David Drivers Revit One-sheets: Linked Project Positioning and shared coordinates

This paper discusses the following features of Revit Building
□   Shared Coordinates
□   Named locations
□   Publish and acquire Vs Saving locations
□   Shared Coordinates and workset enabled files
Revision 1 (Version 9.0)
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File linking and shared coordinates are confusing because:
1) The terminology involved does not really help explain the behavior of the commands involved
2) The behavior has no corollary function in AutoCAD.
3) When you use some of these feature in a host drawing you are really changing the linked file NOT the file you are working in.

Terminology:

There are two main concepts you need to understand and keep in the back of your mind as you read this. These are *Shared Coordinate system* and *Named (and saved) location*. These two concepts have everything to do with the behavior of how 2 or more projects behave as they are linked.
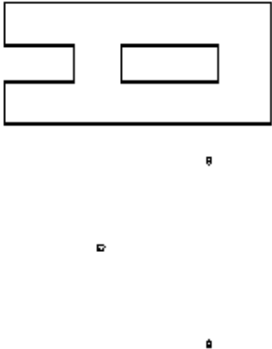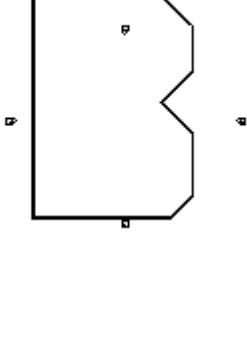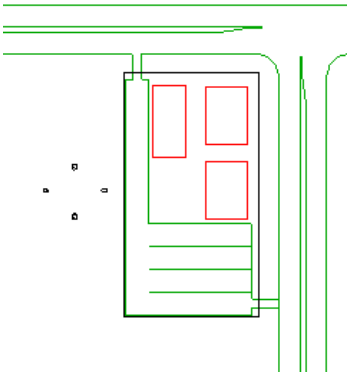
Shared Coordinates

From the help file:

> *A Revit Building project has internal coordinates for all the elements that compose the model in a project. Those coordinates are known to this project only. This is acceptable if you have a standalone model whose position is not relevant to other models or to a site, but if you want the position of this model to be known to other linked models, you need to share coordinates. In short the shared coordinate system*

Named Locations
A named location is saved in the linked file and can be used to set up multiple instances of one linked Revit file in a host Revit file. By default, if you have not created a named location it will be saved as *Internal*.

The following files are referred to in the text that follows

Project A.rvt created offset from project origin and true north is to the right, but project north is up	Project B.rvt created roughly at origin, project north and true north are same	Site.rvt Pads and property line

Linking Revit Files

When working with linked files you have several different options about to control the positional behavior of the linked file.
A) At the time of linking = options in the import dialog box
B) As a property of the linked Revit project

Positional properties as set in the import dialog box
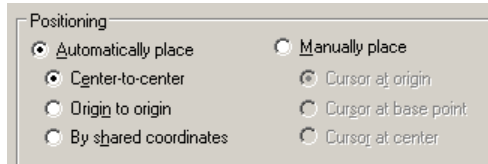
Not Shared Coordinates:

| Center to Center: Geometric center of host (site) and linked file (Project A) used for placement	Origin to Origin: Origin of host and linked files are used for placement

Manually place uses the same ideas as automatically place so are not screen capped here.
These placement options work just like an AutoCAD XREF – while the files are linked there is no communication between them

Sharing coordinates

Shared coordinates allow coordination between linked Revit files. Shared Coordinates keep track of the location of a linked file with respect to its host.
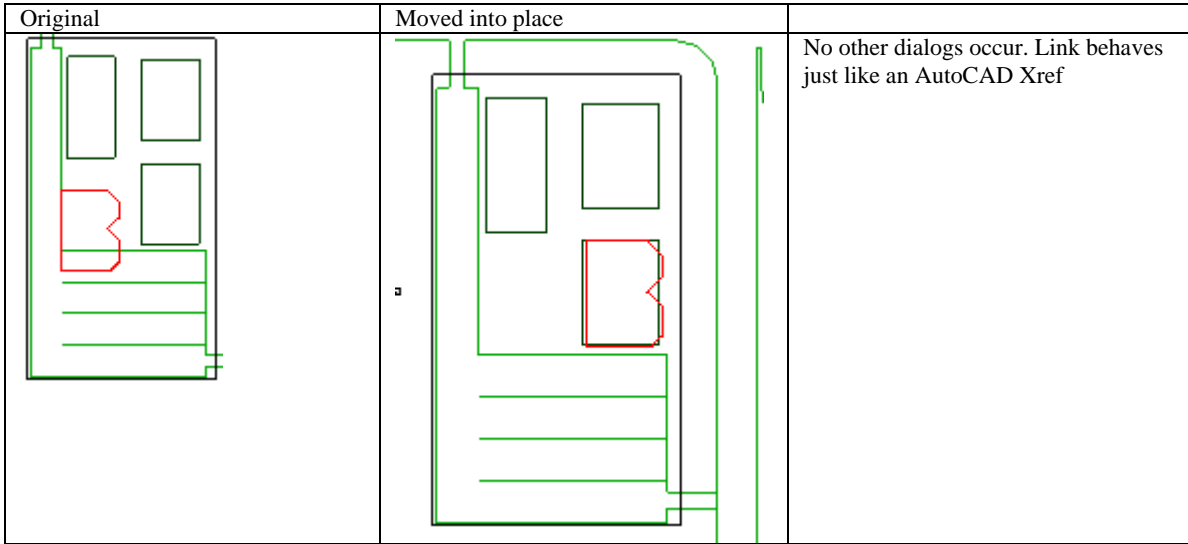
Inserting WITH shared coordinates

Confusion #1. When you select the shared coordinates as the insertion positioning option, What the end result is will depend on if you have already established a shared coordinate system between the projects. If not, you will receive this message
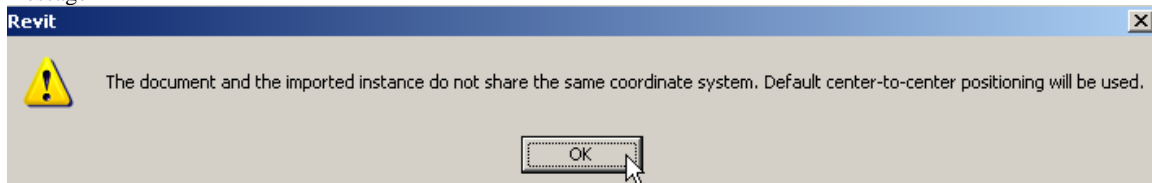
And the projects will be place center to center as in the previous image Center to Center. The end result of this function is NO DIFFERENT than using center to center. You still have not established the shared coordinate system. This must be established.

Without shared coordinates

| Original	Moved into place	
		No other dialogs occur. Link behaves just like an AutoCAD Xref

Establishing a shared coordinate system:

This can be accomplished either by using the menu pick or by a property parameter on the linked project. In either cast you are changing the linked file NOT the host. Using the property parameter describes a bit more what is happening than using menu picks:
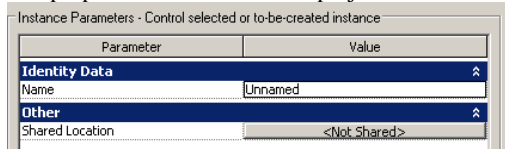
Menu picks

Tools> Shared Coordinates>Publish coordinates
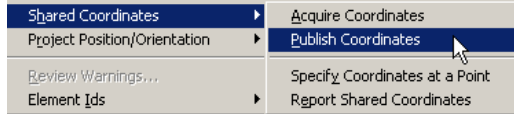
Then selecting the linked file to publish the coordinates to.
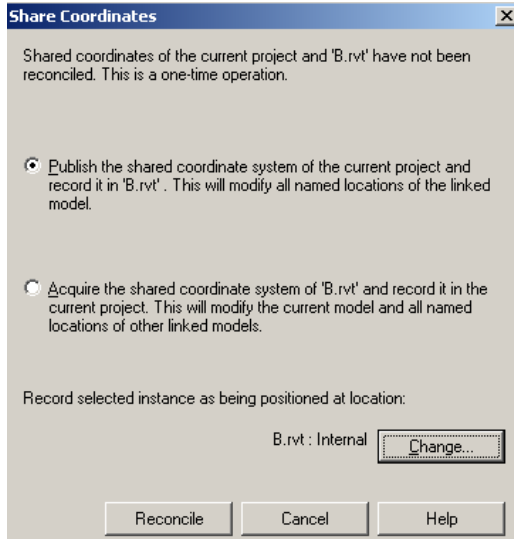
Linked file properties parameter

The properties of the linked file project B contain the instance parameters name and shared location.


If the shared location has not been established picking on <not shared> gives:

I talk more about named locations later in this document but picking [Reconcile] will do the same thing as publish menu picks earlier.

Once publish is complete the host file (site) and the linked file (ProjectB) now share coordinates. This means that any movement of the linked projectB will prompt you to save the changes the next time you save the host revit file….
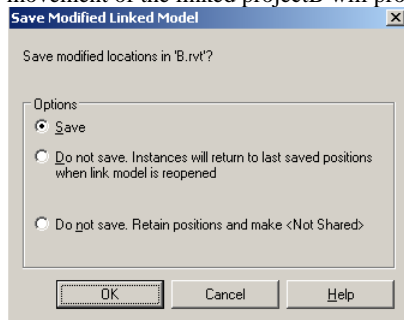
These options are available also on the manage links page
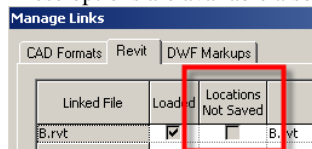
Once the location has been saved, any further movement will give yet another dialog warning:
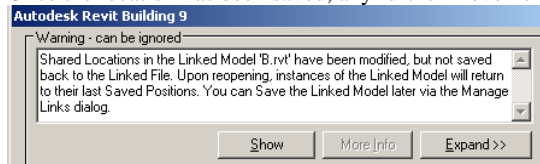
While odd – this is being saved into the linked file projectB, this makes more sense when you have more than one file you are attempting to work with.
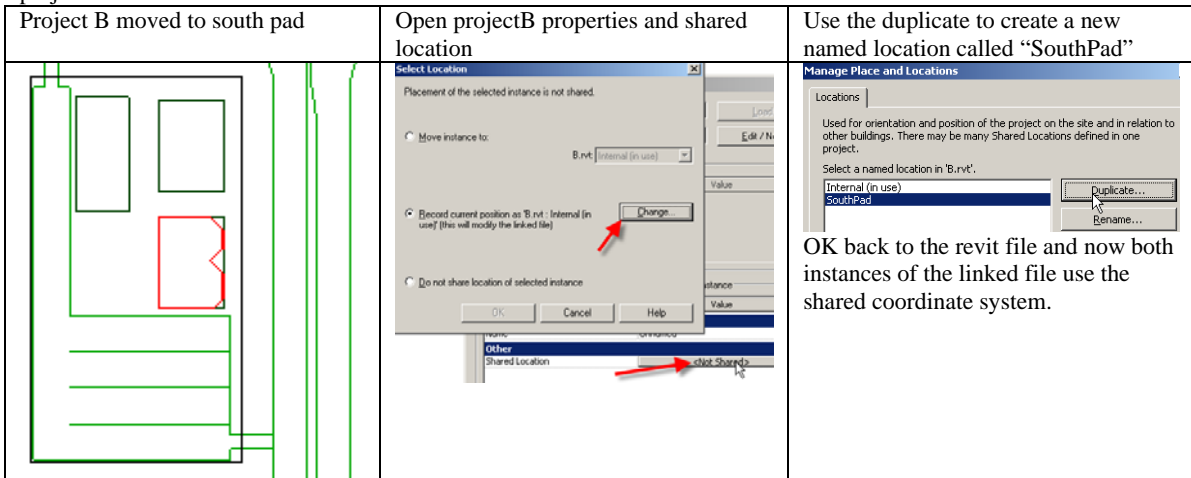
Saved location	Moved into place	

|		
		Shared location dialog box opens with warning noted above
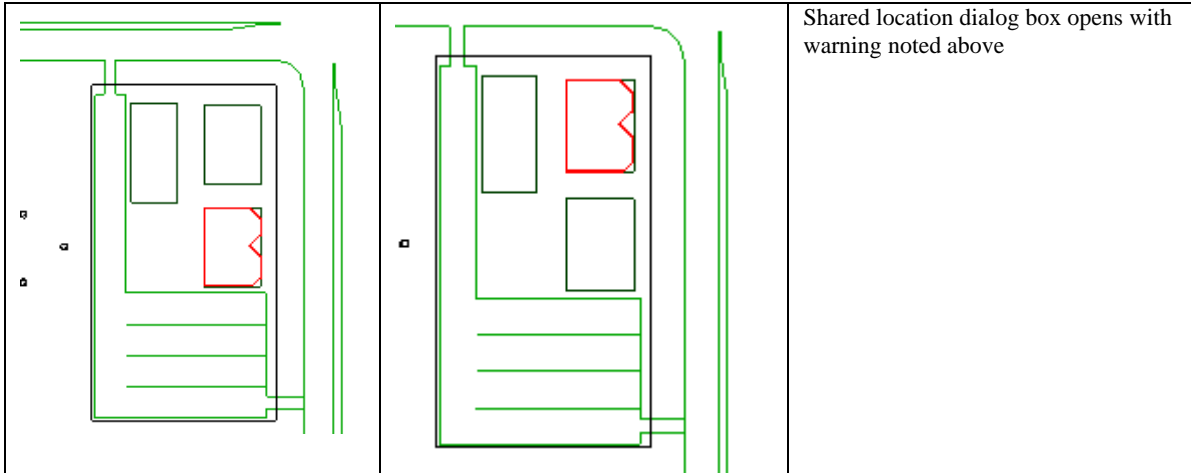
Named Locations

Up to now, each time linke file project b is moved the location is just saved to the default name *Internal*. You can store multiple locations as named locations. A named location is simply a saved location for a linked project file. A named location is store in the linked file.

Note: you cannot publish coordinates from a host file that has multiple named locations. So it makes sense to keep one file (your site file) as the master location file (where you move your buildings) and the named locations in the building project files.

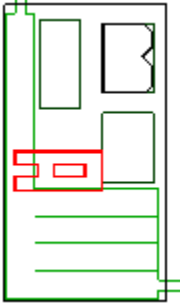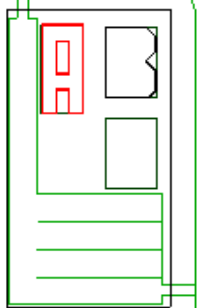| Project B moved to south pad	Open projectB properties and shared location	Use the duplicate to create a new named location called "SouthPad"
		 OK back to the revit file and now both instances of the linked file use the shared coordinate system.

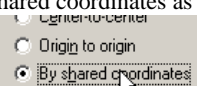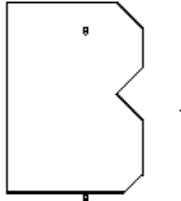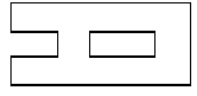Using the same dialogs you can now use these named locations to move the linked file back and forth between the two locations
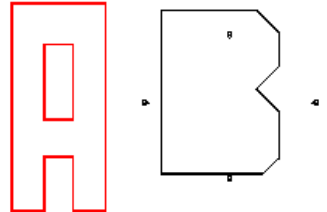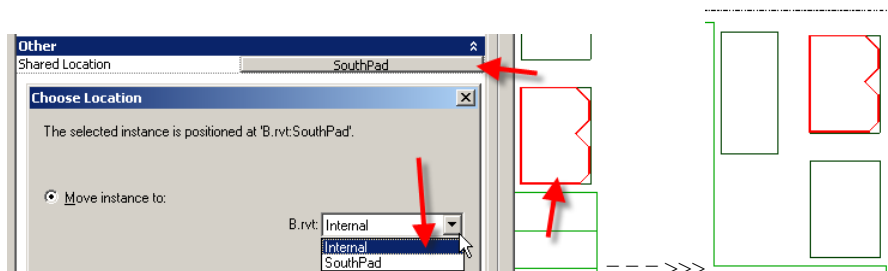
Once Shared Coordinates are established…
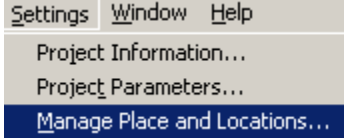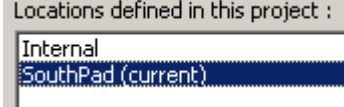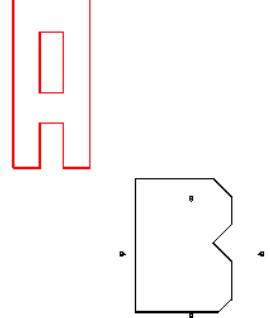
They affect all projects linked together regardless of which file is linked into the other.

Project A linked	Moved into place	
		Now all three files share a common coordinate system.
Project is placed Center to Center because no shared coordinate system exists between project A and site (host)	Project A is moved and rotated then project and shared location are saved.	

Site project is saved and closed

Project B opened	Project A linked into project B using shared coordinates as positioning	Because these two projects share the coordinate system when they are linked they will be related to each other the same way they are in the site
	Center-to-center Origin to origin ⦿ By shared coordinates	
	 Project A's native orientation	

Named locations are stored in the file linked into the site. Project B has named locations *Internal* and *SouthPad*. These can be use to move the linked projectA while working in project B

Using Settings> Manage Place and Locations to access named locations	Setting SouthPad current	Moves the linked file project A into its place relative to this named location defined in project B. (as if you were doing documentation for the southern building instead of the north.
Settings Window Help Project Information… Project Parameters… Manage Place and Locations…	Locations defined in this project : Internal SouthPad (current)	

Project B is copied onto second pad. The copy does not share coordinate syste,

Differences between saving locations and publishing coordinates….

Publishing coordinates was used to establish the link, saving locations is used to record changes of a linked file.
Also from the help file:

> *When you publish shared coordinates from a host project to a linked project, this changes the linked project. The host project's True North and shared origin are recorded in the linked project, based on the current location of the linked instance. This location is now named in both the host project and the linked project. More than one location of the link can be recorded.*

Saving locations only records the location of the linked file. And does not modify true north or shared origin.

Differences between publishing Vs Acquire coordinates….

Help file: You should derive shared coordinates from only one file. That one file defines the coordinates for all other files that compose the project. Acquire coordinates from one file and then publish those coordinates to other files.
Publish location – published to linked file

Some notes on workset enabled….

While directly from the help file I thought I would put the following in here just as a handy reference.

In some cases, you may need to link projects that have Worksharing enabled. In these cases, you should consider the following:

- o *Selective open of worksets*: When linking a Worksharing-enabled building model, you can specify which worksets to open after the link is made. In the Add Link dialog box, under Open Worksets, select Specify. This enhances performance by reducing the quantity of components that must be opened and drawn.
- o *Changing the linked worksets*: While working in a host file with Worksharing-enabled linked files, you may decide that you need to see additional worksets of one of those linked files. To do this, go to the Manage Links dialog box and use the Reload From command. You can then specify the additional worksets you need opened.
- o *Linking a building model into multiple host projects*: Although the same Worksharing-enabled building model can be linked within multiple host projects, the specific worksets opened in each host project must be identical. The user who creates the first link determines the status for all other linked files.
- o *Host files with Worksharing enabled*: When the host file has Worksharing activated, you must keep in mind which workset the link is placed in. Links consist of two parts: the link symbol and the link instance. When you initially place the link, both the link symbol and the link instance are placed in the active workset. However, link instances can be reassigned to different worksets. In general, you should try to keep all instances of a link on the same workset.

TIP:When opening a Worksharing-enabled host file, it is possible to specify which links are loaded when the host file opens. A link is only loaded if the workset that the link instance is assigned to opens. If you choose not to open that workset, the link is not loaded.