



# Moving to BIM: How Organizations are moving from 2D Plans to Digital Deliverables

Steve Willoughby, Senior Application Engineer





# BIM



The diagram illustrates the foundational elements of BIM (Building Information Modeling) using a classical architectural metaphor. The pediment at the top contains the acronym 'BIM'. Below it, a row of nine columns supports the structure. Each column is labeled with a specific BIM concept, listed from left to right: Collaboration, Electronic Data Management, CAPEX Information Management, OPEX Information Management, Information Exchange, Information Security, Better Outcomes, and Information definition standards.

Collaboration

Electronic Data Management

CAPEX Information  
Management

OPEX Information  
Management

Information Exchange

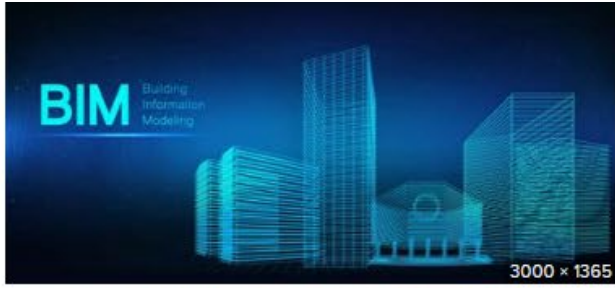
Information Security

Better Outcomes

Information definition  
standards







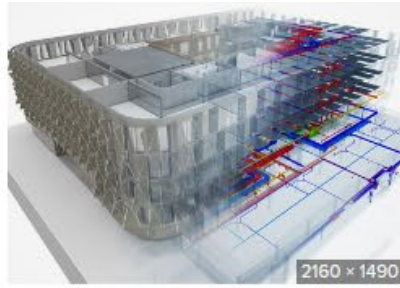
3000 x 1365

A brief introduction to BIM - Insights, Introduction To BIM, BIM ... commercialdesignindia.com



2022 x 2022

The global BIM market pr... workplacesight.net



2160 x 1490

BIG BIM plus Open BIM with Vectorwor... architosh.com



1869 x 1043

Building information modeling (BIM) | Digitalizatio... new.siemens.com



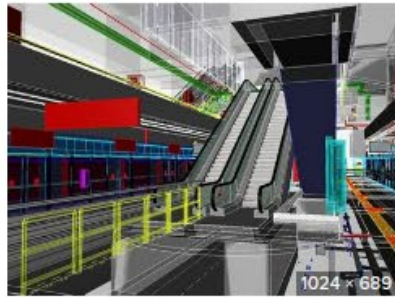
1920 x 1200

Rivoluzione o Evoluzione: scopri il tuo appro... 4mgroup.it



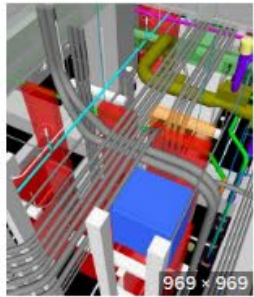
1920 x 1000

BIM 101 PDF Guides & Resources | Autodesk autodesk.com



1024 x 689

Leverage operational and maintenance... bimnbeyond.com



969 x 969

Building Information Mo... commonwelthelectric.com



1088 x 507

Revit BIM Modeling Services - The Drafting Company Trust... thedraftingcompany.com



4500 x 2500

Why Australian manufacturers need to build up t... manmonthly.com.au



2060 x 1455

BIM takeoff is up and coming, but 2D ... etakeoff.com



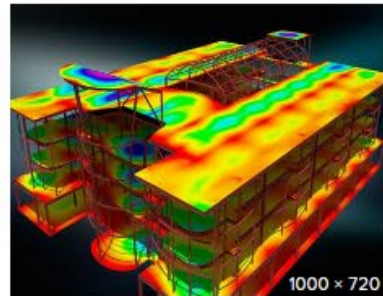
1200 x 680

BIM is set to conquer Facility Management theagilityeffect.com



2000 x 1125

Did You Say FREE BIM Tools for Revit? - CADD Mi... caddmicrosystems.com



1000 x 720

3 Keys That Will Unlock the Future of ... blog.hagerman.com



1750 x 1000

BIM Manager Training performance.network





# Keys to Moving Forward with BIM




- Stakeholder buy-in
  - Understanding the process
    - Adoption of 3D design methodology, not adoption of 3D design technology
  - The technology is necessary, but not sufficient.
  - Effective 3D design requires change (for the better) in the way of doing business

Buy-In




# Connecticut DOT and Bentley CONNECT Edition



Connecticut DOT      Number: ED-2020-5

Office of Engineering      Date: July 20, 2020

## ENGINEERING DIRECTIVE

  
Theodore H. Nezames,  
P.E.  
2020.07.16 15:02:45-04'00'

Engineering Administrator

### CONNECT Digital Design Environment (CAD Standards) for Capital Projects

This directive establishes the requirements to use Bentley's CONNECT Suite of products with CTDOT's CONNECT Digital Design Environment (CAD Standards) to prepare CAD models and contract plans for capital projects starting July 1<sup>st</sup> in accordance with the following:

- All new projects starting after August 1, 2020.
- Projects that have not reached design approval by August 1, 2020 should be moved to CONNECT, but at the discretion of the Project Manager (PM). AEC Applications is available to support the conversion of a project from V8i to CONNECT.
- Projects that have reached design approval by August 1, 2020 should remain in V8i, but can be moved at the discretion of the PM. AEC Applications is available to support the conversion of a project from V8i to CONNECT.

Training for the CONNECT suite of products will continue and be available to in-house designers as required.

## CONNECT Digital Design Environment

[SUPPORT FORM](#) | [STAFF DIRECTORY](#)  | [MANUALS](#)

Supported by AEC Applications

The Connecticut Department of Transportation's (CTDOT) Connect DDE (Digital Design Environment) is CTDOT's new configuration/workspace for Bentley's Connect Edition software. The CTDOT Connect DDE contains resources, standards and the tools necessary for designing projects in accordance with CTDOT CAD Standards.

[Transition Plan Frequently Asked Questions](#)

### Software Requirements

The CTDOT CONNECT DDE is configured to work with the following Bentley Systems, Inc. trademark products:

- **OpenRoads Designer®** (Version 10.12.02.04) is Bentley's civil design software solution for surveying, drainage, subsurface utilities, roadway, and site design.
- **OpenBridge Modeler®** (Version 10.12.1.83) is Bentley's 3D bridge modeling software.
- **OpenRail Designer®** (Version 10.12.02.04) is Bentley's civil design software solution for rail.
- **OpenBuildings Designer®** (Version 10.10.01.151) is Bentley's building design and energy analysis software.



# Texas DOT and OpenBridge Designer

- TxDOT DOT announcement post it on October 1<sup>st</sup>, 2021
- Training DOT personnel started in December 2021.

The screenshot shows the Texas Department of Transportation website. The header includes the Texas DOT logo and navigation links for Driver, Government, Business, Inside TxDOT, and Careers. A search bar is located in the top right. The main navigation bar highlights the 'Business' section, with sub-links for Consultants, Contractors, Vendors, Letting and Bids, Opportunities, Projects, Training, Resources, and Partnerships. The 'Resources' sidebar on the left lists various links, including Bridge, Test Procedures, Signed Contracts, Purchase Orders, Business Contacts, Statewide Standard CAD Files, Standard TxDOT Specifications for Construction and Maintenance of Highways, Streets and Bridges, Materials Information, Material Producer List, and Archive Material Producer List. The main content area is titled 'OpenRoads Designer (ORD) - CONNECT Edition Data' and includes a breadcrumb trail: Texas Department of Transportation > Business > Resources. The text states that the page contains files for OpenRoads Designer – CONNECT Edition and provides a note about updates. A compatibility list includes MicroStation CONNECT Edition 10.16.00.80, OpenRoads Designer CONNECT Edition 10.10.01.03, OpenBridge Designer 10.10.00.26 (highlighted), and OpenBridge Modeler 10.10.00.85. A table at the bottom lists project configuration files and workspace details.

Title	Description	README	Files
Project Configuration Files and Workspace	Complete Workspace		



# Virginia DOT and OpenBridge Designer

SP105-DB0620-00

VIRGINIA DEPARTMENT OF TRANSPORTATION  
SPECIAL PROVISIONS FOR

## MODEL BASED DESIGN AND CONSTRUCTION FOR DESIGN-BUILD PROJECTS

February 19, 2021

### I. DESCRIPTION

This work consists of creating a single comprehensive 3D model for the Approved for Construction (AFC) condition, revising the 3D model to accommodate any approved plan revisions, and delivering an 'As-Built' Model for the project based on the 'As-Built' plans. The model requirements shall supplement, and shall not replace, any other project deliverables.

### II. DEFINITIONS & MATERIALS

#### A. 3D Model:

A virtual model that is three dimensional (3D) and geospatially accurate including easting, and elevation to represent the work to be performed. The model uses coordinate systems based on the project datum such as the State Plane Coordinate System coordinate system with X, Y, and Z values. The model contains representations of proposed, and constructed physical objects within project limits. Physical objects are not limited to: roads, bridges, streetlights, sidewalks, buildings, tunnels, drainage (temporary and permanent), guardrail, signage, stormwater management features (above and below ground), and other permanent site features. The content of the 3D Level of Development / Level of Detail (LOD) for modeled elements/objects as specified in the contract.



### III. SOFTWARE REQUIREMENTS

Electronic files shall use the required software specified in the contract and herein. The software requirements shall supplement, and shall not replace, any other software requirements of the project deliverables specified in the contract.

The Design-Builder shall submit all files, file formats, element tables, and saved views in accordance with the contract requirements and the most recent VDOT Location and Design Division Instructional and Informational Memorandum 118 (IIM-LD-118). If the Design-Builder wishes to deviate from the file submission process and format requirements, the VDOT Project Manager shall determine the approval of the change during the review phase of the Model Management Plan. The submission process and format requirements shall supplement, and shall not replace any other submission process and format requirements of the project deliverables specified in the contract.

#### A. Software Requirements

Bentley's Civil Engineering Suite line of products (Bentley Systems, Inc.) including OpenRoads Civil Design Software and OpenBridge technologies.

#### B. Format Requirements

All engineering design data used to create the PDF Plan Set and 3D models shall be provided in an i-Model open format. The 3D models and 'As-Built' Models shall be in both DGN and searchable PDF file formats.

The Design-Builder shall submit all DGN files and PDF files for the 3D models by way of VDOT's ProjectWise.



# Kansas DOT and OpenBridge Designer

## MEMO



DATE: April 13, 2021  
TO: KDOT Prequalified Design Consultants  
FROM: Calvin E. Reed, P.E.; Div. of Engineering and Design  
CC:  
RE: Project Requirements for

A handwritten signature in black ink, appearing to read "Calvin Reed", is written over the "FROM:" and "CC:" lines of the memo header.

Eisenhower State Office Building  
700 S.W. Harrison Street  
Topeka, KS 66603-3745  
kdot#publicinfo@ks.gov  
<http://www.ksdot.org>

### DESIGN POLICY

This directive establishes KDOT project requirements for using Bentley CONNECT Edition software products with KDOT's CONNECT Edition workspace environment in preparing Plans and digital deliverables for improvement projects starting October 1, 2021 as follows:

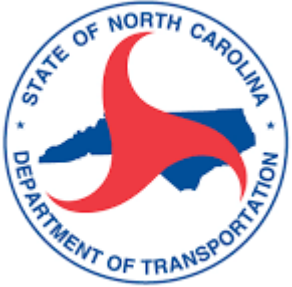
- All projects will be delivered

### BACKGROUND

KDOT is developing the software standards (workspace) for preparing CONNECT Edition software to deliver KDOT project designs. The first version of KDOT's CONNECT Edition workspace will be deployed in April 2021 and will contain minimum functionality needed to support KDOT project delivery. Subsequent workspace releases will incrementally increase functionality to allow design teams to take full advantage of Bentley's CONNECT Edition software.

*Note: KDOT's CONNECT Edition workspace will support OpenBridge Modeler use with KDOT-specific standards, but there is no requirement for the use of OpenBridge Modeler or structure model delivery at the time of CONNECT Edition workspace deployment.*

# North Carolina DOT and Bentley CONNECT Edition



## SMU's Migration Plan

- **Phase 1** – (January 2021) transition SMU Staff and PEF's to **OBD for 2D plan production**
- **Phase 2** – (**July 1<sup>st</sup>, 2021**) all new projects and existing projects less than 75% complete, or as SMU Project Engineers see fit to switch, produce the following:
  - 2D plans & Digital Twin (DT) Creation
- **Phase 3** – (Future Date) full DT production

## Phase 2 Deliverables

- **2D dgn's and PDF's** (same as V8 process)
- **Preliminary Digital Twin** (Delivered with PGD's)
- **Final Digital Twin** (Delivered with final dgn's and sealed plan set)

## Level of Detail (LOD)

A term used in the BrIM process to define the amount of detailing/precision required to match the design intent with respect to a Digital Twin...

### **SMU Phase 2 DT's = LOD 300**

LOD 300 = Accurate Modeling and Detailed Design

- Accurate modeling and shop drawings where element shells are defined with specific assemblies, quantities, size, shape, location and orientation.



# Keys to Moving Forward with BIM

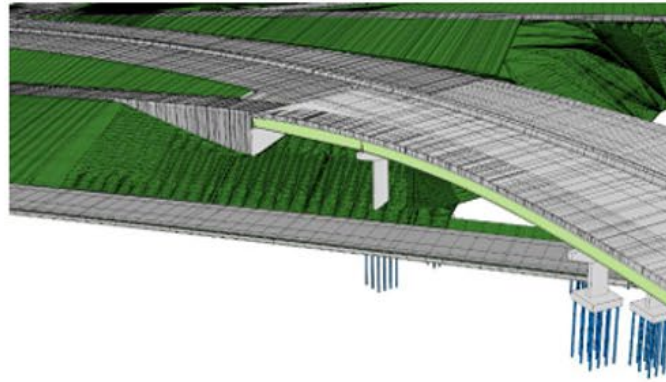


- Planning
  - Implementation planning
  - Establish short-term and long-term goals
- BIM Execution Plan





PennDOT



# Digital Delivery

Interim Guidelines

Version 2.4

Digital Delivery Directive 2025

*Pennsylvania Department of Transportation*  
February 28, 2023



# Michigan DOT and OpenBridge Designer

## What Is the CONNECT Edition?

The CONNECT edition of Bentley products are a family of products that are built on top of new version of Microstation know productivity.

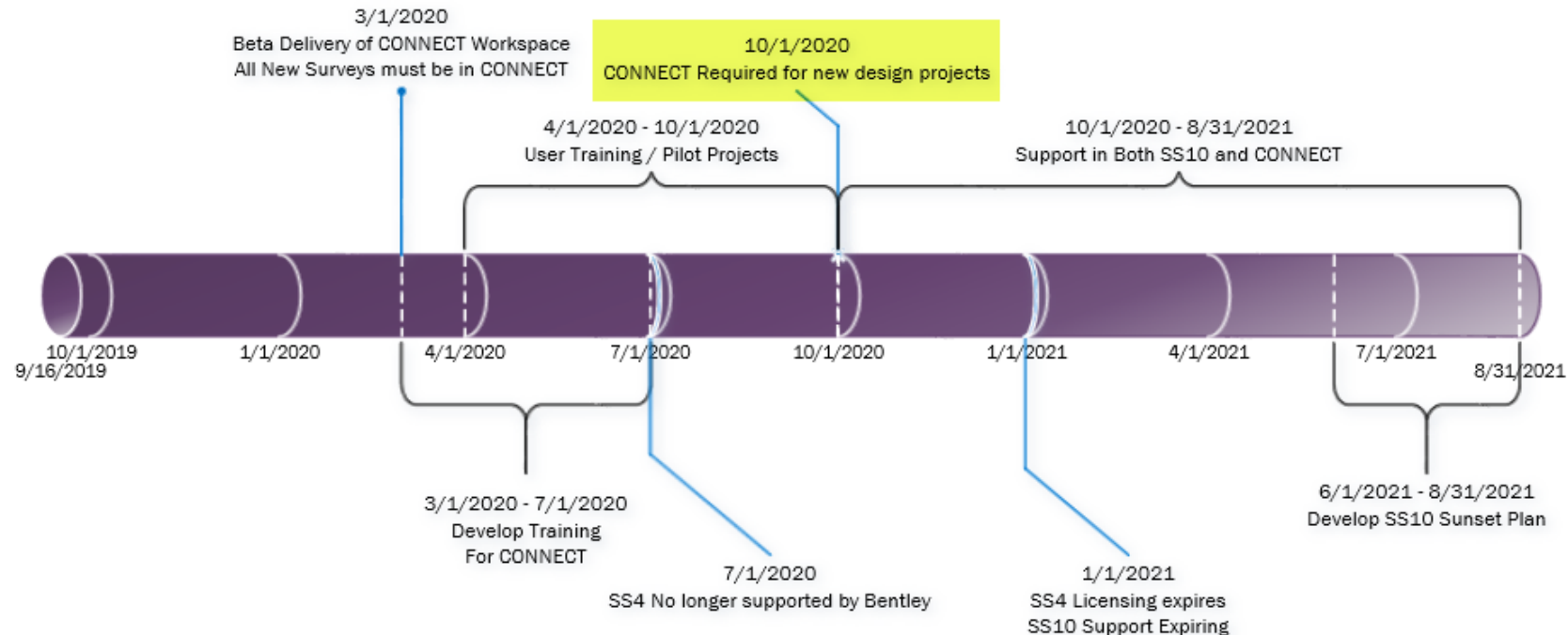
Overall, the software is very similar in operation to SS4 from both a modeling standpoint and a drafting standpoint. However:

CONNECT edition products that will replace PowerGEOPAK SS4 / SS10 at MDOT include

- OpenRoads Designer
- OpenBridge Modeler
- OpenBridge Designer

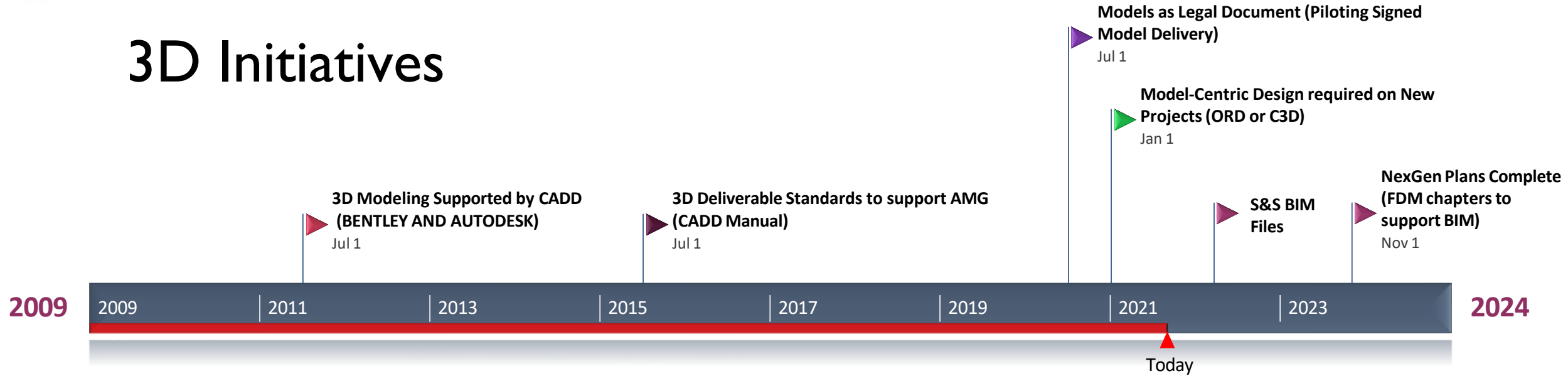


## CONNECT Edition Timeline





# 3D Initiatives



## 3D CADD INITIATIVES





# PennDOT – Digital Delivery Directive 2025



- Purpose
  - Improved Design Quality
  - Reduced Risks and Project Costs or Delays
  - Increased Construction Efficiency
  - Improved As-Built Records
- Vision
  - By 2025, construction projects will be bid using 3-D technology and no longer be in a traditional construction plan format.

Project	District	County	SR-Section	Description	Anticipated Let Date
<a href="#">114138</a>	1	Crawford	1032-B00	SR 1032 Bridge over Shirley Run	02/16/2023
<a href="#">57945</a>	1	Crawford	0006-B12	US 6 French Ck Br #3	08/10/2023
<a href="#">8308</a>	4	Lackawanna	3006-250	SR 3006 over Gardner Creek	03/02/2023

# Keys to Moving Forward with BIM

- Standardize
  - Creation of standardized corporate/agency workspace
  - Creation of standard practices/workflows/deliverables



"I'M A STRONG BELIEVER IN CAD STANDARDS—THAT'S WHY I USE THIS EXCELLENT SET OF MY OWN"





	A	B	C	D
	Category	Items to Verify	Status	Notes
2	<b>Libraries</b>			
3		Deck	Available for Testing	Decks added to OBM library
4		Barriers	Available for Testing	Barriers added to OBM library
5		Beams	Available for Testing	Beams added to OBM library - Delete non-SCDOT folders, and add (SC) to the names
6		Columns	No work needed	
7		Piers	No work needed	
8		Abutments	No work needed	
9		Wingwall	No work needed	
10		Sleeper Slab	Available for Testing	
11		Material	Available for Testing	SCDOT will modify
12		Stiffeners	No work needed	
13		Cross Frames	No work needed	
14		Connection Plates	No work needed	
15		Shear studs	No work needed	
16		Splices	No work needed	
17		Connector Angles	No work needed	
18		LEAP Bridge Lib	Available for Testing	SCDOT provided on 5/26.
19	<b>Feature Library</b>			
20		Levels	No work needed	
21		Element Templates	No work needed	
22		Feature Symbolologies	No work needed	
23		Feature Definitions	No work needed	
24	<b>Cell Libraries</b>			
25		Abutment FC's	Available for Testing	
26		End Bents with Steel Piles	Available for Testing	
27		End Bents with Concrete Piles	Available for Testing	
28		Free Standing End Bent	Available for Testing	



- Wiki Page
- Links to Workspace
- Training Links
- Training Videos

[Main page](#)  
[Standard Files](#)  
[Folder Structure](#)  
[Collaborative Milestone Review Process](#)  
[Digital Delivery](#)  
[Project Quantity Spreadsheet](#)  
[Project Signature Sheet](#)  
[Community portal](#)  
[Current events](#)  
[Recent changes](#)  
[Random page](#)  
[Help](#)  
[Content Revision Procedures](#)

[Development Resources](#)

[Design Submittal Requirements](#)  
[Survey Standards of Practice](#)  
[Design Training Traffic and Safety](#)

[Tools](#)

Page [Discussion](#)

## OpenBridge Modeler

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[OpenBridge Modeler Learning Path](#)  
[Course Overviews](#)  
[OpenBridge Modeler Basics](#)  
[Intro to Bridge Modeling](#)  
[OBM Workflows](#)

## OpenBridge Modeler Learning Path



Microstation Part 1: Connect Edition Basics (Bentley Learn)



OpenBridge Modeler Part 1: Introduction to OpenBridge Modeler



# FDOT CADD Manual

- >Annual Updates published every November 1<sup>st</sup>
- >Effective January 1

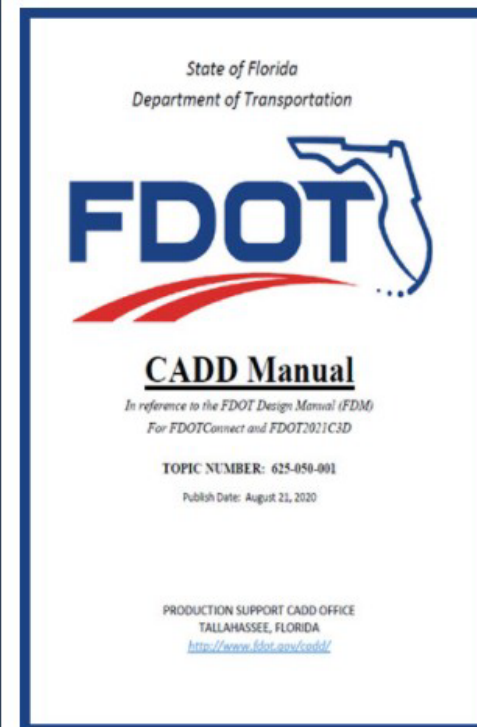
## Production Support | CADD

CADD / Publications / CADD Manual

### CADD Manual - FDOTConnect and FDOT2021C3D



This CADD Manual is to be used by all in-house personnel producing engineering projects. It is to be included in all contracts requiring engineering plans preparation. This manual will affect all offices of the Department and all consultants, contractors and others who utilize engineering CADD applications or engineering data produced by these applications.



**Chapter 1 Introduction:** The CADD Manual addresses the requirements to utilize Computer Aided Design and Drafting (CADD) for production and delivery of digital project data for the Florida Department of Transportation (Department). In addition to software and configuration requirements, it identifies tools, techniques, applications, standards and procedures that are used to produce a consistent and quality CADD product for the Department.

**Chapter 2 CADD Computer Systems:** This chapter establishes the minimum requirements for procurement, maintenance and technical support of the Florida Department of Transportation (Department's) Computer Aided Design and Drafting (CADD) systems.

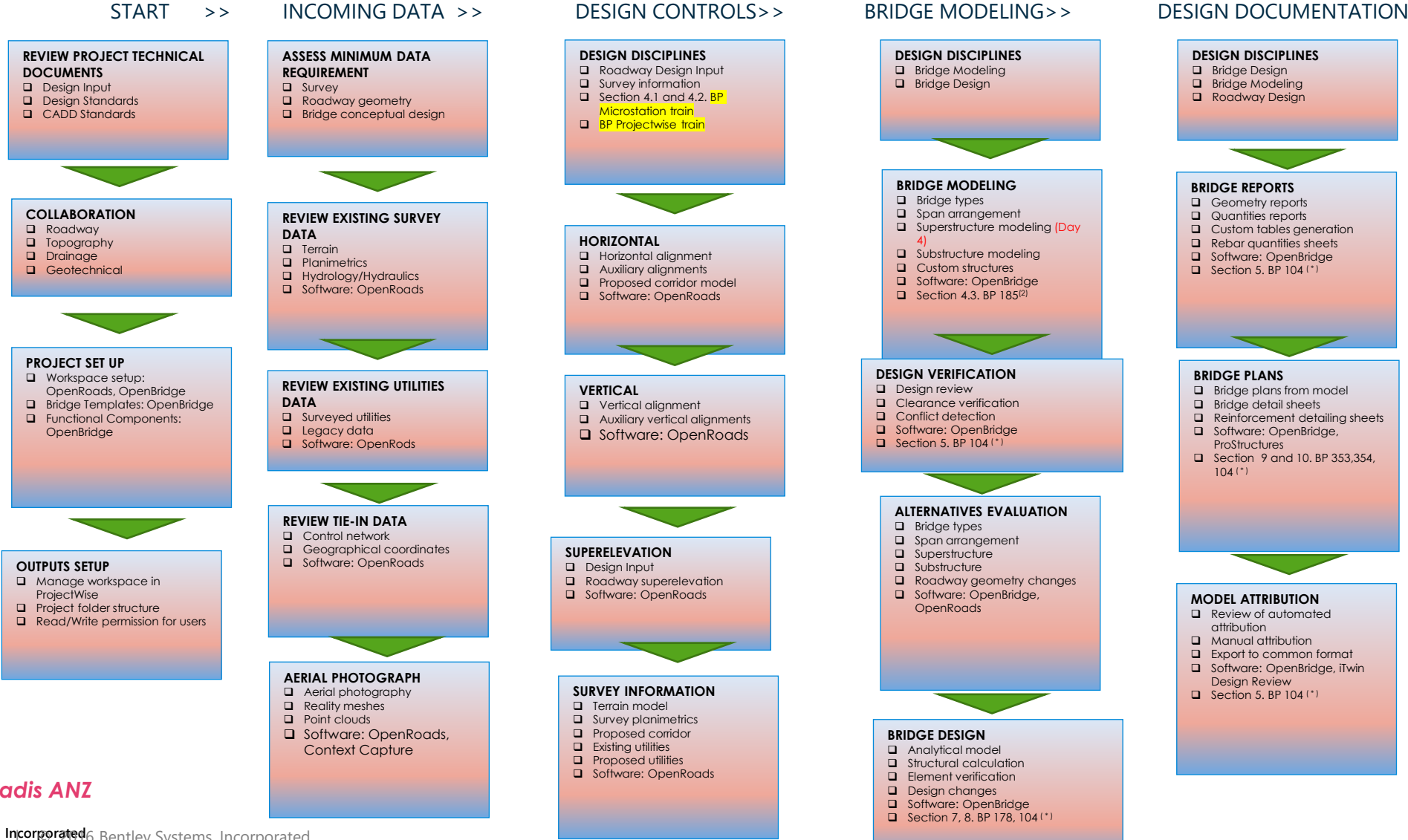
**Chapter 3 CADD Software, Development & Distribution:** This chapter establishes how Florida Department of Transportation (Department) Computer Aided Design and Drafting (CADD) software is developed, tested, approved and distributed..

**Chapter 4 CADD Support:** This chapter establishes the primary components of Florida Department of Transportation (Department) Computer Aided Design and Drafting (CADD) support structure and services, including the statewide training, and defines the applications and tools supported by the Production Support CADD Office.

**Chapter 5 CADD Standards:** This chapter defines the Florida Department of Transportation (Department's) critical Computer Aided Design & Drafting (CADD) Production Standards to be used in the production of the Department's CADD projects.

**Chapter 6 CADD Project Prerequisites:** This chapter defines the initial steps and processes for preparing the final Computer Aided Design and Drafting (CADD) projects in reflection of the FDOT Design Manual (FDM) for the Florida Department of Transportation (Department).

# Bridge Modeling & Design Workflow



• Courtesy of Arcadis ANZ

# OpenBridge Modeler CE

WorkSpace

WorkSet

ADOT Standards - 2021R1 f0297

Search

\* Custom Configuration

ADOT Standards - 2021R1

Arcadis Metric

CDOT\_Standards

Hatch\_Metric

MnDOT\_CE


NCDOT\_Structures

NJDOT

+ Create WorkSpace

Configuration Assistant

## Workspace



Pier Name: Florida Pier

Pier Type: Multi Column

Pier Properties

Cap Column Strut Footing Piles

Column Type: Variable

1

**Dimensions**

Length (unadjusted) 40.0000 [']

Auto Spacing On

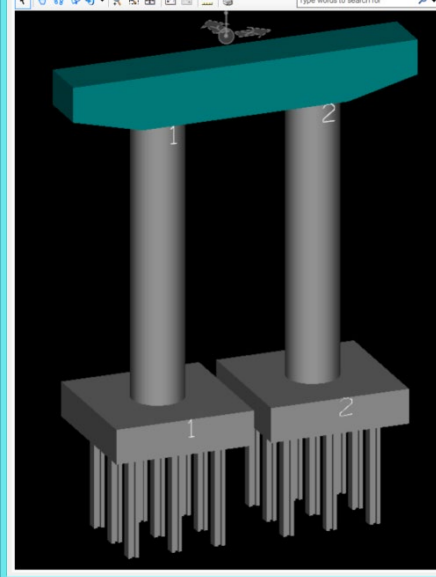
**Misc**

Variation Variable Sections

### Edit Variable Column

Section Height (')	Shape	Start Dimensions (") (W, L, X, Y)	End Dimensions (") (W, L, X, Y)	Variation	
1.8333	RectFill	164.0000, 60.0000, ...	155.0000, 60.0000, 6...	ParabolicStart	
6.2500	RectFill	155.0000, 60.0000, ...	96.0000, 60.0000, 6.0...	ParabolicEnd	
31.9167	Template			Linear	Florida\B...

## Edit Pier



Pier Name: MC-2

Pier Type: Multi Column

Pier Properties

Cap Column Strut Footing Pile

Cap Type: Tapered

**Dimensions**

Cap Length 10.0000 [m]

Cap Height 150.0000 [cm]

Cap Width 150.0000 [cm]

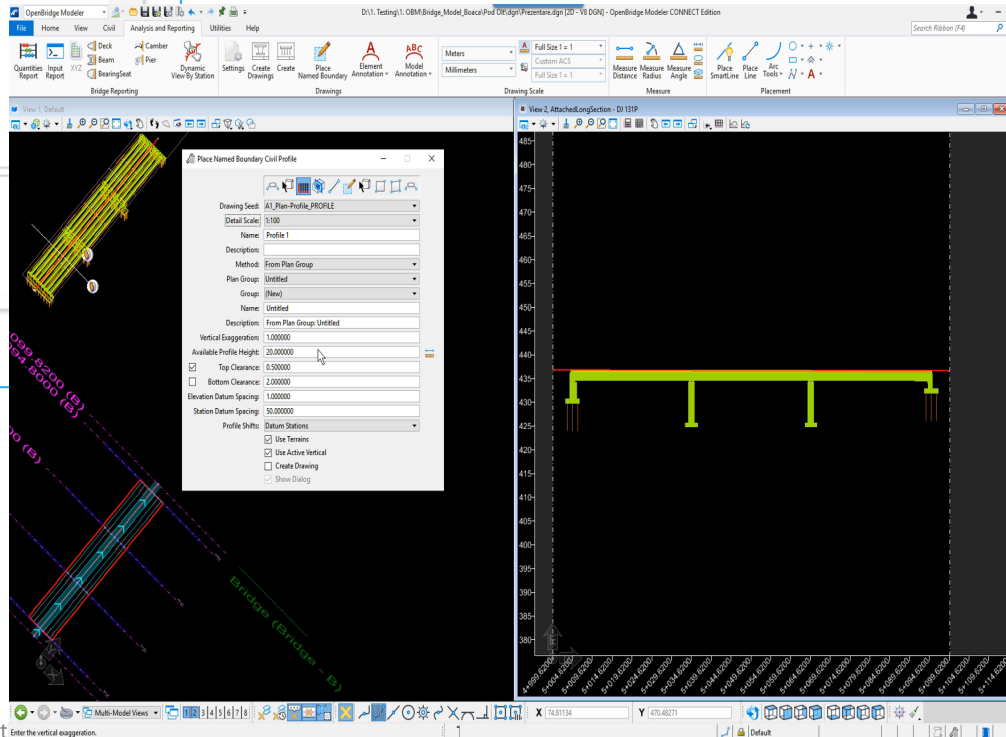
Cap Min Height 100.0000 [cm]

Left Delta 200.0000 [cm]

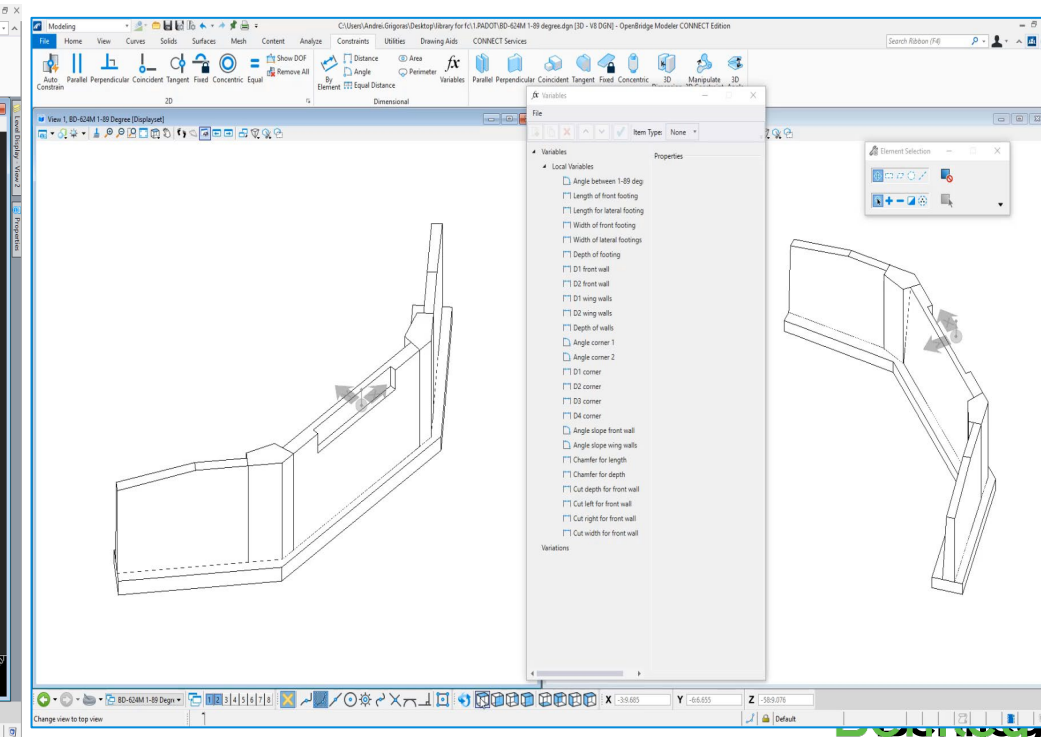
Right Delta 200.0000 [cm]

**Misc**

Working Point Location Left



OpenBridge Modeler CE interface showing a plan view of a bridge structure and a 'Place Named Boundary Cull Profile' dialog box. The dialog box includes fields for Name, Description, Method, Plan Group, Group, Name, Description, Vertical Exaggeration, Available Profile Height, Top Clearance, Bottom Clearance, Elevation Datum Spacing, Station Datum Spacing, Profile Shifts, Datum Stations, Use Terrain, Use Active Vertical, Create Drawing, and Show Dialog.



OpenBridge Modeler CE interface showing a 3D view of a bridge structure and a 'Properties' dialog box. The dialog box includes a list of variables and their properties, such as Angle between 1-89 deg, Length of front footing, Length for lateral footing, Width of front footing, Width of lateral footings, Depth of footing, D0 front wall, D1 front wall, D0 wing walls, D1 wing walls, Depth of walls, Angle corner 1, Angle corner 2, D1 corner, D0 corner, D1 corner, D0 corner, Angle slope front wall, Angle slope wing walls, Chamfer for length, Chamfer for depth, Cut depth for front wall, Cut left for front wall, Cut right for front wall, and Cut width for front wall.



# BIM Model Element Breakdown Workbook

	B	C	D	E	G	H	I	K	L	M	N	O	P	Q
	Model Element Name	Included in Project? Y/N	LOD Standard	Data Model 2D,3D, Both	S&S Contract Document Yes/ No	Engineer of Record	Source CADD File	Required Element Data Attributes (BOE, Location, GIS, Other)				FDOT Specification	Limitations	Required Reports
1														
5	Final Surface (Top Mesh)	Yes	300	3D	Yes	Roadway	AMG-3SURFACEPR	No	No	No	Yes			
6	Final Subgrade Design File (3D Lines)	Yes	300	3D	Yes	Roadway	AMG-3DSG NRDEW	No	No	No	Yes			
7	Final Surface Design File(3D Lines)	Yes	300	3D	Yes	Roadway	AMG-3DSG NRPR	No	No	No	Yes			
8	<b>Earthwork</b>													
9	Excavation	Yes	300	3D	Yes	Roadway	MODLRD	Yes	Yes	No	N/A			Use EAV I
10	Embankment	Yes	300	3D	Yes	Roadway	MODLRD	Yes	Yes	No	N/A			Use EAV I
11	Embankment for Bridge	Yes	300	3D	No	N/A	MODLRD	Yes	Yes	No	N/A			
12	Excavation for Bridge	Yes	300	3D	No	N/A	MODLRD	Yes	Yes	No	N/A			
13	Subsoil Excavation	Yes	300	3D	No	N/A	MODLRD	Yes	Yes	No	N/A			
14	add other pay items for excavation									No	N/A			
15	<b>Pavement</b>													
16	Stabilization	Yes	200	2D	No	N/A	QTDSRD	Yes	Yes	Yes	Yes			
17	Base Course	Yes	300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
18	Structural Course Asphalt	Yes	300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
19	FC Asphalt Pavement	Yes	300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
20	Concrete Pavement	Yes	300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
21	Pavement Milling	Yes	300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
22	Pavement Overbuild	Yes	300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
23	Pavement Overlay	Yes	300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
24	<b>Shoulder Pavement</b>													
25	Stabilization		200	2D	No	N/A	QTDSRD	Yes	Yes	Yes	Yes			
26	Base Course		300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
27	Structural Course Asphalt		300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
28	FC Asphalt Pavement		300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
29	Concrete Pavement		300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
30	Pavement Milling		300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
31	Pavement Overbuild		300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			
32	Pavement Overlay		300	Both	No	Roadway	MODLRD	Yes	Yes	Yes	Yes			

# Keys to Moving Forward with BIM



- Internal champions
  - Individuals or design teams
    - with vision and commitment
    - who take leadership roles
    - are persistent at moving forward
- Pilot project(s)
  - to work out the kinks and showcase the 3D process

Champions

Standards Development

Planning

Buy-In



511PA Travel Info



Driver & Vehicle Services



Submit Concern



REAL ID



Projects



Results



Funding



Forms, Pubs & Maps

[DOT](#) > [Projects & Programs](#) > [Digital Delivery Directive 2025](#) > [3D2025 Pilot Projects](#)

## 3D2025 Pilot Projects

PennDOT will use pilot projects to facilitate an incremental approach to developing and deploying digital delivery. The pilot projects will allow PennDOT to test the digital solution, monitor, receive feedback, refine and retest. The pilot projects will be on a small scale. As the solution is refined, piloting will expand in scope to include more projects, but will not change PennDOT's policy or guidance documents.

This page will be updated as new pilot projects are launched.

[DOT](#) > [Projects & Programs](#) > [Digital Delivery Directive 2025](#) > [3D2025 Pilot Projects](#) > [Bridge Authoring](#)

## Bridge Authoring

For this phase of the directive, we are piloting the process of developing model-based deliverables for construction contracts using the OpenBridge Designer software, which includes analysis, 3D modeling and detailing tools. The objectives of this project are to develop a 3D model as complete as possible to reproduce the content traditionally conveyed through plan sheets; evaluate the Bentley software stack, and enable contractor use of the model.

Selected Pilot Projects:

Project	District	County	SR-Section	Description	Anticipated Let Date
<a href="#">114138</a>	1	Crawford	1032-B00	SR 1032 Bridge over Shirley Run	02/16/2023
<a href="#">57945</a>	1	Crawford	0006-B12	US 6 French Ck Br #3	08/10/2023
<a href="#">8308</a>	4	Lackawanna	3006-250	SR 3006 over Gardner Creek	03/02/2023

- PennDOT will use pilot projects to facilitate an incremental approach to developing and deploying digital delivery. The pilot projects will allow PennDOT to test the digital solution, monitor, receive feedback, refine and retest.




# Keys to Moving Forward with BIM


- Training
  - Accessible
  - OnDemand
  - Applicable to
    - Job/discipline
    - Project workflow
    - Project Deliverable




# Training Plan

- Start from the basics

<p><b>OpenBridge Modeler, RM Bridge and ProStructures Transition Plan</b></p> <p>March 2022</p>	
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 Advancing Infrastructure



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OpenBridge Modeler, RM Bridge and ProStructures Knowledge Transition Plan for Arcadis

**3.2 Meeting with Key Users**

As soon as the Stakeholder Meeting and its immediate actions are complete, Bentley will host a short meeting with the key project participants who will be users of OpenBridge Designer. The objective of this meeting is to assure those users that they will be supported through this process, they will be successful and will get some significant benefit from the process.

The meeting will outline how the rollout program will work and attempt to address any concerns from the group.

**Stage 1**


**4 Project Knowledge Phase for OpenBridge Modeler**  
Provide skills and support to enable users to be more efficient and productive

**4.1 User Prerequisite Self-Learning**

Before engaging in implementing OpenBridge Designer, the expectation is all users will undertake a small amount of self-led learning to ensure some fundamental principles are understood. This will be through selected training courses offered on the Bentley's LEARN Server.

Bentley will provide a learning path of the on-demand courses <https://learn.bentley.com/app/Public> to take. This training is concept based so new users would get familiar with general MicroStation terminology and capabilities.

Scoped for	MicroStation Learning Path	Description
New User	MicroStation for New Users	In this course, you will learn how to use MicroStation CONNECT Edition from the perspective of a new user. You will learn about the interface; work with tools; define element attributes; learn to use AccuDraw and AccuSnap; create, select, manipulate, and modify elements; work with cells; annotate and compose designs and drawings; and learn about printing and publishing.
New User	MicroStation CONNECT Edition Basics for Civil Designers	These courses are taught from the point of view of a civil designer or drafter working at a design firm, whose company has been awarded a design project using MicroStation. During the courses you will learn basic navigation of the MicroStation CONNECT user interface, creating and working with MicroStation design files, drawing and manipulation tools, design file settings, and much more.
New User	3D Modeling in MicroStation CONNECT Edition	This learning path covers the concepts and capabilities of MicroStation CONNECT Edition for modeling of Curves, Surfaces, Solids and Meshes in a 3D design file. It also teaches



# Training Resources



## Practice Workbook

This workbook is designed for use in Live instructor-led training and for OnDemand self study. OnDemand videos for this course are available through [CONNECT Advisor](#) and on the [LEARN Server](#).

## Introduction to OpenBridge Designer

### CONNECT Edition (10.10.00.XX)

About this Practice Workbook...

- This PDF file includes bookmarks providing an overview of the document. Click on the bookmark to quickly jump to any section in the file. You may have to turn on the bookmark function in your PDF viewer.
- The dataset used throughout this Getting Started guide uses imperial and metric units.
- This training uses the *Imperial Standards/Metric Standards* workspace installed with the OpenBridge Modeler software. The workspaces are based on the OpenRoads Designer workspaces.
- The terms *Left-click*, *Click*, *Select* and *Data* are used interchangeably to represent pressing the left mouse button. The terms *Right-click* and *Reset* are also used interchangeably. If your mouse buttons are assigned differently, such as for left-handed use, you will need to adjust accordingly.

### Have a Question? Need Help?

- If you have questions while taking this course, submit them to the Bridge Analysis Forum on Bentley Communities where peers and Bentley subject matter experts are available to help.

TRNC03273-1/0005

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# Training Resources

## Drawing Production with OpenBridge Training





# Training Resources



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Bentley OpenBridge

@BentleyBridgeAnalysis 3.46K subscribers 336 videos

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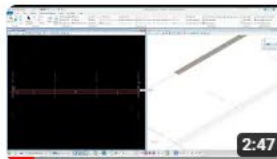
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CHANNELS

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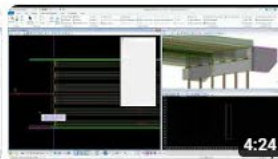


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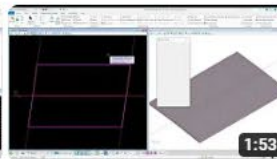
01 Single Beam in Beam Slab Type Bridges

46 views • 55 minutes ago



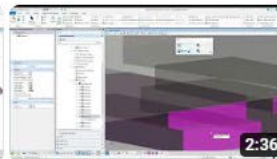
02 Barrier on Wingwall

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03 Barrier End Cut Orientation

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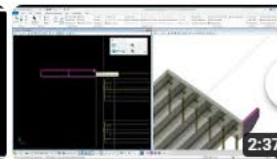
04 Bearing Elevations Reporting Tools

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05 Bearing Decorations

11 views • 55 minutes ago



06 Wingwall Transverse Offset

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# Training Plan



## Practice Workbook

This workbook is designed for use in Live instructor-led training and for OnDemand self study. OnDemand videos for this course are available through [CONNECT Advisor](#) and on the [LEARN Server](#).

## Introduction to OpenBridge Designer for TxDOT Prestressed Girder Bridges

### CONNECT Edition (10.10.00.XX)

About this Practice Workbook...

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### Have a Question? Need Help?

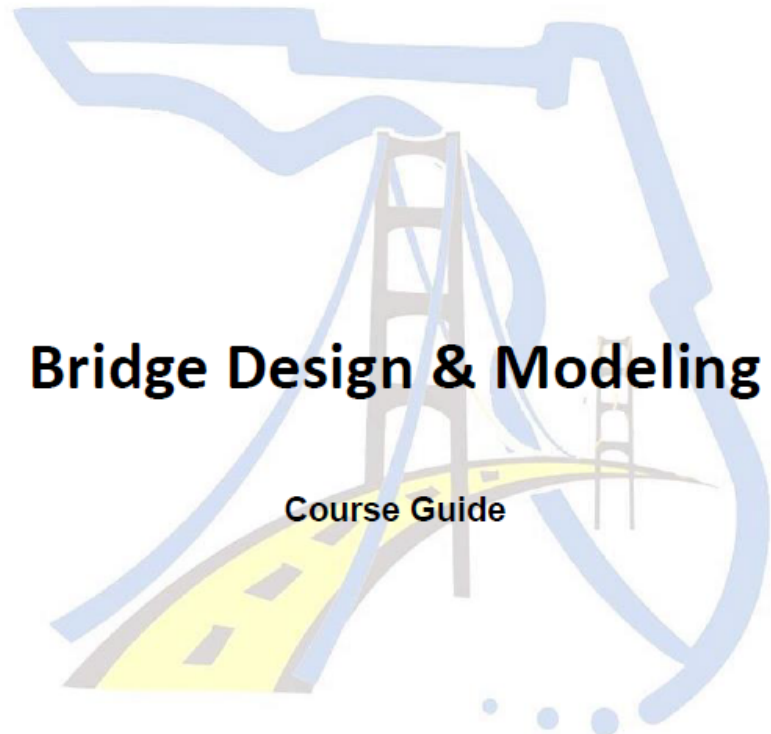
- If you have questions while taking this course, submit them to the Bridge Analysis Forum on Bentley Communities where peers and Bentley subject matter experts are available to help.

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State of Florida  
Department of Transportation

## FDOTConnect for OpenBridge Modeler



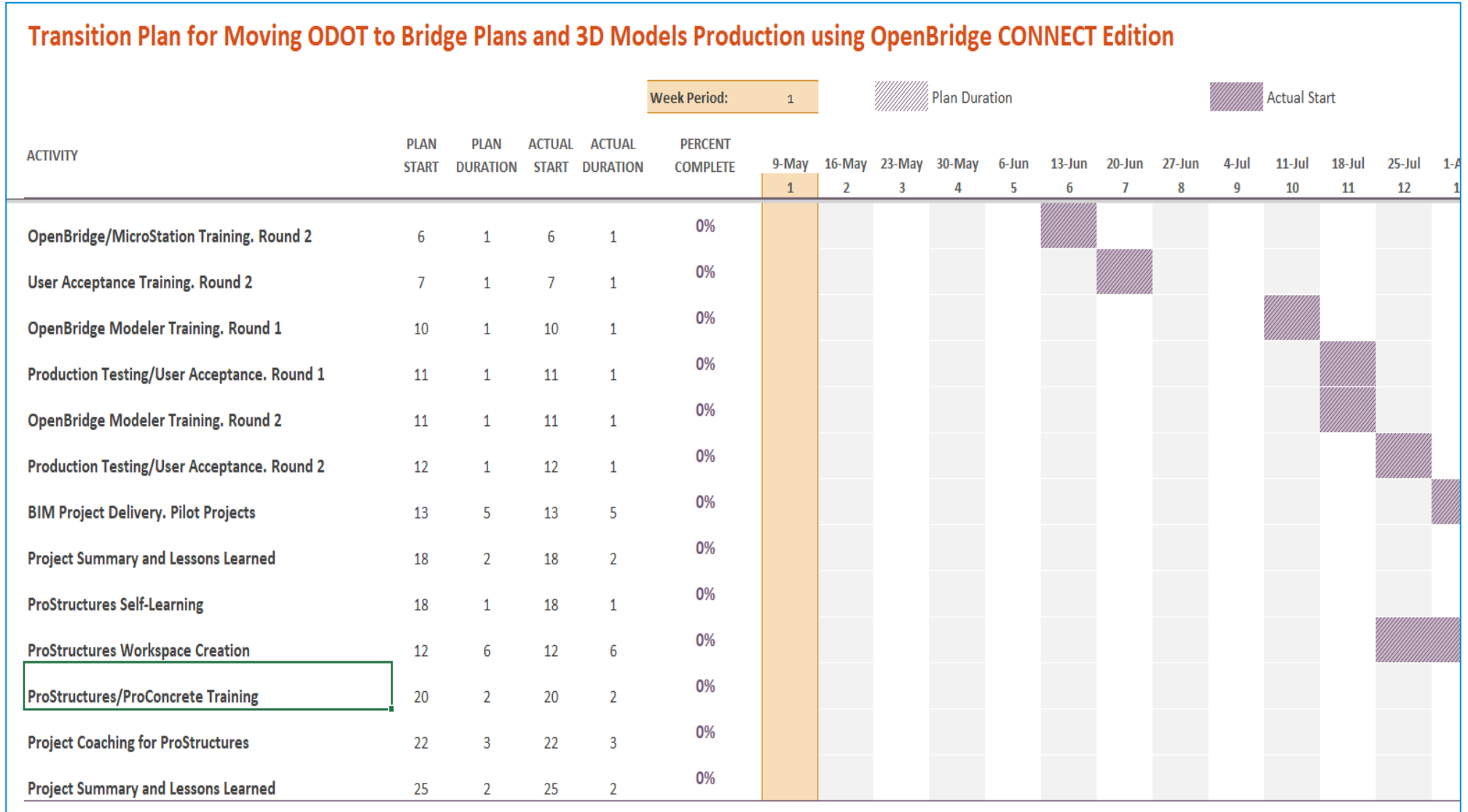
## Bridge Design & Modeling

Course Guide

PRODUCTION SUPPORT CADD OFFICE  
TALLAHASSEE, FLORIDA  
[HTTP://WWW.FDOT.GOV/CADD/](http://www.fdot.gov/cadd/)

# Training Timeline

- Always moving forward







## Keys to Moving Forward with BIM

- Implement
  - Move forward with both internal and external stakeholder participation
  - Stick to the plan/schedule

# Typical Project Savings

01



**COST**

**-11%**

Reduction in cost as processes get shortened and unnecessary rework is eliminated

02



**ROI**

**+23%**

Even though software, possible hardware upgrades and training personnel is required, the return of investment is always positive.

03



**Time**

**-10%**

Design and construction schedules are optimized with new and more efficient workflows.

04



**Quality**

**+30%**

Quality improves as multiple alternatives could be analyzed and there is more time to optimize the final solution

