

DIGITAL GOVERNANCE

Autodesk Construction Cloud Standards

February 26, 2024 Version 2.0







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AUS AUTODESK CONSTRUCTION CLOUD STANDARDS



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AUS AUTODESK CONSTRUCTION CLOUD STANDARDS



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SUMMARY OF REVISIONS:

While this document is intended as a reference that can be cited in agreements such as contracts and BIM execution plans, it is recognized that the use of Autodesk Construction Cloud in design and construction is evolving. To accommodate this evolution this document will be updated periodically in clearly identifiable versions. A project can adopt a specific version and then has the option to remain with that version or update if an updated version is published. Initially the target update frequency is annually, but that may change in the future. In addition, interim updates may be issued if needed.

Table 0.01 summarizes changes made to the Autodesk Construction Cloud Standards from the previous approved version. Information displayed is for reference only.

TABLE 0.01: REVISION HISTORY

Revision	Date	Author	Approver	Description
1.0	07NOV23	AUS		First Version of ACC Standards
2.0	26FEB24	AUS		Updated appendices

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INTRODUCTION

If used effectively, Autodesk Construction Cloud (ACC) provides opportunities to vastly improve upon traditional methods of design and construction coordination thereby reducing the potential for costly change orders, providing multiple opportunities for Owner review and participation by means of 3D visualization of the project and specialty spaces, and reducing design and construction schedules. In addition, ACC creates opportunities for reusing data for multiple purposes, including the operation and maintenance of Austin Bergstrom International Airport (AUS) facilities. To achieve these ends, ACC must be structured to the required purposes. This document describes AUS requirements for the production and use of Autodesk Construction Cloud in the design, construction, and maintenance of its facilities.

PURPOSE OF AUTODESK CONSTRUCTION CLOUD STANDARDS

The AUS Autodesk Construction Cloud Standards ensure that the design team will produce, release, and receive data in a consistent format. This will maintain an efficient exchange of data between disciplines, compatibility of each discipline's Building Information Models (BIMs) with various outside consultants, and all government agencies, including Federal Aviation Administration (FAA) and the City of Austin (COA). AUS technology practice is comprised of several Autodesk products. The AUS Autodesk Construction Cloud Standards will use terminology and references that are common to the Autodesk-based software applications.

The Autodesk Construction Cloud Standards is a live document and should be maintained by the AUS BIM Department. External Companies are required to contact the AUS Planning and Development Project Manager or BIM Department for the current version and referenced documentation. Any modifications, deletions, or variances to these standards will not be allowed without the permission of AUS BIM Department.

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CHAPTER 1: AUTODESK CONSTRUCTION CLOUD

Autodesk Construction Cloud connects workflows, teams, and data at every stage of the project lifecycle to reduce risk and maximize efficiency. It is an Autodesk cloud-based solution that allows project teams to effectively work in a single collaborative environment.

ACC is separated into two parallel cloud platforms, the online website (Chapter 3) and Autodesk Software (Chapter 4). Prior to use on a project, ACC setup (Chapter 2) is required. All AUS ACC projects shall be configured to these standards unless otherwise noted within the project BIM Execution Plan (BEP).

CHAPTER 2: PROJECT CREATION AND SETUP

Each AUS project will have an ACC project established at project kick-off. New ACC projects will be created and hosted by the AUS BIM department. From the AUS ACC hub admin page, new projects will be created and include Project Name, Project Number, Account, Project Type, Project Image, Project Address, and Template, Figure 2.01.

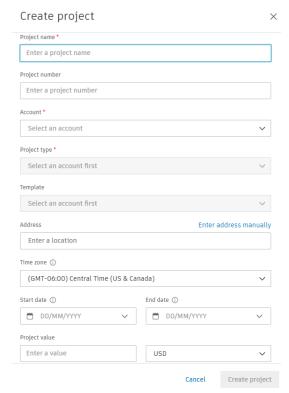


FIGURE 2.01: PROJECT CREATION WINDOW

- Project Name: Project number (AUS Project #) with project name (ex: ####-Project Name)
- Project Number: eCAPRIS number
- Account: AUS Hub
- Project Type: Industry for Project (ex: Airport)
- Project Image: Latest AUS logo
- Project Address: Aligned to the location that best fits project scope
- Template: AUS Project template

After selecting "Create Project," the AUS ACC administrator will pause setup until the new project email is received and all preset administrators display within the members list. Five minutes shall be used as the standard wait time, but configuration time may vary. Overrides to template



configuration will occur if setup is continued prior to the notification and verification. Once a project is created modules, users and companies, permissions, teams, publishing, and notifications will be configured.

2.01: AUS ACC Modules

Autodesk Construction Cloud is the overarching concept that is comprised of various modules focusing on distinct aspects of the project lifecycle. Modules can be utilized as needed to meet project requirements or turned off when other platforms or procedures facilitate the matching functionality. To prevent duplication of procedures, AUS ACC Standards shall cover the modules required for efficient file collaboration and interoperability. Project Management procedures will be covered under the AUS project management platform, refer to the Project Management Platform standards for more information. The modules utilized by AUS will be Insight, Docs, and Design Collaboration.

Activating ACC Modules

Modules can be activated/deactivated throughout the project under each user's assigned products. Additional modules are to be activated on per project basis. Refer to the project BEP for additional modules to be activated. Modules must only be assigned to participants who require the functionality. Activating modules may have additional costs and will trigger the 30-day trial. Additional modules must be reviewed by the AUS BIM department prior to activation.

2.02: Adding Project Members and Companies

Before project members can be assigned to a specific project, each user must be added to the AUS ACC platform. In the account admin module, AUS ACC administrators will create the companies and fill out the company name, type, and logo fields. Next AUS ACC administrators will add new users, Figure 2.02. Each user must have a selected company and role. The role will match that of their discipline for internal AUS staff and all external contributors shall be set to "Contractor" or "Subcontractor." Email addresses should be from a verified company, personal emails will not be accepted.

ACC license subscriptions are required for access and will be assigned to internal AUS corporate emails only. External parties are responsible for procuring licenses as needed to facilitate the project role assigned.

Once users are added to the ACC hub, each can be added to projects. Additional users can be added at the project level, but shall be added to the account admin module prior to closeout for future inclusion on projects.

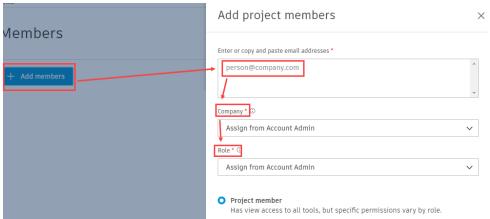


FIGURE 2.02: ADDING NEW USERS



2.03: Setting Permissions

By default, permissions will be set based on the company and role assigned to each user. If companies and roles are not preset, the ACC project administrator can set additional permissions. ACC project administrators will be the lead project BIM Manager or designated administer indicated in the project BEP.

Access to files in Docs is controlled by permissions based on name, role, and company. Permissions are set from the highest level and carry down to the lowest folder directory. At setup, projects will have role-based permissions configured, but templates will not carry over name or company permissions. Each project will require company level permissions to be added at project start. Without company permissions, users will not be able to reference other disciplines. All companies must be added at the Project Files level with "View + Download" permissions, Figure 2.03. Each external company will require "Edit" permissions for the matching discipline subfolder(s) assigned on a project. Refer to the project BEP for all additional permissions required beyond the default template including but not limited to: Project Management, External Companies, Clients, and Construction Management.

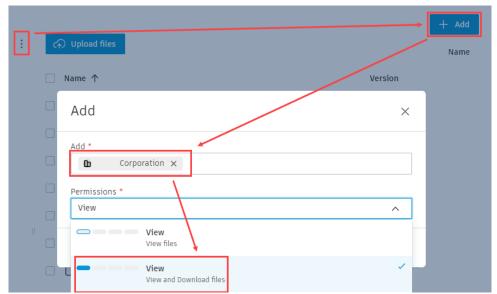


FIGURE 2.03: SETTING PERMISSIONS

2.04: Design Collaboration Creating a Team

Before Design Collaboration can be used, ACC project administrators need to create "Teams". Teams represent a collection of models and drawings based on available folders. A Team will be made per discipline folder and named to match that of the folder, Figure 2.04. When opening Design Collaboration for the first time, ACC is configured with the AUS standard Teams. ACC project administrators must review the available Teams and add or delete as needed for the project. Deleted Teams will prompt to remove their Team and shared folder, both must be deleted. Projects with multiple facilities under one project number will be separated by parent folders with copies of the discipline folders under each.



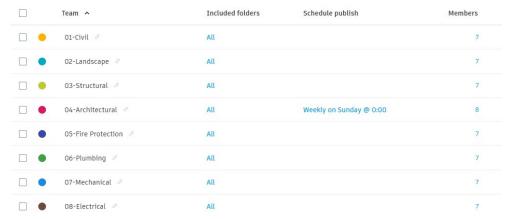


FIGURE 2.04: ACC TEAMS

If ACC fails to create the preset Teams, each can be added manually. Folders with the same name will error out and each must be unique.

Design Collaboration Manage Settings

After all Teams are configured, the ACC project administrator must set the "Main Model" and AutoCAD DWG support. The Main Model determines the file where levels and phases are extracted and will be set to the Architectural model for AUS projects. Projects without an Architectural model will select an alternative Main Model and insert the information into the project BEP.

AutoCAD and Civil 3D files can be supported under Design Collaboration. DWG file support shall be turned on for all AUS projects.

2.05: Schedule a Publish

Publishing is the workflow required to upload design content from the live cloud environment to the static web-based cloud. Under Design Collaboration settings, each Team shall schedule a publish with a frequency of once a week. A scheduled publish can only be added once a model is uploaded in the matching Team folder and must be set for each Team independently, Figure 2.05. Frequency shall be noted in the project BEP.

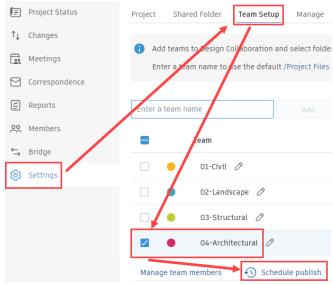


FIGURE 2.05: SCHEDULING A PUBLISH



2.06: Setting Notification Frequency

ACC tools have the functionality to notify project Team members of changes and updates through email. By default, notifications are set to instantly send emails. To reduce the number of emails, all frequencies will be set to "Never" with the permissions set to "Manage," Figure 2.06. Notifications shall be configured for all Team members, but can be turned on per user for personal platform updates.

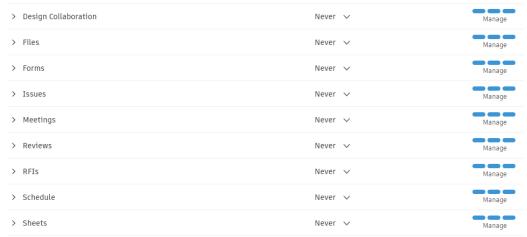


FIGURE 2.06: DEFAULT NOTIFICATION SETTINGS

CHAPTER 3: WEB PLATFORM

The web platform is the interface for all project contributors and participants and accessed through the ACC website. New users will need to create an account with their corporate email address when signing in for the first time. Only ACC projects assigned to each user will be available after sign in.

3.01: Project Navigation

Selecting a project will load an available module and defaults to either Insight or the last used. The current module will be displayed in the top left-hand corner button. This button will display all available modules to the user, Figure 3.01.

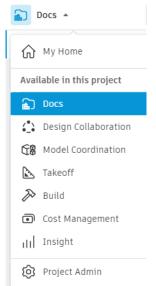


FIGURE 3.01: EXAMPLE MODULE OPTIONS BUTTON



3.02: Insight

Insight is the homepage module for project information and metric cards. ACC project administrators shall create dashboards as required for the project. By default, the project address and weather shall be included on the primary dashboard.

3.03: Docs

Docs is the document management module for files, reports, transmittals, reviews, issues, and bridge. AUS use of Docs will be limited to files and bridge, but participants can utilize markups and issues for internal or interdisciplinary coordination. Refer to the Project Management Platform standards for use of Bluebeam or Procore for milestone, RFI, submittals, and other official reviews.

File Locations and Folder Structure

The "Files" tool contains the digital content uploaded to ACC. Files are not limited to Revit models or AutoCAD drawings and can include schedules, reports, images, budgets, and project documents. ACC will not host official deliverables submitted to AUS. Deliverables shall be included within the AUS transmittal form and sent to the AUS Project Manager for Procore upload. The AUS' file structure is configured by discipline, Figure 3.02, and can be expanded as needed for project requirements. Refer to Chapter 2 for more information.

00-Project Support	11-Fire Protection
01-General	12-Plumbing
02-Hazardous Materials	13-Process
03-Survey and Mapping	14-Mechanical
04-Geotechnical	15-Electrical
☐ 05-Civil	16-Distributed Energy
06-Landscape	17-Telecommunications
07-Structural	18-Other Disciplines
08-Architectural	19-Resource
09-Interiors	20-Contractor and Shop Drawings
10-Equipment	21-Operations

FIGURE 3.02: AUS ACC FOLDER STRUCTURE

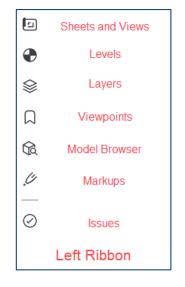
View Files

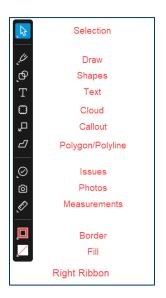
Files can be viewed on ACC for collaboration and coordination. Deliverables must be viewed from copies available on the AUS Procore project. The primary view will vary from 2D to 3D, based on file type. Around the viewer edges will be three tool ribbons, Figure 3.03:

- Left = information which breaks down Docs by feature (view markups and issues)
- Right = mark-up tools
- Bottom = navigation & visual settings

An additional toolset will be available in the top right-hand corner to compare, download, share, and print the active file, Figure 3.03.











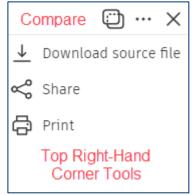


FIGURE 3.03: FILE VIEWER RIBBONS



Markup Documents

Markups can be used by the design and construction contributors for internal or interdisciplinary coordination only. All comments are considered unofficial for AUS reviews. Users will have the option to publish markups. Unpublished markups will only be visible to the creator, while published comments will be available for all users, Figure 3.04. Publish status can be changed by the creator, as needed. Comments can be deleted by the creator and will be permanently deleted.

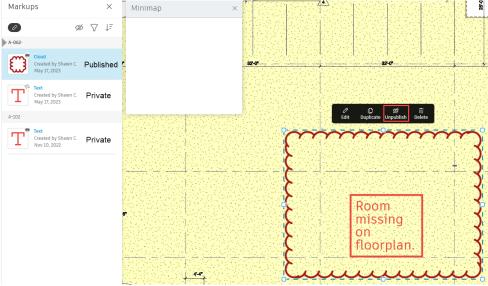


FIGURE 3.04: ACC MARKUPS IN VIEWER

Create an Issue

Issues, like markups, allow the user to add comments and notes to 2D/3D views, but have the additional feature to assign a project member. Issues will appear as circles, Figure 3.05. Types categorize issues by stage of the project lifecycle. Custom types can be developed as needed for a project by the ACC project administrator.

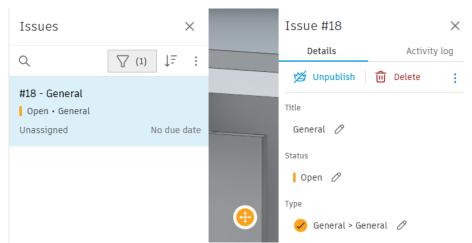


FIGURE 3.05: ISSUE PLACEMENT



Share Documents

Documents can be shared to project members with permissions to the folder or document, Figure 3.03. Files shared are limited to users who have been added to the ACC project. External project sharing is off by default and must be reviewed and approved by the AUS BIM department prior to activation. Activation will allow anyone with a link to distribute externally and must be added to the project BEP for record and acknowledgement.

Print Documents

Files can be printed from ACC, but this method does not replace printing drawings from their native authoring software or deliverables on Procore. Prints from ACC should only be used internally, as the plot settings are limited.

Bridge

Bridge is a file transfer tool within Docs for connecting multiple ACC projects. Shared files can be automated for continued updates as a project progresses. ACC project administrators can use bridge as needed for the project. If automated, the schedule and frequency must be added to the project BEP.

3.04: Design Collaboration

Design Collaboration is the model monitoring module for tracking model updates and edits. The web platform is utilized for sharing content between Teams by publishing a "Package."

Create and Share a Package

Shared packages are snapshots in time of a project design. The Design Collaboration page will display the package status of the last selected Team. Before a package is created, the model(s) must be published to the latest version and have Sets defined, refer to Section 4.02.

Once published, a package can be created from the three dots in the center of the screen, Figure 3.06.

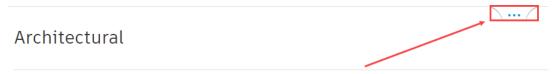


FIGURE 3.06: DESIGN COLLABORATION TIMELINE EXPANSION BUTTON

The expanded timeline will show the selected Team and previous shared packages. On the right side will be an open circle with a plus sign, Figure 3.07. This button will create a new package and brings the user to the file viewer.



FIGURE 3.07: NEW PACKAGE BUTTON ON TIMELINE



A properties bar will display and is broken into three categories: Sets, Models, and Documents. For AUS packages, the Sets option will be used with the defined Set, Section 4.02. Package names will clearly indicate the contents shared. Sharing strategies must be included within the project BEP if utilized on a project.

Consume a Package

Consumed Packages are snapshots of the shared packages. A shared package will not automatically apply to other disciplines with the consume method. Each discipline must review and consume a package to incorporate changes. Unconsumed packages will appear as an open circle, refer to Figure 3.08 for all timeline indicators.

Node Type	Description
0	An empty circle on another team's line represents a package that has been shared, but not consumed by your team.
Shared	A filled circle on another team's line represents a package that your team has consumed.
ENEM -	A filled circle on your team's line represents a package you have shared.
\circ	A dotted-line circle on your team's line represents the start of a new package that you haven't shared yet.
•	A numbered badge with a circle represents a cluster of packages. The two-tone color means some have been consumed, some have not. Click or zoom to expand the cluster.
-@	A numbered badge with an empty circle represents multiple packages that haven't been consumed. Click or zoom to expand.
O	A numbered badge with a filled circle represents multiple packages that have been consumed. Click or zoom to expand.
	A square represents a model uploaded to the team folder in the Files tool (in Docs or Build). $ \\$
•	A numbered badge with a square represents a cluster of models. Click or zoom to expand.
	A numbered badge with a hybrid square and circle shape represents a cluster of models and packages. Click or zoom to expand.
•	A numbered badge with a hybrid square and circle shape represents a cluster of models and packages. The two-tone color means some have been consumed, some have not. Click or zoom to expand the cluster.
-(+)-	The plus node allows you to create a new package to share your team's work.

FIGURE 3.08: DESIGN COLLABORATION TIMELINE SYMBOLS

CHAPTER 4: AUTODESK SOFTWARE

The second cloud platform is specific to Autodesk software for live design and construction content and linking.

4.01: Desktop Connector

Desktop Connector is a companion application that creates a local drive to connect the ACC web platform and the authoring software. In File Explorer, Desktop Connector will be listed as "Autodesk Docs," Figure 4.01. This drive acts the same as a network drive for file uploads and access.



Uploads and access do not require design authoring software and all users must install Desktop Connector if contributing to a project. The latest available version must be installed, unless otherwise noted in the project BEP.

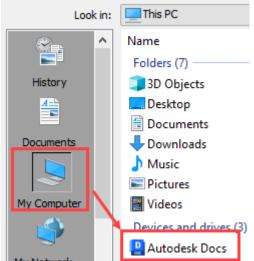


FIGURE 4.01: DESKTOP CONNECTOR DRIVE LOCATION

Once installed, projects need to be selected through the Desktop Connector application located on the taskbar. Project selection will be listed under settings in the top right corner of the window, Figure 4.02. Users must select all actively assigned projects. Projects can be deselected following project closeout or after all project contributions are complete.

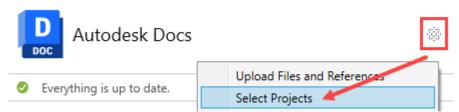


FIGURE 4.02: SELECT DESKTOP CONNECTOR PROJECTS

4.02: Revit

Revit operates the same as locally collaborated projects with the exceptions to the save, open, link, publish, and management processes.

Save Process

Models can be saved as cloud or collaborated models. Cloud models have single user access and shall be used sparingly. Once a project has more than one user working in a model, the file will be updated with collaboration in cloud. The first model saved in an ACC project will set the Revit version. Once set, the project will only recognize models of the same version. The version will match the BIM Guide and Standards

- Cloud model: Single user models, Figure 4.03
- Collaborated model: Multi-user model with additional Revit functionality, Figure 4.04



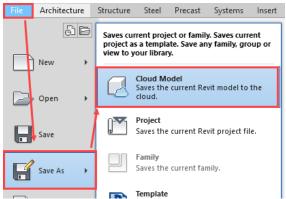


FIGURE 4.03: SAVING A CLOUD MODEL

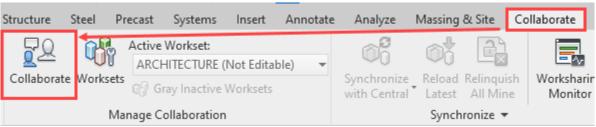


FIGURE 4.04: SAVING A COLLABORATED MODEL

Open Process

In Revit 2023 or newer, models are opened through the "Autodesk Docs" option on the left-hand column of the main Revit window, Figure 4.05. The project list will only contain projects that were created with the same version of Revit and the user has edit permissions. All models must be opened through Autodesk Docs. "Recent Files" cannot be used to open a model to prevent selecting out of date, archived, or corrupt copies.

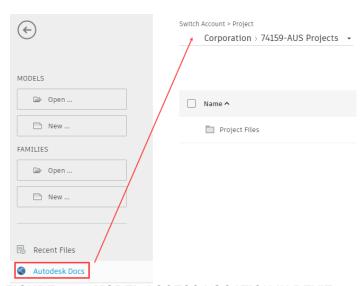


FIGURE 4.05: MODEL ACCESS LOCATION IN REVIT

Link Process

Models can be linked with three methods: Live, Shared, and Consumed. All projects will link with the live method unless noted in the project BEP.



- Live Linking is the same method used in local projects where models are linked directly to another model with active design and changes.
- **Shared Linking** connects models that are copies of the Live model when a package is shared through Design Collaboration. The first shared package automatically creates a folder under the Project Files>Shared subfolder. Shared models will only update within Revit when a new package is shared. Projects using shared models must have notifications turned on and a sharing schedule added in the project BEP. Project BIM Managers are responsible for updating linked models from the Live to Shared location.
- **Consumed Linking** connect models that are copies of the shared models created from accepting a shared package. After a package is consumed, a folder under the matching discipline folder is created called Consumed. This method will provide the opportunity to review the changes before the linked model is updated. Projects using consumed models must have notifications turned on, sharing schedule, and consuming schedule added in the project BEP. Project BIM Managers are responsible for updating linked models from the Live or Shared to Consumed location.

Drawings, documents, and other files uploaded on ACC can be linked through the Desktop Connector. Desktop Connector files operate the same as network computer files. Point Clouds are the exception and must be linked with a downloaded copy from ACC and saved locally at C:\Point Clouds. Users must update the root path under Revit's Options and create the folder, Figure 4.06. Subfolders cannot be created within the root path. Local Point Cloud files should be removed when no longer in use. Point Clouds shall be saved to ACC for download only. Project BIM Managers are responsible for the initial link of scan files into the model.

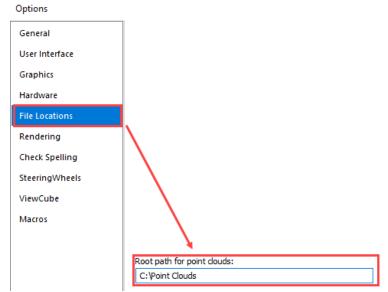


FIGURE 4.06: POINT CLOUD FILE LOCATION FOR REVIT

Publish Process

Creating a Set to Publish

Before a model can be published, the content that will be uploaded must be selected. ACC uses Revit's View/Sheet Sets to specify the 2D and 3D views. Sets can be created under multiple options, including but not limited to, Printing, Exporting, and Publishing Settings. Sets will be created using the "Publishing Settings" option under the Collaboration tab, Figure 4.07.





FIGURE 4.07: REVIT PUBLISH SETTINGS

In the Sets pop-up window, the user will select the views and sheets. At a minimum, a clean 3D view and all issued sheets shall be included with the Set name aligned to the model's name. An example set is shown within Figure 4.08 for an Architectural model. Sets should be maintained throughout the project lifecycle.

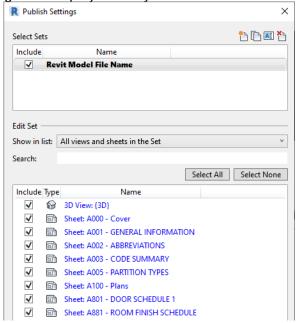


FIGURE 4.08: EXAMPLE PUBLISH SET

Manually Publishing a Revit Model

Models can be published manually from the Revit home screen. The home screen will have a "Publish Status" column for each model, Figure 4.09. If the column reads "Update Available", the model has been altered since the last time it was published. All users with edit permissions can manually publish the model. Models must be published at a minimum for each milestone deliverable.

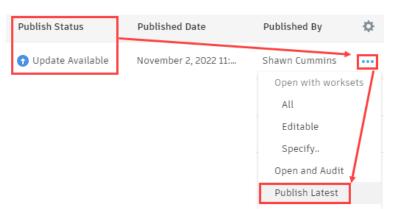


FIGURE 4.09: REVIT PUBLISH STATUS



Management Process

Revit has an additional management tool when models are saved on ACC. This tool can relinquish users and roll back model versions. Only ACC project managers and administers can use this tool and take responsibility of model corruption if a user is force relinquished while still in the model. Roll back of a model must be reviewed with the ACC project manager and model team prior to changing.

4.03: AutoCAD and Civil 3D

AutoCAD and Civil 3D operate the same as locally collaborated projects with the exceptions to the save, open, and link processes.

Save Process

Drawings will be saved to ACC through the Desktop Connector or uploaded on the ACC web platform. Once uploaded, drawings will have the option to be locked to prevent changes or access. All drawings are to be kept unlocked unless reviewed and approved with the ACC project administrator.

Open Process

In AutoCAD and Civil 3D 2023 or newer, models are opened through the "Autodesk Docs" option on the left-hand column of the main window, Figure 4.10. The project list will only contain projects that were selected in the Desktop Connector and the user has edit permissions. All drawings must be opened through Autodesk Docs. "Recent" files cannot be used to open a drawing to prevent selecting out of date, archived, or corrupt copies.

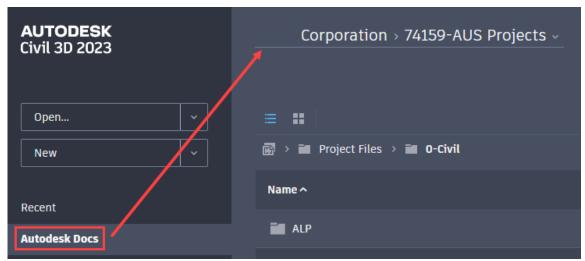


FIGURE 4.10: DRAWING ACCESS LOCATION IN AUTOCAD OR CIVIL 3D

Link Process

Files will be referenced through the Desktop Connector. File types not supported by ACC can be saved on a local network for reference.



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CREDITS

This manual was developed for and coordinated with the Aviation Department of the City of Austin and the AUS BIM Department. It is a tool that is provided to assist in the implementation of BIM as required per AUS standards and contracts.

Please direct any questions about this manual to the AUS Project Manager. Please do not contact any of the other contributors pertaining to this manual.

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