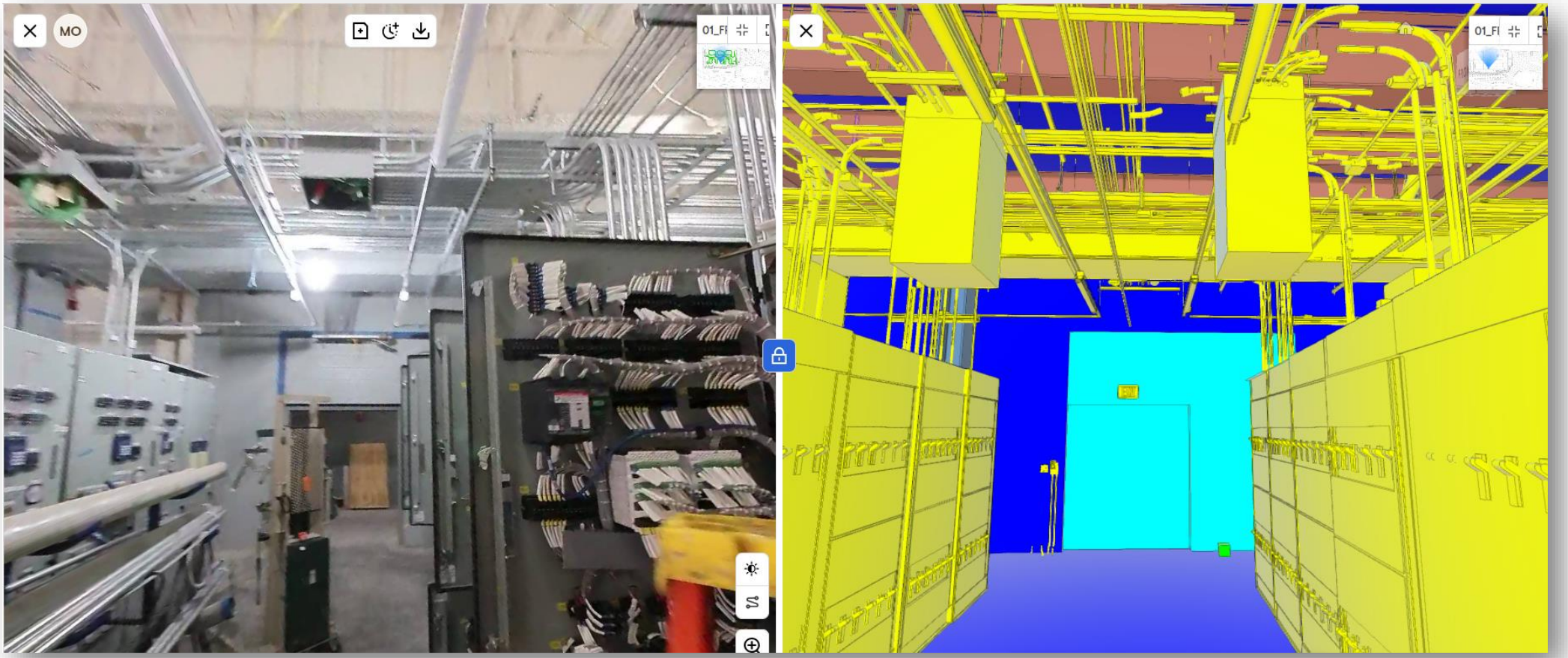
Leveraging BIM and Digital Twins for Enhanced Maintenance in Healthcare Facilities

SYSKA HENNESSY GROUP



Today's Presenters

Mike Ortega

Leigh Ann Vogel

PE, LEED AP BD+C

Brandon Hensen

PE, CPD

About Syska Hennessy Group

- Integrated Consulting + Engineering + Commissioning Firm Founded in 1928
- 599 Employees in 20 Offices Worldwide
- Ranked Among the Top Engineering Firms by E*NR, CSE, BD+C* and *EC+M*
- Specialized Healthcare Practice Area
- Leader in High-Performance Design
- Culture of Innovation and Award-Winning Engineering
- Early Adopter of BIM/3D Modeling and MEP Enhancements

Topics

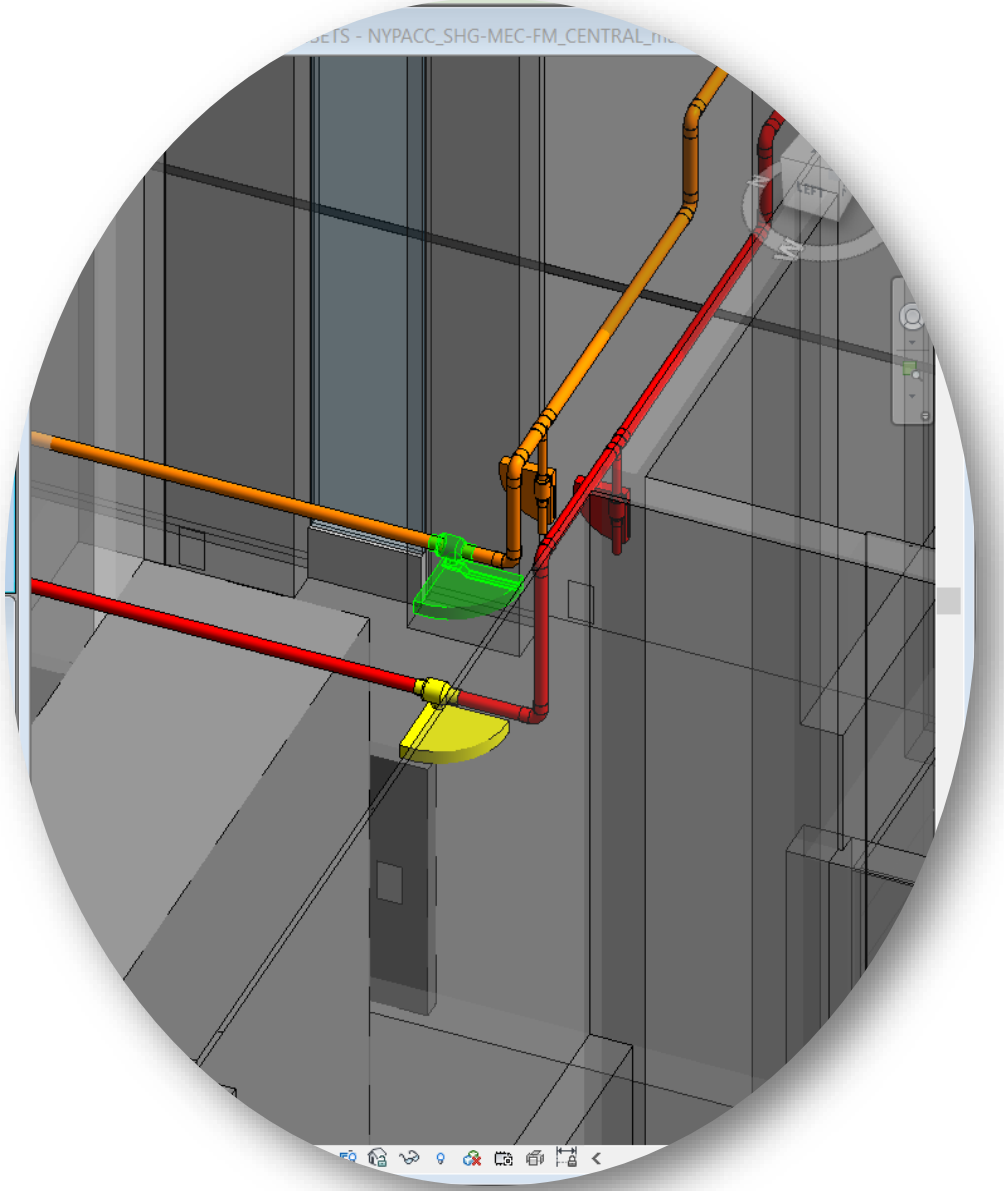
- Who's SHG?
- BIM / Digital Twin by Definition
- Benefits for Digital Twin
- Clients Wants vs Needs
- FM Needs
- Lessons Learned
- Digital Twin Providers

BIM…by definition

- Building Information Modeling (BIM)
- 3D model elements with parametric data representing AEC objects.
- Data rich 3D modeling that can be used for planning, design, construction, and operations.
- Model elements work with each other to allow for a collaborated design.

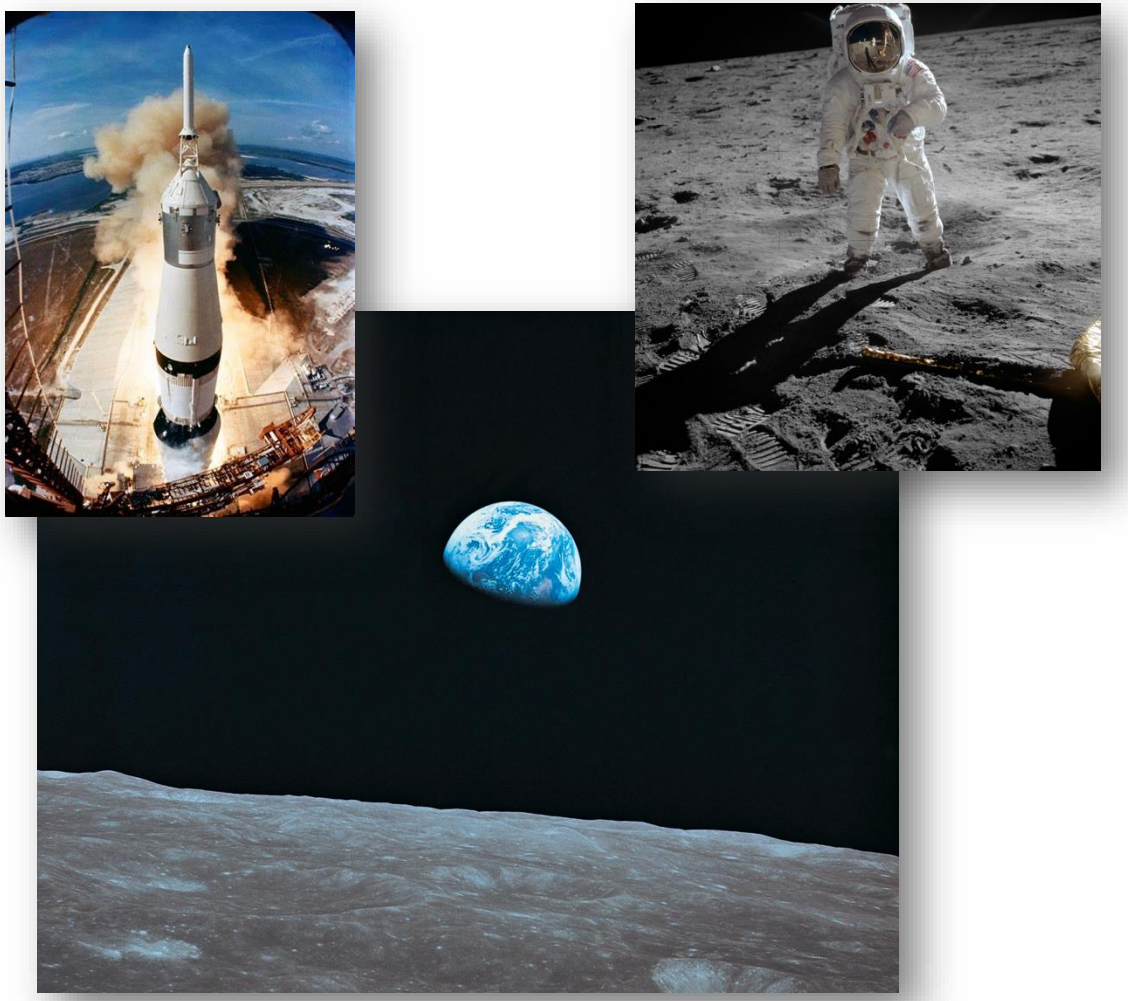
So, What's Digital Twin?

When you recreate the
physical world in a BIM model



Digital Twin…by definition

- NASA's John Vickers introduced a new term—"digital twin"—in 2010.
- NASA pioneered digital twin technology during its space exploration missions of the 1960s
- NASA took data from their missions, applied them to simulators to help predict and recommend solutions.



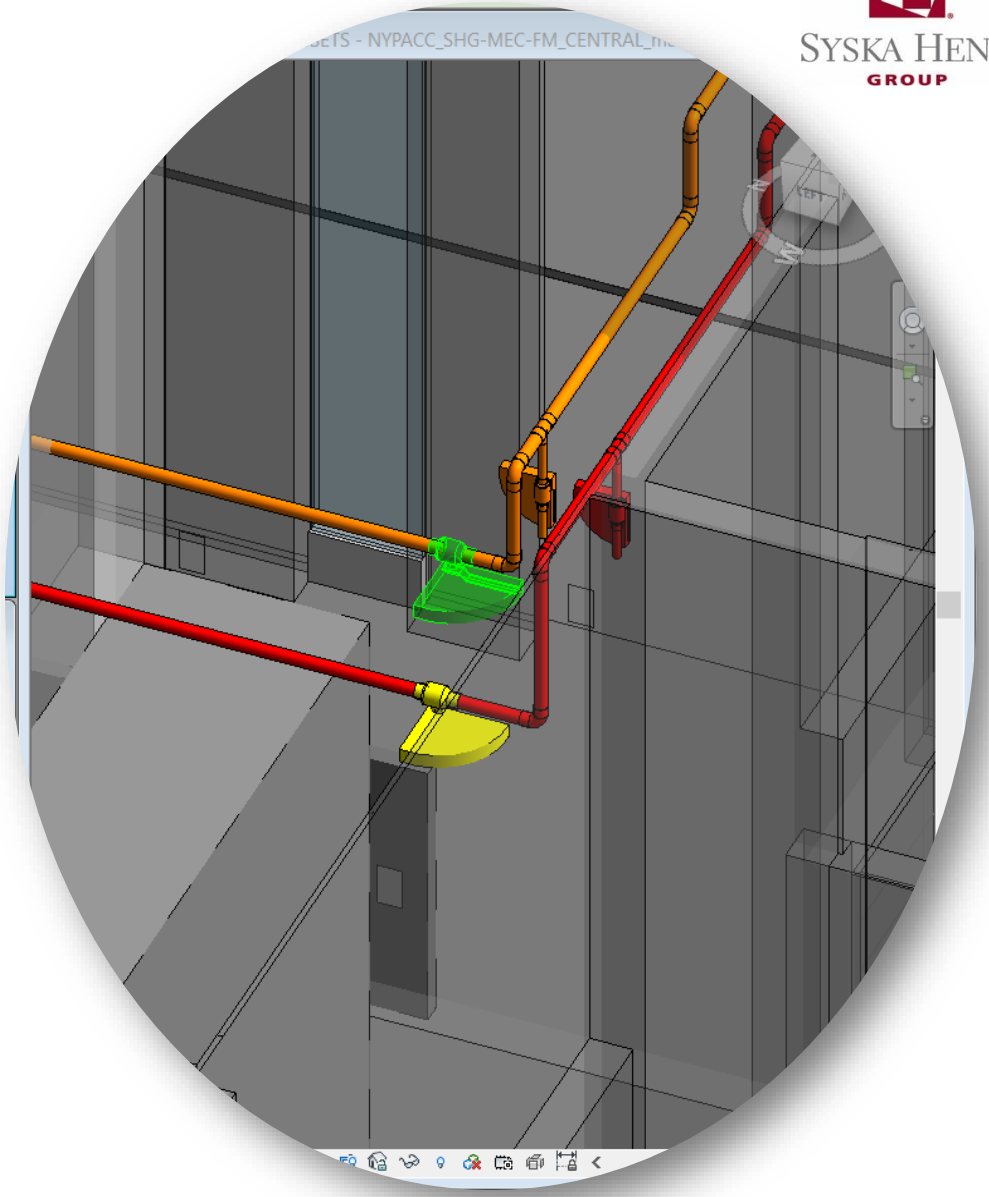
How is Digital Twin created?

Capturing tools:

- Point Cloud Scanning
- 360 Captures

What do you see here?

- Some see piping
- Some see a ball valve
- Some see the swing of the ball valve handle



How can it help me?

Capturing visual data

Capturing existing conditions throughout construction enhances coordination

Build the Twin…

Keep models true by adjusting critical equipment to match the installed condition

Benefits of BIM into Digital Twin…

Leverage models by standardizing informati on

Incorporate existing workflow data

Take models to next level by adjusting equipment to match as-builts

Benefits of BIM into Digital Twin…

Smart building platform enables owners to manage data to improve sustainability, operational performance, increase building value

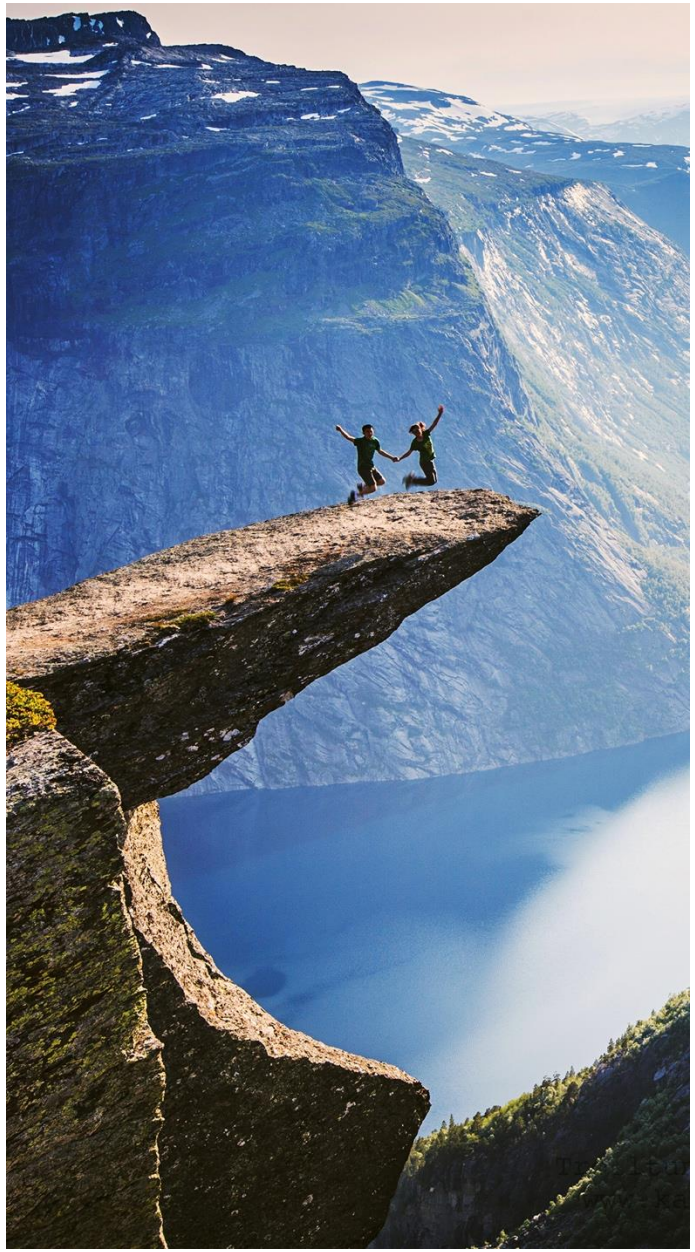
Data generated by a sensor can provide real time value

Client **Wants** vs Needs

- Initial request is everything and the…
  - Data for all Equipment/ Devices
  - Virtual Model showing every element (Arch, Struc, MEP, Interiors) as per Spec.
- Primary reasons for “Sky is the limit” request – Misunderstanding of wants vs needs
  - Acquiring and creating the data = $$$
  - Project timeline ≠ Demand

Client **Wants** vs Needs

- Data Rich model with equipment, devices, system, and furniture that is searchable by:
  - Bar Code
  - Design label
  - Level and Space (Room)
  - And more…
- Meet with the client and address actual needs.
  - Talk them off the ledge of endless data
  - Focus on what the facility management needs



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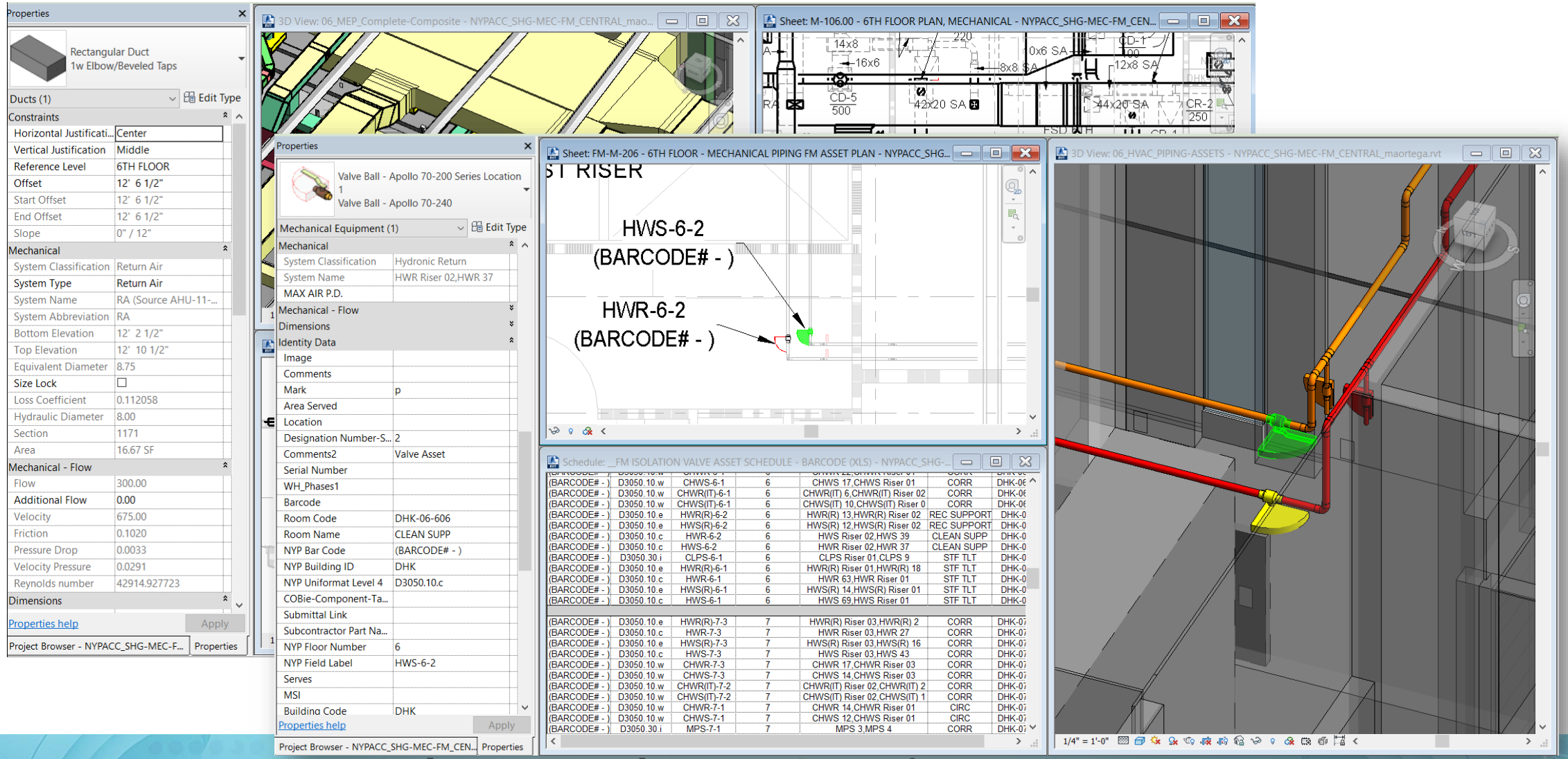
Facilities Management Needs

- Manageable data models to
  - List Assets
  - Predict potential issues
  - Track Issues
  - Can be used by CMS
- Visual representation
  - FM plans and diagrams
  - Adopt digital workflows

Facilities Management Needs



Facilities Management Needs

Asset Tagging FM Schedules/ Plans

__FM VAV UNIT SCHEDULE - BARCODE (XLS)

NYP Bar Code	NYP Uniformat Level 4	Design Label	NYP Floor Number	SERVICE	Room Name	F
(BARCODE# -)	D3050.50.d	VAV(S)-6-23	6	AHU-11-04	ELEV LOBBY	D
(BARCODE# -)	D3050.50.d	VAV(S)-6-24	6	AHU-11-04	REC	D
(BARCODE# -)	D3050.50.d					
(BARCODE# -)	D3050.50.d					
(BARCODE# -)	D3050.50.d					
(BARCODE# -)	D3050.50.d					
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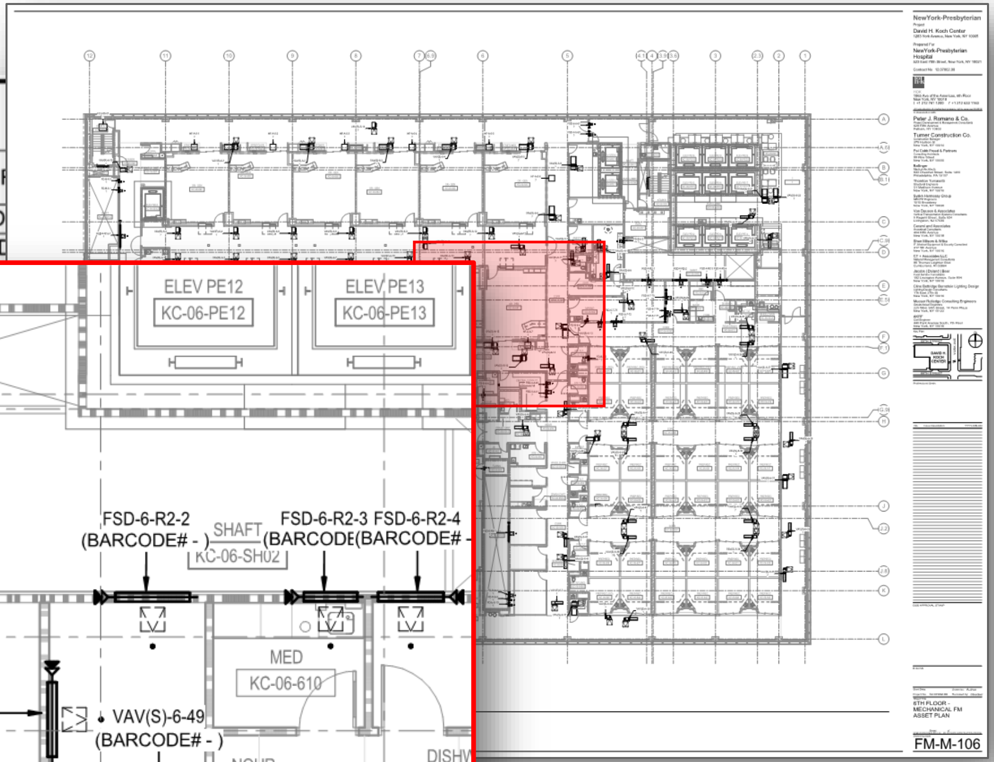
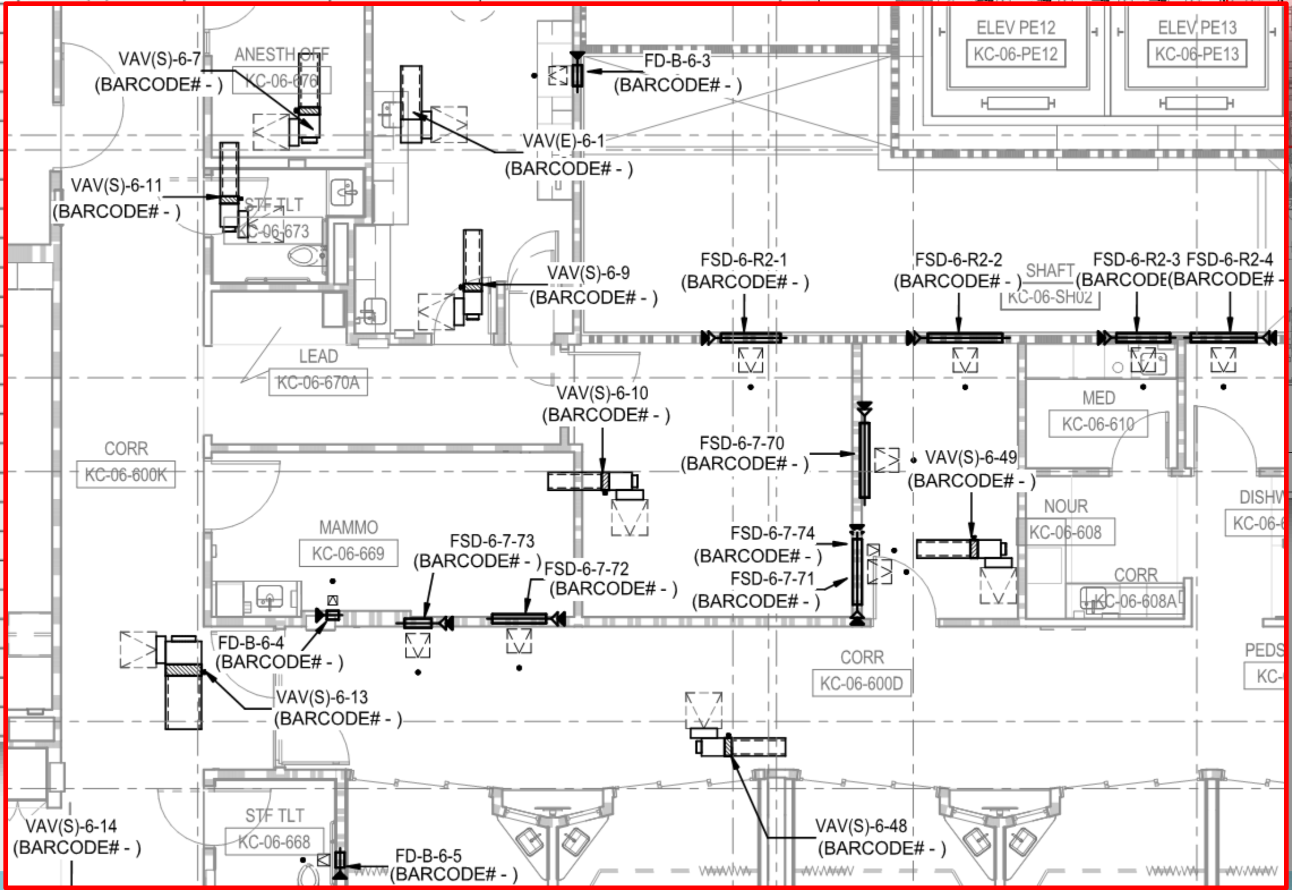




Facilities Management Needs

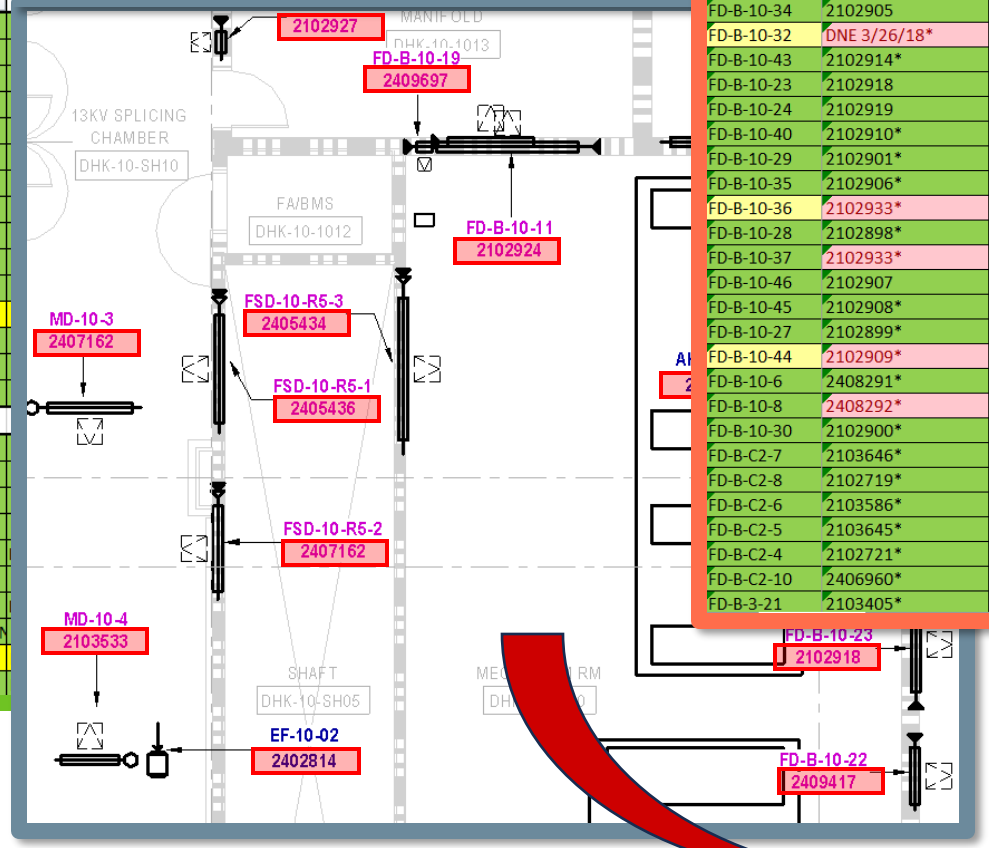
Barcoding Assets

Received Excel Spreadsheets

EM DUCT ACCESSORY SCHEDULE - BARCODE (XLS)

NYP Bar Code	NYP Uniformat	Design Label	NYP Floor Numbe	System Abbrevia	Room Name
2103556	D3050.60.a	FD-B-1-1	1	EA	FA/BMS
2103558	D3050.60.a	FD-B-1-2	1	SA	FA/BMS
2103532	D3050.60.a	FD-B-1-3	1	RA	FA/BMS
2103415	D3050.60.a	FD-B-1-4	1	EA	DRIVE AISLE
2103530	D3050.60.a	FD-B-1-5	1	EA	ELEC
2405314	D3050.60.a	FD-B-1-6	1		DRIVE AISLE VEST N
2405313	D3050.60.a	FD-B-1-7	1	SA	DRIVE AISLE VEST N
2405495	D3050.60.a	FD-B-1-8	1		DRIVE AISLE VEST S
2102736	D3050.60.a	FD-B-1-9	1	SA	DRIVE AISLE VEST S
2102731	D3050.60.a	FD-B-1-10	1	SA	DRIVE AISLE VEST S
2102732	D3050.60.a	FD-B-1-11	1		DRIVE AISLE VEST S
Not installed 3/25/18	D3050.60.a	FD-B-1-12	1	SA	DRIVE AISLE VEST S
2405402	D3050.60.a	FD-B-1-13	1		DRIVE AISLE VEST S
2102862	D3050.60.b	FSD-1-5-50	1	SA	68TH ST VEST
2102861	D3050.60.b	FSD-1-5-51	1	SA	STAIR CC
2405548	D3050.60.a	FD-B-1M-1	1M	EA	FIRE PUMP
2103544	D3050.60.a	FD-B-1M-2	1M	EA	FIRE PUMP
2103633	D3050.60.a	FD-B-1M-3	1M	EA	STAIR A
2103545	D3050.60.a	FD-B-1M-4	1M	EA	FIRE PUMP
2103550	D3050.60.a	FD-B-1M-5	1M	EA	CORR
2103546	D3050.60.a	FD-B-1M-6	1M	EA	SOIL LINEN HOLD
2103549	D3050.60.a	FD-B-1M-7	1M	EA	CORR
2405551	D3050.60.a	FD-B-1M-8	1M	EA	RASH STAGING/LOADIN
NOT READY 02.14.2018	D3050.60.a	FD-B-1M-9	1M		TRUCK BERTH
2405551	D3050.60.a	FD-B-1M-10	1M		TRUCK BERTH

Revit Model (Drawing Database)



Shared Excel Spreadsheet

Design ID	NYP Barcode	Asse	Asse	Asset Type		Ca	Bu	Fl	Room/ Area
New Assets									
FD-B-10-41	2102913*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1007A
FD-B-10-38	2102912*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1007B
FD-B-10-34	2102905	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1008A
FD-B-10-32	DNE 3/26/18*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1008A
FD-B-10-43	2102914*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1007A
FD-B-10-23	2102918	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1010
FD-B-10-24	2102919	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1010
FD-B-10-40	2102910*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1007A
FD-B-10-29	2102901*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1008B
FD-B-10-35	2102906*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1008A
FD-B-10-36	2102933*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1007
FD-B-10-28	2102898*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1008
FD-B-10-37	2102933*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1007
FD-B-10-46	2102907	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1006
FD-B-10-45	2102908*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1006
FD-B-10-27	2102899*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1008
FD-B-10-44	2102909*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1007
FD-B-10-6	2408291*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1014
FD-B-10-8	2408292*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1014
FD-B-10-30	2102900*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	10	DHK-10-1008B
FD-B-C2-7	2103646*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	C2	DHK-00-021
FD-B-C2-8	2102719*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	C2	DHK-00-000D
FD-B-C2-6	2103586*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	C2	DHK-00-000D
FD-B-C2-5	2103645*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	C2	DHK-00-019
FD-B-C2-4	2102721*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	C2	DHK-00-019
FD-B-C2-10	2406960*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	C2	DHK-00-021
FD-B-3-21	2103405*	DUCT	FIRE D	D3050.60.a	(DMP.FD) - DAMPER (FIRE)	WCI	DHK	3	DHK-03-300F

Lessons Learned

- Governance and Process Development:
  - Establish process for creating and managing BIM models.
  - Develop procedures that make BIM central to the project.
  - Update a single model from a controlled share site
  - Agree on Facility Assets that require maintenance / testing
- Our role as Third-Party Assistance:
  - Guide and implement the BIM process, including:
    - Creating LOD 500 models for operations and maintenance.
    - Codifying the BIM process and guidelines.
    - Managing BIM efforts through the shared site.

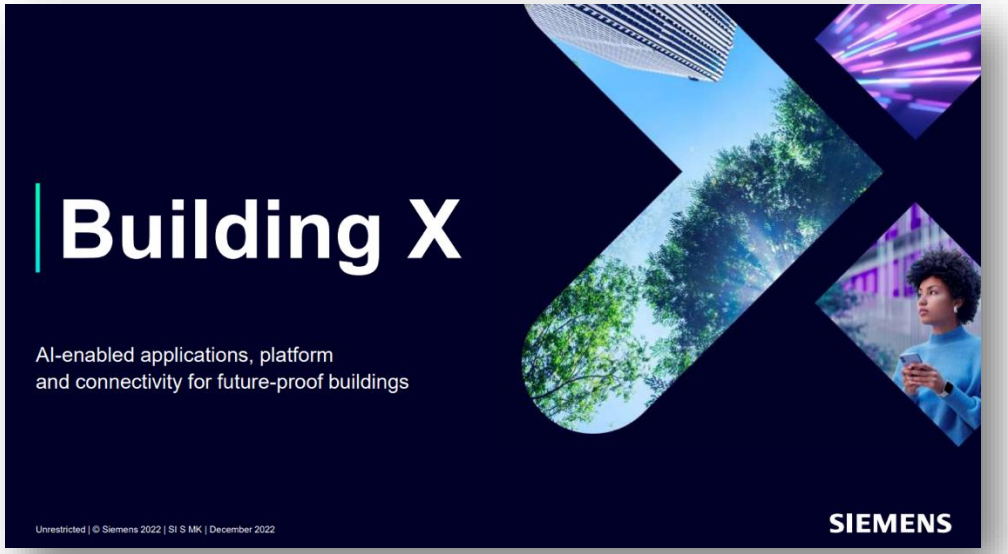
Lessons Learned

- Focus on coordination early to aid design and construction
- Invest in tools that allow facilities to provide constructive feedback

Lessons Learned

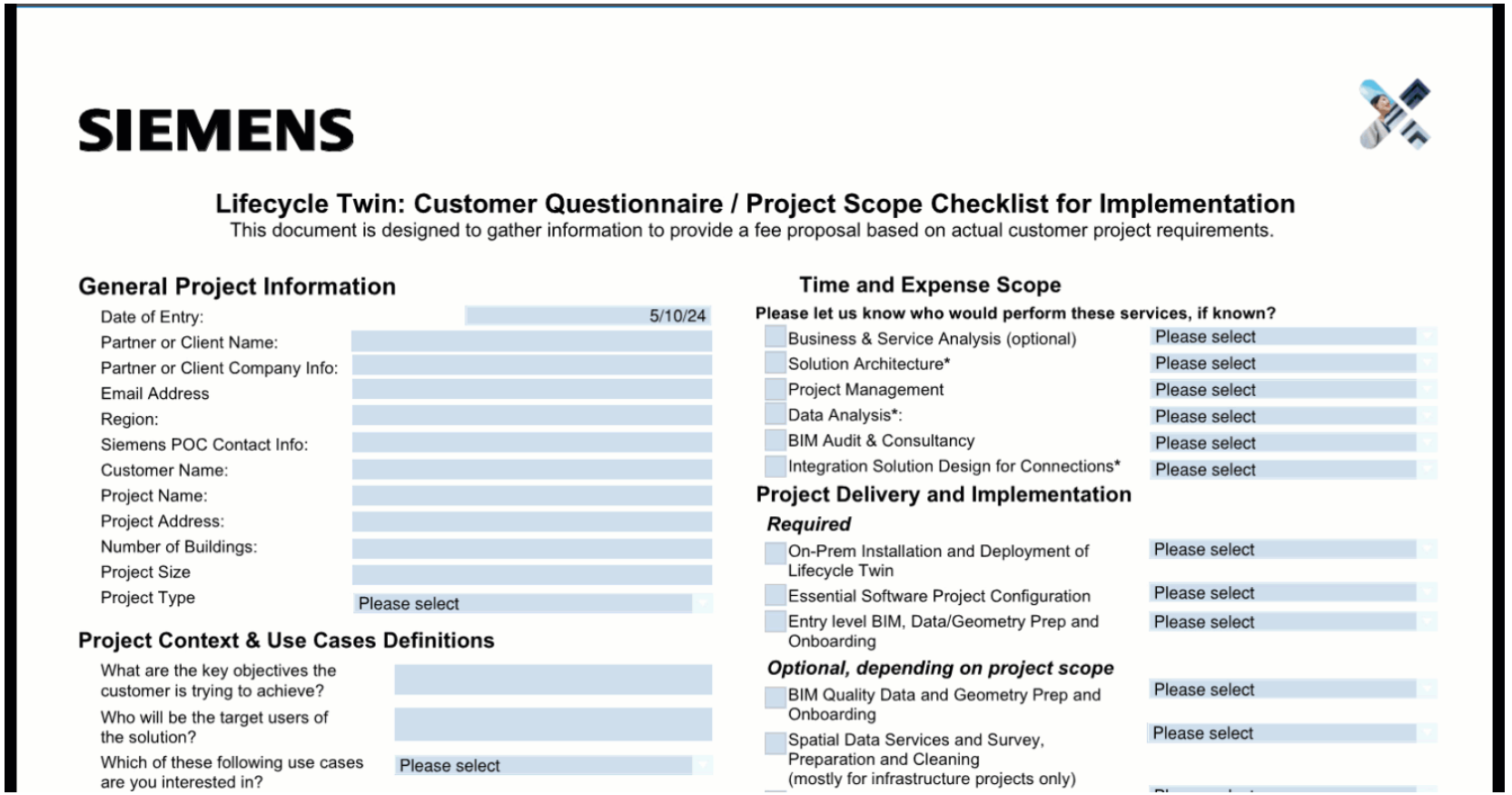
- Stay ahead of the project during CA using site capturing tools

Examples of Digital Twin Platforms



Digital Twin – Check Lists

- Digital Twin platforms Questionnaire to understand where FM is now and what where they would like to be



SIEMENS

Lifecycle Twin: Customer Questionnaire / Project Scope Checklist for Implementation

This document is designed to gather information to provide a fee proposal based on actual customer project requirements.

General Project Information

Date of Entry:	5/10/24
Partner or Client Name:	
Partner or Client Company Info:	
Email Address	
Region:	
Siemens POC Contact Info:	
Customer Name:	
Project Name:	
Project Address:	
Number of Buildings:	
Project Size	
Project Type	Please select

Project Context & Use Cases Definitions

What are the key objectives the customer is trying to achieve?	
Who will be the target users of the solution?	
Which of these following use cases are you interested in?	Please select

Time and Expense Scope

Please let us know who would perform these services, if known?

Business & Service Analysis (optional)	Please select
Solution Architecture*	Please select
Project Management	Please select
Data Analysis*:	Please select
BIM Audit & Consultancy	Please select
Integration Solution Design for Connections*	Please select

Project Delivery and Implementation

Required

On-Prem Installation and Deployment of Lifecycle Twin	Please select
Essential Software Project Configuration	Please select
Entry level BIM, Data/Geometry Prep and Onboarding	Please select

Optional, depending on project scope

BIM Quality Data and Geometry Prep and Onboarding	Please select
Spatial Data Services and Survey, Preparation and Cleaning (mostly for infrastructure projects only)	Please select

SHG Teamed with

SYSKA HENNESSY GROUP

Any Questions?

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Thank you!