Upgrading the Life-Support System for Your Facility

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Class summary

This class will explain how facility managers can change, upgrade, or possibly even create their own “cradle to cradle” facility documentation and management process. This will allow stakeholders to work together, and the facility manager or owner having the ability to take ownership of the process.

Key learning objectives

At the end of this class, you will be able to:

- Understand how the traditional design and coordination process can be blended and made more efficient.
- Learn how facility managers and staff can have ownership and management of their BIM process.
- Discover how workflow steps, over the entire lifecycle of the project, are reduced to enable faster project delivery.
- Understand how the BIM model and BIM data are transferred and managed in a post-construction environment.

“911, What’s Your Emergency?”

- Assess the Risk
- Rethink Your Processes
- Implement
- Cultivate, Nurture, and Preserve the Processes

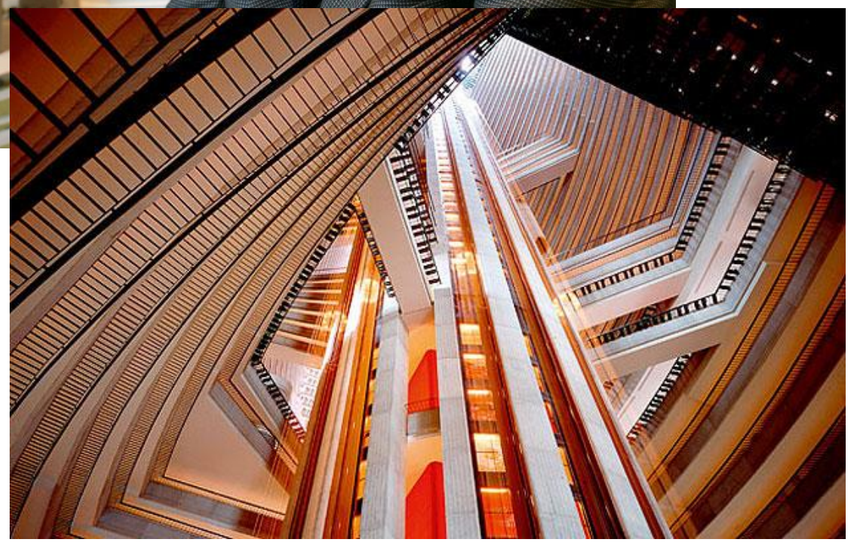
Assess the Risk

Assess the Risk

What every facility manager should know about BIM and facility management

- It is just as much about digital FM as it is about virtual construction
- Brings transparency of asset data
- Applies to all types of public and private sector type properties
- Project size does not matter
- Not all about technology, it is about process and collaboration
- Focus is the on total lifecycle of the building
- Facility managers have to think “outside the box”, and add staff that can allow them to take ownership of this new way of thinking

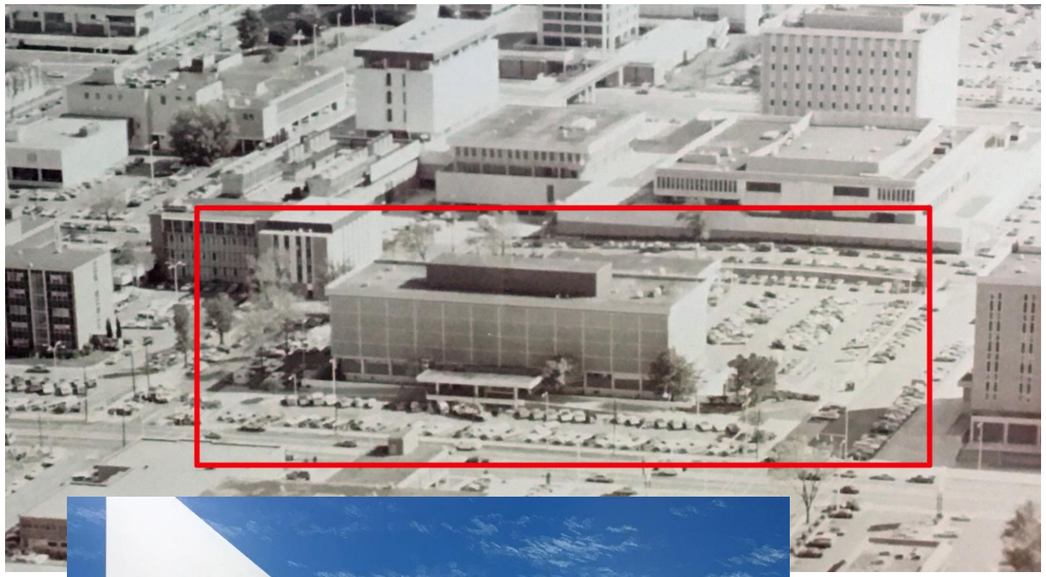
Assess the Risk – The Path to Change



"I came to the conclusion that I got to think beyond the isolated building, and think in terms of the city, and think in terms of the society and community, and I have got to make something that enhances life."

John Portman, AIA
Life of a Building

Assess the Risk – The Path to Change



Quick Facts about Children's of Alabama

- Founded in 1911
- 100 bed facility built in 1965
- 1980 largest expansion $24.5 million
- 1980 – 1989 several expansions
- 1989 major hospital vertical expansion -225 beds
- 1991 Ambulatory Care Center

Assess the Risk – The Path to Change

Quick Facts about Children's of Alabama

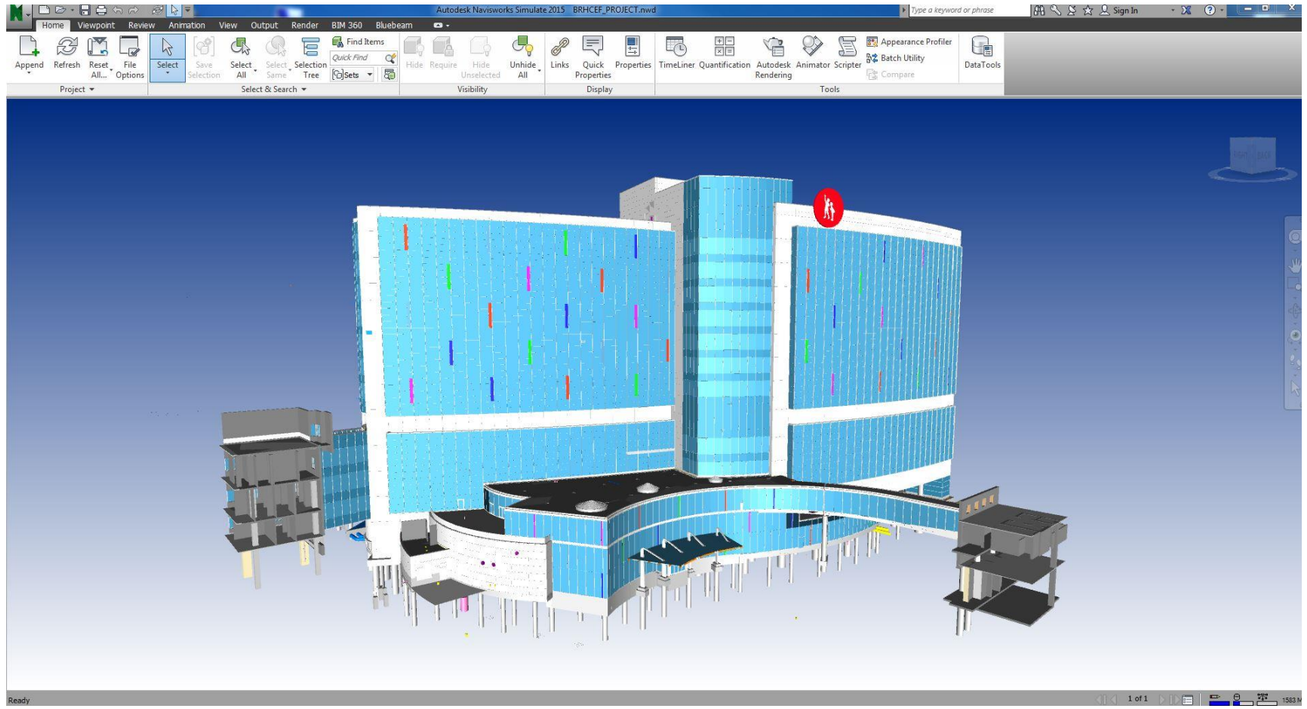
- 1998 Park Place North & South Parking Deck & Outpatient Clinics
- 2000 Children's Harbor Family Resource Center & Research Labs
- Children's South Outpatient Center
- 16 Satellite Clinics throughout Alabama

Assess the Risk – The Path to Change

2008 – Keeping Promises Campaign

- $400 million dollar construction
- 12 story building
- 760,000 square feet – largest medical facility expansion in the history of Alabama
- 332 bed facility plus 48 NICU bassinets
- Level 1 Trauma Center
- Leed Gold Certified
- Third largest pediatric hospital in US

Assess the Risk – The Path to Change

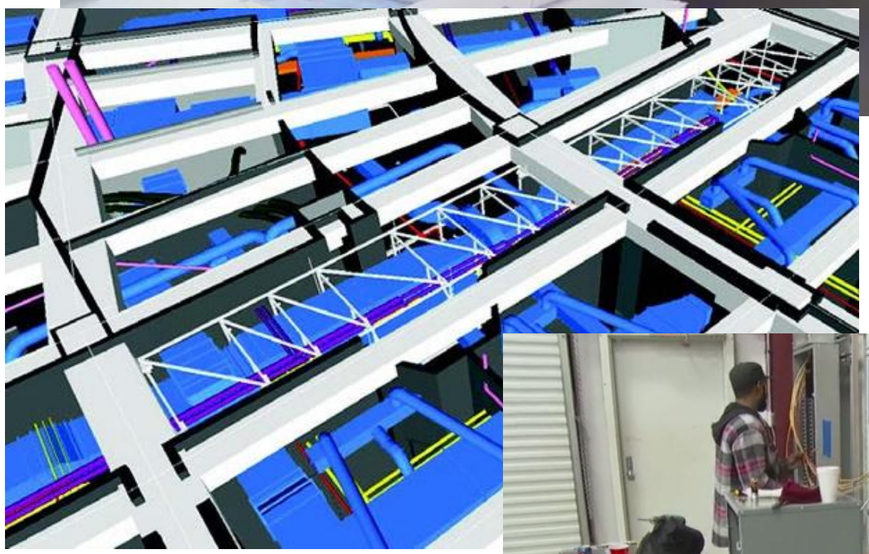


Benjamin Russell Building

Brought the introduction of BIM and Collaboration to Children's

- Owner
- Dual Architectural Firms
- Engineering Firms
- Program Manager
- Construction Managers
- Contractor
- Subcontractor

Assess the Risk – The Path to Change



Collaboration Results:

- 2.8 million hours of coordinated man hours
- 6 months of Pre-Construction
- 3 Year Construction
- Lean Building Methods
- Pre-Assembled Components
- $1.5 million dollars saved on plumbing costs alone

Assess the Risk – The Path to Change

Sustainable Sites

Native Plant Selections
Preferred Park for Fuel Efficient Cars
Green Roofs
Bike Sharing Programs

Environmental Impact

- Our 30,000 Square Feet of green roofs are the size of 6 Bartow Arena basketball courts and saves enough in utility costs to buy 2,000 basketballs each year.

Assess the Risk – The Path to Change

Water Efficiency

Low Flow Plumbing Fixtures
Cooling System Water Reuse
Drought Tolerant Landscaping

Environmental Impact

- We reduced our annual water usage by 2,600,000 gallons which is enough to fill the peach water tower in Clanton Alabama 5 times.

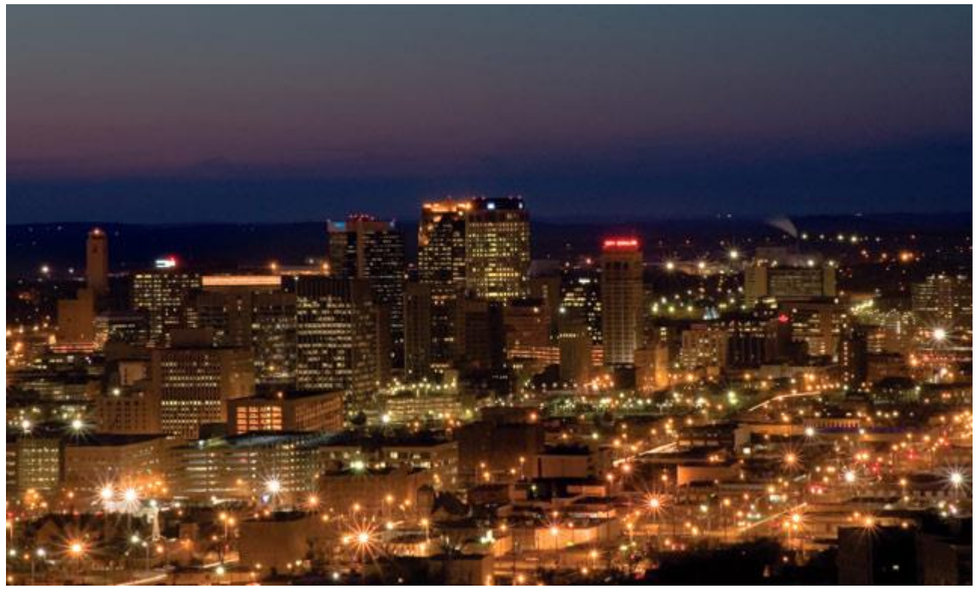
Assess the Risk – The Path to Change

Energy & Atmosphere

High Energy Mechanical Equipment
High Performance Glass
Energy Efficient Light Fixtures

Environmental Impact

- The Benjamin Russell hospital is 29% more efficient than a typical hospital, and the energy saved could power 315 homes in Birmingham for an entire year.



Assess the Risk – The Path to Change

Materials & Resources

Local Building Products
Recycled Building Products
Renewable Materials
Construction Waste Recycling

Environmental Impact

- While building the Benjamin Russell building 18,000 tons of construction waste was diverted from landfills that equals about 1,500 dump truck loads. If you stacked the trucks on top of each other, the truck stack is 40 times taller than the Saturn V Rocket in Huntsville.

Assess the Risk – The Path to Change

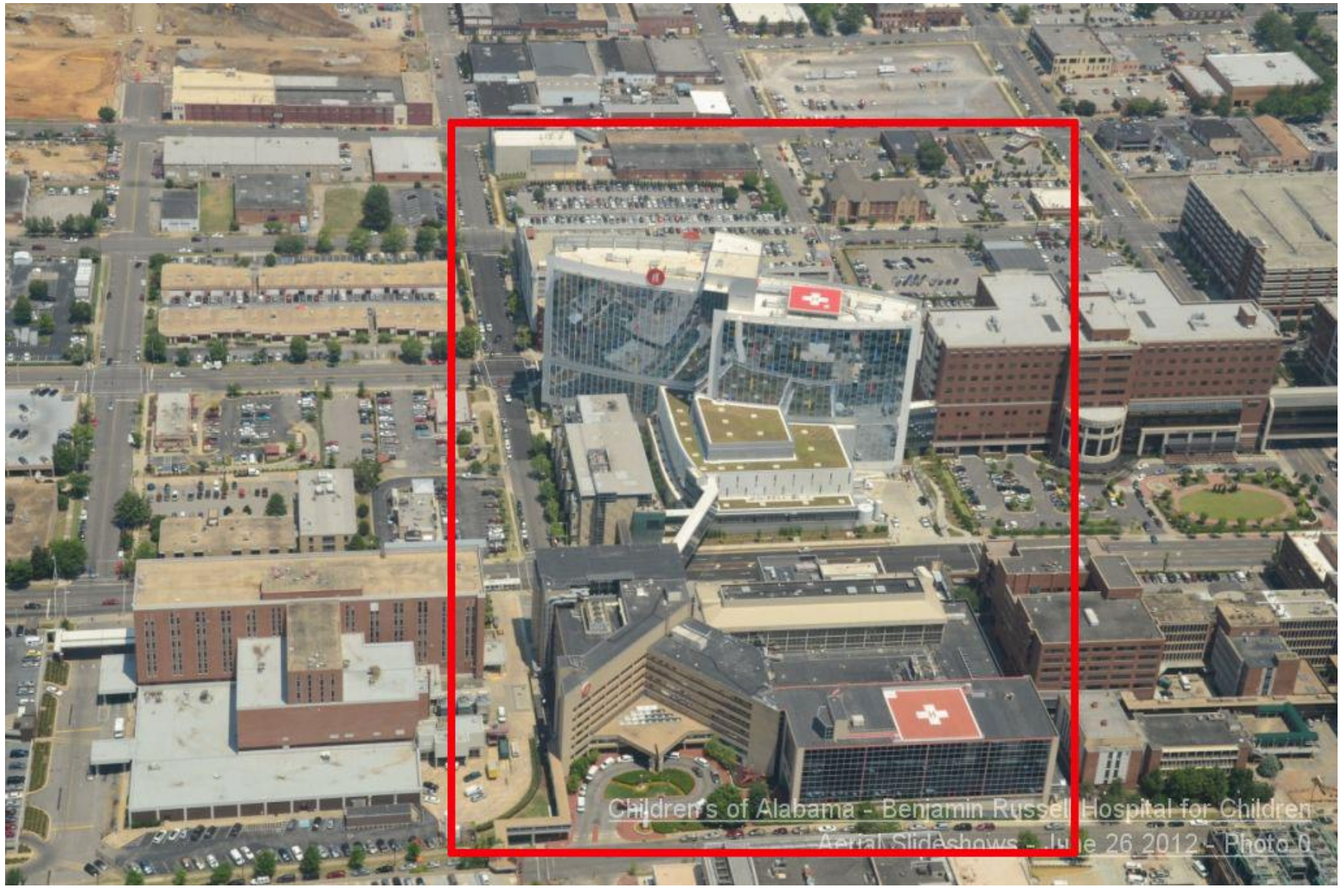
Indoor Environmental Quality

LOW VOC Materials
Natural Light
Lighting and Thermal Controls

Environmental Impact

- Our Green Cleaning Program eliminates approximately 200,000 gallons of water each year to fill 1,600,000 water bottles.

Assess the Risk – The Path to Change



Net Results

- 2.1 million square feet
- 7 Buildings
- 4 City Blocks
- 50 years of Facility Data

Assess the Risk – The Path to Change

Adaptive Reuse Project

- 600,000 + Square Feet
- 3 Buildings with approximately 25 various renovations or additions
- Transition from specialized inpatient care units and suites to outpatient clinic and hospital support spaces
- Create full BIM & FM Process

Assess the Risk - How are You Doing Really?

- Services were being duplicated
- Current processes were too complicated and archaic
- Lack of communication
- As-Built Information incorrect, missing, or non-existent
- Data on facility not being maintained

Assess the Risk - You are always in a Season

What season is your facility in?

- Growth
- Consolidation
- Transition
- Malaise
- Reinvention

“Most facility managers neglect to let their stakeholders know what season they are in when trying to make a change.”

Assess the Risk - Dangers of Incrementalism

Be specific and communicate with your stakeholders the true assessment of your current facility management and collaboration processes.

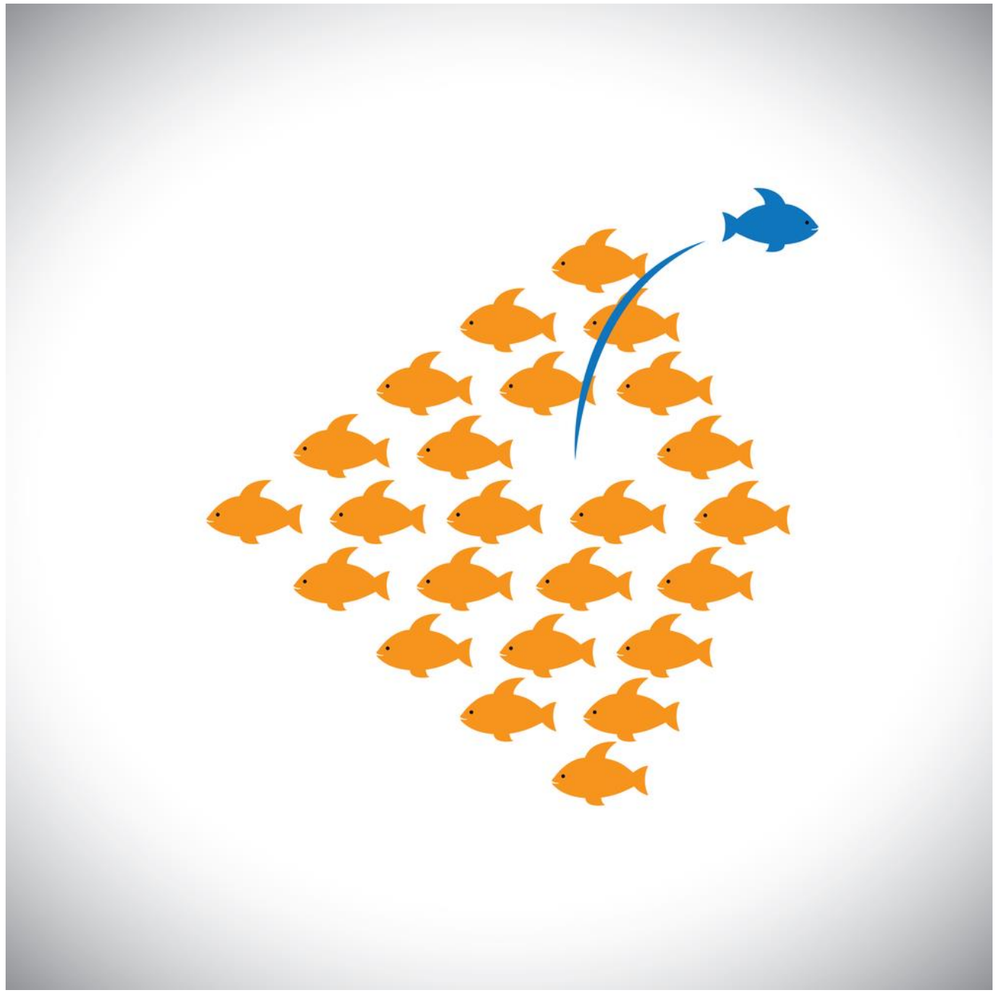
Incremental Thinking
+Incremental Planning
+Incremental Outcomes
Kiss of Death for your FM Collaboration

Assess the Risk – Make the Big Ask!

Leadership is a lot about asking. Share your vision with the following framework:

- Direct the Rider
- Motivate the Elephant
- Shape the Path

Assess the Risk – Bold Move



"You never take big hills without making bold moves"

- Rethink your processes
- Test and Balance
- Prepare for Implementation

Incrementalism and innovation make terrible bed fellows. Make a few bold moves, or you'll breathe your last facility documentation management breathe far too soon.

Rethink your Processes

Rethink your Processes – Know Who's Driving

As you begin to rethink your processes you must ask the critical question:

Who is going to be driving this change and take control of the processes?

- Facility & Maintenance Team
- Facility Documentation Manager
- Third Party hired by Owner

Rethink your Processes – Know Who's Driving

Standard Code of Ethics Thinking

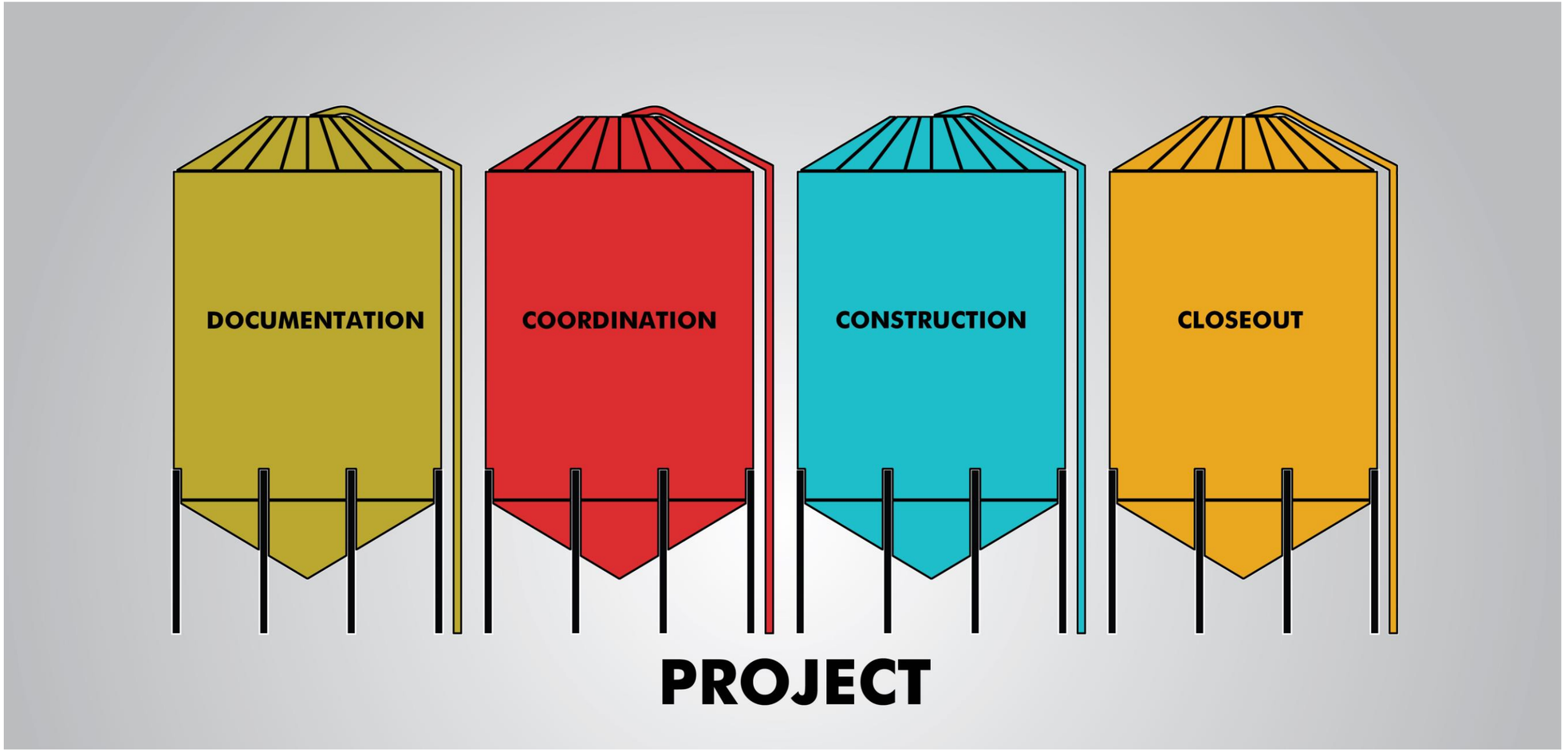
Rethink your Processes

When rethinking your processes…..

“Rain is a good thing”

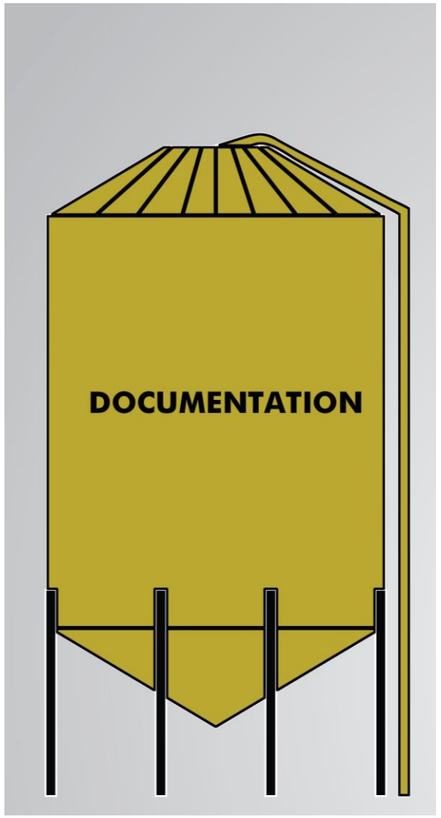
Changing your processes is a good thing

Rethink your Processes – Know Who's Driving



Typical Design-Bid-Build Model

Rethink your Processes – Know Who's Driving



Documentation Silo

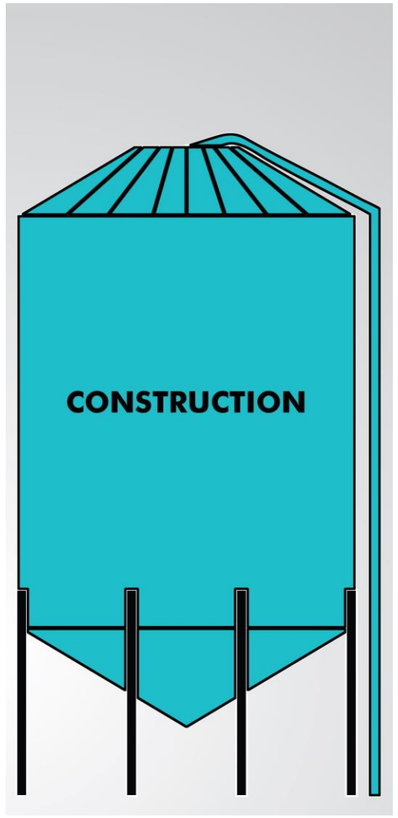
- Typical the Architect hired by the owner
- Architect selects engineering team typically
- "Filtered" information back to the owner: Schematic Design, Design Development, Construction Documents

Rethink your Processes – Know Who's Driving

Coordination Silo

- Exchanging of design information and ideas about the project
- Most overlooked and mismanaged phase of the project "Field Verify" "NIC" "OFCI"

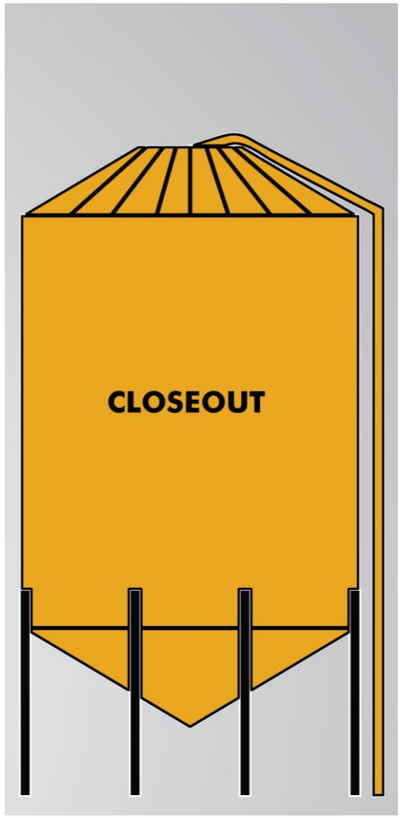
Rethink your Processes – Know Who's Driving



Construction Silo

- Architect and Engineers typical handle Construction and Construction Administration
- Owner or Facility Manager minimally engaged until project completion.

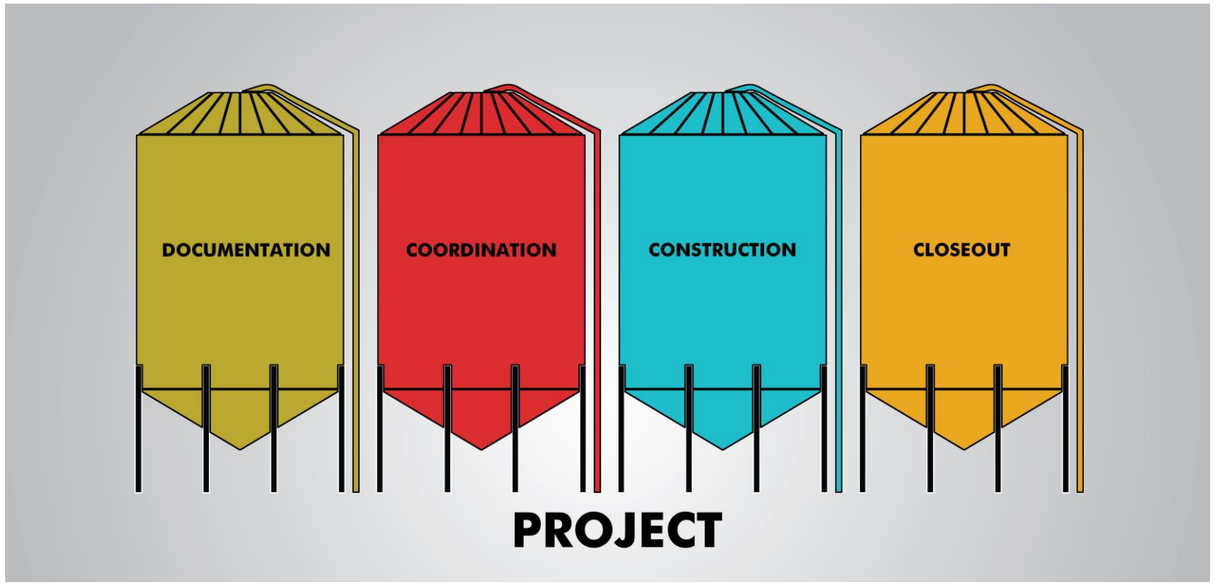
Rethink your Processes – Know Who's Driving



Closeout Silo

- Exchanging of design information and ideas about the project
- Most overlooked and mismanaged phase of the project "Field Verify" "NIC" "OFCI"
- Closeouts often are incomplete and not checked or verified.

Rethink your Processes – Know Who's Driving



Pros

- Competitive Pricing on Projects
- Project Delivery method has proven to be successful for lots of owners and groups.
- Can be adapted to work in a FM Documentation Management Program

Cons

- Owner / facility manager typically not involved in all phases.
- Can potentially complicate the project team leadership or lead to duplication of services

Rethink your Processes – Know Who's Driving

Design-Build Model or Cradle to Cradle

Rethink your Processes – Know Who's Driving

Optimization

- Documentation process streamlined
- Facility Manager distributes "As-Built" Master Models to Design Teams
- Stakeholders follow and use facility designed BIM families, utilize facility guidelines and standards
- Allows for a "quicker" startup of the project, reduces project design schedules potentially

Rethink your Processes – Know Who's Driving

Connection

- Facility Manager is head of the coordination effort, and is actively working with all stakeholders to ensure that information is being communicated timely and properly
- See real time project status anytime
- Communicate changes to all stakeholders "on the fly" immediately and with instant notification

Rethink your Processes – Know Who's Driving

Delivery

- Traditional Construction is focused in this phase.
- Facility Manager leads all stakeholders in looking at methods to streamline the construction process and make it more efficient.
- Facility Manager reviews BIM models and data to ensure that model integrity is being made.
- Traditional closeouts are incorporated into this phase.

Rethink your Processes – Know Who's Driving

Assets

- Design Team and Contractor are finished as stakeholders in the project.
- The BIM model and datasets are placed back into the Master Model and maintained as changes occur.
- Staff is updated on changes to Master BIM model, project data is reviewed, training and education on systems and products is done.

Rethink your Processes – Know Who's Driving

Design-Build Model or Cradle to Cradle

Pros

- Streamline the Process
- Avoid Duplication of Services
- Receive a more comprehensive and coordinated deliverable
- Reduce potential change orders
- Control of your entire process

Cons

- Owner has to be active and take lead in this method.
- Lose competitive pricing model with General Contractor

Implement the Plan

Implement the Plan – Direct the Rider

- Setting up the new processes
- Deployment of Facility Documentation Management Guidelines
- Creation of master BIM models
- Creation of master BIM families
- Development of your facility documentation management communication programs

Implement the Plan – Motivate the Elephant

- Educate your stakeholders
- Test and Balance each process before implementation and work out as many “bugs” as possible.
- Encourage your stakeholders as they begin this new process that it is for the greater good of the facility.

Implement the Plan – Shape the Path

Words of Wisdom

- Be accessible to all stakeholders as the present issues that need to be addressed.
- Be ready to test, modify, and change often.
- Stay consistent and update all polices and guidelines at a minimum of yearly. Every six months is ideal.

Implement the Plan

Facility Documentation Manual

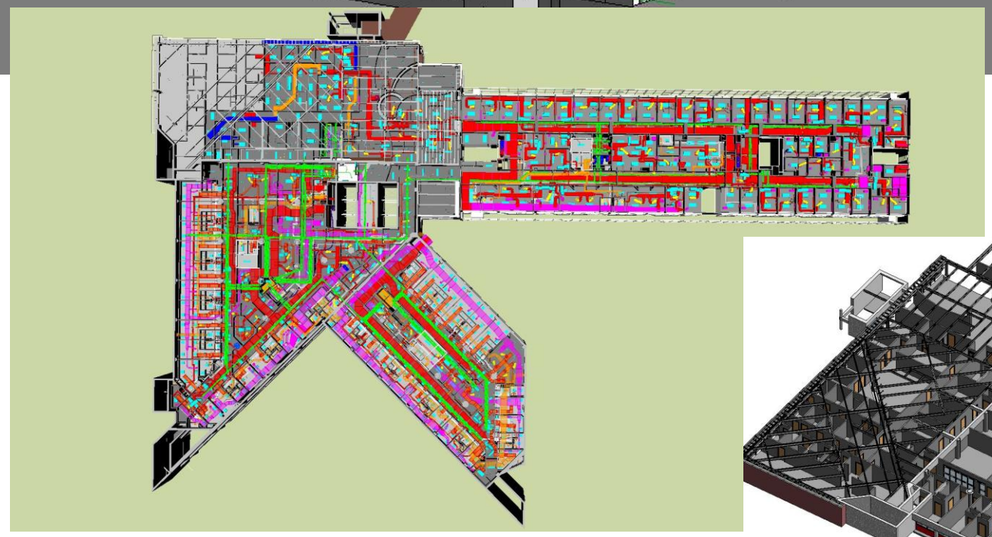
- Covers the entire “cradle to cradle” process
- Allows for continuity on all projects
- Maintained and developed by Facility Manager / Owner

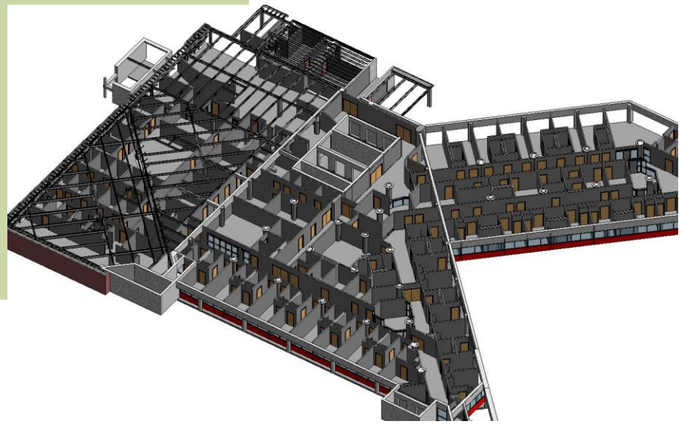
Implement the Plan

Facility Documentation Manual

- Overview
- Project Development
- Project Development and BIM
- BIM
- Level of Development
- BIM Families
- Standard Room Sizes
- COA Construction Communication Software
- A360
- Navisworks
- Alabama Department of Public Health Submission Guidelines
- Local Building Code Submission Guidelines
- Existing Facilities Inventory
- Campus Master Plan Phasing and Vacancy Plans
- Project Closeout Procedures
- Shared Parameters

Implement the Plan

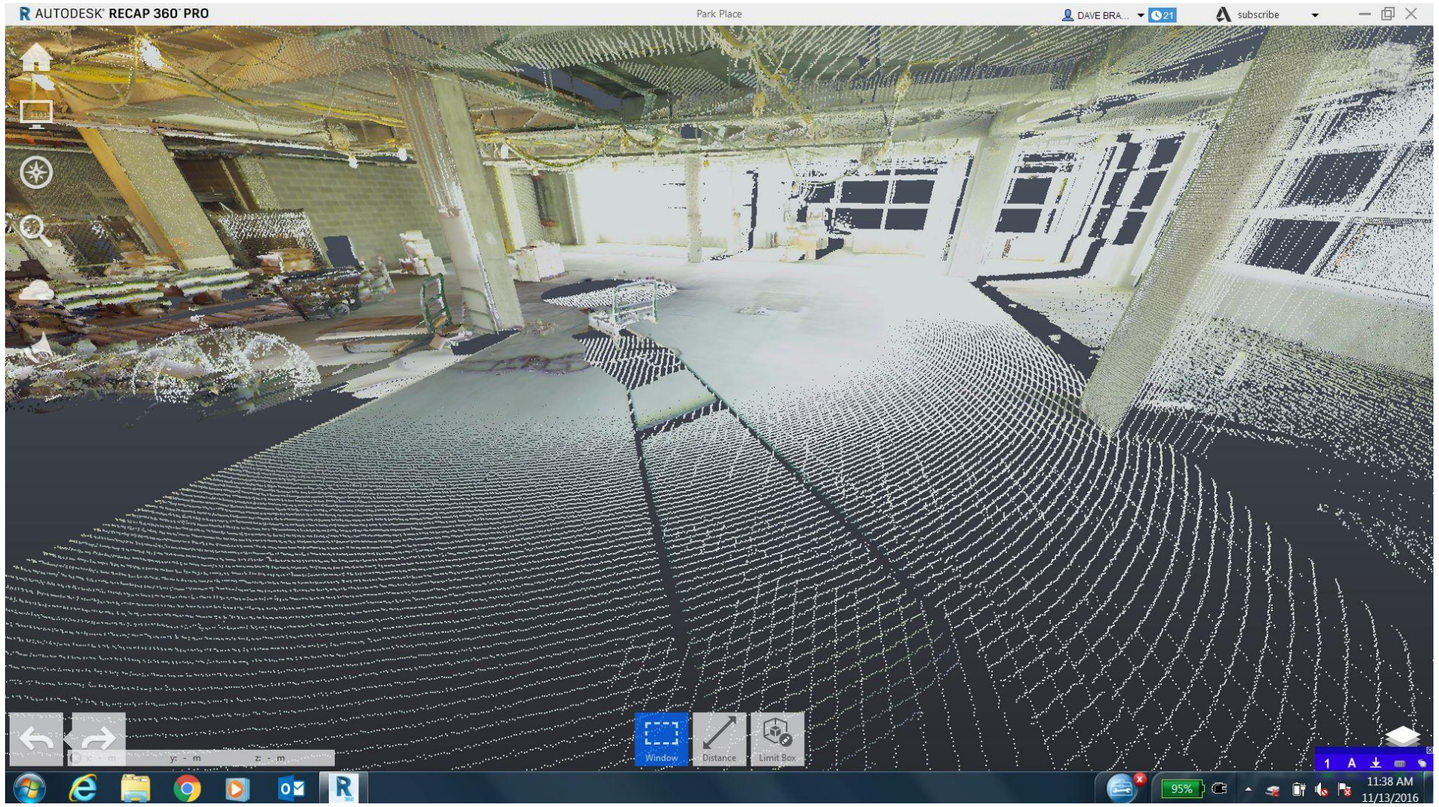




Master BIM Models

- Create Master BIM Models of each of your buildings that you maintain
- Create Master BIM Models so that they can be opened and worked on in a fast and efficient method.
- Do not build entire Master BIM model in one file.

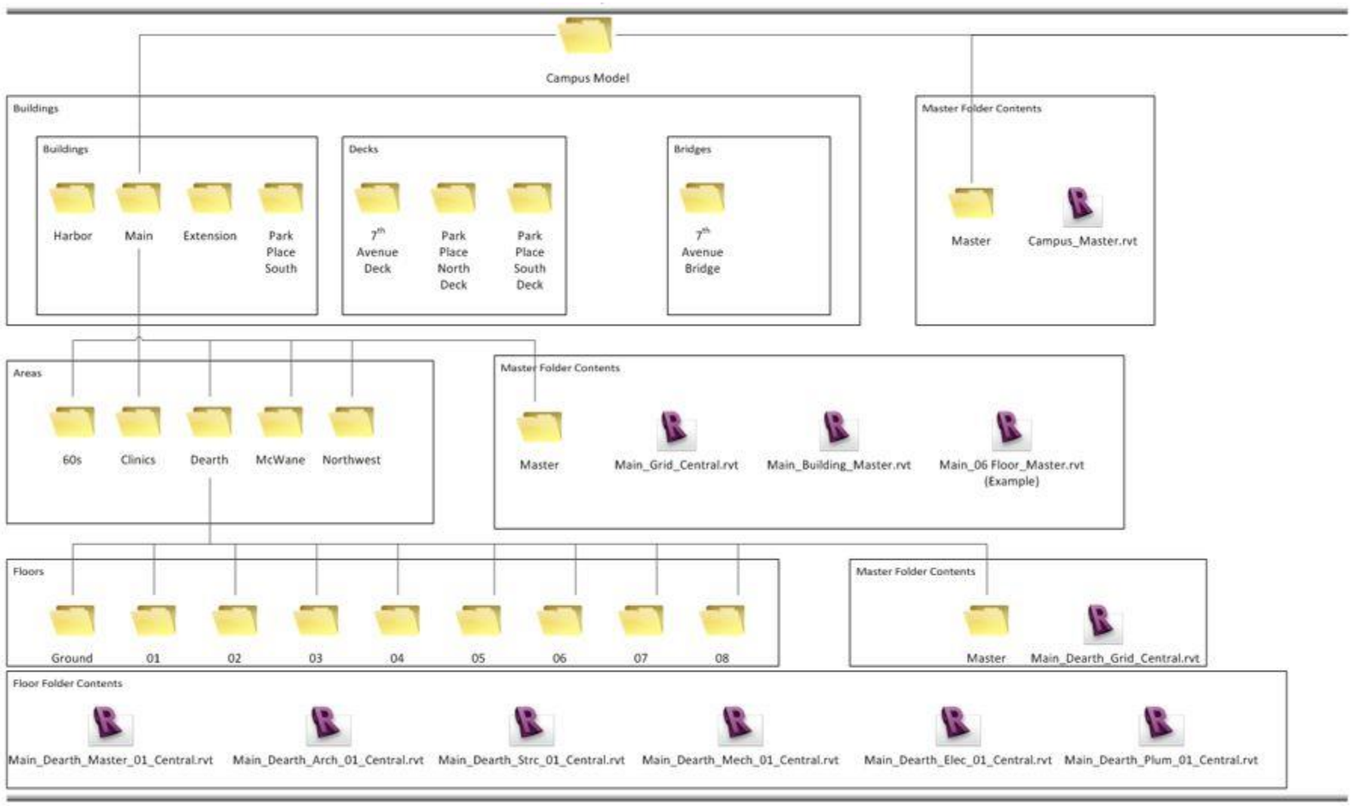
Implement the Plan



Laser Scanning

- Laser scanning allows you to capture the true As-Built “snap shot” of your existing conditions.
- Utilized for master BIM modeling, construction coordination, and final as-built documentation.

Implement the Plan



Master BIM Model File Structure Organization

- Create a structure of how stakeholders should access and setup the Master BIM files.
- Link portions of the model together to create project model and also Master BIM models.
  - Structural Model
  - Interior Model
  - Exterior Model

Implement the Plan

TASK	COA BIM MGR	Arch	Mech Eng.	Elec. Eng.	Struc. Eng.	Fire Protec	Cont. BIM Mgr.	Cont Sub BIM
Children's Master Model of all Facilities	X							
Laser Scanning of all Children's properties and projects	X							
Master Family Library development, review, and maintenance	X							
Project Redbook development and update	X							
Project As-Built Model Preparation, Development & Distribution	X							
Project As-Built Model Verification	X	X	X	X	X	X	X	
Design Model - Architectural	X	X					X	
Design Model - Mechanical & Plumbing	X	X	X				X	
Design Model - Electrical	X	X		X			X	
Design Model - Structural	X	X			X		X	
Design Model - Fire Protection	X	X	X			X	X	
Design Model Coordination & Review	X	X	X	X	X	X	X	
Design Model Clash Detection	X						X	
Design Model Redbook Review	X						X	
Design Model Redbook Corrections	X	X	X	X	X	X	X	
Design Model Coordination between Contractor(s)	X						X	
Design Model Family Creation	X	X	X	X	X	X	X	
Design Model Family Creation review	X						X	
ADPH Submittal	X	X	X	X	X	X	X	
City of Birmingham Submittal	X	X	X	X	X	X	X	
ADPH Comments incoporated and coordinated with Design Model	X	X	X	X	X	X	X	
City of Birmingham Comments incoporated and coordinated with Design Model	X	X	X	X	X	X	X	
Design BIM to Construction BIM Kickoff Meeting	X	X	X	X	X	X	X	X
Construction Model - Architectural As-Built	X	X					X	
Construction Model - Electrical As-Built	X			X			X	
Construction Model - Mechanical & Plumbing As-Built	X		X				X	
Construction Model - Structural As-Built	X				X		X	
Construction Model - Fire Protection As-Built	X					X	X	
Construction Model Coordination Meetings with Subcontractors	X						X	X
Construction Sub-Contractor Navisworks Models	X						X	X
Construction Submittals for Master Model Review	X						X	
Construction Submittal Digital Preparation for Master Model	X						X	
Project Model Closeout Review Meeting	X	X	X	X	X	X	X	X
Project Closeout - Architectural	X	X					X	X
Project Closeout - Mechanical & Plumbing	X		X				X	X
Project Closeout - Electrical	X			X			X	X
Project Closeout - Structural	X				X		X	X
Project Closeout - Fire Protection	X					X	X	X
Project Closeout - Navisworks Coordination Models	X						X	X
Project BIM Closeout	X						X	
Project BIM Closeout to Master Model	X							
Master Model Update	X							

LEAD

SECONDARY

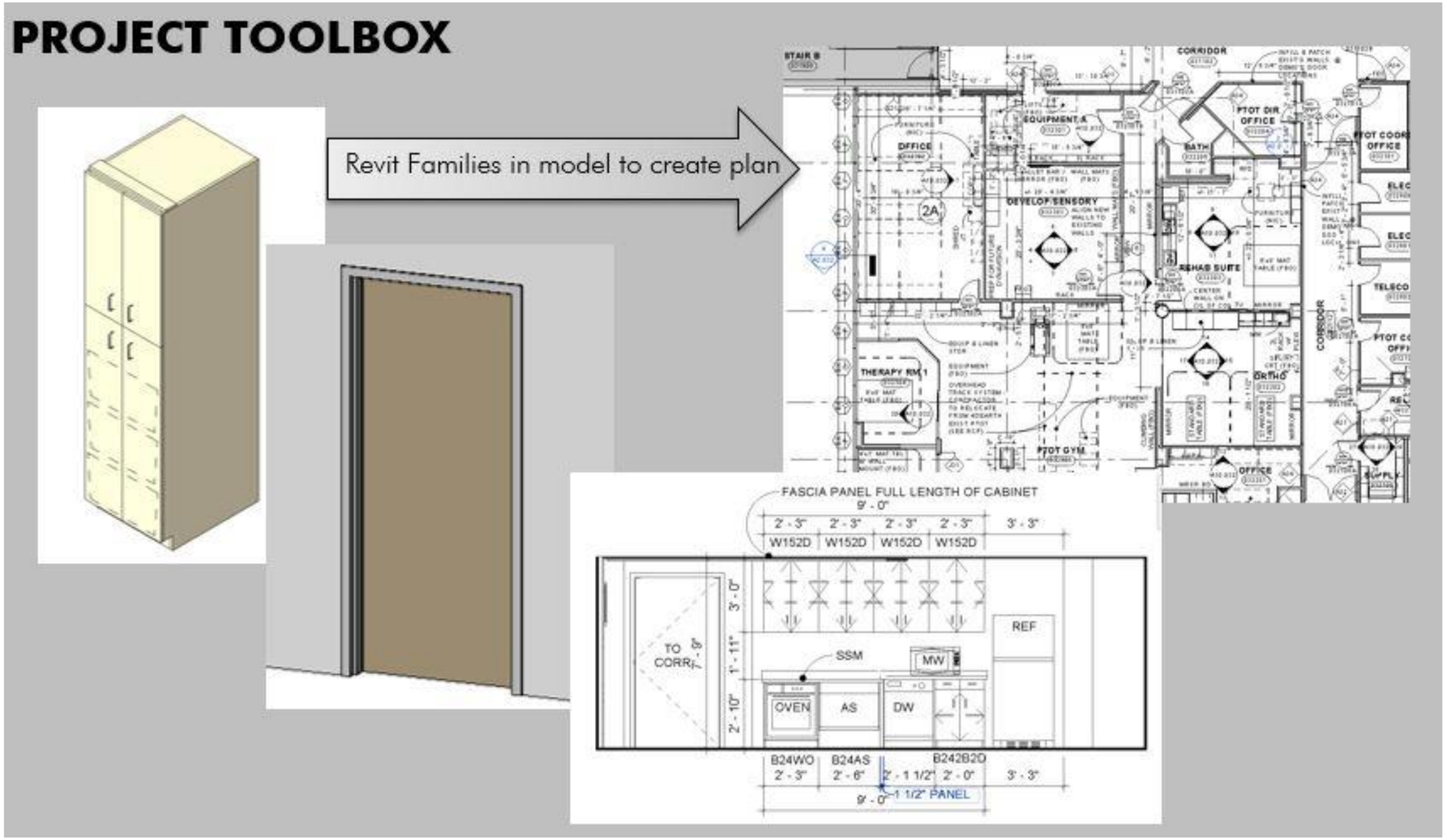
TEAM MEMBER

COA REDBOOK COMPLIANCE

Project Roles

- Outlines the role of each stakeholder
- Outlines what phases that they will be engaged on the project

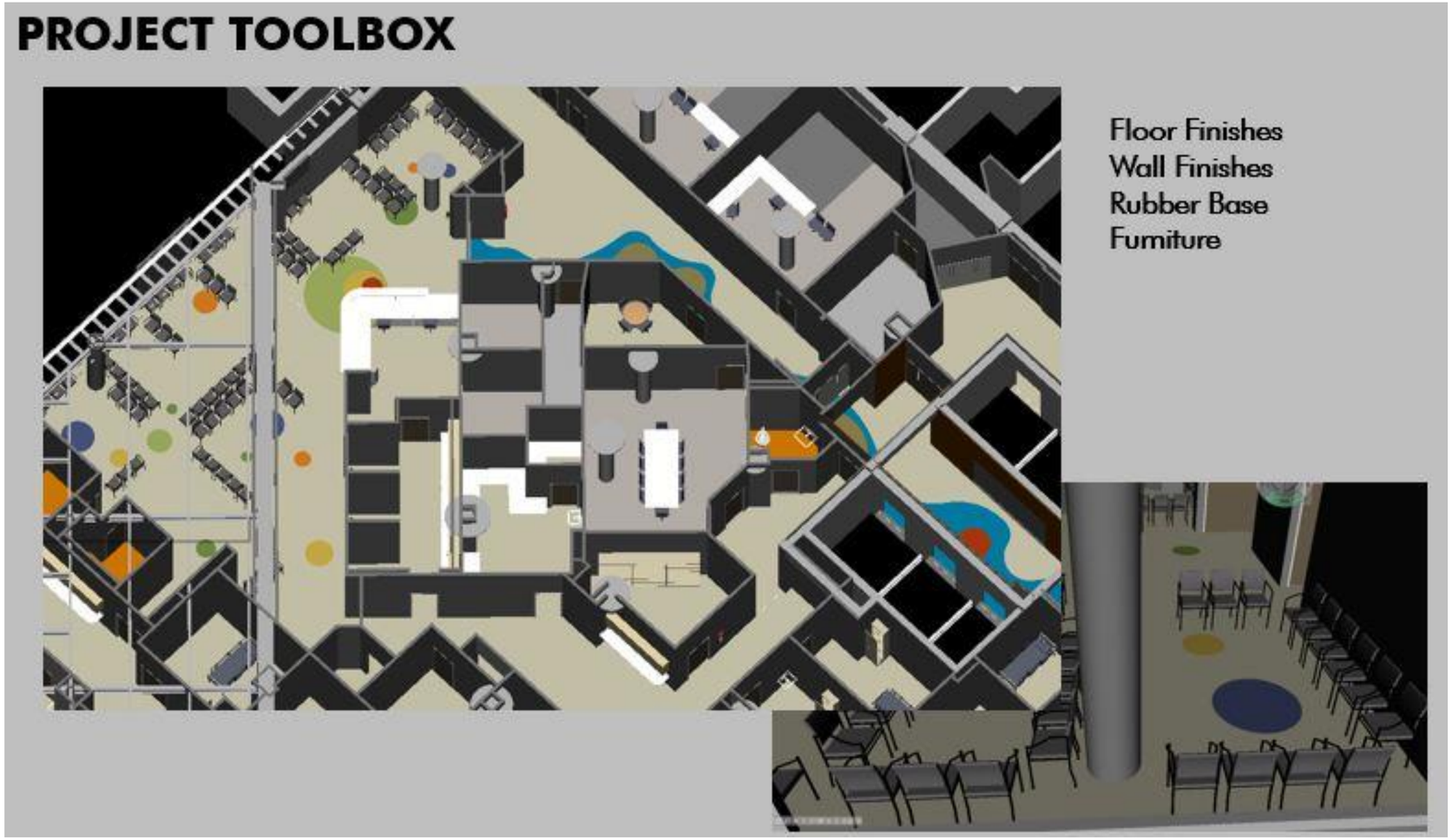
Implement the Plan



BIM Families

- "Drag and Drop" set of Owner approved BIM families.
- Matches your LOD
- Works automatically with your templates, and schedules within the template

Implement the Plan



BIM Families

- All interior finishes are specified and shown in models.
- Quantifies flooring and wall surface areas.

Implement the Plan

Wall Types

- Both exterior and interior wall created in template.
- Color coded or hatched for easy identification.

WALL TYPE IDENTIFICATION

A21F WALL TYPE TAG

FAMILY NAME:
COA WALL TAG.RFA

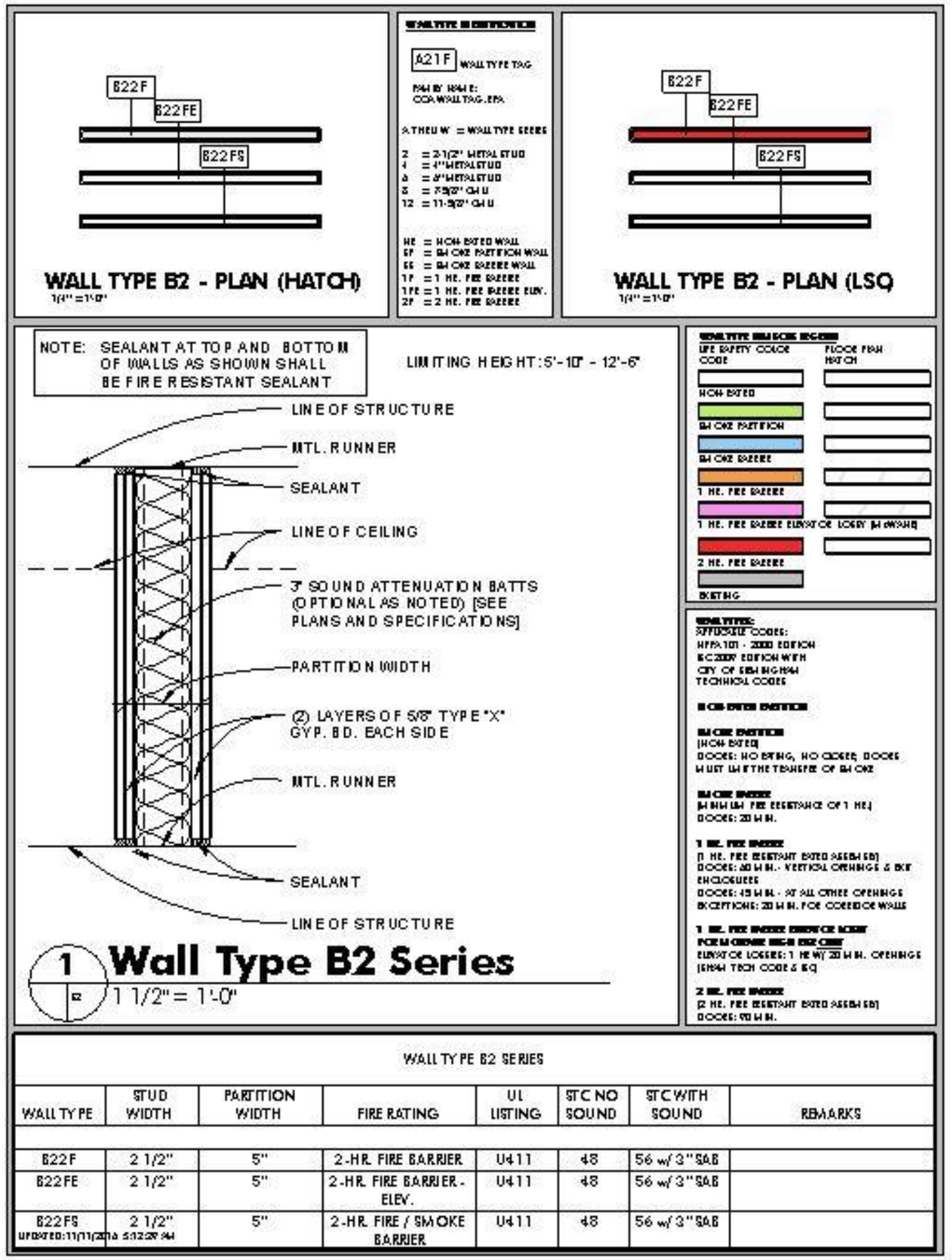
A THRU W = WALL TYPE SERIES

2 = 2-1/2" METAL STUD
4 = 4" METAL STUD
6 = 6" METAL STUD
8 = 7-5/8" CMU
12 = 11-5/8" CMU

NR = NON-RATED WALL
SP = SMOKE PARTITION WALL
SB = SMOKE BARRIER WALL
1F = 1 HR. FIRE BARRIER
1FE = 1 HR. FIRE BARRIER ELEV.
2F = 2 HR. FIRE BARRIER

WALL TYPE SYMBOLS LEGEND

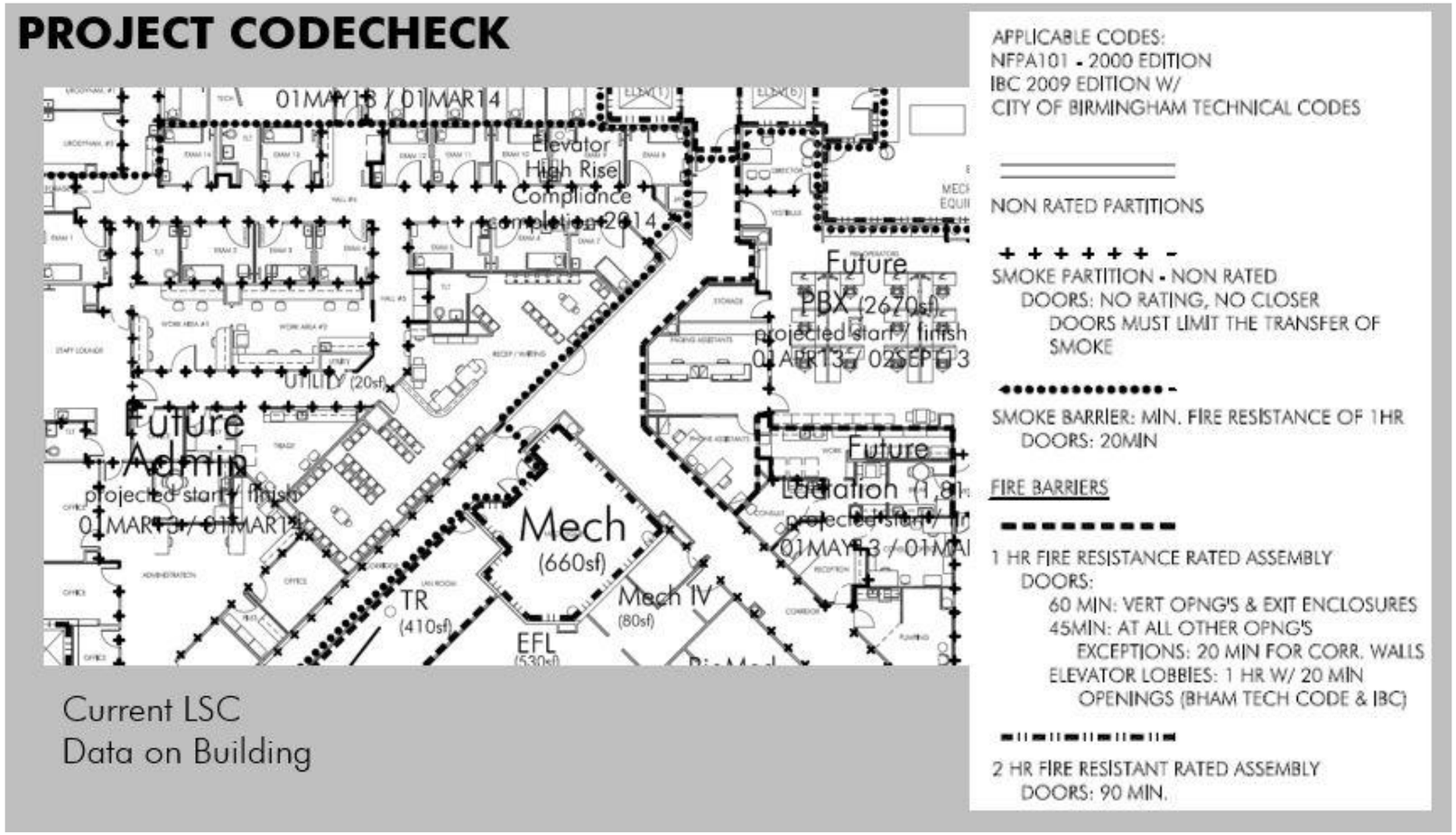
LIFE SAFETY COLOR CODE	FLOOR PLAN HATCH
NON-RATED	
SMOKE PARTITION	
SMOKE BARRIER	
1 HR. FIRE BARRIER	
1 HR. FIRE BARRIER ELEVATOR LOBBY (McWANE)	
2 HR. FIRE BARRIER	
EXISTING	



WALL TYPE B2 SERIES

WALL TYPE	STUD WIDTH	PARTITION WIDTH	FIRE RATING	UL LISTING	STC NO SOUND	STC WITH SOUND	REMARKS
B22F	2 1/2"	5"	2-HR. FIRE BARRIER	U411	48	56 w/ 3" SAB	
B22FE	2 1/2"	5"	2-HR. FIRE BARRIER - ELEV.	U411	48	56 w/ 3" SAB	
B22FS	2 1/2"	5"	2-HR. FIRE / SMOKE BARRIER	U411	48	56 w/ 3" SAB	

Implement the Plan

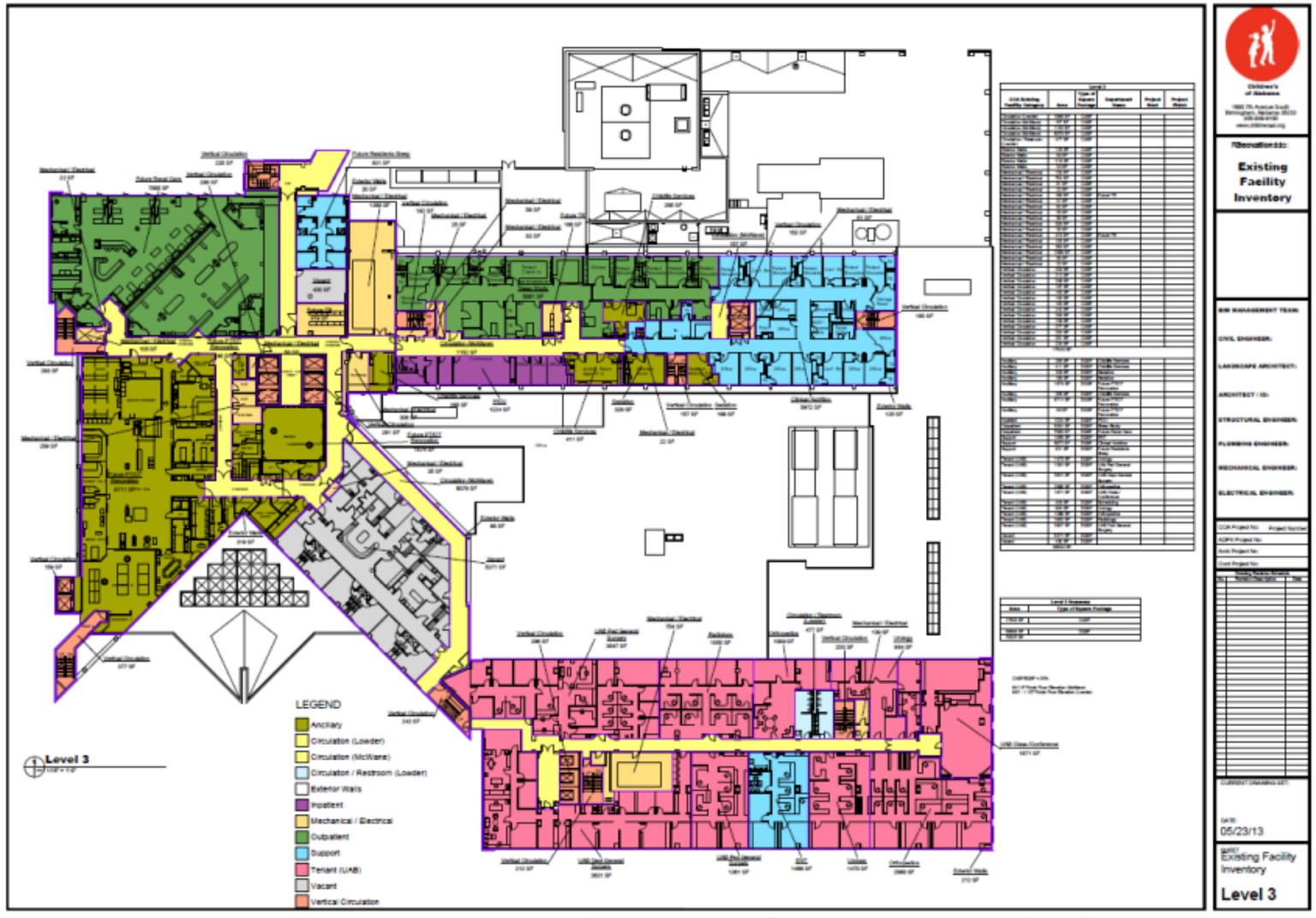


Current LSC
Data on Building

Life Safety Code Data

- Walls can be viewed in various modes or colors codes.
- Used to maintain all Barrier Management and Life Safety Code Information on each building

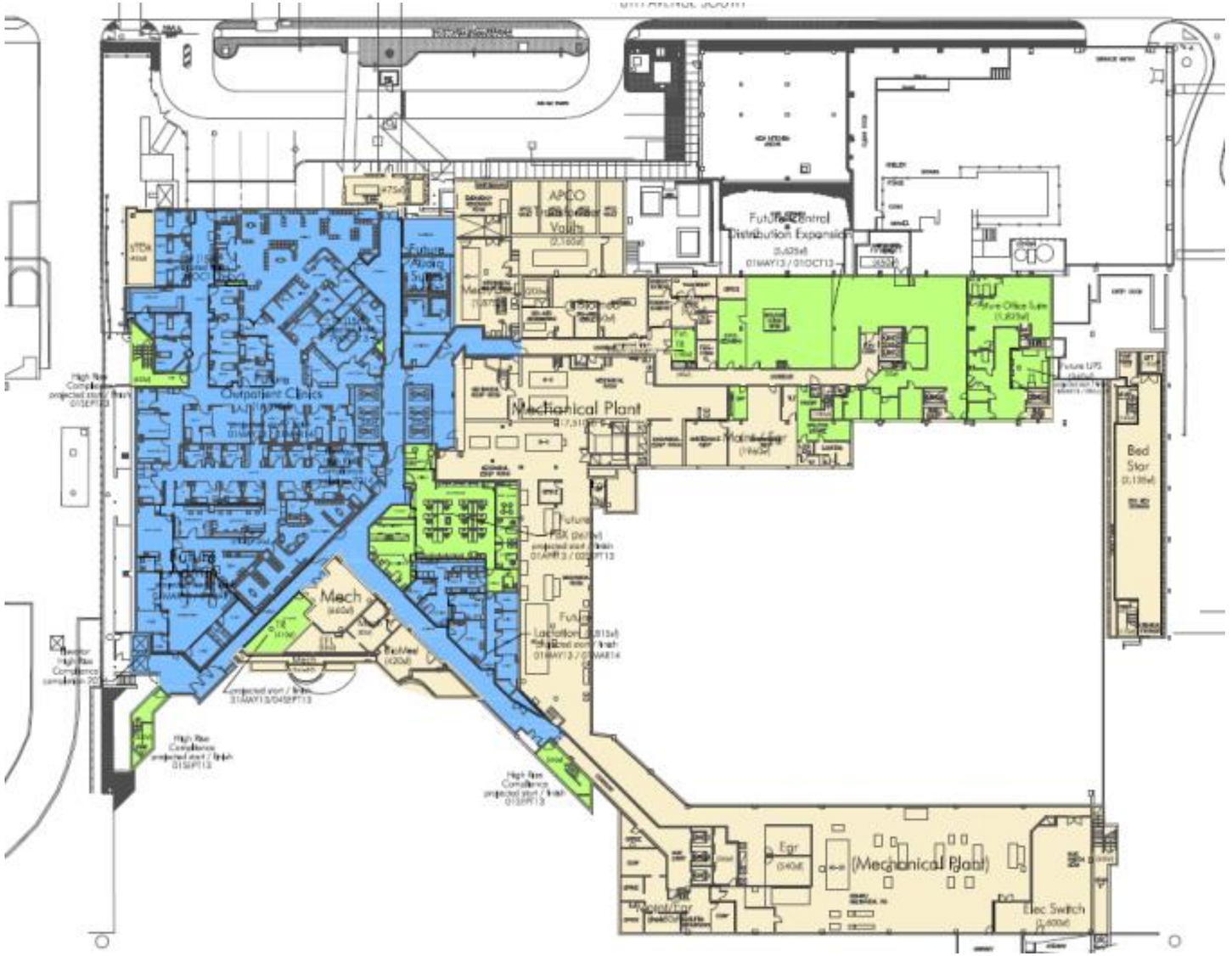
Implement the Plan



Existing Facility Inventory

- Allows for real time Space Management of departments and suites within the building.
- Multiple reports and views can be created for different types of space reconciliation reports.

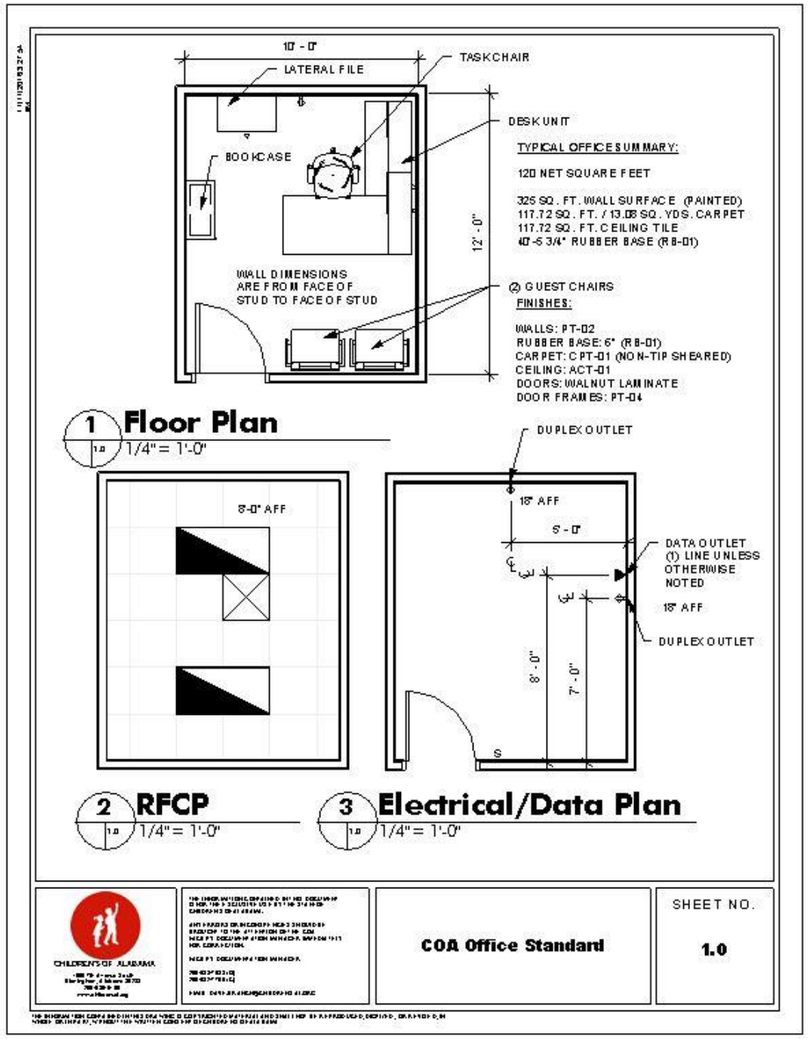
Implement the Plan

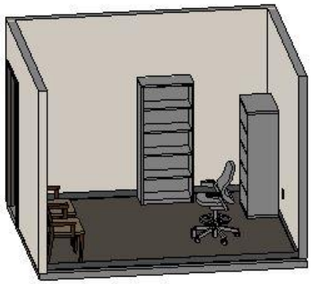


Master Plan & Vacancy Plans

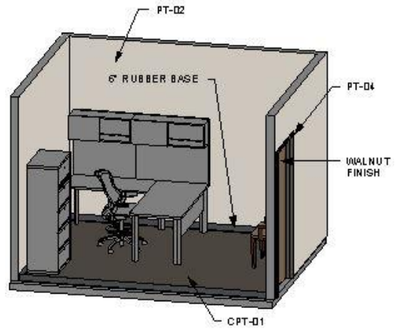
- Tracks areas of building that are currently vacant or shell space.
- Used to track project schedule and other campus master plan items.

Implement the Plan





1 Perspective 1

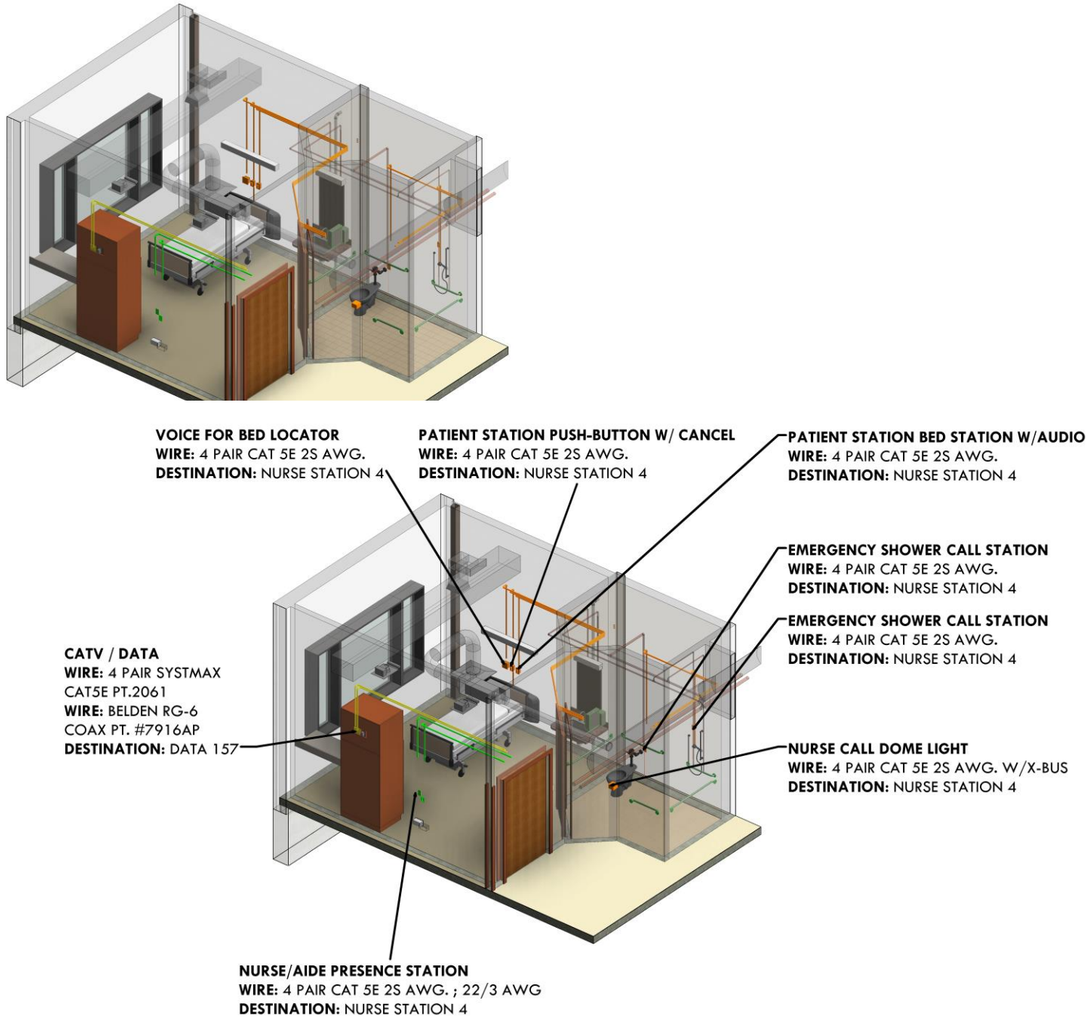


2 Perspective 2

Typical Room Types:

- Offices
- Exam Rooms
- Patient Rooms
- Restrooms
- Gang Restrooms
- Break Rooms
- Conference Rooms

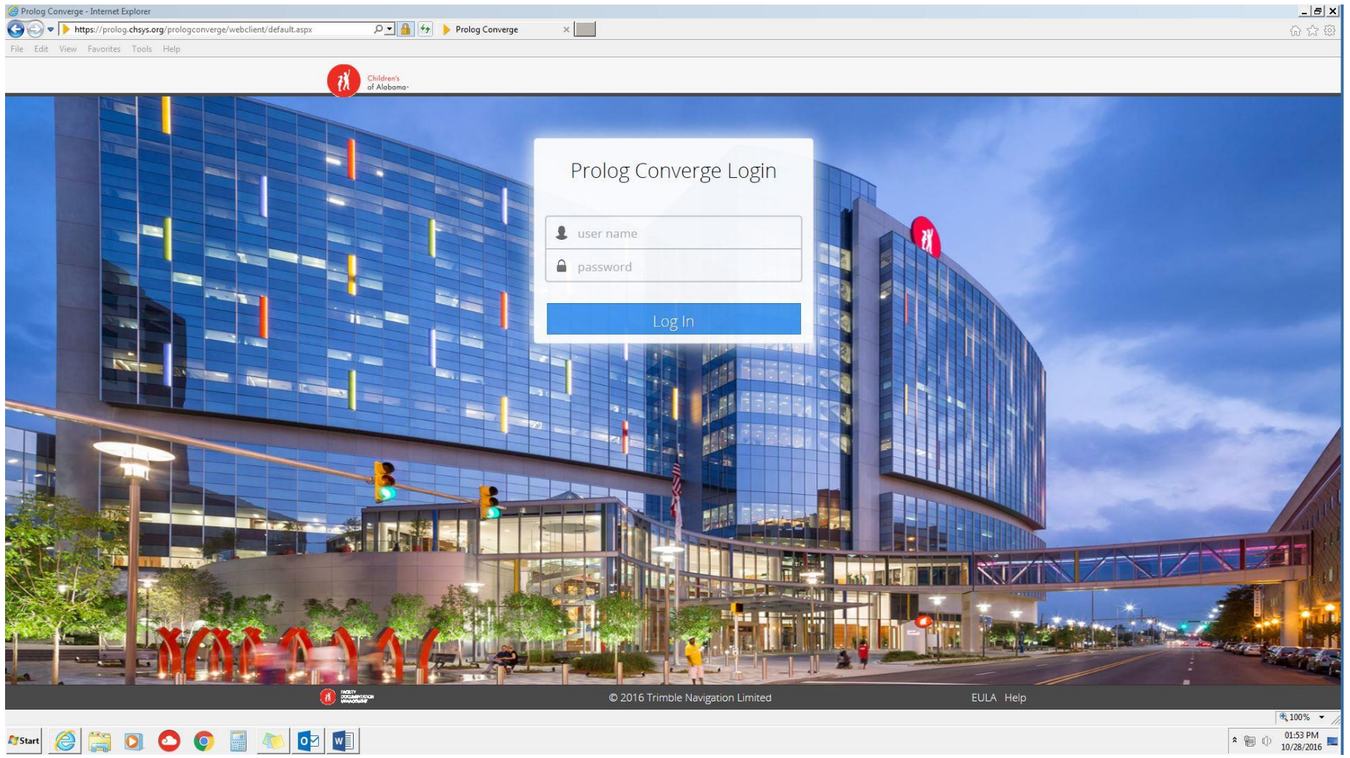
Implement the Plan



Typical Room Sizes and Standards

- Pertinent Data for each type of space
- Pre-configured so that coordination has already been done on standard items (i.e. data outlet heights, power locations, etc.)

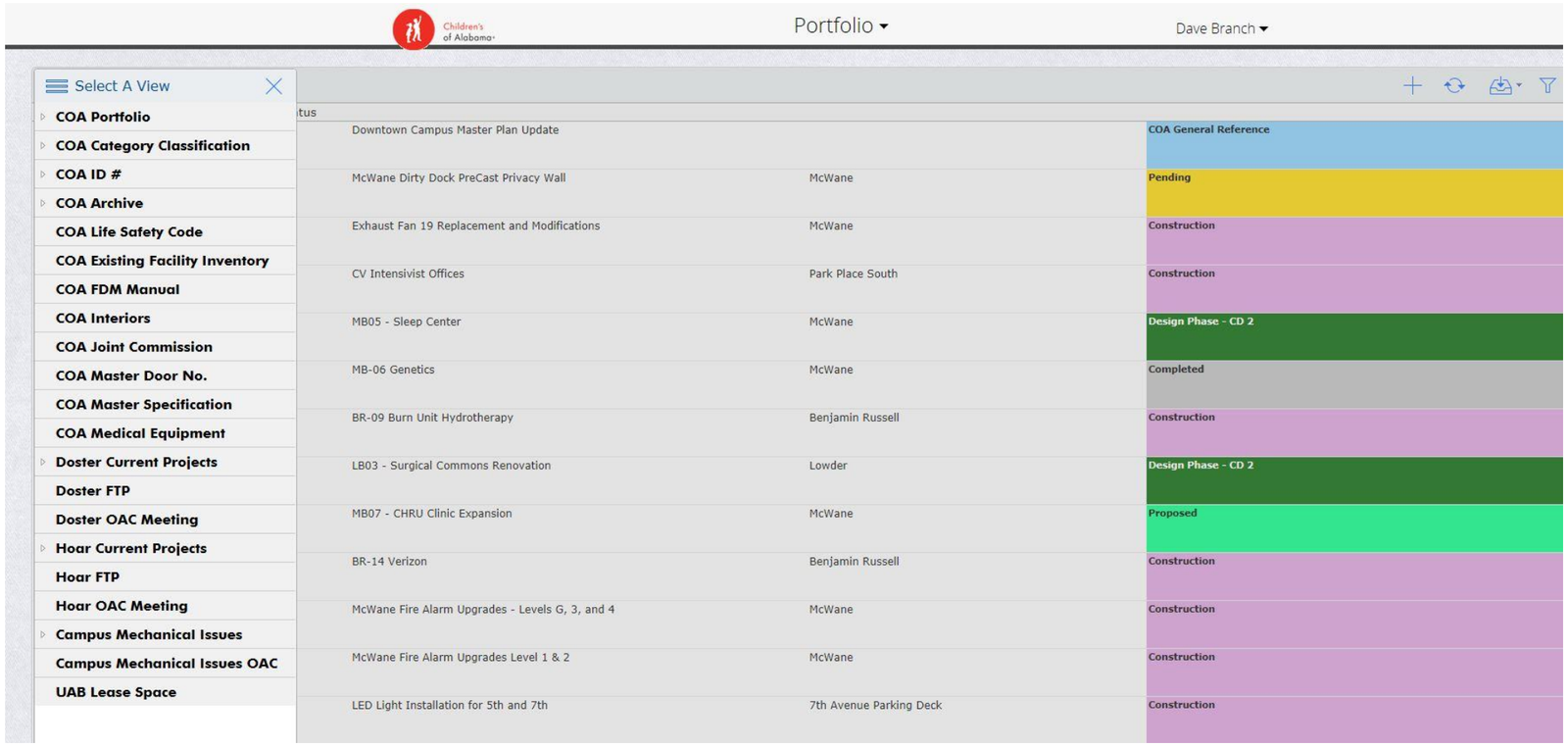
Implement the Plan



Project Communication Software

- Allows all stakeholders to communicate on a common interface
- Project data is all stored in one location. Data such as: budgets, cost estimates, contracts, schedules, RFIs, etc.

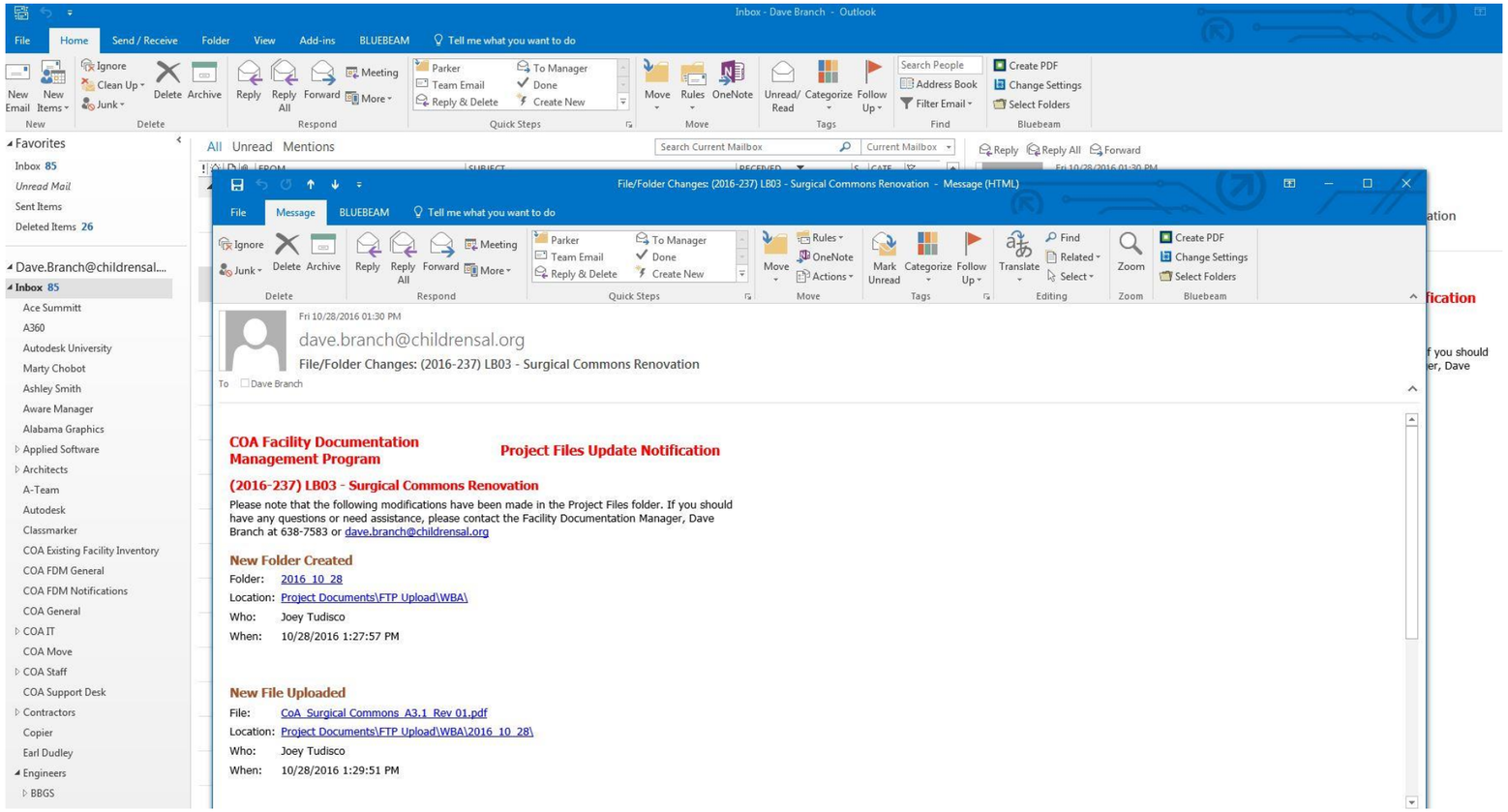
Implement the Plan



Project Communication Software

- Setup in an easy to follow navigation setting, that is customized to Facility Management standards.
- All data is on Owner's server.

Implement the Plan



Project Communication Software

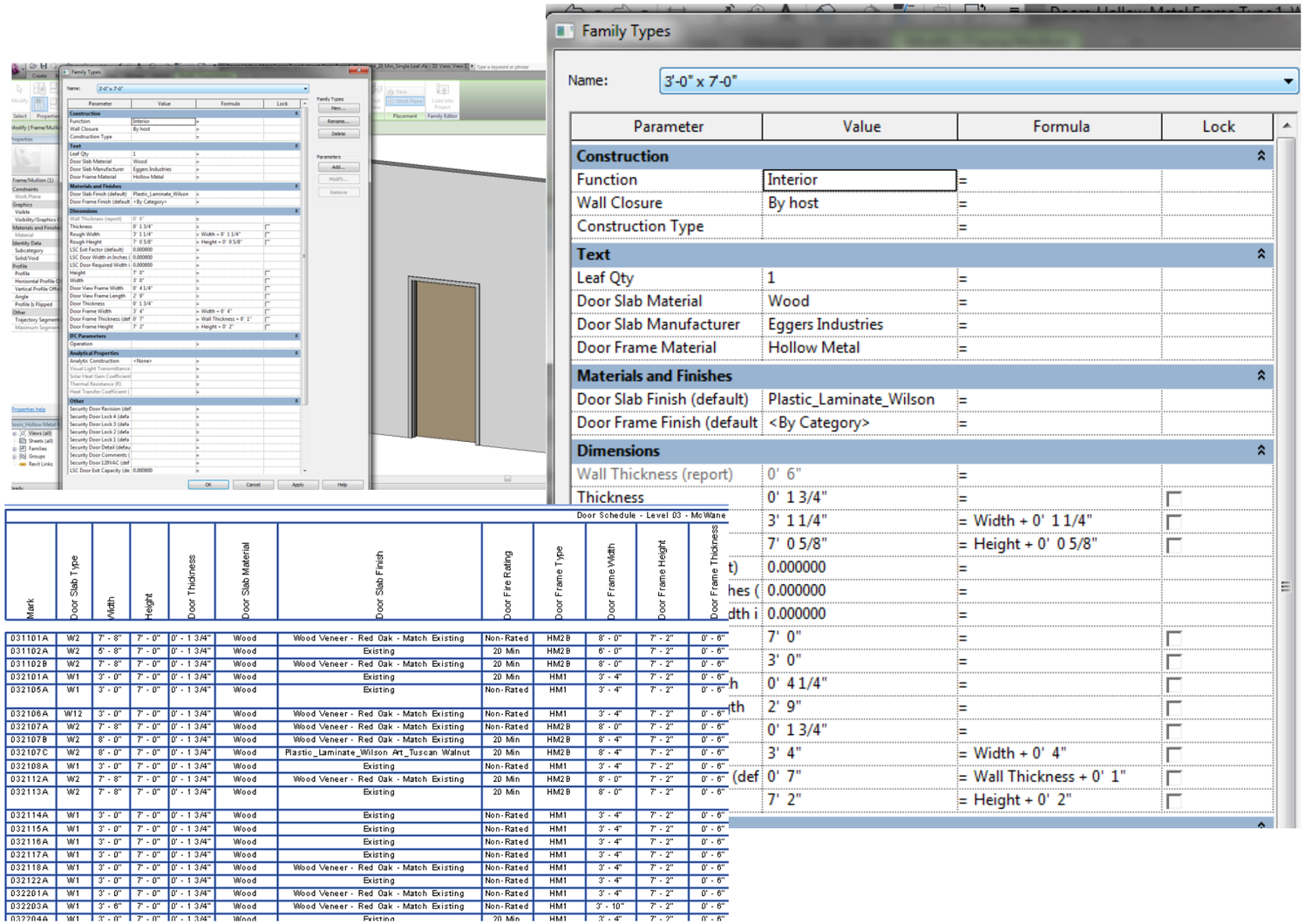
- As data is entered or changed all stakeholders receive email notifications of what information has changed.

Implement the Plan

Shared Parameters

- Shared Parameters is the “switchboard” of making your customized BIM program work.
- One master Shared Parameter file maintained by the facility manager and distributed out to all stakeholders.

Implement the Plan

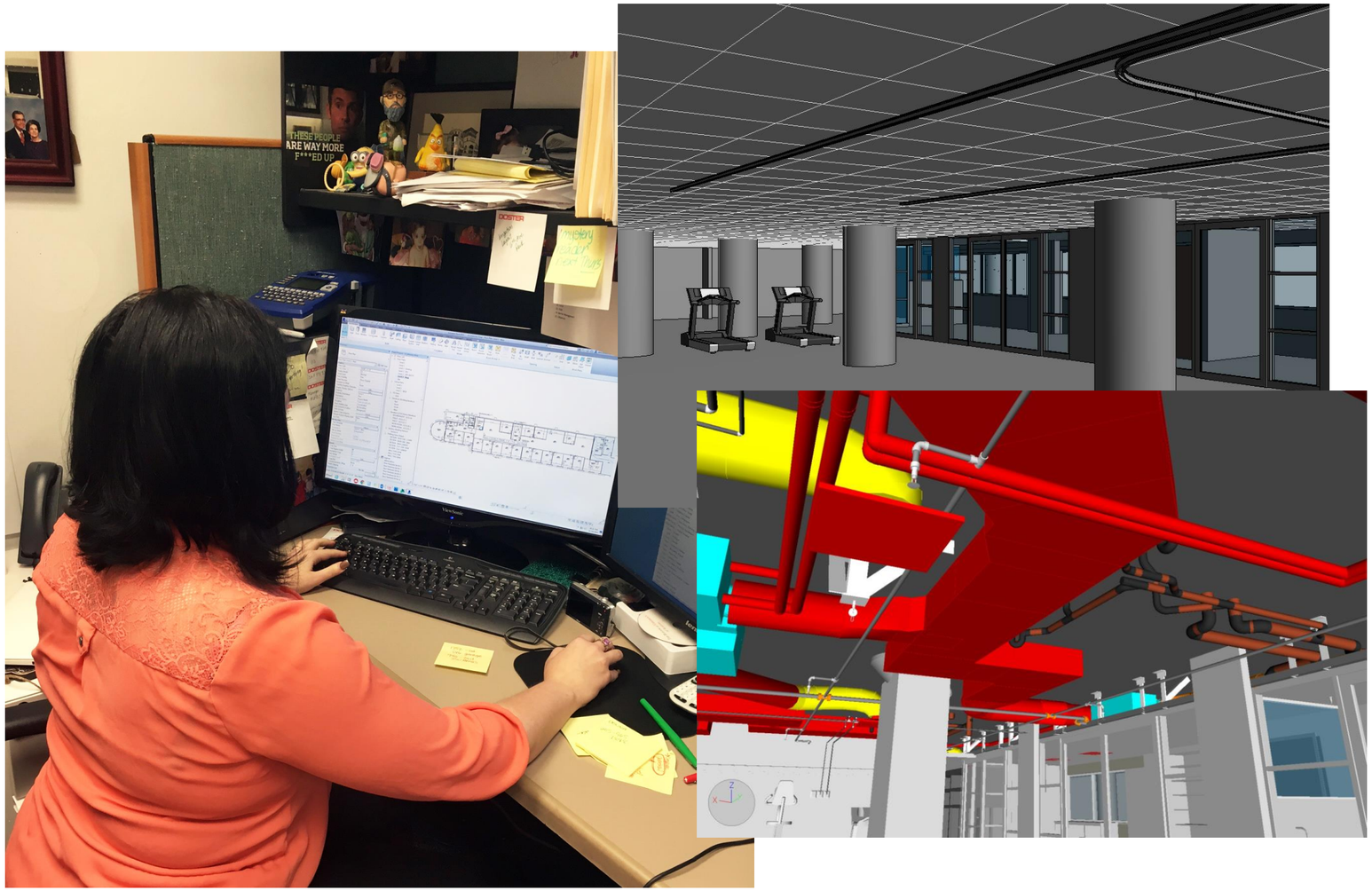


Schedules

- Project schedules are automatically populated by the use of Owner's customized BIM families, and preconfigured schedules.
- Ties into customized Shared Parameter file

Cultivate, Nurture, and Preserve the Process

Cultivate the Process



Asset Management

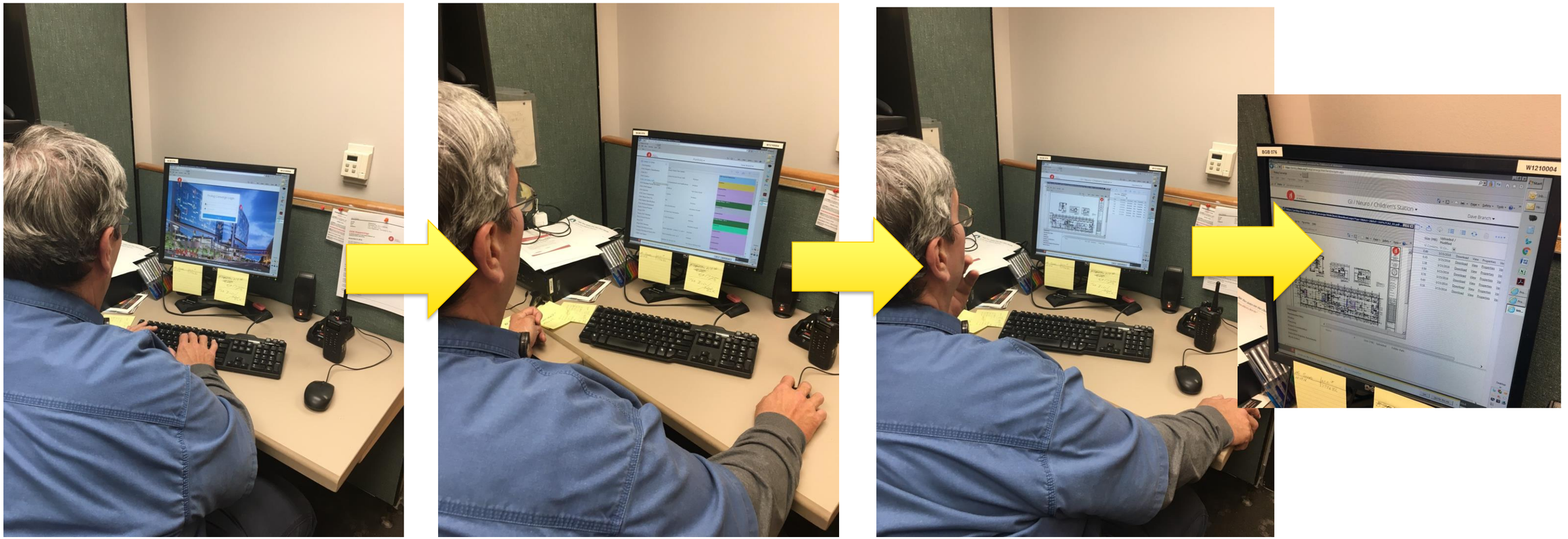
- As items in your building are changed in the post construction environment, so should your BIM model updated. This will allow you to keep a “real time” virtual FM model of your buildings.

Cultivate the Process

Asset Management

- Digital conversion of all old “paper information”

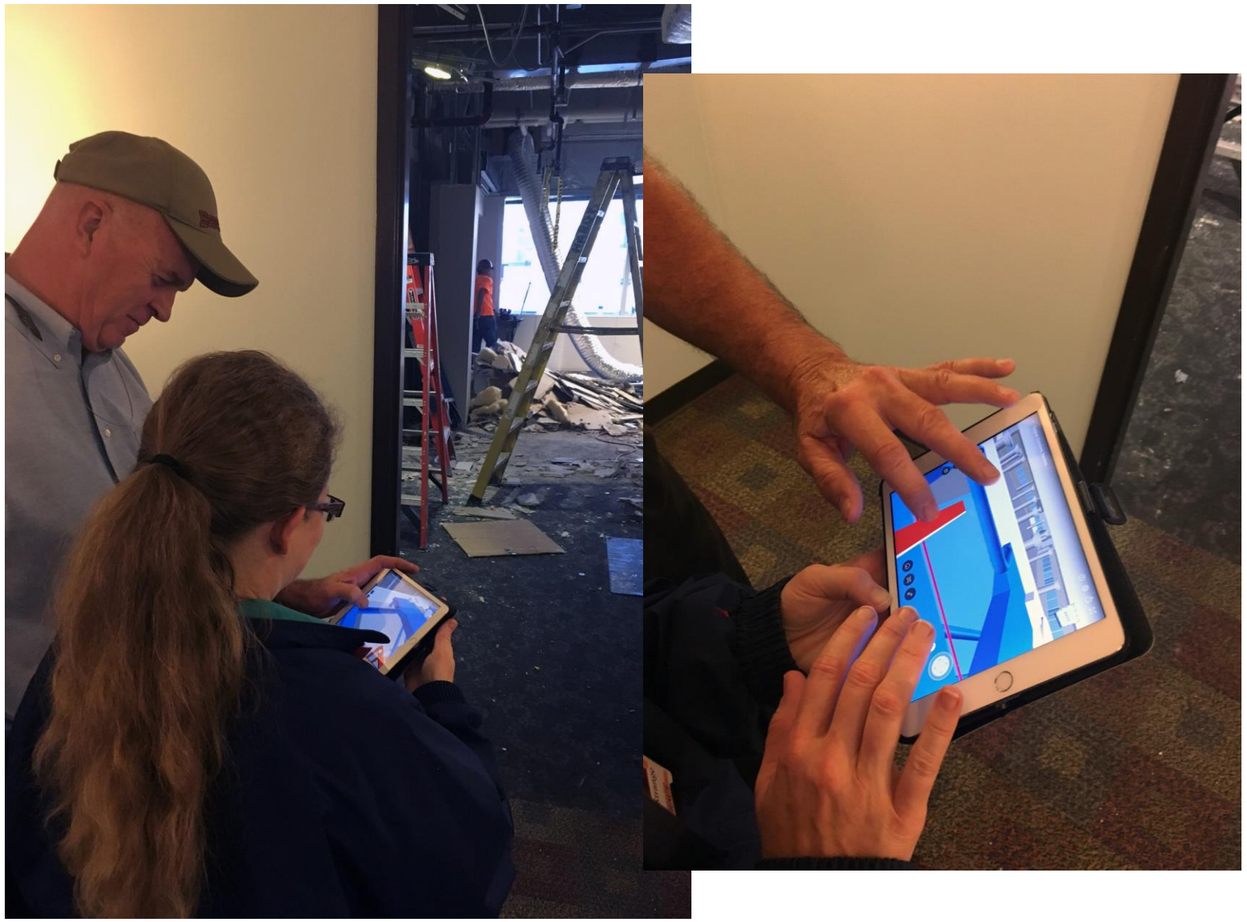
Cultivate the Process



Asset Management

- Digital conversion, tagging, and linking archive files to facility documentation communication software and BIM models

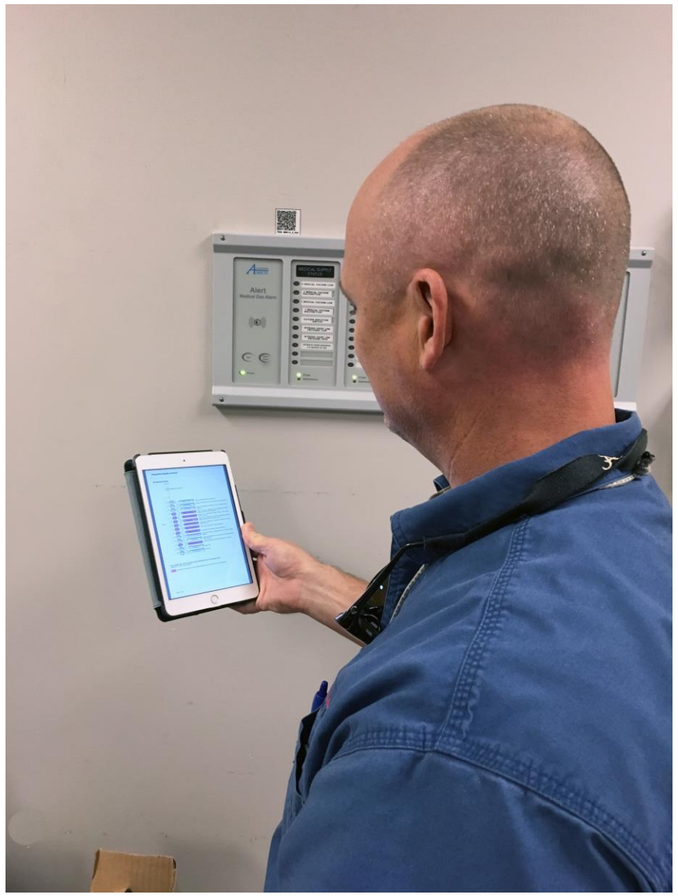
Nurture the Process



Construction Review

- Utilizing the BIM models, Navisworks models, and A360 to review project design versus actual construction to ensure project design is being followed.

Nurture the Process

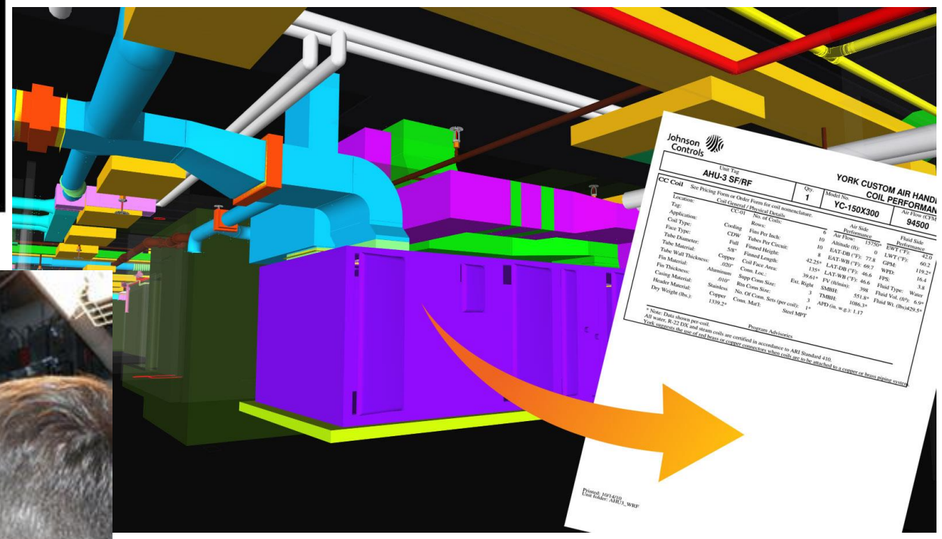


Operations & Maintenance

- Asset tracking and operations and maintenance information tied to both the BIM model and the FDM communication software system, allows staff to scan QR Code that links to both BIM model and product data for quick information access.

Nurture the Process

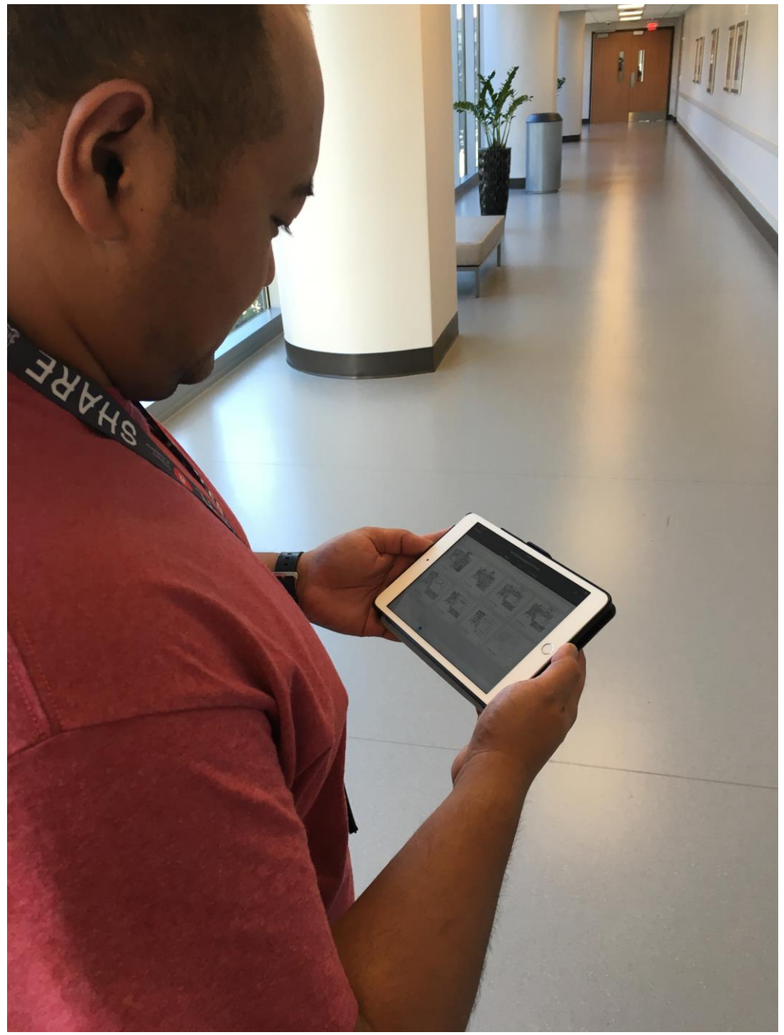
FDM BRH12_3_325



Operations & Maintenance

- QR codes are linked to FDM communication software
- Coded so that you know what floor, sector of building, and what QR code is being scanned.
- Three digit code matches type of code being scanned (i.e. 3 = HVAC equipment; 4= data equipment)

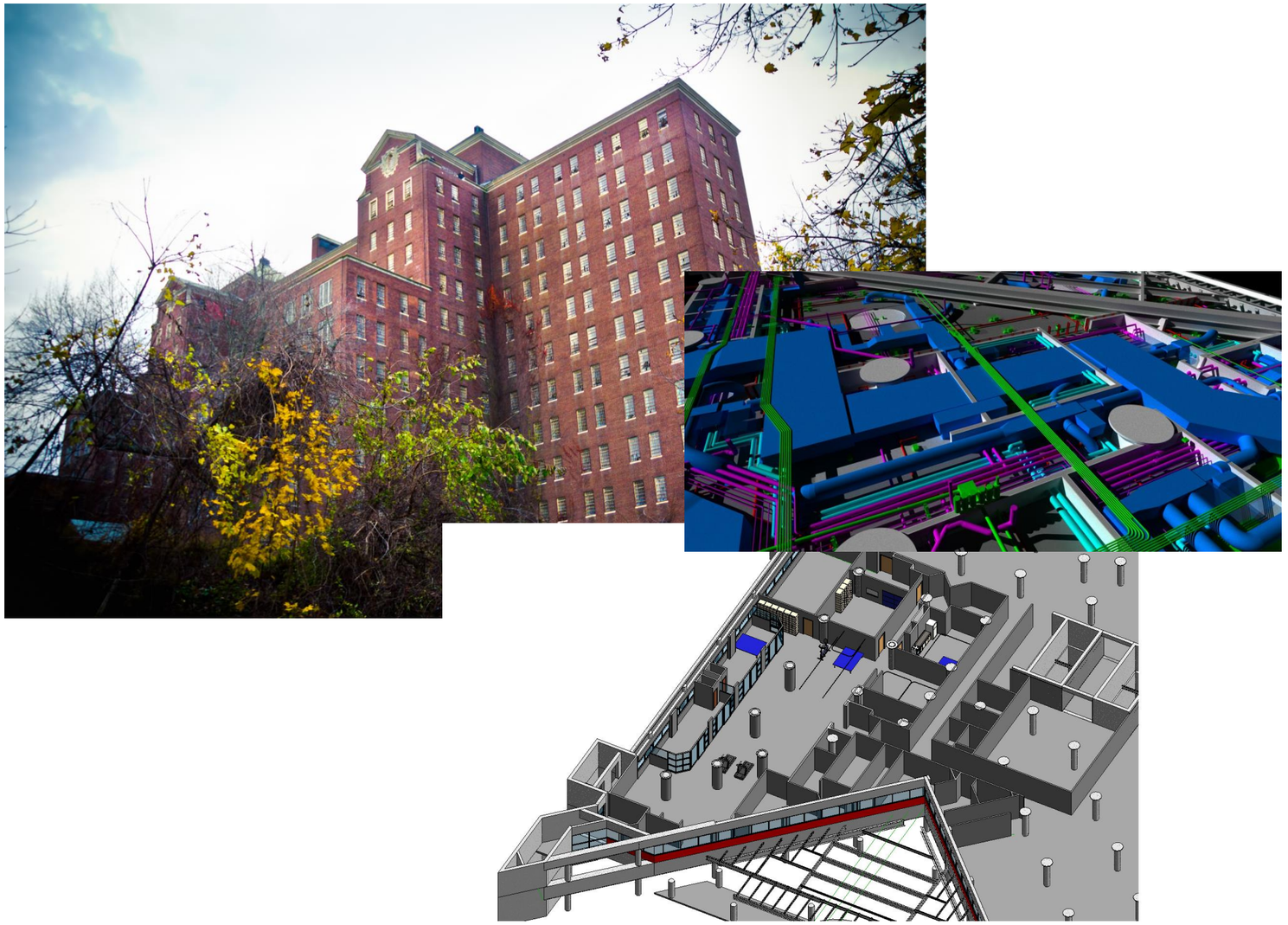
Nurture the Process



Staff Education

- A360 access by staff allows them to have instant access to each floor plan of each building, so that they can learn the building layout, or locate different departments, and other information as needed.

Preserve the Process



BIM Model Preservation

- As your building changes or concluding its lifecycle, you want to ensure that you are maintaining at a periodical time frames an archive copy of the master BIM models. This will allow you to keep an historical snapshot of your buildings.

Documentation, Optimization and, Connection

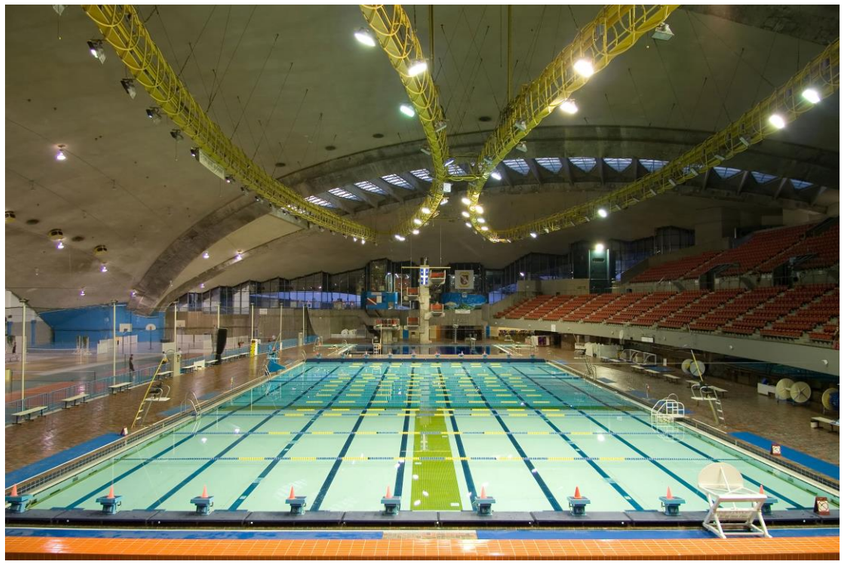
Documentation, Optimization, and Connection

Design & Construction Cost Savings

- Over an 20 month period of time close to approximately $500,000 in excess design and engineering fees were saved in organized and structured facility documentation management program.

Documentation, Optimization, and Connection

Water Efficiency



Water Consumption Savings

- Through a cooperative effort with a streamlined Facility Documentation Management program, 2015 the team saved enough water to fill 10 Olympic size swimming pools.

Documentation, Optimization, and Connection

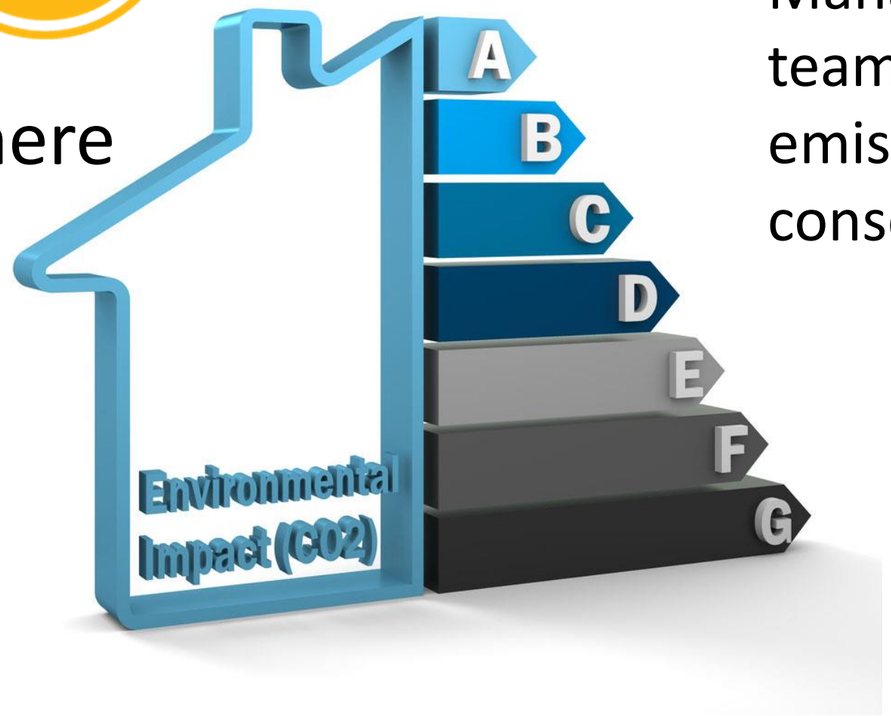
Materials & Resources

Material & Resource Savings

- Through a cooperative effort with a streamlined Facility Documentation Management program, 2015 the team diverted 1,516,000 lbs of construction debris from going into the local landfills. That is equal to 54,143 concrete blocks, or 48,127 square feet.

Documentation, Optimization, and Connection

Energy & Atmosphere



Material & Resource Savings

- Through a cooperative effort with a streamlined Facility Documentation Management program, 2015 the team diverted 1,678,205 lbs. of CO2 emissions through energy conservation.

Always remember Begin with the End in Mind

BIM & Facility Management – The Power to Change Lives

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Facebook: @synertekgrp

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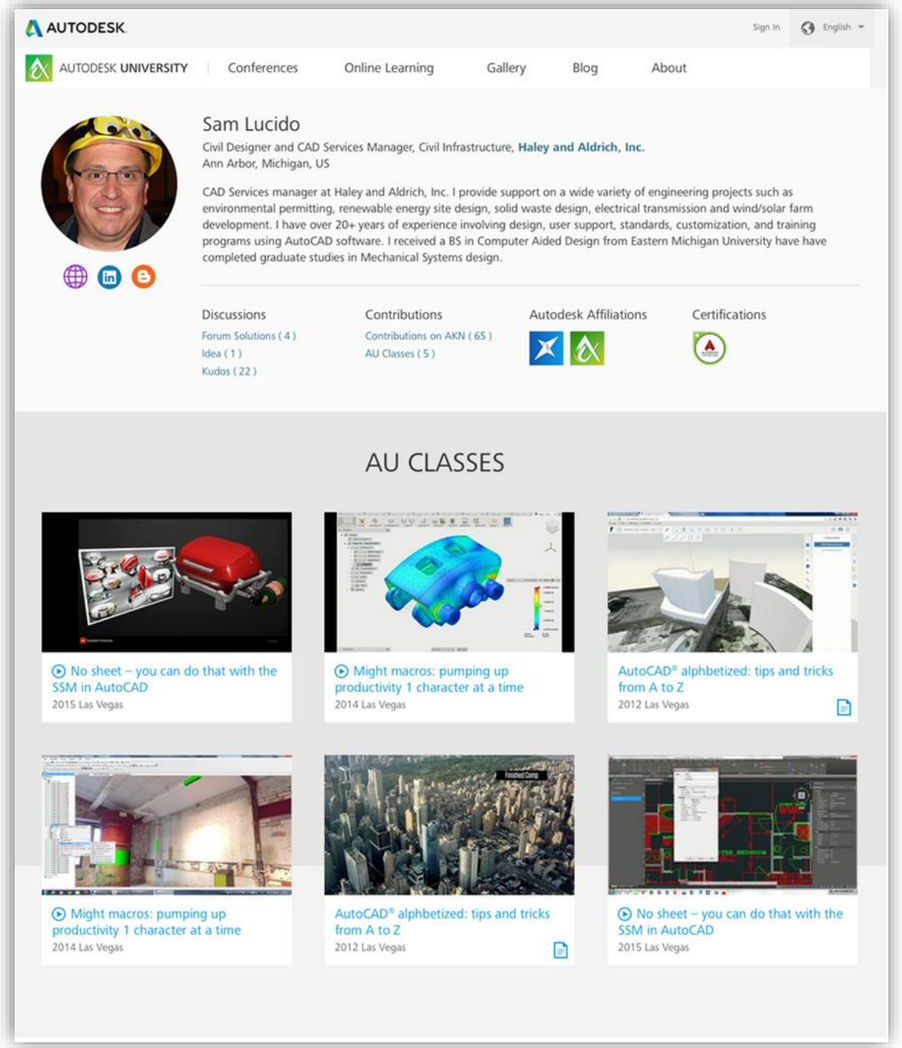

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