Building Your Project With References and Models

Coordinating design data across your projects has never been easier than when using references and models in concert. Learn how to apply models and references in your workflow.

Shawn Foster

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What are we doing today?

- V7 Definitions
- V8 Definitions
- Just what the heck is a model?
- V8 review of references and models
- Convergence of concepts
- Where do you use what?

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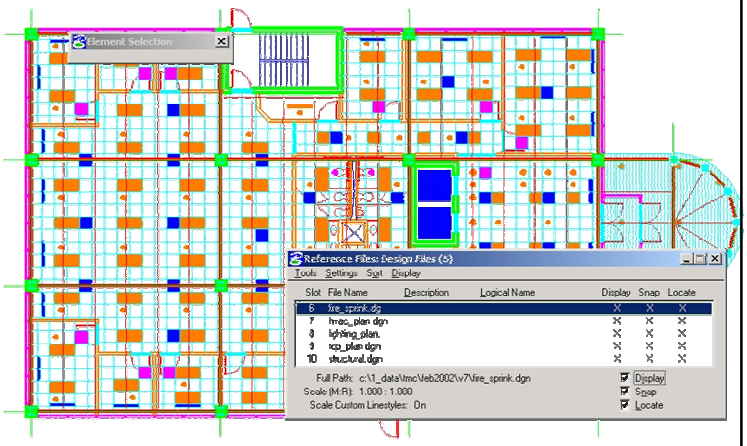
V7 Definition - References

Reference files are design or raster files that can be attached and displayed, plotted, and (in the case of reference design files) used for construction purposes, but they cannot be modified in any way



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V7 Limitations include…

References

255 attachments per file

Total cannot be more than 32 MEG

Symbology is “all or nothing”

101 Vertices for boundary clipping/masking

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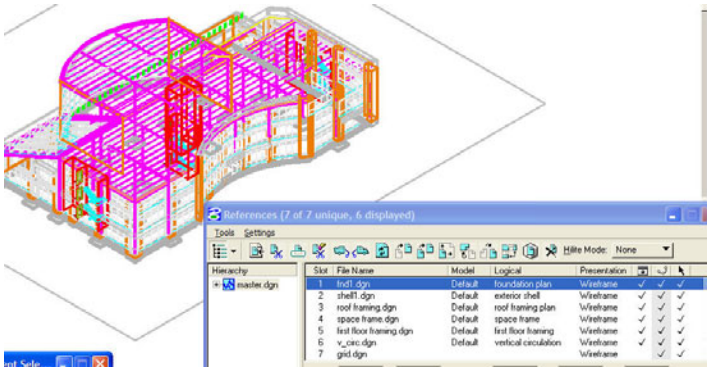
V8 Definitions

A **reference** attachment is a **model** attached to and displayed with the active model for plotting or construction purposes. A reference cannot be modified. You can attach, as a reference, a **model** that resides in either the open DGN file or some other DGN file



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What the heck is a model?

Well…you see…a model…is…well…

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A model is…..

"It's only a model…."

No? Okay….

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What the heck is a model?

A model is a collection of design elements that share a common co-ordinate space in a manner similar to the familiar design plane…

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Huh? What does all that mean?

Reference = Model within Model

DGN File = collection of Models

References

Model = Model within Model

Models

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What the heck is a model?

A model is a design area within a file

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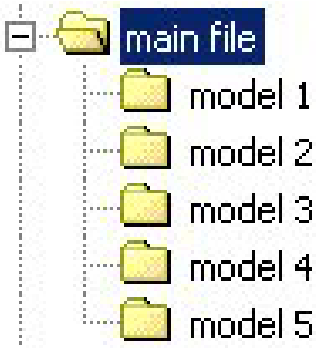
I repeat… What the heck is a model?

Think of file folders within a folder



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What settings apply where?

FILE 1: File-specific settings

- **Level Manager**
- **Symbology (Active Design Settings):** Level, Colour, Style, Weight, Angle, scale
- **Definitions:** Dimension Styles, Levels, Multi-lines, Tag Sets, Text Styles, View Groups
- **Colour:** Table, Highlight, Selection Set, Pointer (Note: The colour table is stored in the file when you attach a specific one i.e. not the default.)
- **Locks:** ACS Plane, Axis, Boresite, Graphic Group, Level, Text Node
- **Co-ordinate Readout, Fence Mode, Rendering Settings, Snaps, View Groups**

MODEL A: Model specific settings	MODEL B	MODEL C
Level display You will view all levels for the entire file but can control what level is on or off in the individual view per model.	**Level display**	**Level display**
Drawn Elements	Drawn Elements	**Drawn Elements**
Reference Files	Reference Files	**Reference Files**
Locks: Isometric	Locks: Isometric	**Locks: Isometric**
Saved Views: Although they appear to be view-specific the settings for views 1 - 8 are stored in the model.	Saved Views	**Saved Views**
View Attributes	View Attributes	**View Attributes**
Working Units, Grid Units & Configuration	Working Units Grid Units Grid Configuration	**Working Units** **Grid Units** **Grid Configuration**

Image courtesy of Karen Fugle, KPF UK

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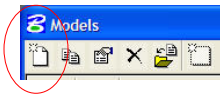
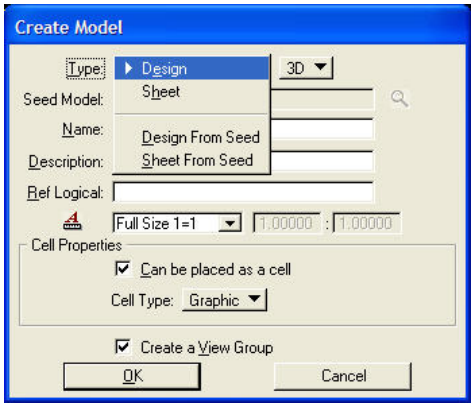
Creating a model



- Models have separate geometry
- Models have separate working units
- Models can be either Design or Sheet
- Models can be either 2D or 3D
- Models have an Annotation Scale (chat later)



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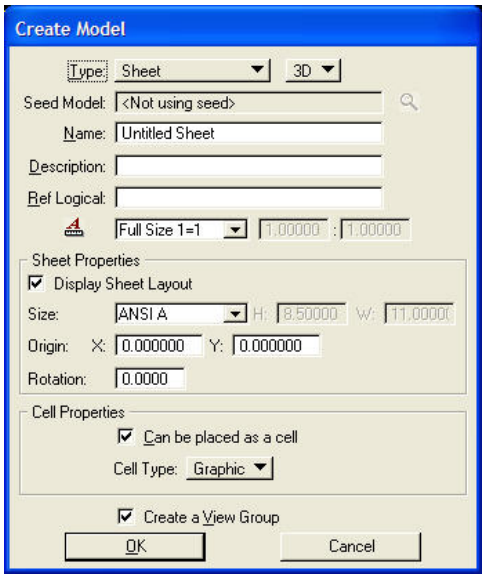
But that's not all….

- Sheet Models can have a Sheet layout



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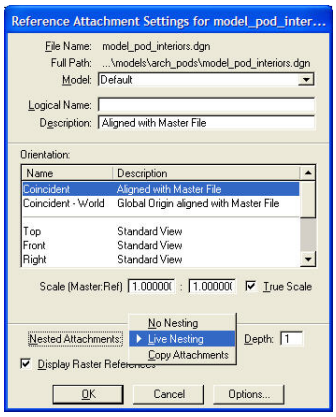
Live Nesting



Nesting: the ability to reference a design's references

No Nesting: The file is attached

Live Nesting: the file is attached, and other attachments follow along

Copy Attachments: all the 'followers' are directly attached

Changes to the nested file show up in the main file…no reload or extra attachment needed

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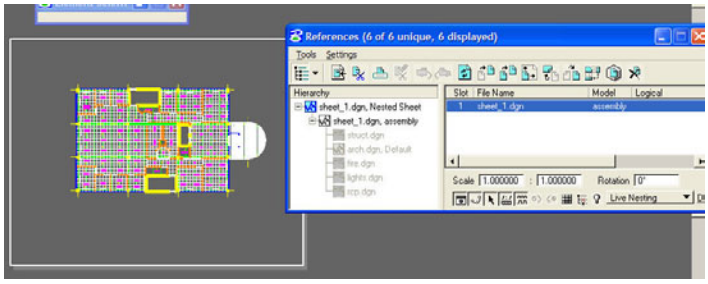
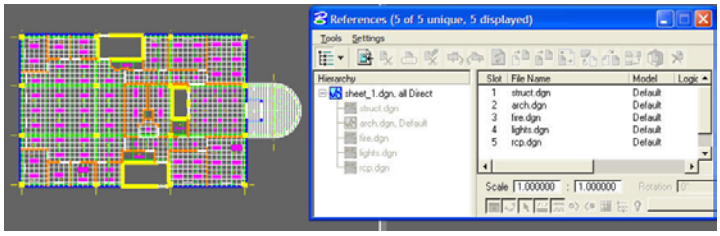
Live Nesting and Sheet setup



Vs.



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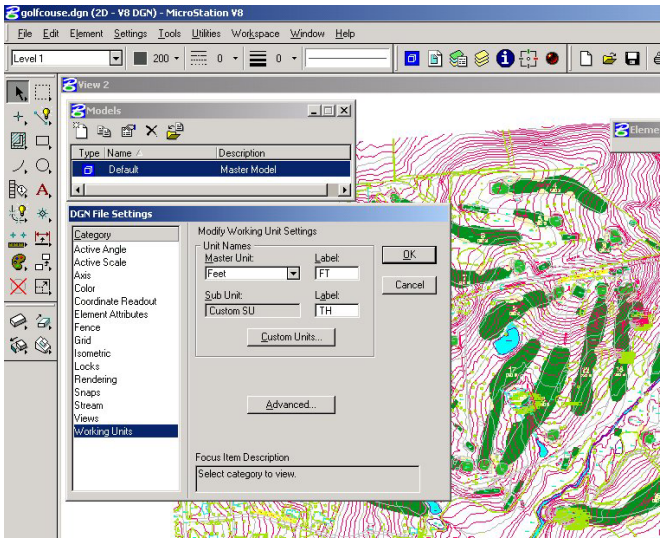
English and Metric



Design in one unit of measurement…

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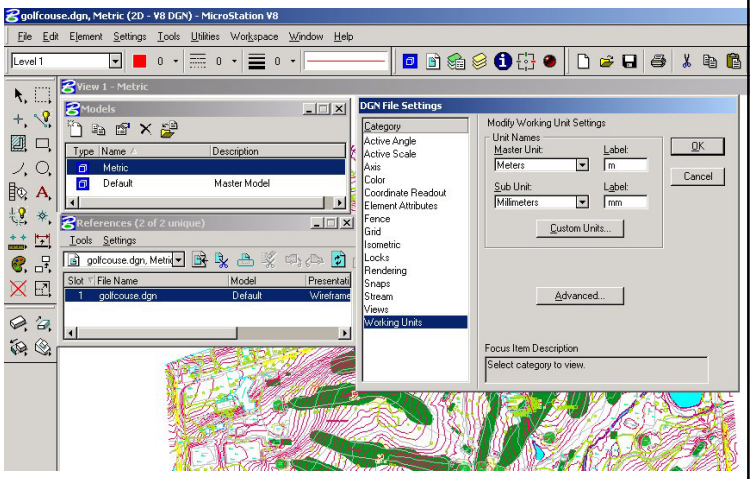

Self Reference into a separate Model,
then change the working units

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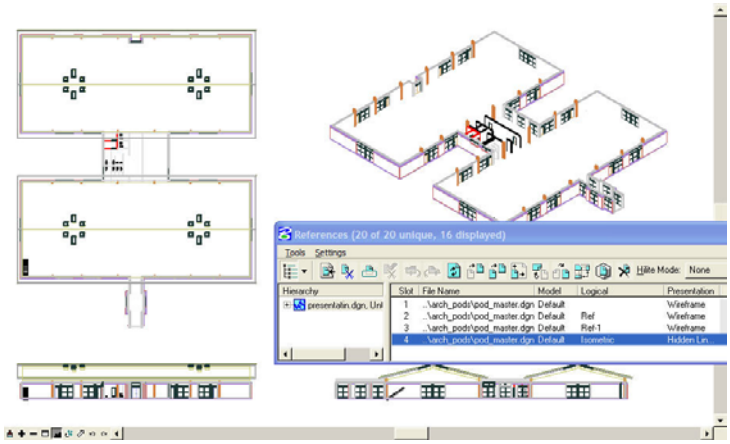
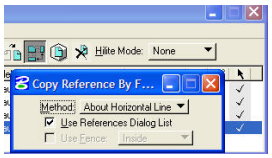
Copy Fold and Presentation





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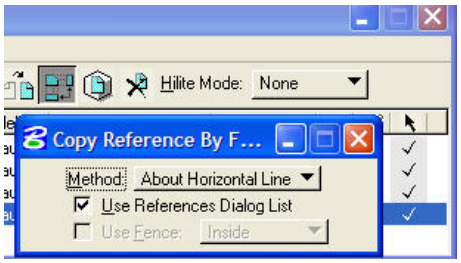
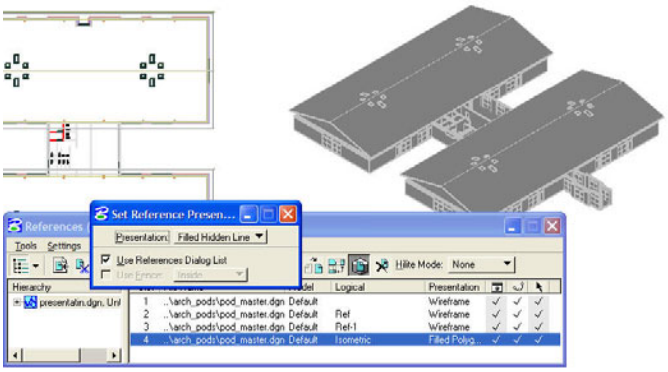
Copy Fold and Presentation





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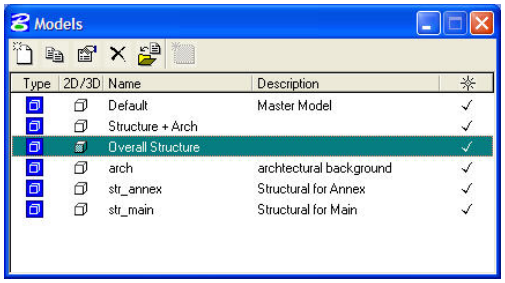
Holding information

Hold original and needed information in a model vs. a level or different file



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Holding information

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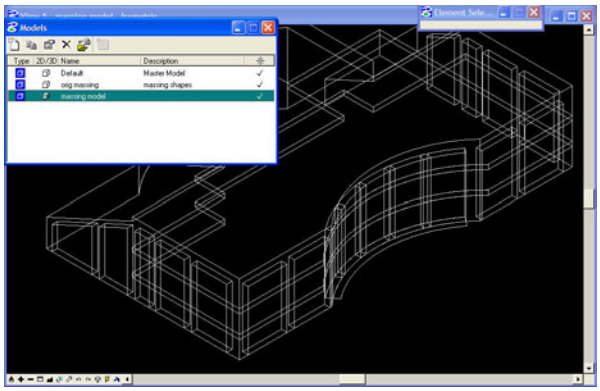

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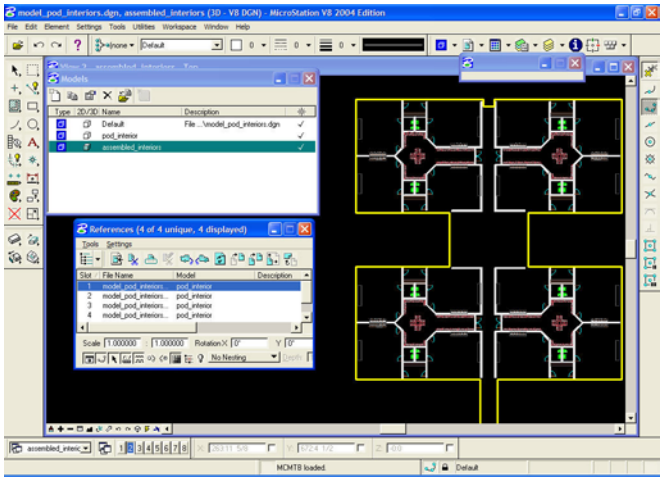
Holding information

Same, but different information

Maybe mirrored



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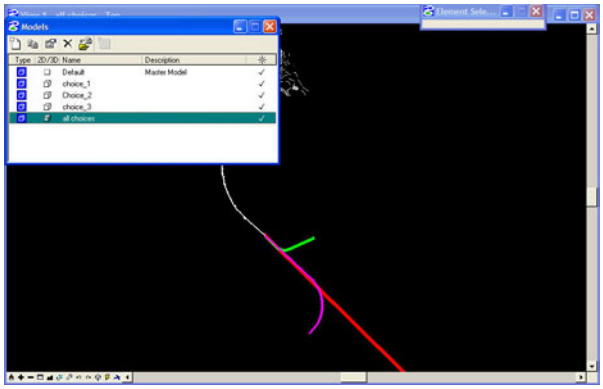
Alternates and choices

Hold your design choices or alternatives in the same file. This ensures that you don't miss any references



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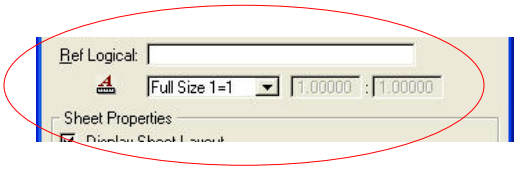
Sheet Layout and Annotation Scale

What is Annotation Scale



- Annotation Scale is a model setting that assigns a scale factor to the text and dimensions within the model
- A Changeable setting
- Allows for one “scale” of text in your text styles (real world size) and makes it easier to adjust

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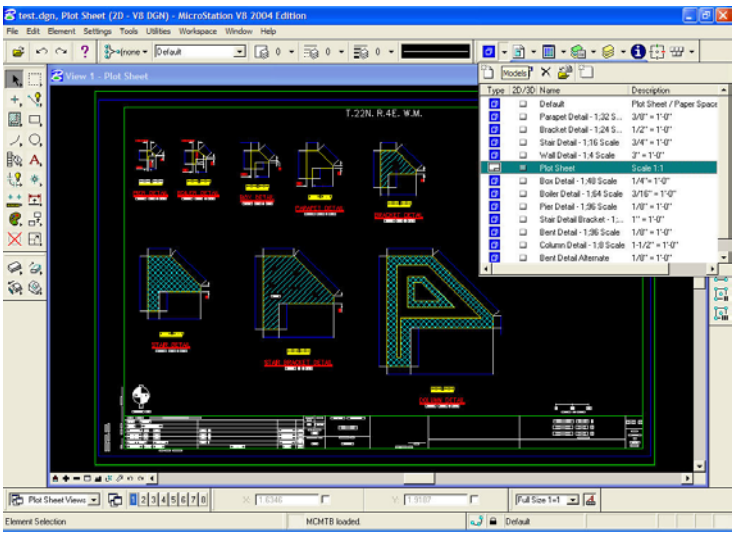
Sheet Layout and Annotation Scale



- Multiple Scales on the same sheet
- Difficult to manage?

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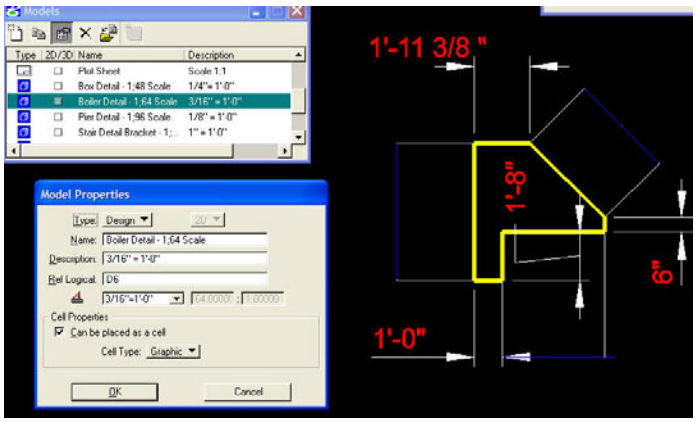
Sheet Layout and Annotation Scale



- Each drawn 1:1 with its own Annotation Scale

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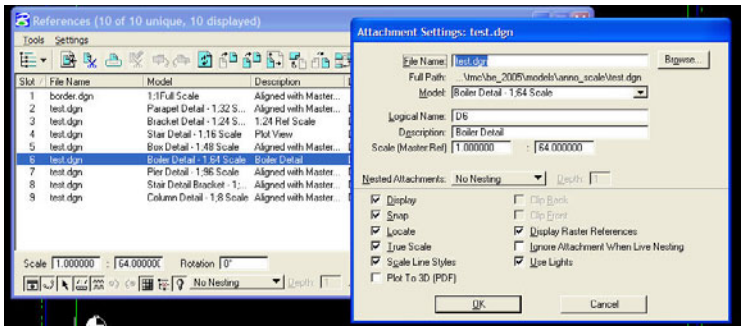
Sheet Layout and Annotation Scale



- Referenced in at “reverse scale”

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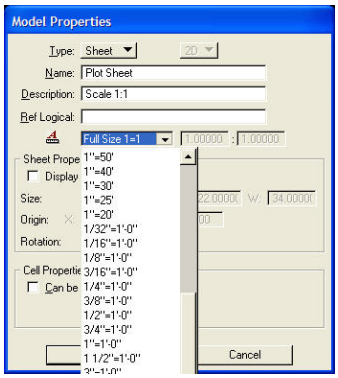
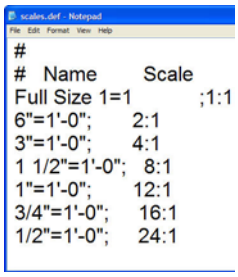
Sheet Layout and Annotation Scale

- Things to know





- MS_CUSTOMSCALEDEF points to the SCALES.DEF
- By default \workspace\system\data

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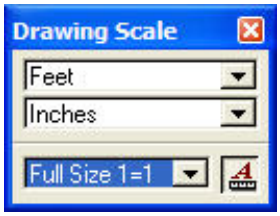
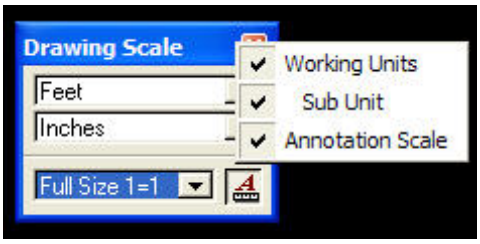
Sheet Layout and Annotation Scale

- Things to know

Dialog drawingscale open





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Other neat stuff

- MS_REF_DEFAULTSETTINGS
- CONFIG attachments
- Relative attachments
- MS_REF_NEWLEVELDISPLAY
- MS_NEST_COLORADJUSTMENT
- MS_LEVEL_EDIT_ATTRIBUTE_LIST
- Model Seeds

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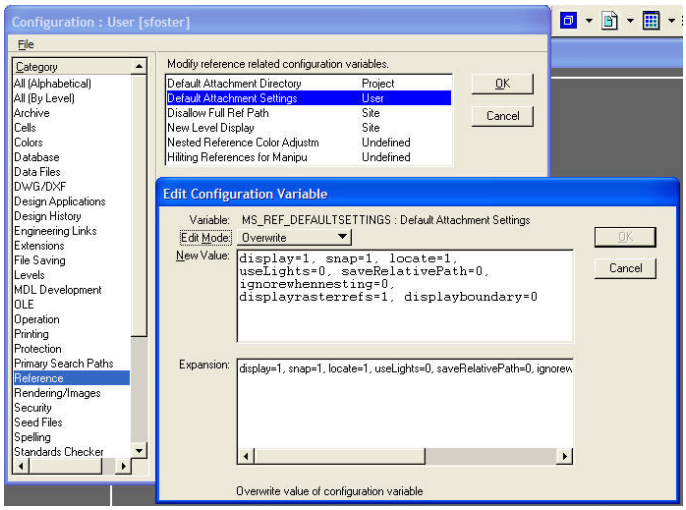
Other neat stuff

MS_REF_DEFAULTSETTINGS



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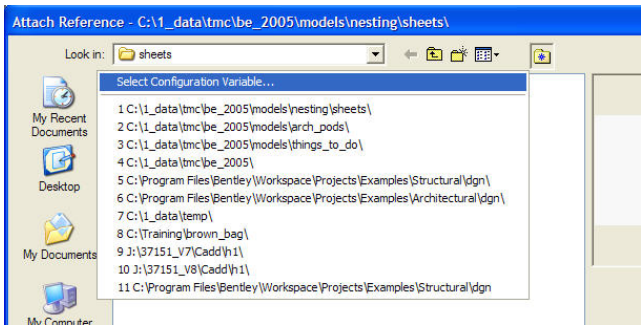
Other neat stuff

CONFIG attachments

- The ability to create a variable and user this variable in your attachment
- (BTW, ProjectWise does this on ALL the files)



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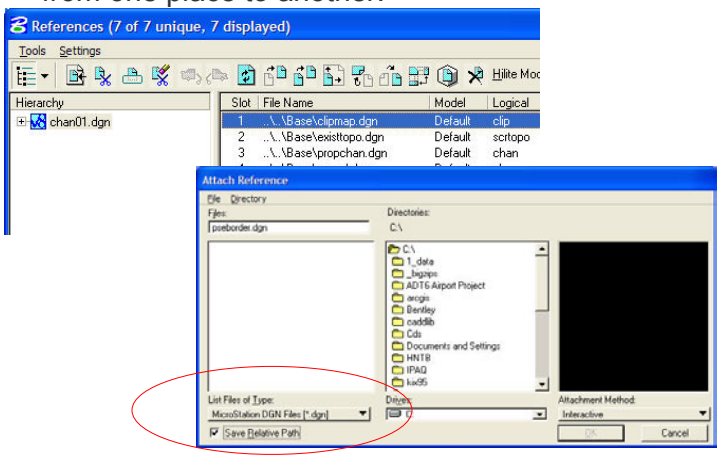
Other neat stuff

Relative attachments

The ability to attach a reference relative to the existing folder.

Great if you have to move the folder structure in tact from one place to another.



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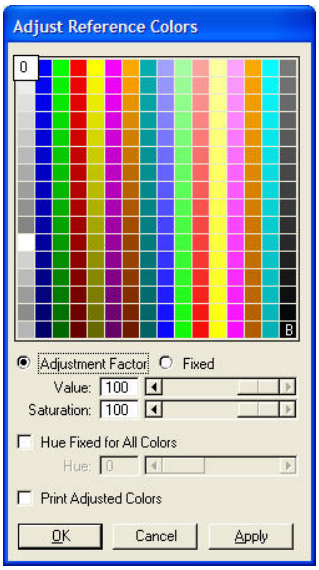
Other neat stuff

MS_NEST_COLORADJUSTMENT

specifies the multiplier applied to the nested reference color adjustments at each level.

If not set, the color adjustment for the top level reference controls the color adjustment for all nested references.



Other neat stuff

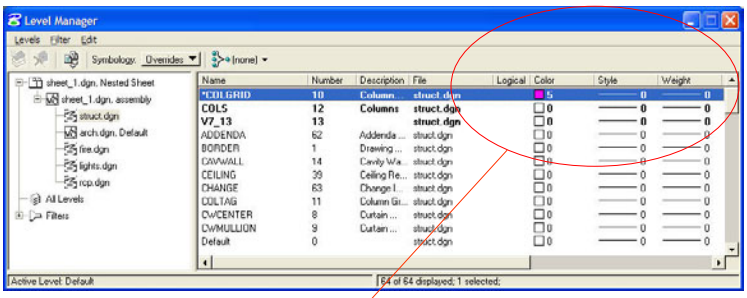
MS_LEVEL_EDIT_ATTRIBUTE_LIST

Controls which level attributes can be edited or overridden . The attributes to be edited can be one or more of the following as a comma separated list. Each attribute accepts a "Library" or "Reference" prefix.
Without the prefix, the attribute will be editable for both references and library levels.

MS_LEVEL_EDIT_ATTRIBUTE_LIST = OverrideSymbology, OverrideColor, OverrideStyle, OverrideWeight, ByLevelColor, ByLevelStyle, ByLevelWeight, GlobalDisplay, GlobalFreeze, Lock, Plot

Other neat stuff

MS_LEVEL_EDIT_ATTRIBUTE_LIST



If you want to be able to edit these settings, you'll need to set the variable

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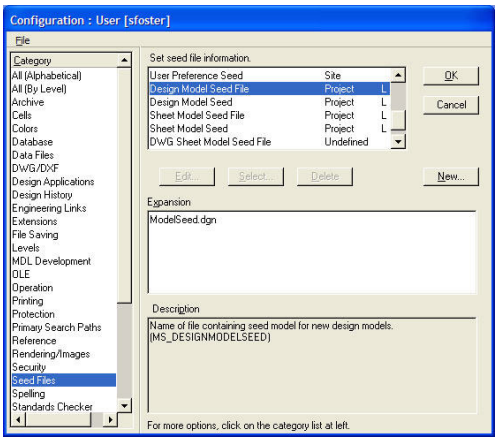
Other neat stuff

Model Seeds



If you want to have information already created in your models, point these variables to the files with the needed models

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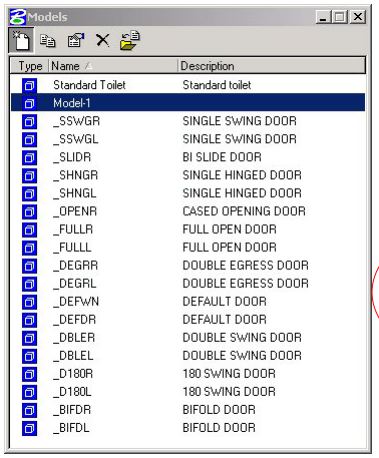
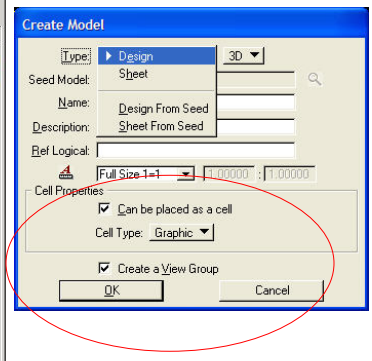
Models and Cells





A cell library is a DGN file with many **models** within…created with the "Place as cell" toggle enabled

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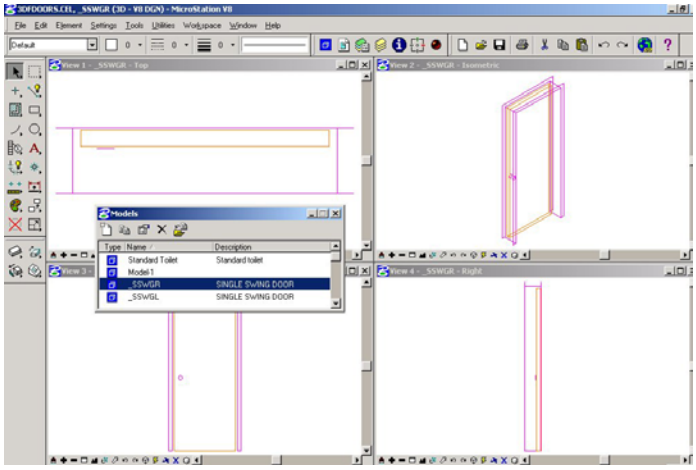

The possibility of editing a cell "live"

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Crash!!!!!!

DGN File = Model

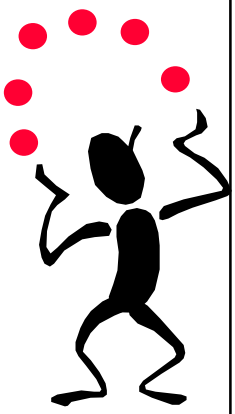
Cells

Cell = DGN File

Reference = Model within Model

Model = Model within Model

Models References



Model = Reference = Cell = DGN?

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So what do I use where?

Who says you have to change?

Reference = background

Cells = symbols

Models = Anything you want!

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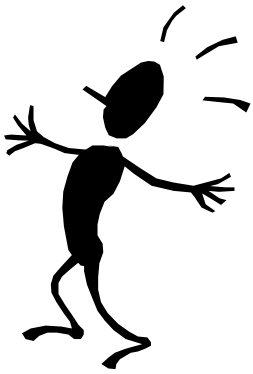
Use Cells as References?

So what do I use where?

Maybe you can store details or larger cells in a cell library, place them as references, and then edit them on the fly?



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Let's open it up for Q&A

Open Discussion

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Thanks

Shawn Foster – HNTB

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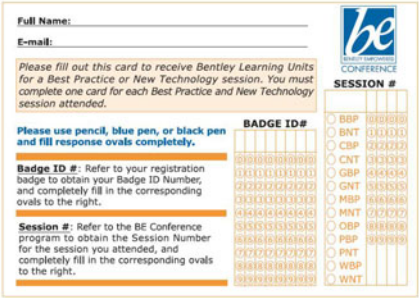
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