



## CS21864

### BIM 360 Field to Building Ops—Lessons Learned in the Setup of a Project

Joshua Lannen  
BOND Brothers

#### Learning Objectives

- Learn how to ask the right question about turnover to do a proper job setup
- Understand how the equipment matrix transfers from BIM 360 Field to Building Ops
- Learn how to engage and get participation from the project team in entering data
- Understand basic key elements needed by most clients for FAM

#### Description

An increase of technology and mobile devices on construction projects means we collect more data than ever. Clients are asking for access to this data as part of our turnover package in electronic format. Traditionally, our projects have not been set up at the beginning to facilitate this transfer of data. Simple things like Locations and Asset IDs are not in the contract documents until the end of the project. Also, owners don't know what they want or need. This class will follow a case-study format of a completed project started before the client had purchased Building Ops software. It will follow the process to set up BIM 360 Field software to build and utilize the Equipment matrix, and we'll cover how the initial assumptions and decisions that were made affected the turnover process. We will discuss our lessons learned and give time to focus attention on early to limit rework and reorganization of data to meet the turnover needs. This discussion will focus on the transition from BIM 360 Field software to Building Ops software, but it could be applied to most FAMS software. This session features BIM 360 Field and Building Ops. AIA Approved

#### About the Speaker

Josh Lannen's current position with BOND Brothers is a quality assurance / quality control (QA/QC) manager, and he oversees BIM 360 software deployment. Josh started his career in 2000 with Turner Construction working on projects for clients such as Amgen, Millennium Pharmaceutical, Liberty Mutual, Blue Cross Blue Shield Association, and Harvard Business School. Over the last 16 years, he has held the positions of field engineer, assistant superintendent, superintendent, and project manager. Josh was a key team member on the Tata Hall project for Harvard Business School, where he provided support and technical assistance in addition to the utilization of BIM 360 software to its full capabilities. In his current role as QA/QC manager for BOND, he oversees the company's quality program and BIM 360 software database. He is continually improving best practices and keeping the company current on industry advances and trends. Josh earned a BS in civil engineering from Northeastern University and is a member in good standing with American Society of Civil Engineers.

[jlannen@bondbrothers.com](mailto:jlannen@bondbrothers.com)

<http://www.bondbrothers.com/>

## About BOND

BOND is a fourth generation, privately held, full service construction management and civil & utility general contracting firm, we are driven forward by listening to the needs of our clients. Our focus is on building a bond of trust that fuels each construction project we undertake.



### Introduction:

Four years ago, one of our university clients contracted with us to set up a complex and detailed FAM matrix for all the mechanical equipment on our project. Each piece of equipment was entered into the matrix, barcoded, and tracked during construction. The matrix we were asked to set up had over 250 tracking elements per piece of equipment. It took a significant amount of time and labor to set-up and populate. Once completed, we exported the raw data in csv format to our client for import to their FAMS system.

This exercise taught us the power and functionality of the Equipment Module within BIM 360 Field as a construction tracking tool. After doing a series of tests on a smaller scale, with smaller projects we were ready to scale the process up and once again try it out again on a large project.

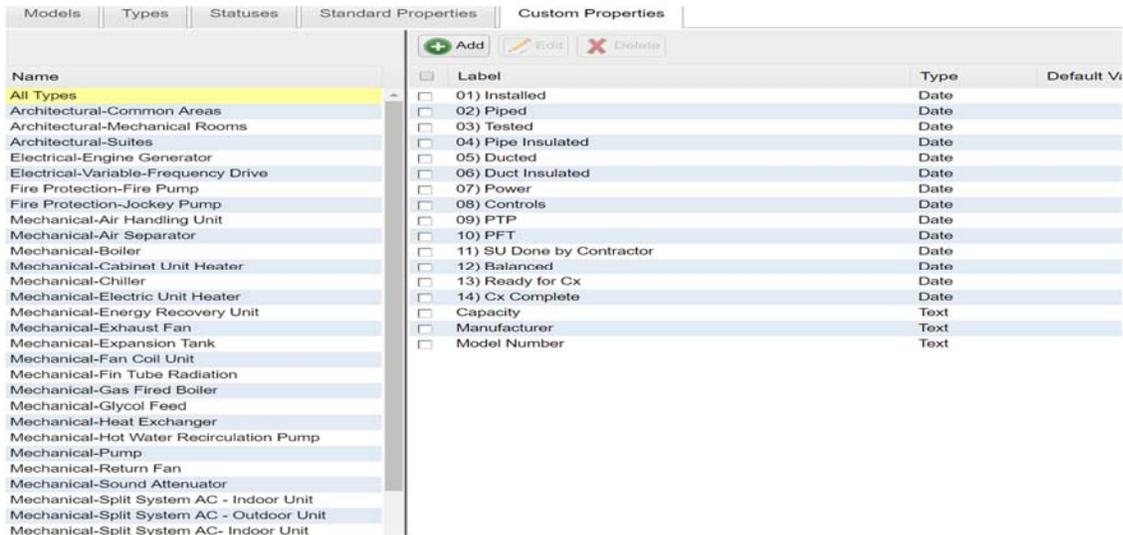
As we began our set-up, we did not know our new client was in discussion with Autodesk about adopting Building Ops, so we proceeded with entering information from the drawings as it made sense to us and did not have any engagement with the design team or our client. Our goal was to provide a more efficient method for organizing and tracking the installation of the MEP equipment and set ourselves up for commissioning. It wasn't until only a few months before the project was complete that we were approached by the client to investigate setting up BIM 360 Field with enough information to populate their Building Ops database. This presentation will provide information about our challenges to merge the two databases late in the project.

### Initial Equipment Matrix Set-up

Equipment names, barcodes, types, and descriptions were drawn from the design documents and very basic.

Name	Barcode	Type	Description	Location Path
AC-1	AC-1	Split System AC-Indoor Unit	Serves: T-D 075	East Building>Ground Floor>075 TeleData
AC-2	AC-2	Split System AC-Indoor Unit	Serves: ELEV CTRLM604	South Building>Mech. Level>M604 Mechattic-6
ACCU-1	ACCU-1	Split System AC-Outdoor Unit	Serves: T-D 075	East Building>Roof
ACCU-2	ACCU-2	Split System AC-Outdoor Unit	Serves: ELEV. M604	East Building>Roof
AHU-1	AHU-1	Air Handling Unit	Serves: NE CORNER	East Building>Ground Floor>097 Mech. Room
AHU-2	AHU-2	Air Handling Unit	Serves: COMMON AREAS	North Building>Mech. Level>M602 Mechattic-3

Custom Fields were added to signify construction installation milestones dates such as delivery, installation, piped, wired, insulated, tested, etc.



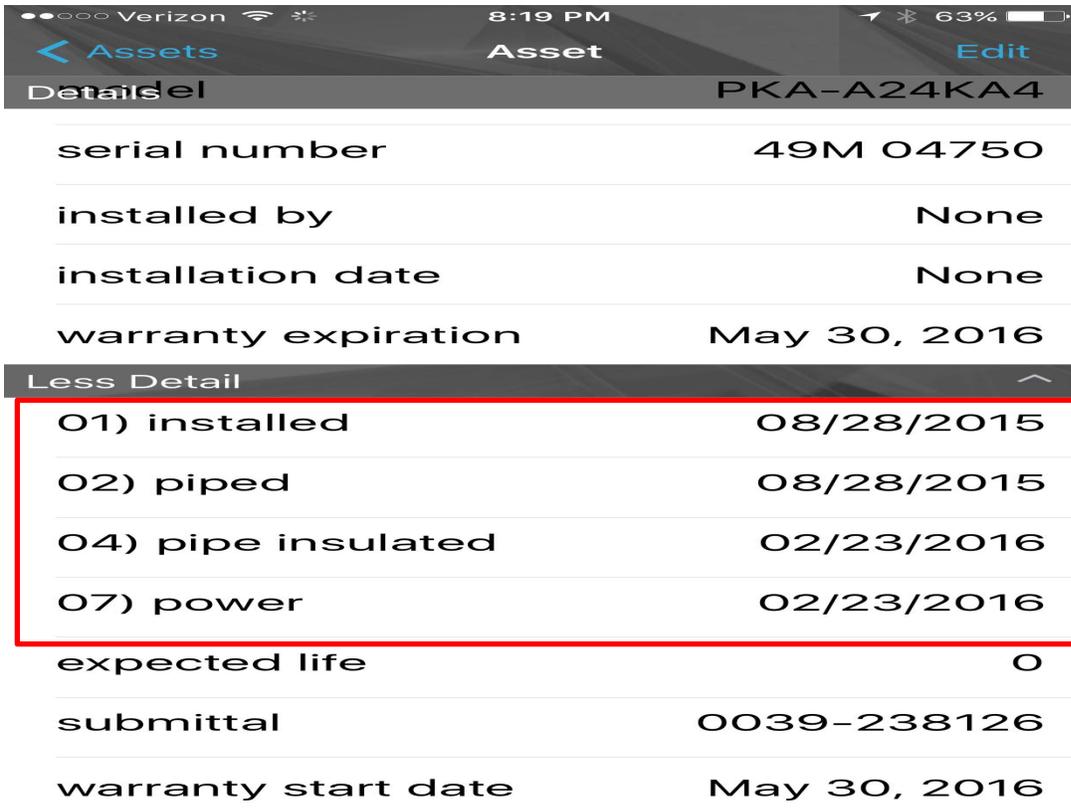
*\*Note: Be careful how you set-up custom properties as some fields may not make sense across all of your equipment types*

## Construction Tracking and Owner Request

Population and use of the equipment matrix was uneventful until the client approached us about the possibility of setting up Field to transfer into Building Ops. At this time we convened a meeting to discuss their ideal information and what we currently had in the system. At this moment we realized that many of our categories and our naming convention was not aligned/consistent with the client's standard categories. This meeting also led the client to the conclusion that their own internal conventions were not as consistent with what their needs were and spurred a very productive internal conversation about their own processes.

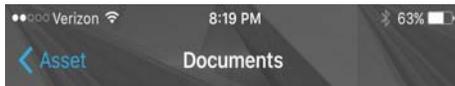
### Trial Data Dump

With the help of Autodesk, we set up a test environment to find out what information would be sent over to ABO and what formatting changes needed to be made. We quickly noticed that we had several construction fields that were not needed by the client and needed to develop a means for fine tuning the data. (See Box Below)



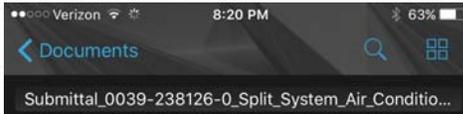
Details		PKA-A24KA4
serial number		49M 04750
installed by		None
installation date		None
warranty expiration		May 30, 2016
Less Detail		
01) installed		08/28/2015
02) piped		08/28/2015
04) pipe insulated		02/23/2016
07) power		02/23/2016
expected life		0
submittal		0039-238126
warranty start date		May 30, 2016

This process did have some very positive benefits though. The most important discovery was how many and how much turnover data in the form of O&M and Submittals we could send directly into the client's database with little to no effort. This data was then immediately accessible on a smart phone or tablet by scanning the QR codes we placed on equipment.



AC\_PKA-A-KA4\_O\_M.pdf >

Submittal\_0039-238126-0\_Spli... >





**P-SERIES**

**SUBMITTAL DATA: PKA-A12HA4 & PU-Y-A12NHA4 (-BS)**

Job Name: Boston College 2150 Comm Ave  
 System Reference: ac-1 acc-1 Date: 6-4-14




Submittal File: 0039-238126-0

**GENERAL FEATURES**

- Easy-to-install indoor unit for residential and commercial applications
- 30mm-white indoor plastic, compact design
- Quiet operation: built-in noise and outdoor noise
- Self-check function—integrated diagnostics
- Labeled externally for green parts and energy peak compressor

**LAST OPTION**

① Outdoor Unit: PKA-A12HA4  
 ② Indoor Unit: PU-Y-A12NHA4

**ACCESSORIES**

Indoor Unit

- ① Condensate Drain (Standard) (PKA-12C141-10000)
- ② Drain Pan (PKA-12C141-10000)
- ③ Drain Pan (PKA-12C141-10000)
- ④ Drain Pan (PKA-12C141-10000)
- ⑤ Drain Pan (PKA-12C141-10000)
- ⑥ Drain Pan (PKA-12C141-10000)
- ⑦ Drain Pan (PKA-12C141-10000)
- ⑧ Drain Pan (PKA-12C141-10000)
- ⑨ Drain Pan (PKA-12C141-10000)
- ⑩ Drain Pan (PKA-12C141-10000)

Outdoor Unit

- ① Mounting Bracket (PKA-12C141-10000)
- ② Mounting Bracket (PKA-12C141-10000)
- ③ Mounting Bracket (PKA-12C141-10000)
- ④ Mounting Bracket (PKA-12C141-10000)
- ⑤ Mounting Bracket (PKA-12C141-10000)
- ⑥ Mounting Bracket (PKA-12C141-10000)
- ⑦ Mounting Bracket (PKA-12C141-10000)
- ⑧ Mounting Bracket (PKA-12C141-10000)
- ⑨ Mounting Bracket (PKA-12C141-10000)
- ⑩ Mounting Bracket (PKA-12C141-10000)

Control Options

- ① Remote Control (PKA-12C141-10000)
- ② Remote Control (PKA-12C141-10000)
- ③ Remote Control (PKA-12C141-10000)
- ④ Remote Control (PKA-12C141-10000)
- ⑤ Remote Control (PKA-12C141-10000)
- ⑥ Remote Control (PKA-12C141-10000)
- ⑦ Remote Control (PKA-12C141-10000)
- ⑧ Remote Control (PKA-12C141-10000)
- ⑨ Remote Control (PKA-12C141-10000)
- ⑩ Remote Control (PKA-12C141-10000)

**BEACON PROTECTION**

- External Color Panel
- Protective coating + Acrylic Enamel coating
- Flat Mirror Support
- Easy rear coating (at edge face)
- Repellent treatment + Glass Bead
- Glass rear coating (at edge face)

\*"Blue Fin" treatment is an anti-corrosion treatment that is applied to the outdoor unit to prevent a rust-like surface undercoating.



Specifications are subject to change without notice.  
 © 2014 Mitsubishi Electric Co., Ltd.



## Notes from our Client

### Learn How To Ask The Right Question About Turnover To Do A Proper Job Setup

Some important questions that an Owner should be asked when it comes to turnover data and proper job setup are the following:

- *What assets will the Owner's FM team perform regular preventative maintenance on?*
  - Because the FM Team used the implementation process as an opportunity to standardize turnover data (including asset data), a group of professionals identified key pieces of equipment that need to have a scheduled preventative maintenance associated to it in order for buildings to operate efficiently. They are known **Preventative Maintenance (PM) Assets**.
  - An example of PM Assets at include Air Handling Units, Boilers, Fan Coil Units, Pumps, and more.
- *What assets will the Owner's FM team NOT PERFORM regular preventative maintenance on, but would like to track in a computerized maintenance management system (CMMS), like Building Ops, for locational purposes?*
  - The FM team not only includes PM Assets in their new CMMS, but they also include Tracking Assets. **Tracking Assets** are MEP equipment that do not have a regularly scheduled maintenance session, but are important to know the location and identity data of in case of failure or other operational reasons.
  - An example of Tracking Assets include: Condensers, Motor Control Centers, Switchboards, Tanks, Water Heaters, and more.
- *Besides standard data that Building Ops asks for about each asset (i.e. Asset ID, Description, Manufacturer, Model, Serial Number, Warranty Data), is there any additional information the Owner would like to keep track of for each asset?*
  - The FM team had a lot of conversations over what we would like to track in our new CMMS. The amount of information had to be both reasonable and usable. Loading too much information could become useless and bog the system down.
  - Because of that, the FM Team has agreed to track three additional fields in Building Ops relating towards each asset. They include **Asset Type** (preventative maintenance or tracking), **Serves** (what the equipment serves), and **Field Comments** (additional data).
- *Does the Owner have any space standards that the CM Firm must adhere to?*
  - Our client has an internal department that deals specifically with space management data. The data includes names of spaces, departmental uses, square footage, rentable square footage, and more.



- During New Construction and Major Renovation projects, the space management department informs the CM Firm of all required space management standards, which are then conveyed into BIM 360 Field, and are eventually turned over properly to Building Ops.
- *Will the Owner like to Barcode/QR Code any rooms or assets? If so, is there a specific way they should be treated?*
  - The FM Team has recently began QR Coding all assets and rooms on campus. Standards are still being developed, but there are specific characteristics the QR Code must have.
- *Does the Owner have specific naming conventions for data that the CM Firm to adhere to when tracking and loading data?*
  - Like previously mentioned, the FM Team has recently developed an advanced set of data standards for turnover and inventory purposes.
  - There are now naming conventions for asset data, spatial data, and even QR Codes. The CM Firm should adhere to all, especially when loading data into BIM 360 Field. When turnover data is transferred from BIM 360 Field to Building Ops, it will take all naming conventions loaded in Field.
- *Besides O&M's, Submittals, and other standard asset documentation, does the Owner want any additional documentation being tracked in the CMMS?*
  - The FM Team is happy with just O&M's and Submittals, but images of each piece of equipment are required, along with an image of the name plate.

These are questions Facilities Management has learned must be asked by the CM Firm at the beginning of the project, especially if the CM Firm is using BIM 360 Field. If the questions aren't asked, then the Owner must communicate his/her responses, even if BIM 360 Field is not being used by the CM Firm.

## Understand How The Equipment Matrix Transfers From BIM 360 Field to Building Ops

If the Owner is using Building Ops as their CMMS and the CM Firm is using BIM 360 Field, it's especially important to understand the attribute matrix between both systems. In simplest terms, an equipment field in BIM 360 Field does not line up one-to-one in Buildings Ops. The table below identifies the proper setup.

<b>Building Ops Property</b>	<b>BIM 360 Field Property</b>	<b>BIM 360 Field Type</b>	<b>Notes</b>
Asset ID	Name	Required	If Asset ID is not used*
Description	Description	Standard	If Asset ID is not used*
Category	Type	Standard	
Barcode/QR Code	Barcode	Standard	
Location	Location		Imported as a string



Manufacturer	Manufacturer	Custom	
Model	Model	Custom	
Serial Number	Serial Number	Standard	
Installation Date	Install Date	Standard	
Warranty Expiration	Warranty End Date	Standard	
More Details	Any other standard and custom properties.		

More information regarding the equipment attribute matrix between BIM 360 Field and Building Ops can be found at: <http://www.autodeskbuildingops.com/blog/are-you-delivering-all-the-value-you-can-at-handover>

---

## Learn How To Engage And Get Participation From The Project Team In Entering Data

From an Owner’s perspective, inclusiveness is extremely important throughout all aspects of construction project. Whether it be during the planning and design phase or construction and execution, an Owner always wants to be in the loop about his/her project. For Owners in the Higher Education Industry, there can be multiple internal departments involved on a New Construction or Major Renovation project. With new technologies emerging, communications between different parties of project are becoming easier than ever, making it more appealing for people to participate in a construction project.

From a FM perspective, the ease of transferring the majority of turnover data from BIM 360 Field into Building Ops **encourages** strong participation from the Owner’s side. Facility Managers will want to begin providing input to CM Firms, such as making sure naming conventions are correct, assets are organized properly and all required identity data is included, documentation of each asset is loaded properly, locations and spaces line up one-to-one with what was given, and much more. If standards and participation are exchanged at the beginning of a project, turnover data from the CM Firm is as simple as a click of a button, removing the painful process of FM personnel dissecting data, organizing it in a completely different way, and loading it into their CMMS.

---

## Understand Basic Key Elements Needed By Most Clients For Facilities Management

The simplest way for CM Firms, and other parties of a construction project, to understand basic key elements needed by the FM department to operate a building is by speaking with FM personnel at the beginning of a project. The questions listed at the beginning of this document can be a great way to find basic needs of the FM department, as well as lead into additional findings that can help the FM department operate more efficiently.

The FM Team at has learned to communicate their basic needs at the beginning of a construction project so all parties are on the same page regarding deliverables.

