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ISO 19650, the Common Data Environment and Autodesk Construction Cloud

Joan Allen
Autodesk

Angela Yee
Autodesk

Learning Objectives

- Understand the requirements of ISO 19650
- Learn how Autodesk Construction Cloud products can be used to support ISO 19650 standards
- Discover best practices for data and document management for construction projects

Description

Use of standards for construction project delivery has grown over the last decade, with national and regional mandates, and an increase in Building Information Modelling has led to the development of the ISO19650 set of standards. This session will discuss the development and use of these standards and how they relate to how people are using Autodesk Construction Cloud.

Speakers

Joan E. Allen, P.E., LEED AP
Joan leads product management for Autodesk Construction Solutions' document management and construction records management platform. Joan is a registered Civil Engineer with over 30 years of experience in construction management and technology for the AEC industry. Since joining Autodesk, she has focused on delivering innovative, cloud-based solutions for connecting AEC project teams and improving project delivery workflows, Autodesk BIM 360 Docs, Autodesk BIM 360 Glue, and Autodesk Buzzsaw.

Angela Yee, MBA, R.A.
Angela is a senior product manager for Autodesk Construction Solutions’ document management team working on the common data environment initiative. Angela is a registered architect with over 15 years of experience in architecture, construction management and technology in the AEC industry. Since joining Autodesk, Angela has continued to be an advocate for building the best-in-class document management and compliance solutions for BIM 360 Docs users.

Introduction: Common Data Environment

"The common data environment (CDE), is the single source of information used to collect, manage and disseminate documentation, the graphical model and non-graphical data for the whole project team," says the BIM Wiki. "Creating this single source of information facilitates collaboration between project team members and helps avoid duplication and mistakes."

In other words, a common data environment is a digital hub where information comes together as part of a typical building information modeling (BIM) workflow. In fact, it was originally developed and popularized as a component of the UK BIM Level 2 standards. Today it extends beyond BIM data and information, and it can include anything from project contracts, schedule, change orders, and more. Basically, if it involves information created during a project, it's available to everyone who is given permission from its inception through to the end of the project and beyond.

Why is a Common Data Environment Important?

Figure 1 below shows a comparison of a typical project information flow vs. one in which a Common Data Environment (CDE) has been implemented.

On the left, there is a simplified view of how team members typically exchange information on a project. It is a giant matrix, and it is hard to ensure the right information is with the right person at the right time. Often information lives within different systems. and information exchange is manual, error prone, and can lead to costly mistakes.

On the right, a CDE has been adopted by the project team. With a CDE, the information flows through a central repository where, ideally, it is more easily controlled and up-to-date. The CDE provides mechanisms to gate information flow so that construction documents (and other information such as markups and issues) are only available to project team members when the information has been reviewed, approved, and release for its intended purpose.

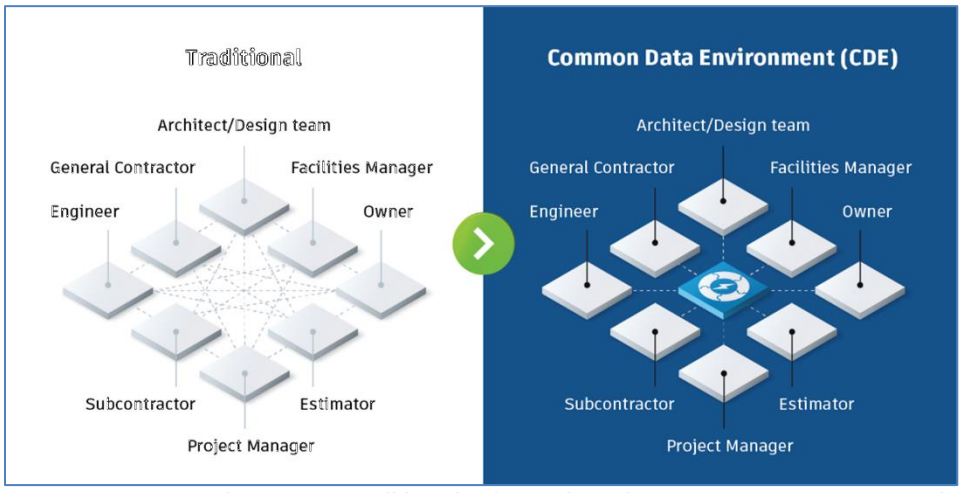

Figure 1 – Traditional Information Flow vs. Common Data Environment

Figure 2 reflects a common project delivery configuration, representing the ecosystem of companies that need to work together to design, build, and operate a building or infrastructure project. However, there are many challenges, including

- Contractual boundaries between disciplines and teams
- The design and construction teams, as well as the entire supply chain, are different entities that need to control the sharing of and access to data and information on the project.

A central hub of information for the project is essential to not only the teams but also the owner – without that, information can be unreliable and increases project risk.

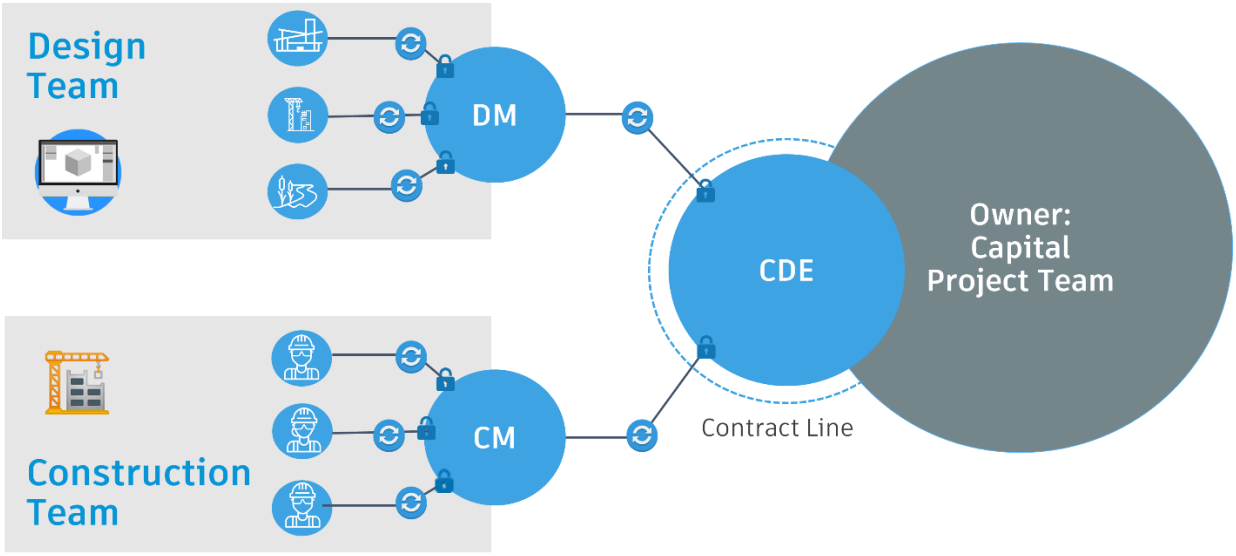

Figure 2 – Project Team Organization

Benefits of a Common Data Environment

- Enhances collaboration: Digital technologies have proven time and again that they can improve collaboration if used correctly. That means that all project data and information needs to flow into and be updated in one centralized system. This leads to improved coordination and teamwork, both internally and across teams.
- Creates a single source of truth: Never underestimate the power of one single source of truth on a project. One reliable place for team members to access real-time plans, changes, and data leads to better decision-making and insight across projects and even company-wide.
- Improves efficiency and quality: Common data environments reduce the need to manually recreate data, which leads to reduced input errors and lost information. Consequently, the entire firm has improved access to information that empowers teams to make decisions faster.

- Reduces risk: A CDE lowers risk with better transparency and insight into the entire project landscape. Over time, this enables continuous improvement and predictability, crucial for excelling a business forward.
- Strengthens security: With a CDE, administrators and IT professionals have better control of data and information, creating more security.

ISO 19650

ISO 19650 is an international standard for end-to-end information management over the life cycle of a built asset. It provides clear definitions Clear definitions for the information needed by the project client or asset owner and for the methods, processes, deadlines for the efficient and effective transfers of information between project team members.

ISO 19650 3.3.15 common data environment (CDE): "agreed source of *information* (3.3.1) for any given project or *asset* (3.2.8), for collecting, managing and disseminating each *information container* (3.3.12) through a managed process."

ISO-19650 defines the requirements, and the National Annexes define the actual standards associated with those requirements. A CDE is not a technology solution alone – it requires the project team to follow a standard process that can be enabled and enhanced by the technology.

Key requirements include:

- Unique, standard identification for every "information container" (including drawing, model, file, and other data)
- This includes naming convention standards that are defined by each country adopting the standard (also called a "National Annex)
- The ability to classify the data and to assign specific "suitability status" to ensure that anyone accessing and using that data can be confident in the reliability, accuracy, and intended use.
- Revision control, so that only specific revisions are available for use by the project team, ensuring that everyone is working from the correct information.
- Controlled information flow and approval processes to ensure that only approved information goes from WIP to Shared to Published.
- Audit trail

What to look for in a CDE

- Easy to Use: User experience is an essential component of a common data environment. To be effective, it needs to be easy to use, meaning it's intuitive with minimal to no training to get teams working in the system.
- Accessible: Cloud-based means accessible from anywhere - to anyone who needs the information (if they have the permissions, of course) whether they are in the office or out on a jobsite.
- Integrated: A CDE must work with current systems and processes. The goal is to break down silos and increase collaboration overall.

- Standardized and Scalable: A CDE should allow you to standardize workflows and processes across projects, and it should scale to projects of any size or complexity.
- Secure: Your common data environment must be secure – to ensure data integrity and controlled access to your confidential and proprietary information.

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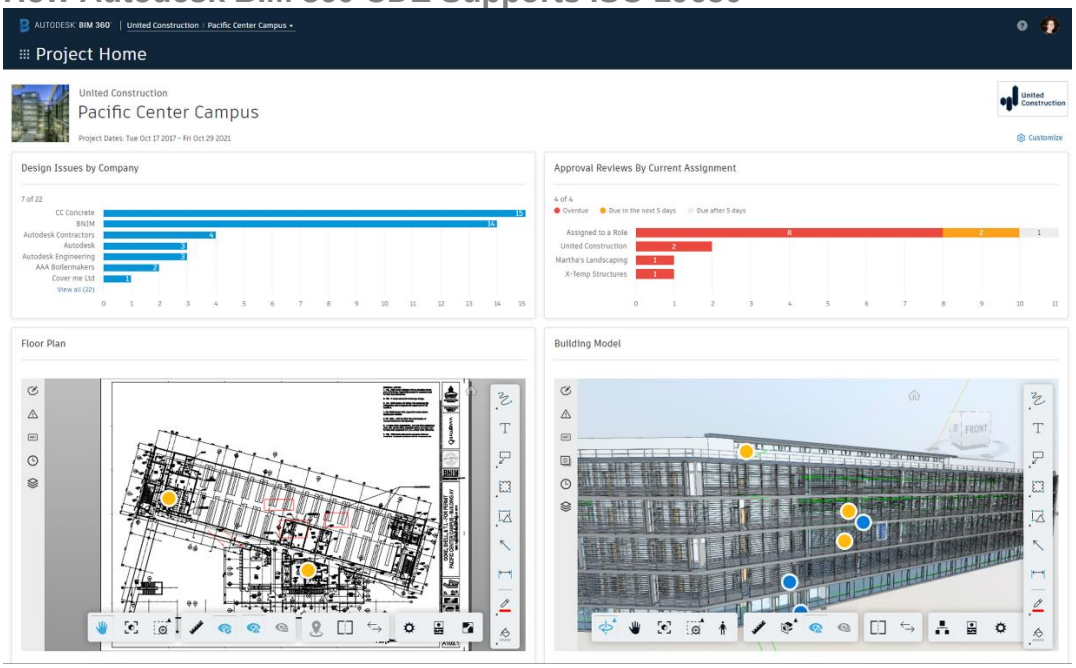
How Autodesk BIM 360 CDE Supports ISO 19650



Autodesk BIM 360 is a Common Data Enviroment, with support for:

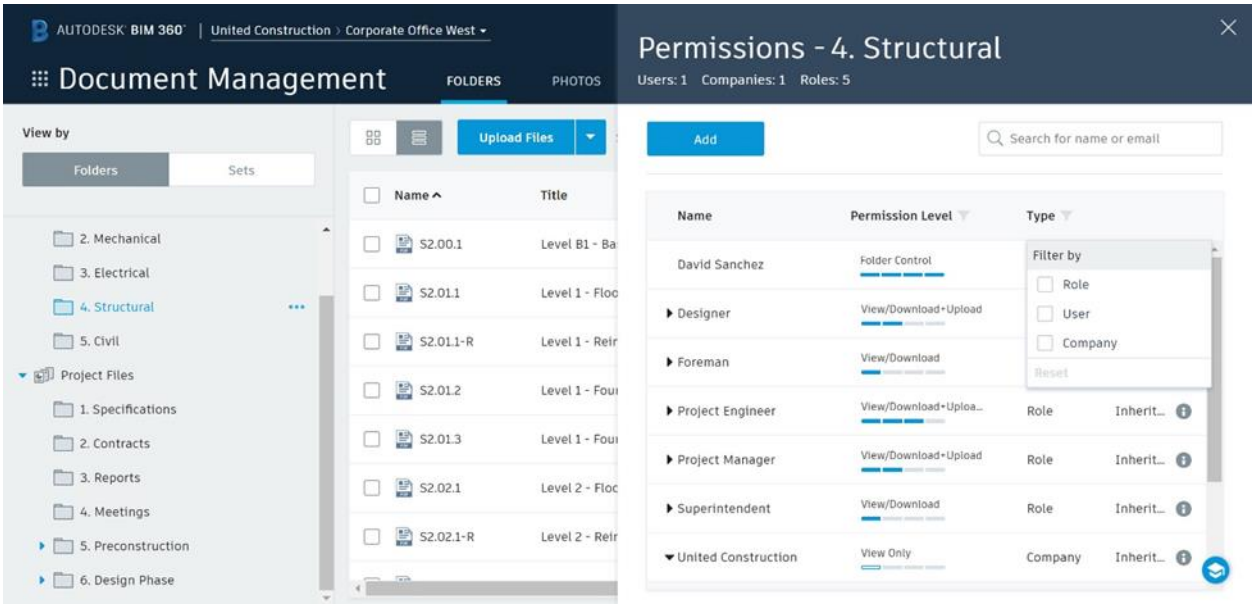
- Permission control
- Audit trail
- Document control & versioning
- Custom metadata
- Integrated with design workflows
- Design and office file viewing
- 2D & 3D viewing & compare
- Approval workflow
- Transmittals
- Markups and Issue Management
- Mobile access
- Reporting & analytics
- Support for unique file naming*
- Support for file naming standards*
- Revision and Status*
- Enhanced Review and Approval Workflows*

**currently available in limited beta*

Best Practices for Setting Up Your CDE

- Set up separate folders for WIP, Shared, Published (and Archived, if applicable) for each discipline. Use “Project Files” folders (Plans folders are
    - Folders in BIM 360 Docs will display in alphanumeric order by default
    - In order to ensure a folder order that you want, use a number / label format like this: 01-WIP, 02-Shared, 03-Published

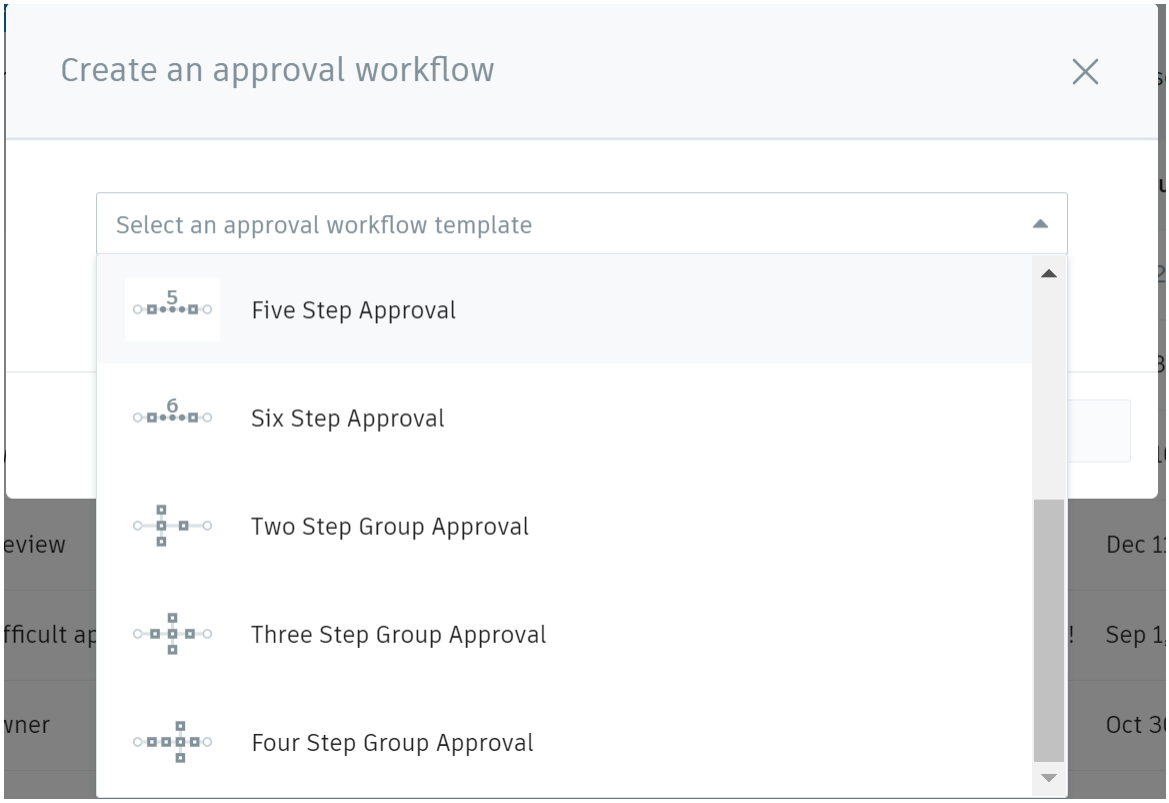
- Set up Role-based or Company-based permissions for each of these folders. Permissions in BIM 360 are set at the folder level, and apply to all subfolders and documents contained in that folder. Permission levels range from view-only to full administrative control. Permission levels include:
    - **View only**: User/role/company may view documents, add private markups, and create issues.
    - **View + Download**: User/role/company may view documents, add private markups, create issues.
    - **Upload only**: User/role/company may upload documents but not see the folder contents.
    - **View + Download + Upload**: User/role/company may share their own documents with team members and view any other documents in that folder.
    - **View + Download + Upload + Edit**: User/role/company may share their own documents with team members, view and edit any other documents in that folder, and publish markups.
    - **Folder Control**: User/role/company may share their own documents with team members and view and edit any other documents in that folder. With folder control permission they can also carry out tasks within that folder that are usually restricted to the project administrator. This includes creating title blocks, adding project members, managing permissions, and editing set assignment. This permission level offers the greatest access to folders.



- Best Practice: Set up a Template Project, so that it is easy to create additional project CDE's. A template project is simply a BIM 360 Docs project with folders and **Role-based** permissions. When you create a new project in BIM 360 Account Admin, you can choose your Template Project and "Copy Project Settings"

- In Project Admin, add project members and assign Role(s) and Company. The project members' access will be controlled by the Role and Company based permissions. When project members are added to or removed from the project at a later date, the Role and Company based permissions ensure that the individuals have the proper access right away.

- In Project Admin, from the Document Management>Reviews tab, set up Review and Approval workflows. Choose from templates (1 to 6 steps) with both serial and "group" (parallel) review steps.



- You can assign individual users, roles, or companies to each workflow step. You can also copy a workflow and adjust the steps to easily additional workflow templates.