

- D1.01 General
- D1.02 Applications
- D1.03 WSDOT Resources and Related Standards
- D1.04 Project Specific/Custom Resources
- D1.05 WSDOT Custom Utilities

D1.01 General

WSDOT has developed software resources to support Agency specific standards and deliverable requirements related to the drafting, design, construction, and survey disciplines. These resources provide a standard element list with associated symbology and productivity tools that support the WSDOT Plans Preparation Manual and this manual. WSDOT standard resources for the CONNECT platform are only available and maintained within the WSDOT ProjectWise environment via Managed Workspaces.

All deliverables will use the most current set of WSDOT resources as managed by WSDOT ProjectWise Managed Workspaces.

D1.02 Applications

The WSDOT standard Computer Aided Drafting and Design (CADD) platform is Bentley Systems.

See the WSDOT [Computer Aided Engineering](#) website for acceptable deliverable file format and versions.

D1.03 WSDOT Resources and Related Standards

The WSDOT CAE ProjectWise Managed Workspace(s) provides files and electronic resources organized under a master resource folder. The master resource folder contains all the electronic resources necessary to support WSDOT survey, roadway engineering, Plans, Specifications, and Estimates (PS&E), and Right of Way contract plan set development and deliverables.

Periodic resource updates and bug fixes are reviewed for impact to production and deployed in a controlled manner through the managed workspace environment. All applicable users will see the change the next time they open a DGN file after the deployment takes place.

This section describes the purpose and contents of primary resources in the WSDOT environment for all major disciplines. Additional discipline specific resources will be covered in their respective sections of this manual.

D1.03(1) Asset Management

This section will be updated in the future when this function is incorporated into the WSDOT environment.

D1.03(2) Cell Libraries

Cells can be simple or complex graphics placed as point symbology for all disciplines. From single feature symbology in base plans to legends, schedules, and details in sheets, they are compiled into libraries with CEL file extension.

The native size of a cell accommodates the standard at *Full Size 1=1* on a sheet.

CONNECT utilizes annotation cells. This means that the cell will adhere to\apply the assigned drawing scale set in the current model. It is not static across models. A design model might display a cell at 1" = 50' for ease of work while that same cell may be referenced to a sheet model at a detail scale of 1" = 100'.

Exceptions to this behavior are *True-size* cells. These cells are always the actual ground size of the objects they represent. Examples of true-size (also referred to as non-scalable) cells include many of the painted pavement markings such as the HOV symbol and RR crossing symbol and 3D Models such as Catch Basins, will reflect the true ground size regardless of plotting scale. True-size cells are flagged in the [Symbology 4](#) and [5](#) sections of this manual.

All standard cells are available via the WSDOT ProjectWise environment. See D1.04 of this manual for project-specific considerations.

D1.03(3) Color Tables

By default, the standard WSDOT color table *WSDOT_Color.tbl* is attached to the provided WSDOT seed files.

Do not manually assign color using the *True Color* or *Color Books* options. These utilize methods to define the color (RGB or user defined color) that will not work with other processes like color mapping in the print functions. Do not change the color table values attached. Contact the [WSDOT HQ CAE Help Desk](#) for assistance.

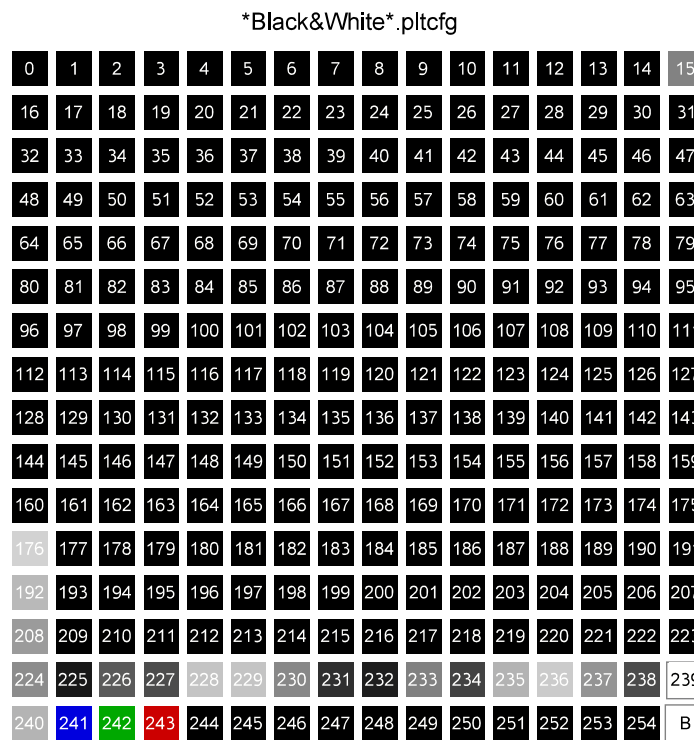
WSDOT groups areas of the color tables for discipline and printing function.

Figure D1-1 WSDOT color table grouping



WSDOT standard colors for Color and B/W print output.

Figure D1-2 WSDOT standard color print output



D1.03(4) DGN Libraries

DGN Libraries store many of the settings, resources, and functions controlling the CADD applications.

The primary feature definition DGN Libraries contain the WSDOT standard elements including Feature Definitions, Element Templates, base Level and ByLevel attributes, Survey settings, Text Favorites, Text and Dimension styles, along with Civil Label settings.

Other DGN Libraries include Civil Cells, WSDOT tools, Item Types, Line styles, Print styles, Sheet Seeds, Standards Checker settings and Tables.

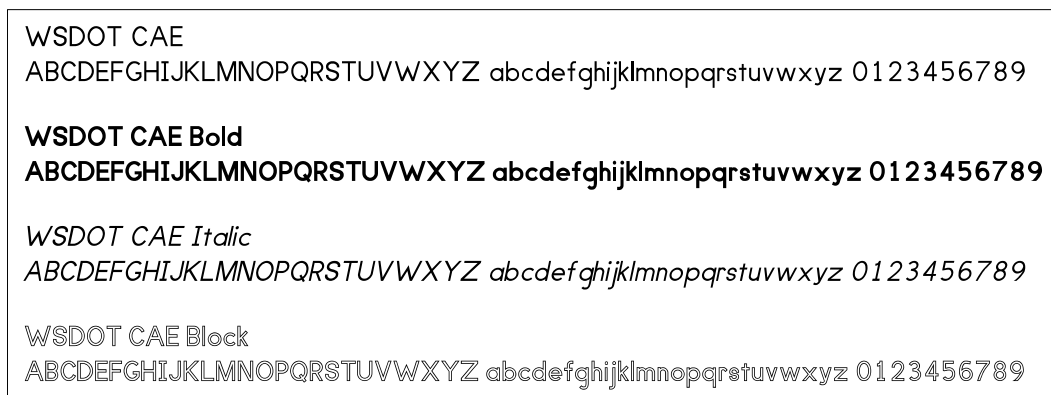
Like cells, Line styles adhere to drawing scale settings in all models. In sheet models, the drawing scale is full size 1=1. The details referenced into the sheet border have their own scale settings based on the detail scale.

D1.03(5) Fonts

The general WSDOT standard font is *WSDOT CAE* true-type font. Fonts supporting MUTCD sign text are also included in the WSDOT standards.

All text shall use WSDOT standard fonts via assigned text styles. Exceptions and more specific details can be found in the *Symbology 4* and *Symbology 5* sections of this manual.

Figure D1-3 WSDOT CAE True Type Font



Like cells, text styles adhere to drawing scale settings in all models. In sheet models, the drawing scale is full size 1=1. The details referenced into the sheet border have their own scale settings based on the detail scale.

The result is that all text displayed in a sheet model appears at a consistent and correct size according to the assigned text style regardless of in the title block, notes, or references at various scales.

D1.03(6) Printing Resources

CONNECT applications provide two primary print options, Print and Print Organizer. Print is intended for one file at a time and uses Plot Configurations file to manage output. The Print Organizer is the primary tool to print plan sets, it allows batch printing of multiple files and uses Print Styles to manage output.

WSDOT plot configuration files and print styles must be used to ensure the output of color, linestyle, and weight are per the WSDOT standards. Do not use a system PDF driver to create PDF files, WSDOT PDF plot config file and WSDOT PDF print styles create a word searchable PDF that is required for WSDOT plan sets.

Plot Configuration Files (.pltcfg)

WSDOT plot configuration file provide output to EMF, PDF and Printers in multiple paper sizes.

EMF_BW.pltcfg and *EMF_Color.pltcfg* create a black/white or color *.emf file. Enhanced Metafiles (EMFs) are an image format that offer several advantages. They contain rich image metadata, including detailed RGB color information and precise dimensions, ensuring images are displayed consistently across different platforms and devices. Additionally, their scalability means that image quality is maintained regardless of scale, the precise vector data allows for high-detail and precision images making them versatile for various digital needs. The page sizes available are dependent of the system default printer.

PDF_BW.pltcfg and *PDF_Color.pltcfg* create a black/white or color *.pdf file. The WSDOT *PDF_BW.pltcfg* is the default plot config file loaded when the Print function is used. A Portable Document Format (PDF) standardized file format developed by Adobe. It allows you to present documents, including text formatting and images, in a consistent manner across different hardware, operating systems, and applications. The page sizes available are ANSI A 8 1/2"X11", ANSI B 11"X17" (default page), ANSI C 18"X24", and ANSI D 22"X34".

Printer_BW.pltcfg and *Printer_Color.pltcfg* output hard copies to the system printer(s) installed on the device. Do not use a PDF driver like Adobe PDF, Bluebeam PDF, or Microsoft Print to PDF to create a PDF file. Use the WSDOT *PDF_BW.pltcfg* and *PDF_Color.pltcfg* to create PDF drawings.

Pen Table

Pen tables contain instructions for re-symbolizing the printed output of DGN files. At WSDOT, this typically takes the form of sequencing element printing and text substitution information for print deliverables.

No action to select a pen table is required to produce WSDOT standard deliverables that have been developed per the EEDS manual requirements.

The default pen table is set to **WSDOT_PenTable.tbl** in the standard resource configuration files. This pen table prints raster images first, then vector elements so that the raster image appears behind the other graphics regardless of the display.

WSDOT_OrderByPriority.tbl prints the elements as displayed in the DGN model using referencing update sequence and element priorities.

Print Styles

A set of four Print Styles are available for use with the Print Organizer. These are for various sizes of PDF and hard copy prints, from both base and sheet files. They are automatically configured to be available using the WSDOT environment. These styles are stored in a *DGNLib* file within the WSDOT resource file set.

D1.03(7) Reports

This folder includes groupings of XSL report styles for various OpenRoads report functions. These provide the data formatting, labels, and math functions appropriate for the given report output.

D1.03(8) Seed Files

Seed files are template DGN models used to initiate working models with base settings and behavior. WSDOT includes a complete set of seed files. The standard 2D seed file is configured as default when creating a new file.

WSDOT seed files shall be used when creating new DGN files.

For roadway design data and plans preparation base development, the seed is *WSDOT_2D_Seed.dgn*.

For survey data processing, the seed is *WSDOT_3D_Survey_Seed.dgn*.

For AutoTurn movements and turning simulations, the seed is *WSDOT_2D_AutoTurn_Seed.dgn*.

The drawing model seed is *WSDOT_2D_Drawing Seed.dgn*.

The sheet model seed is *WSDOT_2D_Sheet Seed.dgn*.

Sheet files are created from the *Named Boundary* toolset and utilize appropriate WSDOT sheet borders through an automated process.

Stand-alone sheet models can be created in the Models dialog window and will create a sheet model with the selected sheet size and border/title block.

Details on the WSDOT Design Seed files are as follows:

- Master Units: US Survey Feet
- Sub Units : US Survey Inches
- Resolution: 10,000 per US Survey Foot

See *Deliverables 7Drafting and Plans Preparation* of this manual for more information.

D1.03(9) Orthographic Imagery Web Map Services (WMS)

WMS ortho-imagery is available in ProjectWise via the [Imagery](#) folder. Ortho-imagery in subfolders appended by “_Public” are available to the public and all ProjectWise users. All other images are only available via logging into the WSDOT network.

To reproject the WMS imagery to the project coordinate system a Geographic Coordinate System (GCS) must be set in the DGN file that has the WMS attached.

D1.04 Project Specific/Custom Resources

Project specific resources are by definition, not standard which presents potential problems for downstream (non-ProjectWise) customers and exporting this data to other applications; therefore, their use should be minimized as much as possible.

If a necessary element (symbology or text type) is not currently available, submit a request via email to the [WSDOT HQ CAE Help Desk](#) for inclusion in the master resources. They will assist in short-term and long-term solutions. Use this same approach to request changes to existing symbology or propose a new productivity enhancement.

Project specific or user custom resources must not conflict with master resources.

Each project specific resource type (cell library, color table, etc.) shall be stored in the *work area* \Standards structure in the appropriate folder. When placed correctly, most basic custom resources will be recognized by the work area configuration without modification. If the resources do not show as expected, contact the [WSDOT HQ CAE Help Desk](#).

The WSDOT configuration does not allow creation of new levels. If a new level is needed contact the [WSDOT HQ CAE Help Desk](#). The request will be evaluated with the appropriate resource owner and plan review groups.

D1.05 WSDOT Custom Utilities

WSDOT is using the vendor installations and tools as much as possible. Listed below are the custom utilities that WSDOT CAE has developed for the Connect environment.

Ask WSDOT CAE Support

Ask CAE Support utility is in the WSDOT Drawing Workflow, Help tab, WSDOT CAE Support ribbon group. Used to send CAE and other support staff for specific questions or problem via email.

Figure D1-4 Ask WSDOT CAE Support dialog

Ask WSDOT CAE Support [X]

About Me

First Name: Region:

Computer ID:

I'm using...

MicroStation AutoTURN ProjectWise

OpenRoads Designer SignCAD Other

I Have a Questions About...

<input type="checkbox"/> Annotation	<input type="checkbox"/> Geo.Coord. Sys.	<input type="checkbox"/> Survey Processing
<input type="checkbox"/> Bridge	<input type="checkbox"/> Geometry	<input type="checkbox"/> Terrains
<input type="checkbox"/> CAE Resources	<input type="checkbox"/> Hydraulics	<input type="checkbox"/> Titleblocks
<input type="checkbox"/> CAE Standards	<input type="checkbox"/> Models	<input type="checkbox"/> Traffic
<input type="checkbox"/> Corridors	<input type="checkbox"/> Plans Production	<input type="checkbox"/> Vehide Path
<input type="checkbox"/> Custom Vehides	<input type="checkbox"/> Printing	<input type="checkbox"/> Visualization
<input type="checkbox"/> Document Mngmt	<input type="checkbox"/> Sign development	<input type="checkbox"/> Work Area Access
<input type="checkbox"/> General Drafting	<input type="checkbox"/> Survey Controllers	<input type="checkbox"/> Other

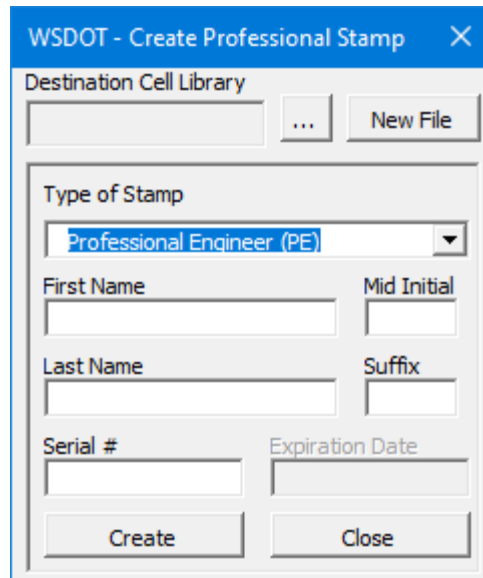
What's On Your Mind (briefly)?

Click the Submit button to send this message to CAE Support...

WSDOT Create Professional Stamp

Create Stamp utility is in the WSDOT Drawing Workflow, Annotation tab, Professional Stamps ribbon group. Used to create a professional stamp for Professional Engineers, Professional Land Surveyor, Landscape Architect, Structural Engineer, Registered Architect, and Engineering Geologist.

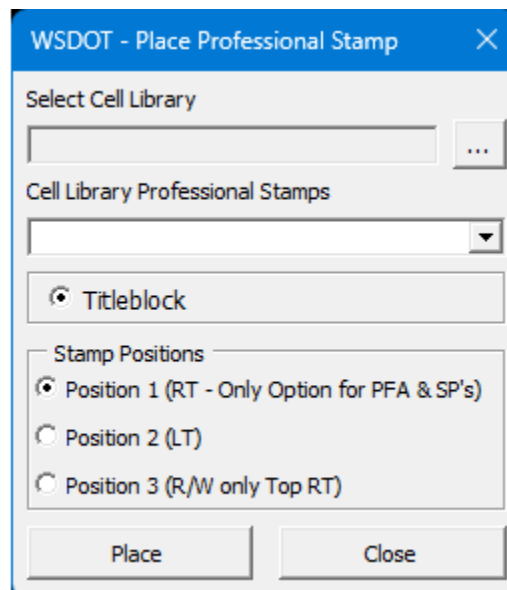
Figure D1-5 WSDOT Create Professional Stamp dialog



WSDOT Place Professional Stamp

Place Professional Stamp utility is in the WSDOT Drawing Workflow, Annotation tab, Professional Stamps ribbon group. Used to place a stamp in a certificate sheet or in a sheet title block.

Figure D1-6 WSDOT Place Professional Stamp dialog



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