AVEVA Everything3D™ 2.1

Migration & Interoperability Guide

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Revision Log

Date	Revision	Description	Author	Reviewed	Approved
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Updates

Change highlighting will be employed for all revisions. Where new or changed information is presented section headings will be highlighted.

Suggestion / Problems

This manual provides documentation relating to products to which you may not have access or which may not be licensed to you. For further information on which products are licensed to you please refer to your licence conditions.

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Disclaimer

1.1 AVEVA does not warrant that the use of the AVEVA software will be uninterrupted, error-free or free from viruses.

1.2 AVEVA shall not be liable for: loss of profits; loss of business; depletion of goodwill and/or similar losses; loss of anticipated savings; loss of goods; loss of contract; loss of use; loss or corruption of data or information; any special, indirect, consequential or pure economic loss, costs, damages, charges or expenses which may be suffered by the user, including any loss suffered by the user resulting from the inaccuracy or invalidity of any data created by the AVEVA software, irrespective of whether such losses are suffered directly or indirectly, or arise in contract, tort (including negligence) or otherwise.

1.3 AVEVA's total liability in contract, tort (including negligence), or otherwise, arising in connection with the performance of the AVEVA software shall be limited to 100% of the licence fees paid in the year in which the user's claim is brought.

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1.5 In the event of any conflict between the above clauses and the analogous clauses in the software licence under which the AVEVA software was purchased, the clauses in the software licence shall take precedence.

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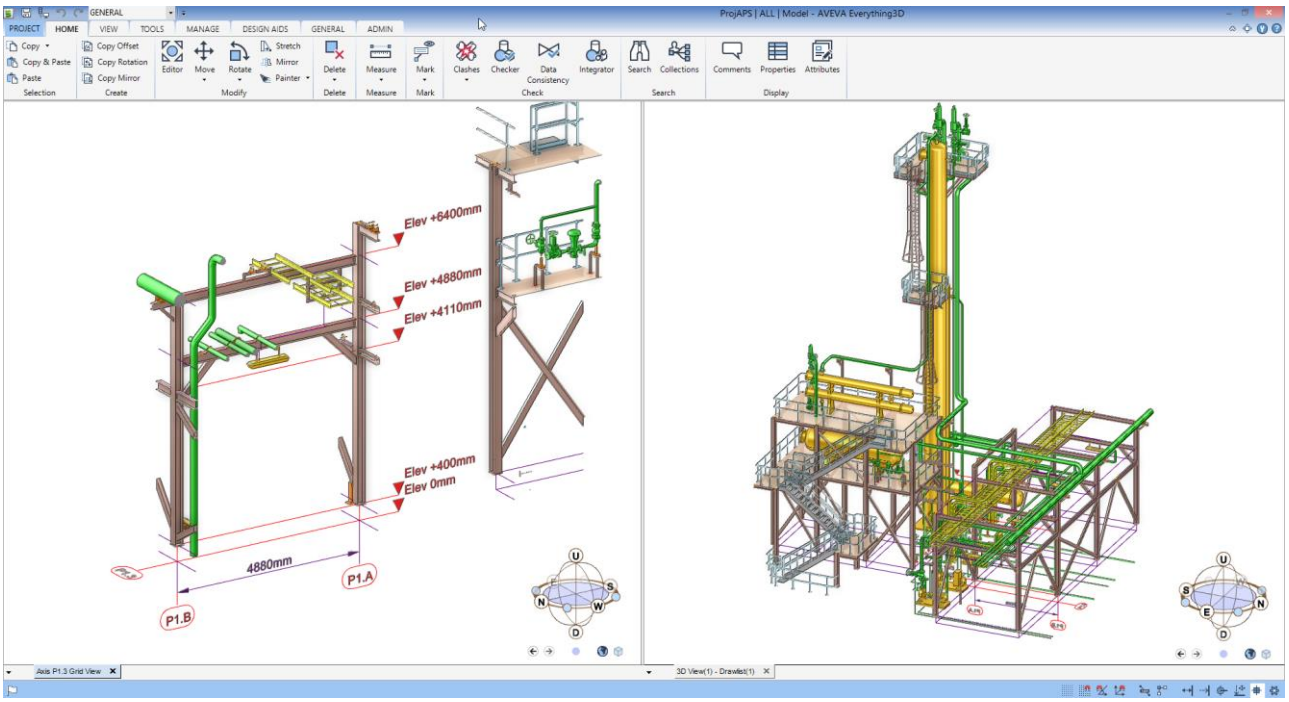
1 Introduction

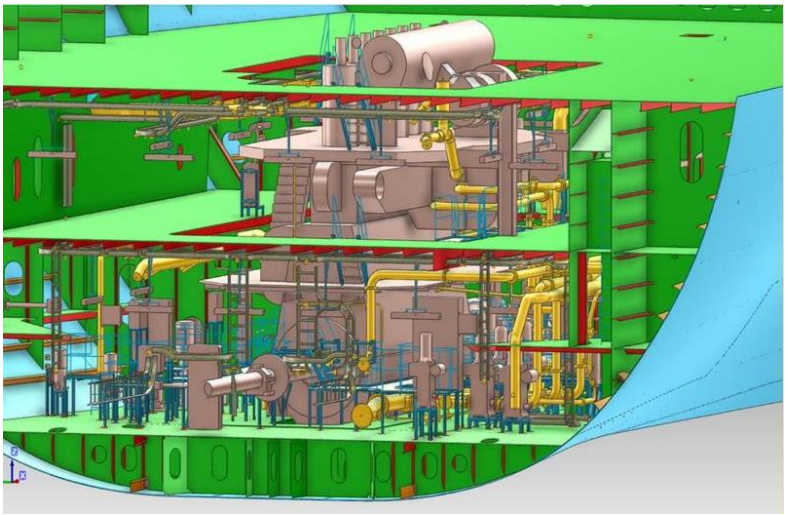
This document is intended to provide an overview of the migration process to AVEVA Everything3D™ 2.1 and will highlight project considerations ahead of the successful implementation of the product.

1.1 Introducing AVEVA Everything3D™ 2.1

AVEVA Everything3D™ 2.1 (AVEVA E3D™ 2.1) is an innovative new flagship 3D design product from AVEVA covering the needs of Plant industries. AVEVA E3D 2.1 also introduces the capability to display, interact with and draw Hull models produced in AVEVA Marine.

AVEVA E3D 2.1 provides a platform that enables lean construction principles to be adopted, increasing quality and speed of execution throughout the entire project. This is achieved through advanced usability for all design tasks which improves productivity by utilising latest technologies and best in class User Experience to enable innovative and ever more efficient project execution processes. This is demonstrated by the clean and intuitive user interface of the product that encourages graphical centric modelling and interaction.





: Hull Model in AVEVA E3D 2.1.

AVEVA E3D 2.1 is based upon a proven platform of technologies used to support a wider family of products; supporting common capabilities such as multi-user, distributed and concurrent access to the design model, and the comparison and update of information. This allows global teams to collaborate in building fully detailed models, from which construction-ready drawings and BOMs can be automatically generated

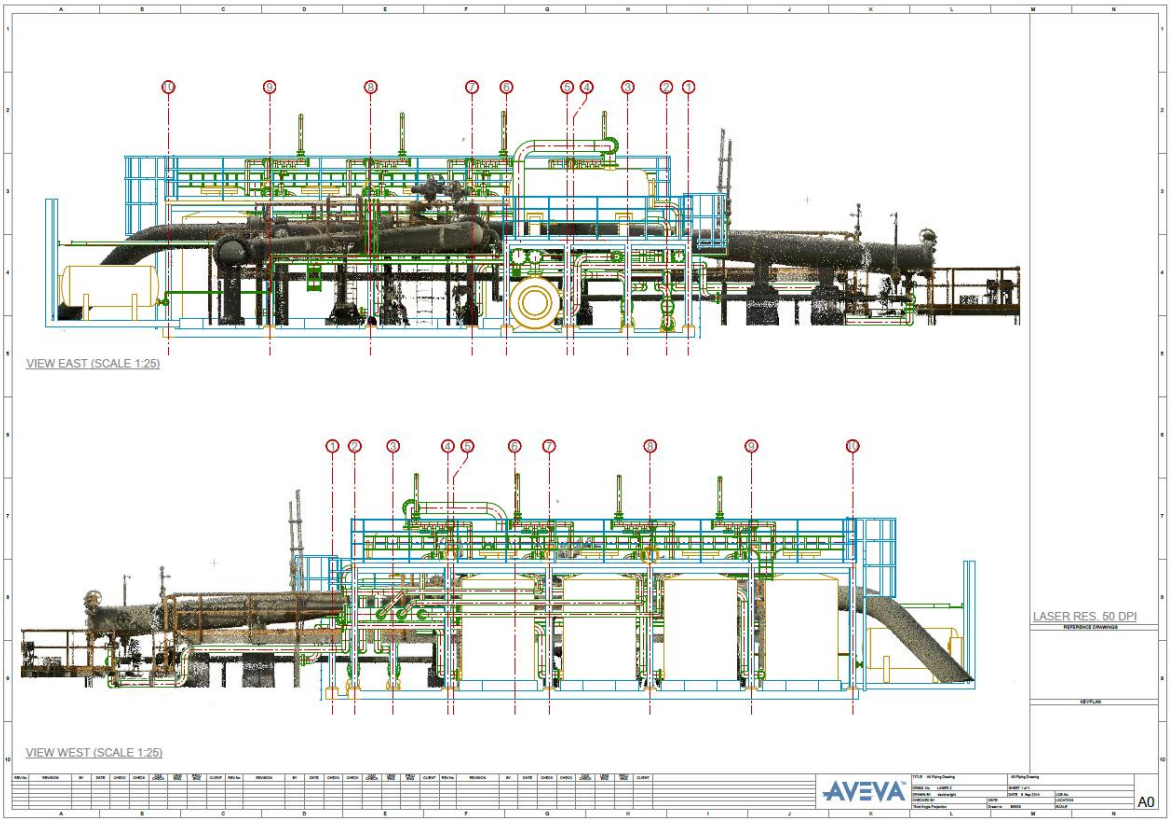
AVEVA E3D 2.1 contains the following principal modules:

- Model - An interactive 3D design environment.
- Draw - Facilitates the production of scaled, annotated drawings from the 3D Model.
- IsoDraft - Used in the production of piping isometrics.

As part of an integrated product solution, AVEVA E3D 2.1 may integrate with AVEVA Engineering and Schematics products. The Piping Integrator feature has been redesigned to bring the 3D Design - P&ID checking task to the daily workflow of a Piping designer. Further, AVEVA E3D 2,1 may be integrated with AVEVA NET, epitomised by the Design in Context feature that allows the direct interrogation of the AVEVA NET Dashboard in the Model and Draw environment.

The Model module provides enhanced access to project Design database and functions. The 3D graphics, introduced at AVEVA E3D 1.1 are based on Microsoft DirectX, delivering a faster and clear graphic. AVEVA E3D 2.1 introduces a redesigned structural application that places the model at the centre of design workflows. Another primary development at AVEVA E3D 2.1 is the provision of a redesigned Supports application that promotes an efficient and intuitive design workflow across different locations.

New innovation with laser data, utilising the immersive living Point Cloud capability of AVEVA HyperBubble™ will deliver project benefits, especially in brownfield projects. Powerful 2D drafting also allows the inclusion of Laser data, removing the need to remodel existing Digital Assets.



System administration and configuration, together with catalogue and specification capabilities, are provided by the separate AVEVA Administration™ and AVEVA Catalogue™ products respectively. AVEVA Catalogue has been updated at this latest release and introduces a new user interface that is aligned in design with AVEVA E3D 2.1.

AVEVA E3D 2.1 has been designed from the outset to be compatible with AVEVA PDMS and Hull & Outfitting 12.1.SP4 and it uses the same database and data management technology, enabling the two to be used in conjunction on operational projects.

1.2 The Migration & Interoperability Guide

The aim of the Migration & Interoperability Guide is to provide an overview of the main differences between AVEVA E3D 2.1 and AVEVA PDMS and Hull & Outfitting 12.1.SP4. It includes the project data migration process between the two products and highlight the interoperability of the two products on a project.

This guide should be useful to administrators who wish to migrate an AVEVA PDMS or Hull & Outfitting project, including those who wish to operate on projects in a mode where both products are in use. Customers who are still using earlier releases of AVEVA PDMS and Hull & Outfitting should also read the latest editions of the 12.0 & 12.1 User Bulletins, as supplied with those releases to migrate project data to 12.1.SP4 prior to AVEVA E3D 2.1.

1.2.1 Using this Guide

Certain text styles are used to indicate special situations throughout this document.

Button clicks are indicated by **bold turquoise text**.

Additional information notes and references to other documentation will be indicated in the styles below.

Additional information

Refer to other documentation

Example files or inputs will be in the `courier new` font.

1.3 AVEVA Experience

In addition to the migration of a project and the data to AVEVA E3D 2.1, it is also important to consider the users of the product and their adaption to the functionality provided in order to realise an efficient design workflow. This adoption is aided by an intuitive AVEVA E3D 2.1 user interface and workflows; designed with the user and the graphical model at the centre of the process.

In addition AVEVA Experience™ (http://www.aveva.com/experience) provides an effective and easily accessible way to gain hands-on experience of AVEVA E3D, wherever the user is located. For employers, it makes it easier to train and upskill engineers and designers.

Once registered, the user will have the opportunity to go through an extensive set of training modules on core aspects of AVEVA E3D, including training exercises and 'how-to' videos. These modules will highlight the key differences between AVEVA PDMS and AVEVA E3D. The user will also be able to work with a Cloud-hosted deployment of AVEVA E3D, including a sample set of project data.

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2 AVEVA Everything3D™ 2.1

The AVEVA Everything3D™ 2.1 (AVEVA E3D™ 2.1) release, usually supplied by download from a secure website, self-installs using standard Microsoft installation procedures. Please contact your local AVEVA office if a DVD installation is required. As found with other AVEVA products, the release is typically installed to individual PCs with a Microsoft Windows operating system, with the license server and file installed to a networked Microsoft Windows server. In addition, the project data is typically located on a separate server.

AVEVA E3D 2.1 is a full release that may be run alongside and in conjunction with AVEVA PDMS and Hull & Outfitting 12.1.SP4 (Fix Release 28 onwards).

*AVEVA E3D 2.1 may also be used in conjunction with other products in the AVEVA product portfolio – please refer to **Chapter 6 Compatibility & Interoperability**.*

AVEVA E3D 2.1 requires the use of AVEVA Catalogue and AVEVA Administration: these are distributed and installed with it, but are licensed separately and may also be used for AVEVA PDMS, Hull & Outfitting, Engineering and Schematics products.

2.1 Workstation Configuration

The following configuration is recommended in the use of AVEVA E3D 2.1. A **64 bit operating system** is required for the installation of AVEVA Everything3D™ 2.1 and for the visualisation and use of laser data in the application.

Operating System(s)	• Windows® 7 Professional or Enterprise + Service Pack 1*[1]. • Windows® 8.1*[2]. • Microsoft .NET Framework 4.0*[3]. (*Supplied with AVEVA E3D 2.1 and installed if necessary).*
Processor Type / Speed	Intel x86 or x64 compatible - CPU with high performance in each processor core.
Memory	8 GB of high speed RAM
Hard Disk Storage	A full installation requires approximately 1GB of drive space. In addition, extra capacity is usually required for local storage and data; this may be used for the database cache where the Database Cache Service is employed. The use of two SATA-300 RAID HDDs is recommended where projects are stored on the local machine. The product has also been verified with solid state HDDs.
Display	High resolution widescreen display recommended (1920 x 1200); dual screens also supported. Minimum resolution 1280 x 1024.
Graphics Card	NVIDIA Quadro, AMD FirePro™ or similar. *Please refer to **Section 2.2 Graphics Cards** for further information.*
File System	NTFS For information on conversion to NTFS, please see http://technet.microsoft.com/en-us/library/bb456984.aspx.

*[1] Please note that a Windows Platform Update (Windows 7 SP1 and Windows Server 2008 R2 SP1) is a pre-requisite for accurate 2D rendering (for example Text graphics) in the 3D canvas (http://support.microsoft.com/kb/2670838).

*[2] AVEVA does not support the installation of E3D 2.1 software and\or Projects on to disk volumes with Short\8.3 file name format disabled. Please ensure that Short\8.3 file name format is enabled on all relevant volumes before installation. Please refer to Knowledge Base item 5702 for details.

*2 AVEVA E3D 2.1 has been tested with Microsoft .NET Framework 4.0 with the following fix: http://www.microsoft.com/en-us/download/details.aspx?id=3556. This fix is mandatory for the use of the Design in Context Feature.

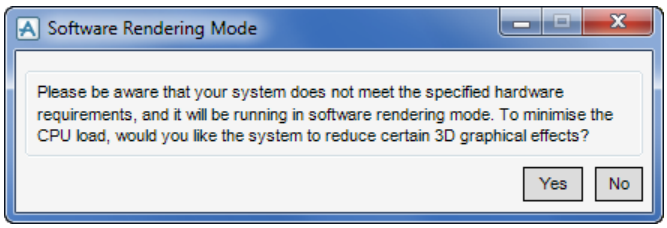
Microsoft .NET Framework 4.5 Fix 2 has been tested with AVEVA E3D 2.1. The fix release is required to ensure the correct visualisation of AVEVA E3D Draw 2.1 print dialog.

For further information regarding IT Configuration please contact the local AVEVA Support Office. Recommended / supported hardware and software configurations are constantly subject to review; please consult the AVEVA support web pages for the latest recommendations.

2.2 Graphics Cards

AVEVA E3D 2.1 requires 3D graphics hardware, capable of running DirectX 11, to ensure optimum performance for both design and drafting. DirectX 11 is included as an integral part of the Windows 7 & 8.1 operating systems.

AVEVA strongly recommends that appropriate hardware is used for AVEVA E3D 2.1. If appropriate graphics hardware is not detected on entry, AVEVA E3D 2.1 may still be used but a warning will be given and certain graphical effects, including use of laser data, limited.



Following extensive testing of current market Graphics Cards and AVEVA E3D 2.1, a recommended configuration is summarised in the table below.

	Desktop	Laptop
Graphics Card	• NVIDIA® Quadro® K2000 or K2200. • AMD FirePro™ W4100.	• NVIDIA® Quadro® K2000M or K2100M. • AMD FirePro™ 4000M.
DirectX Support	• DirectX 11 (Shader Model 5.0).	• DirectX 11 (Shader Model 5.0).

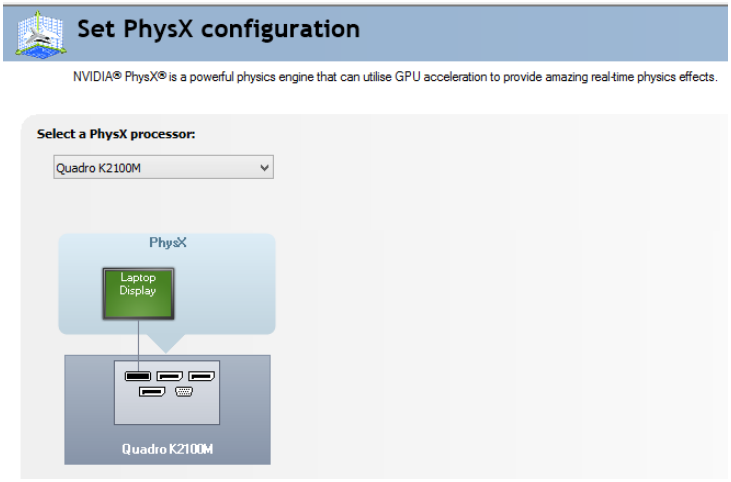
Users using only AVEVA Catalogue or AVEVA Administration could consider a lower specification graphics card such as a NVIDIA Quadro K620 (Desktop) or NVIDIA® Quadro® K1100M (Laptop).

Where laser data is utilised, the Graphics Card memory allocation is an important consideration as this is further exploited in the visualization and manipulation of laser data (incl. HyperBubble™). Note that the system will post an error message on entering the HyperBubble where the GPU memory is less than 1GB.

AVEVA strongly recommends that clients should test their chosen card or laptop in their own environment before purchase.

Availability and support of graphics cards changes frequently; a full updated list of graphics cards that have been verified with AVEVA E3D 2.1 is available via the IT Configuration area of the AVEVA Support Site (http://support.aveva.com).

To ensure the optimal performance of the graphical memory, i.e. when utilising laser data, it is recommended that the Physical Processor is altered (where employing a NVIDIA graphics card).



Using the NVIDIA Control Panel, setting a GPU allows an increase in PhysX processing and may improve overall performance.

In the example here the PhysX processor has been set to the NVIDIA Quadro K2100M graphics card.

2.2.1 Graphical Performance

To ensure optimum graphical performance, and in addition to any Graphics Card specified, the workstation used for AVEVA E3D 2.1 must conform to a reasonably high specification. To aid this specification, AVEVA E3D 2.1 has been verified with 3DMark® (www.3dmark.com). A measure of overall system performance, the score includes CPU, RAM etc.

Following verification with AVEVA E3D 2.1, a recommended 3DMark score is summarised in the table below. Please note that the rating may vary from machine to machine depending on hardware specification and software installed. The recommended scores are therefore indicative only.

	Desktop	Laptop
3DMark® Combined Score	**130,000**	**70,000**

Note: Laptop score is an average score across a number of laptop hardware specifications. Desktop score based on System information: Processor Intel(R) Xeon(R) CPU E5-1603 v3 @ 2.80GHz, Installed Memory 8.00GB, 64-bit Operating System.

2.3 Server Configuration

The following configuration is recommended in the use of AVEVA E3D 2.1 with a server configuration. A 64 bit operating system is required for the installation of AVEVA Everything3D™ 2.1.

Operating System(s)	• Windows Server 2008 R2 + Service Pack 1. • Windows Server 2012 R2. • Microsoft .NET Framework 4.0*1. (*Supplied with AVEVA E3D 2.1 and installed if necessary).*
Processor Type / Speed	Intel x86 or x64 compatible - Modern architecture multiple core processors recommended (AVEVA E3D 2.1 has been verified using a Server Machine with 4 core CPUs).
Memory	16 GB RAM. Additional RAM increases the caching capability and thereby the performance.
Hard Disk Requirements	The amount of disk space should be configured according to the customer's requirement based on the number and size of projects (incl. supporting laser data). To secure data and improve performance, the use of RAID 0+1 or 5 storage is recommended; 15k rpm drives are preferred.

File System	NTFS For information on conversion to NTFS, please see http://technet.microsoft.com/en-us/library/bb456984.aspx
Network	Gigabit Ethernet (GbE) LAN. 64-bit capable network adapter. The network should provide at least 1 Gb/sec for each workstation. Two or more network cards are recommended for increased performance and redundancy.

*[1] AVEVA E3D 2.1 has been tested with Microsoft .NET Framework 4.0 with the following fix: http://www.microsoft.com/en-us/download/details.aspx?id=3556. This fix is mandatory for the use of the Design in Context Feature.

Microsoft .NET Framework 4.5 Fix 2 has been tested with AVEVA E3D 2.1. The fix release is required to ensure the correct visualisation of AVEVA E3D Draw 2.1 print dialog.

2.4 Prerequisite for this Release (Products)

The following products are required for the use of AVEVA E3D 2.1.

2.4.1 AVEVA Licensing™ 2.0.0

AVEVA Licensing™ 2.0 or later and an appropriate License File is required for the operation of AVEVA E3D 2.1. AVEVA Licensing 2.0 provides the following improvements:

- Support for Windows 8.1 and Windows Server 2012 thereby allowing customers to move their Licensing Server to these later versions of the Microsoft operating systems.
- Improved support facilities to help customers when reporting licensing issues. This support bundle will enable the customer to gather all relevant files and information in a zip file so that AVEVA can investigate problems and provide an improved support response.
- Error messaging has been improved to aid AVEVA Support to investigate and respond to issues reported by our customers.

As a consequence of the enhancements it is required that when migrating to AVEVA Licensing 2.0 a new format license file is installed. It is an important consideration that the new license is requested and received prior to updating the license server.

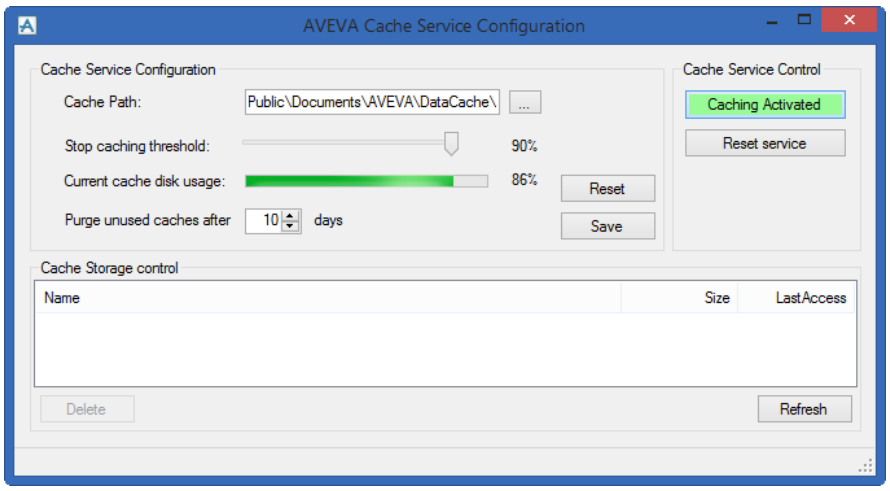
ⓘ *AVEVA Everything3D™ 2.1 does **NOT** operate with AVEVA Flexman.*

ⓘ *If upgrading from AVEVA Licensing System 1.1.1, please install Fix release 1.1.1.3 in order to correct an uninstall defect in that release. Once this has been done version 1.1.1.3 can be uninstalled and replaced with later versions.*

2.4.2 AVEVA Client Cache Service™ 1.0.5

The AVEVA Client Cache Service is designed for use on a LAN or WLAN network with full connectivity to the Database files and can make a considerable improvement to Dabacon database performance. The use of the Service is strongly recommended for all multi-user projects. The AVEVA Client Cache Service has been developed to produce an improved performance when reading data over 'high' latency networks by minimizing traffic.

The AVEVA Client Cache Service stores a copy of the read project data on the local disk which improves performance where there is repeated reading of project data across a computer network. The service operates by a data request being sent to the local Cache folder to retrieve the required Data (Database Page). If the data is not within the Cache folder, a Data Request is sent across the network to the central server to retrieve the required data. Likewise, data that is unchanged since it was previously read is retrieved from the local Cache whereas Data that has changed in the Database must be read again from the central Database file. Similarly, data that must be written to a Database file must still be written to that identified file.



The AVEVA Client Cache Service is installed with AVEVA E3D 2.1 and may be configured or disabled using the **AVEVA Cache Service Configuration** application. The prompted form, seen above, enables an Administrator to configure the caching threshold level to avoid the local hard drive being filled.

ⓘ *The Default is to stop caching on the Hard Drive on becoming 80% full. When full, data is continued to be delivered where already cached but no further data is cached until more space is made available. The Cache persists data locally between sessions – thereby, very often, the start-up will be quicker.*

ⓘ *To ensure the performance benefits of the service are realised, Microsoft Message Queuing (MSMQ) must be enabled. This is achieved using the **Windows Components** feature of **Windows Control Panel > Add or Remove Programs**.*

📖 *For full details, please refer to the **AVEVA Everything3D™ 2.1 Installation Guide**.*

2.4.3 AVEVA Catalogue 2.1.0

AVEVA Catalogue™ 2.1 is installed as part of the AVEVA E3D 2.1 install and is fully compatible.

2.4.4 Microsoft® Software

The following Microsoft products are required to support the operation of AVEVA E3D 2.1.

2.4.4.1 Microsoft Office & Fonts

Microsoft Office 2010 (and later) is required for some functions:

- Optimum operation of the AVEVA Design Platform GUI requires Arial Unicode MS font, supplied with Microsoft Office and also with Microsoft Office Visio.
- The layout and display of forms and the general user interface may also be adversely affected if the screen font size is not set to the **smallest** size.
- Microsoft Office Excel import utilities in AVEVA E3D 2.1 require ".NET Programmability Support" enabled when Office is installed. This can be found under "Advanced customization of applications" and installs the Microsoft.Office.Interop.Excel.dll.

ⓘ *AVEVA E3D 2.1 has been verified with Microsoft® Office 365.*

Microsoft Office Visio 2010 (Standard edition, 32-bit) or later is required where AVEVA Schematic Model Viewer is used in conjunction with AVEVA E3D 2.1.

2.4.4.2 Microsoft Internet Explorer

Internet Explorer 8 or later is required to support AVEVA E3D 2.1 e.g. the Model and Draw Design in Context feature.

2.4.4.3 Microsoft .NET Framework

AVEVA E3D™ 2.1 uses Visual Studio 2010 and .NET 4.0 SP1 for .NET Customisation.

Please note that serialized settings (of the user interface configuration) are now saved in the following location on Windows 7 and 8.1:

```
C:\Users\<username>\AppData\Local\Aveva\AVEVA Everything3D\2.1
```

2.5 Environment Variables

AVEVA E3D 2.1 relies on the use of environment variables for various aspects of configuration, notably the location of folders for project databases and user workspace.

When setting up a user's environment, please bear in mind that Write access is required for folders such as AVEVA_DESIGN_USER and AVEVA_DESIGN_WORK. The installer uses default locations, for both the program files and these data folders, that are different from those used for PDMS. These were chosen to work better on Windows 7 and 8.1; additional dialogs enable the user to control them better.

The defaults are:

Work files C:\Users\<username>\AppData\Local\Temp\

User files C:\Users\Public\Documents\AVEVA\USERDATA\

Environment variables are usually set up for AVEVA E3D by the program initialisation (.INIT) file when running interactively or by using a batch (.BAT) file.

ⓘ *Note that at AVEVA E3D 2.1 an optional feature is available whereby a customer may remove all the Project evars from the corresponding bat files apart from <proj>000 and ID (required to display project in Login form). On selecting the project and entering AVEVA E3D 2.1, the start-up process will look to the project and set up any required environment variables. Where an evar is already set, the start-up process will leave that untouched, thus avoiding any unnecessary changes.*

2.6 Network

AVEVA E3D 2.1 is best run on a network offering Internet access.

The system will by default be set up to access the latest online version of the documentation from the AVEVA website. It is possible instead to install the documentation locally. It may be downloaded from the AVEVA Support website, currently: AVEVA Everything3D - Documentation 2.1.

2.7 Install

Installations using setup.exe will install to `C:\Program Files (x86)\AVEVA\Everything3D2.1.0` by default. The individual .msi files will use the drive with most free space by default.

It is important that any files, including configuration files or sample data, that need to be updated by users are accessible for read, write etc. so they are not by default installed with the software. This is particularly important when installing in Program Files due to the introduction of User Account Control (UAC). In particular, this makes it important to ensure that files that need to be written are accessible by users without Administrator privileges. This applies to folders specified by environment variables such as AVEVA_DESIGN_WORK and AVEVA_DESIGN_USER. The AVEVA Everything3D™ installer has been designed to allow the separate definition of suitable folders, with different defaults.

ⓘ *It is not recommended that any combination of AVEVA products are installed in the same folder because AVEVA does not guarantee runtime compatibility between Separate Products on different release cycles, and the uninstall of one of them subsequently damaging the other.*

📖 *For further details, please refer to the **AVEVA Everything3D™ 2.1 Installation Guide**. This may be accessed from the start screen of the installation process or found within the E3D210 release folder.*

2.8 AVEVA Everything3D™ – Projects 2.1

As part of the install process for AVEVA E3D 2.1, a variety of standard model projects may be installed and thereafter used in the product. The projects are also available as a separate download available here: AVEVA Everything3D™ - Projects.

The sample projects have been extended, enhanced and renamed but wherever data matches the previous (AVEVA PDMS and Hull & Outfitting) sample model data, the same reference numbers and database numbers are used to ensure compatibility.

ⓘ *Note that all databases are in Unicode format (as found in the AVEVA 12.1 Series) so are not compatible with the AVEVA 12.0 series or earlier.*

A file, for example APS_Project_description.pdf, is included in each project folder giving brief details of the purpose and data included in that project. The Catalogue Project (ACP) provides example component data and specifications (Component Data). All data in the projects are provided as sample data only and should be verified prior to production use.

Major project differences at AVEVA E3D 2.1 include:

- The main catalogue sample project (formerly MAS) is now called ACP (AVEVA Catalogue Project).
- The main sample data projects (formerly SAM and MAR) are now called APS (AVEVA Plant Sample) and AMS (AVEVA Marine Sample).
- Sample drawings are in the new Draw format and Draw project libraries have been extended to support new Draw capabilities.
- The catalogue has been enhanced for structural, supports and bolt holes
- Additional data has been added to support the use and demonstration of Supports, Structural and Laser.

The AVEVA sample projects are regularly revised. Please check the AVEVA Support Site (AVEVA Everything3D™ Fix Release History) frequently for updates.

📖 *A detailed list of changes is included in **Appendix B Details of Sample Project Changes**.*

2.8.1 AVEVA Sample Laser Data 1.1

AVEVA Laser Sample Data 1.1 is available for use with AVEVA E3D 1.1 for the purpose of familiarisation with the extensive laser functionality available, including the new HyperBubble™ technology.

ⓘ *The data was captured during a project to survey the Eaton Training Centre in Houston utilizing the latest laser scanning technology from Dot Product, FARO, Leica, Riegl, Trimble and Z+F. The various datasets have been prepared for consumption using LFM Software technology, the only laser scan data processing solution available that is able to combine such a broad selection of data formats into a single dataset.*

AVEVA and LFM would like to thank Eaton for granting permission to utilize this data with our customers. Eaton's training facility focuses on industrial applications with over 5000 products installed on the mock-up site and is available for a variety of training applications year-round.

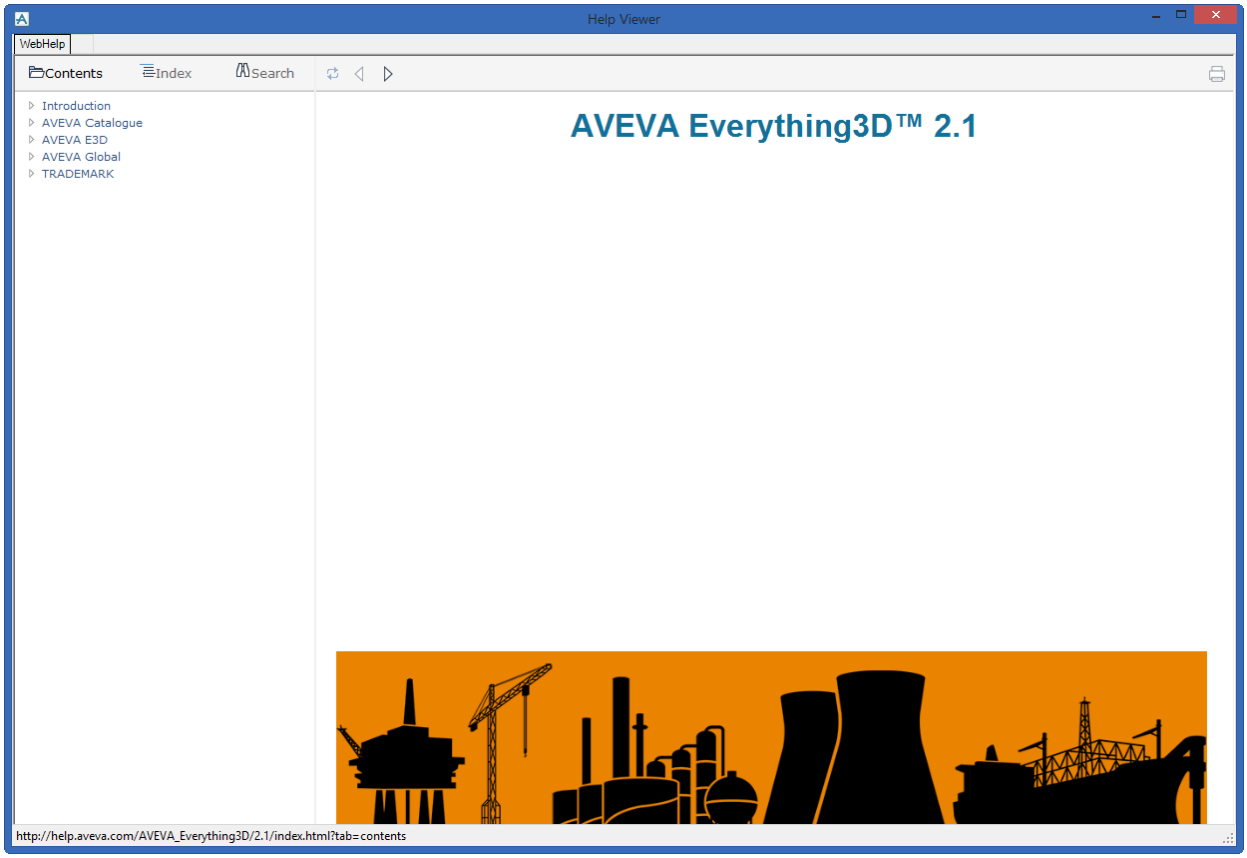
2.9 AVEVA Everything3D™ – Documentation 2.1

The AVEVA E3D 2.1 documentation includes the AVEVA Administration, Catalogue and Global product user guides.

Documentation is available online so that it may be continually updated and remain current for any new functionality introduced through the life of the product. AVEVA Documentation 2.1 may also be downloaded separately for local installation here.

The documentation may be accessed via the top of the main product window, via the Project tab or via the context sensitive F1 key.

The Documentation is presented via a Help Viewer, which comprises an Explorer style Contents list complete with Search function and a reading pane.



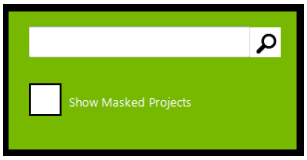
2.10 Entering AVEVA Everything3D 2.1

AVEVA Everything3D 2.1 may be accessed via the Windows Start menu or Start screen depending on the Windows Operating System being used.

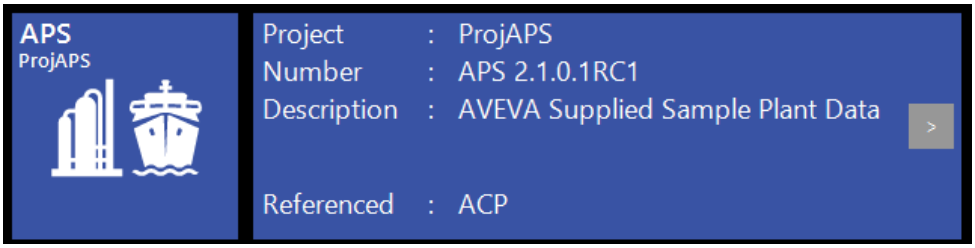
AVEVA Plant > Design > Everything3D 2.1.0 from the Windows Start Menu.

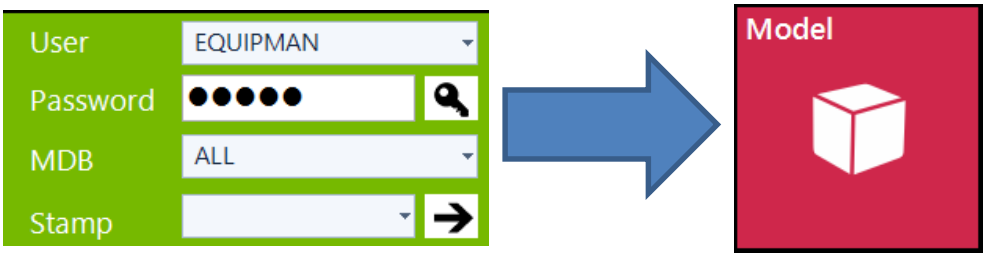
The **Login** form is displayed.

From the **Login** form a project may be accessed by selecting the identified **Project** tile prior to entering the required login information and clicking on the desired module.



The Project search Tile allows the user to search for a project and to display masked project tiles.





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3 Project Migration

This chapter gives an overview of the process of migrating from **AVEVA PDMS** and **AVEVA Hull & Outfitting** to the new AVEVA E3D 2.1 product.

The process is slightly different if the two products are used in conjunction on a project; in this case, it is important that a recent version (and Fix release) of AVEVA PDMS or Hull & Outfitting is used. AVEVA E3D databases are compatible with PDMS but a number of the enhancements in AVEVA E3D require a minor upgrade to the database schema; this means that PDMS must be at version 12.1.SP4 Fix.28 or later.

ⓘ *It is recommended that a project backup is created prior to starting any migration process.*

3.1 Migrating projects from AVEVA PDMS or Hull & Outfitting 12.0

The following guidance is for those customers who currently utilise PDMS or Hull & Outfitting 12.0 on a Project, this section can be omitted where a Project uses AVEVA PDMS or AVEVA Hull & Outfitting 12.1.

ⓘ *For those customers using AVEVA PDMS 11.6, please refer to the User Bulletin for PDMS 12.0 for full details on the migration process to AVEVA PDMS 12.0.*

Both AVEVA PDMS 12.0 and 12.1 brought significant changes to the database, which need to be applied prior to the migration to AVEVA E3D 2.1.

ⓘ *The procedure for Global projects is more complex; please refer to the PDMS and Global User Bulletins. It may be advisable to consider consolidating a project at the hub and redistributing it when the upgrade is complete.*

3.1.1 AVEVA PDMS 12.0 ➔ AVEVA PDMS 12.1

Key developments at AVEVA PDMS 12.1 include Unicode handling, revised UKEYs and Draft Line Widths.

The upgrade process is summarised by:

- Install PDMS 12.1.SP4 Fix Release 28 and use the command syntax: `DBupgrade project to latest`.

ⓘ *Is should be noted that once upgraded the Project data cannot be accessed via earlier versions of AVEVA PDMS.*

📖 *Please refer to the User Bulletin for PDMS 12.1.SP4 for full details and is further described in this guide in **Appendix A: Migration from PDMS 12.0 to 12.1**.*

ⓘ *Customers' own PML applications may need adjustment for changes in AVEVA PDMS and Hull & Outfitting 12.1. Please refer to the relevant User Bulletins for further details.*

3.1.2 AVEVA Hull & Outfitting 12.0 ➔ AVEVA Hull & Outfitting 12.1

Further to above there was an optional database upgrade (no 12010301) between AVEVA Hull & Outfitting 12.1.SP2 and 12.1.SP3. This should be considered as the upgrade item **2931 Storing of coordinate system entities under a GENPRI element** is relevant to AVEVA E3D 2.1 where there is a wish to make use of this feature.

📖 *Please refer to the **AVEVA Hull & Outfitting 12.1.SP3 User Bulletin – Chapter 2 Upgrading from Previous Release** for further information.*

3.2 Preparing an AVEVA PDMS or Hull & Outfitting 12.1.SP4 Project

There are no major database changes between PDMS 12.1 and AVEVA E3D 2.1. However, if PDMS 12.1 is to be used on the same project as AVEVA E3D, it is important that PDMS 12.1.SP4 (Fix 28 or later) is used.

📖 ***Chapter 6 Compatibility & Interoperability*** *outlines the use AVEVA E3D 2.1 alongside AVEVA PDMS or AVEVA Hull & Outfitting 12.1.SP4.*

A project that uses only AVEVA PDMS or AVEVA Hull & Outfitting 12.1 and/or AVEVA E3D has no need for legacy text formats so all databases could be migrated to the current Unicode database format. However, this is not mandatory.

ⓘ *The encoding of a database can be checked using the command Q DBTEncoding.*

It is of course necessary to ensure that the AVEVA E3D environment variables are set up to access the PDMS project; this can be achieved by adding a call to the project in `custom_evars.bat`.

In order to secure legacy data, projects may continue to reference 12.0 databases (in read mode) as foreign databases. However, customers are recommended to validate this in their domain as AVEVA is unable to replicate the wide variety of customer data configurations.

3.2.1 Marine Projects (Hull data) in AVEVA E3D 2.1

When using AVEVA E3D 2.1 in a marine context there are two alternatives for the project environment.

AVEVA E3D 2.1 can be started with either:

- A project marked as '**Plant'** with **Hull** 12.1.SP4 databases included as foreign databases.

  The Hull databases are read-only in this alternative, providing a visual Hull context for the modelling of Outfitting elements.

  In this scenario hull settings must be made available to AVEVA E3D 2.1. This is achieved via a function in the **Inithull** utility found in AVEVA Hull & Outfitting 12.1.SP4 Fix 23 onwards. The function transfers the Hull System Defaults to the Hull database.

  ⓘ *Drawing databases should not be included as foreign databases. Drawings stored in a 12.1 format will be transformed when opened in AVEVA E3D 2.1 Draw and this requires write access to the PADD database.*

- A project marked as '**Marine'**.

  This is a full marine environment, including the project setup **d065** file and a number of default files controlling settings for Hull modelling and drafting.

  A marine project environment, including these settings, is required for the marine specific AVEVA E3D 2.1 Draw functionality such as the creation and modification of Hull Symbolic Views.

ⓘ *Please note that spaces in their pathnames should be avoided for AVEVA Marine (Hull) 12.1.SP4 projects.*

3.3 Preparing an AVEVA Everything3D 1.1 project

An AVEVA E3D 1.1 project may be used with AVEVA E3D 2.1 without any project migration or restriction. It should be noted that the use of AVEVA E3D 1.1 and AVEVA E3D 2.1 on the same project is **not** a supported setup.

📖 *Please refer to Chapter 4 Model Data for further information on the migration of Model data to support the new Model functionality found in AVEVA E3D 2.1.*

3.4 AVEVA Catalogue and AVEVA Administration

AVEVA E3D 2.1 is released alongside and supported by AVEVA Catalogue 2.1 and AVEVA Administration 1.4.

In a project scenario where AVEVA E3D 2.1 is used in conjunction with AVEVA PDMS 12.1.SP4 for example, it is strongly recommended (and is mandatory for some operations) that the latest AVEVA Administration and AVEVA Catalogue products are used rather than the (PDMS) versions of those modules.

In regards to the migration process, the use of AVEVA Administration 1.4.0 on an AVEVA PDMS or Hull & Outfitting 12.1.SP4 project will automatically define the necessary Module Definition for the E3D Draw module. A user will be unable to access the Draw module until this administrative action has been completed.

The use of AVEVA Catalogue 2.1 is essential in supporting the migration process of PDMS and Outfitting model data to AVEVA E3D 2.1.

*For further information regarding the use of **AVEVA Catalogue 2.1** in supporting model data migration please refer to **Chapter 4 Model Data**.*

3.5 Customer PML & .NET Applications

Before considering the migration of any customisations to AVEVA E3D 2.1 it is important to assess the extensive functionality and redefined workflows found therein. After consideration, it may be found that previous customisations have been rendered redundant or require adapting to ensure the most efficient workflow is promoted.

The majority of customisations should operate as expected in AVEVA E3D 2.1 but may require adjustment where the customisation is called from, or accessed via, a menu bar or toolbar as these do not exist in the Model or Draw modules. Further, aspects of AVEVA E3D Draw that differ somewhat from PDMS Draft and Marine Drafting will necessitate changes to customisations.

*For more details, please see **Chapter 7 Customisations**.*

As Draw is a new module at AVEVA E3D, any changes made to the module definition for PDMS Draft may also be required for Draw.

It should be noted that Users can no longer define new modules in AVEVA Administration.

As module switching between **AVEVA Administration or Catalogue modules and AVEVA E3D modules is no longer possible,** any macro doing this will need to be re-structured. In addition, some forms may need adjustment to their layout for best presentation.

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4 Model Data

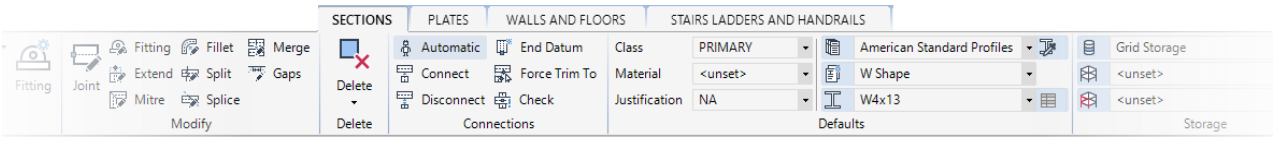
The following chapter outlines the key migration considerations where model data from an AVEVA PDMS or AVEVA Marine 12.1.SP4 project is to be used with AVEVA E3D 2.1.

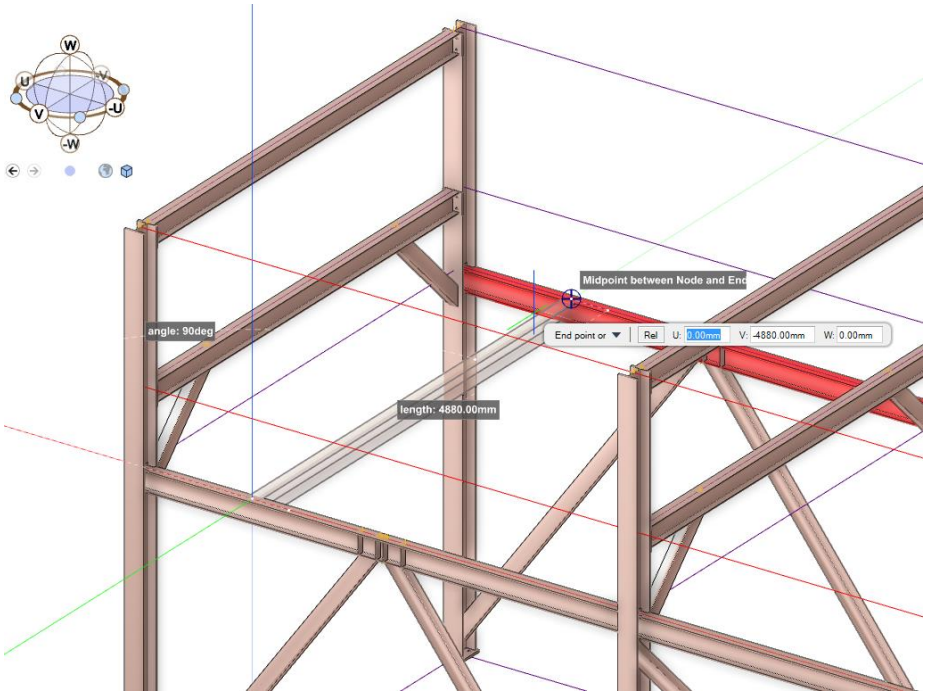
4.1 Structural

A key feature of the AVEVA E3D 2.1 product, the structural application places the model at the centre of design workflows.

Highlights of the structural application include the following:

- Less reliance on forms and menus with direct graphic input and interaction; supported by a gesture based PowerWheel™ and powerful Properties Grid.
- Automated storage of elements and a grid allied structural model reduces the reliance on the Model Explorer.
- Preservation of user input to ensure data persists and is easily retrieved.
- Automatic connection between elements at creation and a connectivity model that is dynamically maintained.
- New and more comprehensive Structural Catalogues based on the latest National Standards.





*Please refer to the **AVEVA E3D 2.1 User Bulletin** for an outline of the key structural concepts and available structural functionality in the E3D 2.1 Model module.*

4.1.1 Section Conversion

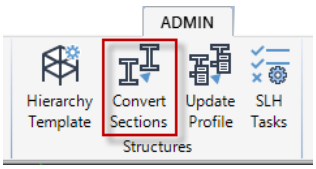
To enable the use of the AVEVA E3D 2.1 structural application functionality to modify existing model data, it is necessary to convert all Section (SCTN) elements to GENSEC elements.

It is recommended that this action is the first step taken in the conversion process for a structural model and that the process is completed in manageable hierarchy segments i.e. STRUs or FRMWs depending on the complexity of the model.

ⓘ *It is recommended that where the conversion of MDS Template data is required, the SCTN to GENSEC conversion process should be undertaken using the Support Convert Template utility and not the Structural Conversion utility. Please refer to* ***Section 4.3.3 Template Data****.*

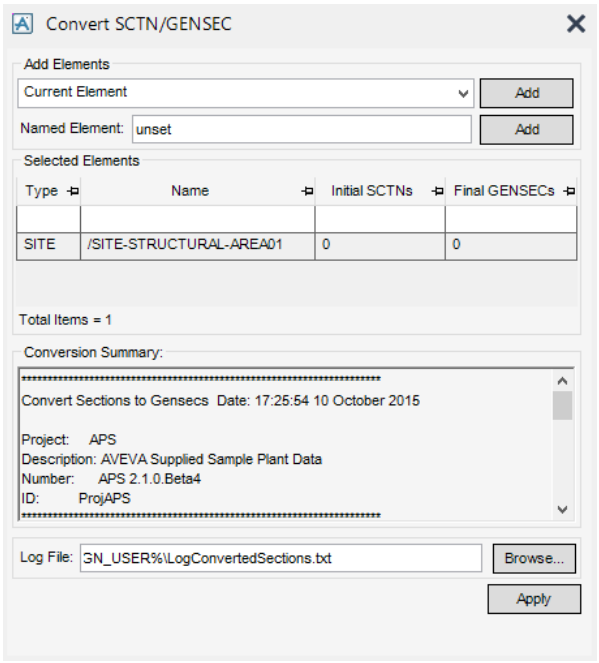
As part of the conversion process:

- Fitting (FITT) and Joint (SJOI) elements are converted to Fitting (FIXING) and Joint (FIXING) elements.
- Primary Node (PNODE) and Primary Joint (PJOI) elements are converted to End Datum (ENDATU) elements that own a Joint (FIXING) with the referenced joint.



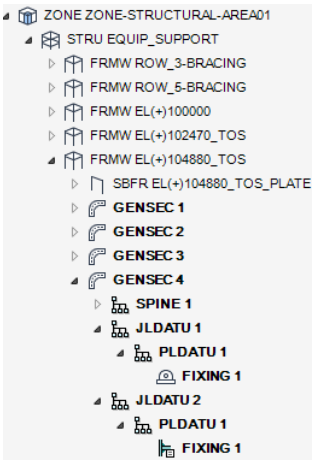
A utility, **Convert Sections**, is provided in the **Structures** group of the **ADMIN** tab in AVEVA E3D 2.1.

ⓘ *The conversion of SCTN elements to GENSEC elements is an administration task; access is only available to users with administration rights (member of the STRUADMIN team) or a free user.*



The **Convert SCTN/GENSEC** form allows the Administrator to select and convert SCTN elements to the required GENSEC elements.

When the SCTN to GENSEC conversion is complete, the GENSEC elements are updated and displayed in the Model Explorer.

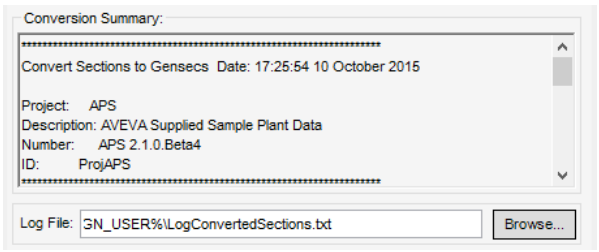


The **Model Explorer** highlights the result of the conversion process:

The utility converts SCTN elements to straight GENSECs i.e. the GENSEC's SPINE (only) owns two POINSP elements.

Any connections, i.e. SNOD/SJOI elements, are converted to the equivalent GENSEC elements of JLDATU/PLDATU/FIXING, and all connectivity remains, as are all joints and fitting Specification References.

PNOD/PJOI elements, say for baseplate joints on the bottom of columns, are converted to the new ENDATU element and the SpecRef maintained.



The utility presents a conversion summary and maintains a log file to which any errors in the conversion process are written.

4.1.2 Catalogue – Joints & Fittings

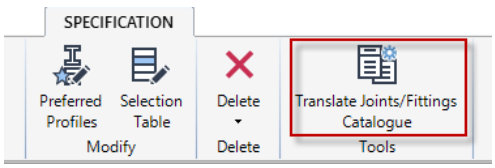
A new profile catalogue, based on the latest National standards, has been developed for AVEVA Catalogue 2.1. Translation of Joints and Fittings is required to ensure compatibility with the P-line and Profile parameter of the new profile catalogue.

Where joint and fitting catalogues are to be translated, this should be done **prior** to updating the Specification Reference of existing GENSECs to use the new catalogue profiles. This is due to the Profile Catalogue update referring to the updated Joints & Fittings in the update process.

ⓘ *Please refer to the **AVEVA E3D 2.1 User Bulletin** for an outline of the key changes to the structural catalogue at AVEVA Catalogue 2.1.*

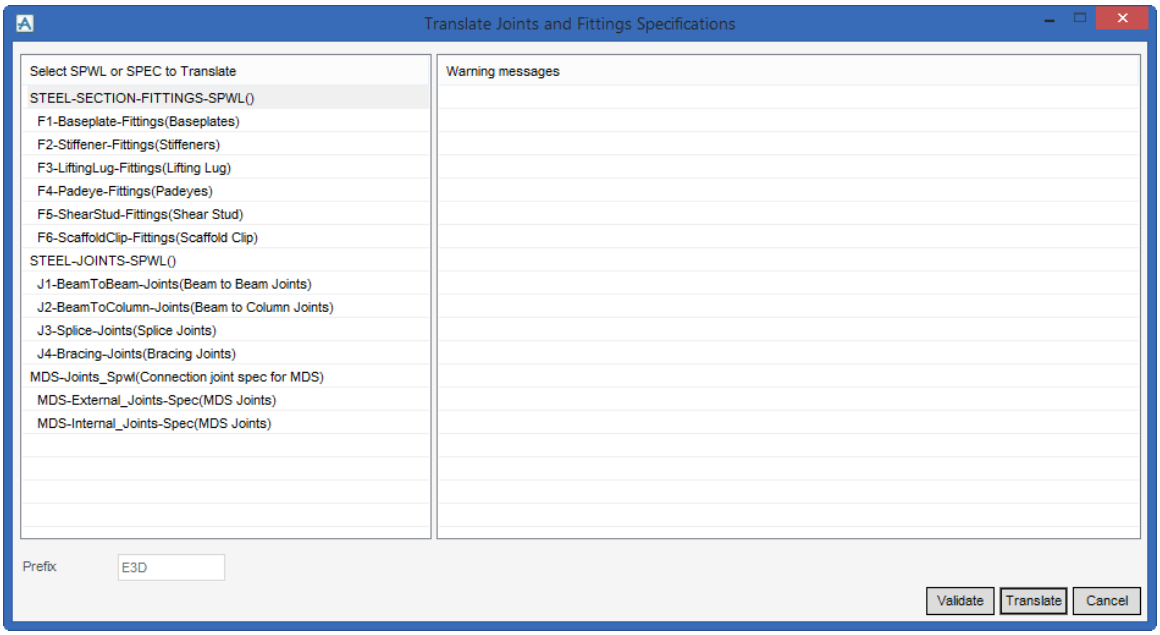
ⓘ *It is not necessary to update to the new catalogue as AVEVA E3D 2.1 will function correctly with the 'old' catalogue data, however, images on the joint and fitting selection forms will not be available.*

A utility is provided in **AVEVA Catalogue 2.1** to translate joint and fitting catalogues, and specifications that work with the previous catalogue to work with the new catalogue.



The utility, **Translate Joints/Fittings Catalogue** in the **Tools** group of the **SPECIFICATION** tab in Paragon, copies the former specifications and then interrogates the reference data to translate it to the 'new' catalogue

The **Translate Joints and Fittings Specifications** form is displayed, as shown on the following page, and allows the selection of the Specification World (SPWL) or Specification (SPEC) to be validated and translated.



It is important to consider that if the catalogue joints or fittings do not comply with the way the AVEVA sample joints and fittings in the 'old' catalogue are constructed, or the parameter order/Dkey attributes of the profiles that they relate to have been changed, then the translation process will be unsuccessful and the translation must be done manually.

ⓘ *It should also be noted that template joints and fittings cannot be translated automatically. They **must** be translated manually.*

4.1.3 Catalogue – Profiles

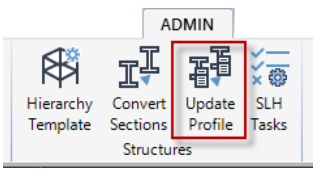
As indicated in the previous section, a new profile catalogue has been introduced alongside the AVEVA E3D 2.1 structural capability. The new profiles have common Gtype geometry and P-line sets, together with a common data set. Therefore joints and fittings, developed for and used with the previous profile catalogue (AVEVA PDMS and Hull & Outfitting 12.1.SP4 / AVEVA E3D 1.1) will not work with the new catalogue at AVEVA E3D 2.1.

In addition, Angle profiles have been re-orientated to conform to National Standards and to be aligned with the typical orientation used by other software packages.

The profile specification of GENSEC and FIXING elements must be converted for compatibility with the most recent profile specification catalogue.

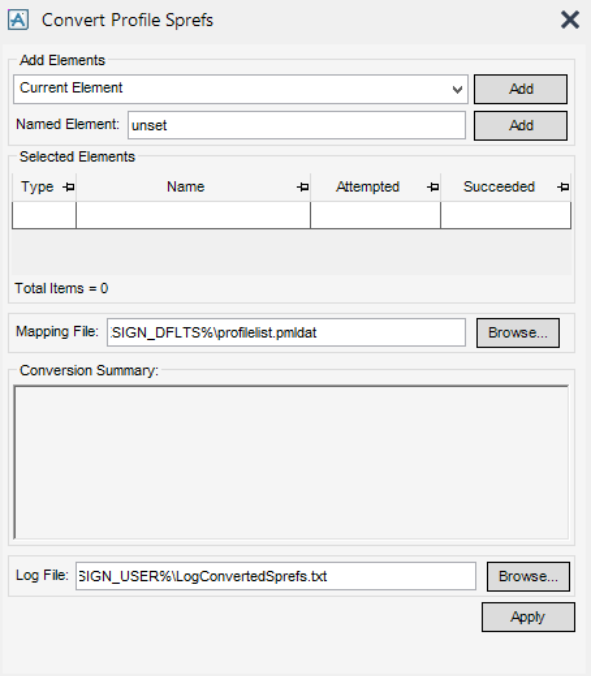
ⓘ *It is not necessary to update to the new catalogue as AVEVA E3D2.1 will function correctly with the 'old' catalogue data, however, images on the joint and fitting selection forms will not be available.*

ⓘ *SCTN, FITT and SJOI elements must be converted to GENSEC and FIXING elements prior to conversion of the profile specification. Joints and fittings applied to GENSECs where the SpecRef is from the previous catalogue will not work with the new catalogue due to the change in profile parameter order and the Dkey attributes.*



A utility, **Update Profile**, is provided in the **Structures** group of the **ADMIN** tab. The utility updates profiles from the catalogue previously used to the new catalogue.

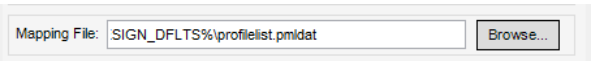
ⓘ *The profile specification conversion of GENSEC and FIXING elements is an administration task, access is only available to users with administration rights (member of the STRUADMIN team) or a free user.*



The **Convert Profile Sprefs** form allows the Administrator to convert the profile specification of GENSEC and FIXING elements.

When the conversion is complete, the Attempted and Succeeded columns are populated with the number of profile specifications that were attempted for conversion and the number that were successfully converted.

The conversion utilises a mapping file, **%AVEVA_DESIGN_DFLTS%\profilelist.pmldat**, to convert the Specification references, Gtypes, justification lines, etc.



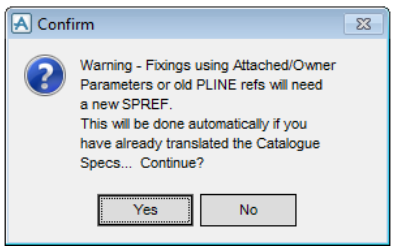
The **Browse…** button adjacent to the **Mapping File** text box allows the Administrator to navigate to a required location and select an alternative mapping file.

It should be noted that whilst the new catalogue contains many more profiles compared to the old catalogue, for some profiles in the old catalogue there are no equivalent profiles in the new catalogue. This is because the National Standards have been updated and the profiles have been deleted from the standards.

Similarly, customer profile catalogues or profiles where the Spref name has been changed will not be updated by this utility unless the mapping file is updated manually.

The example below is an extract of a mapping file that indicates the old and new profile specifications.

```
# File to define profile translation
# to new AVEVA structural catalogue
# <old spco> <new spco>
/AISC/C15x50 /US-C15x50
/AISC/C15x40 /US-C15x40
/AISC/C15x33.9 /US-C15x33.9
/AISC/C12x30 /US-C12x30
/AISC/C12x25 /US-C12x25
/AISC/C12x20.7 /US-C12x20.7
```



On clicking **Apply** to convert the profile specifications, a **Confirm** message is displayed.

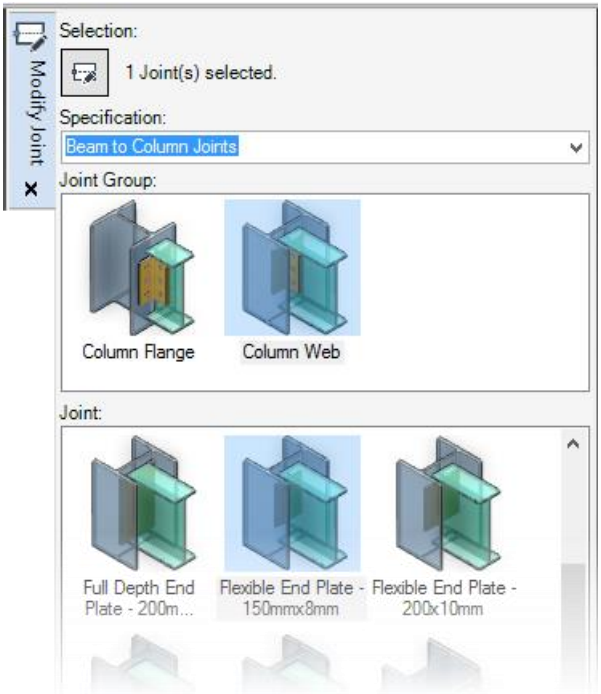
The message informs the Administrator that the catalogue specifications must be translated before the conversion of the profile specifications.

It should be noted that Angle profiles are automatically re-orientated to the new catalogue orientation during the process.

The utility presents a conversion summary and maintains a log file to which any errors in the conversion process are written.

4.1.4 Adding Joint & Fitting Images

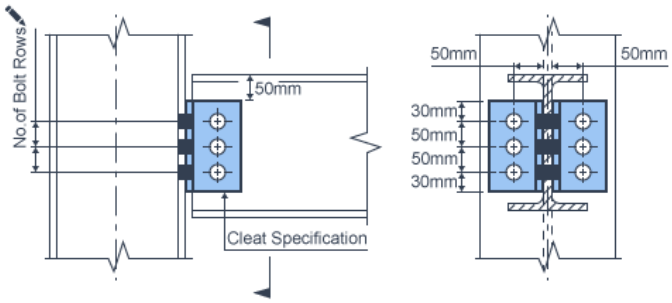
The use of the AVEVA E3D 2.1 structural application and workflows therein are greatly aided by the available images (.png) for joints and fittings.



: The **Section Fitting / Modify Joints** forms include a selection gallery displaying all available joints and fixings that may be applied within the current specification.

All icons and help files are available for the standard Joints and Fittings catalogue. These are .png files which are stored in the file:

`Aveva.Interaction.Structural.Resources.resources.`



: In addition a sketch of the joint or fitting including the defining Parameters of the joint or fitting can be opened via the Detail button on the Create Fixing / Modify Joints forms.

In regards to the migration process, an important consideration is the inclusion of user-defined, customer images of Project Joints and Fittings to complement those already found in the structural application.

The following will describe how to create icons (.png format) for a customer joint and fitting catalogue and the process to follow in the naming and storing of them.

*Please refer to **Appendix C. Forming Structural Joint & Fixing Images** for further information and a recommended workflow for the creation of quality images.*

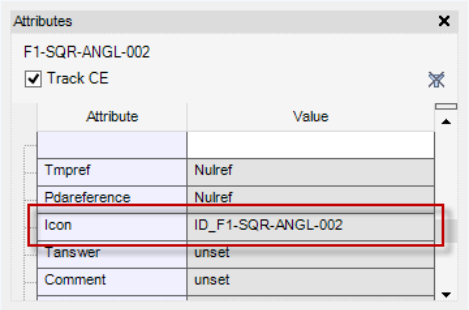
4.1.4.1 Naming

All joint and fitting specification components (SPCO elements) within the AVEVA Sample Catalogue are named following a simple naming convention. For example:

- **Joint SPCO:** J1S1-WEL-PFC-PFC-001, J1S2-SNS-PFI-PFI-001 and J2S4-FEP-PFI-CTUB-002.
- **Fitting SPCO:** F1-CIR-CTUB-4H-STIFF, F3-PLT-PFI-001 and F2-FLS-PFI-VAR.

The reciprocal image must be named as per the SPCO with the exception that any forward slash is replaced by a hyphen.

In addition, SELE elements also require an image with a similar naming convention used.



In AVEVA Catalogue Paragon, SPCO and SELE elements have an attribute Icon which is the full name of the icon file stored in the resource file.

The '**ID_**' prefix is added to all icon names.

In determining the **help sketch image**, the file name is based upon the name of the STCA element (owning the Catref of the SPCO) where a Catalogue joint/fitting or, alternatively, the Template name (Tmpref of SPCO) is used where a Template joint/fitting.

ⓘ *The image names are case sensitive so it is advised to use only upper case in icon names. Indeed, when files are added to resource files the names are all upper case.*

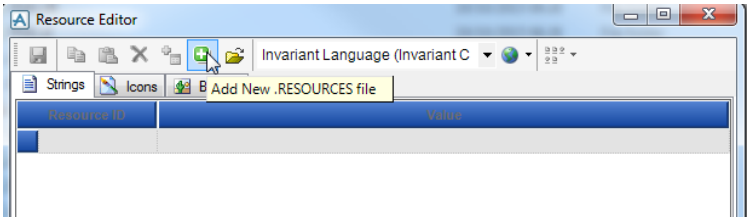
ⓘ *When adding .pngs files to a resources file with the Resource Editor the prefix is added automatically so the prefix is not required on the png file itself.*

4.1.4.2 Storage of User-defined Images

Customised images (icons or help sketch) may be added to the default resource file Aveva.Interaction.Structural.Resources.resources in the AVEVA E3D 2.1 installation folder but it is recommended to create a new Resource file to store customer images.

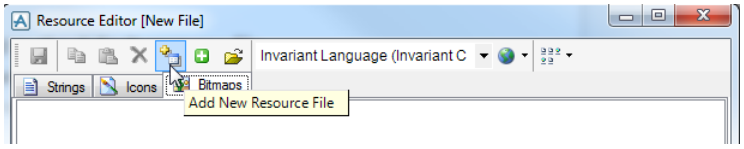
ⓘ *Please note that the Joint/Fitting forms must be prompted in AVEVA E3D 2.1 to first populate the **Resource Editor**.*

To create a new Resource file, the **Resource Editor** can be utilised from the installation folder of AVEVA E3D 2.1.



A new Resource File is added on clicking the + icon.

A new image is added to the resource file by clicking the **Add New Resource File** from the **Bitmaps** tab and then selecting the required .png file to be added.



ⓘ *A png file can also be added to the Resource Editor window by a Drag and Drop action.*

The file is to be saved with an easily identifiable name, for example: `Company.Resources.resources`.

The next step is to open the *Aveva.Interaction.Structural.Resources.resources* file and edit the string ID_FILE_STRU_IMAGE_FILE to refer to the created resources file.

ⓘ *This reference operation must be done for each installation of the application.*

On opening the Joints or Fitting forms, the application will first look within the `Company.Resources` file and if no image is found, will proceed to look in the default AVEVA Resource file.

ⓘ *If no image is found in a resource file a default image will be displayed (blank image).*

4.1.5 Stairs, Ladders & Handrails

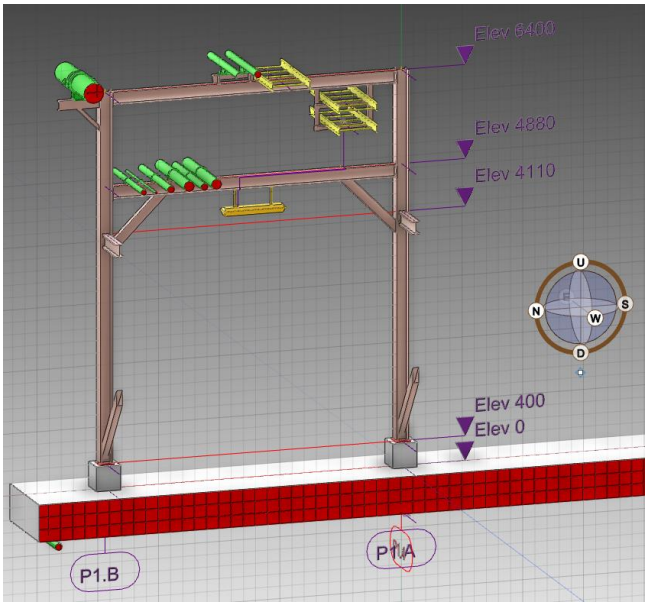
It should be noted that there is no utility provided to update SLH Defaults or Assemblies to use the new structural catalogue due to the complex cross referencing of elements.

Therefore, it is recommended that if it is desired to use the new profile catalogue with SLH, new Defaults and Assemblies should be created. It is possible to manually modify Defaults and Assemblies but this should be approached with caution and contact with AVEVA Support made to go through the process.

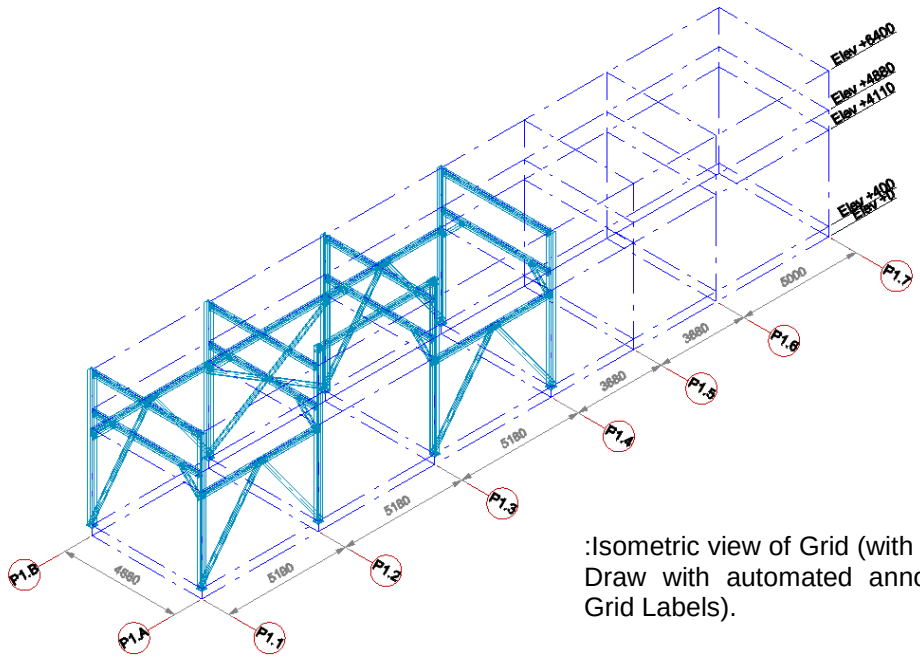
ⓘ *Specifications associated with the old AVEVA Catalogue have been disabled. If the old AVEVA Catalogue is to be used for new SLH elements, the relevant Specification will be required to be reactivated by setting the PURP attribute for the SPEC to STL. This will display the identified Profiles in the appropriate SLH forms.*

4.2 Grids

A principal aid to the AVEVA E3D 2.1 Model Designer is the provision of new Grid elements called Reference Grids. Reference Grids are formed in the Model Database, may be used across an entire project and added, with automated annotation, to project drawings in AVEVA E3D 2.1 Draw.



: Clipped Model Graphic along a Grid Plane with Model annotation (Elevations and Grid Labels).



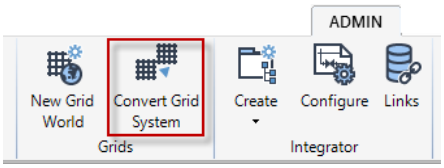
:Isometric view of Grid (with associated Structure) in Draw with automated annotation (Elevations and Grid Labels).

*Please refer to the **AVEVA E3D 2.1 User Bulletin** for an outline of available Grid functionality and how they may be utlilised and incorporated into both Draw and Model alike.*

4.2.1 Ship & Plant Grid Conversion

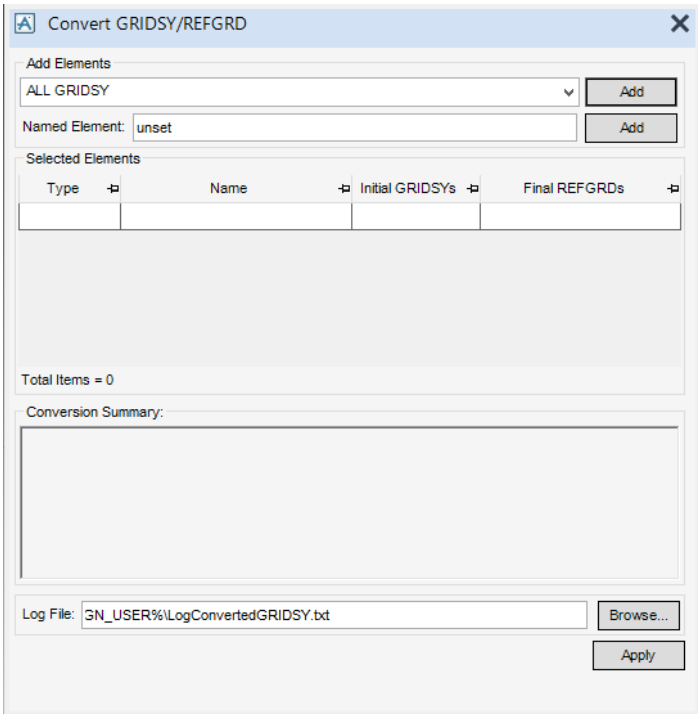
To facilitate use across a project, Plant and Ship Grids are stored in a Design (DESI) database. In AVEVA PDMS and Hull & Outfitting 12.1.SP4 and AVEVA E3D 1.1 the Grid is stored beneath a Grid System (**GRDSYS**) element, while in AVEVA E3D 2.1 the Grid is stored below a Reference Grid (**REFGRD**).

A conversion tool is available in AVEVA E3D 2.1 Model to convert Grids from GRDSYS to REFGRD elements.



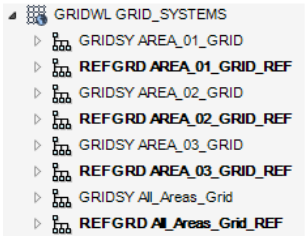
The conversion is considered an administrative task and is available via the **Convert Grid System** button in the **Grids** group of the **ADMIN** tab.

ⓘ *The Convert Grid System process is an administrative task; access is only available to users with administration rights or as a free user.*



The **Convert GRIDSY/REFGRD** form allows the Administrator to select GRIDSY elements for conversion by defining all elements, selected elements or named elements within the project.

The utility presents a conversion summary and maintains a log file to which any errors in the conversion process are written.



When the GRIDSY to REFGRD conversion is complete, the REFGRD elements are displayed in the Model Explorer.

All Grid Axis (**GRIDAX**) and Grid Line (**GRIDLN**) elements are converted to Grid Face (**GRIDFA**), Grid Elevation (**GRIDEL**) and Grid Plane (**GRIDPL**) elements.

ⓘ *The original GRIDSY elements are not deleted as part of the conversion and can be deleted manually.*

ⓘ *For Hull users, please note that Hull Grid Elements (**GENTAB**) are not visible in the Model Hierarchy; having been converted to GRIDSYS elements in AVEVA Hull & Outfitting 12.1.SP4.*

The following naming rules apply to the conversion of GRIDSY elements:

- If the original GRIDSY element is named, the suffix '_REF' is added to the name of the new REFGRD element.
- If the GRIDSY element is not named and the Purpose property is SHIP, the new REFGRD element is named 'SHIP_GRID_REF'.
- If the GRIDSY element is not named and the Purpose property is set to be other than SHIP, the REFGRD element is not named.

The following naming rules apply to the conversion of GRIDAX elements:

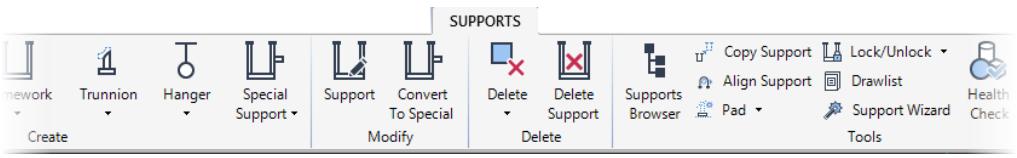
- If the GRIDAX element is named, the suffix '_FA' or '_EL' is added to name of the new GRIDFA and GRIDEL elements respectively.
- If the GRIDAX element is not named and the Purpose property of the owning GRIDSY element is SHIP, the new GRIDFA and GRIDEL elements are named 'SHIP_X_FA', 'SHIP_Y_FA' and 'SHIP_Z_EL' respectively.
- If the GRIDAX element is not named and the Purpose property of the owning GRIDSY element is set to be other than SHIP, the new GRIDFA and GRIDEL elements are not named.

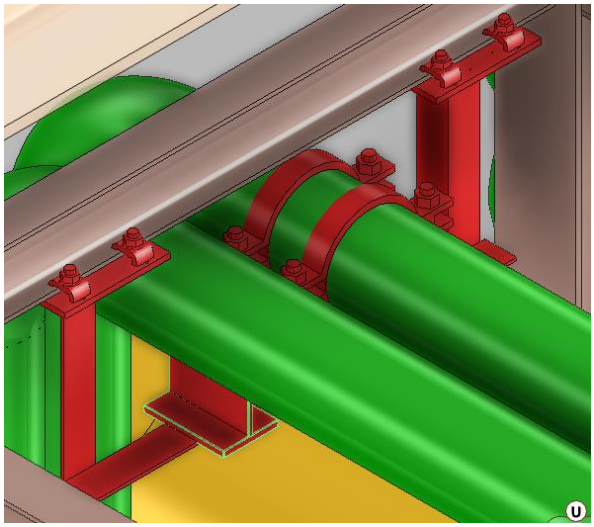
ⓘ *Auto naming rules can be applied to Grid Planes.*

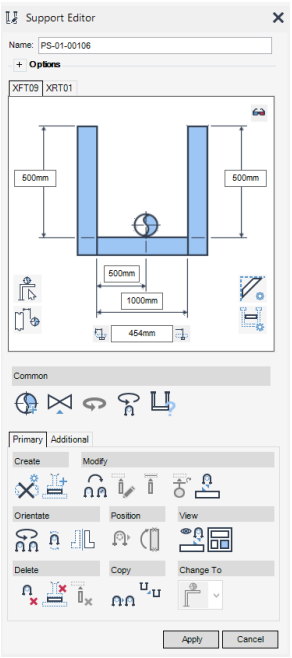
An auto naming file providing Grid Plane names for the Ship Grid, in the same format as in AVEVA Hull & Outfitting 12.1SP4, is installed with AVEVA E3D 2.1.

4.3 Supports

A key development in AVEVA E3D 2.1, the Supports application enables users to create multi-discipline supports using an efficient and intuitive workflow that does not require write access to Piping, Cable, HVAC or connecting Steelwork elements. Extending existing configuration capabilities, AVEVA E3D 2.1 allows the user to configure various support types available within the Supports application to meet project requirements.







ⓘ *Please note that AVEVA Outfitting Supports is not available in AVEVA E3D 2.1.*

In order to use the new Supports application with AVEVA PDMS or Hull & Outfitting 12.1.SP4 or AVEVA E3D 1.1 version model data, a number of conversion steps are necessary to make existing model data compatible with the new application.

Before project data can be successfully upgraded to function within the AVEVA E3D 2.1 environment the Administrator must ensure that all product updates have been performed to align it with the update

requirements for AVEVA E3D 2.1. The conversion process requires that the customer project utilises either AVEVA PDMS or Hull & Outfitting12.1.SP4 Fix.28 (earliest compatible fix with AVEVA E3D 2.1) or AVEVA E3D 1.1.

4.3.1 Database Updates

In using the Supports application at AVEVA E3D 2.1 it is important to consider that many of the default AVEVA maintained database libraries used previously have been updated for AVEVA E3D 2.1 and will need to be included or replaced within customer projects.

The databases used by the MDS application are split into two classes

- AVEVA controlled reference libraries i.e. those databases that are maintained by AVEVA and generally regarded as being non-user definable.
- User definable template and configuration databases i.e. those databases that contain client/project specific customised supports data.

- **AVEVA controlled reference library updates:**

The following library databases are required by the new Supports application and the existing user references to these items must be reset to the AVEVA ACP project versions:

- MDS/CATA DB 7320
- MASTER/MDSDICT DB 7325

- **User definable template & configuration databases**

These are user defined database items that may already exist within customer versions of AVEVA PDMS or Hull & Outfitting 12.1.SP4 or AVEVA E3D 1.1. For example:

- MDS/APPDEFAULTS
- MDS/DESITMPL-BS
- MDS/DESITMPL-BS-ORI
- MDS/DESI-SPECIAL-TMPL-BS
- MDS/DESITMPL-PSL

In such cases were existing user/corporate versions of these databases exist then such databases can either be included within the working project by either foreign reference or by a direct copy into the working project.

ⓘ *Further information regarding project setup is located in the Supports Customization guide.*

The following is an example administrative workflow to replace the MAS Project reference library data with the ACP Project library data within a working project. User defined template databases are included via foreign data reference but they could also be copied into a working project as previously stated.

It is recommended that where user maintained data is to be updated to work in the AVEVA E3D 2.1 environment, backup copies of the project or relevant databases are taken before work commences.

1. **Exclude MAS Reference Databases**.

2. **Include required ACP Reference Databases**.

3. **Include required Support Template Databases.**

   If the project to be updated for use in AVEVA E3D 2.1 already includes the MDS template databases etc. listed below then it is unlikely that further steps are required in the administration before moving on to the next update step. The following steps are therefore included for reference:

   For new projects Support template databases are (normally) copied to a user project to enable editing. The sample versions of these databases are supplied in the APS project. In the case below we consider the situation where customer versions of these databases already exist in PDMS or E3D1.1 and need to be included within the working project that is being converted for use in E3D2.1. In the example below we assume that customer template database data is stored within a corporate reference project named COR and the required data will be included in the working project by a foreign reference.

   Databases required by the Supports Application:

   MDS/WELDS
   MDS/DRAFT
   MDU/CATA
   MDS/APPDEFAULTS

   Framework Template Data – one or more databases are required from the following list:

   MDS/DESITMPL-AISC
   MDS/DESITMPL-BS
   MDS/DESITMPL-DIN
   MDS/DESITMPL-OGLAEND

   Note: Additionally, if defined, the following databases can also be included but only if the non-ori version is also included
   MDS/DESITMPL-AISC-ORI
   MDS/DESITMPL-BS-ORI
   MDS/DESITMPL-DIN-ORI

   Special Template Data – one or more databases are required from the following list:

   MDS/DESI-SPECIAL-AISC
   MDS/DESI-SPECIAL -BS
   MDS/DESI-SPECIAL -DIN

   Hanger Template Data – One or more databases are required from the following list:

   MDS/DESITMPL-GRI
   MDS/DESITMPL-PIHASA
   MDS/DESITMPL-PSL

4. **Add the New Steelwork Reference Databases.**

   MASTER/STL_PROFILE_CATA
   MASTER/STL_PROFILE_SPECS
   MASTER/STL_JOINTS_FITTS
   MASTER/STL_JOINTS_FITTS_TMPL

5. **Update all MDBs to re-add the included / new databases.**

ⓘ *Where user modified databases are being included within the AVEVA E3D 2.1 environment, additional update steps may be required for use in the supports application. These are detailed in subsequent sections*

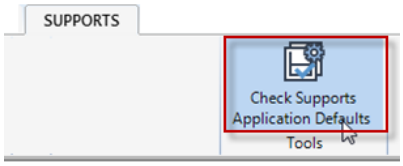
4.3.2 Supports Application Defaults

The new Supports application uses an application defaults database (MDS/APPDEFAULTS) to store user customisable design data in the same way that the previous MDS application did within AVEVA PDMS 12.1 SP4 and AVEVA E3D 1.1.

Several updates have been made to the structure of the MDS/APPDEFAULTS database at E3D2.1 which means that user maintained versions of this database will need to be upgraded to the new version before use.

The provided upgrade tool allows the user to easily update existing standards or add application defaults for any new standards that have become available. The tool is relevant where upgrading from a previous version of a project or continuing work on a project that uses a previous version of the MDS/APPDEFAULTS database.

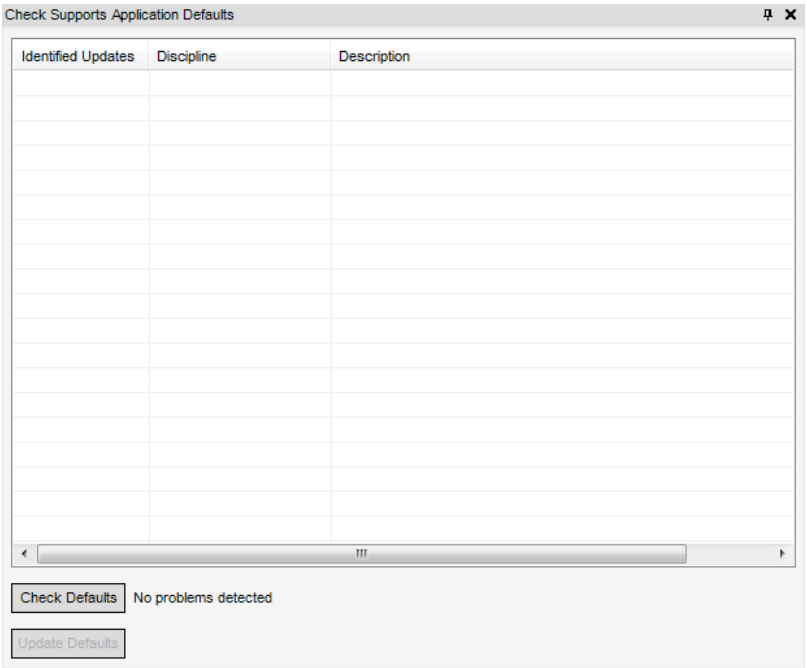
The utility to check and update the Supports Application Defaults is provided in the **AVEVA Catalogue 2.1 Paragon** module.

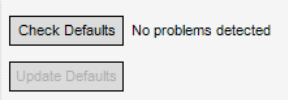


The tool is accessed by clicking the **Check Supports Application Defaults** button in the **Tools** group of the **Supports** tab.

The user must have suitable permissions to modify the catalogue to successfully update the Supports Application Defaults.

The **Check Supports Application Defaults** form is prompted.



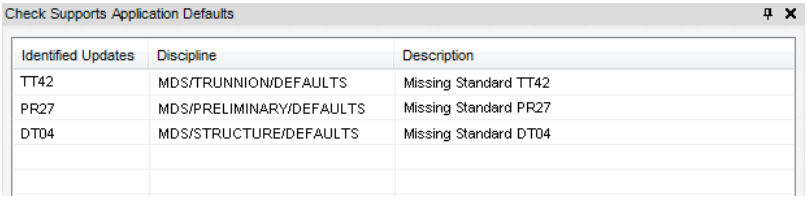


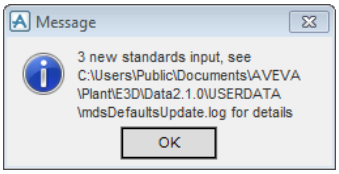
The **Check Defaults** button allows the user to check the Supports application defaults database against the standard set of defaults contained in the MDS project.

The defaults database is checked to determine if any default standards are missing or if any updates to existing standards need to be applied.

ⓘ *The Check and subsequent update may take a prolonged period of time to complete.*

All detected updates to existing standards or missing default standards are identified in the **Check Supports Application Defaults** form.





The **Update Defaults** button is clicked to add or update an application default within the project defaults database. Once completed, a **Message** window is displayed to inform the user that the required number of defaults have been successfully created or updated.

A log file containing detailed information about the modifications to the database is created during the defaults update. The log file is created in the current `%AVEVA_DESIGN_USER%` directory and is named `mdsDefaultsUpdate.log`.

4.3.3 Template Data

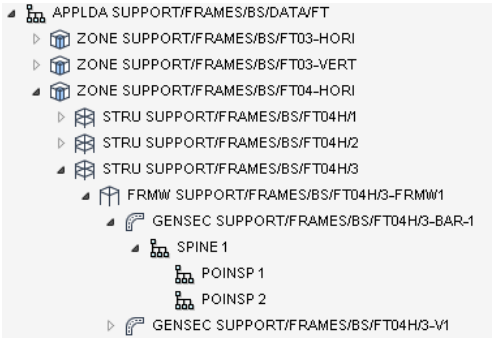
MDS/TEMPLATES based template data from AVEVA PDMS 12.1.SP4 and AVEVA E3D 1.1 is no longer compatible for use with the Supports application at AVEVA E3D 2.1. A conversion tool is provided to transfer existing template data into a recognised format.

Three main changes have been implemented to the format of template data for use with the Supports application.

- Template data is now stored in an application data world hierarchy rather than a site based hierarchy.
- All SCTN members and sub-members have been converted into GENSEC based hierarchies.
- All PNOD / PJOI constructs are converted to ENDATU / FIXING constructs that are owned by GENSECs.

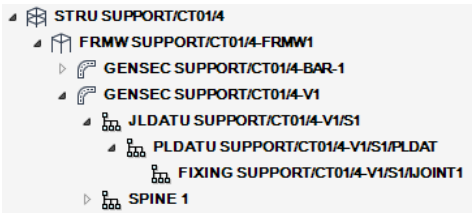
: The application data world hierarchy separates the template data from the 3D model in the sense that it no longer belongs to a Site.

ⓘ *By default, application data world elements are not visible to the user in the Model Explorer as they are considered to be administrative elements.*



: Template data is categorised by type.

Template data is contained within a STRU / FRMW hierarchy. All SCTN elements and associated sub-members are converted to the GENSEC format.



: Existing template joints, for example, SNOD/SJOI, FITT and CMFI are all converted to the single format of:

GENSEC
> JLDATU
> PLDATU
> FIXING

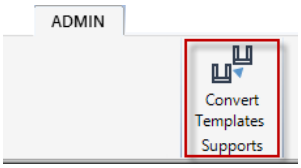
Joint conversion attempts to re-establish connectivity with the original template members, including the appropriate joint references on the new GENSEC members and all rules currently associated with the support.

All SUBS and TMPL elements are copied directly into the new hierarchy.

4.3.3.1 Convert Existing MDS/TEMPLATES Sites

To aid the conversion of Template Data, a conversion tool is available in AVEVA E3D 2.1 Model to convert multiple instances of MDS/TEMPLATES in one MDB into multiple Application Data Worlds.

ⓘ *The conversion process is undertaken at site level where either one or many sites can be converted per session. Template conversion can be staggered across sessions.*



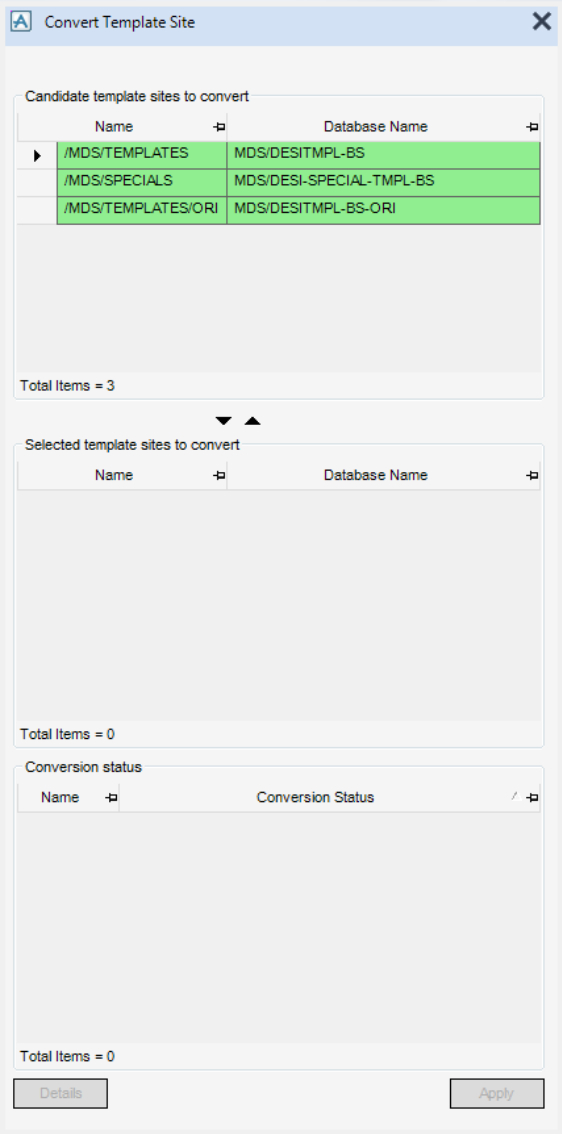
A conversion tool, **Convert Templates**, is provided in the **Supports** group of the **ADMIN** tab.

ⓘ *The Template conversion task is an administration task; access is only available to users with administration rights or as a free user.*

ⓘ *UDA updates may be required before template conversion can proceed – please refer to **Section 4.3.3.3 Missing UDA Definitions**.*

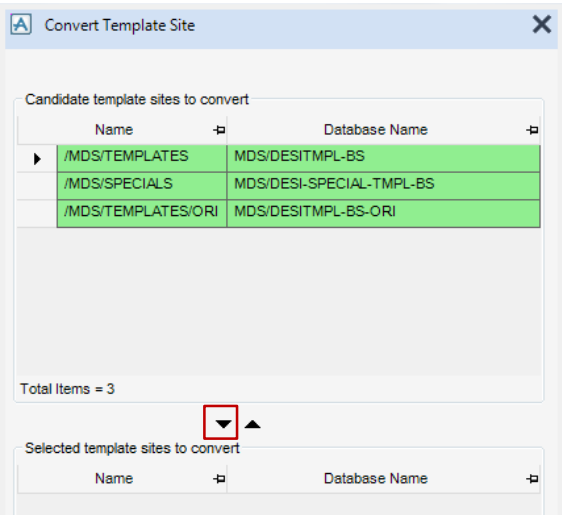
It is recommended that where the conversion of MDS Template data is required, SCTN to GENSEC conversion should be undertaken using the Support Convert Template utility and not the Structural Conversion utility. This is required to support the new hierarchy described.

📖 *The User may wish to convert the structural profile specifications for support template steelwork. In this case the user should use the "Update Profile" tool detailed in **Sections 4.1.2** & **4.1.3**. Please note that cases in which profile size substitutions have been made (in the case of deprecated steelwork sizes) it may be necessary to manually reposition the template steelwork to account for any size differences.*



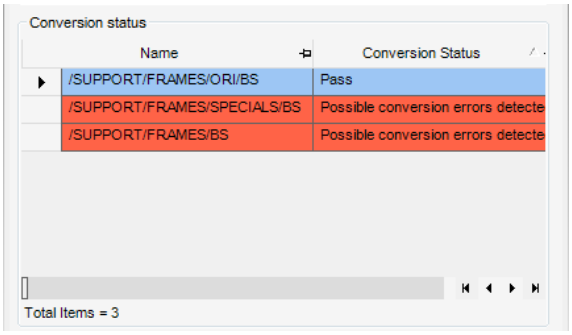
On clicking the **Convert Templates** button the **Convert Template Site** form is displayed.

The potential Template Sites to be converted are listed alongside the respective Database Names(s).

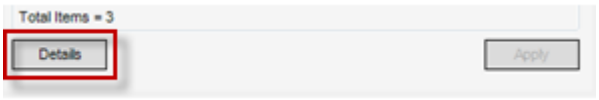


Candidate templates may be promoted and demoted for conversion by the use of the **up** and **down** arrow buttons below the listed Template Sites.

At the end of the conversion process a number of checks are performed against the old MDS/TEMPLATES site to identify any conversion errors that have occurred that may require review. Errors occur when rules are re-executed and cannot be evaluated or when the geometry of the support template does not match that of the previous template.

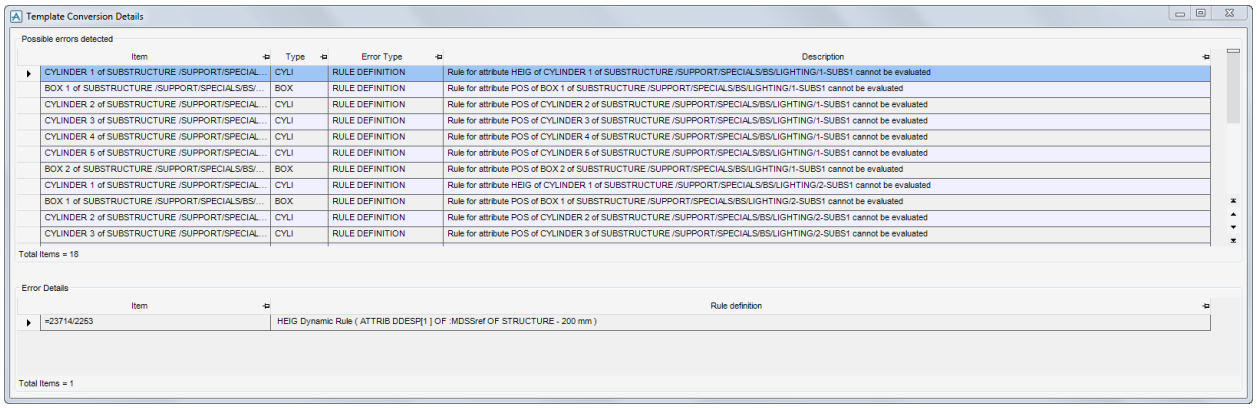


Conversion status, including possible conversion errors, is highlighted by the Conversion status area of the form.



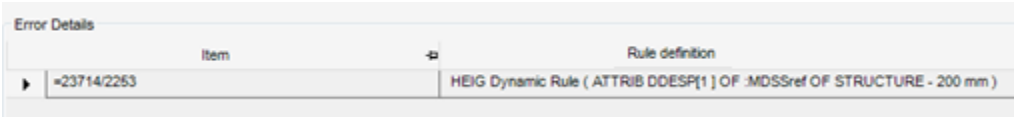
Templates with possible conversion errors can be selected and investigated via the **Details** button.

The **Template Conversion Details** form is prompted and displays possible errors detected: Rule Definition, Joint Definition or Geometry Definition errors.



Upon selection of an Error, the details of the error display in the **Error Details** section of the form and the appropriate elements from the new Application Data World are added to the 3D View Drawlist.

In the example below, a Rule that cannot be evaluated is elaborated upon by the provision of the Rule definition.



When the site conversion is complete, the new Application Data World is available for use. The naming of the APPLDW is taken from the Database name.

For example, MDS/TEMPLATES in the Database MDS/DESITMPL-BS is converted to APPLDW/SUPPORT/FRAMES/BS. If no suffix is found, the APPLDW uses a number as the suffix. For example SUPPORT/FRAMES/1.

ⓘ *The database session must be saved to ensure that the converted Application Data World is stored.*

It is recommended that the converted data is reviewed following conversion. If conversion errors are not encountered, the original /MDS/TEMPLATES site can be deleted from the database.

ⓘ *It is recommended that the user creates a database listing of each /MDS/TEMPLATES site before deletion to allow for ease of restoration.*

4.3.3.2 Template Sets

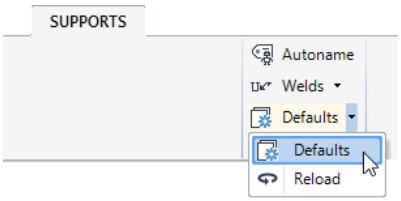
Different sets of templates, individually contained in APPLDW elements, can exist in the same MDB. For example an APPLDW may contain BS, DIN and AISC framework template sets.

Each APPLDW must have a Purpose attribute (PURP) set. By default, the correct Purpose is automatically assigned during the conversion process. Each template type is based on the Purpose of the APPLDW:

- Framework templates: Purpose = MDST.
- Special templates: Purpose = MDSS.
- Hanger templates: Purpose = MDSH.
- ORI framework templates: Purpose = MDSO.

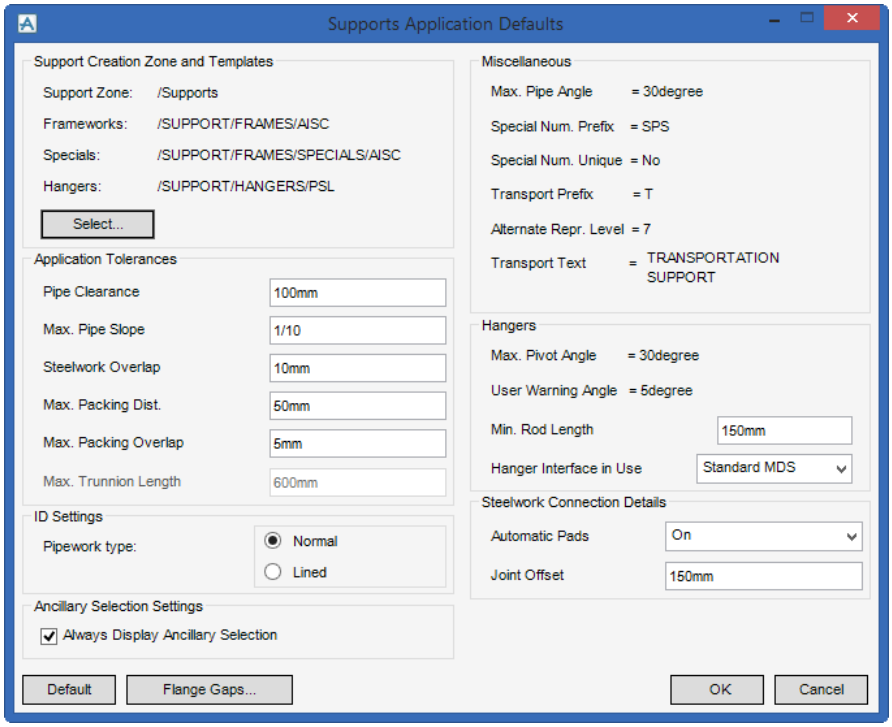
The Description (DESC) of the APPLDW is taken from the description of the converted SITE. For example:

- SUPPORT/FRAMES/BS
- SUPPORT/FRAMES/DIN
- SUPPORT/FRAMES/AISC



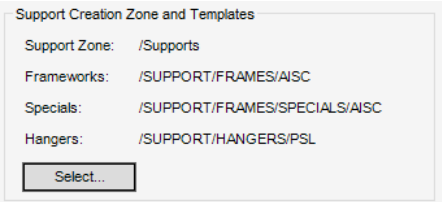
The Supports application defaults may be interrogated at any time via the **Defaults** option in the **Settings** group of the **SUPPORTS** tab.

The prompted **Supports Application Defaults** window allows an overview of, and the ability to modify, the Supports application defaults.



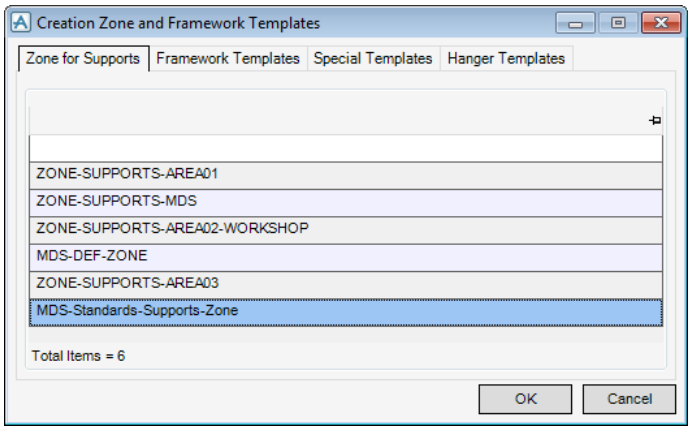
ⓘ *The **Supports Admin Data** form in **AVEVA Catalogue 2.1** (accessed via the **Application Defaults** button in the **Configuration** group of the **SUPPORTS** tab) modifies values in the file*

MDS/OPTION/DEFAULTS – the basis of the defaults set in the Supports Application Defaults form in the Model module.



The default **Support Creation Zone and Templates** to be used in the Support creation workflows are referenced in the identified area of the form and may be modified via the **Select…** button.

The prompted **Creation Zone and Framework Templates** form allows the selection of framework templates, special templates and hanger templates for the project. ORI framework templates are based on the selected framework template.



ⓘ *In regards to the setting of the **Support Zone** default, it is important to note that AVEVA PDMS Supports and AVEVA E3D 2.1 Supports cannot share the same Zone.*

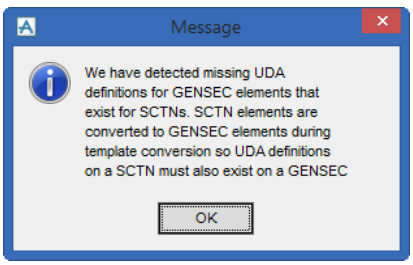
*The **purpose** of the Zone should also be set as defined within the **Support Admin Data** form in **AVEVA Catalogue 2.1**. By default the Zone Purpose is set to **SUPP**.*

Once set, the selection is stored in %AVEVA_DESIGN_DFLTS% and is retained for each user session.

4.3.3.3 Missing UDA Definitions

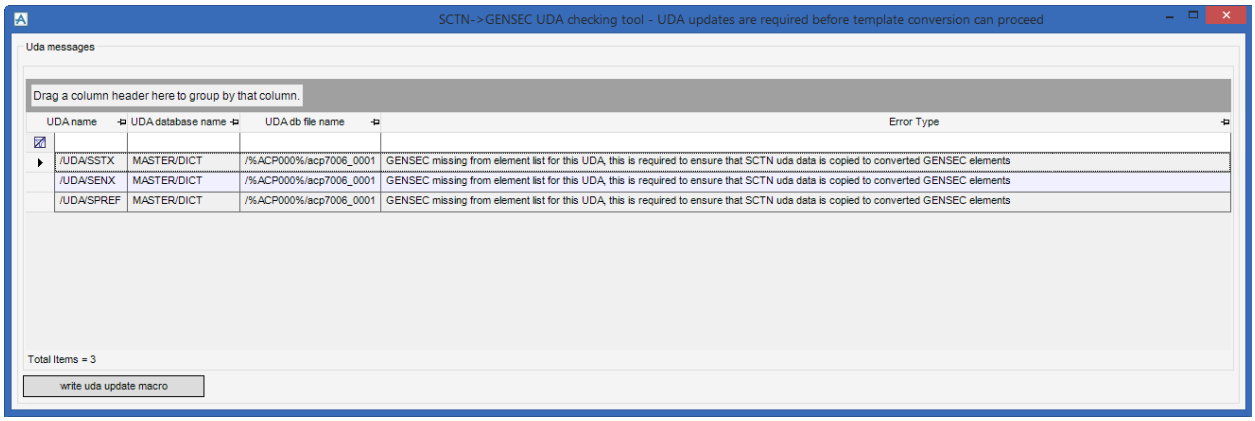
Prior to Support Template conversion, UDA updates may be required to support the conversion of SCTN to GENSEC elements.

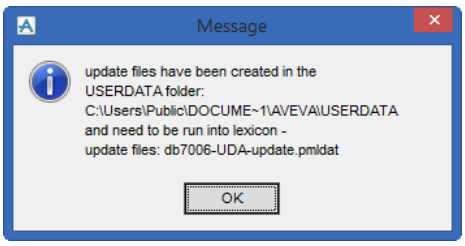
UDA updates would be required where users have appended their own attributes to SCTNs within a project. Because we are converting from SCTN to GENSEC we need to ensure that GENSEC elements can store the same UDA data that a SCTN can otherwise we risk losing user data when performing the conversion.



A **Message** is prompted on clicking the **Convert Templates** button in the **Supports** group of the **ADMIN** tab where missing GENSEC UDA definitions are detected that exist for SCTN elements.

On confirming the message dialog, the **SCTN > GENSEC UDA checking tool** is displayed with the UDA and Error Types listed.





On clicking the **write uda update macro** button a message is prompted to inform the user of the location of the update files to be run into the **Lexicon** module of **AVEVA Administration 1.4**.

4.3.3.4 User Defined Attributes

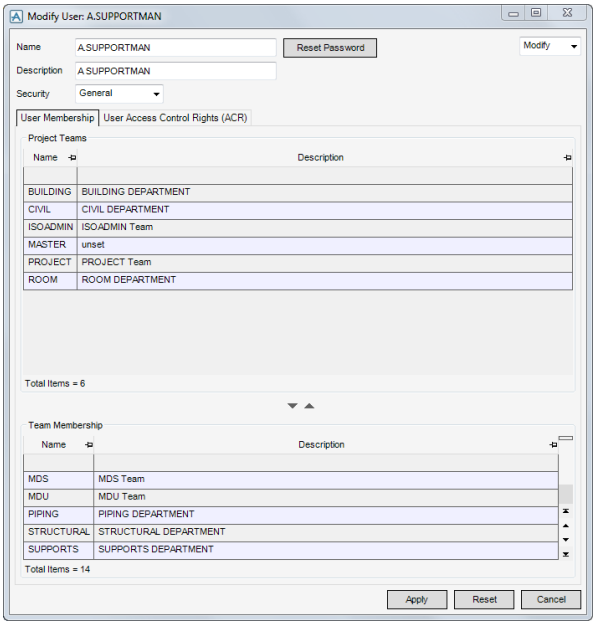
By default, User Defined Attributes (UDA) that are being used to store supports data (i.e. Supports application specific UDAs) are no longer visible. To query an application specific UDA, a direct line command must be used. For example, q :MDSSuppRef. It is possible to query which UDAs exist on an element by use of the q udaLis line command.

ⓘ *The UDA **:MDSPipeMat CS** is an exception and is visible within AVEVA E3D 2.1.*

4.3.4 Model Data Upgrade

Model data conversion utilities to upgrade existing model data (i.e. ATTA based support elements) will be provided via an AVEVA E3D 2.1 Fix Release.

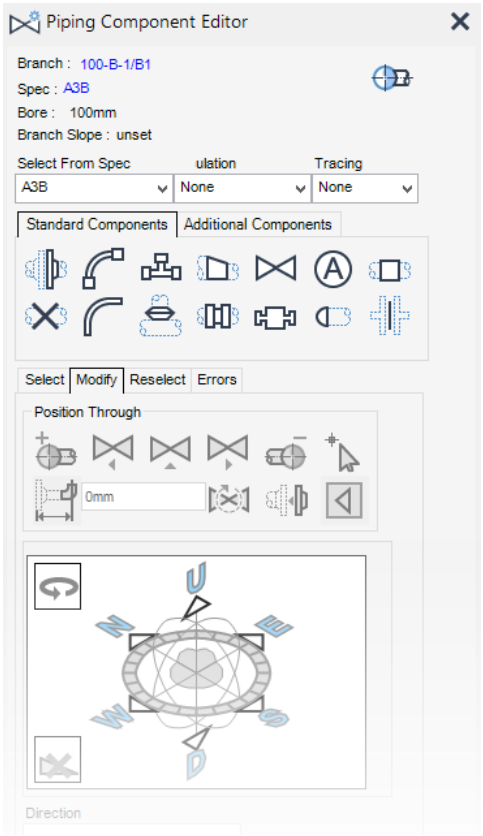
4.3.5 Support Designer Access



The hierarchy structure and creation workflows of the Supports application at AVEVA E3D 2.1 allows the potential to alter the access permission for a Support designer to remove access to Pipes, Steelwork, Tray and HVAC if appropriate. This is completed via the **Modify User** forms in **AVEVA Administration**.

4.4 Piping

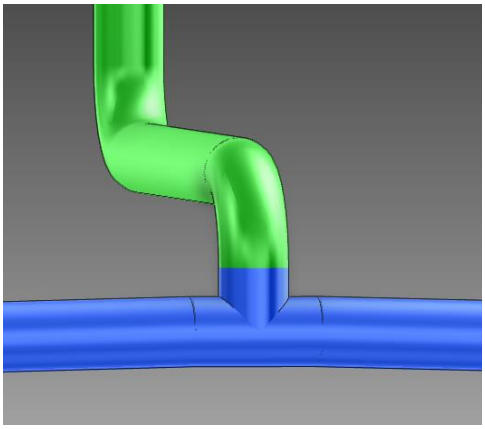
AVEVA E3D 1.1 introduced an enhanced graphical user interface and functional workflow for Pipe modelling and modification.



The **PIPING** tab includes all the tools required to create, modify and check piping elements. The creation and modification of piping elements is further supported by a series of intuitive forms, such as the Piping Component Editor, that combine a number of modelling tasks into one logical user interface.

To ensure compatibility with AVEVA PDMS and Hull & Outfitting 12.1.SP4 the piping application has been extended at AVEVA E3D 2.1 to account for functionality introduced in 12.1.SP4 e.g. Non-Standard Branch Connections.

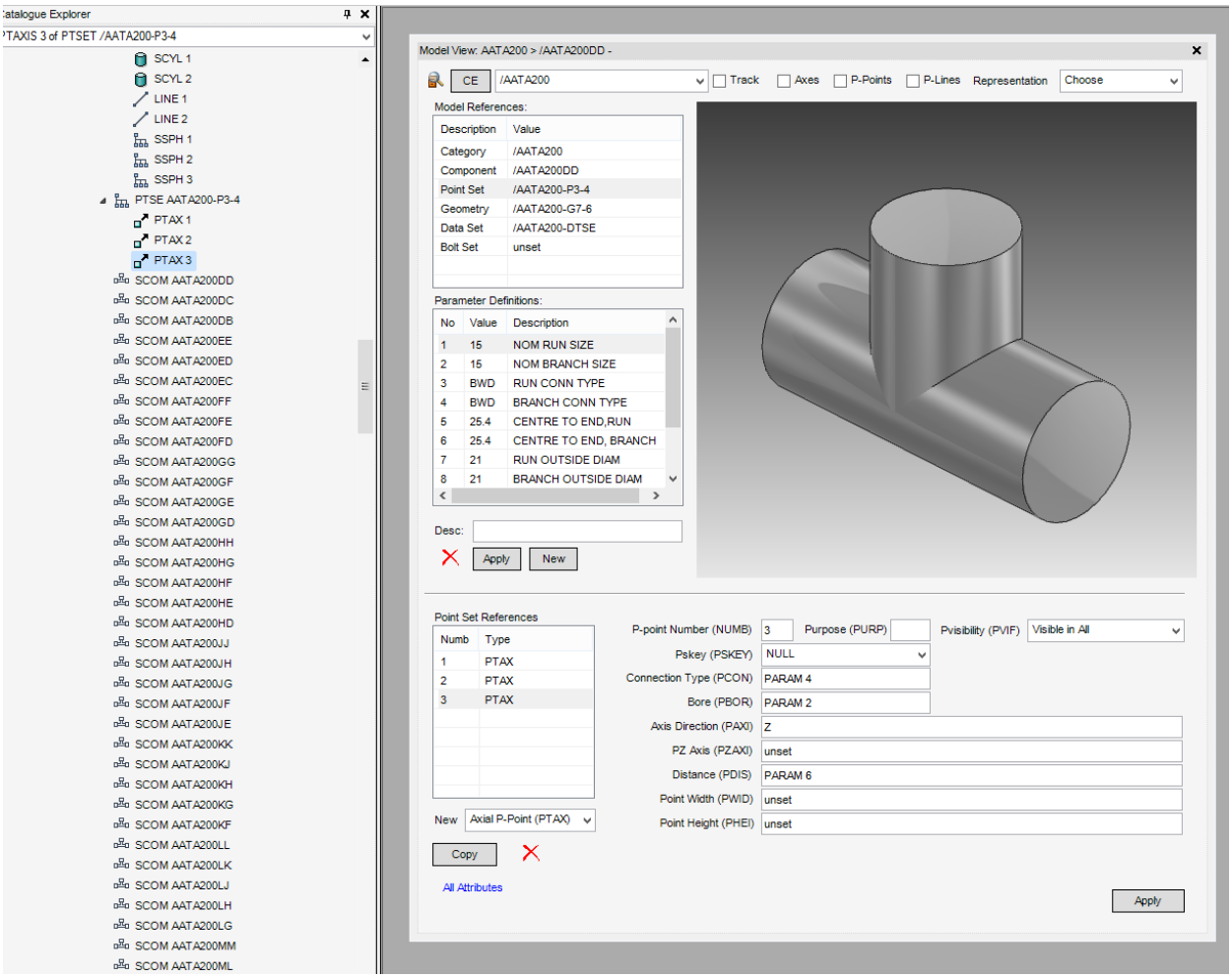
4.4.1 Sloping Pipes

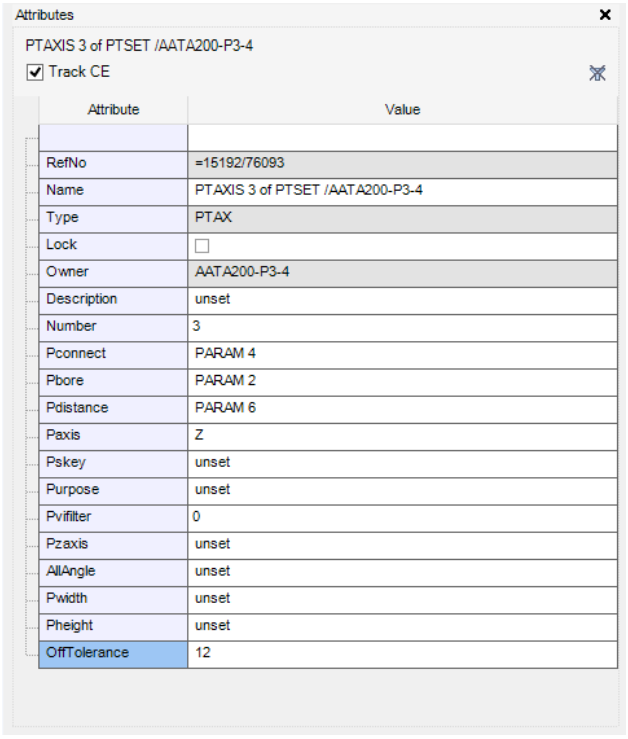


The Piping application sloping pipe capability has been extended at AVEVA E3D 2.1 to allow for multiple sloping pipes at a piping component (plus the representation thereof in IsoDraft and Draw).

In regards to the migration process to AVEVA E3D 2.1, an update is required to the Piping Catalogue(s) to utilise the multiple sloping pipe to component functionality.

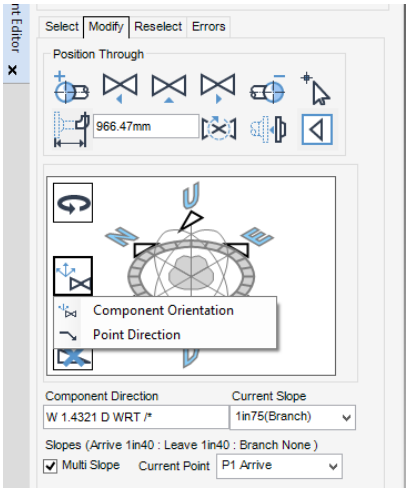
The update is completed using the **AVEVA Catalogue 2.1 Paragon** module.





The update involves setting the P-Point offset tolerance (**OFFTOL**) on all the P-Points of the element required to be sloped from/to.

In the example here the OFFTOL is set to 12 degrees to allow for a maximum possible slope of 1 in 5 (11.7 degrees).



Setting the **OFFTOL** allows the piping user to directly slope away from the identified P-Point using the Piping user interface.

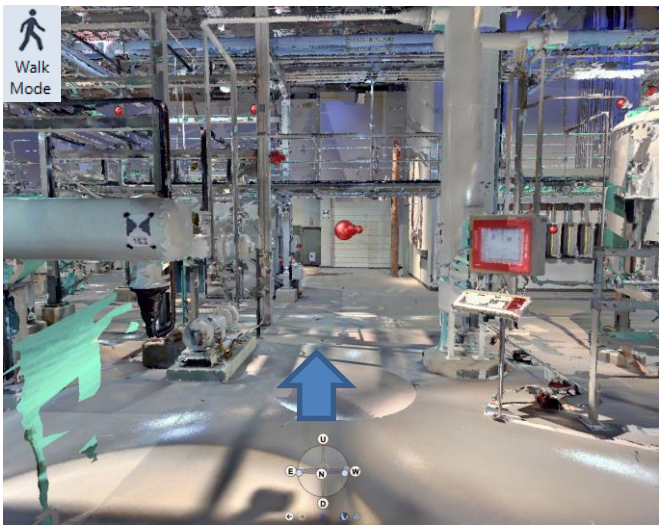
4.4.2 Piping & Supports

Although not detrimental to the use of the data in AVEVA E3D 2.1, where migrating supports data from AVEVA PDMS or Hull & Outfitting 12.1.SP4, an Administrator may consider removing the MDS updates from piping elements Reducers, Tees, and Elbows. This can be considered as the Supports application no longer requires such modifications for the creation of Trunnions.

4.5 Laser

A key facet of the AVEVA E3D 2.1 product is the use of, and interaction with, laser data in the Model and Draw environments. Key laser features improved upon and introduced in AVEVA E3D 2.1 include:

- Integrated Laser User Interface.
- Exact Clashing with intuitive object-centric reporting.
- Integrated and simplified Pipework Modelling.
- Laser data area management & Demolition.
- Incorporation of Laser Data in E3D Draw Drawings.
- HyperBubble™ technology allowing the user to walk or fly though a combined Model and BubbleView quality environment.



Please refer to the AVEVA E3D 2.1 User Bulletin and User Documentation for further information on laser capabilities in AVEVA E3D 2.1.

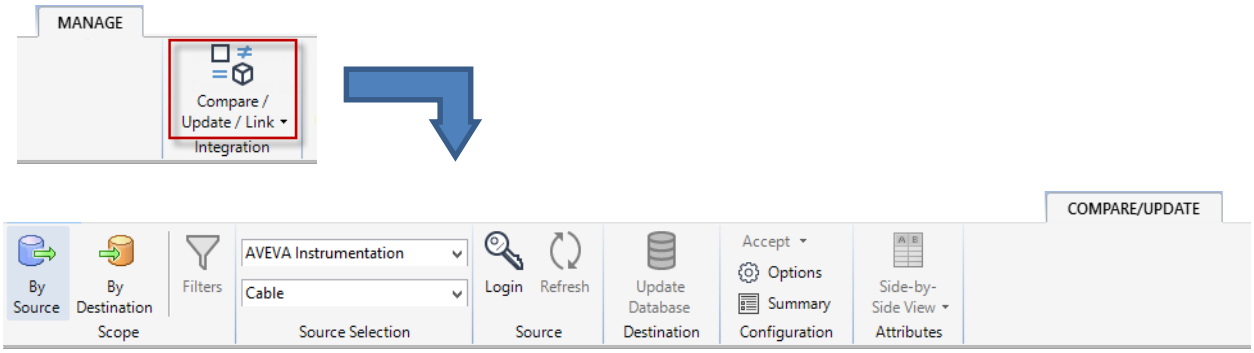
4.5.1 Preparing for the HyperBubble

There is no specific migration process for laser data within a Project but in order to access the HyperBubble functionality, the laser data must have a texture render applied using LFM Server 4.4.

Please refer to the LFM Server 4.4 user documentation for further information on the rendering process for laser data.

4.6 Compare / Update

Compare / Update has a dedicated tab (and form) accessed via the



For more information on the general functionality of Compare / Update please refer to the Compare/Update User Documentation.

*For further information on new features introduced at AVEVA E3D 2.1, please refer to the **AVEVA E3D User Bulletin**.*

Configurations from earlier versions of Compare / Update require upgrade at AVEVA E3D 2.1.

A member of team CUADMIN can trigger an automatic upgrade by opening the **Options** dialogue. If upgrades are available a prompt will be displayed to proceed. Once completed a log file will be displayed. This file is stored in the folder CUConfigs2.0 under the project defaults folder. The file will list which configurations have been upgraded or skipped, along with any warnings.

The upgrade will not overwrite any configurations already defined in the later version. It will first upgrade available configurations from AVEVA Engineering 14.1 and then from earlier versions of AVEVA PDMS or Hull & Outfitting 12.1.SP4. Note that configurations with a source AVEVA P&ID will require a service port number to be added manually.

5 Draw Data

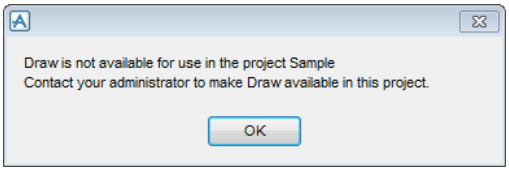
The following Chapter details the process of migrating data from AVEVA PDMS Draft 12.1 SP4 and AVEVA Marine Drafting 12.1 SP4 to AVEVA E3D 2.1 Draw.

5.1 Module Definition

Prior to the use of an AVEVA PDMS or AVEVA Hull & Outfitting 12.1.SP4 project in AVEVA E3D 2.1, the Administrator must define the Draw module.

This definition is achieved by opening the migrated Project in **AVEVA Administration 1.4** and performing a **Savework**. The Draw module is automatically defined at this point.

It should be noted that Users can no longer define new modules in AVEVA Administration.



Without the correct Draw module definition the referenced project will not be opened and a notification will be displayed to the user.

5.2 Draw Transformation

Visual elements originally created by AVEVA PDMS Draft or AVEVA Marine Drafting must be transformed before being viewed or modified by a Draw user in AVEVA E3D 2.1.

The transformation of visual elements such as Sheets, Backing Sheets, Symbol Templates and Sheet Templates is only necessary when migrating AVEVA PDMS or Hull & Outfitting 12.1.SP4 project data to AVEVA E3D 2.1 Draw. Transformation is not required for new projects created with AVEVA E3D, or for new visual elements created in AVEVA E3D Draw.

Once transformation is complete and a Save Work has been applied, it is no longer possible to view or modify the sheet using AVEVA PDMS Draft or AVEVA Marine Drafting. Similarly, new sheets created in Draw will not be accessible.

The transformation process is not reversible other than by reverting or backtracking a database session. It is recommended to copy libraries prior to transformation.

Transformation can be achieved in two ways.

- **On-the-fly**: Visual elements will be transformed automatically on being opened (the system will prompt the user to confirm first). The advantage of this mechanism is that no up-front transformation is required. Instead visual elements are transformed as and when required

  *A notable exception is the requirement to refresh Overlays – please refer to **Section 5.2.4 Refreshing Overlays**.*

- **Bulk up-front**: Visual elements can be bulk transformed up-front. This functionality is available from the Draw **Command Window** and also from the Draw **ADMIN** tab.

  It is possible to run the transformation commands in both TTY and graphics mode. When transforming an entire project, the Transformation commands can be run at World level in Draw for each MDB.

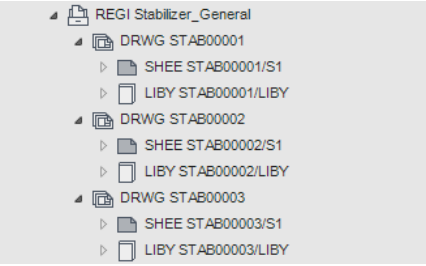
Running the commands repeatedly is safe, as they skip visual elements that have already been transformed. A full log file listing transformed elements is produced.

ⓘ *Prior to transforming drawings all relevant model data changes should be carried out first.*

The following sections will explain the transformation process in greater detail.

5.2.1 Sheets

Before a Sheet can be viewed or modified by an E3D Draw user it must be transformed.

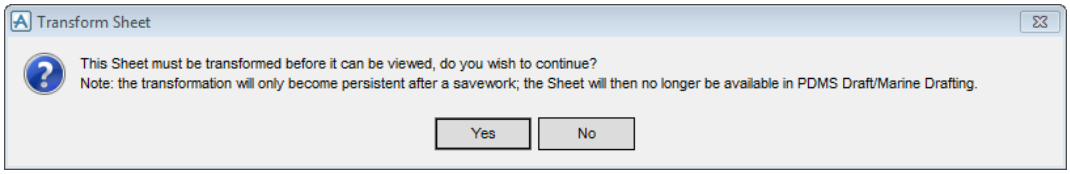


Prior to transformation, the Sheet is displayed in the **Draw Explorer** with a grey icon to indicate that it is an untransformed Sheet.

A Sheet transformation can be made on-the-fly or via a bulk transformation through the Draw Administration User Interface or by using a designated command.

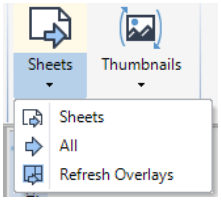
5.2.1.1 On-the-fly Transformation

On opening an untransformed Sheet in Draw, the following message is presented to the user.



On clicking **Yes** the Sheet is transformed.

5.2.1.2 Draw Administration User Interface



Sheets may be transformed via the **Sheets** button in the **Transform** group of the **ADMIN** tab in Draw. The action applies to the Current Element and the hierarchy below it.

ⓘ *The Transformation process is an administration task, access to the **ADMIN** tab is only available to users with administration rights or as a free user.*

ⓘ *The Transformation result can be viewed in the **Command Window** where open.*

5.2.1.3 Command Syntax

The Draw command TRANSFORMSHEETS operates on the current element and the hierarchy below it e.g. it could be utilised at the Sheet, Drawing, Registry, Department or World levels.

```
TRANSFORMSHEETS [THUMBNAILS|NOTHUMBNAILS] [NOPROMPT]
```

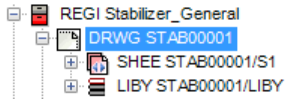
The default is NOTHUMBNAILS to aid the speed of transformation. The GENERATETHUMBNAILS command can be called separately.

NOPROMPT is automatic in TTY mode; in graphical mode the default is to prompt the user to confirm transformation.

When the transformation process is complete, a log file is created and stored in the directory %AVEVA_DESIGN_USER%. The file name is of the format DraftTransform-20141114-144807.log. The log file details the transformed elements.

*A query of transformed Sheets may be formed using the syntax: **Q ACPICT**. ACPICT = Only equates to a Sheet created or transformed in AVEVA E3D 2.1.*

5.2.1.4 Transformed Sheet in AVEA PDMS and Marine Drafting



An AVEVA E3D Draw transformed Sheet does still appear in the AVEVA PDMS and Marine Drafting 12.1.SP4 Explorer. The transformed Sheet is denoted by a double arrow to indicate it has been transformed.

Any attempt to open the transformed Sheet in AVEVA PDMS Draft or Marine Drafting prompts a **Message** informing the user that the Sheet has been transformed and may be accessed using AVEVA E3D Draw.

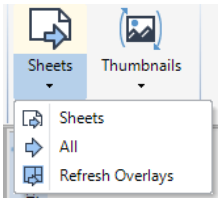
5.2.2 Library Elements

Visual library elements, namely Backing Sheets, Overlays, Symbol Templates, IsoDraft Symbol Templates and Sheet Templates, must be transformed before they can be viewed or modified in AVEVA E3D Draw. On being transformed it will no longer be possible to view or modify them using AVEVA PDMS Draft or AVEVA Marine Drafting.

AVEVA PDMS Draft or AVEVA Marine Drafting may still reference transformed AVEVA E3D Draw library elements, but this is not recommended as any changes made by E3D Draw may not be represented correctly. In a mixed project environment, it is therefore recommended to copy library elements before modifying them in AVEVA E3D Draw. The modified library elements can then be referenced exclusively by AVEVA E3D Draw sheets.

Transformation can be made via a bulk transformation through the Draw Administration User Interface or by using a designated command.

5.2.2.1 Draw Administration User Interface



Library Elements may be transformed via the **All** button in the **Transform** group of the **ADMIN** tab in Draw. The action applies to the Current Element and the hierarchy below it.

*The Transformation process is an administration task, access to the **ADMIN** tab is only available to users with administration rights or as a free user.*

*The Transformation result can be viewed in the **Command Window** where open.*

5.2.2.2 Command Syntax

Bulk transformation is implemented separately for Sheets and other Library items: Draw commands TRANSFORMSHEETS and TRANSFORMLIBS respectively. These commands operate on the current element and the hierarchy below it e.g. it could be utilised at the Sheet, Drawing, Registry, Department or World levels.

One can transform library items using the command:

```
TRANSFORMLIBRARIES
ALL|OVERLAYS|BACKINGSHEETS|SYMBOLTEMPLATES|ISOTEMPLATES|SHEETTEMPLATES
[THUMBNAILS|NOTHUMBNAILS] [NOPROMPT]
```

The default command is THUMBNAILS as although it slows the conversion process there are not expected to be very large numbers of library elements.

ⓘ *NOPROMPT is automatic in TTY mode; in graphical mode the default is to prompt the user to confirm transformation.*

When the transformation process is complete, a log file is created and stored in the directory %AVEVA_DESIGN_USER%. The file name is of the format DraftTransform-20141114-144807.log. The log file details the transformed elements.

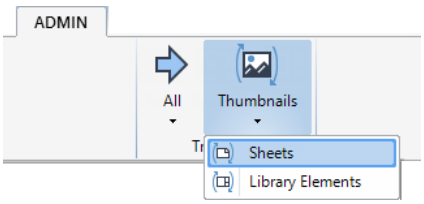
5.2.3 Thumbnails

The thumbnail generation function allows an E3D Draw user to view thumbnails of the transformed sheets and library items created in AVEVA PDMS Draft and AVEVA Marine Drafting. Thumbnail creation is not required for sheets and library items created in AVEVA E3D Draw.

Thumbnail previews display, for example, when a user wishes to open a sheet.

Thumbnail generation can be made via a bulk up-front action through the Draw Administration User Interface or by using a designated command.

5.2.3.1 Draw Administration User Interface



Thumbnails can be generated for Sheets and Library Elements via the **Thumbnail** button in the **Transform** group of the **ADMIN** tab in Draw. The action applies to the Current Element and the hierarchy below it.

ⓘ *The Generation process is an administration task, access to the **ADMIN** tab is only available to users with administration rights or as a free user.*

ⓘ *The Thumbnail Generation result can be viewed in the **Command Window** where open.*

5.2.3.2 Command Syntax

One can create thumbnails using the command:

```
GENERATETHUMBNAILS ALL|SHEETS|LIBRARYELEMENTS [FORCERECREATE] [NOPROMPT]
```

The default is to skip elements which already have thumbnails; unless `FORCERECREATE` is specified.

ⓘ *`NOPROMPT` is automatic in tty mode, in graphical mode the default is to prompt the user to confirm generation.*

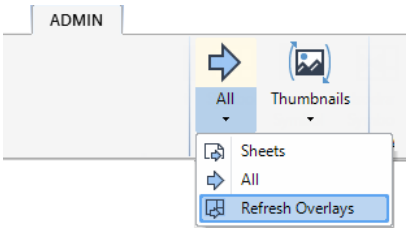
When the thumbnail creation process is complete, a log file is created and stored in the directory %AVEVA_DESIGN_USER%. The file name is of the form DrawThumbnailRefresh-20141114-144807.log. The log file details the generated thumbnails.

5.2.4 Refreshing overlays

One exception to the transformation of Sheets 'on-the-fly' is the requirement to 'refresh' Overlays. This is not required where Overlays are to be transformed as part of a bulk up-front transformation process. Refreshing is necessary in order for Overlays to appear correctly in AVEVA E3D Draw sheets. Unlike transformation, a refresh does not affect the use of overlays in AVEVA PDMS Draft or AVEVA Marine Drafting in any way. This is important when using AVEVA E3D Draw in a mixed project environment.

An Overlay Refresh can be made via a bulk refresh through the Draw Administration User Interface or by using a designated command.

5.2.4.1 Draw Administration User Interface



Thumbnails can be generated for Sheets and Library Elements via the **Refresh Overlays** button in the **Transform** group of the **ADMIN** tab in Draw. The action applies to the Current Element and the hierarchy below it.

ⓘ *The Refresh process is an administration task, access to the **ADMIN** tab is only available to users with administration rights or as a free user.*

ⓘ *The Refresh Overlay result can be viewed in the **Command Window** where open.*

5.2.4.2 Command Syntax

One can refresh Overlays using the command:

```
REFRESHOVERLAYS [THUMBNAILS|NOTHUMBNAILS] [NOPROMPT]
```

The default command is THUMBNAILS as although it slows the conversion process there are not expected to be very large numbers of Overlay elements.

ⓘ *`NOPROMPT` is automatic in tty mode, in graphical mode the default is to prompt you to confirm transformation.*

When the refresh Overlay process is complete, a log file is created and stored in the directory %AVEVA_DESIGN_USER%. The file name is of the form DraftLibraryRefresh-20141114-144807.log. The log file details the transformed elements.

5.3 Modification of Library elements

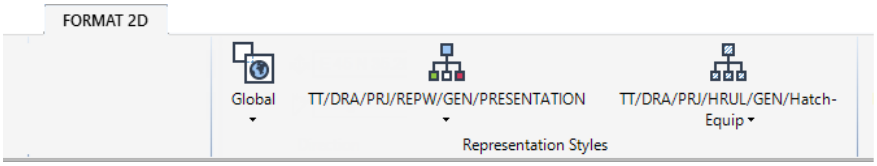
In addition to the transformation of Library elements for use in AVEVA E3D Draw, a Draw Administrator should also consider updating Draw library elements to account for Model changes at AVEVA E3D 2.1 e.g. supporting Libraries for the tagging and representation of Reference Grids. In addition, a Draw Administrator may consider changes to Draw library elements in order to best utilise Draw functionality in both Plant and Marine projects, e.g. the transformation of a project Backing Sheet and the replacement of any company logo in the Backing Sheet frame with a better defined **Image** logo.

ⓘ *Examples of AVEVA E3D 2.1 Libraries, Styles and Templates are provided in the AVEVA Plant Sample Project (APS) and AVEVA Marine Sample Project (AMS). These examples may be referenced and/or can be copied to a customer project as required. For further details, please refer to the Project Documentation.*

The following sections outline a selection of Library administrative tasks in AVEVA E3D Draw that may be considered alongside the migration process from AVEVA PDMS Draft and Marine Drafting 12.1.SP4 to AVEVA E3D Draw.

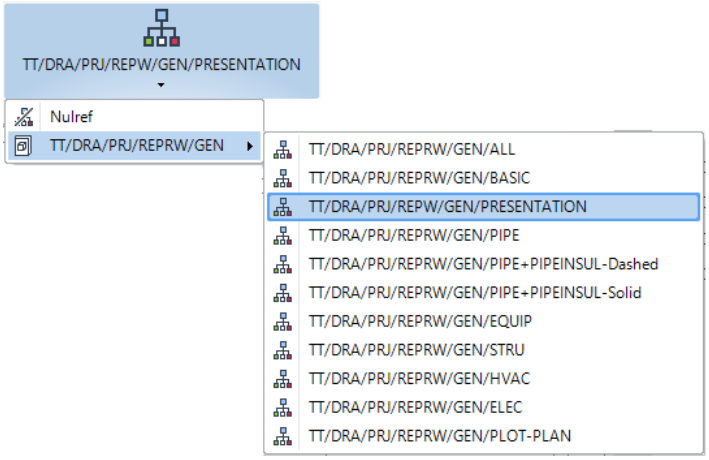
5.3.1 Representation Rules & Styles

The **Representation Styles** group within the **View: Format 2D** tab allows the control of the View representation in the **Draw Canvas** through the definition of the View Type, Representation Style and Hatching Style.



ⓘ *The presented Representation Styles are set by the **User Defaults** and usually defined by a Draw Administrator. The displayed **Representation Library** (**RPLB**) contains **Representation Ruleset** (**RRST**) elements that are used to control the View representation of various Model elements. This is achieved by the given Representation Ruleset containing **Representation Rules** that apply a referenced **Style** to a specified Model element type or name.*

Due to Model element changes in AVEVA E3D 2.1 (e.g. the use of GENSEC elements in lieu of SCTN elements, modifications to Supports, inclusion of Hull data and the introduction of Reference Grids) it is expected that a number of customer Representation Rules and Styles will require updating and extending.



Updates to representation rules and styles have been made in the sample data.

In the example here, the Representation Library denoted by REPRW/GEN includes a set of representation rules adapted to the default white background Draw Canvas.

5.3.2 Label & Symbols

In a similar fashion to the update of Representation Rules and Styles, it may prudent to assess Label Templates and Symbol Templates in the customer project libraries to understand whether new Draw

functionality may be utilised and whether updates are required e.g. Auto tagging rules that reference SCTN elements will be required to be updated for GENSEC elements, and Label Templates may be required to identify and support Grid annotation of the new Reference Grids.

5.3.3 Visual Styles

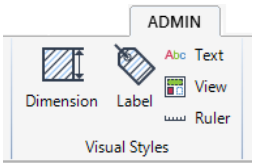
Introduced at AVEVA E3D 1.1, a **Visual Style** contains pre-set representation properties for the Draw elements View, Text, Label, Dimension and Grid Ruler. An element adopts a Visual Style either through definition on creation or by modification.

The use of a Visual Style ensures the **consistency** within the Sheet and across a series of Drawings. The properties of the Visual Style are determined by the Draw Administrator and any further alterations to the Visual Style are reflected in each instance the style has been referenced.

At AVEVA E3D 2.1 the View Visual Style has been extended to allow the definition of Grid Annotation in a View, and a Grid Ruler Visual Style has been introduced.

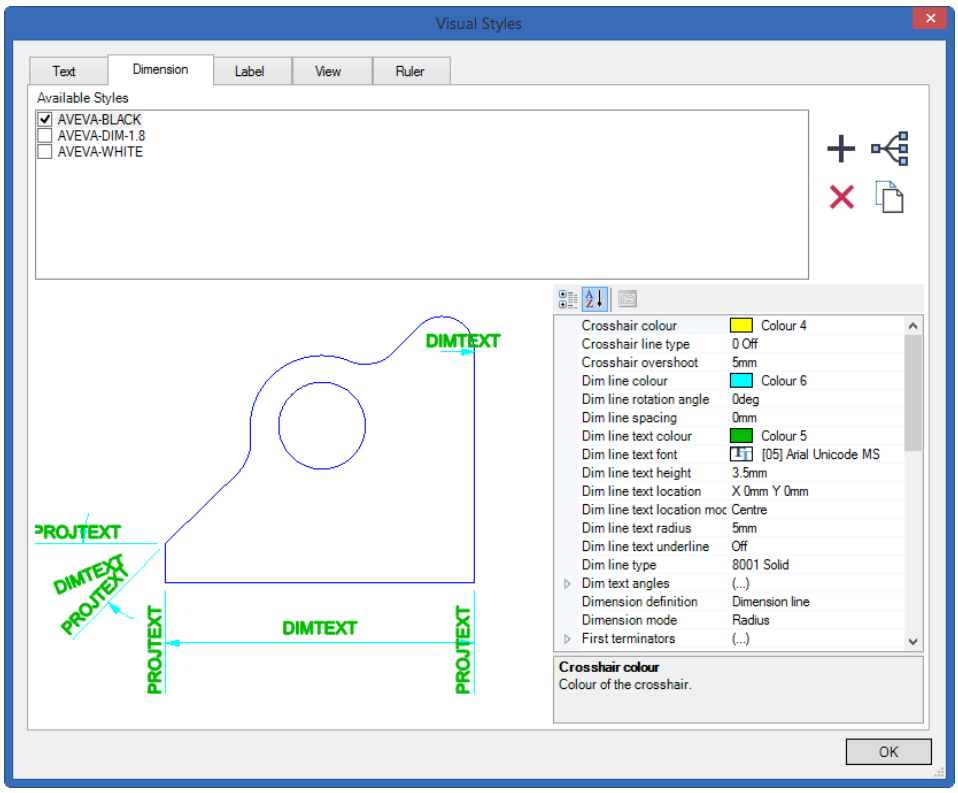
ⓘ *For further information on the use of Visual Styles including the definition of Grid Annotation and Grid Rulers in Draw, please refer to the AVEVA E3D 2.1 User Bulletin and User Documentation.*

AVEVA E3D 2.1 Draw is supplied with the AVEVA Default Visual Style which is initially assigned to labels, text, dimensions, rulers and view frames by default. The Visual Style may be specified by the Draw user prior to element creation by setting the style within the **Active Visual Styles** group of the **Annotate** tab.



To add or modify a Visual Style, click the **Dimension**, **Label**, **Text**, **Ruler** or **View** button as required from the **Visual Styles** group of the **ADMIN** tab.

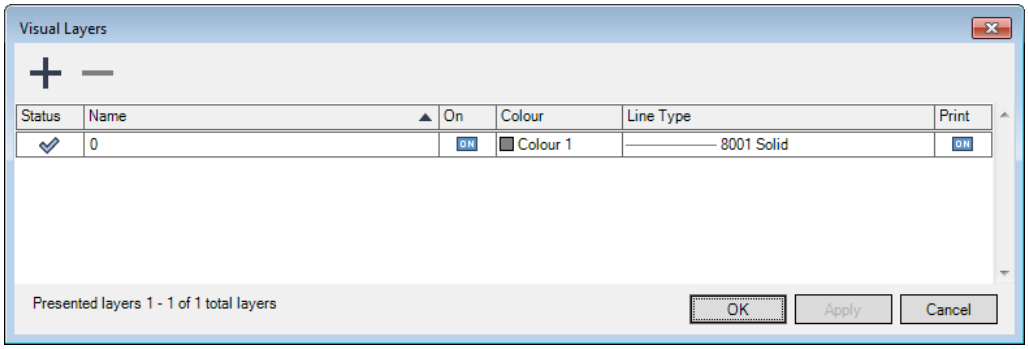
The **Visual Styles** form is displayed with the appropriate tab selected. The Visual Style is defined via the incorporated **Properties Grid** and illustrated by the preview window. Any number of Visual Styles can be defined for a variety of purposes – the required default Visual Style is indicated by an adjacent checkbox tick which thereby populates the Draw System Defaults form with the identified default.



5.3.4 Visual Layers

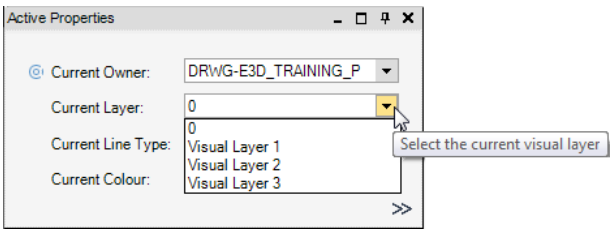
Draw utilises a system of **Visual Layers** to group objects in the Sheet to aid the management and editing of a Drawing.

Acting as a series of overlays to the Drawing content, each Visual Layer may be employed in an organisational capacity to group drawing elements by purpose or type i.e. construction lines or annotation. In addition, with each Visual Layer having an associated Colour and Line Type, a Visual Layer may be used to define the collective properties of a series of elements.



*In regards to the Draw Hierarchy, a **Sheet** (**SHEE**) owns a **Visual Layer Set** (**VLYSET**) which contains the individual **Visual Layers** (**VLAYER**).*

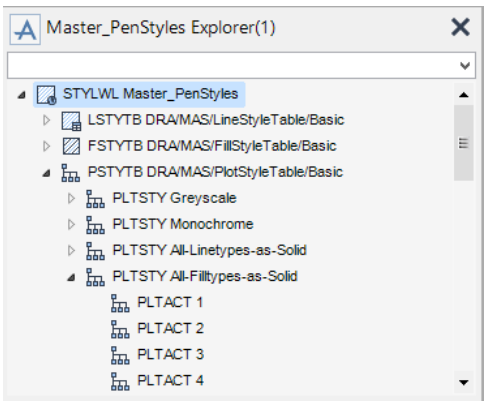
Visual Layers should not be confused with LAYE elements. From the perspective of a Draw User, the LAYE element is owned by a Sheet in the Draw hierarchy and is an administrative element for the storage of Draw annotation. A series of LAYE elements, through naming and setting of purpose, remain integral to the Automatic Drawing Production process and the population of the Drawing Sheet.



Visual Layers may be considered during the migration of Drawing Templates to AVEVA E3D Draw 2.1. Drawing Templates are utilised by the Draw user to create drawings and sheets to a pre-defined standard and orientation; it may therefore be advisable to also include a series of Visual Layers in the Template with a pre-defined representation to be selectable from the **Active Properties** form.

5.3.5 Plot Styles

At AVEVA E3D 2.1 changes have been made to the storage mechanism for Plot Styles. Plot Styles are now accessed and stored in the database.



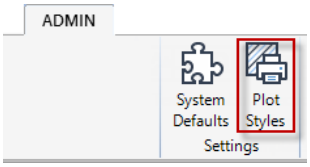
The Plot Style is stored beneath a Style World (**STYWL**) and Plot Style Table (**PSTYTB**) and defined by a series of Action Types (**PLTACT**).

Available Action Types include:

- Colour
- Line Type
- Fill Type

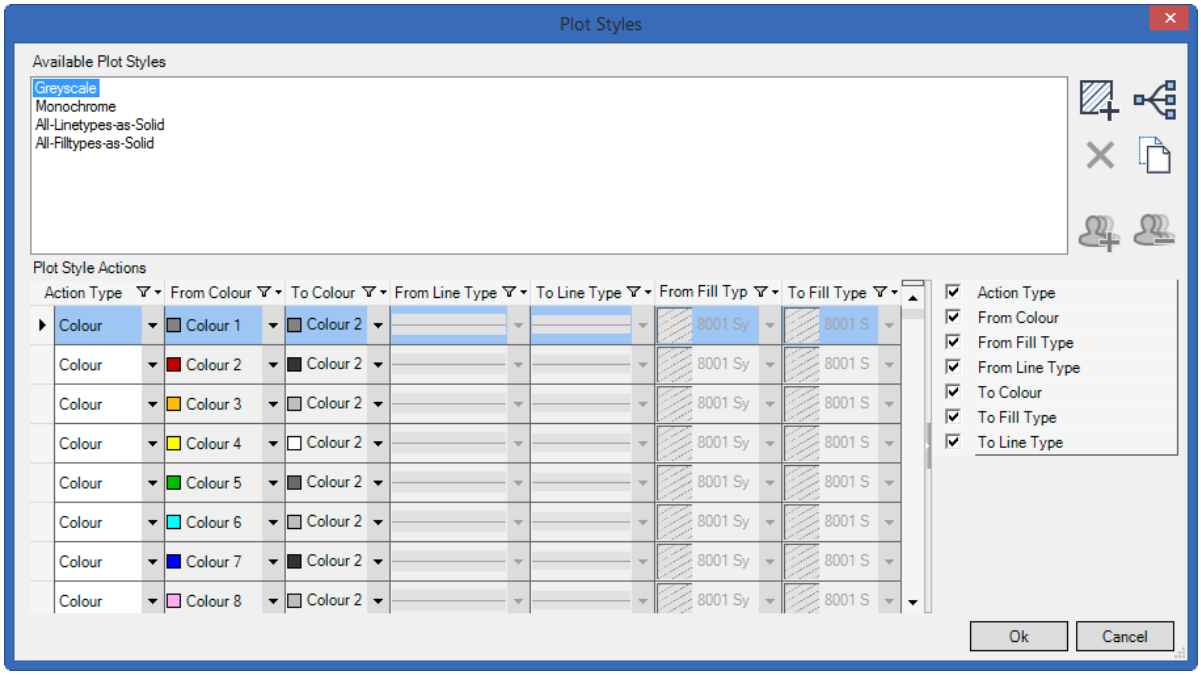
As highlighted by the screenshot here, updates to Plot Styles have been made to the Draw sample data.

A new user interface has been provided at AVEVA E3D 2.1 to create and administer Plot Styles.



To create or modify Plot Styles, the **Plot Styles** button is clicked in the **Settings** group of the **ADMIN** tab.

The **Plot Styles** form is displayed; listing the existing Plot Styles. The list(s) of actions that comprise the Plot Style are displayed in the Plot Style Actions area of the form. In the example below colours in the Sheet are to be transformed to a shade of grey (**Monochrome**) through a colour **Action Type**.



Plot Styles can be migrated (added to the database) from a macro file using the following command line syntax, while the destination Plot Style Table (PSTYTB) is selected:

```
PLOTMAP IMPORT FROM FILE /filename
```

Where filename is the file path of the macro file - this shouldn't contain any spaces. Plot styles can also be added for temporary use by running the macros in the normal way.

ⓘ *A Plot Style macro file can be generated using the Plot Styles user interface in AVEVA E3D 1.1.*

5.4 Reference Grids in Draw

A principal aid to the AVEVA E3D 2.1 Model Designer is the provision of new Grid elements called Reference Grids. Reference Grids are formed in the Model Database and may be used across an entire project and added, with automated annotation, to project drawings in AVEVA E3D 2.1 Draw.

In regards to the migration to AVEVA E3D 2.1 Draw, in addition to any updates to Project Libraries to account for the new elements (previously Grid Systems was the primary grid facility), the following Automatic Drawing Production updates may be required.

5.4.1 General ADP

The General ADP application has been modified so that the previously inherent gridline annotation functionality is disabled by default to allow for the new grid annotation at AVEVA E3D 2.1 via the View Visual Style.

The following application defaults have been modified to disable the previous gridline annotation:

```
%PDMSUI%\dflts\dra-genadp-equilocn

%PDMSUI%\dflts\dra-genadp-piping

%PDMSUI%\dflts\dra-genadp-plotplan

%PDMSUI%\dflts\dra-genadp-supports
```

In each case, the following setting has been altered:

```
var !!CDDIMLEV3FLG    |FALSE|
```

*If an administrator wishes to reinstate the previous gridline annotation, each file global variable may be set back to TRUE. However, one must remember to set the system automatic Reference Grid annotation off, by setting the relevant View Visual Style attribute **AGMODE OFF**. Otherwise, duplicate annotation will be generated.*

5.4.2 Area-Based ADP

Area-Based ADP generates annotation using TASK elements, which call PML Functions. The standard supplied examples include tasks for the generation of Gridline Annotation Labels and Dimensions. Since the system now generates these automatically, these tasks may no longer be required. Consequently, some changes have been made to the application data to ensure that gridlines are not annotated twice.

- The View Tasks that generated the gridline annotation have been removed from the AVEVA sample templates that were previously supplied.
- The AVEVA sample Drawlist rules that is used to find the old grid system have been modified to find the new reference grids to ensure gridline annotation is automatically generated.

  For example consider the IDLI /equipment_discipline

  ADDE 2 ALL REFGRD WITH (ATTRIB PURP EQ 'PLNT')

  In the supplied sample project this rule would find REFGRD /PLANT_GRID

A customer may continue with former grid annotation tasks but should ensure that the system automatic grid annotation is turned off. This is achieved by setting the template View to reference a View Visual Style that has ‘Grid annotation mode’ set to OFF.

In the instance where the Automatic Grid Annotation parameters are not TASK driven, they may be modified by:

- Create a new Visual Style: Set the Grid Annotation parameters as necessary and set the template view to reference this View Visual Style, as described above
- Create a new View Task: A new View Task is created that calls a PML function to manipulate either the View parameters to update the gridline annotation or manipulate the generated annotation. For example:

```
NEW TASK /equipment_2/S1/V1/VTask3
SPPURPOSE ABAV
FUNCTION 'Modify View Grid Parameters'
PMLFUNCTION 'MODIFYVIEWGRIDS'

define function !!modifyViewGrids(!arguments is ARRAY)

-- At view
!viewRefe = !!ce

 -- Set grid parameters
```

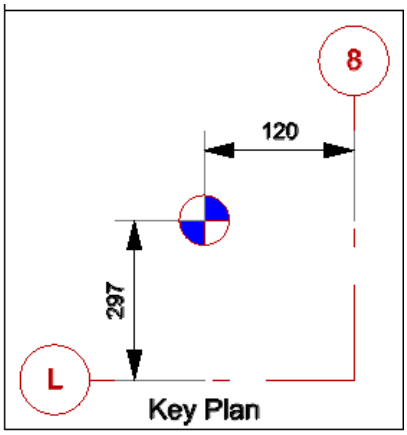
```
AGSIDE 'TOP LEFT'

-- Update the grid annotation
UPDATE GRIDANNO

endfunction
```

3.4.2 The Isometric ADP

The Isometric ADP application uses the grid system to calculate the nearest gridline to the spool origin. This is handled by a PML function specifically designed to suit a particular project since different projects may have different model data.

In the case of the AVEVA supplied sample project the PML function is as follows;

%PMLLIB%\isometricadp\userfunctions\isoapskeyplan.pmlfnc



At AVEVA E3D 2.1 this has been modified to extract data using the new Reference Grids to produce this example result.

ⓘ *Where the relevant AVEVA functions previously supplied have been modified or a user-defined function has been created and are required to use the new Reference Grid element, they must be upgraded in a similar way. Please refer to the supplied PML function for details.*

5.5 Using a Marine Project with Draw

In addition to the advice given thus far, this Section describes the specific actions and considerations recommended to prepare an AVEVA Marine Drafting 12.1.SP4 project for use in AVEVA E3D 2.1 Draw.

5.5.1 Draw System Defaults

For a Marine project it is advised to create a project specific version of the Draw System Default file, DRA-GEN-SYSTEM, pointing to the marine default libraries and styles. The project specific version should be stored in the project defaults folder (%<project>DFLTS%).

5.5.2 Drawing Database Storage

As previously described, Drawings opened and saved in AVEVA E3D 2.1 Draw cannot be opened in AVEVA Marine Drafting 12.1.SP4.

ⓘ *When considering the saving of a Drawing in AVEVA E3D Draw, the AVEVA Marine Drafting user should note that, unlike AVEVA Marine Drafting, the closing of the Drawing (and Draw Canvas) does not invalidate the opening of the Sheet or any changes that have been made; the Sheet will be saved (and transformed) on a Savework.*

If there is a project requirement not to mix transformed and un-transformed drawings in the same PADD database, it is recommended to create a new PADD database for AVEVA E3D drawings. A new MDB for AVEVA E3D Draw could then be formed and the new database included while excluding the PADD databases to be used in AVEVA Marine Drafting only.

This recommendation is aided in AVEVA Marine Drafting by the **Copy Drawings** tool available (File > Databank > Copy Drawings…), thus allowing drawings to be copied prior to the transformation process. This prior copying of drawings will prevent AVEVA E3D users from accidentally overwriting AVEVA Marine Drafting drawings.

📖 *For detailed information on the **Copy Drawings** function please refer to the 12.1 SP4 Marine Drafting User Guide.*

5.5.3 Transformation of a Marine Drafting Drawing (incl. SDB File & Picture File)

In AVEVA Marine Drafting a Drawing is stored in the PADD database but also defined by a SDB-file and Picture file. While the Picture file is a cache and can normally be regenerated from the information found in the PADD database, the SDB-file may contain information that is only found therein and not in the PADD database.

AVEVA E3D Draw does not support SDB-files and will solely operate with the data found in the PADD database and Picture file. Therefore, the AVEVA Marine Drafting drawing must be modified during the transformation operation on being opened in AVEVA E3D Draw 2.1. This operation is a variation of the transformation process previously described in the chapter; the key difference being the need to account for all the information contained only in the SBD-file and translate it to the PADD database or picture file.

ⓘ *The Transformation process and the use of the user interface in the ADMIN tab is as previously described – the marine transformation process is triggered automatically in a marine project.*

The overall requirement for the transformation process is to ensure the Drawing deliverable is identical to that found in AVEVA Marine Drafting 12.1 SP4. However, some drawing entities may lose their intelligence and connection to the Model where a functional difference exists between AVEVA E3D Draw and AVEVA Marine Drafting.

The following sections will explain in more detail the effect on various kinds of entities in an AVEVA Marine Drafting drawing when undergoing the transform operation.

5.5.3.1 Form Views

Where an AVEVA Marine Drafting Drawing contains a Form, the Form is converted during the transform operation to an AVEVA E3D Draw Backing Sheet (**BACK**). The Backing Sheet is referenced by the Sheet via the Backing Sheet Reference (**BSRF**) attribute. The converted Backing Sheet is stored in a Library local to the Drawing.

Any Text originating from Form rules will be converted to Text Primitives (**TEXP**) and will lose their original intelligence. As part of the transformation process, 2D geometry and texts are stored in the PADD Database and the Administrator should note, and correct, any font or line style discrepancies.

📖 *Potential discrepancies in line styles and text fonts during the transformation process are described in **Section 5.5.3.4 Texts** and **Section 5.5.3.12 Line Types**.*

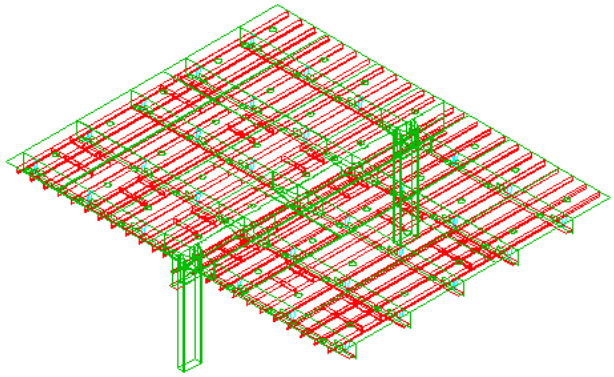
5.5.3.2 Model Views

- **General Model Views (Insert Model Views)**

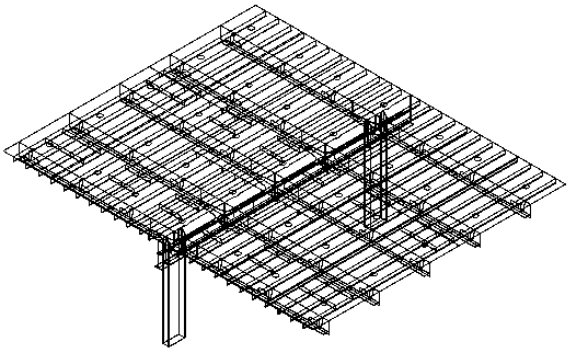
General Model Views, created via the menu option Insert > Model in AVEVA Marine Drafting 12.1.SP4, are maintained during the transformation process to AVEVA E3D 2.1 Draw.

The transformed Views will look as per the AVEVA Marine Drafting on the opening of Sheet in respect to colour and line styles. However, without supporting Representation and Style libraries, an Update Design

action may result in a change to the representation of the data. This is due to the Hull models being drawn with the colours and line styles set up by the current Representation Rule set for the View.



General Model View in
AVEVA Marine Drafting 12.1.SP4.



General Model View after an Update Design in AVEVA E3D 2.1 Draw without supporting Representation Rules and Styles.

The View can be corrected by altering the Representation Style for the View.

In the AVEVA Marine Sample (AMS) project there are example Representation Rule Sets and Styles that will emulate the representation found in AVEVA Marine Drafting 12.1.SP4.

In addition to alterations to the View Representation, there may also be some Line Types that cannot be resolved in AVEVA E3D Draw. This can be mitigated by using line style mapping, please refer to ***Section 5.5.3.12 Line Types*** *for further details.*

It should be noted there are also some differences in how Hull Models are drawn in AVEVA E3D Draw. As an example, a Profile section will have a more accurate look for bulb-bars but, conversely, there are instances where a Hull Model cannot be currently drawn in AVEVA E3D Draw.

Please refer to ***Section 6.3.4 Hull Data*** *for a list of Hull elements not supported at the first release of AVEVA E3D 2.1.*

- **Hull Symbolic Views**

A Hull Symbolic View will be transformed and maintained in AVEVA E3D Draw 2.1. Following the transformation, it should be noted that subsequent to an Update Design, the appearance may alter as the View reverts to a default setting.

- The View properties that control whether Text and Symbols are currently visible are not preserved and will revert to the default setting.
- In regards to Line type and colour control, the Hull Symbolic View will be generated with the current AVEVA Marine Drafting default setting of keyword ‘SVIEW_LT_COL’. If another style object was used, this is overwritten.

In addition to alterations to the View Representation, there may also be some line types that cannot be resolved in AVEVA E3D Draw. This can be mitigated by using line style mapping, please refer to ***Section 5.5.3.12 Line Types*** *for further details.*

- **Special Hull Model Views**

AVEVA E3D 2.1 is unable to entirely transform and perform an Update Design operation on the following special Marine model views:

- Body Plan View.
- Shell Expansion View.
- Developed Plate View.
- Curve Panel View.
- Shell Stiffener View.

On transformation of the above Views into AVEVA E3D Draw, the geometry representing the Model data is converted to 2D contours and the link to the Model is broken.

In addition to alterations to the View Representation, there may also be some line types that cannot be resolved in AVEVA E3D Draw. This can be mitigated by using line style mapping, please refer to ***Section 5.5.3.12 Line Types*** *for further details.*

5.5.3.3 2D Contours

On transformation, all 2D geometry within the AVEVA Marine Drafting Drawing (e.g. lines, arcs and clouds) are stored in the PADD database, if not already present, and represented in the Drawing Sheet.

2D Geometry that does not have an equivalent Draw element in the PADD database will be converted to the most suitable Draw element type.

5.5.3.4 Texts

On transformation, Text elements within the AVEVA Marine Drafting Drawing will be stored in the PADD database as Text Primitives (**TEXP**) where not already present.

If in the instance the Text font is a TBSystemFont, the font is converted to the true type Marine System Font that has the closest resemblance within the AVEVA E3D 2.1 install. However, unlike TBSystemFonts, true type fonts respect the current zoom scale i.e. the font becomes emboldened as one zooms in.

Please note that the "Slant" and "Aspect" text properties are not supported in AVEVA E3D 2.1 Draw.

The transformation process preserves the Text height in principal but AVEVA Marine Drafting and AVEVA E3D Draw differ in text height interpretation. A factor of 1.25 is applied and the length of the text may appear to be elongated.

5.5.3.5 Loss of 2DGeometry

There are situations where geometry in the drawing may be lost during the transform operation. This is observed when the 2D geometry has been manually added to a system defined drawing component (label, dimension or ruler) or to a component that represents a model. The entire drawing component will be replaced and recreated during the transformation process.

In general terms, the loss of geometry observed in AVEVA Marine Drafting on an Update Design or Update Annotation operation is also observed on opening the same Drawing in AVEVA E3D Draw and an Update Design is invoked for the first time.

5.5.3.6 Symbols

Symbols in AVEVA Marine Drafting will be 'exploded' during the transformation process i.e. converted to 2D geometry. Thus, a transformed symbol will not be treated as a single entity in AVEVA E3D Draw but as a collection of primitives without model intelligence.

5.5.3.7 Dimensions

There are a number of 2D and 3D dimension types in AVEVA Marine Drafting and the transformation process will endeavour to include them in AVEVA E3D Draw as true dimensions. AVEVA Marine Drafting dimensions that have no corresponding equivalent in AVEVA E3D Draw will be transformed as simple 2D geometry. Examples include Curved, Area, 3D Coordinate, Curve Length, WCOG, Shell Profile Mounting Angle and Distance to RSO dimensions.

In general, dimensions will be transformed to AVEVA E3D Draw and displayed with a similar appearance. However, there are notable differences in how a dimension is transformed and thereafter managed in AVEVA E3D Draw compared to AVEVA Marine Drafting:

- A Dimension that has been 'de-persisted' in AVEVA Marine Drafting will be transformed as simple 2D geometry. The dimension will look like the dimension found in AVEVA Marine Drafting but it will no longer be a dimension.
- Dimension Text fonts and other text properties are subject to the same limitations described earlier.
- The following AVEVA Marine Drafting dimension properties (via menu options) have no direct equivalent in AVEVA E3D Draw 2.1:
  - Modify > Modify Dimension > Flip Arrow.
  - Modify > Modify Dimension > Hide/Unhide.
  - Create Dimension > Advanced > Fit.
  - Create Dimension > Advanced > Text position.
  - Create Dimension > Unsymmetrical tolerance.
    Note: AVEVA E3D Draw displays the tolerance via the text '+<max>/-<min>'.
  - Create Dimension > Advanced > Arrow type 25.
    Note: AVEVA E3D Draw displays this as solely a Circle rather than the Circle and Cross observed in AVEVA Marine Drafting.
  - Create Radius/Diameter Dimension > Type 3 (2 arrows).
    Note: The 'Text and Arrow Layout' is limited to the first choice in AVEVA E3D Draw and a line between the arrows is omitted.

5.5.3.8 Position Rulers

A position ruler will be transformed to a Grid Ruler element (**GRDRLR**) in AVEVA E3D Draw. In order for this to succeed the project must contain a Reference Grid (**REFGRD**) element with a Ship Coordinate definition.

*Please refer to **Section 4.2.1 Ship & Plant Grid Conversion** for further information on the conversion of Grid Systems to Reference Grids in AVEVA E3D 2.1 Model.*

Grid Rulers in AVEVA E3D Draw are more advanced than the former Position Rulers with the ability to configure the appearance of the Grid Ruler via a Visual Style.

In the Transform Configuration file a Visual Style can be referenced to define the Grid Rulers during the transformation process.

Please refer to the AVEVA E3D 2.1 User Bulletin for further information on the use of Grid Rulers (and associated Visual Style).

5.5.3.9 Labels & Notes

Labels created via the AVEVA Marine Drafting menu functions Annotate > Labels or Auto-tagging are created directly within the PADD database and there is no special consideration given in the Marine drawing transformation operation.

AVEVA Marine Drafting Notes: General Notes, Hull Notes and Config Notes, are converted to Symbolic Labels (**SLAB**) and may be modified thereafter in AVEVA E3D Draw as a Label. For each instance of the note, a symbolic template (**SYTM**) is created and stored in a local library to the Drawing.

AVEVA E3D 2.1 Draw does not support multiple leader lines. Any General Notes with multiple leader lines are not transformed as intelligent leader lines connected to the Model.

5.5.3.10 Invisible Geometry

Geometry in AVEVA Marine Drafting may be defined as invisible when:

- The geometry (model geometry or 2D geometry) belongs to a layer that is hidden in the Drawing.
- Drawing elements have the Visibility flag set to False. This can be set e.g. by the Modify > General function.
- The LVIS attribute is set to False for a drawing element (e.g. VNOT or LAYE) in the PADD database. In Marine Drafting, you can only set this attribute explicitly in command window or in the attributes dialog.

Acknowledging that AVEVA Marine Drafting and AVEVA E3D Draw do not have the same functionality to handle visibility, the transformation operation processes the invisible geometry with the following guidelines.

- **Model Geometry**

Where model geometry has been made invisible, the Drawing will look as per AVEVA Marine Drafting on transforming and opening in AVEVA E3D Draw. However, on Update Design, the invisible geometry will become visible.

- **Other Geometry**

For 2D geometry and annotations there is a difference whether the data is already stored in the PADD database or not.

When invisible geometry is already stored in the PADD database the data will normally become visible in Draw after the transformation. An exception is if the LVIS attribute has been set to False; in this case the geometry will still be invisible. Geometry that is stored in PADD includes Label.

Invisible geometry that is not in the PADD database prior to the Drawing transformation (such data is stored in SDB file only) will be ignored i.e. this data will not exist in the drawing after the transform is complete. This includes Symbols, Dimensions other than Linear / Radial / Angle and Annotations other than Labels.

Some types of geometry elements are sometimes stored in PADD, sometimes not. Where they are stored depends on by which function the geometry was created and how the ‘Persist’ environment variables are set in Marine Drafting. Such element types are Texts, Contours and Dimensions of type Linear / Radial / Angle.

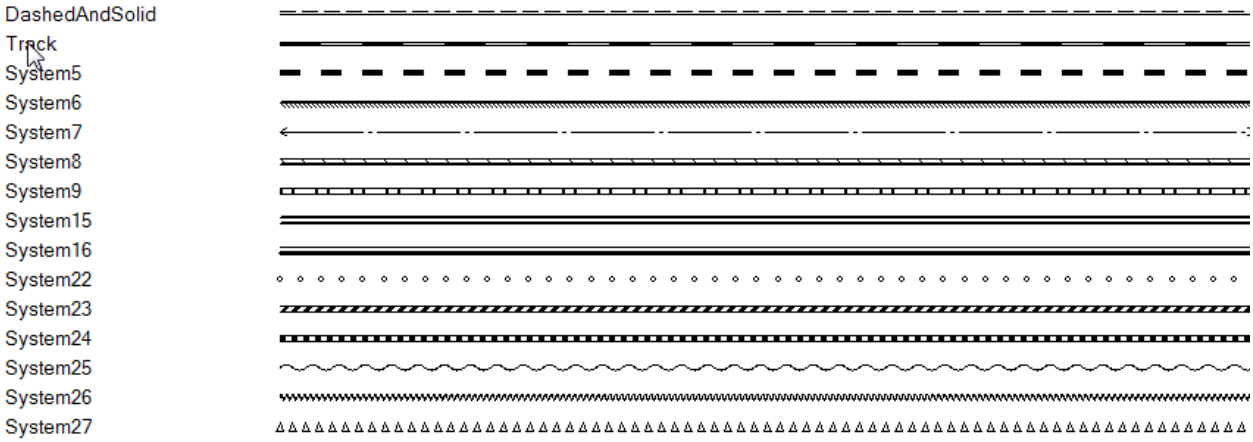
5.5.3.11 Referenced Drawings

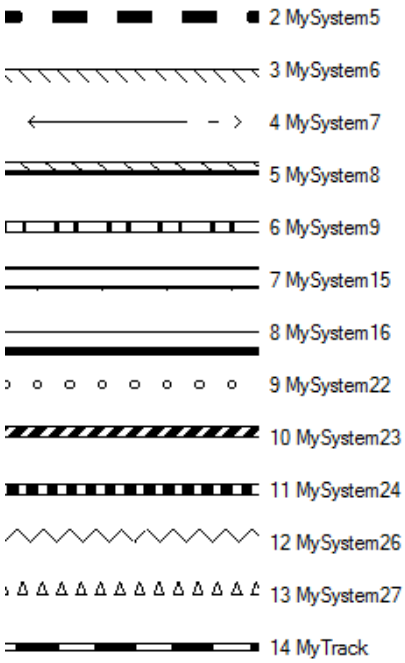
In the scenario where a drawing contains a reference to another drawing, the reference will be expanded upon prior to the transform. This will result in the reference becoming a part of the transformed drawing in AVEVA E3D Draw.

5.5.3.12 Line Types

The set of system defined line types in AVEVA E3D Draw do not fully correspond to the line styles available in AVEVA Marine Drafting.

The following AVEVA Marine Drafting Line Types do not exist in Draw:



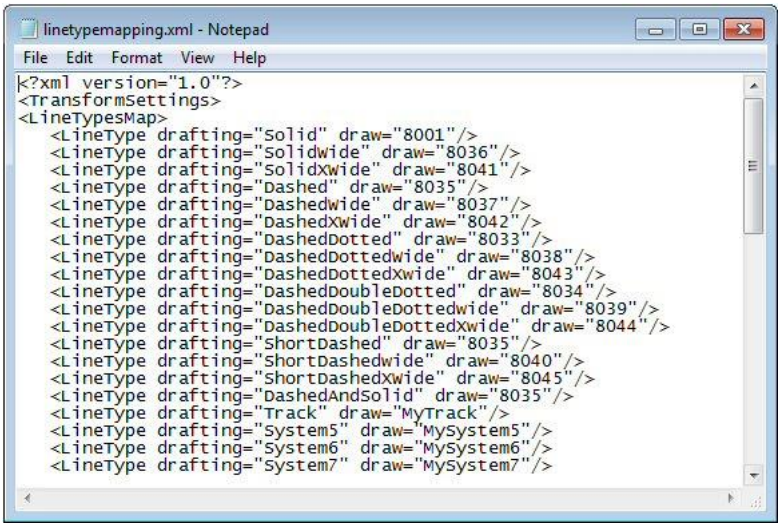


A number of User Defined line styles, which can be used to simulate some of line styles not supported by Draw, have been added to the AVEVA Marine Sample Project (AMS) and can be copied to a project.

There is a built-in mapping between AVEVA Marine Drafting Line Types and AVEVA E3D Draw Line Styles.

Where a user-defined line style mapping is required, a mapping table can be used to dictate to the system that certain Marine Drafting line styles should be replaced with identified Draw line styles. The line style mapping table is referred to when transforming marine drawings and on creating a Hull Symbolic View in Draw.

The line type mapping file is referenced via an environment variable SBD_E3D_DRAW_LINETYPE_MAPPING in the d065 file for the marine project.



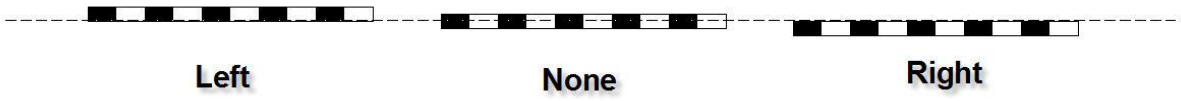
: Example line type mapping .xml (.xml is held in the Marine (mar) def folder).

The line type mapping file contains an entry for each AVEVA Marine Drafting line type required to be mapped to an AVEVA E3D Draw line type. The Draw line types can be identified as the font name or font number. Where the Draw line type is user-defined, the name of the line type equates to the description, i.e. the text assigned to the FUNCTION attribute of the LINEST element.

ⓘ *Any non-supported line styles not mapped will be converted to a default line style and a message output to the transform log.*

5.5.3.13 Line Thickness Alignment

In AVEVA Marine Drafting the user can apply a shift option controlling the line thickness alignment during rendering. This is not supported in AVEVA E3D Draw.



In AVEVA Marine Drafting each line type has a system default thickness (mm), pattern definition (pen ups and downs) and pattern length (mm). At a project level, it is possible to configure these parameters via environment variables. This is not possible in AVEVA E3D Draw.

There are a number of differences in how lines are rendered in the Draw Canvas compared to AVEVA Marine Drafting (and AVEVA PDMS Draft). In AVEVA E3D Draw all lines are shown with the same thickness unless the **line weight** option is activated and the line thickness / line pattern renders to the Draw Canvas zoom scale.

5.5.4 Marine Transform Configuration File

The Marine Transform Configuration file is used when the type of the transformed drawing is ‘marine’. The Transform operation can be configured by defining a Transform configuration file. This file should be pointed to in the Marine Project setup in the D065-file via the environment variable SBD_E3D_DRAW_TRANSFORM_SETTINGS.

This is an example of a setting file (XML format):

```
<?xml version="1.0"?>
<TransformSettings>
<GridRuler>
   <RulerBaseLineStyle name="MARINE_BASE_STYLE"/>
```

```
    <RulerCenterLineStyle name="MARINE_CENTER_STYLE"/>
    <RulerLongHorStyle name="MARINE_Y_STYLE"/>
    <RulerLongVerStyle name="MARINE_Z_STYLE"/>
    <RulerFrameStyle name="MARINE_X_STYLE"/>
</GridRuler>
</TransformSettings>
```

The Grid Ruler section of the Configuration file has settings which are relevant when transforming a Drawing with Position Rulers. A Position Ruler is transformed to a Grid Ruler (GRDRLR). The appearance of a Grid Ruler in AVEVA E3D Draw is controlled by a Visual Style and a required style can be defined within the Configuration file depending on the ruler type:

- RulerBaseLineStyle Visual style for a Base Line ruler.
- RulerCenterLineStyle Visual style for a Centre Line ruler.
- RulerLongHorStyle Visual style for a Longitudinal Horizontal ruler.
- RulerLongVerStyle Visual style for a Longitudinal Vertical ruler.
- RulerFrameStyle Visual style for a Frame ruler.

6 Compatibility & Interoperability

The following Chapter will outline the AVEVA products that are compatible with AVEVA E3D 2.1 and will examine the interoperability of this release; a particular focus being the interoperable relationship between AVEVA E3D 2.1 and AVEVA PDMS and Marine & Outfitting 12.1.SP4.

6.1 Compatibility with other AVEVA Products

For full compatibility details, and for information about AVEVA E3D 2.1 compatibility with any later versions, please refer to the compatibility matrix. A full and up to date compatibility matrix can be found via compatability.aveva.com/matrix.

The following AVEVA products are compatible with AVEVA Everything3D™ 2.1.0.

- AVEVA Administration™ 1.4.0.
  Note: This release supersedes all previous AVEVA Administration versions delivered with other AVEVA products.
- AVEVA Applications Service™ 1.3.0 & 2.1.0.
  Note: For customers who use AVEVA E3D Insight™ 2.1.0: AVEVA Applications Service 2.1.0 or higher must be used. Earlier versions are incompatible.
- AVEVA Bocad™ 2.2.1 & 2.30.
  Note: The supporting AVEVA Bocad Steel Interface is not included in the first release of AVEVA E3D 2.1.0 and is to be included in a forthcoming Fix Release.
- AVEVA Catalogue™ 2.1.0.
- AVEVA Client Cache Service™ 1.0.5.
- AVEVA Clash Manager™ 2.1.0.
  Note: This is a planned compatibility on the release of the AVEVA Clash Manager product.
- AVEVA Design Checker™ 1.1.0.
- AVEVA Diagrams™ 14.1.0 (Fix Release 4).
- AVEVA E3D Documentation™ 2.1.0.
- AVEVA Electrical™ 12.1.3 (Fix Release 8).
- AVEVA Engineering™ 14.1.1 (Fix Release 4).
- AVEVA Global Server™ 3.2.1.
  Note: Includes separately licensed products AVEVA Global Hub and AVEVA Global Satellite.
- AVEVA Hull & Outfitting™ 12.1.4 & associated products (Fix Release 28).
- AVEVA Instrumentation™ 12.1.3 (Fix Release 6).
- AVEVA Integration Service 1.2.0.1.
  Note: This is the primary route for compatibility with AVEVA P&ID™ 12.1.2 (Fix Release 9). The service also supports compatibility with AVEVA Electrical™ 12.1.3 and AVEVA Instrumentation™ 12.1.3.
- AVEVA NET Workhub & Dashboard™ 5.0.1.
- AVEVA PDMS™ 12.1.4 & associated products (Fix Release 28).
- AVEVA PDMS-VPRM Gateway™ 5.6.0.
- AVEVA Plot Utilities™ 12.1.5.

- AVEVA Pipe Stress Interface™ 2.1.0.
- AVEVA PML Publisher™ 2.2.0
- AVEVA Review™ 12.2.0 (Fix Release 10).
- AVEVA Shared Services™ 3.3.0.

The following LFM products are compatible with AVEVA Everything3D™ 2.1.0:

- LFM Server™ 4.4.0.

6.2 Interoperability - AVEVA PDMS or Hull & Outfitting 12.1.SP4

Where required, AVEVA E3D 2.1 and AVEVA PDMS or Hull & Outfitting 12.1.SP4 (Fix Release 28) products may operate on the same project. With such a project setup, it is strongly recommended (and is mandatory for some operations) that the latest version of) AVEVA Administration is used for all on-going administration work.

Although Everything3D 2.1 is 'industry neutral', and can be used on either Plant or Marine projects, it does use project settings to customise itself in ways appropriate to Plant or Marine.

Later fix releases of AVEVA PDMS or Hull & Outfitting 12.1.SP4 may be required for compatibility to account for fix releases of AVEVA E3D 2.1 which contain modelling enhancements. Please regularly refer to the AVEVA PDMS or Hull & Outfitting 12.1.SP4 and AVEVA E3D 2.1 release notes for information on continued compatibility between the products.

The following sections will outline a number of project considerations where AVEVA PDMS or Hull & Outfitting 12.1.SP4 and AVEVA E3D 2.1 are used on the same project.

Please refer to the AVEVA E3D 2.1 Release documentation for the latest information on known exceptions to the interoperarbility of AVEVA E3D 2.1 and AVEVA PDMS / Hull & Outfitting 12.1.SP4.

6.2.1 Project Setup

To facilitate the use of AVEVA PDMS or Hull & Outfitting 12.1.SP4 and AVEVA E3D 2.1 on a project, it is important that the appropriate environment is defined to utilise both products on the project.

- **AVEVA PDMS 12.1.SP4 Project**

In most cases, an interoperable project setup will typically involve adapting an AVEVA E3D 2.1 setup to use an AVEVA PDMS project. The following is recommended:

- Check that the project is up to date and is using AVEVA PDMS 12.1.SP4 Fix 28 or later.
- In AVEVA E3D 2.1 add a call to the project in the **`custom_evars.bat`** file (this is by default stored in: C:\Users\Public\Documents\AVEVA\Projects\E3D2.1).
- Define the Draw module using AVEVA Administration (1.4).

  *Please refer to **Section 5.1 Module Definition** for further information.*

- **AVEVA Hull & Outfitting 12.1.SP4 Project**

In most cases, an interoperable project setup will typically involve adapting an AVEVA E3D 2.1 setup to use an AVEVA Hull & Outfitting project. The following is recommended:

- Check that the project defined as 'Marine', is up to date and is using AVEVA Hull & Outfitting 12.1.SP4 Fix 28 or later.

- In AVEVA E3D 2.1 add a call to the project in the **`custom_evars.bat`** file (this is by default stored in: C:\Users\Public\Documents\AVEVA\Projects\E3D2.1).
- Define the Draw module using AVEVA Administration (1.4).

*Please refer to **Section 5.1 Module Definition** for further information.*

*Please note that spaces in pathnames should be avoided for AVEVA Marine (Hull) 12.1.SP4 projects. For the inclusion of Marine data in AVEVA E3D 2.1, please also refer to **Section 3.2.1 Marine Projects (Hull data) in AVEVA E3D 2.1**.*

- **AVEVA E3D 2.1 Project**

It is also possible to use AVEVA PDMS 12.1.SP4 to access a project newly created for AVEVA E3D 2.1 using AVEVA Administration (1.4). The following is recommended:

- In AVEVA PDMS or Hull & Outfitting 12.1.SP4 Fix 28 (or later) add a call to the project in the **`evars.bat`** file.

*The .bat files provided in AVEVA PDMS and Hull & Outfitting 12.1.SP4 Fix 28 have been set to ensure interoperability with AVEVA E3D 2.1. Any.bat files that have been customised need to have a call to **set_forward_compatibility.bat** inserted. This .bat file contains new environment variables and is stored with the AVEVA E3D 2.1 executables (this is located by default at: C:\Program Files (x86)\AVEVA\Everything3D2.10\set_forward_compatibility.bat).*

6.2.2 Model Data

Interoperability in regards Model Data may be summarised as the ability to see shared AVEVA E3D 2.1 and AVEVA PDMS or Hull & Outfitting 12.1.SP4 3D model objects in the Model Explorer, add them to the 3D View, Clash check against them, perform additional spatial map actions such as 'Add within Volume' and, produce reports and drawings containing Model data created in the alternative product.

Where there is no data model change between the products it is feasible to change the 3D model data in either product, however there are exceptions to this such as Stairs, Ladders & Handrails (SLH) and Supports.

6.2.2.1 Design Aids

AVEVA E3D 2.1 Design Aids, such as Reference Grids and Aid Lines, are not classified as 3D Model Objects and are therefore not visible in AVEVA PDMS or Hull & Outfitting 12.1.SP4.

The Design Aids are present in the AVEVA PDMS / Hull & Outfitting Model Explorer but appear as an Unknown Type.

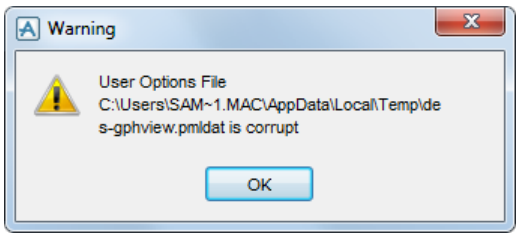
6.2.2.2 Supports Data

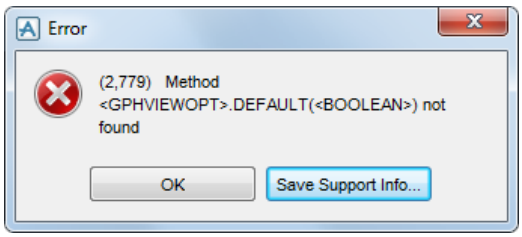
Where a customer intends to use MDS at PDMS12.1.SP4 with AVEVA E3D™ 2.1 it is recommended that the administrator replaces the foreign reference to database MDS/CATA (DB Number 7320) from the MAS project version (or ACP at E3D1.1) to the AVEVA E3D™ 2.1 version of this database. This substitution will not require any additional upgrades to the project.

*Please refer to **Section 4.3 Supports** for further information on the migration and interoperability of Supports data.*

6.2.2.3 Saved Views

The changes in the 3D graphics between AVEVA PDMS / Hull & Outfitting and AVEVA E3D mean that the files saved when module switching are incompatible. By default, they will be in different locations so there is no problem – and this arrangement is recommended. If however the same User folder is used for both AVEVA E3D and PDMS, an error will be detected when trying to read the serialized status in PDMS after running AVEVA E3D and the 3D view will not be restored.





6.2.3 Outfitting Applications

The following AVEVA Hull & Outfitting 12.1.SP4 utilities are not available in AVEVA E3D 2.1 Model:

- Assembly Planning.
- Room Design.
- AVEVA Outfitting Supports.
- Equipment Seat Application.

6.2.4 Hull Data

Hull design data is made available in AVEVA E3D 2.1 to support outfitting design users working in marine or mixed projects. The access to hull objects is not complete and the following hull objects are not visualized in the current version:

- Initial Design compartments
- Hull blocks
- Hull Marks
- Welds
- Spaces and space arrangements
- Hull curve
- Hull seam
- Hull plane
- Hull point
- Hull cylinder
- Pin Jigs
- FE-Images

6.2.5 Reports

The following should be noted in regards to the use of Report Designer Templates in a mixed project environment:

- Report Designer Templates created in AVEVA PDMS 12.1.SP4 can be used with either AVEVA PDMS 12.1.SP4 or AVEVA E3D 2.1.
- Report Designer Templates created via AVEVA Administration 1.4 or AVEVA E3D 2.1 cannot be used with AVEVA PDMS 12.1.SP4.

ⓘ *Please note that where updating AVEVA (PDMS) 12.SP4 Report Templates in AVEVA E3D 2.1, it is prudent to copy the Template first as the Tempalte will no longer be available for use in AVEVA (PDMS) 12.1.SP4.*

6.2.6 Draw Data

It is possible for user to utilise AVEVA E3D 2.1 Draw and AVEVA PDMS or Marine Drafting 12.1.SP4 on the same project but there are important considerations.

6.2.6.1 Transformation

Visual elements originally created by AVEVA PDMS Draft or AVEVA Marine Drafting must be transformed before being viewed or modified by a Draw user in AVEVA E3D 2.1.

The transformation of visual elements such as Sheets, Backing Sheets, Symbol Templates and Sheet Templates is only necessary when migrating AVEVA PDMS or Hull & Outfitting 12.1.SP4 project data to AVEVA E3D 2.1 Draw. Transformation is not required for new projects created with AVEVA E3D, or for new visual elements created in AVEVA E3D Draw.

Once transformation is complete and a Save Work has been applied, it is no longer possible to view or modify the sheet using AVEVA PDMS Draft or AVEVA Marine Drafting. Similarly, new sheets created in Draw will not be accessible.

ⓘ *The same PADD database can be accessed both from AVEVA E3D 2.1 Draw and AVEVA Marine Drafting 12.1SP4 but the storing format for drawings is different though. In AVEVA E3D Draw all drawing data is stored in the PADD database, while in AVEVA Marine Drafting some data is stored in PADD database and other data in a separate file, the SDB file and is therefore subject to an extended marine specific transformation process.*

One exception to the transformation of Sheets 'on-the-fly' is the requirement to 'refresh' Overlays. This is not required where Overlays are to be transformed as part of a bulk up-front transformation process. Refreshing is necessary in order for Overlays to appear correctly in AVEVA E3D Draw sheets. Unlike transformation, a refresh does not affect the use of overlays in AVEVA PDMS Draft or AVEVA Marine Drafting in any way. This is important when using AVEVA E3D Draw in a mixed project environment.

📖 *Please refer to **Chapter 5 Draw Data** for further information on the transformation process from AVEVA PDMS Draft and Marine Drafting 12.1.SP4 to AVEVA E3D 2.1.*

6.2.6.2 Sharing Library Elements

Sheets in Draw can reference DRAFT library elements without the need to transform them, with the result that these can be shared between DRAFT and DRAW. Overlays only must be 'refreshed' before use in DRAW (see section "Transforming DRAFT data for DRAW"). This does not affect their use in DRAFT in any way.

AVEVA PDMS Draft or AVEVA Marine Drafting may still reference transformed AVEVA E3D Draw library elements, but this is not recommended as any changes made by E3D Draw may not be represented correctly. In a mixed project environment, it is therefore recommended to copy library elements before modifying them in AVEVA E3D Draw. The modified library elements can then be referenced exclusively by AVEVA E3D Draw sheets.

6.2.6.3 Supports Area-Based ADP

There is no specific upgrade requirements for the Draw module in regards to the representation and drawing of the new supports.

However, it should be noted that the AVEVA E3D 2.1 Draw Supports Area-Based ADP utility only recognises the new Support hierarchy introduced at AVEVA E3D 2.1. Therefore, where a customer intends to use the MDS application in AVEVA PDMS or Hull & Outfitting 12.1.SP4 with AVEVA E3D 2.1, MDS Area-Based ADP drawings must be created in AVEVA PDMS 12.1.SP4 Draft.

6.3 AVEVA Administration 1.4.0

Where AVEVA E3D 2.1 and AVEVA PDMS or Hull & Outfitting 12.1.SP4 (Fix Release 28) products operate on the same project, it is strongly recommended (and is mandatory for some operations) that AVEVA Administration 1.4 or later is used for all on-going administration work.

One should be aware of the following considerations where AVEVA Administration 1.4 is used to administer a project environment using AVEVA PDMS or Hull & Outfitting 12.1.SP4 and AVEVA E3D 2.1.

6.3.1 New Database Types

New Database Types introduced by AVEVA Administration 1.4 (XPRD, CONF, TASK and RDFN) will not be opened in AVEVA PDMS or Hull & Outfitting 12.1.SP4.

The Cross Product Database Type (**XPRD**) contains Comments shared between AVEVA E3D 2.1 and AVEVA E3D Insight 2.1.

*For information on the use Cross Product Databases please refer to the **AVEVA Administration User Documentation**.*

*The **CONF**, **TASK** and **RDFN** database types are for future use by AVEVA products; no data will be created in them by AVEVA E3D 2.1.*

6.3.2 Draw Module

Prior to the use of an AVEVA PDMS or AVEVA Hull & Outfitting 12.1.SP4 project in AVEVA E3D 2.1, the Administrator must define the Draw module.

This definition is achieved by opening the Project in AVEVA Administration 1.4 and performing a **Savework**. The Draw module is automatically defined at this point.

*Please refer to **Section 5.1 Module Definition** for further information.*

6.3.3 Dynamic Database Sets

AVEVA Administration 1.4 introduces the ability for Database Sets (**DBSETs**) to contain selection criteria to enable dynamic updating.

The dynamic DBSETs can be used within AVEVA E3D 2.1 but they should not be included in MDBs to be used in AVEVA PDMS or Hull & Outfitting 12.1.SP4 to avoid an error being presented on login.

6.3.4 Multi-write Dictionary & Property Databases

Dictionary (**DICT**) and Property (**PROP)** Databases are multi-write in AVEVA Administration 1.4 and Catalogue 2.1. The 'latest with latest' rules means nobody should be using these with Admin, Lexicon or Paragon from 12.1.SP4. The Design, Draft and Isodraft Modules will open them read-only.

6.3.5 Flexible Explorer

A Flexible Explorer can be created with AVEVA Administration 1.4 but cannot be viewed in AVEVA PDMS or Hull & Outfitting 12.1.SP4. Such Explorers can be viewed in AVEVA Engineering 14.1.1 and AVEVA Diagrams 14.1.0.

Please refer to the .NET Customisation Guide for further information on the use of the Flexible Explorer customisation in AVEVA E3D 2.1.

6.3.6 Unit Sets

Unit Sets can be created using AVEVA Administration 1.4 (Lexicon module) but are not utilised in AVEVA E3D 2.1.

*Please refer to the **AVEVA Lexicon User Guide** for further information on the definition and use of Unit Sets.*

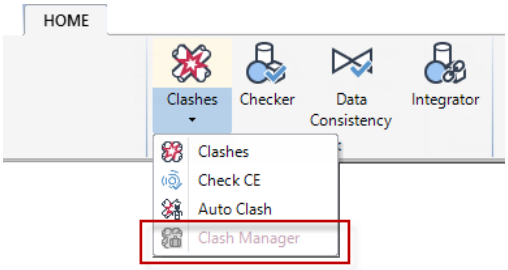
6.4 AVEVA Global 3.2.1

AVEVA Global 3.2.1 has been released to support AVEVA E3D 2.1, AVEVA Engineering 14.1.1, AVEVA Diagrams 14.1 and AVEVA Administration 1.4 products, but is also compatible with AVEVA PDMS and Hull & Outfitting 12.1.SP4.

AVEVA Global 3.2.1 should be used for all sites in a project, whether running AVEVA E3D 2.1 or AVEVA PDMS or Hull & Outfitting 12.1.SP4.

*For further information on the use of AVEVA Global with AVEVA E3D 2.1 please refer to the **AVEVA Global 3.2.1 Release** and **User Documentation**.*

6.5 AVEVA Clash Manager 12.1



The forthcoming AVEVA Clash Manager 12.1 will be compatible with both AVEVA E3D 2.1 and AVEVA PDMS or Hull & Outfitting 12.1.SP4.

CHAPTER 7

7 Customisations

There are two types of Graphical User Interface (GUI) in AVEVA E3D 2.1. The Model and Draw modules have adopted a tabbed (Microsoft Fluent UI) interface without a main menu bar or associated toolbars. The other modules (Spool and IsoDraft) continue to have PML menus and toolbars.

The following sections will describe changes to PML and C# code that may be necessary to migrate a customer's new and modified functions from AVEVA PDMS and Hull & Outfitting to AVEVA E3D 2.1. Some of the advice given in this section applies to all code and some applies only to modules with ribbon menus.

As a general rule, it is recommended that customers add their own applications by adding new tabs to the AVEVA E3D 2.1 ribbon. This should avoid interference with the standard AVEVA functions and should enable their users to distinguish the company specific functions.

7.1 Use of PML & C# in AVEVA E3D 2.1

The AVEVA E3D PML language has extensions not available in AVEVA PDMS and Hull & Outfitting, but the language is upwards compatible with PDMS PML. Therefore most PML code written for AVEVA PDMS and Hull & Outfitting can simply be copied into an AVEVA E3D environment, and it will work as expected. In most cases, it would be possible to share PML forms and functions but this would need careful consideration.

📖 *Please refer to **Section 7.8 Writing PML code to work in both PDMS & AVEVA E3D** for further information.*

It should be noted that PML can always access Engineering and Schematics data as AVEVA E3D always operates in 'integrated' mode.

📖 *Please refer to the .NET Customisation Guide, the Software Customisation Guide and the Software Customisation Reference Guide for further information on the use of C# and PML in forming AVEVA E3D 2.1 customisations.*

ⓘ *AVEVA E3D 2.1 utilises Infragistics 15.1. Any C# customisations that utilise Infragistics (via a Design Licence) must use the same Infragistics version. Note that the AVEVA GridControl and ExplorerControl can be used on PML forms without having to have an Infragistics Design licence.*

7.2 General Considerations

The following are general considerations to the migration of customisations to AVEVA E3D 2.1.

7.2.1 Environment Variables

AVEVA E3D and AVEVA PDMS and Hull & Outfitting rely on the use of environment variables for various aspects of configuration. AVEVA E3D has a different set of Environment Variables to PDMS. Most notably for PML developers, PMLLIB is unchanged but PDMSUI has been replaced by PMLUI. There is a compatibility mode so most applications will work using PDMS environment variable names.

Where AVEVA PDMS and Hull & Outfitting environment variables are used in PML code, these should be changed to the equivalent AVEVA E3D environment variable name.

The following table shows equivalent AVEVA PDMS / Hull & Outfitting and AVEVA E3D environment variables.

PDMS Environment Variable	AVEVA E3D™ Environment Variable
PDMSEXE	AVEVA_DESIGN_EXE
PDMSUI	**PMLUI**
PMLLIB	**PMLLIB**
PDMSDFLTS	AVEVA_DESIGN_DFLTS
PDMSPLOTS	AVEVA_DESIGN_PLOTS
PDMSUSER	AVEVA_DESIGN_USER
PDMSWK	AVEVA_DESIGN_WORK
PDMSREPDIR	AVEVA_DESIGN_REP_DIR
PDMSHELPDIR	AVEVA_DESIGN_HELP_DIR
PDMS_INSTALLED_DIR	AVEVA_DESIGN_INSTALLED_DIR
PDMS_MARINE	AVEVA_DESIGN_MARINE
PDMS_ACAD	AVEVA_DESIGN_ACAD
PDMS_ACAD_PATH	AVEVA_DESIGN_ACAD_PATH
PDMS_CONSOLE_WINDOW	AVEVA_DESIGN_CONSOLE_WINDOW
PDMSLOG	AVEVA_DESIGN_LOG
PDMS_DEBUG	AVEVA_DESIGN_DEBUG
PDMSABALOG	AVEVA_DESIGN_ABA_LOG
PDMSABAHYPER	AVEVA_DESIGN_ABA_HYPER
PDMSABAPLOT	AVEVA_DESIGN_ABA_PLOT
PDMSABABATCH	AVEVA_DESIGN_ABA_BATCH
PDMSABAREPORT	AVEVA_DESIGN_ABA_REPORT
PDMSABADATA	AVEVA_DESIGN_ABA_DATA
PDMSLOGOPT	AVEVA_DESIGN_LOG_OPT
PDMSABA	AVEVA_DESIGN_ABA

7.2.2 PMLLIB, PMLUI and CAF_UIC_PATH Path

It is recommended that PMLLIB and PMLUI paths are used to add customised PML functions to AVEVA E3D. This is the same approach as used in AVEVA PDMS and Hull & Outfitting with PMLLIB and PDMSUI paths. A variable (**CAF_UIC_PATH**) is used in AVEVA E3D to specify where the system will find customised User Interface Configuration files.

7.2.3 Core .dlls

The name of many of the AVEVA assemblies (DLLs) have been altered at AVEVA E3D 2.1. In most cases the word CORE has been introduced to replace the former PDMS notation, for example the assembly Aveva.Pdms.Database has been renamed to Aveva.Core.Database.

This change is to align naming with the core codebase that AVEVA E3D 2.1 utilises. Core functionality and supporting code has now been separated to support a number of AVEVA products.

As a consequence, customised C# Visual Studio projects will need to be refactored for the new references.

The USING & NAMESPACE commands used in PML and associated with C# controls will also need to be updated (such as the PMLFILEBROWSER, NETGRIDCONTROL, etc.).

7.3 Forms & Menus

7.3.1 Form Layout

The AVEVA E3D form definition language is compatible with PDMS, but the presentation of form gadgets is different. This can lead to minor problems with the layout of forms moved from AVEVA PDMS and Hull & Outfitting to AVEVA E3D. Most forms will work without modification, but some will require minor adjustments to gadget spacing and alignment.

Form layout of docked forms may need to be changed to account for the new Sliding Forms minimum form width. See section 7.6.4 for further information on PML considerations to Form Layout.

See section 1.3.3 for further information on PML considerations on docked forms.

7.3.2 Sliding Forms

Sliding forms have been introduced at AVEVA E3D 2.1 in the Model and Draw modules to ensure that the graphical canvas does not change as forms are docked and undocked from the sides of the application.

Any use of the CreateDockedWindow method (C#) will continue to work, but the system will only dock the window to the right or the left in the Model & Draw modules.

The Forms & Menus PML syntax to define a docked form is unchanged.

Forms docked to the left and right of the display will appear as Sliding Forms, and these forms have a minimum form width. Ideally, all forms docked to the left or right will be designed to be the same width as other docked forms. The current AVEVA E3D default width is 368 pixels.

In AVEVA E3D there are no bottom or top docked forms. The syntax will not fail, but any forms defined to be docked to the top or bottom will appear as standard floating resizable forms.

7.3.3 Form Title & Icon

In regards to the Sliding Form tab, it is now possible to customise the form title, icon and tooltip. These can be set in the FormsMetaData section of UIC files.

For a specific example of this customisation ability, please refer to the Design.uic for example use.

7.3.4 3D View Form Borders

The option to add borders (rulers and scroll bars) to a 3D View using the user interface has been removed at AVEVA E3D 2.1 but it is still possible to prompt using PML.

The following will display the borders but the statements must be in the order given.

```
!view.statusline = true

!view.borders = true
```

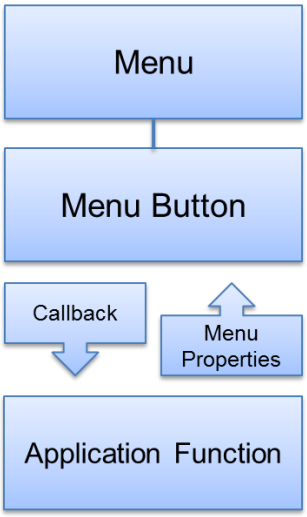
7.4 Modules with Ribbon Menus

AVEVA PDMS and Hull & Outfitting main menu bar and toolbars are not implemented in AVEVA E3D 2.1 Model and Draw modules. All code referencing menu gadgets must be changed to access equivalent PML Command objects.

The menu bar and toolbar has also been removed from AVEVA Administration 1.4 and AVEVA Catalogue 2.1.

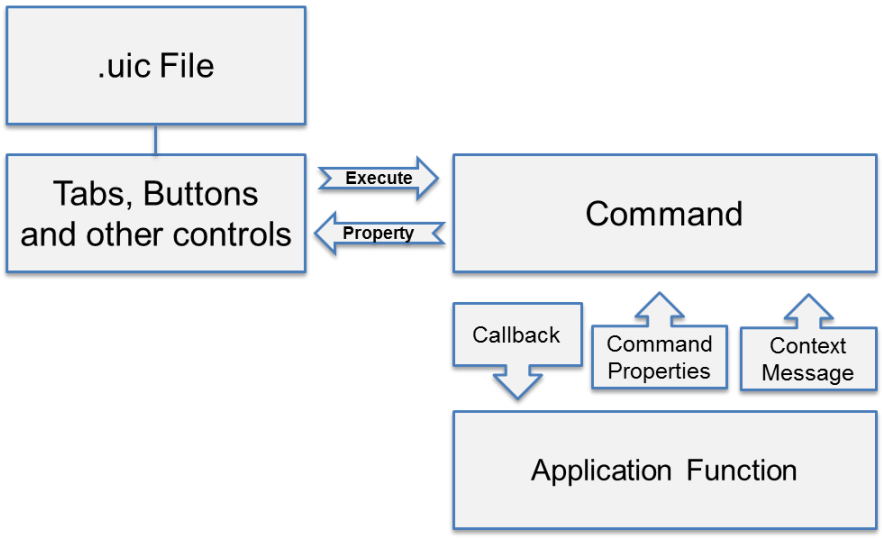
The PML Command objects allow application code written in PML to access properties of gadgets on ribbon menus.

PML Commands are described in the Software Customisation Guide and the Software Customisation Reference Guide.



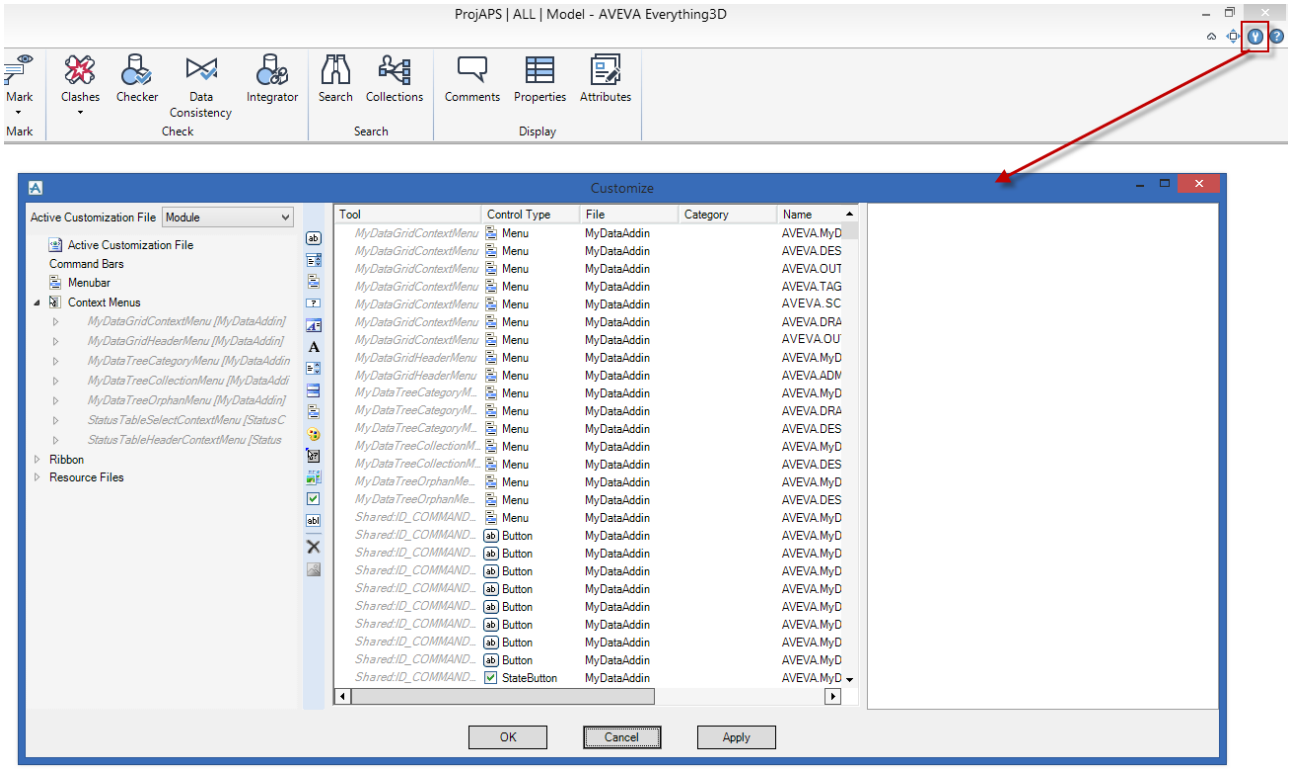
In AVEVA PDMS and Hull & Outfitting, and in AVEVA E3D modules with a main menu bar and toolbars, PML code can query and change properties of menu gadgets directly as illustrated in the diagram.

All access to gadgets on a ribbon menu in AVEVA E3D is via Command objects as illustrated below. User Interface Configuration (UIC) files contain a definition of the content and layout of ribbon menus. Visibility, active state and, where appropriate, content of ribbon tab buttons and controls can be controlled by PML Command Objects, but new gadgets can only be added to ribbon menus in UIC files.



Note that Command Objects can be implemented in PML or in C#.

A user interface customisation tool is provided to modify UIC files. The Customise form is accessed via the button shown below in the Model and Draw modules.



7.4.1 Customising Ribbon Menus with PML

The *Software Customisation Guide* describes how to use PML Command Objects; how to modify ribbon menus; and how to approach common customisation scenarios. It includes sections on:

- How PML functions, PML commands and ribbon tools are linked together
- Replacing a standard product function invoked from a ribbon menu button or other tool with a customised version of that function
- Removing or hiding a standard product function
- Adding a new function to a tab
- Adding a new tab containing buttons for user functions
- Adding a new PML add-in application

7.4.2 PML Add-in files

PML Add-in files are used to customise applications in AVEVA PDMS and Hull & Outfitting. This mechanism also works in the AVEVA E3D MODEL module, but with one major change – the menu definition callback (Object declaration) is ignored.

In AVEVA PDMS and Hull & Outfitting, the PML object specified in the Object declaration is used to define the main menu and toolbars. This is not required in AVEVA E3D™ because ribbon menus are not defined using PML code.

The module startup and application switch callbacks work as they do in AVEVA PDMS and Hull & Outfitting.

A new optional Control declaration has been added to PML add-in files. This allows an object to be defined as the controller for an application or set of utility functions. This can be used to handle module and application

switch callbacks, and to maintain state information about the add-in functions. It may be used to load and register new PML Command objects associated with the add-in functions.

PML Add-ins are described in the Software Customisation Guide.

7.4.3 Other Considerations

Ribbon tooltips cannot be modified by PML code at run-time.

It is possible in AVEVA E3D to use Icons from resource files on ribbon menus and on forms. The addPixmap function has been extended to load Icons from resource files. This does not replace use of png files.

7.5 Applications

Customisation of a number of AVEVA PDMS 12.1.SP4 applications can be migrated to AVEVA E3D with minor modifications. Some deprecated AVEVA PDMS and Hull & Outfitting applications (see list below) will not be found in AVEVA E3D, and some applications have been replaced by a new version. However, the Structural and Supports disciplines have undergone a major redesign at AVEVA E3D 2.1 which means customers are strongly advised to evaluate the need for their own customisations. A key example in Structural and Supports is the replacement of SCTNs with GENSECs.

If customers have modified AVEVA delivered PML then each case will require evaluation as extensive changes to AVEVA applications has taken place at this release.

The following applications are not in the AVEVA E3D 2.1 Model & Draw modules:

- ASL – has been replaced by SLH
- Hangers and Supports (PML code)
- Penetrations utility.
- Assembly Planning.
- Room Design.
- AVEVA Outfitting Supports.
- Equipment Seat Application.
- AutoDraft.

AVEVA E3D has a Piping application which is largely compatible with the PDMS Piping application. PDMS piping application customisations may need modification to be used in AVEVA E3D.

AVEVA E3D has an improved Search and Collections tool. PML Lists are not implemented in AVEVA E3D. A new interface is available to replace PML lists with collections (See PMLLIB\common\listinterface.pmlobj).

Handling of 3D views has changed in AVEVA E3D Model. Some of the functions found on buttons on 3D views in AVEVA PDMS and Hull & Outfitting are located on the 3D View tab in Model.

7.6 AVEVA PDMS Draft & AVEVA Marine Drafting Customisations

Some additional considerations apply.

7.6.1 Accessing DRAW 2D Views

DRAW does not support additional 2D Area View gadgets. Instead DRAW has a single 2D View (commonly referred to as the DRAW 2D canvas) which supports multiple tabs.

The DRAW 2D canvas supports all expected CURSOR interaction commands.

To display a logical element (BACK, SHEE, OVER, SYTM) in a new tab on the DRAW 2D canvas, use the following command:

```
!!runsynonymwithargs(|CALLIBM UELEMSEL <Element Name> |)
```

Notes:

- The INSERT command for dimension points is deprecated and now always adds the new point as the last dimension point. The SORT DIM command should be used as required.
- The HIGHLIGHT command is deprecated and no longer do anything. The ENHANCE command is recommended to be used where Draw elements are to be highlighted through selection.
- Some of the more obscure PLOT and LIEXEC syntax is deprecated and does nothing. Please refer to the *Draw User Manual* for the full PLOT and LIEXEC syntax.

The recommended way of adding user-defined controls to the canvas is by defining a new ribbon tab and adding user-defined controls to that.

7.6.2 Accessing the Draw Browser

In general terms, in order to open a picture owner the following syntax may be used:

```
!!cmsys.executeCommand('AVEVA.Draw.CommandOpenPicture')
```

Alternatively, the following syntax may be used to call the **Administration Browser** (it should be noted that the Browser does not support selection):

```
!!cmsys.executeCommand('AVEVA.Draw.CommandShowPictureBrowser')
```

In the specific context of a selection, for example the selection of a label via the Select Label browser, the browser can be called using:

```
!!cmsys.executeCommand('AVEVA.Draw.CommandLabel')
```

7.6.3 Use of :CDLimits

It should be noted that the use of the :CDLimits UDA has been replaced by the use of the Attribute VWLIMI. It is recommended that this attribute is used in any customisation.

ⓘ *Please note that for existing Drawings VWLimits is set from :CDLimits on first entering the 3D View but is not used thereafter.*

7.6.4 PML Object for Sections

With the introduction of extensive Section functionality in the Draw Canvas and 3D View, the PML Objects SectionPlaneManager and SectionPlane have been deprecated at AVEVA E3D 2.1.

7.6.5 Marine Drafting

In regards to a Marine Drafting specific customisation, it should be noted that the MAR API is not available in AVEVA E3D 2.1.

7.7 Module Switching

AVEVA E3D 2.1 does not include the AVEVA Administration or AVEVA Catalogue products, now in the Manage product family. Is should be noted that if macros are used that switch between modules now in

different product families they will not work. Switching between modules in the same product family (e.g. between Model and Draw) within a macro will continue to work.

ⓘ *Please note that the Monitor Module cannot be switched to from the AVEVA E3D 2.1 Login screen but may be switched to via the **PROJECT** tab when in AVEVA E3D 2.1. Inter-database macros may be run from the **Modify** group of the **MANAGE** tab in Model.*

7.8 Writing PML code to work in both PDMS & AVEVA E3D

Most PML code written for AVEVA PDMS and Hull & Outfitting will work in AVEVA E3D without change. Code that cannot be shared between the two environments can be implemented behind a common interface that decouples the application from product specific functions.

The main areas where differences can occur between AVEVA E3D and AVEVA PDMS and Hull & Outfitting are:

- The interface to main bar menu and tool bar functions
- Changes to environment variables (e.g. PDMSUSER replaced by AVEVA_DESIGN_USER)
- Use of Lists which have been replaced by Collections in AVEVA E3D
- Changes to form layout, including docked forms
- Use of resource files for Icons
- PML code setting AVEVA E3D view properties

7.8.1 The interface to main bar menu and tool bar functions

This is the area where most differences will be found between AVEVA E3D and AVEVA PDMS and Hull & Outfitting PML code.

The method of introducing new functions to ribbon menus in AVEVA E3D is very different to the method used with PML main menus. Both methods are described in the E3D Software Customisation Guide.

In order to maximise sharing of PML code between AVEVA E3D and AVEVA PDMS and Hull & Outfitting, it is necessary to separate functions that access properties of the GUI from application code or data access code. One approach to this is to create PML functions or objects that provide a standard interface to GUI specific code, allowing application code to be written that works with either GUI.

For example, setting the tooltip on a PML menu button is done with PML code, but tooltips on ribbon buttons are set in the uic file. A PML function or method can be implemented that sets the tooltip on a PML menu button, but does nothing in AVEVA E3D. For example,

```
define method .setWallSpecTooltip(!tooltip is STRING)

  if( defined( !!appdesmain.wallSpec ) ) then

    !!appdesmain.wallSpec.settooltip(!tooltip)

  endif

endmethod
```

Similarly, a method or function can be used where the action taken differs between AVEVA E3D and AVEVA PDMS and Hull & Outfitting. In the following example a value is retrieved from a PML gadget in PDMS, and in AVEVA E3D it is retrieved from a command object linked to a field on an AVEVA E3D ribbon.

```
define method .getWallProfileSpecification() is STRING

  if( defined(!!appdesmain.wallSpec) ) then
```

```
    -- PML gadget exists - get its value
    return !!appdesmain.wallSpec.val
  else
    -- get value from E3D Command object
    return !!wallSpecification.value()
  endif
endmethod
```

7.8.2 Changes to environment variables

A table of equivalent AVEVA PDMS and Hull & Outfitting and AVEVA E3D environment variables can be found in section 7.2.1 above. AVEVA E3D has a compatibility mode, so most references to AVEVA PDMS and Hull & Outfitting variables will work in AVEVA E3D, but references to AVEVA E3D variables will not work in PDMS.

One way to allow PML code to work with environment variables in both products is to create a set of customer specific environment variables that can be used in both.

7.8.3 Use of Lists which have been replaced by Collections in AVEVA E3D

The function !!lstCurrentList() returns the members of the current list in AVEVA PDMS and Hull & Outfitting and it returns the members of the current collection in E3D. PML code accessing the PDMS current list directly should be replaced by a call to !!lstCurrentList().

7.8.4 Changes to form layout

Changes to form layout are unlikely to cause problems. However, in cases where form layout has become untidy, it is often possible to define the position and width of gadgets in a way that is acceptable in both products by using relative positioning functions and by setting explicit width and tagwidth properties.

7.8.5 Use of resource files for Icons

In AVEVA E3D it is possible to load icons from resource files and from .png files. Icons cannot be loaded from resource files in PDMS so all icons should be loaded as .png files in code shared by PDMS and AVEVA E3D.

7.8.6 PML code setting view properties

AVEVA E3D view properties are upwards compatible with AVEVA PDMS and Hull & Outfitting 3D views, but AVEVA E3D has view properties that are not available on PDMS views (e.g. shadows, gradient, and anti-alias). When writing shared PML code that modifies view properties, care must be taken to avoid setting properties that are not available in AVEVA PDMS and Hull & Outfitting.

7.8.7 Changes to PML TABSET gadgets

The PML syntax for .visible for a tab on a tabset has been changed so that it is in line with all of the other gadgets, so ".visible = false" will hide a tab. The syntax ".selected = true" will now select a tab.

Therefore on a tabset, the .visible syntax should be changed to .selected.

Appendix A Migration from PDMS 12.0 to 12.1

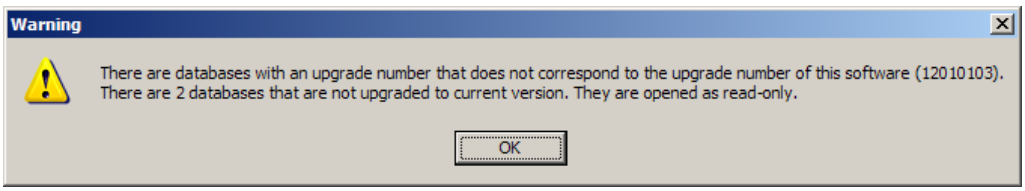
For full details, please refer to the PDMS 12.1 User Bulletin

Upgrade overview

A number of the enhancements made at PDMS 12.1 *require* an upgrade to the database. Each of these individual changes is referred to as a Part Upgrade. In normal use, the whole project will be upgraded to the latest version, though each part upgrade is in general designed to be 'optional'. In other words, the 12.1 software can work with a database that has not been upgraded and will degrade gracefully – that is, it will continue to work, although some new functions may not be available.

This means that it is possible for customers to continue to work with Foreign DBs, which may be shared with 12.0 or earlier projects and which have not been upgraded, included in their projects. An example would be a Corporate Catalogue DB used for 12.0 and multiple projects.

Databases which have not been upgraded will however be read-only. The following warning will appear when opening an MDB from a project that has not been upgraded:



This warning (or similar) indicates that the project needs to be upgraded to the latest version in order to allow write access.

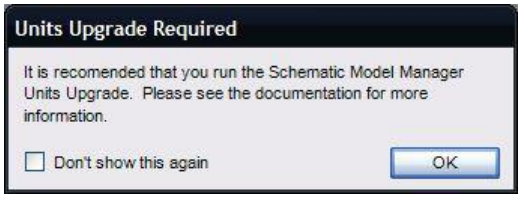
All the Part Upgrades will be run by a DBUPGRADE command, which converts a PDMS 12.0 project to 12.1. This is initiated from Admin using the following commands in the Command Pane (or TTY mode):

```
lock

dbupgrade project to latest

unlock
```

This procedure may also be used with Global projects if some additional precautions are taken. A brief summary is given below – further details are given in the *12.0 to 12.1 Upgrade* manual.

Earlier projects should first be upgraded to PDMS 12.0.

Schematic Model Manager has its own units handling at PDMS 12.0. It also has its own upgrade mechanism, which is separately documented; the software will advise if it is necessary to run this:



DBUpgrade command

The Upgrade procedure is invoked from Admin; it controls the upgrade process and runs each Part Upgrade in the appropriate order. Upgrades relevant to PDMS that are covered by this process are:

- UKEYs (now include database number to avoid duplicates)

- Performance of 'finding' database elements (index by type)
- Module Definitions – new TAGS module (and renamed Marine Drafting module)
- Character handling (Unicode representation for names, text etc.)
- Line widths in Draft (widths of thin, medium and thick lines now stored in system database)

The upgrade process puts an upgrade number in the databases, indicating the level to which they have been upgraded. This makes it easy to detect, on opening, whether a database has or has not been upgraded. This upgrade number will also be used by the Reconfigure process.

Database Version Control

The upgrade version number is used to verify that the versions of the database and the software that accesses them are compatible. During application start-up, databases are checked against the software; access may be restricted according to the following table:

	Database Upgrade Version		
	Pre 12.1	**12.1.1**	**Future (e.g. 12.2)**
Software Version	*Max Open Mode*		
Pre 12.1	**R/W**	**X**	**X**
12.1.1	**R**	**R/W**	**X**
Future (e.g. 12.2)	**R**	**R**	**R/W**

This control ensures that AVEVA software that opens a database is compatible with the contents of that database and thereby prevents accidental data corruption. It also ensures that data intended for use with one software version is not modified by a newer, incompatible software version.

X indicates 'no access'; however, versions earlier than 12.1 do not make this check, so cannot detect a database upgraded to 12.1 or later.

Global

It is recommended that the whole project, excluding Foreign databases, should be upgraded at once. However it is recognised that this needs to be achieved in stages, and different locations and databases can be upgraded independently of each other.

It is not necessary to disable automatic update events. Global can continue to work as normal during the upgrade procedure.

Databases can only be upgraded at their primary location. Project upgrade will ignore secondary databases including databases which are undergoing re-location, as well as extract hierarchies which contain secondary extracts.

All extracts of any database must be upgraded as a group. It is not possible to upgrade a single master or extract independent of the remainder of the extract hierarchy. In a Global project, this requires the extracts to be relocated to the primary location of the master.

In ADMIN, the Upgrade Status query (Q UPGRADE STATUS) provides additional information on secondary databases and those which own secondary extracts.

Global cannot upgrade extract hierarchies which contain working extracts at more than one location, and it is not possible to relocate working extracts. It is recommended that these should be deleted before upgrade

(after data has been flushed). If all working extracts are at a single location, this location should be used to upgrade the master and its extracts.

The Upgrade Process

The upgrade process will be undertaken by System Administrators responsible for the project at all locations. When upgrading multiple projects, many System Administrators will need to co-ordinate. The upgrade process will upgrade one project at a time. Customers will need to give careful consideration to the order of upgrade for the various projects.

The projects will need to be locked for the duration of the upgrade, with all Users out of the system.

The upgrade process will be:

- Ensure all users have exited from project
- Lock project at all locations (upgrade will check for this (see below)
- Disable Automatic update events if required. (Recommended but not essential)
- Expunge all users in the system at the local location
- Flush data from Working extracts – these will not be considered; in Global projects they should be deleted
- Check project using DICE (Integrity Checker)
- [If DICE reveals issues, address them, then re-run DICE]
- Administrator may want to unlock project while DICE issues are being addressed, but will need to exclude all users and Lock project again before final DICE check
- [After clean DICE check]
- Back-up project at all locations
- Temporarily relocate all non-Foreign DBs to their master's Primary location
- Check for No Transient Databases
- Upgrade the project at each location
- **Optionally** Merge Sessions
- **Optionally** Reconfigure for Unicode
- DICE check project
- Relocate extracts back to their original locations
- Perform non-framework upgrades if applicable
- Unlock the project

Locking the Project

The project as a whole cannot be locked, only individual locations; however, it is possible to lock all online locations from the HUB through Global. To do this run the following command from the HUB:

```
LOCK AT <location>
```

The HUB can be locked without the need for a server command using the command:

```
LOCK
```

It is possible to confirm whether locations are locked by evaluating the return result from:

```
QUERY LOCK AT <location>
```

The Hub can also unlock satellite projects:

```
UNLOCK AT <location>)
```

Extract Hierarchies

It should not be necessary to change the extract hierarchy, nor to consolidate data within extract hierarchies. Therefore the System Administrator should not need to FLUSH, ISSUE, DROP data between extracts (working extracts are an exception to this – see below). Nor should they need to delete any extract families to leave only Masters. However all extracts will need to be relocated to a single location, although this does not need to be the HUB.

Working Extracts

Working Extracts cannot be propagated as they are specific to a single location. See note in section 3.2.1.

Offline Locations

Global supports Offline locations without a Global connection. Offline locations do not support distributed Extracts but can support stand-alone extract families.

It will not be possible to co-ordinate the upgrade from another location if Offline locations are used. The Offline satellite databases (and standalone extract families) will need to be upgraded there, and data transferred to the hub in the normal way.

International characters (Unicode)

New text files, including Datal files, will be output by default in UTF-8 with a BOM, unless the CADC_LANG_NEW environment variable is set. Datal files written from earlier versions will not be UTF-8 but will be read according to the CADC_LANG environment variable or Latin-1 if unset. If this is incorrect, this could cause encoding problems causing the file to be misread. For further information, please see the *PDMS 12.1 User Bulletin*.

New databases created at PDMS 12.1 will by default use the Unicode character set for textual attributes and names. However, no upgrade is required for older databases: they will be handled according to the project character set as defined in Admin (PROJECT CHARSET or PROJECT MBCHARSET commands). They will also be converted according to this setting if they are reconfigured so it is important that it is set correctly!

In cases where an extended range of characters is needed, Reconfigure may be used to convert a ‘legacy’ database to a Unicode encoded database.

In the following example legacy DICT databases (used to hold UDA and UDET names) are reconfigured to be Unicode encoded, using Admin 12.1.

FROM DB MASTER/DICT

TO FILE /c:\DICT1 /c:\DICT2

RCFCOPY ALL

RECONFIG SESSIONS

FROM FILE /c:\DICT1 /c:\DICT2

TO DB MASTER/DICT

RECONFIG

Doing it this way means that no deletion and recreation (or copy) is required for the DB, and therefore neither is re-adding to the MDB structures required. Using RECONFIG SESSIONS in the FROM phase of the reconfigure operation will preserve both the sessions and references.

As a summary:

Locally Encoded (Legacy) Databases:

- can be opened for read access in both PDMS 12.1 and earlier versions of PDMS
- can be opened for write access in both PDMS 12.1 and non-Unicode versions of PDMS, but the range of characters which may be used is restricted to the set defined by the project settings
- require that the project settings are correct so that characters can be interpreted correctly
- can be reconfigured to a Unicode encoded database

Unicode Encoded Databases:

- cannot be opened for read or write access in versions of PDMS prior to 12.1
- can store the full range of Unicode characters available in PDMS 12.1

Units of measure

Distance and bore units are handled in much the same way as before and should need no conversion. Other attributes will now be converted to and stored in appropriate units. Details are given in the *PDMS 12.1 User Bulletin*. Where a database has stored all quantities of a dimension in the appropriate unit, the new functions can be used without upgrade.

Attributes other than distances and bores have the UNIT field set for the first time; in previous versions of PDMS, they were until now stored as values with no specified unit, other than by use and convention - they could change from application to application, and project to project. This approach is not compatible with automated conversion so the storage units must be defined. For compatibility, it is possible to set the units to NUMERIC, which will disable Units conversion for that physical dimension. Disabling a specific dimension in this way means that no advantage will be gained from the introduction of that dimension.

Previous versions of Schematic Model Manager had special units support for Angle, Area, Pressure, Temperature, Volume and Weight values that could be included in the ISO 15926 format import file. Units UDAs were provided as mandatory UDAs and were attributes on each Diagram element (SCDIAG). The chosen units for these dimensioned quantities could be set in the Project Options form in Schematic Model Manager. In 12.1, the new units capabilities mean that the special units support in Schematic Model Manager is no longer required. Data imported in 12.1 will be stored in the appropriate units consistent with the data read from the ISO 15926 import file. The upgrade process for projects moving to 12.1 includes a part upgrade for Schematic Model Manager dimensioned data.

Please note that the CATA database elements MSET, MTYP, ATLI, USEC and UDEF are no longer used; they will be removed from the database in due course.

Schematics functions

Projects that are upgraded from PDMS 12.0 or earlier need a suitable module definition in order to use the new Engineering functions in the new Tags product (see above).

The data will need some reconfiguring:

- Integrator links world (CYMWRL) has been moved to Reference database
- Shape upgrades in Diagrams – automatic when opening a diagram in write mode
- Systems moved to Reference Design database

Appendix B Details of Sample Project Changes

The following tables highlight the significant changes made to sample projects between AVEVA PDMS and Hull & Outfitting 12.1.SP4 and AVEVA E3D 2.1.

ⓘ *Please note that further improvements will be made to the sample projects in subsequent releases. Details of these changes will be given in the accompanying release letters.*

Major project differences at AVEVA E3D 2.1 include:

- The main catalogue sample project (formerly MAS) is now called ACP (AVEVA Catalogue Project).
- The main sample data projects (formerly SAM and MAR) are now called APS (AVEVA Plant Sample) and AMS (AVEVA Marine Sample).
- Reference numbers have been preserved in the forming of the ACP project from the MAS project. This will ensure that any Project references are maintained on migration to use the ACP project.
- Sample drawings are in the new Draw format and Draw project libraries have been extended to support new Draw capabilities.
- The catalogue has been enhanced for structural, supports and bolt holes
- Additional data has been added to support the use and demonstration of Supports, Structural and Laser data.

The AVEVA sample projects are regularly revised. Please check the AVEVA Support Site (AVEVA Everything3D™ Fix Release History) frequently for updates.

ACP Project

Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
SI 39911	COCO Table in New Database	●	●
DFN P-45252	Extra HVAC Joint sizes	●	●
DFN P-45442	Update CCTA with COCDES description	●	●
DFN P-45528	UDAs for AI and AE Integration	●	●
TFS 67925	MASKED_PROJECTS' evar added to evars.bat	●	●
DFN P-45524	UDAs and Plines for AVEVA OpenSteel Interface	●	●
SI 41769	AISC rectangular tube depth and width correction	●	●
AVEVA	Flat Bar OBST value changed from 0 to 2	●	●
AVEVA	Add default mdb /ALL to supplied ACP project	●	●
AVEVA	Legrand Cable Tray Data	●	●
AVEVA	HVAC Catalogue element rename to satisfy MC1174	●	●
AVEVA	Version Number in Project Number (not Description)	●	●
AVEVA	Rem db MASTER/UNIT from /ALL mdb	●	●
AVEVA	Add 2 additional MASTER dbs to mdb /ALL	●	●
AVEVA	Relief Valve Update	●	●
AVEVA	Bolt holes for ANSI, DIN and BS flanges	●	●

Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
AVEVA	Update to SLH catalogue data	●	●
TFS 79366	MDS Naming Files Update	●	●
AVEVA	Incorrect elbos/tee in /AAEC and /AATC	●	●
AVEVA	/TEE-ELBO Para out of range (6) correction	●	●
AVEVA	Updated Bolt holes for ANSI, DIN and BS flanges	●	●
AVEVA	Structural joint - Standard_Clearance_Cutback	●	●
AVEVA	COCO Table Update	●	●
AVEVA	Add MDS Default files to ACPDFLTS folder	●	●
TFS 78338	Set PSIWEI UDA UUTYPE to MASS	●	●
AVEVA	PPROP modifications to AVEVAHVAC CATA	●	●
TFS 81668	PTYP DIST on all SLH profile for Imperial	●	●
TFS 81779	Update of MDS Cross SKEY	●	●
TFS 81225	E3D Update to Pipe Data Table for Wall Thickness	●	●
TFS 81680	Parameter Error in catalogue category /ABCF360	●	●
SI 51229	Bolting Catalogue Updates	●	●
TFS 84190	Extra COCO for screwed fittings	●	●
TFS 78548	Filter out SDNF plines	●	●
AVEVA	PDMSPIPE.COCO requires Purpose set to PIPE	●	●
AVEVA	COCO Modifications	●	●
TFS 79366	MDS Naming Files Update	●	●
AVEVA	SDNF UDA /SDNF-TYPE	●	●
AVEVA	SLH Catalogue Data Update	●	●
TFS 87563	/TT/DRA/MAS/BACKS/MET Revision Text	●	●
TFS 87847	Change Rung Ladder Hoops to ref MASTER/SLHCATA	●	●
AVEVA	Adjustment to mdb /ALL structure	●	●
TFS 87786	Cabling - Legrand & Cablofil catalogue corrections	●	●
TFS 87847 / TFS 88566	Re-structure Structural Dbs + hide/remove ASL dbs	●	●
AVEVA	MDS Forward port	●	●
AVEVA	Marine Endcut Data	●	●
TFS 69684	UDA with ALLP can refer to TUBI	●	●
AVEVA	Legrand 'Salamandre' Cable Trunking Range	●	●
TFS 64974	HVAC TUBI to use LBOR of PREV	●	●
TFS 91807	Integration Status addition	●	●
AVEVA	UDA modification to resolve compile warnings	●	●
AVEVA	Hole Management for cable tray and floor fittings	●	●
TFS 82253	Globe Valve /AAVHBCR correction	●	●
AVEVA	Pipe Tapping SPEC additions to /SP/DR07C	●	●
TFS 95202	Lexicon update for PBS	●	●
TFS 95040	Correction to MDS CATA DATA/DEFAULTS Conflict	●	●
TFS 94705	MDS New cata data in MDS/APPDEFAULTS	●	●
TFS 95168	Standalone fixings to support 'Create Fixings' form	●	●
TFS 95244	CATA Data for Pipe Fabrication	●	●

Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
AVEVA	MDS Compensation Plate SPREF reset (/MDS/CP-01)	●	●
TFS 97389	Rename UDA /Type to /PumpType	●	●
TFS 97414	Update SP/DR07C SHOP Flag	●	●
TFS 95636	TAGS Datasheet UDA modification	●	●
AVEVA	UDA modifications to remove validation errors	●	●
TFS 97378	COUP Additions to SPWL plus Weights	●	●
TFS 97389	Rename UDNAME TYPE to PUMPTYPE	●	●
AVEVA	Loff Selector added to spec /SP/DR07C	●	●
AVEVA	Reset Spref on Standalone LUG fixings	●	●
AVEVA	UDA modifications to resolve Integrator issue	●	●
TFS 99271	Remove obst value from flange bolt holes	●	●
TFS 100838	Restore Session 2 to db MASTER/DICT	●	●
TFS 99496	Fix to /SP/DR07C SHOP Question	●	●
TFS 105913	Major OGLAEND and CABL Update with Part Worlds	●	●
TFS 102550	MDS Unique Naming turned off after install	●	●
TFS 105021	A3B Spec Update with Spectacle Plates	●	●
TFS 104741	Correct MDS templates for FT30 standards (BS and AISC)	●	●
TFS 105089 / SI 60012	Sample data for Cable Enhancements (E3D 1.1)	●	●
AVEVA	Pipe Tapping Spec for E3D	●	●
TFS 110887	Remove DB MDU/CATA7360-OLD from /ALL mdb	●	●
TFS 111785	Hole Management Description Correction	●	●
AVEVA	E3D2 Struc CATA dbs + top level elements		●
TFS 117910	Integrator UDAs	●	●
TFS 121260	Change HVAC UDA value from Bore to Length	●	●
TFS 121587	Flat Oval PZ axis settings	●	●
AVEVA	SKEY Data for Legrand 'Salamandre' Cable Trunking	●	●
TFS 101960	Mod to PTCDIR for MDS PTSE-AT09-P13 & P14	●	●
AVEVA	Add DB Descriptions to supplied dbs		●
TFS 118828	Add FLTH prop to DIN valves	●	●
TFS 129724	/AATA200-P3-4 & /DATA200-P3-4 OFTOL addition		●
TFS 139227	Spec Update to /A3B Spectacle Plates PCOM50	●	●
AVEVA	CATR and DETR Fix to Support Data (MDS)		●
AVEVA	Initiate Supports Data major upgrade		●
AVEVA	Add MET Marine Backing Sheets (Master)		●
TFS 129316	Extend VVALs for STRUCL on GENSECs and PANELs		●
TFS 146365	DESPAR correction to Channel Profiles	●	●
TFS 135915	Rename Pipesketch UDA world		●
AVEVA	Plot Style Data in PSTYTB		●
AVEVA	Oglaend FOE Specs		●

Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
SI 76519 / TFS 158969	Oglaend RZE Specs		●
AVEVA	Steelwork Template DESI DB		●
AVEVA	Oglaend FTE Specs		●
AVEVA	Steel Profile Pline Mods for Supports		●
AVEVA	ABSI UDAs (AVEVA Bocad Steel Interface)		●
AVEVA	Add Pvifilter to Plines of PFC, PFI, & PLTG Gtypes		●
AVEVA	Oglaend FOE-FTE Specs		●
AVEVA	Steel Profile PLINE mod additions		●
AVEVA	Commenting UDAs with set REFNO and UKEY		●
AVEVA	Angle PLINE Additions		●
AVEVA	Empty and unnamed UWRL deleted		●
AVEVA	Miscellaneous E3D2 Steel Catalogue changes		●
AVEVA	Remove rogue SPWL in DB MASTER/STL_JOINTS_FITTS		●
AVEVA	Steelwork Profile Joints & Fittings Catalogue		●
TFS 164182	Delete empty Status definition		●
AVEVA	Structural Catalogue TFI Profile Model Changes		●
SI 37182 / TFS 69334	Material TXT name changes in MASTER/PIPECATA DB		●
AVEVA	Un-hide UDA/MDS-Uda-MDSPipeMat		●
TFS 177908	Include MDU/CATA in MDB /ALL from APS as Foreign		●
TFS 154991	Elliptical holes catalogue data		●
TFS 178243	Wall Spec MATREF Correction		●
AVEVA	Corrections to /OGLAEND-SPB-RF SPEC		●
TFS 146586	Unset P2 for FLAN elements & PTREF additions		●
AVEVA	Structural Catalogue Update		●
AVEVA	Finalise Supports Data major upgrade (Started with MC 1461)		●
TFS 164644	Re-order TMPLs DPSE + DDSE in /SLH_Template_World		●
AVEVA	Steelwork Cata PANE/FITT modifications		●
AVEVA	Hide Panel fittings with no geometry / design para		●
AVEVA	Further Steelwork Cata PANE/FITT modifications		●
AVEVA	Ring Plate and Bracing Modification		●
AVEVA	Remove PPM (Production Prep Model) Panel Fittings		●
TFS 146586	Unset P2 for FLAN elements & PTREF additions		●
AVEVA	Fix to OLET PTSET /BBTY5XT-P3-2	●	●
AVEVA	Add MDS and related projects into Standard Sample Data	●	●
AVEVA	Version Number format changed to suit product	●	●
AVEVA	Major Sample Data Overhaul for E3D 1.1 (Create APS+ACP)	●	●
AVEVA	Create DRAW Module Definition	●	●

Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
TFS 80631	Piping Catalogue and Piping Design Sample Data updates	●	●
AVEVA	Project Description PDF files	●	●
TFS 81139	E3D Bolt Weight Update including STD ISO opt file	●	●
AVEVA	Relocate MDS dbs	●	●
AVEVA	Move MDU/CATA db from ACP to APS	●	●
AVEVA	Apply Optional Upgrade to project dbs	●	●
TFS 142894	Status data for subset of pipes		●
AVEVA	Removal of xxxMAR Folder		●
TFS 168041	BS JOIST PLINES need CCON (ANY)		●
TFS 162761	Admin Team and User for Structures UI		●
TFS 68017	ACP Supports PR SCOM parameter reorder		●
TFS 185450	ACP CATE /F1_SQR_PFI_8H Joint 6 holes not 8		●
TFS 185610	ACP Joint TMPL and Joint SPCO TMPR/efs change		●

APS Project

Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
AVEVA	AVEVA OpenSteel Interface MDB for Sample Project	●	●
AVEVA	MDS DESP Correction in /DESISTDS and /DESITMPL-PIHASA	●	●
AVEVA	Transform on DRAFT data to enable DRAW	●	●
AVEVA	Sheet and reference updates	●	●
AVEVA	Add GPWL GROUPs	●	●
AVEVA	Additional Sheet and Ref updates	●	●
AVEVA	Relief Valve Correction - VALV is now INST	●	●
TFS 78211	Fabrication Machine Additions	●	●
AVEVA	SCTN Tidy Nodes/Joints/Chk Conn Refs/Assign MATREF	●	●
TFS 81362	Design Checker Rules	●	●
SI 50220	Piping Update AREA01	●	●
SI 50292 / TFS 80262	2D Data for E3D 1.1	●	●
TFS 77632	Add db PPROJECT/SYSTEMS	●	●
TFS 79012	Add ASSOC/ASSOC and new db PPROJECT/HMLINKS	●	●
AVEVA	Fix to DRAW SHEET /DRWG-PIPING-AREA01/S1	●	●
AVEVA	Modifications to workshop portal frame	●	●
TFS 80350	2 x SECT elements in MDS/MDSAPPDEFAULTS db	●	●
TFS 78047	Add SLHADMIN Team	●	●
AVEVA	Model update for MDS UDA: TREF	●	●
TFS 81229	Correct 'Name too long' error in CWAY definitions group	●	●
TFS 81519	Layout Spec Update	●	●
TFS 81605	Add Valve Numbers	●	●

Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
AVEVA	Set SCM COCO for /SPRINKHEAD-15	●	●
AVEVA	APP Tutorial Data Removal / Rename sample mdb to /ALL	●	●
AVEVA	APP Grid Systems	●	●
AVEVA	DRAW Library Data	●	●
AVEVA	Area02 Steelwork Plinths L10 and L11	●	●
SI 51337	AREA01 Piping Sample Data	●	●
SI 51340	APP Updates E3D Schematic Data	●	●
SI 51337	Drawing repairs	●	●
AVEVA	Remove Training Refs from Example Sheets	●	●
SI 51337	AREA01 Piping Sample Data - Correct COCOs/ Connections	●	●
AVEVA	Add Functions to DRAW elements	●	●
AVEVA	Area02 - Connection Modifications	●	●
AVEVA	Area02 (Workshop) Cref recon on FITT elements	●	●
AVEVA	Addition of DESIGN-Pipe MTO report	●	●
AVEVA	Design Data changes and reports	●	●
TFS 85472	Valve /V150 Leave Tube	●	●
TFS 85183	Diagram SVG files	●	●
TFS 84727	Tagrule IDLN reset	●	●
AVEVA	LIBYs, Drawings and additional PSPOOL data	●	●
TFS 85981	Change desc of the APPLDW /DesignChecker/Rules	●	●
AVEVA	GTYP additions for Schematic Elements	●	●
TFS 85980	Reset HVAC Href Connections	●	●
AVEVA	Add Imperial MDB /ALLIMP	●	●
AVEVA	Isodraft option files to display pdf plotfile	●	●
AVEVA	Drawing Libys - Set Mstyid to 0 for all liby MRKP	●	●
AVEVA	Multiple Piping mods - Areas 02 and 03	●	●
AVEVA	Update to the SLH catalogue	●	●
AVEVA	Re-modeled SLH in Area 1	●	●
AVEVA	Cable Corrections	●	●
AVEVA	Add new termination to SLH assembly	●	●
AVEVA	SLH re-modeled SLH in Area 2	●	●
AVEVA	Structural Joints update (All Areas)	●	●
AVEVA	Extend status control data model	●	●
AVEVA	Apply status control values to Model elements	●	●
TFS 85979	Include db SDNF/DICTSDNF in the ALL MDB.	●	●
AVEVA	Reset SHEET TITL attribute on template drawings	●	●
AVEVA	Remove /TT/DRA/PRJ/TMP/DEMO	●	●
AVEVA	Re-set MDS-ABA template idli refs	●	●
AVEVA	Reset backing sheet on /APS-1001/1 to A1	●	●
AVEVA	Idli fix for Tags	●	●
AVEVA	SLH RLADDR DDDFAULT change	●	●
AVEVA	Additional APS Libys - Set Mstyid to 0 for liby MRKP	●	●

Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
TFS 65856 / 84913	Add New Air Cooler TMPL - AVEVA Std Equi	●	●
AVEVA	Reset MDS References	●	●
AVEVA	Piping Re-connections	●	●
AVEVA	SLH data to refer to MASTER/SLHCATA	●	●
AVEVA	Set MDSYSF attribute for HVAC Systems	●	●
TFS 87689	Pipe Tasks & Tasks for Spools for default Pipe	●	●
AVEVA	Re-reference for supports dbs	●	●
TFS 69993	Create HVAC defaults for min fill length	●	●
TFS 87689	Resolve DATACON errors	●	●
TFS 66403	Update :MDSRange ATTR for MDS/DESITMPL-BS STRU	●	●
AVEVA	Set HREF for Branch trunnions	●	●
SI 32916 / TFS 61515	Resolve D880 error for Circular branch on Circular main	●	●
TFS 92615	Pipe Fabrication Data modifications	●	●
TFS 76765	Populating the PBOR3 for fabricated OLET	●	●
TFS 93254	New version of the DBSCATALOGUE file for DFLTS	●	●
TFS 95636	TAGS Datasheets	●	●
TFS 95217	Detail plot file for non-standard-branch connections	●	●
TFS 95339 / TFS 95599	Unset PURP on Pipe Fabrication Data	●	●
TFS 95617	DDATA Setting for Pipe Fabrication	●	●
TFS 96617	Data for Pipe Fabrication fix to 94898	●	●
TFS 95636	Replacement Datasheet Templates	●	●
TFS 96919	Pipe Fabrication fix to 96856 Iso/Sketch types	●	●
TFS 95482	BEND End Connection Correction	●	●
TFS 97455	Replacement Datasheet Settings XML file	●	●
TFS 95482	BEND End Connection Correction BWD should be TUB	●	●
AVEVA	Equipment associations update	●	●
TFS 101110	Add Tube on drain for /80-B-14	●	●
AVEVA	Add sample MEI Data	●	●
TFS 64297	Styles & Representation Rulesets for Piping + Insulation	●	●
TFS 110330	NSBC and sloping pipes		●
TFS 89552	Additional HVAC Sketch backing sheet column 'ROTATE'	●	●
TFS 107368 / SI 60593	Add DESC to Area 03 Skids for GPSET use	●	●
TFS 113588	Equipment C1101 Nozzle Elevation Change	●	●
TFS 112167	Structural PBS Examples		●
TFS 114109 / SI 62723	Comment Database	●	●
TFS 110168	Sample Sheet SLABs set to LVIS True	●	●
TFS 111478	Spectacle blind corrections for schematic data	●	●

Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
AVEVA	Add ENGI dbs to /ALL mdb	●	●
AVEVA	Equi DRWG IDLN fix C1101-SKIRT & COLM-SKIRT	●	●
TFS 117945 /SI 64209	Team Membership for DB ASSOC/ASSOC	●	●
TFS 118930	Integrator Redesign data		●
TFS 85183 / TFS 86327	Diagram File realignment for Cable and HVAC	●	●
TFS 122573	Pipe Fabrication Sample Data		●
TFS 57069	CU Config Default Mapping Files	●	●
TFS 123714	PIPER & EQUIPMAN R/W access to Links and Groups	●	●
AVEVA	Reset Integrator Links	●	●
TFS 120297	Isometric ADP MDS Symbol & Label	●	●
TFS 124375	Project Liby update for Pipe Fabrication	●	●
TFS 126553	Ex of User Defined Fitt - Strt Bran Conn off End of Main	●	●
AVEVA	Lib Update Structural DRWGs with REFGRIDs		●
AVEVA	Renumber DBNOs for Imperial DBs	●	●
TFS 136671	Norsok sample datasheets and data	●	●
TFS 95675	Convert SCTN to GENSEC		●
AVEVA	Flexible Explorer Structural PBS changes		●
TFS139949	Commenting Database Additions (XPRD DB)		●
TFS139953	Lexicon Data for Cross Product Databases (DICT)		●
TFS 95675	Convert Refs to new Cata Profiles for GENSECs		●
TFS 129316	Replace GRDSYS elements with GRDREF elements		●
AVEVA	Unset Badrefs on Area03 Zone and two pipes	●	●
TFS 129316	Structural FRMW GRDREF setting and name changes		●
TFS 129316	Set GRDAXE on Grid faces & elevations GRIDX GRIDY GRIDZ		●
TFS 112167	Structural PBS USDA - Usysty correction to STRUCL		●
AVEVA	Add REFGRDS to GPSET Groups		●
AVEVA	Correction to FRMW names		●
AVEVA	CABLE, HAVC and PIPING Diagrams Update	●	●
TFS 146534	Area01 /100-B-1A Branch Href reset		●
AVEVA	Revision Control Config for Diagrams	●	●
TFS 139099	Sample Bolt Reports	●	●
TFS 146462	Set STRUCLASS on structural elements		●
TFS 146534	Area01 /100-B-1A Branch Href reset	●	●
AVEVA	Addition of /SCHEMATIC and /ENGINEERING mdbs	●	●
TFS 150749	Add SAMPLE/LINKDOCS DB to MDBs		●
AVEVA	Multi-sloping Pipe for Area 03		●
AVEVA	Single SCSTEN removal		●
AVEVA	Name unnamed REFGLN elements		●
TFS 157458	IDLN setting removal for DRWG and SHEE		●
TFS 156290	Major Sample Drawings Update to reflect REFGRD		●
AVEVA	Add /PLANT_GRID REFGRDS to GPSET Groups		●

Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
AVEVA	Visual Style Addition (AVEVA-BLACK & AVEVA-DIM)		●
TFS 159606	Reorder Pipe /150-B-6 in Hierarchy		●
TFS 101075	Break-In (Tie-In) Assemblies for Laser Data		●
AVEVA	Report Template for Pipe Spool List		●
TFS 164256	Change STEPID on INFO1 of GRIDWL		●
TFS 164886	ISO Default option files are missing in E3D2.1 Test12		●
TFS 164920	PPROJECT/DICT Access change to be Multiwrite		●
TFS 164257	Grid Elevation Modifications		●
AVEVA	Library Automatic Grid Annotation Modify SYTM		●
AVEVA	Set :CDLIMITS on View /APS-1000/1/V2		●
AVEVA	Re-clad Area02 Workshop with BPANEL		●
TFS 168312	Remove SUPPORTMAN from the Design TEAMs		●
TFS 143575	Pipe Fabrication Templates and Backing Sheets		●
AVEVA	DB ADMIN/NSEQ addition to MDB /ALL		●
SI 81584 / TFS 173810	Sample Project Update to Users and Teams		●
SI 81414 / TFS 173360	Delete APPLDW and FMWLD in DB ADMIN/REFDATA		●
AVEVA	Users & Teams Update to Project Document .PDF files		●
AVEVA	Re-Instate 2 MDS UDAs		●
TFS 176544	PPROJECT/MACHINE data moved to ADMIN/REFDATA		●
TFS 164920	Change all local DICT DBs to Multiwrite Access		●
AVEVA	Re-apply status control values		●
AVEVA	Area02 Workshop CWAY BPANEL Hole		●
TFS 173613	TE/US DRAFTADMIN removed, DRAWADMIN added.		●
AVEVA	Reset Support :MDSConn / :MDSAttaRef Area 03		●
AVEVA	Add Trap Weights: Reset GPART Steam Trap Weights		●
AVEVA	Supports Sample Design Data		●
AVEVA	Unset Invalid Refs		●
AVEVA	Remove Spurious SYLB from DB MDS/DRAFT		●
AVEVA	Structural Joint and Fitting (Design) update		●
AVEVA	/PLINTH_PUMP_KIOSK_01 Addition		●
TFS 170771	Isometric ADP MDS Supports Drawing Update		●
AVEVA	Rework for Area02 AHU to remove Zone within Zone		●
AVEVA	New format Project Description document		●
TFS 183047	Correction to spelling error in APPLDATA Function		●
AVEVA	Rework Area 02 (B01) HVAC Bran		●
AVEVA	Reinstate DB STRUC/TEMPLATE in APS MDBs		●
AVEVA	HVAC AISC Support Specials Template Modification		●
AVEVA	Support Template Sample Data Updates		●
AVEVA	Project Library AVEVA Plant Rulers		●
TFS 170773/95 /96/80	DRAW DRWG Update and Associated LIBYs		●

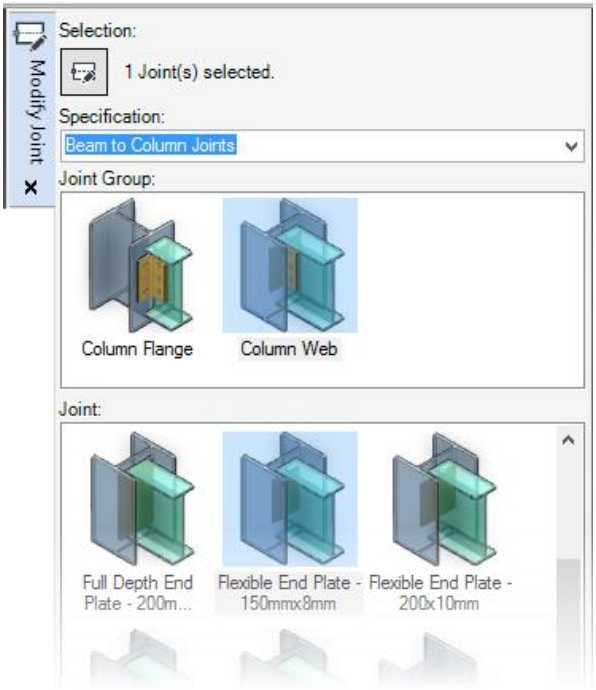
Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
AVEVA	Add MDS and related projects into Standard Sample Data	●	●
AVEVA	Version Number format changed to suit product	●	●
AVEVA	Major Sample Data Overhaul for E3D 1.1 (Create APS+ACP)	●	●
AVEVA	Create DRAW Module Definition	●	●
TFS 80631	Piping Catalogue and Piping Design Sample Data updates	●	●
AVEVA	Project Description PDF files	●	●
TFS 81139	E3D Bolt Weight Update including STD ISO opt file	●	●
AVEVA	Relocate MDS dbs	●	●
AVEVA	Move MDU/CATA db from ACP to APS	●	●
AVEVA	Apply Optional Upgrade to project dbs	●	●
TFS 142894	Status data for subset of pipes		●
AVEVA	Removal of xxxMAR Folder		●
TFS 168041	BS JOIST PLINES need CCON (ANY)		●
SI 151262	Linkdoc XPRD dbs		●
TFS 158073	VSI (View Section Indicator) DRAW Libraries		●
TFS 164854	Set Isometric preview to PDF		●
AVEVA	Support Reports in DFLTS/DATA		●
TFS 180161	Supports Symbol File added to ISO OPT Files		●
TFS 181499	Commenting Report Templates		●
TFS 162761	Admin Team and User for Structures UI		●
TFS 182706	APS Support Template Sample Data Updates Rev2		●
TFS 184896	APS Rebuild HVAC DRAW sheets		●

AMS Project

Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
AVEVA	AVEVA Marine Sample (Create AMS project)		●
AVEVA	Path correction in d065 file		●
AVEVA	Add AMSDRG evar to evarsAvevaMarineSample.bat		●
TFS 163736	Change MPROJECT/LINKDOCS db to Acc Multiwrite		●
TFS 164870	Multiple Updates to Project		●
AVEVA	SBD_E3D_DRAW_TRANSFORM_SETTINGS Addition		●
AVEVA	APPLDW re-reference to AMS not MTP		●
AVEVA	dra-gen-system file addition to AMSDFLTS		●
AVEVA	Add Steelwork CATA DBs to all MDBs		●
AVEVA	SUPPORTS MDBs modification		●
AVEVA	/ALL_ADMIN MDB modification to fix spatial maps		●

Origin Ref.	Project Change Description	AVEVA E3D 1.1 (1.1.0.7)	AVEVA E3D 2.1 (2.1.0.0)
AVEVA	Multiple Updates and Corrections		●
TFS 176513	Power_system diagram released for 3D		●
TFS 176542	Change DB MPROJECT/DICT to Multiwrite Access		●
TFS 176621	Replace AvevaNetExportConfigAddin.xml AMSDFLTS		●
AVEVA	Multiple Updates and Corrections		●
AVEVA	Project Description document updated to Rev 3		●
AVEVA	New format Project Description document		●
TFS 168886	BSHEE Update and ILP Defect Text Enable		●
TFS 183081	BSHEE Versioning		●
SI 151262	Linkdoc XPRD dbs		●
TFS 158073	VSI (View Section Indicator) DRAW Libraries		●
TFS 164854	Set Isometric preview to PDF		●
AVEVA	Support Reports in DFLTS/DATA		●
TFS 180161	Supports Symbol File added to ISO OPT Files		●
TFS 181499	Commenting Report Templates		●
TFS 162761	Admin Team and User for Structures UI		●
TFS 185203	AMS Master reconfigure to remove compatibility issue		●

Appendix C Forming Structural Joint & Fitting Images



The use of the AVEVA E3D 2.1 structural application and workflows therein are greatly aided by the available images (.png) for joints and fittings. An important consideration is the inclusion of user-defined images of Project Joints and Fittings to complement those already found in the structural application.

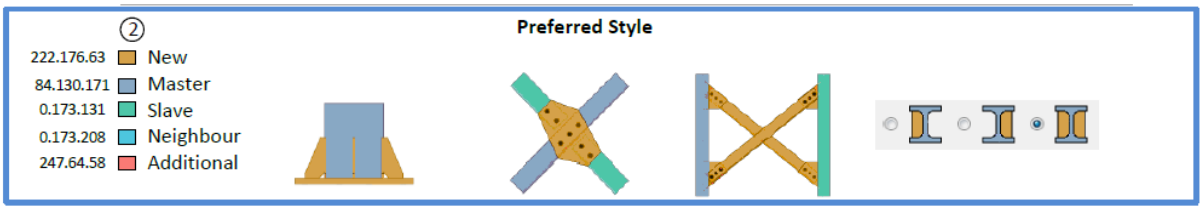
Refer to Section 4.1.4 for details on the inclusion of the Image(s) in the application via the resource file.

The following sections explain the recommended process to form images for use in the user interface of the Structural application.

It is recommended that customers add something specific to their images that make them distinct from those supplied by AVEVA.

Colours

The colours to be used for the joint and fitting images in AVEVA E3D (and AVEVA Bocad) have been given the following RGB values:



In E3D 2.1 only three of the colours are required and have the following designations:

- Owning Profile: **Master** colour RGB 84.130.171
- Attached Profile: **Slave** colour RGB 0.173.131
- Joint or Fitting Geometry: **New** colour RGB 222.176.63

*These three colours do not correspond to the standard AVEVA 255 colour palette and, therefore, must be defined in the file **pdms-colours** located in a standard E3D 2.1 installation at the following location: **.C:\Users\Public\Documents\AVEVA\Everything3D\Data2.10\DFLTS***

The colours may be defined in the file as follows:

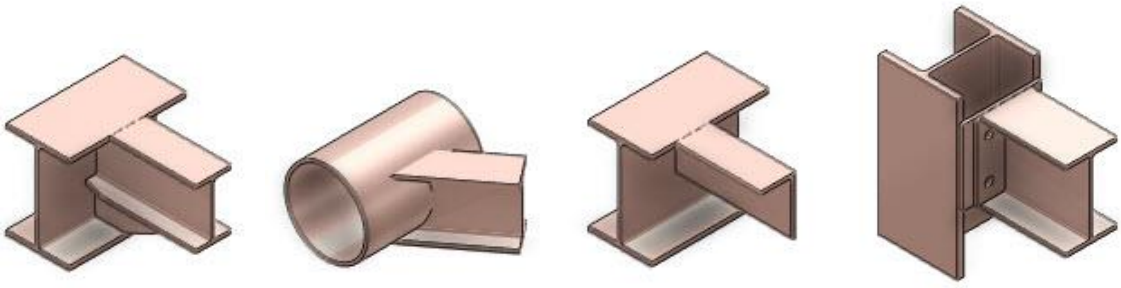
```
Colour Control File

# If the 50 standard PDMS colours are not required,
# uncomment the following line.
HIDE_STANDARD_COLOURS

# User defined colours are entered as <Colour name> <Colour number>
# Where <Colour name> is a valid system colour and
#       <Colour number> is in the range 1-128

# Edit the list below or cut & paste example colours from %AVEVA_DESIGN_DFLTS%/des-colours
# Note you can use RGB mix, such as:
# RGB60,40,20   100

# Uncomment and edit as required
# .png image colours
# Joint/Fitting Geometry (New)
RGB222,176,63 50
# Owning (Master)
RGB84,130,171 51
# Attached (Slave)
RGB0,173,131 52

```

The three colours have been designated as colours **50**, **51** and **52**.

Setting up a Joint in Model

An image is required of every joint variation in the catalogue as well as a 'generic' image for selecting the joint type (3rd level SELE in the SPEC).

The joint needs to be setup in Model using appropriately sized profiles, i.e. smaller rather than larger, to get as clear an image as possible in the restricted pixel size (85 x 85 pixels). The length of the owning and attached members should be as short as possible to give a good proportion to the joint.



ⓘ *In the examples above the owning member is 250mm long with an owning profile size around 200mm deep, although these may be adjusted to suit.*

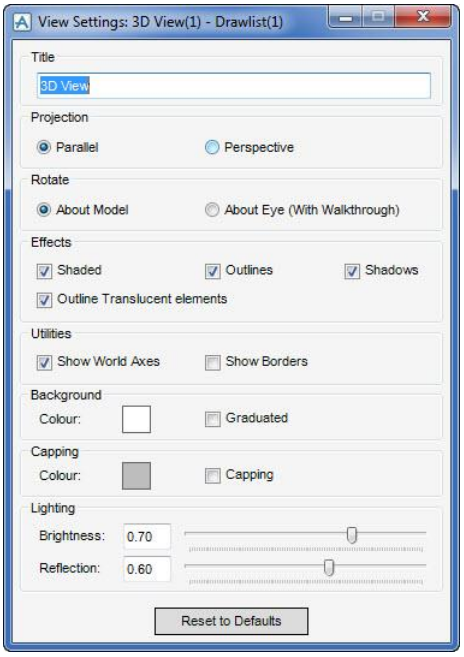
ⓘ *The owning member, attached member and joint geometry should be the only elements in the 3D View in order to eliminate any possibility of shadows from elements not involved in the joint.*

Setting up a Section Fitting in Model

Setting up Section Fittings in Model is similar to setting up joints, i.e. appropriate size profiles should be used to get the clearest image in the restricted pixel size (85 x 85 pixels). Consideration should also be given to the relative size of the profile compared to the fitting, i.e. a large padeye on a small beam would not be correct.

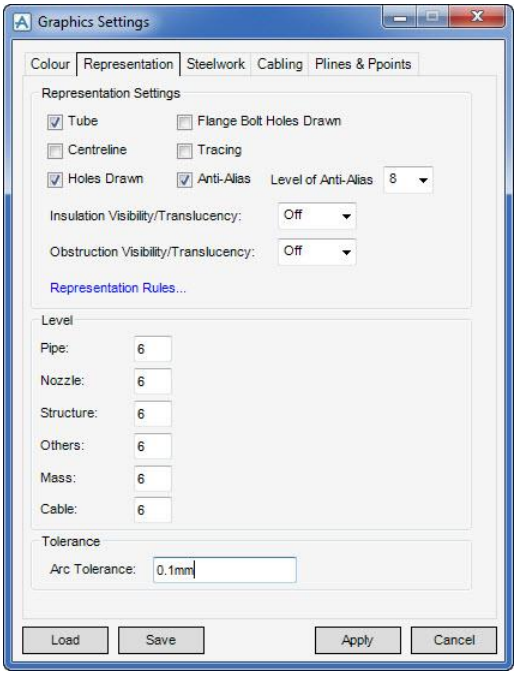
Setting up the 3D View

Remove all elements from the 3D View and add back the owing/attached members to be used for the required joint/fitting and apply the joint fitting Spref if not already done so.



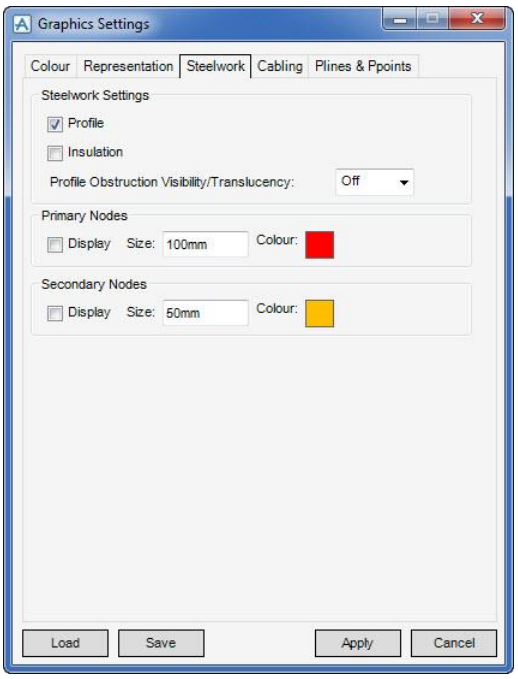
On the **3D VIEW** tab in the **Settings** group click the **Current View** button to display the **View Settings** form.

- In the **Effects** frame make sure that all four checkboxes are checked.
- In the **Background** frame change the **Colour** to white and uncheck the **Graduated** checkbox.
- In the **Lighting** frame change the **Reflection** value to **0.60** using the slider.



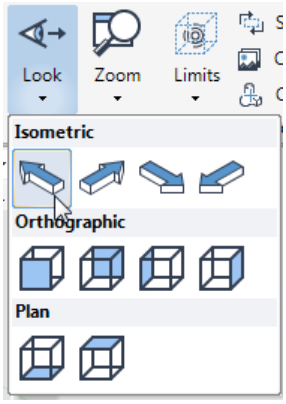
On the **3D VIEW** tab in the **Settings** group click the **Graphics** button to display the **Graphics Settings** form.

- On the **Representation** tab in the **Representation Settings** frame set the **Level of Anti-Alias** to **8** from the options list.
- In the **Tolerance** frame set the **Arc Tolerance** to **0.1mm**.



On the **Steelwork** tab uncheck the **Display** checkboxes in the **Primary Nodes** and **Secondary Nodes** frames.

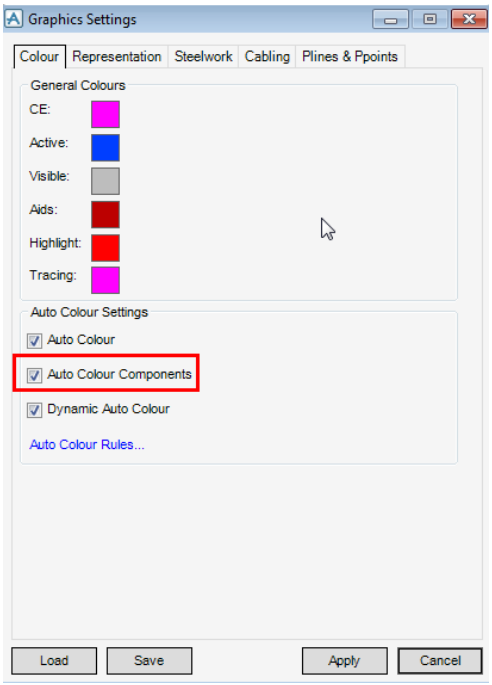
Click the **Save** button, the **Apply** button and then the **Cancel** button.



On the **3D VIEW** tab in the **Manipulate** group open the **View Direction** options list and select the first Isometric button (the icon may be different), i.e. North must be pointing to the top left hand corner of the 3D View.

In the Status bar in the bottom left hand corner of the E3D window click the **Display Grid** toggle to turn the LCS grid off.

Setting the Auto Colours rules and Translucencies



On the **3D VIEW** tab in the **Settings** group click the **Graphics** button to display the **Graphics** form.

Check the **Auto Colour Components** toggle. This will allow to have Joints / Fitting in a different colour than its owner.

Three Auto Colour Rules need to be set for:

- FIXING
- GENSEC with Structural Class = PRIMARY
- GENSEC with Structural Class = SECONDARY.

Edit the 2 files des-col.pmldat and des-element-rules.pmldat which can be found in **C:\Users\Public\Documents\AVEVA\Everything3D\Data2.10\DFLTS** and save these in user data folder: **C:\Users\Public\Documents\AVEVA\USERDATA.**

The content of des-col.pmldat should contain:

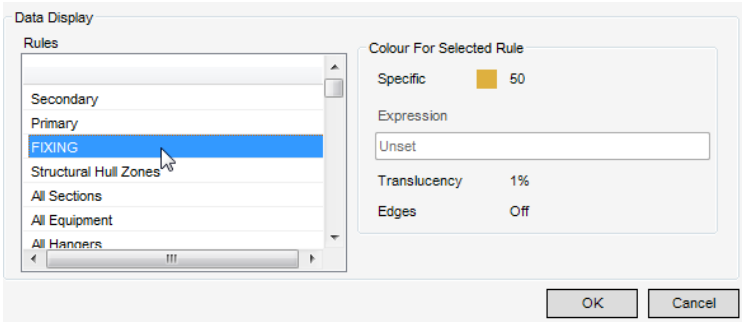
```
!gphAutoColourRul = |Secondary|

!gphAutoColTnslVal = 35

!gphAutoColEdgeOn = TRUE

!gphAutoColourCol = object COLOUR(|52|)

!gphAutoColour     = object GPHAUTOCOLOUR(!gphAutoColourRul, !gphAutoColourCol, !gphAutoColTnslVal,
!gphAutoColEdgeOn)

!tempArray[1] = !gphAutoColour


!gphAutoColourRul = |Primary|

!gphAutoColTnslVal = 35

!gphAutoColEdgeOn = TRUE

!gphAutoColourCol = object COLOUR(|51|)

!gphAutoColour     = object GPHAUTOCOLOUR(!gphAutoColourRul, !gphAutoColourCol, !gphAutoColTnslVal,
!gphAutoColEdgeOn)

!tempArray[2] = !gphAutoColour


!gphAutoColourRul = |FIXING|

!gphAutoColTnslVal = 1

!gphAutoColEdgeOn = FALSE

!gphAutoColourCol = object COLOUR(|50|)

!gphAutoColour     = object GPHAUTOCOLOUR(!gphAutoColourRul, !gphAutoColourCol, !gphAutoColTnslVal,
!gphAutoColEdgeOn)

!tempArray[3] = !gphAutoColour
```

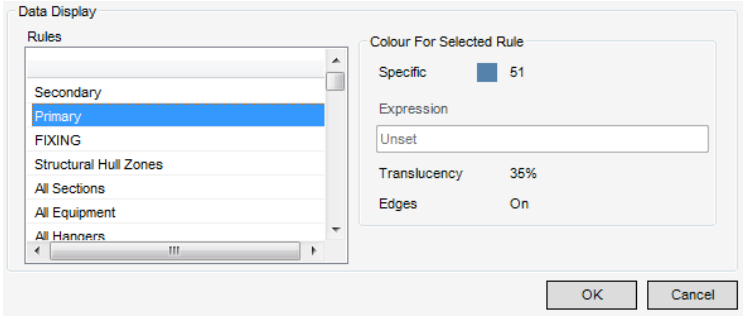
The content of des-element-rules.pmldat should contain:

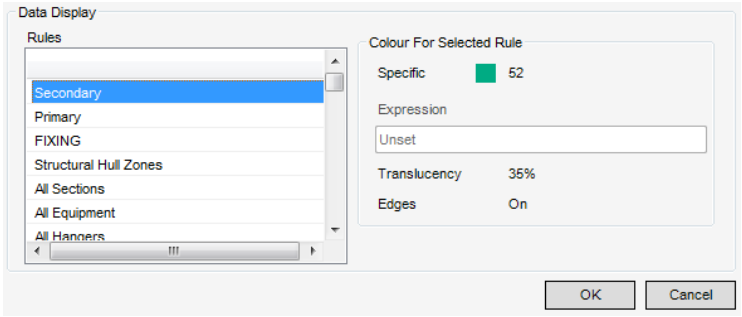
```
!rule             = object RULE()

!rule.name        = |FIXING|

!rule.rule        = ||

!rule.types       = |FIXING|

!rule.description = |Rule for fixing|

!!tmpRuleArray.append(!rule)
```

```
!rule             = object RULE()

!rule.name        = |Primary|

!rule.rule        = |Struclass EQ 'PRIMARY'|

!rule.types       = |GENSEC|

!rule.description = |Rule for primary|

!!tmpRuleArray.append(!rule)


!rule             = object RULE()

!rule.name        = |Secondary|

!rule.rule        = |Struclass EQ 'SECONDARY'|

!rule.types       = |GENSEC|

!rule.description = |Rule for secondary|

!!tmpRuleArray.append(!rule)
```

Autocolour rules should be defined as follows in the application:

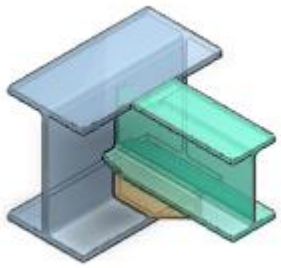






In the **Model Explorer** navigate away from joint / fitting elements and with the cursor in the 3D View press the **Esc** key to de-select the graphical selection.

The joint/fitting should now look like this:



Taking the Screenshot

Any image capture software must have the capability to take a fixed region image of 85x85 pixels in different positions on the screen (as it is not possible to get the model centred in exactly the same position every time)

Make sure the joint /fitting model is centred in the 3D View and zoom in and out until it fits in the image capture software's 85x85 pixel view frame as fully as possible. The CIE command **Zoom>Realtime** is very useful for this. Double check the view direction is the first isometric direction and take the screenshot.

Naming the Image

All joints and fittings specification components (SPCO elements) are named following a simple naming convention. For example,

Joint SPCOs are typically named like:

- J1S1-WEL-PFC-PFC-001
- J1S2-SNS-PFI-PFI-001
- J2S4-FEP-PFI-CTUB-002

Fitting SPCO are typically named

- F1-CIR-CTUB-4H-STIFF
- F3-PLT-PFI-001
- F2-FLS-PFI-VAR

The image must be named the same as the SPCO except that any forward slash is replaced by a hyphen, for example the image name for SPCO J1S1-WEL-PFC-PFC-001 would be J1S1-WEL-PFC-PFC-001.