**MicroStation and OpenRoads Designer WorkSpace Configuration**

**Reference Documentation**



**Revisions:**

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Revision No | Description | Signature |
| 01/16/2025 | 1 | First release |  |
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## Introduction

South Carolina Department of Transportation (SCDOT) has developed a workspace to support the use of Bentley MicroStation (MS), Bentley OpenRoads Designer (ORD), and Bentley OpenBridge Designer (OBD). This document serves to inform the user of the structure of the relevant WorkSpace and the folders and files that pertain to this WorkSpace.

We will discuss the folder structure, the files in those folders and what each are used for. While we will not elaborate on every line in each file, we will provide a brief description of specific elements that are of importance to the user of this WorkSpace.

The folder structure refers to the WorkSpace as it is installed on the local (c:) drive. The latter portion of the document refers to the same WorkSpace that has been uploaded to ProjectWise and what the configuration is for this WorkSpace in a ProjectWise Managed WorkSpace.

# MicroStation / OpenRoads Designer Configuration Files

## Description:

Files within the SCDOT configuration folder structure are used to set up the working environment by directing configuration variables to specific directories and/or filenames. There is a specific hierarchy to these folders and files and the application will read these in a specific sequence.

## Included Configuration Files:

..\SCDOT\WorkSpaces\SCDOT.cfg

* The workspace configuration file includes primary variables used to include resources defined at the workspace level. SCDOT provides all of its resources delivered at the Organization-Civil level so the primary entries in this file are the first 2 uncommented lines that direct the workspace to the configuration files for the Civil Organization and Bridge Organization:
	+ CIVIL\_ORGANIZATION\_NAME = SCDOT
	+ BRIDGE\_ORGANIZATION\_NAME = SCDOT\_Bridge

..\SCDOT\Organization-Civil\SCDOT.cfg

* This is where the variables are defined to include the SCDOT provided resources. This resources include the MicroStation resources like levels, line styles, fonts, text styles, cells as well as the ORD resources such as features, annotation groups, civil labels to name a few.

..\SCDOT\Organization-Civil\SCDOT\_Bridge.cfg

* This configuration file is used when OBM is used to open the SCDOT workspace. It will define the variables required by OBM and override some variables previously defined to optimize the environment for bridge users.

.. \SCDOT\WorkSpaces\SCDOT\WorkSets\\_NewWorksetTemplate.cfg

* This configuration file is used to define variables at the WorkSet level. This file will be copied when new WorkSets are created using this as the Template. It sets the default WorkSet specific variables and provides a configuration level resources such as cells that are unique to WorkSet.



# WorkSet Configuration

## Description:

“Project Data” is referred to as a “WorkSet” in MS/ORD/OBM terminology and is located under the .. “\SCDOT\WorkSpaces\SCDOT\WorkSets\”folder structure by default. This location can be redefined by editing the WorkSpaceSetup.cfg in the root of the configuration and setting the variable MY\_WORKSET\_LOCATION to the new path.

This folder structure will contain a corresponding WorkSet configuration file for each WorkSet. The WorkSet CFG files delivered with the SCDOT configuration have been customized to create the DGNWS files in the root folder of the WorkSet. The DGNWS file ctores the WorkSet’s custom properties and Sheet Index. It will be created in the root of the workset and be named after the workset with a .dgnws extension. ..\*<WorkSet Name>*\*<WorkSet Name>.dgnws*

The configuration file contains additional configuration variables specific to the WorkSet itself, facilitating the ability to have additional standards related only to that WorkSet. This allows the user to append their own standards to the delivered SCDOT standards.

The WorkSet.cfg has also been updated to automatically load a custom template library ITL file if it is save in the WorkSet’s Standards\Template Library folder and the ITL is named after the WorkSet.

..\*<WorkSet Name>*\Standards\Template Library\*<WorkSet Name>.itl*

# Resource Files

## Description:

MS Resource files contain a file extension of RSC. These resource files contain either MS fonts or MS custom line styles. In addition to RSC files, sometimes custom linestyles may also be imported from a RSC file to a design file library (DGNLIB) file. This is the case for the 3D custom linestyles included in the SCDOT WorkSpace.

## Resource folder locations included by configuration variables:

..\SCDOT\ Organization-Civil\SCDOT\Dgnlib\Line Styles\

..\SCDOT\ \Organization-Civil\SCDOT\Dgnlib\Line Styles\Legacy\

..\SCDOT\ Organization-Civil\SCDOT\Fonts\

# Cell Libraries

## Description:

MS cell libraries contain preconfigured drawings that can be used for repetitive drawing tasks. In the SCDOT WorkSpace there are two distinct folders for cell libraries. The first folder is for basic MS cells, cells specific for the Bubble Note application, and finally ORD annotation cells. The second folder location contains ORD Civil Cells. Civil Cells are exclusive to ORD where design intent is incorporated into each cell for example a Civil Cell may be used to model a 3D ADA Ramp.

## Cell folder locations included by configuration variables:

..\SCDOT\Organization-Civil\SCDOT\Cell\

..\SCDOT\Organization-Civil\SCDOT\Dgnlib\Civil Cells\

# Asset Manager

## Description:

Files associated with Asset Manager can be configured to make bulk assignments of MS Item Types. MS Item Types are properties that can be assigned to any graphical MS element. For example, a station and offset property may be assigned to a plan view cell representing a stop sign. These item types can then be used to create annotations or compute quantities. There are typically two Excel spreadsheets designated for Asset Manager configuration. There are no SCDOT customizations within this folder at the time of SCDOT configuration’s delivery.

**Asset Manager folder locations included by configuration variables:**

..\SCDOT\Organization-Civil\SCDOT\Asset Manager\

# Color Table

## Description:

SCDOT’s configuration utilizes a custom color table. are included to support the Bubble Note annotation application. Thes color table is defined using the variable MS\_DEFCTBL in the Organization-Civil\SCDOT.cfg.

## Color Table folder location included by configuration variables:

 ..\SCDOT\Organization-Civil\SCDOT\Color Table\

# DGN Libraries (\*.dgnlib)

## Description:

DGNLIBs typically contain a multitude of different settings for MS, ORD and OBM. For example, a DGNLIB might contain all the MS levels or element templates. DGNLIBs are included in multiple folders throughout SCDOT WorkSpace. The following list details the specific files and their contents:

## Included DGN Libraries:

*..\SCDOT\Organization-Civil\SCDOT\Civil Cells\SCDOT\_Basin.dgnlib*

* Contains a Basin Civil Cell

*..\SCDOT\Organization-Civil\SCDOT\Civil Cells\SCDOT\_Bridge\_Items.dgnlib*

* Contains a Sloped Abutment Civil Cell

*..\SCDOT\Organization-Civil\SCDOT\Civil Cells\SCDOT\_Connector.dgnlib*

* Contains basic median cross over connector Civil Cells

*..\SCDOT\Organization-Civil\SCDOT\Civil Cells\SCDOT\_Curb\_Ramps.dgnlib*

* Contains ADA Ramp Civil Cells

*..\SCDOT\Organization-Civil\SCDOT\Civil Cells\SCDOT\_Drives.dgnlib*

* Contains Driveway Civil Cells

*..\SCDOT\Organization-Civil\SCDOT\Civil Cells\SCDOT\_Medians.dgnlib*

* Contains mefian cross over Civil Cells

*..\SCDOT\Organization-Civil\SCDOT\Civil Cells\SCDOT\_Interchange.dgnlib*

* Contains Interchange Civil Cells

*..\SCDOT\Organization-Civil\SCDOT\Civil Cells\SCDOT\_Roundabouts.dgnlib*

* Contains Round About Civil Cells

*..\SCDOT\Organization-Civil\SCDOT\Civil Cells\SCDOT\_T-Intersections.dgnlib*

* Contains Intersection Civil Cells

*..\SCDOT\Organization-Civil\SCDOT\Civil Cells\gINT standard colors.dgnlib*

* gINT color table to define the different material layer colors

*..\SCDOT\Organization-Civil\SCDOT\Dgnlib\Design Standards\AASHTO Design Standards 2011.dgnlib*

* Contains horizontal and vertical curve standards for designing geometry. This is based on AASHTO 2011 published standards and is delivered with ORD installation.

*..\SCDOT\Organization-Civil\SCDOT\Dgnlib\Design Standards\AASHTO Design Standards 2018.dgnlib*

* Contains horizontal and vertical curve standards for designing geometry. This is based on AASHTO 2018 published standards and is delivered with ORD installation.

*..\SCDOT\Organization-Civil\SCDOT\Dgnlib\ Display Styles \Display Styles-Rules.dgnlib*

* Contains specific MS Display Rules. These display style rules can be used to control turning on or off predefined elements, highlighting elements, etc.

*..\SCDOT\Organization-Civil\SCDOT\Dgnlib\Display Styles\Display Styles.dgnlib*

* Contains specific MS Display Styles used to control how elements are displayed.

*..\SCDOT\Organization-Civil\SCDOT\Dgnlib\Feature Definitions\SCDOT\_Standards.dgnlib*

* Primary library defining SCDOT standards. Discipline specific libraries will supplement the resources defined here.
	+ Text Styles
	+ Dimension Styles
	+ Text Favorites
	+ Item Types
	+ Levels
	+ Element Templates
	+ Features
	+ Feature Symbologies
	+ Annotation Groups and Definitions
	+ Label Definitions

*..\SCDOT\Organization-Civil\SCDOT\Dgnlib\Feature Definitions\SCDOT\_Hydraulic\_Standards.dgnlib*

* Contains all the necessary configurations associated with OpenRoads Drainage and Utilities.
	+ Text Styles
	+ Text Favorites
	+ Element Templates
	+ Drainage Features
	+ Drainage Feature Symbologies
	+ Drainage Annotation Groups and Definitions
	+ Prototypes
	+ Catalogs

*..\SCDOT\Organization-Civil\SCDOT\Dgnlib\Feature Definitions\SCDOT\_SUE\_Standards.dgnlib*

* Contains all necessary resources associated with SCDOT Subsurface Utility Engineering (SUE) .
	+ Text Styles
	+ Dimension Styles
	+ Text Favorites
	+ Item Types
	+ Levels
	+ Element Templates
	+ Features
	+ Feature Symbologies
	+ Annotation Groups and Definitions
	+ Label Definitions

*..\SCDOT\Organization-Civil\SCDOT\Dgnlib\Graphical Filters\SCDOT\_Filters.dgnlib*

* Contains all the graphical filters for building selection sets or terrain models specific to SCDOT’s Feature Definitions.

*..\SCDOT\Organization-Civil\SCDOT\Dgnlib\GUI\custom\_menu.dgnlib*

* Contains customizations to the Graphical User Interface (GUI). This file is copied from Bentley’s delivered workspace. It should be updated when moving to newer versions of OpenRoads Designer by recopying the library and macros from the updated Bentley delivered workspace.

*..\SCDOT\Organization-Civil\SCDOT\Dgnlib\GUI\SCDOT\_GUI.dgnlib*

* Contains customizations unique to the SCDOT configuration. Keeping the interface changes unique to SCDOT in this file allows the other file in this directory to be updated frm Bentley workspaces without having to redo SCDOT customizations.

*..\SCDOT\Organization-Civil\SCDOT\Dgnlib\Item Types\*

* *SCDOT\_Reports.dgnlib* Contains reports and table seeds used to evaluate data in design files and their references.
* Other files in this directory are used to configure item type lookups, pick lists and define rules for applying item types for tools which split or combine elements with items attached.

*..\SCDOT\Organization-Civil\SCDOT\Dgnlib\Sheet Seeds\*

* *The files in this directory contain the drawing seeds used in the Place Named Boundary dialog.*

*..\SCDOT\Organization-Civil\SCDOT\GCS\GeoCoordFavorites.xml*

* *Adds SCDOT’s coordinate system (SC83IF) to the favorites list to make it easy to select when assigning a coordinate system to a model.*

*..\SCDOT\Organization-Civil\SCDOT\Macros\*

* *This directory contains VBAs used in the SCDOT configuration.*

*..\SCDOT\Organization-Civil\SCDOT\Materials\Materials.dgnlib*

* Contains all the rendering materials settings required for the 3D model display.

*..\Sheet Seeds\\*.dgnlib* – There are many DGNLIBs in this folder all dedicated to the same purpose of creating plans production sheets. Each DGNLIB contains named boundaries and settings for different scale and port combinations.

# Fonts

## Description:

Font files and/or font configuration files control what fonts are available in MS and ORD. Fonts themselves are \*.RSC, \*.TTF, \*.SHX, etc. XML files related to Fonts may be used for configuring the Favorite Symbols list or what fonts to make available to the user as an example.

## Included Font Files:

*..\SCDOT\Organization-Civil\SCDOT\Fonts\*

*This directory contains multiple fonts delivered with the SCDOT configuration. These supplement the fonts installed in the Widows fonts directory.*

*MstnFontConfig.xml* – Contains the necessary settings to control what fonts are available and how they are to be displayed.

*FavoriteSymbols.xml* – Contains the list of favorite symbols to be displayed in the MS text editor.

# Macros

## Description:

The Macros folder structure contains multiple MS Visual Basic Application (MVBA) macros used to automate repetitive task.

## Included Macro Files:

*..\SCDOT\Organization-Civil\SCDOT\Macros\*

*ViewSet.mvba* – This macro is used in conjunction with the right-click view control menu option to setup pre-arranged views for ORD. It works with the settings file ViewControlConfigurations.xml.

*SnappableToggle.mvba* – Used to toggle on or off a preconfigured list of level names. The level names are listed in the included text file entitled *SnappableToggle\_Levels.txt*

# Materials

## Description:

MS materials are part of the MS platform and are used for rendering 3D surfaces. The included DGNLIB contains all the settings for each of the materials in the Palette entitled “Civil”. In addition to the DGNLIB, there are two subfolders entitled “bump” and “pattern” containing computer image files used within the settings of the DGNLIB.

## Materials DGNLIB location included by configuration variable:

..\SCDOT\Organization-Civil\SCDOT\Materials\materials.dgnlib

## Materials Bump Images location included by configuration variable:

..\SCDOT\Organization-Civil\SCDOT\Materials\bump\

## Materials Pattern Images location included by configuration variable:

..\SCDOT\Organization-Civil\SCDOT\Materials\pattern\

# Preference Seeds

## Description:

Preference seeds are used to define the initial arrangement of dialogs, user preferences, button assignments, and function keys used when working with the SCDOT configuration active in ORD. These are used to create user specific preferences in the user’s Window profile.

..\SCDOT\Organization-Civil\SCDOT\Preference Seeds\

# Printing

## Description:

This folder contains files used to configure printing for SCDOT. Resources are provided to print using iPlot, Print Organizer, and the Print dialog.

..\SCDOT\Organization-Civil\SCDOT\Pen Tables\iplot\Pen Tables\

Contains the pen tables used with iplot with legacy versions of the workspace. Some have been updated to current standards.

..\SCDOT\Organization-Civil\SCDOT\Pen Tables\ MicroStation\

Contains the files used by the MicroStation printing tools. This includes the print styles, pen tables and printer drivers.

# References

## Description:

This folder contains preconfigured MS files based on SCDOT standards commonly used throughout the design and plans production process. One example would be a previously completed detail sheet.

## References files location included by configuration variable:

..\SCDOT\Organization-Civil\SCDOT\Reference\

# Reports

## Description:

The Reports folder structure contains specific style sheets that are programmed to format the RAW data coming out of ORD and displayed in the Civil Reports Browser. These SCDOT specific style sheets are provided to supplement those from ORD and are formatted for SCDOT’s particular needs.

## Reports style sheets location included by configuration variable:

..\SCDOT\Organization-Civil\SCDOT\Reports\

# Scales

## Description:

This folder structure contains specific setting files for the SCDOT configuration.

## Settings files location included by configuration variables:

..\SCDOT\Organization-Civil\SCDOT\Scales\

## Included Settings Files:

*Units.def* – MS units definition file.

*SCDOT\_Scales.def* – MS scales definition file.

*Sheetsizes.def* – MS sheet sizes definition file.

# Seeds

## Description:

This folder contains all the required seed files to be used for new drawing creation within the MS and or ORD configuration. These seed files contain all the specific settings required based on SCDOT Standards.

## Seed files locations included by configuration variables:

..\SCDOT\Organization-Civil\SCDOT\Seed\

..\SCDOT\Organization-Civil\SCDOT\Seed\Sheets\

# Sheet Borders

## Description:

This folder contains the drawing boundary (title block) used by all the sheet seed definition DGNLIBs used for plans production within ORD.

## Sheet border dgn file location:

..\SCDOT\Organization-Civil\SCDOT\Sheet Borders\

# Sight Visibility

## Description:

This folder contains the XML settings file required for the Sight Visibility tool in ORD. This ASCII text file formatted with XML, contains multiple settings such as speed tables, eye height, etc. based on AASHTO design standards. This is delivered with the ORD installation and manually copied to SCDOT’s WorkSpace folder structure.

## Sight visibility settings folder location included by a configuration variable:

..\SCDOT\Organization-Civil\SCDOT\Sight Visibility\

# Superelevation

## Description:

This folder contains all the necessary XML configuration files related to Superelevation computations for ORD. Three files are setup specifically for SCDOT standards. Additionally, there are two files delivered with ORD installation based on AASHTO standards.

## Superelevation settings folder location included by a configuration variable:

..\SCDOT\Organization-Civil\SCDOT\Superelevation\

# Survey

## Description:

This folder structure contains several Text Import Wizard (TIW files) used during the survey field book creation process.

## TIW folder location included by a configuration variable:

..\SCDOT\Organization-Civil\SCDOT\Survey\

# Template Library

## Description:

This folder contains the SCDOT ORD Template Library used for modeling linear template drops, surfaces, and corridors. It contains a multitude of SCDOT standardized components and templates.

## Template library folder location included by a configuration variable:

..\SCDOT\Organization-Civil\SCDOT\_Standards\Template Library\

# Widening

## Description:

This folder contains curve widening tables used by ORD to automatically widen the proposed pavement within a corridor when curves are encountered. There are two files, one with spiral usage and one without.

## Widening tables folder location included by a configuration variable:

..\SCDOT\Organization-Civil\SCDOT\_Standards\Widening\

# WorkSpace/WorkSet Templates

## Description:

This folder structure contains the “workset.template” required to setup a WorkSpace and/or WorkSet. This ASCII files contain all the MS config variable settings for the SCDOT WorkSpace and WorkSet. Also included, the template for the WorkSet DGNWS file (\_NewWorksetTemplate.DGNWS) that contains the default settings for the Sheet Index.

## Templates folder locations included by configuration variables:

..\SCDOT\WorkSpaces\SCDOT\Template\