

Prototyping 2.0: Onsite Prefabrication Minimizes Risk & Speeds Delivery

March 13, 2023

Evaluation & CECs

Let us know what you think! Your feedback is important to us and used when planning future events.

USING YOUR MOBLE APP

STEP 1

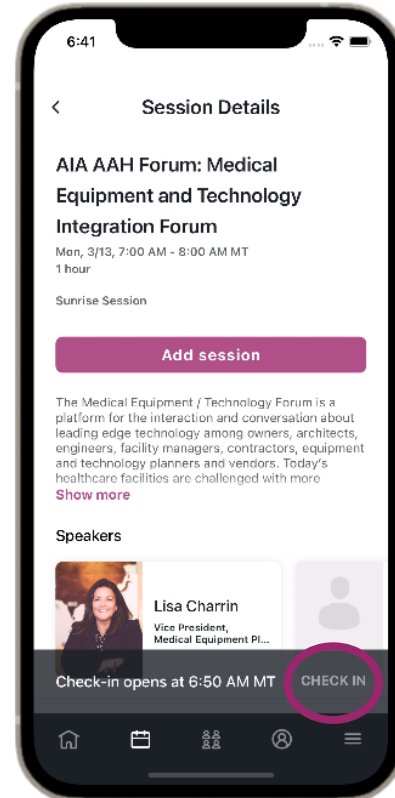
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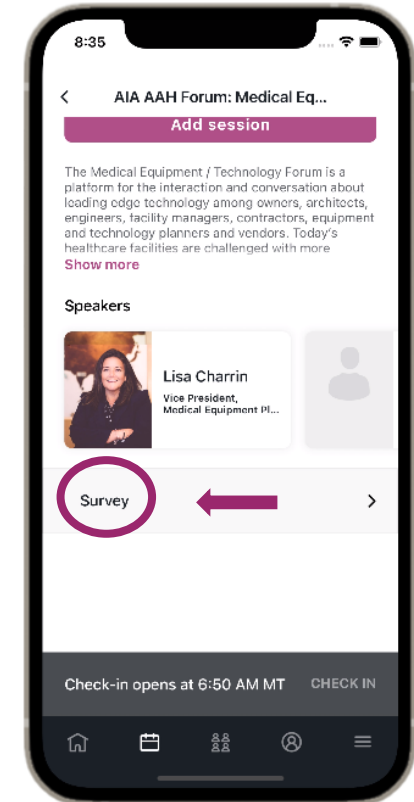
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Thank you.



Speakers



Jim Lupidi
LEED AP, ASHE
Vice President
Danis Construction



Molly Ironmonger
LEED AP
System Director, Planning & Preconstruction
Bon Secours Mercy Health



Mickey LeRoy
AIA, ACHA, LEED AP
Principal
GBBN

Prototyping 2.0: Onsite Prefabrication Minimizes Risk & Speeds Delivery





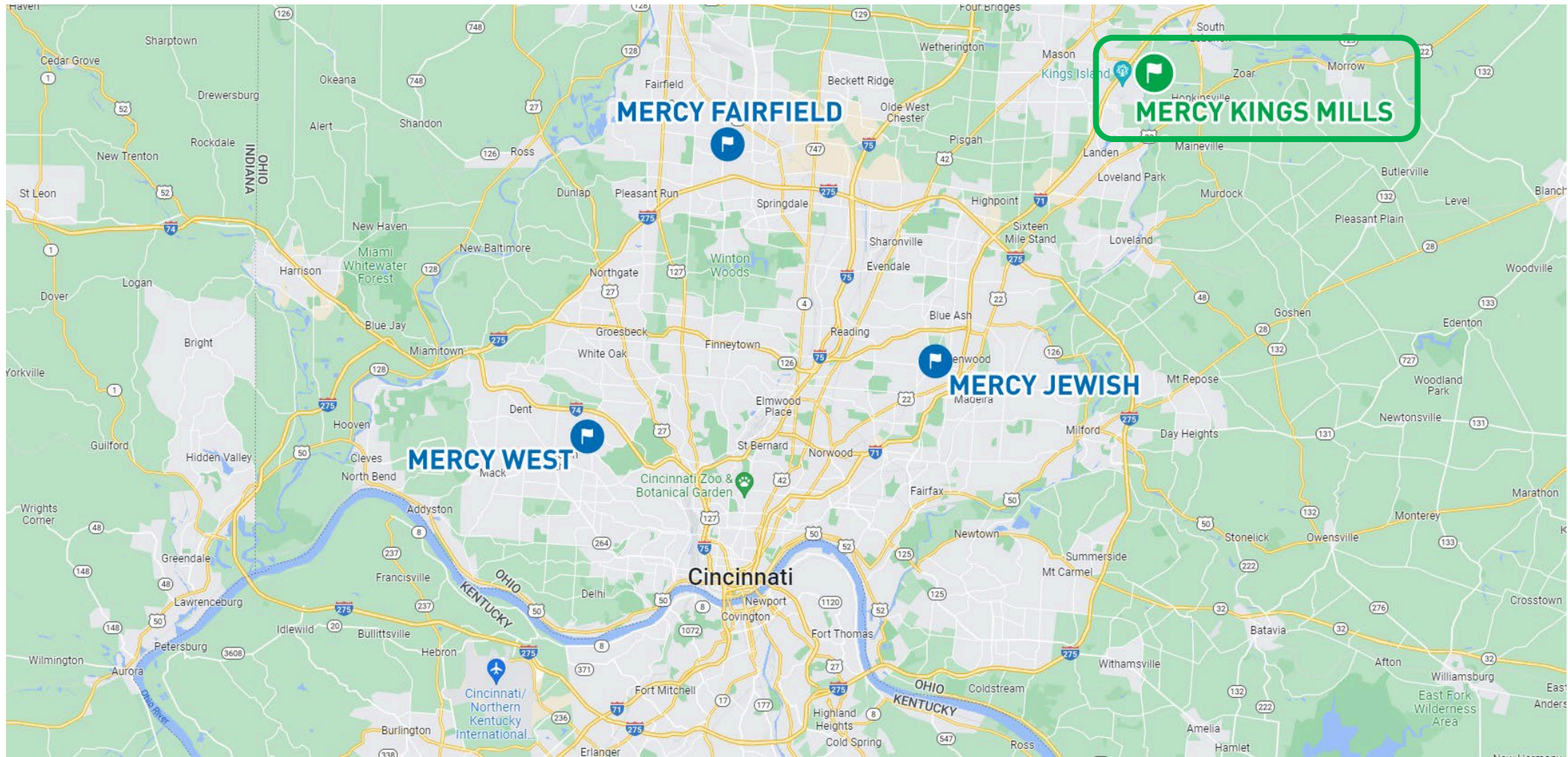
Agenda

- Introduction & Goals
- Owner's Perspective
- Design Phase Overview
- Construction Planning & Delivery
- Wrap Up / Q&A

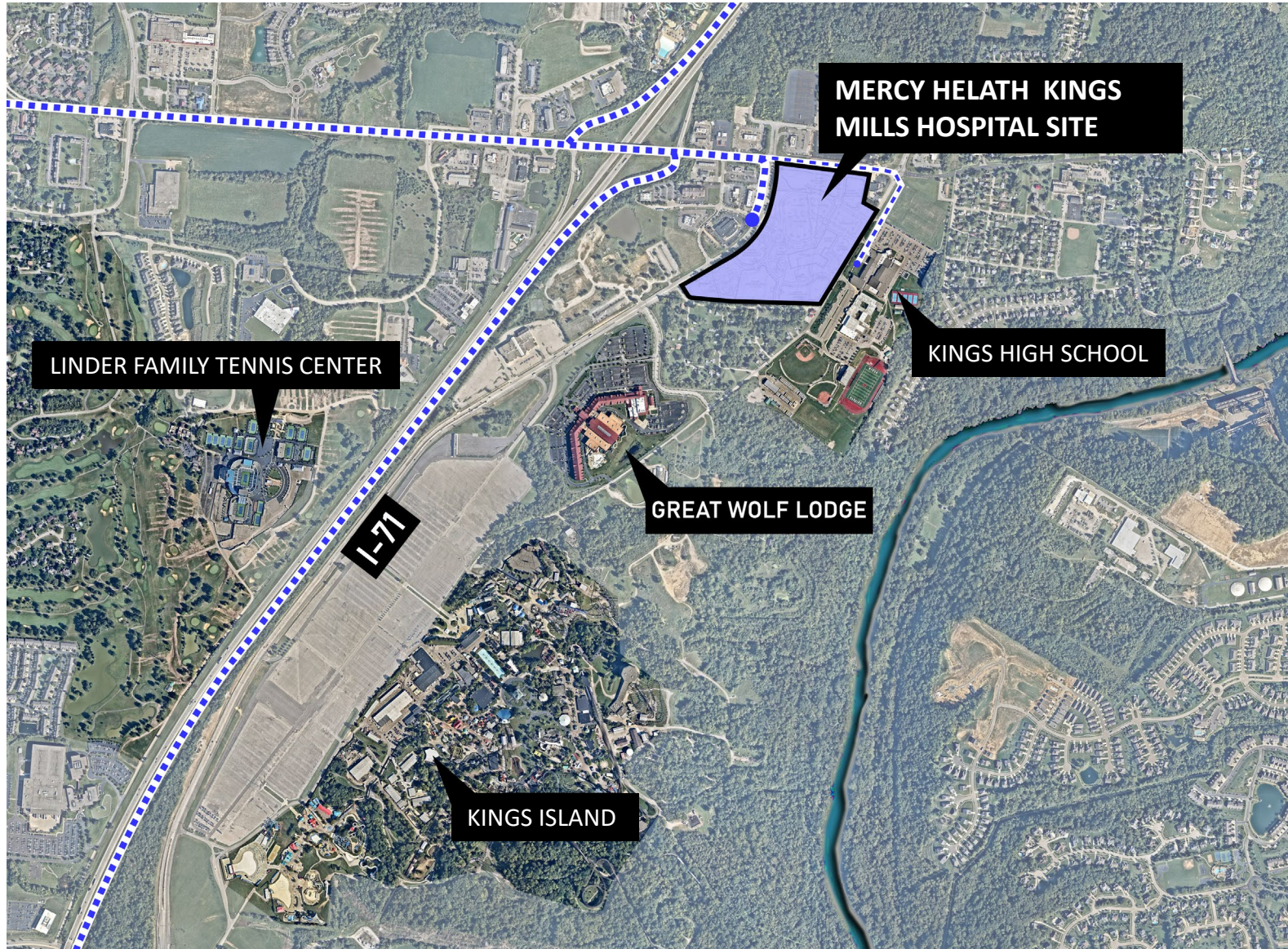
Prototyping 2.0: Owner's Perspective

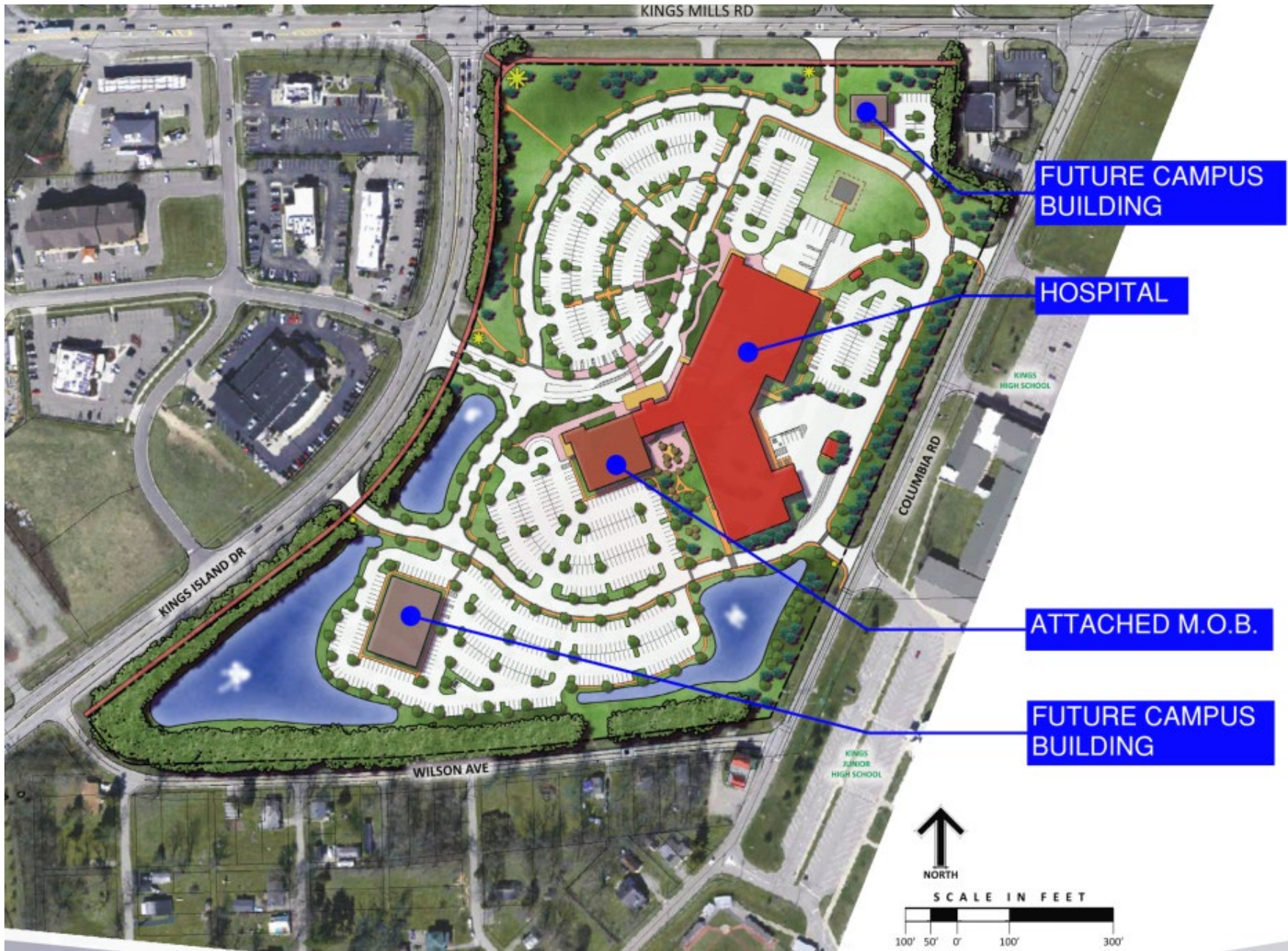


Project Overview



Project Overview





Integrated Project Delivery (IPD)

BON SECOURS MERCY HEALTH

- Corporate Design, Construction and Real Estate
- Cincinnati Market Leadership
- Owner's Consultants



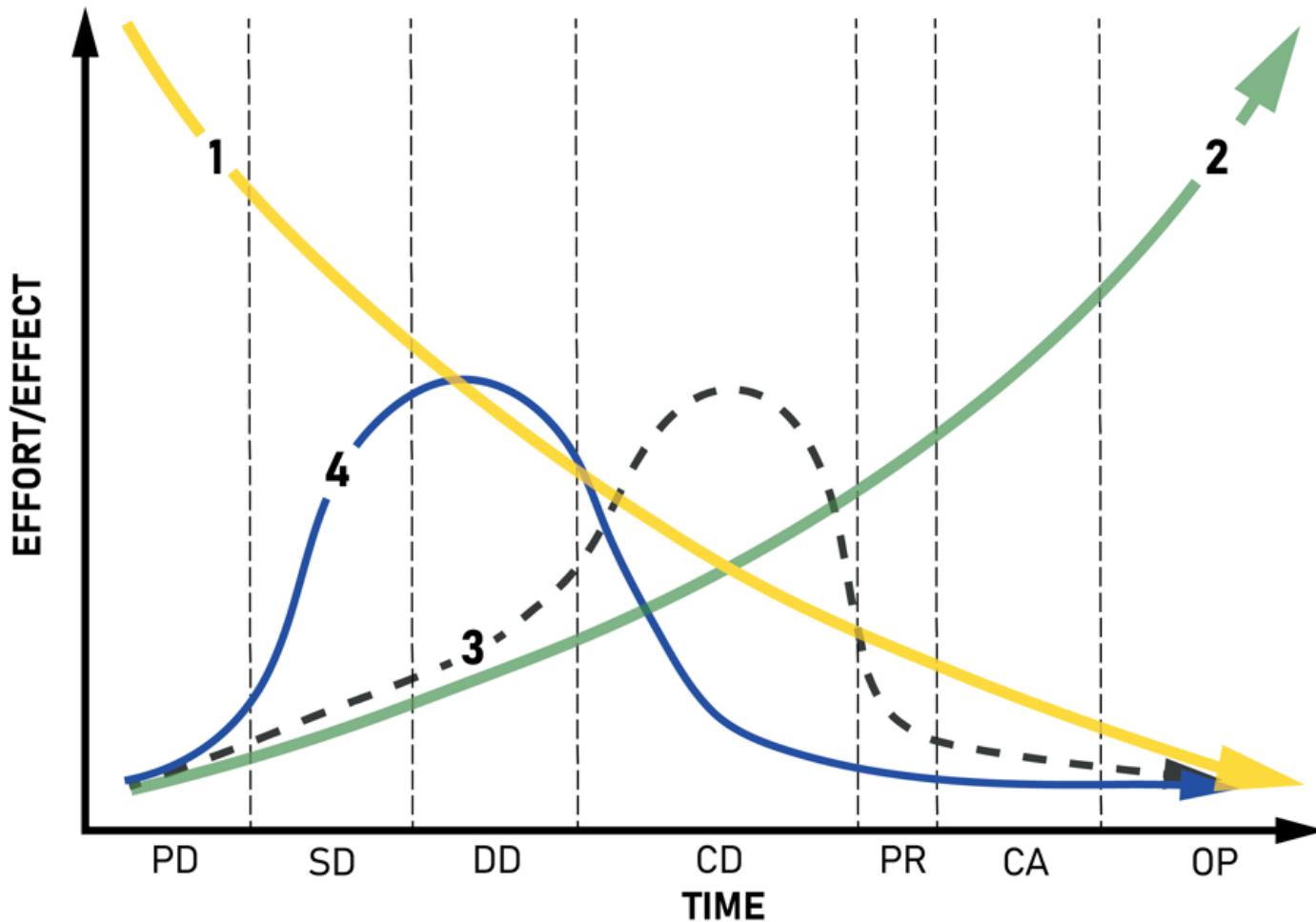
- Construction Manager
- Design-Assist Subcontractors







- A/E Design Team
- Design Consultants

Mercy Kings Mills Hospital
Integrated Project Team

IPD Process Improvement



PD: PRE-DESIGN
SD: SCHEMATIC DESIGN
DD: DESIGN DEVELOPMENT
CD: CONSTRUCTION DOCUMENTATION
PR: PROCUREMENT
CA: CONSTRUCTION ADMINISTRATION
OP: OPERATION

- 1.  ABILITY TO IMPACT FUNCTIONAL CAPABILITIES
- 2.  COST OF DESIGN CHANGES
- 3.  TRADITIONAL DESIGN PROCESS
- 4.  INTEGRATED TEAM APPROACH

Traditional Onboarding



**BON SECOURS
MERCY HEALTH**

Owner



Architect



Civil



MEP, FP & Tech



Med. Equip.

schaefer
Structural



Construction
Manager



Mechanical



Millwork



I.C.C.

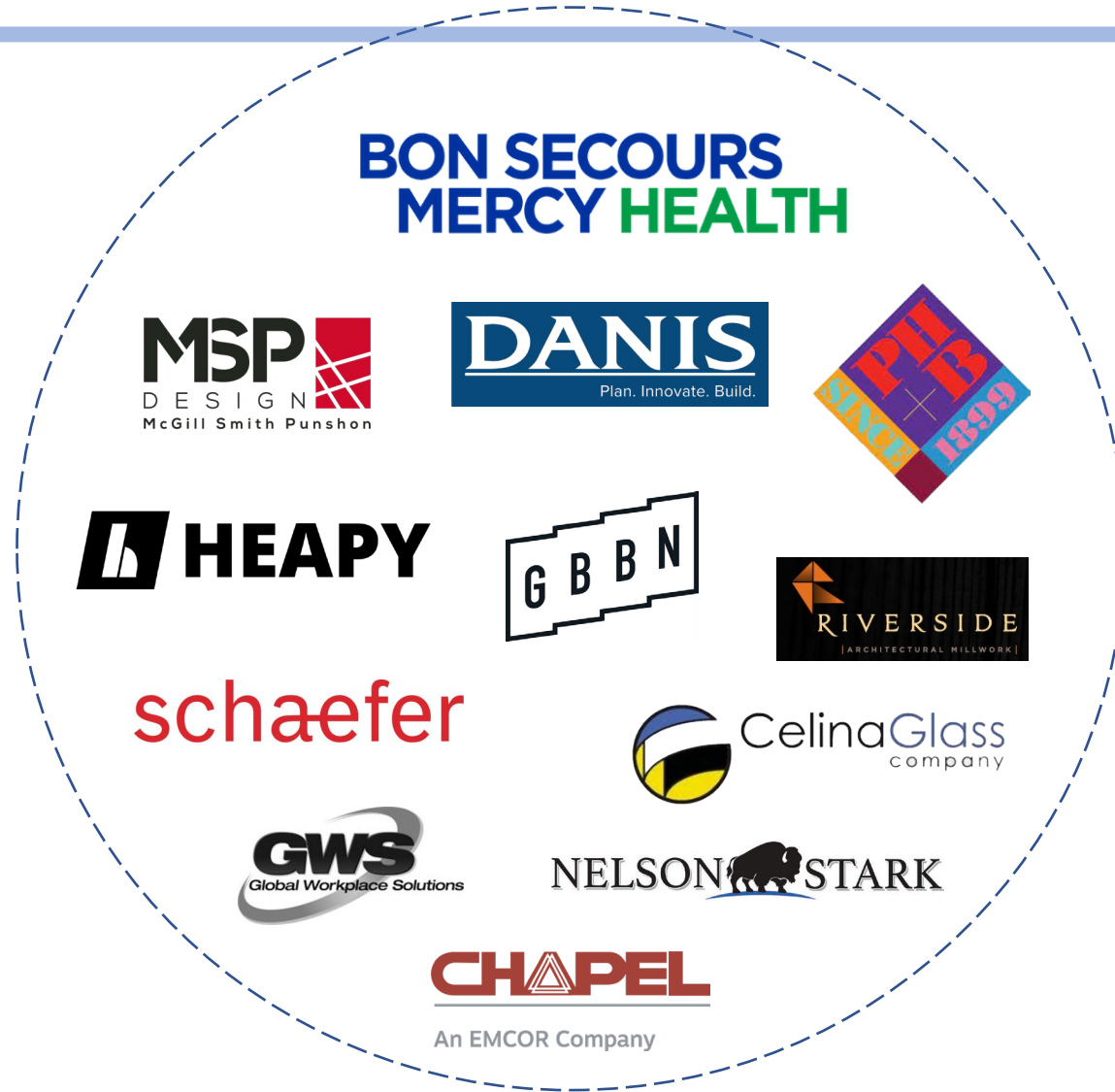
Trade Partners

NELSON & STARK
PLUMBING

CHAPEL
An EMCOR Company
Electric

 CelinaGlass
company
Glazing

IPD Team



Prototyping 2.0: Design Phase Overview

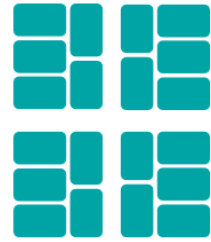


Standardized Design



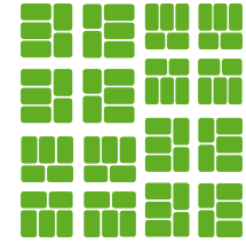
NEIGHBORHOOD

+/-25,000 SF



COMMUNITY

25,000 – 50,000 SF



REGIONAL

50,000 – 125,000 SF



Chester VA



Greenville SC



Cincinnati OH

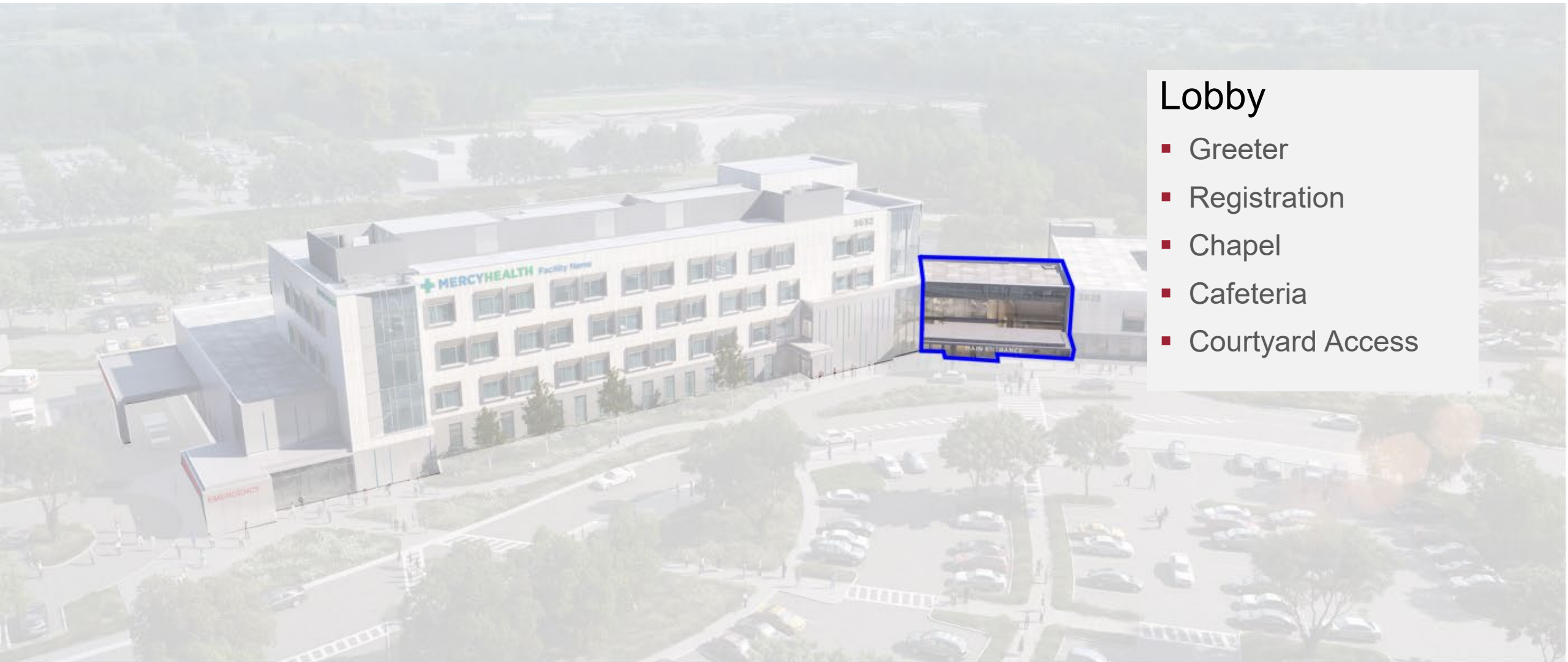
Design Overview





Hospital

- Emergency Department
- Imaging
- Administration
- Support Services
- Surgery & Cath
- Critical Care (12 beds)
- Med/Surg (48 beds)
- Observation Unit (Shelled)
- Central Utility Plant



- ## Lobby
- Greeter
 - Registration
 - Chapel
 - Cafeteria
 - Courtyard Access

Medical Office Bldg.

- Outreach Lab
- Clinics
- Conference Room
- Second Floor Shelled



Design Phase Coordination

	MON.	TUES.	WED.	THURS.	FRI.
6AM					
7AM					
8AM	MEP WORKSESSION	DESIGN TEAM DAILY HUDDLES			MEP INTEGRATED TEAM
9AM	● ● ●			SKIN & STRUCTURE INTEGRATED TEAM	● ● ● ● ●
10AM				● ● ● ● ●	
11AM					
12PM					
1PM	ISSUES RESOLUTION TEAM		WORKING GROUP /OAC	INTERIORS INTEGRATED TEAM	
2PM	● ● ●		● ● ● ● ● ● ●	● ● ● ● ●	
3PM		CM/DESIGN TEAM		SITE INTEGRATED TEAM	
4PM		● ●		● ● ● ●	
5PM					
6PM					

- OWNER
- ARCHITECT
- CONSTRUCTION MANAGER
- MEP ENGINEER
- DESIGN ASSIST SUBCONTRACTORS
- STRUCTURAL ENGINEER
- CIVIL ENGINEER





IPD: Design Phase Wins

- Early identification and coordination of the modular corridor mechanical racks allowed us to reduce skin and structure costs by lowering floor to floor heights. (Arch, CM, MEP, Structure, Mechanical DA)
- On-site fabrication of exterior wall panels allowed for the panel design to be larger than typical prefabricated panels that need to be trucked from a factory. These larger panel sizes were coordinated by the design team early in the process. (Arch, CM, Framing DA, Structure)



Construction Phase

- Critical mass of activity on site allows for efficient construction observation – no separate trips needed to the pre-fab factory.
- Design Team/CM/Trade Partner relationships built in the design phase form a strong foundation for effective, team-based problem solving during the construction phase.

Prototyping 2.0: Construction Planning & Delivery



MERCY HEALTH KINGS MILLS HOSPITAL



\$200M

total project budget

24 month

accelerated schedule

206,000 SF

full service hospital

BEDS

60

Med-Surg/ICU

16

ED

6

OR/Cath Lab



WHY ONSITE INDUSTRIALIZED CONSTRUCTION



1 MILLION+
SKILLED
LABOR CRAFTS
WORKERS
LOST



SUPPLY
CHAIN
DISRUPTION



PRICING
ESCALATION



STRATEGIC INNOVATION PREFABRICATION REDEFINED SOLVING THE SKILLED LABOR SHORTAGE



**MERCY
HEALTH**

DANIS
Plan. Innovate. Build.



DANIS Innovations

Industrialized Construction Center



HOW ONSITE INDUSTRIALIZED CONSTRUCTION CENTER

Similar to an automotive manufacturing assembly line, single-trade assemblies are brought into one end of the ICC and assembled into a multi-trade assembly.

INNOVATION

ONSITE INDUSTRIALIZED CONSTRUCTION CENTER

- Portable Factory
- Three (3), 230 ft. Proprietary Construction Assembly Lines
- Lean/Takt Manufacturing Principles
- Zero Shipping Limiters
- Zero Rain Days / Resource Leveling
- Sustainable

DANIS Innovations
Industrialized Construction Center

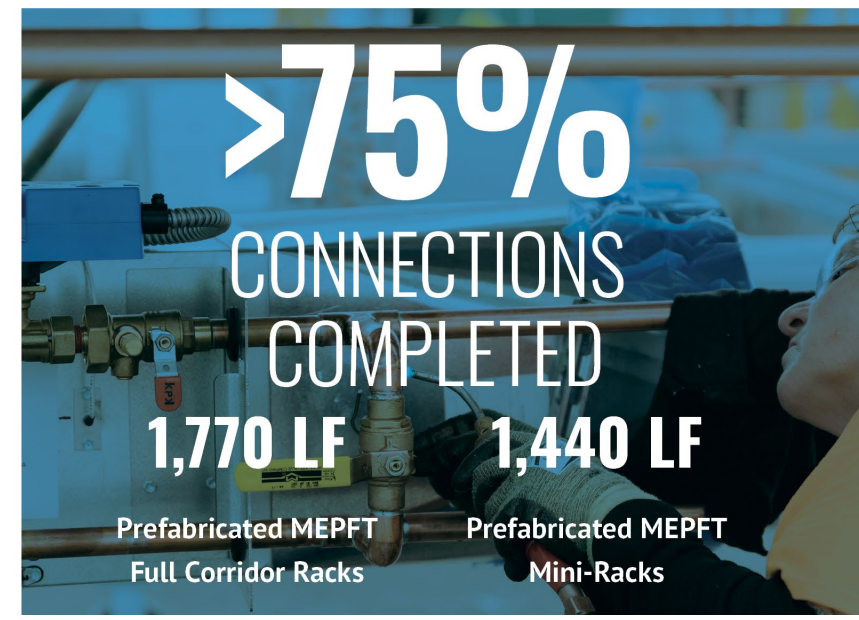
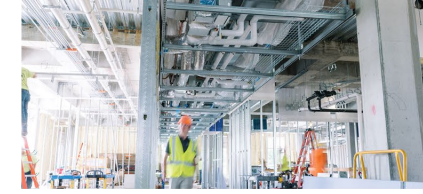




90%
EXTERIOR WALLS
PANELIZED
177
15' x 32' Large Exterior
Wall Assemblies



48 Patient Bathroom
Multi-Trade Wall Assemblies
80 Headwall
Assemblies



>75%
CONNECTIONS
COMPLETED
1,770 LF Prefabricated MEPFT
Full Corridor Racks
1,440 LF Prefabricated MEPFT
Mini-Racks

RESULTS ONSITE INDUSTRIALIZED CONSTRUCTION



5 month

SCHEDULE SAVINGS



203 Typical Manpower Needed
Onsite for Monthly Revenue

112 Actual Manpower
Onsite with Danis ICC

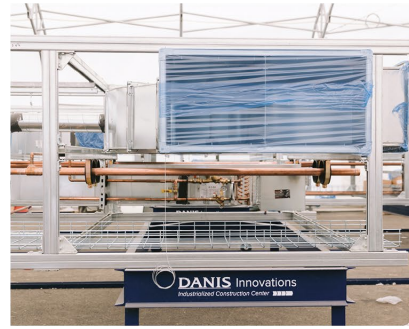
81% Improved
Manpower
Utilization

51%

REDUCTION
days on-site

ZERO
SAFETY
incidents

18%
inspections
DIVERTED to ICC



Prototyping 2.0: Wrap Up



Wrap Up

Summary of the ICC experience from the BSMH perspective:

- What was differentiating about the ICC as a proposed concept and how has it materialized during construction? What met BSMH expectations and what has been unexpected?
- As an owner, what are the benefits of On-Site Industrialized Construction vs. traditional off-site prefabrication?
- How will this experience inform future BSMH Ministry projects?

Prototyping 2.0: Q&A



Thank you

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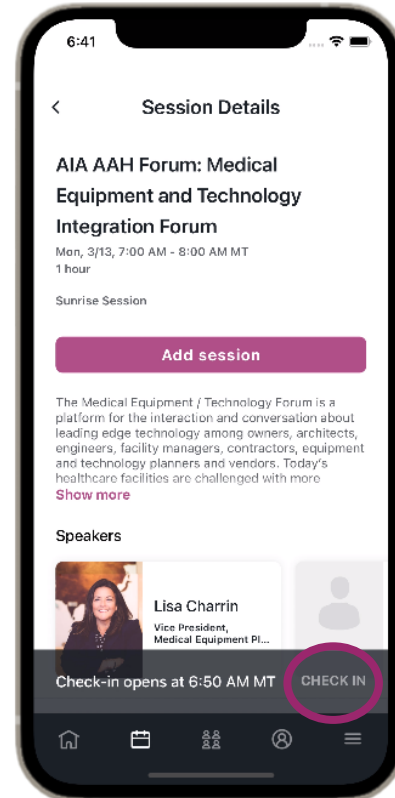
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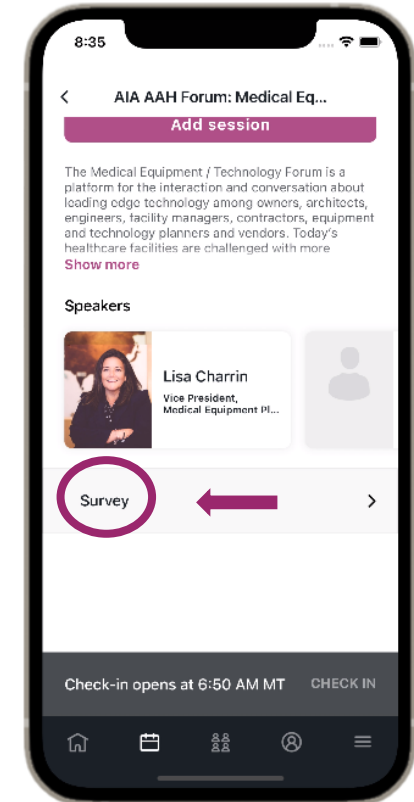
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