

CES500123

Connecting your AutoCAD workflows to the cloud using Autodesk Docs

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Autodesk

Learning Objectives

- Learn how to connect your existing workflows to the Autodesk Construction Cloud Platform
- Learn how AutoCAD data can be shared using Autodesk Docs with Desktop Connector
- Learn how to work efficiently, maximize project performance and how to navigate issues when they occur
- Learn how to ensure your entire project team have access to the most up-to-date design documentation

Description

With the redesign of the start tab in AutoCAD 2022, users can easily access project data in the cloud using Autodesk Docs and Desktop Connector. However not everyone knows where to start.

This session will go over the essentials on how to get started and being comfortable when collaborating with AutoCAD. You will learn how to work efficiently, maximize project performance and how to navigate issues when they occur.

Speaker

Morgan Smith has spent the past 6 years at Autodesk as a Designated Support Specialist where he delivered Enterprise-level support services included in Autodesk's Customer Success Program. Now as an Implementation Consultant he enables customers scale impactful solutions across their organization to achieve meaningful business results.

Prior to joining Autodesk, Morgan gained over 20 years' experience in the civil infrastructure industry, working as a Senior CAD technician / CAD Systems Manager for large consulting companies and Technical Consultant for an Autodesk Platinum Partner.



Morgan's experience extends from large highways, tunnels, and interchanges down to smaller site development work using a variety of software packages. He is a Civil 3D Certified Professional, Autodesk Certified Instructor and has spoken at Autodesk University (Las Vegas and Australia) and RTC Australasia.

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Contents

- Connecting your AutoCAD workflows to the cloud using Autodesk Docs 1
- Introduction 4
- Learn how to connect your existing workflows to the Autodesk Construction Cloud Platform 5
 - Short History of Remote Work..... 5
 - Autodesk Construction Cloud..... 6
 - Connecting Team, Workflows and Data 7
 - Collaborating with AutoCAD using Autodesk Docs..... 8
 - Master the four essentials: Prepare; Install; Design and Manage..... 8
- Learn how AutoCAD data can be shared using Autodesk Docs with Desktop Connector..... 9
 - PREPARE..... 9
 - Step 1 – Create a project and activate products 10
 - Step 2 – Manage Project Members 11
 - Step 3 – Create Folder Structure 12
 - Step 4 – Assign Folder Permissions 12
 - INSTALL 14
 - Deploy latest versions (including updates and hotfixes)..... 14
 - Autodesk Docs File Locking on AutoCAD..... 14
 - DESIGN 14
 - Getting Started with Desktop Connector 14
 - Preparing for Collaboration..... 18
 - Working with AutoCAD files..... 20
 - Autodesk Docs inside AutoCAD 20
 - Saving to the Cloud 21
 - File Locking 21
 - Versioning & Syncing 22
 - CloudCollabModifiedOption - system variable for file locking..... 22
- Learn how to work efficiently, maximize project performance and how to navigate issues when they occur 23
 - Working with References..... 23
 - Working with Desktop Connector / Connected Drive in Windows Explorer 23
 - Reloading References 24
 - Drawing Maintenance..... 25
 - Items to be aware of... 25

AUTODESK UNIVERSITY

- Troubleshooting Techniques25
- Learn how to ensure your entire project team have access to the most up-to-date design documentation26
- MANAGE26
 - Integrated with AutoCAD and Revit26
 - View files with installing additional software.....26
 - Compare all design changes in each file version26
 - Supports the Document approval process26
 - Send files to other project members or teams.....27
 - Design Collaboration (included with BIM Collaborate/BIM Collaborate Pro)27
- Resources.....28

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Introduction

The release of AutoCAD 2022 introduced users to cloud collaboration using Autodesk Docs and Desktop Connector. This document details the essentials on how to work efficiently, maximize project performance and how to navigate issues when they occur. I consider it a snapshot in time as this solution is rapidly evolving. Please make sure you refer the latest documentation as new functionality will increase the extended value of this solution.

Key points covered:

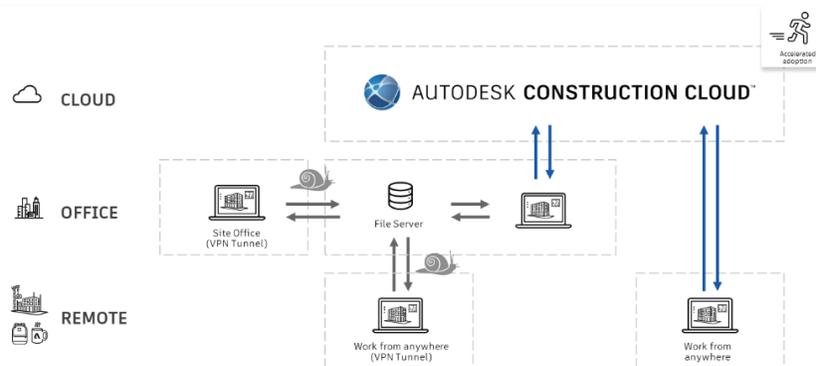
1. It is critical that everyone working in this environment deploy the latest updates of both AutoCAD (2020 – 2022) and Autodesk Desktop Connector.
2. There are frequent updates to Desktop Connector (monthly) so teams should form a plan for consuming these updates as they become available.
3. AutoCAD 2022 users working in this environment will experience the same locking behavior as Civil 3D 2020.2 onwards. However, AutoCAD 2020 or 2021 does not include this support natively. Users should install a separate locking app that manages DWG file locking.
4. Automated locking is not supported for certain file types including Microsoft Word and Excel format files. These files should be manually locked / unlocked when editing using desktop versions of these products.
5. There are visual tools in throughout this environment that users can leverage to better understand the current state of files (e.g., AutoCAD “Start Tab”, Desktop Connector “Pending Actions”).
6. It is very important that projects have valid references when migrating to Autodesk Docs and as the project evolves once in this environment. This environment is sensitive to referenced files (e.g., DWG, images, etc.) being valid and located in the project structure.
7. Maintain drawing integrity throughout the file/project lifecycle to improve performance (e.g., audit / purge unused block definitions, layers, regapps, etc.)
8. There are some capabilities that are not supported or that require workflow modifications for use in a production environment. One example is AutoCAD Sheet Set Manager.

Learn how to connect your existing workflows to the Autodesk Construction Cloud Platform

Before 2020, the “Work from Anywhere” movement was emerging. The increased use of personal technology and digital connectivity prompted the question, “Do we really need to be together, in an office to do our work?” We learned that a great many of us don’t in fact need to be co-located with colleagues on-site to do our jobs. Individuals, teams, entire workforces, can perform well while being entirely distributed.

Short History of Remote Work

Before we started “Working from anywhere” project teams relied on on-premises servers located in their offices to host project files. Companies’ setup VPN connections to the office network for project teams to have continued access to project files. Then IT departments started looking at cost-effective solutions due to the cost of electrical bills, specialized skillset, as well as hardware expenditures to keep a typical server running. They then turned to document collaboration tools in the cloud.



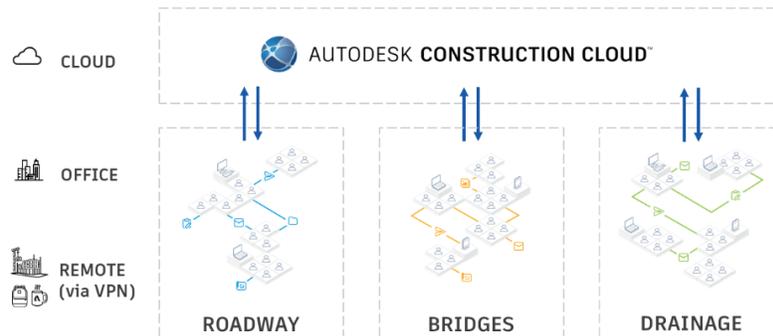
Personal computers, the internet, email, and cloud computing accelerated the adoption of Remote Work

Autodesk Construction Cloud (ACC) is very similar to widely available document collaboration tools like Google Docs or OneDrive. The main difference is that the Autodesk Construction Cloud can host and view CAD files from within the platform. In addition, users can leverage other tools on the Autodesk platform to enhance productivity.

The COVID-19 pandemic exposed the shortfalls of hosting project files on-premises. Without a strong broadband connection (i.e., a wired LAN cable connected to the workstation), modelling workflows slowed to a crawl and in turn accelerating the adoption of cloud workflows. With Autodesk Construction Cloud, all project files are stored in servers maintained by Autodesk and allows users to access the data directly instead of VPN connections.

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As we have seen in our previous example, projects have been created and managed on a local server. This setup can work well for teams that are all working under one roof. However, when a project team includes stakeholders working in another office or another state or even from home the local server restriction makes it challenging for these workers to access project files and ensure everyone on the team is working from the current design.

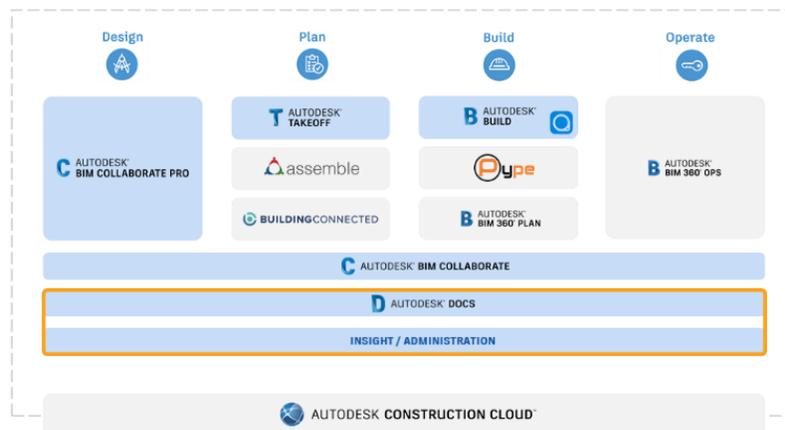


Autodesk Construction Cloud connecting distributed teams

Using Autodesk Docs, AutoCAD projects can be hosted in the cloud allowing distributed teams to easily access and edit live models in addition cloud-based projects are managed virtually the same as traditional projects hosted on a local server making it easy for users to shift to the new system.

Autodesk Construction Cloud

The Autodesk Construction Cloud connects data, workflows, and teams throughout the entire building lifecycle, from design to operations across the headquarters, office, and jobsite. Earlier this year, Autodesk announced three new additions to the Autodesk Construction Cloud – Autodesk Build, Autodesk Takeoff and Autodesk BIM Collaborate. Built on a unified platform and common data environment, the new modules empower general contractors, specialty trades, designers, and owners to drive better business outcomes.



Autodesk Docs is the common data environment for the unified platform.

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Connecting Team, Workflows and Data

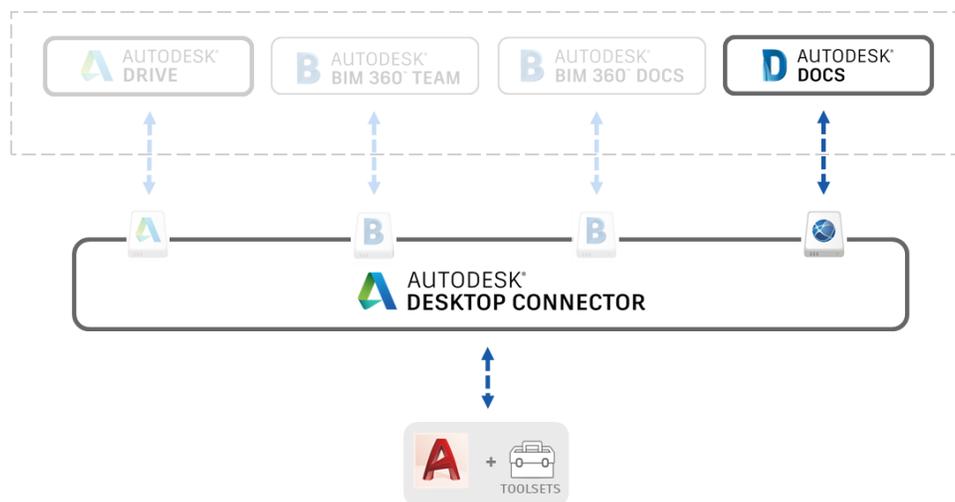
There are a number of Cloud storage solutions available from Autodesk so why are we using Autodesk Docs? Let's have a quick look at each of the products.

Autodesk Drive: Data storage for individuals and small teams. Allows users to upload data to a personal cloud drive so they can organize, preview, and share any type of design or model data.

BIM 360 Team: First collaborative product that enabled project teams to work together in one central workspace during the design phase. Commonly referred to as BIM 360 Classic Platform.

BIM 360 Docs: Second generation product provided greater file and folder-based access and permission controls that supported controlled data and document management from design through construction. Commonly referred to as BIM 360 Next-Gen Platform

Autodesk Docs: Considered the next step in closing workflow gaps by creating an ecosystem where all project participants are connected and integrated into the project lifecycle. Commonly referred to as the Unified Platform



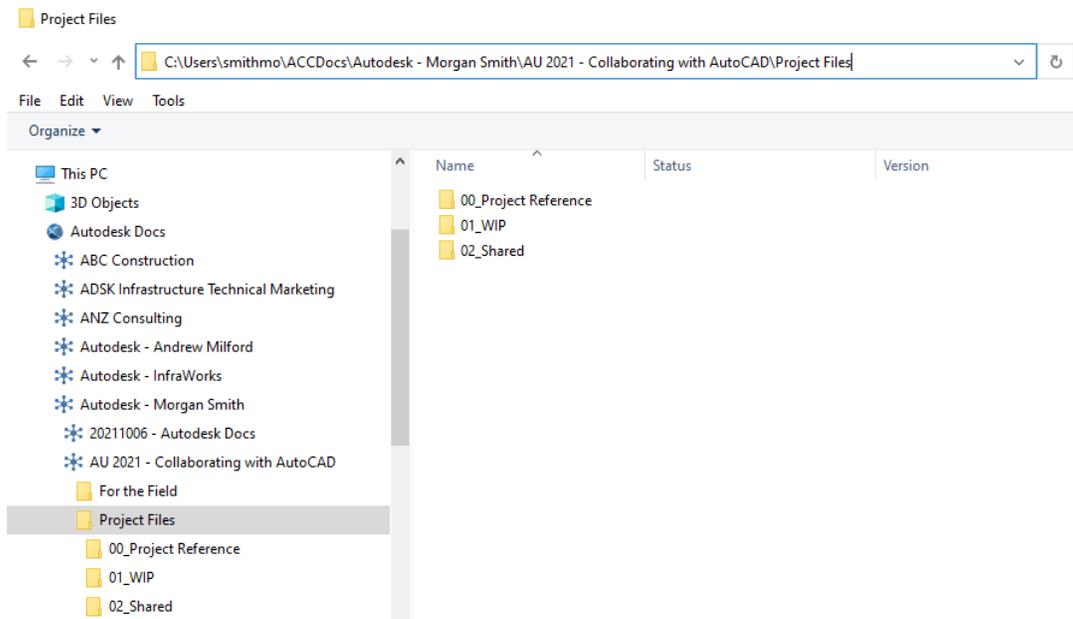
Cloud storage solutions available from Autodesk

In summary, use Autodesk Drive for a simple file sharing and anything beyond that use either BIM 360 Docs or Autodesk Docs. In terms of functionality there is a lot of overlap between the two. The differences essentially lie in what platform the common data environment for a project uses.

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Collaborating with AutoCAD using Autodesk Docs

As discussed, Autodesk Docs is the common data environment where the project teams store their project data. To enable the transfer of files from the desktop to the cloud, Desktop Connector is required.



[Manage file in the cloud, from your desktop using Desktop Connector](#)

Once desktop connector is installed you will see a drive in Windows Files Explorer mirroring the structure of projects, folders, and files located on the connected data source. From there, you can perform basic file management actions on the folders and files, such as viewing, moving, renaming, adding, exporting, and even going to a file in the data source. All the changes performed on the connected drive files and folders are synced back to Autodesk Docs automatically and made available to other project members using Desktop Connector, mobile app, or web client.

Master the four essentials: Prepare; Install; Design and Manage

When getting started its important lay the correct foundation to launch from. Have you considered the following?

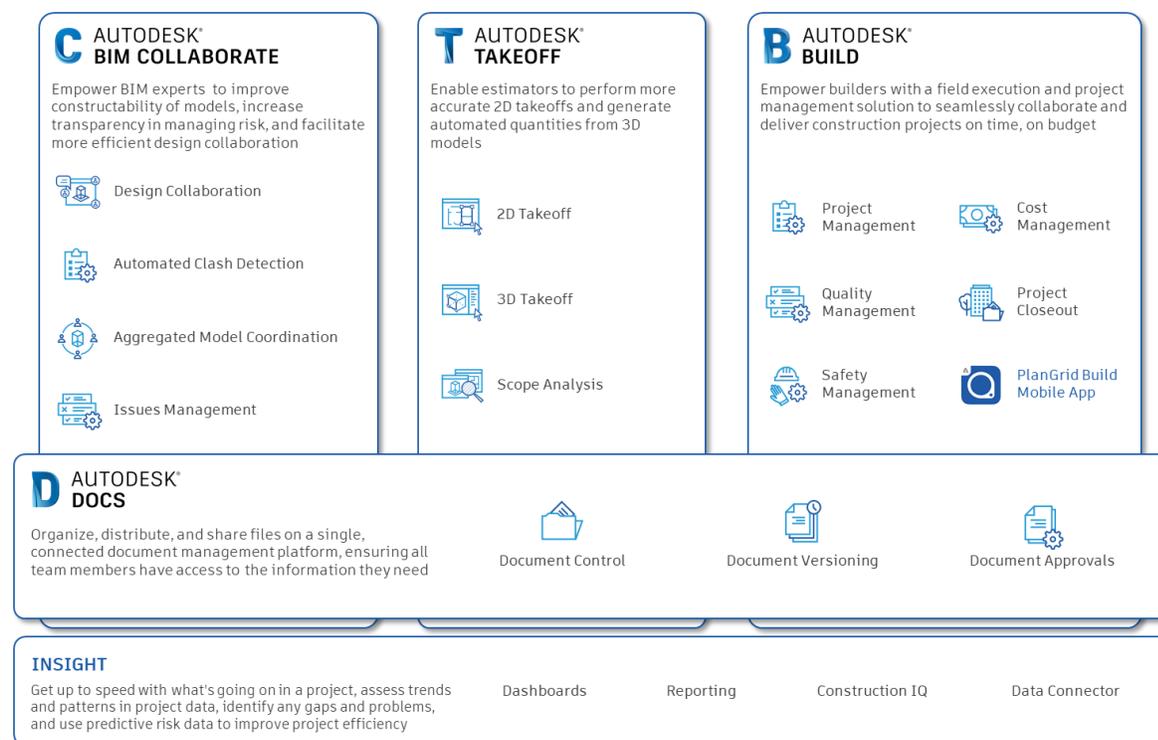
1. How do I prepare my project for collaboration? (Prepare)
2. Do I have the correct software installed? (Install)
3. Have I reviewed my production environment to ensure they are compatible with cloud collaboration? (Design)
4. How do I manage the flow of information between project teams? (Manage)

Learn how AutoCAD data can be shared using Autodesk Docs with Desktop Connector

PREPARE

How do I access Autodesk Docs?

Autodesk Docs is Autodesk's centralised document management solution on Autodesk Construction Cloud and is a great way to introduce collaboration into your workflows. It is available in the AEC Collection, as well as Autodesk BIM Collaborate and Autodesk BIM Collaborate Pro, Autodesk Takeoff and Autodesk Build. If you're only interested in Autodesk Docs, it's available as a standalone subscription.



Autodesk Construction Cloud Products – Refer [here](#) for full portfolio

How are licenses and entitlements managed?

On the Autodesk Construction Cloud platform all users will need a valid subscription to Autodesk Docs or through the AEC Collection, Autodesk Build, Autodesk BIM Collaborate, Autodesk BIM Collaborate Pro, or Autodesk Takeoff. Your Contract Manager will need to add the entitlement to your Autodesk ID in Autodesk Account. Any invited users without a subscription will be prompted to either start a trial of an offering listed above or purchase a subscription to one of the offerings. Refer [Product Access and Subscriptions](#) for more information.

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Prepare your project for Collaboration

Step 1 – Create a project and activate products

1. Log into [Autodesk Construction Cloud Project Portal](#) using your Autodesk ID
2. Click **Account Administration** on right. Confirm you are in the correct Account and in the Account Admin module
3. Click **Projects** from the left navigation to open the Projects tool.
4. Click **Create Project**
5. Enter the project details in the Create project dialog:
 - a. Project name
 - b. Project number
 - c. Account. The account represents your organization's account and not your individual Autodesk Account.
 - d. Project type
 - e. Template. Select a project template with predefined settings to use as a starting point for the new project. Templates can be setup at the account level, for easier project creation. See [Project Templates](#) for more information.
 - f. Address. As you start typing the address, you can choose from a list of suggested addresses that match your text. If the address doesn't exist in the suggested list, click **Enter address manually**.
 - g. Time zone. The time zone defaults to the time zone used by your browser. Not all tools use the project time zone.
 - h. Start and End date. Choose project start and end dates using the date pickers. These appear on the Project Progress feature in the Home tool if your project uses Autodesk Build. These dates don't impact subscription access to the product.
 - i. Project value

Note: Required fields are marked with an asterisk.

6. Click **Create project**.

At this point, the project will open in Project Administration. As the project creator, you'll be added as the first project administrator. Confirm your access level and product entitlements

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Step 2 – Manage Project Members

Note: Account administrators can manage all account members and their respective properties from the Members tool in Account Administration

1. Click **Members** from the left navigation to open the Members tool.
2. Click **Add members**
3. Enter an email address for the members or paste in a list of email addresses separated by commas, tabs, spaces, or semi-colons.
4. Select a **Company** or **Role** for the members. The company and role can be used to quickly apply the same permissions to multiple members.
5. Choose the **Access level** for the members.
 - **Account administrator:** Members are added as additional account administrators
 - **Executive:** Members are given access to account specific dashboards in Insight. Note: If you don't select either checkbox, the new members are added to the account and are made available to project administrators to add to a project but won't receive an invitation yet.
6. Click **Invite**.

After the members are added, you can control their subscription assignments:

1. From the Members tool, click the member's name in the list of members.
2. In the member profile on the right define the member's subscriptions:
 - **Autodesk BIM Collaborate:** Click the drop-down list to choose one of the following:
 - Autodesk BIM Collaborate Pro
 - Autodesk BIM Collaborate
 - No license
 - **Autodesk Takeoff:** Toggle the switch to **Yes** to provide a subscription.
 - **Autodesk Build:** Click the drop-down list to choose one of the following:
 - Autodesk Build Unlimited
 - Autodesk Build 5000
 - Autodesk Build 550
 - No license

Note: The number of available subscriptions for each option is shown. If 0 subscriptions remain, you can't provide a subscription to that member unless additional subscriptions are made available.

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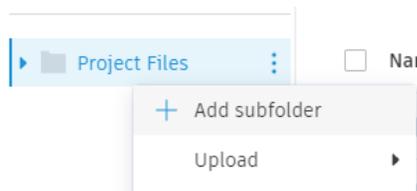
Project Administrators are able to control more granular product access for each member.

Important: Providing a member the ability to use a product on your project includes two parts: (1) product access and (2) subscription assignment. Account administrators can assign subscriptions and project administrators can provide product access when inviting members to a project. See the [Product Access and Subscriptions](#) topic to learn more

Step 3 – Create Folder Structure

Folders can be added in either of the root folders. To add a folder:

1. Hover your cursor over the root For the Field or Project Files folder and click the More menu (three dots).
2. Click **Add subfolder**.



3. Type the name of the folder and press Enter on your keyboard or click to add the folder.
4. Continue adding folders as needed to build out and organize your document structure.

Tip: If your organization uses a similar folder structure across different projects, you can use a project template to set up folders in the Files tool when the project is created.

Step 4 – Assign Folder Permissions

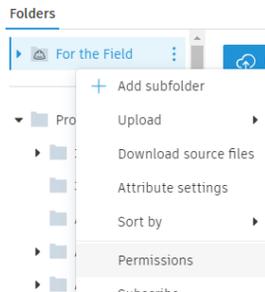
Project administrators can provide increased permissions to members to allow for actions such as downloading, uploading, or editing files, and publishing markups. Project administrators have Manage permissions to all folders.

Subfolders automatically inherit the permission level of the parent folder but can be changed later. If changed, subfolder permissions must match the access level of the parent folder or else have a greater (less restricted) permission level than the parent folder.

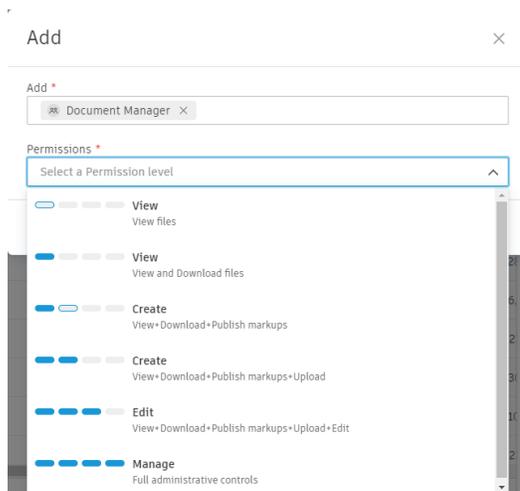
To add or update permissions for a folder:

1. Click **Files** from the left navigation to open the Files tool.
2. Navigate to a folder.

3. Hover your cursor over the folder and click the More menu  > **Permissions**.



4. Click **Add** to add new permissions for a user, company, or role.
5. After defining the user, company, or role and the associated permission level, click **Add** to complete the process.



Folder Permission Levels:

Permission levels		Actions
View	View only	View files, add private markups, and create issues.
	View + Download	View and download files, add private markups, and create issues.
Create	View + Download + Publish markups	View and download files, and create issues.
	View + Download + Publish markups + Upload	View, download, and upload files, and create issues.
Edit	View + Download + Publish markups + Upload + Edit	Share your own files with members, view and edit any other files in that folder, and publish markups.
Manage	Full administrative controls	Share files with members and view and edit any other files in that folder. With Manage permission you can carry out the same folder tasks as a project administrator.

Note: Project administrators have **Manage** permissions by default.

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INSTALL

Deploy latest versions (including updates and hotfixes)

We recommend that users deploy the latest versions of both AutoCAD and Autodesk Desktop Connector. When working with Autodesk Docs, AutoCAD users should use the following versions as well as any supporting updates / hotfixes. Current as of Sept 15, 2021.

- AutoCAD 2022.1
- AutoCAD 2021.1.1*
- AutoCAD 2020.1.4*

*requires separate [locking app](#) that manages .DWG file locking

It is also critical that you deploy updates to Autodesk Desktop Connector. Note that Desktop Connector is updated more frequently (monthly) and will, beginning in April 2021, be available along with other Autodesk products via the new Autodesk installation system.

Refer here for [Autodesk Desktop Connector Downloads and Release Notes](#)

Autodesk Docs File Locking on AutoCAD

Project team members who are using AutoCAD 2020 and 2021-based products can install the [File Locking for Autodesk® BIM 360®](#) application, which provides automatic locking and unlocking for DWG and DWT files that are stored in Autodesk Docs when they are opened in AutoCAD. AutoCAD 2022 supports file locking, so there's no need to install the app.

If you have AutoCAD 2021 and 2020 installed together with AutoCAD 2022 on the same machine and want to enable file locking for AutoCAD 2021 or 2020, please make sure to install the version 2.2.0. (Version 1.0.0 of file locking app in this case will introduce unexpected locking behaviors on AutoCAD 2022.)

DESIGN

Getting Started with Desktop Connector

Desktop Connector is a desktop application that, once installed on a computer and connected to the internet, allows the bi-directional synchronization of files and folders when signed into a compatible Autodesk cloud service.

Once installed and connected, Desktop Connector creates the folder structure and placeholder files in a local drive, that replicates the folder structure that the user signed in can access in Document Management. Desktop Connector does not download all data that is stored in Autodesk Docs. Instead, it only downloads files and linked files that are opened by the user, or manually synced (on demand).

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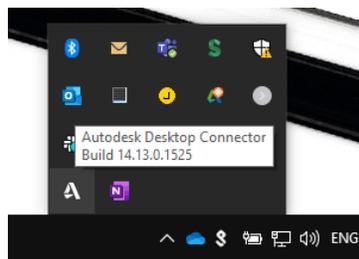
Installation

Desktop Connector Installation files can be downloaded from Autodesk Account or release notes. It is possible to download the latest version or, for troubleshooting purposes, it is also possible to download previous versions.

The current links for download of installation files are:

- Current version - [Desktop Connector Release Notes](#)
- Previous versions - [Older Releases](#)

Due to the components installed during the setup process, its recommended that you restart your computer. At any time, you can review the version installed by hovering the mouse over the Desktop Connector “A” icon in the Windows tray.

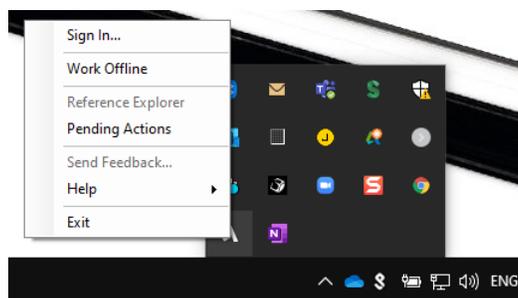


Desktop Connector icon in the system tray

Start up and sign in

Once Desktop Connector is installed, the Desktop Connector icon displays in the Windows tray. If it doesn't display, start Autodesk Desktop Connector from the Windows Start menu.

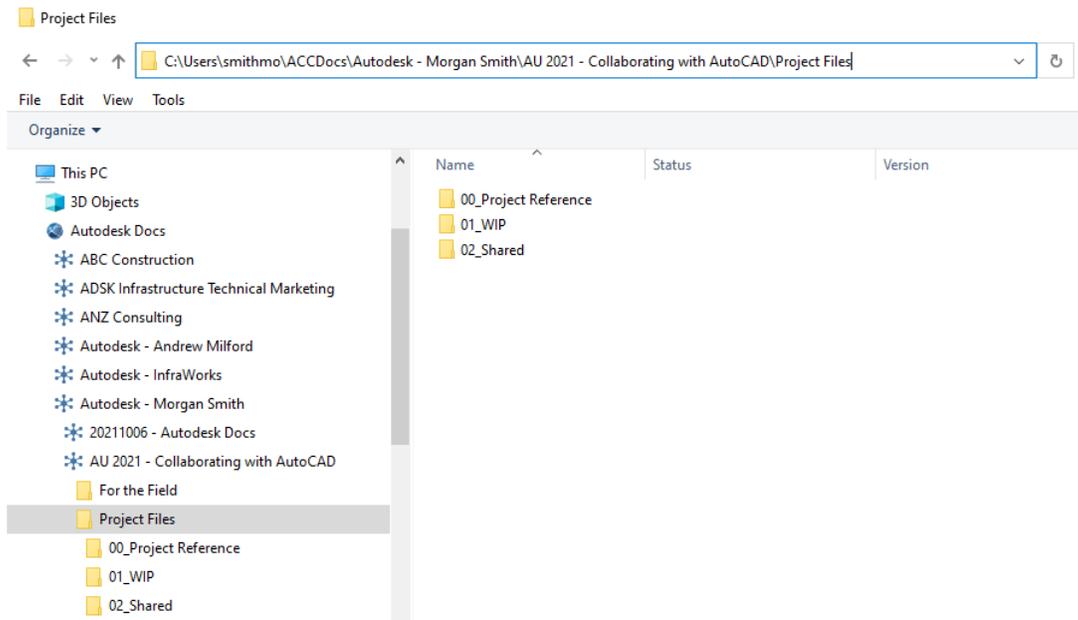
To sign in, right-click the icon and click in Sign in... . The same email and password that is used to log into Autodesk Docs should be used here.



Desktop Connector icon in the system tray

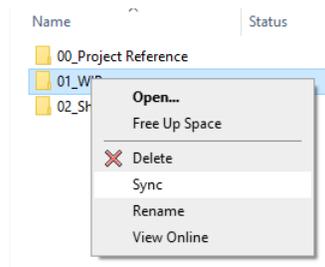
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Once signed in, Desktop Connector will check what the user is allowed to access. This is directly related to user's permissions to folders in Document Management. It will then display all accessible Autodesk Construction Cloud accounts, projects, and folders in the Autodesk Docs connected drive in Windows File Explorer, under This PC.



Folder structure of the Autodesk Docs connected Drive in File Explorer

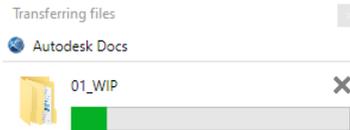
The location used by Desktop Connector is C:\Users<username>\Autodesk Docs\. This is known as the connected drive, or local cache folder. This location cannot be changed. The folder structure seen is a mirror of the folders the user has permissions to in the Project Files folder in Document Management. Note that the actual files are not downloaded to the local drive when you start using Desktop Connector. Only files that are opened or synced are downloaded locally. When opening files with linked files, such as AutoCAD XREFs, the links are also downloaded. Files can be opened by double-clicking in File Explorer, right-click > Open, or via the Open command in the authoring application. You can sync files to have a copy transferred to your local drive. To sync a file or folder, right-click the file or folder and select Sync



Sync files and folder via right-click

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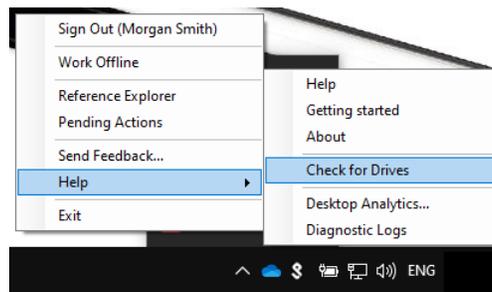
A notification that the file is being transferred is displayed



Transferring file notification is displayed

Refresh drives (Check for Drives)

If your access to Autodesk Construction Cloud accounts changes, use the **Check for Drives** option to force the access update



Check for Drives to Update Autodesk Construction Cloud user entitlements

Once drives are refreshed, you may see more or less Autodesk Construction Cloud accounts available to you in the connected drive, depending on Autodesk Construction Cloud account access or lack of.

Uploading/Syncing Files

When you upload or sync AutoCAD DWG files that have references, the files and folder structures are also uploaded or synced

Upload:

- Drag n drop DWG with references to Desktop Connector folder also uploads its children
- When uploading file that links other files in folders which don't exist in Docs, a new folder is created for these files. See: [Related Data](#)

Open:

- Open an AutoCAD DWG file from Desktop Connector results in the sync of its referenced files. If you don't have permissions for the referenced files, these won't load but all other references are maintained

Sync:

- When syncing an AutoCAD DWG file, its referenced files will also be synced.

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Preparing for Collaboration

New Project

Anytime you embark on a new project or new technology its important to plan ahead, identify which workflows require amending and the team is aware is aware of them!

In addition the topics covered in this handout, here are a couple of extra tips have haven't been covered elsewhere.

- New projects must be initiated on the web by the Project admin
- Users must log in at least once to the project via the web to “accept” the project invitation if they didn't accept the project invitation via email
- Still can't access the project? Check the user has been added to the project and granted permissions to the folder structure.
- Keep drawings clean and healthy

Migrate an Existing Project

Moving an existing project to Autodesk Docs must be done with care. Multiple problems can arise if AutoCAD projects with existing references are saved to the cloud without preparation. Problems can arise such as:

- Data Integrity Issues impacting migration:
 - Duplicated data uploaded to the cloud: This will result in unexpected file overwriting.
 - Incorrect data reference (DREF) or external reference (XREF) paths
 - Paths that are too long for Desktop Connector to handle (>260 chars)
 - Duplicated path structure
 - Related Data: Desktop Connect doesn't know where to upload source files that are outside the host's folder, so they are uploaded to a folder called Related Data. It will result in one source being uploaded to multiple places on Autodesk Docs which makes it difficult to apply changes to all host files.
 - Unsupported File Types by Autodesk Docs: This will result in a failure to uploading relevant files.
- Other data issues impacting work efficiency:
 - Drawing Corruption
 - Redundant or Unclean data

How to migrate existing projects to Autodesk Docs directly via Desktop Connector

It is recommended to move portions of the project by dragging the top folder and dropping it into the destination Autodesk Docs folder on the connected drive using Desktop Connector's Windows Explorer UI. By using this method, most of the file references in the project can be copied to the same folder in Autodesk Docs and the path can be maintained.

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Try dragging and dropping top level folders one at a time such as External References subfolder first rather than the entire project directory to prevent Desktop Connector from being overloaded. As the project is uploaded, Desktop Connector examines each file to determine its links and dependencies. Keep this in mind while uploading project structures to Autodesk Docs. Upload images and referenced sources first. Add production drawings last.

When first moving an AutoCAD project, expect it to take time for Desktop Connector to sync the files. In some cases, it can take hours (depending on your bandwidth and the size of the project).

Migration Checklist

Before migrating an existing project, it's recommended that you review and update your project data before uploading it:

- Check folder paths to ensure that they do not exceed the path length limit and rearrange folders if needed to shorten the path length. Refer [Long Path](#) for more information.
- Update the paths of references so that they are relative paths instead of absolute paths.

Note: Using relative paths can prevent issues from occurring when uploading data using the Autodesk Docs web site or when uploading files that are not in the same folder structure.

- Repair broken links to references.
- Remove duplicate, unused, or corrupt data.
- Consider rearranging the folder structure and updating links so that all files are in the same folder structure.

If referenced files are not in the same folder structure as the host drawings, the referenced files will be uploaded into the related data folder within the host drawing's folder and the links in the host drawing to the referenced files will be recreated (Related Data).

To avoid the creation of a related data folder, you can either move the referenced files into the same folder structure as the host drawings and update the links, or you can use the following steps when uploading:

- i. Update the paths of the references so that they are relative paths instead of absolute paths.
- ii. Upload the folder that contains the referenced files.
- iii. When uploading folder by folder, the same relative folder structure that exists locally should be created in Autodesk Docs so that the paths to the referenced files are maintained.
- iv. After uploading the folder that contains the referenced files, rename or move the local folder so that its location cannot be found by Desktop Connector.
- v. Renaming or moving the local folder that contains the referenced files prevents the referenced files from being uploaded to a related data folder when their host drawings are uploaded.
- vi. Upload the folder that contains the host drawings.
- vii. Upload this folder to a location in Autodesk Docs that will preserve the same relative folder structure that exists locally so that the paths to the referenced files are maintained.

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Working with AutoCAD files

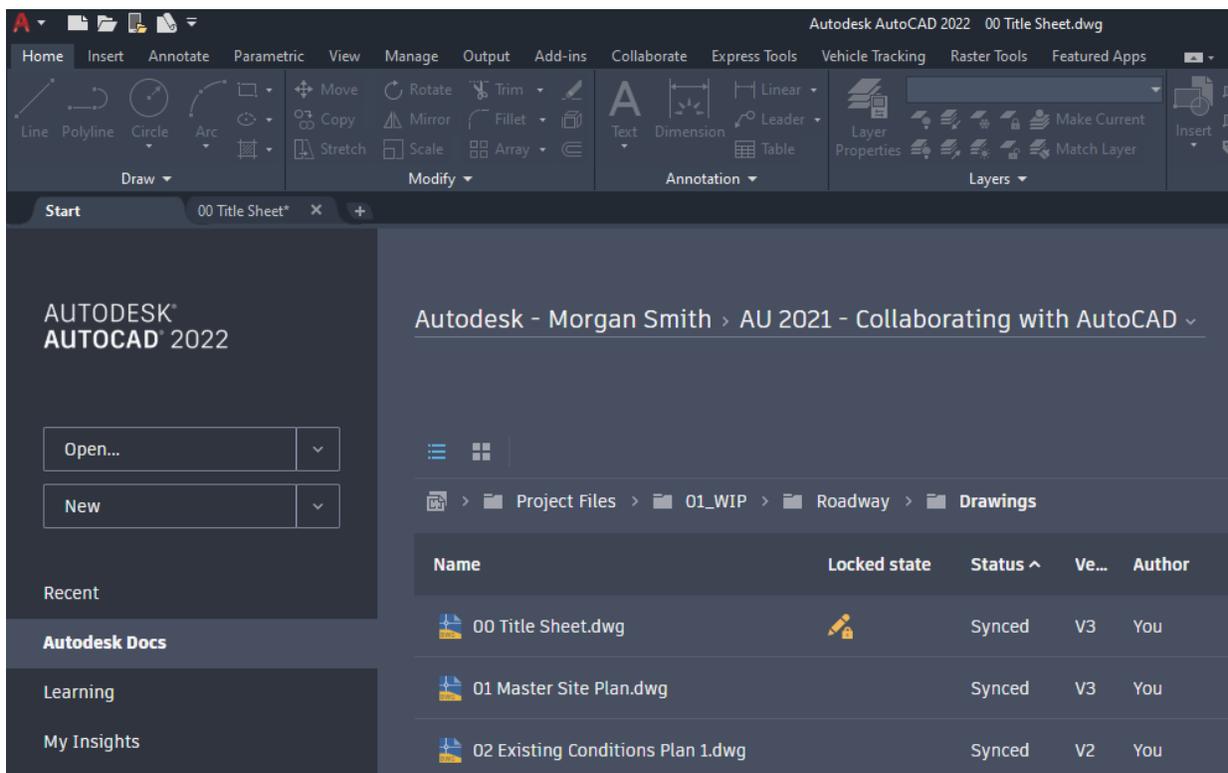
Verify Desktop Connector is Running

Before you can use Autodesk Docs with AutoCAD, be sure Desktop Connector is running. A small white 'A' will appear in your Windows system tray.

When Autodesk Desktop Connector is installed, it will add itself to your Windows startup. That means it should launch automatically when you start Windows. If you need to launch Desktop Connector manually, go to the Windows start menu > Autodesk > Autodesk Desktop Connector.

Autodesk Docs inside AutoCAD

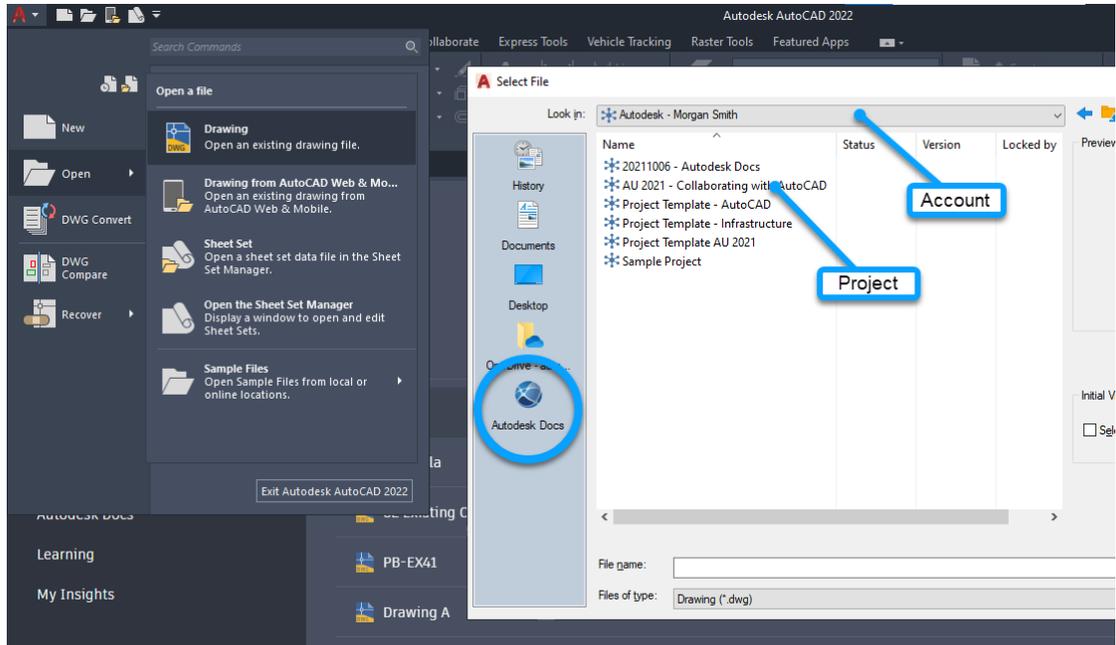
Within AutoCAD 2022 the Start tab has been redesigned to accommodate Autodesk Docs design workflows. Click Autodesk Docs on the far left of the screen.



Select your project and double-click Project Files to “wake up” the folder. Note, if you want to rename any folders, you need to do so on the Autodesk Docs website.

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Users can open a AutoCAD file through the start tab mentioned previously, or by opening the file through the application menu.



On selecting a file, it may take a few moments to open. Desktop Connector is communicating with Autodesk Docs to verify the version you are opening is up-to-date and not locked by another user. The file and any required references will be downloaded on demand.

- Do not double-click a DWG file to open it from the local Autodesk Docs folder.

Once inside AutoCAD, work can commence on the DWG as normal.

Saving to the Cloud

When saving a file to the cloud for the first time, it will take time for it to sync and propagate to all other users. If you click save again too soon, you will receive a message indicating that the file is write protected.

- Be patient on first-time saves to the cloud.

File Locking

When a user opens a DWG, it is locked to other users. Autodesk Docs does not enable the ability for multiple users to edit a file at once. The file will appear locked if it is in the process of being synced to Autodesk Docs.

To unlock files that are locked by others, you need Folder Control permission. For more information, see [Folder Permissions](#).

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Versioning & Syncing

A new version is created when the file is saved, and AutoCAD is closed. By default (on 2022.0), Saving a file will temporarily lock the file as the new information is shared to Autodesk Docs. To change the unlocking behavior, please refer to the CloudCollabModifiedOption system variable below. Syncing comes upon closing out of AutoCAD.

CloudCollabModifiedOption - system variable for file locking

Use the CloudCollabModifiedOption system variable to control when documents (DWG files and DWT files) are unlocked in Autodesk Docs after they are closed in AutoCAD.

Use the following settings for the CloudCollabModifiedOption system variable:

Value	Description
0 (Default)	<p>Documents are not immediately unlocked after you close them. When a document has been edited, saved, and closed, it is unlocked after the changes have finished uploading to Autodesk Docs. This prevents another user from opening the document before the latest changes have finished uploading.</p> <p>An "Unlocking file" action appears in the Autodesk Desktop Connector Pending Actions window after you close a document, even if no changes have been made to the document.</p>
1	<p>In most scenarios, documents are immediately unlocked after you close them (the exception is when a document has unsaved changes), which can provide better performance. When a document is unlocked immediately after it is closed, an "Unlocking file" action does not appear in the Autodesk Desktop Connector Pending Actions window.</p> <p>Important: When the CloudCollabModifiedOption system variable is set to 1, documents that have been edited and saved are unlocked immediately after they are closed. Depending on when you close a document after saving it, it is possible that it may be unlocked in Autodesk Docs before the changes have finished uploading to Autodesk Docs. To ensure that documents remain locked in Autodesk Docs until your changes have finished uploading, you can change the value of the CloudCollabModifiedOption system variable to 0.</p>

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Learn how to work efficiently, maximize project performance and how to navigate issues when they occur

Working with References

Proper use of referenced files is fundamental to AutoCAD and efficient drawing management. If there are any gaps/weaknesses in your existing workflows will soon be realized when collaborating in the cloud.

The biggest change in day-to-day workflow for users is remembering to upload and then attach files intended for use as references. In this context, reference refers to any file outside of the host DWG. This could be images, other DWG files, Excel spreadsheets, Navisworks projects, Recap Point clouds, and text files.

Remember to upload/save intended references to Autodesk Docs first; then attach!

Recommend the following best practices when handling referenced files:

Reference type: OVERLAY
Path type: RELATIVE
Layer: xref-<filename>
Use clipping boundaries (xclip) to define a partial references
Detach unloaded references when not in use

Why?

- Overlay prevents circular references from being created
- Relative paths don't break when projects are moved
- Custom layer allows individual Xrefs to be frozen/thawed
- Desktop Connector will see the unloaded reference and sync the file regardless of its status
- Better performance when combined with XLOADCTRL (2) and INDEXCTRL (3)
- Clipping boundaries crop display of selected Xref to specified boundary
- clipping boundary determines the portion of an xref or block instance that is hidden, either outside or inside the boundary

Working with Desktop Connector / Connected Drive in Windows Explorer

When you upload or sync AutoCAD DWG files that have references, the files and folder structures are also uploaded or synced. It is recommended that files that are referenced by host drawings as external references or files referenced by templates are organized inside the same folder structure as the host drawing (such as in the same folder or in a subfolder).

If referenced files are not in the same folder structure, the files will be uploaded into the [related data](#) folder within the host drawing's folder and the links in the host drawing to the referenced files will be recreated.

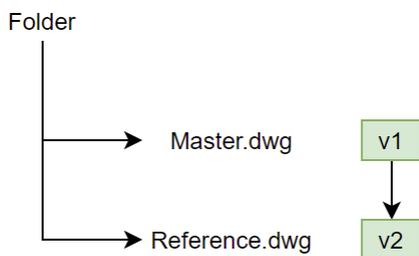
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Reloading References

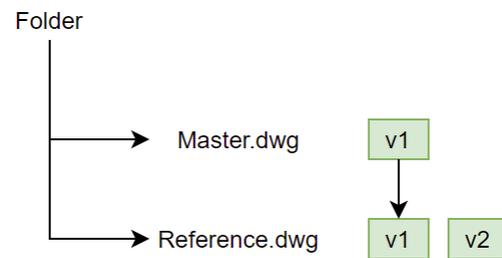
When working with Autodesk Docs, it's important to understand how AutoCAD handles referenced files. Before cloud collaboration tools were introduced, a user would expect all references to load upon opening a drawing. If a reference was changed, they would get notified and reload the file. There were no "versions" as the latest was always available.

When we start using Autodesk Docs there is an expectation that when a user uploads a modified reference, all master files that use the reference should reflect the changes in the cloud. As discussed earlier, when a file is uploaded to Autodesk Docs it will increase the file version number. Autodesk Docs will hold the version number to ensure Approval workflows and Model Coordination Workflows work as designed. To ensure all master files reflect the changes made to the reference, the master file should be opened and saved to force the refresh of the web view in Autodesk Docs.

In Desktop Connector and AutoCAD:



In Docs:



When working with the master and references, it's important to keep track of their current state (e.g. stale, cached, etc). Visual tools can be leveraged to better understand the current state of files (e.g., AutoCAD ["Start Tab"](#), Desktop Connector ["Pending Actions"](#), Connected Drive ["Status"](#) Column). With AutoCAD 2022.1 update applied, the "xref update" notification will pop up when a referenced drawing is saved on Autodesk Docs as Desktop Connector is download on demand.

When reloading references, I recommend the following:

- Ensure AutoCAD 2022.1 update is applied...

If not...

- Check AutoCAD "Start Tab". If stale, go back to Xref Manager and reload or
- Windows Explorer and Sync to get latest or
- Save, Close and Reopen to download latest

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Drawing Maintenance

Drawing and file maintenance and management is critical to minimize the time required to migrate and access data; not only in Autodesk Docs, but these drawing maintenance procedures should also be used with all AutoCAD drawings. Refer [Maintaining Clean Drawings](#) for more information.

- Check for Drawing Errors
- Remove Unused Data
- Locate Redundant Objects
- Repair Drawings
- Map 3D Cleanup
- Delete Corrupt Data
- Remove Unneeded Objects

100's of drawings to "clean"? Recommend the following AU Class on AutoCAD scripting - [AutoCAD Scripting Extreme with VBA, Excel, and AutoCAD Core Console](#)

Items to be aware of...

- Know your System Variables:
 - Ensure file is unlocked after uploading, change CloudCollabModifiedOption to 0
 - If Start tab missing, change STARTMODE to 1 (On)Note: restart AutoCAD after changing system variables
- Sheet Set Manager is not optimized to work environment of cloud collaboration using Desktop Connector. [If you absolutely must use SSM, refer here](#)
- Support Files to be stored on local drive for best performance

Troubleshooting Techniques

If you're not sure why things not are going as expected, try some of the following:

- Review file properties in File Explorer. Eg columns in window explorer
- Check if any action is needed for ["Pending Actions"](#)
- Use [Reference Explorer](#) to visualize all files in a dataset including relationships between them.
- Gather [Diagnostic logs](#) to assist Autodesk Support trouble shoot Desktop Connector events

AUTODESK UNIVERSITY

Learn how to ensure your entire project team have access to the most up-to-date design documentation

Up to now we have been using Autodesk Docs as the teams CDE or Common Data Environment. We are now going to explore other features that make Autodesk Docs unique for managing your data.

MANAGE

Integrated with AutoCAD and Revit

When you're a member of an Autodesk Docs project you can view and access the models. When using Revit you save your non-workshared, local model to a selected project on Autodesk Docs. If you have the Autodesk BIM Collaborate Pro entitlement, you can convert a non-workshared cloud model to a workshared cloud model, which allows multiple users to work on a cloud model at the same time.

View files with installing additional software

Autodesk has a file viewer embedded into Autodesk Docs. It supports many 2D and 3D design file types for both Autodesk and non-Autodesk Products. Users aren't required to have or understand specific design software in order to start viewing, they just need the design file or a shared link. With the ability to share entire models online, you can quickly get the feedback you need from colleagues and stakeholders.

Compare all design changes in each file version

As your design evolves, there are many iterations until the design is finished. Autodesk Docs keeps all file versions you save on the platform. You can make any version as the current version. And you can see information about the versions like who updated it and when. The advantage of keeping all the versions is you can compare all the design changes in each version.

Supports the Document approval process

As a Document Manager, you need to distribute project drawings, models, and files for review and approval, before construction can begin. The [approval workflow](#) feature enables document managers to facilitate, control, and automate the distribution of files to project members. Members designated as reviewers can then review and comment on the files, and members designated as approvers can give final approval for the files to be used.

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Send files to other project members or teams

Need to share files or folders with non-project members? Once Project Admins have enabled this option, any project member with **View + Download** or higher permissions will be able to create public share links that will allow downloading of the shared file or folder by the individuals that are not members of your Project.

Design Collaboration (included with BIM Collaborate/BIM Collaborate Pro)

Design Collaboration is a web-based product module included in our cloud offerings BIM Collaborate (for project reviewers) and its Pro version (for design authors). Our Revit-reliant customers have been using Design Collaboration to manage the exchange of design data between teams ever since BIM Collaborate Pro, formerly “BIM 360 Design”, was launched.

By making use of separated data structures in the form of ‘folders’ that turn into visually distinct ‘swim lanes’, Design Collaboration helps distinguish work-in-progress design work from completed, ready-to-share design work. Your team benefits from the rich and structured presentation of project data in one location – Design Collaboration – accessible in a web browser.

- The **Project Model Viewer** aggregates multidiscipline visualizations of 3D model information so you can click around the model to understand what’s changing across elements, disciplines, versions, levels, and more.
- The **Project Timeline** is another visual aid that shows logs of all shared data between teams inside of curated “packages”, helping to maintain accountability and transparency for deliverables and deadlines.

As your project needs evolve, the desire to control how files are referenced by others increases. Being able to organize cross-industry teams in one location gives teams:

- The opportunity to establish proper exchange practices on a project
- Better access controls for intra versus inter-team collaboration
- Package-based data exchange, with the ability to curate only the necessary 2D or 3D data that’s ready to send to other teams
- “Explore” and “consume” features give project managers the ability to browse before committing to accept other team’s data into their team’s data structures
- Versioning and issue management in a central location for DWG, RVT, and IFC file types
- Seeing all teams’ models contextually in one combined view, with information about changes to model elements
- Track deliverables shared throughout the project on a common timeline

For detailed tutorials on how to use Autodesk Docs, Autodesk BIM Collaborate, I recommend visiting the [Autodesk Construction Cloud Learning Center](#) page to access free online courses.

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Resources

Learn how to use the Autodesk Construction Cloud

Visit the [Autodesk Construction Cloud Learning Center](#) page to access free **Autodesk Docs** online courses.

Contact support

If you are still stuck, please reach out to the Autodesk technical support team. We will be happy to help you. You can get product help and contact support directly from [Docs](#). If you have a question while you're working, click the ? and choose Help to access the product help or click Contact support to open the Support Hub.

If you haven't done so yet, we recommend bookmarking health.autodesk.com where you can view the current status of Autodesk cloud products. You can also sign up to receive email alerts for any status changes or future maintenance windows

Autodesk University classes

Visit the Autodesk University website to access class recordings from previous years, such as [Setting Up and Using Desktop Connector with BIM 360 Docs](#)

Release Notes

Desktop Connector and Autodesk Docs are being improved constantly. The information in this document is very likely to change with new releases. To keep up-to-date, review the following pages:

[AutoCAD 2022 Release Notes](#)

[Desktop Connector Release Notes](#)

[Autodesk Construction Cloud Product News](#)

Other

Autodesk Health Dashboard

<https://health.autodesk.com/>

Digital Builder (Blog)

<https://constructionblog.autodesk.com/>

Autodesk Customer Success Hub

<https://customersuccess.autodesk.com/>