BIM 360 Design Workflow for Revit, Robot, and Advance Steel

Lina El-Khoury
Design Applications Manager

Joe Sam
IT Enterprise Architect, Engineering Platforms

Hung Nguyen
Technical Consultant

David Naylor
Senior Technical Specialist
Hung Nguyen has 26+ years of experience in Autodesk Products. He has a strong background in Architectural and Manufacturing fields. His is a BIM & Manufacturing Technical Consultant. Hung also has extensive experience in a diverse range of CAD-related software such as: Revit, Inventor, Fusion 360, Alias, and Simulation to name a few. He have presented multiple times at Revit Technology Conference (RTC), Canadian Festival of Architecture, CanBIM, and Autodesk University from 2013 to 2017.
David is the LPM and Senior Technical Specialist for Advance Steel supporting North American customers. He brings over a wealth of industry experience in structural engineering, from traditional steel, concrete, and timber design, to seismic design and spectral analysis working for over 13 years in California and 3 years in Canada. He has worked for Walt Disney Imagineering, Parsons, and PCL on projects worldwide.

BIM integration has been one of his focuses since working on Disney's Expedition Everest in 2004. He holds a Bachelor’s Degree in Architectural Engineering (BS ArcE) from Cal Poly State University in San Luis Obispo in 1995.
About the speakers

Lina El-Khoury

Lina El Khoury is the Design Applications Manager at James K.M. Cheng Architects in Vancouver BC. With over 25 years of experience in Architecture, Building Systems, Interior Architecture and Building Manufacturing, she now specializes in BIM technologies. She has been the National BIM Lead for GEVINAR (WSP) and worked at Perkins + Will locally and firm wide – always raising the bar for better BIM collaboration, deliverables and efficiency. Equipped with CAD knowledge and BIM expertise in multidisciplinary platforms, combined with 10 years of Building Manufacturing experience, Lina has trained and coached many teams in multiple design and subcontracting AEC firms. Her passion, dedication, contributions to the BIM development and implementation have been very valuable and appreciated by many firms which she’s worked.
Joe Sam

Joe Sam is the subject matter expert for collaboration solutions, and also leads Building Information Modelling (BIM) strategies for WSP Nationally which helps bridge the design conversation for design and facilities management (FM) through construction while capitalizing on the data-rich information for actual use in the facility lifecycle. Since joining WSP, Joe has been specializing in Building Information Modeling (BIM) implementation for architects, Structure and MEP (mechanical, electrical, and plumbing) engineers. In addition, Joe has been responsible for providing internal demonstrations, implementation, training, and support for AEC products for architects, engineers and leadership. Joe is passionate and highly engaged in the BIM industry. He is active participant and chaired local Revit user groups, and has spoken at various Construction associations and collages on the benefits of BIM.
Introduction

BIM 360 Design is Autodesk’s new AEC cloud brand & project delivery platform. The unified BIM 360 solution aggregates the data and provides transparency to project stakeholders making everyone more accountable and improving visibility in real time.

This delivery platform also tremendously helps the “tridirectionally” structural data exchange between Revit, Robot and Advance Steel.
Objectives

- BIM 360 Design - Best Practices (What we have learned)
- BIM 360 Design Test Drive by James KM Chen Architects
- Revit – RSA - Advance Steel – Dynamo Workflow Demo
- Q&A
BIM 360 NEXT GEN

BIM 360 Design

BIM 360 Glue

BIM 360 Build

BIM 360 Ops

BIM 360 Docs

BENEFITS "FASTER, MORE EFFICIENT REVIT COLLABORATION"

- Controlled work sharing across teams
- Reduce internal server and IT costs
- Coordinate with remote staff
- Real-time work with scalable project activity and file version history
- Realistic design reviews with stakeholders
- Streamline inclusion of takeoffs/estimates
- Access your project data anytime, anywhere

ANALYTICS & INSIGHT

PROJECT DATA

AUTODESK FORGE

HANDBOOK & OPERATIONS

FIELD EXECUTION

Constructability Coordination

Quality / Safety
Progress Tracking
Work Coordination

AUTHORING

Collaboration

Detailing

PRE-CONSTRUCTION

Clash Detection

Commissioning

Handover / Maintenance

DESIGN

AUTODESK FORGE
BENEFITS “FASTER, MORE EFFICIENT REVIT COLLABORATION”

- Controlled work-sharing across teams
- Reduce internal server and IT costs
- Coordination with remote staff
- Reduce re-work with trackable project activity and file version history
- Perform design review with stakeholders
- Streamlined inclusion of subconsultants
- Access your project data anytime, anywhere
Best Practices (What we have learned)

- PROJECT NAME
- MODEL PLACEHOLDER
- AUTODESK DESKTOP CONNECTOR (ADC)
- CAVEATS/CONCERN WITH ADC (AUTODESK DESKTOP CONNECTOR)
- MEMBERSHIP ROLES
- REMOVE THE BAD LINKING HABITS
- BIM 360 TEAM COMMUNICATOR (NOT SUPPORTED)
- WHERE HAS ALL MY HARD DRIVE SPACE GONE?
- DATA IN THE MODEL IS CORRUPT
- IS THE BIM 360 DOWN?
- BIM 360 DOCUMENT MANAGEMENT FOR INTERNAL TEAMS
BIM360 Project Names

• The issue I have always had with C4R and now with Design Collaboration is that you cannot access the project through Revit unless you are using the correct version of Revit.

• So if you need to do any model management though Revit (such as Publish, or Relinquish) or simply to open the model, you need to know the version of Revit to open first, because once a model is saved into the Collaboration service (Classic C4R or Design Collaboration) it is now only accessible by that version of Revit.

• This also causes issues with users trying to open the model though Revit, they tend to believe they are not invited to the project or they do not have the appropriate Entitlement because they cannot see the project though Revit when opening, simply because they are not in the right version of Revit.
BIM360 Project Names

- So, with that said, We include the Revit in the project name, in our case we use:


  189-0000-00 – ABC HOTEL – R18

- This way if someone needs to access the model, they immediately know the version to use (for opening the model or to do model management through Revit)

- Some other naming conventions we tend to use is also adding the version on the end of the model file as well XXX-R18, this helps enforce the version to use (when exporting out of BIM360, or when using the Autodesk Desktop Connector)
• As I mentioned above, the BIM360 project is only accessible by that version of Revit, BUT

• When you first create a BIM360 project, that project is in **VERSION LIMBO** until it is imprinted to a version of Revit, once a model is saved to the BIM360 project site, that project is then **imprinted** to that version of Revit and CANNOT be changed (you have to use the upgrade project through Revit, which is another topic for another day).

• Before a model is saved to that project, that limbo project runs the risk of someone saving the wrong version of Revit to that limbo project site, so if the project was intended to be a BIM360 Design Collaboration project for Revit 2018, but then a user saves a Revit 2019 model, that project is now imprinted for Revit 2019 model files (Oh No).

• So what we tend to do is create a BIM360 project (Example 999-99999 – ABC Hotel – R18), then before we invite anyone else to the Project site, we save a blank placeholder model for the intended version of Revit **PLACEHOLDER – R18.RVT**, this way there is no possibility of having the wrong version of Revit saved to the project and being imprinted incorrectly.

• This is a larger issue with Classic C4R as it can have Revit 2015-2018 projects, less of a concern right now with Design Collaboration (2018.3 – 2019), but will eventually be an issue as time goes on.
Autodesk Desktop Connector (ADC)

- The ADC has been a great addition to the BIM360 environment, it not only allows you to connect AutoCAD files that are located in BIM360 into your models, but also allows you to connect other Revit models that are not authored on BIM360 environment (Revit 2018 and higher), that are not Live models (more like static files)
- The issue with Classic C4R was for model collaboration to work, everyone needed to be all in, all consultants sharing their models on the cloud. That means they had to pay for that BIM360 Design Collaboration entitlement, and this is where a lot of consultants opted out (you had to do workarounds to have the consultant model in BIM 360)
- This is where the ADC can help with Revit 2018 and above, allowing consultants to add their models in a BIM360 ecosystem without having to pay for Design Collaboration Entitlement (and no workarounds), I believe they will still require BIM360 Document Management seats/licenses assigned to them in order to use the ADC
  - Document Management entitlement is considerably less costly then Design Collaboration entitlement
- **DID YOU KNOW:**
  - Did you know you can now Drag and Drop an Empty Folder structure into the ADC to create all your folders
Autodesk Desktop Connector (ADC)

CAVEATS/CONCERN WITH ADC

- The ADC is there to allow teams to drop a model there for others to link to (or simply access), this is more of an unmanaged model file (or static model, not a live model), it is not intended to save and work directly though the ADC.
- It’s not intended to work directly from the ADC and save back to it, if this is done (for Central or even non-workshared models) you will get the typical backup files created in your ADC area and in your BIM360 site (Ugly)
Autodesk Desktop Connector (ADC)

CAVEATS/CONCERN WITH ADC

• Something to be aware of with Models in ADC, if someone opens a model though the ADC, it will create the standard Central backup files (the ones that generally appear on Local servers) or the standard non-workshare backup files (Project1.0001.rvt)

• Sorry, there is no way to avoid the file bloating/backup issue.

• So, in a nutshell, never open a model directly from within the ADC, instead work on the model from within your own network (or workstation) and copy the updated model into the ADC or uploaded it to the BIM360 Project website.

• If you keep the file’s name the same, then the BIM360 versioning (V2, V3, V4…) will kick in as well.
**Membership Roles**

- When creating and adding Members, we have found that using just the companies (instead of Roles) allows for more permission flexibility than using Roles, simply because you can create your own company’s, but the Roles are fixed and we have found them to vague (Autodesk is working to change this in the near future to allow us role creation).

**ASSIGNING PERMISSIONS**

- Engineer? Is this the Structural Engineer, Mechanical Engineer, Electrical Engineer??

**NOTE:** if you are adding members that you would consider Regulars to BIM360 projects, consider adding them in at the Project Admin level first, this was you can assign the default Role or Default Company.
Remove the bad linking habits

- We have found this more with newer users to BIM360 Cloud Environment, linking in CAD and Revit models to your local LAN instead of placing the model/cad file on BIM360 and linking them to the cloud (ADC)
- This will generally not be a problem if all team members are working on a BIM360 project and happen to be in the same office (on the same LAN and have the same drive mapping)
Remove the bad linking habits

• **BUT** if you have others that need to work on this model and do not have the same drive mapping
  - OR
• They are on your network but are in a different office and all the above links need to be then pulled over the WAN
  - *Geez this BIM360 thing is really slow*
• Team members can have a bad experience working models with these lining habits.
• So, if your team is distributed and working on the same model, I suggest placing the model links in BIM360 and link to them from there, do the same for CAD files, and utilize the ADC for lining those files
BIM 360 Team Communicator (Not Supported)

Thought I would mention this because it had some nice features, the Communicator is no longer supported in Revit 2019 and above.
Where has all my hard drive space gone?

AH, THE BIG MYSTERY

• The other discovery we have had found working with Cloud Services, especially BIM360 Collaboration for Revit (Classic or Nextgen) is we are quickly running out of local hard drive space

• We (as an WSP standard) have moved to SSD hard drives for better efficiencies, but the tradeoff is the SSD are generally smaller, and when working with Collaboration for Revit, all files you work on (including linked models) need to be downloaded to your local C: drive.

• So if you are a team member that works on many projects and your model files are huge and has many linked files, you will start consuming local hard drive space FAST

• Not sure how we will deal with Point Clouds if they are stored in BIM360 (Cached)???

BEFORE YOU ASK

There is no way (easy way) of changing the location of where a local model file gets changes on your local c: drive

Note: here is a workaround on how to change the Reference to where cached files go

Where has all my hard drive space gone?

Location of Local Cached Revit files:

\%LOCALAPPDATA\%\Autodesk\Revit\Autodesk Revit ####\CollaborationCache

C:\Users\joe.sam\AppData\Local\Autodesk\Revit\Autodesk Revit 2018\CollaborationCache

NOTE: Older versions of C4R stored the PACCache in “ \PACCache “

RUNNING OUT OF SPACE

• You will need to peruse to your Local Collaboration Cache folder and start deleting folders/files, BUT

The files are all obfuscated, so you will not know what files or folders to delete (or related to what project)
Where has all my hard drive space gone?

• To figure what file/folder belongs to what BIM360 project, you will have a look put your detective hat on and look through your Journal files to discover this, someone does not want you messing with these files

• To figure what file/folder belongs to what BIM360 project, you will have a look put your detective hat on and look through your Journal files to discover this (someone does not want you messing with these files)

I have reached out to Autodesk to help manage this issue (its on their list) to either give us the ability to control where cached files go but I think this is a larger systemic issue and I think they need to supply an application to help us manage all cached cloud data for all the cloud services in general.
Where has all my hard drive space gone?

• In the meantime, we have developed our own application to help manage local BIM360 cached files.

**NOTE**

If you do decide to delete your cached models, the next time you open that BIM360 project, the models (and model links) will have to be re-cached, like the first time you opened the model.
Data in the model is Corrupt

• So, since we just finished talking about clearing cache, you will also need to clear your cache from time to time if you receive the Corrupted error message when opening or saving a BIM360 model.

• You will know this is the case when you talk with other team members that are working with the same workshared model and they DO NOT have the same issues, probably means the model (or a linked model) is corrupt.
Data in the model is Corrupt

- In this case delete that cache and try re-opening, 90% of the time this does the trick, otherwise you will need to access your Versions though the Manage Cloud Model though Revit
Recover the model

- if the central model is corrupt and there is no saving it, you can consider restoring from BIM360 Backups (in Revit > Collaborate > Manage Cloud Models)
Recover the model

- Also, if you publish your models frequently, you could also download a copy from the BIM360 Docs and see if it's corrupt (if it's not can make that the new central)
Service is down

- If you do receive a message like this, this generally means that the BIM360 service (BIM 360 Document Management, or BIM 360 Design Collaboration is down)

- If you are a BIM Manager for a large firm and you are the goto person, do yourself a favor and have all your BIM360 users signup for the Health Dashboard notification so you don’t get the 100 of emails asking if the service is down, and if its back up

- [https://health.autodesk.com/](https://health.autodesk.com/)
BIM 360 Document Management for Internal Teams

- We have been using BIM 360 Docs for design collaboration without the BIM 360 Design Collaboration module turned on.
- We do this for internal teams on BIM 360 projects.
- So for instance if we need to design collaborate with WSP Structure, WSP Mechanical, WSP Electrical teams on a BIM 360 project, we will create a BIM 360 Document Management project alone with no other modules.
- This allows us the ease of setup and administration for a design team, this is a very similar setup of what we had in classic C4R Team projects, BUT with the addition of Managed Access (where Classic C4R/BIM360 Team is a High Trust access).
  - So you can control the other internal teams to only have view access (they can’t open your model or cannot access the model through ‘Manage Cloud Models’ in Revit).
- With this workflow only using just the Document Management module, gives us Live linking, again what we had when using classic C4R.
  - Live linking: There is no need to publish models through Revit (Manage Cloud Models).
    - You would publish if you want to show that version of your model on the Docs site.
- For internal teams, they don’t need to create package and consume packages and they would not be adding in external consultants that want to do that as well.
- You still have to have BIM 360 Design entitlement for each user by the way.
Our Firm

James K.M. Cheng Architects is a collaborative architecture & urban design practice that prides itself on creating meaningful and dynamic built environments. Based in Vancouver, Canada, our firm is recognized for its pioneering contribution to west coast architecture and city building. Founded by James Cheng in 1978, our 30-person practice has grown to specialize in a variety of scales, with a strong emphasis on the integration of Urban Design, Landscape Design, Architectural Design, and Interior Design. This ensures projects are carried out comprehensively from start to finish, and from exterior to interior.
BIM 360 Design Test Drive

BIM 360 Design Test Drive

- Why were we interested in a Test Drive?
- How do we like/dislike BIM 360 Design? And why?
BIM 360 Design Test Drive

- Will we use BIM 360 Design in our firm?
- Why did we want to see BIM 360 Workflow for Structure Engineering and Detailing?
DEMO FEATURES

A QUICK OVERVIEW OF REVIT – ROBOT – ADVANCE STEEL – DYNAMO – BIM 360 DESIGN

- LINKS REVIT STRUCTURE MODEL TO RSA AND AVANCE STEEL
- REGIONAL CODE CHECK & OPTIMIZATION WITH ROBOT STRUCTURE ANALYSIS
- ADVANCE STEEL FOR CONNECTION DESIGN & DETAILING
- DYNAMO USAGE
- BIM 360 DESIGN PLATFORM - *SINGLE SOURCE OF TRUTH*
RECOMMENDED PAST AND CURRENT AU SESSIONS

FOR MORE IN-DEPTH RSA, ADVANCE STEEL, BIM 360 DESIGN, CHECK OUT THESE SESSIONS:

- Integration Robot Structural Analysis Professional with Advance Steel AU 2015 – By Artur Kosakowski
- Producing Accurate Fabrication Documents for Miscellaneous Steel Using Advance Steel (2014) – By David Naylor
- Up and Running with Advance Steel – By Deepak Maini
- BES219753-L - More Dynamo for Structure – By Marcello Sgambelluri - Masha Pekurovsky - John Pierson - Mercedes Carriquiry
- ENR227371 - Owner Feedback in the Clouds – By Patrick Flora
EXPERT HELP IS HERE

Get help for training, software development, customization, and more.

SolidCAD is an approved provider on the Autodesk Services Marketplace

servicesmarketplace.autodesk.com/provider/public/solidcad
The Services Marketplace team will be headquartered at the Answer Bar in the exhibit hall throughout AU.