Construction @ FNAL

Presenter: Mark Jeffers

Community Advisory Board

May 26, 2022

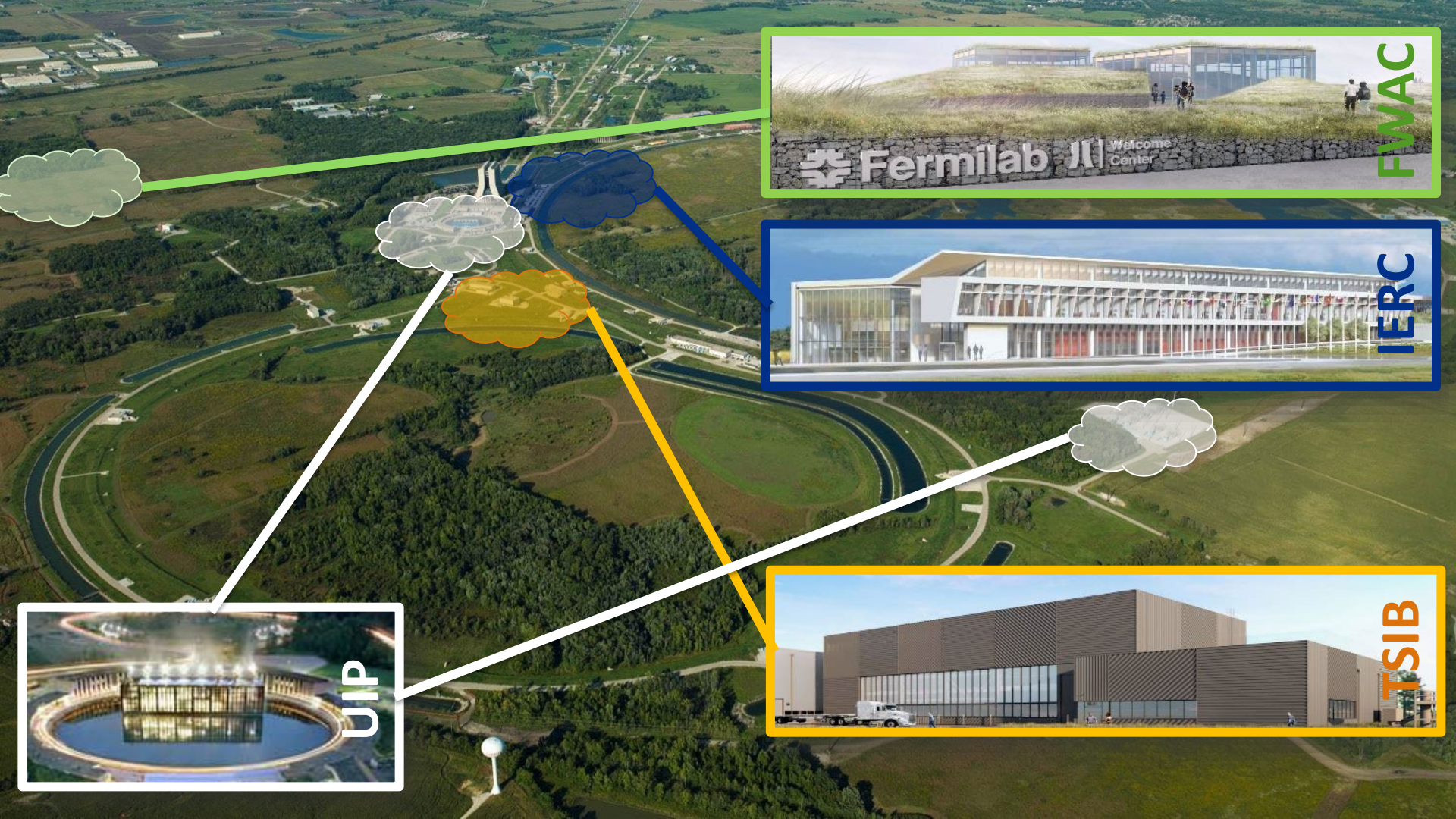
Agenda

Integrated Engineering Resource Center (IERC)

Target Systems Integration Building (TSIB)

Fermilab Welcome and Access Center (FWAC)

Utilities Infrastructure Project (UIP)


Fermilab
Welcome Center
FWAC
IERC
TSIB
UIP

Integrated Engineering Research Center (IERC)

CD-0
Mission Need identified
JUL – 2015

CD-1
Prelim Project Plan Approved
APR – 2017

CD-2/3
Completed Final Design
Construction Start
SEP – 2020

CD-4
Project Closeout Complete
ETA: FY23

Integrated Engineering Research Center (IERC)

PROJECT OVERVIEW

- 80,000 Gross Sq. Ft. / 2 stories
- Funded by the DOE Science Laboratories Infrastructure (SLI) Program

Subcontractor Team

- Architect: Perkins & Will
- Engineer (Mech., Elec., Plumbing, Fire Prot., Structural): Arup
- Engineer (Civil): Terra
- Construction Manager / General Contractor: Mortenson
- Commissioning Agent: Burns & McDonnell

Integrated Engineering Research Center (IERC)

IERC is designed to support staff with science, engineering & technical expertise from Neutrino Division, Particle Physics Division, and Scientific Computing Division

Detector Development & Operations Department

Liquid Argon Detector

Real-time Systems Engineering

Mechanical Engineering

Electrical Engineering

Integrated Engineering Research Center (IERC)

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Integrated Engineering Research Center (IERC)

Coming Soon!

Target Systems Integration Building (TSIB)

Milestones

PD-0
Mission Need identified
FEB-2020

PD-1
Prelim Project Plan Approved
MAR-2021

PD-2
Completed Final Design
NOV-2021

PD-3
Construction Start
ETA: FY2023

PD-4
Project Closeout Complete
ETA: FY2024

Target Systems Integration Building (TSIB)

Project Overview

- Addition to the existing Main Injector Service Building (MI-8)
- General Plant Project (GPP)
- Funded by DOE High Energy Physics (HEP)

Champion Organization

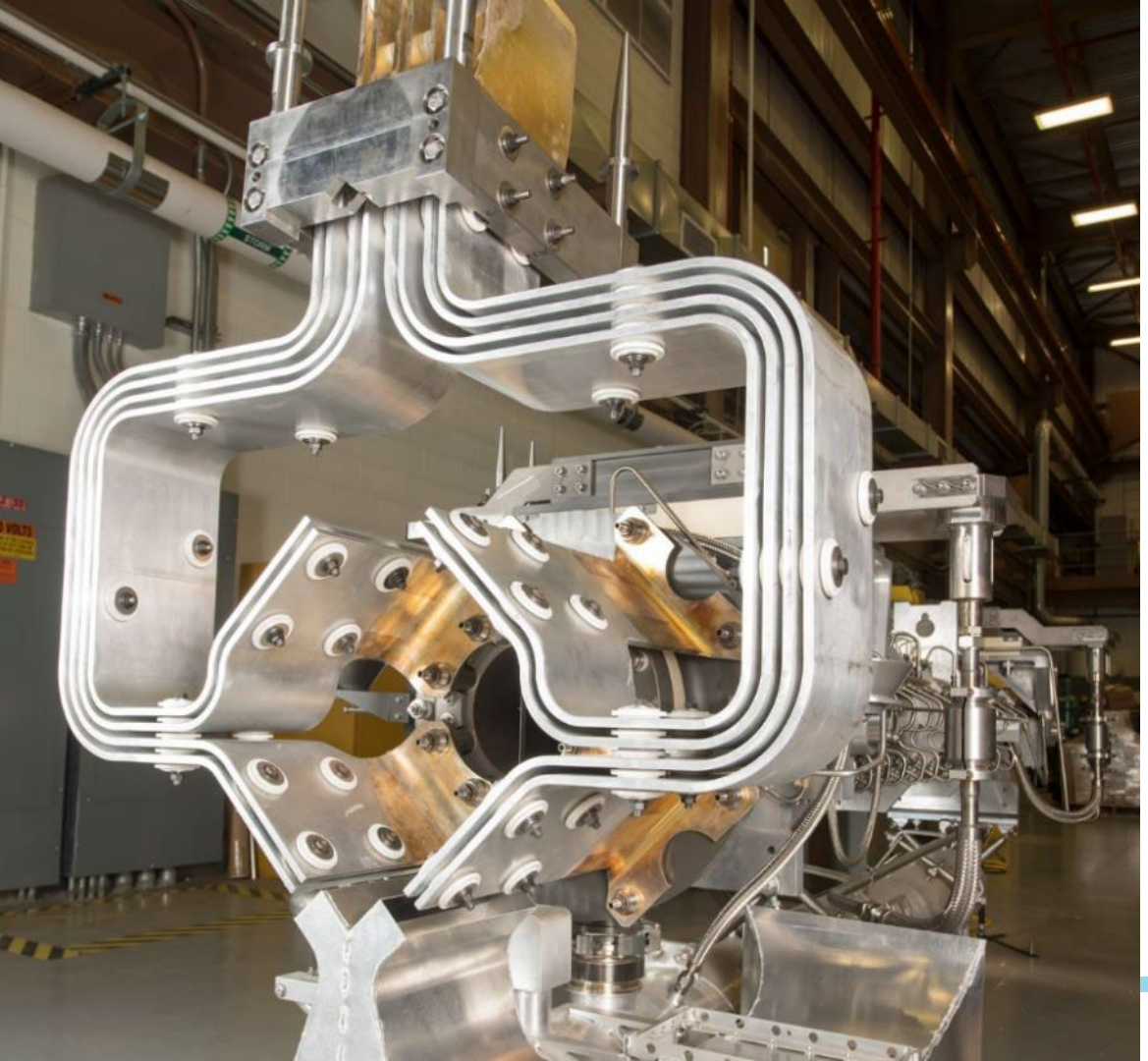
- Accelerator Division

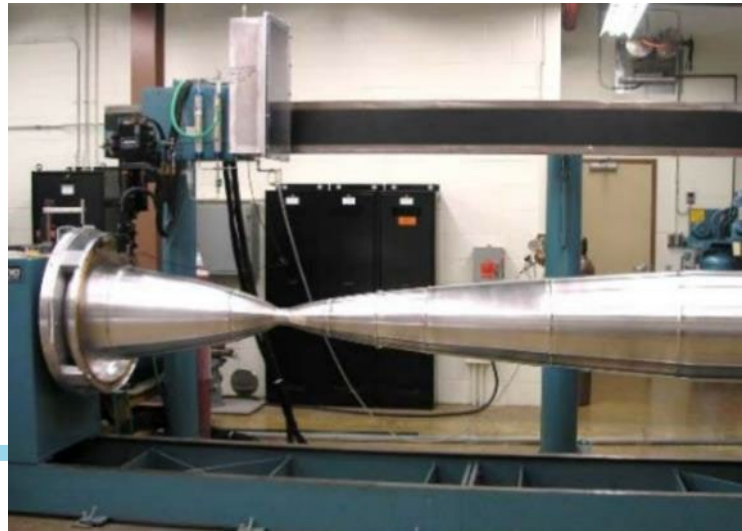
Subcontractor:

- Architect: **Canon Design**

TSIB Needed to Meet Demand of Current & Next Gen HEP Experiments

- MI-8 footprint running at full capacity to meet demand at existing **4 Target Stations.**
- MI-8 production areas not suited for the scale of the next generation experiments



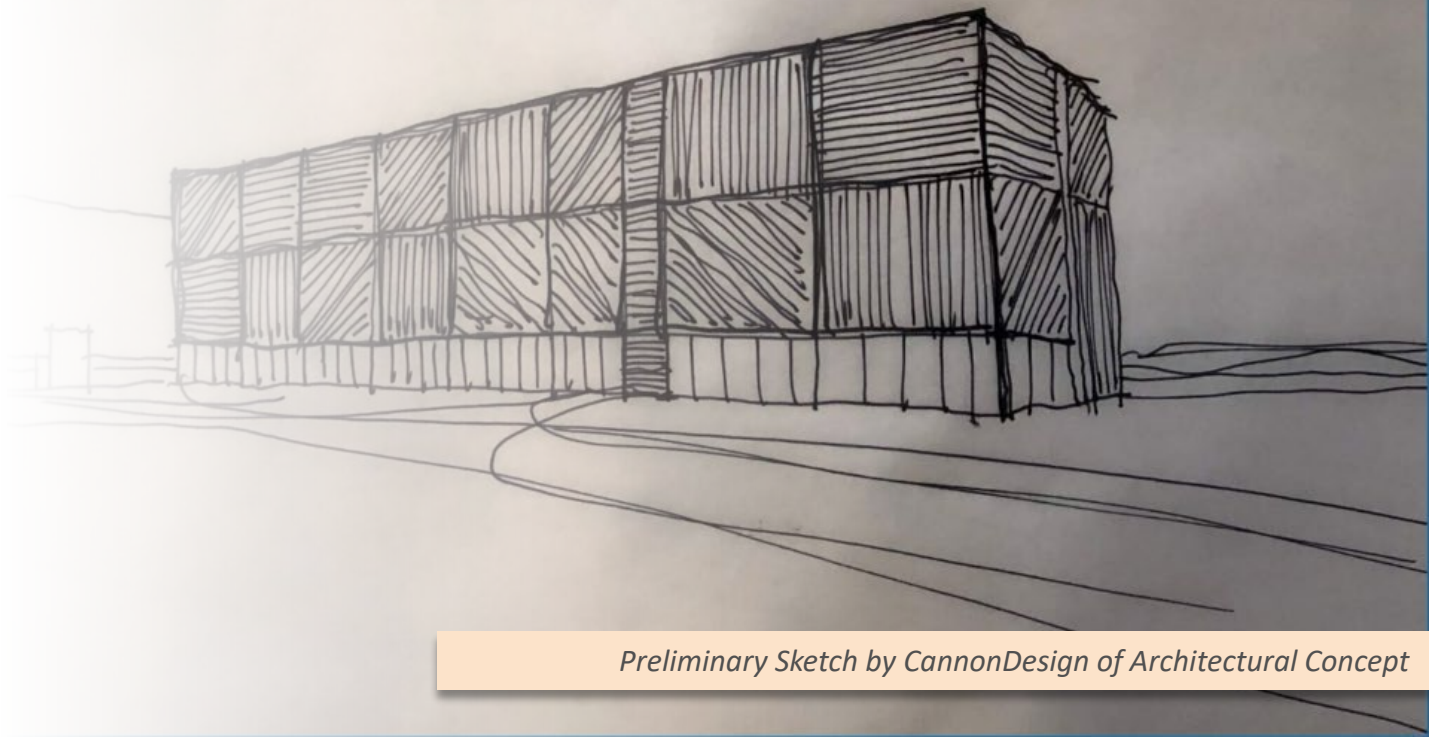


Target Systems Integration Building (TSIB)

View from the proposed horn assembly area at TSIB highbay

Target Systems Integration Building (TSIB)

ARCHITECTURAL CONCEPT



Preliminary Sketch by CannonDesign of Architectural Concept

Target Systems Integration Building (TSIB)

Arriving in 2025!

Fermilab Welcome & Access Center (FWAC)

PD-0
Mission Need identified
JUN – 2020

PD-1
Prelim Project Plan Approved
APR – 2021

PD-2
Completed Final Design
FEB – 2022

PD-3
Construction Start
ETA: FY2023

PD-4
Project Closeout Complete
ETA: FY2025

Fermilab Welcome & Access Center (FWAC)

PROJECT OVERVIEW

- Align site security with DOE requirements by providing a new security facility at the Fermilab main entrance, Kirk Road & Pine Street
- General Plant Project (GPP)
- Funded by the DOE Science Laboratories Infrastructure (SLI) Program

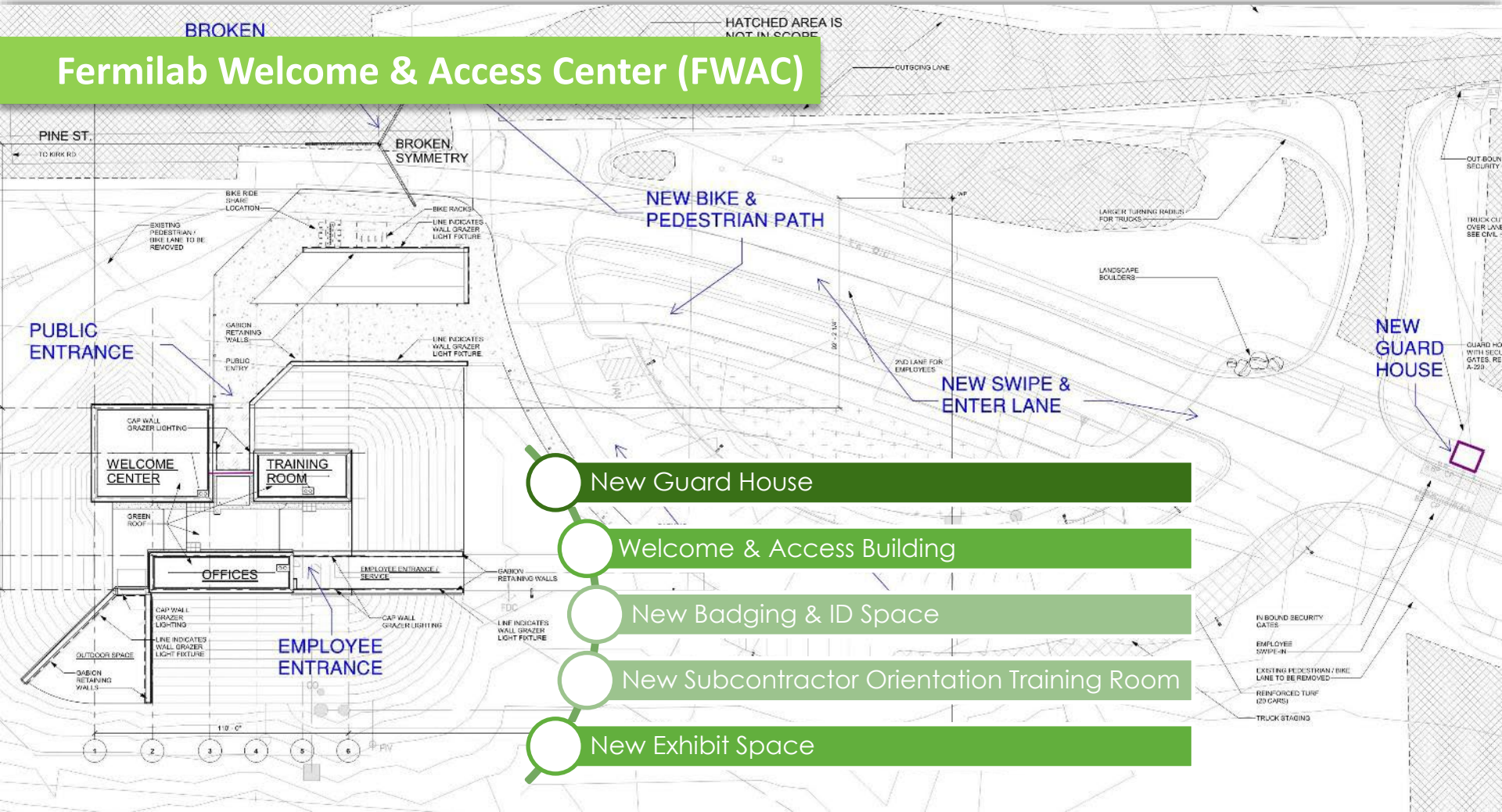
Project Goals

- Enhance Site Security & Safety
- Consolidate Pre-badge functions to Public facing Non-secure Area
- Maximize Sustainability
- Establish a Welcoming & Informative Visitor Access Area

Subcontractor:

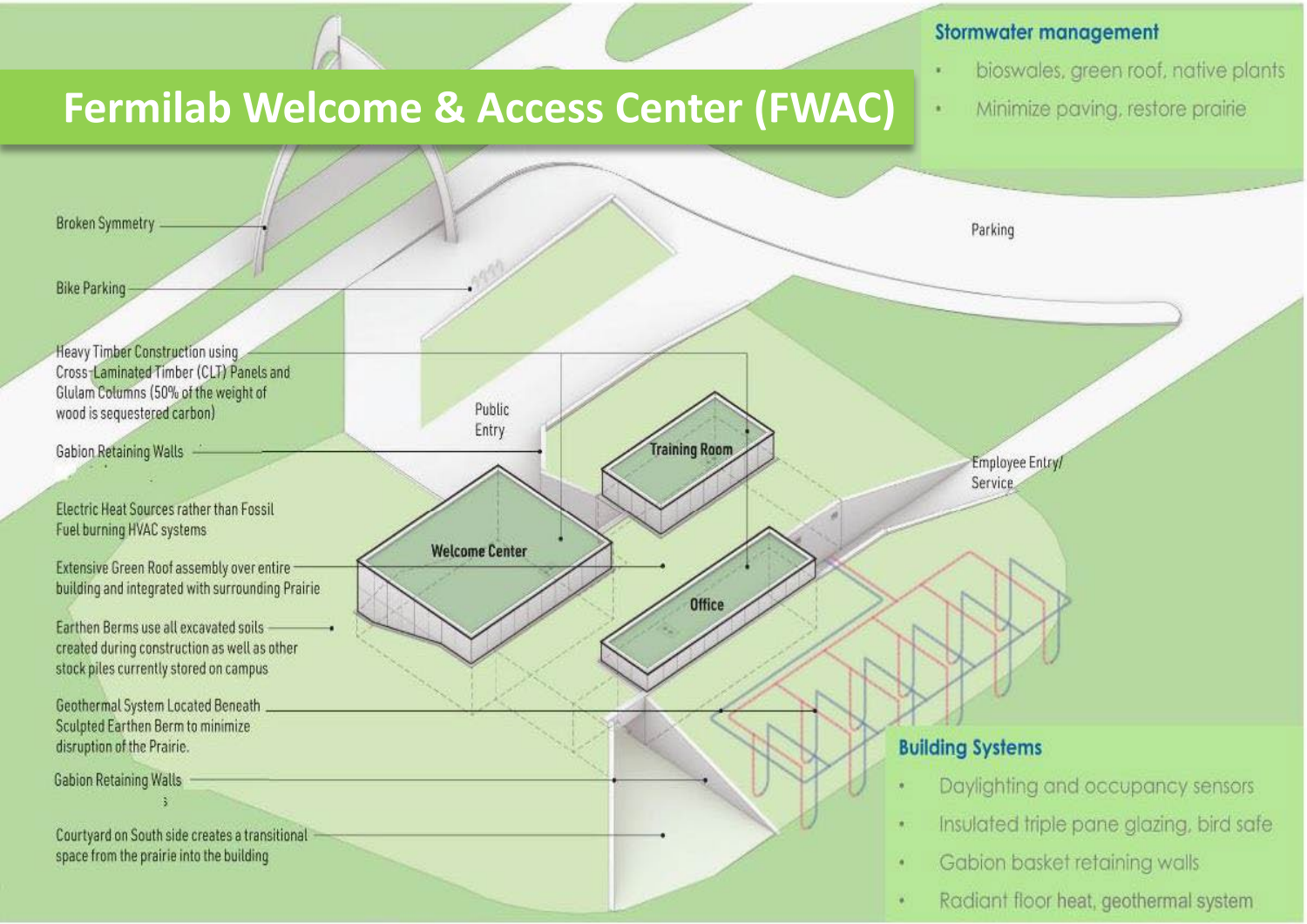
- Architect: **AECOM**

Fermilab Welcome & Access Center (FWAC)



- New Guard House
- Welcome & Access Building
- New Badging & ID Space
- New Subcontractor Orientation Training Room
- New Exhibit Space

Fermilab Welcome & Access Center (FWAC)



Net Zero Energy Ready

Carbon Neutral

Extensive Green Roof System Manages Stormwater, Reduces Heat Island Effect, and Improves Air Quality

Green Roof & Earthen Berms Insulate Building

Engineered Timber Structure Sequesters Carbon (50% of mass)

Geothermal Heat Pump Radiant Floor Heating and HVAC Systems

Minimized Paving for Stormwater Management

Fill Materials for Earthen Berms and Gabion Retaining Walls Incorporate Local Materials

Fermilab Welcome & Access Center (FWAC)

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Utilities Infrastructure Project (UIP)

CD-0
Mission Need identified
MAY-2019

CD-1
Prelim Project Plan Approved
FEB - 2022

CD-2/3 – (#1)
Completed Final Design
Construction Start
ETA: DEC – 2025

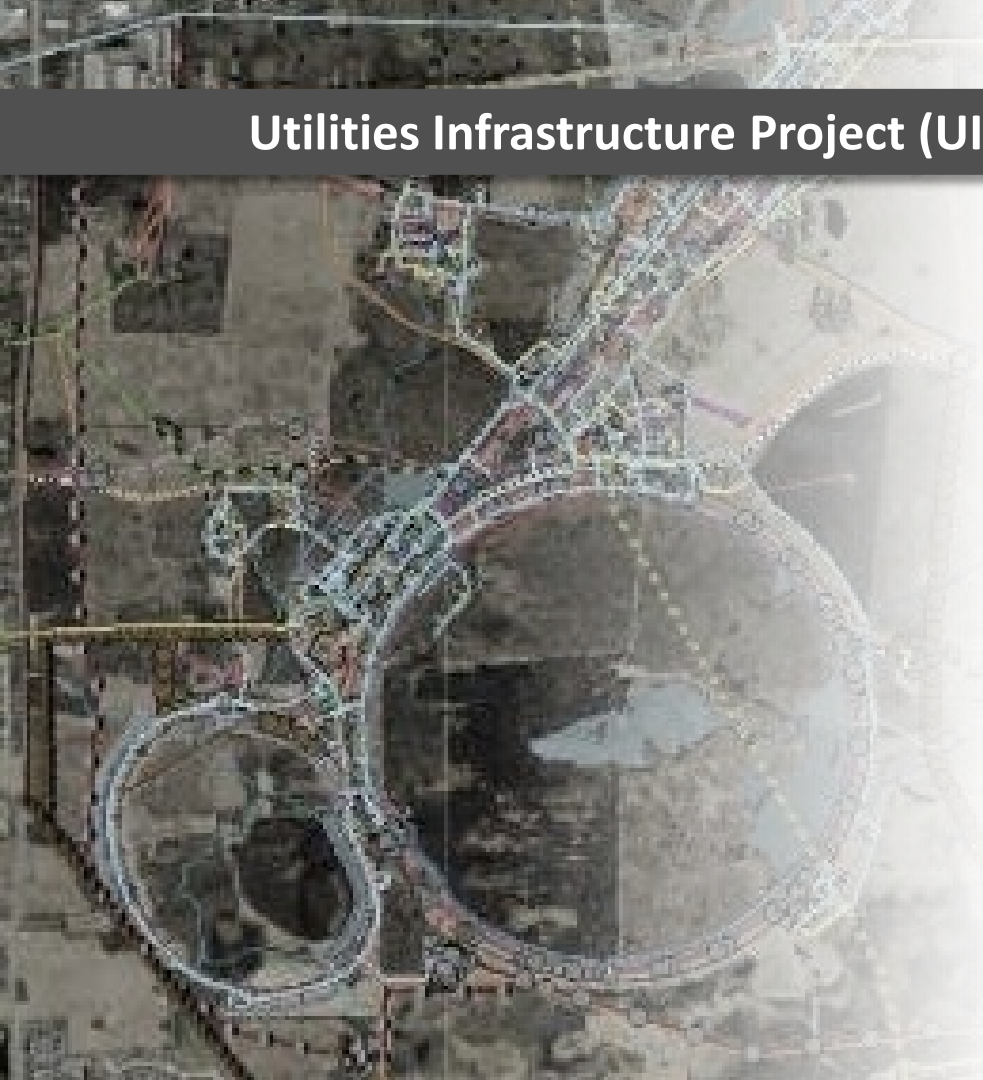
CD-2/3 – (#2)
Completed Final Design
Construction Start
ETA: JUN – 2025

CD-2/3 – (#3)
Completed Final Design
Construction Start
ETA: SEP – 2027

CD-4 – (#1)
Project Closeout Complete
ETA: JAN – 2031

CD-4 – (#2)
Project Closeout Complete
ETA: JAN – 2032

CD-4 – (#3)
Project Closeout Complete
ETA: MAY – 2034



Utilities Infrastructure Project (UIP)

Project Overview

- Recapitalization of overaged, obsolete, and severely deteriorated aspects of Fermilab's utility infrastructure
- Funded by the DOE Science Laboratories Infrastructure (SLI) Program

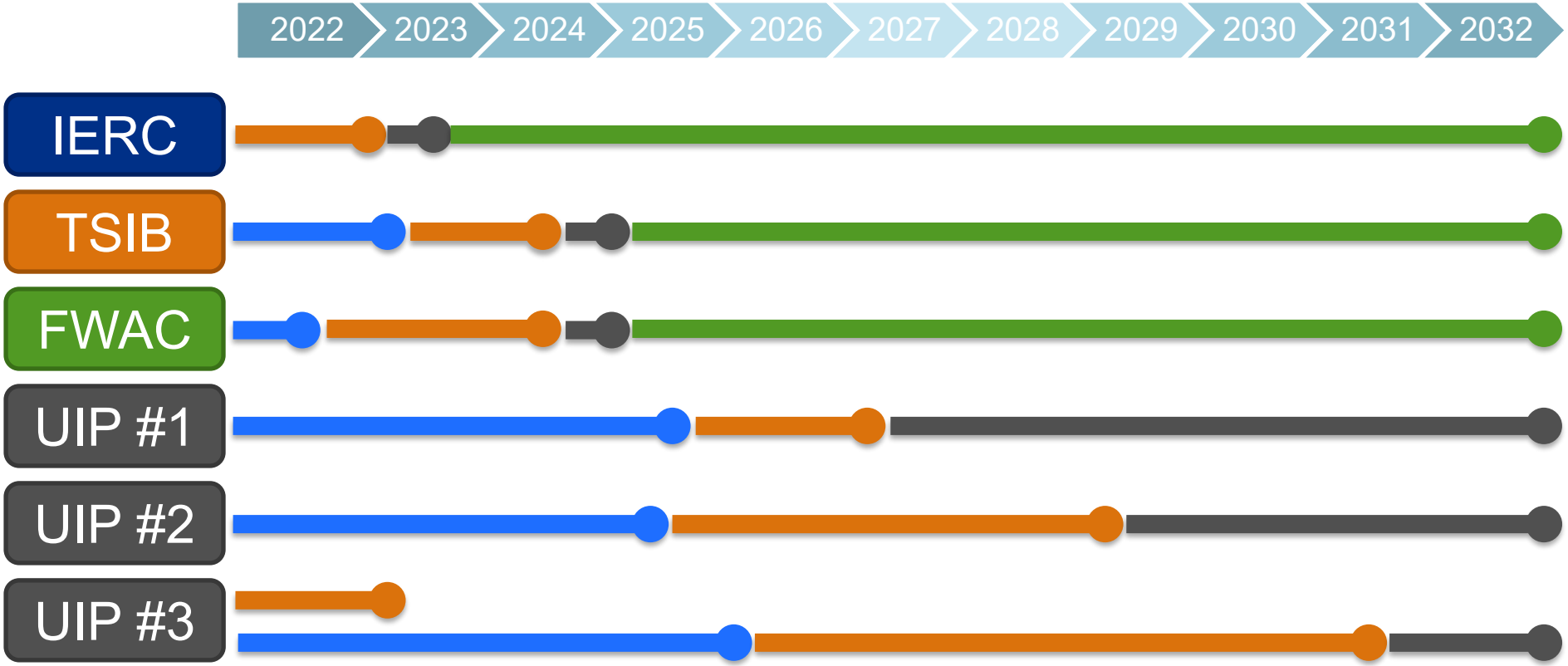
Project Structure

- 10+ year project separated into three major subprojects:
  - Renovation of the existing Central Utilities Building & construction of a new Chilled Water Plant
  - Replacement of the Kautz Road 345kV Substation
  - Recapitalization of electric distribution, natural gas, industrial cooling water, domestic water, storm water, and sanitary systems using risk-based approach

Subcontractor:

- Architect: **ARUP**

Notable Construction Schedule



Conclusion / Key Takeaways

Infrastructure project portfolio is growing

- 2020's on track to have 2x – 5x larger investment profile than 2010's

Wide variety of projects

- Over 100 potential projects ranging from new facilities to replacing underground utilities to constructing state-of-the-art clean rooms to safety improvements

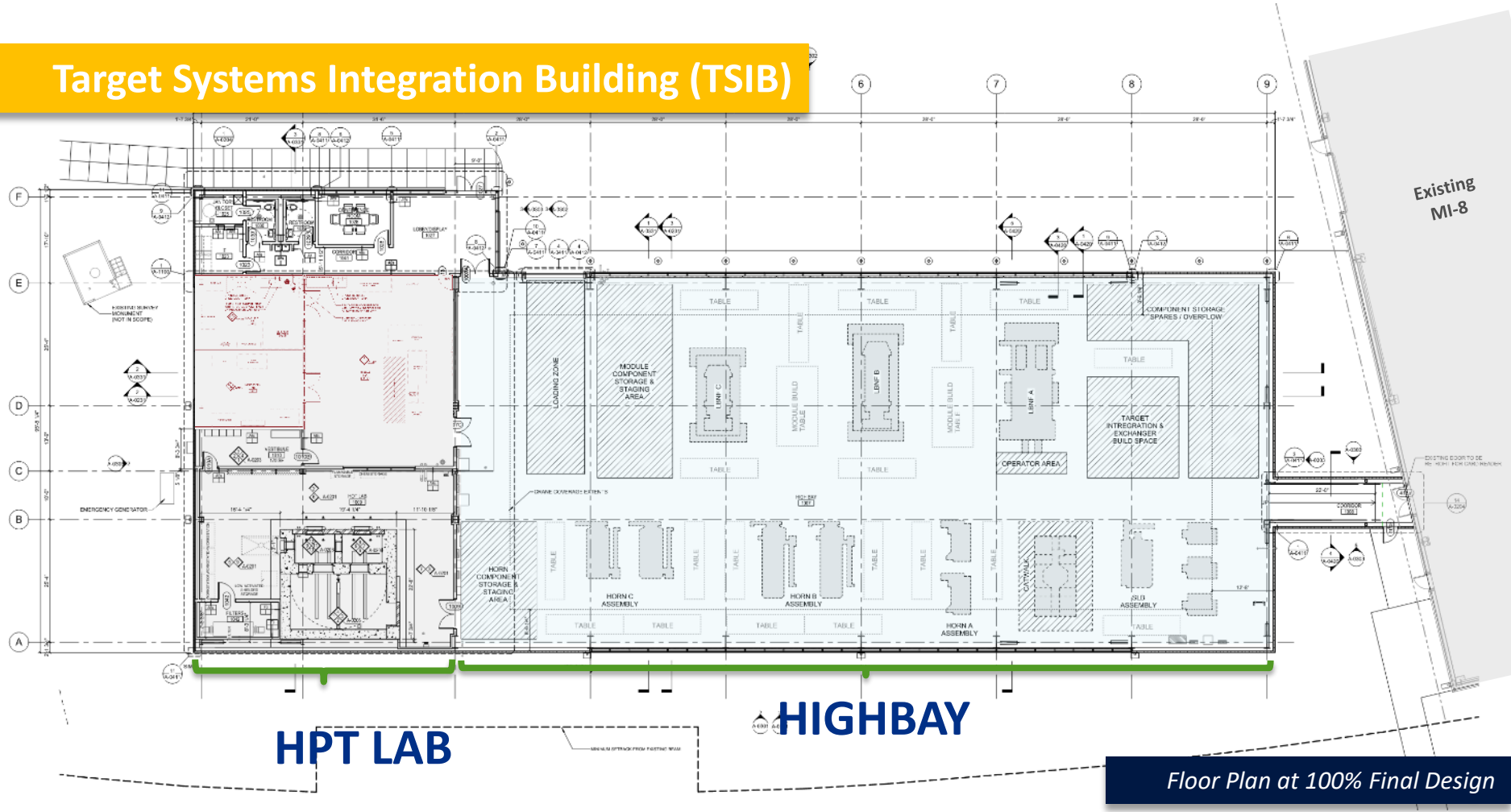
Building for the next 50 years of operations

- The projects being developed, designed, and constructed are focused on providing the necessary infrastructure to support the Lab's mission

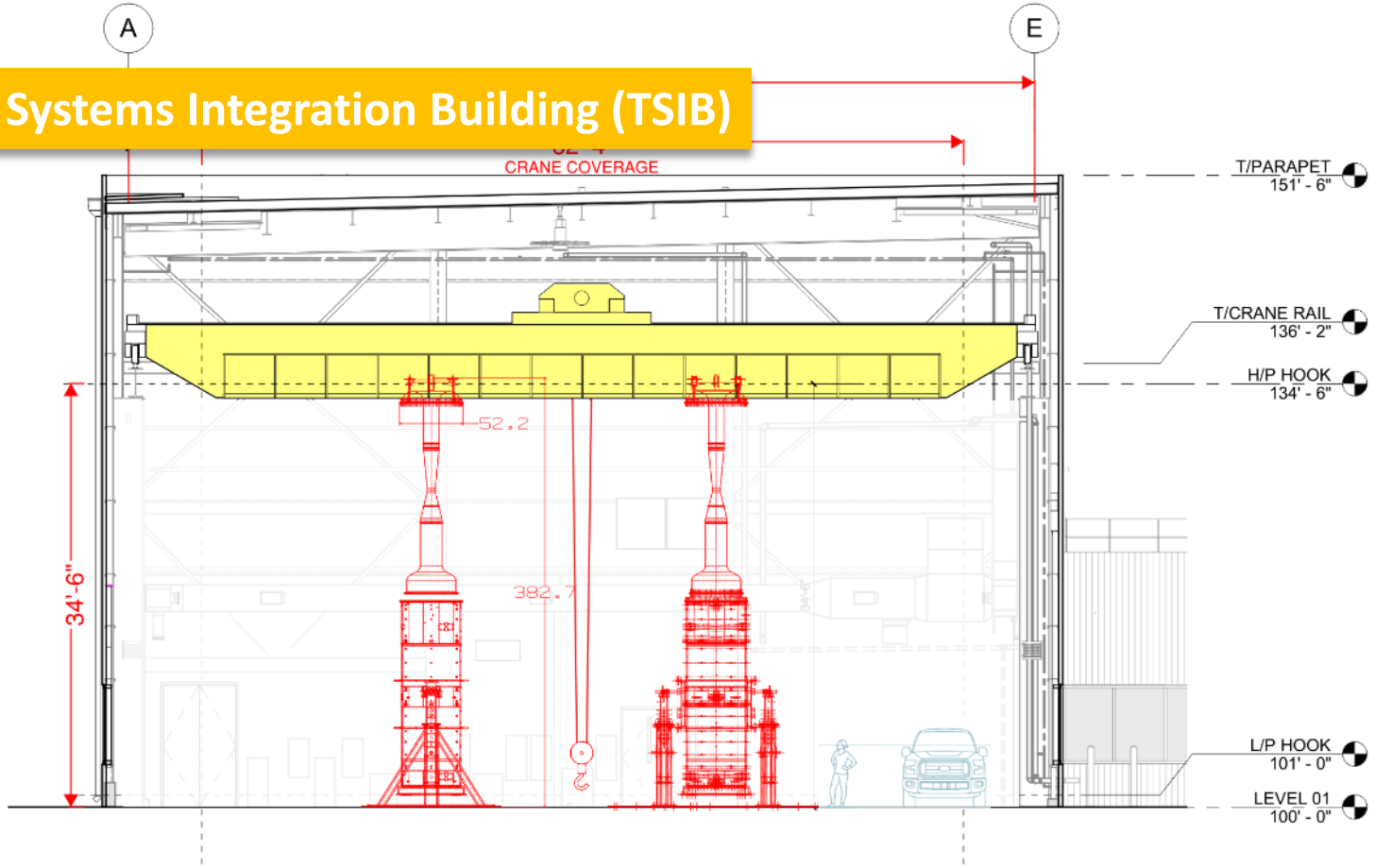
Questions?

Additional Slides

Target Systems Integration Building (TSIB)

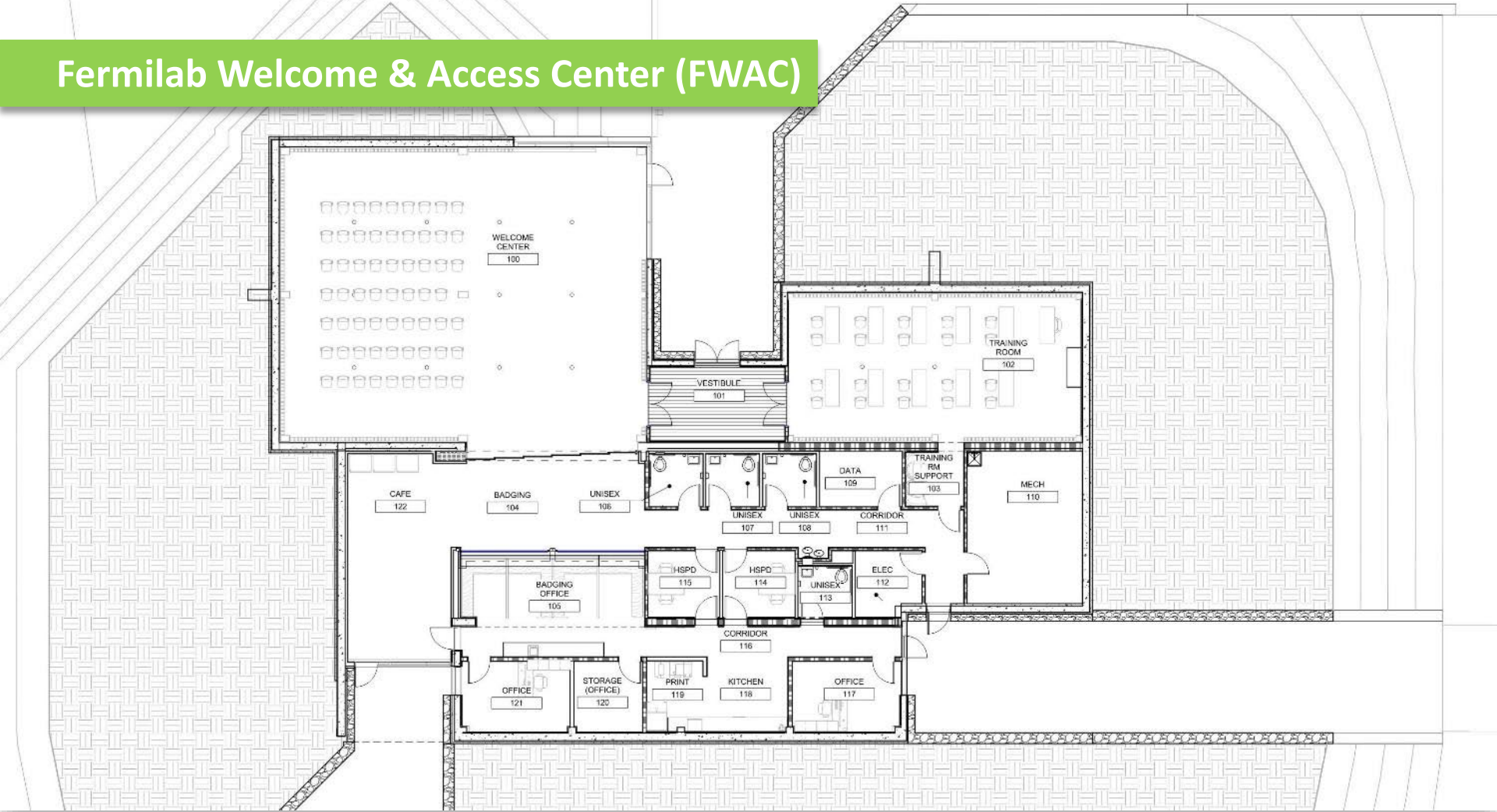


Target Systems Integration Building (TSIB)



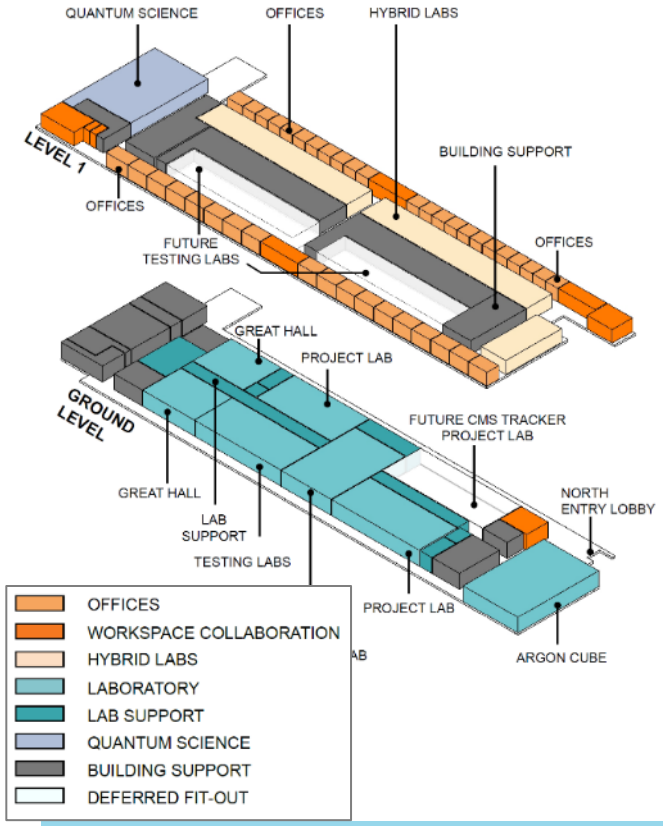
Building Section through highbay at 100% Final Design

Fermilab Welcome & Access Center (FWAC)

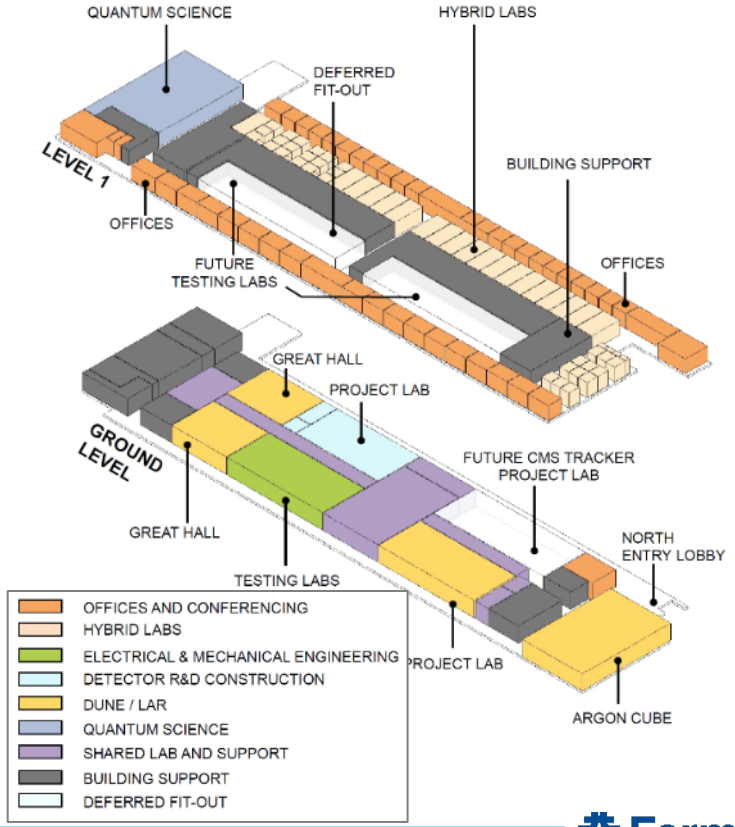


IERC – Programming

Space Diagram

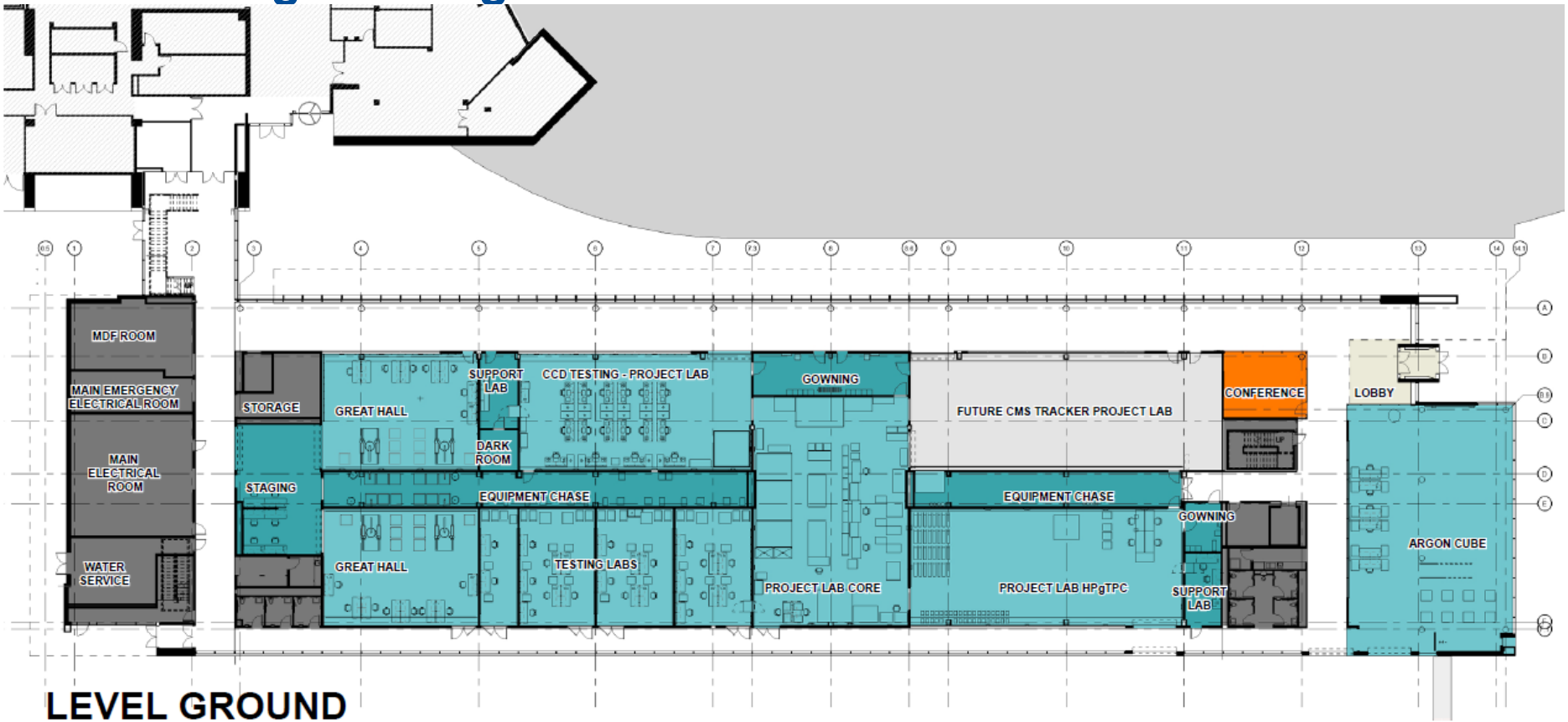


Department Diagram



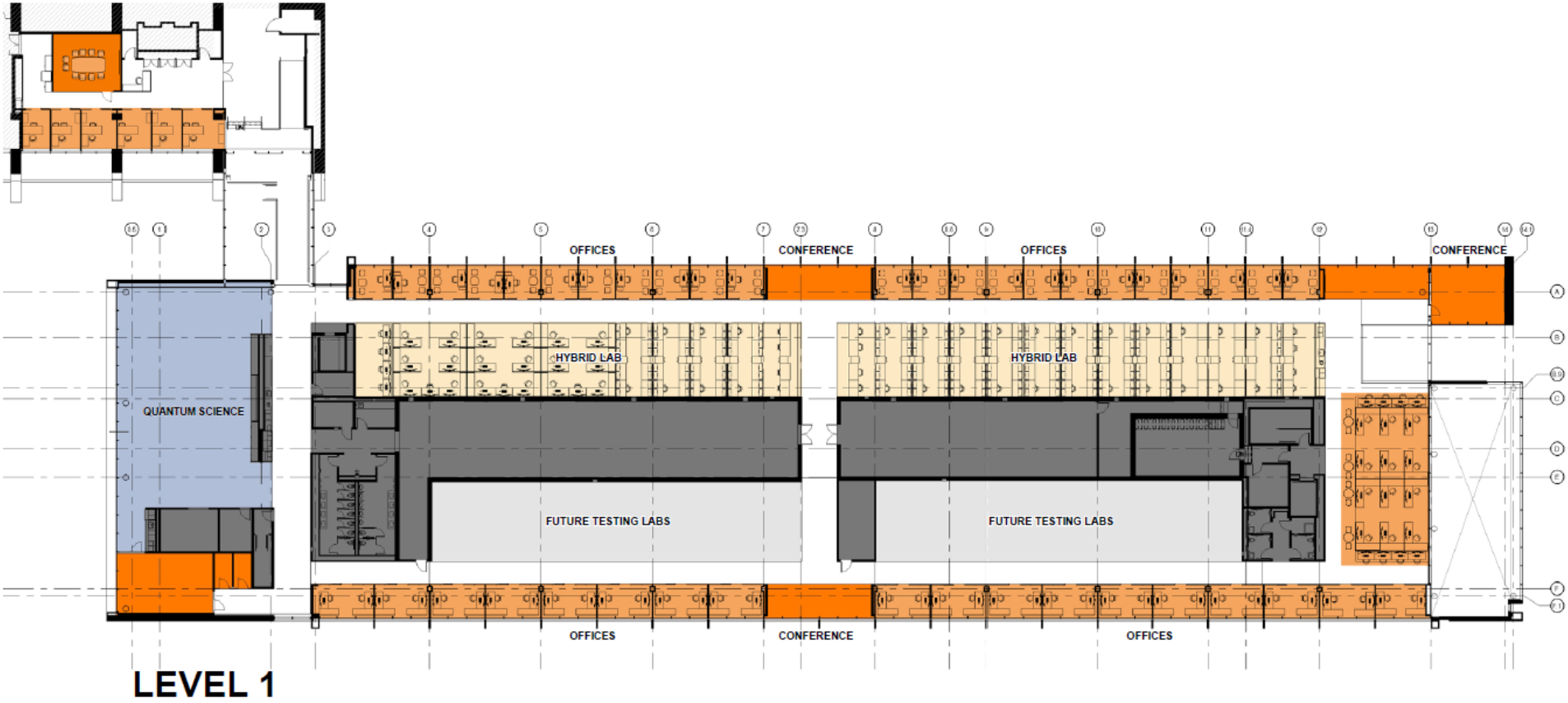
Fermilab

IERC – Programming



Fermilab

IERC – Programming



Fermilab