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- Scan the barcode OR Visit <https://ops.bim360ops.com>  
(or download **BIM 360 Ops** from the App Store)
- Enter your email address and join the portfolio  
**AU2019.**
- Confirm your email address and enter a phone #
- You are now an occupant of this portfolio
- Add tickets with questions, comments, feedback etc.!
- Create your own portfolio and start managing your own building.



# How to Write an Awesome Facilities Management Data Specification

Mark Mergenschroer

Customer Success Engineer – BIM 360 Ops

BLD322830







## About the speaker

### Mark Mergenschroer

Mark is entering his 24<sup>th</sup> year in the industry and has moved into the role of Customer Success Engineer for the Autodesk BIM 360 Ops Software. With this role, Mark will be working with customers on the successful integration of BIM 360 Ops, leading pre-sales opportunities, speaking at industry events and developing case studies with our customers.

Mark is an adjunct professor at Arizona State University on the subject of Building Commissioning and Facility Start-Up. Mark has focused on new and improved ways for a Facility Manager to maintain the operations of a building for its lifecycle.



## The Story behind my Passion for Facilities

# BIM 360 Ops Classes at AU 2019

Session ID	Title	Day and Time
BLD322234	Getting Started with BIM 360 Ops	Tuesday 1:30
BLD322245	Indoor Mapping for Facility Operations	Tuesday 2:45
BLD322176	Revit to BIM 360 Ops—Exporting Asset and Location Data for Facilities Management	Tuesday 4:30
BLD323807	Autodesk Facilities and BIM 360 Ops: How We Integrated Our Systems and Why	Wednesday 8:00
BLD322056	Maintaining Models with Value: What OSU Learned Moving to BIM	Wednesday 9:15
<b>BLD334451</b>	<b>Leveraging Apple Indoor Maps Program for Building Operations</b>	<b>Wednesday 10:30</b>
BLD322039	FM—with the End in Mind	Wednesday 1:30
BLD323156	How to Manage a Large Portfolio of Buildings in BIM 360 Ops	Wednesday 2:45
BLD322704	BIM 360 Ops for Data Centers: An Application Review	Wednesday 4:30
BLD323162	Existing to Expansion—BIM 360 Ops for the Fayetteville Public Library System	Thursday 8:00
CS323783	Getting Real with BIM 360: A Case Study of Autodesk's Boston Office	Thursday 10:30
CS322863	Enhanced Workflows to Successfully Implement BIM 360 Ops	Thursday 1:30
BLD322830	How to Write an Awesome Facilities Management Data Specification	Thursday 2:45

# What is Autodesk BIM 360 Ops?

- **Easy to use, mobile-first** maintenance management solution with web and mobile clients
- For maintenance managers, **technicians**, and building occupants
- Connects **BIM asset data** to the people who need it most, when they need it, where they need it
- Creates actionable tickets from **building sensors**
- Provides **indoor maps** to locate tickets and assets, do wayfinding for technicians, and enable more effective ticket triaging and analysis



# What Are the Benefits of BIM 360 Ops?

- **Enables owners to begin operations on day one** with a turnkey maintenance and asset management solution
- **Helps owners realize the operating potential of their buildings** and reduce expenses from unmaintained equipment
- **Offers a simple and elegant mobile and responsive web interface** that meets the needs of the mobile maintenance workforce
- **Improves the facility team efficiency by delivering indoor maps** that make ticket and asset data immediately actionable and contextually relevant

# BIM 360 Ops Resources

\*\*\*Email us! [Ops.at.au@autodesk.com](mailto:Ops.at.au@autodesk.com)\*\*\*

- Blogs: <https://bim360ops.autodesk.com/blog>
- Product Site: <https://bim360ops.autodesk.com/>
- App Store (Mobile App): <https://itunes.apple.com/us/app/bim-360-ops/id941471006?mt=8>
- Web App: <http://ops.bim360ops.com/>
- O&M Blog article:  
<https://bim360ops.autodesk.com/blog/sample-om-data-spec>



# Focus on Facilities Data



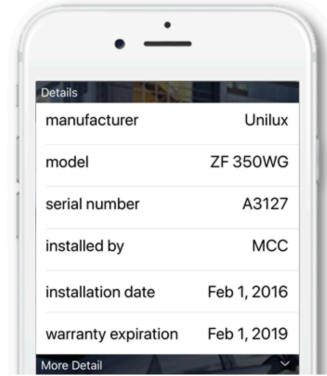
# Facilities Management Data Specification

- Have you seen a facilities management spec?
- What is a facilities management spec?
- As a facilities manager, would you like to have a say in what your data deliverable is?
- As a contractor, would you like know what the facilities team needs as a deliverable?

**B** AUTODESK® **BIM 360° OPS**

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Details	
manufacturer	Unilux
model	ZF 350WG
serial number	A3127
installed by	MCC
installation date	Feb 1, 2016
warranty expiration	Feb 1, 2019
More Detail	

### Sample O&M Data Specification

December 5, 2017  
By Mark Mergenschroer | [Handover & Commissioning](#), [Asset Management](#)

<https://bim360ops.autodesk.com/blog/sample-om-data-spec>



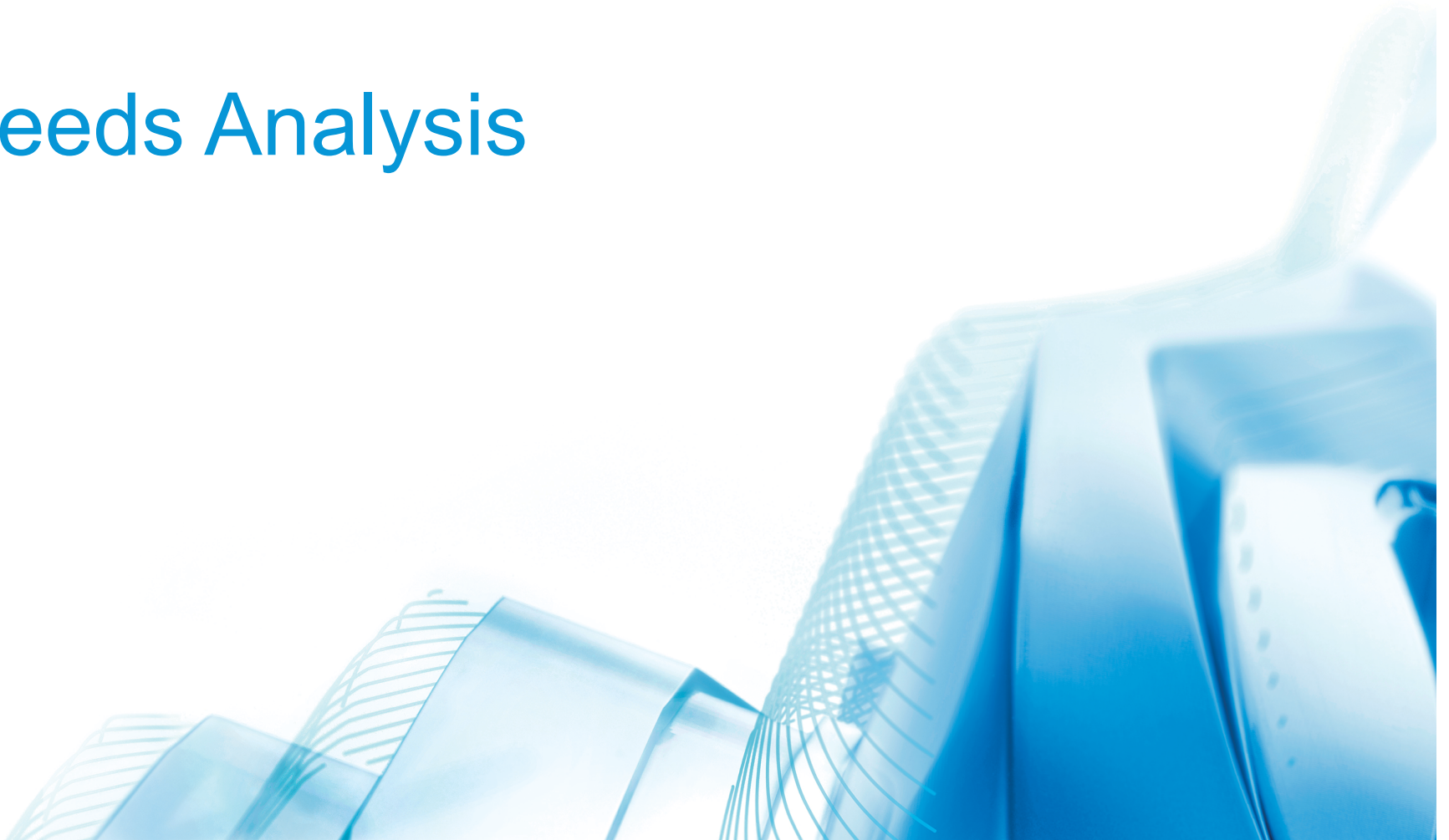
Our industry is producing  
some fantastic data, but  
facility teams are often  
left with none of it or an  
overwhelming, unusable  
amount of it

What if we focused on  
the data facilities need to  
maintain their facility, and  
not the data we want to  
provide them.

What if the asset data  
needed to maintain a  
facility was collected,  
organized, and usable  
before the facility  
opened?

What if the preventative maintenance tasks were scheduled and the maintenance records were accessible on a mobile device before day one of operation?

# Needs Analysis



# Asset Management Goals

- Why are you looking for an asset management solution?
- What are your goals?
- Do you currently have a system to track asset data?
- How do you manage your preventive maintenance?
- What issues do you have with your existing process?
- How do you manage work orders today?

MSR Design Issue for Bid 02-08-2019	FAYETTEVILLE PUBLIC LIBRARY SECTION 017500 OPERATION AND MAINTENANCE DATA INTEGRATION
<p>1. Required Information</p> <ul style="list-style-type: none"><li>a. Vendor Name</li><li>b. Complete Address</li><li>c. Phone</li><li>d. Email</li><li>e. Project Contact</li><li>f. Responsible Party: Contractor</li></ul> <p>B. Installing Contractor Contact Information</p> <p>1. Required Information</p> <ul style="list-style-type: none"><li>a. Vendor Name</li><li>b. Complete Address</li><li>c. Phone</li><li>d. Email</li><li>e. Project Contact</li><li>f. Responsible Party: Contractor</li></ul> <p>C. Sub-Contractor Contact Information</p> <p>1. Required for any sub-contractors associated with the installation of each Asset</p> <p>2. Required Information</p> <ul style="list-style-type: none"><li>a. Vendor Name</li><li>b. Complete Address</li><li>c. Phone</li><li>d. Email</li><li>e. Project Contact</li><li>f. Responsible Party: Contractor</li></ul>	
<p><b>PART 4 - SPECIFIC ASSET DATA REQUIREMENTS</b></p> <p>4.1 The Responsible Party for Population of Data in Section 4 is the Installing Contractor unless otherwise specified.</p> <p>4.2 MECHANICAL - 1100</p> <ul style="list-style-type: none"><li>A. 1101 - VARIABLE REFRIGERANT VOLUME FAN COIL UNIT<ul style="list-style-type: none"><li>1. Asset Number<ul style="list-style-type: none"><li>a. Responsible Party: FMS</li></ul></li><li>2. Asset ID<ul style="list-style-type: none"><li>a. Responsible Party: CxA</li></ul></li></ul></li></ul>	
<p>017500 - 6</p>	

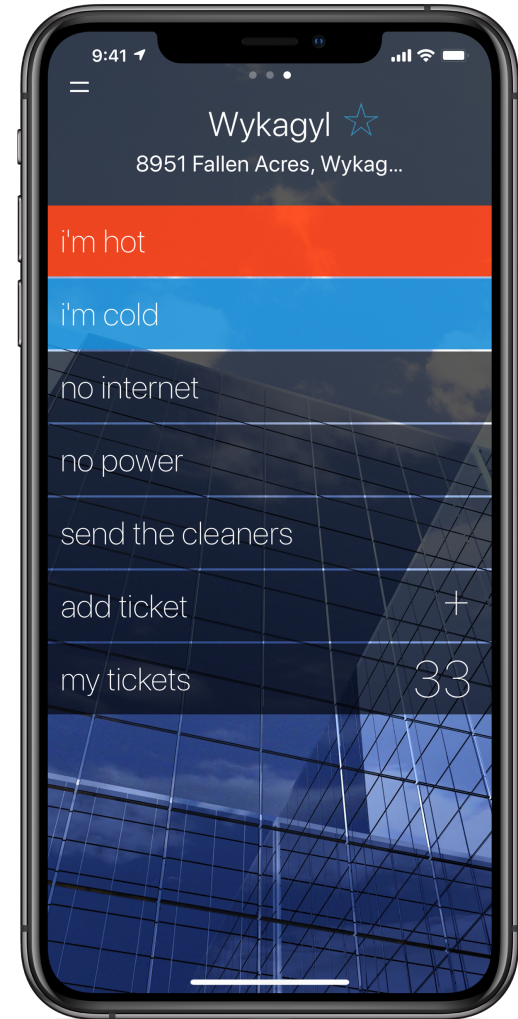
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- How do you manage your preventive maintenance?
- What issues do you have with your existing process?
- How do you manage work orders today?

MSR Design Issue for Bid 02-08-2019	FAYETTEVILLE PUBLIC LIBRARY SECTION 017500 OPERATION AND MAINTENANCE DATA INTEGRATION
3. Asset Category a. Responsible Party: CxA 4. Asset Type a. Responsible Party: CxA 5. Room Name / Number a. Responsible Party: CxA 6. Manufacturer a. Responsible Party: CxA 7. Model Number a. Responsible Party: CxA 8. Serial Number 9. Original Cost 10. Estimated Life 11. Warranty Start 12. Warranty End 13. Installation Date 14. Source Power Panel Name 15. Source Power Panel Location 16. Source Power Breaker Number(s) 17. Horsepower (nameplate data) 18. Space Served a. Responsible Party: CxA 19. CW Flow Rate (submitted value) a. Responsible Party: CxA 20. HW Flow Rate (submitted value) a. Responsible Party: CxA 21. Max Primary Airflow (CFM) a. Responsible Party: CxA 22. Belt size 23. Filter Type 24. Filter Size / Quantity 25. Voltage (nameplate data) 26. Amperage (nameplate data) 27. Thermostat Location	B. 1102 – AIR COOLED VRF HEAT RECOVERY CONDENSING UNIT 1. Asset Number a. Responsible Party: FMS 2. Asset ID a. Responsible Party: CxA 3. Asset Type a. Responsible Party: CxA 4. Room Name / Number a. Responsible Party: CxA 5. Manufacturer a. Responsible Party: CxA
017500 - 7	

# Portfolio Information

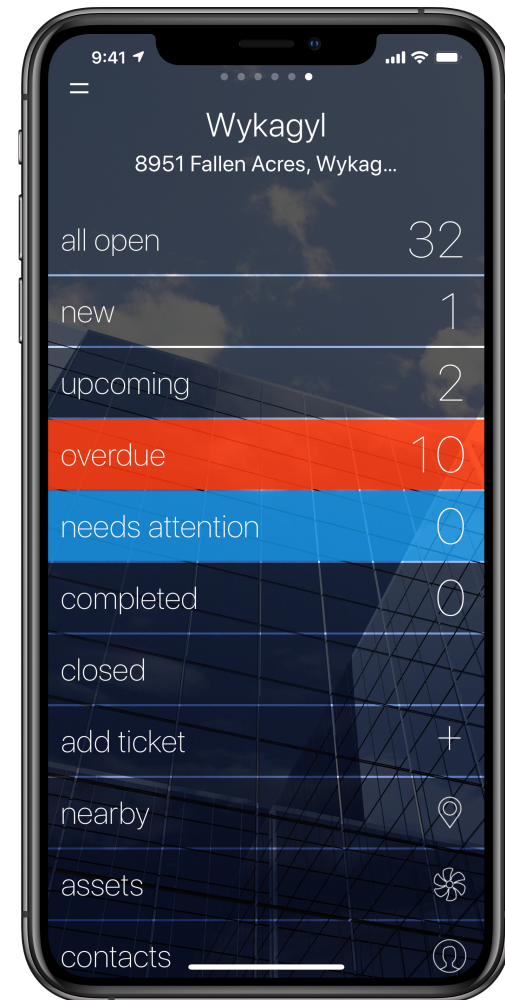
- Will you keep a Revit model up-to-date after construction is complete? What is your process to do this?
- What is your current process to keep your building drawings and PDF's up to date with all building changes?
- Are you interested in documenting construction using photometric scanning? Do you want pictures of what is behind a wall or above a ceiling?
- What reports do you need?





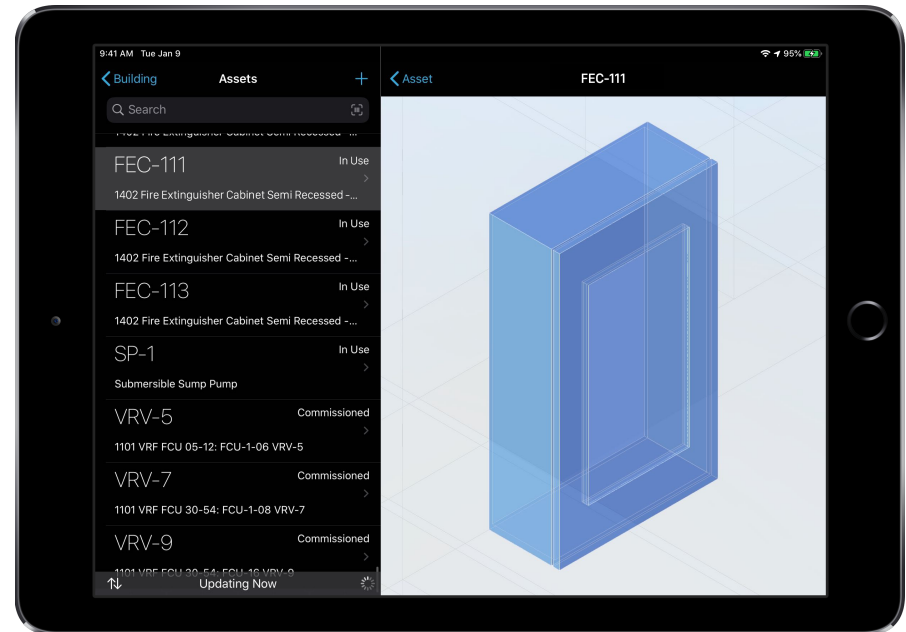
# Portfolio Information

- How many buildings do you manage?
- Are the buildings located on a single campus or dispersed?
- Do you have a floor naming standard?
- Do you have a room number and room name standard?
- Do you have department categories to define different types of departments?
- Do you have a data source that currently has this information available to download in a spreadsheet?
- Do you have updated AutoCAD or Revit drawings that accurately represent your facility?
- Do you want the 3D Revit geometry tied to your building assets?



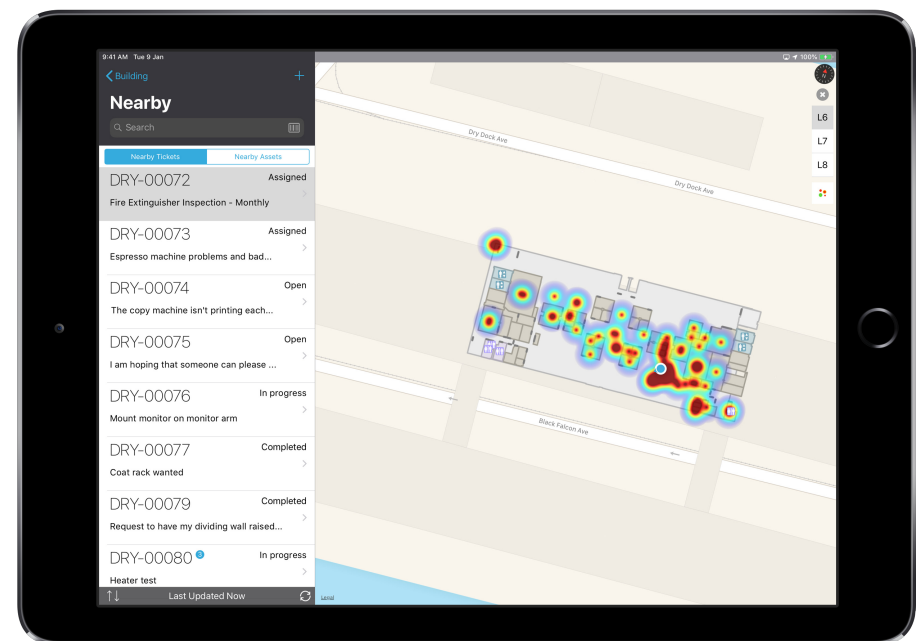
# Asset and Maintenance Information

- What is your current process for managing equipment information?
- Do you track assets?
- Do you have a list of assets that you would like to have maintained?
- Do you have an asset-naming or numbering standard?
- Do you have barcodes or QR codes on your assets?
- What is your current work order ticketing process?
- How do you manage and track preventive maintenance?
- Do you have a data source with preventive maintenance checklists or protocols that can export to a spreadsheet?
- Will you use the manufacturer's recommended maintenance procedure or the facilities best practice procedures?



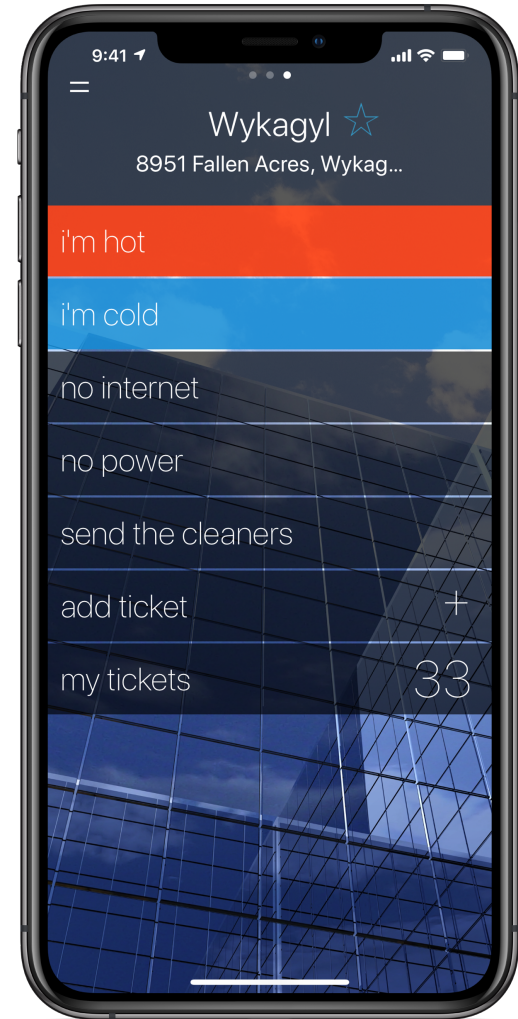
# Asset and Maintenance Information

- Do you have full-time facility technicians?
- How do your technicians access work order and asset data information on the go?
- Do your technicians enter their notes at the end of the shift? How much time do they spend entering data in the office?
- What percent of your maintenance is performed by outside vendors?
- Where are your building, asset, and preventive maintenance records stored today?
- How do you group work orders for reporting? (For example, HVAC or electrical)
- What reports do you need?



# Occupants and Tenants

- How do your occupants report issues today?
- What if your occupants could report issues directly in the ticketing system?
- Do you want single-sign-on for your occupants and staff?
- Do you have a tenant management system that you want to integrate with a facilities ticketing system?



# Simplifying the Approach



# Sample Process

- Discuss building portfolio and select prototype building.
- Discuss maintenance needs for assets (using templates to guide us).
- Develop basic level model or use current Revit files with basic information.
- Push available information from Revit files into BIM 360 Ops
- Build balance of asset information
- Build contacts, tasks, checklists, service agreements, ticket templates.
- Licensing commitment – start annual subscription.
- Create maps and enable mapping feature.
- Push information back to Revit files (with more robust information populated from Ops).
- Implementation training.



# Sample Assets

- 120-208 VOLT ELECTRICAL PANEL (EMERGENCY)
- 120-208 VOLT ELECTRICAL PANEL (NORMAL)
- 277-480 VOLT ELECTRICAL PANEL (EMERGENCY)
- 277-480 VOLT ELECTRICAL PANEL (NORMAL)
- AIR COMPRESSOR, INSTRUMENT
- AIR COMPRESSOR, MEDICAL
- AIR COMPRESSOR, SHOP
- AIR HANDLING UNIT
- AIR HANDLING UNIT, PACKAGED
- AIR/DIRT SEPARATOR
- AUTOMATIC TRANSFER SWITCH
- BACKFLOW PREVENTER, DOMESTIC WATER
- BACKFLOW PREVENTER, LANDSCAPING
- BASIN SWEEPER PUMP
- BLOWER COIL UNIT
- BOILER
- CHEMICAL TREATMENT PUMP
- CHILLED WATER PUMP
- CHILLER
- HILLED WATER PUMP
- CHILLER
- CONDENSER WATER PUMP
- COOLING TOWER
- DOMESTIC HOT WATER PUMP
- DOMESTIC WATER FILTER
- DOMESTIC WATER HEATER
- DOMESTIC WATER ISOLATION VALVE
- EMERGENCY GENERATOR
- EMERGENCY LIGHTING
- EMERGENCY SMOKE EXHAUST FAN
- ENERGY RECOVERY UNIT
- EXHAUST AIR TERMINAL UNIT
- EXHAUST FAN
- EXPANSION TANK
- FAN COIL UNIT
- FIN TUBE RADIATOR
- FIRE ALARM PANEL
- FIRE PROTECTION BACKFLOW PREVENTER
- FIRE PROTECTION JOCKEY PUMP
- FIRE PROTECTION VALVE
- FIRE PUMP
- FIRE/SMOKE DAMPER
- HAZARDOUS EXHAUST FAN
- HEAT PUMP CHILLER
- HEAT PUMP CHILLER CONDENSER PUMP
- HEAT PUMP CHILLER EVAPORATOR PUMP
- HEATING COIL PUMP
- HEATING WATER PUMP
- HELIPAD LIGHTING
- MAIN ELECTRICAL BREAKER EMERGENCY
- MAIN ELECTRICAL SWITCHGEAR PANEL
- MAIN WATER ISOLATION VALVE
- MAKEUP AIR UNIT
- MASTER MED GAS ALARM
- MED GAS AREA ALARM
- MED GAS MANIFOLD
- MEDICAL AIR DRYER

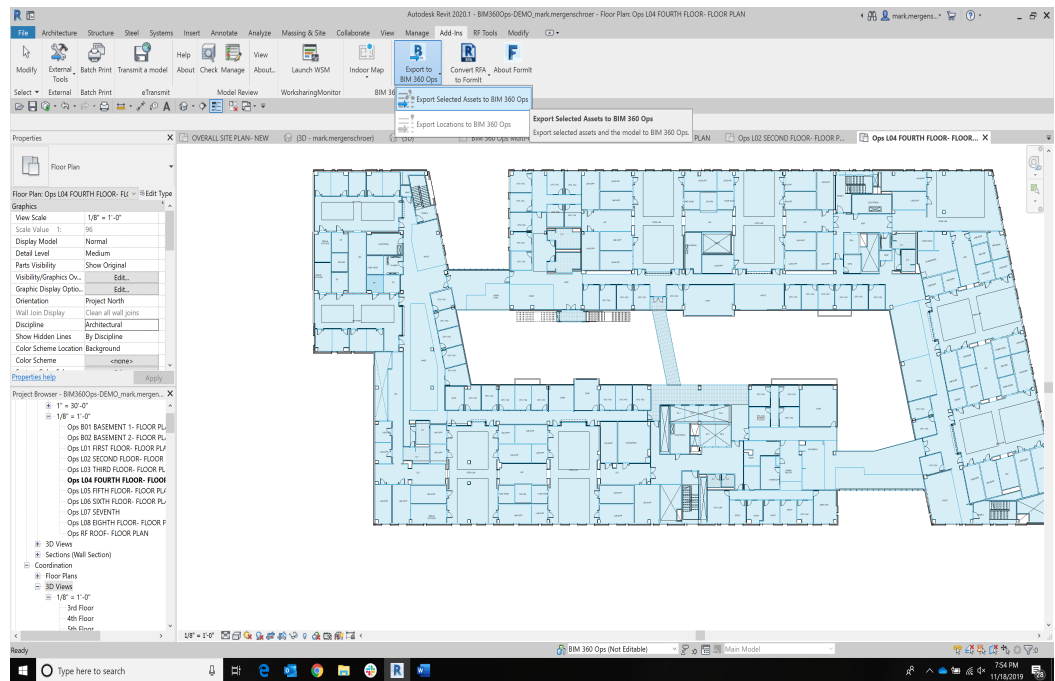
# Sample Assets

- MEDICAL GAS ZONE VALVE BOXES
- MEDICAL VACUUM PUMP
- TOWER WATER PUMP
- TRANSFORMERS
- VARIABLE FREQUENCY DRIVE
- VAV TERMINAL UNIT
- WATER SOFTENER
- AIR CURTAIN
- AUTOMATIC DOOR OPENER
- BULK OXYGEN TANK FARM
- CARBON MONOXIDE MONITOR
- CARD READER
- DEW POINT MONITOR
- DI WATER SYSTEM
- DIESEL FUEL TANK
- ELEVATOR
- EMERGENCY DISCONNECT SWITCH
- EXIT SIGNS
- EYE WASH STATION
- FIRE DOOR
- FIRE EXTINGUISHERS
- FUEL OIL POLISHER
- FUEL OIL PUMP
- GREASE TRAP
- ICE MAKER
- JET FUEL TANKS
- LANDSCAPING IRRIGATION SYSTEM
- LAUNDRY CHUTE
- LOUVER
- PNEUMATIC TUBE SYSTEM
- VARIABLE REFRIGERANT VOLUME FAN COIL UNIT
- AIR COOLED VRF HEAT RECOVERY CONDENSING UNIT
- BRANCH SELECTOR
- MAKEUP AIR UNIT
- AIR HANDLING UNIT
- ENERGY RECOVERY VENTILATOR
- ELECTRIC BASEBOARD HEATER
- EXHAUST FAN
- DUCTLESS MINI-SPLIT SYSTEM
- DUAL DUCT VAV BOX
- LOUVERS
- AIR COMPRESSOR
- BOILER
- HEATING WATER PUMP
- HVAC WATER VALVE
- GENERATOR
- TRANSFORMERS
- LIGHTING CONTROL PANELS
- GREASE INTERCEPTOR
- PUMPS
- WATER HEATERS
- BACKFLOW PREVENTOR
- DOMESTIC MAIN WATER VALVE
- FIRE ALARM CONTROL PANEL
- FIRE EXTINGUISHER
- FIRE DAMPER
- FIRE DOORS



# Sample Assets

- FIRE PROTECTION FIRE SPRINKLER CONTROL VALVES
- EXIT SIGNS
- EMERGENCY LIGHTING
- ENTRANCE KIOSKS
- CARD READERS
- SECURITY CAMERA
- ELEVATOR
- REFRIGERATED EQUIPMENT
- HEATED EQUIPMENT
- FIRE SUPPRESSION
- KITCHEN HOODS
- MISCELLANEOUS KITCHEN EQUIPMENT
- PROJECTORS
- AV CARTS
- DIGITAL DISPLAYS



## Attribute Sample

- Asset Number - (Bar Code-QR Code)
- Asset ID - (AHU-1)
- Category - (HVAC, Plumbing, Electrical)
  - Used to Assign Code for Asset number
- Type - (Air Compressor, Boiler)
- Room Name / Number
- Manufacturer
- Model
- Serial Number
- Original Cost
- Estimated life
- Floor Level
  - (Used to Assign Code for Asset number)
- Photo of Asset - Taken by Facilities In Ops
- Photo of Name Plate - Taken by Facilities in OPS

**sample\_assets (17)**

**Home** | Insert | Draw | Page Layout | Formulas | Data | Review | View

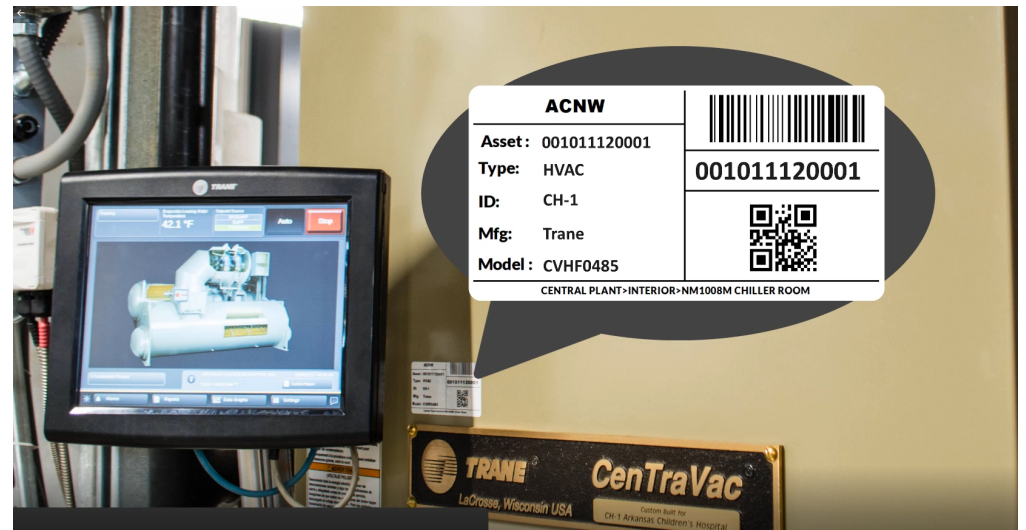
Paste | Cut | Copy | Format | Arial | 12 | Bold | Italic | Underline | Paragraph | Merge & Center | General | Conditional Formatting | Format as Table | Cell Styles | Insert | Delete | Format | AutoSum | Fill | Clear | Sort & Filter | Find & Select | Ideas | Sensitivity

A	B	C	D	E	F	G	H	I	J	K	L	M
Asset ID	Asset Description	Asset Category	Asset Status	Barcode	Floor	Room Number	Manufacturer	Model	Serial Number	Installed By	Installation Date	Warranty Expiration
Required	Required (140 characters maximum)	Must be: Commissioned, In Use, Maintenance, or Decommissioned										
<b>Add your content above this row and delete this row and the sample data before importing.</b>												
RTU-1	Rooftop Packaged Air Handling Unit	HVAC	Commissioned	1123581321	R	R001	Carrier	Weathermaker 50KC	DBAX334JWNVA	stewart.thomas@jeico.com	7/7/2015	7/7/2020
SP-1	Submersible Sump Pump	Plumbing	In Use	1123581102	B	N140	Zweller	VGX808VZC-PF		olga.mason@corset.com	7/7/2015	7/7/2020
CT-1	Cooling Tower	HVAC	Maintenance	1123581003	1	1003	Baltimore	CBZ2FDLC6RY		max.duke@relatoon.com	7/7/2015	7/7/2020
B-1	Boiler	Plumbing	Decommissioned	1123581025	B	B011	Burnham	V9	R9P6S4Y6KFZB	olga.mason@corset.com	7/7/2000	7/7/2005

# Sample Process

## QR/Bar Code Tagging System Info

Asset Code	Building	Level	Running Number
0000 -	01 -	00	0000



# Responsibilities

	<ol style="list-style-type: none"><li>1. Required Information<ol style="list-style-type: none"><li>a. Vendor Name</li><li>b. Complete Address</li><li>c. Phone</li><li>d. Email</li><li>e. Project Contact</li><li>f. Responsible Party: Contractor</li></ol></li><li>B. Installing Contractor Contact Information<ol style="list-style-type: none"><li>1. Required Information<ol style="list-style-type: none"><li>a. Vendor Name</li><li>b. Complete Address</li><li>c. Phone</li><li>d. Email</li><li>e. Project Contact</li><li>f. Responsible Party: Contractor</li></ol></li><li>C. Sub-Contractor Contact Information<ol style="list-style-type: none"><li>1. Required for any sub-contractors associated with the installation of each Asset</li><li>2. Required Information<ol style="list-style-type: none"><li>a. Vendor Name</li><li>b. Complete Address</li><li>c. Phone</li><li>d. Email</li><li>e. Project Contact</li><li>f. Responsible Party: Contractor</li></ol></li></ol></li></ol></li></ol>
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	<ol style="list-style-type: none"><li>3. Asset Category<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li><li>4. Asset Type<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li><li>5. Room Name / Number<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li><li>6. Manufacturer<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li><li>7. Model Number<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li><li>8. Serial Number</li><li>9. Original Cost</li><li>10. Estimated Life</li><li>11. Warranty Start</li><li>12. Warranty End</li><li>13. Installation Date</li><li>14. Source Power Panel Name</li><li>15. Source Power Panel Location</li><li>16. Source Power Breaker Number(s)</li><li>17. Horsepower (nameplate data)</li><li>18. Space Served<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li><li>19. CW Flow Rate (submitted value)<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li><li>20. HW Flow Rate (submitted value)<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li><li>21. Max Primary Airflow (CFM)<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li><li>22. Belt size</li><li>23. Filter Type</li><li>24. Filter Size / Quantity</li><li>25. Voltage (nameplate data)</li><li>26. Amperage (nameplate data)</li><li>27. Thermostat Location</li></ol>
B.	1102 – AIR COOLED VRF HEAT RECOVERY CONDENSING UNIT <ol style="list-style-type: none"><li>1. Asset Number<ol style="list-style-type: none"><li>a. Responsible Party: FMS</li></ol></li><li>2. Asset ID<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li><li>3. Asset Type<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li><li>4. Room Name / Number<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li><li>5. Manufacturer<ol style="list-style-type: none"><li>a. Responsible Party: CxA</li></ol></li></ol>

# Operations and Maintenance Data needs

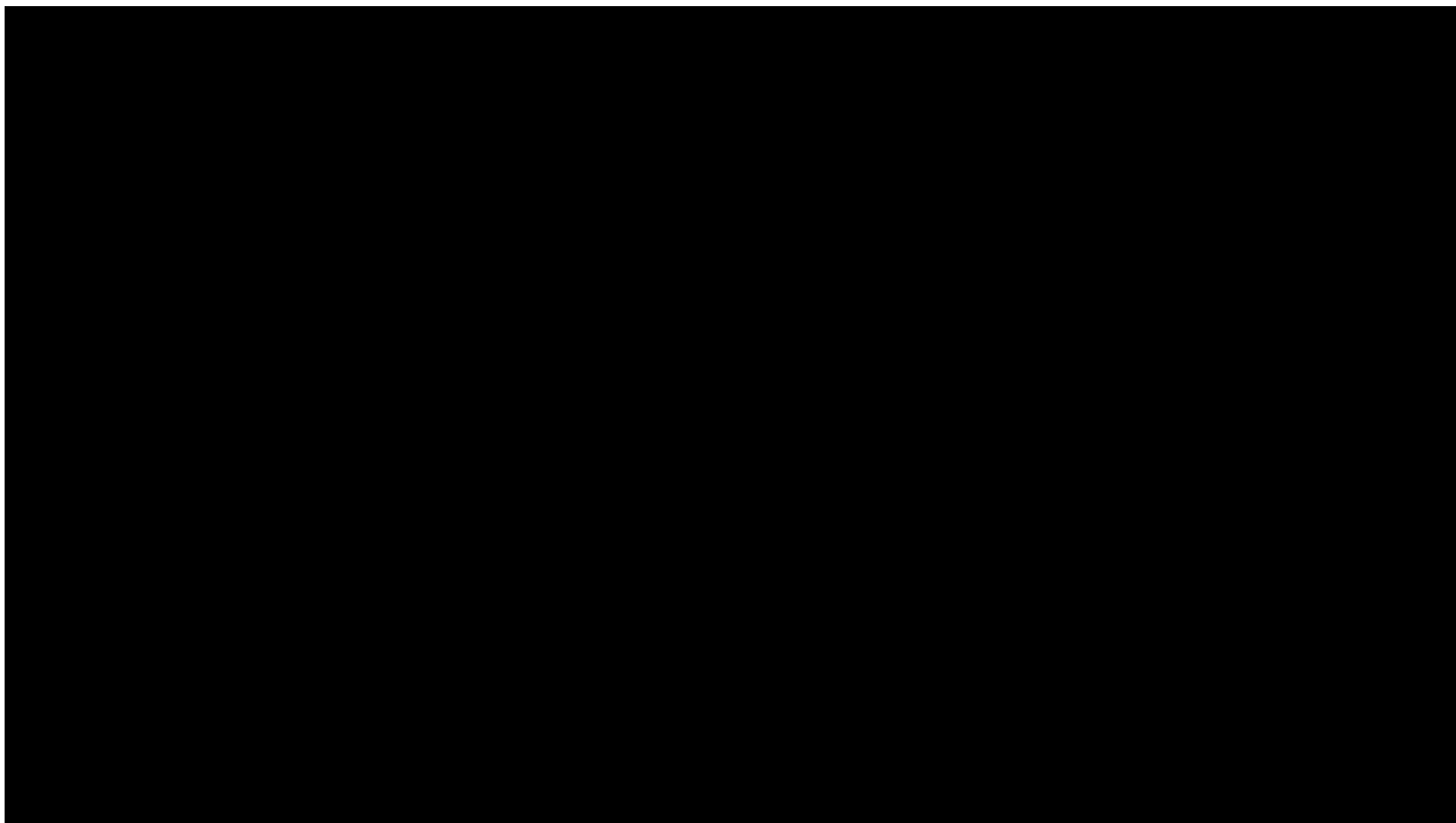
- Data for maintenance items
  - Preventative maintenance
  - Maintenance inspections
  - Site inspections
- Tasks define common items such as intervals and checklists
- Schedules define dates and assignees for the individual locations and assets
- Building Commissioning Data
- Excel format from Vendors for PM info

15 Items

AHU Annual PM

hvac x add category

associated tickets	associated tasks
None	None
Ensure hatches, covers, and doors are in place and properly fastened.	
Notify Control Room of unit Shutdown (coordinate with department leader prior to shutdown)	
Follow proper lock out tag out procedures	
Ensure unit Asset Tag number is correct and appropriately attached.	
Clean Fan wheel	
Clean Coils	
Blow out drain lines	
Lubricate bearings (if applicable)	
Inspect protective finish	
Lightly lubricate damper bushings and associated linkage (Ruskin- Back draft damper)	
Check fan housing condition for corrosion and penetrations.	
Remove lock out tag out devices	
Notify Control room of start-up and return unit to auto mode	
Check for excessive noise or vibration.	
Record Magnehelic reading	





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