AUTODESK. UNIVERSITY

BIM 360 Design - Revit \ Civil 3D Collaboration

Jeff Morris & Cherisse Biddulph

Learning Content Developers

ASCENT- Center for Technical Knowledge

Instructional Demo

Session ID: CES466206

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About the speaker

Jefferson Morris

Jeff's career has been completely engrossed within the BIM / CAD technologies for buildings as well as civil and infrastructures, which demonstrates clearly his passion for these exciting, albeit still young technologies / methods / systems. Jeff's work has been divided between working as an Infrastructure Application Expert for the Autodesk channel and being a CAD / BIM Manager for large and small multidiscipline firms / Civil and Architectural. Most of his career he has been a consultant / teacher / mentor / implementer - a champion of CAD and BIM. Now with ASCENT, he develops learning content for their Infrastructure / BIM 360 and Navisworks courses and as well as developing custom content

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About the speaker

Cherisse Biddulph

Cherisse is an Autodesk Certified Professional for Revit, as well as an Autodesk Certified Instructor. She brings 15 years of industry, teaching, and technical support experience to her role as a Learning Content Developer with ASCENT. With a passion for design and architecture, she assisted several firms with CAD Manager needs and getting others up to speed on the latest software. In 2004, she joined IMAGINiT as an Application Engineer (AE), where she developed custom training and provided support for customers. She transitioned from her work as an AE to the IMAGINiT Solution Center as a Senior Technical Support Specialist, where she became proficient in AutoCAD, BIM 360, Navisworks, and Revit. Today, Cherisse continues to expand her knowledge in the ever-evolving AEC industry and the software used to support it.

Learning Objectives

BIM 360 – DESIGN COLLABORATION

Understand the nature of design collaboration within BIM 360

CIVIL 3D

Understand how Civil 3D design sharing with Data Shortcuts and Xrefs can occur through BIM 360

REVIT – BIM 360 DESIGN

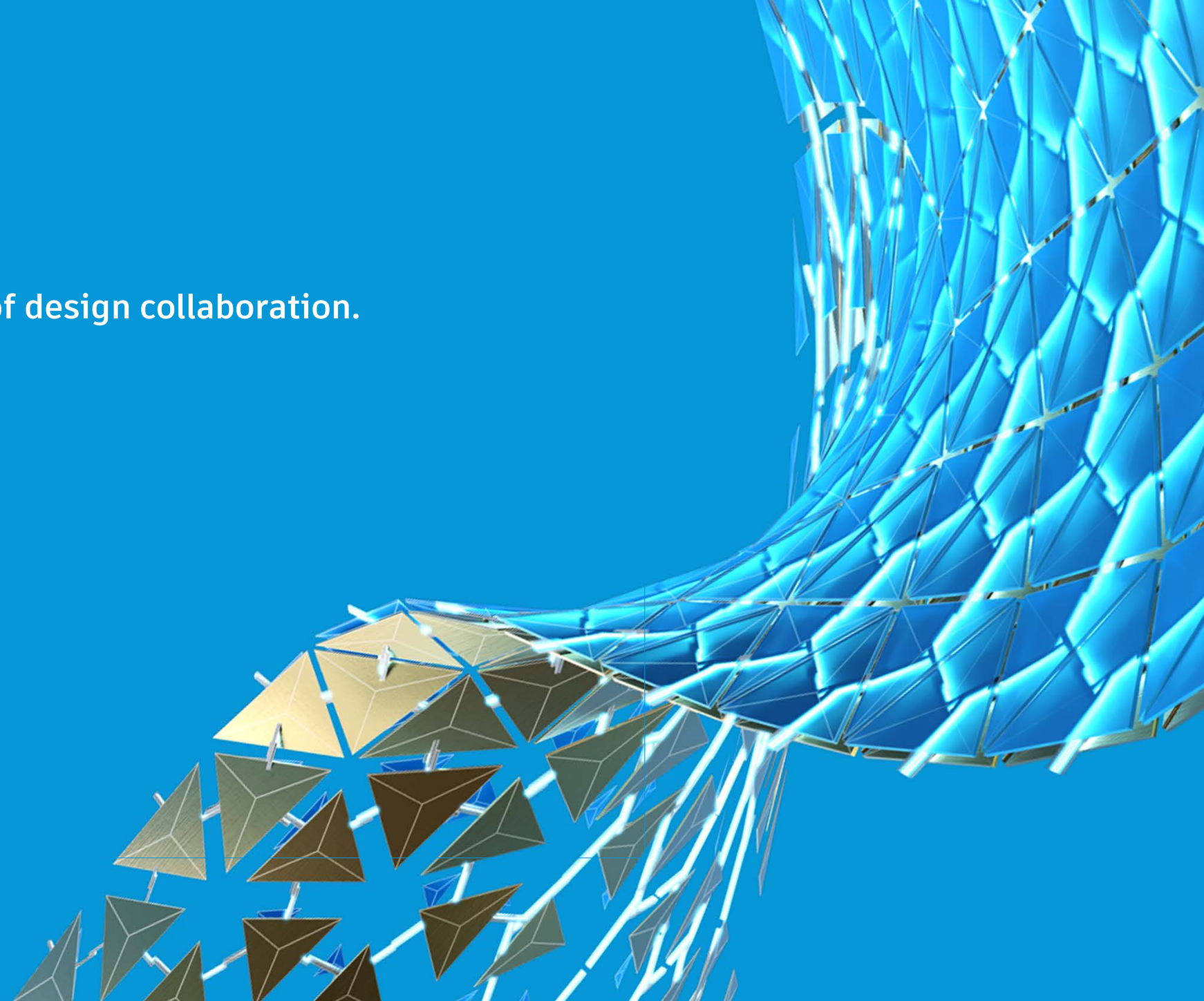
Experience the cloud worksharing in Revit through BIM 360 Design

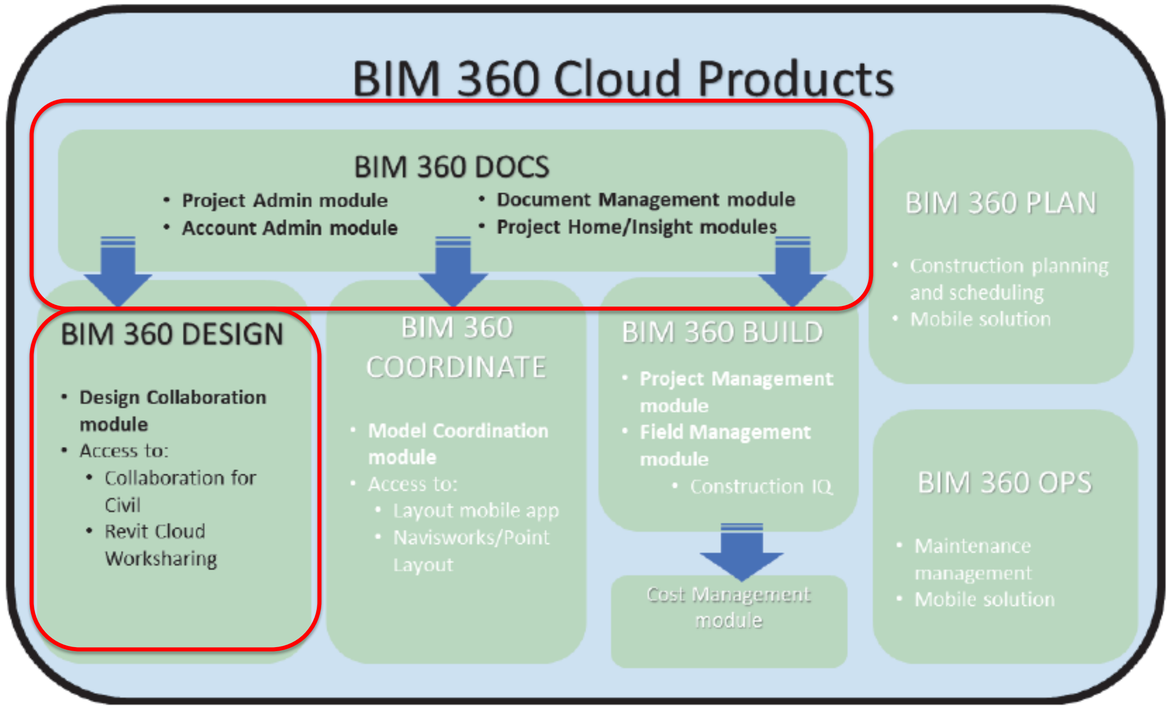
CIVIL 3D AND REVIT

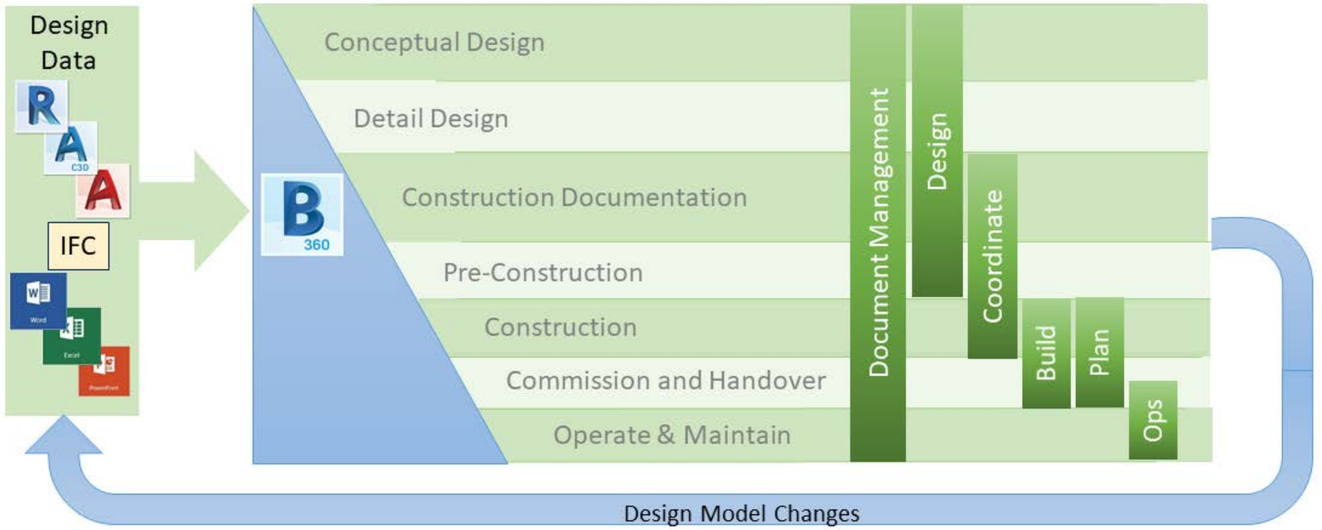
Examine how Civil 3D and Revit data can be shared through BIM 360

Objective

1. Understand the nature of design collaboration.







BIM 360 Platform

BIM 360 :

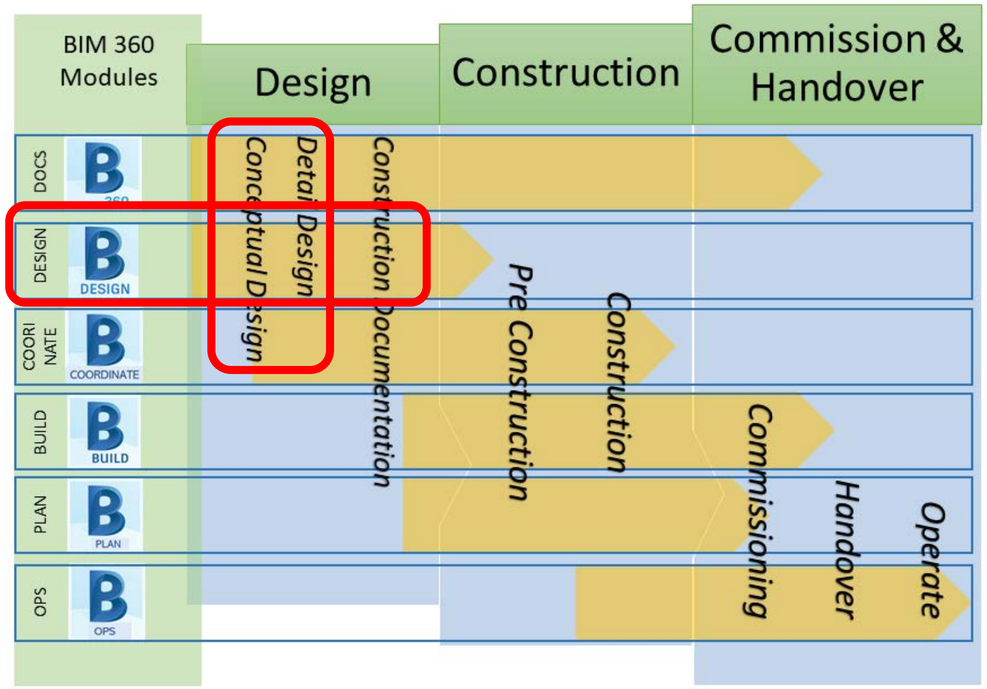
- BIM 360 is an application to manage the design data throughout all stages of a design/build/own project.
- BIM 360 provides a unified platform for design collaboration
- A shared platform enables effective decision-making throughout the life cycle of a project.

BIM 360 DOCS

DOCS Program:

- Manage and properly control 3D models, drawings, and other documents.
- View, measure and markups.
- Create and manage Issues and RFIs.
- Serves as the Base for BIM 360 Design.

Project Workflow



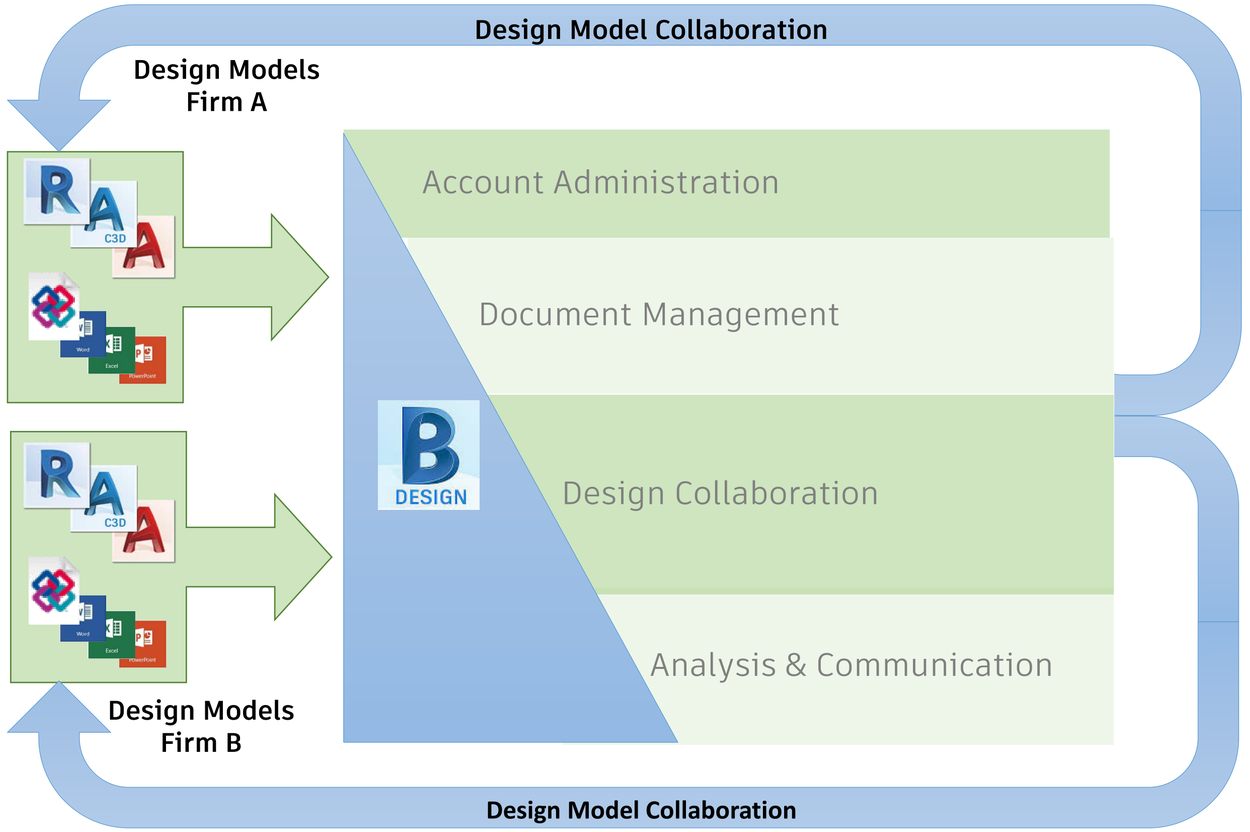
Conceptual / Design Development Threshold:

- When Project grows from one to multiple designers.
- Proper Archiving required, then set project up for multi-user.
- Within Firewall, Xrefs ,Drefs Revit Links and a slew of other references shared on the LAN
- Outside of Firewall, BIM 360 setup, population, Design & Entitlements

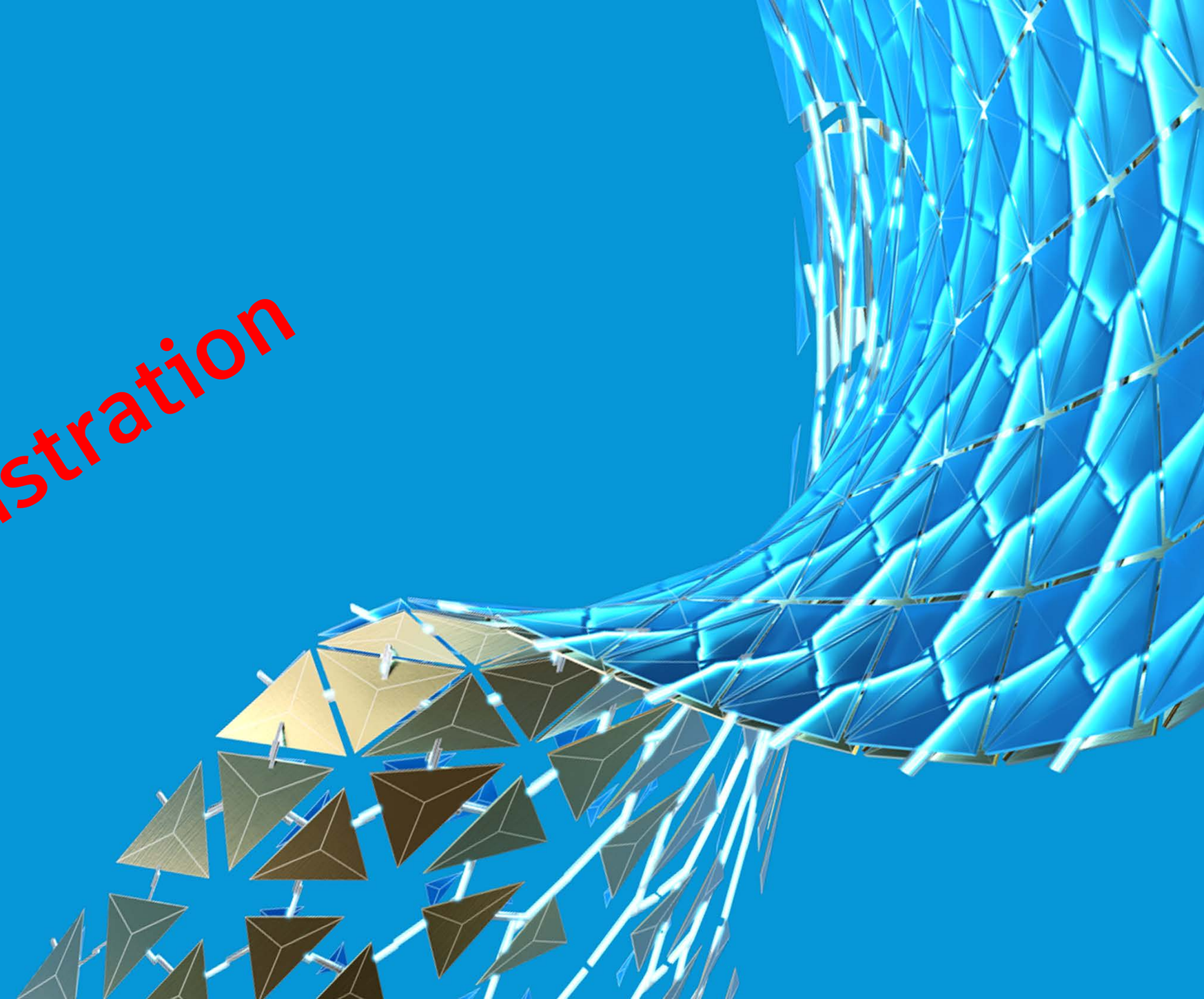
BIM 360 Design

BIM 360 Project setup:

- Create a Project and activate services.
- Add members to the project, assign services to the user.
- Setup Document Management folder structure, add members, and assign permissions.
- Populate BIM 360 with drawings, Revit Model and Design Data for a projects lifecycle.



Demonstration



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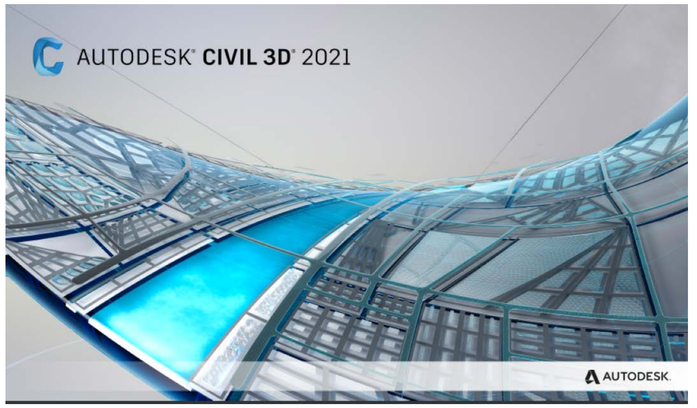


BIM 360 Design Collaboration

“The Design Collaboration module provides a visual project timeline for deliverables and allows you to track changes, review/compare model updates, and control sharing and what gets linked into your model.”

Revit Cloud Worksharing entitlement

“Revit’s worksharing in one centralized location, allowing multiple firms across the globe access to co-author models, share files, and communicate effectively in the cloud.”

BIM 360 Collaboration for Civil 3D entitlement

“cloud-based collaboration solution allowing project teams the ability to store data shortcuts, design files, and external references in one secure central location, which enables project collaboration with multiple firms around the globe.”

History of BIM 360 Collaboration

Autodesk Revit

Worksharing

- Working within a local area network was introduced in 2002.

Revit Server

- In 2011 Revit Server allowed users to work within a WAN.

Revit Cloud Worksharing

- BIM 360 Teams was introduced in 2015 utilizing the power of the cloud for users all over the globe to work on a project.

BIM 360 Design

- In 2018, the next generation of cloud sharing was introduced with more robust features and securities.

Autodesk Civil 3D

Data "Projects"

- Civil3D 2006
- Data Shortcuts released in 2007

Vault Projects

- Civil3D 2007

Survey Database

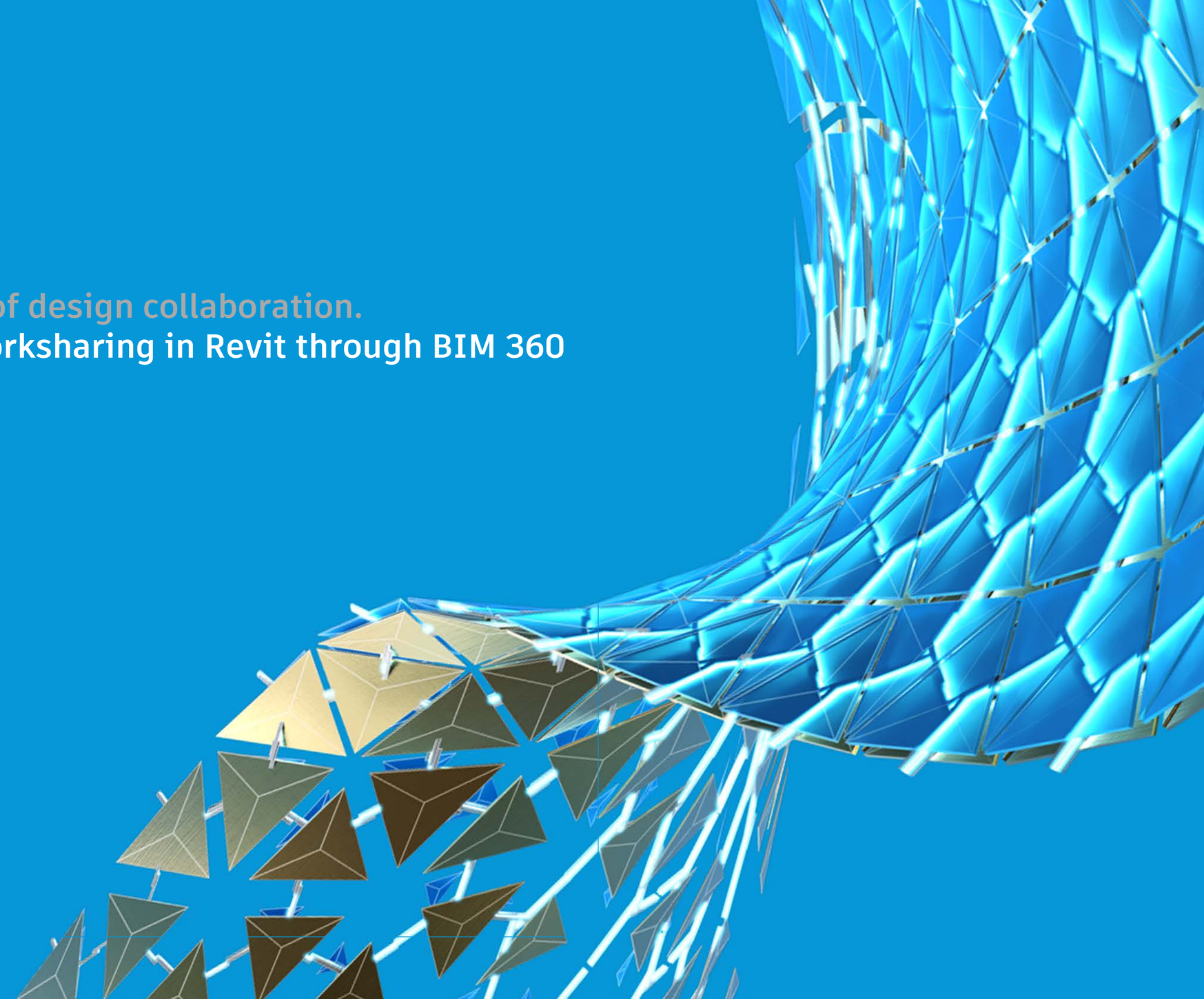
- Introduced Civil3D 2013

Autodesk Desktop Connector

- Civil3D 2019.1
- Required BIM 360 Design "Entitlements".

Objective

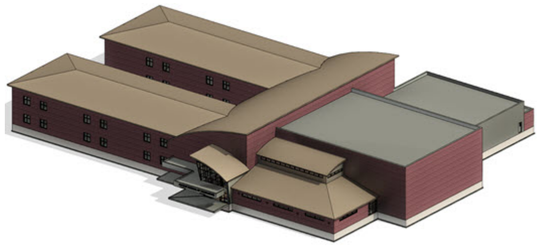
1. Understand the nature of design collaboration.
2. Experience the cloud worksharing in Revit through BIM 360 Design

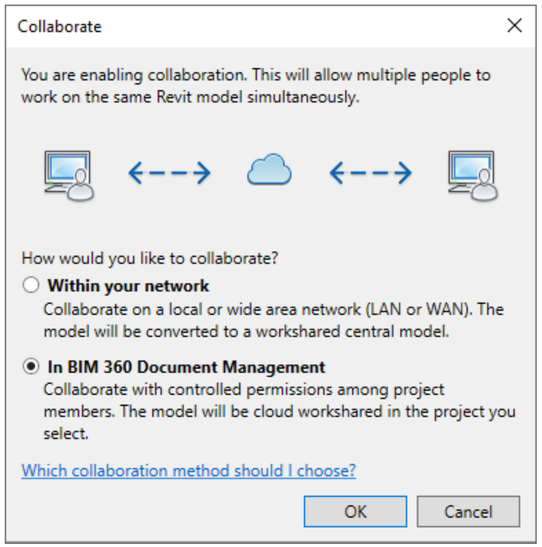


Create a Workshared Model

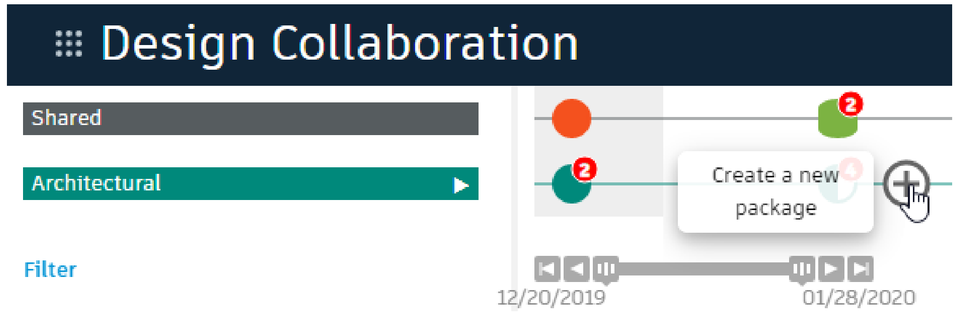
Revit Cloud Worksharing workflow:

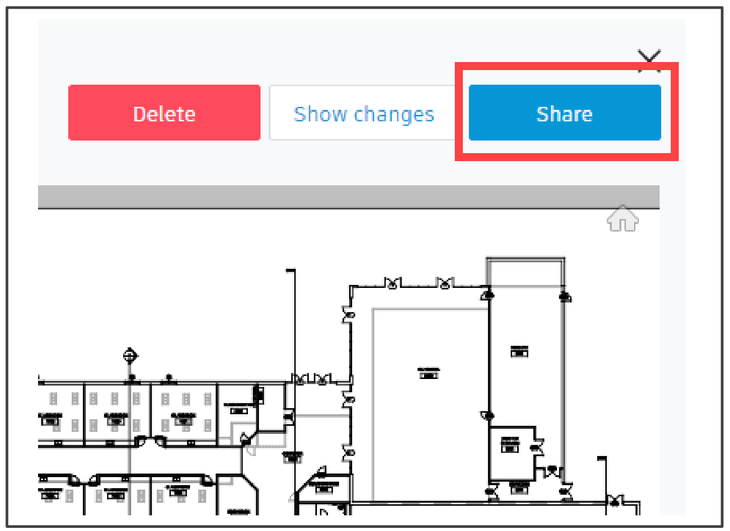
- Have a project set up within your BIM 360 hub.
- Within Revit, initiate your model to the cloud.
- Create a Publish Set.
- Synchronize with Central.
- Publish the model to the cloud.



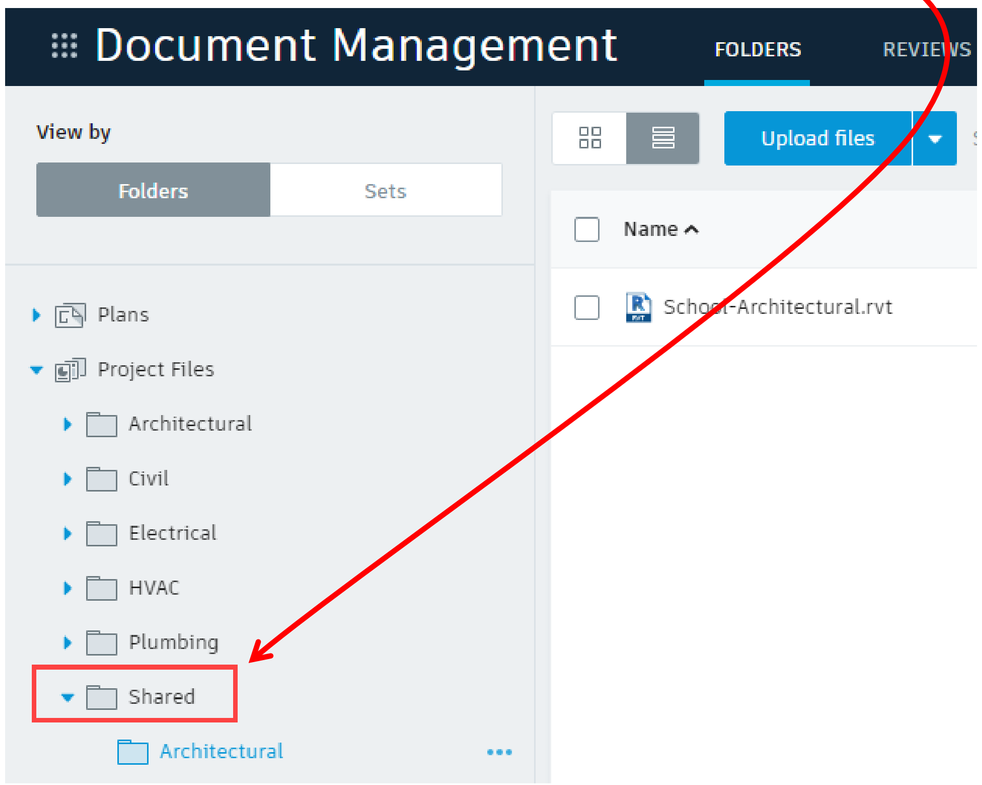


Creating a Shared Package

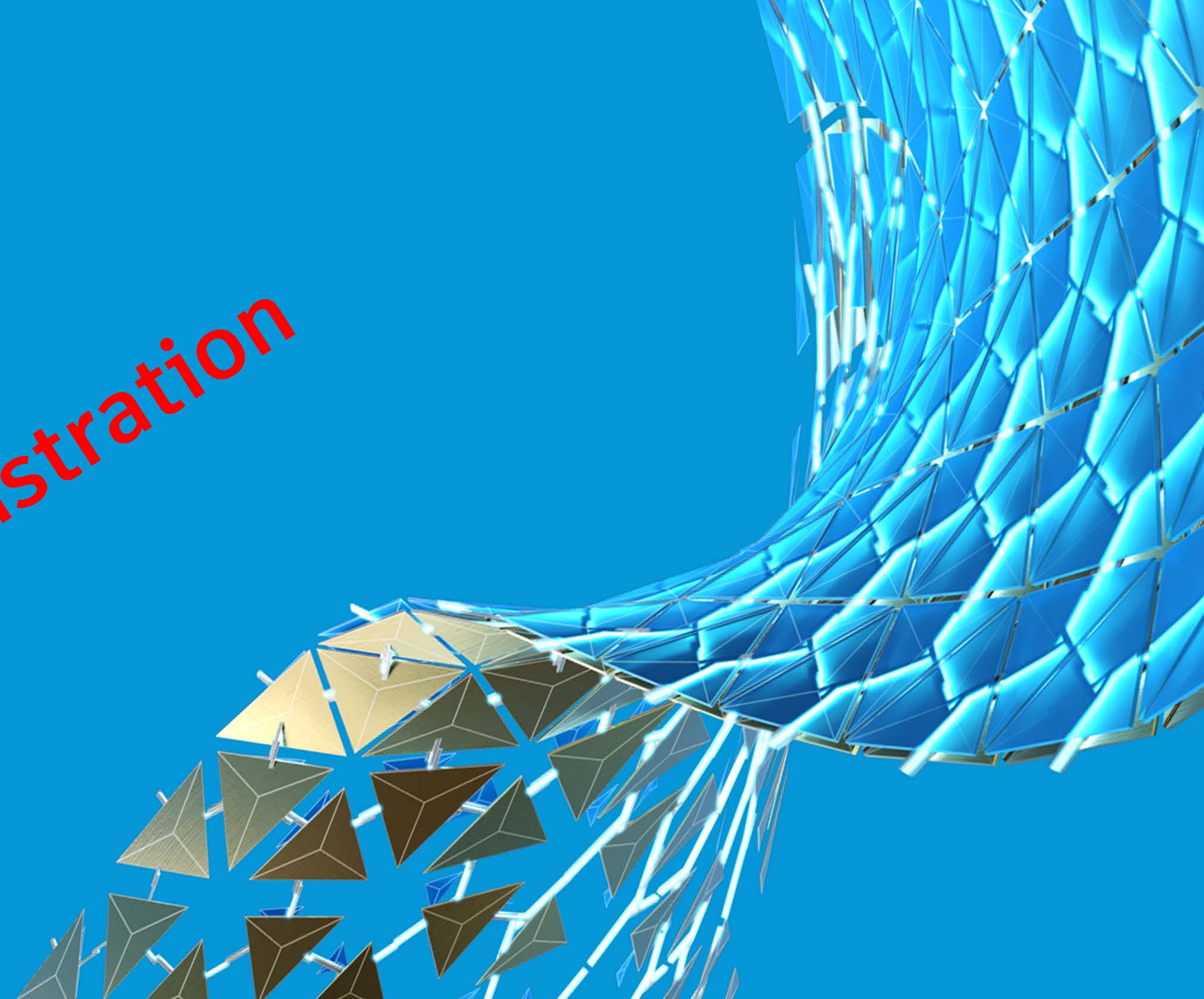




Once you create a shared package, it will show within the *Shared* folder in the Document Management module.

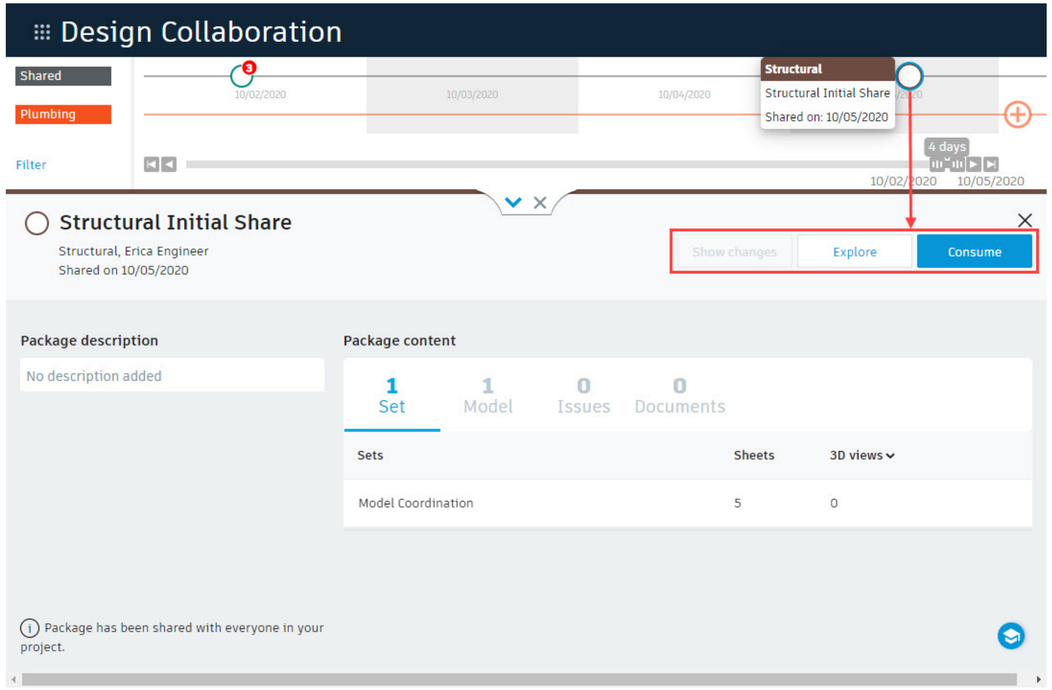


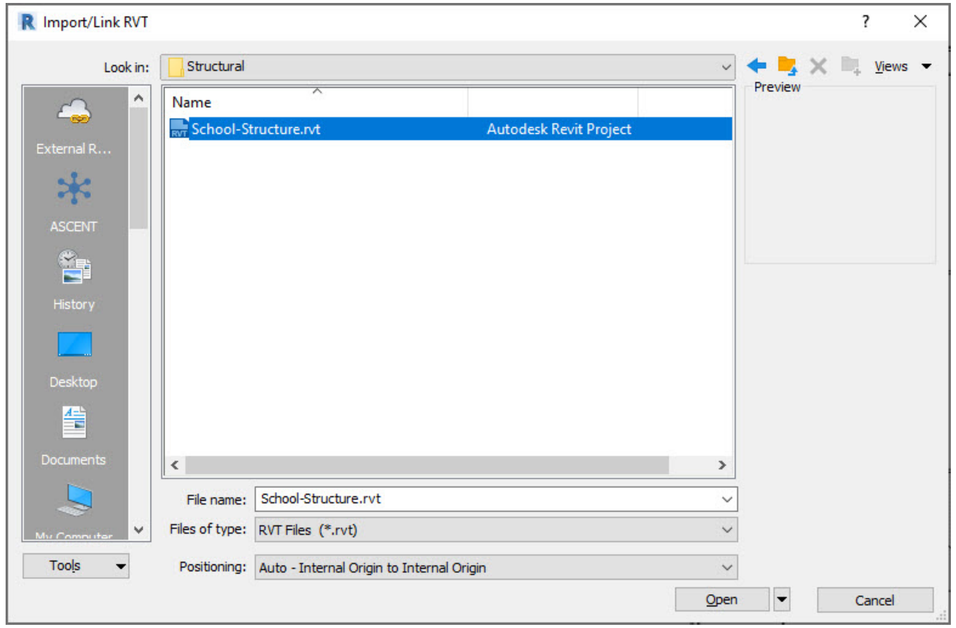
Demonstration



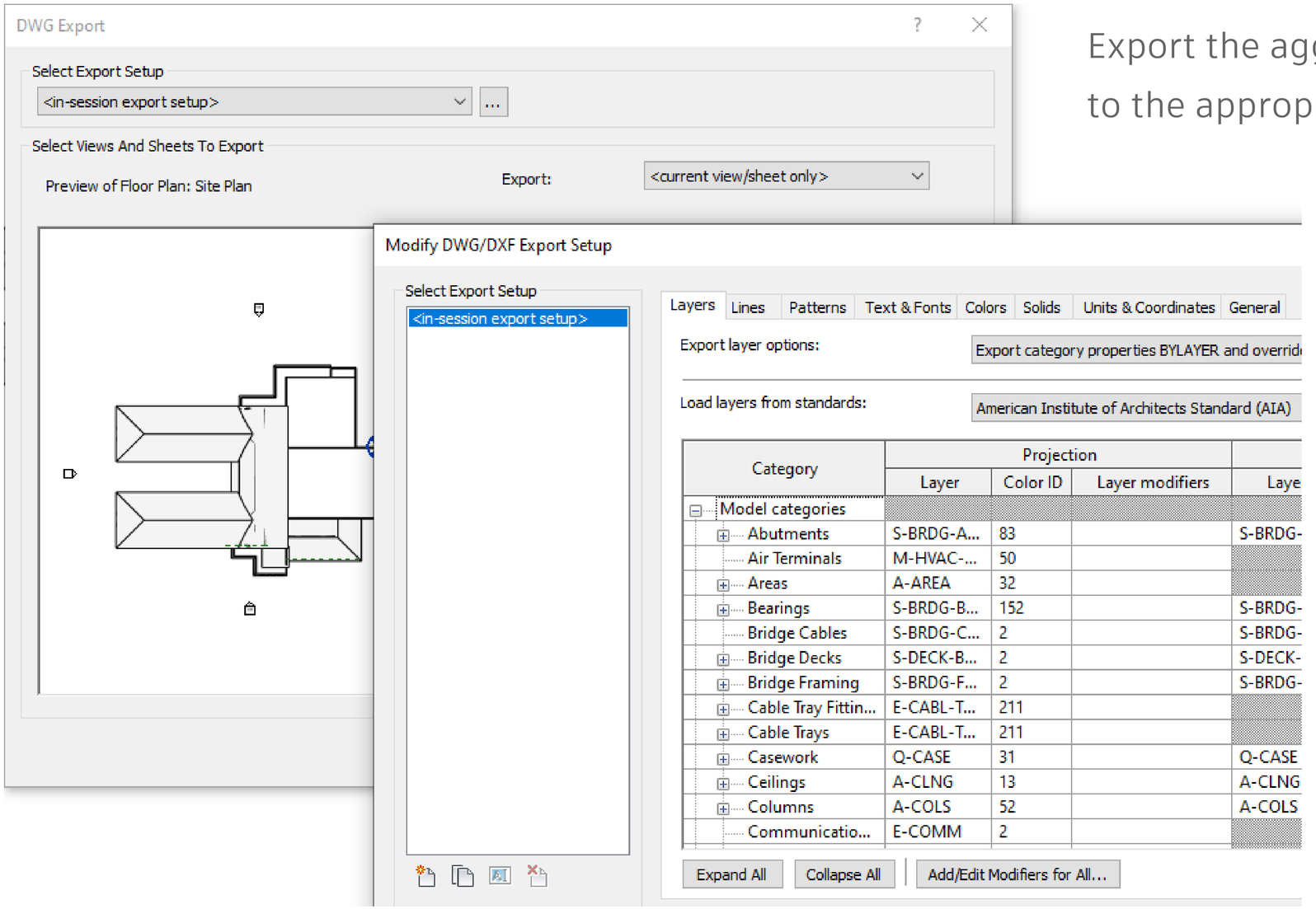
Consuming a Shared Package and Linking the Consumed Package

- Before consuming a shared package, you can:
  - Show changes to compare them with a previously consumed package.
  - Explore the shared package.
  - Create an issue.
- You can then consume the shared package.
- It is best practice to link in consumed packages with a positioning of Auto – Internal Origin to Internal Origin.



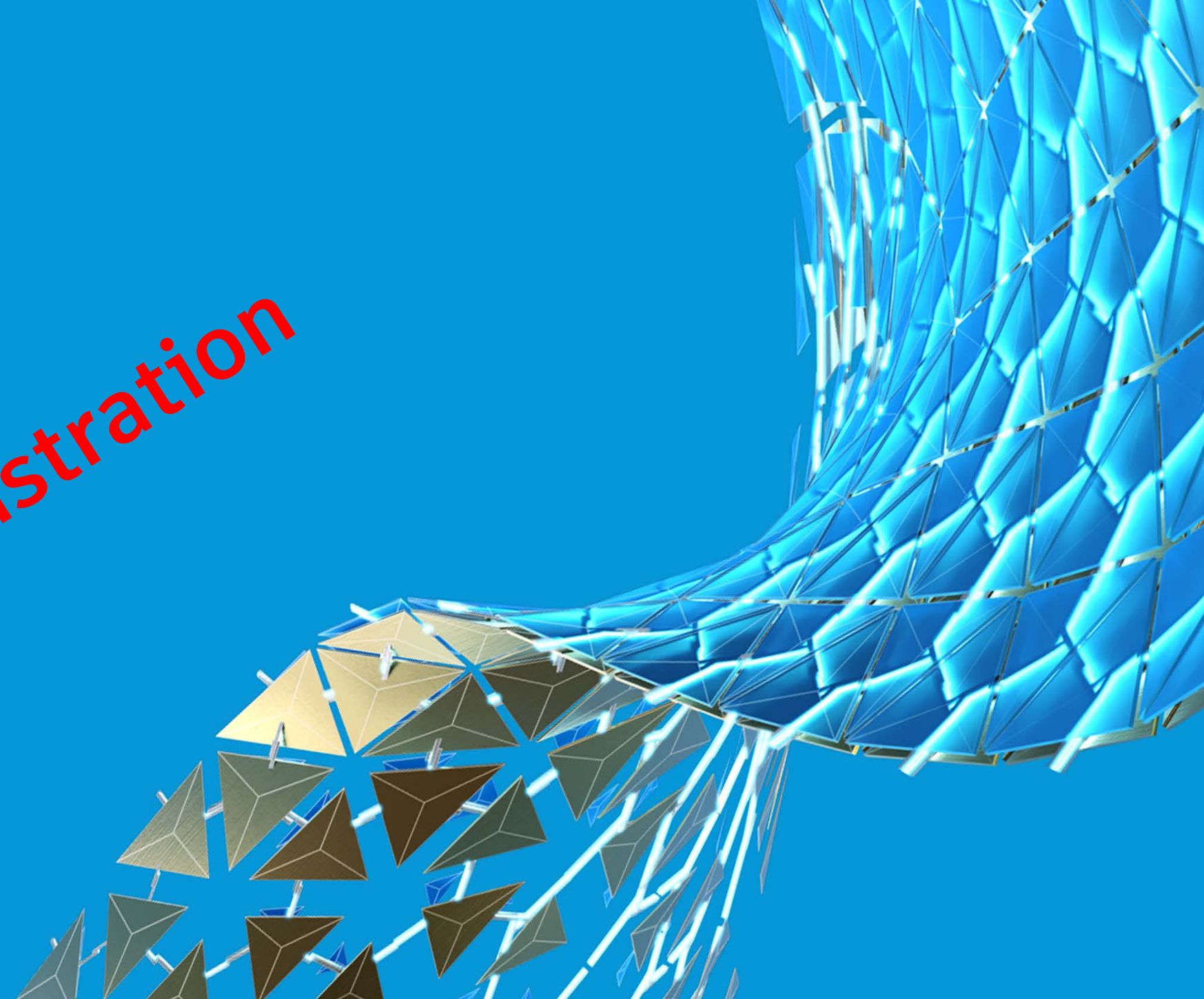


Exporting the Revit Model to DWG



Export the aggregated model to a 2D and 3D DWG to the appropriate cloud folder.

Demonstration



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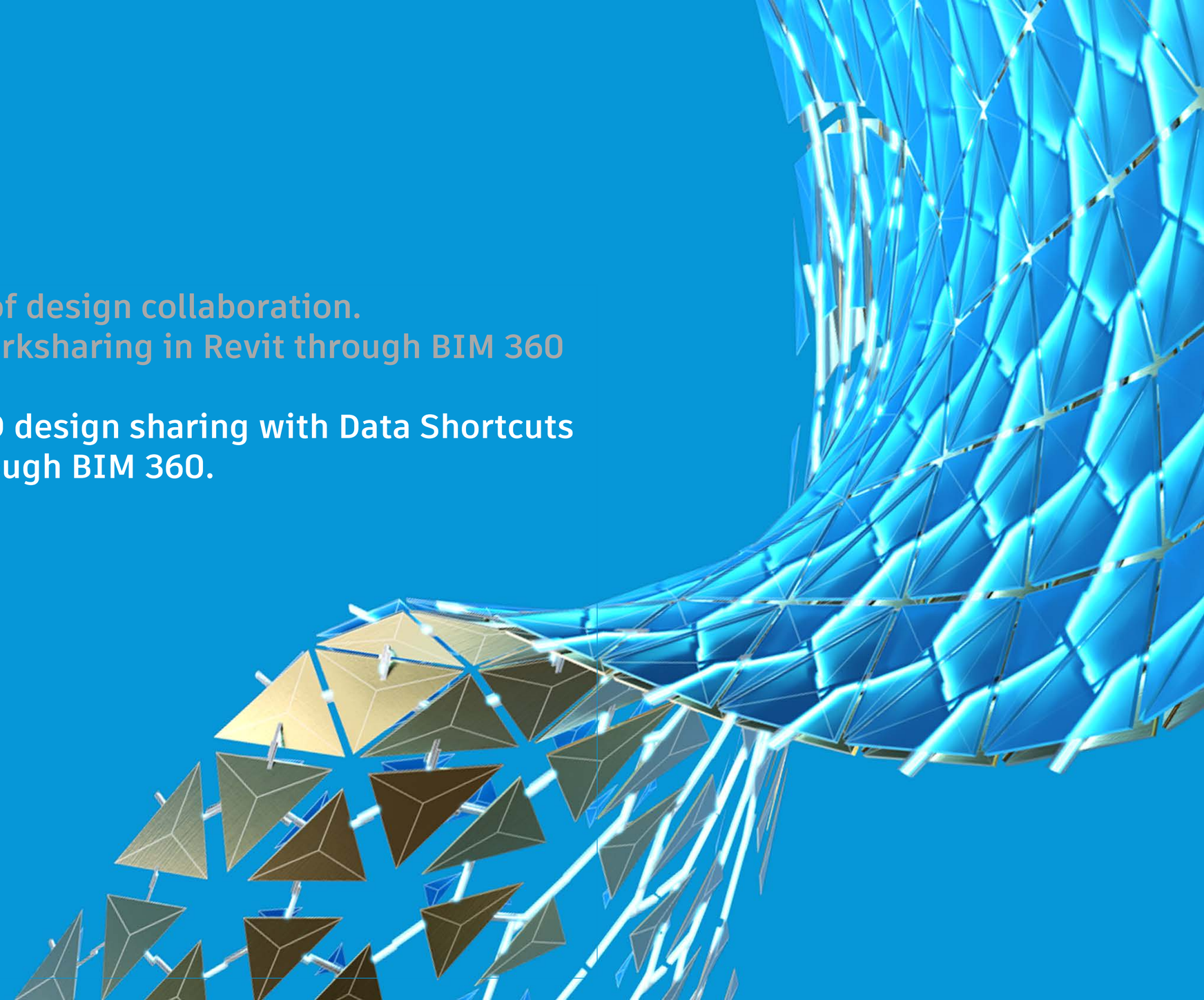
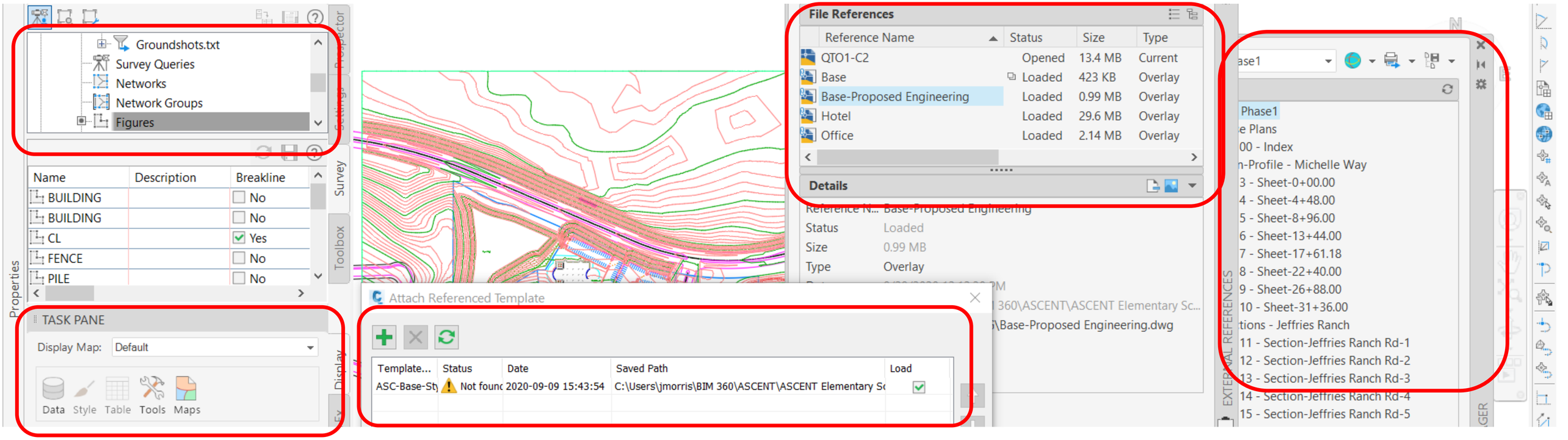




Civil 3D Collaboration

AutoCAD Shared Files:

- External References (Xref)
- Images (and World Files)
- Sheet Sets
- Tables / Spreadsheets
- Remote Text (Express Tools)
- Pen Tables

Civil Shared Files:

- Data Shortcuts (Dref)
- Style References
- LandXML Files
- MMX Files (Large Surfaces)
- QTO Spreadsheets

Survey Database Files:

- Survey Databases
- Point Files & Field Books
- Query Definitions (QML)
- Figure Prefixes
- Linecode Sets
- Equipment Databases

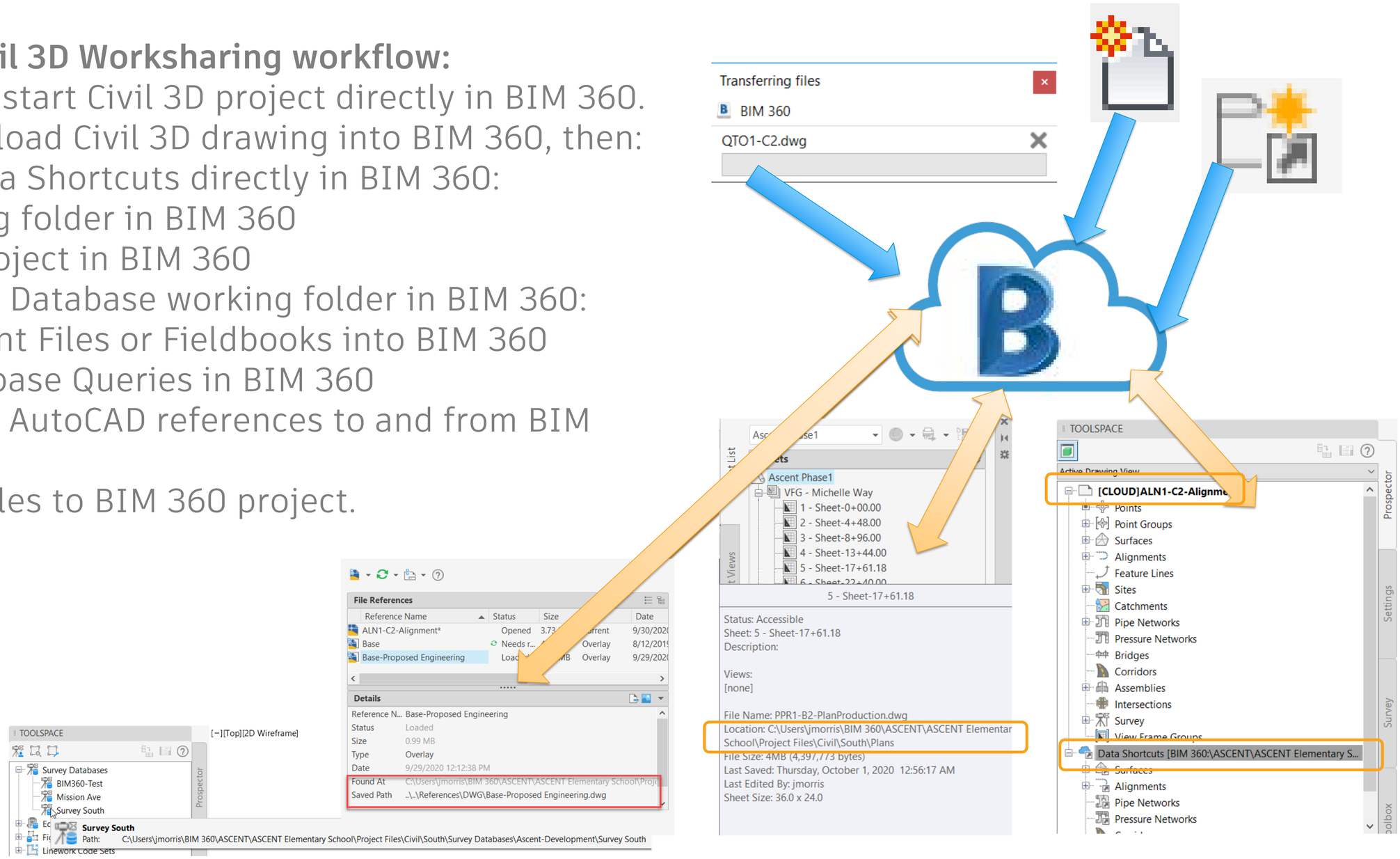
AutoCAD Map Shared Files:

- GIS Databases
- Images (and World Files)
- Source Drawings
- Map Books
- Queries
- Topologies
- Object Classifications

Recommended way to setup Civil 3D Projects in BIM 360

Recommended Civil 3D Worksharing workflow:

- Recommend to start Civil 3D project directly in BIM 360.
- Failing that, upload Civil 3D drawing into BIM 360, then:
  - Establish Data Shortcuts directly in BIM 360:
    - Set working folder in BIM 360
    - Set new project in BIM 360
  - Setup Survey Database working folder in BIM 360:
    - Upload Point Files or Fieldbooks into BIM 360
    - Store database Queries in BIM 360
- Create all other AutoCAD references to and from BIM 360.
- Upload pen tables to BIM 360 project.

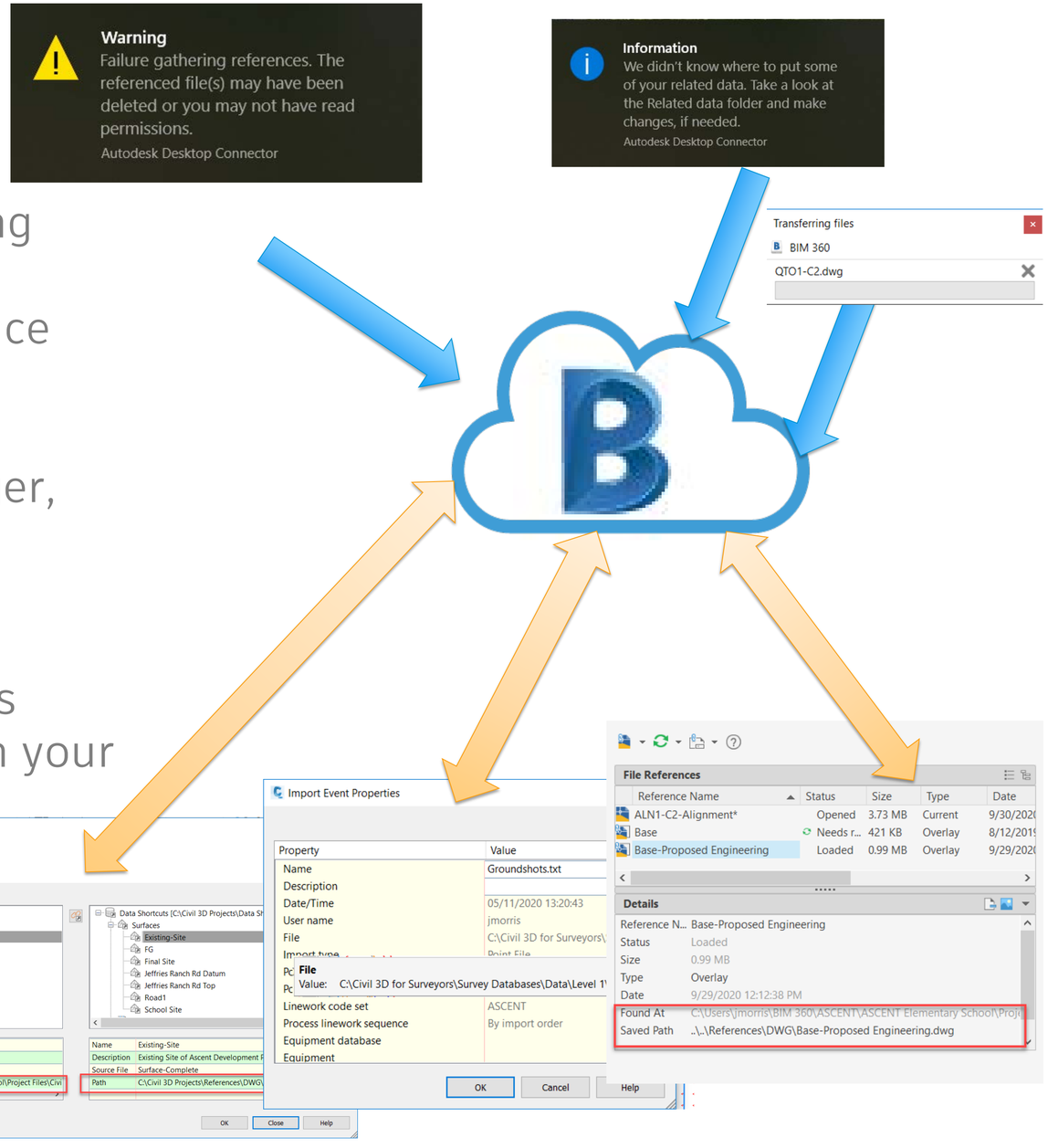


No easy way to setup existing Civil 3D Projects in BIM 360

Realistic Civil 3D Worksharing workflow:

- Often when projects are ready to be shared beyond the firewall, many references have already been created lying within the firewall.
- There are many workflows for transferring these reference files into the BIM 360 Project:
  - Manual workflows.
  - Existing AutoCAD and Civil 3D tools (Reference Manager, Data Shortcut Manager, Etransmit).
  - 3rd party “automated” processes.
  - Beta workflows

  Whichever way is used, you need to ensure the references within the drawing are properly mapped to objects within your BIM 360 project.



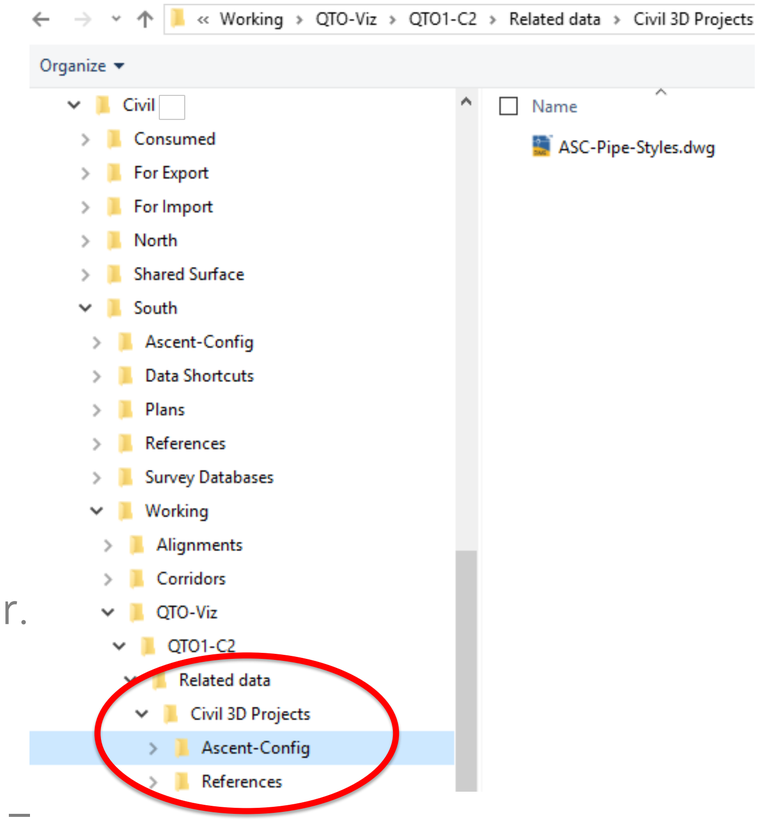
Civil 3D Projects in BIM 360

Presentation Civil 3D Worksharing workflow:
Existing drawings and links already uploaded to the cloud.
Verify pathing for:

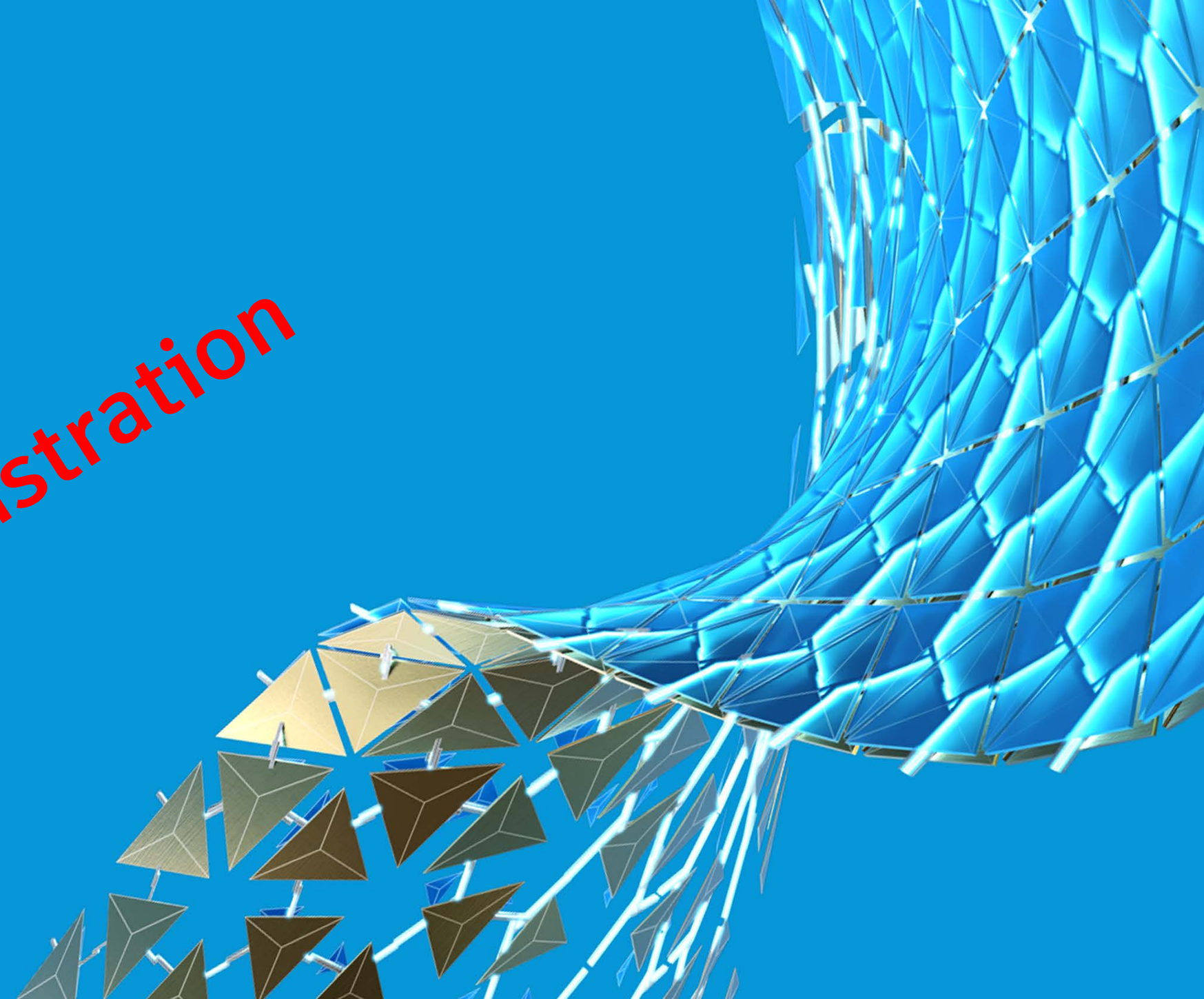
- External Reference Files (also check attachment type is “Overlay”).
- Data Shortcuts:
  - Working Folder
  - Current Project
  - Referenced Objects
- Survey Databases.
- Style References
  - Need to repath for it is referencing a ***Related data*** folder…

Attach (overlay) the Revit Building Footprint:

- CAD Manager has already verified contents of file in the “***For Imports***” folder.
- CAD Manager has copied the verified file into the “***For Imports\Published***” folder.
- Select the 2D building footprint file
- Rename the reference from “School-2D” to “School” (so we can swap the 2D – 3D files easily)



Demonstration



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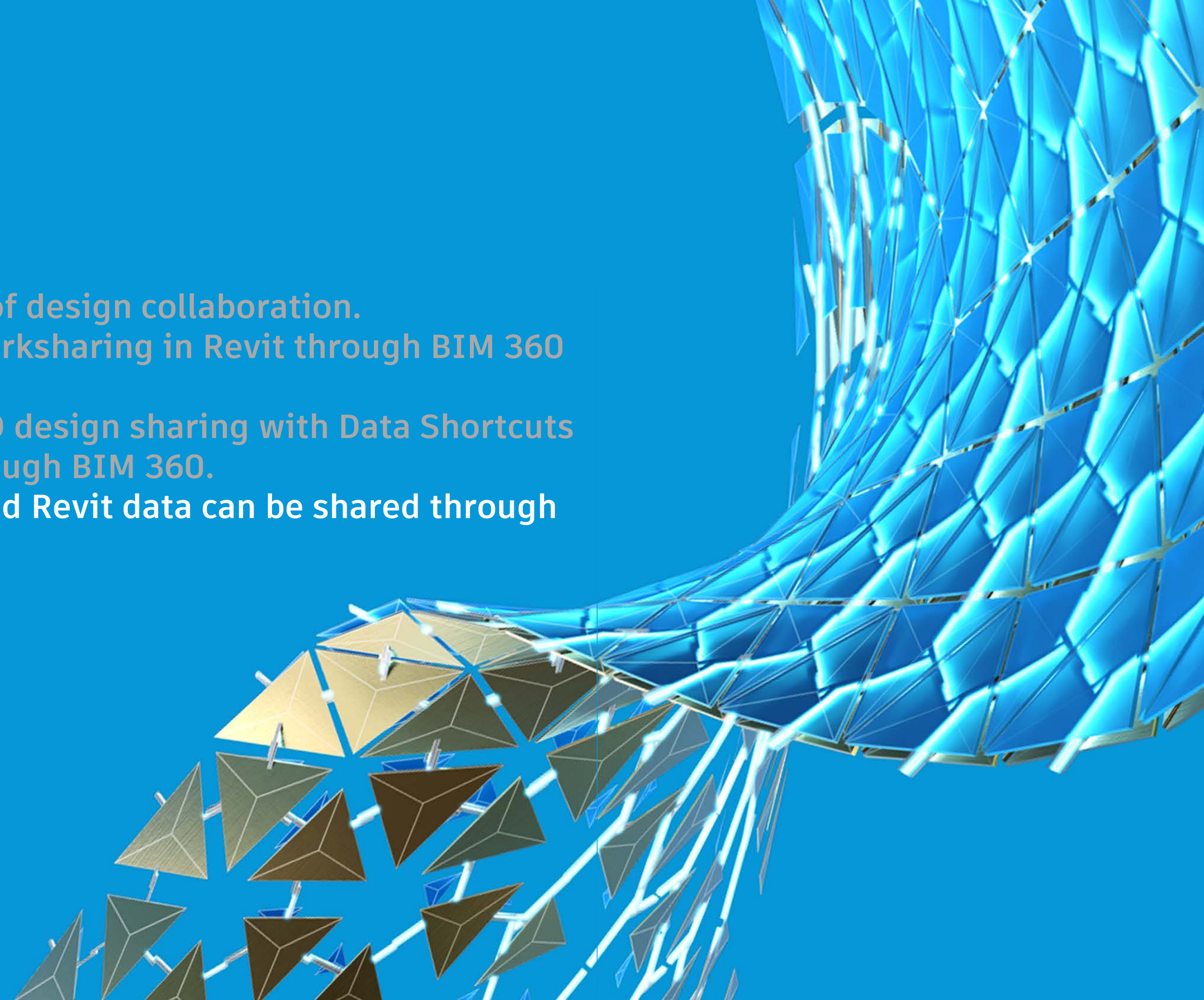
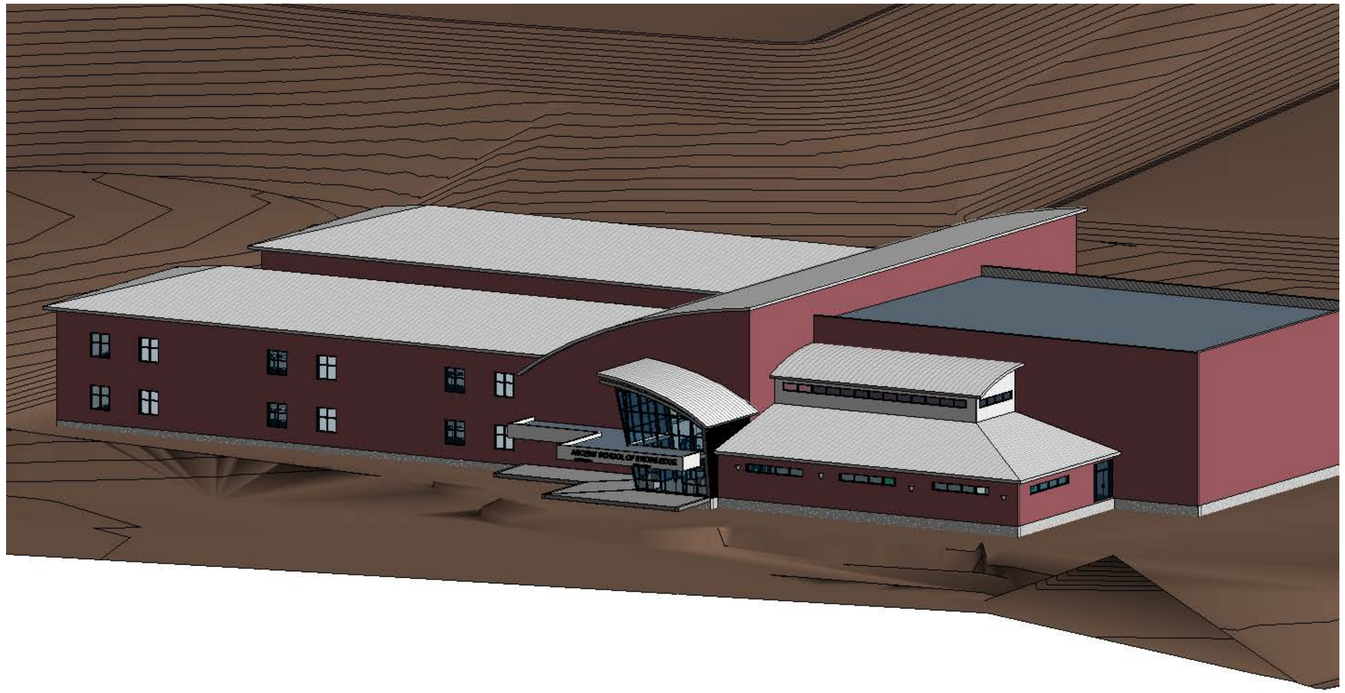
4. **Examine how Civil 3D and Revit data can be shared through BIM 360.**



Share surfaces between Civil 3D and Revit using Desktop Connector

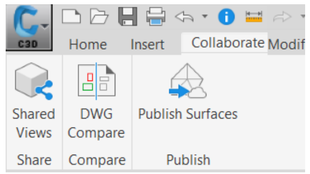


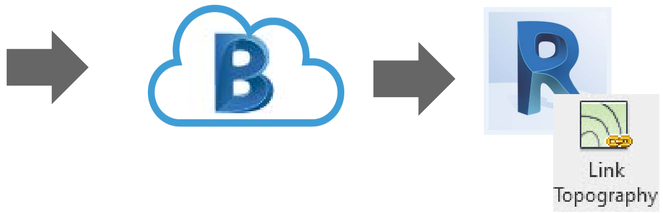
Once preliminary surface is established, it can be shared with Revit via the Desktop Connector.

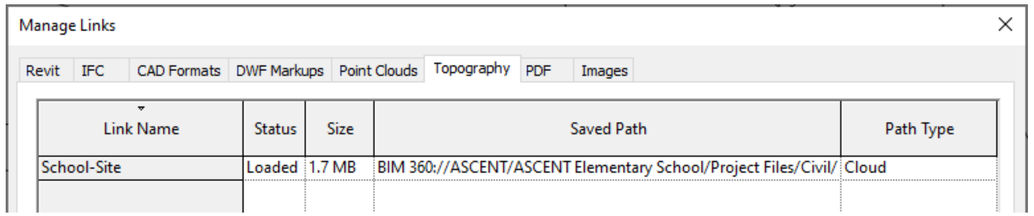
If there are multiple Revit Buildings, consider a separate surface for each building.

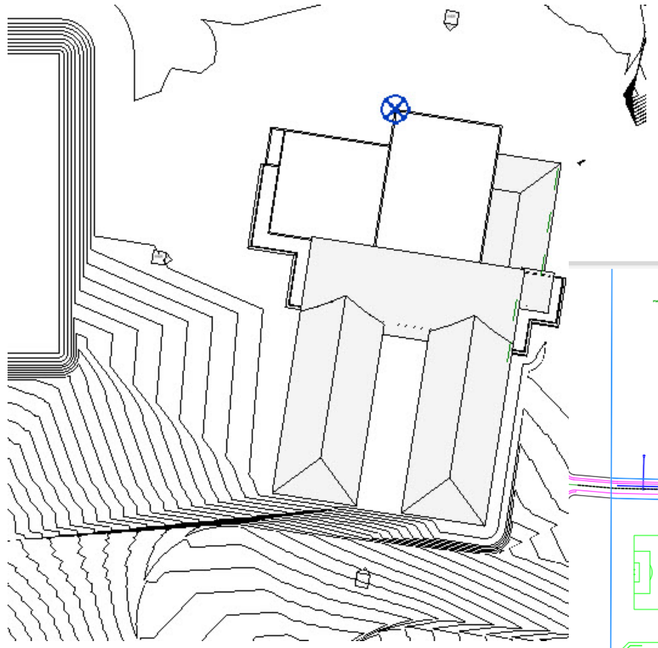
In Revit, link to the topography via BIM 360.

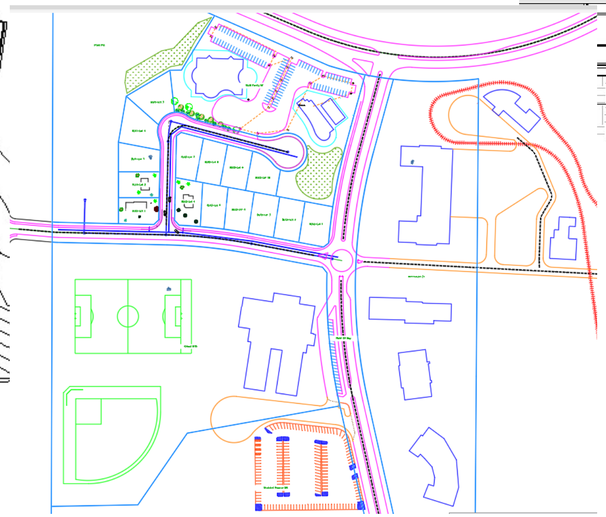
The topography link can be refreshed or re-pathed, like any other link in Revit.

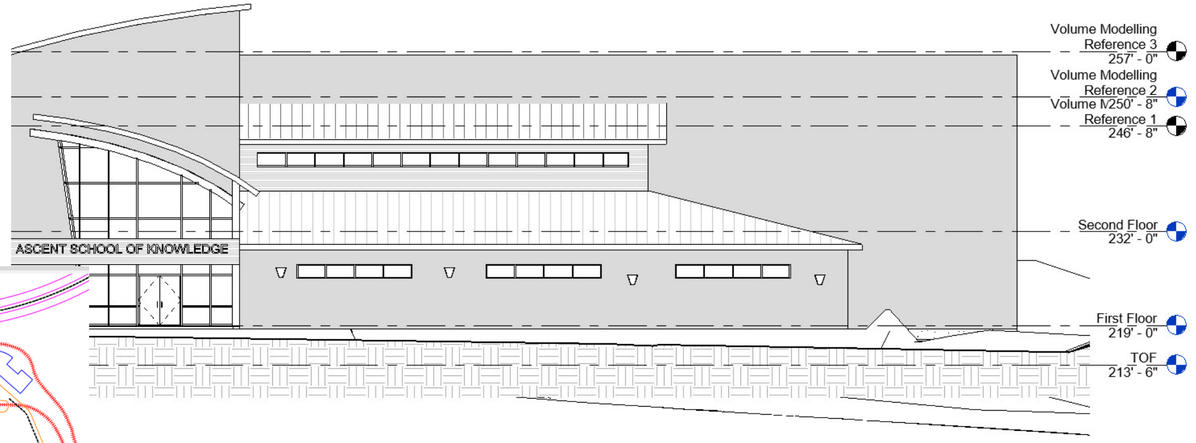












Revit

Linking Topography:

- Shared References, automatic placement
- Without Shared References need manual placement

Prepping for Civil 3D data in Revit:

- Project Base Point of buildings
- Coordinates and Elevations
- Shared Reference Point

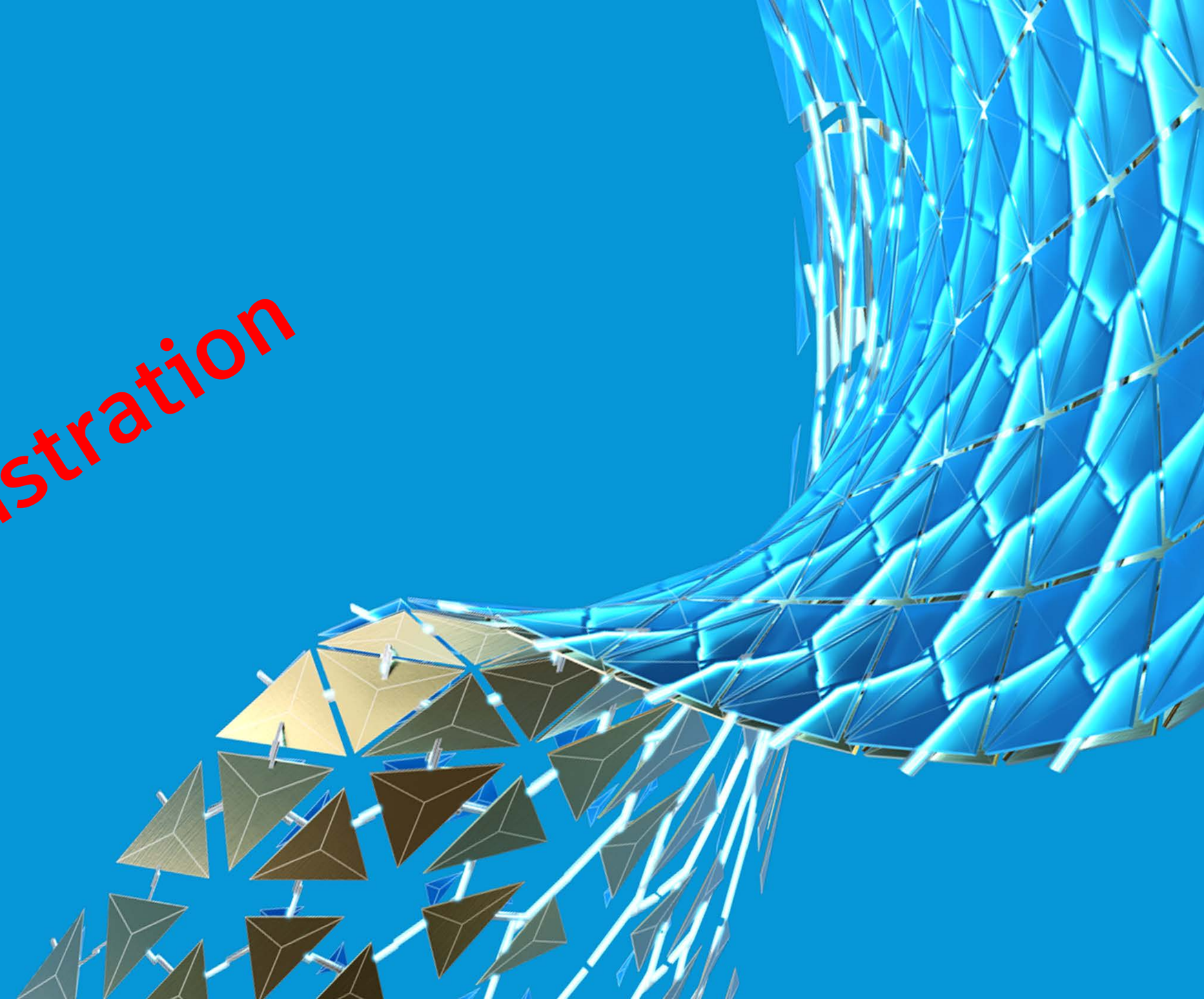
Other considerations:

- Duplicate views for True North
- Level markers, Survey or Project
- Spot and Elevation markers, Survey or Project

Linking CAD Site Drawing:

- Place via Shared Coordinates
- Ignore warning message

Demonstration



Review

Were the Learning Objectives met?

BIM 360 – Design Collaboration

- Understand the nature of design collaboration within BIM 360

Civil 3D

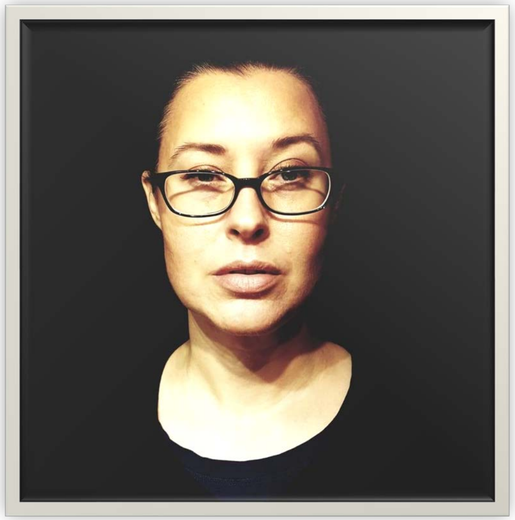
- Understand how Civil 3D design sharing with Data Shortcuts and Xrefs can occur through BIM 360

Revit – BIM 360 design

- Experience the cloud worksharing in Revit through BIM 360 Design

Civil 3D and Revit

- Examine how Civil 3D and Revit data can be shared through BIM 360



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