

NHDOT CAD/D Update

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CAD/D Section
Supervisor
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The cover of the "2022 CAD/D Procedures & Requirements" manual. The background is a dark blue technical drawing of a road plan with various annotations like "C.A.R.O.W.", "P-2907", "PT 5016+23.51", "DRAIN.", "B", "PFD", "EXIST. C.A.R.O.W.", "CLEAR TO LINE BETWEEN POINTS - NO CLEARING", "CLEAR TO SLOPE LINE ONLY", "WOODS", and "5014".

New Hampshire
Department of Transportation

2022
**CAD/D Procedures
& Requirements**

Three small inset images: the left one shows a surveyor in a high-visibility vest and hard hat using a surveying instrument at a construction site; the middle one shows a 3D perspective view of a road and surrounding terrain; the right one shows two people, one wearing a hard hat, looking at a computer monitor in an office setting.

Effective May 1, 2022

Welcome!

CAD/D Support Staff

Highway Design

Bill Caswell – William.Caswell@dot.nh.gov

Eric Milliken – Eric.D.Milliken@dot.nh.gov

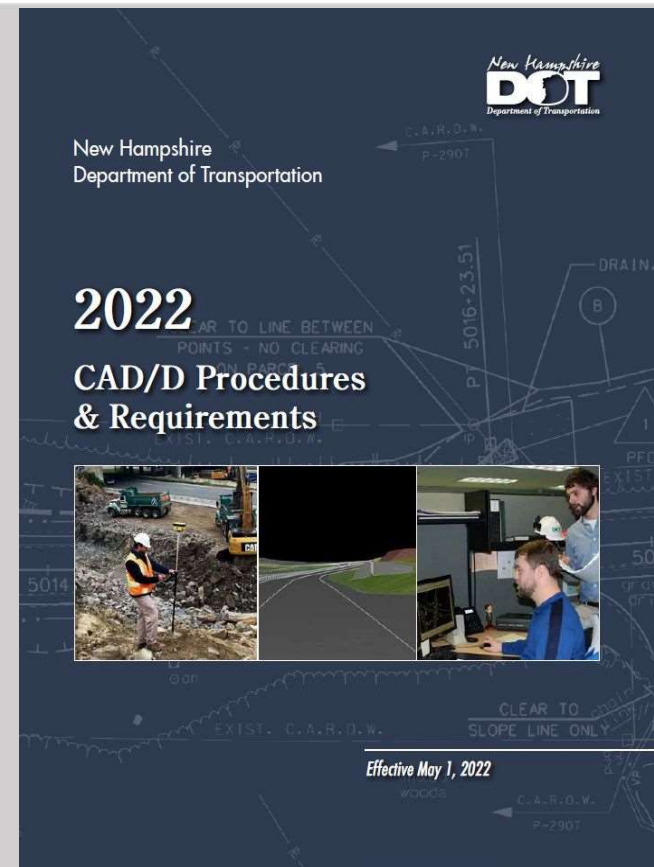
Brian Easler – Brian.R.Easler@dot.nh.gov

Bridge Design

Aaron Janssen – Aaron.C.Janssen@dot.nh.gov

CAD/D Standards

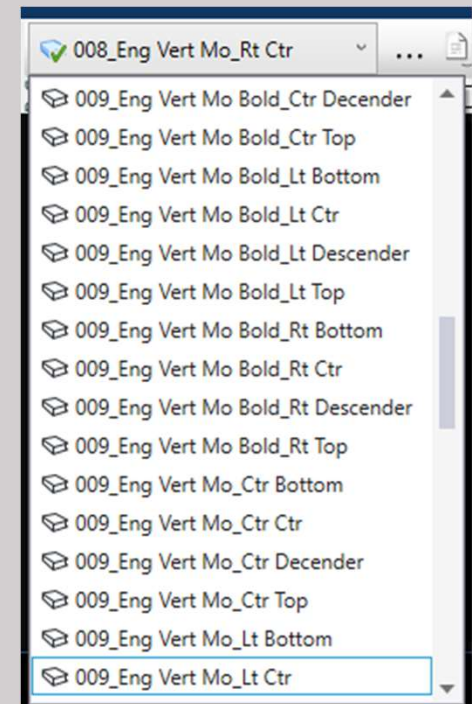
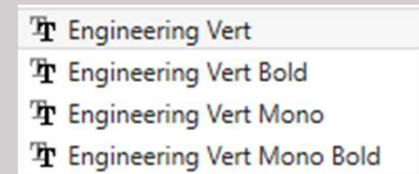
- Latest standard is the 2022 version
- For In-House and Consultant design projects
- Includes 3D Design deliverables for Construction



Transition to MicroStation Connect & OpenRoads Designer

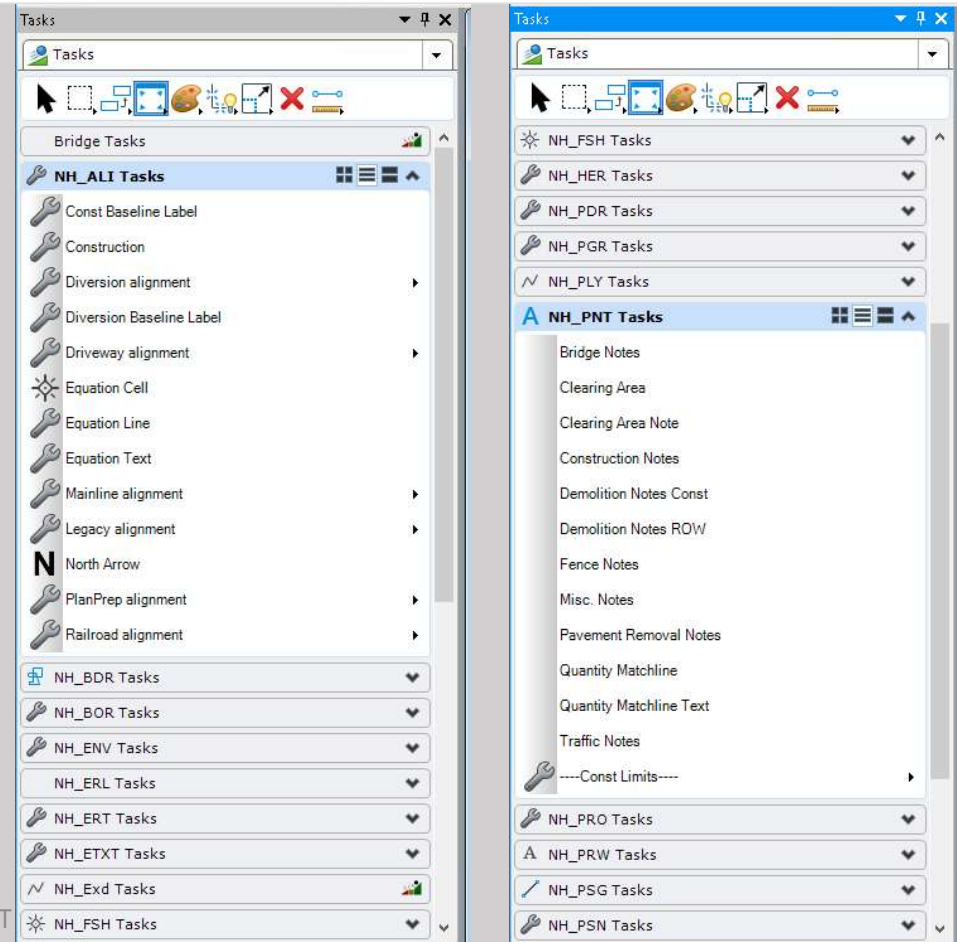
Transition to MicroStation Connect & OpenRoads Designer

- Significant changes to NHDOT workspace
 - New folder structure
 - New seed files
 - New feature definitions
 - New level names
 - New linestyles
 - New cells
 - New fonts & text styles
 - Using *Engineering Vert* and *Engineering Vert Mono* fonts
 - Text styles created for various sizes and justifications



Transition to MicroStation Connect & OpenRoads Designer

- Task Menus Were Recreated for MicroStation Connect
 - Simplifies user's selection of color, level, linestyle, etc.
 - Still some issues due to the extent of changes during the transition.
 - Please notify us of anything that does not work the way it should.



Transition to MicroStation Connect & OpenRoads Designer

- New projects are to use the new software
- Routines developed to bring drawings up to new standards.
 - Drawings for consultant projects are mostly being converted by NHDOT staff.
- Documentation is being worked on

Challenges We Experienced

Challenges We Experienced

- Early versions of ORD had instability issues
 - Recent versions are much more stable
 - We have found that some crashes result from insufficient memory in the computer. New hardware has improved this issue.
- The tools for developing cut sheets were for the most part non-existent when software was initially released.
 - Later versions have resolved that.
- In early versions of ORD, cutting cross-sections would not automatically add annotation for survey features they crossed.
 - Later releases have fixed that.

Challenges We Experienced

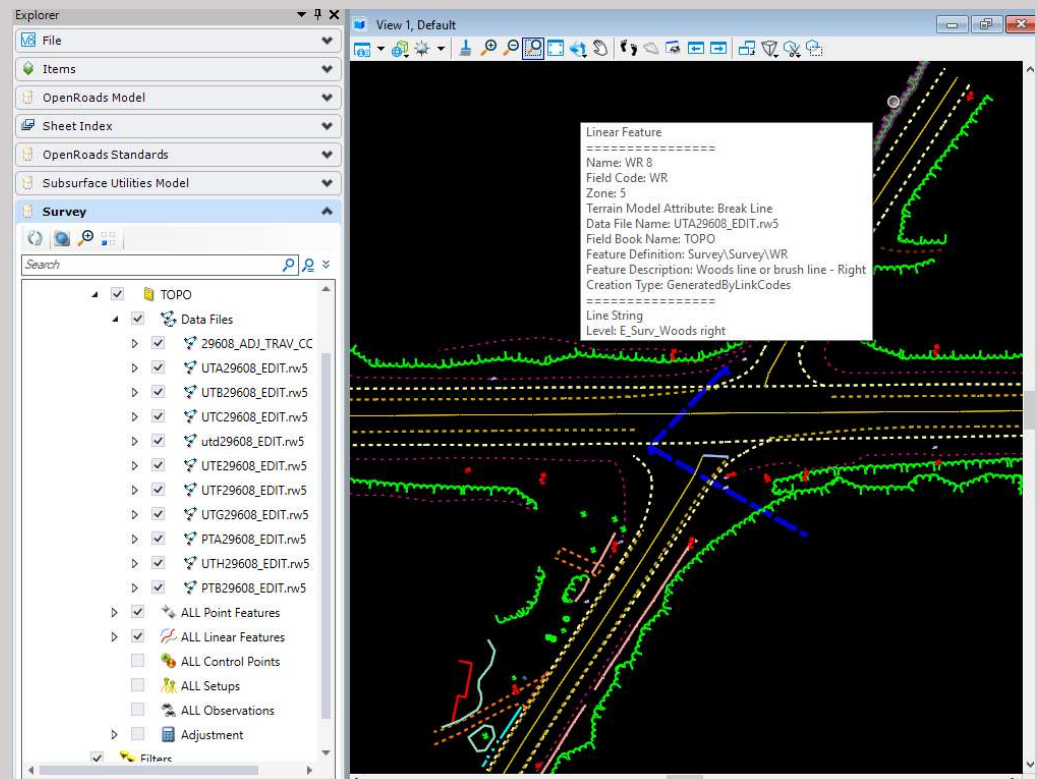
- Our workspace wasn't fully developed when NHDOT and some consultants started using it.
 - We worked with users to focus development where the need was the greatest.
- The drainage library did not include some items needed for a project.
 - Initially, we created the most commonly used items for the library.
 - Once we were aware of the additional items needed, we added them too.

Challenges We Experienced

- Large projects resulted in intense models overwhelming computers.
 - We modified standards to separate existing terrain (surface) models from detail features reducing the amount of data on a drawing.
 - We eliminated the use of 3D cells beyond drainage and utility items since they also bogged down drawings.

Challenges We Experienced

- Procedures for converting legacy survey data to ORD were troublesome resulting in a number of Bentley defect reports.
- Although the bugs have not been resolved, we have developed a process that works well.



Challenges We Experienced

- Keeping up with new releases
 - Reviewing bugs/defects fixed
 - Testing previous development to confirm it still works
 - In latest release, text favorites (pre-defined blocks of annotation text such as alignment curve data) for many civil features including alignments and drainage and utility features needed to be recreated. This affected plan, profile and xsection annotation.
 - Pipe profiles can no longer have bends in them, you need to insert additional dummy nodes for things like underdrain and slope drain pipes.
 - Intelligence added to Drainage and Utility features is causing issues when updating drawings to the newest release.

Challenges We Experienced

- Keeping documentation updated during development
- Finding time to host user group meetings or other “continuing education” sessions

Work In Progress

Work in Progress

- Drawings for the Highway Design Manual are being converted to Connect versions.
- New plan sheet development procedures
- Adding intelligence to drawing features to speed up procedures and enhance annotation of drawings and cross-sections.
 - This also aids in quantity computations.

CAD/D Resources

CAD/D Resources

- CAD/D website documentation

The screenshot displays the New Hampshire Department of Transportation (DOT) website. The header includes the DOT logo, the text "New Hampshire Department of Transportation", and "an official NEW HAMPSHIRE government website". The date "Thursday, March 23, 2023" is shown on the left, and navigation tabs for "CAD/D Home", "MicroStation", "MX", "OpenRoads", and "Downloads" are on the right. A search bar is located in the top right corner.

The main content area is titled "OpenRoads" and features a "Standards" section with the following links:

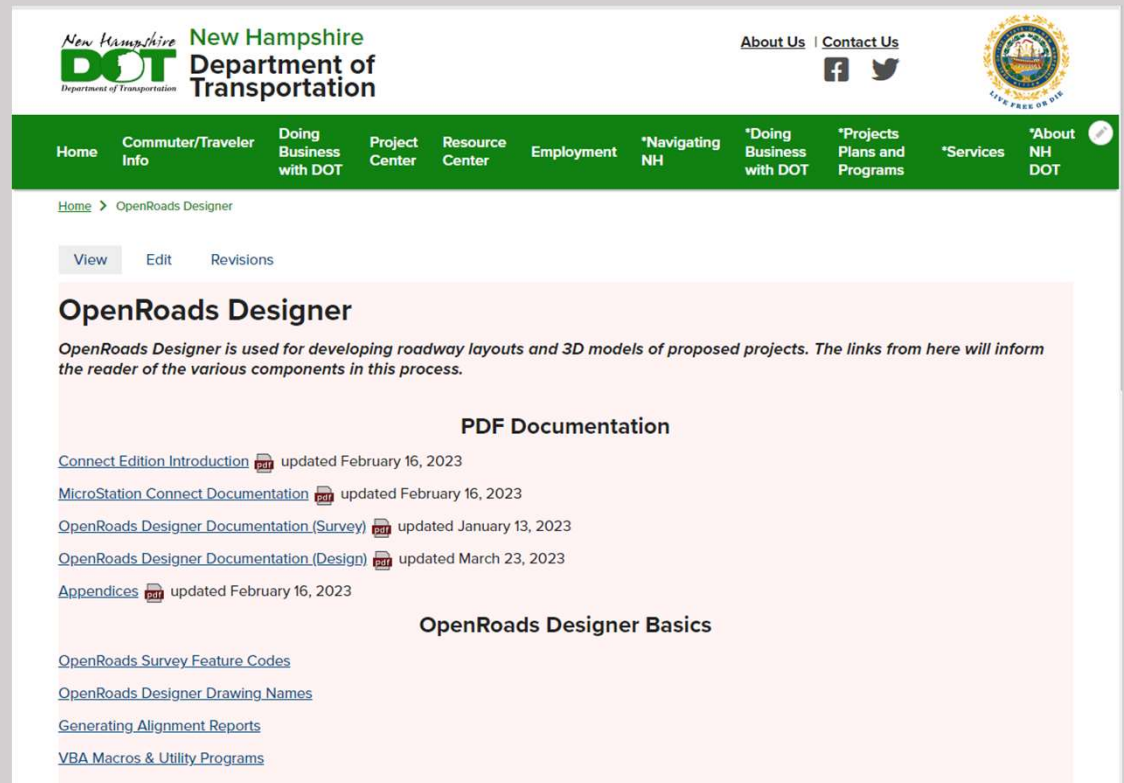
- OpenRoads Designer Documentation
 - [Status of OpenRoads Designer Transition](#)
 - [Connect Edition Introduction](#)
 - [MicroStation Connect Documentation](#)
 - [OpenRoads Drawing Names](#)
 - [OpenRoads Designer Documentation \(Survey\)](#)
 - [OpenRoads Designer Documentation \(Design\)](#)
 - [Appendices](#)

A "Resources" sidebar on the right lists the following items:

- ♦ NHDOT CAD/D Procedures and Requirements
- ♦ Highway Design Details
- ♦ Highway Design Manual
- ♦ Bridge Design Manual
- ♦ Bridge Detail Sheets
- ♦ GIS Project Viewer

CAD/D Resources

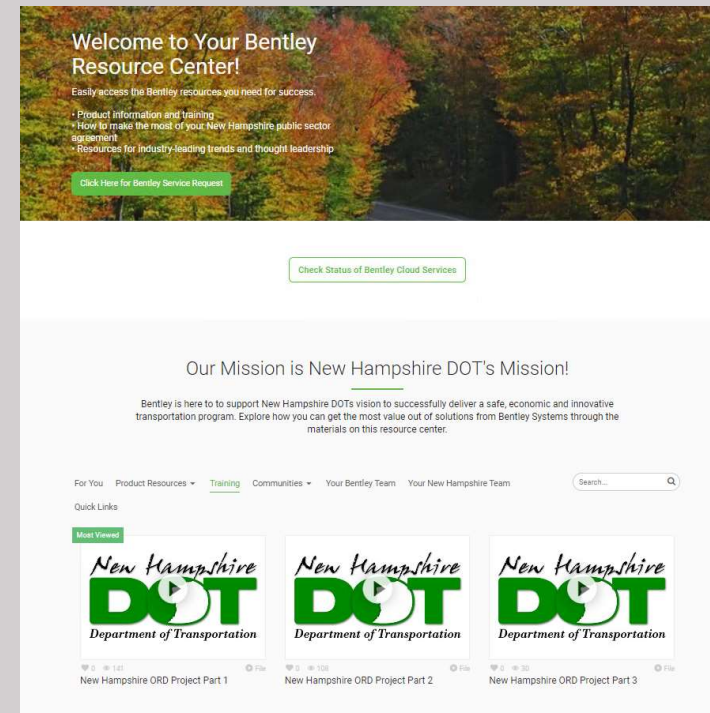
- Updating CAD/D website documentation
- New DOT website in the works



The screenshot displays the New Hampshire Department of Transportation website. The header includes the DOT logo, navigation links for 'About Us' and 'Contact Us', and social media icons for Facebook and Twitter. A green navigation bar contains links for 'Home', 'Commuter/Traveler Info', 'Doing Business with DOT', 'Project Center', 'Resource Center', 'Employment', 'Navigating NH', 'Doing Business with DOT', 'Projects Plans and Programs', 'Services', and 'About NH DOT'. The main content area is titled 'OpenRoads Designer' and includes a sub-header 'PDF Documentation'. Below this, there are several links to PDF documents with their respective update dates: 'Connect Edition Introduction' (updated February 16, 2023), 'MicroStation Connect Documentation' (updated February 16, 2023), 'OpenRoads Designer Documentation (Survey)' (updated January 13, 2023), 'OpenRoads Designer Documentation (Design)' (updated March 23, 2023), and 'Appendices' (updated February 16, 2023). A second sub-header, 'OpenRoads Designer Basics', is followed by links to 'OpenRoads Survey Feature Codes', 'OpenRoads Designer Drawing Names', 'Generating Alignment Reports', and 'VBA Macros & Utility Programs'.

CAD/D Resources

- Training videos available to NHDOT consultants
<https://engage.bentley.com/newhampshire-dot-resources/training>
- Need to register an account with Bentley to have access to videos



Questions?

CAD/D Documentation

www.nh.gov/dot/cadd/

General administration questions

Bill Caswell – William.Caswell@dot.nh.gov

Technical questions

Eric Milliken – Eric.D.Milliken@dot.nh.gov

Brian Easler – Brian.R.Easler@dot.nh.gov

Structural Design questions

Aaron Janssen – Aaron.C.Janssen@dot.nh.gov

