORKSPACE

John Drsek P.E.

MIMIC OUR WORKSPACE OUTSIDE OF PROJECTWISE

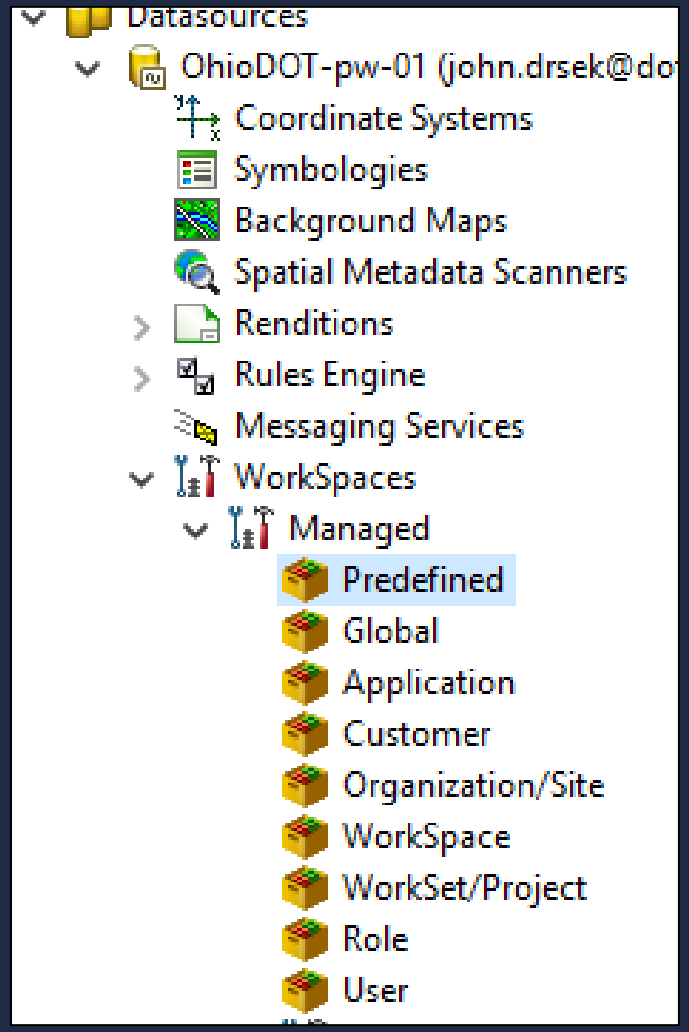




MicroStation_Versions.cfg
-sets if statement to control how configuration should be run. Specifically to switch between CONNECT config and v8i config.

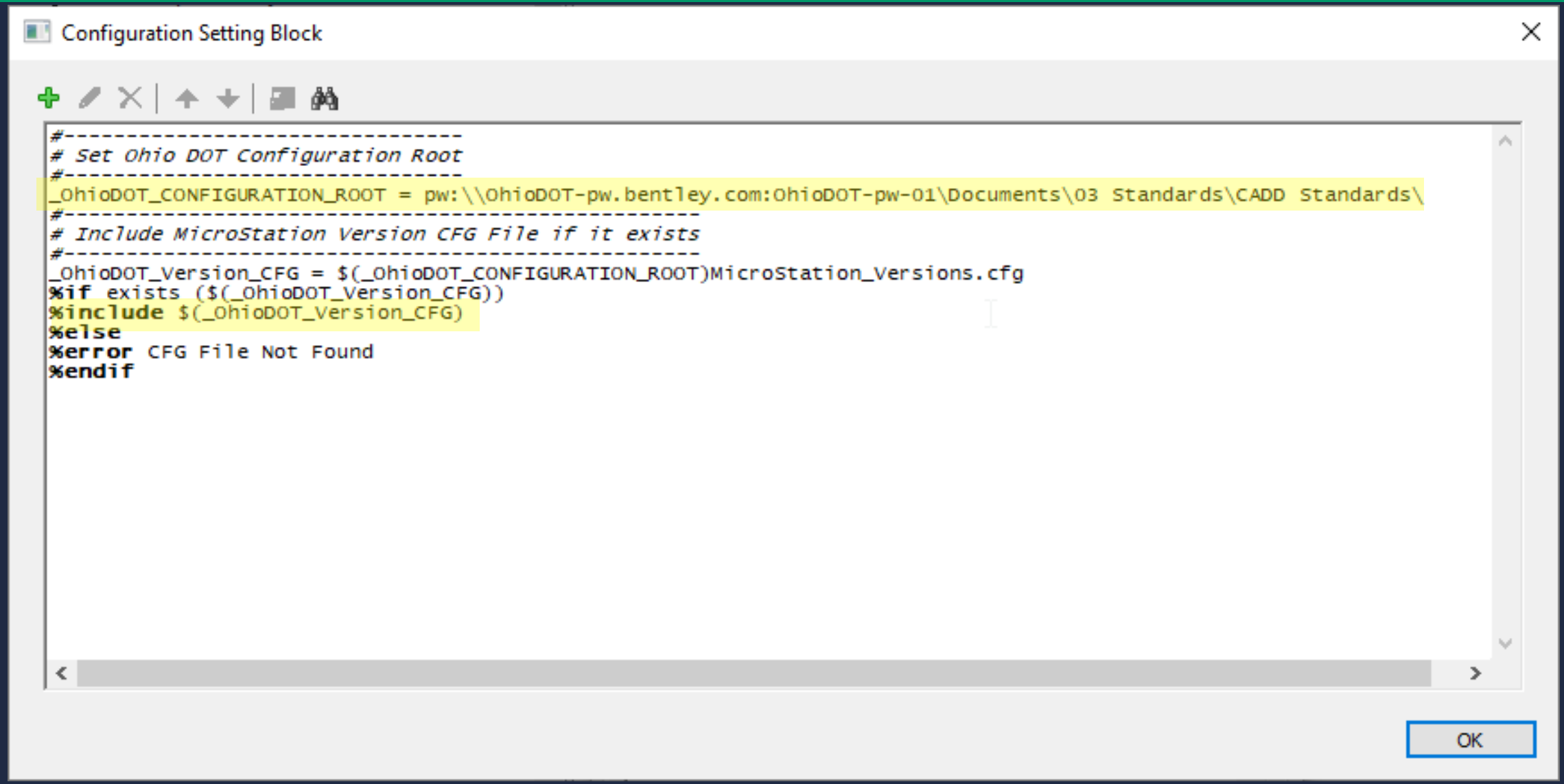
NEED TO TELL PROJECTWISE HOW TO RUN this cfg file!!!!

SETTING UP MANAGED WORKSPACE

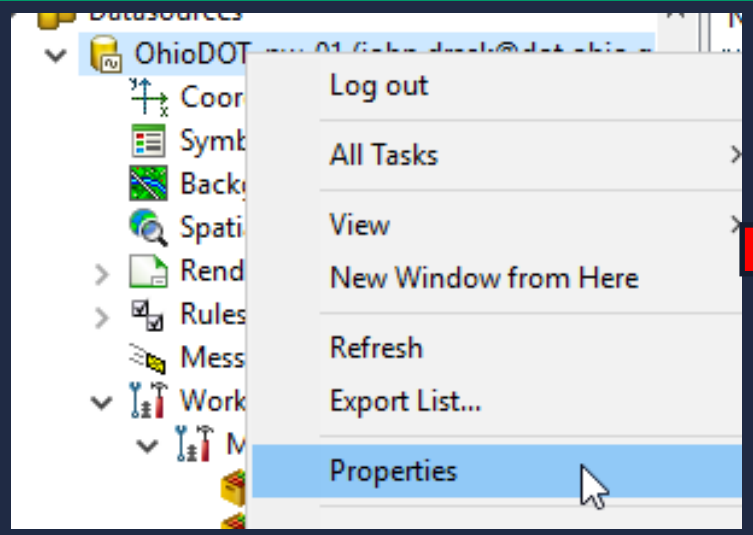


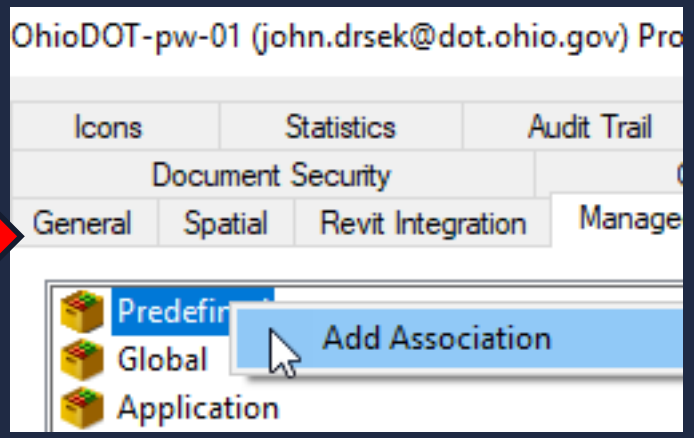
- -Use Configuration Settings Block (CSB) (ProjectWise Administrator)
- -Create CSB at Predefined level to call **MicroStation_Versions.cfg**
- -Add Association to datasource (ProjectWise Administrator)

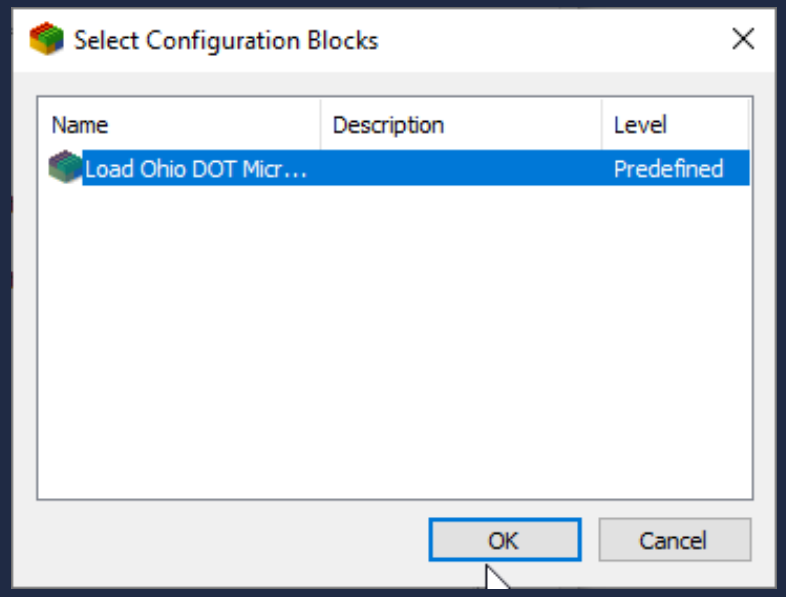
PREDEFINED CSB

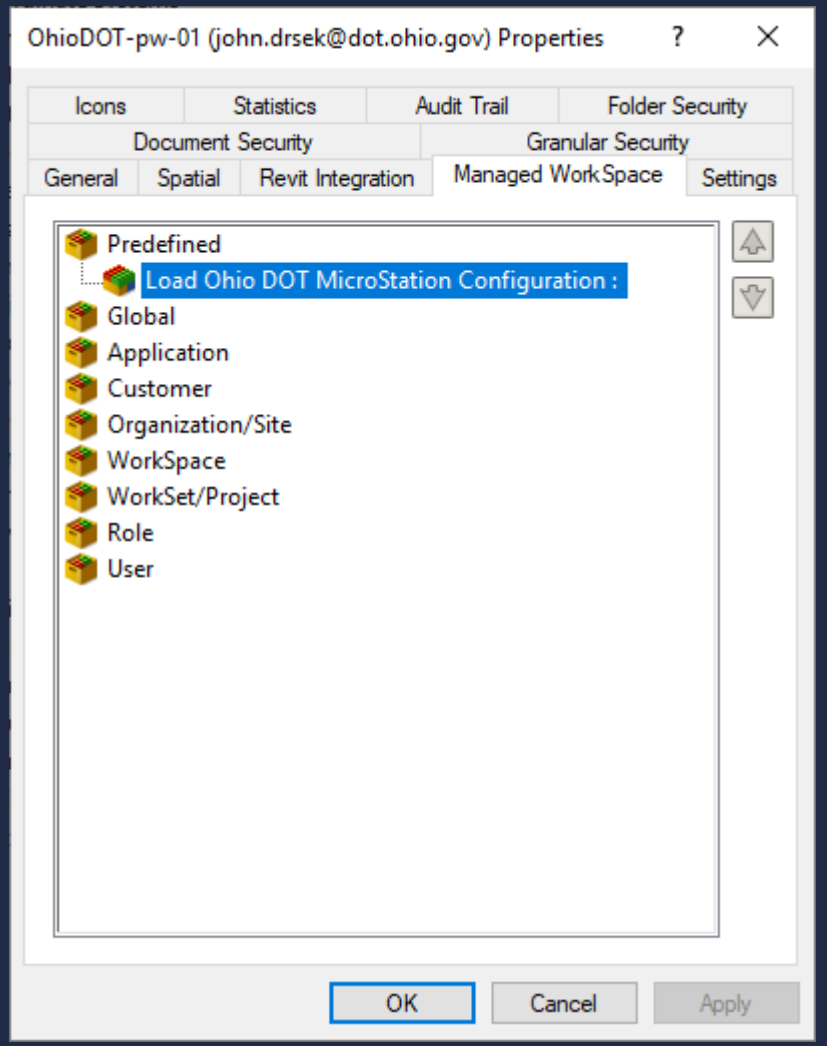


KICKING OFF THE MANAGED WORKSPACE





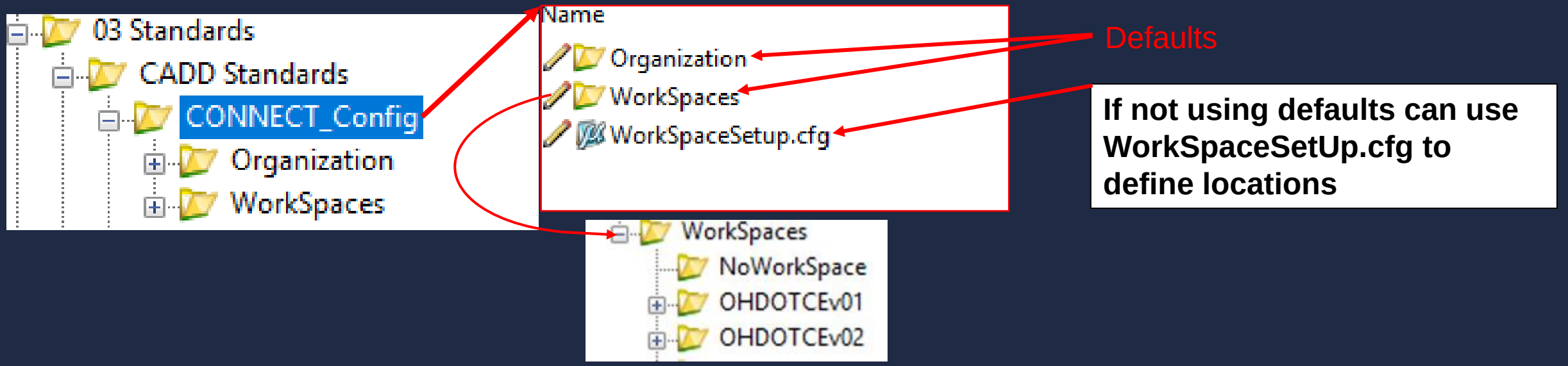




MICROSTATION_VERSIONS.CFG

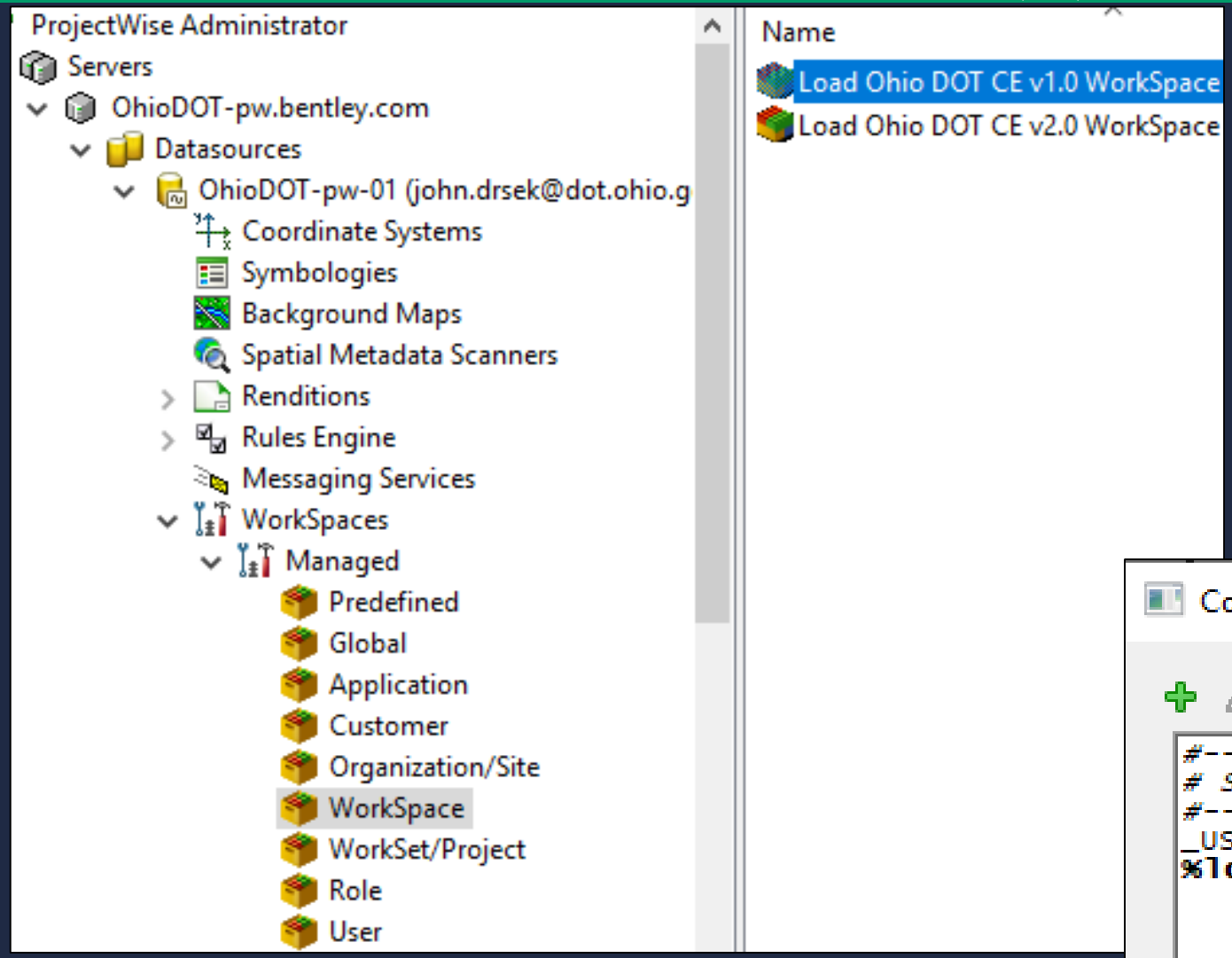
```
##########################################################################################################################
#
#   Available Variables that were defined in the MicroStation application command line or CSBs
#
#       PW Application  Variable                                        Value
#
#       CSB Block                                                       Level           Variable
#       Load OhioDOT MicroStation Configuration Pre-defined     _OhioDOT_CONFIGURATION_ROOT             @:\Standards\CADD Standards\
#
##########################################################################################################################

# If user is running MicroStation CE, Set configuration location
# MicroStation will load all CFG files in _USTN_ORGANIZATION
%if defined (_VERSION_10_0)
        OHIODOT_MICROSTATION_CONFIGURATION_TYPE = CONNECT Edition
        _USTN_CONFIGURATION = $(_OhioDOT_CONFIGURATION_ROOT)CONNECT_Config/
        %lock _USTN_CONFIGURATION

        # Set DEFAULT WorkSpace Name to OhioDOTCEv01 and DEFAULT WorkSet to NoWorkSet (this gets overwritten if opened from inside works
        _USTN_WORKSPACENAME = OHDOTCEv01


# If user is running MicroStation V8i, set the appropriate variables to load OhioDOT CADD standards.
# Configure variables needed to be in place before running z_ODOT_redirect.cfg at the system level
%elif defined (_VERSION_8_11)
        OHIODOT_MICROSTATION_CONFIGURATION_TYPE = V8i
    ...
%else
        OHIODOT_MICROSTATION_CONFIGURATION_TYPE = Not Supported
%endif
```

CONFIGURATION

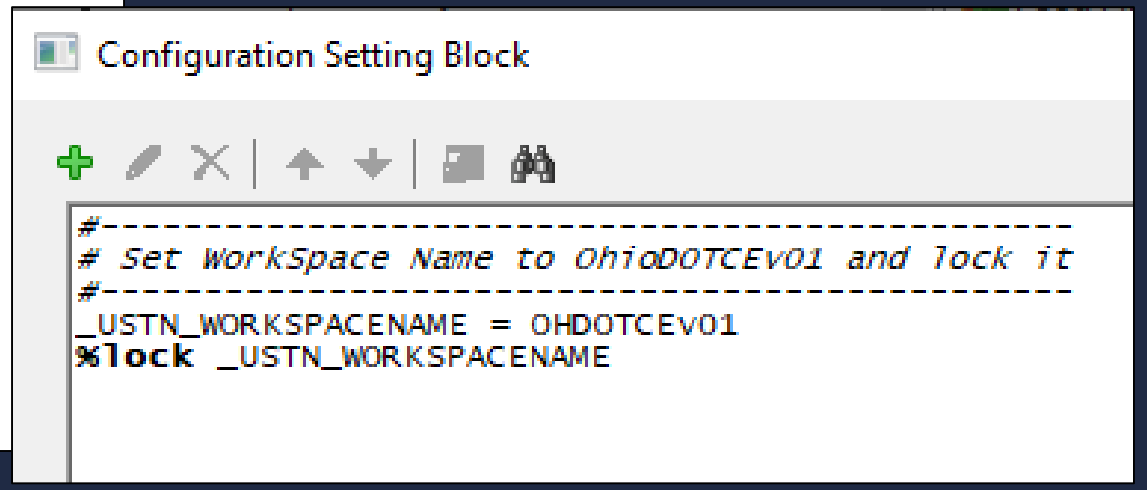


- Microstation knows where to look for workspaces but not which one to use…unlike outside projectwise the user is not selecting the workspace from the start up dialog.

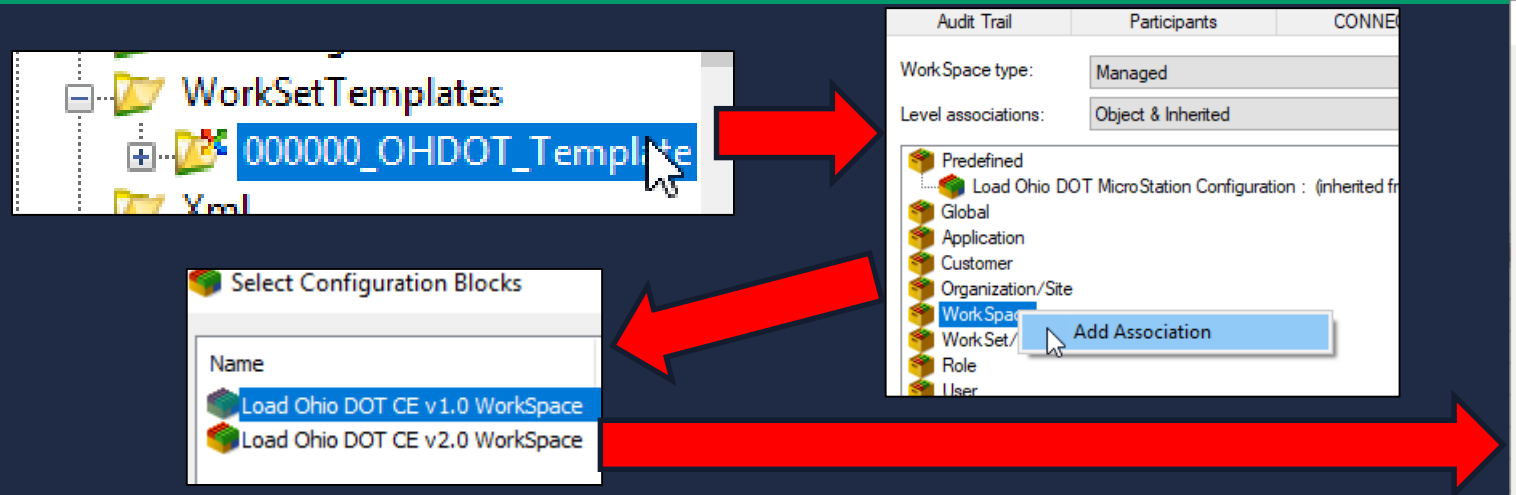
SETTING UP WORKSPACE(S)

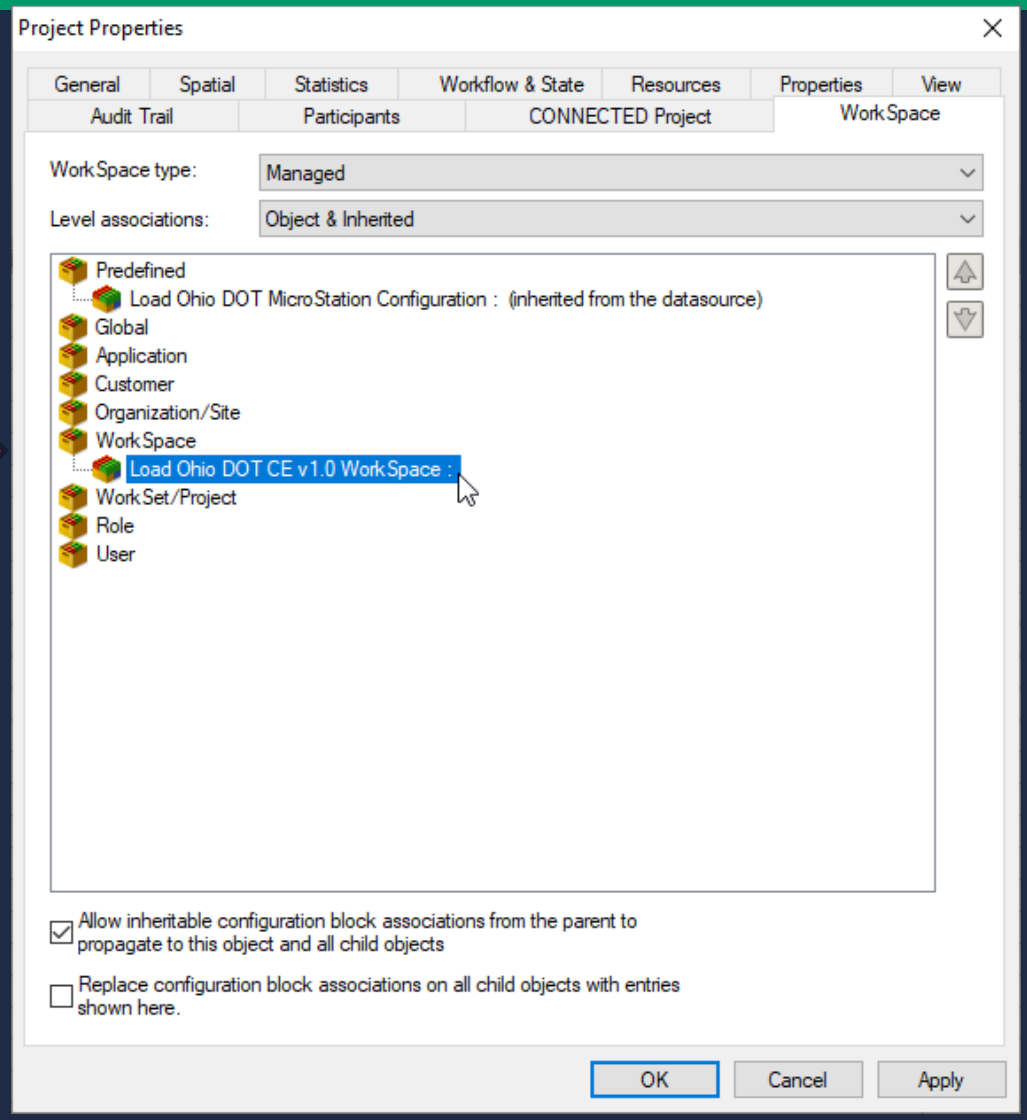


- ..Back to CSB
- Each workspace would have its own CSB in the workspace section.
- Only need to set _USTN_WORKSPACENAME (MicroStation config will find the config file)
- …still need to tell ProjectWise when to use what CSB file.



TELLING PROJECTWISE WHICH WORKSPACE TO USE



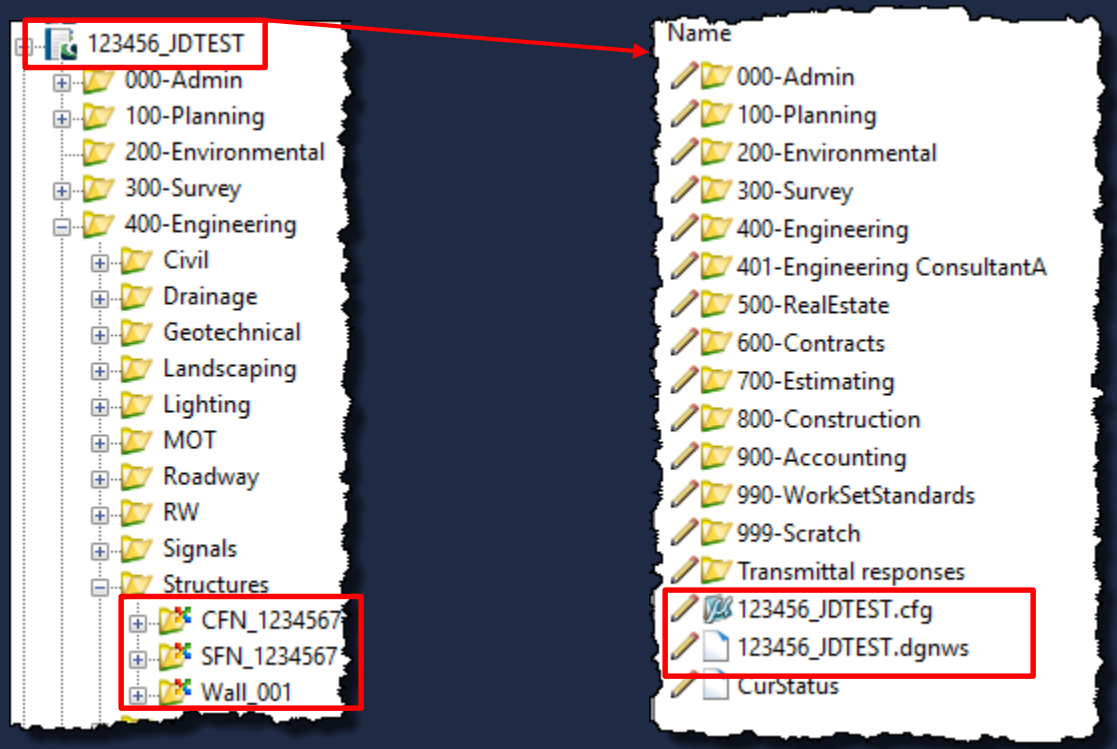


- This is done by adding an association to the desired workspace CSB in the WorkSet folder.
- If you define this on your WorkSet Template folder and use that when creating a new WorkArea then it will already be set. Now any dgn opened inside this folder (or sub-folder) will use the defined CSB to know what workspace to use

WORKSET BACKGROUND

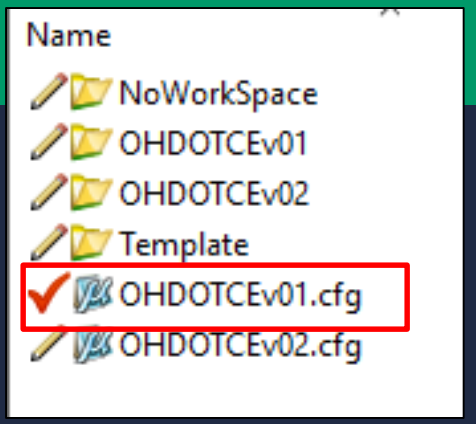
- Next need to set what Workset to use and where the workset cfg file is.

- OHDOT has set up their Worksets in projectwise as follows:
  - WorkSet Root is a WorkArea
  - WorkSet cfg file is inside WorkSet Root
  - WorkSetdgnws file is inside WorkSet Root
  - There are sub-WorkAreas inside the WorkSet



WORKSPACE LEVEL

```
%if defined (_PWEXPLORER)
        %if exists (dms_parentproject (_dgndir))
                %if exists ($(dms_parentproject (_dgndir))$(lastdirpiece ($(dms_parentproject (_dgndir)))).cfg)
                        # CASE 1 - The File is in a Structural Sub Work Area - PID Work Area is the parent project
                        _USTN_WORKSETSROOT = $(dms_parentproject (_dgndir))
                        %lock _USTN_WORKSETSROOT
                %else
                        # CASE 2 - The File is in the PID Work Area
                        _USTN_WORKSETSROOT = $(dms_project (_dgndir))
                        %lock _USTN_WORKSETSROOT
                %endif
        %else
                # CASE 2 - The File is in the PID Work Area
                _USTN_WORKSETSROOT = $(dms_project (_dgndir))
                %lock _USTN_WORKSETSROOT
        %endif

        _USTN_WORKSETNAME = $(lastdirpiece (_USTN_WORKSETSROOT))
        %lock _USTN_WORKSETNAME

        %if defined (_USTN_WORKSETNAME) && exists ($(_USTN_WORKSETSROOT)$(_USTN_WORKSETNAME).cfg)
          _USTN_WORKSETCFG = $(_USTN_WORKSETSROOT)$(_USTN_WORKSETNAME).cfg
          %lock _USTN_WORKSETCFG
        %else
                %error cant find workset cfg
        %endif

%else
        %error outside PW
        # File is outside ProjectWise so we will use the regular template for a new WorkSet CFG file
        _USTN_WORKSETTEMPLATE = $(_USTN_WORKSPACEROOT)Standards/WorkSetTemplates/000000_OHDOT_Template.cfg
%endif
```



- Still need to specify workset!...do this dynamically with workspace config
- Dependent on how WorkSet folder structure is set up.
- Need to Find the root WorkSet (which is also a WorkArea).
- OHDOT also chose to have the WorkSet cfg inside the root WorkSet.
- MUST SET _USTN_WORKSET**S**ROOT

WORKSPACE LEVEL CONTINUED

- The Workspace cfg also calls OHDOTs main configuration file (matches what configuration outside projectwise does)

```
#=============================================================================
# Include the OHDOT WorkSpace Standards
#=============================================================================

_OhioDOT_WORKSPACECONFIGURATIONFILE = $(_USTN_WORKSPACEROOT)Standards/Config/OHDOT_WorkSpace.cfg

%if exists ($(_OhioDOT_WORKSPACECONFIGURATIONFILE))
        %include $(_OhioDOT_WORKSPACECONFIGURATIONFILE)
%else
        %error $(_OhioDOT_WORKSPACECONFIGURATIONFILE) NOT FOUND (Check Access Control)
%endif

 # Reset the following variables to their defaults if ProjectWise was launched
 # They were defined to the current DGN Directory and would need to change every tim
 # a DGN is opened from a different folder
 %if defined (_PWEXPLORER)
         MS_BACKUP = $(_USTN_OUT) # Redefine to _USTN_OUT

         %ifdef MS_REPORT_OUTPUT # Remove this variable
                 %undef MS_REPORT_OUTPUT
         %endif

         %ifdef MS_RFDIR # Remove this variable since references are managed by ProjectWise
                 %undef MS_RFDIR
         %endif
%endif
```

WORKSET LEVEL

- OHDOT also puts the dgnws file at the root level of the WorkSet. Need to define some variables to achieve this
- Some other things defined here…

```
_USTN_WORKSETROOT = $(_USTN_WORKSETSROOT)
_USTN_WORKSETDGNWS = $(_USTN_WORKSETROOT)$(_USTN_WORKSETNAME).dgnws
```

```
# Search path for design files
MS_DEF                                  = $(_USTN_WORKSETROOT)400-Engineering/ #Project Locatior

MS_SEEDFILES                            = $(_USTN_WORKSETSTANDARDS)/seed/   # Search Directory t
MS_DESIGNSEED                           = $(OHDOT_PID)_DesignSeed2d.dgn   # Default Seed File.
MS_DESIGNMODELSEED                      = $(OHDOT_PID)_DesignSeed2d.dgn
MS_DESIGNMODELSEEDNAME                  = Design
MS_DRAWINGMODELSEED                     = OHDOT_DrawingSeed2d.dgn
MS_DRAWINGMODELSEEDNAME                 = Drawing
MS_SHEETMODELSEED                       = OHDOT_SheetSeed2d.dgn
MS_SHEETMODELSEEDNAME                   = Sheet

MS_GEOCOORDINATE_USERLIBRARIES          = $(_USTN_WORKSETSTANDARDS)GCS/$(OHDOT_PID)_Custom.dty

CIVIL_ROADWAY_TEMPLATE_LIBRARY          = $(_USTN_WORKSETSTANDARDS)Template Library/$(OHDOT_PID)

MS_PRINTDEF_PATH                        = $(_USTN_WORKSETROOT)/000-Admin/PlanReviews/   # Search

MS_PLTFILES                             = $(_USTN_WORKSETROOT)000-Admin/PlanReviews/   # Output

MS_REF_DEFAULTATTACHDIRECTORY           = $(_USTN_WORKSETDGNS)  # Set the default directory wher
MS_RFDIR                                < $(_USTN_WORKSETROOT)300-Survey/Basemaps/
```

RECAP

Create Pre-Defined CSB that calls MicroStationVersions.cfg

This is what defines how to start the configuration

Add association to Pre-Defined CSB to the datasource

This is how the configuration gets kicked off

Create MicroStationVersions.cfg with the switch between v8i and CONNECT configuration

CONNECT configuration sets _USTN_CONFIGURATION

Create WorkSpace CSB that sets the WorkSpace Name

This is what defines what WorkSpace to use

Add association to WorkSpace CSB to WorkSet Template

This is what tells MicroStation to use this WorkSpace

Create WorkSpace cfg file that dynamically sets the worksetroot

This is how MicroStation knows and finds what workset to configure.

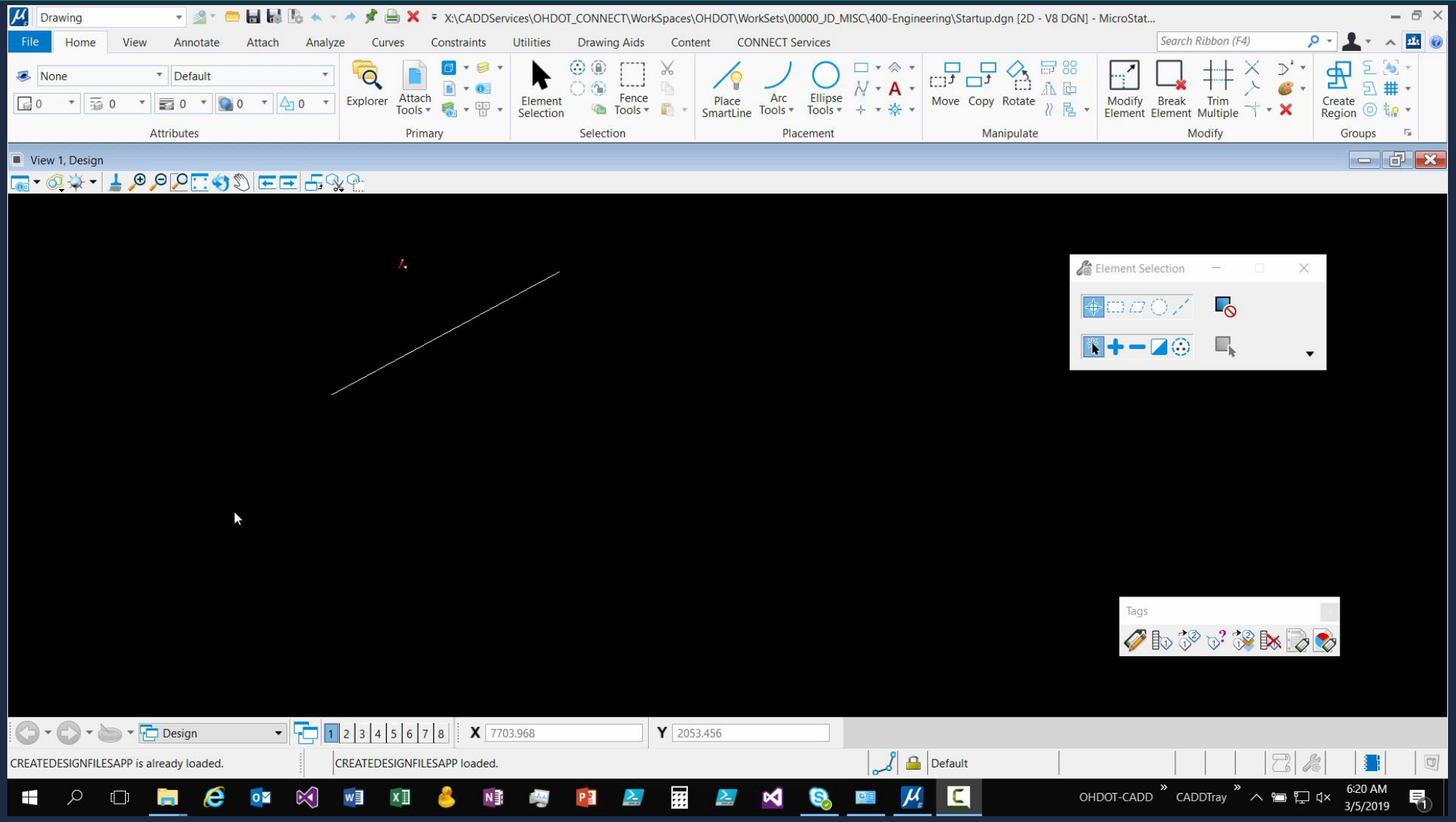
CREATING WORKSET

- Need 3 things
  - Folder Template
  - WorkSet cfg
  - WorkSet dgnws
- Steps to create
  - Create New WorkArea and select template
  - Copy and renamed Template WorkSet cfg file
  - Let MicroStation create the dgnws from template when user opens microstation file within WorkSet.
    - **need to define _USTN_WORKSETDGNWSTEMPLATE**
- OHDOT has created an application to streamline this process and set up access control

DELIVERING THE MANAGED WORKSPACE

- Working on delivery method
- Initial delivery helping to simplify set up process
- Later introduce sync tool similar to outside projectwise
- What do you want??
  - Attribute Exchange Rules??, workflows??, environments??

NEW CREATE DESIGN FILES ADDIN DEMO



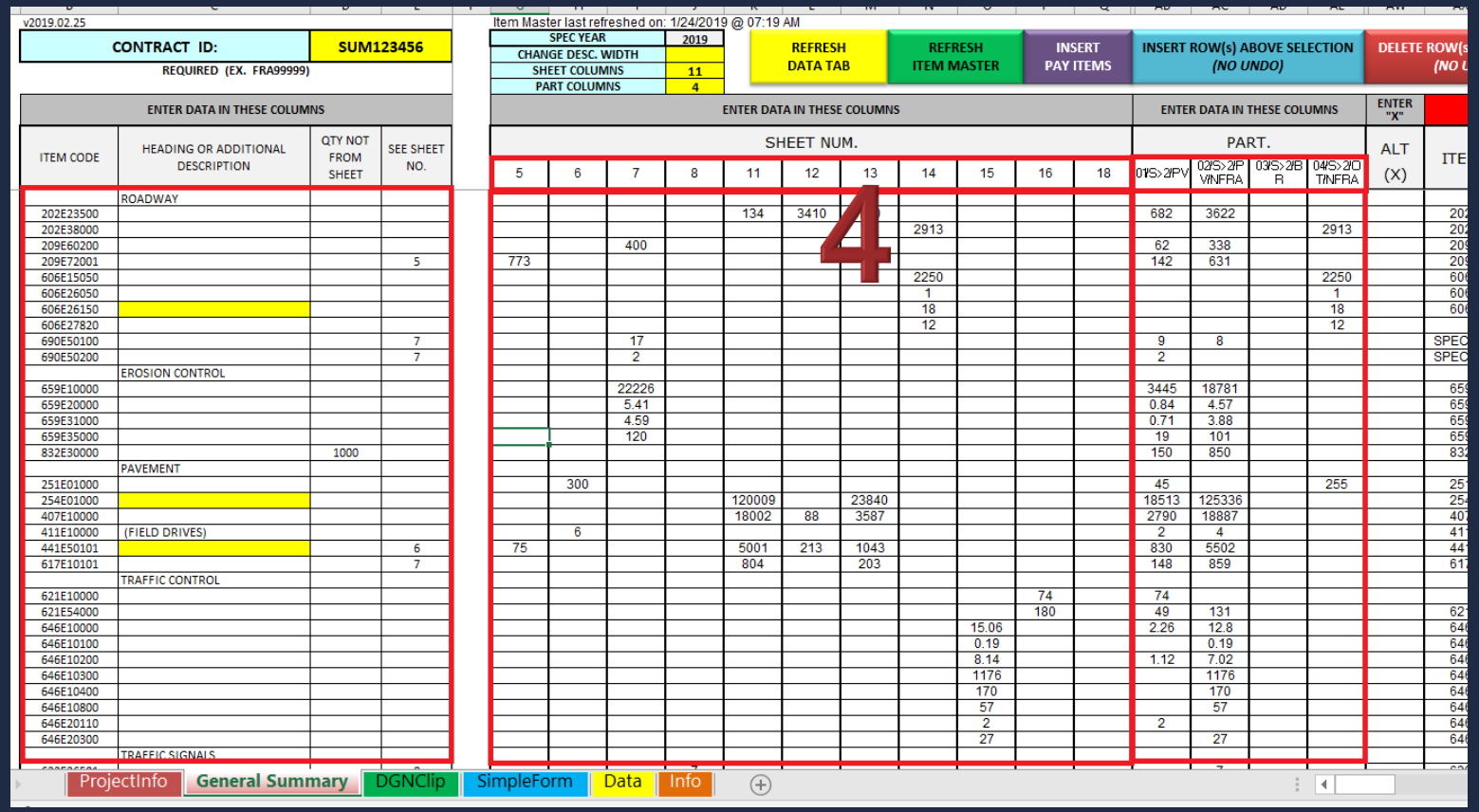
QUESTIONS

SPEC YEAR 2019 - GENSUM

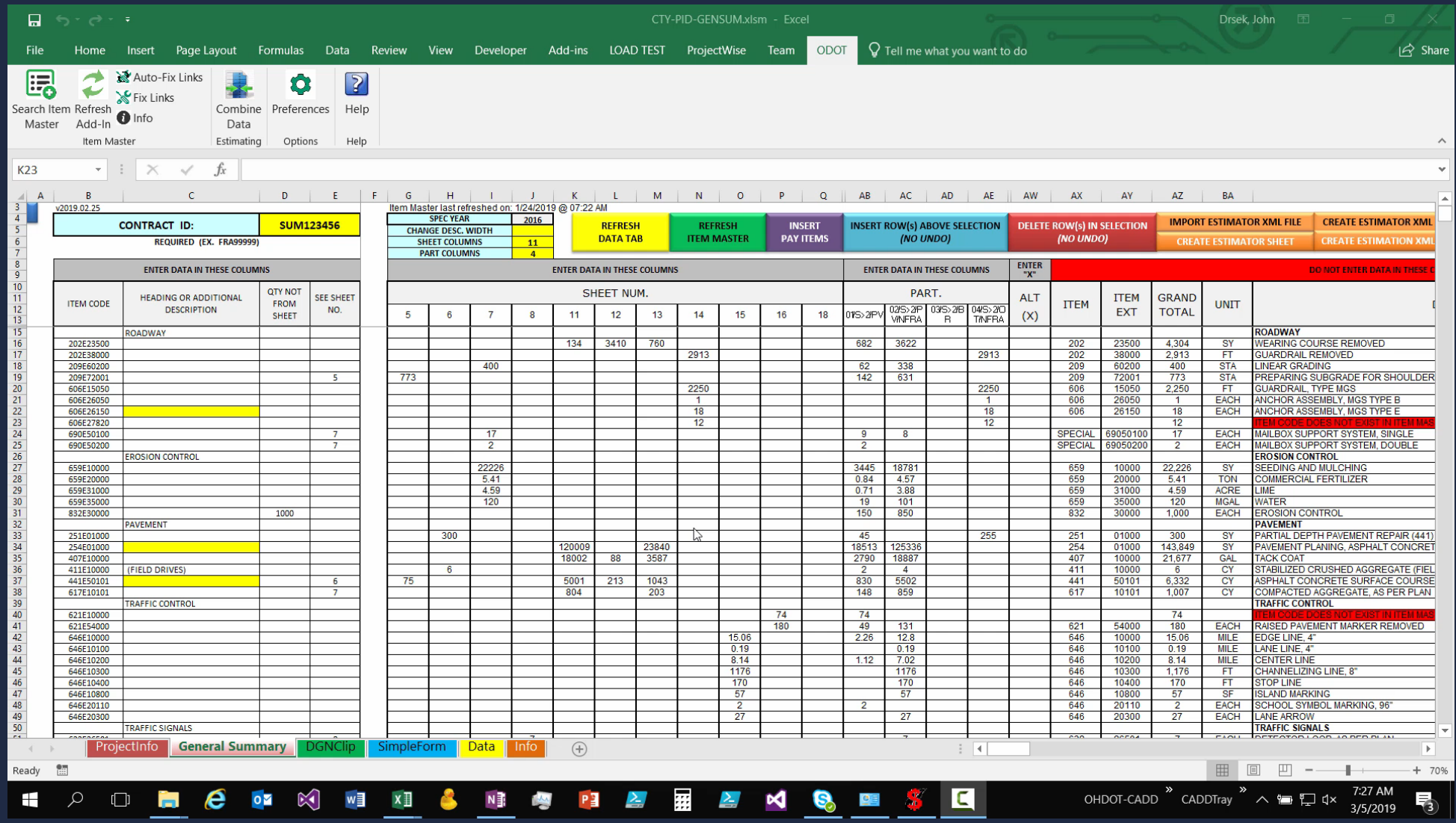
- New version of the GenSum v2019.02.25
- Contains 2016 and 2019 spec year Item Masters
  - Removed 2013 and added 2019 item masters
- Export to XML for estimator!!!!
- Updated ItemMaster Excel Addon to remove 2013 item master and add 2019 item master

UPDATING AN OLD GENSUM TO A NEWER VERSION

- Youtube video! https://www.youtube.com/watch?v=Xfx-FGlffqM&list=PLdyShNRgZlb4S1QpyT0V9mxBs82Qz11KU&index=4



GENSUM - DEMO



OHIO DEPARTMENT OF TRANSPORTATION

QUESTIONS

CADD MEETING • MARCH 6, 2019

OHIO DEPARTMENT OF TRANSPORTATION

TRANSITIONING TO OPENROADS DESIGNER: WHAT CAN I EXPECT?

Eric Thomas
CADD Consultant
CADD & Mapping Services

TOPICS

- Bentley Software Support Timeline
- Licensing and Software Updates
- Software Compatibility
- OHDOT WorkSpace/WorkSets
- ORD Software Introduction

BENTLEY SOFTWARE SUPPORT TIMELINE

SUPPORT STATUS	CONTINUOUS SUPPORT	FULL SUPPORT	EXPIRING SUPPORT	SUPPORT DISCONTINUED
CONNECT Edition	■			
V8*i* (Latest SELECTseries) Refer to *Latest V8i Applications* SELECTseries		■	As of July 1, 2019	As of January 1, 2021
V8*i* (Earlier SELECTseries)			■	As of July 1, 2019
V8, XM, 2004, ...				■

https://www.bentley.com/en/desktop-applications

BENTLEY SOFTWARE SUPPORT TIMELINE

- GEOPAK v8i SS4 Support:
  - ***July 2019 Support Status***: "EXPIRING SUPPORT"
    - No longer available for download
    - No OS compatibility or maintenance updates
    - No access to support analysts

BENTLEY SOFTWARE SUPPORT TIMELINE

- GEOPAK v8i SS4 Support:
  - ***Jan 2021 Support Status***: **"SUPPORT DISCONTINUED"**
    - No service request submittals
    - No online knowledge base
    - No online learning content

OPENROADS DESIGNER LICENSING & UPDATES

- MicroStation Connect Edition (CE)
  - Released Sept. 2015
  - 64 bit version
  - Already on Update 12
- OpenRoads Designer (ORD)
  - Built on MicroStation Connect Edition
  - Next generation of Bentley Civil products
    - Replaces InRoads, GEOPAK, MX Road
  - ORD can be installed simultaneously with SS4

OPENROADS DESIGNER LICENSING & UPDATES

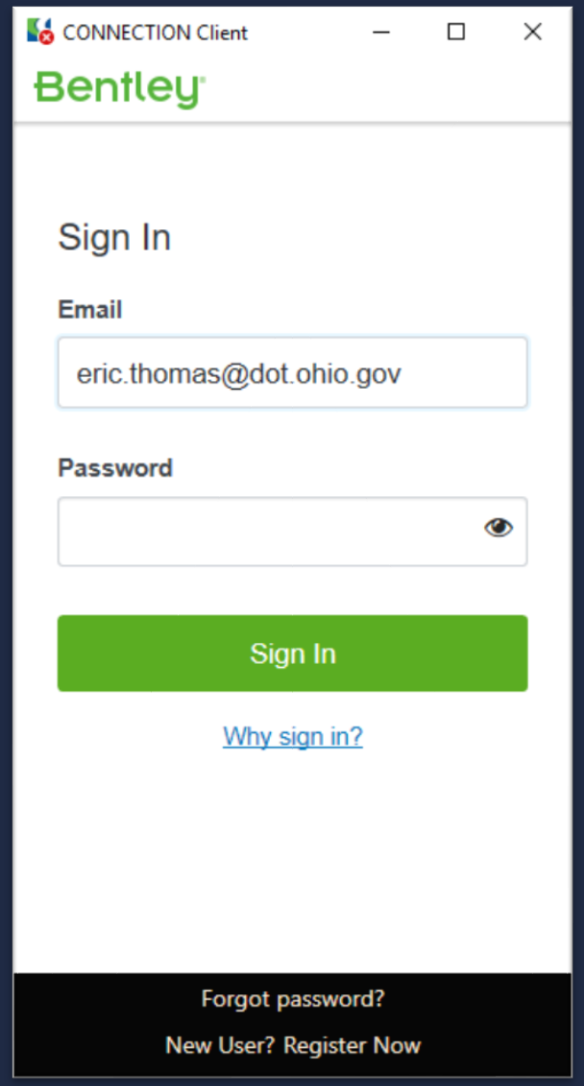
- OpenBridge Modeler
  - ODOT is not using it at this time
- OpenRail Designer
  - ODOT is not using it at this time
- Consultants may choose to use these applications

OPENROADS DESIGNER LICENSING & UPDATES

- 2019 Bentley Connect Licensing
  - Required for all Bentley products
  - ORD/MicroStation CE are two separate licenses
  - Contact you Bentley account representative

OPENROADS DESIGNER LICENSING & UPDATES

- Requires users to log in to Bentley Connection Client
- ODOT users:
  - Sign in with your ODOT email address
  - Password is automatically applied



OPENROADS DESIGNER LICENSING & UPDATES

- ORD Software Updates
  - Quarterly update cycle
  - Updates to the ORD Standards (DGNLIBs) may not be backwards compatible with previous versions of the software
  - Current Version:

    2018 Release 4 Update 6 – Version 10.06.00.38
  - Keeping all users are on the same version as ODOT is essential!
  - Don’t fall behind, stay current!

OPENROADS TECHNOLOGY VS. ORD

- OpenRoads Technology
  - Refers to the OpenRoads Functions embedded in SELECTseries Products
  - Introduced in SS2
  - Included with InRoads, GEOPAK, and MX Road
    - Common tools across all platforms
    - Geometry, Survey, Terrains, and 3D Modeling
    - Rely on legacy software for plan production functions

OPENROADS TECHNOLOGY VS. ORD

- OpenRoads Designer (ORD)
  - Refers to a new 64 bit version of the software built on MicroStation Connect Edition
  - Removes the legacy software (InRoads, GEOPAK, MX Road)
  - Adds new plan production tools
    - Sheet clipping
    - Labeling
    - Earthworks
    - etc…

OPENROADS TECHNOLOGY VS. ORD

- OpenRoads Designer (ORD)
  - Everything is DGN based
    - No GPK file
    - No SMD file
    - No TIN file

SOFTWARE COMPATIBILITY

- I have a project already started in SS4. Can I convert it to ORD?

SOFTWARE COMPATIBILITY

ODOT CADD Standards Version	Corresponding Bentley Software
~~V7std~~	~~V7~~
~~ODOTstd~~	~~SS1/SS2/SS3~~
ODOTcadd	SS4
OHDOT	ORD/CE

SOFTWARE COMPATIBILITY

- SS4 to ORD
  - SS4 Civil Data is not forward compatible with ORD
    - SS4 DGN files can be referenced by ORD
    - Referenced SS4 Terrains can be leveraged with limited value
    - In general, migrating SS4 data to ORD is a conversion process
      - Not impossible, but difficult
      - Could be time consuming

SOFTWARE COMPATIBILITY

- I’m working in ORD, but my sub-consultant is working in SS4. Can the sub use my ORD data?

SOFTWARE COMPATIBILITY

- ORD data with SS4
  - ORD Civil Data is ***not*** backwards compatible
  - Your team should be on the same platform
  - ODOT does not want mismatched sources of data

OHDOT WORKSPACE

- WorkSpace
  - Defines the CADD Standards
  - Defines the location of the WorkSets
  - Selected from the Work Session page after opening ORD

OHDOT WORKSPACE

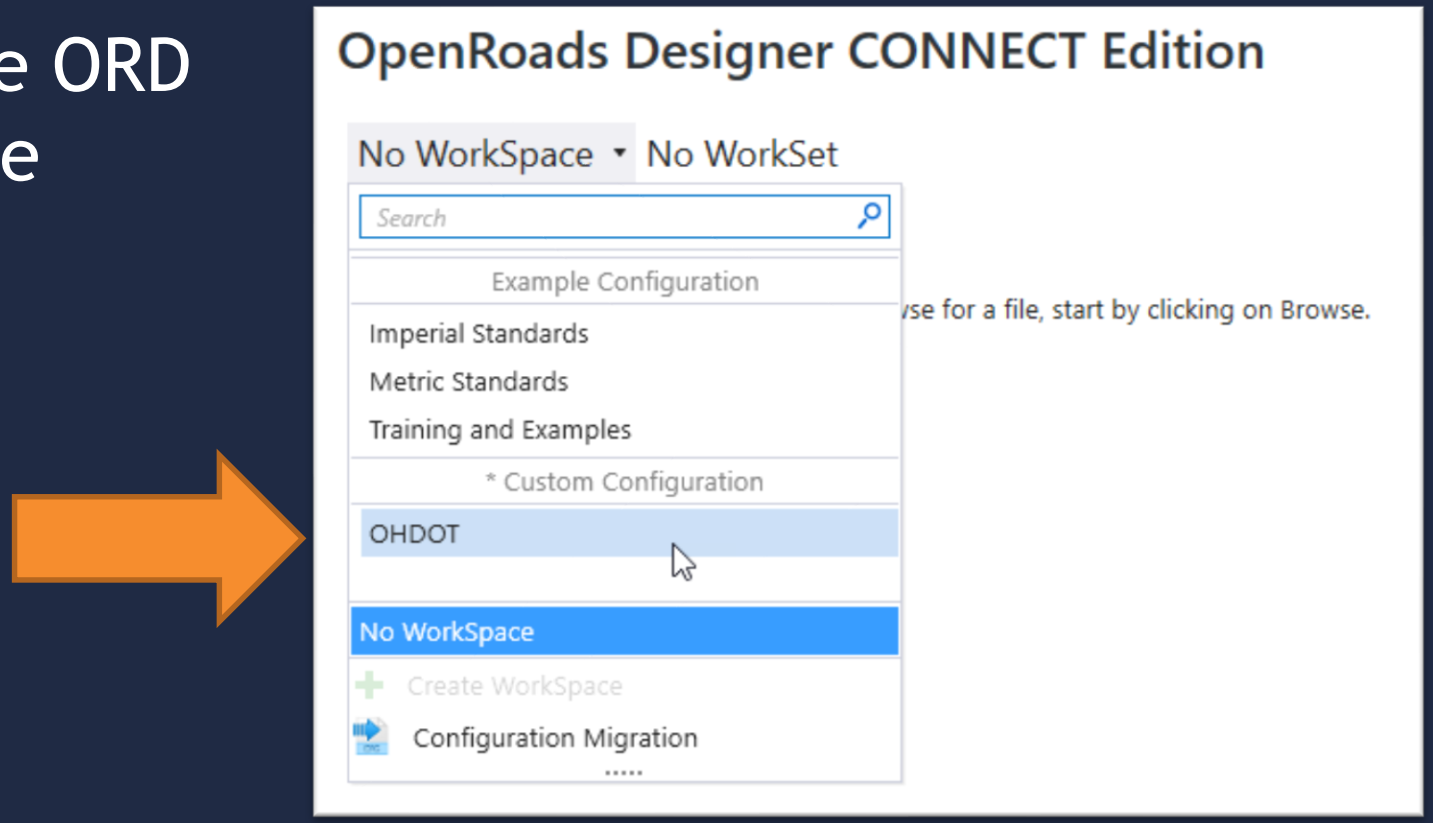
- OHDOT WorkSpace
  - First draft released January 18, 2018
  - Will be taken out of draft April 1, 2019
  - Defines Ohio DOT CADD Standards for Connect products
  - Not compatible with SS4
    - Complete active projects using current software versions according to ODOT's ORD migration policy

OHDOT WORKSPACE

- OHDOT WorkSpace: Updates
  - Updated as needed (not on a quarterly schedule)
  - Use ODOT's Synchronization Tool

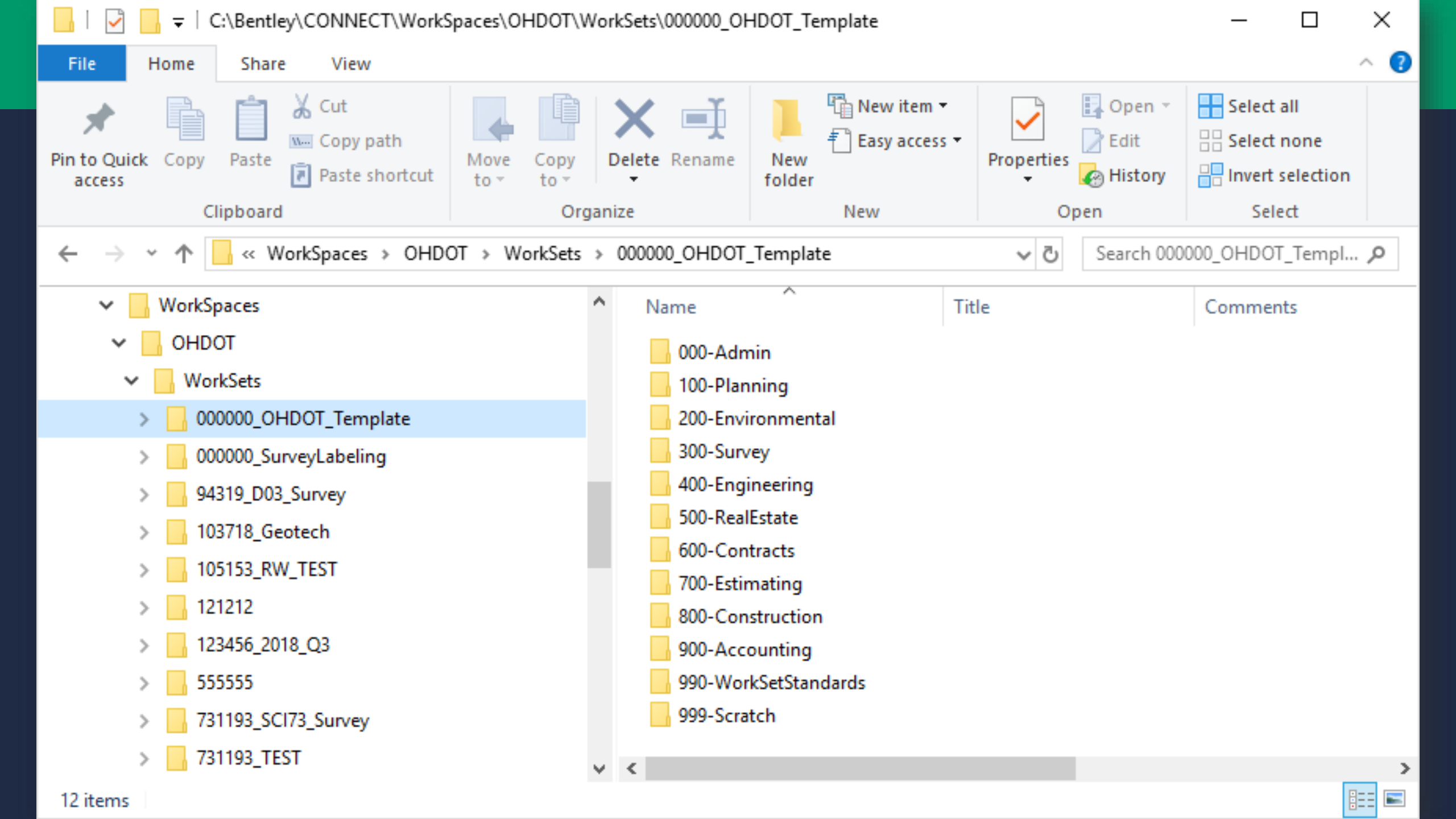
OHDOT WORKSPACE

- OHDOT WorkSpace
  - Selected from the ORD Work Session page



WORKSETS

- WorkSet (ORD) = Project (SS4)
- OHDOT WorkSet
  - Folder Structure modified for ORD/ProjectWise
  - Supports workflows
  - Adds administrative value

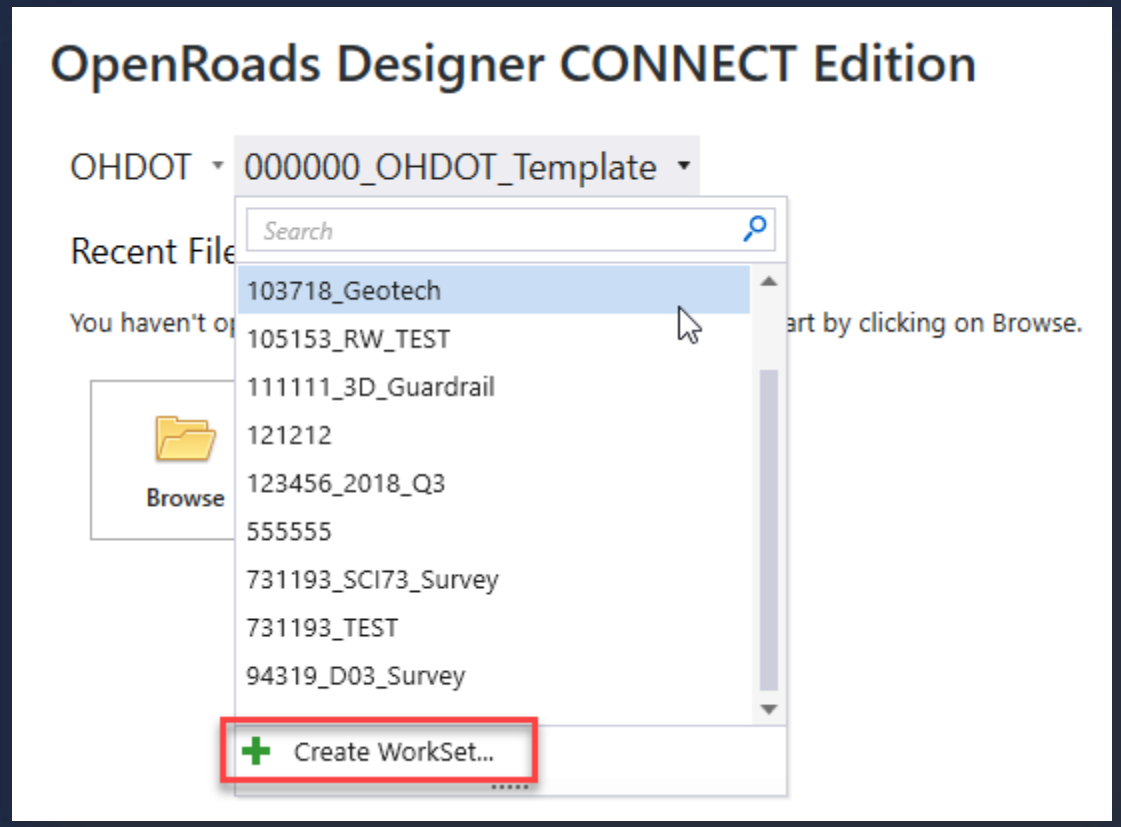

C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\000000_OHDOT_Template
File
Home
Share
View
Pin to Quick access
Copy
Paste
Cut
Copy path
Paste shortcut
Clipboard
Move to
Copy to
Delete
Rename
Organize
New folder
New item
Easy access
New
Properties
Open
Edit
History
Open
Select all
Select none
Invert selection
Select
« WorkSpaces › OHDOT › WorkSets › 000000_OHDOT_Template
Search 000000_OHDOT_Templ...
WorkSpaces
OHDOT
WorkSets
000000_OHDOT_Template
000000_SurveyLabeling
94319_D03_Survey
103718_Geotech
105153_RW_TEST
121212
123456_2018_Q3
555555
731193_SCI73_Survey
731193_TEST
Name
Title
Comments
000-Admin
100-Planning
200-Environmental
300-Survey
400-Engineering
500-RealEstate
600-Contracts
700-Estimating
800-Construction
900-Accounting
990-WorkSetStandards
999-Scratch
12 items

WORKSETS

- 300-Survey
  - Survey information is separate from Design
- 400-Engineering
- 990-Standards
  - Standards folder moved to allow all users access
- There is no more GEOPAK folder

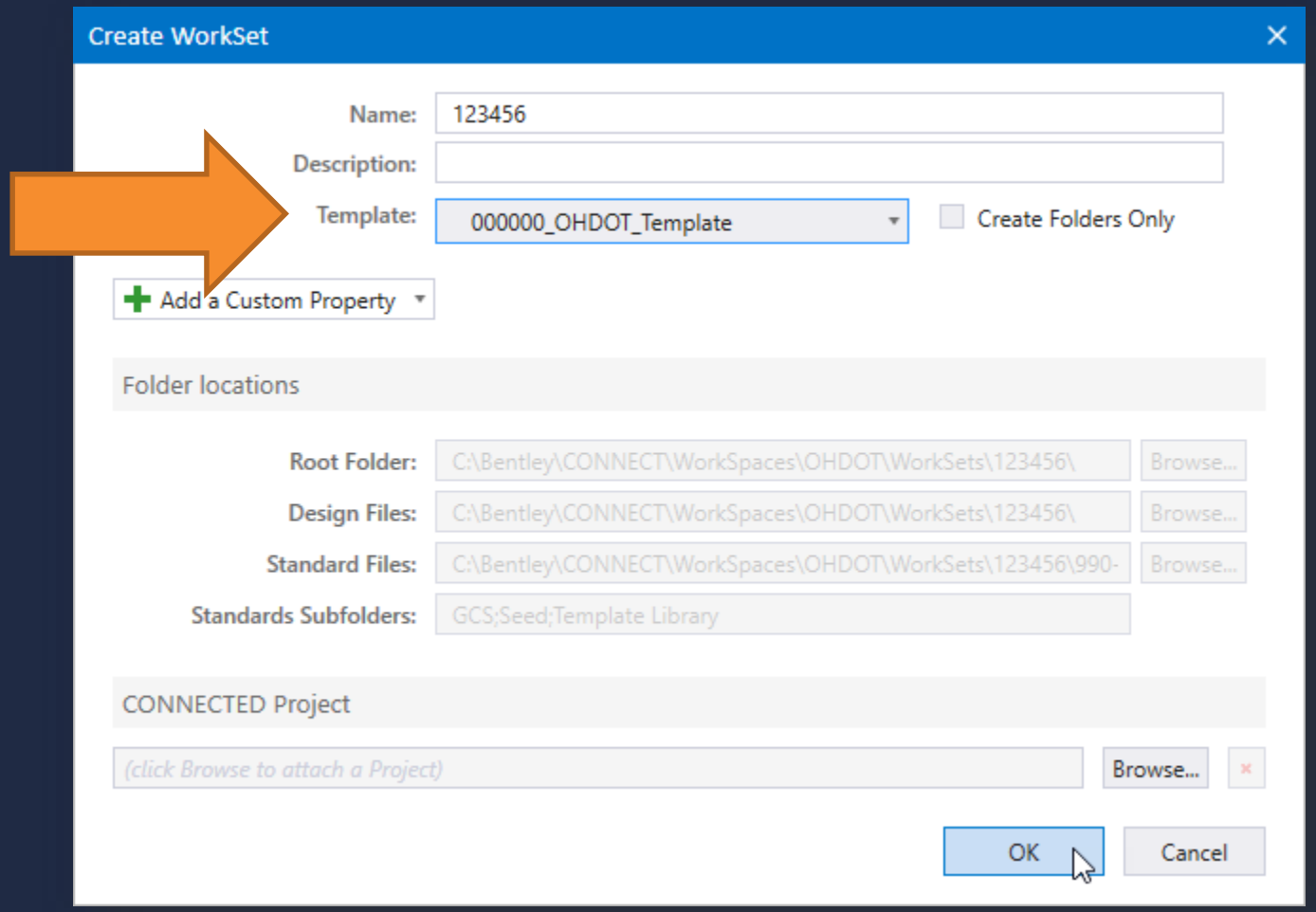
WORKSETS

- WorkSet Selection
  - Selected from the ORD Work Session page



WORKSETS

- WorkSet Creation
  - Outside of ProjectWise, a Template is used



WORKSETS

- Startup.dgn
  - Located in 400-Engineering
  - Used as a starting place to open the new WorkSet
  - Upon first use, a VBA app is used to rename the default files with the ODOT PID Number
    - This VBA is not applicable in ProjectWise
  - After completion, the user is prompted to create design files for the project

OpenRoads Designer CONNECT Edition

No WorkSpace ▾ No WorkSet

Recent Files

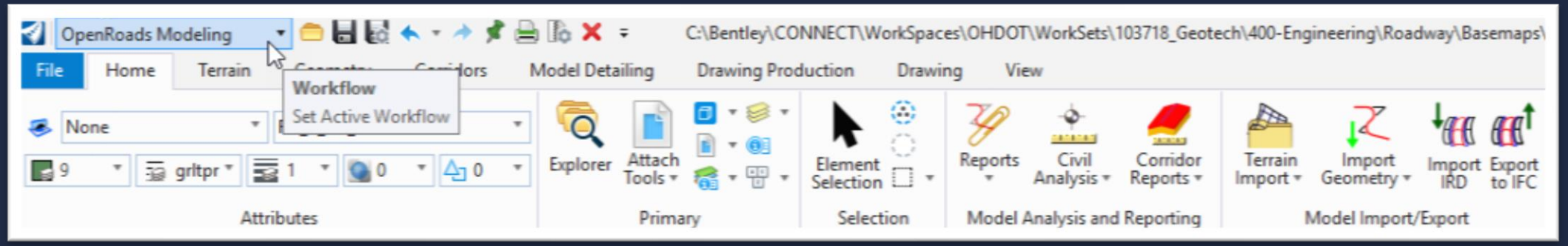
You haven't opened any files recently. To browse for a file, start by clicking on Browse.

Browse

New File

OPENROADS DESIGNER GUI

- Uses the Ribbon Interface



OPENROADS DESIGNER GUI

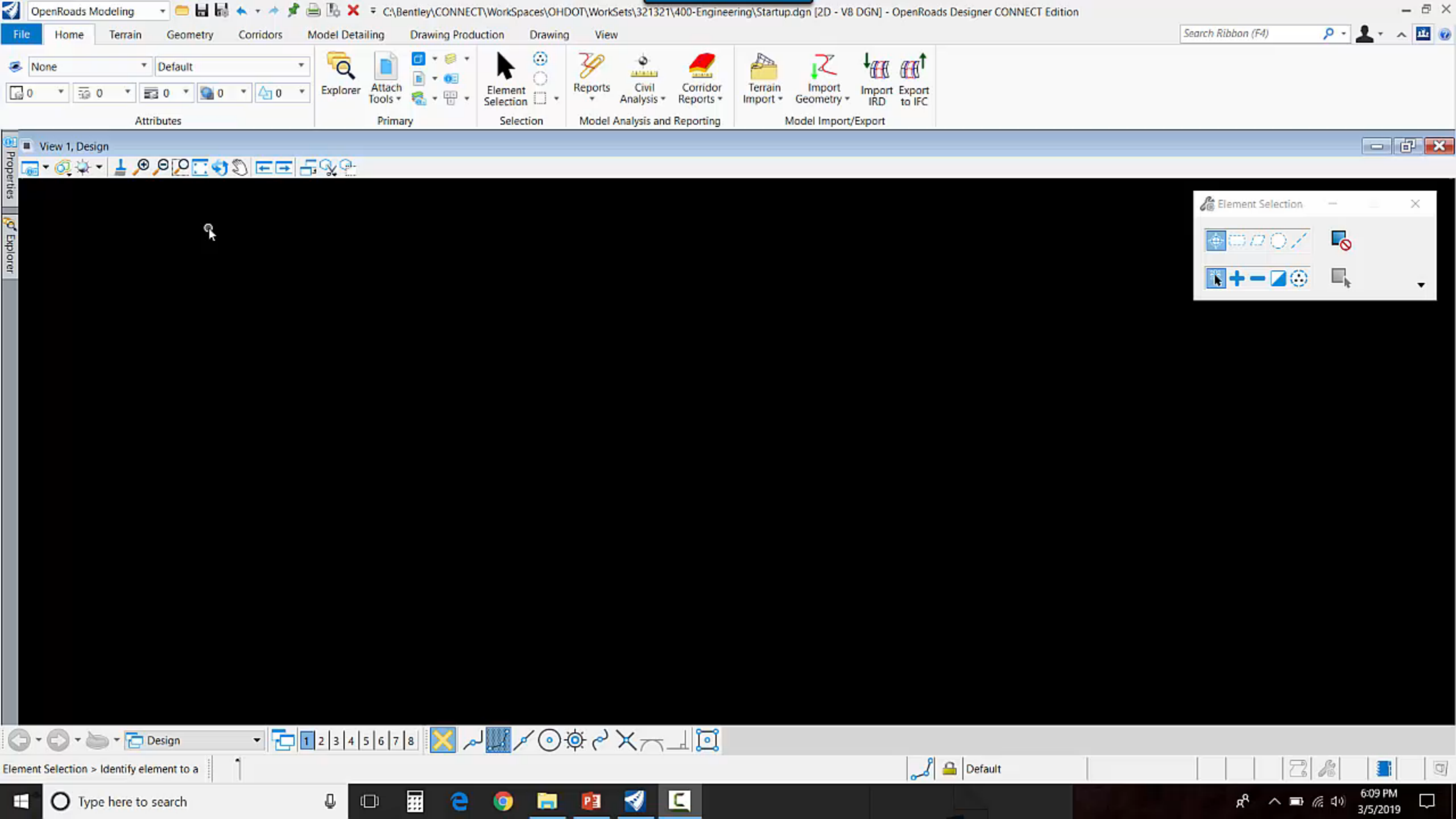
- WorkFlows
  - Located in the upper left of the interface
  - Allows access to groups of tools grouped logically for specific workflows

OPENROADS DESIGNER GUI

- Search Ribbon
  - Located in the upper right of the interface
  - Easily find commands
  - Lists the various locations where the tool can be accessed

OPENROADS DESIGNER GUI

- Non-drawing related tools are located on the “backstage”
  - Configuration Variables
  - User Preferences, function key menus
  - DGN File Settings
  - Etc…


OpenRoads Modeling
C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\321321\400-Engineering\Startup.dgn [2D - V8 DGN] - OpenRoads Designer CONNECT Edition
File
Home
Terrain
Geometry
Corridors
Model Detailing
Drawing Production
Drawing
View
Search Ribbon (F4)
None
Default
Explorer
Attach Tools
Element Selection
Reports
Civil Analysis
Corridor Reports
Terrain Import
Import Geometry
Import IRD
Export to IFC
Attributes
Primary
Selection
Model Analysis and Reporting
Model Import/Export
View 1, Design
Element Selection
Properties
Explorer
Design
Element Selection > Identify element to a
Default
Type here to search
6:09 PM
3/5/2019

OPENROADS SURVEY

- Survey Processing
  - The ORD process is nearly identical to SS4
    - Annotation process has changed

OPENROADS SURVEY

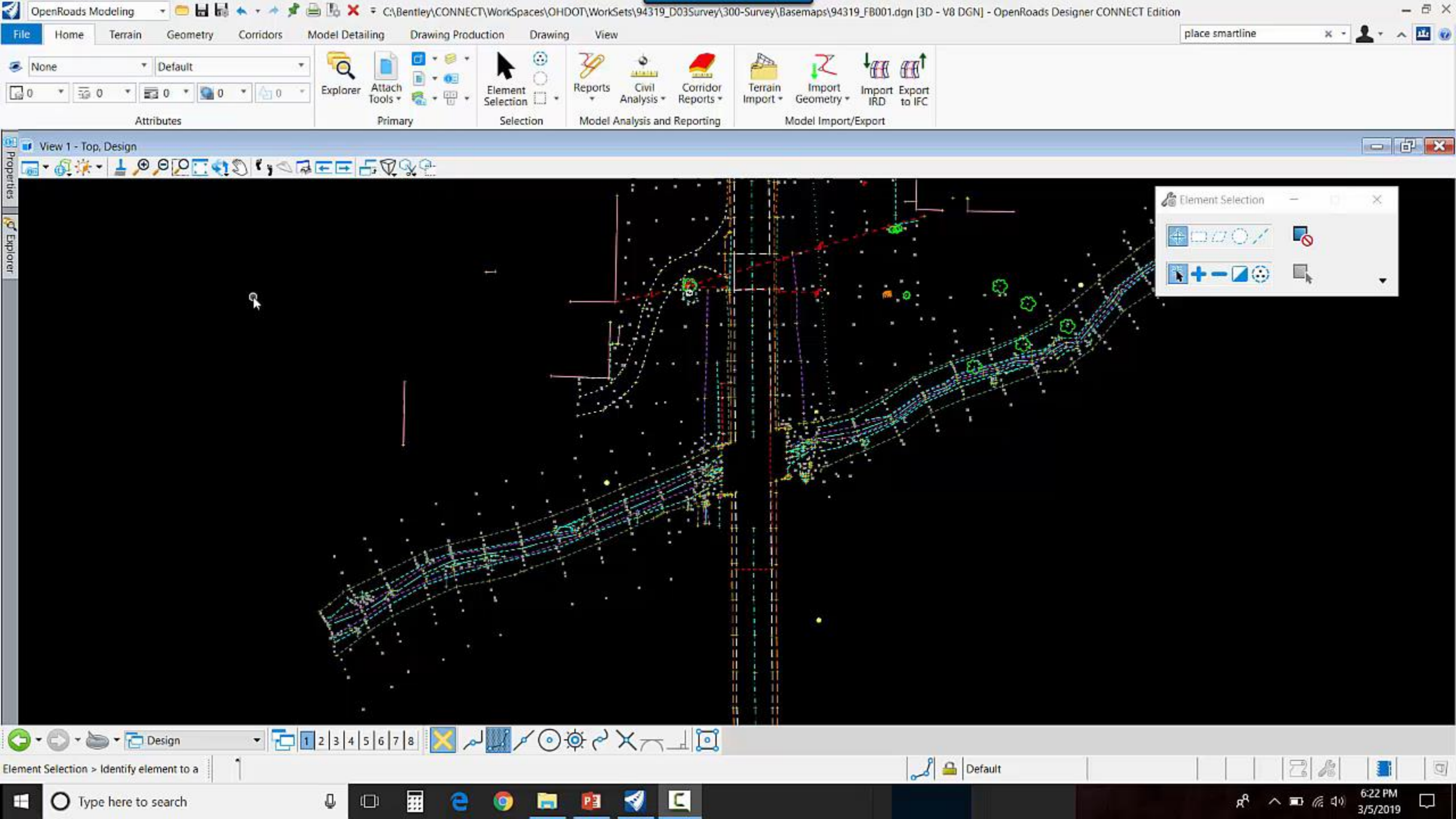
- OHDOT Procedures:
  - Parent Folder: 300-Survey/Basemaps/
  - Process survey in the Field Book (FB) design file
  - Exporting to a Survey Basemap (BE) is discontinued
  - Design personnel will reference the FB file from the 300-Survey/Basemaps/ folder

OPENROADS SURVEY

- Survey Annotation
  - Survey Decorators
    - Used to display point names, descriptions, etc.
    - This information is ***not*** written to the DGN file
    - Cannot be viewed across reference attachments
    - Settings defined in the User Preferences

OPENROADS SURVEY

- Survey Annotation
  - Element/Model Annotation
    - Written to the DGN file
    - Annotations that might be shown on the plan
    - Format defined by the Feature Definition
    - Annotated by element or model


OpenRoads Modeling
C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\94319_D03Survey\300-Survey\Basemaps\94319_FB001.dgn [3D - V8 DGN] - OpenRoads Designer CONNECT Edition
File
Home
Terrain
Geometry
Corridors
Model Detailing
Drawing Production
Drawing
View
place smartline
None
Default
Explorer
Attach Tools
Element Selection
Reports
Civil Analysis
Corridor Reports
Terrain Import
Import Geometry
Import IRD
Export to IFC
Attributes
Primary
Selection
Model Analysis and Reporting
Model Import/Export
View 1 - Top, Design
Element Selection
Properties
Explorer
Design
Element Selection > Identify element to a
Default
Type here to search
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3/5/2019

OPENROADS SURVEY

- Geographic Coordinate Systems
  - DTY file used to define custom coordinate systems
  - Customizing the DTY file is currently not supported by ORD/CE
  - Bentley Map Connect Edition is required
    - Current Options:
      - Purchase a single license of Bentley Map
      - Edit the DTY file in SS4 to be used in ORD/CE
      - Leave the coordinate system undefined

OPENROADS SURVEY

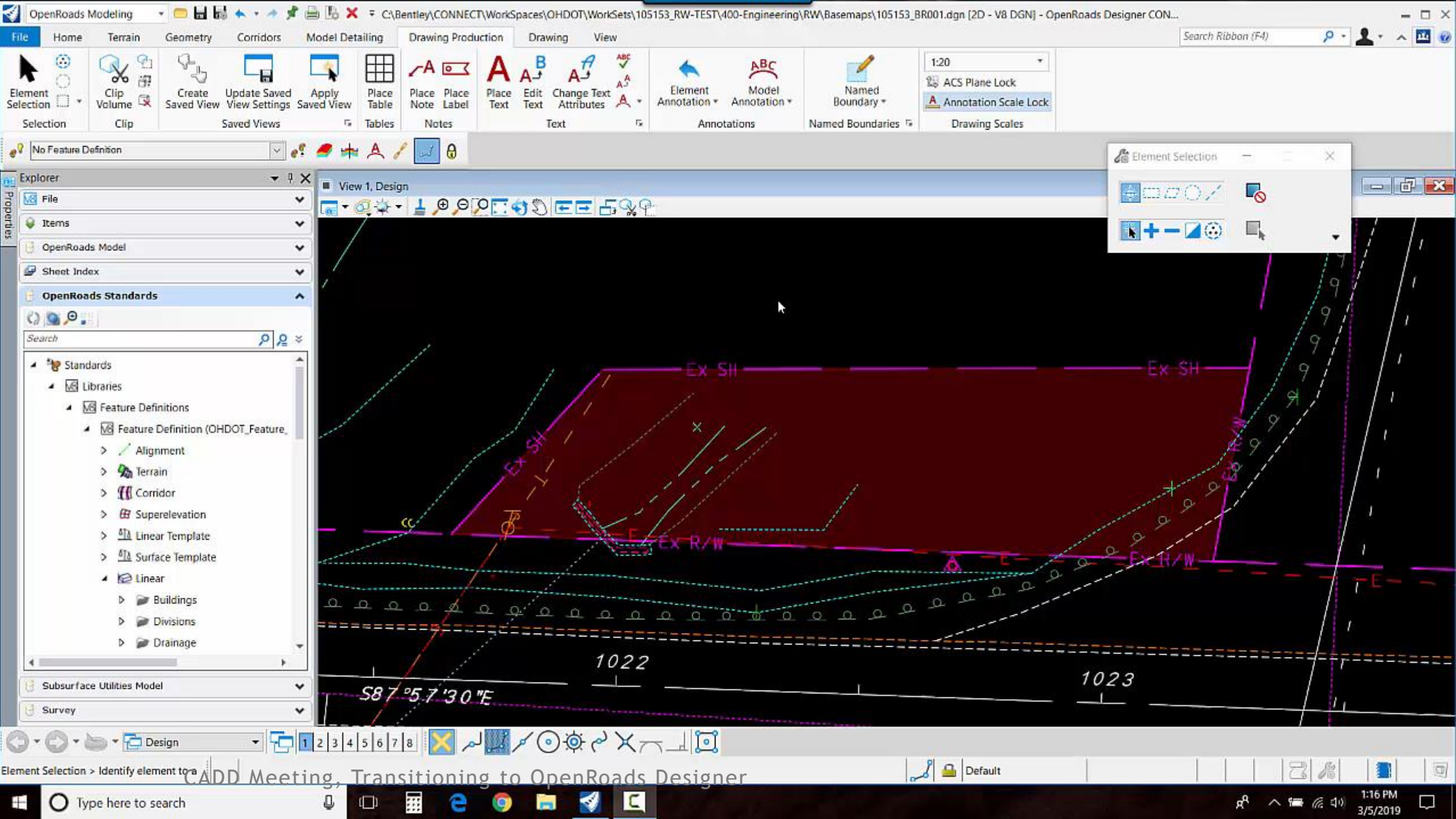
- Drainage Field Codes/Features
  - Removed the generic field codes for structures and pipes:
    - CBR, CBS, CI, MI, STMH, SSMH
  - See ODOT's SS4 OpenRoads Survey training guide for more information

RIGHT-OF-WAY AND PARCELS

- There is not an equivalent to the GEOPAK COGO Parcel elements in ORD
- Use closed geometry for parcel components
  - Parent Tract
  - Present Road Occupied
  - Taking Areas, Easements
  - Etc…

RIGHT-OF-WAY AND PARCELS

- Store parcel areas as closed ORD geometry
- Feature Definitions are available in the OHDOT WorkSpace for the various parcel component areas
- Reports are available for closures and legal descriptions


OpenRoads Modeling
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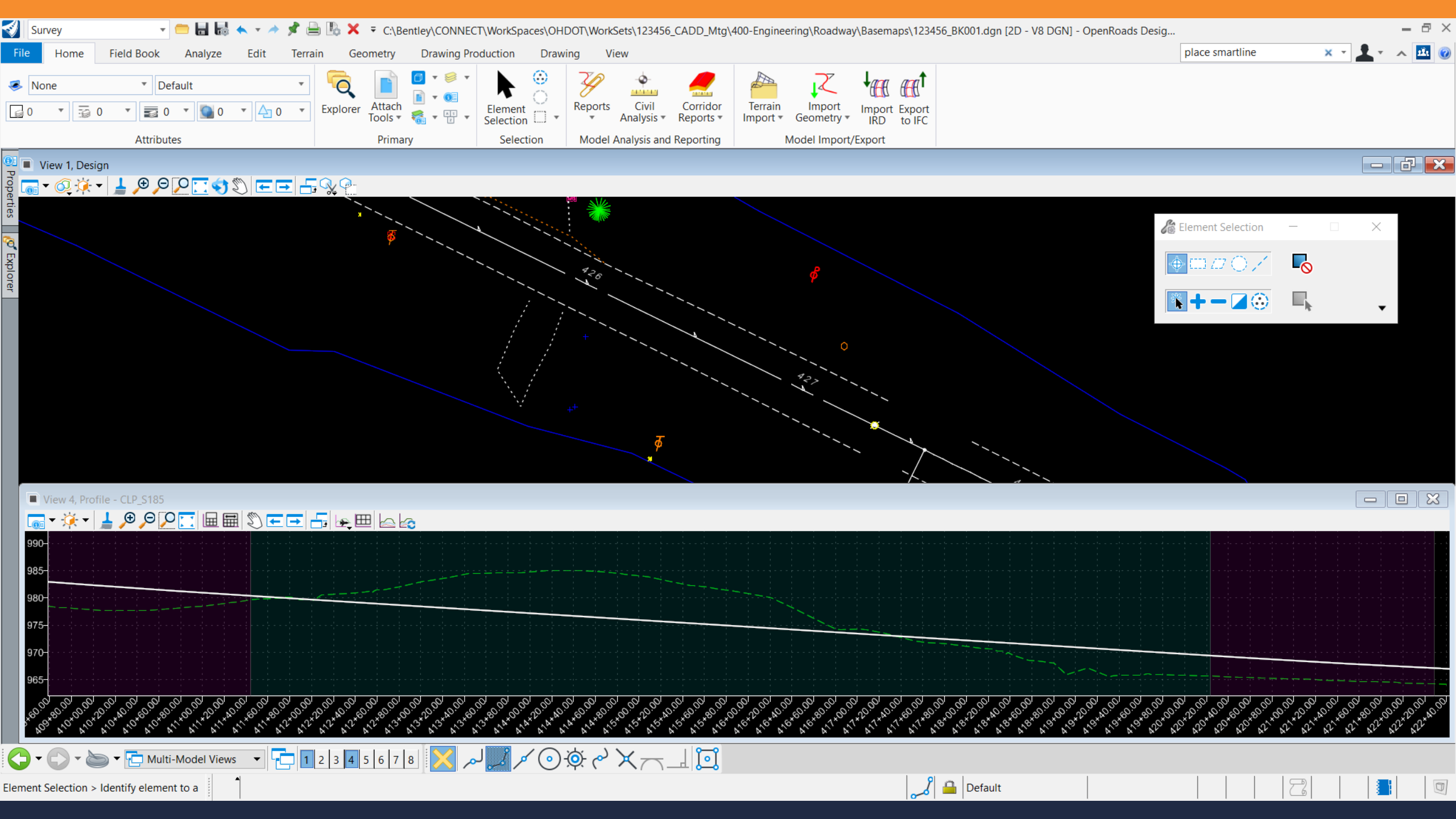
ALIGNMENTS AND PROFILES

- No GPK File
  - Alignments and profiles are stored in DGN files
  - Typically one alignment per file
  - Profiles are a sub-component of the alignment
  - Can be imported from the GPK
  - Can export to LandXML

ALIGNMENTS AND PROFILES

- Profiles
  - Profiles are stored in the same design file as the geometry
  - Not specifically written to the DGN file
  - Displayed in a separate view window
  - Can be imported from the GPK
  - Can export to LandXML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Element Selection > Identify element to a
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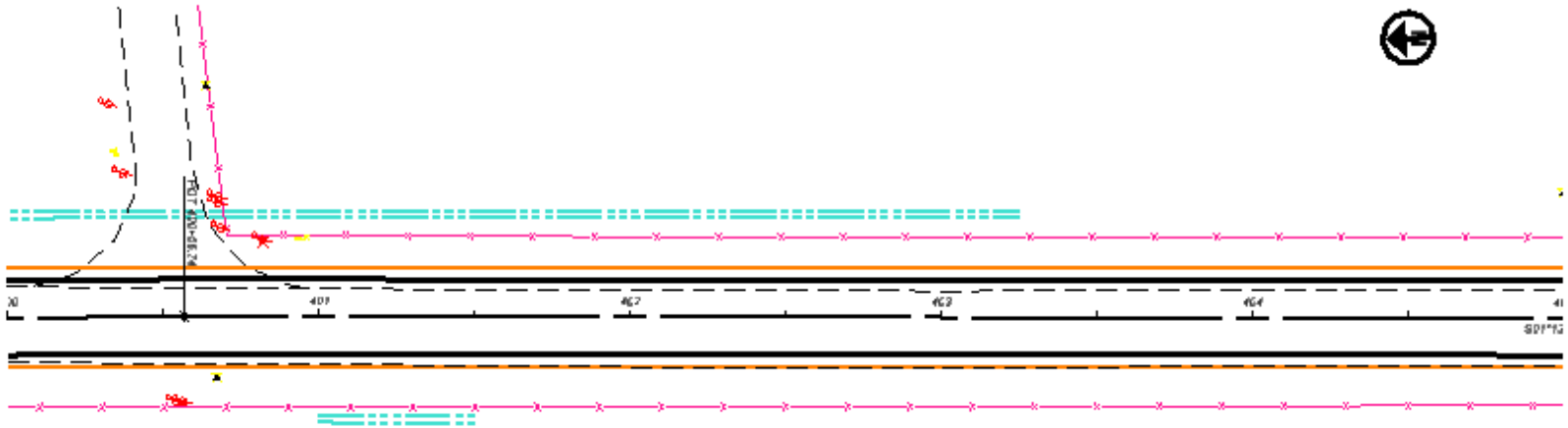
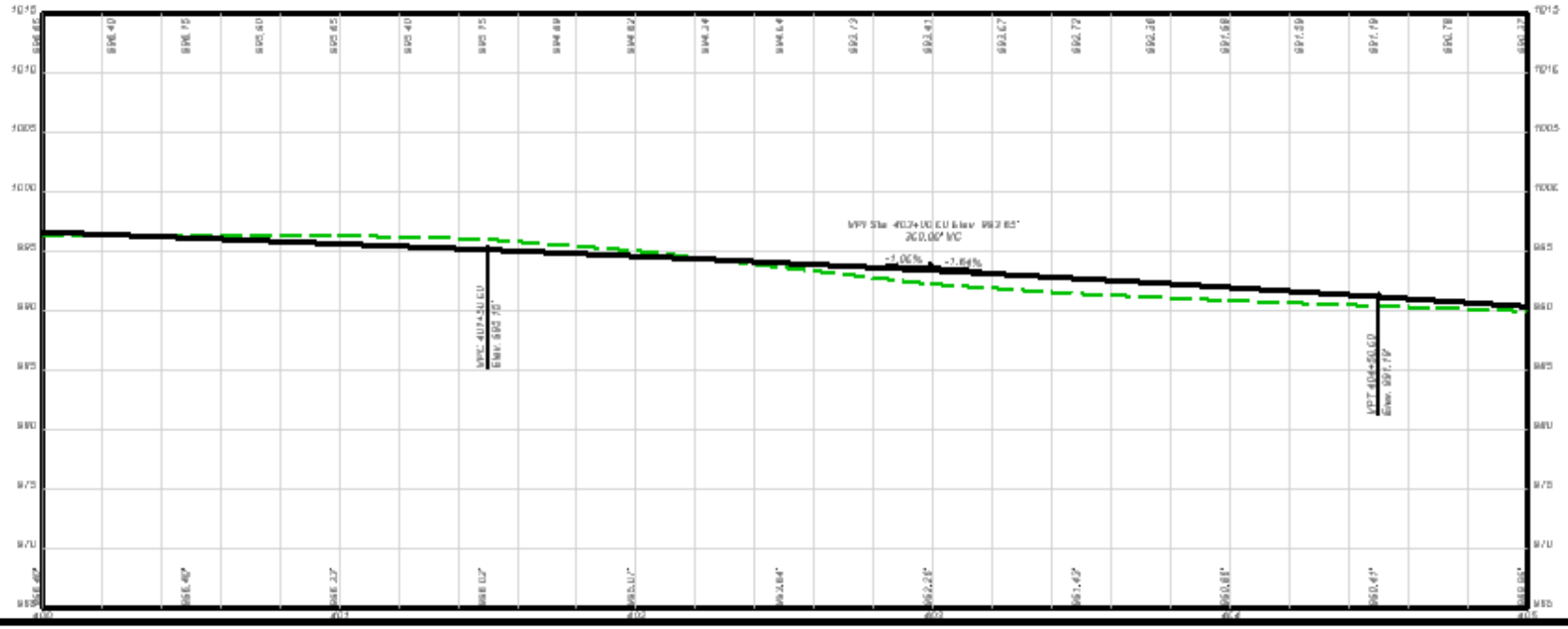
ANNOTATION AND SHEET CLIPPING

- Eric's Disclaimer (not official ODOT policy)
  - Modern appearance
  - Content over presentation
  - Not everyone in ODOT has seen this stuff yet…

COUNTY-ROUTE-SECTION





HORIZONTAL SCALE IN FEET

PLAN AND PROFILE
SHEET SUB-TITLE

ANNOTATION AND SHEET CLIPPING

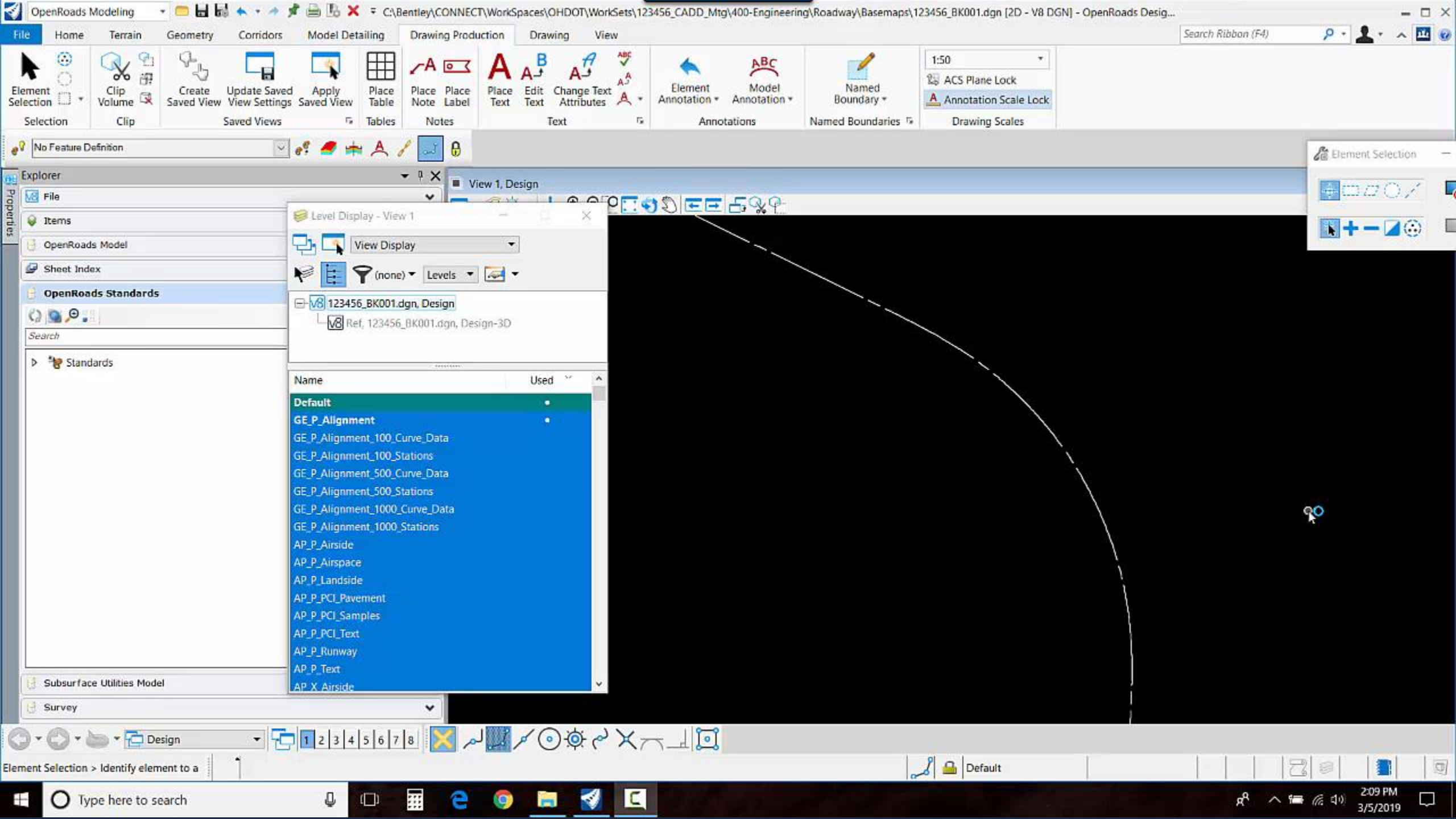
- Fonts
  - Arial will be used for ODOT plans
  - OHDOTSymbols True Type Font added for special characters not found in standards fonts

ANNOTATION AND SHEET CLIPPING

- Alignment Annotation
  - Annotation is defined by the Feature Definition
  - Annotation is dynamically updated if the geometry is changed
    - This uses a MicroStation Field
  - Annotation can be placed in the geometry basemap or the sheet Drawing Model

ANNOTATION AND SHEET CLIPPING

- Alignment Annotation
  - Stations, tics, and curve data are annotated in three
  - Each set is defined with different spacing for the station text (100’, 500’, 1000’)
  - Curve and Spiral data is annotated independently
    - Don’t waste time reformatting a combined SCS cure data presentation
    - Just go with it! The necessary information is there


OpenRoads Modeling
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GE_P_Alignment_100_Stations
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AP_P_Airspace
AP_P_Landside
AP_P_PCI_Pavement
AP_P_PCI_Samples
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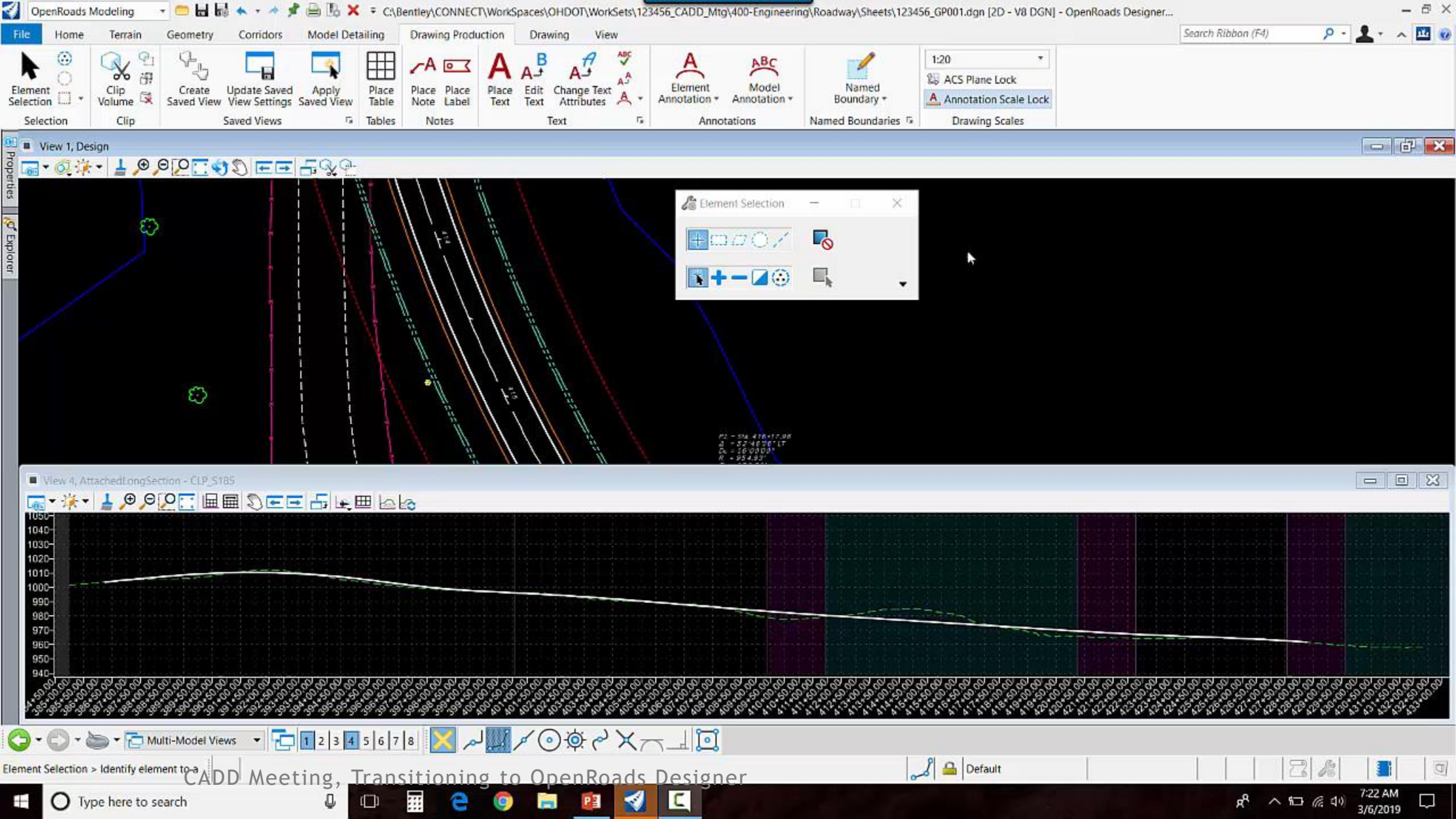
3/5/2019

ANNOTATION AND SHEET CLIPPING

- Sheet Clipping
  - Uses MicroStation Named Boundaries
  - DGNLIB Managed
  - Offers more options
  - Sheet borders have been improved
  - All sheets are clipped into the active file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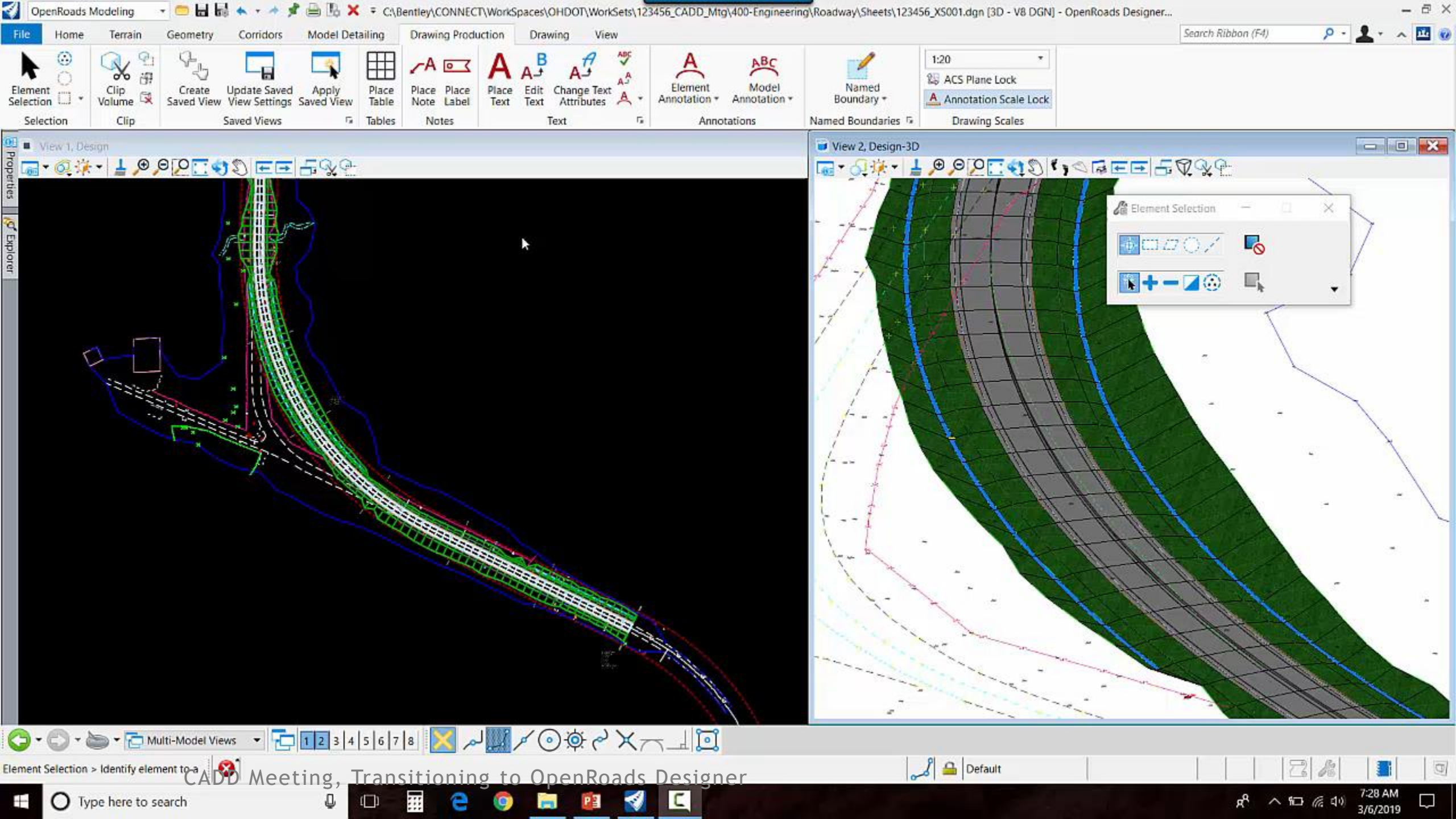
3/6/2019


OpenRoads Modeling
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CADD Meeting, Transitioning to OpenRoads Designer
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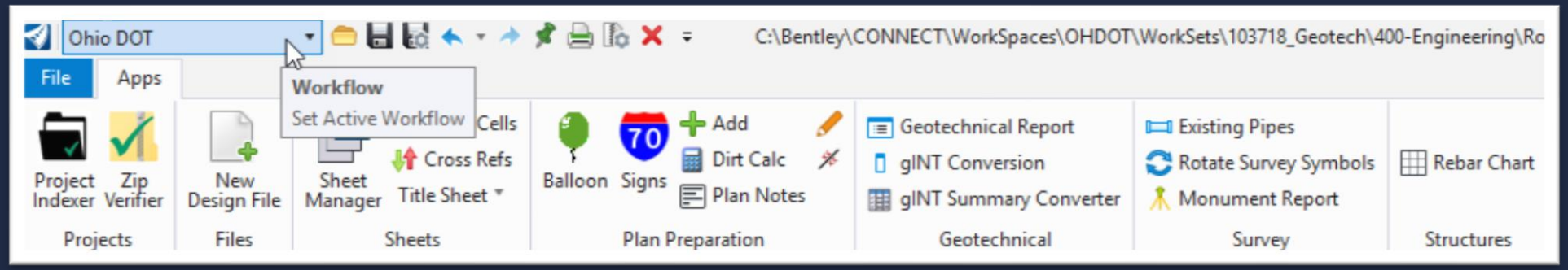
3/6/2019

CUSTOM APPLICATIONS

- An OHDOT Worklow is added to the GUI for VBA Applications



CUSTOM APPLICATIONS

- VBA Applications
  - Anything that reads the GPK file is discontinued
  - Bentley delivered VBA apps for ORD are included in the OHDOT workspace
    - ViewSet.mvba
    - SmartObjects.mvba
    - SnappableToggle.mvba

QUESTIONS

Last updated 3/25/2019

How we Reduced Estimated Construction Cost by 30% Using OpenRoads Tools

Welcome

arch 6, 2019

exandra Monda
an Barnhart

Who We Are

Mead&Hunt

EMPLOYEE-OWNED ENGINEERING & ARCHITECTURE FIRM

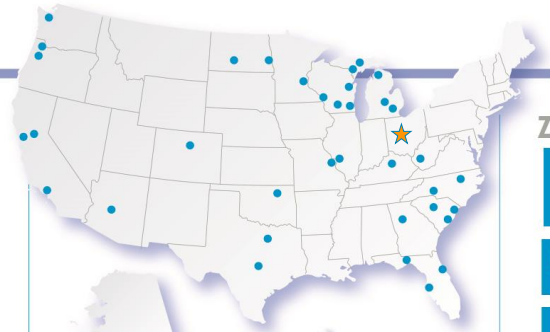
~700 EMPLOYEES

ENGINEERS • ARCHITECTS • SCIENTISTS • PLANNERS

#139 TOP 500 DESIGN FIRM BY ENGINEERING NEWS RECORD

ONE OF THE BEST PLACES TO WORK BY CE NEWS

$137 MILLION REVENUES IN FY 2018



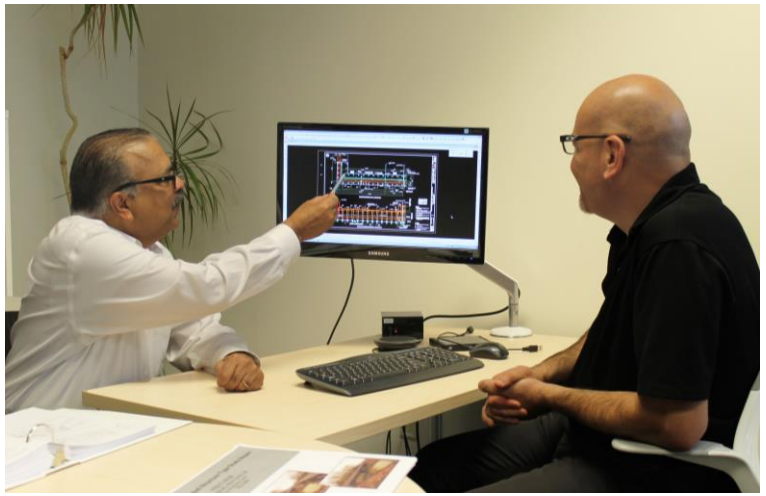
30+ OFFICES NATIONWIDE SERVICE AREA

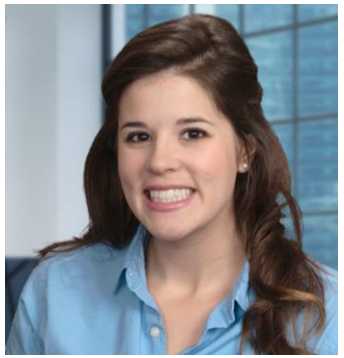
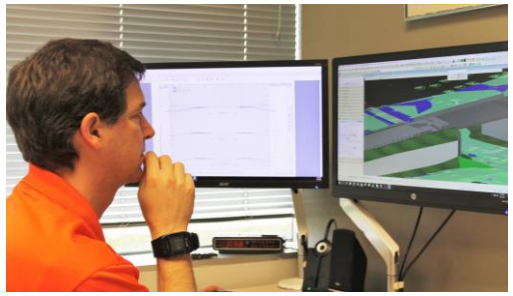
ZWEIG GROUP HOT FIRM LIST

Alexandra Monda, PE
Alex.Monda@Meadhunt.com

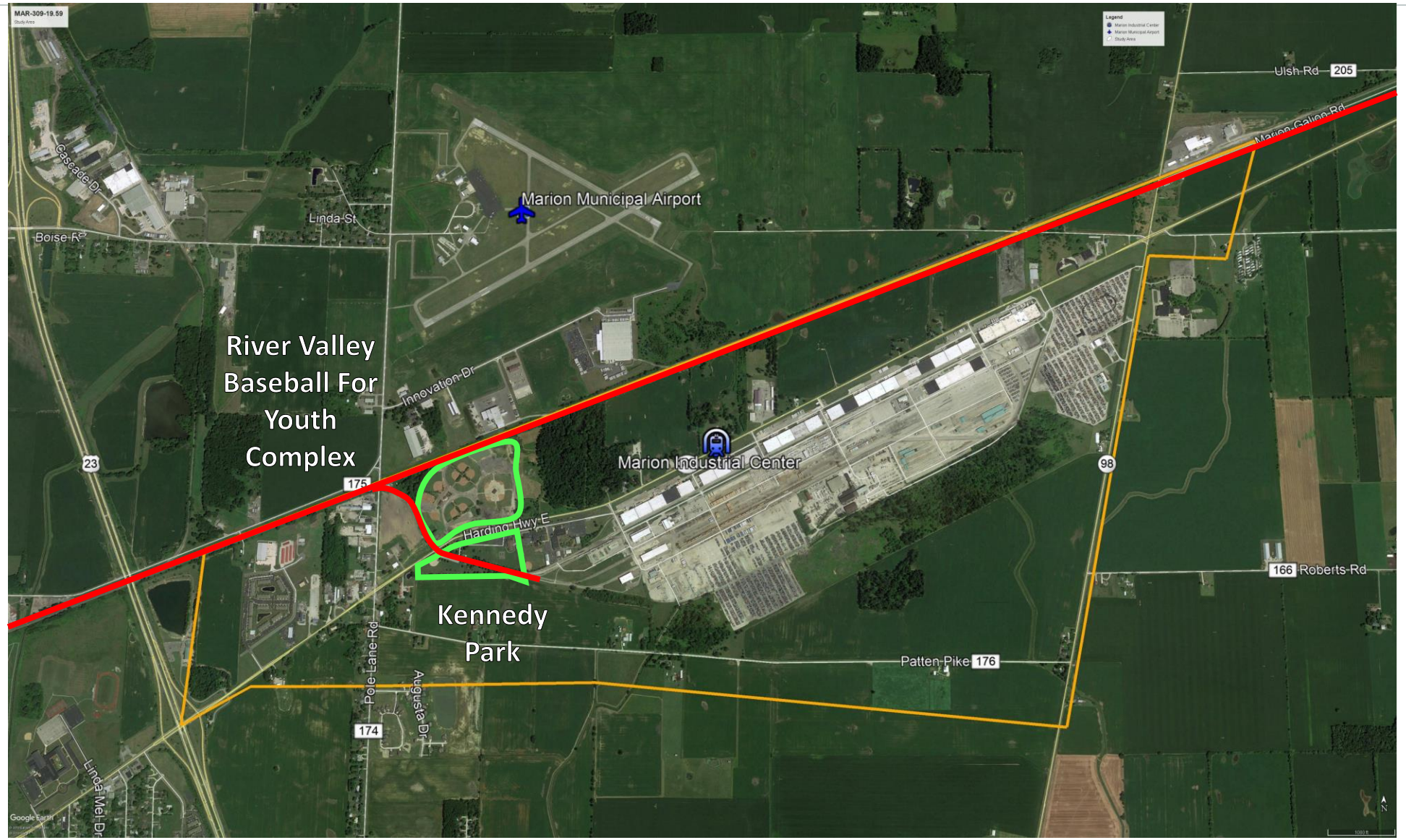
Dan Barnhart
Dan.Barnhart@Meadhunt.com

Who We Are



MAR-309 Study Area



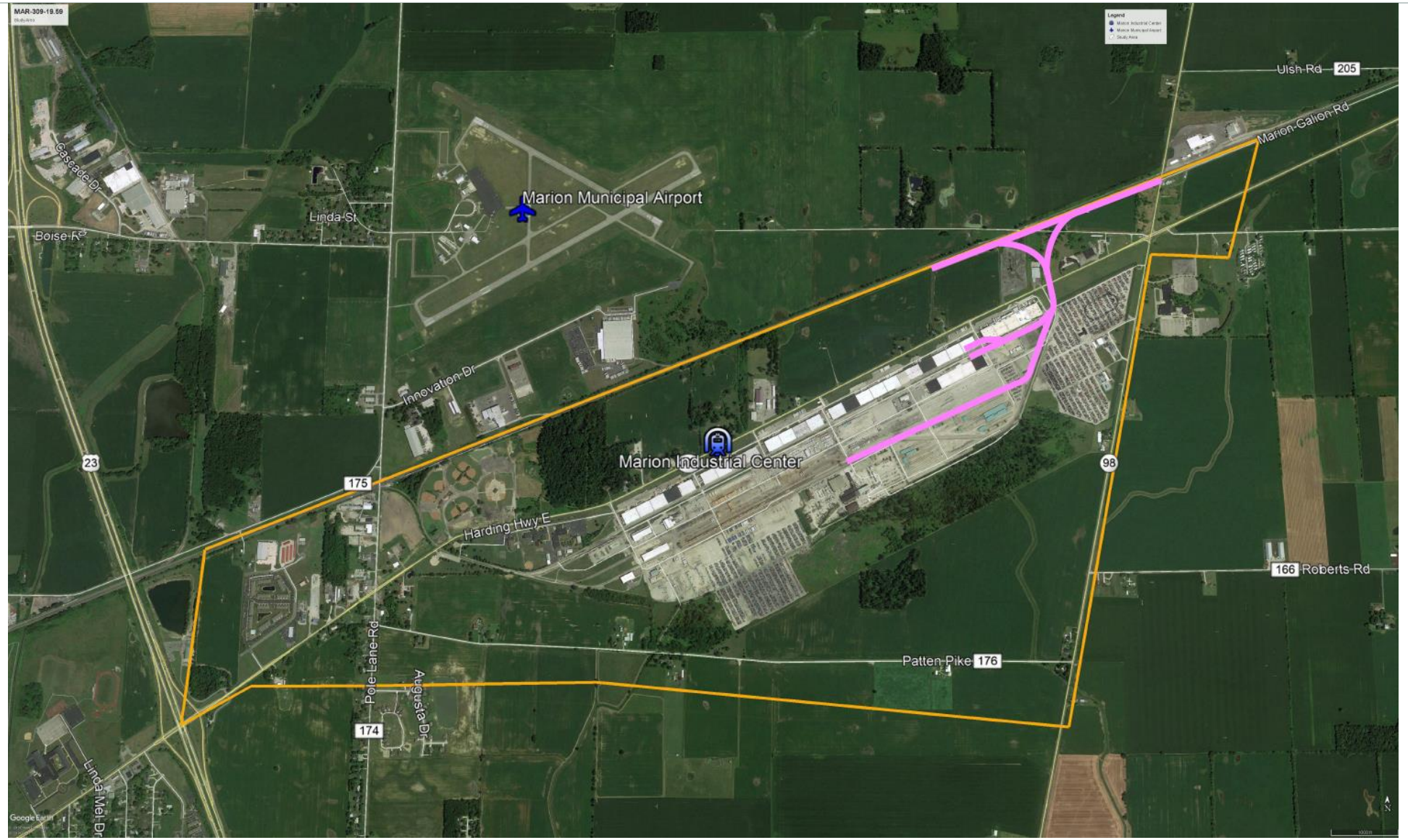
MAR-309 Alternates-minor improvements

MAR-309 Alternates-Relocation with Underpass

MAR-309 Alternates-Relocation with Overpass

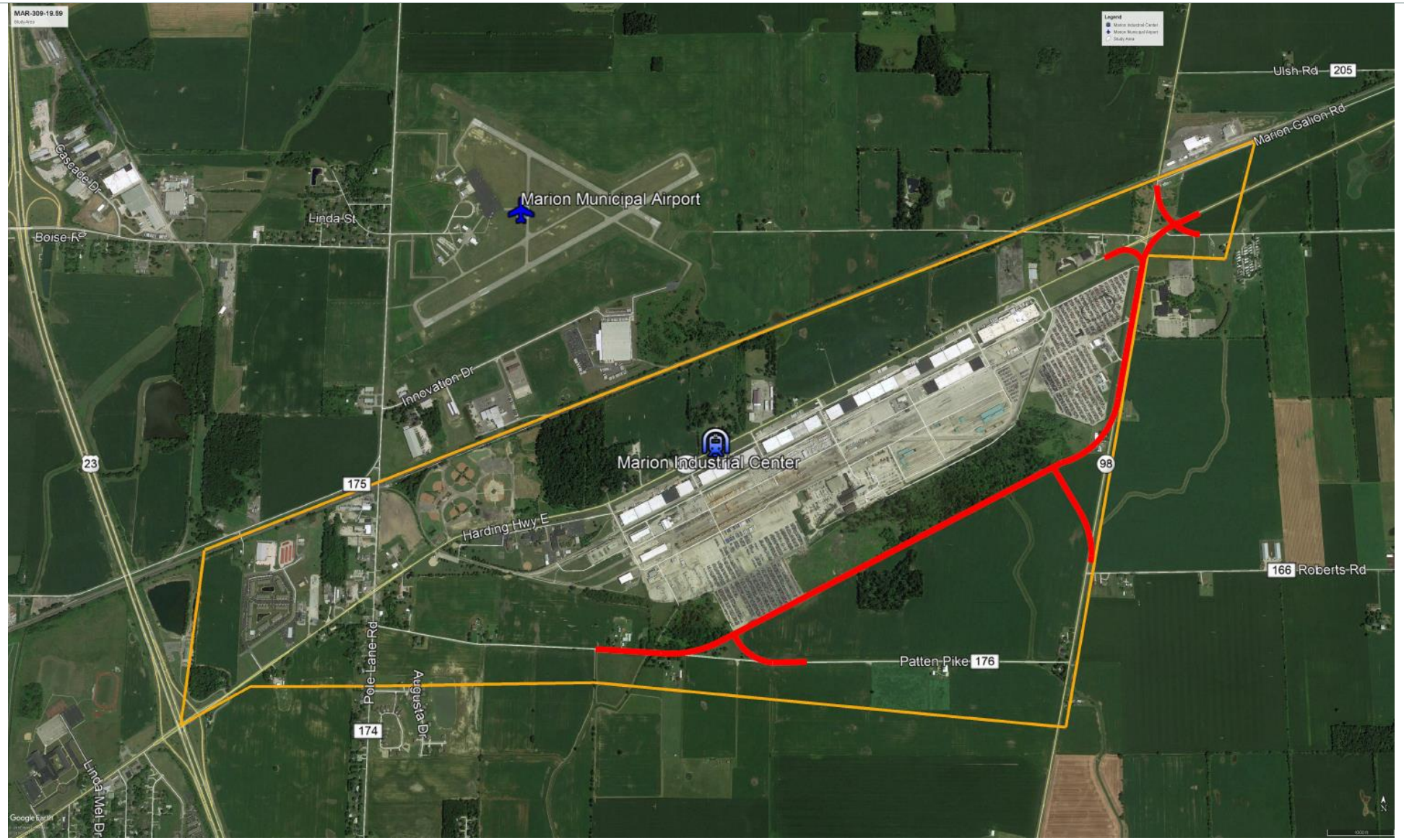
MAR-309 Alternates-Another Overpass

MAR-309 Alternates-Relocating Rail Spur



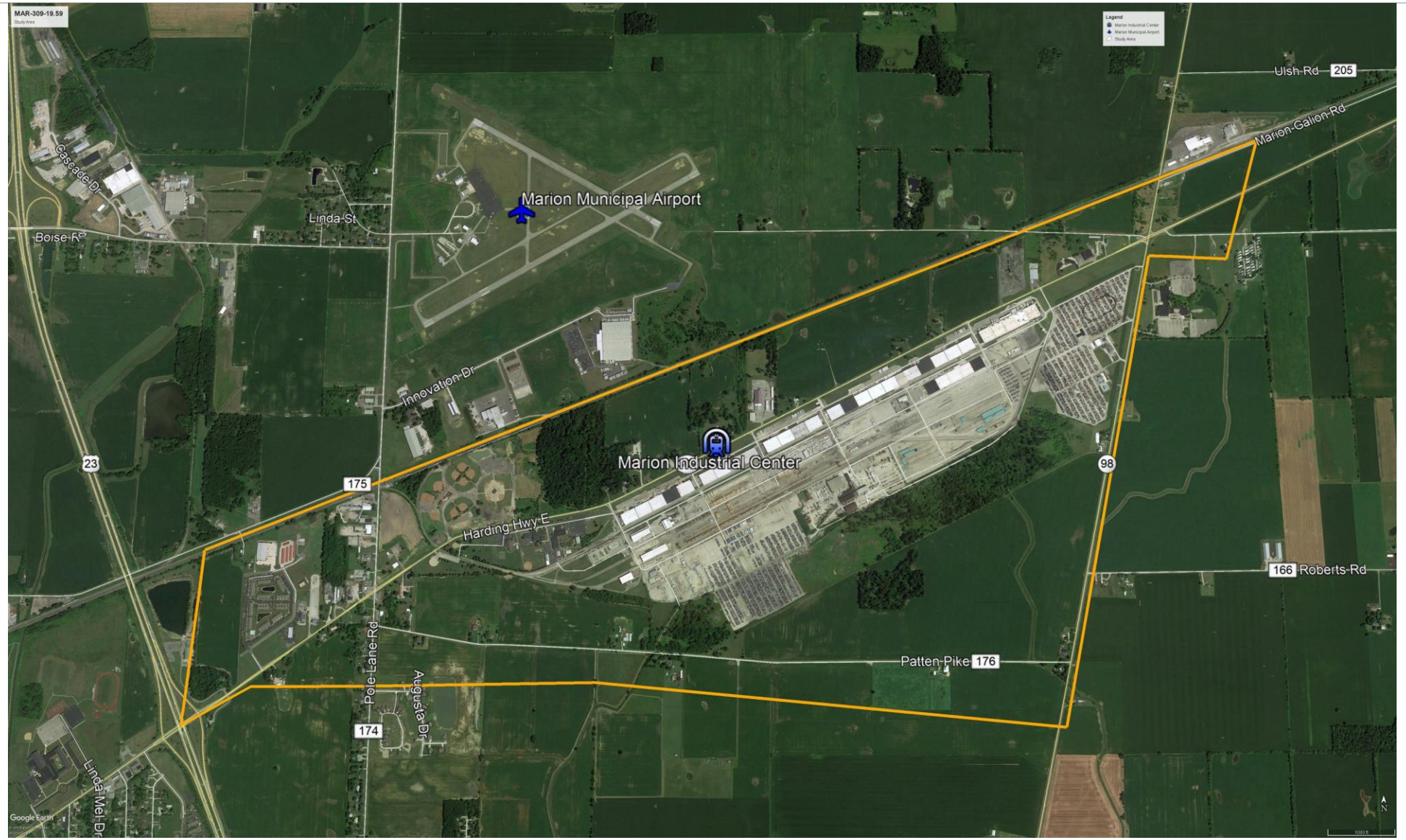
MAR-309 Alternates-Relocation w/o Separation

MAR-309 Alternates-Another One



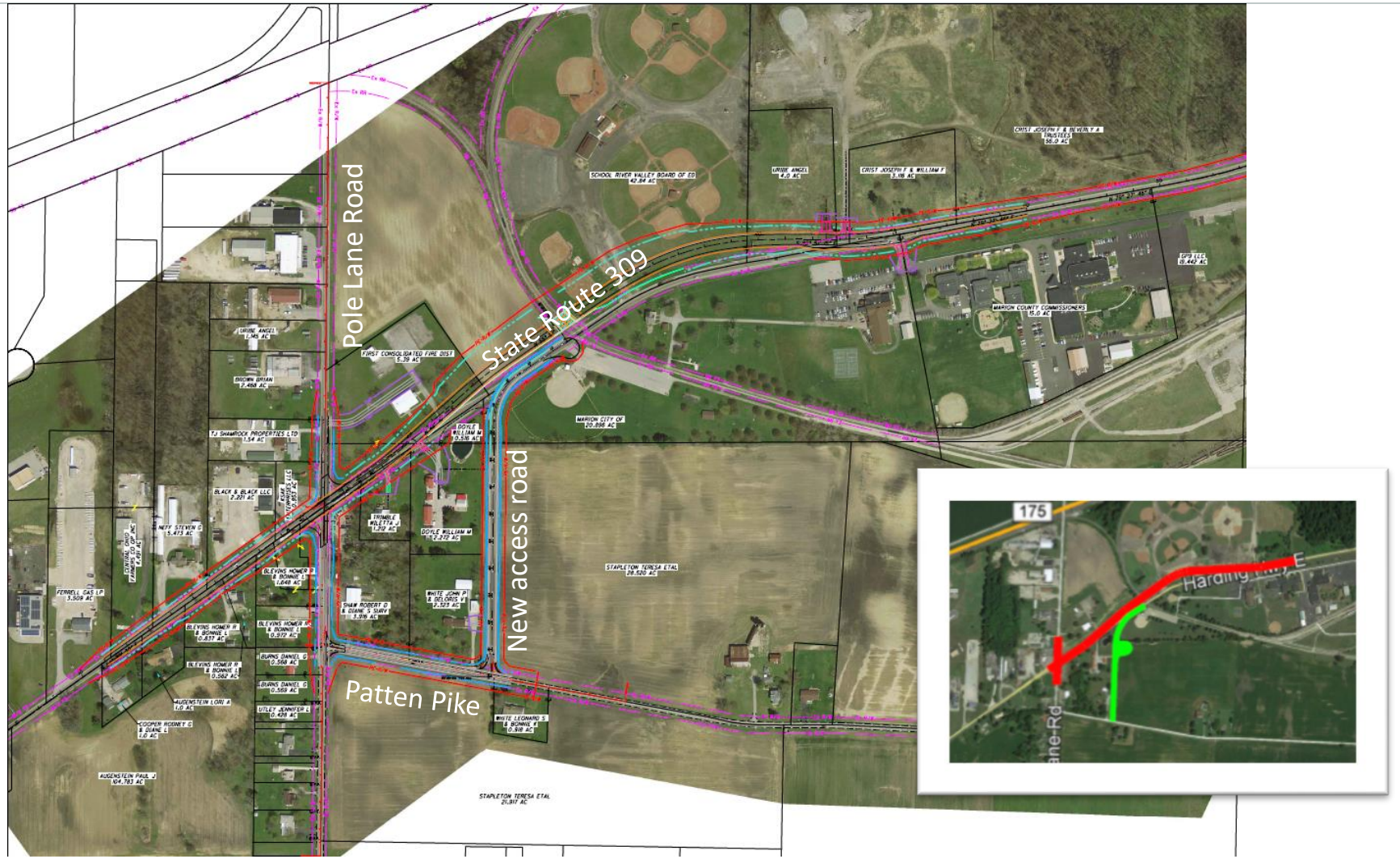
MAR-309 Alternates-Another One

MAR-309 Alternates-No Build

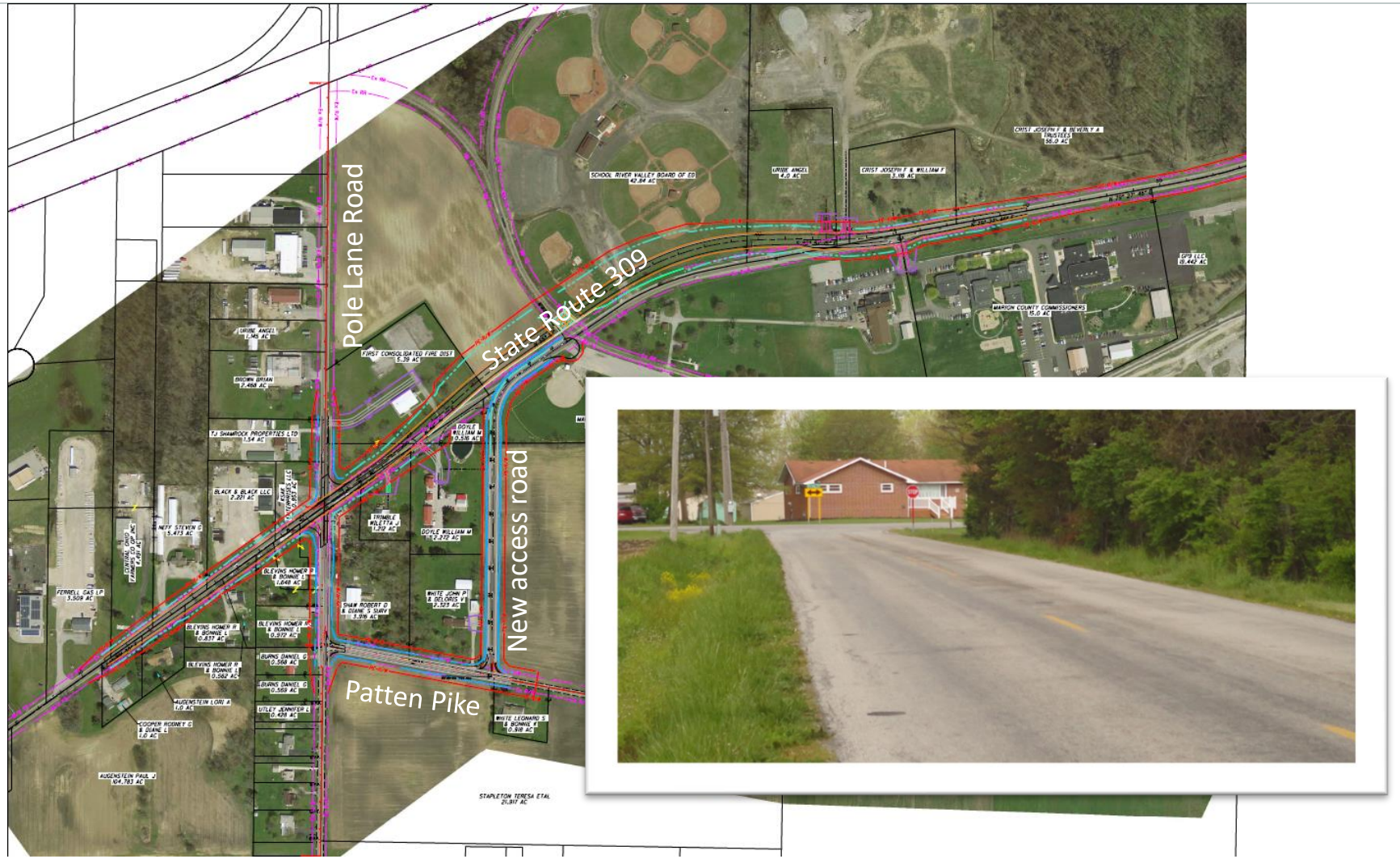


MAR-309 Preferred Alternative

Preliminary Engineering Limits



Preliminary Engineering Limits



- Slightly over $9.8 million

Design Kickoff Meeting

- Thanks for the team's hard work, but…
  - The project schedule has now been accelerated, and…
  - We only have funding for about 2/3 of the preliminary cost estimate

Design Kickoff Meeting

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- Any suggestions…?

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- Any suggestions…? Anyone…? Bueller…?

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- Any suggestions…? Anyone…? Bueller…? Bueller?

Design Kickoff Meeting

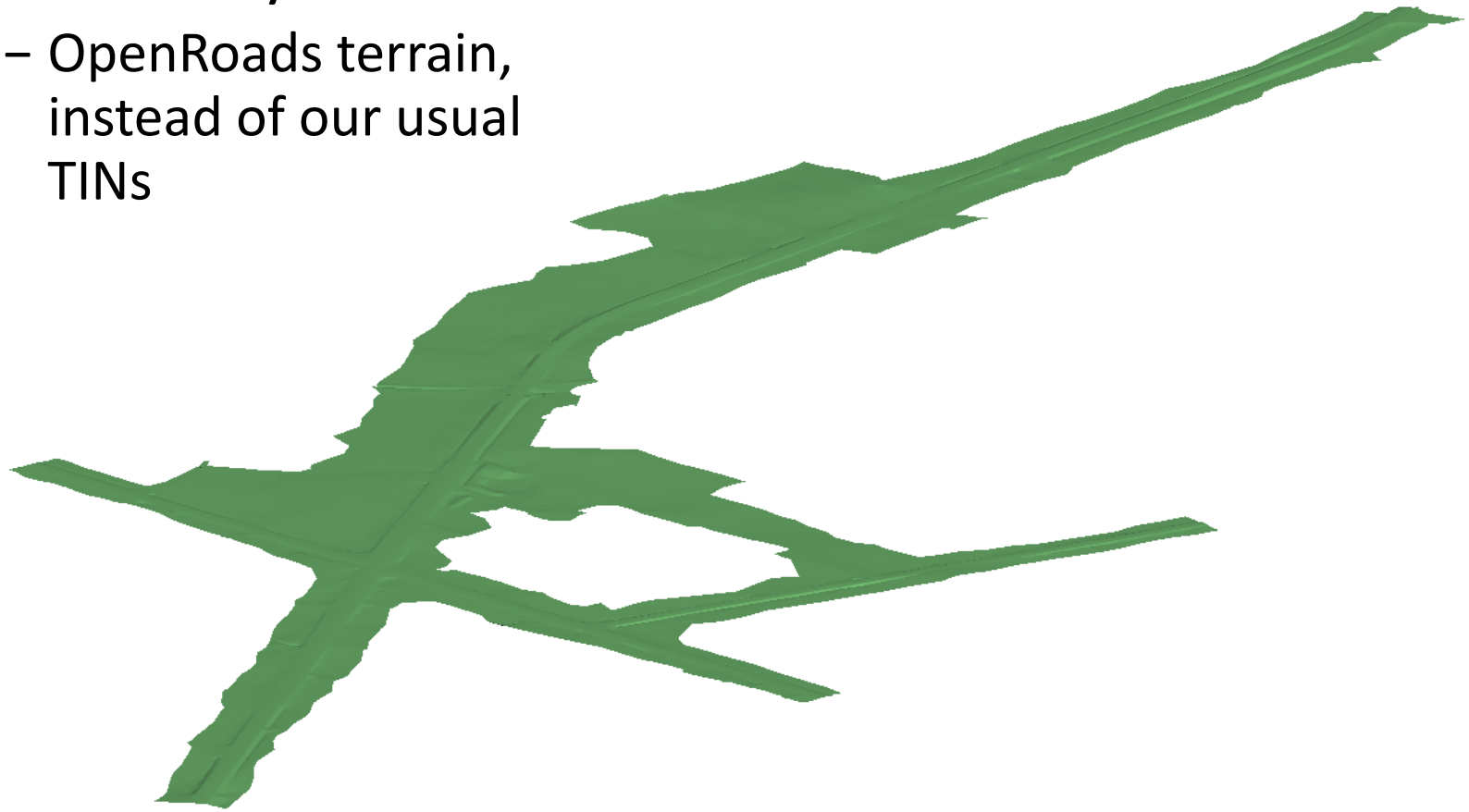
- Thanks for the team's hard work, but…
  - The project schedule has now been accelerated, and…
  - We only have funding for about 2/3 of the preliminary cost estimate
- Any suggestions…? Anyone…? Bueller…? Bueller?

Design Kickoff Meeting

- Let's use OpenRoads technology and model it!!!

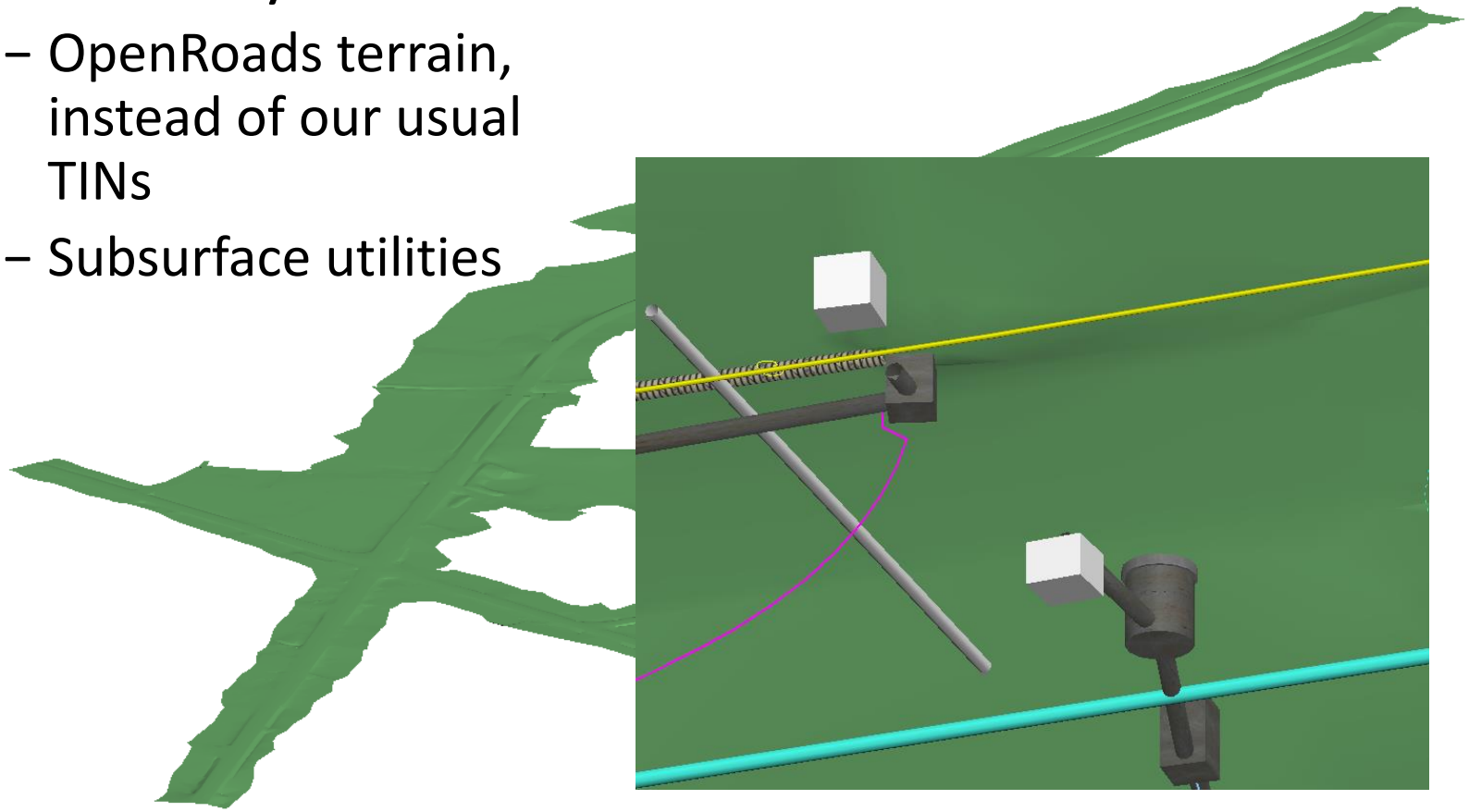
So, now what?

- Field survey
  - OpenRoads terrain, instead of our usual TINs



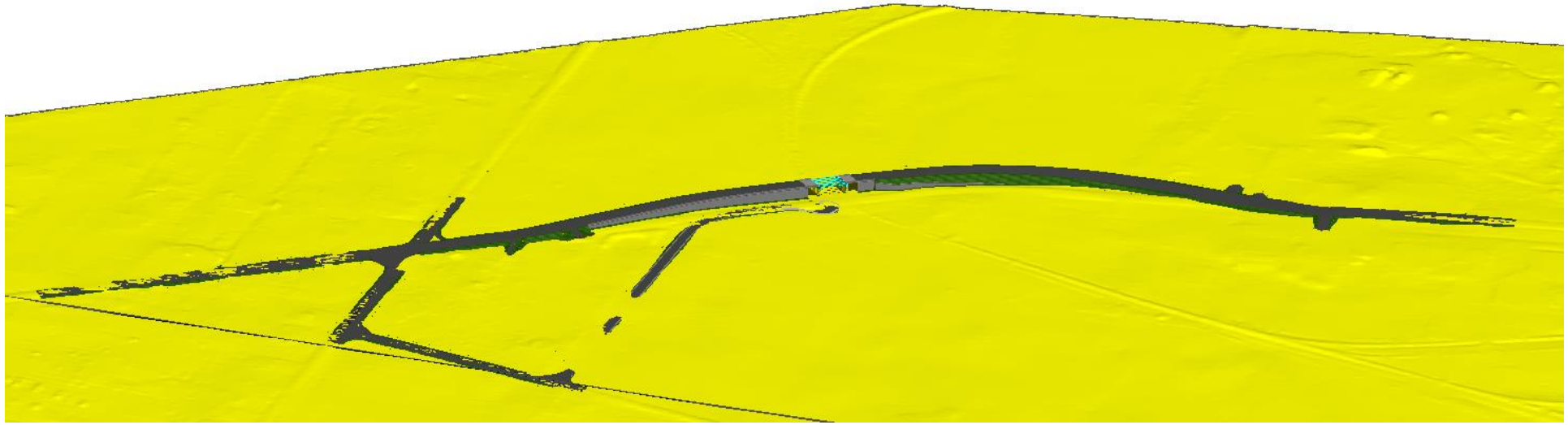
So, now what?

- Field survey
  - OpenRoads terrain, instead of our usual TINs
  - Subsurface utilities

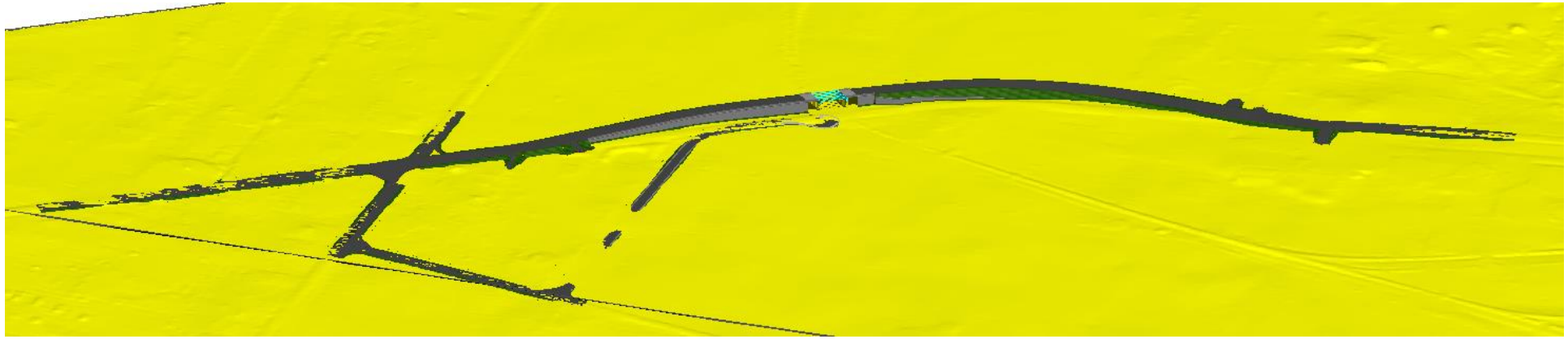


What can we get rid of?

- Start with the big ticket items
  - Pavement
  - Retaining Walls



Pavement - Profile Adjustments



- Eliminated almost 900’ on the west leg
- Eliminated 100’ from the north leg

Pavement - MOT Models

- Phase 1
  - Temporary widening to the south
  - Can we eliminate the run around?

Pavement - MOT Models

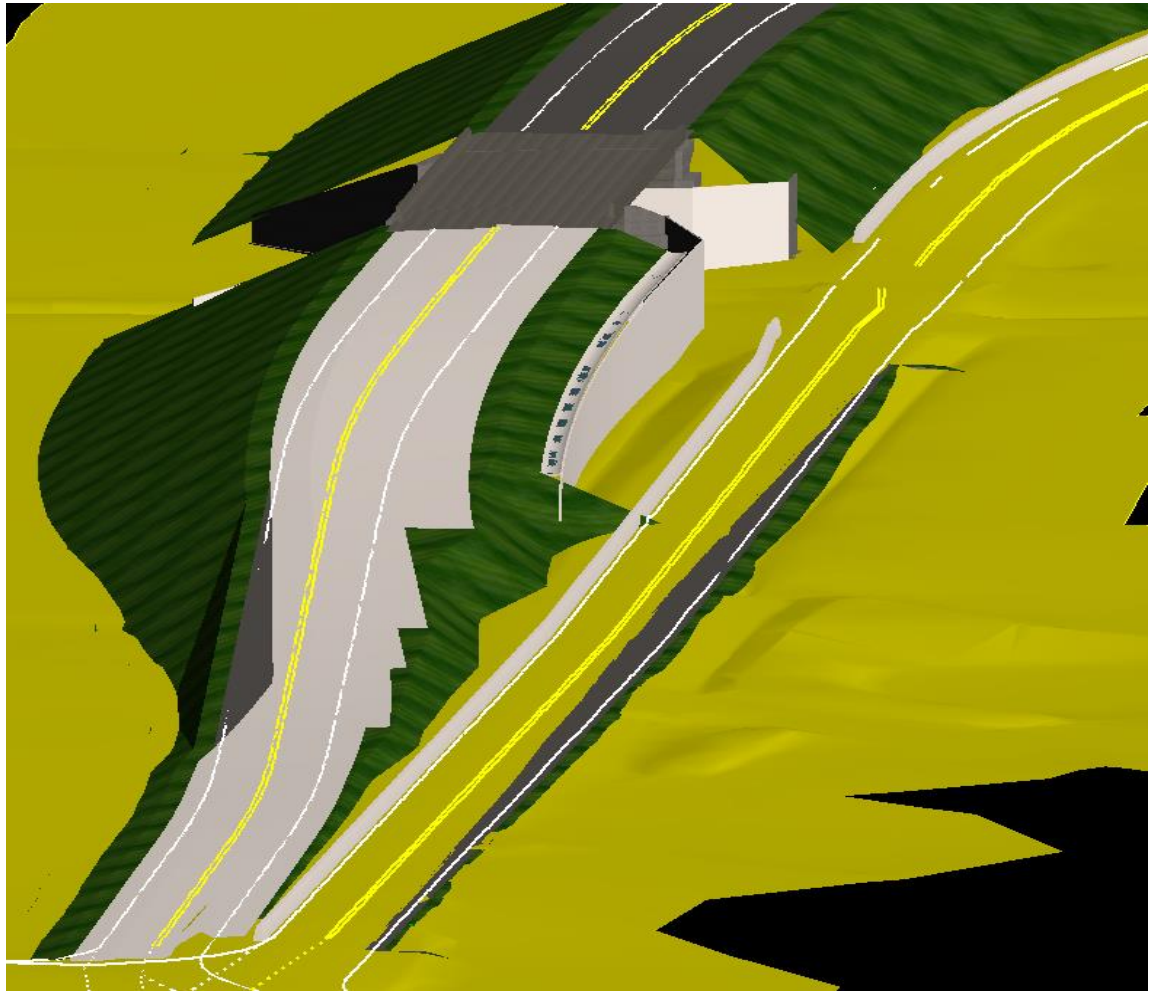
- Phase 2
  - Bridge, retaining walls and embankment

Pavement - MOT Models

- Phase 2
  - Bridge, retaining walls and embankment

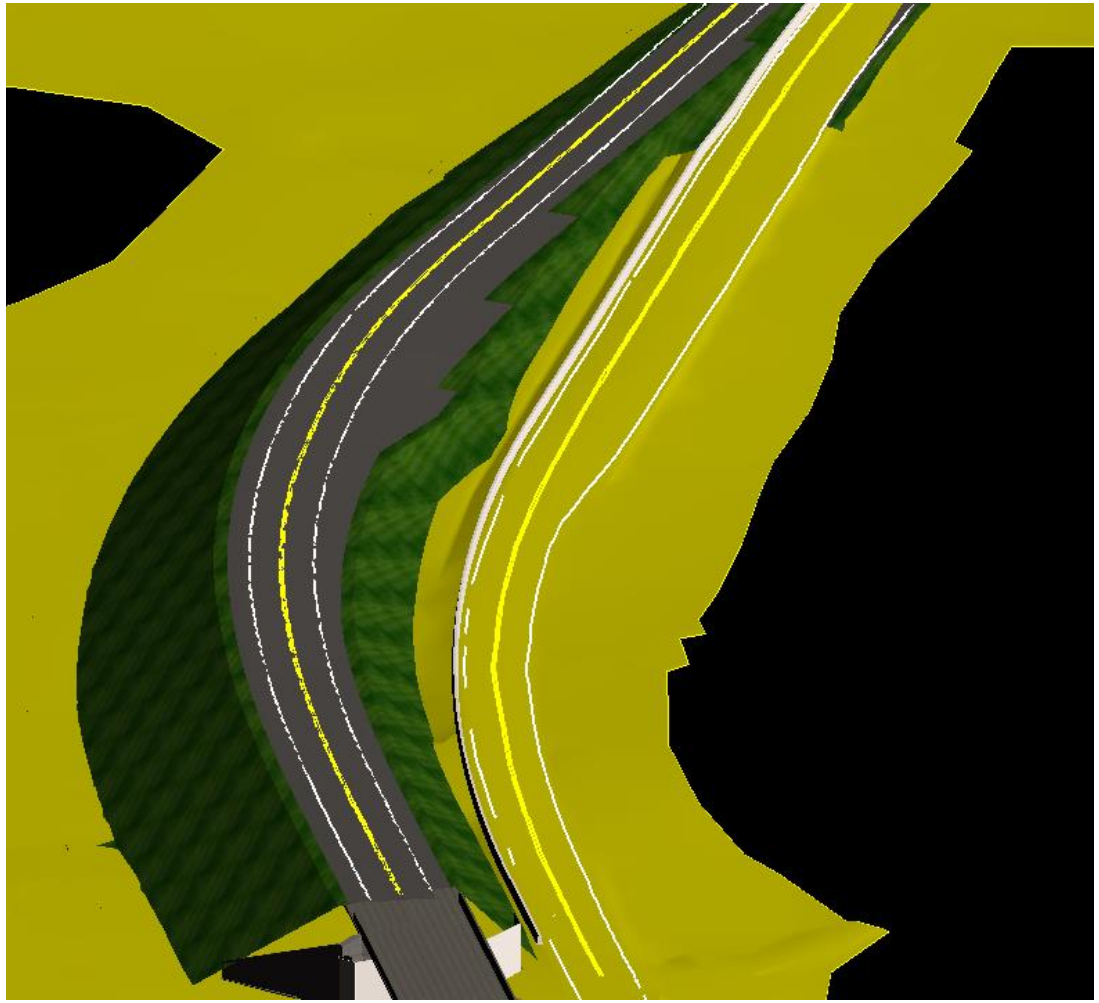
Pavement - MOT Models

- Proof that we could maintain traffic without the temporary detour road

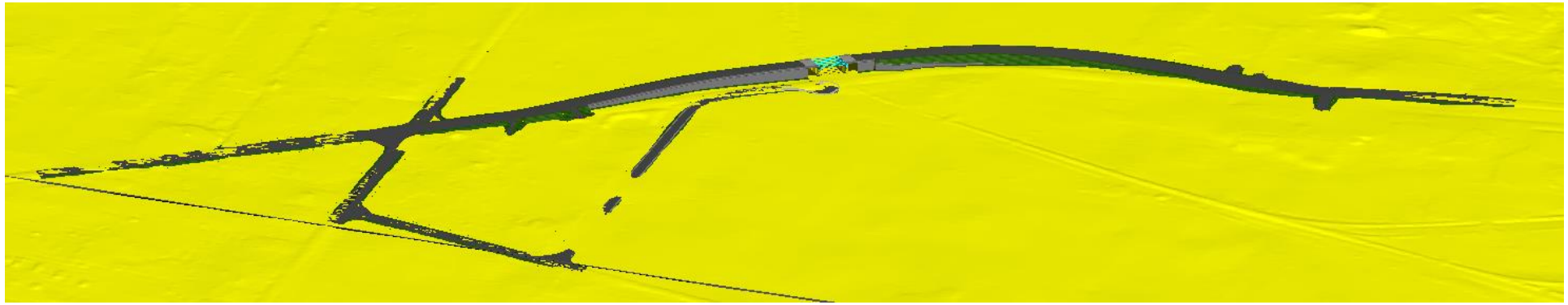


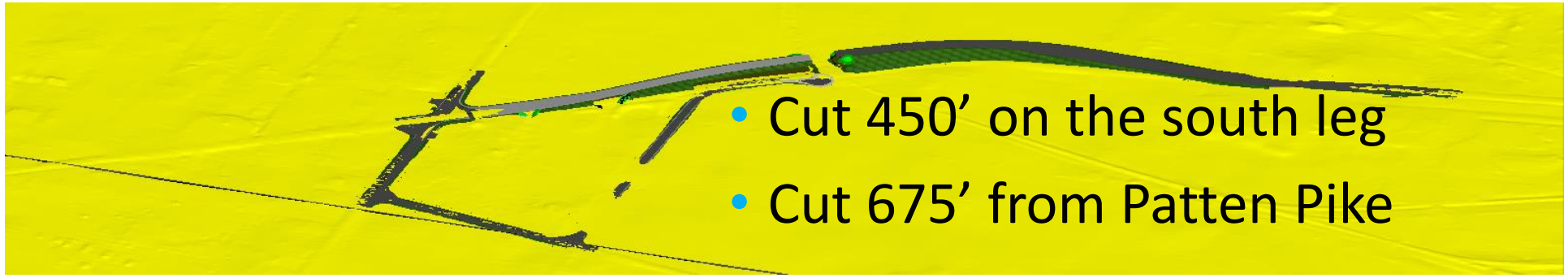
Pavement - MOT Models

- Proof that we could maintain traffic without the temporary detour road



Pavement - Profile/MOT Models

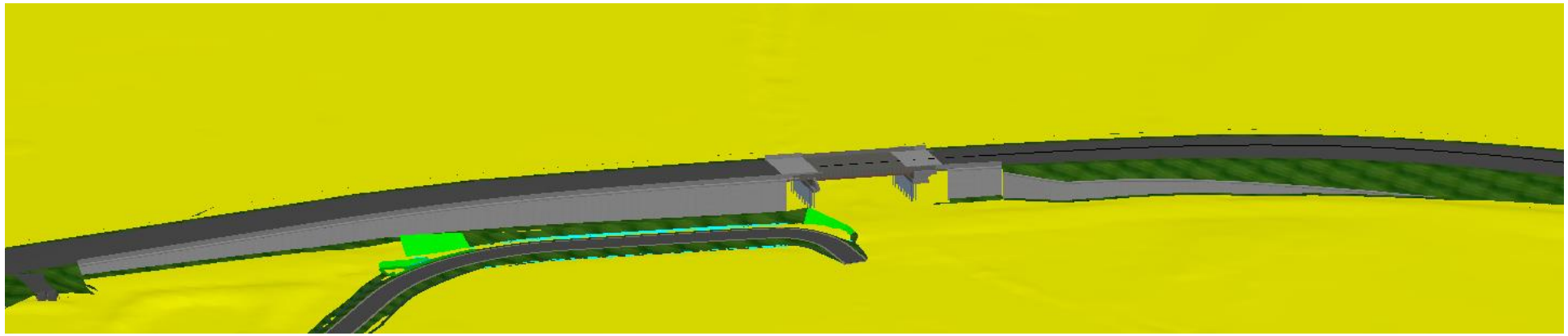




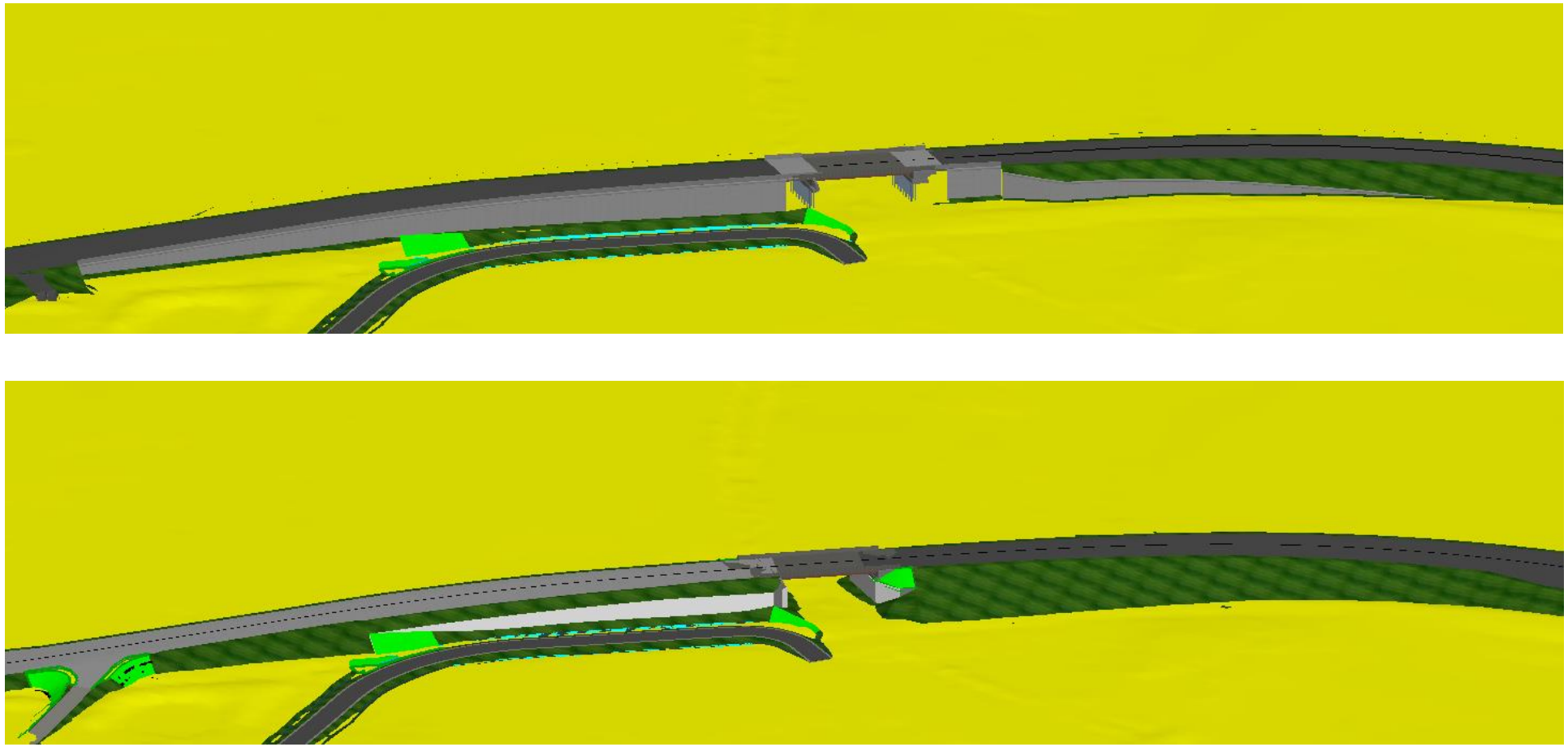
- Cut 450’ on the south leg
- Cut 675’ from Patten Pike

- Pavement reduction for Service Road A

Retaining Walls



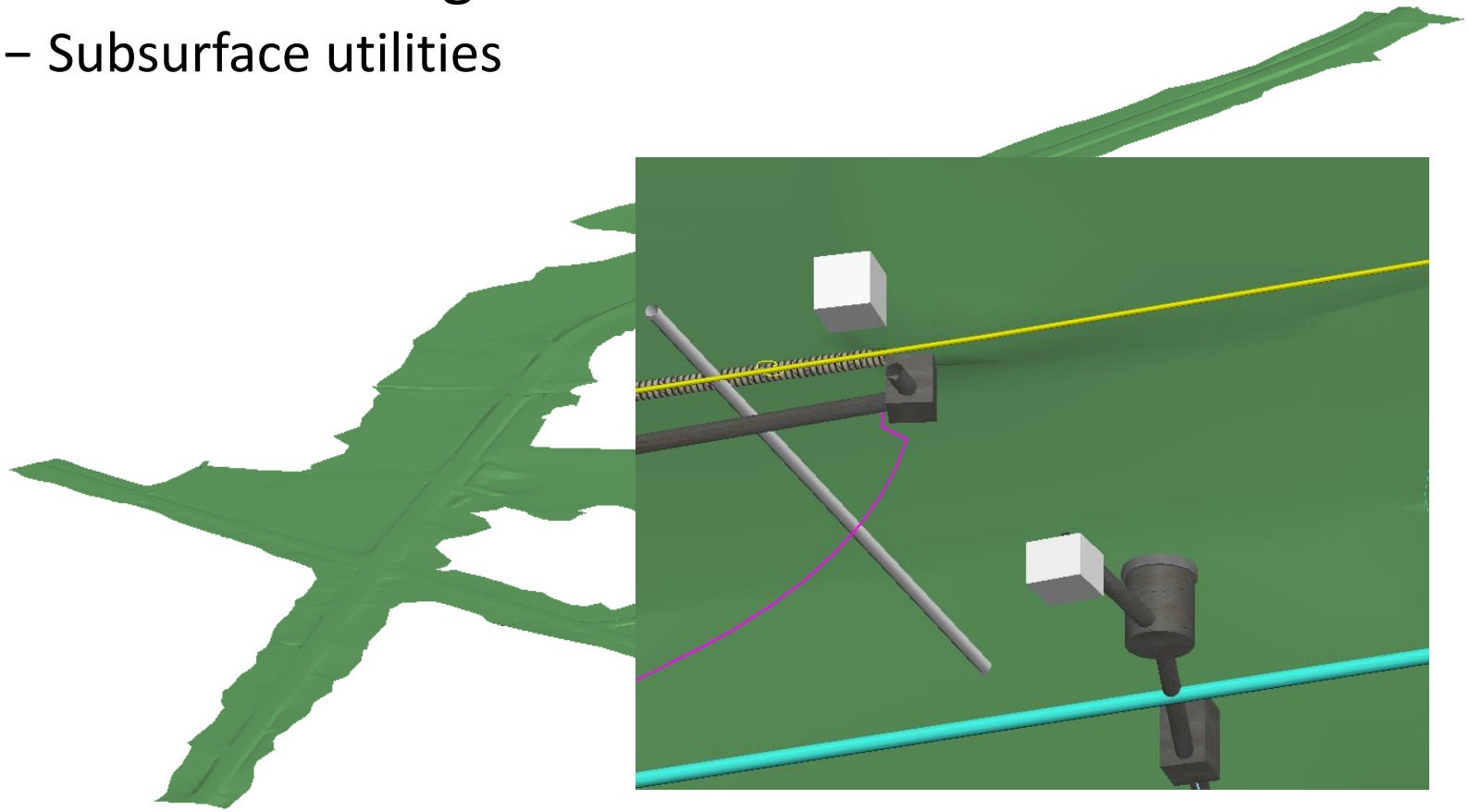
Retaining Walls



- Eliminated over 20,300 square feet

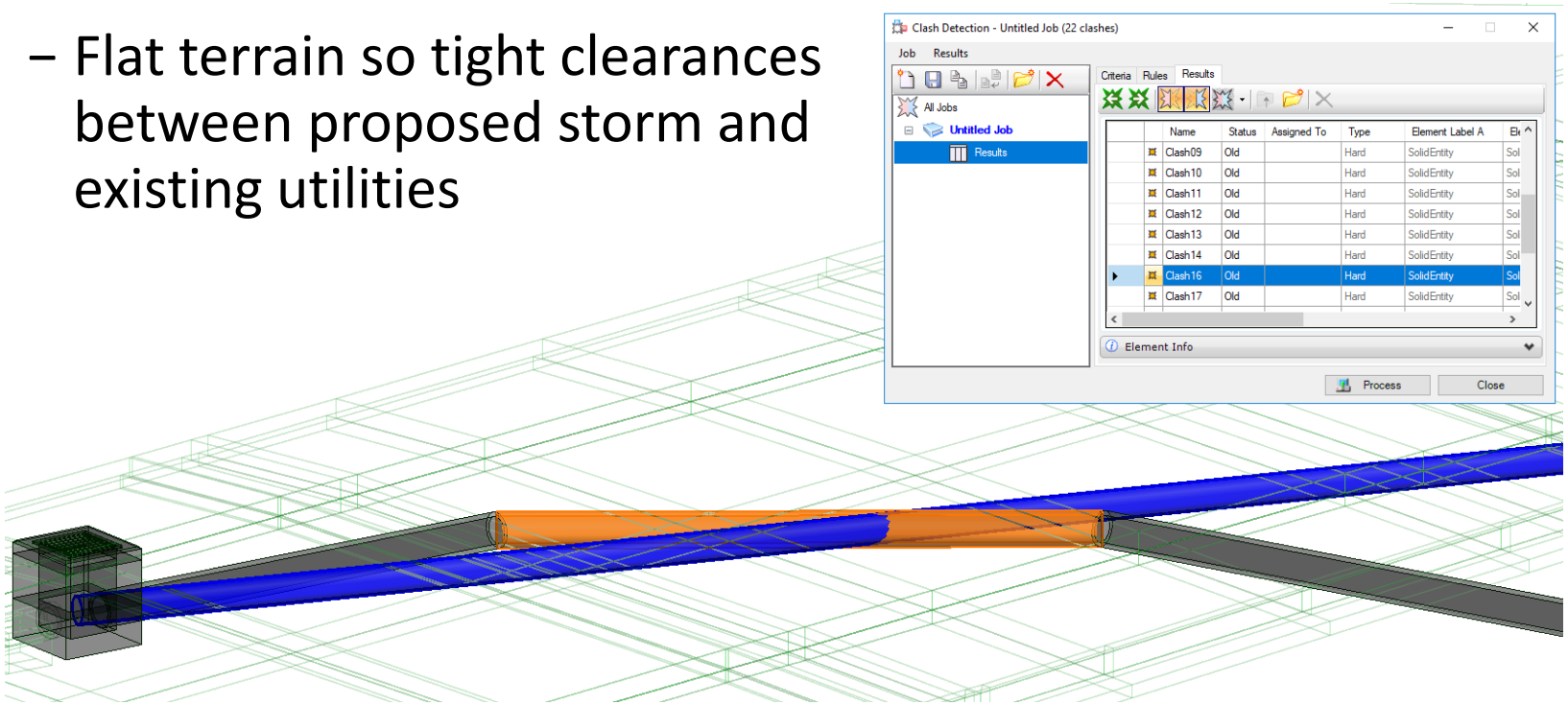
Okay, new project limits - now what?

- Detailed Modeling
  - Subsurface utilities



Subsurface Utilities

- Clash Detection
  - Flat terrain so tight clearances between proposed storm and existing utilities

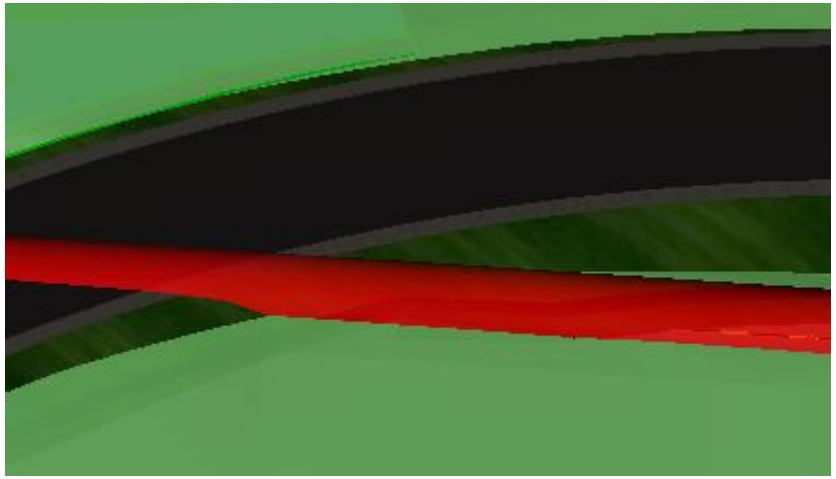


Clash Detection, right?

- Gas line clearances
  - Very specific clearances were given
    - No more than 5’ of fill above
    - Minimum cover and clearance from other objects of 2’

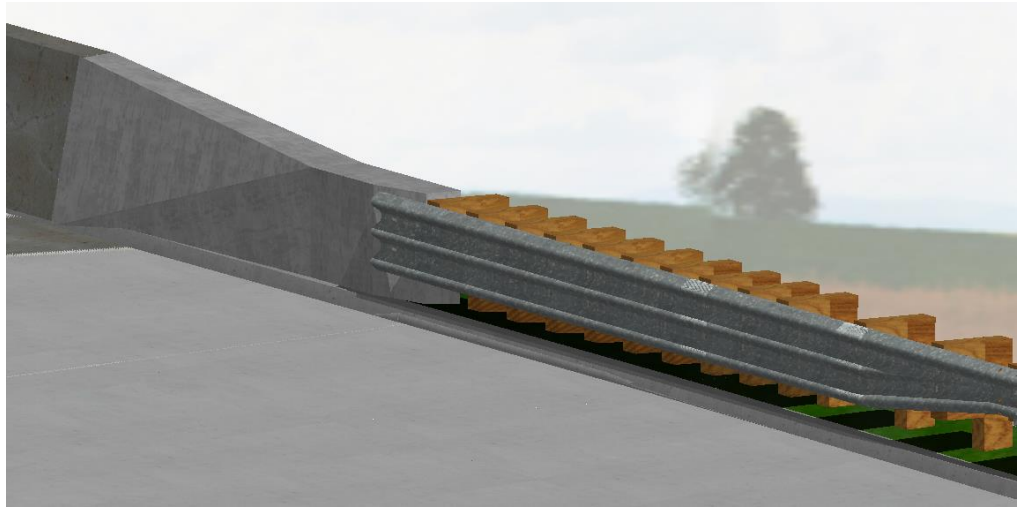
Maybe, but what about solids modeling?

- Gas line clearances
  - Very specific clearances were given
    - No more than 5’ of fill above
    - Minimum cover and clearance from other objects of 2’
- Used Solids modeling to place a cylinder around the existing gas line

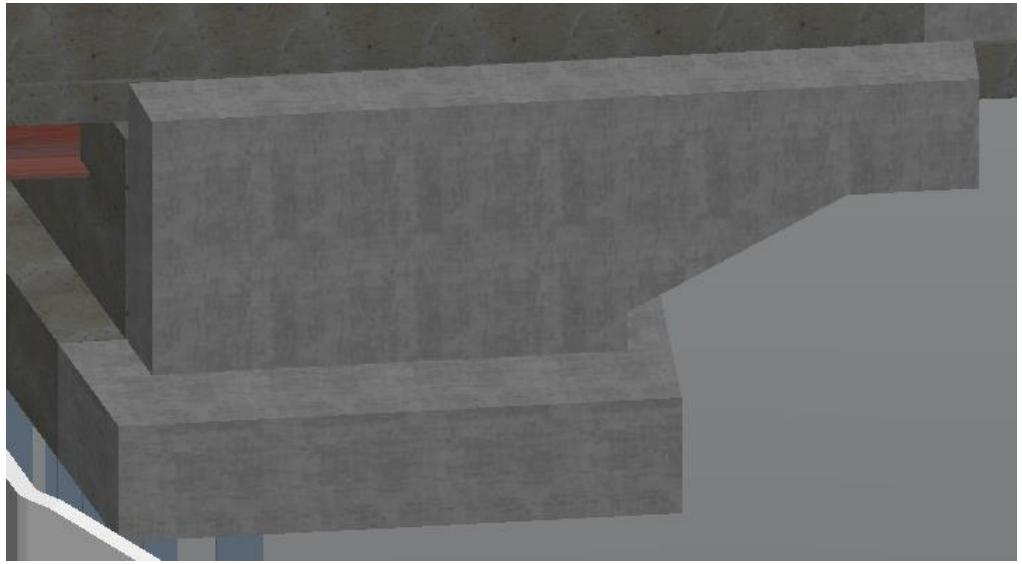


That worked pretty well - anything else?

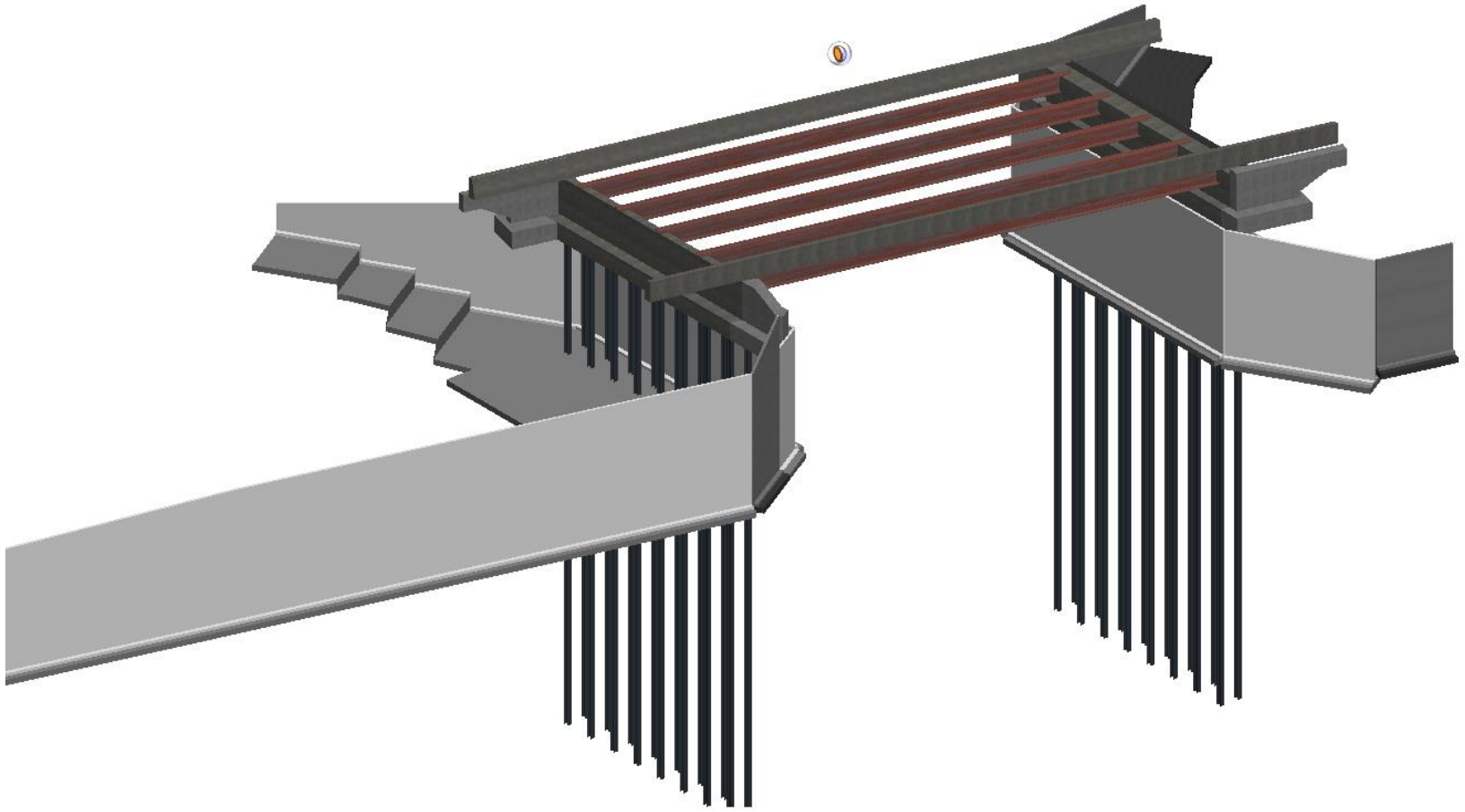
- Guardrail and end treatments



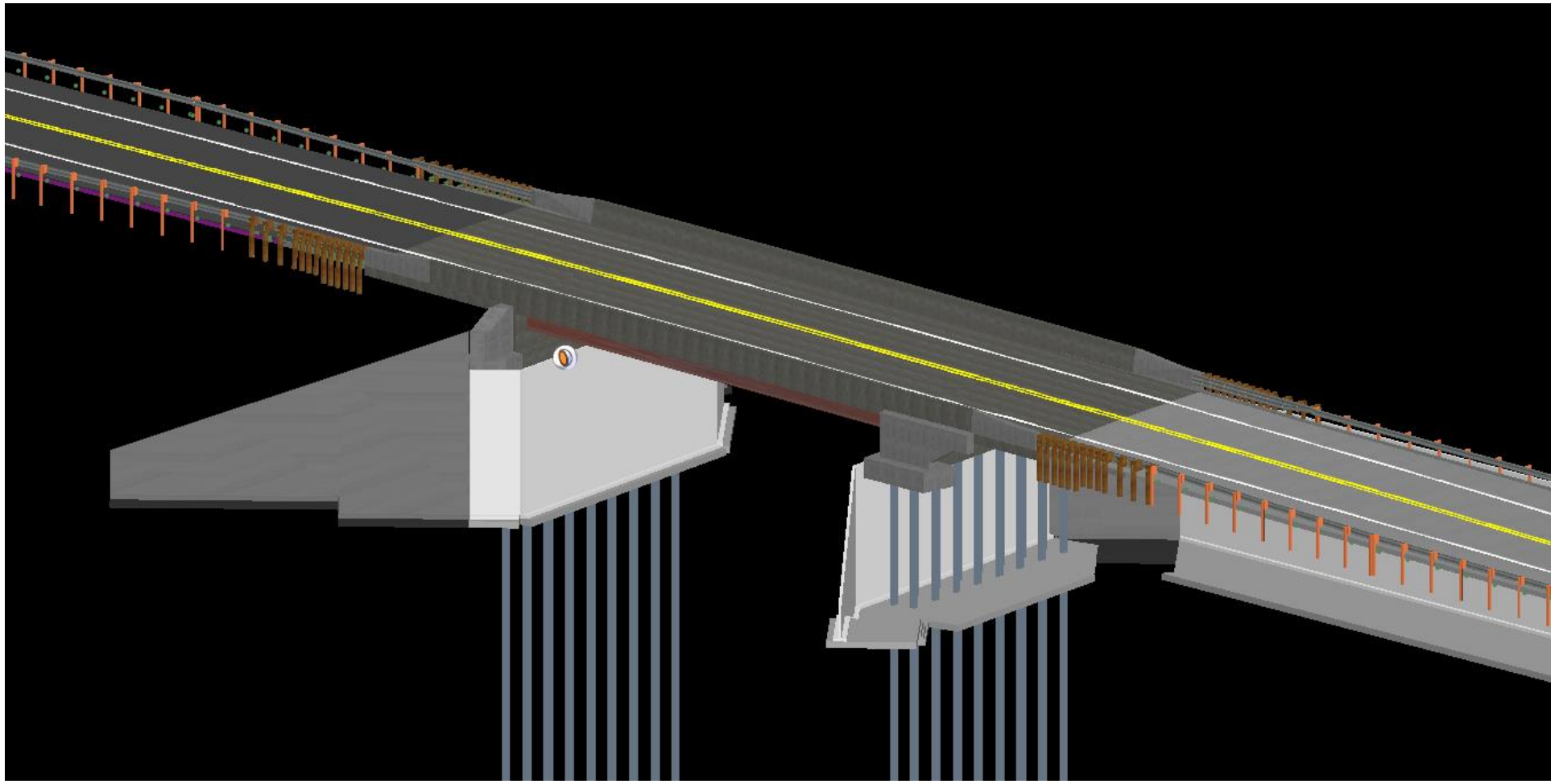
- Bridge abutments and wing walls



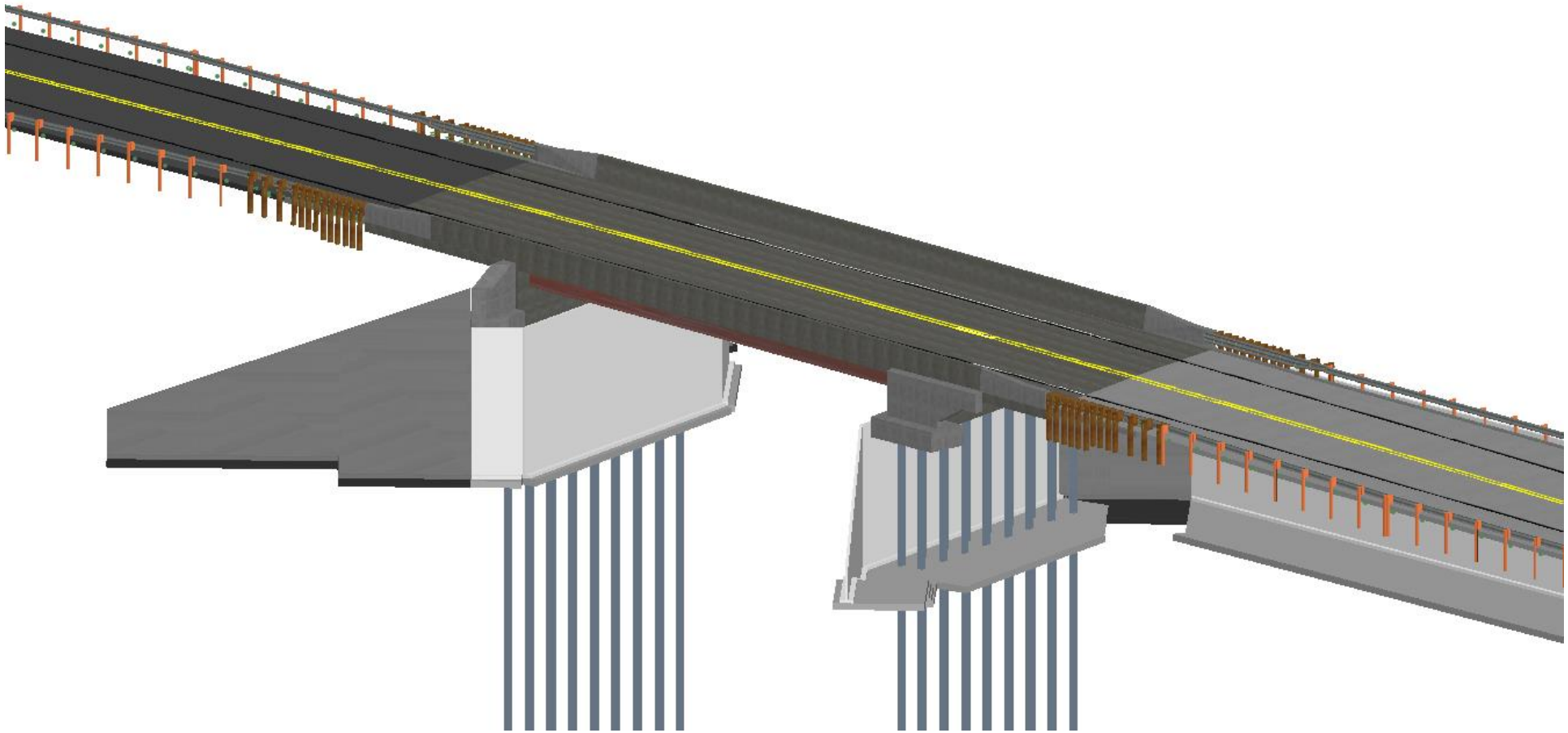
OpenBridge Modeler Utilization



OpenBridge Modeler Utilization

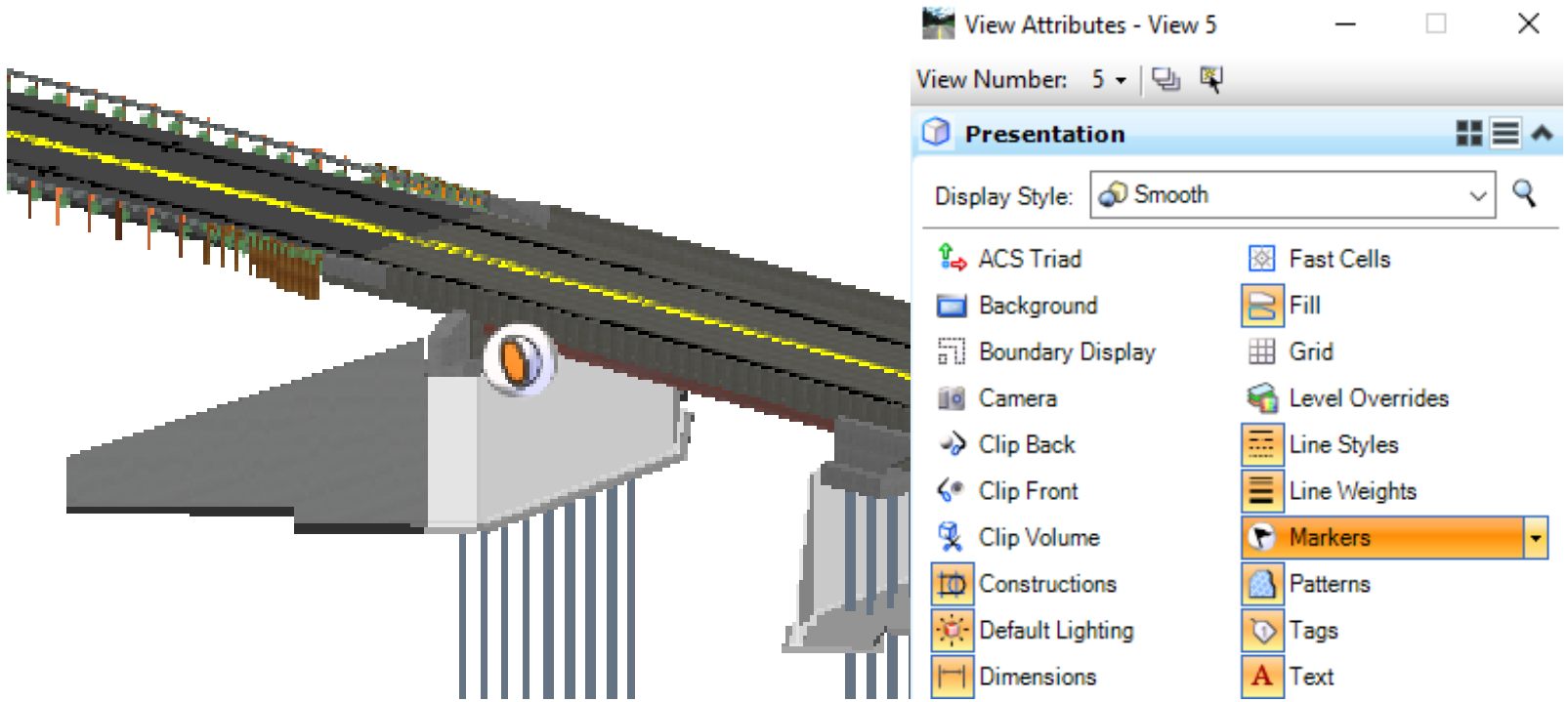


OpenBridge Modeler Utilization



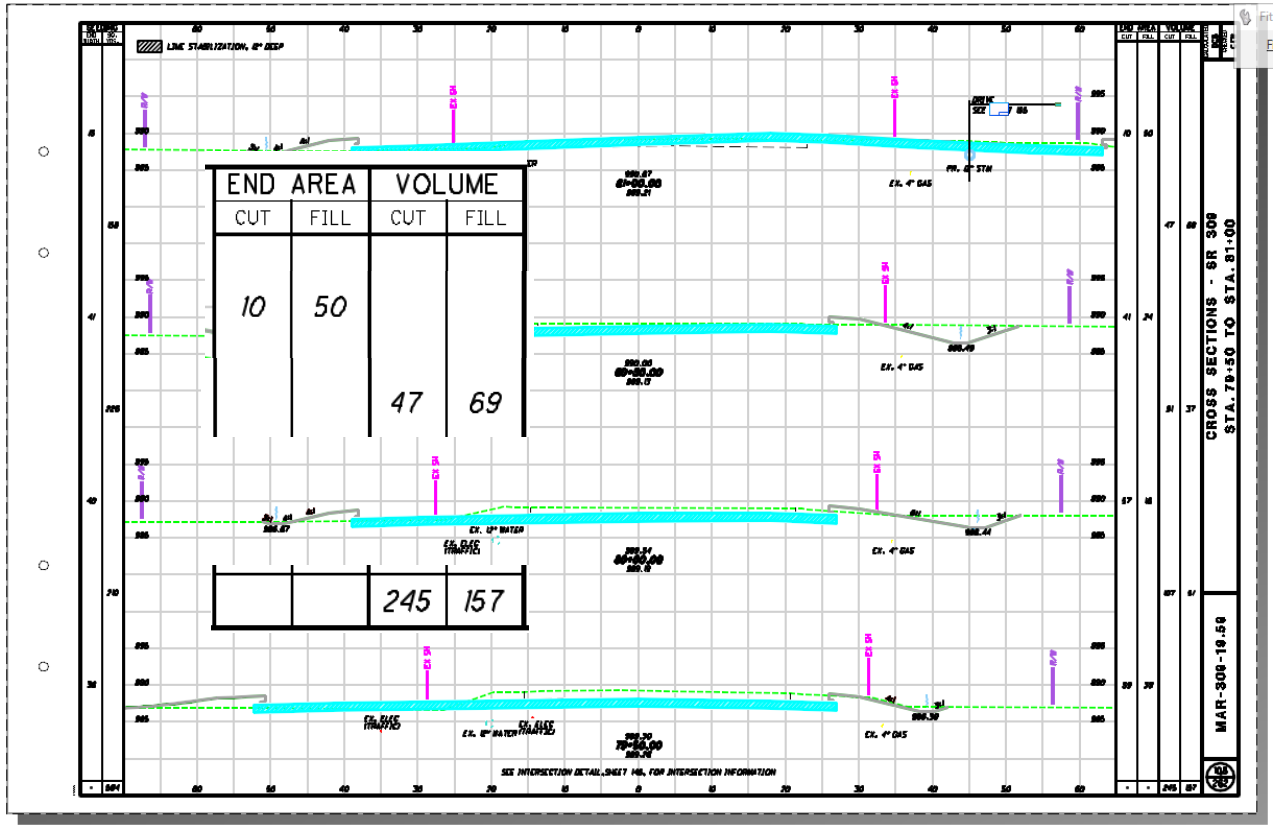
OpenBridge Modeler Utilization

- Turn off Markers in View Attributes



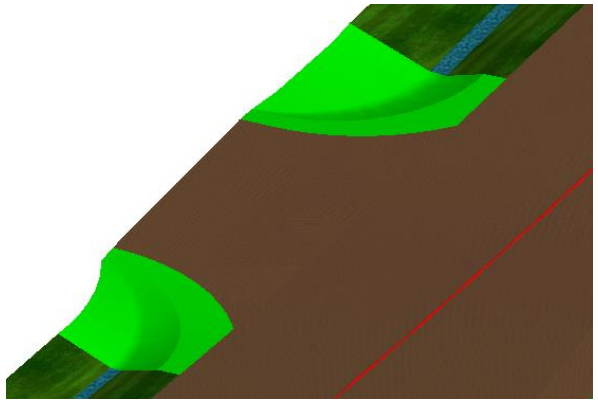
Quantities

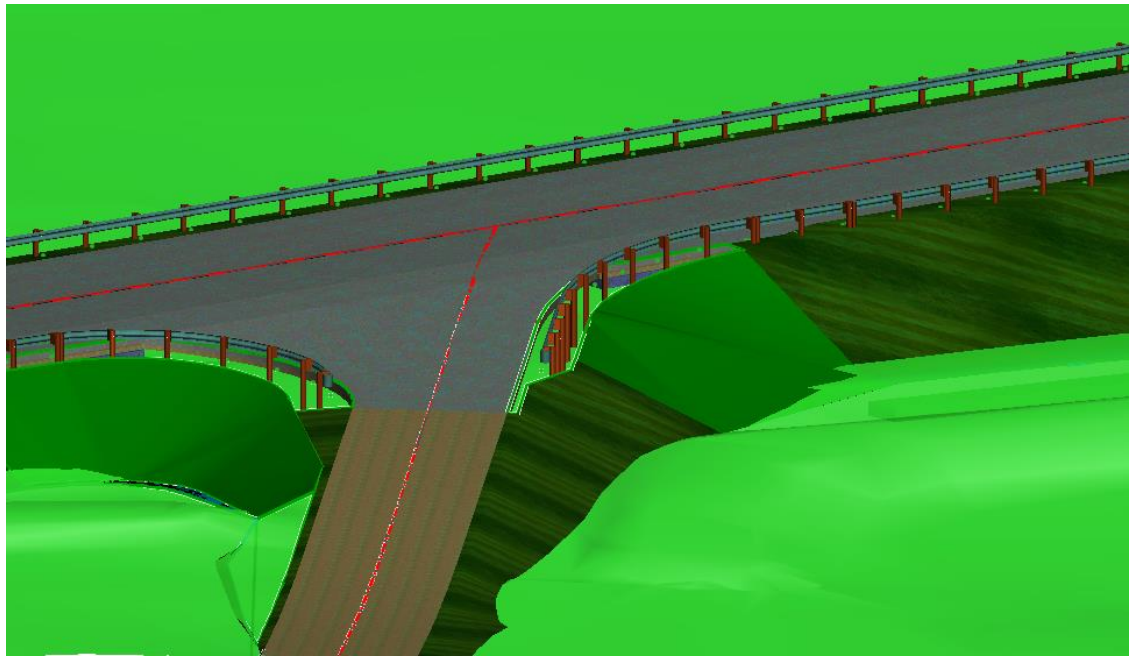
- Conventional methods



Quantities

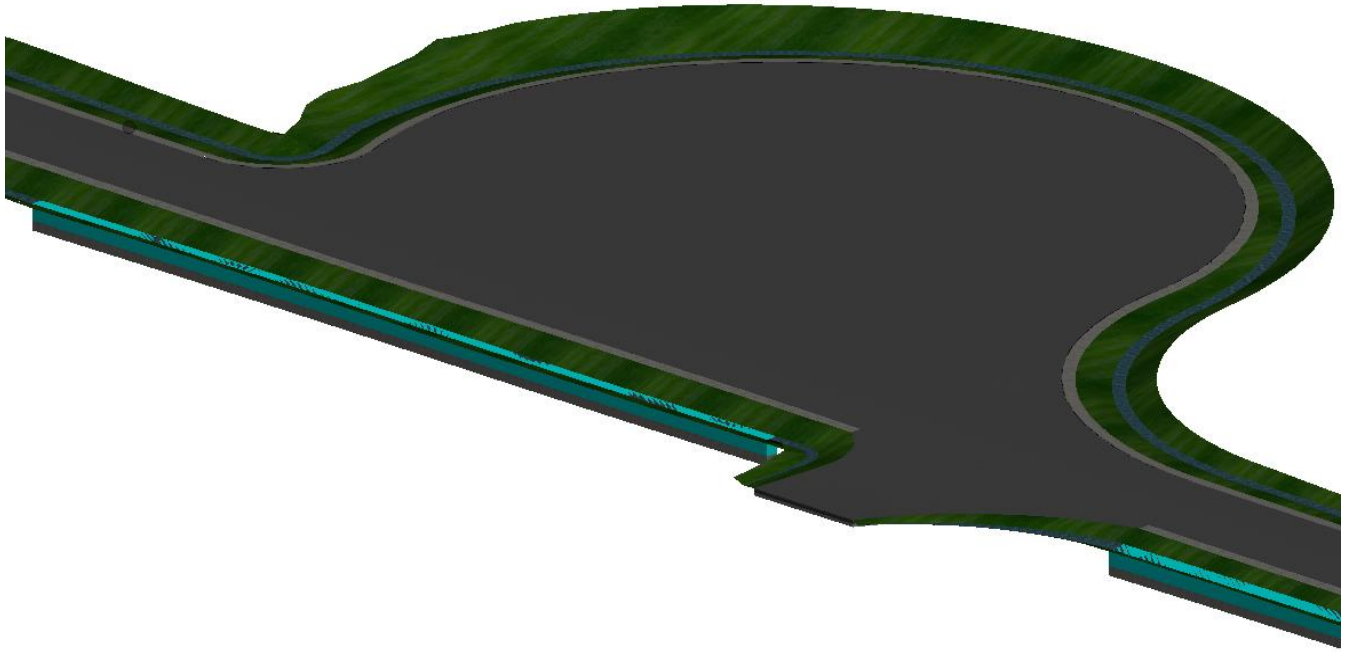
- Harvested from 3D models
- Better embankment and excavation values from drives that were all site modeled





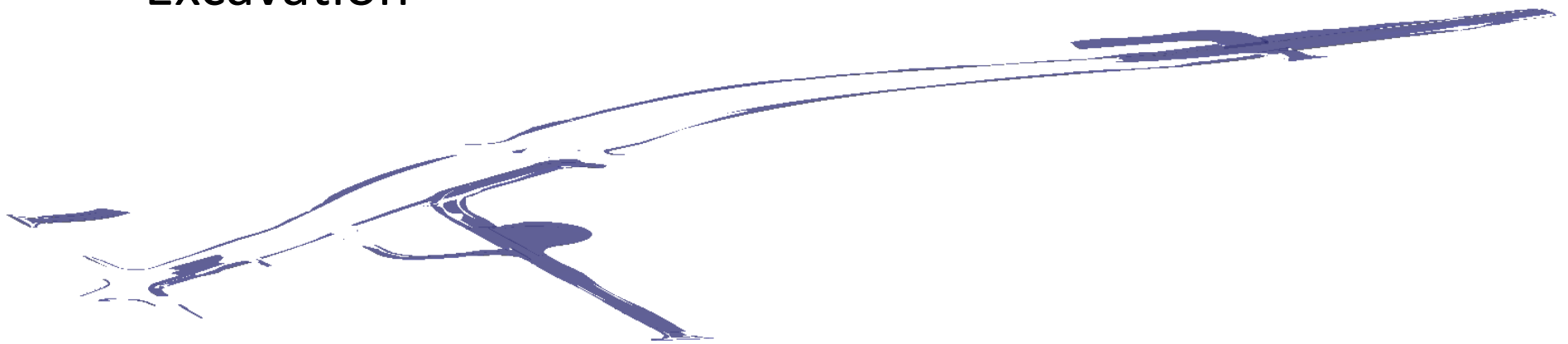
Quantities

- Cul-de-sac that was site modeled



Quantities

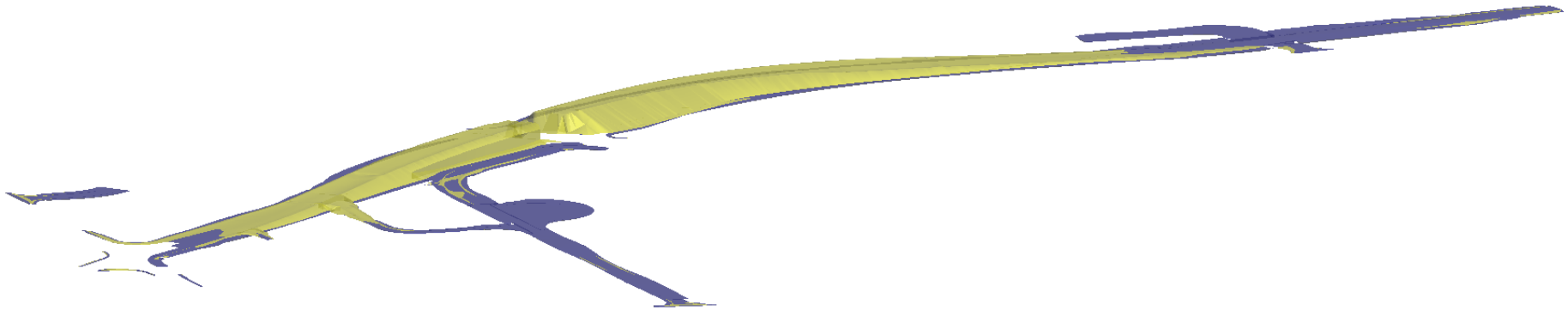
- Excavation



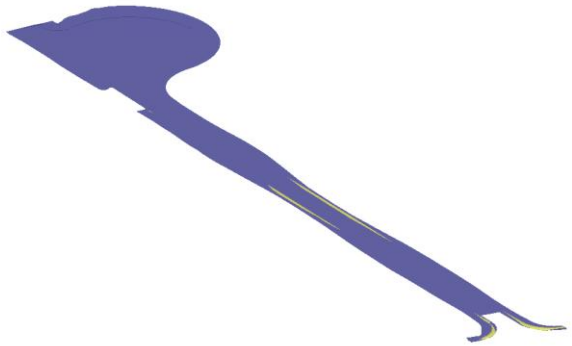
- Embankment

Quantities

- Combined Overall

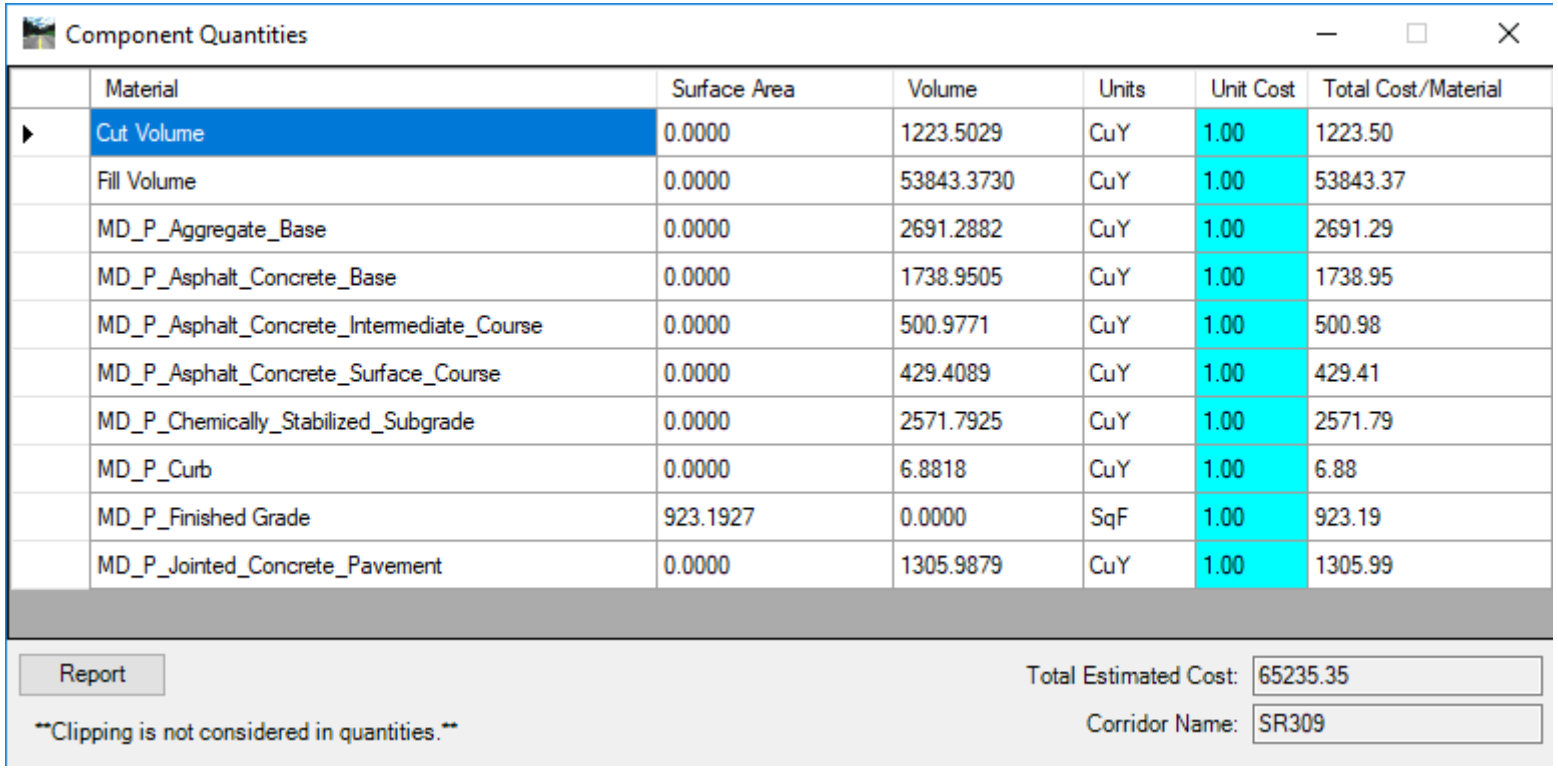


- County Portion



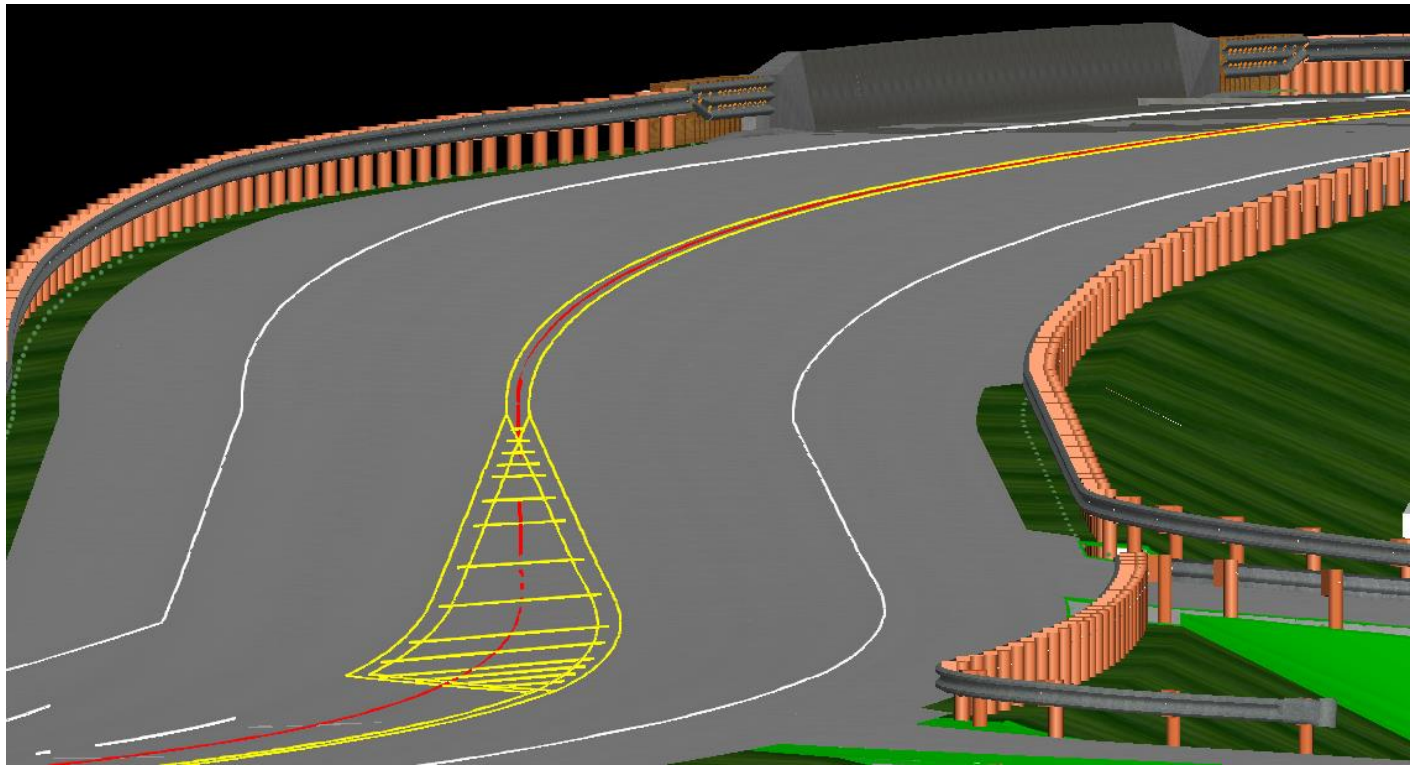
Quantities

- Component quantities



Sight Concerns

- Alleviate concerns over sight distances from any location



Greatest Experience Ever!!!

Not Even Close

- Cli

Rainbows and Unicorns

Success!!!

Success!!!

Success!!!

Success!!!

Success!!!

Success!!!

Success!!!

Success!!!

- ContextCapture Reality Model

Success!!!

- ContextCapture Reality Model

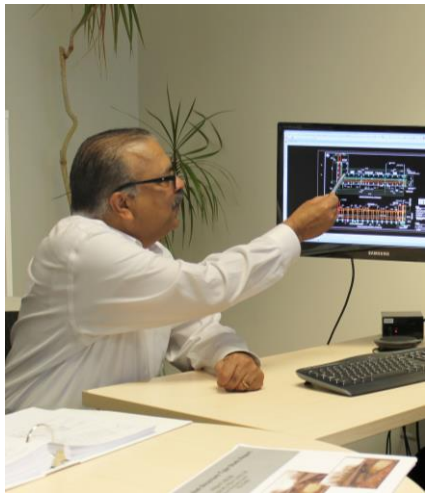
Success!!!

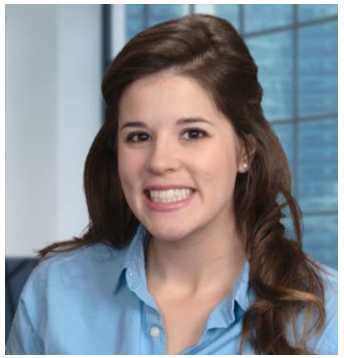
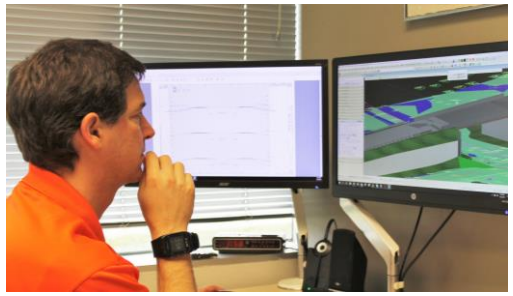
- ContextCapture Reality Model

Cultural Shift

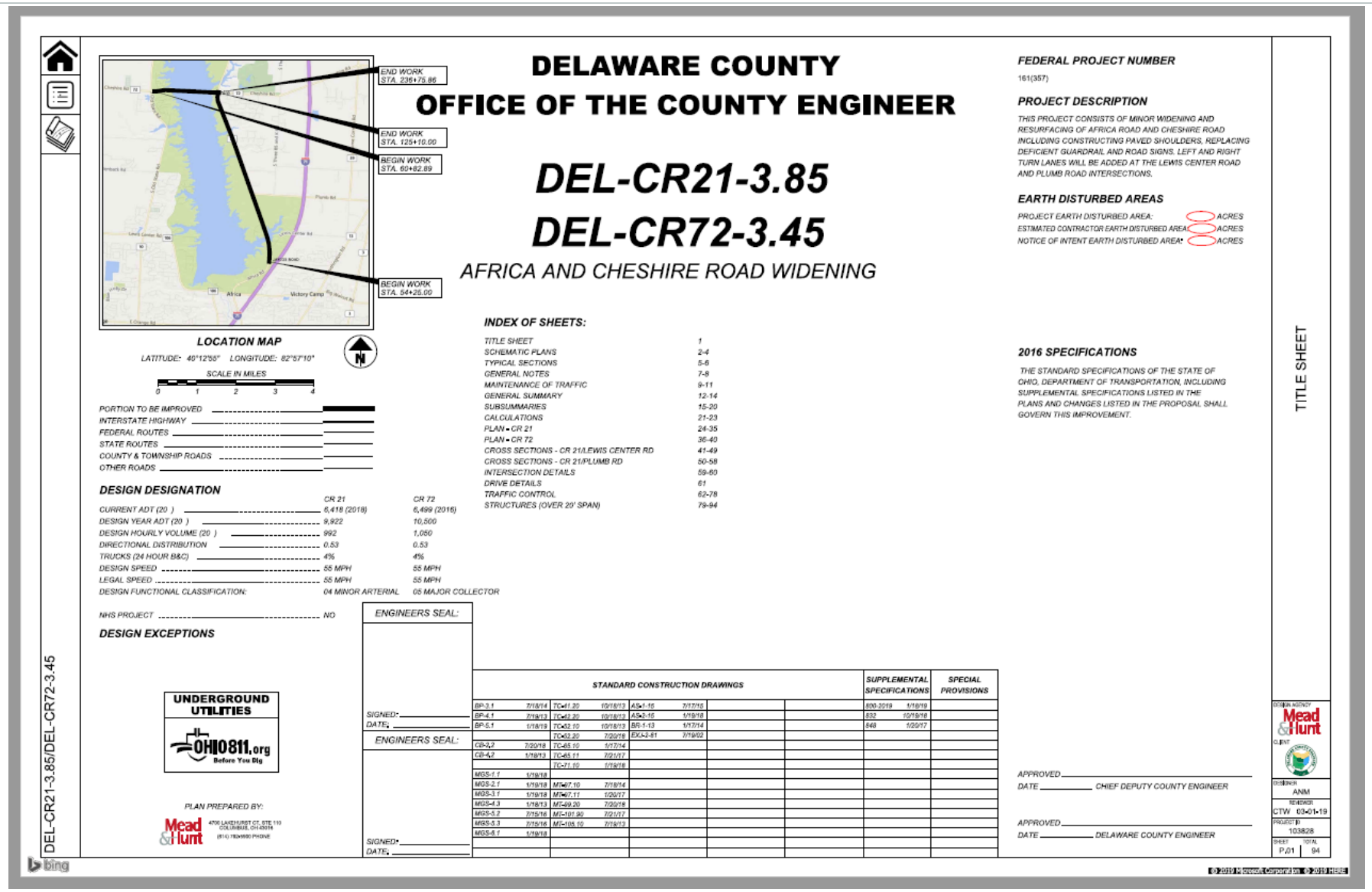
- Specialized, sometimes isolated and fragmented
  - Survey
  - Roads
  - Drainage
  - Structures
- Highly interactive
- Collaborative

MAR-309 Team – Frustrated? Little bit…

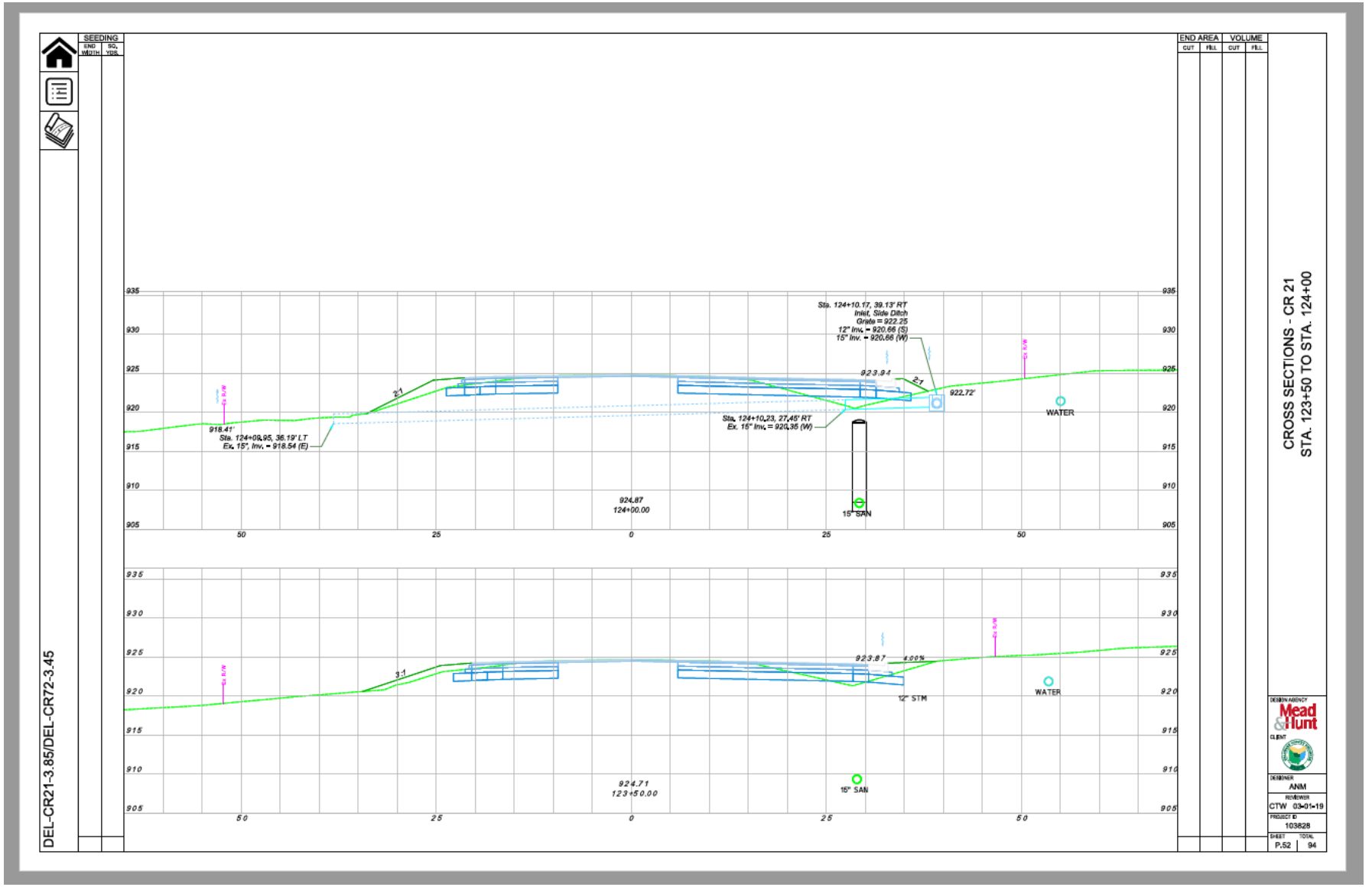


OpenRoads Designer Pilot Project



OpenRoads Designer Pilot Project



OpenRoads Designer Pilot – Lessons Learned

- Plan ahead and be organized
  - Folder Structure
  - Standards
  - Software
  - Staff
  - Schedule

OpenRoads Designer Pilot – Lessons Learned

- Be reasonable
  - Corridor length
    - Don’t exceed a 5000’
  - Processing time
    - Start with “conceptual”
  - Template complexity
    - Just because you CAN do someth SHOULD
  - No. of template drops
  - Collaboration
    - Model/sheet access

Current Progress and Questions???

Contact Information

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Alex.Monda@Meadhunt.com

Dan Barnhart, PE
Dan.Barnhart@Meadhunt.com

Thank you.

CADD USERS GROUP • MARCH 6, 2019

OHIO DEPARTMENT OF TRANSPORTATION

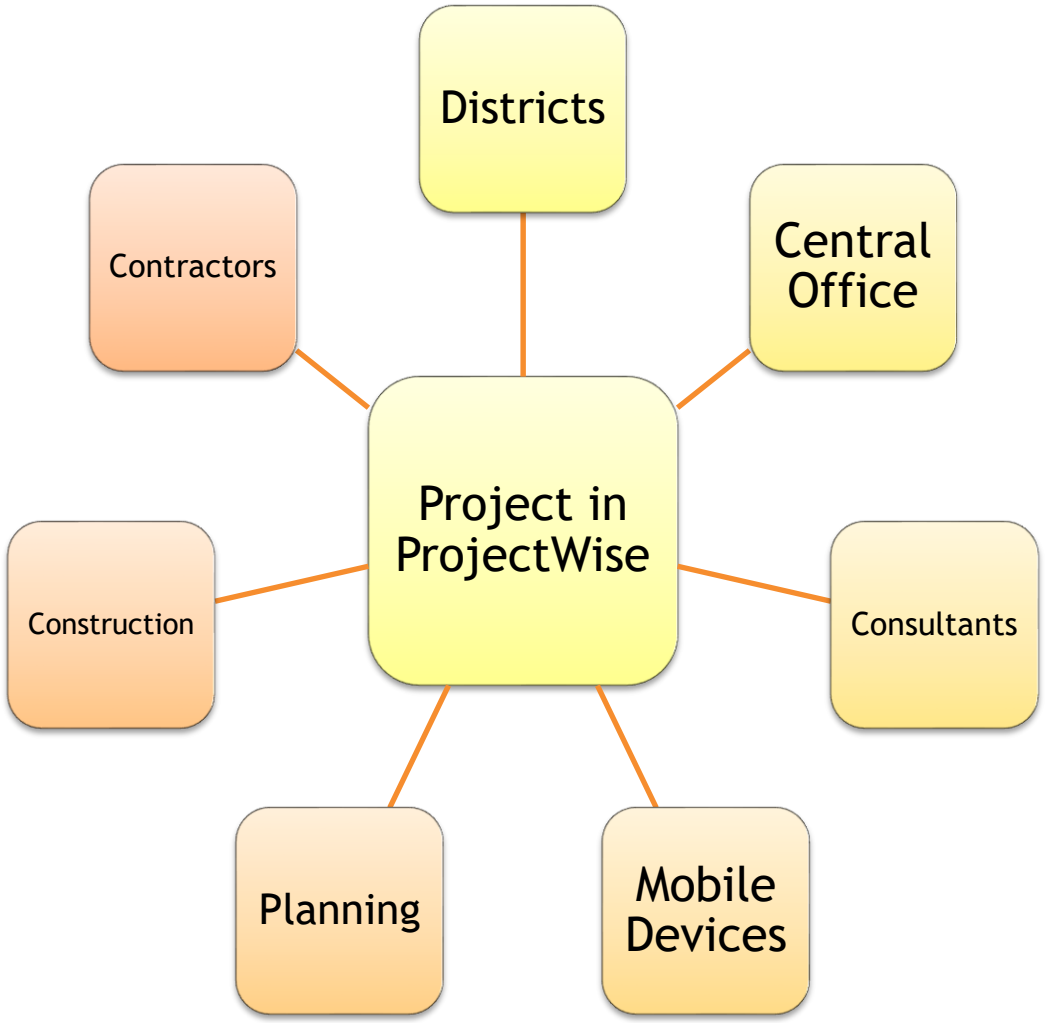
PROJECTWISE

Jack Kerstetter

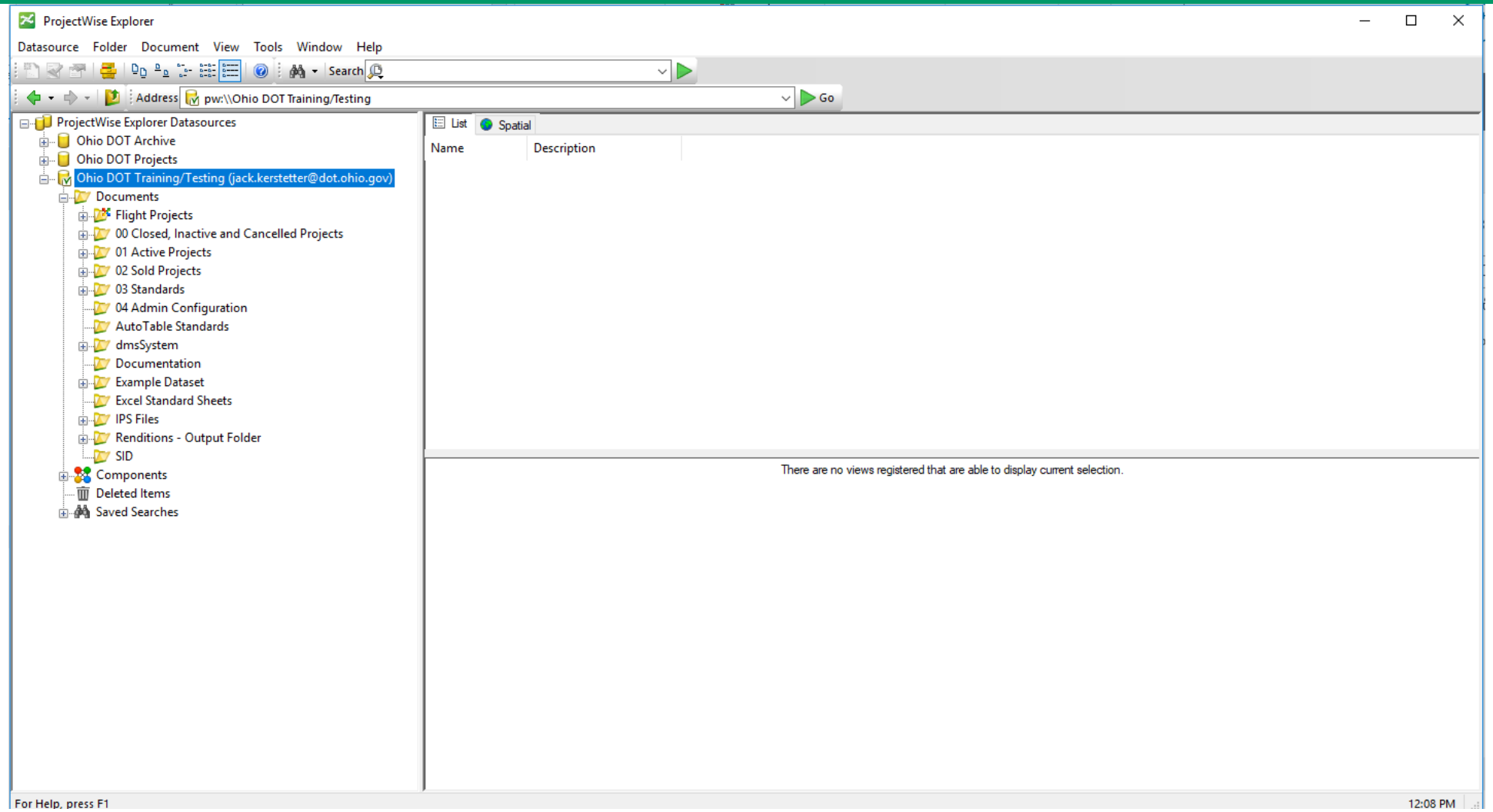
PROJECTWISE

- ProjectWise
  - Engineering Document Management
  - New project directory structure
  - Connected Projects Web portal
  - Plan Vault Archive
  - Managed Workspace
  - Workflows
  - Implementation with ORD
  - Pilot projects by the end of 2018

PROJECTWISE

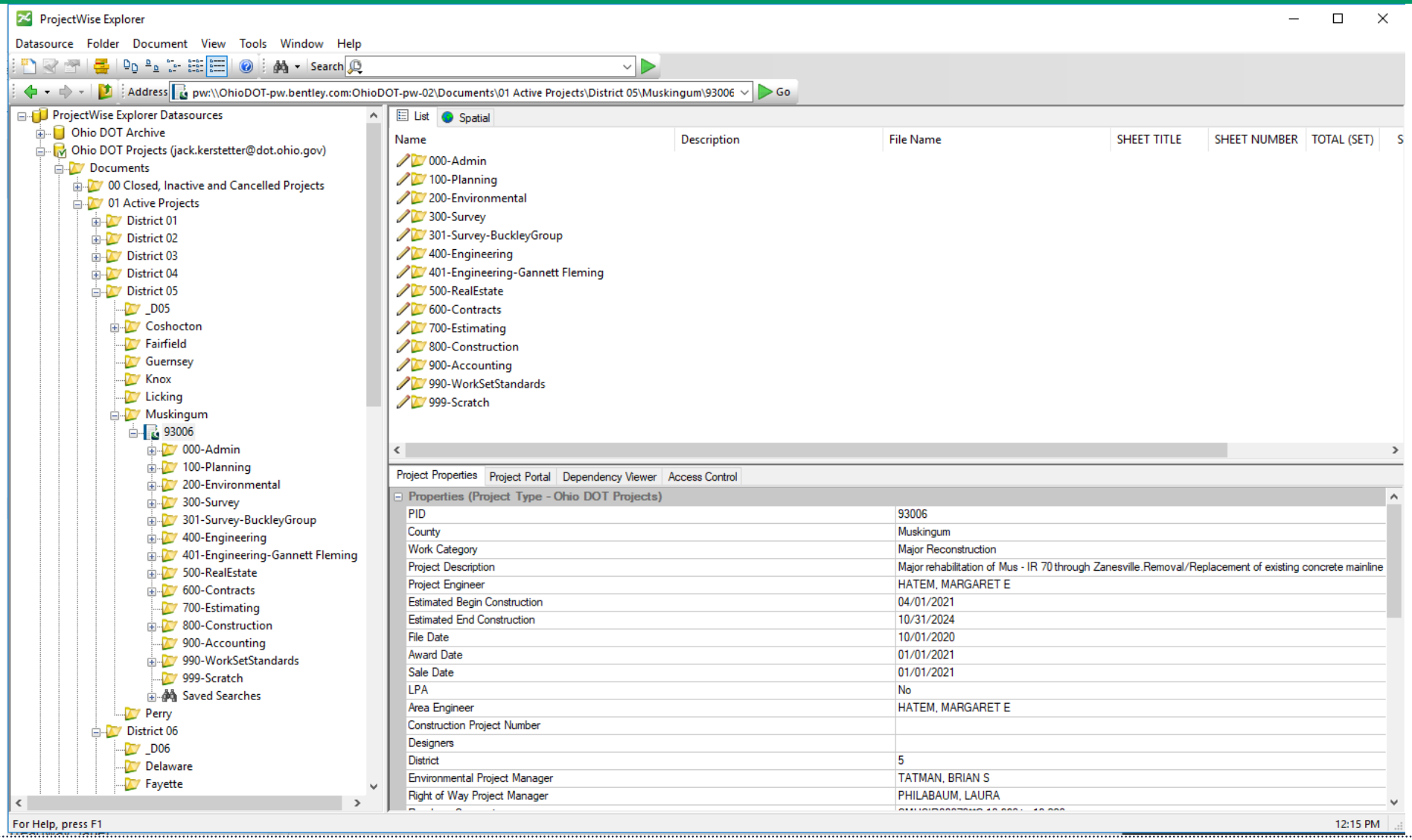


PROJECTWISE



OHIO DEPARTMENT OF TRANSPORTATION

PROJECTWISE

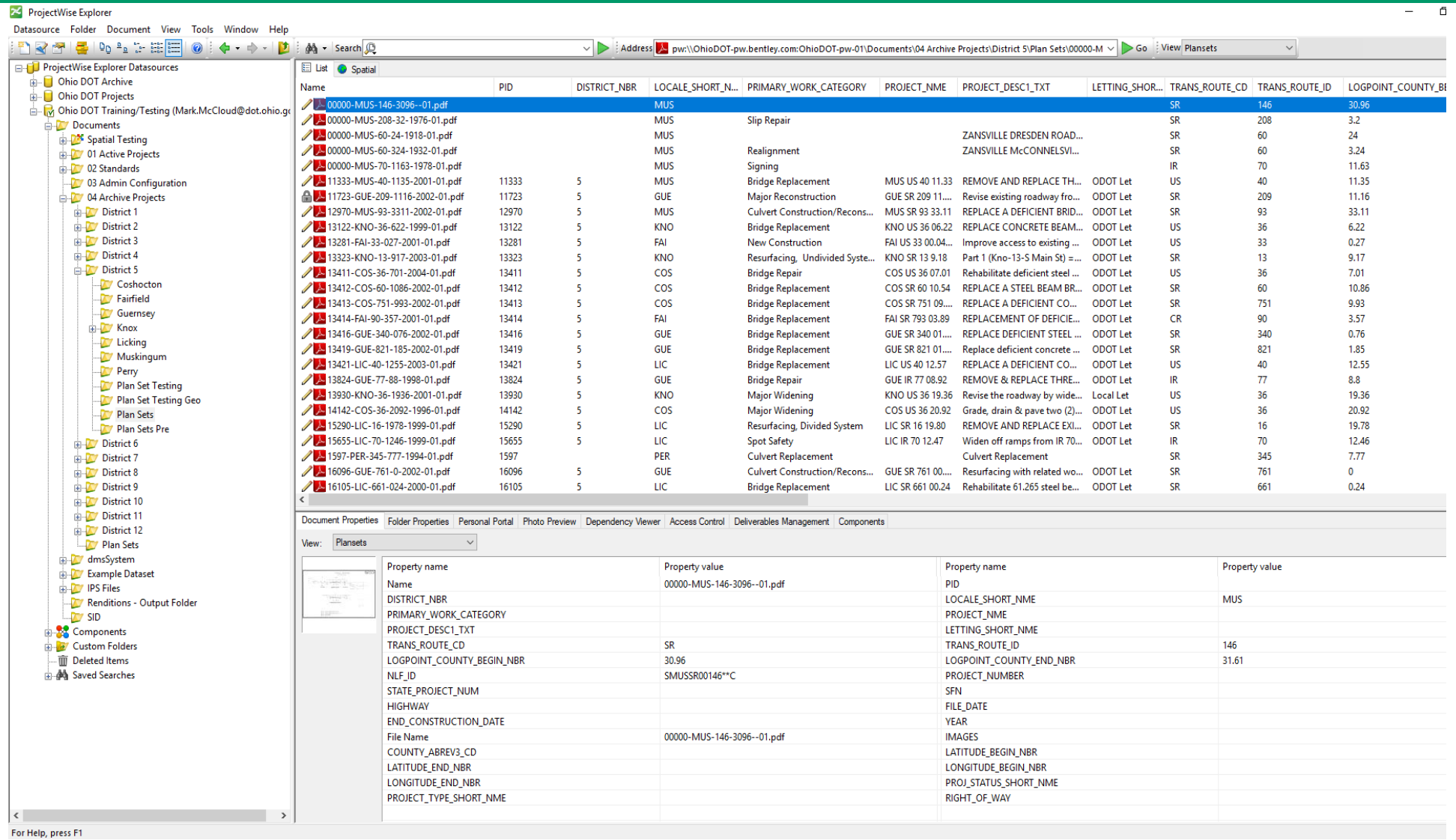


OHIO DEPARTMENT OF TRANSPORTATION

PLAN VAULT ARCHIVE

- Create multi-page PDF's from all the Plan Sets available in Digital Paper
- Link the Project Data from ELLIS and location data from the Roadway Inventory
- Bulk load all the PDF Plans into ProjectWise with the meta data
- Create an application to easily search these plan sets in ProjectWise
- Eventually build a geospatial portal for internal and external access to ODOT's Plan Vault

PLAN VAULT ARCHIVE

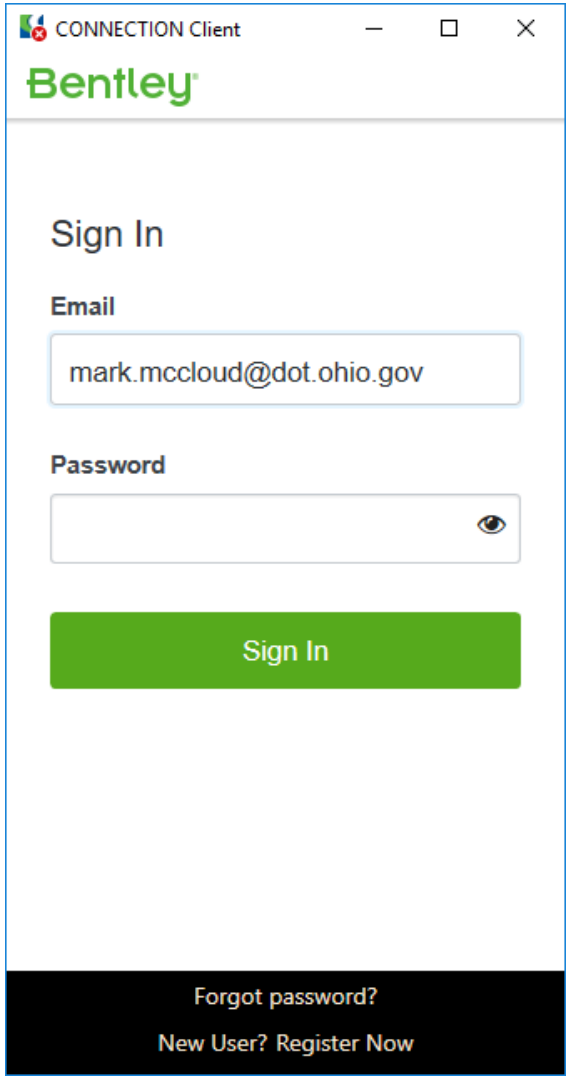


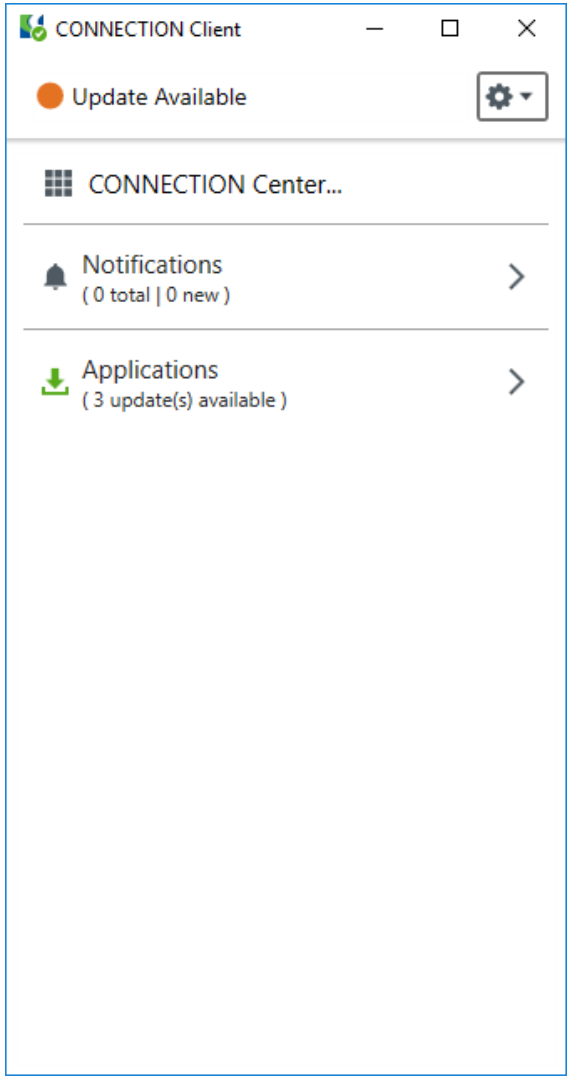
OHIO DEPARTMENT OF TRANSPORTATION

PLAN VAULT ARCHIVE

DEMO

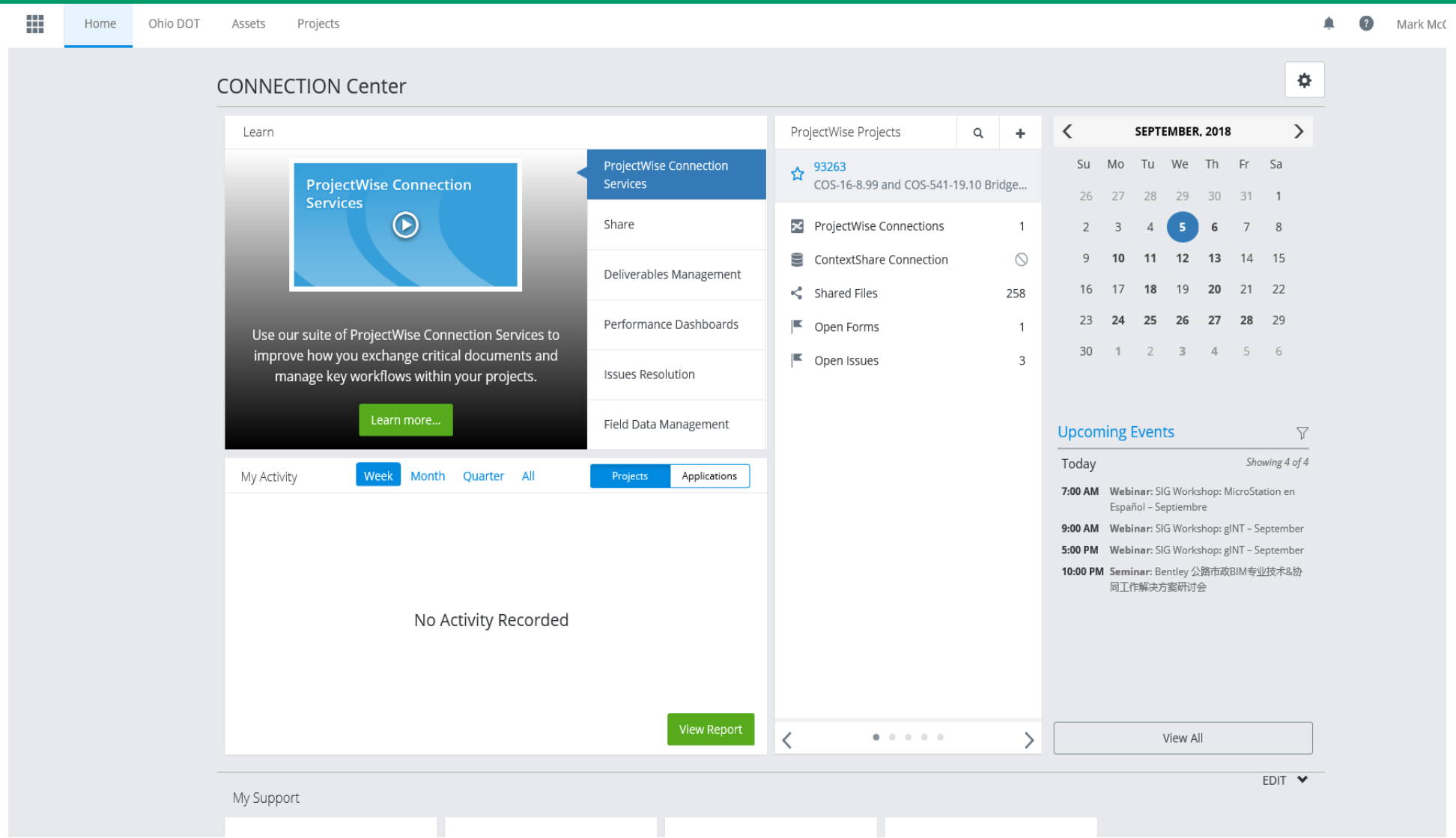
PROJECTWISE





OHIO DEPARTMENT OF TRANSPORTATION

CONNECTION CENTER



OHIO DEPARTMENT OF TRANSPORTATION

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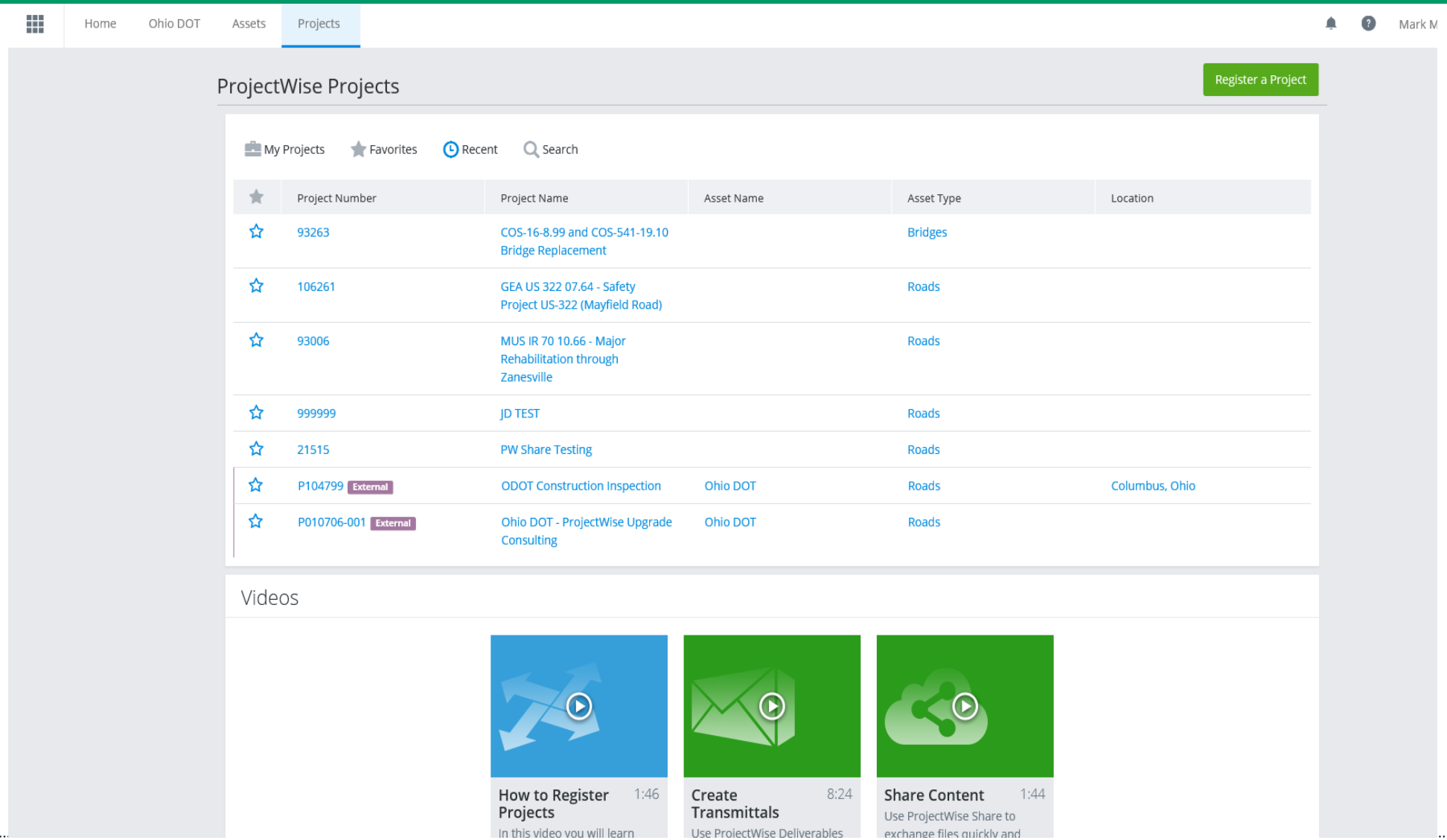

OHIO DEPARTMENT OF TRANSPORTATION

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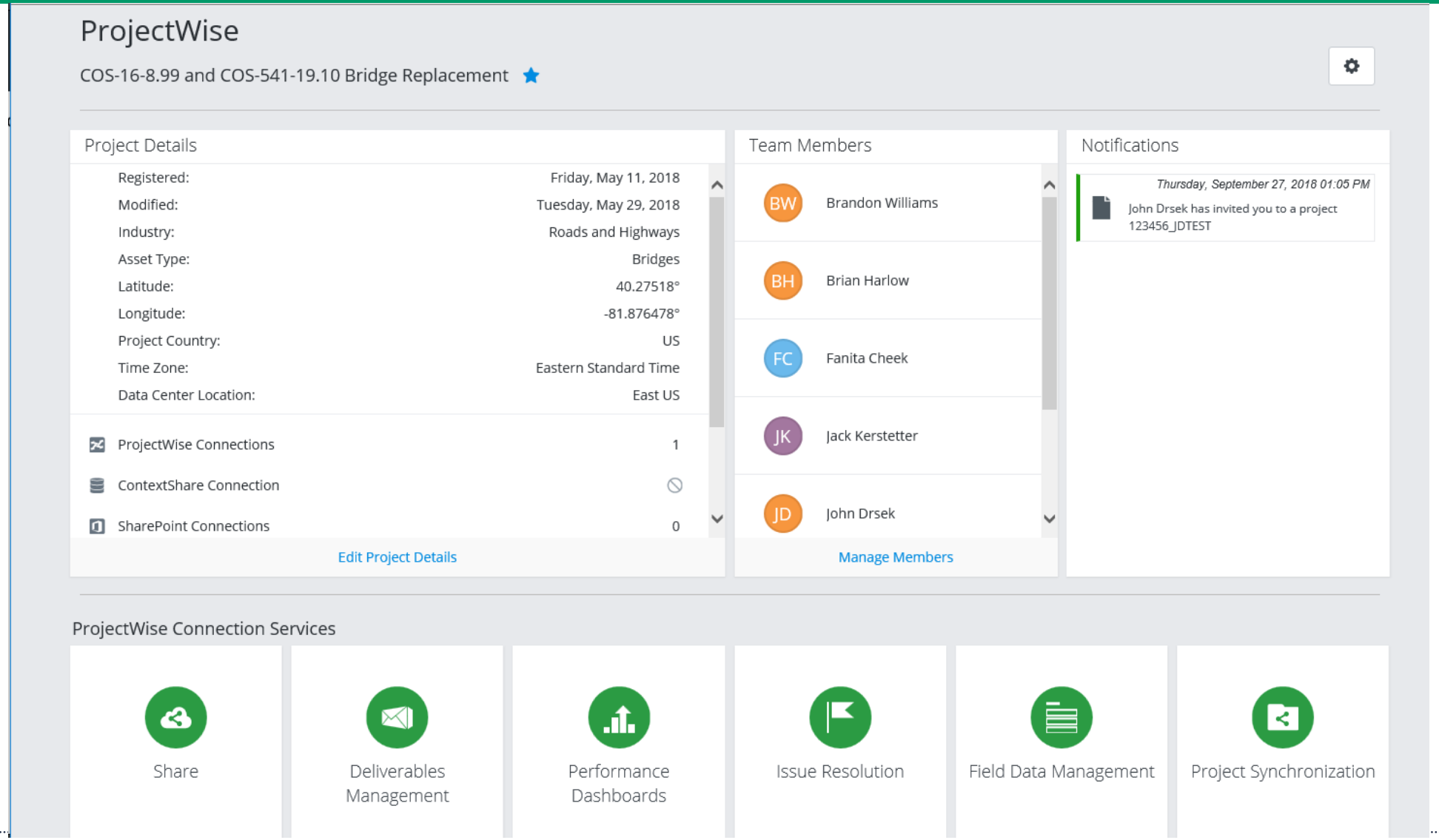

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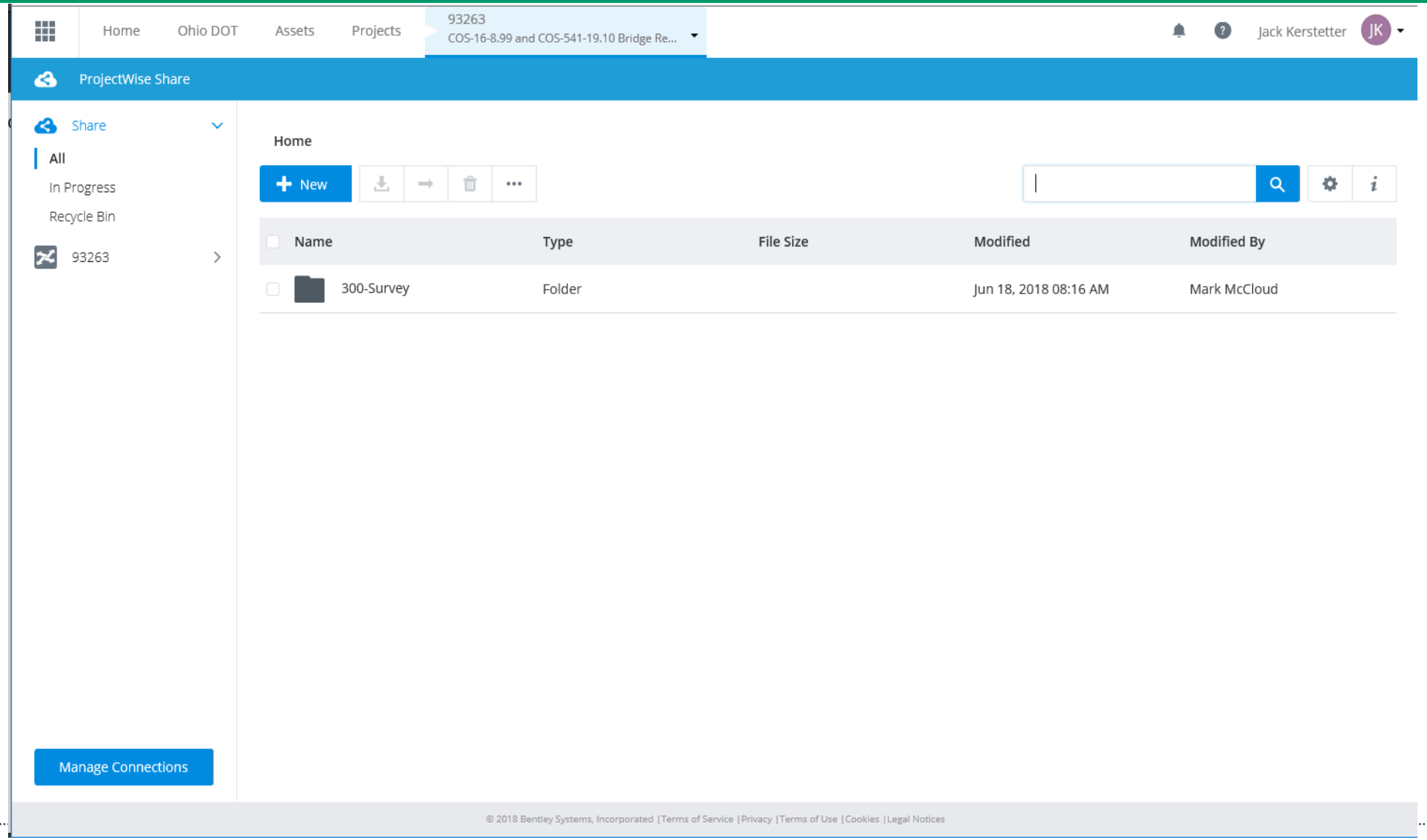

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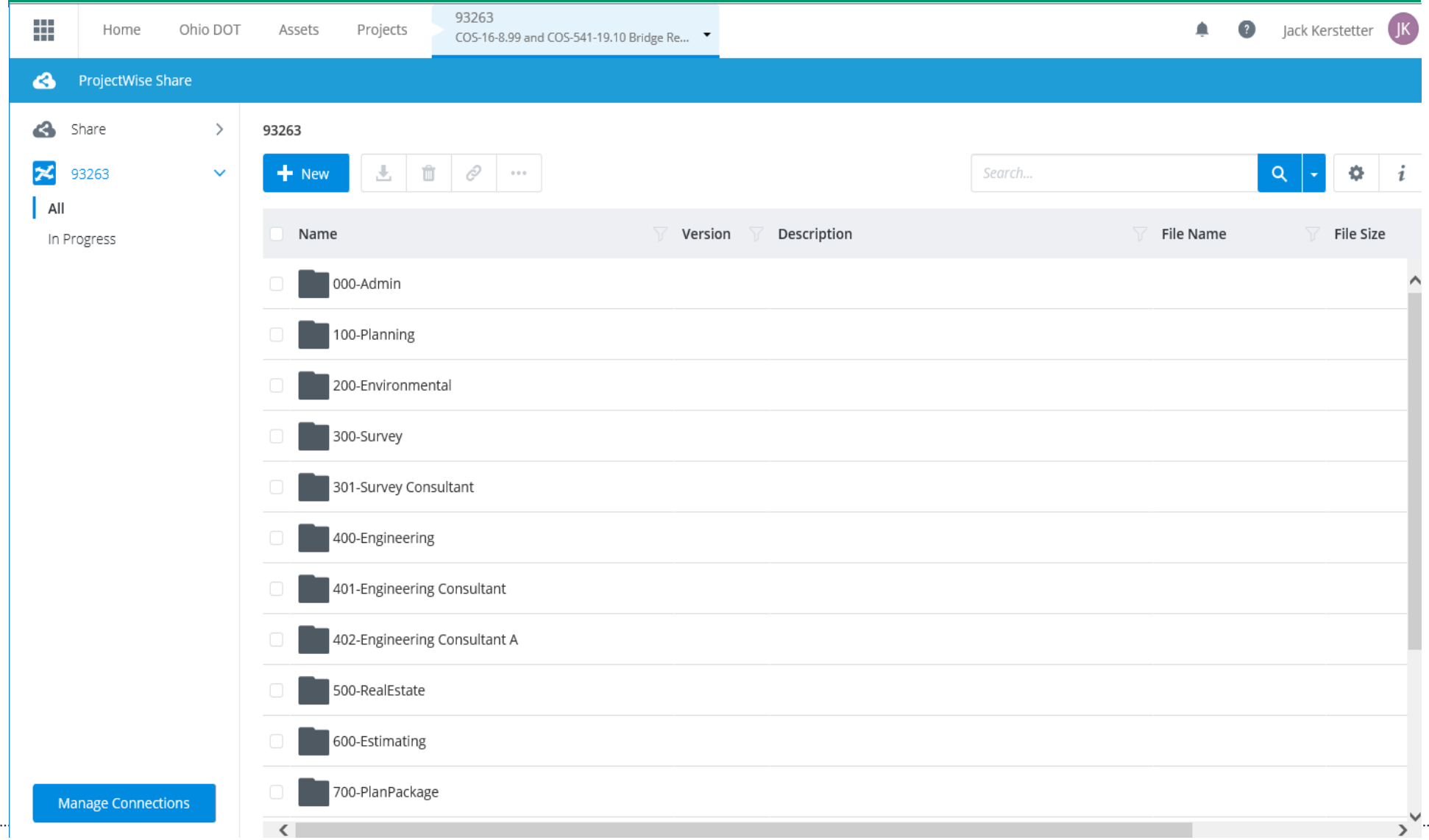
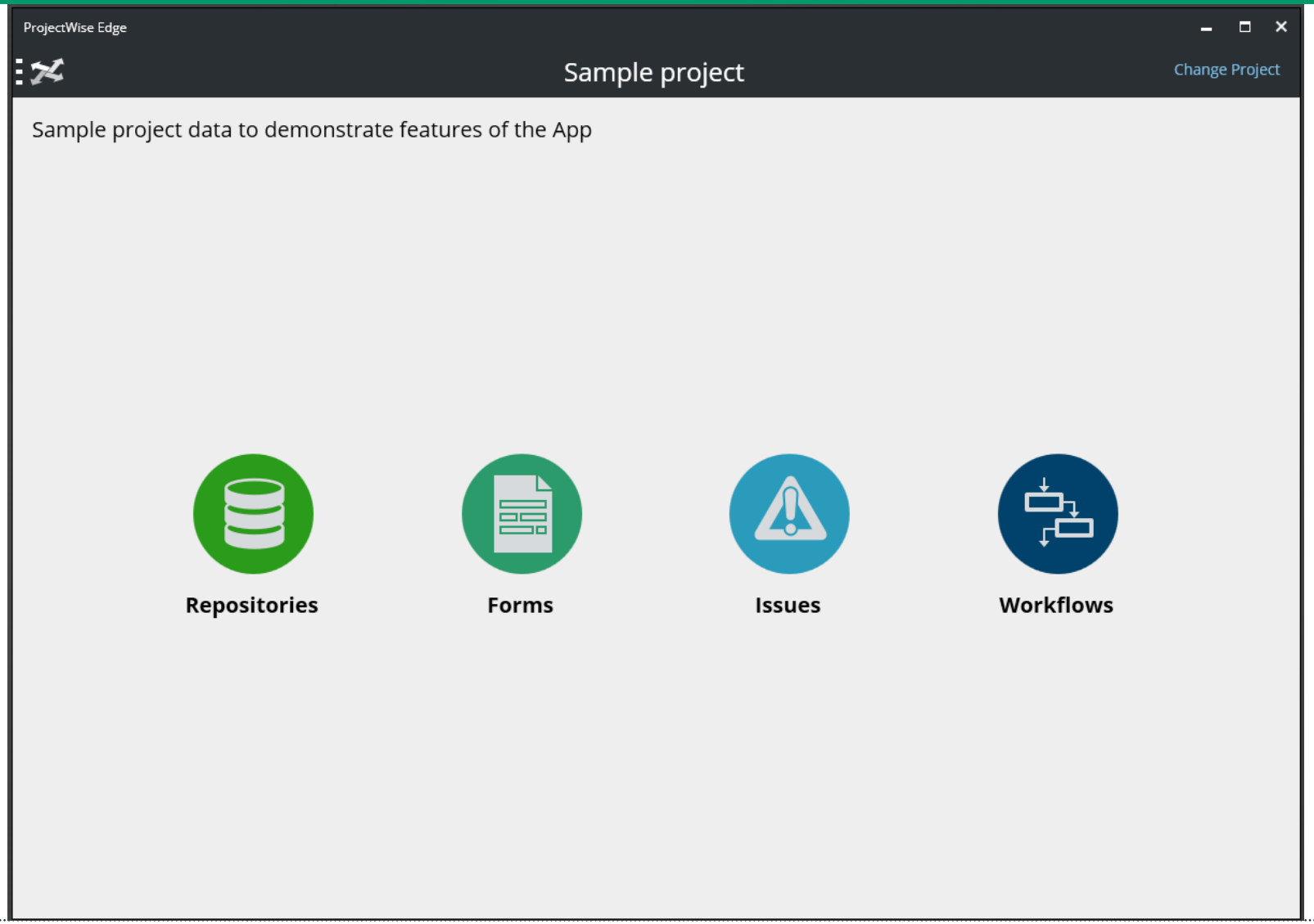


PROJECTWISE EDGE



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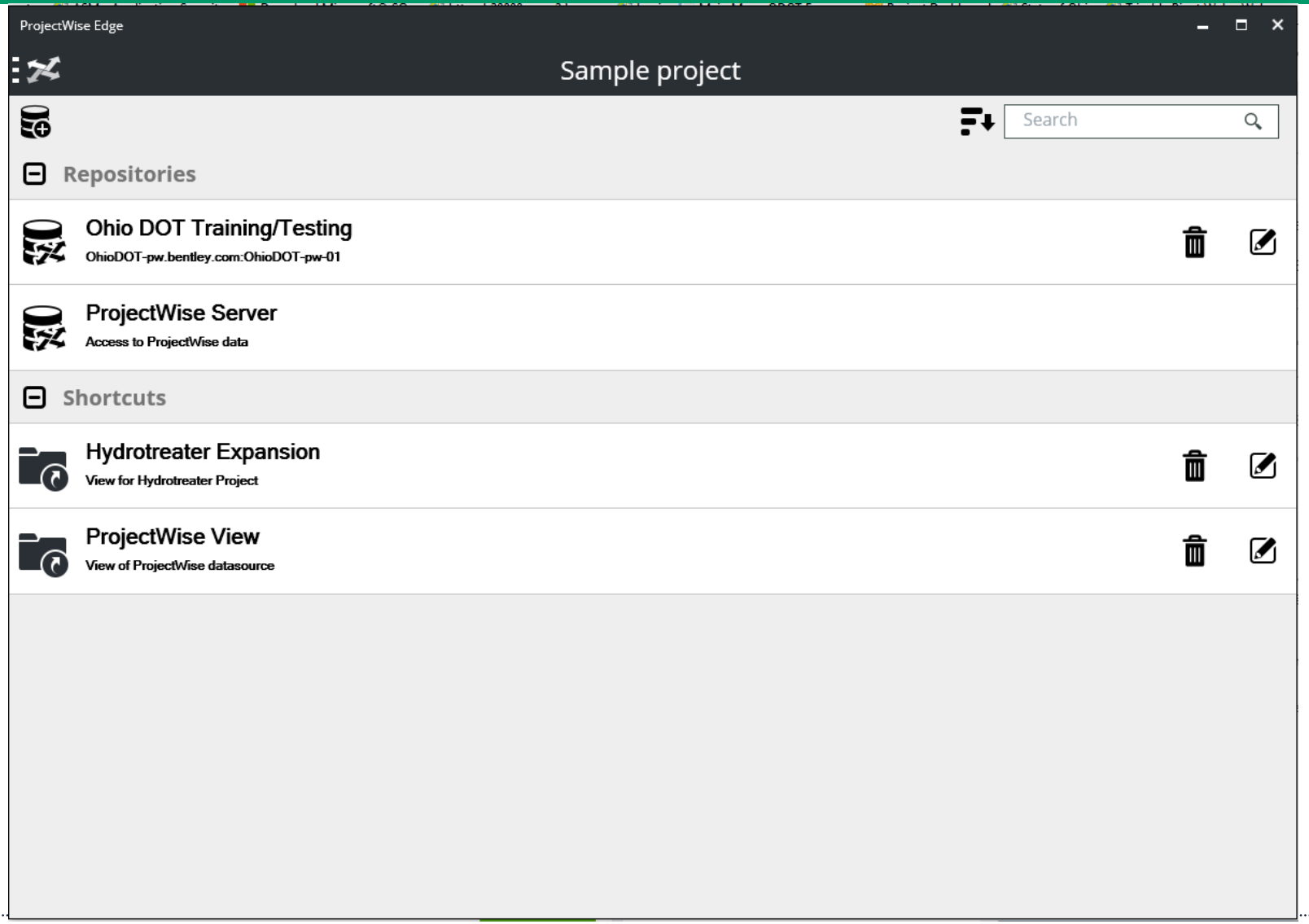
PROJECTWISE EDGE



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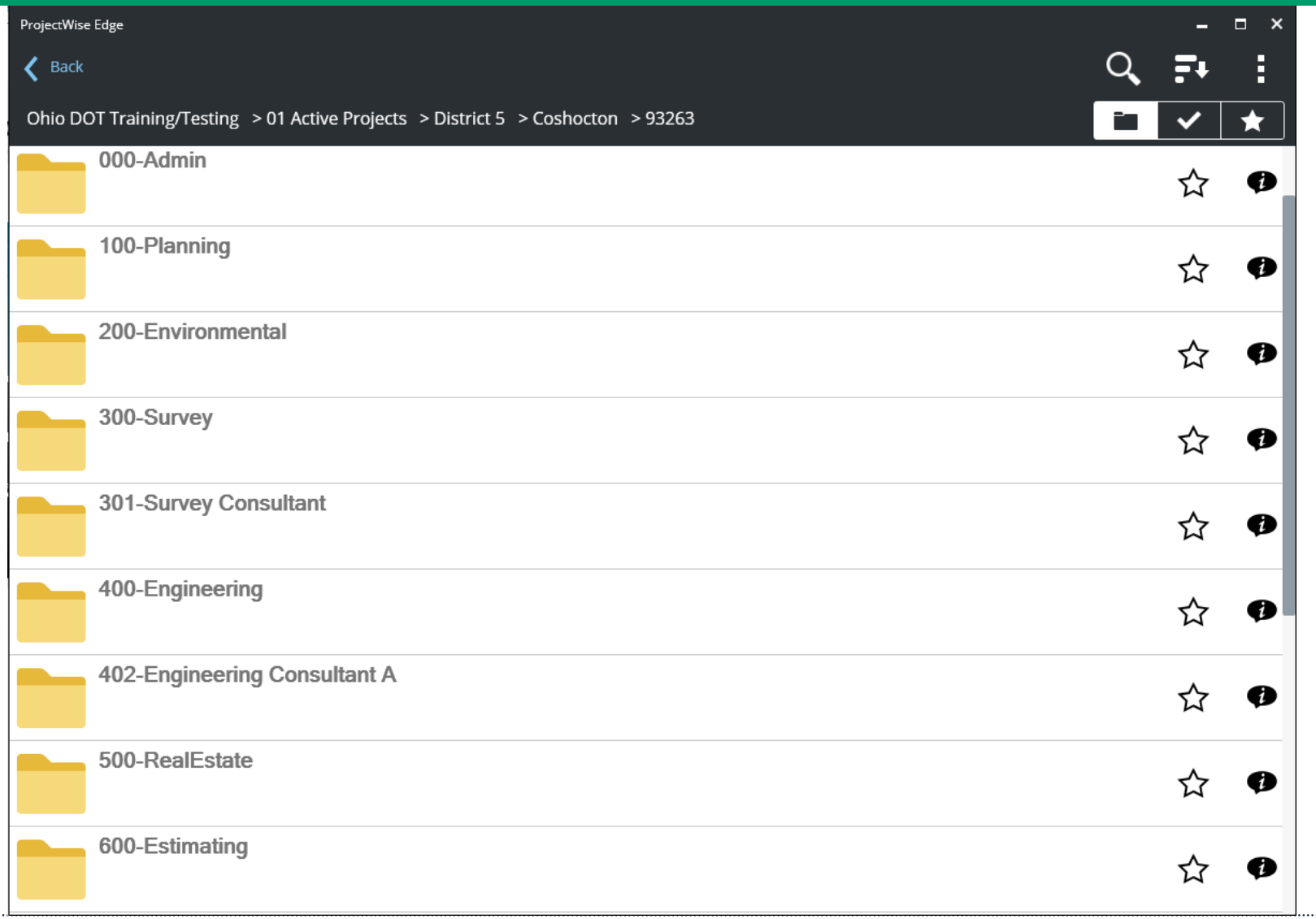
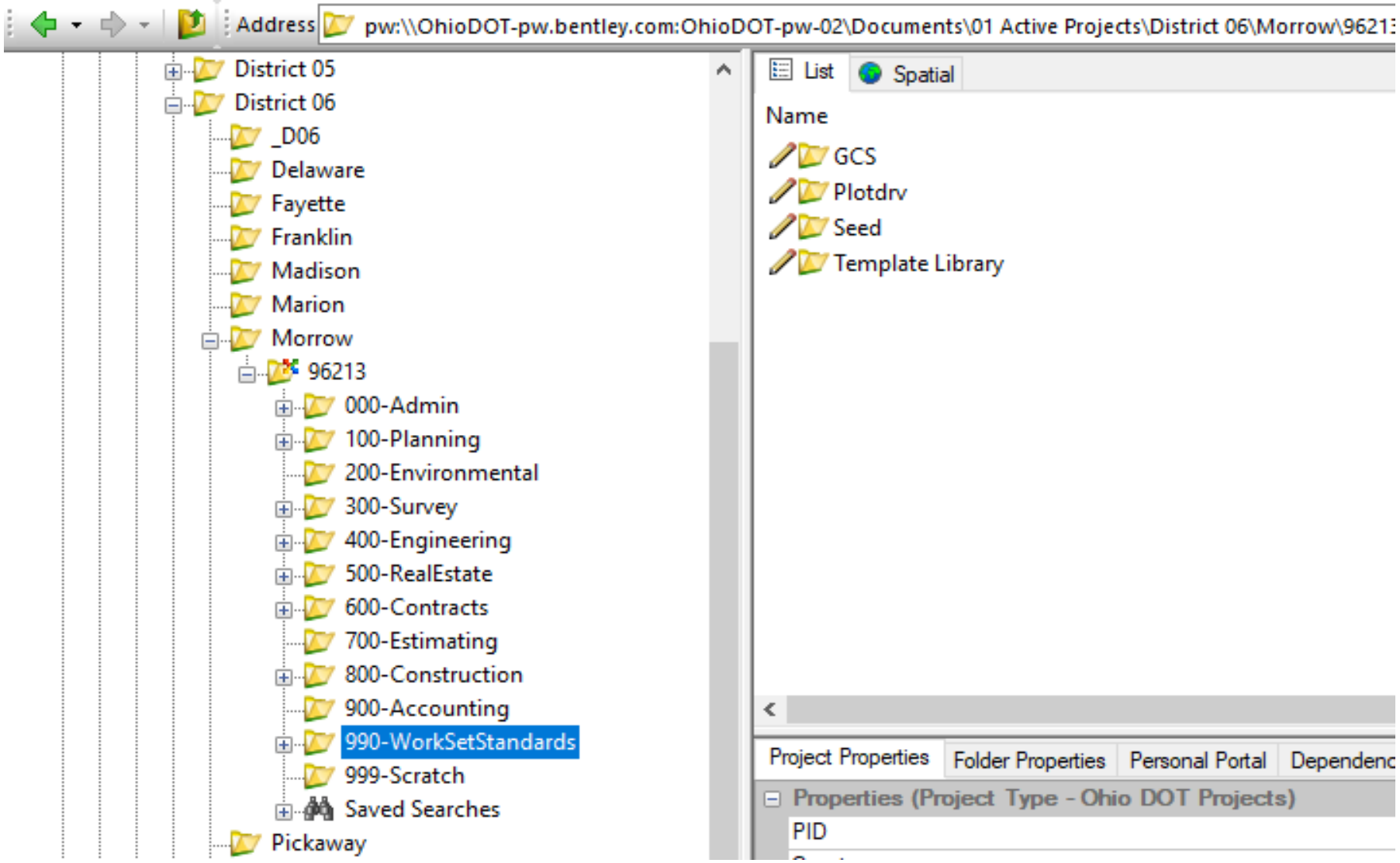
PROJECTWISE EDGE

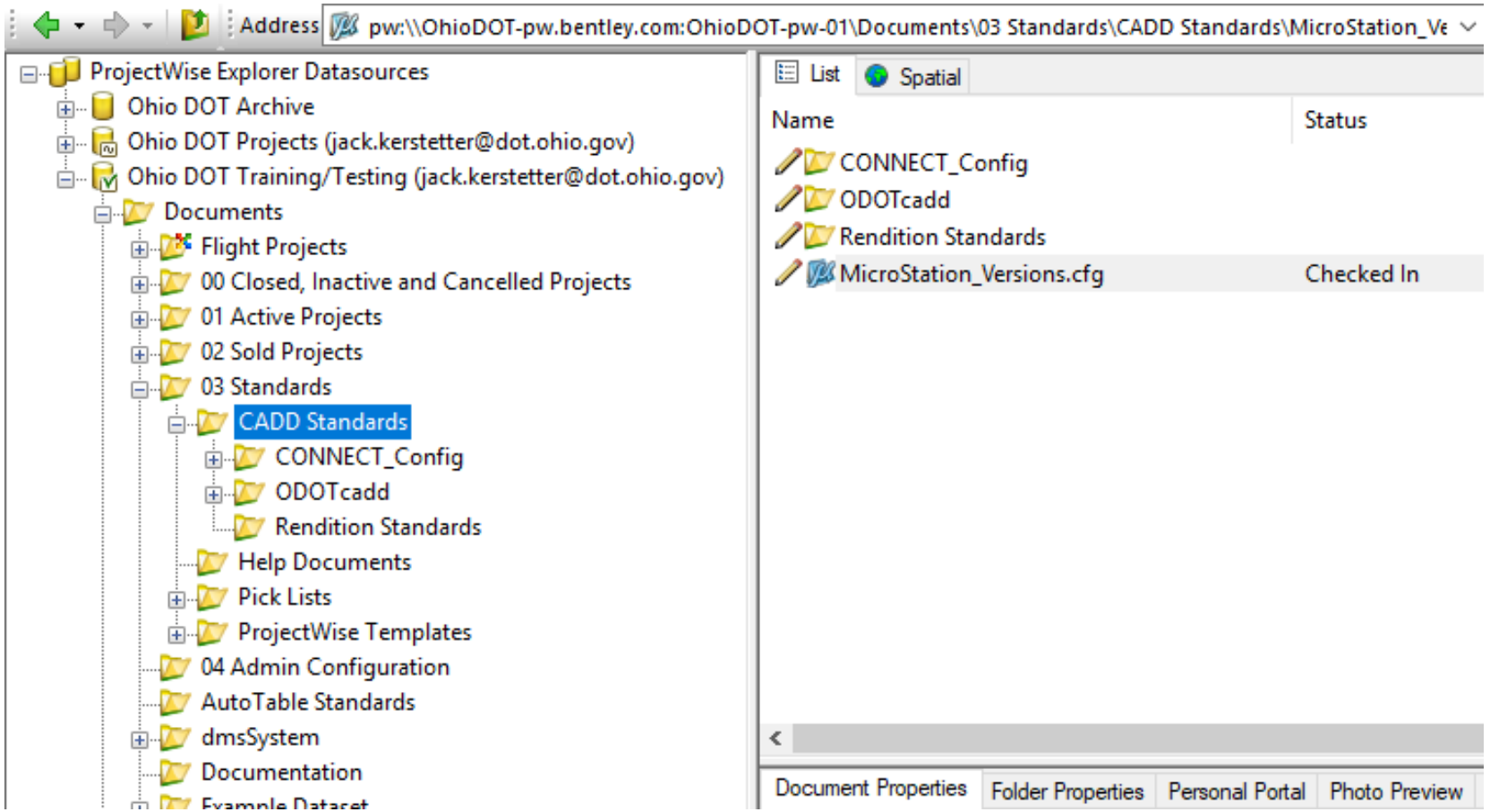


OHIO DEPARTMENT OF TRANSPORTATION

PROJECTWISE CONFIG



PROJECTWISE CONFIG



PROJECTWISE CONFIG

```
#       CSB Block                                                       Level           Variable
#       Load OhioDOT MicroStation Configuration Pre-defined     _OhioDOT_CONFIGURATION_ROOT
#
##########################################################################################################

# If user is running MicroStation CE, use the WorkSpace Level to load OhioDOT standards
# MicroStation will load all CFG files in _USTN_ORGANIZATION during %level Organization
%if defined (_VERSION_10_0)
        OHIODOT_MICROSTATION_CONFIGURATION_TYPE = CONNECT Edition
        _USTN_CONFIGURATION = $(_OhioDOT_CONFIGURATION_ROOT)CONNECT_Config/
        %lock _USTN_CONFIGURATION

        # Set WorkSpace Name to OhioDOTCEv01 and lock it
        _USTN_WORKSPACENAME = OHDOTCEv01
        # %lock _USTN_WORKSPACENAME

# If user is running MicroStation V8i, set the appropriate variables to load OhioDOT CADD standards.
# Configure variables needed to be in place before running z_ODOT_redirect.cfg at the system level
%elif defined (_VERSION_8_11)
        OHIODOT_MICROSTATION_CONFIGURATION_TYPE = V8i

        # Set the location in ProjectWise for this workspace
        _OHIODOT_PW_WORKSPACEPATH = $(_OhioDOT_CONFIGURATION_ROOT)ODOTcadd/
```

QUESTIONS

QUESTIONS

- When do we get to use ProjectWise?
- How do we get ODOT's Managed Workspace?
- How do I deliver a ProjectWise project?
-