



# Tri-Service Workspace Management Guide

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This document is intended to provide an administrative overview of the TS\_WS\_001 version of the Tri-Service’s Workspace for CAD, BIM, and GIS Managers. This guide offers best practices for implementing, maintaining, and troubleshooting the workspace, but should not be deemed a substitute for proper CAD, BIM, or GIS Management training.

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## Tri-Service Workspace Overview

The Tri-Service Workspace contains data which is designed for and intended to be used in the **design**, **construction**, and **operation** of military construction and civil works projects and is made available to Tri-Services personnel and the Architectural/Engineering/Construction firms under contract by Tri-Services in preparation of projects utilizing 2D computer-aided design (CAD) or 3D Information Modeling workflows. The federated workspace integrates standard Tri-Service (i.e., Army, USACE, NAVFAC, Air Force) content that facilitates the creation of drawings and models that comply with the current Tri-Service A/E/C CAD Standard with customizable site-specific and/or project-specific resources that empower project teams to extend the dataset as needed.

TS\_WS\_001 includes:

- A/E/C 5.0 CAD Standard
- CAD Tasks and Templates
- Standardized project directory structure for all workflows
- USACE Building Information Modeling (BIM) Data Standards
- BIM to MII Cost Estimating Data
- USACE InRoads .XIN
- Bi-directional GIS Symbology mapping between A/E/C 5.0 CAD Standard & SDSFIE (Spatial Data Standards for Facilities, Infrastructure, and Environment)

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## TS\_WS\_001 Configuration Goals

- **Shelf Life**

One of the principal focuses during the planning for the TS\_WS\_001 Workspace was on extending the life of the workspace to establish continuity of administrative knowledge. Planning for an extended life, the current workspace name deviates from the prior Tri-Services Workspaces that were previously named by the year and quarter issued (07Q3, 09Q4(a, a\_V8i, & b\_V8i)). Naming of future workspaces will follow incremental numerations with integers for major Workspace releases (i.e., TS\_WS\_002) and decimals for minor releases (i.e., TS\_WS\_001.1). Furthermore in order to achieve an extended shelf life, concepts for such as a [Local Dataset Extension](#) and [Modular Extension Framework](#) for extending the workspace content have been introduced.

While longevity and stability is a priority, the recipient and user of this data should recognize that this data is not deemed static. It will be maintained, improved, and updated continuously in order to accommodate the evolution of standards, content and technology for future Tri-Service CAD and Information Modeling projects. This evolution will result in periodic ‘workspace updates’ that will add or update configuration files, resources and/or directories in the centralized workspace and/or the \_Template\_Project\_B01. These updates will be minor and incremental, and will not result in a Workspace name change. Facilitating the management of such updates, as well as simplifying the initial workspace implementation, will be a [Workspace Installer](#) similar to the one available for the 09Q4b\_V8i Workspace. The Workspace Installer permits any user of the Workspace, including A/E/C firms, to configure and/or update the Workspace to mirror that found in a US Army Corps of Engineers (USACE) district office in a matter of minutes.

***Notifications Workspace Updates will be delivered via email and on our [Center Website](#). Workspace notifications and updates will automatically be sent to those that register and download the Workspace (or previous versions of the Workspace).***

- **Content: User-Focused, A/E/C Compliant**

While the workspace configuration strategies and directory structure are organized to reinforce the organizational needs and business goals of the Tri-Service agencies, ***the content contained within the workspace is the most critical component needed to enable project teams to efficiently complete their phase of the project.*** The content delivered in the TS\_WS\_001 workspace has been updated to reflect the changes to the A/E/C CAD Standard occurring between version 4.0 and 5.0.

There were numerous additional content initiatives across Building, Civil, and GIS that were incorporated into the TS\_WS\_001 Workspace. These efforts aimed to improve user efficiency, increase standards compliance, and elevate project certainty/client satisfaction. Contributions and user feedback from representatives of various USACE Districts weighed heavily on the areas and direction of content development. These expanded user-focused initiatives sought to expand on the success of a similar approach employed for the 09Q4b\_V8i Workspace, which has received considerable positive feedback from users.

- ***Project Directory Structure: Unified & Portable***

Coinciding with the extended shelf life was a need for a single directory structure supporting multiple workflows (2D, 3D, Information Modeling), disciplines, applications, and project types (Military Construction or Civil Works). This unified directory structure provides organizational familiarity across workflows and simplifies the workspace administration. The new directory structure was crafted with input from multiple USACE Districts and private-sector AEC contractors with representation for Military Construction and Civil Works projects utilizing CAD (2D & 3D) and Information Modeling (Building, Civil, Construction & Operations) workflows allowing the configuration and technical review to be executed by Bentley Systems.

Perhaps the most critical aspect of the planning of the project directory structure is that the entire project must be portable (AEC Contractors to Contracting District, Design District to Geographic District, and USACE to the client). Because of the immensity of information generated by/for Tri-Services agencies, making information exchange efficient is a priority throughout the life-cycle of the built assets conceived, constructed and/or operated leveraging the Tri-Service Workspace. Efficiency is achieved by linking each project to the Tri-Service’s centralized workspace and capturing all design files, outputs, associated project files, and edits/additions to the workspace in the project directory. When the encapsulated project is delivered to another entity it will be located and linked to the Tri-Service’s centralized workspace that is replicated on the user’s network.

Project teams utilizing the TS\_WS\_001 Workspace should understand that the centralized dataset content is not considered comprehensive for all designs and/or facility types. Therefore, each project is linked to the Tri-Service’s dataset **and** also to a template project dataset. The project dataset is a structured storage container for supplementary files required to reproduce the project’s working environment on other networks, allowing users to add content not captured in the Tri-Service’s dataset. Content captured in the project dataset may be reviewed by Tri-Service Workspace administrators for possible inclusion in future workspace updates.

- ***ProjectWise Integration***

The TS\_WS\_001 Workspace was planned for simple, low-maintenance integration with ProjectWise Managed Workspaces. ProjectWise Explorer SELECTseries 4 (or newer) is recommended for use with the TS\_WS\_001 Workspace, especially for applications utilizing Dynamic Views/Hyper-models. Additionally, the new project directory structure was planned to supplement, rather than compete with, the ProjectWise Collaboration Model (PCM) Work Breakdown Structure (WBS).

For information on configuring the Workspace to be managed in ProjectWise contact the ProjectWise or Tri-Service Operational Resource (**USACE only**) or Bentley Professional Services.

**Supported Applications**

- CAD 2D & 3D
  - MicroStation V8i
- Design Review
  - Bentley Navigator V8i
  - Bentley i-Model Composer V8i
  - Bentley View V8i
- Information Modeling (Building)
  - AECOsim Building Designer V8i
  - Bentley Raceway and Cable Management
  - ProStructures
- Information Modeling (Civil)
  - InRoads V8i
  - InRoads Suite V8i
  - Power InRoads V8i
  - GEOPAK Suite V8i
  - Power GEOPAK V8i
  - Bentley PowerCivil V8i
- GeoTechnical
  - gINT Logs V8i
  - gINT Professional V8i
  - gINT Professional Plus V8i
- GIS
  - Bentley Map V8i
  - Bentley Map Enterprise V8i
- Virtual Teaming
  - ProjectWise V8i



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## Software

The TS\_WS\_001 Workspace's centralized dataset and project structure is dependent on the installation of one or more Bentley applications. However installing the Workspace does not include the Bentley application installation files or licenses. For example, the installation, administration, and configuration of the appropriate Bentley application such as MicroStation or InRoads on workstations is the responsibility of the organization utilizing the Tri-Service Workspace.

***A list of Bentley Software Versions tested against the Tri-Services TS\_WS\_001 Workspace is available at:***

[Workspace Tested and Approved Software Versions](#)

If you have any questions concerning these products, please contact [Bentley Systems, Incorporated](#). Bentley Select Subscribers can download these applications from:

<http://selectservices.bentley.com/en-US/Support/Downloads+And+Updates/>

If additional applications not listed in the [Supported Applications](#) are required, contact the CAD/BIM Technology Center.

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## Installing the Workspace

### *Tri-Service Workspace Installer*

The workspace installer was created to streamline the setup and configuration of the Tri-Service Workspace either locally or on a network. The workspace installer will support patch updates to the workspace that might include content additions or bug fixes. The CAD/BIM Technology Center intends to release incremental workspace corrections/improvements to the TS\_WS\_001 Tri-Service Workspace via the workspace installer and subsequent patch releases. The Tri-Service TS\_WS\_001 Workspace **does not alter** any of the files on the local workstation and uses only a series of shortcuts to access their networked base configuration.

### *Capabilities*

The workspace installer will prompt the user for three locations, and then it will complete the rest of the workspace configuration on its own. The three inputs needed are:

1. The location where your applications are installed
2. The location where you want the network workspace to be installed
3. The location where you want the project templates to be installed

Based on these three input values, the workspace installer will install the network workspace and project templates in the locations specified, modify the configuration files to reflect the installed locations, and create shortcuts for the workspace that reflect the applications' installed path(s) and network workspace location.

### *Shortcuts*

The installer will only create shortcuts for applications that are installed on the machine from which the workspace is being installed. Both 32-bit and 64-bit shortcuts will be created, based on the assumption that the applications are installed in the same location other than "(x86)" in the Program Files path for 64-bit operating systems.

If the appropriate applications are installed, the installer will create the following shortcuts:

- TS MicroStation\_WS\_001
- TS Bentley Navigator\_WS\_001
- TS InRoads\_WS\_001
- TS Bentley i-model Composer WS\_001
- TS InRoads Suite\_WS\_001
- TS ABD\_WS\_001
- TS Power InRoads\_WS\_001
- TS ABD\_Architectural\_WS\_001
- TS GEOPAK\_WS\_001
- TS ABD\_Electrical\_WS\_001
- TS Power GEOPAK\_WS\_001
- TS ABD\_Mechanical\_WS\_001
- TS Bentley PowerCivil\_WS\_001
- TS ABD\_Structural\_WS\_001
- TS Bentley Map\_WS\_001
- TS ABD\_Microstation\_WS\_001

**Workspace Installation Instructions:**

The workspace only needs to be installed from one computer. The workspace can be installed to the server where the “network” drive is to reside, but should only be done if the Bentley applications are installed on that server in the same location as the user’s computers. If not installing to the server, it is recommended to install on a secure machine that is controlled by a BIM or CAD Manager. When available, patch updates to the workspace should be installed on the same server/computer as the original TS\_WS\_001 Workspace.

1. Run Tri-Service\_Installer.msi (**NOTE:** The workspace can only be installed **once** per computer.)
2. From the Workspace Setup Dialog establish the installation parameters. (Figure 1)
  - All paths need to end with a trailing backslash (“\”).

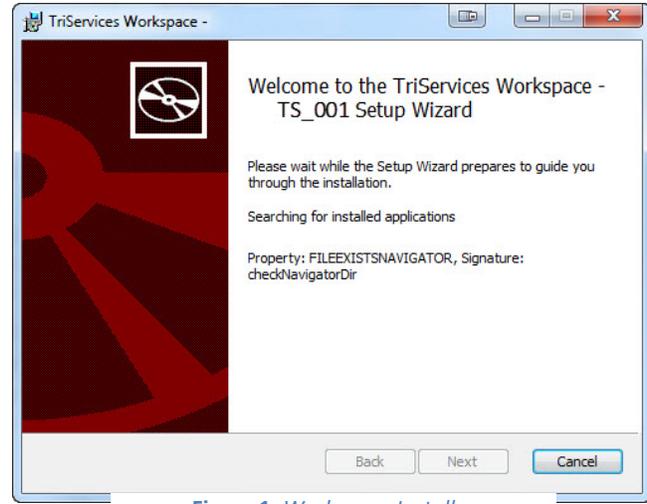


Figure 1: Workspace Installer

- a. Specify “Drive where programs are installed:”
  - Should be a folder containing all Bentley applications. It could be as non-specific as D:\ or more specific like D:\Program Files\Bentley\. The more specific you get, the faster the applications will be detected.
- b. Specify the “Project Drive:”
  - The project template will be installed in the folder specified by this field and the variable TS\_PROJECTDIR will be set to this location in TS\_mslocal.cfg
- c. Specify the “Network Drive:”
  - Should be the folder where you want the folder TS\_Workspaces (and the subsequent directory structure to be installed). If a TS\_Workspaces folder already exists in the path the Workspace will be installed within the existing folder. The configuration variable TS\_ROOT will be determined in TS\_mslocal.cfg by the value entered into this field.

*Note: The Workspace only needs to be installed from a single machine. All other computers wishing to access the workspace can simple copy the newly created shortcuts located in*

*... \TS\_Workspaces\TS\_WS\_001\\_Shortcuts\ folder*

*It is important that the computer installing the workspace have all of the necessary Bentley applications installed so that the correct shortcuts can be created.*

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### Uninstalling the Workspace:

The Tri-Service’s Workspace Installer will show up in the Add/Remove Programs list. The workspace can be uninstalled as you would uninstall any other program.

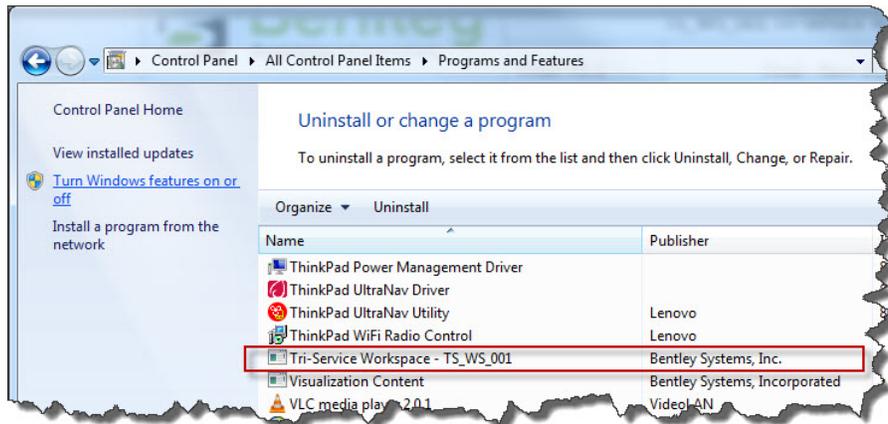


Figure 2: Add/Remove Program

When uninstalling the workspace, there is an option to backup the workspace and project templates. The backup process will leave copies of the project drive and network drive with “\_backup” appended to the folder names. Removing the “\_backup” from the folder names will restore the workspace to a fully functional state. Restoring backups is not recommended as it may provide undesired results when installing a patch update. This process should only be used if the workspace installer needs to be removed from a computer while the workspace is still required to be operational.

*Note: If any previous versions of the TriServices Workspace installer are installed, they will need to be removed prior to installing TS\_001. In this case, the backup procedure listed above should be followed.*

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## Workspace Configuration (Command Line, Site, Dataset, Project, User)

Bentley applications utilize a federated workspace configuration that operates through a series of text files chained together by include statements to direct configuration parameters, directory locations, and default application behaviors. These text files typically have a .cfg, .pcf, or .ucf file extension and together they establish five hierarchical levels, respectively named System (0), Application (1), Site (2), Project (3), and User (4). Within these configuration files, logical operators are used to initiate certain settings when specific conditions exist. An example of this could be if a specific Bentley application was being launched or a certain 'User' was selected then additional configuration settings might be initiated.

*Below is an example showing the configuration hierarchy for the configuration variable MS\_MARKUPSHEETSEED where higher levels can override the configuration settings of lower levels.*

**System Level (Level 0):** (C:\Program Files\Bentley\...\config\system\markup.cfg)

MS\_MARKUPSHEETSEED = \$\_(USTN\_SYSTEMROOT)dgnlib\PageLayout.dgnlib

**Site Level (Level 2):** (...TS\_WS\_001\Workspace\Standards\TS\_02.5\_DesignReview.cfg)

MS\_MARKUPSHEETSEED = \$\_(USTN\_SITE)seed\MarkupTemplates.dgnlib

**Project Level (Level 3):** (...TS\_WS\_001\Workspace\Projects\My\_Project.pcf)

MS\_MARKUPSHEETSEED = \$(PROJ\_DATASET)seed\Project\_MarkupSeed.dgnlib

**Final Value:**

MS\_MARKUPSHEETSEED = \$(PROJ\_DATASET)seed\Project\_MarkupSeed.dgnlib

**Final Value Expansion:**

P:\{ProjectName}\CAD\_BIM\Support\Bentley\seed\Project\_MarkupSeed.dgnlib

Figure 3 shows the sequence of configuration files processed when AECOSim Building Designer V8i is launched out-of-the-box. Other Bentley applications like MicroStation, Bentley Navigator, Bentley i-Model Composer, Bentley InRoads will follow a similar configuration sequence to that of AECOSim Building Designer.

Figure 4 outlines the alterations that are made to the Tri-Service TS\_WS\_001 Workspace configurations. The only files that are altered or added to make the TS\_WS\_001 Workspace function are those specifically called out in that diagram.

*Figure 3: Configuration sequence for out-of-box AECOSim Building Designer. Numbers reflect the order in which the configuration files are processed.*

- 0 - mslocal.cfg
  - 1 - msdir.cfg
    - 2 - msconfig.cfg
      - 3 - applicationload.cfg
      - 4 - dockingprefseed.cfg
      - 5 - dotnetlocalest.cfg
      - 6 - ecbrowser.cfg
      - 7 - ecom.cfg
      - 8 - GroupPanelPrefSeed.cfg
      - 9 - gui.cfg
      - 10 - helpwinforms.cfg
      - 11 - level.cfg
      - 12 - markup.cfg
      - 13 - msdirs.cfg
      - 14 - msfiles.cfg
      - 15 - msgeocoord.cfg
      - 16 - mslocale.cfg
      - 17 - mstrans.cfg
      - 18 - msweb.cfg
      - 19 - pointcloud.cfg
      - 20 - printserver.cfg
      - 21 - publishdgn.cfg
      - 22 - security.cfg
      - 23 - spellchecker.cfg
      - 24 - systemdgnlib.cfg
      - 25 - TaskDialogPrefSeed.cfg
      - 26 - workmode.cfg
      - 27 - BD\_PW.cfg
      - 28 - BuildingDesigner.cfg
        - 29 - dataset.cfg
        - 30 - BuildingDesigner\_PW.cfg
        - 31 - BuildingDisciplines.cfg
          - 32 - DatasetUnitSystem.cfg
          - 33 - ClashDetection.cfg
          - 34 - ComponentView.cfg
          - 35 - energy\_analysis.cfg
          - 36 - ProStructures.cfg
          - 37 - pw.cfg
          - 38 - Rebis.cfg
          - 39 - sketchup.cfg
          - 40 - standards.cfg
          - 41 - BuildingDesigner.ucf
          - 42 - BuildingTemplate\_US.pcf

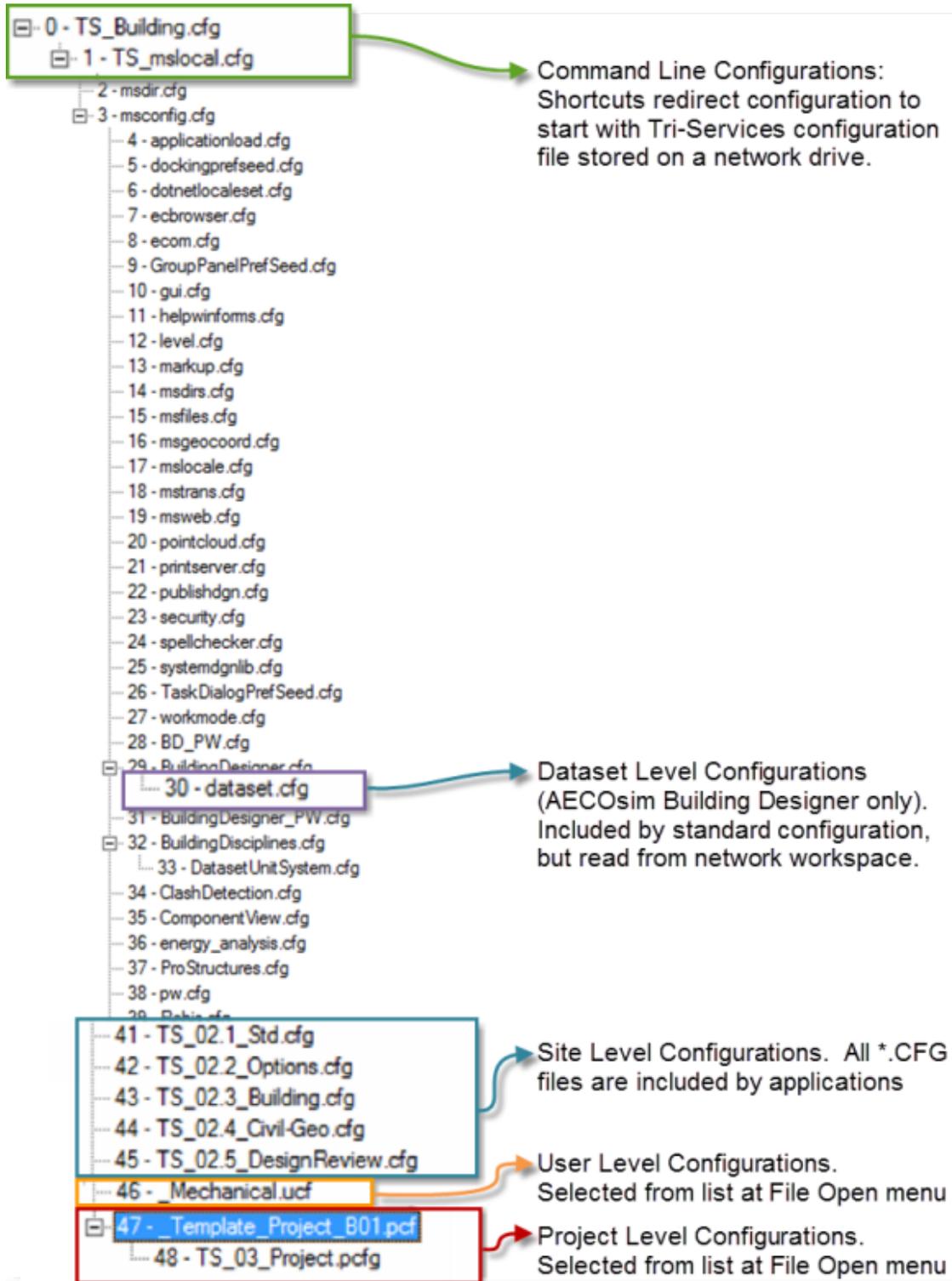
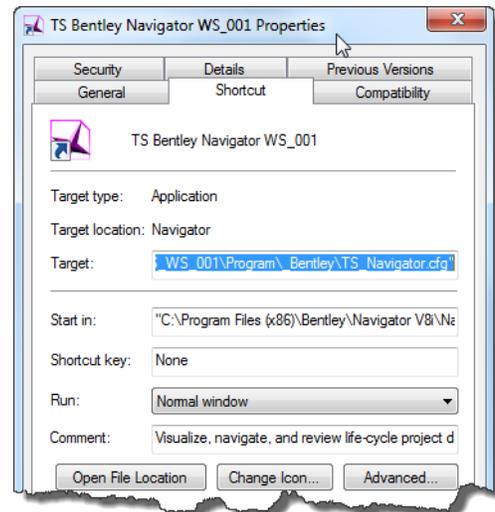


Figure 4: Configuration sequence for AECOsim Building Designer using TS\_WS\_001 with Tri-Service modified configuration files noted.

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### Command Line Configurations

The Tri-Service Workspace is enabled by a customized set of Bentley application shortcuts that redirect the application to initiate with a Tri-Service’s customized configuration file that is located on a network drive. This is accomplished by adding `-wc"{path to network config file.cfg}"` to the properties of the application shortcut. When using the [Tri-Service Workspace Installer](#) these shortcuts are automatically created in `...\TS_Workspaces\TS_WS_001_Shortcuts_Bentley\` based on the inputs specified when the workspace was installed. To view or edit the target of these modified shortcuts simply right-click on the shortcut and choose “Properties”.



**Figure 5:** Example shortcut for running Bentley Navigator with TS\_WS\_001. Full Target: "C:\Program Files (x86)\Bentley\Navigator V8i\Navigator\Navigator.exe" -wc"O:\TS\_Workspaces\TS\_WS\_001\Program\ Bentley\TS\_Navigator.cfg"

Target configuration files for Bentley Applications using TS\_WS\_001 Workspace (in addition to the path of the executable), *i.e.*, `C:\Program Files (x86)\Bentley\MicroStation V8i\MicroStation\ustation.exe`

- MicroStation  
-wc"{N:\}TS\_Workspaces\TS\_WS\_001\Program\ Bentley\TS\_mslocal.cfg"
- AECOsim Building Designer  
-wc"{N:\}TS\_Workspaces\TS\_WS\_001\Program\ Bentley\TS\_Building.cfg"
- Bentley Navigator  
-wc"{N:\}TS\_Workspaces\TS\_WS\_001\Program\ Bentley\TS\_Navigator.cfg"
- Bentley i-Model Composer  
-wc"{N:\}TS\_Workspaces\TS\_WS\_001\Program\ Bentley\TS\_iModel.cfg"
- Bentley Map  
-wc"{N:\} TS\_Workspaces\TS\_WS\_001\Program\ Bentley\Civil-Geospatial\Map\config\TS\_mslocal.cfg "

**NOTE:** Paths with spaces must be encapsulated by quotation marks `-wc"N:/path to my file/TS_mslocal.cfg"`

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### Application Initiation Configurations

With the application's configuration launch redirected to a network-based configuration file via the customized shortcut, the Tri-Service Workspace is initiated. Regardless of which configuration file instigates the TS\_WS\_001 workspace, TS\_mslocal.cfg will be processed, either by direct target in the shortcut or by one of the other shortcut targets (TS\_building.cfg, TS\_Navigator.cfg, etc.) directing the configuration to include it. The reason: TS\_mslocal.cfg is the keystone configuration file that commands the Centralized Workspace and Project Directory locales.

When the TS\_WS\_001 Workspace is installed using the [Workspace Installer](#) the variables **TS\_ROOT** and **TS\_PROJECTDIR** will be established in TS\_mslocal.cfg based on the input values passed to the installer. By defining a network path for **TS\_ROOT** in TS\_mslocal.cfg, you are establishing the base location for the Central Workspace and also redirecting the variables [\\_USTN\\_USER](#), [\\_USTN\\_PROJECT](#), and [\\_USTN\\_SITE](#), which are constructed using **TS\_ROOT** as a base. **TS\_PROJECTDIR** will be referenced at the [Site](#) level by TS\_01\_Std to establish the location for project design files. These two variables may be modified after the workspace is installed if the locations of the Project Directory or Central Workspace change but these are the only two settings that should be modified in TS\_mslocal.cfg.

**NOTE: Mapped network drives or UNC Paths may be used for both TS\_ROOT and TS\_PROJECTDIR, but all paths must end with a forward slash "/".**

```

=====
# Standard Editable Workspace configuration variables
# (EDIT THESE VARIABLES TO LOCALIZE THE WORKSPACE)
=====
# Location of the TriServices Workspace Root
TS_ROOT          =   N:/TS_Workspaces/TS_WS_001/

# Location of the Project Drive, container for the project data folders
TS_PROJECTDIR    =   P:/Projects/

=====
# Redirect Site, Proj & User Configs to Corp location (DO NOT EDIT BELOW THIS LINE)
=====
TS_WORKSPACEROOT = $(TS_ROOT)Workspace/           # Location of TS Workspace Root
_USTN_USER        = $(TS_WORKSPACEROOT)Users/      # Location of TS UCF Files
_USTN_PROJECT     = $(TS_WORKSPACEROOT)Projects/   # Location of TS PCF Files
_USTN_SITE        = $(TS_WORKSPACEROOT)Standards/  # Location of TS Site CFG Files

```

At the end of TS\_mslocal.cfg, the configuration will begin processing the Bentley default configuration files located on each user's computer. As the Bentley configuration executes it will search for configuration files located in the Tri-Service Central Workspace because of the modifications made to [\\_USTN\\_USER](#), [\\_USTN\\_PROJECT](#), and [\\_USTN\\_SITE](#), in TS\_mslocal.cfg.

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### Site Configurations [*USTN\_SITE*]

The site configuration files (\*.CFG) are included automatically by Bentley Applications regardless of which ‘User’ or ‘Project’ is selected from the File Open dialog. The configuration files and resource files maintained at the Site Level should be thought of as Enterprise (Tri-Service) standards. The AEC 5.0 Compliant Level libraries, Text/Dimension Styles, Line Styles, and Cells are among the many resources delivered at the Site Level in the TS\_WS\_001 Workspace. Bentley applications look for Site Level configuration files in the Central Workspace location because of the configuration modifications made to *USTN\_SITE* in *TS\_mslocal.cfg*.

Site Configuration Files (.cfg) are stored in:

```
...\TS_Workspaces\TS_WS_001\Workspace\Standards\
```

- TS\_02.1\_Std.cfg - Standard Seeds, Levels, Cells, Line Styles, Annotation Styles, etc. (Figure 7)
- TS\_02.2\_Options.cfg - Optional default behavior settings (Figure 9)
- TS\_02.3\_Building.cfg - Dataset configurations for AECOsim Building Designer
- TS\_02.4\_Civil-Geo.cfg - Configurations for Civil & Geospatial applications
- TS\_02.5\_DesignReview.cfg - Configurations for Navigator & i-Model Composer



Figure 6: Tri-Service Site Level Configuration Files

```
# MS_CELL: Folder locations of cell libraries
MS_CELL      =  $(_USTN_SYSTEMROOT)cell/
MS_CELL      <  $(_USTN_SITE)cell/

# MS_CELLLIST: List of cell libraries to include in the cell search path
MS_CELLLIST  <  $(_USTN_SITE)cell/*.cel

# MS_CELLSELECTORDIR: Folder location of cell selectors
MS_CELLSELECTORDIR =  $(_USTN_SITE)cell/

# MS_DETAILINGSYMBOLS_CELLLIST: List of cell library files to be searched for cells used as callout-
MS_DETAILINGSYMBOLS_CELLLIST =  $(_USTN_SITE)cell/TS_DetailingSymbolCells.cel

#=====  
# DGNLIBs:  
#=====  
# MS_DGNLIBLIST: Appends the location and the name of the dgn library containing levels.
MS_DGNLIBLIST >  $(_USTN_SITE)dgnlib/ElementTemplates/*.dgnlib
MS_DGNLIBLIST >  $(_USTN_SITE)dgnlib/Interfaces/*.dgnlib
MS_DGNLIBLIST >  $(TS_LEVEL_LIBLIST)
TS_LEVEL_LIBLIST =  $(_USTN_SITE)dgnlib/Levels/*.dgnlib # This can be overwritt
MS_DGNLIBLIST >  $(_USTN_SITE)dgnlib/NamedExpressions/*.dgnlib
```

Figure 7: Sample configuration section from *TS\_02.1\_Std.cfg*

Some of these configuration files contain variables that only apply to certain Bentley applications. These application-specific configurations are generally encapsulated within conditional directives that will only process the configuration lines if the appropriate application is being used. An example of one of these conditional directives is shown in Figure 8.

#### From *TS\_02.5\_DesignReview.cfg*

```
%if defined (_NAVIGATOR)
  {Configuration for Bentley Navigator}
%endif
```

Figure 8: Example from *TS\_02.5\_DesignReview.cfg*. Any configuration settings occurring between the %if defined and %endif will only be processed if Bentley Navigator is used.

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**Important:** To preserve the integrity of the Enterprise working environment for seamless project sharing Site Level resource files should **not** be modified by the end-user of the TS\_WS\_001 Workspace. If Site-level content requires modifications, the resource file(s) should be copied to [Project Level](#) and then modified, where the project modifications will override the Site Level.

TS\_02.2\_Options.cfg is the only Site-level file that may be edited. This file contains configuration variables managing the default behavior of functionalities within the Bentley applications that do not affect the resultant geometry/data in a way that is necessary for reading/editing the project when it is delivered back to the USACE or the owner. Only configuration settings that do not generate a workspace dependency for the project design files should be made in TS\_02.2\_Options.cfg. If there is any doubt about whether or not a workspace dependency is created by the configuration, it is recommended that the configuration modifications be made in the [Project Configuration File](#) or a [Local Dataset Extension](#) configuration file, both of which will be delivered/archived with the project design files.

```

31 #=====
32 # Reference Files Behaviors
33 #=====
34 # MS_REF_DEFAULTSETTINGS: Default Reference file behavior
35 # MS_REF_DEFAULTSETTINGS > ignoreWhenNesting=1
36 # MS_REF_DEFAULTSETTINGS > nestdepth=10
37 # MS_REF_DEFAULTSETTINGS > nestMode=live
38 MS_REF_DEFAULTSETTINGS > useLights=0
39 MS_REF_DEFAULTSETTINGS > nestOverrides=allow
40
41 # MS_NEST_COLORADJUSTMENT: If not set, the color adjustment for the top level refer
42 # nested reference color adjustments at each level are multiplied to get the net a
43 MS_NEST_COLORADJUSTMENT = 1
44
45 # MS_LEVEL_EDIT_NESTED_ATTACHMENT_LEVELS: If defined, users are allow to edit nester
46 MS_LEVEL_EDIT_NESTED_ATTACHMENT_LEVELS = 1
47
48 # MS_REF_NEWLEVELDISPLAY: When set to 1, MicroStation displays newly created levels
49 # By default, when new levels are created in a model that is referenced by another
50 # MS_REF_NEWLEVELDISPLAY = 1

```

Figure 9: Sample configuration section from TS\_02.2\_Options.cfg applying default reference attachment settings.

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### Dataset Configurations [TF\_DATASETS] (Only applies to AECOsim Building Designer)

As the AECOsim Building Designer default configurations are processed (after the command line and application initiation configurations) there is a file processed called Dataset.cfg that is included by BuildingDesigner.cfg. The Dataset.cfg mainly determines default values for tool specific behavior within AECOsim Building Designer, including the determination of the default Family and/or Part to be applied when using various Architectural and Mechanical tools.

```

58 # (The following configuration variables support only single values and
59 # should not be appended or prepended)
60 #
61 #-----
62
63 HVAC_FAMILY_DUCT_DEFAULT           = Duct
64 BMECH_FAMILY_PLUMBING_DEFAULT      = Plumbing::DomesticColdWater-New
65 BMECH_FAMILY_PLUMBINGFIXTURE_DEFAULT = PlumbingFixture::PlumbingFixture
66 BMECH_FAMILY_DIFFUSER_DEFAULT      = Diffuser::Supply-New
67 BMECH_FAMILY_GRILLE_DEFAULT        = GrilleRegisters::Supply-New-Ceiling
68 BMECH_FAMILY_HVACEQUIPMENT_DEFAULT = HvacEquipment::HVAC-New
69 BMECH_FAMILY_PLUMBINGEQUIPMENT_DEFAULT = HvacPiping
70 BMECH_FAMILY_FIREFIGHTING_DEFAULT  = FireProtectionEquipment
71 HVAC_FAMILY_INSULATION_DEFAULT     = Insulation
72

```

Figure 10: Sample section from Dataset.cfg establishing default Family and/or Part for Mechanical/ Plumbing tools.

Dataset.cfg is included by the file BuildingDesigner.cfg (see Figure 11). Even though BuildingDesigner.cfg (located in C:\Program Files\Bentley\AECOsim Building Designer\...) is not modified by the TS\_WS\_001 configurations it will still include the dataset.cfg from the TS\_WS\_001 workspace. This is because the variable TFDIR is constructed by \$(TF\_DATASETS)\$ (TF\_DATASETNAME)/ both of which were modified in TS\_Building.cfg. Therefore the include call is to ...\\TS\_WS\_001\Workspace\Datasets\Building\_US\dataset.cfg.

```

559 #-----
560 # Include config file to define Family mappings for Roles
561 #-----
562 %if exists $(TFDIR)dataset.cfg)
563 %include $(TFDIR)dataset.cfg
564 %endif
565 #

```

Figure 11: Sample from BuildingDesigner.cfg located in C:\Program Files\Bentley\... makes the call to include Dataset.cfg.

### Alternate Datasets

Sometimes a Building Dataset other than Building\_US may be required. If this is the case, the Dataset.cfg for Building\_US will still be loaded, which may apply the incorrect default settings. To circumvent this, modifications must be made to the [Project Configuration File](#) to redefine the value of TF\_DATASETNAME to the name of the alternate dataset (Figure 12). This change will then automatically trigger TS\_03\_Project.pcf to include the Dataset.cfg file for the alternate dataset (Figure 13).

```

44
45 %if defined (BB_DISCIPLINE)
46 # TF_DATASETNAME = Building_US
47 %endif
48

```

Figure 12: \_Template\_Project\_B01.pcf

```

157 #-----
158 # Include Dataset.cfg if an alternate Dataset is utilized
159 #-----
160 %if ($(TF_DATASETNAME) != "Building_US")
161 %if exists ($(TFDIR)dataset.cfg)
162 %include $(TFDIR)dataset.cfg
163 %endif
164 %endif

```

Figure 13: TS\_03\_Project.pcf

**NOTE: Dataset.cfg may be edited by the CAD/BIM Manager if desired by users; however, caution should be taken as changes made will determine the default tool behavior for everyone using the dataset.**

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### Project Configurations [*USTN\_PROJECT*]

The project configuration file (.PCF) is the file that is selected when the user selects the project component of a workspace in the File Open dialog (see Figure 14). There should be a single PCF that corresponds to each project directory, which can be located in a different network location than the PCF. Bentley applications look for project configuration files in the Central Workspace location because of the configuration modifications made to *\_USTN\_PROJECT* in *TS\_mslocal.cfg*.

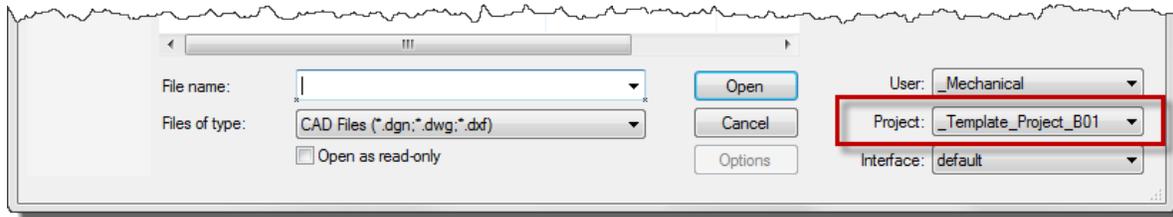


Figure 14: File Open Dialog with PROJECT Selection menu noted.

Project Configuration Files (.pcf) are stored in:

...\*TS\_Workspaces*\TS\_WS\_001\Workspace\Projects\

Within the TS\_WS\_001 workspace the PCF's main function is to establish the project-specific directory locations for working design files, output files, and project dataset resource files. Additionally, the PCF can also be used to enable [Dataset Extensions](#) or to alter the configuration settings for a specific project.

For consistency and predictability of the project directory organization, the default project configurations for the TS\_WS\_001 Workspace are maintained in *TS\_03\_Project.pcfg*, which is located in ...\*TS\_WS\_001*\Workspace\Standards\. ***TS\_03\_Project.pcfg*** is included by the PCF (see excerpt in image below) and ***MUST NOT be edited***. Configuration changes for the project ***MUST*** be made in the PCF, added at the bottom below the section designated for Project Specific Configurations (see Figure 15), or in the [Local Dataset Extension](#).

```

111 #=====
112 # Include configurations for TriService project standards:
113 #=====
114 #
115 # TriService Project Standard Configurations
116 #=====
117 #include $(USTN_SITE)TS_03_Project.pcfg
118 #=====
119 # Project Specific Configurations
120 # ADD PROJECT CONFIGURATIONS IN THE SECTION BELOW
121 #=====
122 #=====

```

Figure 15: Configuration sample from *\_Template\_Project\_B01.pcf*. Note lines 119-121 indicating that all project-specific configuration changes should follow.

For additional information and project setup see [Creating New Projects](#).

### User Configuration [*USTN\_USER*]

The user configuration file (.UCF) is the file that is selected when the user selects the 'USER' component of a workspace in the File Open dialog (see Figure 16). Bentley applications look for user configuration files in the Central Workspace location because of the configuration modifications made to *\_USTN\_USER* in *TS\_mslocal.cfg*.

User Configuration Files (.ucf) are stored in:

...\*TS\_Workspaces\TS\_WS\_001\Workspace\Users\*

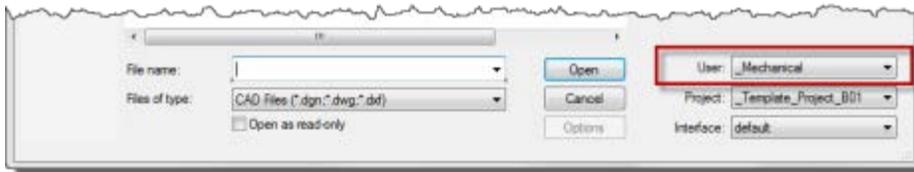


Figure 16: File Open Dialog with USER Selection menu noted.

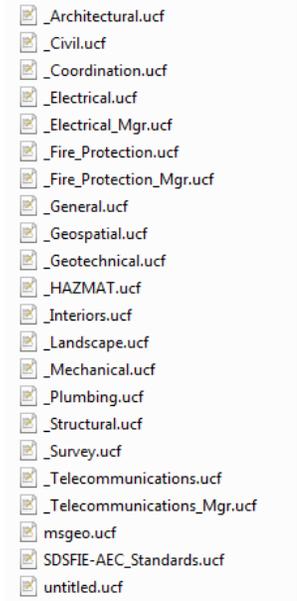


Figure 17: Default list of *TS\_WS\_001* USERS

When launching any of the Bentley Applications supported by the Tri-Service Workspace it is important to select an appropriate *USER* to ensure that design files and corresponding output files related to that user (i.e., discipline) are located properly in the [project directory](#) structure. The appropriate *USER* (.ucf) should be the discipline that corresponds to the directory that modeling/drafting will be done for that application session. For example, an architect working in the *.../CAD\_BIM/08\_Arch/* directory should select the *\_Architectural USER*; by selecting the *\_Architectural USER* (*\_Architectural.ucf*) the variables *TS\_DISCIPLINE* and *TS\_DISCDIR* will be set to discipline-specific values (see Figure 18).

```

15 #=====
16 # User Information
17 #=====
18
19 # TS_DISCIPLINE: Sets the discipline for this user. This drives the folder location for design models, drawings, and extractions.
20 # Valid Arguments: (PICK ONE) = [Architectural, Civil, Electrical, Fire_Protection, General, Interiors,Landscape, Mechanical,
21 # Plumbing, Security, Structural, Survey, Telecommunications]
22 TS_DISCIPLINE = Architectural
23
24 # TS_DISCDIR: Sets the discipline for this user. This drives the folder location for design models, drawings, and extractions.
25 # Valid Arguments: (PICK ONE) = [01_Gen, 02_HazMat, 03_SurvMap, 04_Geotech, 05_Civil, 06_Lndscp, 07_Struc, 08_Arch, 09_Int,
26 # 10_Equip, 11_FireProt, 12_Plumb, 13_Proc, 14_Mech, 15_Elec, 16_Telcom, 17_Resource, 18_Other, 19_ShopDwgs, 20_Ops]
27 TS_DISCDIR = 08_Arch
28

```

Figure 18: Sample from *\_Architectural.ucf* identifying the primary differences between the various *{\_Discipline}.ucf*

**NOTE: The *\_Electrical\_Mgr*, *\_Fire\_Protection\_Mgr*, & *\_Telecommunications\_Mgr* Users should only be used by experienced AECOsim Building Designer Electrical Users when symbols need to be added or modified. See [Electrical Workspace Updates](#) for additional information.**

For information on how to creating/customizing Users refer to [Creating New Users](#).

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## Project Directory Structure

The Tri-Service Workspace project directory structure has been reorganized with the release of the TS\_WS\_001 Workspace to provide a single unified structure to support CAD (2D & 3D) as well as Information Modeling workflows for both Military Construction and Civil Works projects from initial planning stages through Operation. In addition to promoting uniformity across projects and workflows this directory structure also reinforces a project-centric organization to information versus discipline-based information silos.

For USACE Sites utilizing the ProjectWise Collaboration Model (PCM), this new organization allows for integration into the directory structure of the PCM. The recommended integration point for Civil Works is under “30000 - Planning & Engineering & Design” and for Military projects under “40000 Design Products”. However, the final organization location should be determined by the ProjectWise Administrator at the local site.

The directory structure is organized into five major folders:

- CAD\_BIM
- Design\_Process
- Out
- P&S Sets
- Specifications

### Major Folders

- **CAD\_BIM:** Folder containing all working design files/models and construction drawings (during design), record drawings/models (during construction), and As-Maintained drawings/models (after occupancy), along with any required supporting project dataset.
- **Design\_Process:** Folder for supporting project design, process, and analysis information. This includes (but is not limited to) design calculations/analysis, basis of design product cut sheets, Code information/analysis, LEED data, Clash Detection and Design Review.
- **Out:** Output folder for various file formats that may or may not be required depending on contract type.
- **P&S Sets:** Folder for milestone archives of Plans & Specification (P&S) Sets in PDF Format.
- **Specifications:** Folder for working specification documents (during design) and final specification documents (after design) in native format. PDF record copies should be published to the P&S Sets folder.

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### CAD\_BIM sub-folders

- **\_Master\_Models:** The folder where the project is brought together into a central location. This folder contains the Project Master Model (PMM) where the entire project model is referenced into a single file.
- **Sheets:** Folder containing only the files that are intended to be plotted. Files in this folder should not be referenced into any other file. (Optional: if the local site feels that it is necessary to organize the sheets by disciplines, sub-folders can be created matching the folder naming shown under Discipline Folders below.)
- **Discipline Folders:** The root of each discipline folder (based on NCS, e.g., 01\_Gen = General, 02\_HazMat = Hazardous Materials, etc.) should contain the working design files (models or 2D CAD drawings). Each discipline folder has a “Drawings” sub-folder within it to contain information to be referenced onto the Sheets. This may include drawings created from a model, detail drawings, raster files or schedules.
  - **Bentley:** Contains the [Project Dataset](#)
  - **LocalExt:** Empty container for a Local Dataset Extension. If a [Local Dataset Extension](#) is used by the project it should be copied here before being submitted.
- **Support:** Folder for application-related content created in addition to the content delivered in the Tri-Service Workspace that is necessary to the creation and future maintenance of the project design files.

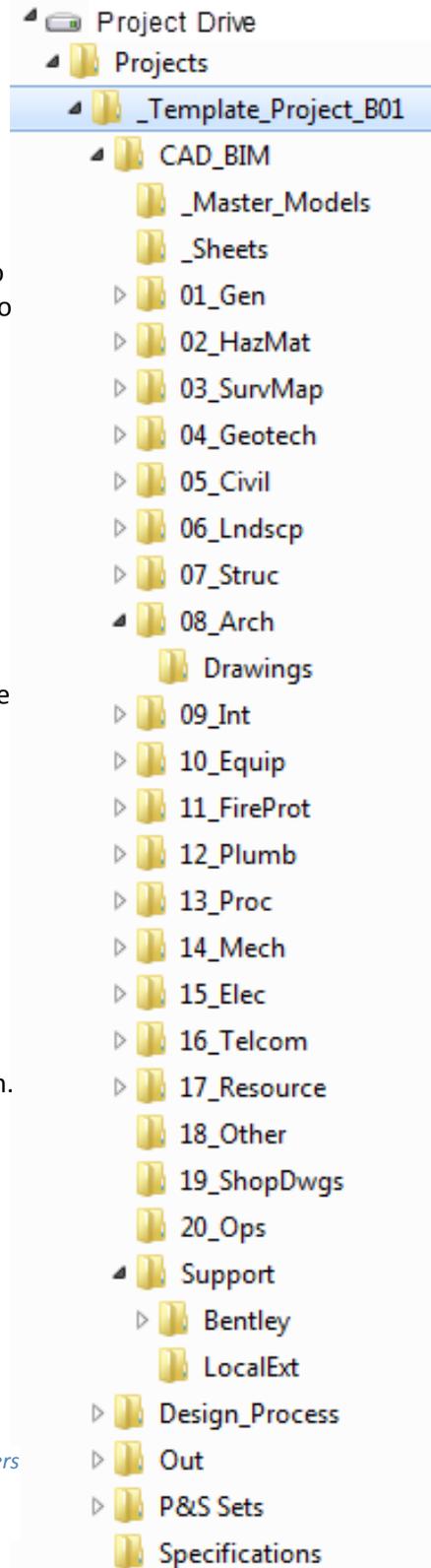


Figure 19: CAD\_BIM Folders and Sub-Folders

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### Design\_Process Sub-Folders

The Design\_Process folder contains two categories, Tasks and Disciplines. Note that previous Tri-Service Workspaces had a “DesignInfo” folder that was not configured by the Bentley applications and therefore was often ignored or omitted. This is not the case with “Design\_Process”, where locations are configured for several tasks that may include deliverables required by your contract.

**TASKS:** (The Task folders begin with an underscore “\_”)

- **\_Coordination:** Clash Detection Reports & Design Review
- **\_Cut Sheets:** Basis of design product and/or as-installed equipment information
- **\_Design-Related Shop Drawings:** Shop Drawings
- **\_Energy:** Analytical Space Models, Analysis & LEED Reports

**DISCIPLINES:**

The Discipline folders are for design calculations and other miscellaneous files related to design. Designers can create sub-folders and organize their own data below these folders. The only disciplines with sub-folders by default are Civil and Geotechnical

- **Civil:** Contains template files for InRoads
- **Geotechnical:** Contains template and library for gINT

### Out Sub-Folders

The Out folder contains non-production Outputs from the design.

- **IFC:** Industry Foundation Class (IFC) files, which may be required by contract. This is the default folder for exported IFC’s
- **MISC:** All other output files. Examples are DWG to DGN conversions, STEP files, gbXML files, etc.
- **PLOT:** Work-in-progress PDF’s or PDF’s to be assembled for submittals or reproduction before they are final (See P&S Sets below). This is the default folder when plotting to PDF.

### P&S Sets Sub-Folders

Plans and Specification Sets (P&S Sets) should contain reproducible construction documents (typically PDF) produced for, and organized by, each submittal. The four generic sub-directories are intended to be renamed to reflect the deliverable packages required for each project. These folders contain what would be sent to reproduction or to a CD or other transmittal device.

### Specification Sub-Folders

The Specification folder does not contain sub folders by default, but they can be created as needed.

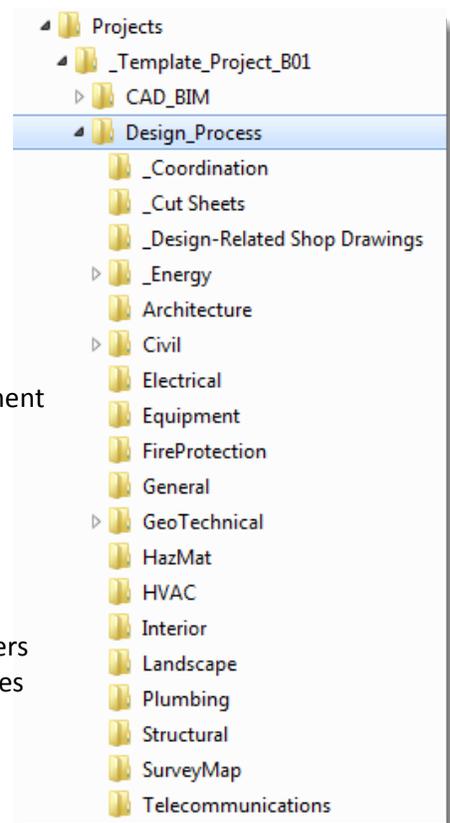


Figure 20: Design\_Process Folders

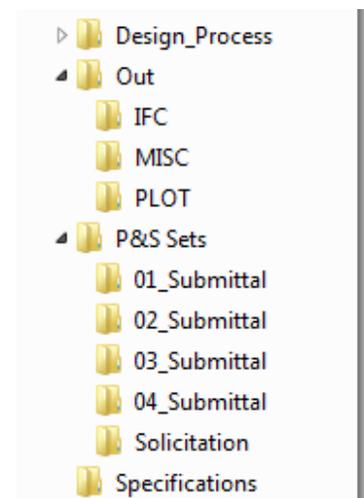


Figure 21: Out, P&S Sets, and Specifications folders.

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## Project Dataset

It is important to remember that the Tri-Service Workspace is not able to deliver all of the required resources to complete a project; therefore a project dataset must be included with each project. This is especially true for the vertical applications like AECOSim Building Designer, InRoads, or GEOPAK. The project dataset is a structured storage container for supplementary files required to reproduce the project. The folders in the project dataset are pre-configured so that users can simply add content to the folder and the application will automatically recognize the added resources. Resources may include newly created content or a copy of the Bentley or TS\_WS\_001 delivered resource file that has been modified. Most project resources will override System/Application/Site-level resources that have the same name as the project version.

Project datasets are stored in:

... \{ProjectDrive}\{ProjectName}\CAD\_BIM\Support\Bentley\

\* **Folders or resource types shown in blue indicates items only utilized by AECOSim Building Designer.**

- **\_Info**: Workspace Version information and raster images
- **cell**: 2D, 3D, Annotation and/or **Compound** Cells
- **comp**: Reporting Component files
- **cpart**: Compound Part files
- **data**: Structural Shapes, Autofitting, export, and other misc. settings
- **datagrouppcatalogs**: DataGroup Catalogs & Catalog Items
- **datagroupplayouts**: DataGroup Schedule Layouts & Templates
- **datagrouppsystem**: DataGroup Schema Definition files
- **dgnlib**: DGN Libraries (Text/Dimension Styles, Levels, Clash Jobs, etc.)
- **elecldb**: Electrical Project Database files
- **frame**: Parametric Cells for Casework, Shelving, Doors, Windows and Stairs
- **guide**: Structural Grid Definition file
- **macros**: Macro files
- **materials**: Rendering materials, patterns, bumps, and/or environments
- **part**: Family/Part files
- **pltcfg**: Plot Configuration files, Pen Tables, etc.
- **rules**: Dynamic View and Extraction Resymbolization Rules
- **seed**: Seed files for new file creation
- **setting**: Mapping Files and Discipline-specific Annotation settings
- **symb**: Custom Line Style files
- **vba**: VBA routines

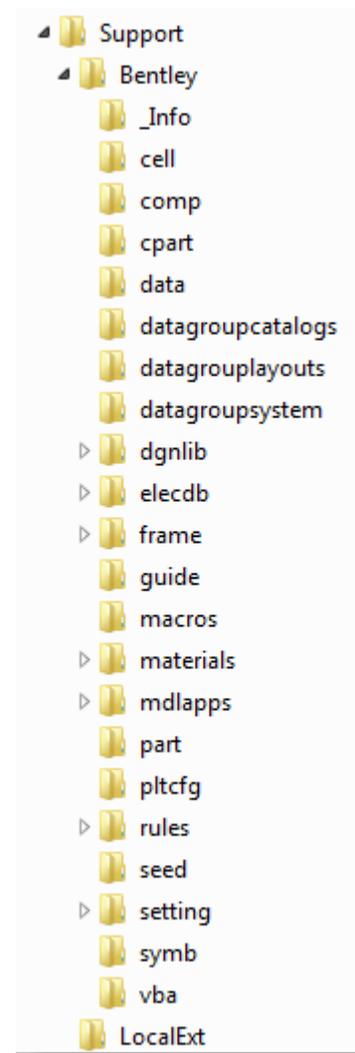


Figure 22: Project Dataset sub-folders.

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## Dataset Extensions

The concept of Modular Dataset Extensions has been introduced in the TS\_WS\_001 Workspace. There is a framework within the configuration to allow for three different dataset extensions related to US Army Corps of Engineers work. These are for District, Division, or CoS (Center of Standardization), whereby a single extension could be enabled, or any combination of the three. These extensions, if applicable, would be delivered by the contracting District and should not be edited by the design and/or building teams. The configuration should consist of a `{ExtensionName}.cfg` file and corresponding `{ExtensionName}` folder containing sub-folders that may vary.

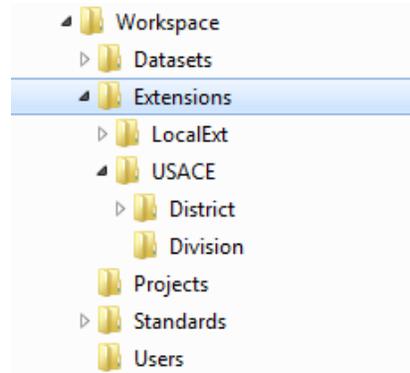


Figure 23: Dataset extensions in centralized Workspace.

```

45 # =====
46 # Standards in use by this Project
47 # Edit these lines to load the Standard Datasets used by this project.
48 # =====
49
50 # TS_Division =
51
52 # TS_District =
53

```

Figure 24: Extensions are enabled by the \*.pcf when TS\_Division or TS\_District variables are defined.

If a value is established for TS\_Division or TS\_District (Figure 24) then the configuration will look for a corresponding .cfg file and if found it will be included by the .PCF (Figure 25).

```

56 # =====
57 # US Army Corps of Engineers Extensions: DO NOT EDIT EXTENSIONS
58 # =====
59
60 # USACE Division Standards Extension
61 # =====
62 %if exists ($(TS_ExtensionDir)USACE/Division/$(TS_Division).cfg)
63     %include $(TS_ExtensionDir)USACE/Division/$(TS_Division).cfg
64 %endif
65
66 # USACE District Standards Extension
67 # =====
68
69 %if exists ($(TS_ExtensionDir)USACE/District/$(TS_District).cfg)
70     %include $(TS_ExtensionDir)USACE/District/$(TS_District).cfg
71 %endif
72

```

Figure 25: Extensions are enabled by the \*.pcf when TS\_Division or TS\_District variables are defined.

**NOTE:** Future Dataset Extension support may be added for other agencies utilizing the Tri-Service Workspace.

### Enabling USACE Dataset Extensions

To enable the extension, first locate the delivered extension module (from the contracting District) in ...\\TS\_WS\_001\\Workspace\\Extensions\\USACE\\{*Division or District*} (Figure 27). Then edit the .PCF for which the extension is to be used to remove the comment (#) before the appropriate extension type (TS\_Division if a Division extension or TS\_District if a District level extension) and then add the name of Extension after the “=” for that configuration variable (See Figure 26).

```

#=====
# Standards in use by this Project
# Edit these lines to load the Standard Datasets used by this project.
#=====
# TS_DIVISION      =
TS_DISTRICT       = NWO

```

Figure 26: Example .PCF enabling a District-Level extension for NWO (Omaha District).

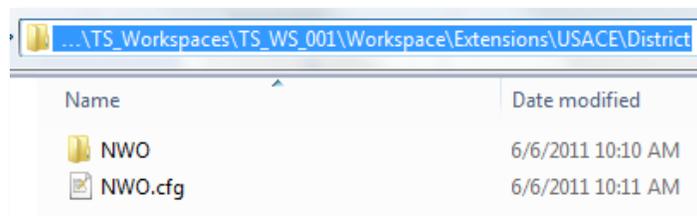


Figure 27: Extension directory example using an Omaha District extension.

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## Local Dataset Extensions

A Local Dataset Extension has been formalized in the TS\_WS\_001 to permit content creation that can be shared across multiple projects within the organization without editing the Tri-Service Site/Dataset standard content (which should never be modified by the end-user). If a Local Dataset Extension is enabled it would be processed after the Site Level configuration, but before the project configurations thus permitting three tiers of federated content when using the TS\_WS\_001 Workspace. Effectively this means that if a resource exists at the Site Level it could be overridden by a duplicate resource (shared name, but different settings) at the Local Dataset Level, which in turn could be overridden by another duplicate at the Project Level.

While the Local Dataset can be located with the Central Workspace, it is critical that anytime the project is delivered to another entity the entire Local Dataset extension directory is copied (as a snapshot in time) into *{ProjectName}/CAD\_BIM/Support/LocalExt/*. Additional information about delivering a Local Dataset Extension may be found in [Delivering a Project](#). Submittals, including interim submittals that do not deliver the Local Dataset Extension when one is used for the project may be rejected by the Contracting District.

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### Creating a Local Dataset Extension

A Local Dataset Extension template has been included in the TS\_WS\_001 workspace and is located at ...\\TS\_Workspaces\\TS\_WS\_001\\Workspace\\Extensions\\LocalExt\\. The template includes some sample empty directories and a configuration file that should be included by the PCF to enable the Local Dataset Extension. Both the configuration file and the directories within the LocalExt folder may be modified as needed, but it is best to not rename the LocalExt folder. The template LocalExt.cfg has conditional directives already setup that allow for configuration to be applied to specific Bentley applications or all Bentley applications as needed.

```

#=====
# Building Designer Specific Configurations
#=====
%if defined (BB_DISCIPLINE)

%endif

#=====
# Bentley Navigator Specific Configurations
#=====
%if defined (_NAVIGATOR)

%endif

#=====
# i-Model Composer Specific Configurations
#=====
%if defined (_IMODELCOMPOSER)

%endif

```

**WARNING: Modifications to the LocalExt.cfg should only be performed by someone with configuration experience and knowledge of the configuration variables being used. Utilizing the LocalExt is optional and offered for convenience not necessity. As such, configuration support for Local Dataset Extensions will not be provided by the CAD/BIM Technology Center or Bentley's Technical Support Group.**

### Enabling a Local Dataset Extension

To enable a Local Dataset Extension you will need to check the settings in two configuration files.

- First open [TS\\_mslocal.cfg](#) to verify that the line below (highlighted in Figure 28) is uncommented (by default it is commented out). To uncomment, simply delete the “#” at the beginning of line.

`EXTENSIONDIR_LOCAL = $(TS_WORKSPACEROOT)Extensions/LocalExt/`

```

17 #-----
18 # Note: the Local extension allows the local site to add settings, cells, libraries, plot drivers,
19 # This is for common data used accross multiple projects. Local sites can choose to use the Local ex
20 # completely inside of the project Support folder. DO NOT edit the Workspace Standards, Datasets, o
21 # Those are for Shared Standards for broad based distribution, maintained by USACE, Divisions, and/
22 #-----
23
24 # Sets the location of the modular extensions, container for the Local extension.
25 # Uncomment “#” this line to set the local dataset to be read from the project directory.
26 # Alternatively: move this line to the Project .PCF file to set for individual projects.
27
28     EXTENSIONDIR_LOCAL    = $(TS_PROJECTDATA)Support/LocalExt/
29
30 # Sets the location of the modular extensions, container for the Local extension.
31 # Uncomment “#” this line to set the local dataset to be located with the central
32 # workspace to be used with all projects.
33 # NOTE: This folder must be delivered with the project on ALL submittals.
34
35 # EXTENSIONDIR_LOCAL    = $(TS_WORKSPACEROOT)Extensions/LocalExt/
36

```

Figure 28: *TS\_mslocal.cfg*. This step is not required to enable the Local Dataset Extension for additional projects.

- Second, in the [project configuration file](#), uncomment (remove the “#”) the five (5) lines in the Local\_Dataset\_Extension section (highlighted in Figure 29).

```

110
111 #-----
112 # Local_Dataset Extension: Office-specific customization shared across all projects
113 # The contents and configuration of this extension must be submitted with Project
114 #-----
115 #if exists ($(EXTENSIONDIR_LOCAL)LocalExt.cfg)
116 #include $(EXTENSIONDIR_LOCAL)LocalExt.cfg
117 #else
118 #error "Missing Local_DatasetExt.cfg. Contact the project's BIM Manager to locate the
119 #endif
120

```

Figure 29: Remove “#” from lines 115-119 (actual line numbers may vary) to enable Local\_Dataset\_Extension.

**NOTE:** If necessary `EXTENSIONDIR_LOCAL` may be redirected by the project configuration file in the section called `EXTENSIONDIR_LOCAL PROJECT OVERRIDE` (see excerpt from `_Template_Project_B01.pcf` in Figure 30).

```

98 #-----
99 # Customizable Extension:
100 #-----
101 #-----
102 # EXTENSIONDIR_LOCAL PROJECT OVERRIDE
103 #-----
104 # EXTENSIONDIR_LOCAL, by default is established in TS_mslocal.cfg.
105 # Uncommenting one of the two lines below will allow this specific project
106 # to redirect the Local Dataset Extension from the default
107
108 # EXTENSIONDIR_LOCAL    = $(TS_PROJECTDATA)Support/LocalExt/
109 # EXTENSIONDIR_LOCAL    = $(TS_WORKSPACEROOT)Extensions/LocalExt/
110

```

Figure 30: Redirecting the Local Dataset Extension in the \*.pcf

## Creating New Projects

Creating a new project using the TS\_WS\_001 Workspace is simple using the template project that is delivered with the workspace. The template project (\_Template\_Project\_B01) directory and corresponding PCF should be kept clean and only be used for creating new projects.

### Step 1: Project Directory

- Copy the entire \_Template\_Project\_B01 directory and paste it into the path established by TS\_PROJECTDIR in ...\\TS\_Workspaces\\TS\_WS\_001\\Program\\\_Bentley\\TS\_mslocal.cfg.
- Rename the copied directory to the name of your new project (as shown in Figure 31 below, \_Template\_Project\_B01 has been copied and renamed My\_New\_Project)

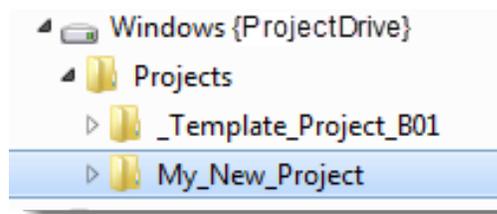


Figure 31: Copy of template project in the TS\_PROJECTDIR folder.

### Step 2: Project Configuration File

- Copy \_Template\_Project\_B01.pcf. Rename \_Template\_Project\_B01.pcf to My\_New\_Project.pcf. Open the My\_New\_Project.pcf file, and set TS\_PROJECTNAME = My\_New\_Project. Also add a project description to \_USTN\_PROJECTDESCR

Figure 32: \_Template\_Project\_B01.pcf

```

34 #=====
35 # Project Information
36 #=====
37     #.....TS_PROJECTNAME:
38     #           This should equal the project directory name
39     TS_PROJECTNAME = _Template_Project_B01
40
41     #....._USTN_PROJECTDESCR:
42     #           Description of the project
43     _USTN_PROJECTDESCR = Template Project_001
44

```

Figure 33: My\_New\_Project.pcf

```

34 #=====
35 # Project Information
36 #=====
37     #.....TS_PROJECTNAME:
38     #           This should equal the project directory name
39     TS_PROJECTNAME = My_New_Project
40
41     #....._USTN_PROJECTDESCR:
42     #           Description of the project
43     _USTN_PROJECTDESCR = My New Project Description|
44

```

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## Creating New Users

Each time a 'USER' and 'PROJECT' is selected from the File Open menu, the selected Project Name is recorded into the UCF file that corresponds to the selected USER. Because of this behavior and also to allow for user-specific customizations; CAD/BIM Managers may want to create additional Users to the ones delivered in the TS\_WS\_001 Workspace.

To create new users, navigate to ... \TS\_Workspaces\TS\_WS\_001\Workspace\Users\ and make a copy of the delivered .ucf file that corresponds to the primary discipline of the new user and rename the file with the desired User Name. Because the TS\_WS\_001 Workspace is dependent on certain variables being established in the User Configuration File, it is important that the delivered UCF's be used as a template.

**NOTE:** *The discipline named .ucf file begins with an “\_” (underscore) so that it remains at the top of the list alphabetically; it is not necessary to include the underscore when naming your user’s configuration files.*

**HINT:** *If creating separate UCFs for each user and some users might be required to work in more than one discipline (i.e., Fire Protection and Plumbing) it is necessary that a separate UCF be setup for each of the disciplines the user will be using. i.e., NewUser\_FireProtection & NewUser\_Plumbing*

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## Delivering a Project

When submitting a project to USACE, the entire project directory structure must be delivered as well as the corresponding Project Configuration File (ProjectName.pcf). These submittal requirements apply to all submittals, not just the final submittal. Interim submittals are required not only to review the design, but also to ensure that the design and/or build team is on track to deliver the drawings and/or models to the standards and level of detail established by the contract.

Care should be taken to ensure that **all contract requirements** are properly located in the appropriate project directories before submitting the project. Reviewing the [Quality Assurance Checking](#) section prior to submitting is recommended to assist in validating your project.

If a local dataset extension was enabled for the project, the entire Local Dataset directory structure and configuration file must be copied into the project directory structure.

*{ProjectDrive}{ProjectName} CAD\_BIM\Support\LocalExt\*

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## Best Practices

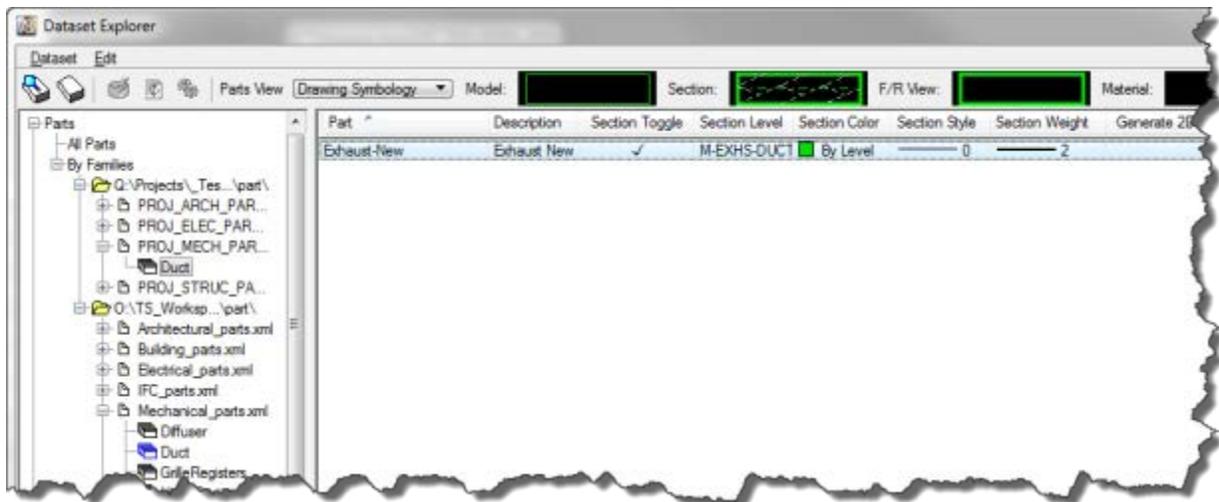
### Family & Part Concatenation

AECOsim Building Designer V8i allows for the concatenation of Family and Parts. This means that individual Parts can be established in more than one XML file and combined into a single Family. In cases where duplicate Parts exist, those defined at higher configuration levels (ex. Project) take precedent and will over-write the settings from lower configuration levels. This hierarchy is configured by default in the TS\_WS\_001 Workspace to allow Parts to be copied from the Tri-Service delivered Families & Parts to the Project Dataset location. This will supersede the Tri-Service Family & Part settings in order to meet the specific project requirements.

To preserve the integrity of the Enterprise working environment for seamless project sharing, users should not edit the Tri-Service Delivered Families & Parts, instead users should create or modify all Families & Parts at the Project level (or Local Extension if enabled) so that the necessary resource files for drawing generation are kept with the Project. It is recommended that permissions be restricted for users so that accidental editing of the Building\_US dataset does not occur. Additionally, discipline-specific Part files have been added to the project template where users can simply copy or create Parts as needed.

- PROJ\_ARCH\_PARTS.xml
- PROJ\_ELEC\_PARTS.xml
- PROJ\_MECH\_PARTS.xml
- PROJ\_STRUC\_PARTS.xml

For more information see [Concatenation of Parts and Families](#) in the AECOsim Building Designer Help.



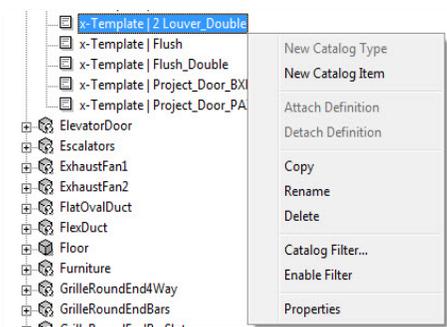
**Figure 34:** Example of Part being copied from Enterprise Dataset to the Project Dataset to override symbology settings. Note the 'Duct' Family in the Enterprise Dataset is shown in blue indicating that the Family is defined at a higher level.

**NOTE:** Compound Family names should be unique, but can reference Parts from concatenated families.

Ex. WallAssembly\_MyProject

## DataGroup Project Templates

The \_Template\_Project\_B01 template project is delivered with multiple DataGroup Catalog XML files located in ...\\{ProjectName}\\CAD\_BIM\\Support\\Bentley\\datagrouppcatalogs\\. These files contain ‘project template’ DataGroup Catalog Items for many of the DataGroup Catalogs. These non-descript templates are placed in the template project to aid users in properly locating project-specific Catalog Items in the project dataset. From the DataGroup Catalog Editor, the user simply needs to copy (by right-clicking > Copy) the project template Catalog Item (typically prefixed with a “x” or “\*”) and a new Catalog Item will automatically be created and stored in the same project-based XML as the “x-Template | Project\_{CatalogType}” that was copied.



**Figure 35:** Project templates for doors in AECOSim Building Designer – DataGroup Catalog Editor

## Project Structural Shapes

If a project requires a unique structural shape that is not in one of the standard structural shapes tables the user can create these in the projectshapes.xml file that is located in ...\\{ProjectName}\\CAD\_BIM\\Support\\Bentley\\data\\. Using the StructuralShapesTemplate.xls file (Figure 36) located in the same folder, users can import the projectshapes.xml, add new structural shapes data in the tab corresponding to the desired profile shape, and then export back to the same XML file. This is particularly useful for creating structural shapes that can be used as piles, piers, footings, turn-down slab edges, or built-up tapered members for pre-engineered steel structures.

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4										
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**Figure 36:** StructuralShapesTemplate.xls template file.

## Quality Assurance (QA) Checking

### General:

- Use Standards Checker to verify compliance with the A/E/C 5.0 CAD Standard
  - *Utilities > Standards Checker*
- Use Design File Cleanup to remove unnecessary duplicates or overlapping elements.
  - *Utilities > Data Cleanup*
- Check the Message Center for Errors or Warnings

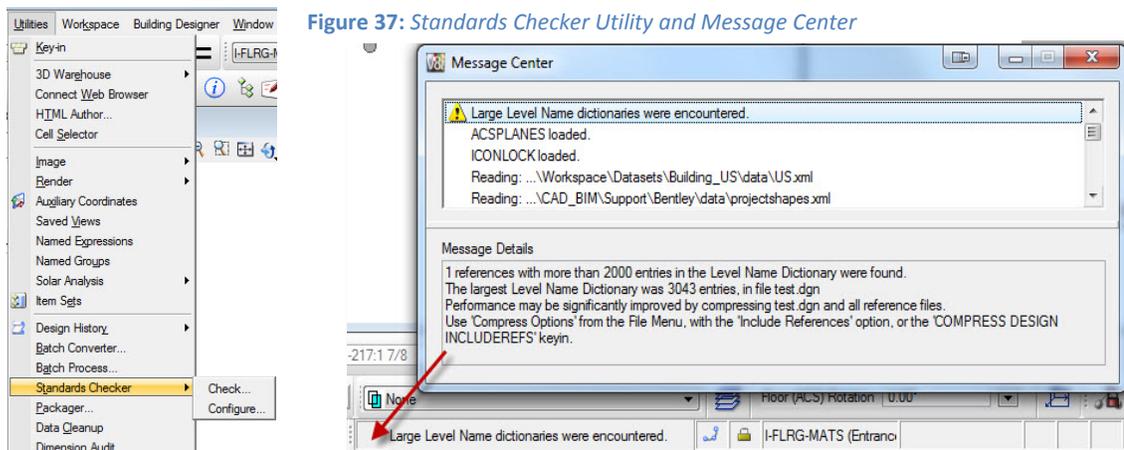


Figure 37: Standards Checker Utility and Message Center

### AECosim Building Designer:

- Run DataGroup Validation to ensure that there are not any errors in the DataGroup System caused by missing resource files or modified schemas.
  - *Building Designer > DataGroup – Building Components > Validate*
- Verify Part and Family Assignments to ensure all elements in the Model have valid Families & Parts.
  - *Building Designer > Family & Parts > Verify Part and Family*

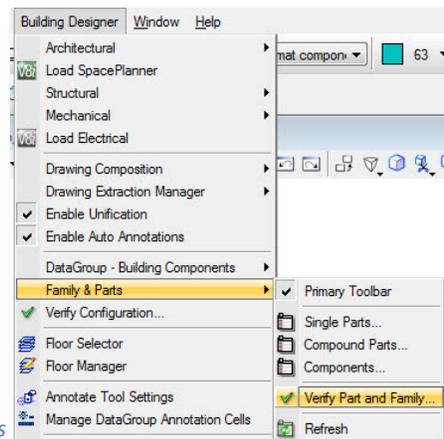


Figure 38: Verify Family and Parts

It is good practice to setup the TS\_WS\_001 Workspace in a separate location from the actively used workspace for testing the integrity of any submittals. Before submitting the project, copy it (with LocalExt if applicable) and run the applicable QA Checks to verify content created for the project was correctly located in the project dataset. If results differ from the actively used workspace when run using the clean version configured locally, it is safe to assume it will not function properly when submitted to the Contracting District. Discrepancies should be resolved prior to submitting the project and the [Troubleshooting Guidelines](#) may offer some assistance in identifying the problem.

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## Troubleshooting the Tri-Service Workspace

There is an extremely useful new workspace configuration utility available called [Bentley Configuration Explorer](#) allowing easy navigation through the configuration files and variables. There is detailed information about what is happening in each line of the configuration, a searchable variable library with descriptions, and even the ability to compare two workspaces (compare live workspaces or compare your active workspace against a 'saved' version of it). Many of the images included in this document were captured from Bentley Configuration Explorer. This utility is highly recommended for anyone managing or troubleshooting the TS\_WS\_001 and it is available for download from [Bentley i-Ware](#).

Additionally, a troubleshooting checklist document has been developed that will assist BIM and CAD managers in identifying and troubleshooting user issues while using any version of the Tri-Service Workspace. In addition to steps that will help identify the core problem, the document also includes steps for getting assistance from the most appropriate source for each given issue. The checklist can be downloaded from [BIM/CAD Manager's Troubleshooting Checklist](#).

### If the problem still exists:

- Check the [KnowledgeBase](#) for similar problems and possible solutions at *SELECT Services Search BE Communities* using keywords for similar problems and possible solutions
- Submit the issue to Bentley Support through the [Service Ticket Manager](#) at *SELECT Services*
- If there is a software or Tri-Services Workspace problem that is preventing you from fulfilling part of the contract, then communicate the issue to the contracting District's BIM Manager as soon as possible to prevent denial of submittal for a problem that you cannot fix.
- Document the agreed upon solution in the Project Execution Plan and include with next submittal for the record.
- If you are in an active workshop with Bentley Professional Services, when the Technical Support Group (TSG) issues you a Service Ticket Number, share that ST# with the Bentley Services Team.

### Before you submit to TSG:

- Have a list of supported application versions.
- Include pertinent screen captures to explain the issue, especially of error messages.
- Include the problem's source: MicroStation, ProjectWise, BIM Application
- Assess the priority of the problem. Is it work-critical? Are users still able to work?
- Do you have a work-around? Communicate the work-around to the team and TSG.

### After you have a solution or work around:

- Test your fix before deploying to the network
- Communicate the solution or work-around to the team

Requests or suggestions for additional content should be submitted to the [CAD/BIM Technology Center](#).