AUTODESK UNIVERSITY 2014

Cracking the Vault: Implementing Autodesk® Vault Professional into Civil/Survey Firms

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CV6308-P Do you have challenges managing data while working in project teams? Are your project teams spread out geographically? Are you constantly emailing drawing files to project team members? If so, then this class is for you. During this class, we dig into the tools and explore tips and techniques that will enable you to successfully implement Vault Professional software to manage the project delivery process. Special attention is paid to categories, lifecycles, and revision schemes as well as methods to effectively collaborate with external partners.

Learning Objectives

At the end of this class, you will be able to:

- Define and track the workflow and lifecycle of files as they move through the design process
- Capture and save important project milestones and incremental design submittals
- Secure and control design data from unwanted access or modifications
- Collaborate with external partners

About the Speaker

As the Infrastructure Solutions Team manager for IMAGINiT Technologies, Joe provides Autodesk civil engineering/survey implementation consulting services. Joe has over 20 years of experience in land surveying and civil engineering encompassing field-data collection, site design and layout, residential subdivision design, and land planning. He is an EIT and a licensed land surveyor in Virginia, and earned his Bachelor of Science degree in Civil Engineering Technology from Old Dominion University in Norfolk, Virginia.

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Introduction

As the adoption of building information modeling grows throughout the AEC industry, it's time for civil engineers and surveyors to take note and finally join in. The concept of BIM is fairly simple: it's the creation and use of coordinated, internally consistent, computable information about a building project in design and construction. Civil engineers and surveyors are being pulled by architects and owners to be part of the integrated delivery process. This means the entire project team including architects, civil engineers, structural engineers, MEP engineers, and surveyors contribute components to a project model that is shared. The benefit is that the model can be explored, evaluated and analyzed before it is built.

This is an awesome concept; however, how can we ask civil engineers and surveyors to share data with the extended project team if they won't even share with each other? Asking civil engineers and surveyors to share the same data is kind of like asking dogs and cats to live together in harmony. The mindset of having individual silos of information and then emailing or making copies of files for others to use is changing. Many organizations are seeing the benefits of sharing the same project data as it helps to reduce errors and omissions as well as reduce the overall timeline on the project. Civil engineers and surveyors, as well as the extended project team, can realize benefits by sharing the same information.

What is Vault?

Technically, Vault is a data and file management system but the easiest way to conceptualize Vault is to think about how you are storing data now. Most companies have a central file server where company data is stored. Users typically have a mapped network drive, like a P:\ drive or a J:\ drive, to place their data. Now, just replace that drive letter with Vault. It is a central location where data gets stored. Vault allows all disciplines working on the project to store their data under a common folder structure. Everything relating to a project is together (where it should be) and easily backed up and archived. I realize the idea of surveyors and civil engineers placing their files and project data together is a very scary thought to many people. Some organizations have very extensive network drive and folder level permissions to make sure data is protected and only accessed by the correct group. Through the power of lifecycles, categories, and permissions inside of Vault, this same data can be equally protected and secured while still being stored together and shared across disciplines.

Vault Professional

The first thing to understand is that Vault is not a new product. Originally introduced to the civil/survey community with Civil 3D 2007, Vault has been around for civil/survey products in one form or another for about the last 7 years. As with any program, Vault has been enhanced over the years to the point where there are multiple Vault products. The version best suited for the civil/survey industry is Vault Professional.

Vault Professional includes the following high level features:

- Versioning
- Lifecycles & Revisions
- Civil 3D Toolspace integration
- MS Office integration
- Active Directory integration
- Centralized data repositories
- Replication
- Simplified searching
- Buzzsaw licenses for collaborating with external partners

I.T. and Installation

I chose to focus this class on the features and functions that can benefit civil engineering and surveying firms instead of getting into the weeds regarding installation, IIS, and server/network configurations. These topics alone could be another class, but I do want to discuss a few concepts that are relevant to this class.

Replication

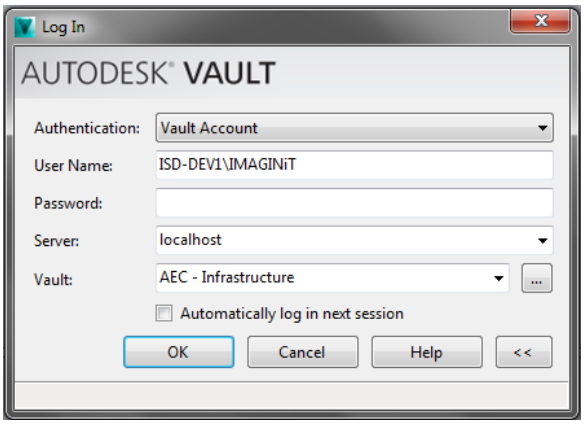


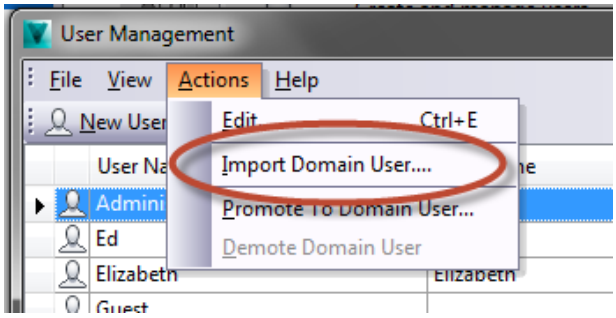
Vault Professional is built to fit the size of any business. From a single office company with only a few people, to global enterprises on multiple continents, Vault Professional can scale to meet the needs of the organization. One way in which this is accomplished is the ability to replicate the filestore and SQL database across multiple offices. This is beneficial in that when users check out files, they are being pulled from a server in the local office instead of being pulled across the company wide area network. This translates into increased performance and faster check in/check out times.

Active Directory Integration

Back in the early days of Vault with Civil 3D 2007 & 2008, one of the common complaints from users was having to remember a separate set of credentials to log into Vault. Let's face it… we all have entirely too many user names and passwords as it is. If you are like me, I am constantly trying to minimize the number of passwords I have to remember. Vault Professional can integrate directly into active directory and users can use their domain credentials to sign into Vault.

Inside of Vault's global settings, individual users or groups can be imported:

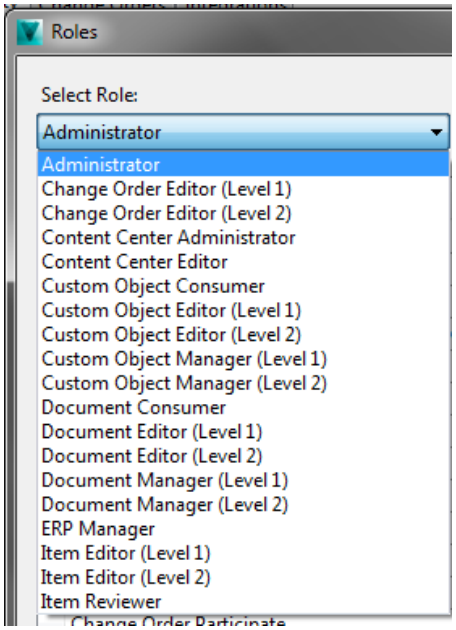




Permissions

Just like in a Microsoft environment, permissions exist inside of Vault. One way permissions are applied is by assigning a user or a group as particular role. There are several roles inside of Vault but the main ones are listed below:

Administrator	Full administrative access to Vault
Doc. Consumer	Read only access to files and folder
Doc Editor 1	Basic read/write but can't delete
Doc Editor 2	Full read/write/delete privileges
Doc Manager 1	Can change categories, lifecycles, and revisions
Doc Manager 2	Can edit categories, lifecycles, and revisions



The Lifecycle of a Drawing

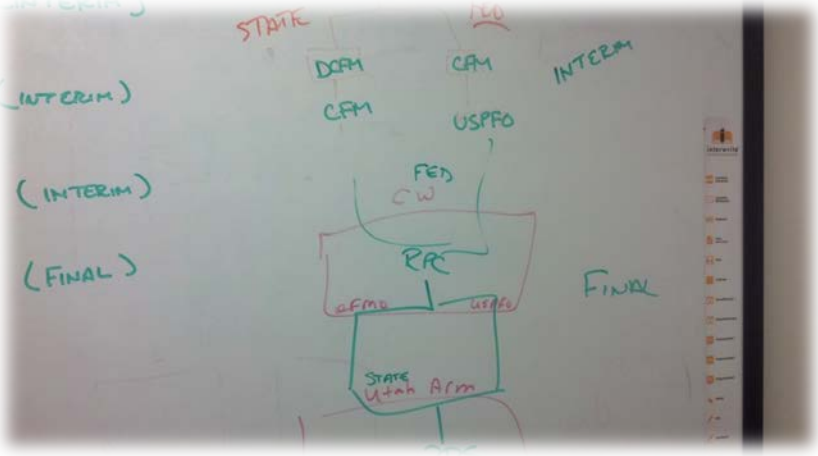
As I travel across North America working with different consulting firms, I am always surprised at the number of people that have trouble describing the lifecycle of a file. I think this is because it is something that just kind of happens in the background that people don't give a lot of thought to. From the time the drawing is initially created from a blank DWT file, to the point that it is approved as the 100% submittal, what are the steps it goes through? Who works on it? Who approves it? How does it move from 30% Complete to 60% Complete to 90 Complete, to 100% Complete? When beginning to think about implementing Vault Professional, the concept of lifecycles should dominate much of the time spent.



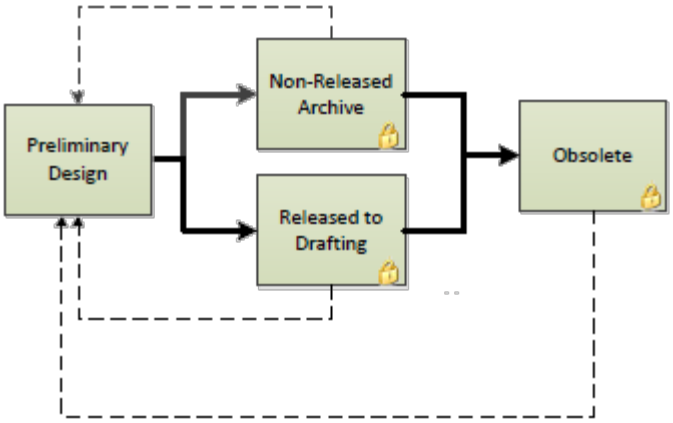
This is one of the simplest examples I can define however it should begin to explain the lifecycle concept. In addition to the steps the drawing progresses, spend time thinking about some additional items as well:

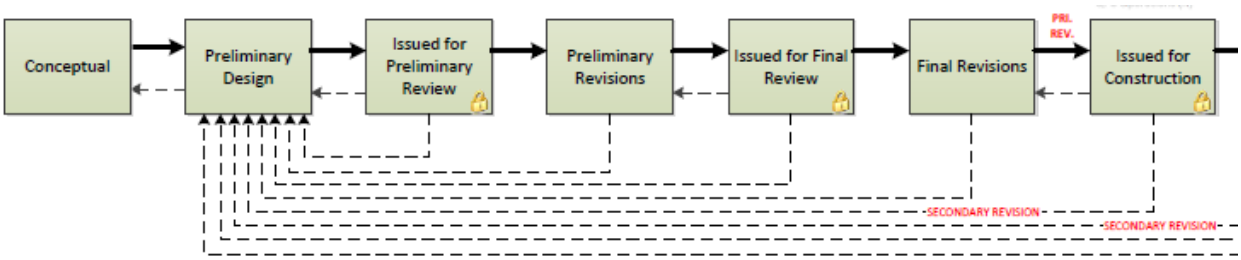
- What groups should be able to see the file at each step in the process?
- Who should be able to move the file from one lifecycle to another?
- Does one progress through the lifecycles sequentially or are the choices? Can some lifecycles be skipped? Can a file move backwards in the process?

These are all things that need to be considered prior to launching the software and beginning to click buttons. The best tip I can impart is to diagram this out. I tend to start on a whiteboard with dry erase markers and then move the finished product into Visio.



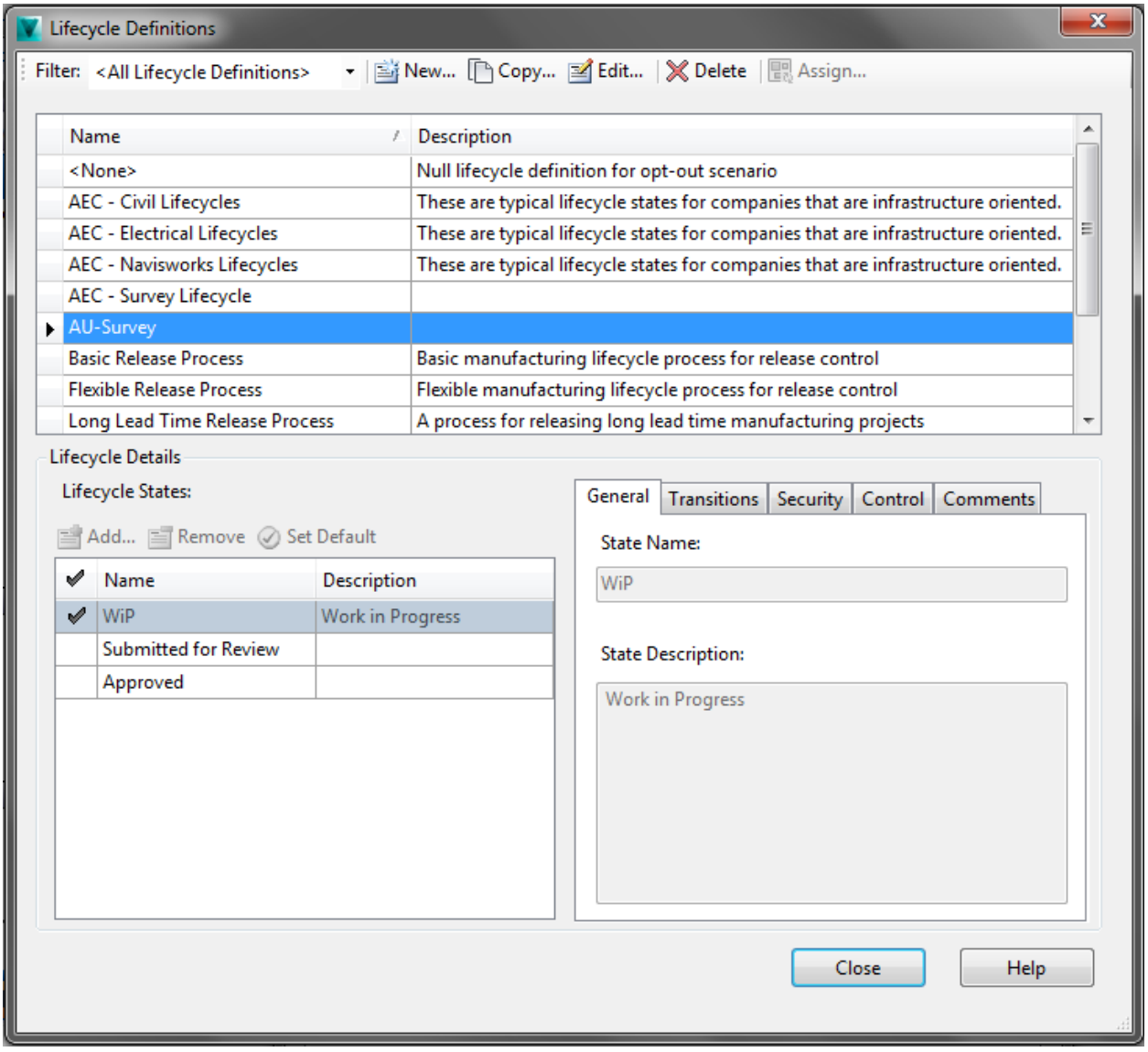
A few examples of my finished products look like this:



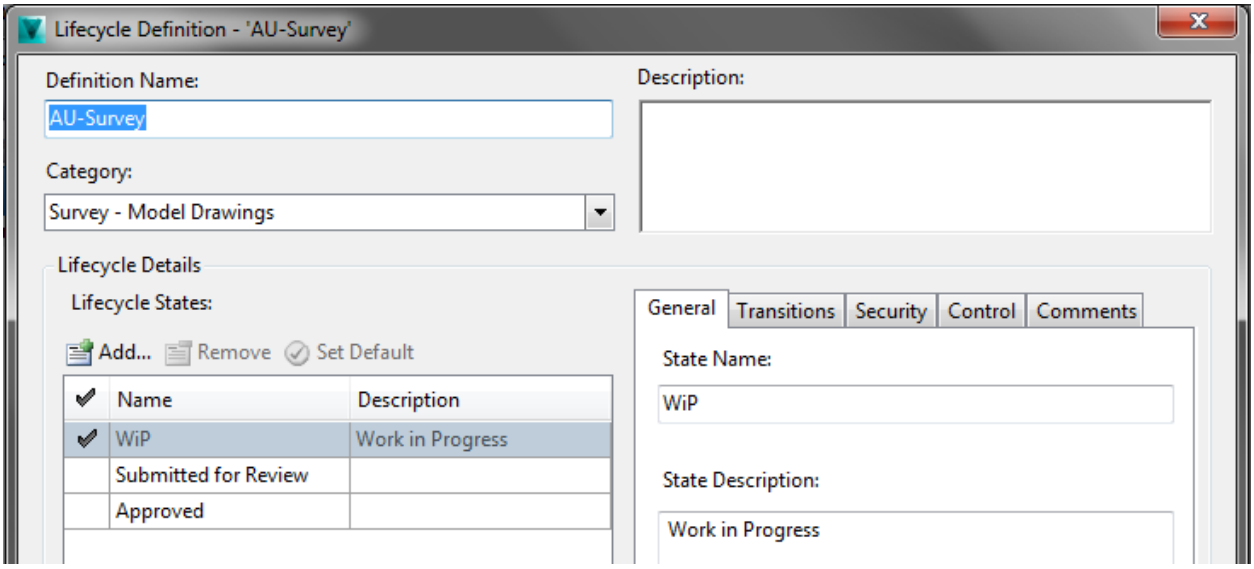


There really isn't a right or wrong answer on this. It's more about what works for the individual to organize their thoughts.

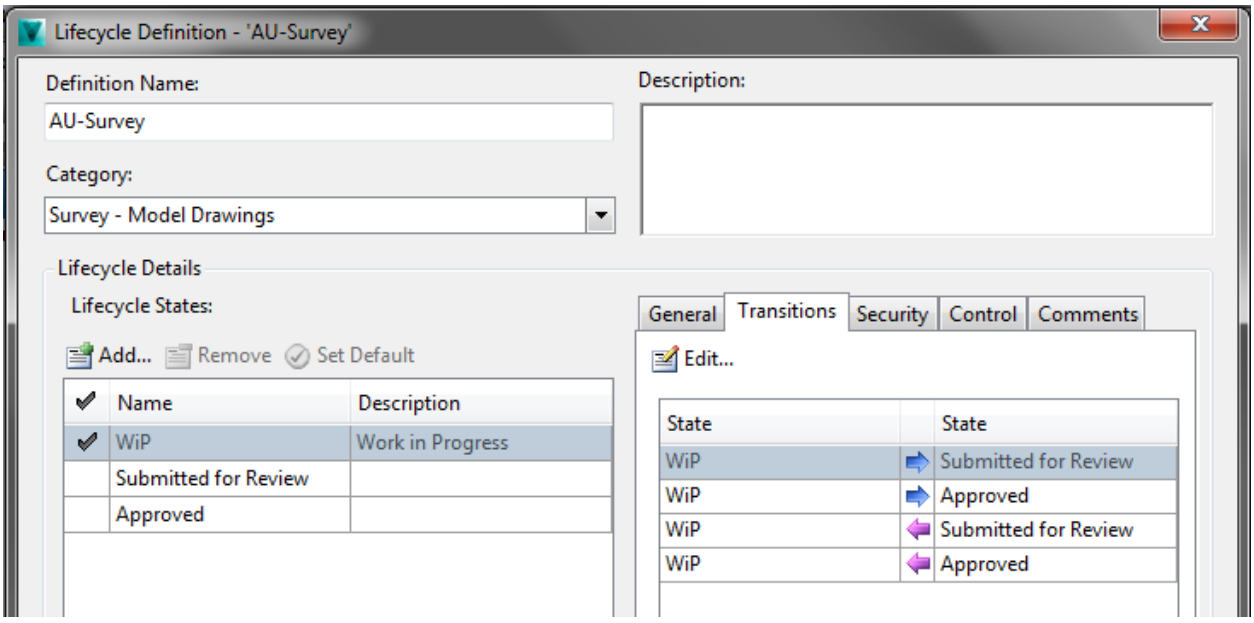
Inside of Vault administration options, the lifecycle definitions appear slightly different:



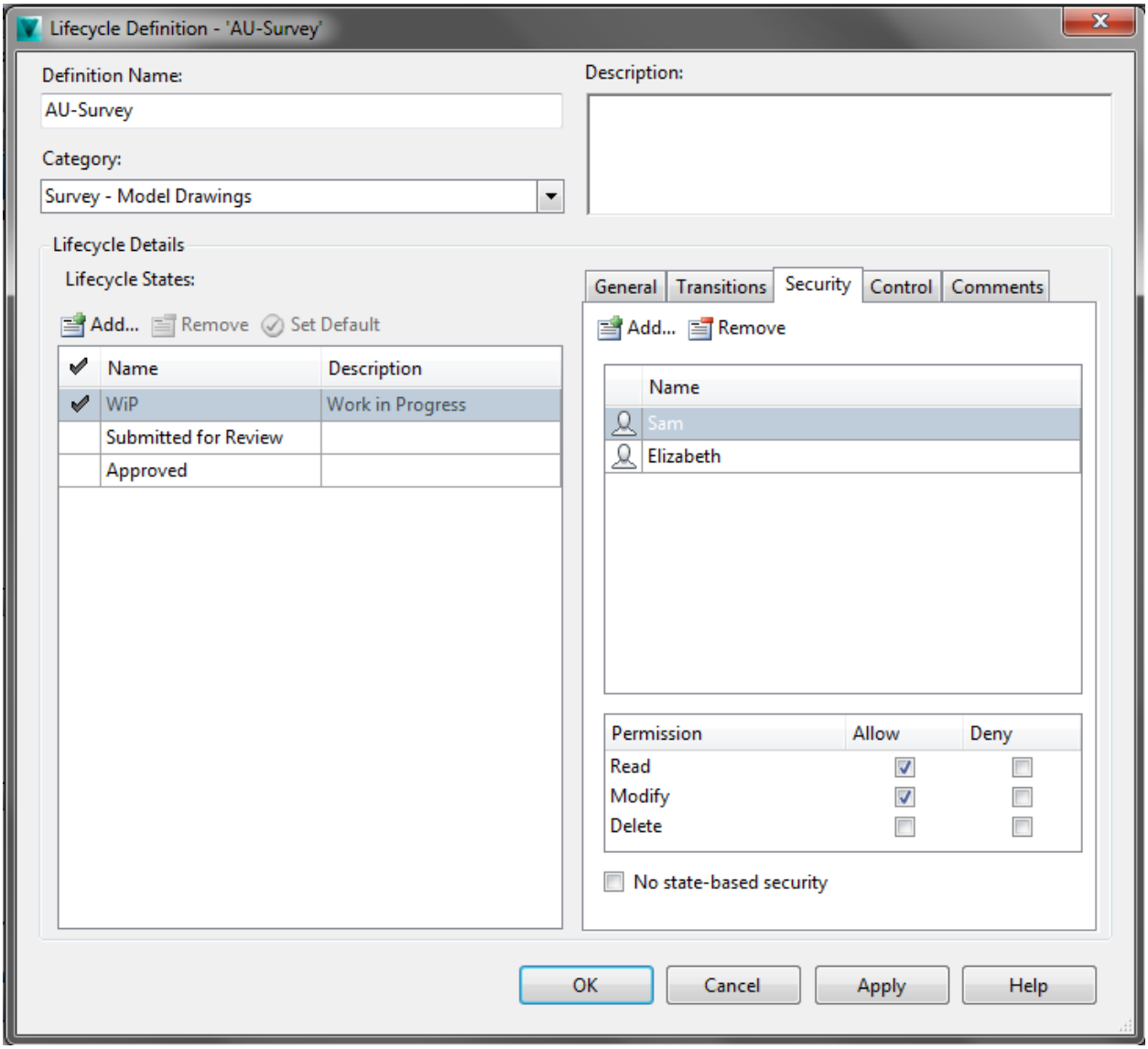
This is the interface to create or edit lifecycles. Once the overall definition is created from utilizing the New command at the top of the dialog box. During the creation or by selecting Edit, the individual lifecycle states can be added:



The right side of the dialog box is where all of the magic happens. Transitions control the sequence and flow through the lifecycle. This is where we can allow or deny the move from one state to another as well as who is allowed to move the file. For example, an intern may do a be able to move a file from WiP to For Review however only a manager can move it from For Review to Approved.



The Security tab is where we can assign the permissions to the file at the given lifecycle state. For example, surveyors may not want anyone outside of the survey group to have access to a file while it is still WiP; however, once it is approved, the engineering group is allowed read-only access to the file.

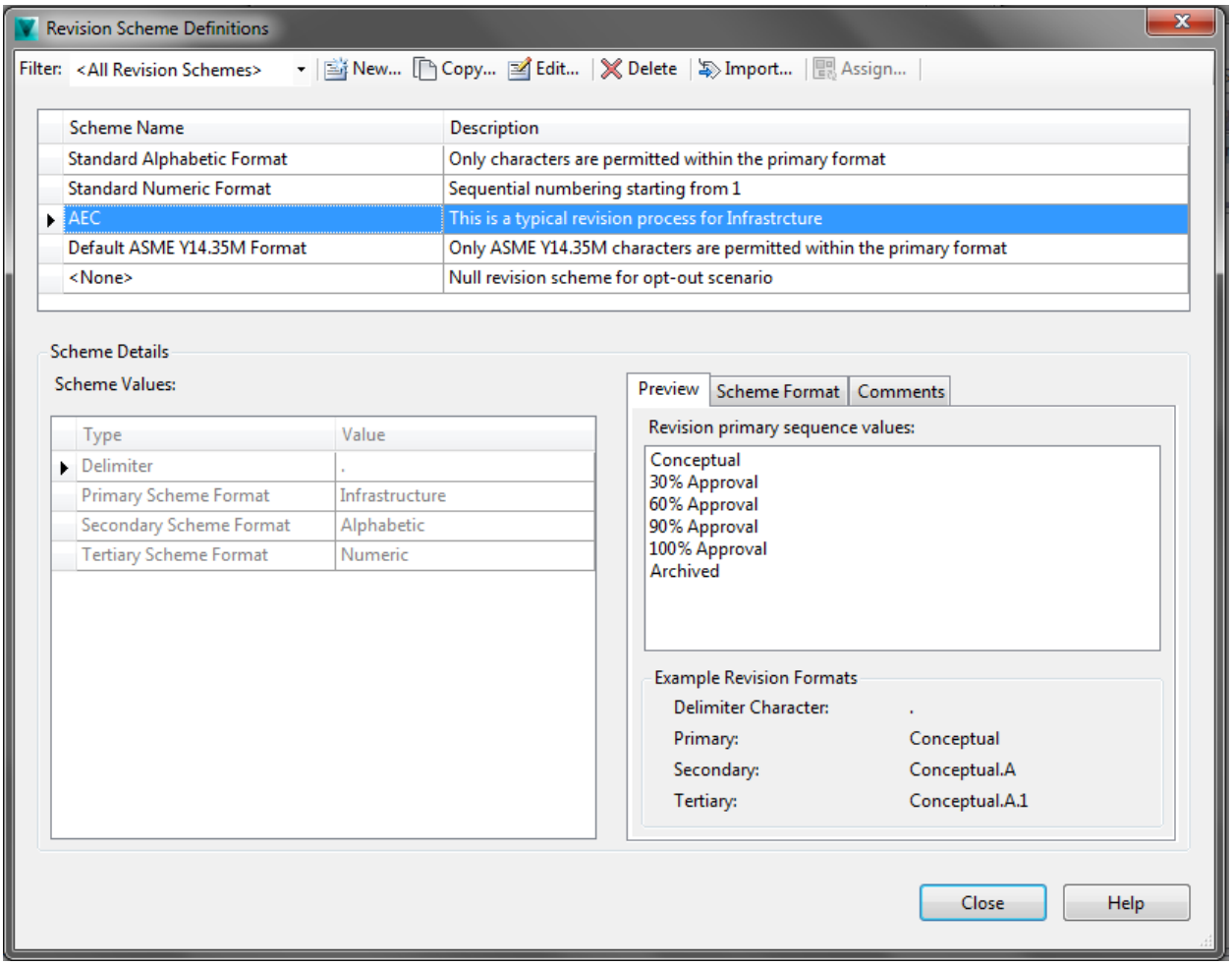


Finally, the Control tab is where we can define if a state is “released” or how any versions of files in that given state are retained during a purge command.

Revision Schemes

Revisions are a significant milestone or a set of changes to a file and its related files. As drawings progress through the design cycle, certain milestones are achieved that are typically stored. The most common example of revision use inside of Vault Professional is tracking 30/60/90/100% approvals.

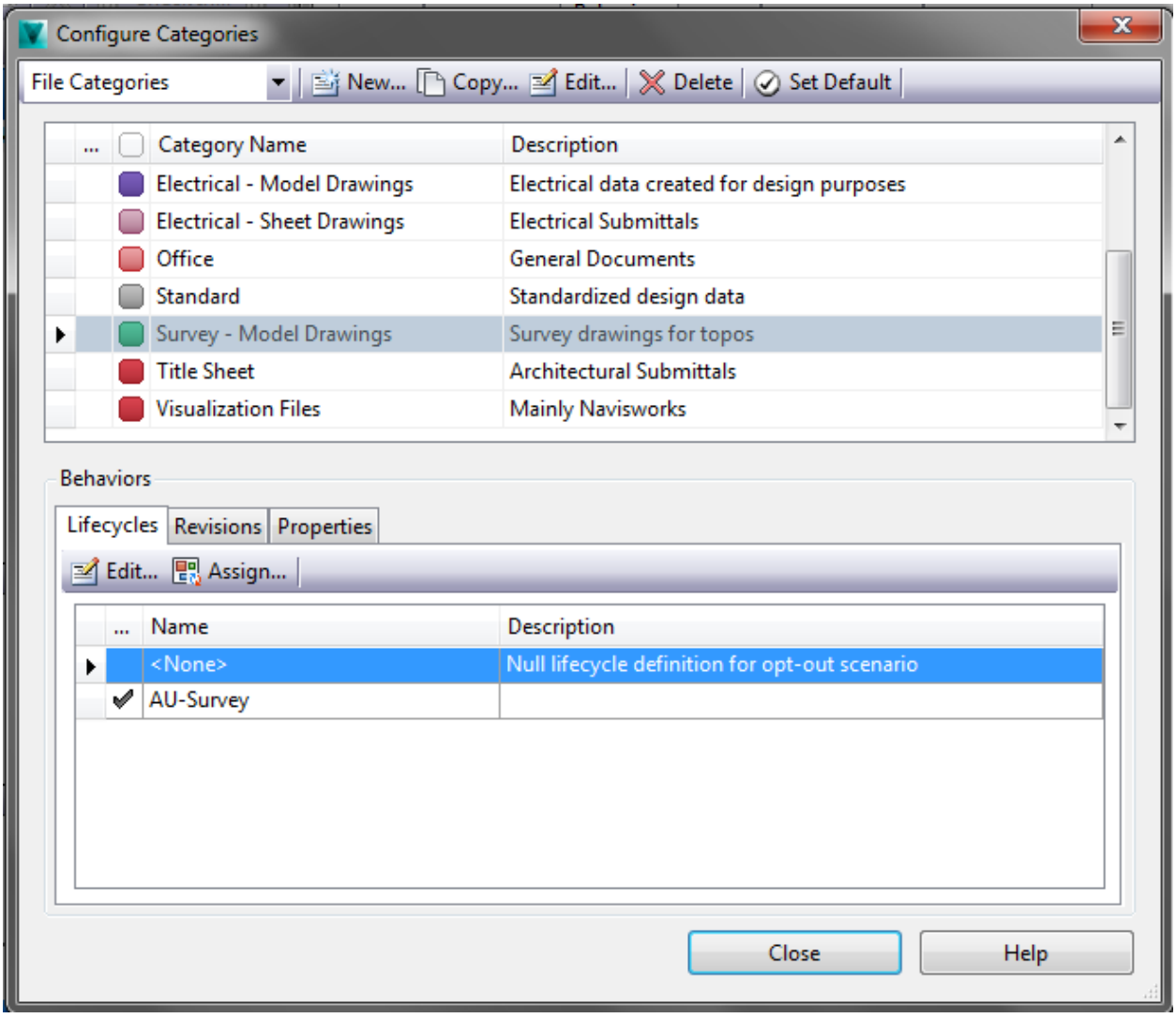
Revision scheme definition is very similar to lifecycles with a similar interface:



Vault Professional allows for primary, secondary, and tertiary revisions. Each revision format is highly customizable and supports numeric, alphabetic, or completely user defined schemes.

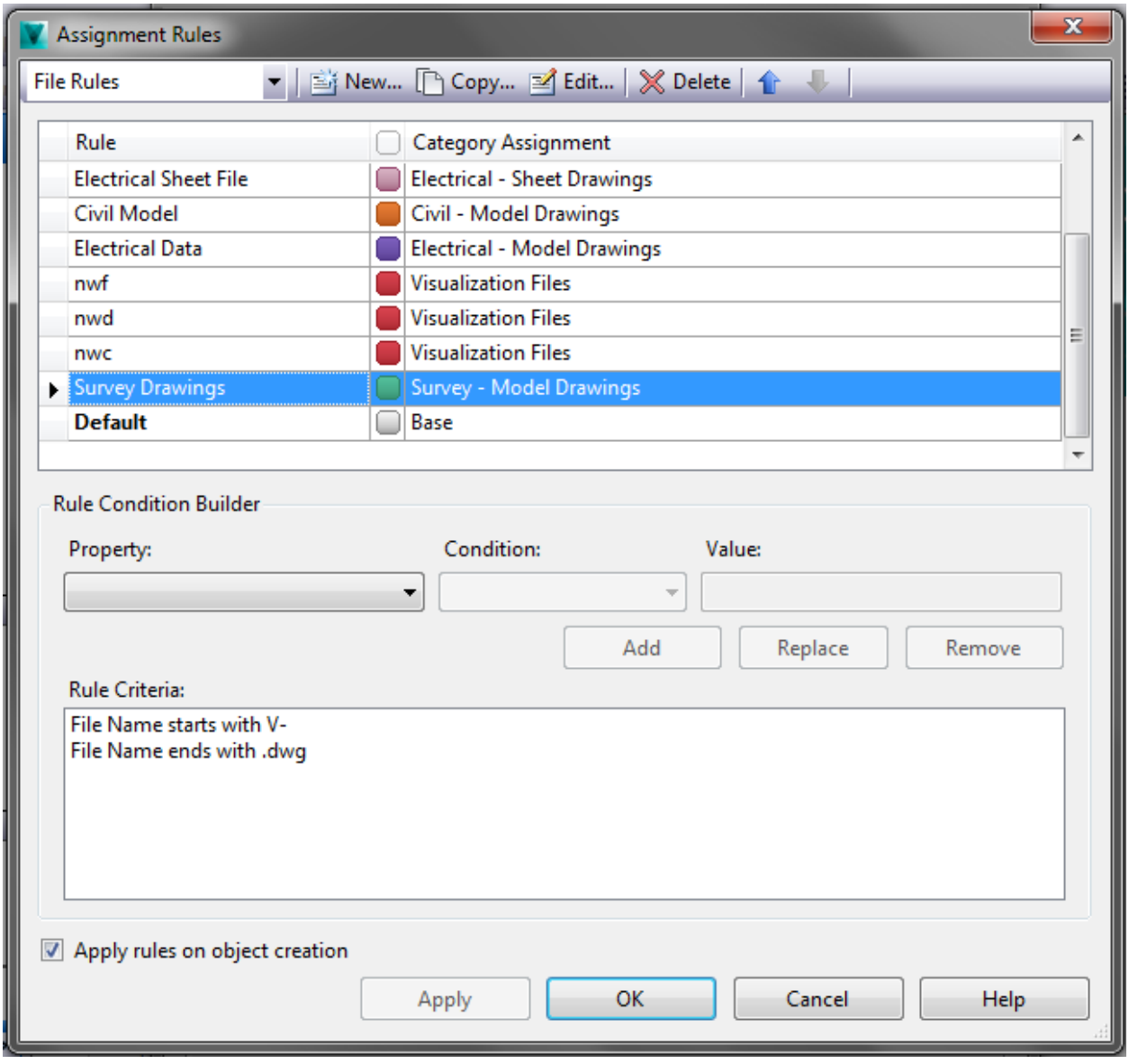
Categories

Categories are containers that associate a lifecycle, revision, and user defined properties together. It is important to note that a given vault can contain several different lifecycles and revision schemes depending on the type of files it contains. For example, survey drawings may have their own lifecycle (approval process) while the civil drawings go through an entirely different lifecycle with different approvals. There may be some file types (like office documents), that don't go through any approval processes. Categories are a way we can start to delineate the different types of files that will go into Vault and associate any applicable lifecycles and revision schemes.



Rules

Assignment rules pull everything together and automatically assign categories, which in turn assign lifecycles (including permissions) and revision schemes, to files as they are checked into the vault. Rules can be based on a multitude of criteria like who checked the file in, subject, or keywords; however, they are most typically assigned by criteria in the file name.

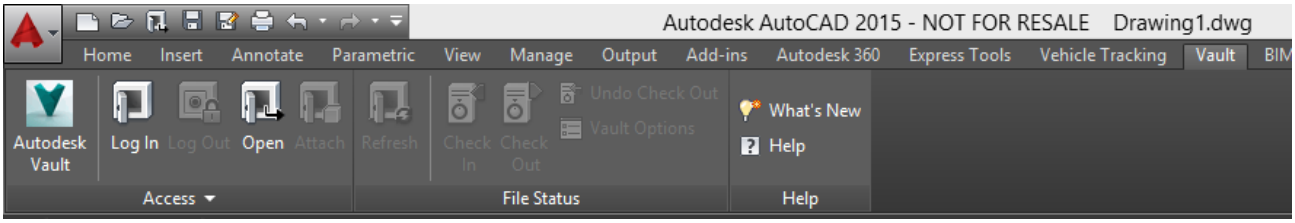


Interacting with Vault

To interact with Vault, the Vault Professional client needs to be installed on the computer. Depending on the installation parameters, Vault will integrate itself automatically with various programs installed on the system.

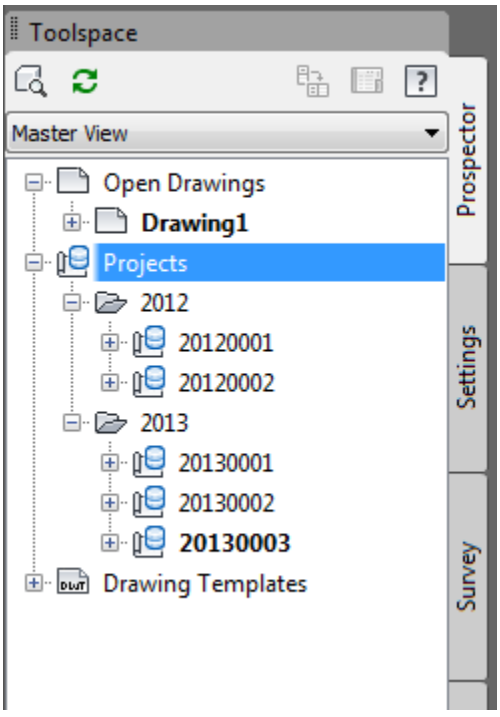
Autodesk Products

Most all of the main Autodesk design products can now interface with Vault. The primary way in which they do so is by adding a Vault ribbon tab to the design application:



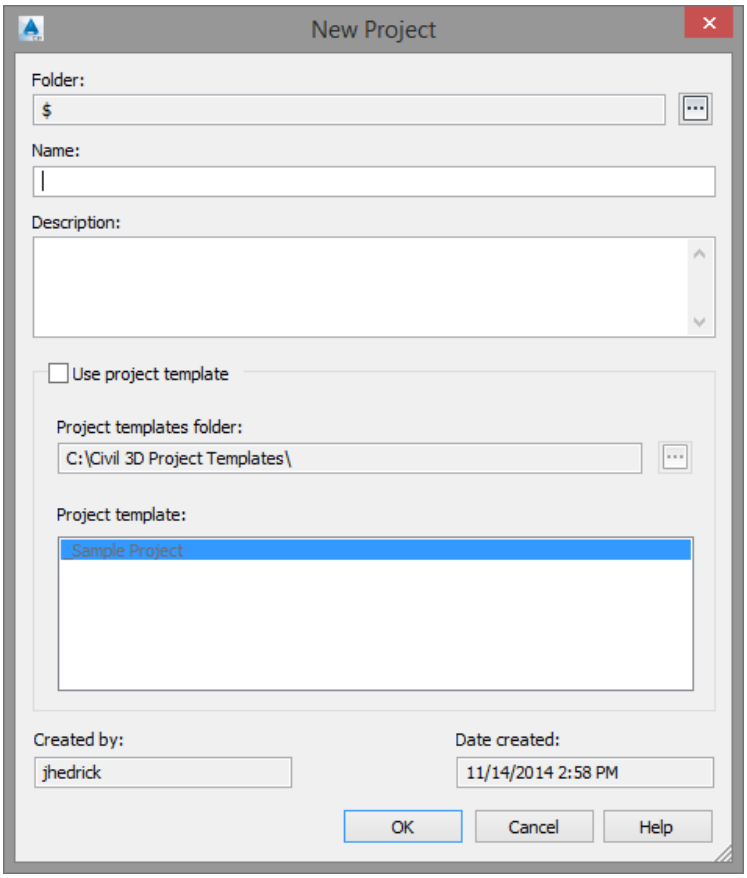
Autodesk Civil 3D

There is added integration with Civil 3D. In addition to the ribbon tab, the Vault client also integrates into the Prospector tab of Toolspace by adding a Projects node.



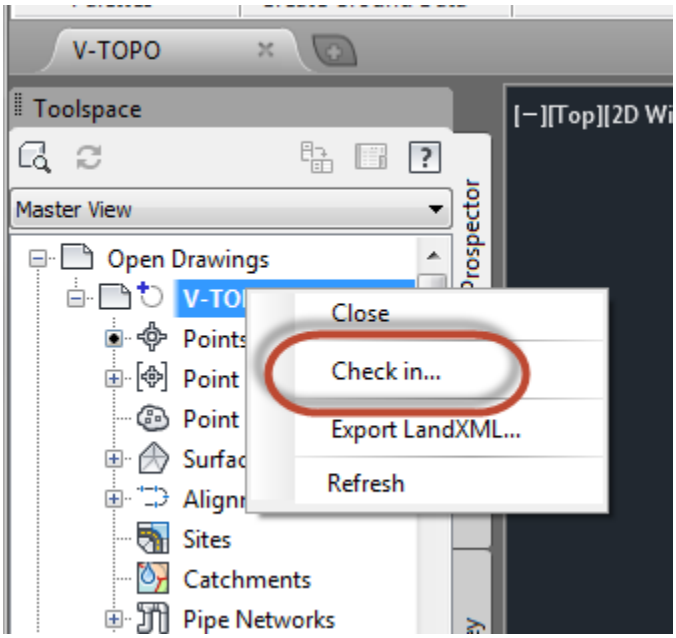
This allows for direct interaction with drawings inside of vault as well as the ability to directly reference design data from one drawing of the project into another. The Vault environment replaces data shortcuts inside of Civil 3D although Autodesk has done a lot of work to make the basic processes and the user interface look similar.

The project creation dialog box looks almost identical to the one displayed for data shortcuts with an additional option for the folder path.



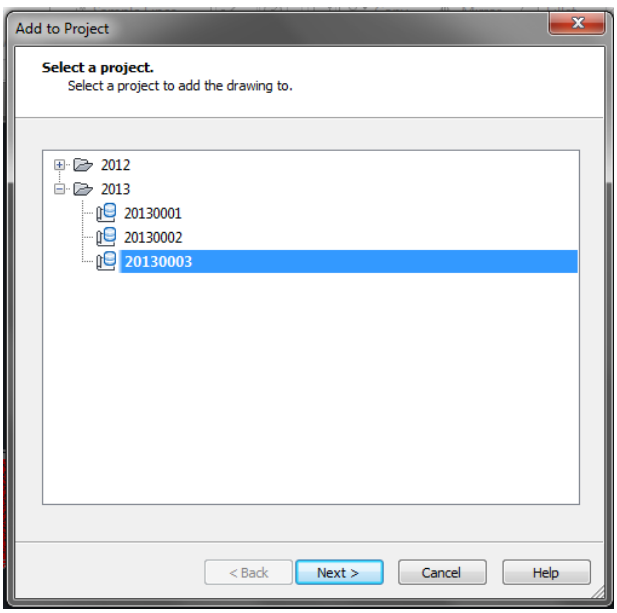
The next step is to get drawings and data into the project. It is important to note that inside of Vault as well as most other document management systems, works like “open” and “close” get replaced with terms like “check out” and “check in”.

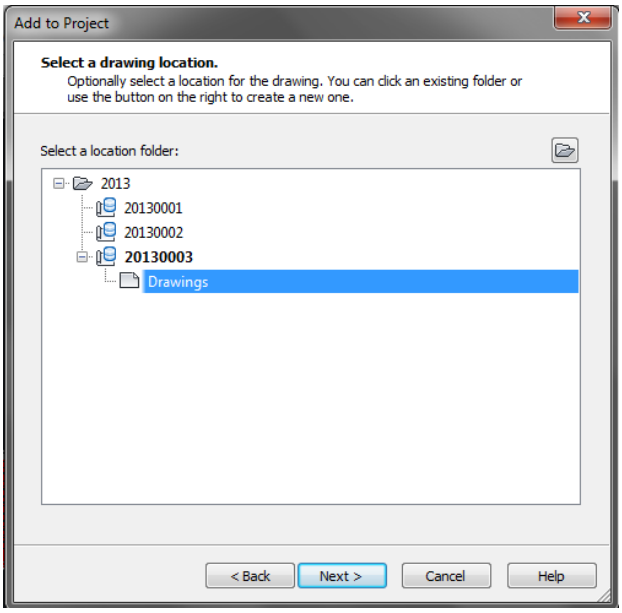
Once signed into Vault, you will notice a few extra icons that didn’t exist otherwise. To get a drawing inside of Vault, simply check it in:



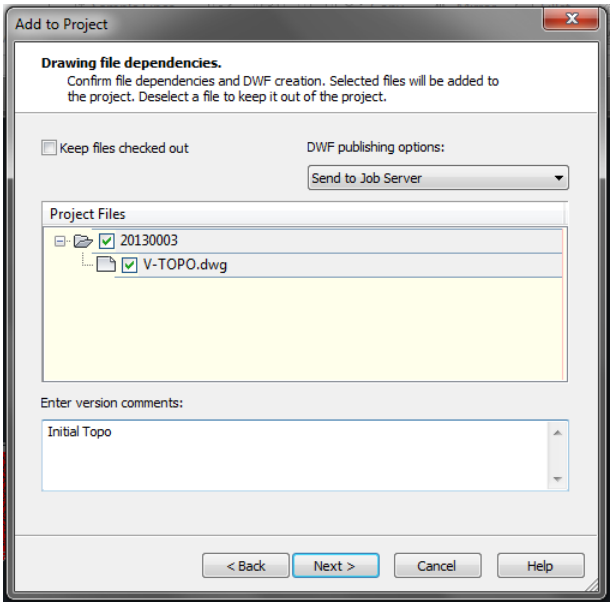
That will launch a series of dialog boxes very similar to the “create shortcuts” command..

First step is to select a project and then a location for the file:

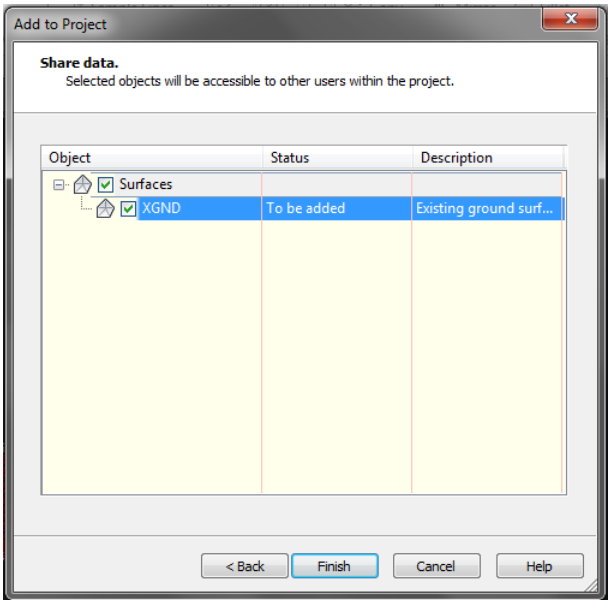




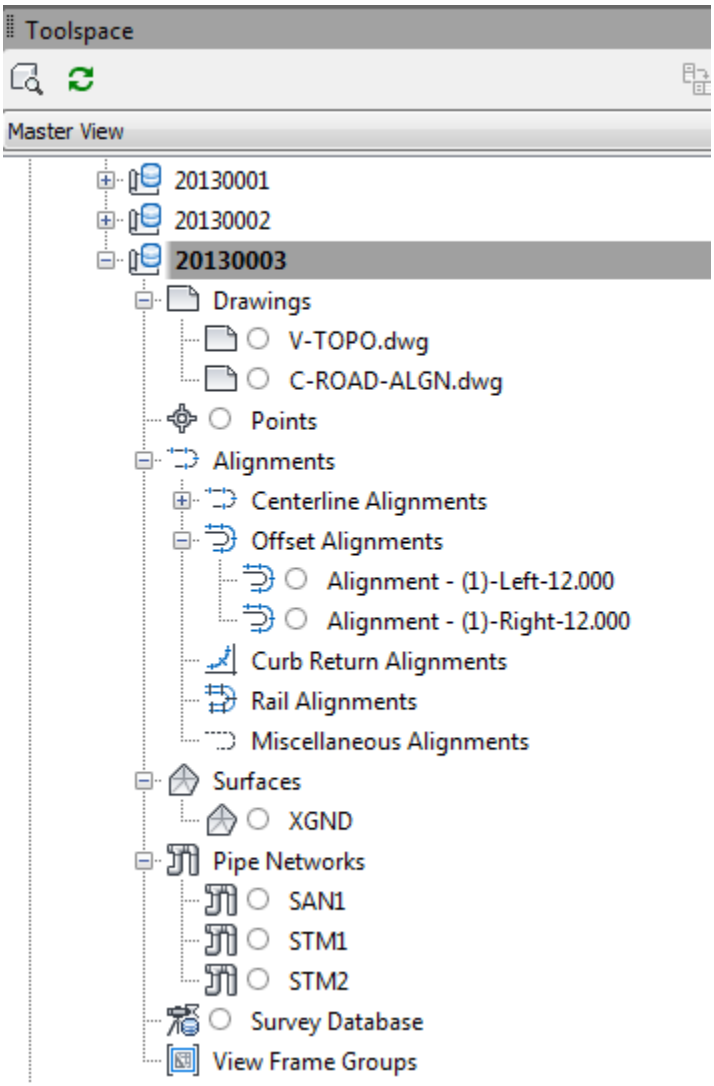
Next is to select whether or not to keep the file checked out or open for editing as well as adding some comments about this version. Comments are handy as they can become searchable fields down the line:



Finally, just as with data shortcuts, we select the bits of data to make avaialble (referenceable) to the rest of the project:

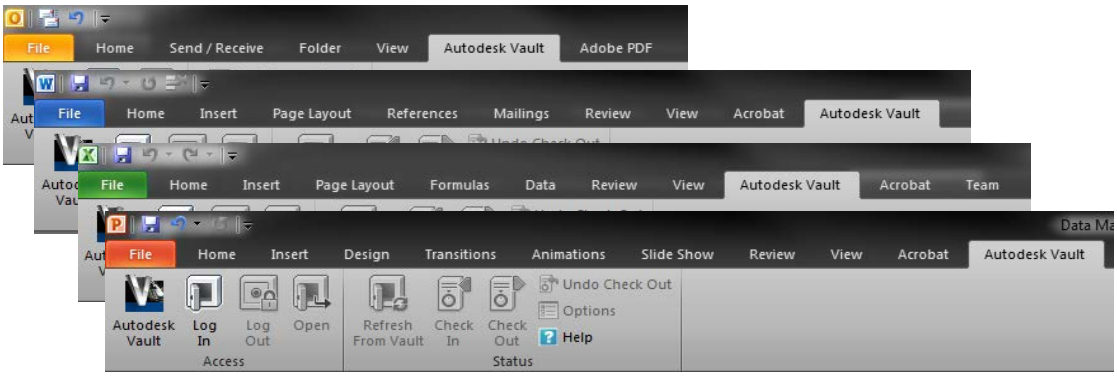


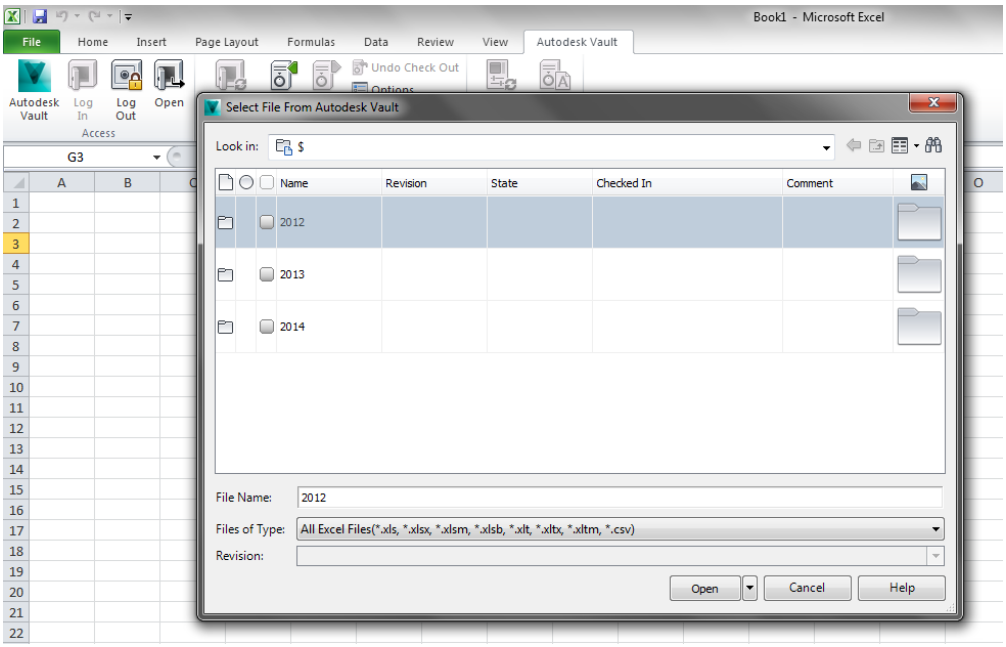
Once this process is complete, the drawing and any shared data will show up in prospector and be avaialble to the rest of the project members (assuming they have the appropriate permissions to use it).



Microsoft Office

The Vault client also integrates directly into Microsoft Office. Word, Excel, Powerpoint, and Outlook receive Autodesk Vault ribbon tabs.

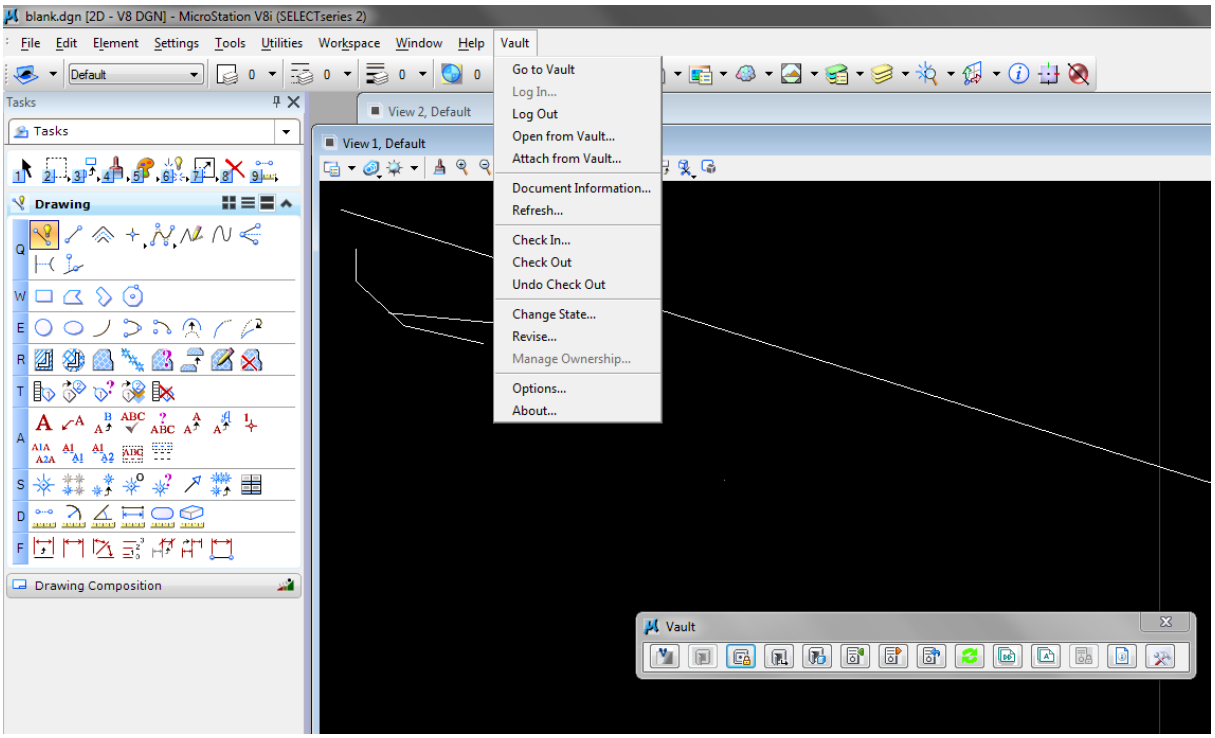




This allows direct Vault interaction from within the Office suite of products. Review letters, spreadsheet calculations, and even email correspondence (including attachments) can be placed inside of Vault with the rest of the project data.

MicroStation

Available to subscription customers, Autodesk released a plug-in to Vault that will allow direct vault interaction from within Bentley MicroStation V8i.



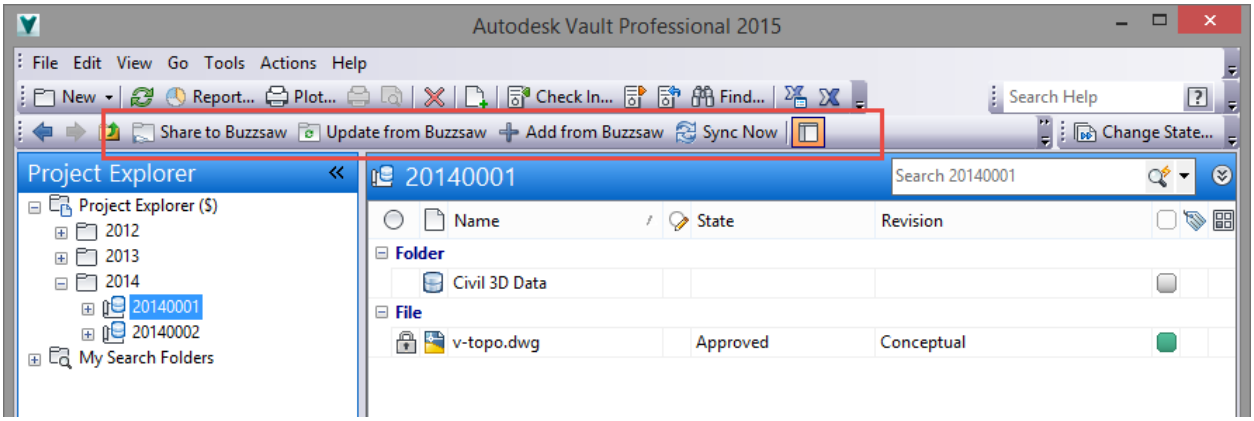
All Other Products

Vault Professional will accept any valid Windows file. This simply means that any file can be placed inside of the Vault. If there isn't an in-application plug-in similar to what's available in Civil 3D or Microsoft Office, those files can be added by simply dragging and dropping them inside of the main vault client application.

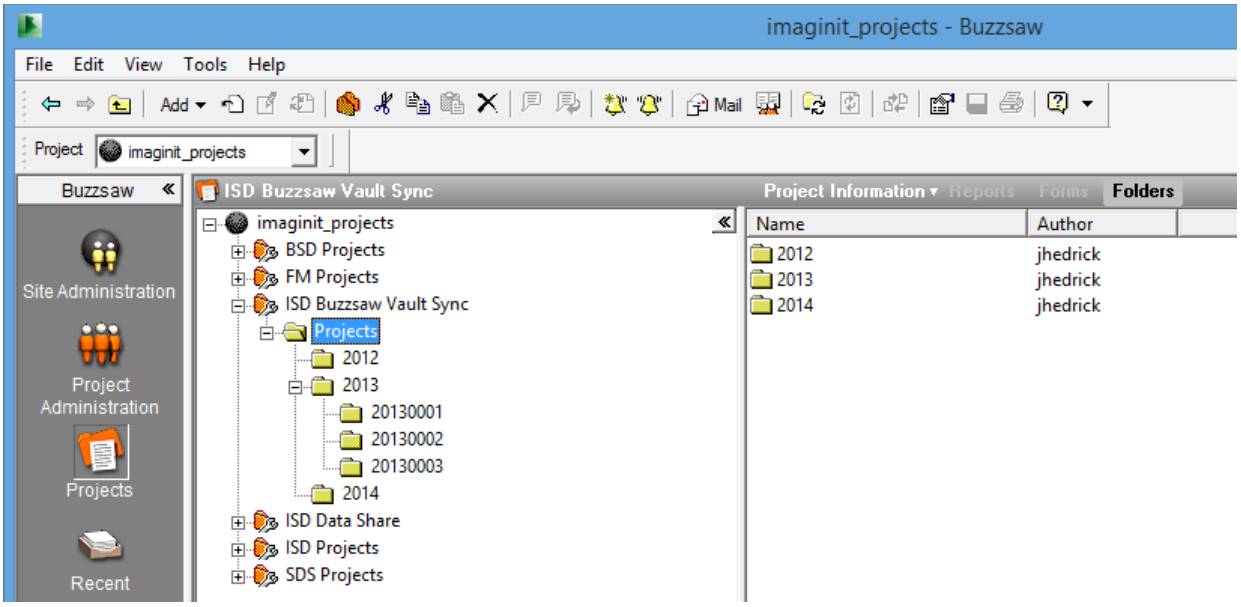
Collaborating with External Partners

Vault Professional does an excellent job for managing data across the offices of an organization, but what happens when a sub-consultant is introduced into the design chain? One way to solve this problem is to open up a port in the company firewall but this introduces a network security thread and IT staff typically won't allow it. Another possible solution is to give the consultant VPN access to the company network. Since Vault Professional comes with access to Autodesk Buzzsaw, the easiest solution is to place the data required to collaborate on this externally hosted site.

Autodesk distributes a free application that will allow Vault to sync data with Buzzsaw. Once installed, it integrates into the Vault Collaboration client:



Once some very simple user credential and folder mapping information has been setup, users simply have to select the files they want to send to Buzzsaw and press the Share to Buzzsaw button. Vault will replicate the same folder structure in Buzzsaw that is inside of Vault. Once the consultant does their work and places updated files on the Buzzsaw site, those files can be added from Buzzsaw to the Vault. Advanced implementations will build the Share to Buzzsaw command into a project lifecycle transition to automate this process. An example would be what once a file has been marked "Approved", it is automatically sent to Buzzsaw for external consumption.



Conclusion

As projects become larger and more complicated, the promise of BIM will continue to require all firms in the design chain to communicate and share data. Vault Professional is an excellent tool to help achieve this level of collaboration.