Handling Files from Other CAD Formats to be for use as Context Only

This task can be a very daunting task, but by applying a little thought and some standard methodology we can get some quite good results. The process varies depending on the format of the data supplied, and that may be able to be influenced by requesting the data be delivered in a particular format. (See Requesting CAD Data)

Objectives

What we want to learn here is not so much the intricacies of importing other format files but being able to ensure the results we achieve are usable and located correctly to all other files in the same project. This is a very complex subject but by following a few basic procedures the integrity of the data can be assured.

Importing Step by Step

1. **Check the Data.**
   Open the supplied CAD file with your Bentley product if possible and check the file for content, units/size and location of the elements. This step is inspection only to see if the supplied data is suitable for our use. If it is not, try requesting the data be supplied in a format that can be used without spending a lot of time preparing it. In many cases the supplier can provide the data as required.
   Check the size of a known distance to make sure you have used the correct units when opening the file. If let's say a car park space, or the size of a door measures significantly different to what it should be, try reopening the file with different units. It is quite usual to see these measurements one thousand times smaller or greater than reality. (Metres/Millimetres)
   It is also common to see a miss match of units where the Design Center Units are set to say Inches and the CAD operator has been using them as millimetres or similar.
   In these cases you need to set the Design Center units to the correct units using the keyin **DWG Units** and **Save Settings**, it should then open with the correct size.
   Note also where the drawing elements are located relative to the (global origin) 0,0 point. This will give you some idea as to whether the file is located relative to the Map Grid coordinate system. Also check all files to see which ones you need to import for your requirements, you may not need them all.

2. **Translate the data to DGN format.**
   There are many methods available to us for this process but the following method is tried and proven over many years.
   Create a new DGN design file in the normal manor using the appropriate seed file, giving it an appropriate name and located in the same folder as the supplied CAD file.
   Reference the supplied file to the new design file using the Coincident Orientation option.
   Check the location of elements in the supplied file for alignment if possible, with data in existing files within the project by referencing an existing file into the new DGN file.
   If the supplied file does not align with the existing file you may have to **Shift, Rotate, or Scale** the referenced CAD file to **match the existing file** then turn off the display for the existing file.
   Turn ON/OFF levels to display only the elements required for use, this will reduce the DGN file size and produce faster loading times and faster screen updates etc. and avoid confusion by having less data to deal with.
   Fence copy (using the overlap option), the data from the supplied file to the new DGN file and turn off

the supplied reference file display, **leave it attached for future trace ability.**
If some of the data was not copied into the active file, check the fence criteria delete the copied data, and copy it again.
Execute the **Fit All** command and if the data is not displayed as expected it may be caused by some elements like cells having an origin at 0,0. These can usually be fixed by placing a fence around all the required elements and doing a **Fence Void-clip Delete**.
This method ensures we are using the correct file units, and colour table etc. and are not importing unnecessary or unwanted data into our new file which in turn creates a cleaner more efficient file for our use.

3. **Prepare the Data for our use.**
   Some elements do not translated into the new file very well and others need to be **dropped** in status for us to be able to use them. Some shared cells contain attributes (text) and when dropped they lose their attributes. This is a real problem if the supplier has bound the whole drawing into a cell, this is a common thing to do in translations from other CAD applications. Request files without the references bound into the one file, if possible get each of the references supplied as a separate file.
   Linestyles may not translate properly and you may need to change the level linestyle to another style that will give a satisfactory result.
   If the data is to be used as context for your drawings etc. it will probably be required to be printed in greyscale, if that is the case then it will probably be better to set **Level Overrides** in this file as they would be required in the drawing files, and will save you time later on.
   Freezing levels on/off etc. as you would like to see them when you reference this file to any other file will also save time later.
   Some filenames from outside sources are not very meaningful and filling in the **Ref Logical Name** in the **Model Properties dialog** with a meaningful name will save confusion later when the file is referenced to any other, it will automatically insert that name as the logical name for the reference.

Using Supplied Files as Base or Context files

In most projects context files are compiled from several files and are updated frequently, the best method to handle this is to use an intermediate file commonly referred to as a Nested Reference file, or Drawing model, it should contain all the context files and displayed as it is required in the final drawings.
Using a single context file will produce great benefits when all your drawing files need to have their context files updated, particularly if the project has many drawings and several files making up the base. If all the drawing files have the context file referenced you would only have to update the one file and it would automatically update all drawings without further input. The context file should have all supplied files referenced to it and displayed as required in the drawing sheet files.
i.e. Files On/Off, Levels On/Off, Level Overrides set etc.
Levels not to be displayed should be FROZEN to avoid problems further down the line,
All reference files should be given **meaningful logical names and descriptions** to leave a trail so that other persons can follow what has been done.
These context files will be referenced to all other files with **Live Nesting ON** and usually **Nest Depth=1**

Handling Files from Other CAD Formats to be for use as Context Only

When the context file requires updating and you need to keep the original file for any reason, save a copy of it with the current date appended to the name, into a superseded folder, prior to any amendments, and then make your changes to the original context file. Using this method you will not have to change any of the working drawings references and you will still have the original for trace ability.

Don't Do's

Do not use the 'Save As' option to convert supplied files to DGN format, as this can produce errors and problems later, and also imports all the unnecessary baggage.

Coordinate System

In plan drawings the global origin determines the geographic location of the drawing elements relative to the Map Grid. When a site is surveyed the surveyor will locate the surveyed elements relative to Map Grid coordinates for the local area.
Ensure you have the correct geographic coordinates set in the context file.
By adopting this system we are able to reference all files to each other and ensure they are correctly located.

Requesting Cad Data

File Format and Contents to Request

If we get the supplied CAD data in the most usable format it can save thousands of dollars on some jobs. The time taken to prepare the supplied data to a standard that produces the results we require, can vary considerably, a DGN or a suitable DWG supplied file can take as little as a few moments to prepare, and some supplied files are just not suitable for our presentation and have to either be re-supplied in a more suitable format, or worst case, traced, and that can involve many hours work.
In most cases, the supplier can optimise the files to your requirements with very little extra time, and could save themselves future time explaining what they have supplied.
The **File Format and Contents** for supplied CAD data should be requested in the following format in the preference order listed, however a good quality AutoCAD DWG file containing just the required data is almost as good as a good quality DGN file.

- **DGN format**, to be supplied as original files and reference files, and if coming from a Bentley product, preferably in pzip format, created with MicroStation Packager. Files should not contain reference files merged into the supplied files, they should be supplied as individual files.
- **AutoCAD DWG**, to be supplied as original files and xref files format. Files should not have xref files bound into the supplied file, they should be supplied as individual files.
- **GIS Files, ESRI (SHP) and MapInfo (MIF/MID) or (TAB)**, can also be directly referenced and copied into DGN files along with the associated data.
- **3D Models, Autodesk (3DS), and Rhino (3DM)**, are 3D models, and can be directly referenced and copied into DGN files.
- **3D Model Exchange format, Autodesk (FBX), and Industry Foundation Classes (IFC)**, are **3D model** exchange formats.
  FBX, or IFC files are open infrastructure information exchange files and enable bi-directional feedback in dynamic workflows. An FBX or IFC file can be directly referenced and copied into DGN files.
- **Cad Exchange format files, iges, step, etc.**, supplied as individual files as above, can also be imported into DGN files.
- **All the file formats that can be referenced directly to dgn files** can be selectively copied into the dgn file. On the right is a list of file extensions that can be referenced directly to a DGN file.
- **Adobe pdf or other graphic formats** should be requested only if CAD data is not available. It should contain as clear information as possible to allow for tracing if necessary.
  If the PDF files have been created from CAD files then the CAD files should be requested.
  If the CAD files are not available then the PDF file may be able to be opened in Adobe Illustrator and saved as a DWG file, the DWG file will not be scaled correctly and it will all be on one level, but may be able to be manipulated to achieve a reasonable result. It is time consuming and should be a last resort only.