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## **Lesson Learned While Uploading Data to BIM 360 Ops**

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### **Learning Objectives**

- Understand the process of uploading information to BIM 360 Ops directly from Revit
- Understand the process of uploading information to BIM 360 through a combination of BIM 360 Glue and BIM 360 Field
- Understand the process for the Revit FM model maintenance
- Learn how to identify a software workflow that will best work with your organization

### **Description**

This class will cover two separate workflows for uploading data to BIM 360 Ops software. Attendees will get an in-depth look at the process UCHealth employed to upload data to BIM 360 Ops directly from Revit software for the Greeley hospital project, and through BIM 360 Glue software and BIM 360 Field software for the Highlands Ranch Hospital project. As the title of this session indicates, we will share lessons learned. Attendees will get an overview of the team structure and data flow, as well as a deeper dive into how to overcome the challenges the UCHealth team encountered, such as parameter concatenation, data revision, and uploading of information changes. This course will be a combination of Microsoft PowerPoint and live demonstration, and will include Revit, BIM 360 Ops, Dynamo, BIM 360 Glue, and BIM 360 Field.

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## Speakers

### Michael B. DuLaney

Mike is the BIM Manager for UCHealth – A ten hospital healthcare provider ranked among the top 15 hospitals in the nation by U.S. News & World Report that includes the University of Colorado Hospital. When he joined UCHealth he was tasked with “Do something with all these models.” Mike is implementing BIM 360 Ops and Archibus relying on the Revit models. Prior to joining UCHealth Mike was VDC Manager for a major building company and one of his projects won the AGC Washington, D.C. chapter “Best use of BIM Projects Greater than \$150M” (it was \$940M) with a congressionally mandated end date.

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### William Carney

William Carney is the BIM director at BSA LifeStructures where he is responsible for overseeing the firm’s use and implementation of design related technology solutions. As an efficiency enthusiast, William seeks to find ways to use technology to streamline BSA LifeStructures multi-disciplined BIM Playground. He is also an Adjunct Professor at Washington University, an Author for LinkedIn Learning/Lynda.com, is actively involved with the St. Louis Revit User Group as one of its steering committee members, and a site moderator for the LinkedIn group “Revit Users”.

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### Bryan Fairchild

Bryan is a 13 year BIM/VDC industry veteran who specializes in managing large scale building system coordination. Recent projects include the 2 million square foot Gaylord Rockies Hotel & Convention Center and the 758,000 square foot Westin Hotel & Transit Center at Denver International Airport. Bryan has a master’s degree in architecture & community design from the University of South Florida.



## Overview

Uploading models and data to BIM 360 Ops can be done via a direct export from Revit using Revit MEP models or via a workflow using subcontractor models exported through BIM 360 Glue to BIM 360 Field to BIM 360 Ops. With the two workflows there are some commonalities. Plan to add QR codes prior to ceiling grid installation or, at the latest, ceiling close-in. This means the models need to be updated in advance of these activities. Meet with the facilities maintenance personnel to discuss equipment naming, data to be collected, where to place the QR code, and what documents to include (O&Ms, submittals, cut sheets). Plan for changes. The owner may make late changes – how will these impact the BIM 360 Ops processes?

## Understand the process of uploading information to BIM 360 Ops directly from Revit.

Prior to using BIM 360 Ops the user must consider the mobile devices that will be used by facilities end users. BIM 360 Ops is formatted for the iPhone and it can be downloaded from the Apple iTunes site: <https://itunes.apple.com/us/app/autodesk-building-ops/id941471006?mt=8>

Unofficially, BIM 360 Ops can be ran in Web mode on an iPad using Safari. The iOS must 10 or higher.

## Exporting the Model and Data from Revit to BIM 360 Ops

Models can be exported directly to BIM 360 Ops from Revit. However, planning must take place concerning the data to be uploaded, the QR coding process, and the construction schedule. For example:

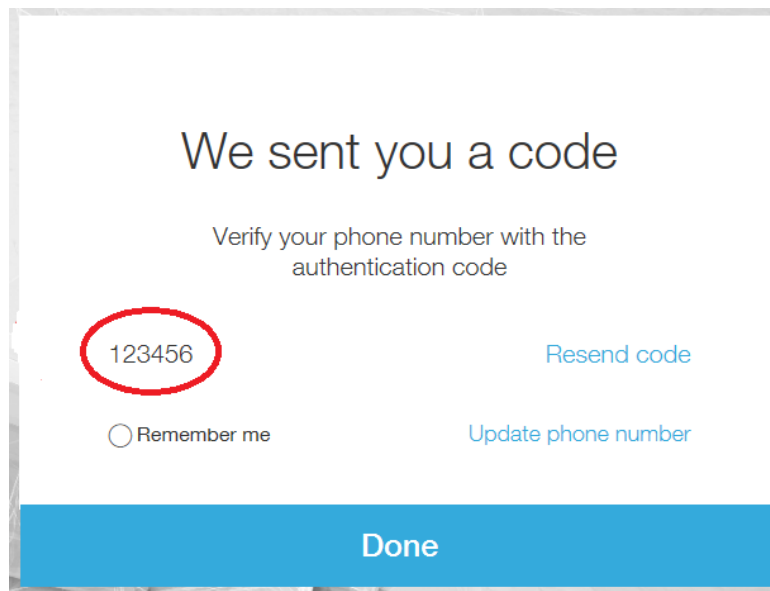
- Is the construction phased?
- When will the ceiling be enclosed?
- Who is adding and scanning the QR codes and collecting the data?
- How will changes be handled?

Exporting the model and data from Revit to BIM 360 Ops consists of the following steps:

Assuming the building information has been created and added to a portfolio in BIM 360 Ops the user shall login to BIM 360 Ops at the following link:

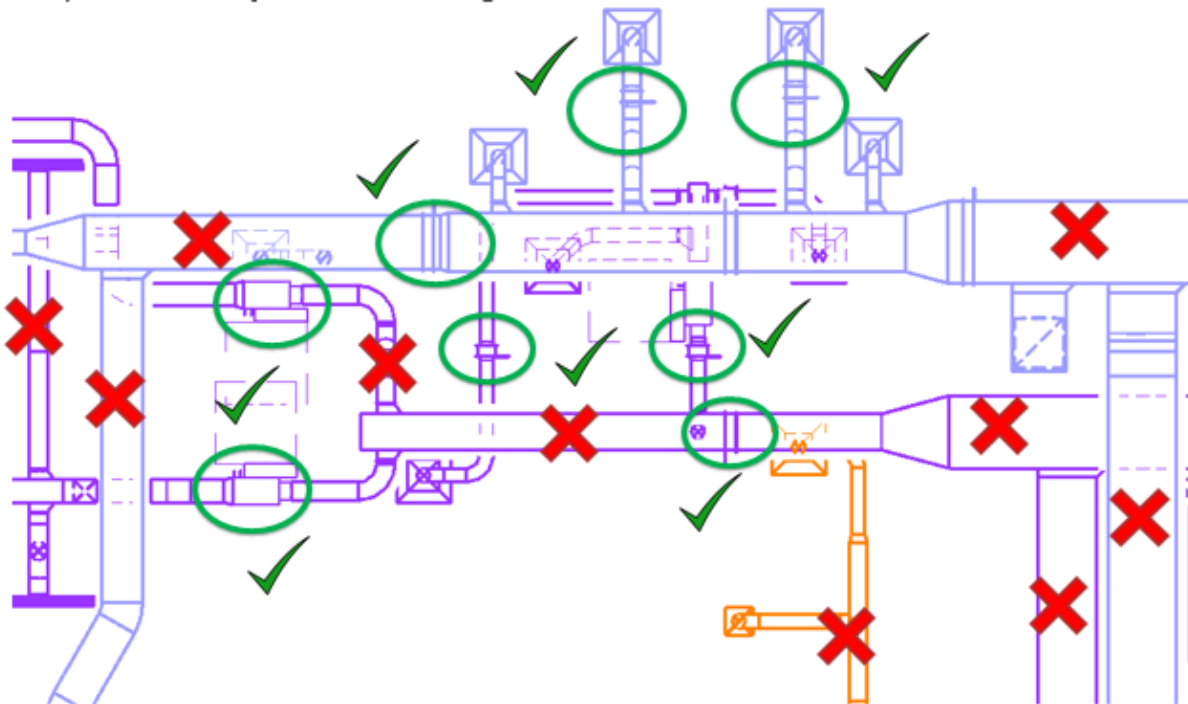
<https://ops.bim360ops.com/welcome>

The user shall enter their e-mail and BIM 360 Ops will send a text with the authentication code to access BIM 360 Ops



*NOTIFICATION BIM 360 OPS*

Once in BIM 360 Ops the user shall go to the Building page and click Generate the Export code. Copy the export code. With the Revit model open select the assets to be exported.



*SELECTING ASSETS FOR EXPORT*

**LESSON LEARNED** – Select only the assets that require maintenance! For example, select air terminal (AT) devices, fans, unit heaters, etc. Do not select assets that do not require maintenance such as duct, pipes, cable trays, etc. as these will export with data to BIM 360 Ops and clutter BIM 360 Ops.

Click Add-Ins and Export BIM 360 Ops.



The selected assets will now export to BIM 360 Ops.

**LESSON LEARNED** – Linked models do not export! That means if the user desires the architectural background to be exported it must be part of the model being exported. In the above example the mechanical assets were exported. If the architectural model is an external reference (XREF) it will not export. The architectural model must be inserted or bound in the model.

*Tip – Copy the architectural model and remove all unnecessary views and families. Keep stairs, walls, floors, doors, windows, etc. (anything that may help the technician reference the location of an asset)*

**LESSON LEARNED** – Consider combining the mechanical, electrical, plumbing, fire protection, models, etc. into one export file with the architectural model and export the assets.

**LESSON LEARNED** – If too many assets are exported from Revit to BIM 360 Ops the export may fail. Consider exporting groups of the same type of asset. For example, export air terminal devices, then export dampers, then export pumps

### Exporting the Custom Revit Parameters in the Model from Revit to BIM 360 Ops

Custom parameters can be exported to BIM 360 Ops and they will show as fields BIM 360 Ops. However, the custom parameters must be in one of the following Parameter Categories:

- Mechanical
- Mechanical – Flow
- Mechanical – Loads
- Electrical – Loads
- Plumbing

**LESSON LEARNED** – Custom parameters do not export to BIM 360 Ops *unless* sample data is included in the parameter. Consider adding a character like a dash (“-”) so the parameter will export to BIM 360 Ops.

Decide where the data will be entered. Will it be entered in the field directly into BIM 360 Ops? If so consider if your project has WiFi access at the site.

**LESSON LEARNED** – Consider purchasing a mobile WiFi device to extend WiFi to your site work area.

**LESSON LEARNED** – QR and barcoding. Make sure QR codes or barcodes do not start with leading zeros. If the data is exported to a CSV file the QR code or barcode field becomes a number field in the export and the leading zeros disappear. That means if the QR code or barcode is reimported into BIM 360 Ops the zeros will be gone. For example – a QR code entered as “0001” becomes “1” in the CSV file. If the file is reimported the QR code in BIM 360 Ops does not match the one on the asset.

*Tip* – when reimporting the CSV file omit the QR code or barcode column. If the column is omitted it will not change the data already in BIM 360 Ops.

## Exporting to CSV

Click assets:



*ACCESSING ASSETS FOR EXPORT TO CSV*

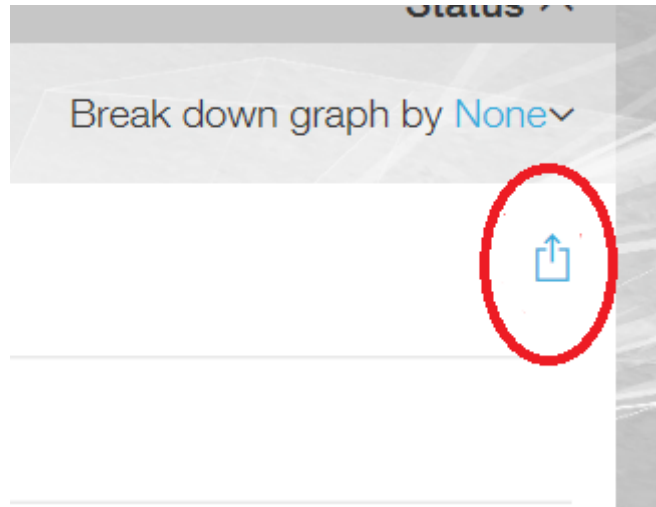
Click Graph:



*ASSET EXPORTING TO CSV IS IN THE GRAPH COMMAND*

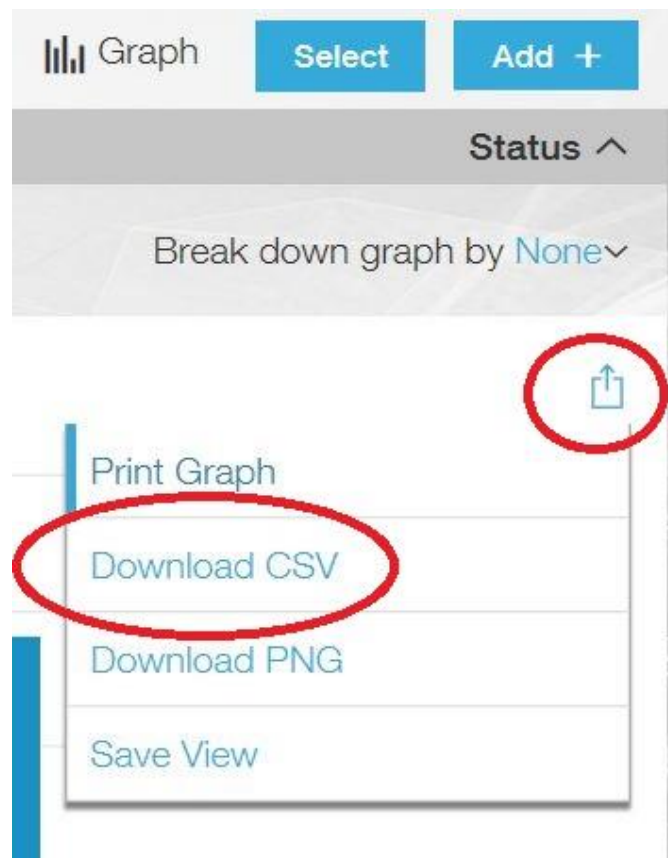


Click Share Graph:



*THE ICON OPENS THE SHARE GRAPH FUNCTION SELECTIONS*

Click download CSV:



*GRAPH OPTIONS*

The following image is from an export of the assets from the Greeley Hospital:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Building	Asset ID	Asset Description	Asset Category	Asset Status	Barcode	Floor	Room Number	Manufacturer	Model	Serial Number	Installed By	Installation	Warranty Expiration	Comments
GREELEY MEDICAL CENTER	AGM-00001	A-Single Duct AT 5-16 - With Reheat Coil: 12" GMC-AT-1.L830	mechanical equipment	Commissioned		15 01- FIRST FLOOR		TITUS		1344668-003-001				
GREELEY MEDICAL CENTER	AGM-00002	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.972	mechanical equipment	Commissioned		7 01- FIRST FLOOR		TITUS		1344668-017-001				
GREELEY MEDICAL CENTER	AGM-00003	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.909	mechanical equipment	Commissioned		22 01- FIRST FLOOR		TITUS		1344668-022-001				
GREELEY MEDICAL CENTER	AGM-00004	A-Single Duct AT 5-16 - With Reheat Coil: 14" GMC-AT-1.L900	mechanical equipment	Commissioned		9 01- FIRST FLOOR		TITUS		1344668-026-001				
GREELEY MEDICAL CENTER	AGM-00005	A-Fire Damper - 1.5 Hour Rated - Rectangular: A-Fire Damper	duct accessories	Commissioned		1474 01- FIRST FLOOR		TITUS		1344668-015-001				
GREELEY MEDICAL CENTER	AGM-00006	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.934	mechanical equipment	Commissioned		3 01- FIRST FLOOR		TITUS		1344668-023-001				
GREELEY MEDICAL CENTER	AGM-00007	A-Single Duct AT 5-16 - With Reheat Coil: 10" GMC-AT-1.908	mechanical equipment	Commissioned		25 01- FIRST FLOOR		TITUS		1344668-016-001				
GREELEY MEDICAL CENTER	AGM-00008	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.960	mechanical equipment	Commissioned		5 01- FIRST FLOOR		Price Industries	FFU-HC					
GREELEY MEDICAL CENTER	AGM-00009	Critical_Environment-FFU_HC-Round_Inlet-Price_Industries	mechanical equipment	Commissioned				Price Industries	FFU-HC					
GREELEY MEDICAL CENTER	AGM-00010	Critical_Environment-FFU_HC-Round_Inlet-Price_Industries	mechanical equipment	Commissioned				Price Industries	FFU-HC					
GREELEY MEDICAL CENTER	AGM-00011	A-Single Duct AT 5-16 - With Reheat Coil: 14" GMC-AT-1.950	mechanical equipment	Commissioned		4 01- FIRST FLOOR		TITUS		1344668-034-001				
GREELEY MEDICAL CENTER	AGM-00012	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.907	mechanical equipment	Commissioned		659 01- FIRST FLOOR		TITUS		1344668-021-001				
GREELEY MEDICAL CENTER	AGM-00013	A-Fire Damper - 1.5 Hour Rated - Rectangular: A-Fire Damper	duct accessories	Commissioned		1323 01- FIRST FLOOR								

CSV EXPORT FROM BIM 360 OPS

**LESSON LEARNED** - The Asset ID is auto-generated by BIM 360 Ops (in yellow):

A	B	C
Building	Asset ID	Asset Description
GREELEY MEDICAL CENTER	AGM-00001	A-Single Duct AT 5-16 - With Reheat Coil: 12" GMC-AT-1.L830
GREELEY MEDICAL CENTER	AGM-00002	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.972
GREELEY MEDICAL CENTER	AGM-00003	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.909
GREELEY MEDICAL CENTER	AGM-00004	A-Single Duct AT 5-16 - With Reheat Coil: 14" GMC-AT-1.L900
GREELEY MEDICAL CENTER	AGM-00005	A-Fire Damper - 1.5 Hour Rated - Rectangular: A-Fire Damper
GREELEY MEDICAL CENTER	AGM-00006	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.934
GREELEY MEDICAL CENTER	AGM-00007	A-Single Duct AT 5-16 - With Reheat Coil: 10" GMC-AT-1.908
GREELEY MEDICAL CENTER	AGM-00008	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.960
GREELEY MEDICAL CENTER	AGM-00009	Critical_Environment-FFU_HC-Round_Inlet-Price_Industries
GREELEY MEDICAL CENTER	AGM-00010	Critical_Environment-FFU_HC-Round_Inlet-Price_Industries

AUTO-GENERATED ASSET ID

The Asset ID can be edited but it cannot be pre-set or formatted to generate per the user's requirements.

**LESSON LEARNED** – BIM 360 Ops concatenates the Mark with the Asset Description:

A	B	C
Building	Asset ID	Asset Description
GREELEY MEDICAL CENTER	AGM-00001	A-Single Duct AT 5-16 - With Reheat Coil: 12" GMC-AT-1.L830
GREELEY MEDICAL CENTER	AGM-00002	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.972
GREELEY MEDICAL CENTER	AGM-00003	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.909
GREELEY MEDICAL CENTER	AGM-00004	A-Single Duct AT 5-16 - With Reheat Coil: 14" GMC-AT-1.L900
GREELEY MEDICAL CENTER	AGM-00005	A-Fire Damper - 1.5 Hour Rated - Rectangular: A-Fire Damper
GREELEY MEDICAL CENTER	AGM-00006	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.934
GREELEY MEDICAL CENTER	AGM-00007	A-Single Duct AT 5-16 - With Reheat Coil: 10" GMC-AT-1.908
GREELEY MEDICAL CENTER	AGM-00008	A-Single Duct AT 5-16 - With Reheat Coil: 08" GMC-AT-1.960

ASSET DESCRIPTION AND MARK CONCATENATION

**LESSON LEARNED –** The custom Revit parameters do not export from BIM 360 Ops

*Tip - Decide if the custom parameters should be added to Revit or added as custom fields to the CSV file (must be added to the right after the Comments field). If the custom parameters are not added in Revit the data will reside in the custom fields from the CSV file.*

*Tip – The custom fields in the CSV file can be exported back to Revit with the data. Then, the data can be exported to BIM 360 Ops. Advantage – the data resides in both Revit and BIM 360 Ops. A Dynamo script can be used to do this.*

**LESSON LEARNED –** SUBSEQUENT UPLOADS FROM REVIT CAN OVERWRITE THE DATA ENTERED IN BIM 360 Ops!!! Be careful, the custom parameters that have the place holder data (such as dashes “-”) can overwrite the data that has been entered in BIM 360 Ops for that custom parameter. For example, a custom parameter named Phase was exported to BIM 360 Ops with a “-” place holder. The BIM 360 Ops user records that Phase as “3” in BIM 360 Ops. If the Revit model is exported again the “-” in the Revit parameter will overwrite the “3” data in BIM 360 Ops.

*Tip – Store the custom data in Revit.*

## Importing the CSV file

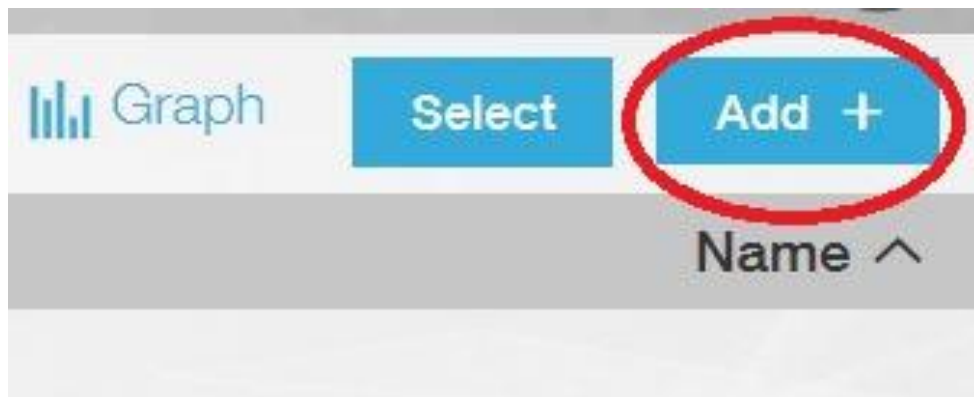
The following are the steps to import the CSV file:

Click assets:



ACCESSING ASSETS FOR EXPORT TO CSV

Click Add +:



*ACCESSING THE CSV IMPORT COMMAND*

Click Import from CSV:



*IMPORTING THE CSV FILE*

Select the CSV file and Open.

*Tip – BIM 360 Ops will not import a field (column) from the CSV file if a value is not present.*

## Understand the development process for the Revit FM model and understand Dynamo scripting to help automate BIM data for uploading to BIM 360 Ops

### Flow of Information

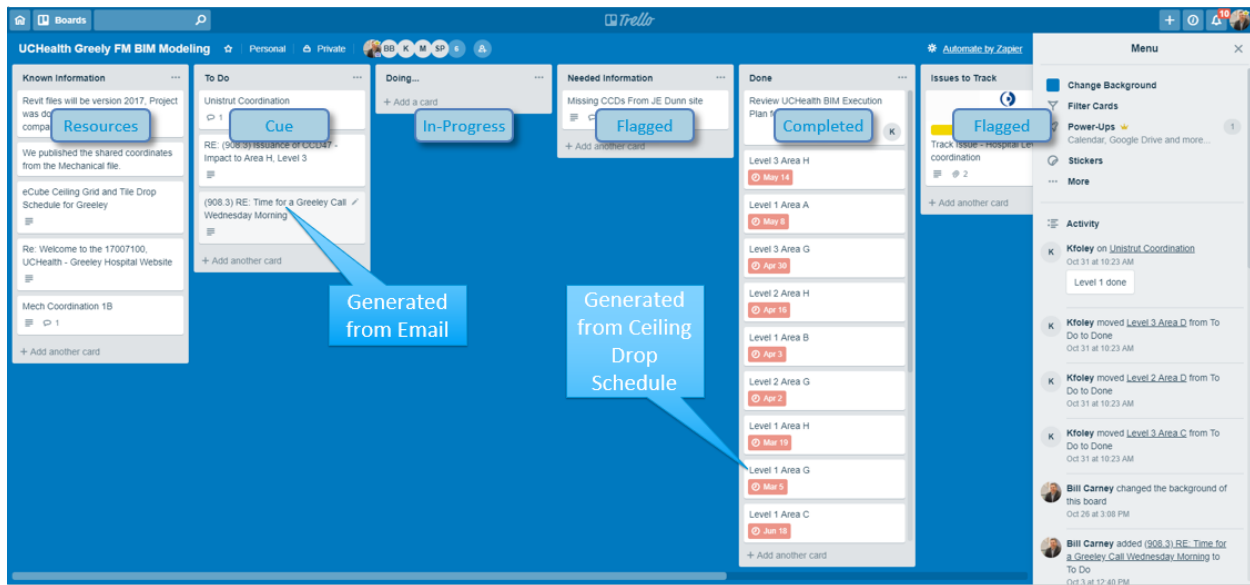
We decided to maintain the FM Revit Model separate from the contractor models and the design team models for a number of reasons. Because of this, our flow of information has BSA LifeStructures as a middle man between document uploads to the contractor site and uploads into BIM 360 ops. To avoid being called a middle man, we'll go with data managers on the project. To specifically map out how data flows on our project, design changes are uploaded to the JE Dunn Construction site where JE Dunn reviews and distributes to the appropriate people. Fabrication drawings are uploaded as well as contractor mark-ups. BSA LifeStructures, receives notification of these drawings and downloads and reviews the drawings. To help target changes, BSA LifeStructures uses a number of tools to help identify what needs to be updated. For PDF drawings.

Document Type Comparisons		
PDF	Drawing Overlay	<a href="http://www.hagenbusiness.com/bluebeam-tips-compare-documents-overlay-pages/">http://www.hagenbusiness.com/bluebeam-tips-compare-documents-overlay-pages/</a>
Revit	Model Compare	<a href="http://revitaddons.blogspot.com/2017/01/metamorphosis-free-and-open-source.html">http://revitaddons.blogspot.com/2017/01/metamorphosis-free-and-open-source.html</a> , <a href="https://youtu.be/uUcwH8GvIDY">https://youtu.be/uUcwH8GvIDY</a>
3D Model	Reverse Clash Detection	Haven't had to do this one yet but the Geometry does not intersect node in Dynamo can show what does not intersect between differing geometry types.

### Task Management

Just like shop drawings, redlines, and fabrication models seem to come in bunches. We also have the challenge of needing to QR code areas before they are completed. BSA LifeStructures used Trello to manage tasks within the team. This allowed us to quickly send emails to the board as tasks, or automate tasks from notifications using Microsoft Flow. We used the ceilings as a deadline for when to have an area completed. Working with ECube, the team determined that a week before the ceiling tiles was a sufficient deadline to have a modeled area available for data entry in Ops. JE Dunn provided a schedule of ceiling tile drop deadlines by building and area that we used to create tasks in Trello to keep the team on pace.





SCREENSHOT FROM TEAM TRELLO BOARD

## Process and Review Models

Graphically seeing changes is a lot easier than reading and finding them. We try to use whatever digital tool we have to help identify what is different between what is constructed and what modeled in the FM model. The type of file that is provided dictates the method of comparison.



When a document is provided that we have a previous document, comparison tools are very helpful. For Revit, model compare, or morphoses are two great tools to compare one document

to another. If the documents are PDF, Adobe and Bluebeam both have a document comparison feature. BSA LifeStructures uses Bluebeam as its primary PDF software and the overlay feature of Bluebeam quickly identifies what is different between two documents.

We have not run into this on our project yet but often the provided file types are not the same. This is when you have to get creative. Our plan is to use Dynamo to compare the geometry of one file to another through the geometry does not intersect can provide the geometry that is not intersecting. This is imperfect but a good starting point to gauge the differences between geometry of differing file types. This is much like clashing a point cloud against a Revit model in Navisworks.

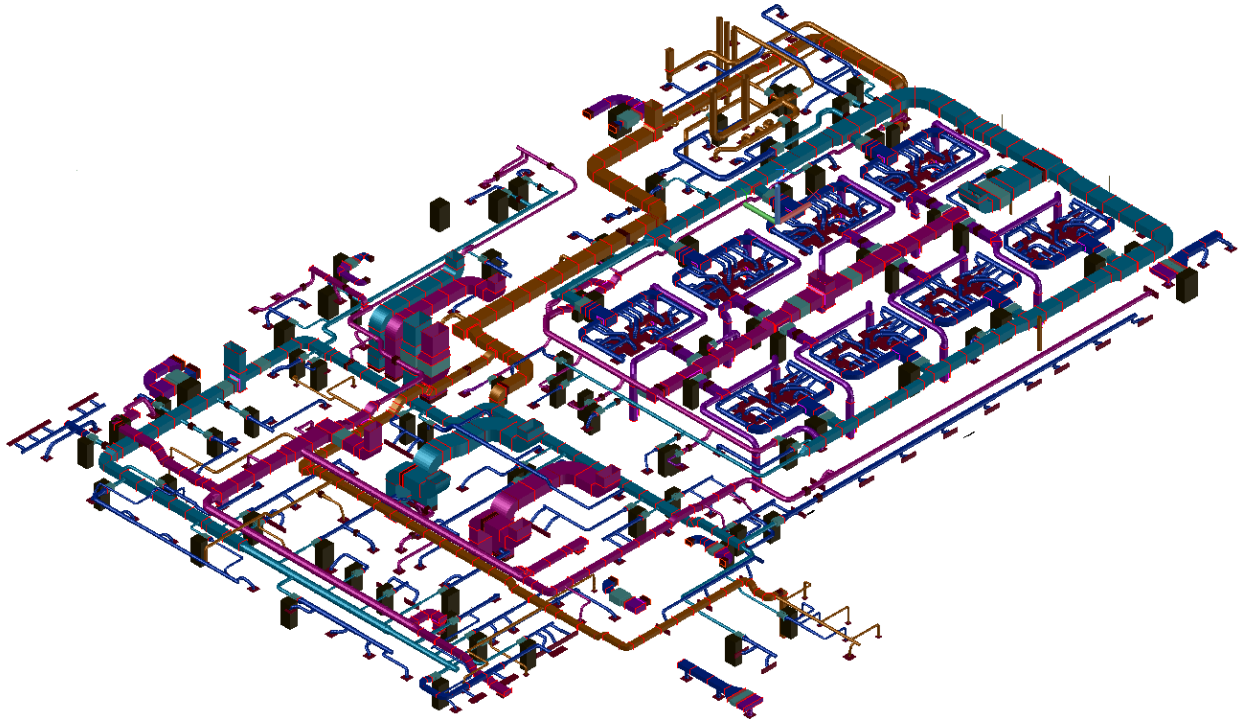
### Update Revit Model

Once we've reviewed our content, we updated the Revit model to match whatever changes we have received. How we do this varies by what we've received. The goal is to do the least amount of work to update the Revit model. This means we use rules of thumb to guide the decision making for the process of updating the Revit model based on what types of changes we have received.

Update Scenarios	
Fabrication Model	Align FM model content with fabrication model.
Small Design Change	Align FM model content with design changes provided
Large Design Change	Model Group and replace FM model content with New Model Content.
Non-Matching or Non- Modeled Content	Replace or remove content in FM model if needed. Model item to match provided content

### Fabrication Models

Fabrication models tend to have more detail than we're actually looking for so we have been referencing them to update the design intent model content in the FM model for the most part. There are some cases where we use the fabrication models. Structural is one of the cases where we will completely replace the design content with a fabrication model.



*IMAGE OF CAD MEP FABRICATION MODEL*

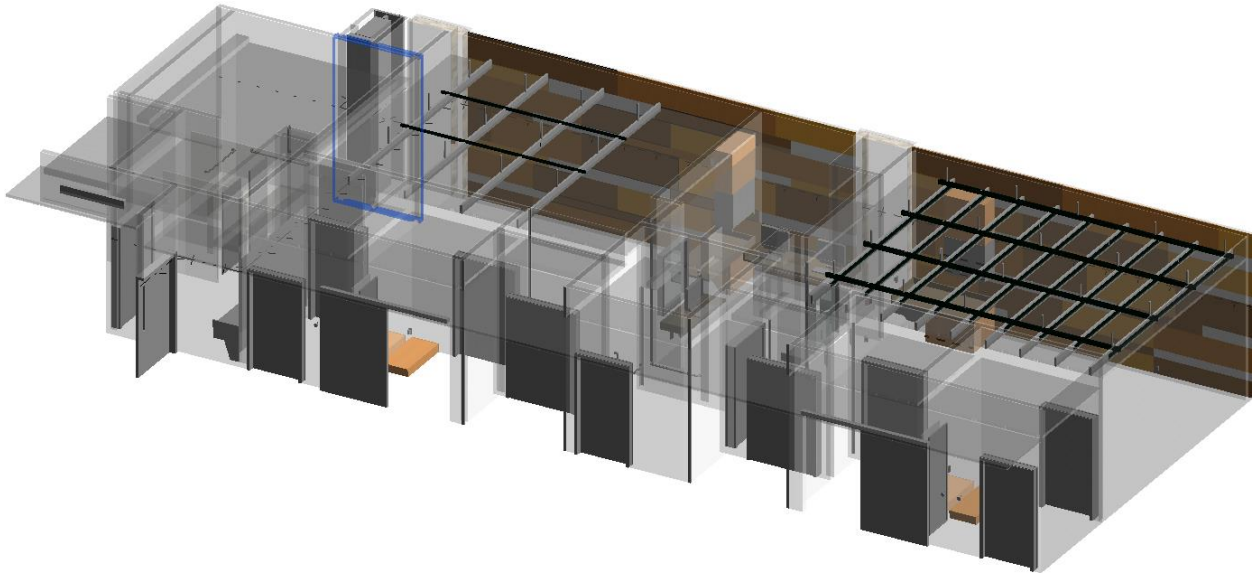
### **Design Changes**

When we receive a small change to the design such as a modification to a restroom layout, we will align the FM model with the changes as individual updates to the model content. When we receive large changes we will replace the content in the FM model with the affected content. If the changes affect more than a few rooms, we replace the content.

### **Non-Matching or Non-Modeled content**

A challenge with a design intent model is that much of the content may not be modeled. When producing construction documents the goal of the design team is to show enough information to convey the intent of the design of the building. That means not modeling everything and using notes and specification text to describe the intent. When you are developing an FM model, it's hard to update something that doesn't exist. An example of this is the Unistrut on this project was referenced in details and described where it should go but not modeled. We received drawings of the Unistrut and modeled the system into the FM model.





*SCREENSHOT OF THE GREELEY MODEL UNISTRUT.*

### **File Transfer**

If you're new to projects than you may not know that file transfer is a fun waste of time. Our goal in this process is to be streamlined. BSA LifeStructures uses Clarity which is a powerful web platform for Revit that can do a ton of Automation tasks. We transfer the current project files to our ShareFile project folder using Clarity. As part of this task, Clarity cleans the files and prints updated drawings. If we had to do this again, we may go the route of BIM 360 design. There have been a lot of cases of working being done in the wrong file even with a process that is automated.

### **Automation**

The more restrictive the BIM standards of a facility are, the more money it will likely cost an owner. As an example, when doors or rooms are required to be numbered with a long code made up of the building number, level, and way finding number, often an architect will need to change their standards for door tags or room tags. This is work and should be included in a bid by the architect to do the job. By not requiring the designer to name and number equipment outside of their firm's standards, more work is created for the FM team. This is where automation comes into play.

Our team used automation on this project for a number of things:

- Consistently add shared parameters
- Number equipment items based to include the design team's nomenclature with
- Systematically Number items
- Add Spaces to MEP model



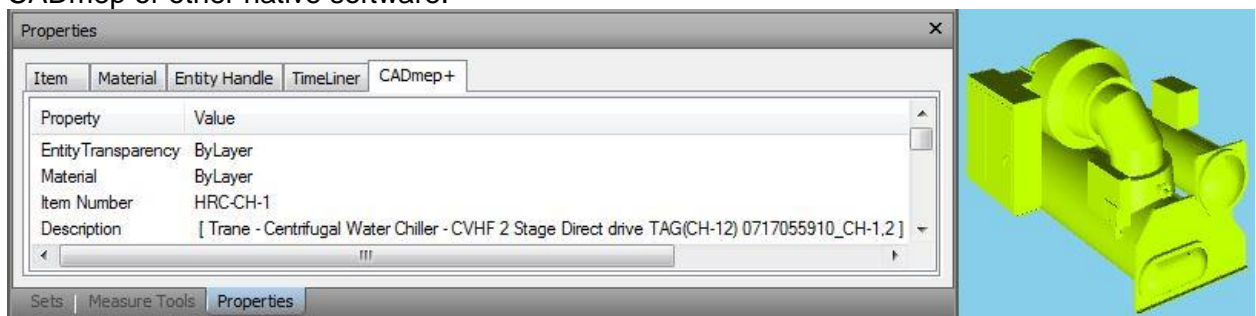
Most of the MEP equipment in our project was not numbered to include the room number or building abbreviation. Using Dynamo we selected the rooms on a level and the items we wanted to update the number. By extruding volume of the rooms to the floor above, we could find if equipment was inside of a room. You may ask why not use the room calculation point. The content in this model was not modeled using a room calculation point.

## BIM 360 Glue – BIM 360 Field – BIM 360 Ops Workflow (Chiller Example Shown)

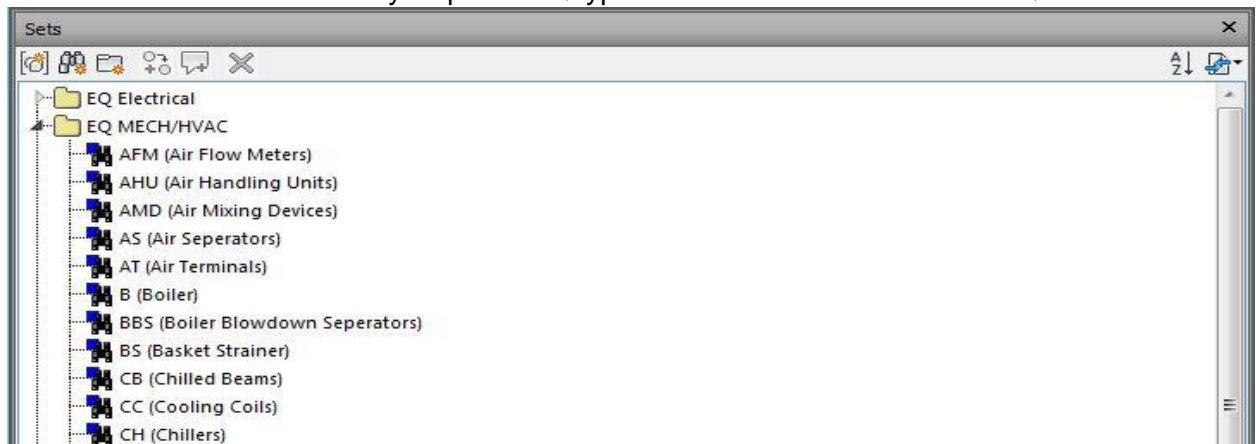
1. Client defines desired equipment data to be available in 360 Ops.
2. Client defines EQ naming convention. (Building Area-Scheduled EQ Mark/Tag)
3. Define which EQ properties will need to be extracted from modeled EQ items.  
(Equipment tag and description in this case)

**LESSON LEARNED –** Clearly define items to be included in the contractor models for BIM 360 Ops.

4. Subcontractor inputs EQ tag and description in to designated property fields within CADmep or other native software.

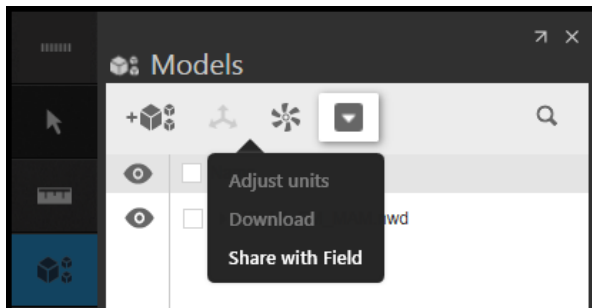


5. Subcontractor exports Navisworks .nwc file(s).
6. Aggregate all .nwc files in to the FM .nwf as-built turnover model.
7. Create selection sets for every required EQ type to be associated with Field EQ.

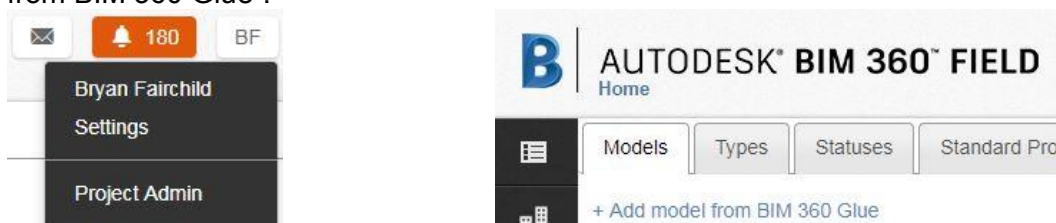


**LESSON LEARNED –** Test this process earlier.

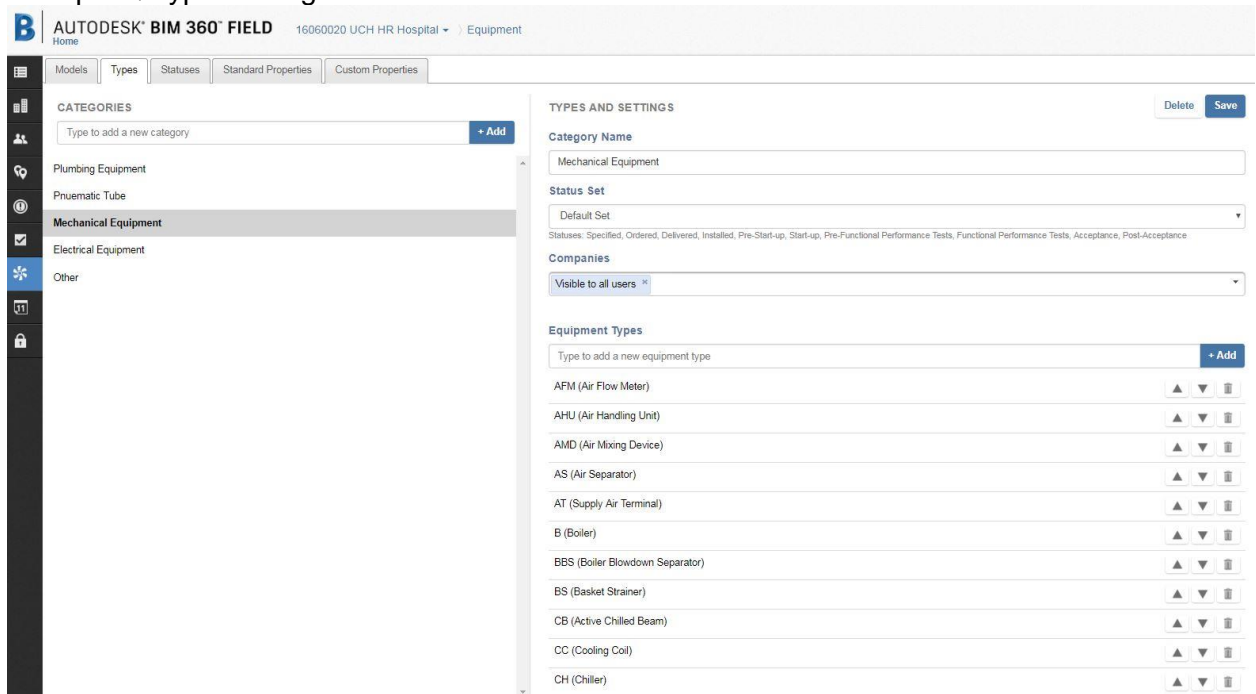
8. Save out Navisworks .nwd file and upload to Glue.
9. Open FM model in Glue and select "Share with Field" by selecting the "Models" tab and then the "More Actions" pulldown.



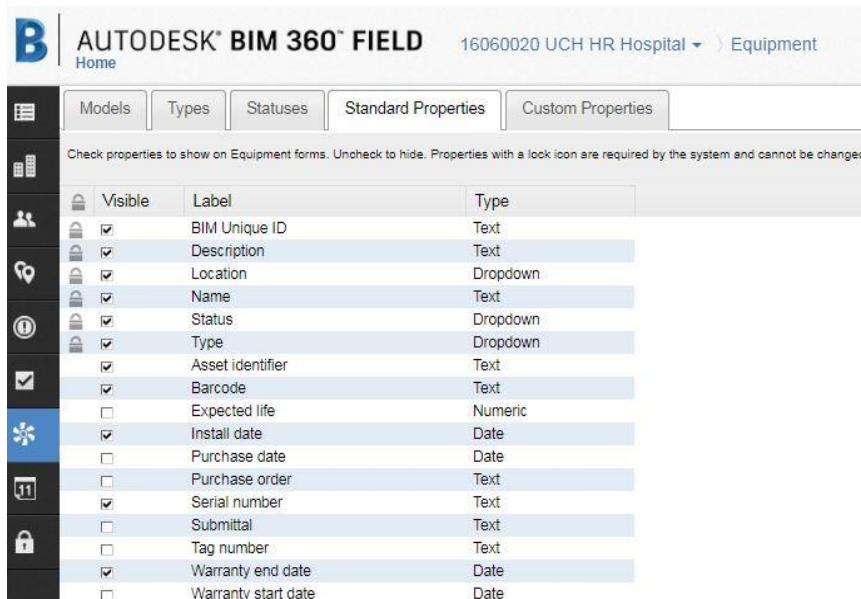
10. Open Field in “Admin” mode. Add Glue models by selecting EQ tab then “Add model from BIM 360 Glue”.



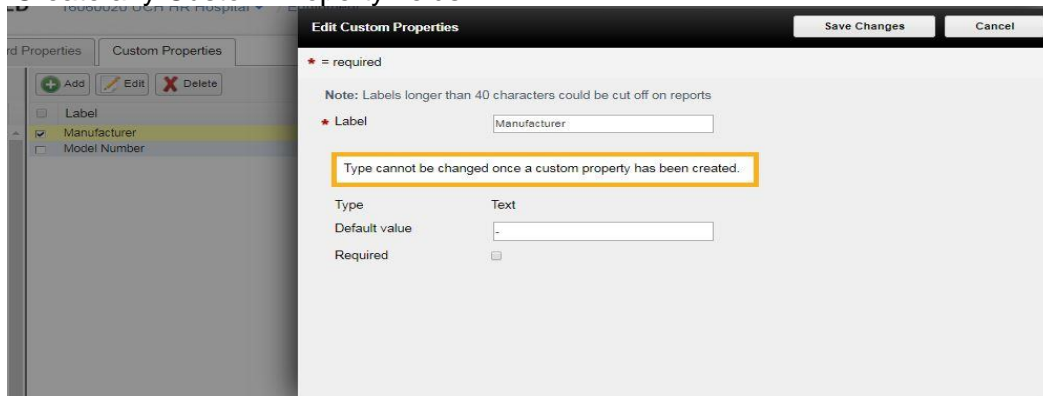
11. Set up EQ Types/Categories in Field to match Selection sets created in Navisworks.



12. Select desired Standard Properties.

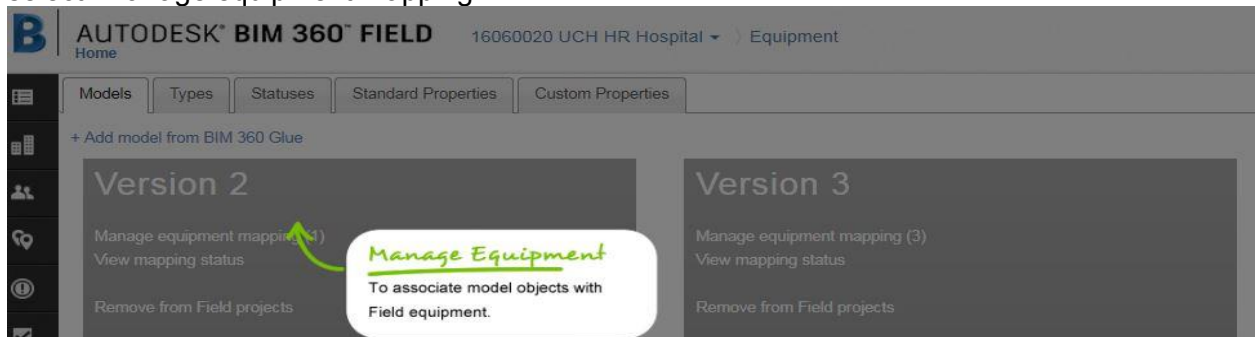


### 13. Create any Custom Property fields

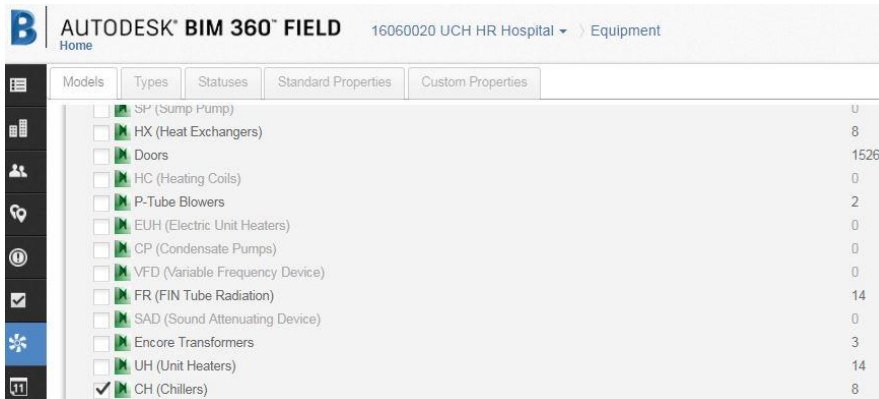


**LESSON LEARNED -** (Enter a dash (-) in the “Default Value” field for Custom Properties since a blank field will not export to Ops).

### 14. To associate model objects with Field equipment, select imported model in Field and select “Manage equipment mapping”.



### 15. Select sets to be mapped (populated from the Navisworks EQ sets). Select “Next”.



16. Associate selected sets with appropriate EQ type. Select “Next”.

### Manage Equipment Mapping (1 of 1)

HO L1 FM MAM - CH (Chillers)



Modifying equipment type will overwrite previous equipment mappings.

17. Select “Advanced” mapping mode then select GUID as unique ID. Select “Next”.

18. In the “Associate model properties with equipment properties” check “Show all categories” and select the property fields from the native models that contain the desired model properties then select the Field property you would like to associate them with. Select “Next”.

Manage Equipment Mapping (1 of 1)  
HO L1 FM MAM - CH (Chillers)



19. In the “Select Equipment Properties” window click “Select property...” and add all properties you want to appear on your EQ lists.



## Manage Equipment Mapping (1 of 1)

HO L1 FM MAM - CH (Chillers)

Select sets

---

Select equipment properties

Select property...

Name

Type

Manufacturer

Model Number

Serial number

20. Select "Save Mapping".
21. Once mapping is complete go to Field (non-admin mode) by selecting the Home tab.
22. Select Equipment tab (🔧).
23. Select "More Actions" then "Customize View" and select desired properties.
24. Verify that all required properties are shown and that associated model properties look correct.

**AUTODESK® BIM 360® FIELD** 16060020 UCH HR Hospital ▾ Equipment

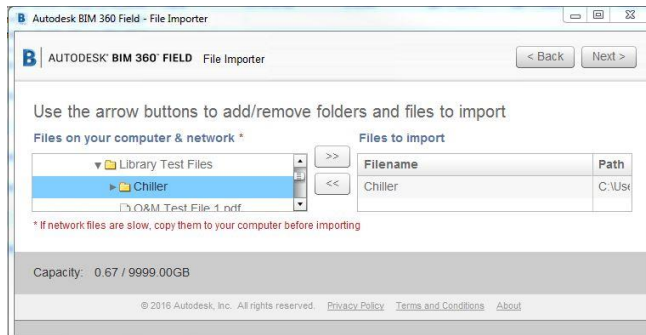
	Name	Type	Description	Model	Manufacturer	Model Number	Serial number	Install date	Warranty end date	Barcode	Status
<input type="checkbox"/>	HRC-CH-1	CH (Chiller)	[ Trane - Centrifugal Water Chiller - CVHF	HO_L1_FM_MAM	-	-	-	-	-	-	Specified
<input type="checkbox"/>	HRC-CH-2	CH (Chiller)	[ Trane - Centrifugal Water Chiller - CVHF	HO_L1_FM_MAM	-	-	-	-	-	-	Specified
<input type="checkbox"/>	HRC-CH-4	CH (Chiller)	[ Trane - Centrifugal Water Chiller - CVHF	HO_L1_FM_MAM	-	-	-	-	-	-	Specified
<input type="checkbox"/>	HRC-CH-3	CH (Chiller)	[ Trane - Centrifugal Water Chiller - CVHF	HO_L1_FM_MAM	-	-	-	-	-	-	Specified

25. Add additional EQ properties to each EQ item by selecting all matching items then selecting "Edit". Enter additional property data. (This can be done by exporting to csv from the "More Actions" tab, entering additional data and re-importing)

**AUTODESK® BIM 360® FIELD** 16060020 UCH HR Hospital ▾ Equipment

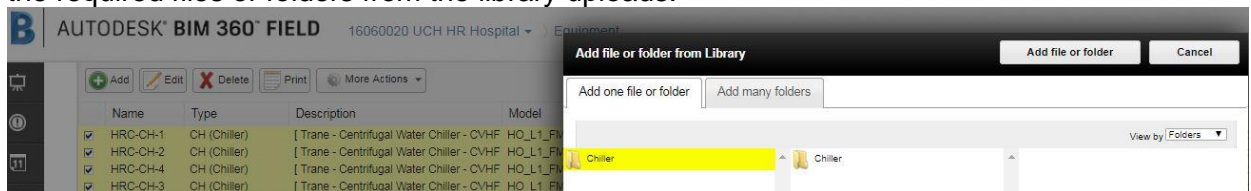
	Name	Type	Description	Model	Manufacturer	Model Number	Serial number	Install date	Warranty end date	Barcode	Status
<input type="checkbox"/>	HRC-CH-1	CH (Chiller)	[ Trane - Centrifugal Water Chiller - CVHF	HO_L1_FM_MAM	Trane	CVHF0760	123456	Jan 1, 2018	Jan 1, 2020	HRC-CH-1	Specified
<input type="checkbox"/>	HRC-CH-2	CH (Chiller)	[ Trane - Centrifugal Water Chiller - CVHF	HO_L1_FM_MAM	Trane	CVHF0760	012345	Jan 1, 2018	Jan 1, 2020	HRC-CH-2	Specified

26. To link O&M's and Submittals to EQ: Select Library tab (📖) and then "Import". (May need to install the BIM 360 Field File Importer Utility)
27. Upload O&M's and Submittals for each EQ item to the Field Library.

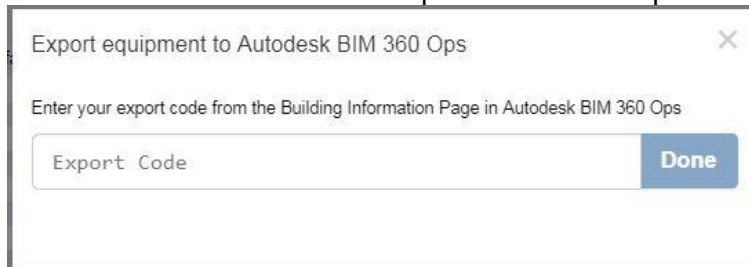


**LESSON LEARNED – Make sure PDFs are clearly identified to the equipment they are associated.**

28. Select Equipment tab and select all EQ types with the same O&M and submittal to be linked.
29. Once all EQ is selected hit the “More Actions” tab, select “Add Library Files”, then add the required files or folders from the library uploads.



30. Once all additional property data and linked library files are complete, select the “More Actions” tab and then select “Export to BIM 360 Ops”.



31. Enter the export code from the Building Information Page in BIM 360 Ops and select “Done”.

**Revit and BIM 360 Field export code**

**GENERATE EXPORT CODE**

32. Click the “Assets” Tab in 360 Ops, select an equipment item and verify that everything looks correct.



Commissioned

Status ^

HRC-CH-2

[ Trane - Centrifugal Water Chiller - CVHF 2 Stage Direct drive TAG(CH-12) 0717055910\_CH-1,2 ]

status [Commissioned](#)

mechanical equipment

ch (chiller)

add category

barcode / QR code

HRC-CH-2

[Add](#)

associated schedules

None

location

Add floor or room

3D model

[View](#)

associated tickets

None

assigned

[None](#)

history

[View](#)

Photos and Videos

Add Photo or Video

238000\_1.02A\_002...

238000\_1.02A\_005...

238000\_1.02A\_004...

238000\_1.02A\_007...

Documents and Manuals

Add PDF

238000\_1.02A\_0...  
Updated: Oct 26, 2018

238000\_1.02A\_0...  
Updated: Oct 26, 2018

238000\_1.02A\_0...  
Updated: Oct 26, 2018

238000\_1.02A\_0...  
Updated: Oct 26, 2018

Add web link

Details

manufacturer

Trane

model

CVHF0760

serial number

012345

installed by

Add installed by

installation date

[Dec 31, 2017](#)

warranty expiration

[Dec 31, 2019](#)

Comments

Add comment

Add +

ARCHIVE

## **Learn How to identify a software workflow that will work best with your organization**

As previously mentioned, BIM 360 Ops offers two workflows. One is to use the Revit model and directly export to BIM 360 Ops. The other is to use BIM 360 Glue and BIM 360 Field to export models to BIM 360 Ops. Each method has its own advantages and disadvantages. The workflows also depend on the size and type of the facility as well as potential for renovations. The following advantages and disadvantages for each are listed:

### **Revit to BIM 360 Ops Workflow:**

#### **Advantages**

- Easy to maintain the Revit model and export to BIM 360 Ops
- Data can be exported (3rd party or via Dynamo) to the Revit model

#### **Disadvantages**

- The Revit MEP model must be updated (as-built) to reflect coordination and asset installation.
- Additional cost to update the Revit MEP models.

### **BIM 360 Glue to BIM 360 Field to BIM 360 Ops Workflow:**

#### **Advantages**

- Ideal method for using trade contractor coordination models which should reflect installation
- Least expensive of the two methods

#### **Disadvantages**

- Possibly multiple file types to maintain
- If owner is maintaining the models Owner will need BIM 360 Glue and BIM 360 Field to export to BIM 360 Ops.

### **Recommendations**

If a facility is large and may undergo frequent renovations consider using the Revit to BIM 360 Ops workflow. The Revit FM model is easier to maintain and is a direct export to BIM 360 Ops but consider carefully the use of custom parameters.

If a facility is expected to have few renovations then the BIM 360 Glue/BIM 360 Field/BIM 360 Ops workflow is preferred. The subcontractor coordination models can be used but make sure the various non-Revit models can be updated and maintained.