



MARYLAND DEPARTMENT
OF TRANSPORTATION

STATE HIGHWAY
ADMINISTRATION

SHA WorkSpace 3.0

What's New

January 27, 2024

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Overview

With the introduction of SHA WorkSpace 3.0, SHA CADD Users may feel overwhelmed. This document was developed to help lessen the learning curve.

WorkSpace 3.0 is built upon an entirely new Bentley CADD Platform – the CONNECT “Power Platform”. The most obvious difference is the adoption of the [Ribbon Interface](#). Less obvious is that the program is now a 64-bit application. MicroStation CONNECT is the base CADD Platform. All other programs used by SHA which used to run on top of MicroStation (InRoads, Storm & Sanitary, etc.) have all been replaced by new products which include the CADD platform.

The CADD Standards used with these programs are based upon the SHA_V8_02 workspace standard of WorkSpace 2.0. This provides users with a familiar starting point. Other changes in the workspace are much more subtle. This document will try to identify many of these changes.

It should be noted that Bentley released the initial version of MicroStation CONNECT in September of 2015. The current release is now branded as Update 23 to correspond with the calendar year, but the prior release was Update 17. The Open Roads Designer prior release was branded as Update 12. The current plan is to begin this migration to the CONNECT Platform with MicroStation 2023 and Open Roads Designer 2022 R3 (Update 12) but this could change.

Platform Changes

Many changes within the workspace were dictated by changes made by Bentley to the core product. These changes impact DGN files in many ways. The most significant impact by these changes is the impact to legacy files. While MicroStation has always had the ability to handle differences between files when referenced, many of these differences introduced in the CONNECT platform are deeply embedded in ways that complicate the use of any legacy files.

The following is a brief list of changes mandated by platform changes:

| | |
|---------------------|---|
| Scales | The Original V8 WorkSpace used settings which embedded the 12” per 1’ conversion factor. As a result, 1” = 50’ was also treated as a ratio scale of 1:50. In CONNECT, this is no longer supported. 1” = 50’ is now a ratio scale of 1:600. This impacts reference file scale factors. |
| Text Sizes & Styles | This change is related to Scales. Text sizes are now reported as decimal feet instead of decimal inches. A size of 0.1 in V8i will now be reported as 0.08333. The decimal inches used as part of text style names has been retained to ease the learning curve for users. |
| Line Styles | This change is related to Scales. The V8i Line Style files all had to be recreated using the new scales. The line style names are unchanged from workspace 2.0, but due to this scale difference, V8i files referenced into a CONNECT file will display at the wrong scale. |

Design File Units This change is generally in an area of the DGN file that most users never have to touch. There is a resolution setting that historically has been user definable and at SHA was always set to 1000. The CONNECT platform recommended increasing this value to 10000.

Cells This is related to Scales and Design File Units. All cells needed to be recreated to new sizes to accommodate the changes to Scales and Resolution. A new naming convention has been adopted for many cell libraries to address issues where different libraries had identically named cells with different graphics.

Workspace Changes

There are several visual and operational changes in the workspace. Some of these are related to the platform changes while others were decisions made to simplify future workspace maintenance. There have been many enhancements to MicroStation since the development of SHA's original V8 workspace (SHA_V8_01). When SHA was developing its SHA_V8_02 workspace standard, it began to integrate several of these enhancements into the workspace. As the CONNECT platform evolves, these efforts will continue.

The following list summarizes workspace changes. Some originated in the SHA_V8_02 workspace standard. These may be unfamiliar to anyone who only used the SHA_V8_01 workspace standard.

NCS Level Names
(X-XXXX-XXXX...)

Like SHA_V8_02, the CONNECT workspace uses NCS Compliant Level names, reinstating the single character discipline designation that was eliminated during the development of the SHA_V8_01 workspace standard.

ByLevel Symbology

Introduced in SHA_V8_02, the CONNECT workspace expands the use of ByLevel Symbology. This setting allows the assignment of Color, Weight and/or Line Styles to individual Levels. When an element is placed on a level, it takes on the symbology assigned to the level. ByLevel Symbology was one of the reasons that the SHA_V8_02 workspace standard needed a new level naming system. ByLevel Symbology can coexist with Level Overrides and simplify future maintenance.

Element Templates

Element Templates are named sets of symbologies, and other settings to be used when placing elements into CAD files. Many Open Roads settings require the use of Element Templates. The use of Element Templates, Named Symbologies and the NCS Level Names greatly simplify workspace maintenance efforts.

| | |
|----------------------------|---|
| Annotation Scale | The CONNECT workspace expands the use of Annotation Scale. Many Cells are now identified as Annotative Cells. This virtually eliminates the need to set a scale factor when placing cells. In V8i, InRoads could not use Annotation Cells. All CONNECT tools have no such limitation. |
| Sheet Models | The CONNECT workspace expands the use of sheet models. The CONNECT platform includes tools for creating sheets for all types of projects. Open Roads tools are used to create plan and/or profile sheets. These sheets use an automatically created 2D drawing model in true coordinates for annotation which is self-referenced into the Sheet Model where it is scaled and rotated to fit. The Sheet Model is printed at a 1:1 scale. Sheet models are impacted by the new scales. This complicates the ability to use legacy sheet models. |
| SHA Ribbons | Certain tools from V8i are no longer available. One of these is the Barmenu. Another is the elimination of any menu bar of MicroStation. The solution to these changes, led SHA to implement several custom Ribbon elements to provide the user with a similar functionality. |
| Workflows | The CONNECT workspace added Workflows to the interface. As specific workflows are selected, the ribbon menus change to reflect the tasks specific to the workflow. Open Roads has several more workflows than MicroStation. The SHA workspace includes one custom workflow for Open Roads users, but more are possible. |
| Quick Access Toolbar (QAT) | As part of the Ribbon Interface, the CONNECT Workspace includes a Quick Access Toolbar . The QAT is easily customized by any user. |
| Tool Boxes & Tasks | Tool Boxes and Tasks are still supported in CONNECT. They may appear to be more difficult to access, but this is related to the elimination of the menu bar and that many settings are now found on using the File (Backstage) tab. The SHA workspace contains one task but more are planned. |
| Hatches & Patterns | Hatches and Patterns now also scale according to Annotation Scale |
| Tables | There is now a Place Table tool. This allows the creation of Excel like tables in MicroStation, with cells, rows, columns, etc. |
| Line Terminators | When a line terminator is used, it is now placed with an association to the element. The terminator will retain the proper orientation if the element is modified. |

Known Compatibility Issues with Legacy Files

When opening or referencing a file that was created in the V8i workspace, linestyles will be off by a scale factor due to the changes in units, scales, and resolution. Sheet models will also have

issues for the same reason. The CAD and ProjectWise team has performed some preliminary testing of potential workflows but have not come up with a definitive process. Other areas of concern are patterns and hatches, cells, text, and dimension styles.

Other significant Changes

The use of InRoads V8i (SELECTseries 4) and later 10, began this migration to the new software platforms. That version of InRoads introduced a subset of the tools of Open Roads. These tools eliminated and/or deprecated several legacy file types. When the Open Roads tools of InRoads were used, the design data formerly saved to these data files were now stored directly in DGN files. The following table summarizes these data file types.

| InRoads Design Data Files | |
|---------------------------|--|
| ALG file | Alignments, Parcels and COGO points (proprietary binary file format) |
| DTM files | Digital Terrain Models (proprietary binary file format) |
| IRD file | Corridor Design file (XML file format) |
| SDB file | Storm Drain Designs (Obsolete Access Database file format) |
| FWD file | Survey Data (ASCII file format) |

As part of this change, a terrain element type was added to MicroStation’s file format. Other changes included the addition of new file types to the SHA Workspace.

Now that project design data is saved directly in DGN files, it becomes very important that users understand which files are design containers. This also dictated that the Project ID portion of all DGN file names needed to be changed from using a Route ID to using the project ID. This was necessary to avoid confusion about which files contain design information for the primary project route versus design information for other routes within the project.

The following table lists some file types using an “example” project AW123 along MD RTE 12.

| Filename | Content | Replaces |
|-------------------------|---|--|
| sTO-S000_AW123.dgn | Open Roads Survey for Project AW123 | MD12.fwd |
| sTM-S000_AW123.dgn | Existing Terrain Model File for Project AW123 | MD12.dtm |
| sAL-0001_AW123-MD12.dgn | Civil Geometry for MD RTE 12 in Project AW123 | MD12.alg – would traditionally contain multiple alignments, including MD RTE 12 and MD RTE 34. These sAL files also illustrate how the use of the Project ID instead of a Route ID avoids multiple references to Route ID’s in any filename. |
| sAL-0002_AW123-MD34.dgn | Civil Geometry for MD RTE 34 in Project AW123 | |

| Filename | Content | Replaces |
|-------------------------|--|---|
| sDD-0000_AW123.dgn | Storm Drain Design for Project AW123 | MD12.sdb |
| sCO-0001_AW123-MD12.dgn | Corridor Model File for MD RTE 12 in Project AW123 | MD12.ird - would traditionally contain multiple Design Corridors, including MD RTE 12 and MD RTE 34. Best practice is one major corridor per sCO file. |
| sCO-0002_AW123-MD34.dgn | Corridor Model File for MD RTE 34 in Project AW123 | |
| sTM-N001_AW123-MD12.dgn | Proposed Terrain Model File for MD RTE 12 in Project AW123 | MD12.dtm - built within the Corridor Modeler workflow or from temporary DTM files using the DTM editing tools of InRoads. Open Roads workflows may mirror this as a composite proposed terrain is built |
| sTM-N002_AW123-MD34.dgn | Proposed Terrain Model File for MD RTE 34 in Project AW123 | |
| sTM-N000_AW123.dgn | Composite Proposed Terrain Model File for Project AW123 | |

Note that a single data file is often replaced with multiple DGN files. This is what Bentley has defined as “Federated Design” data. This is part of their recommended best practices as it reduces file sizes, improves performance, and allows multiple users to work on different parts of the design simultaneously. This approach is similar to Autodesk’s Civil 3D workflows except the CONNECT platforms allow access to the design data of other DGN files via reference files alone. In Open Roads there is no need to manage Data Shortcuts to access external design data.

One of the other goals of this migration is to have these tools develop fully integrated 3D models of the design. The first step is to develop the road designs, but eventually, that needs to include bridge structures, drainage, utilities, landscape, etc. Throughout the industry, more and more contractors are requesting design data in this format. SHA is lagging in these efforts compared to many other DOT’s.

Software Migration Matrix

The following table has been developed to assist all offices in understanding which software is being phased out and what software is intended to replace each eliminated software. Additional software may be added to this list as needed. Bentley is assisting us in developing as comprehensive a list as possible.

Notes: This table uses two abbreviations: Ss10 is the abbreviation for SELECTseries 10, which is the last official version of all Bentley V8i software. Its use in this table may indicate that version, or any earlier version. CE is the abbreviation for CONNECT Edition. All current Bentley software is branded with this name. It indicates the program is 64-bit, uses a Ribbon Interface and more.

| Legacy Software | CONNECT Software | Comments |
|---|-------------------------|--|
| MicroStation V8i (Ss10) | MicroStation CE | Custom Ss10 Applications are not available, except most VBA applications |
| (Power) InRoads V8i InRoads Suite V8i InRoads Storm & Sanitary V8i GEOPAK Road V8i MX V8i | Open Roads Designer CE | Open Roads Designer contains all the tools of Open Site Designer |
| InRoads Site V8i InRoads Site Suite V8i Power Survey V8i InRoads Survey V8i GEOPAK Site V8i GEOPAK Survey V8i SiteOps | Open Site Designer CE | Open Site Designer contains all the Survey Tools of Open Roads Designer. |
| InRoads Bridge V8i | Open Bridge Modeler CE | Open Bridge Modeler is part of a complete bridge designing solution that exchanges structural design data with other design software |
| gINT | Open Ground CE | Bentley has a migration plan to assist gINT users to migrate to Open Ground. |
| STAAD Pro V8i | STADD Pro CE | OIT is working with OOS. Additionally, Bentley has training classes to assist users to migrate to the CE platform. |

Bentley Lifecycle Policy

The following link is to the [Bentley Lifecycle Policy](#) web page.

The current Bentley software support policy consists of a three-year cycle. This means that any software version that is more than three years old is considered obsolete and is out of support. It should be noted that the V8i SELECTseries software used in most SHA offices is at least six or more years old. All support for those products ended on December 31, 2021. Once a product is out of support, it will not be certified for newer versions of Microsoft Windows or ProjectWise. This also means that if something within one of these legacy programs stops functioning and generates error messages, OIT will be unable to get assistance from Bentley to correct the issue. At that point, all users of the non-functional legacy software will be forced to move to the new, supported version and may have to spend project funds on converting all CAD files to that new version, and users will require training on the new version before they can become productive again.

Other Links

The following links provide additional information on these topics, including links to training videos.

[V8i SELECTSeries 10 Support Policy Deprecation and CONNECT Edition Upgrade Initiative](#)

[Desktop Applications Support Policy V1.0.pdf](#)

[Upgrading from MicroStation V8i - Onboarding and Adoption Wiki](#)

[Support Clips, TechNotes & FAQs Links - OpenRoads | OpenSite Wiki](#)

[Open Roads Designer CONNECT Edition Training Links - OpenRoads | OpenSite Wiki](#)