

Case Studies from clients using varied CADD Environments



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Altiva Overview



- ☞ 20 year veteran of the CAD industry
- ☞ Dedicated to CAD standards management
- ☞ CADconform has been commercial over 13 years
- ☞ Offices covering USA, Europe, and Asia/Pacific
- ☞ Growing development, with 24 hour support
- ☞ Autodesk / Bentley / Microsoft Development Partners
- ☞ First and only to be licensed and delivering the US National CAD Standard™ and also the US Army Corps of Engineers A/E/C CAD Drafting Standard

Course Description



- ∞ In this presentation, Altiva will share the problems, tips, tricks and solutions encountered while helping clients verify their deliverables using varied CADD environments .
- ∞ Altiva has helped many AE firms with customized workspaces and technology to assure CAD standard compliant drawings.

Common Problems



- ∞ We have found that the biggest problem most companies face is crossing platforms on projects.
 - The requirement is in MicroStation but you work in AutoCAD, the requirement is plain DWG but you work in BIM, etc.

- ∞ It is also often confusing working with different clients as the standards requirements will change.

Before the project starts...



1. What file format is required for the deliverable?
2. What CAD platform will be used?
3. Will a conversion table be needed?
 - DWG to DGN remapping, etc.
4. Get the resources from the client
5. Compare the resources/output if using multiple CAD platforms
 - Symbols, Working Units, Color Tables, etc.

Set up the CAD environment



- ∞ If you decide that you need to convert from one CAD platform to another for your project, here's what Altiva has found to be gotchas:
 - I default to converting with the MicroStation remapping tables because I still find them more powerful and more user-friendly to set up than the AutoCAD remapping tools, however if you define your resources correctly the AutoCAD remapping could work just fine for you.

CAD Environment Concerns



1. People often forget the MicroStation DWG open options that have important settings like the working units and DGN Seed file.
2. Tag Attributes are commonly used in AutoCAD blocks, however often default MicroStation cells use data fields; so these won't convert correctly.
3. Verify that the cells when compared to the same block in AutoCAD are not different, and vice versa.

Symbol Conversion



4. When MicroStation converts a DWG to DGN, any blocks created with components on a different layer to the block itself (i.e. the block component object is on layer "0", but the block is placed on "SYMB"), the components are moved onto the block layer when a normal MicroStation cell is created.
 - This won't impact MicroStation, however converting back to AutoCAD will present problems because the components are now all on layer "SYMB". So any ByLayer properties won't update since the components are set to "SYMB" layer, not referencing block layer.

Shared Cells Symbol Conversion



5. Saving DWG to DGN using the Filter to remove Shared Cells impacts some of the resulting cell properties. Contrary to the previous issue, converting blocks as Shared Cells will leave components on the original layers/levels (even if different from the block layer). Keeping as Shared Cells will also retain certain properties like ByBlock/ByCell.
 - If you uncheck the Shared Cells flag in the remapping filter then the Shared Cells from AutoCAD will change to normal cells in MicroStation, however the level "0" components will inherit the level setting of the cell itself, and the ByBlock color setting will change to ByLevel.

LIN file / RSC Symbology



6. To replace AutoCAD linetypes when converting to MicroStation DGN, the custom linetypes need to have a different name to the MicroStation linestyles, i.e. -AC suffix.
 - Without the rename, MicroStation would simply load the LIN file version of these linetypes and no conversion would occur. In order to force the conversion back to the MicroStation version linestyle, different names are required.
 - This is not the case going from DGN to DWG as the LIN file is defined in the remapping translation file.

Text Symbology Fonts & Styles



7. When drafting text items, consistently using text styles will help with conversions.
 - In order to remove the need to remap fonts, be sure to use the true type fonts.

Text Symbology Issues



8. When MicroStation converts DWG to DGN, some text objects/properties might not change properly. Some examples include:
 - Basic text is not considered to have a text linestyle property in MicroStation, so a linetype property set on a basic text object in AutoCAD won't remap.
 - I have seen text convert inheriting the font from the style instead of the overriding font on the object.
 - Possibly due to the age of the file or the version/3rd party app used to create the text.

Compliance checking is highly recommended.

Special Characters



9. In addition to the True Type font concerns, it is advisable not to use to the AutoCAD Symbols insertion tool without caution.
 - Some of the symbols will be placed using a code that many other fonts will recognize, i.e. Degrees, Not Equal.
 - However, others will use a specific font for that character and may not map to another CAD system/font, i.e. Center Line.

Platform Specific Features



10. If you need to convert between MicroStation and AutoCAD you should not use any element/object types that are unique to a particular CAD platform. For example:
 - MLeaders are an AutoCAD specific element/object type. The equivalent in MicroStation is a group item called a Note that contains a dimension, a line, and a text element/object.
 - Basic AutoCAD Leader object will convert to DGN as valid elements/objects.

Platform Specific Features



- Solids are a specific AutoCAD element type. MicroStation has fill types which are properties of the object. So there is no equivalent feature type in MicroStation and therefore should be avoided if possible.
- As mentioned earlier, Data-Fields are a MicroStation specific element type with no direct equivalent in AutoCAD. Tag/Attributes should be used instead.

Hatches and Patterns



11. We typically combine custom AutoCAD hatch patterns into a single (.pat) file that also contains the default AutoCAD patterns as is recommended by Autodesk.
 - You can use the Profile to load this custom file earlier than the default AutoCAD one.

Hatches and Patterns



12. MicroStation Patterns come in various shapes and sizes. How these patterns are created (Associative Pattern, Associative Region Boundary, etc.) and the version of AutoCAD/MicroStation being used will impact how these convert.
 - For consistency between platforms, I recommend using the Associative Region Boundary setting for MicroStation patterns.

Conversion Remapping Table



- 13. A common problem seen in the MicroStation conversion tables is that they are defined for one direction remapping and users try to convert both ways.
 - Understand the Input versus Output columns.
- ∞ AutoCAD remapping on the other hand has separate settings configurations for Importing DGN vs. Exporting DGN.

Conversion Remapping Table



14. The MicroStation conversion remapping table does not allow for variables to be used in the path to the required resources (.lin files, .shx files).

Users may need to update this path in the remapping file for different MicroStation versions/resource locations.

- The remapping file is commonly created/saved under the Workspace Projects folder:
 - %ALLUSERSPROFILE%\Bentley\MicroStation
(*version*)\WorkSpace\Projects*(project)*\dwgdata\

Clean up after conversion



15. Don't forget to replace the color table.
Conversions from DWG to DGN will retain the AutoCAD color table.
 - This step is often overlooked by users so we will typically build a VBA to run the conversion, define required settings, and perform extra steps automatically.

Revit to DWG



- ✎ We have worked with some companies utilizing Revit for drafting but with a basic DWG or DGN file deliverable requirement. Many CAD Standards settings can be defined within Revit for exporting DWG, however we did find one major obstacle:
 - All the symbols are renamed to block1, block2 etc. when the file is saved to DWG. Be prepared to replace all the blocks with valid ones from the USACE block libraries if their use is required (I have heard round-tripping via MicroStation can help).