MODEL CENTRIC ROADWAY DESIGN AND DELIVERY

Connecticut Department of Transportation
Guidelines for Electronic Engineering Data Delivery
2016

Connecticut Department of Transportation

AGENDA

AM Session 8:30 to 12:00
8:30 to 9:00 - Introduction Milestones Initiatives Phased Approach
9:00 to 9:45 – Review of CTDOT CAD Standards, with Q & A
9:45 to 10:00 Break
10:00 to 10:45 - Phase 1 & 2 Submittal Requirements
10:45 to 11:30 - Q & A
11:30 to 12:00 - Phase 3 –3D Model Centric Design (OpenRoads Technology)

PURPOSE

The purpose of this open house is to:

- Provide a review of the current CAD Standards and procedures
- Share strategy for submittal of Electronic Engineering Data (EED)
- Collaboration - Get feedback, comments and concerns

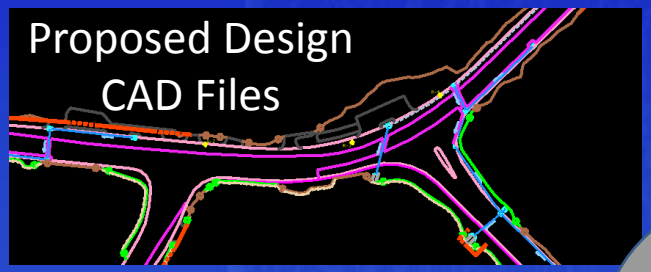
Manual
Standards to promote consistent, uniform, and useable deliverables

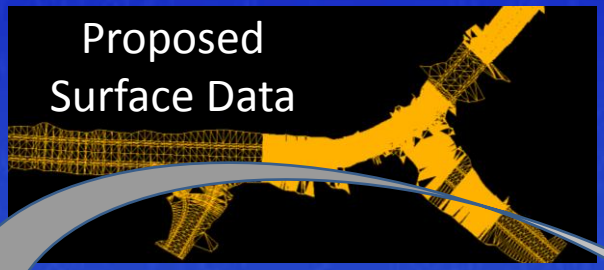
Check Lists (QA/QC)
Projects delivered in a consistent manner following best practices & industry standards

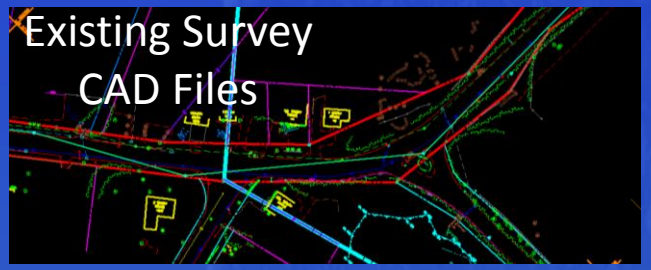
CTDOT Policies & Directives
In house designers and consultant engineers must conform

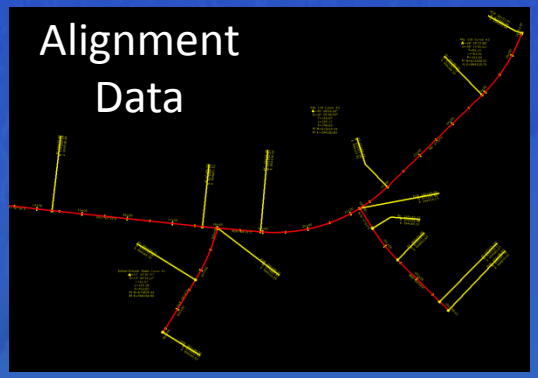
INTRODUCTION

What are common Electronic Engineering Data (EED) Submittal Types?









ProjectWise

INTRODUCTION

Continued

EED is directly related to the FHWA Accelerating Innovation, Every Day Counts Initiatives

EDC-2 3D Engineered Models for Construction

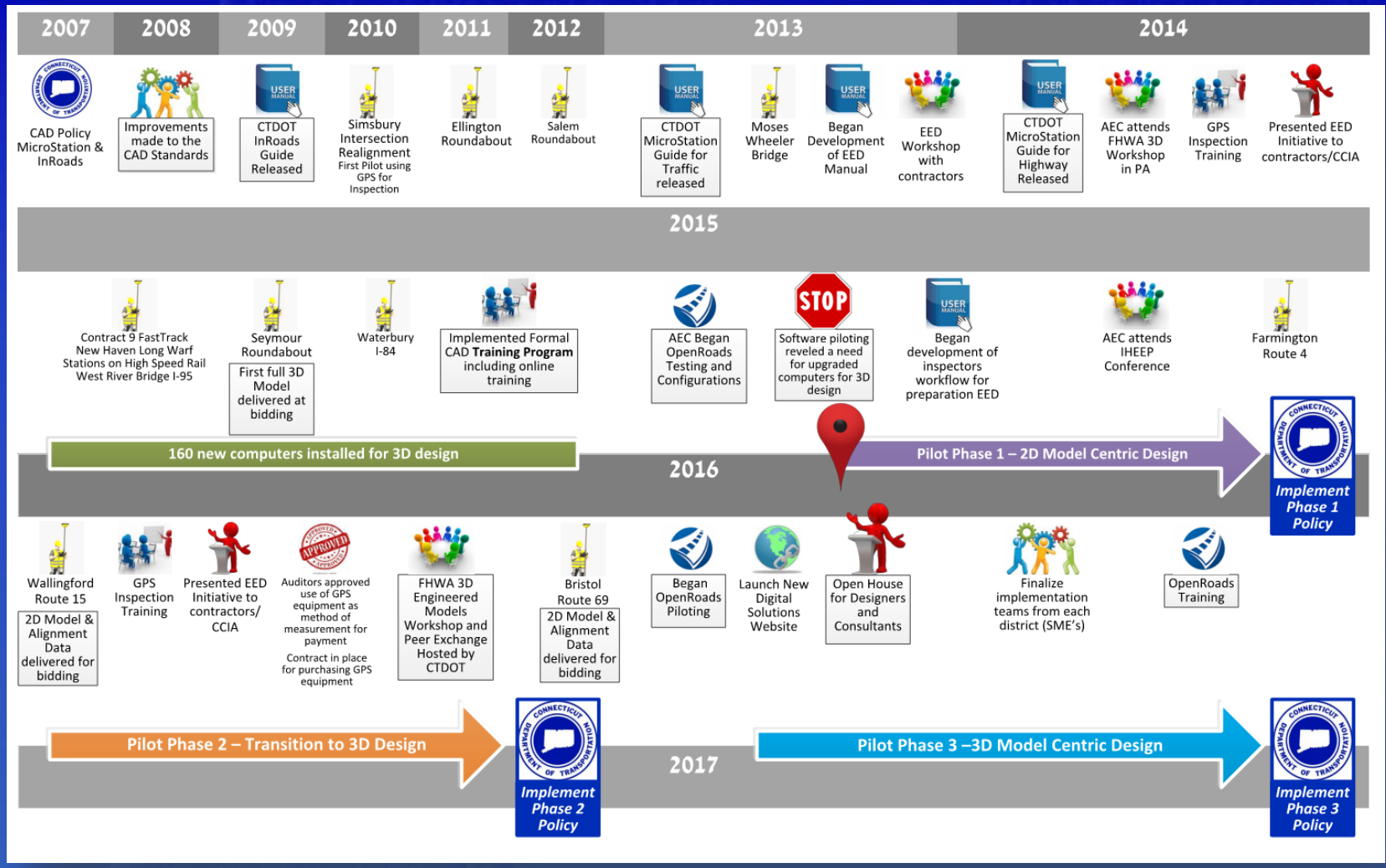
"Using 3D engineered models allows for faster, more accurate and more efficient planning and construction of transportation projects. EDC-2 encouraged a transition from traditional two-dimensional design to 3D modeling as a strategy for shortening project delivery and improving quality and safety on the construction site."

EDC-3 3D Engineered Models: Schedule, Cost and Post-Construction

"Using 3D engineered models enables the highway community to effectively connect a project's design and construction phases. EDC-3 promotes the expansion of 3D applications to manage roadway inventory and assets, improve schedule and cost management, and create accurate as-built records."

INTRODUCTION

Continued



2013 – 2016
130 Users have received CT DOT CAD Standards training

INTRODUCTION

Continued

Why do we need phases?

Why can't we implement 3D requirements right away?

"Focused Solutions"

Will enable the CAD support group to build users confidence:

1. pushing the need to work geospatially & continue to instill the standard CAD Practices
2. fixing common 3D mistakes
3. focusing on full 3D using OpenRoads technology

CONSTRUCTION INITIATIVES

Contractor:

-Use data for bidding
-Use data for construction layout
-Use 3D model for automated for machine guidance

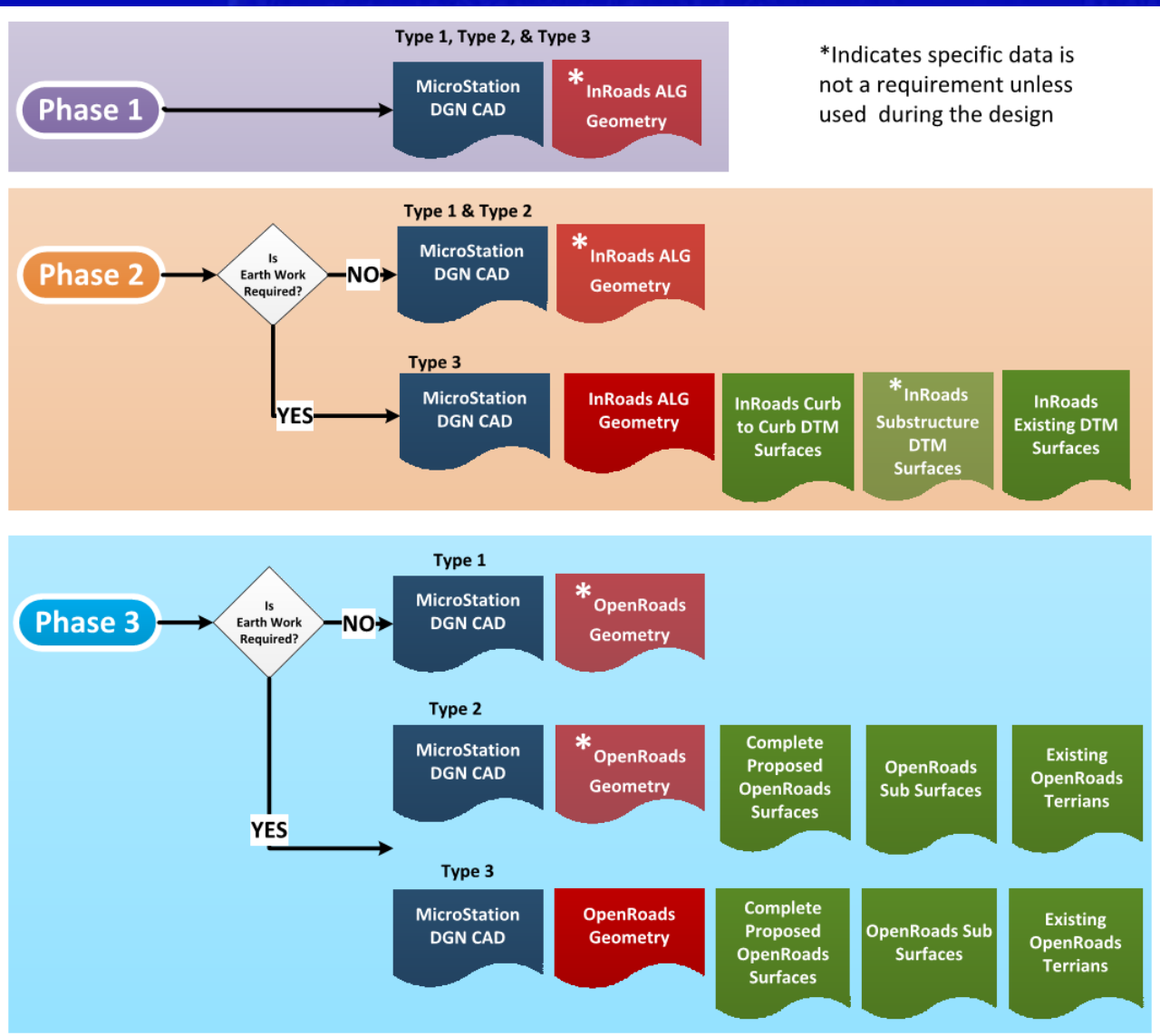
Inspectors:

-Field verification of layout
-Measurement for payments

Future:

-4D Scheduling & Cost
-As-builts
-Assets

EED DELIVERABLES



Example Project Types

Included but not limited to the following:

Type 1

No Earth Work

Milling and Overlay
Traffic Signals
Traffic Signs
Guiderail Improvements

Type 2

Site Earth Work

Facility Construction (Site Work)
Hazardous Waste Removal
Wetland Replacement/Restoration
Retaining Walls/Slope Stabilization

Type 3

Roadway Earth Work

Intersection Improvement
New Interchange
Realignment
Widening

REVIEW OF CTDOT CAD POLICIES

CAD POLICIES

701 COMPLETION OF PLANS

All plans shall be prepared in MicroStation CADD format in accordance with the Department's "CADD Manual."

CONSULTANT DESIGN MANUEL

activities.

- Title Sheet (s)
- Index Plan and Profile Sheet(s)
- Detailed Estimate Sheet(s)
- Typical Cross Sections, Miscellaneous Details, Dra
  Intersection Grading Sheet(s)
- Plan Sheet(s)
- Profile Sheet(s)
- Structure Sheet(s)
- Traffic Sheet(s)
- Maintenance and Protection of Traffic Sheet(s)
- Turfing Sheet(s)
- Railroad Sheet(s)
- Sedimentatio
- Cross Sectio
- Utility Sheet(s
- Standard Dra

Each sheet shall show in th
year in which the project is to be
the highway. An electronic plan border reference file is available from the
Sheets shall be numbered consecutively in the approximate order
the plan sheet immediately succeeded by the profile sheet of correspond

700-2

POLICY STATEMENT

POL
Mar

SUBJECT: Computer Aided Design, Survey, and Roadway Des

It is the policy of this Department to adopt the following softwar
Aided Design, Survey, and Roadway Design related business:

CAD (Computer Aided Design) .....Bentley Microstation
Survey and Roadway Design .....Bentley InRoads

POLICY STATEMENT

Note: This policy only represents Computer Aided Design, Sur
formats. The Department has additional required softwa
disciplines that can be found in the discipline specific De
Department's Internet Site.

Current acceptable versions of the Computer Aided Desi
Design file formats can be found at www.ct.gov/dot/digi

Ralph J. Ca
COMMISS

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

memorandum

subject: Contract Plan CAD Standards
Office of Engineering

date: April 3, 2007

to: Mr. Thomas A. Harley
Mr. John F. Carey
Mr. Joseph J. Obara
Manager of State Design

from: James H. Norman
Acting Engineering Administrator
Bureau of Engineering and
Highway Operations

As part of the effort to standardize the Department's contract plans, the Office of Engineering is issuing a CTDOT CAD Standard for all projects initiated after June 1, 2007.

The new CTDOT CAD Standards will result in uniform, professional contract documents. Such plans will facilitate communications with other engineers, contractors, and stake holders. Delivering and maintaining one CAD Standard promotes efficiency and will help streamline requirements for the consultant community.

Along with the new CTDOT CAD Standards, there will be a change in Contract Drawing Size. The CTDOT CAD Standard will be an "ANSI D" (34"x22") size. The change in size will allow half scale prints to be printed on 11"x17" paper. The CTDOT Standard borders will be

Please inform all personnel that projects initiated after June 1, 2007 are to be developed using the CTDOT CAD Standards. Users may change existing projects to use the new standards with the approval of the prime designer.

MEMORANDUM

styles, new seed files for the "ANSI D" sheet size, along with a new project folder template. Representatives from Engineering Applications will be scheduling a meeting with the discipline representatives for help with any migration of discipline standard CAD drawings, details, cells and bar menus. This standard will be available for consultant engineers on our internet site at http://www.ct.gov/dot/digitaldesign after May 16, 2007.

Please see the attachment for the CTDOT CAD Standards. Also attached is a copy of the recently issued ConnDOT Policy No. F&A-24 regarding Computer Aided Design, Survey and Roadway Design Software File Formats.

Connecticut Depa

CAD POLICIES

Current CAD Standards
The SELECTSeries Digital Design Environment

Supported by AEC Applications

CTDOT Employees

Getting Started
February 2016

Common Solutions

Consultant Engineers

Step by Step Instructions for Installing the CTDOT DDE
Version 3

DOWNLOAD

Summary of Updates
2015
2014

CTDOT Guides

MicroStation for Highway Design
Version 2

MicroStation for Traffic Engineers
Version 7

InRoads Guide for Designers
Version 6

InRoads Guide for Surveyors
Version 7

Miscellaneous Workflows

USGS Permit Plates
February 2014

Project Explorer & Managing Drawing No.
October 2011

Data Acquisition Tools
March 2011

StormCAD SS5 for MicroStation
Version 2

InRoads Survey for Designers
October 2015

InRoads Export to HEC-RAS
August 2014

Earth Exploration Toolset

Software Requirements:
MicroStation V8i (SELECTseries 3) Version 08.11.09.459
BlueBeam Revu or Extreme Version 2015.1
InRoads V8i (SELECTseries 2) Version 8.11.07.615
*This Workspace is **not** configured to work with OpenRoads.*

What is the DDE?
The DDE (Digital Design Environment) is a compilation of electronic files that configure a client or network of client computers to conform to CTDOT's CAD Standards (DDE is configured for Bentley Products). The DDE customizes users' commercial-off-the-shelf (COTS) CAD software installation without compromising previous configurations or standards that they may have for other clients. These standards allow the Department to continue developing on its existing digital contract plans and specification submission process, and progress toward a fully digital project. In addition, with standardized digital contract plans the Department is also able to implement electronic bidding of digitally signed electronic bid packages. A full manual for the SELECTseries DDE has not been written but workflows and guides applicable to the SELECTseries DDE are available at the bottom of this page. The Digital Design Environment Guide that was published with the previous released environment (CTDOT - 2007 Digital Design Environment) may also be a helpful reference.

CAD Environment Set-Up for Consultant Engineers:
The step by step workflow was written to instruct consultant engineers, municipalities and any other private parties on how set up the Connecticut Department of Transportation CAD Environment. Instructions also include installation procedures for MicroStation & InRoads. CTDOT employees wishing to set up for home use can use this workflow as well. This is the download .zip file that contains CTDOT's Projects and Workspaces Directories. Within these files also contains all the necessary MicroStation and InRoads Resources (Cells, Level Names etc.).

Who should use the SELECTseries DDE?
As of September 1st, 2011, all CTDOT Consultant Engineering design assignments shall use the SELECTseries DDE with MicroStation and InRoads (see Policy No. PE-4-04 "Computer Aided Design, Survey and Roadway Design Software File Formats" below). Adhering to this requirement shall be included in the general cost of doing business for the CTDOT and shall not be used to seek additional compensation. Consultants working on existing CTDOT projects may migrate from previous Digital Design Environments to the latest SELECTseries DDE (with no additional compensation).

What are the benefits for migrating from the 2007 DDE to the SELECTseries DDE?
-Access all custom cells, levels & Tasks from inside MicroStation regardless of discipline.
-Use all InRoads resources in the CTDOT DDE regardless of discipline.
-Access to the CTDOT Publishing Task
-Access to the Sheet Composition Task to annotation sheets, place border cells.

Has the required project deliverables changed with the SELECTseries DDE?
There will be no change in project deliverables at this time unless requested in writing by the Department. Please refer to The Digital Project Development (DPD) Manual for the current requirements.
The Department reserves the right to request design information at any time during the design process. This information would contain High Value Data (HVD) such as: InRoads DTMs, Alignments, Drainage Databases, and 3D Models in conformance with the DDE. CTDOT is investigating future submission requirements for HVD 3D and 4D models for GPS Machine Control, GPS inspection techniques, and future modeling applications.

CTDOT WEBSITE

304.05 POST-FINAL DESIGN SUBMISSION

Inevitably, revisions to the Final Design Submission will be necessary as a result of the Department's review and processing of final contract documents. When the Department is satisfied with the condition of the contract documents, the Consulting Engineer shall make a Post-Final Design Submission consisting of the following materials:

1. 3 copies of all documents that required revision as a result of the Department's review and processing of final contract documents (except one copy each of original mylars).
2. Electronic CADD files for the entire project in conformance with the Department's "CADD Manual." The Consulting Engineer shall coordinate media type with the Project Engineer to ensure compatibility with Department hardware prior to making this submission.

CONSULTANT DESIGN MANUEL

CAD POLICIES

CSO Solicitation No. 2271
Design Services for Project No. 0015-0373 – Barnum Station
Prequalification Categories - Facilities Design (All Modal Buildings/Vertical Structures) AND Rail Design AND Bridge and Structure Design

FIRMS WHO ARE ELIGIBLE TO SUBMIT WILL RECEIVE THIS LETTER IN THE MAIL.

IT IS BEING POSTED HERE FOR INFORMATION ONLY.

The Connecticut Department of Transportation (Department) is seeking to engage one (1) prequalified consultant engineering firm, in the categories listed above, to provide engineering services associated with the design of a new railroad station, several railroad bridges and associated railroad infrastructure improvements in the City of Bridgeport (City). This project, often referred to as the "Barnum Station," received a TIGER VII grant from the Federal Transit Administration in the fall of 2015. Both AMTRAK and Metro North Railroad are expected to service this station.

The selected firm will be required to provide preliminary design, design development, final design and design services during construction. It is anticipated the scope of the work will be performed in phases. The first phase of the effort will involve the design and construction of new retaining walls and three railroad bridges to support the track bed which will be widened to accommodate center island platforms for passenger loading. A subsequent second phase of the effort will involve design of cross track pedestrian access as well as vertical circulation from grade to platforms. Separate construction contracts will be pursued for the two phases. A public involvement program will be required, along with coordination with Department and City staff, to ensure design initiatives in the vicinity of the station are compatible with the temporary construction conditions and final configuration of the developed site.

The selected firm must provide all electronic design data (i.e., Ground files, Design files, Digital Terrain Models [surfaces], Alignments, Contract Plans, and/or all other Electronic Engineering Data) in Bentley Systems, Inc. MicroStation V8i (SELECT series 3) and InRoads Suite V8i (SELECT series 2) formats. Submissions will also be required to comply with the Department's Digital Design Environment and the Digital Project Development Manual (http://www.ct.gov/dot/cwp/view.asp?a=3194&q=483668).

Example Solicitation for Consultant Services

multiphase contract, and will utilize either a lump-sum or cost plus-fixed fee payment method.

If your firm would like to be considered for this assignment, your submittal should consist of a letter-of-interest limited to one (1) page, a Department Form CSO 255 (Revised January 2016) and a maximum of five (5) resumes which are limited to two (2) pages each. One of the resumes must be that of the proposed Project Manager in charge of the work, as well as the assurance that he/she will be available for work when required. (The CSO 255 form can be found online at www.ct.gov/dot/business/consultant/selection.) **Four (4) copies of the submittal are required and they must be either postmarked or hand-delivered by 3:00 p.m. on July 14, 2016.** Firms, who are shortlisted based on their CSO 255 submittal, will be notified by the Consultant Selection Office of the time and date for their final selection interview. A final selection is anticipated by September 30, 2016.

REVIEW OF CTDOT CAD STANDARDS

- Benefits
- Useful Resources
- Customized CTDOT MicroStation Workspace
- MicroStation File Types
- Tips for Improvement

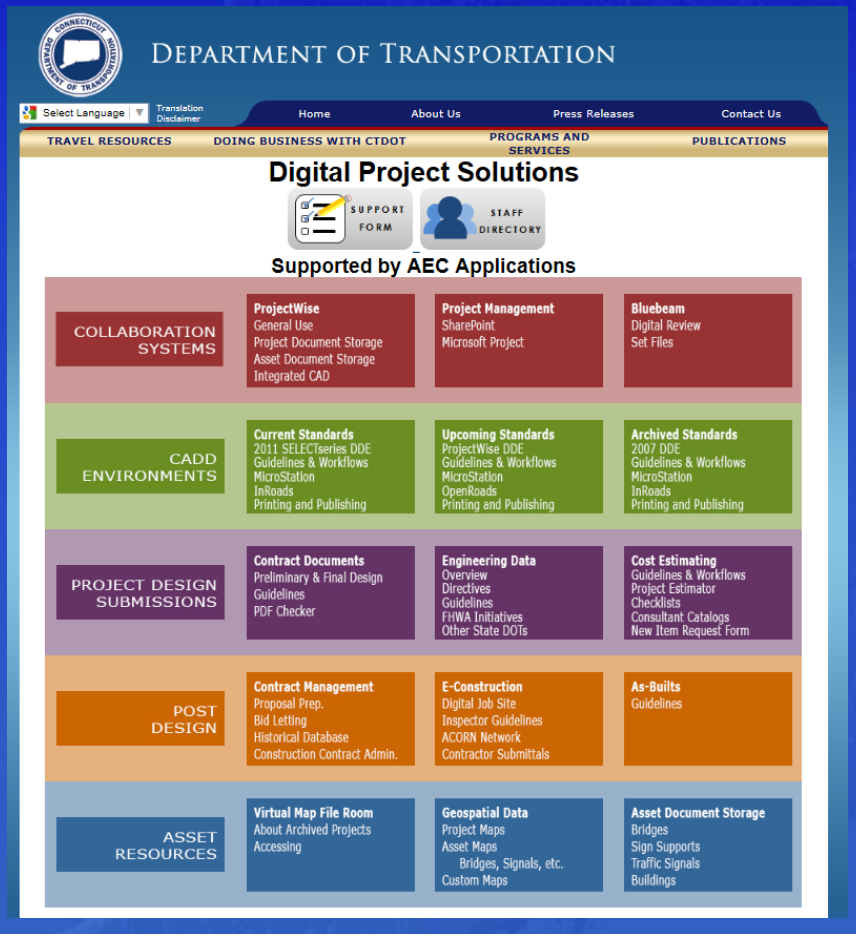
BENEFITS

Following standard CAD practices will

- Ensure consistency throughout the Department (both in-house & consultant engineers)
- Improved productivity
  - Enhancing coordination between design disciplines
  - Ensuring all parts tie together (roadway, structures, & traffic signals)
- Reduce errors
  - Lessing the need for construction change orders
  - improving permitting and ROW coordination
- Improve estimates

RESOURCES

CTDOT Webpages



[*Digital Project Solutions*]

[*SELECTSeries*]

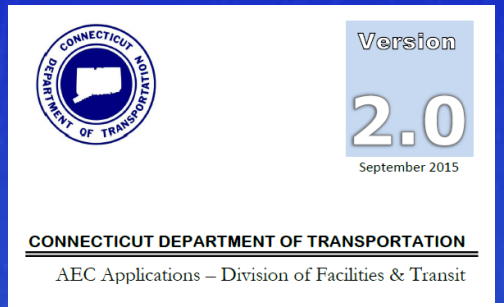
Connecticut Department of Transportation

RESOURCES

Continued

CTDOT MicroStation Guides & Classes

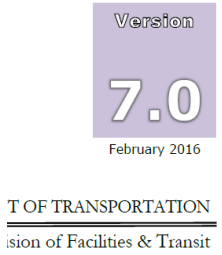
Prerequisite
Bentley Training Class
MicroStation V8i Essentials



File Storage Locations
The CTDOT level structure
Customized discipline tasks & tools
Placing design features
Annotation & Dimensioning
Creating geospatial cut sheet
What belongs in a Design vs a Sheet Model
Creating detail sheets

90 Pages - Issued 2014

CTDOT
MicroStation V8i Guide
for Highway Designers



62 Pages - Issued 2013

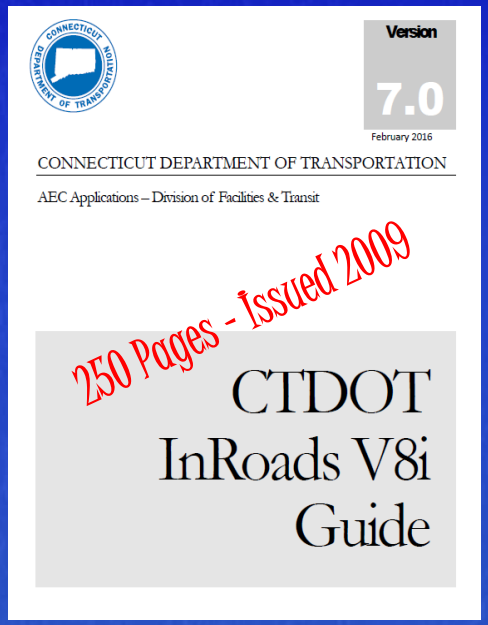
CTDOT
MicroStation V8i Guide
for Traffic Design

RESOURCES

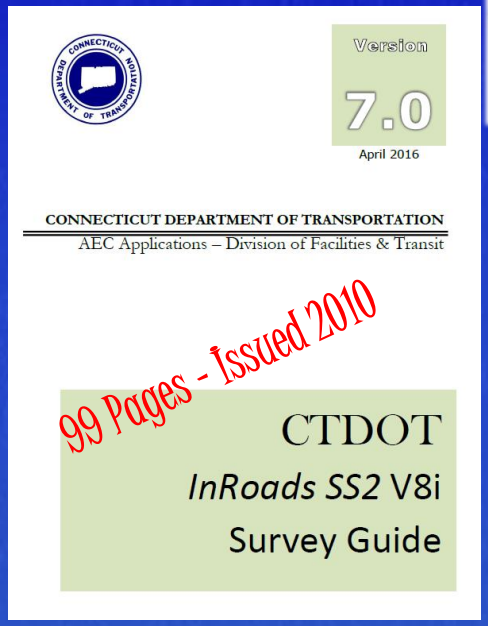
CTDOT InRoads Guides & Classes

Continued

Prerequisite
Bentley Training Classes
MicroStation V8i Essentials
Road Fundamentals



Project Start up
Creating Alignments
Using the CTDOT Template Library
Superelevation
Roadway Modeler
Plan & Profile Generator
Creating Cross sections
Using Storm & Sanitary

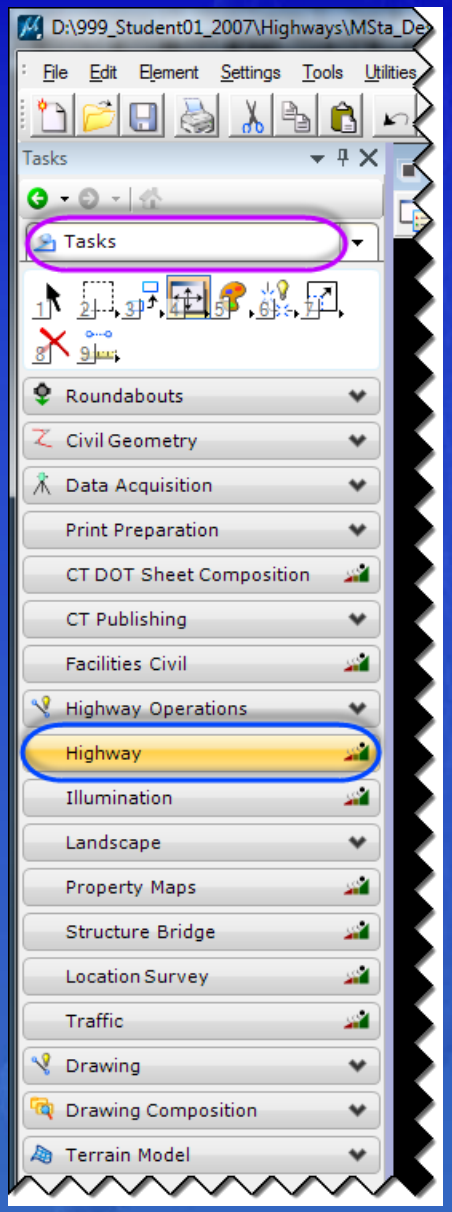


Project Start up
Importing Survey Data
Editing the fieldbook
Surface editing
Creating Alignments
Creating Cross sections

Connecticut Department of Transportation

RESOURCES

Continued



CTDOT Customized Tasks & Tools

A **Task** comprises a MS command with the correct symbology for a pay item/feature

Tasks are used to:

- Ease coherence with CTDOT Standards
- Simplify drafting, annotation, & dimensioning
- Promotes the ease of putting features on the correct levels
- Promotes the ease of using standard text sizes and fonts

RESOURCES

Continued

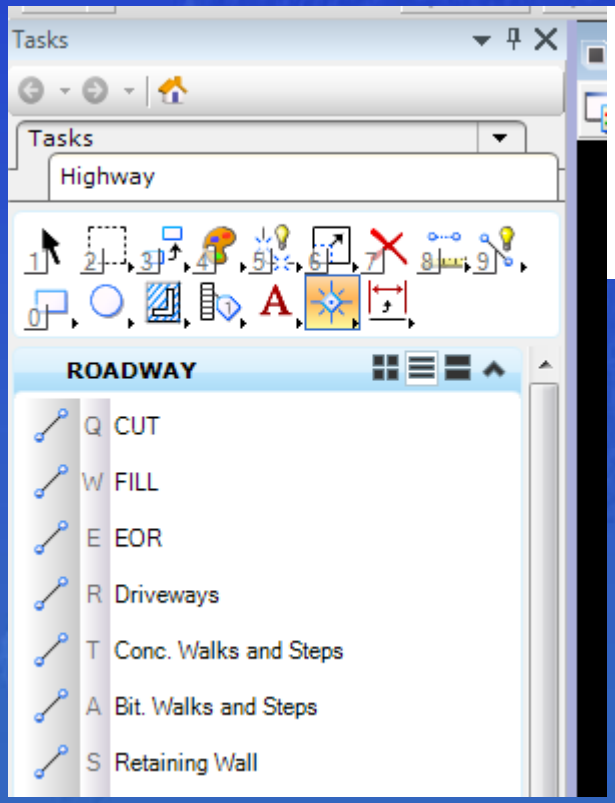
CTDOT Customized Tasks & Tools

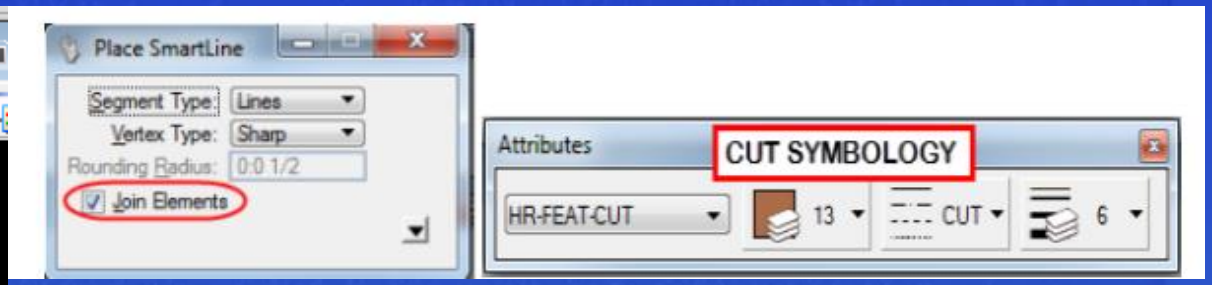
Roadway Task – CUT

Invokes the Place SmartLine command

Sets the CUT Level Active

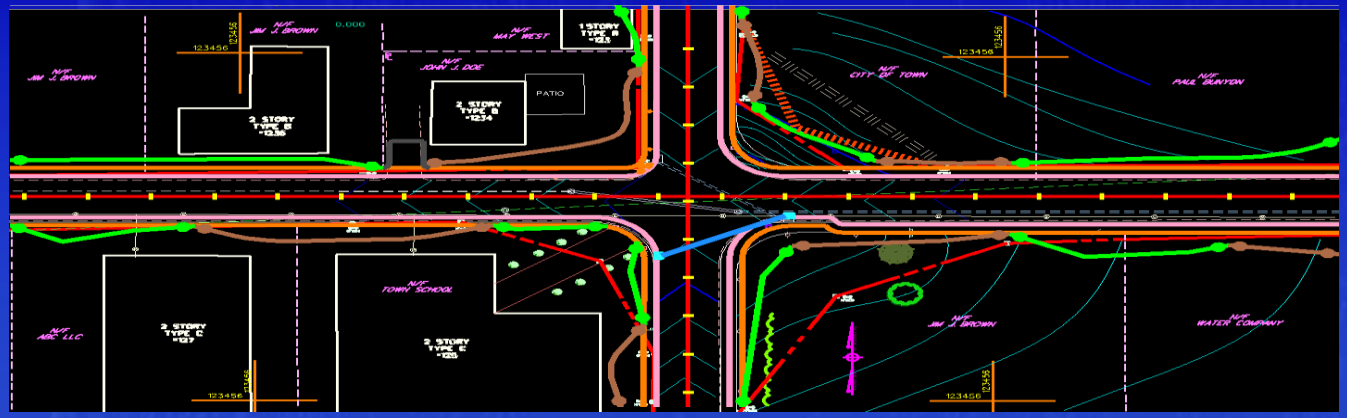
Activates the Template Symbology for a Cut Slope Limit



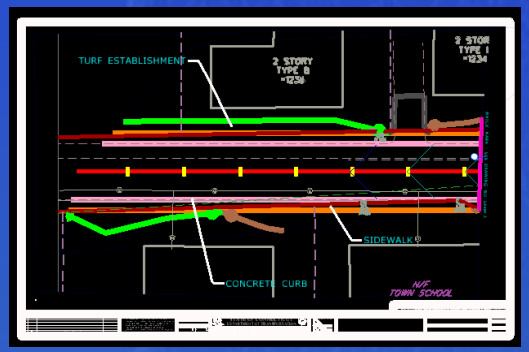


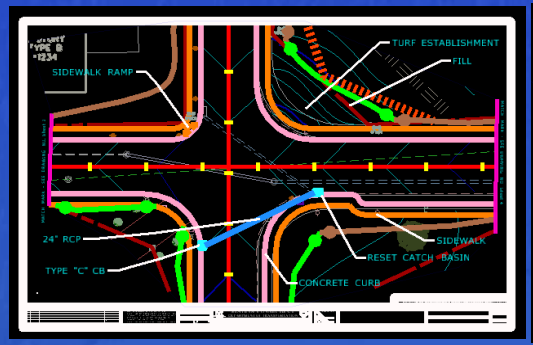
ONE TASK

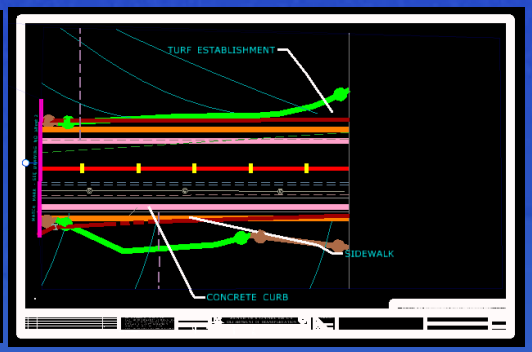
Proper CAD Model Types and Usage



Design Model w/ Survey Referenced







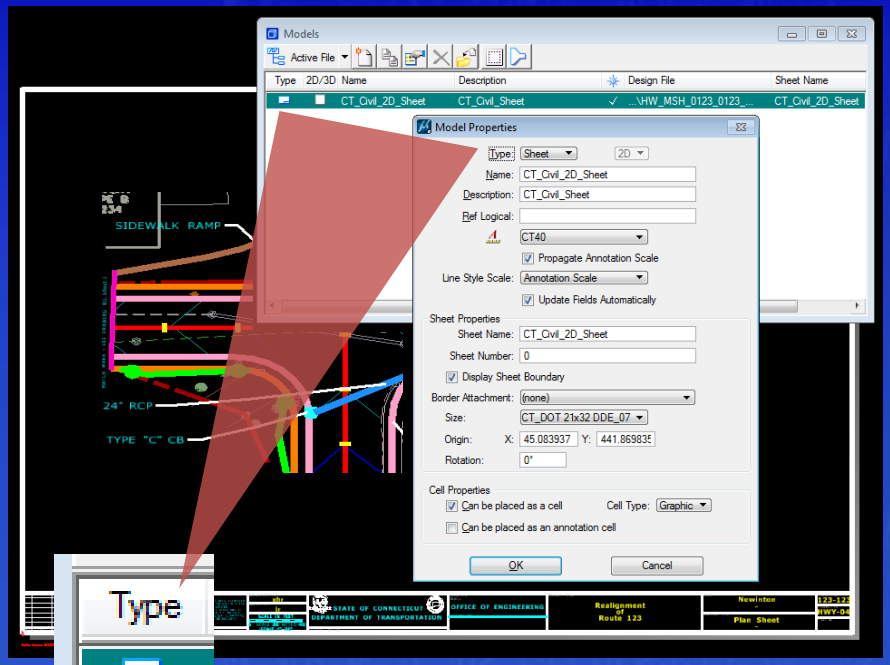
Sheet Models

Contain Border Cell & Call-Outs

The Design & Survey is referenced into the sheet

Proper CAD Model Types and Usage

Continued



Sheet Models

Transient Shape for publishing PDFs & plotting

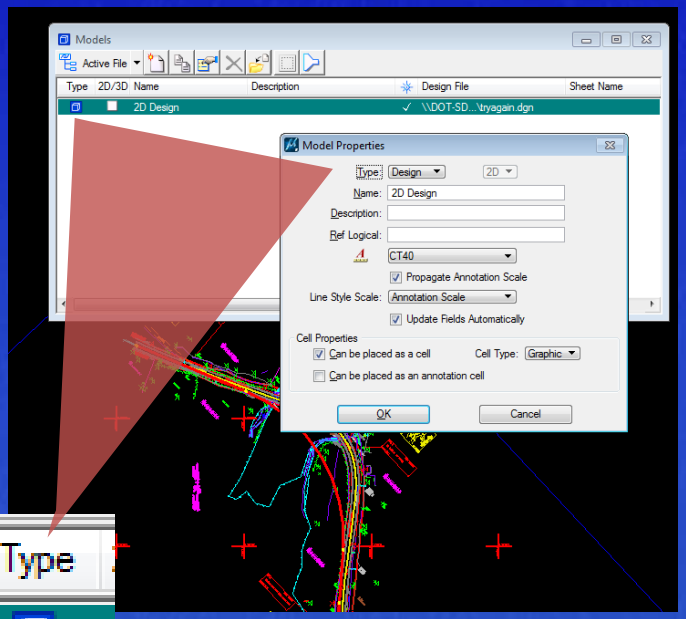
Does not display in print, MicroStation recognizes the shape so users do not have to place a fence.

Geospatially Located Sheet File

Used for plan view sheets – contains only annotation

Detail Sheet Fill

Used for typical sections, miscellaneous details – non-geospatial

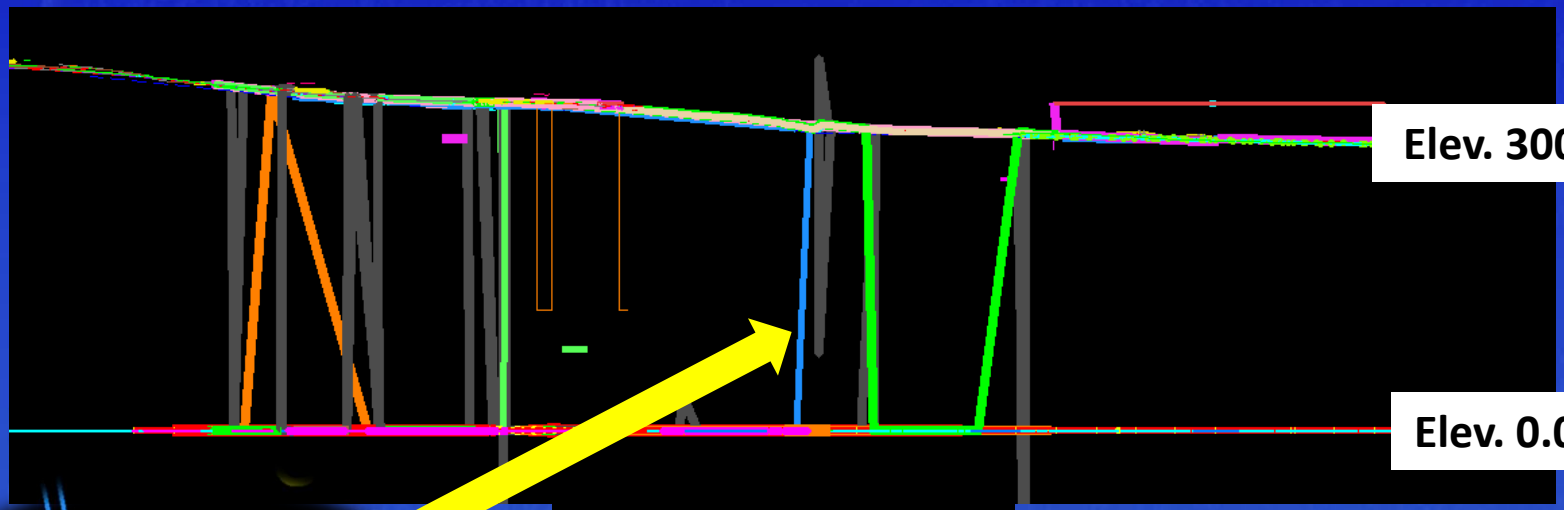


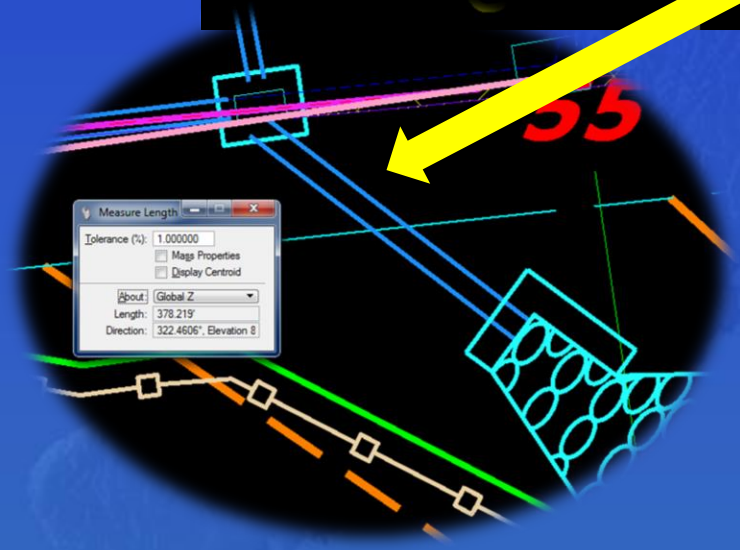
Design Models

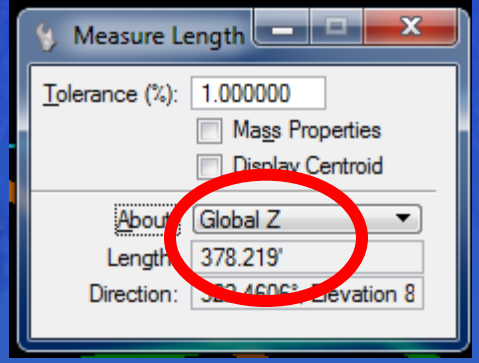
All geospatial features – horiz. alignment, guiderail layout, sed. Control, signs, pavement markings etc…

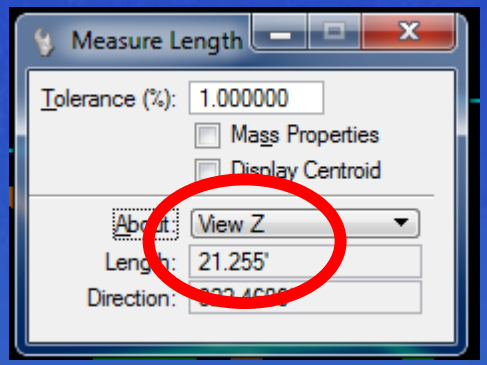
ESSENTIAL IMPROVEMENTS

Resolve 3D inconstancies









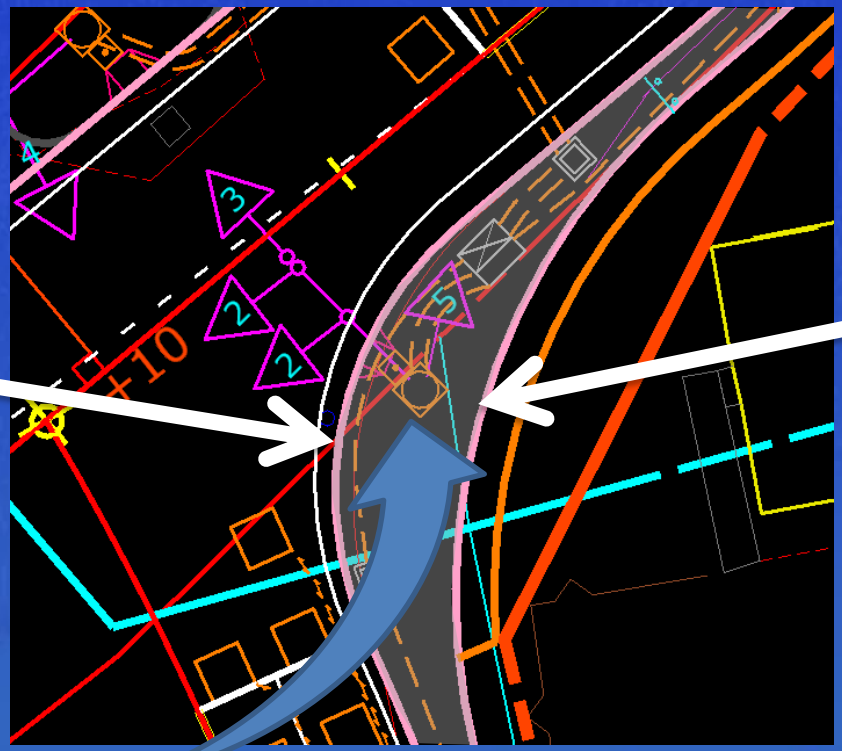
ESSENTIAL IMPROVEMENTS *Continued*

Refrain from copying other units design features

Proposed design elements are being copied from other disiplines instead of referenced. This practice makes it easy to miss critical design updates.

NO COPYING IN OTHER UNITS DESIGN FEATURES, USE REFERENCING

Edge of Road copied in from Highway Design to Signal plan early in design stage



Actual Edge of Road location at Final Design

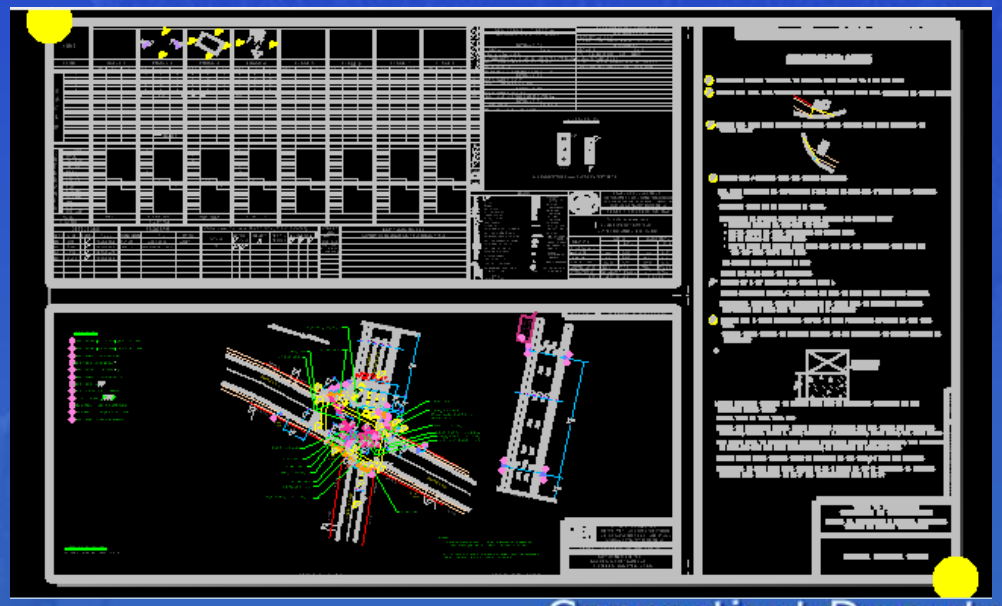
Proposed Signal equipment is in the wrong location

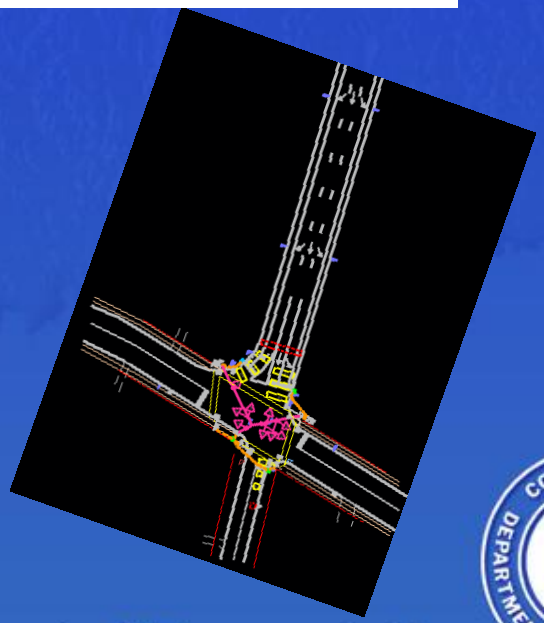
ESSENTIAL IMPROVEMENTS *Continued*

Do not place appurtenances/features directly in cut sheet

Design layouts are being placed directly in the sheet model, cut up and portions moved to fit within the sheet border. With these appurtenances no longer in the correct geospatial location other design units can not easily reference them to check for conflicts.

ALL APPURTENANCES/FEATURES WILL BE PLACED IN THE CORRECT GEOSPATIAL LOCATION IN A DESIGN MODEL NOT THE CUT SHEET



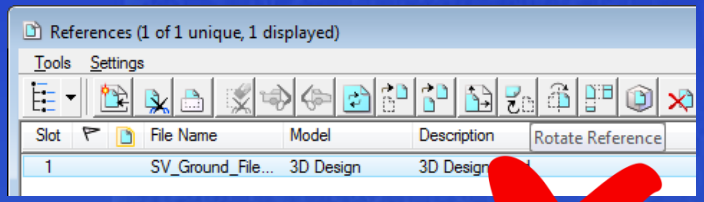


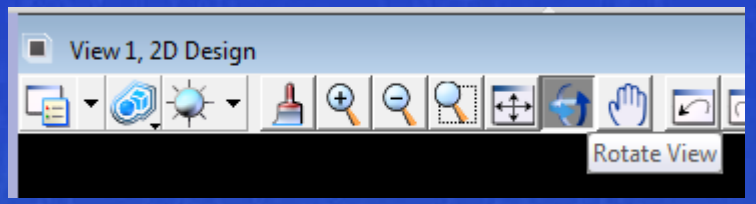
ESSENTIAL IMPROVEMENTS *Continued*

Place the design in the correct geospatial location

When features are not in the correct geospatial location other design units can not easily reference them to check for conflicts.

ALL FEATURES WILL BE PLACED IN THE CORRECT GEOSPATIAL LOCATION IN A DESIGN MODEL



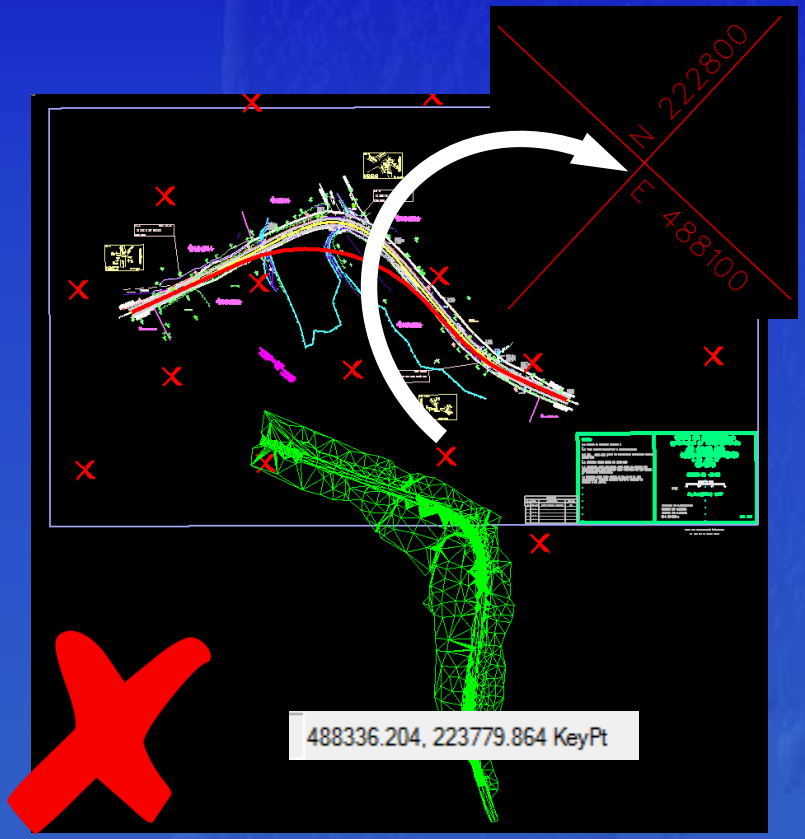


Actual geospatial location of existing topo

Video Link

ESSENTIAL IMPROVEMENTS *Continued*

Check your Coordinates



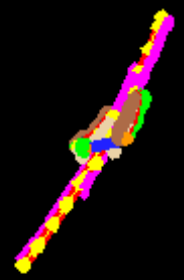
After rotating the **REFERENCE FILE** the coordinates no longer match

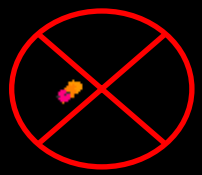
After rotating the **VIEW** the coordinates still match

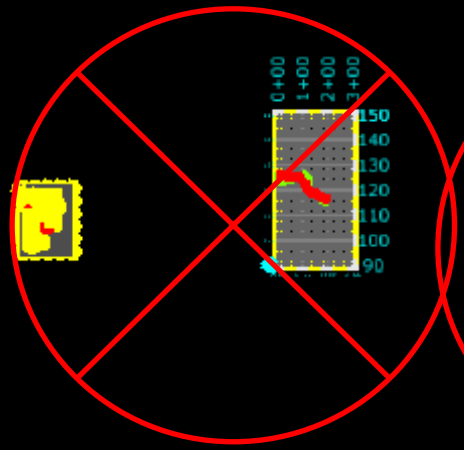
ESSENTIAL IMPROVEMENTS *Continued*

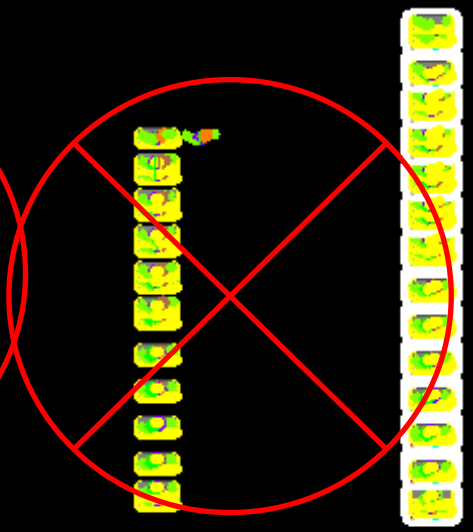
Clean your MicroStation File

Everything in <u>one</u> File
plan – profiles – cross sections
OK for InRoads Working File
Not acceptable for Master Design Model Layout









Defined Model Types and Uses

Disorganized final design files

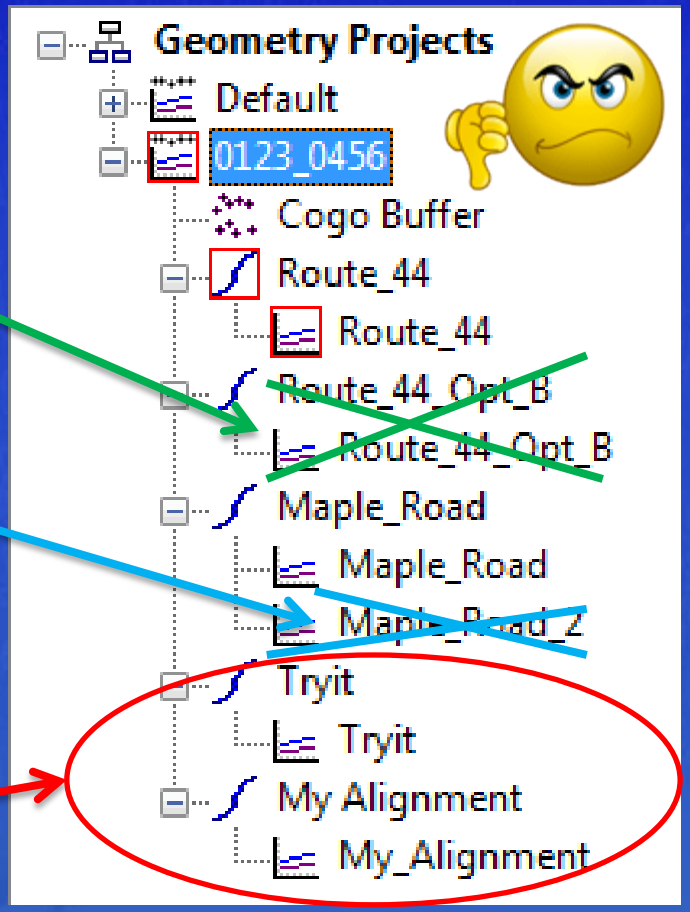
ESSENTIAL IMPROVEMENTS *Continued*

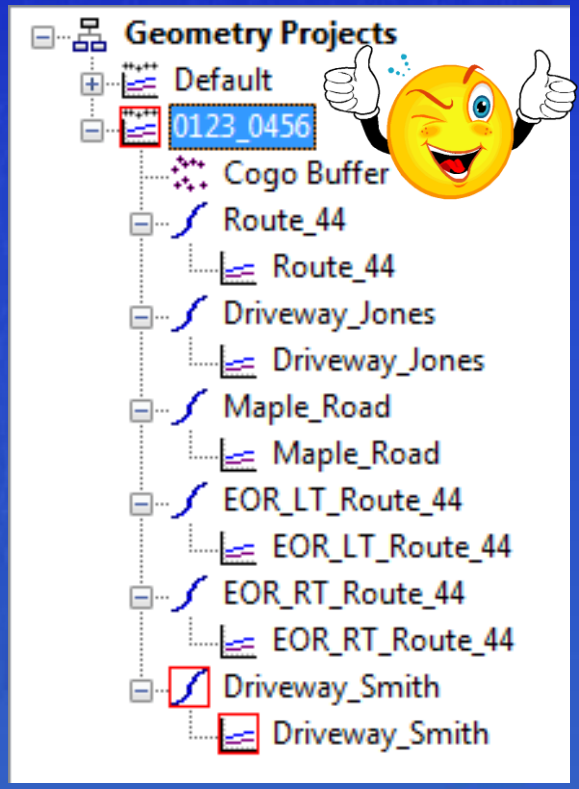
Consistent InRoads geometry naming

Only the final option should be included

Only one profile should be present for each horizontal

The names are not intuitive





Names of alignment shall be intuitive and easy to understand

CAD STANDARDS REVIEW

5 Easy Steps to a Clean CAD File

1. Do not copy in other units features

USE REFERENCING

2. Place all features in the correct geospatial location

ROTATE THE VIEW NOT THE REFERENCE FILES

3. Follow CTDOT procedures for defined model types

SHEET VS DESIGN

4. Use CTDOT Customized Tasks and Tools

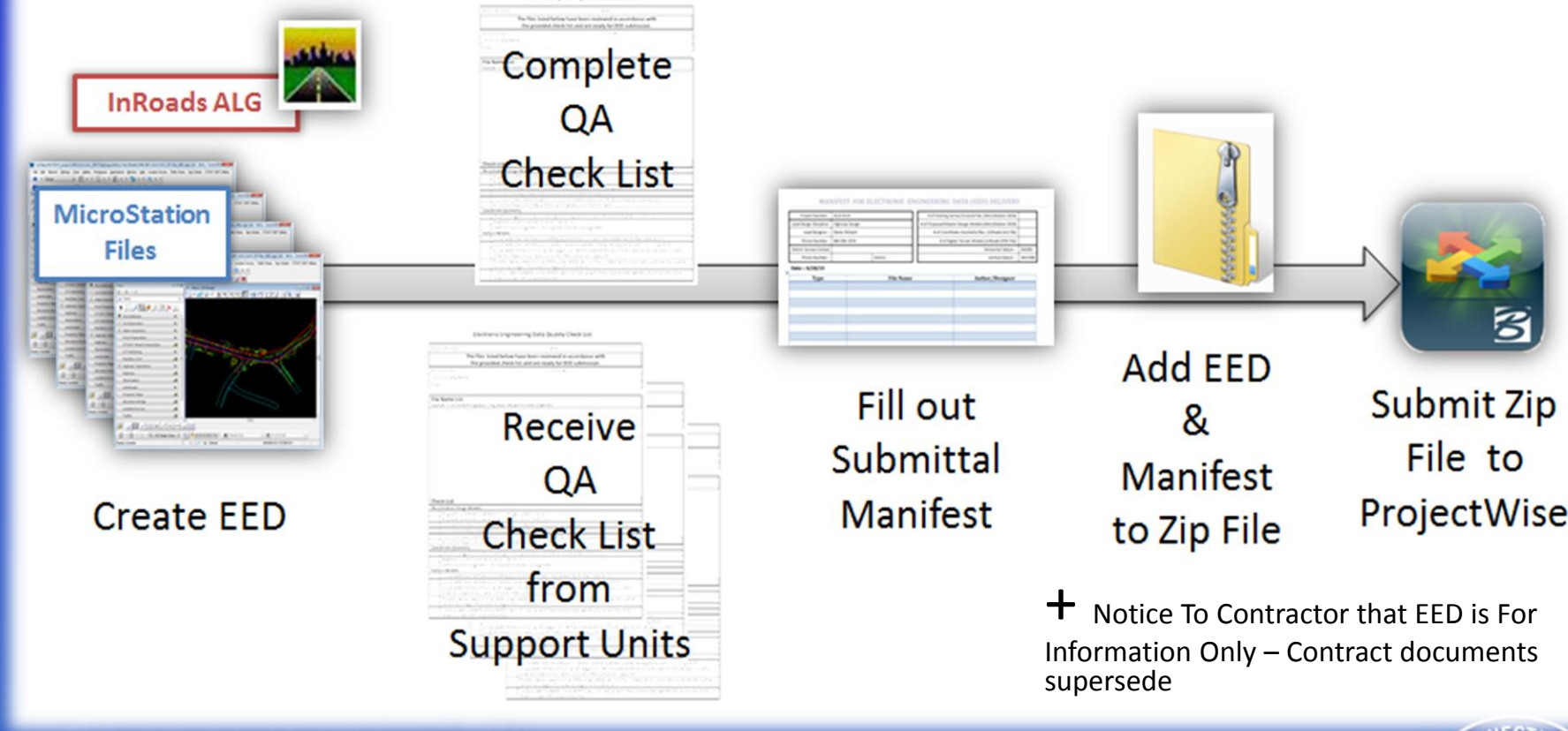
DO NOT CREATE YOUR OWN LEVELS

5. Only the current design data should be present

DELETE OLD DATA

Connecticut Department of Transportation

PHASE 1 - 2D MODEL CENTRIC DESIGN



+ Notice To Contractor that EED is For Information Only – Contract documents supersede

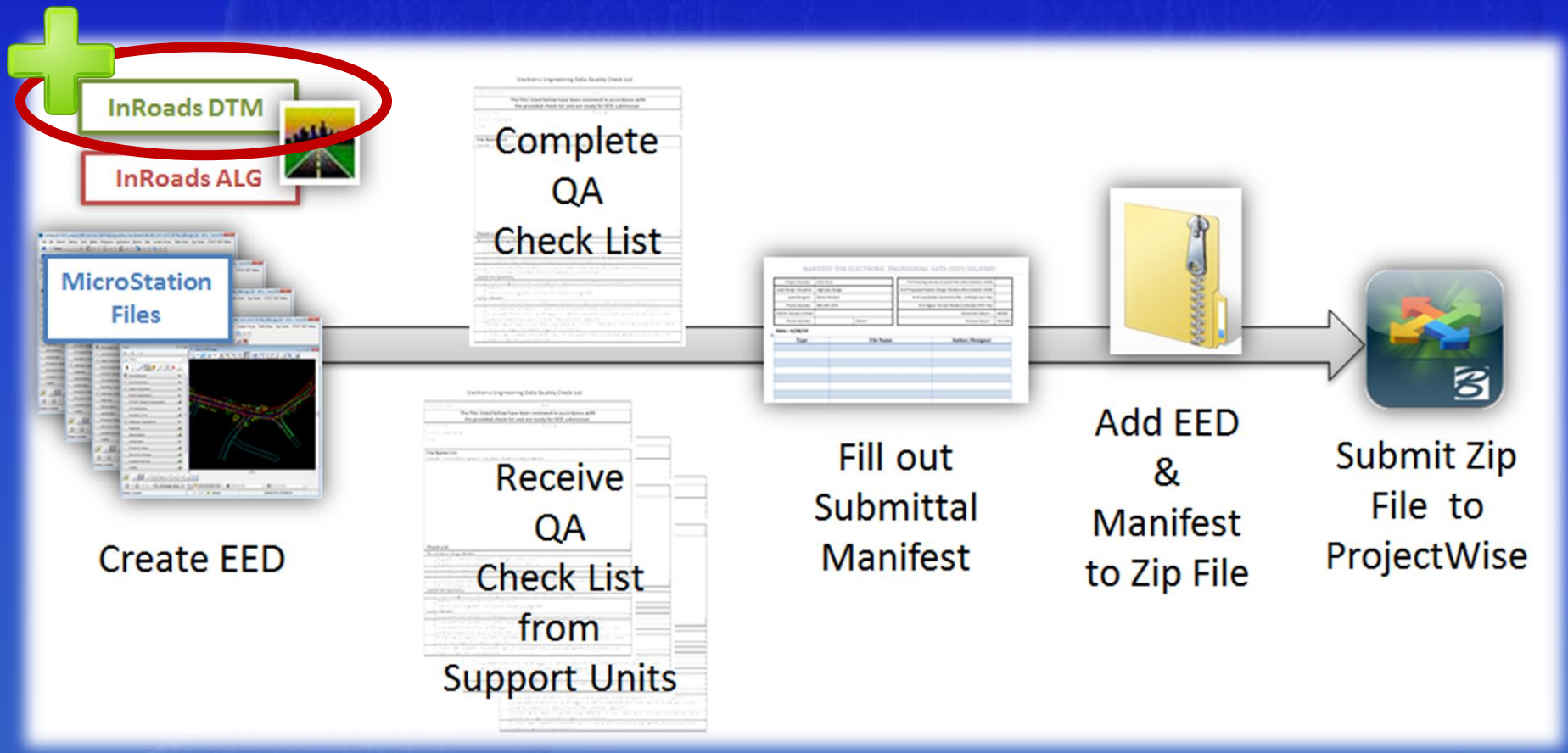
PHASE 1 - 2D MODEL CENTRIC DESIGN

Continued

QA CHECK LIST

Check List	
MicroStation Design Models	
	All graphical elements are at the correct geospatial location.
	All graphical elements are placed on the correct CT DOT Level.
	Files are free of all cross sections, profiles, construction lines for design purposes.
	Files are free of annotation that should reside in the cut sheets.
	Files have clean reference attachments, only needed reference files & no redundant references.
	All 3D files have lines and elements at the proper elevation (no spikes).
Coordinate Geometry	
	Only final alignments are included (preliminary and alternate information has been removed).
	Alignments names and descriptions are intuitive.
	Each horizontal alignment has only one child vertical alignment.
Surface Models	
	Visualized breakline features and they appear to be consistent and match the 2D MicroStation file.
	Visualized breakline features, no vertical faces are present; breaklines appear to be horizontally offset.
	Visualized both the contours and triangles in a 3D file. Looked at it from the top and front, side, and isometric view. No irregular dips, spikes or voids in the surface are apparent.
	Triangles were viewed on top of the proposed design file. The triangles do not cross obvious breaklines such as centerlines, edges of pavement, edges of shoulders, etc.
	Contours were viewed to ensure the low points line up with the proposed drainage structures and structure flowlines match the proposed surface.

PHASE 2 – TRANSITION TO 3D DESIGN



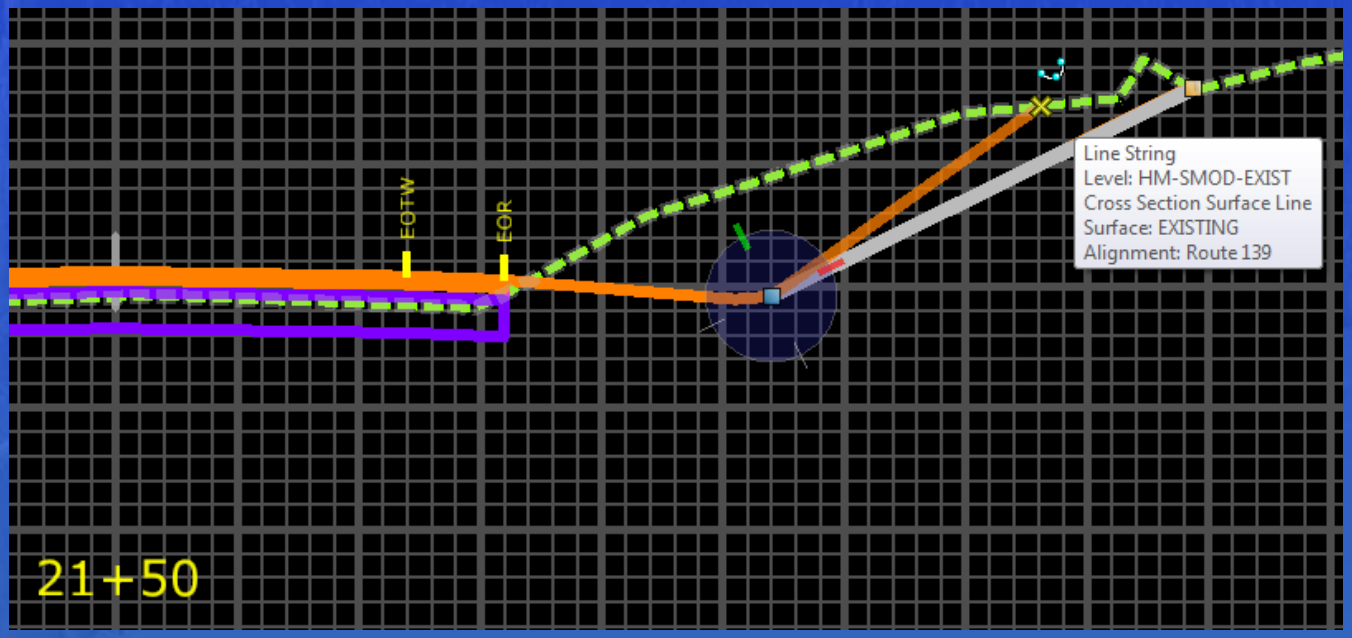
PHASE 2 – TRANSITION TO 3D DESIGN

Continued

Current Practice of Manual Cross Section Editing

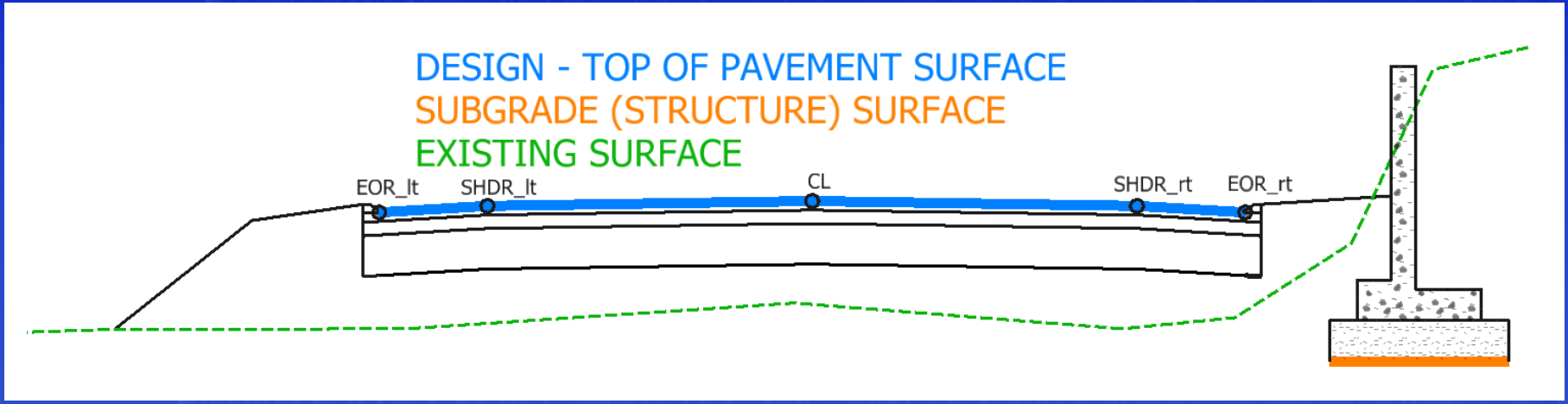
Slope limit modified in cross section using the MicroStation Modify Element Tool

- No connection to the InRoads Surface.
- Requires manual modification to slope limit Plan Graphic
- Subject to error
- The InRoads surface no longer matches the Cross Section or Plan View



PHASE 2 – TRANSITION TO 3D DESIGN

Continued



Existing Ground

undisturbed ground surface prior to construction.

Design (Top of Pavement)

the project design as generated by InRoads using the horizontal alignments, vertical alignments, templates, roadway definitions and surfaced editing tools.

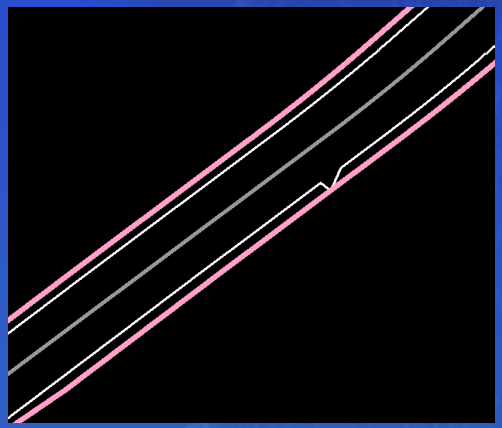
Subgrade (Structure)

Bottom of excavation for footings, box culverts, piers, abutments, sign supports etc....

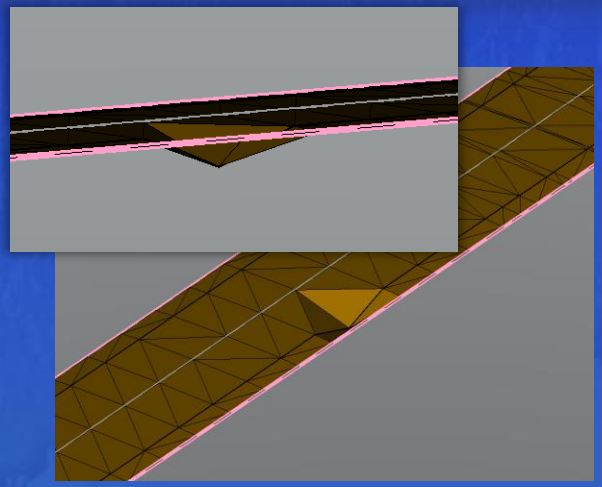
PHASE 2 – TRANSITION TO 3D DESIGN

Continued

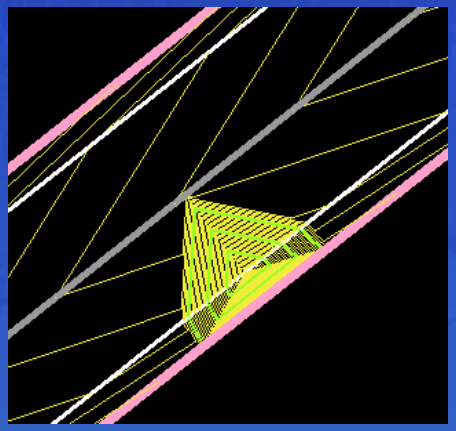
Check List	
Surface Models	
	Visualized breakline features and they appear to be consistent and match the 2D MicroStation file.
	Visualized breakline features, no vertical faces are present; breaklines appear to be horizontally offset.
	Visualized both the contours and triangles in a 3D file. Looked at it from the top and front, side, and isometric view. No irregular dips, spikes or voids in the surface are apparent.
	Triangles were viewed on top of the proposed design file. The triangles do not cross obvious breaklines such as centerlines, edges of pavement, edges of shoulders, etc.
	Contours were viewed to ensure the low points line up with the proposed drainage structures and structure flowlines match the proposed surface.



A Bad Breakline



Results in Spiking Triangles



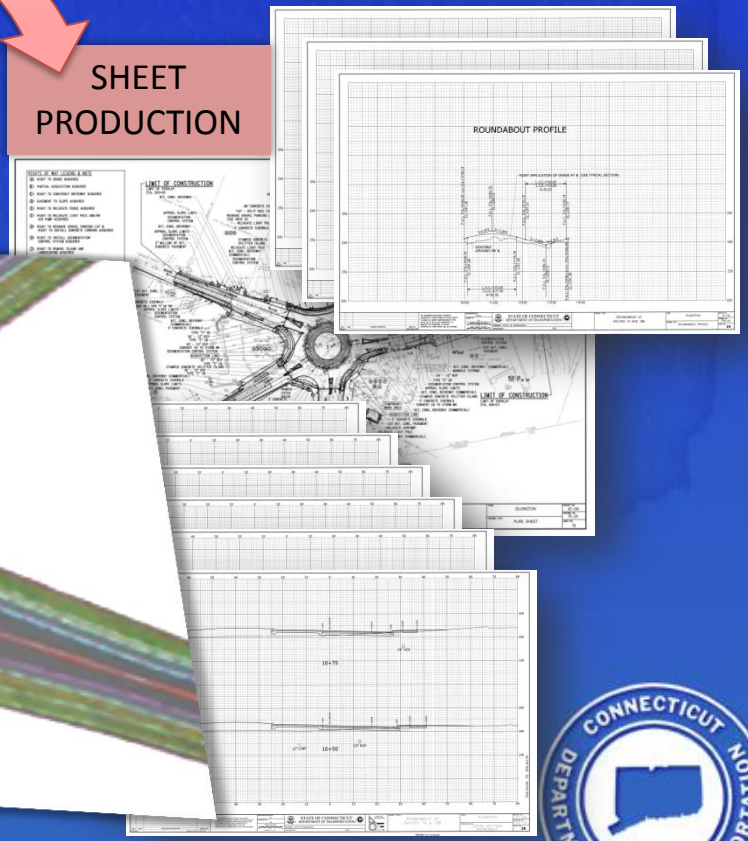
Creates Inconsistent Contours

PHASE 3
3D MODEL CENTRIC DESIGN

CONSTRUCTION

3D MODEL

SHEET PRODUCTION



INSPECTION

Connecticut Department of Transportation

PHASE 3 – 3D MODEL CENTRIC DESIGN

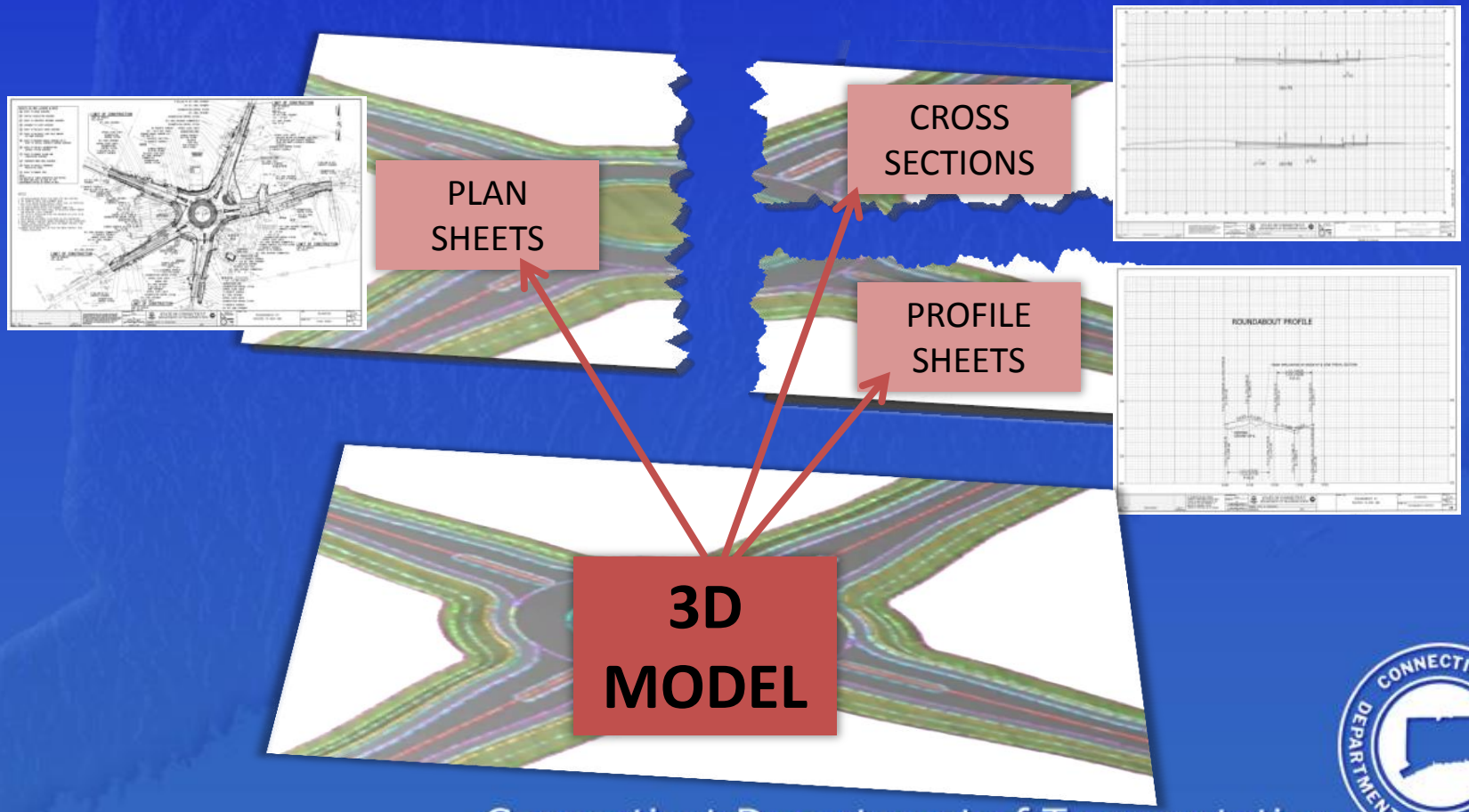
Continued

CTDOT Current Practices use Non-Centric Models

INITIAL ROADWAY COORIDOR IS CREATED IN 3D

MODEL IS CUT INTO 2D PLANS, PROFILES AND CROSS SECTIONS.

EACH DESIGN CHANGE IS **MANUALLY DONE 3 TIMES = PRONE TO ERRORS**



PHASE 3 – 3D MODEL CENTRIC DESIGN

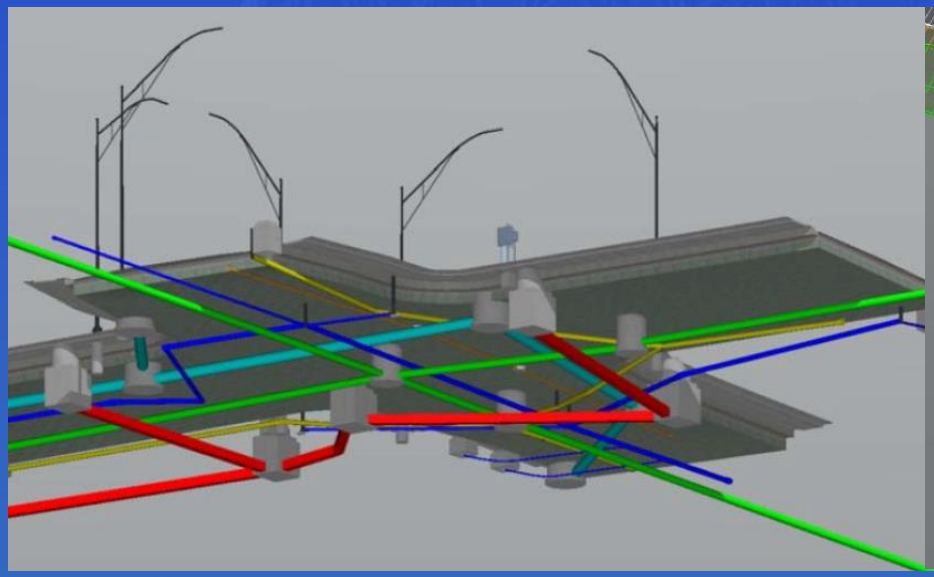
Continued

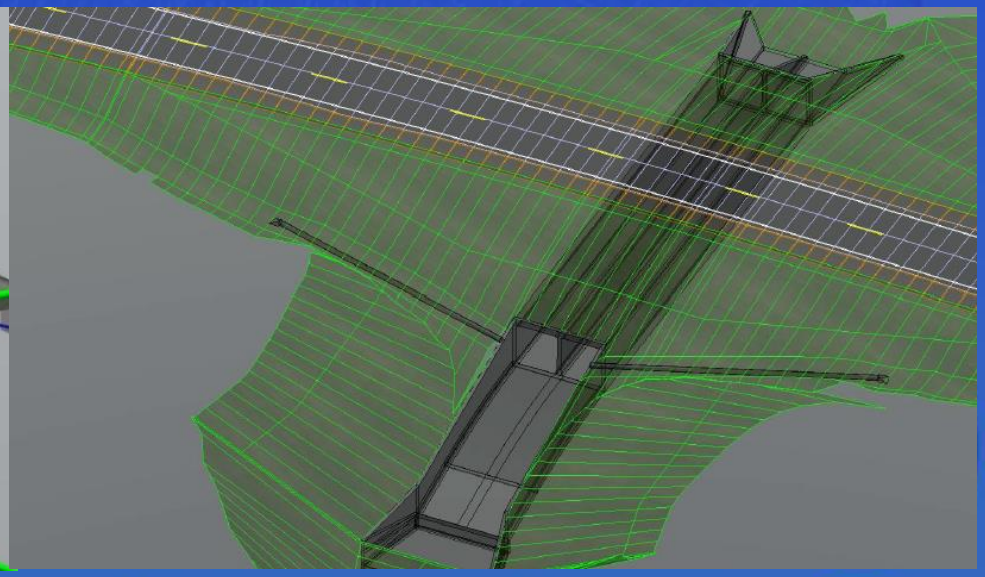
- **3D surface models beyond the pavement limits - Sideslopes, Ditches, driveways, bridges ect…**
  - ✓ Existing
  - ✓ Top
  - ✓ Base Courses
  - ✓ Subgrade
  - ✓ Substratum
- 3D models for field use need to be created in a 3D environment, not reverse-engineered from 2D
- Models will be “true” data source for plan sheets
- Additional content
  - ✓ Horizontal alignments
  - ✓ Vertical profiles
  - ✓ Longitudinal breaklines
  - ✓ Superelevation transition information
  - ✓ 3D Storm Drainage Models

PHASE 3 – 3D MODEL CENTRIC DESIGN

Benefits

- Valuable tool to represent data to others
  (designers, contractors, stakeholders and the pubic)
- Serves as base model to aid in constructability analysis
- Easy to identify where proposed road & structure may not match
- Easy identification of vertical clearance issues
- Easier modeling of drainage & identification of Subsurface conflicts
- Improve sight distance determination
- Design changes are easier to incorporate (parametric modeling)





OVERVIEW OF OPENROADS TECHNOLOGY

Why do we need OpenRoads Technology to implement 3D Model Centric Design?

New 3D surface type enabling the use of larger:
Roadway Corridors
Existing Terrains
Site Models

InRoads would crash when trying to handle large files

Dynamic models
Sites automatically respond to modifications made to a corridor.

InRoads site model had no connection to the corridor model

Civil Cells
Allow the repurpose of common geometric configurations in design layouts to ensure design standards are held "Easy to add Driveways & Intersections – finish the model"

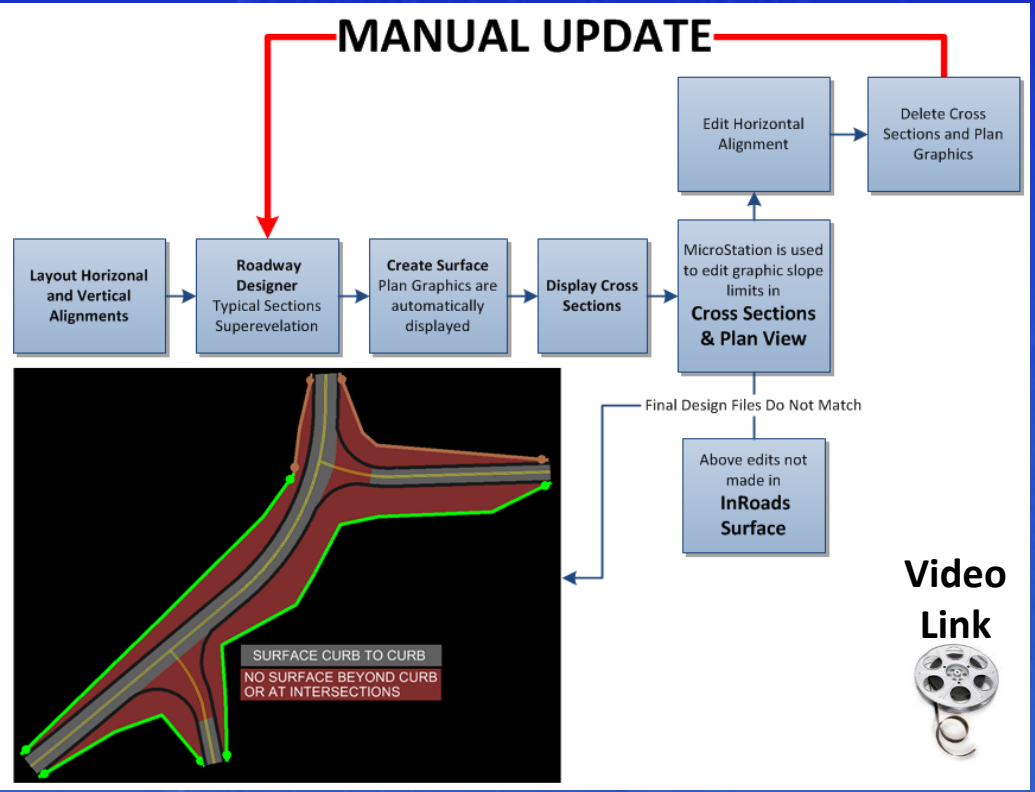
Very difficult and time consuming to finish the model using InRoads

Parametric modeling capabilities
Incorporates rules, relationships, and constraints into the modeling workflow "Design Intent"

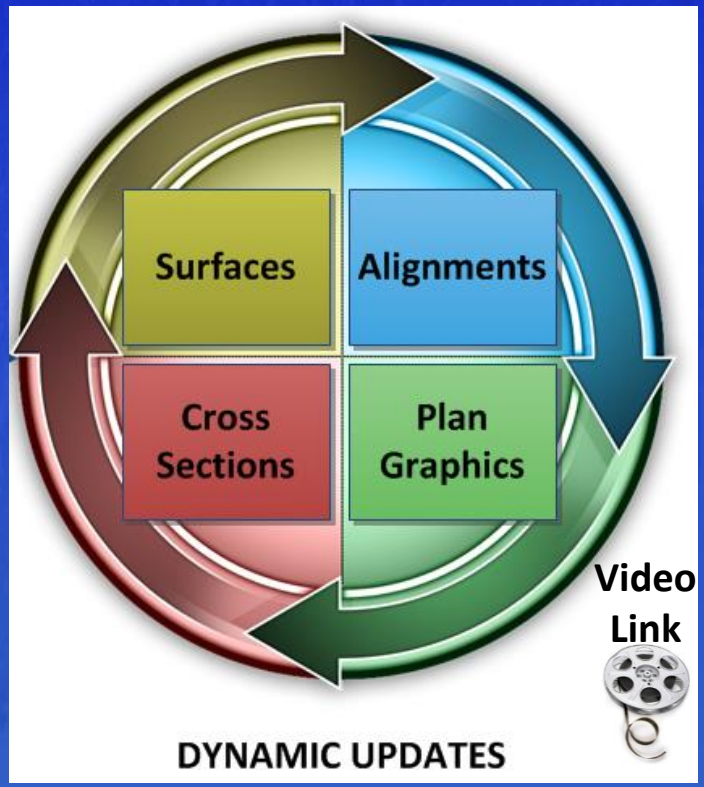
Not available with InRoads

OVERVIEW OF OPENROADS TECHNOLOGY

InRoads



OpenRoads



Surface Modeling

Connecticut Department of Transportation

OPENROADS IMPLEMENTATION PLAN

Scope

- InRoads SS2 to OpenRoads SS4
- New Level Structure
- Parametric Constraints
- Annotation Scale
- ProjectWise Managed workspace
  (no network install)

- 200 ± Inhouse Designers and Surveyors
- 500± Consultants Engineers

OPENROADS IMPLEMENTATION PLAN

Schedule

Currently

- All of Highway Design has upgraded workstations
- Maintenance release OpenRoads testing completed

Summer 2016

- All In house users will receive the software install
- Begin OpenRoads in house pilots

Fall 2016

- In house Surveyors OpenRoads training
- In house Designers OpenRoads training

Full Implementation Date - T.B.D.

CLOSING

Summary of Phases

Phase 1 – Q4 2016

- 2D Model Centric Design

Phase 2 – Q2 2017

- 2D Model Centric Design
- Transition to 3D

Phase 3 – Q4 2017

- 2D Model Centric Design
- 3D Model Centric Design

Please email any comments to:

ronald.tellier@ct.gov or elaine.richard@ct.gov