

Community Advisory Council

BNL Campus Infrastructure Update

Tom Daniels
Associate Laboratory Director
Facilities and Operations Directorate

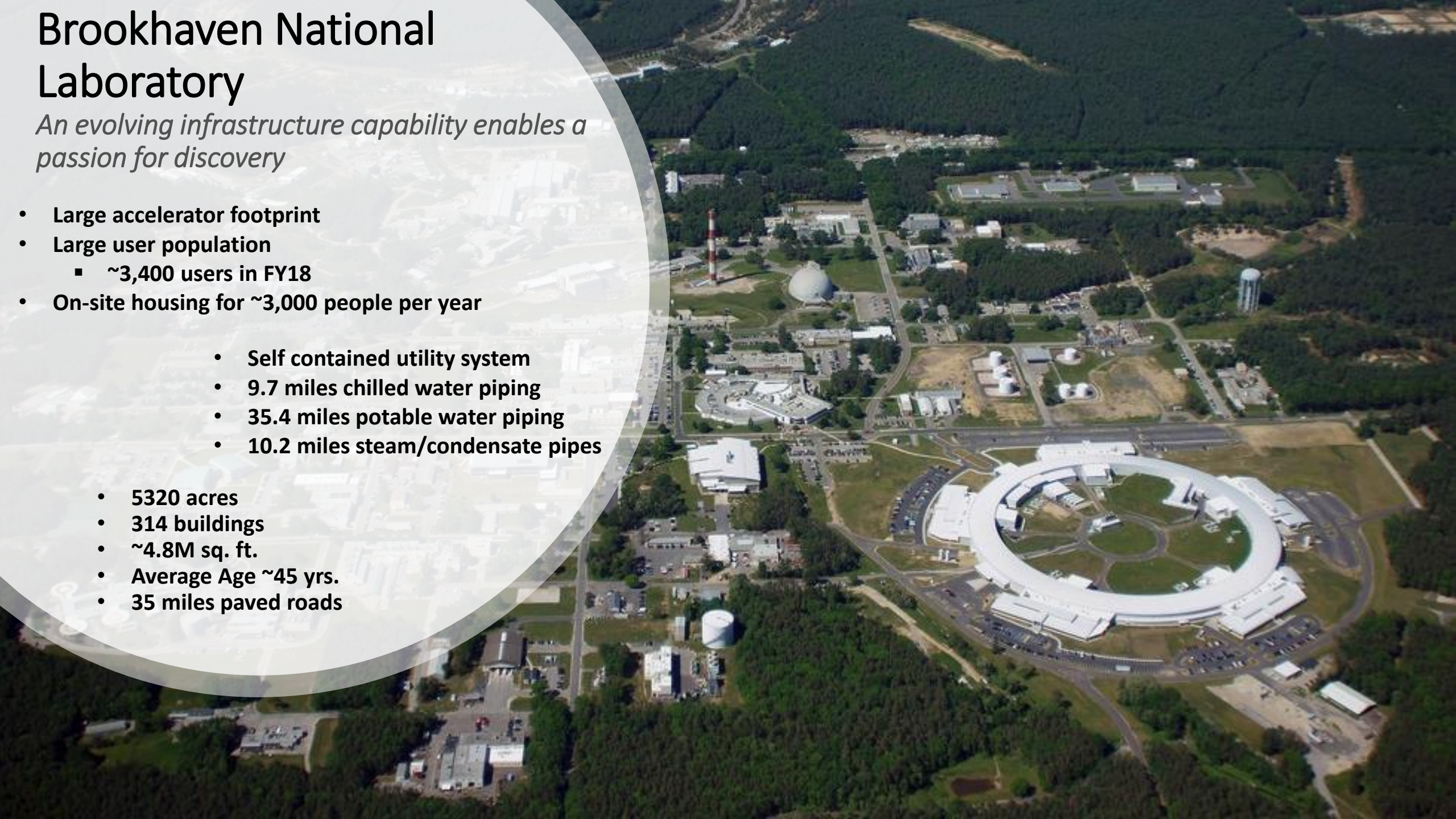
May 9, 2019



Brookhaven National Laboratory

An evolving infrastructure capability enables a passion for discovery

- Large accelerator footprint
- Large user population
 - ~3,400 users in FY18
- On-site housing for ~3,000 people per year
 - Self contained utility system
 - 9.7 miles chilled water piping
 - 35.4 miles potable water piping
 - 10.2 miles steam/condensate pipes
- 5320 acres
- 314 buildings
- ~4.8M sq. ft.
- Average Age ~45 yrs.
- 35 miles paved roads





Ten-year Campus Strategy

BSA is executing a plan to deliver the next decade of science while transforming the Laboratory Campus

Federal
Indirect
Private

1. Improve capability of critical core buildings to enable the scientific agenda
2. Enhance safety and cost effectiveness by optimizing the campus footprint and demolishing old buildings
3. Ensure scientific facility reliability through targeted utility and infrastructure investments
4. Renew infrastructure and support the growing population of scientific users through an innovative public-private concept of *Discovery Park*

Protect



Operate



Modernize



Facilities and Operations Directorate

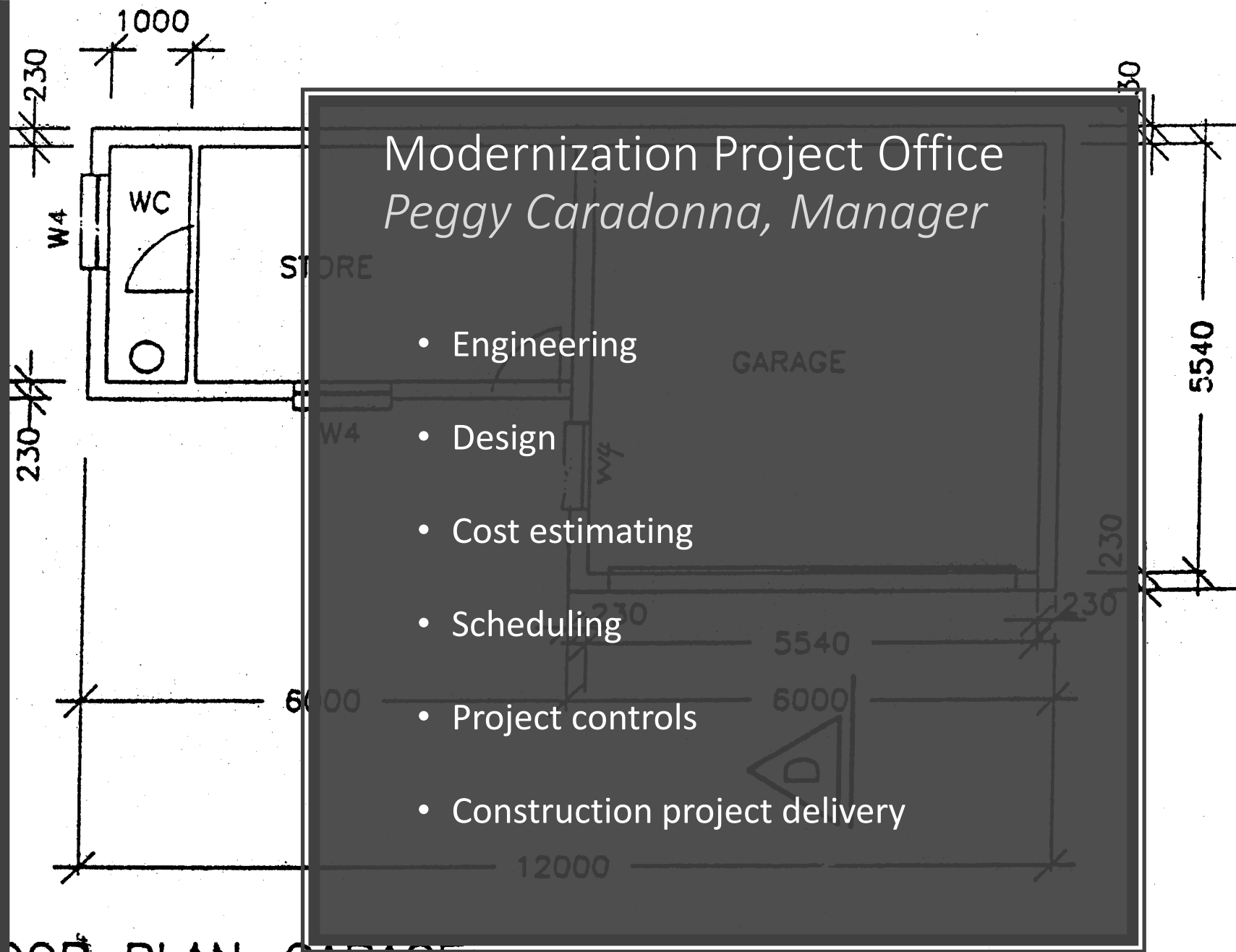
We
Enable
Great
Science!



Site Planning & Infrastructure Management (SPIM)

John DiNicola, Interim Manager

- Site Master Planning
- Space planning & management
- Manages facilities data base (FIMS)
- Configuration management of utilities maps and “Vault” drawing
- Manages BNL's Project Planning, Programming and Budgeting
- Prioritization (3PBP) system



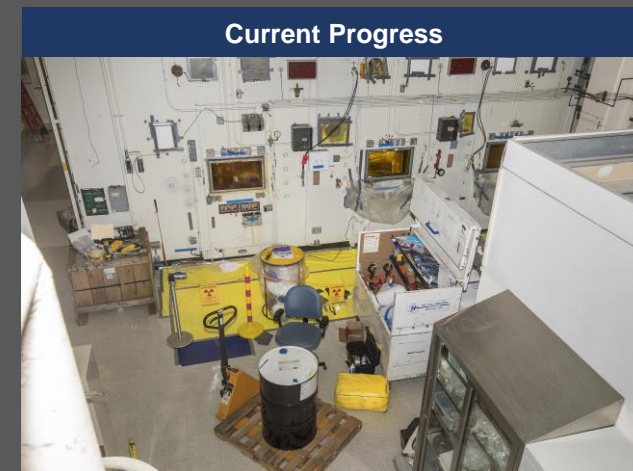
FLOOR PLAN - GARAGE

1: 100

Science Laboratory Infrastructure (SLI) General Plant Projects (GPP): High Impact Investments

Upgrade Building 801 Hot Cells and Labs (\$8.5M)

- Capability of hot cell infrastructure has become the limiting factor for isotope R&D given recent upgrades to BLIP
- Project will modernize hot cell, material handling systems, refurbish shield windows, manipulators, and upgrade support spaces



7/2015

9/2015

PSA = 2.923 ng/mL

PSA = 0.26 ng/mL

PSA < 0.1 ng/mL

SLI GPP: High Impact Investments

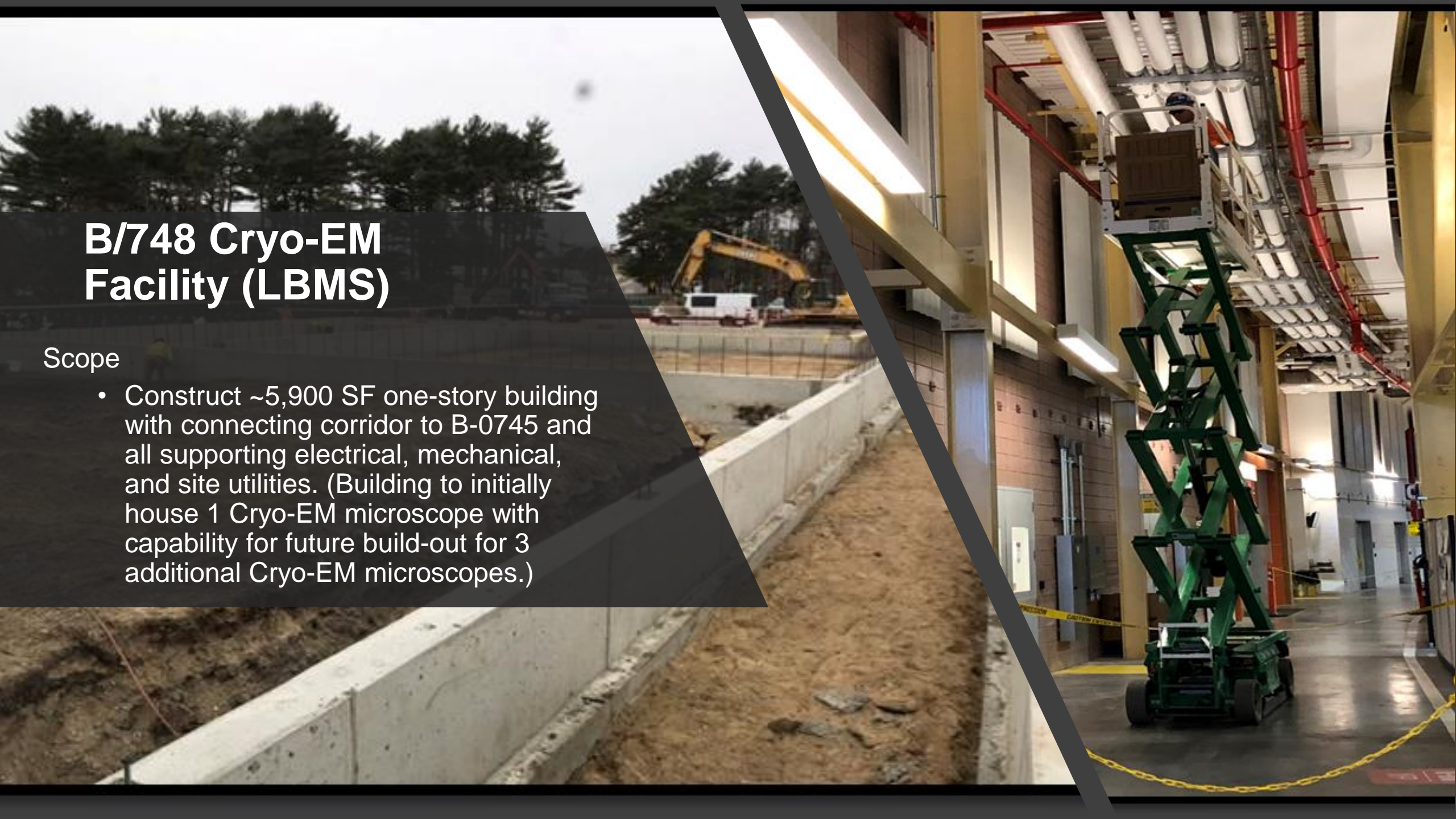
- Biology Labs are 1960s vintage and Lab finishes and supporting HVAC, plumbing, and electric are all substandard
- Project will renovate select lab suites including mechanical, electrical and plumbing infrastructure, case goods and finishes. Results in:
 - Improved service system reliability, lab performance, efficiency and appearance
 - Retires safety risks and ~\$3M of deferred maintenance
 - Enables consolidation of important scientific activities and continued success of the BES plant sciences program and to support research by BER



B/748 Cryo-EM Facility (LBMS)

Scope

- Construct ~5,900 SF one-story building with connecting corridor to B-0745 and all supporting electrical, mechanical, and site utilities. (Building to initially house 1 Cryo-EM microscope with capability for future build-out for 3 additional Cryo-EM microscopes.)



HEX Beamline Satellite Building

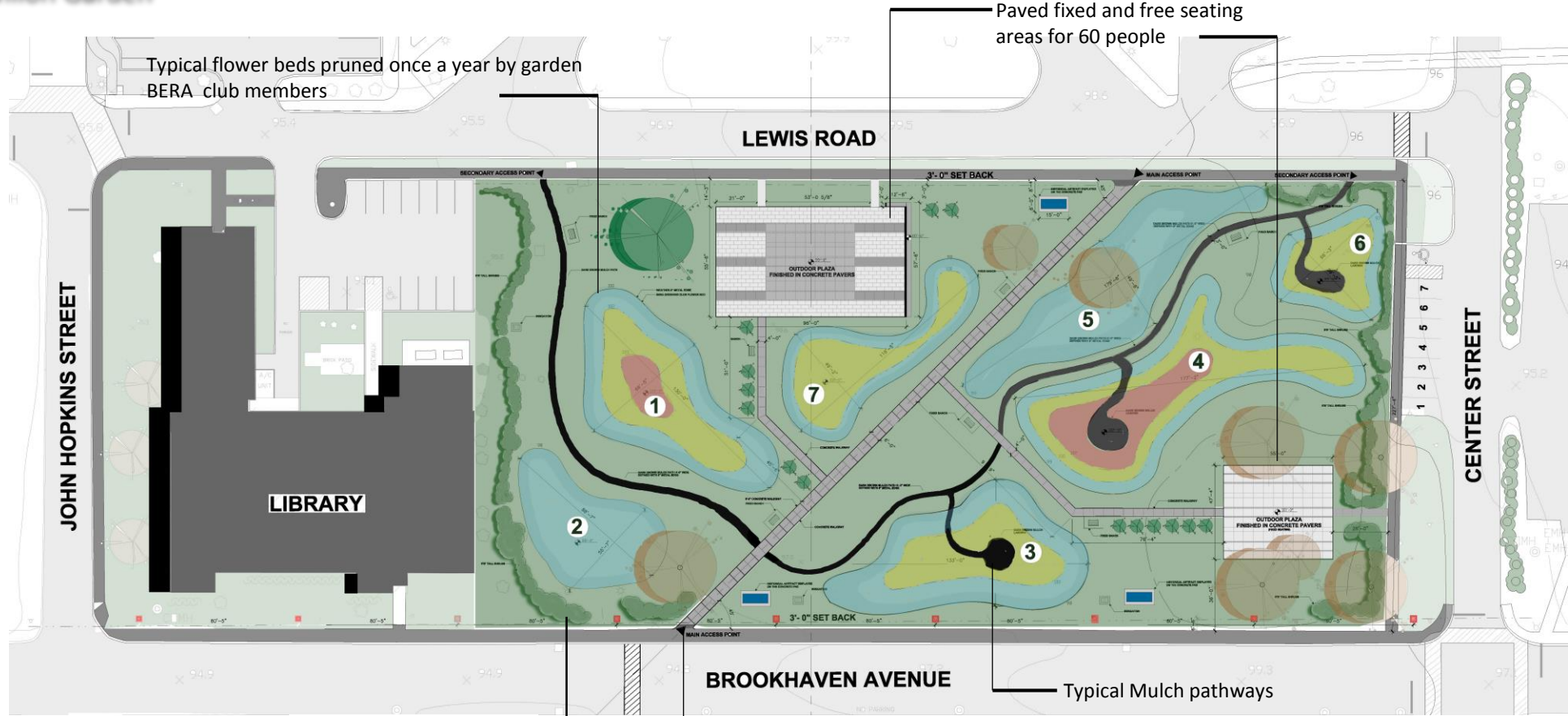


Scope

- Construct 3,850 SF addition to B-0742, LOB 2, including interior concrete hutch and all associated site/civil, mechanical and electrical work.

Proposal for Open Space Public Project

Butterfly Pavilion Garden



Home: New for 2019: Winter Flowering Sun Shade Shop by Theme: JLBG Donate



Antirrhinum hispanicum

Home: New for 2019: Winter Flowering Sun Shade Shop by Theme: JLBG Donate



Panicum virgatum 'Dallas Blues' PF 11,282

Home: New for 2019: Winter Flowering Sun Shade Shop by Theme: JLBG Donate



Eupatorium greggii

(Agastache, Lavender, Rosemary, Calamintha, Pycnanthemum etc.) I had to group them together as top plants for butterfly gardens. These plants also feature fragrant foliage and some of them, like Agastache, have insanely colorful flowers too.

(Nectar): Cabbage White, Hairstreaks, Monarch, Pock's Skipper, Sachem, Silver-Spotted Skipper, Spring and Summer Azure



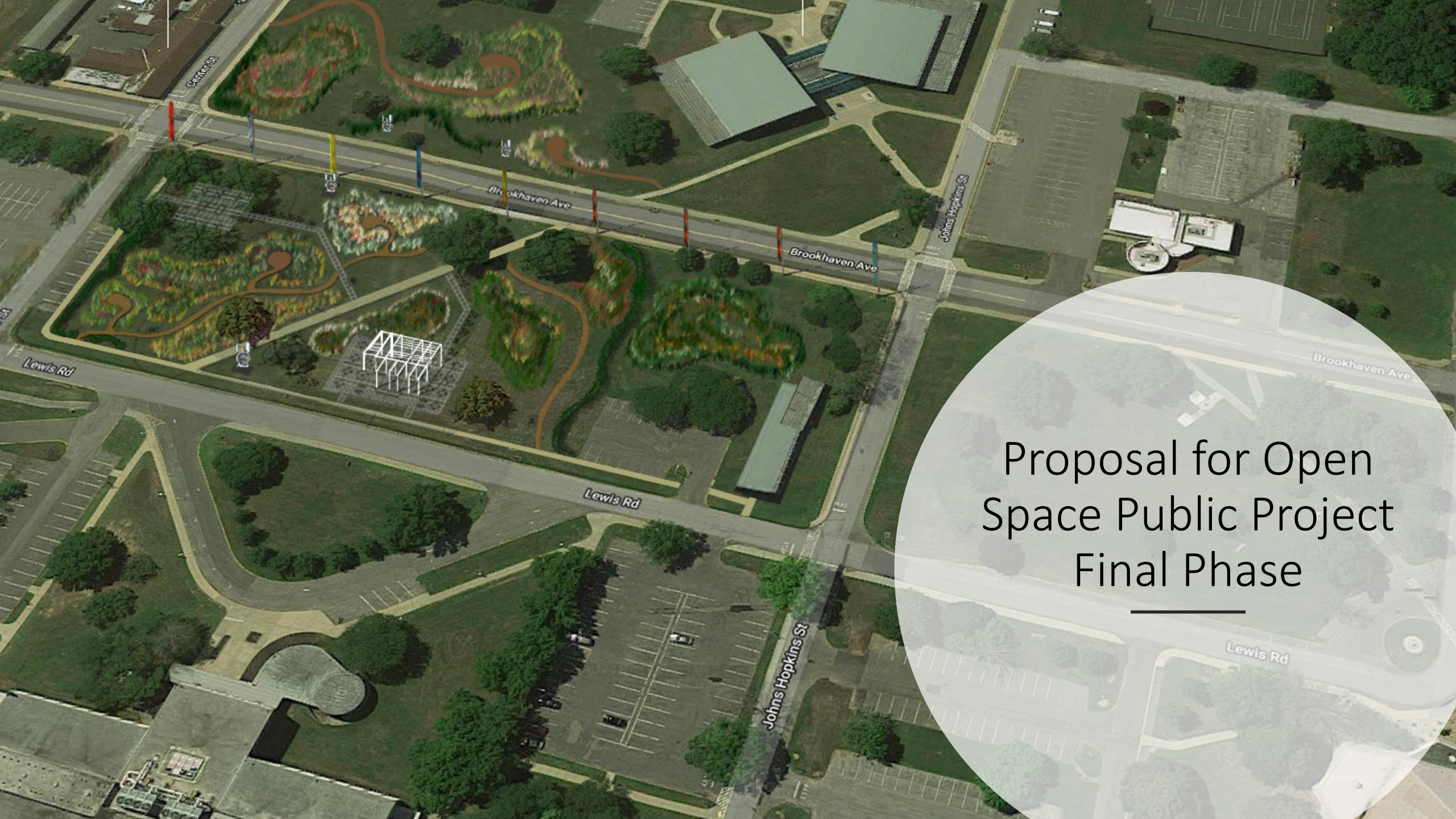
Agastache 'Blue Fortune'

Home: New for 2019: Winter Flowering Sun Shade Shop by Theme: JLBG Donate



Leucanthemum x superbum 'Daisy Duke'

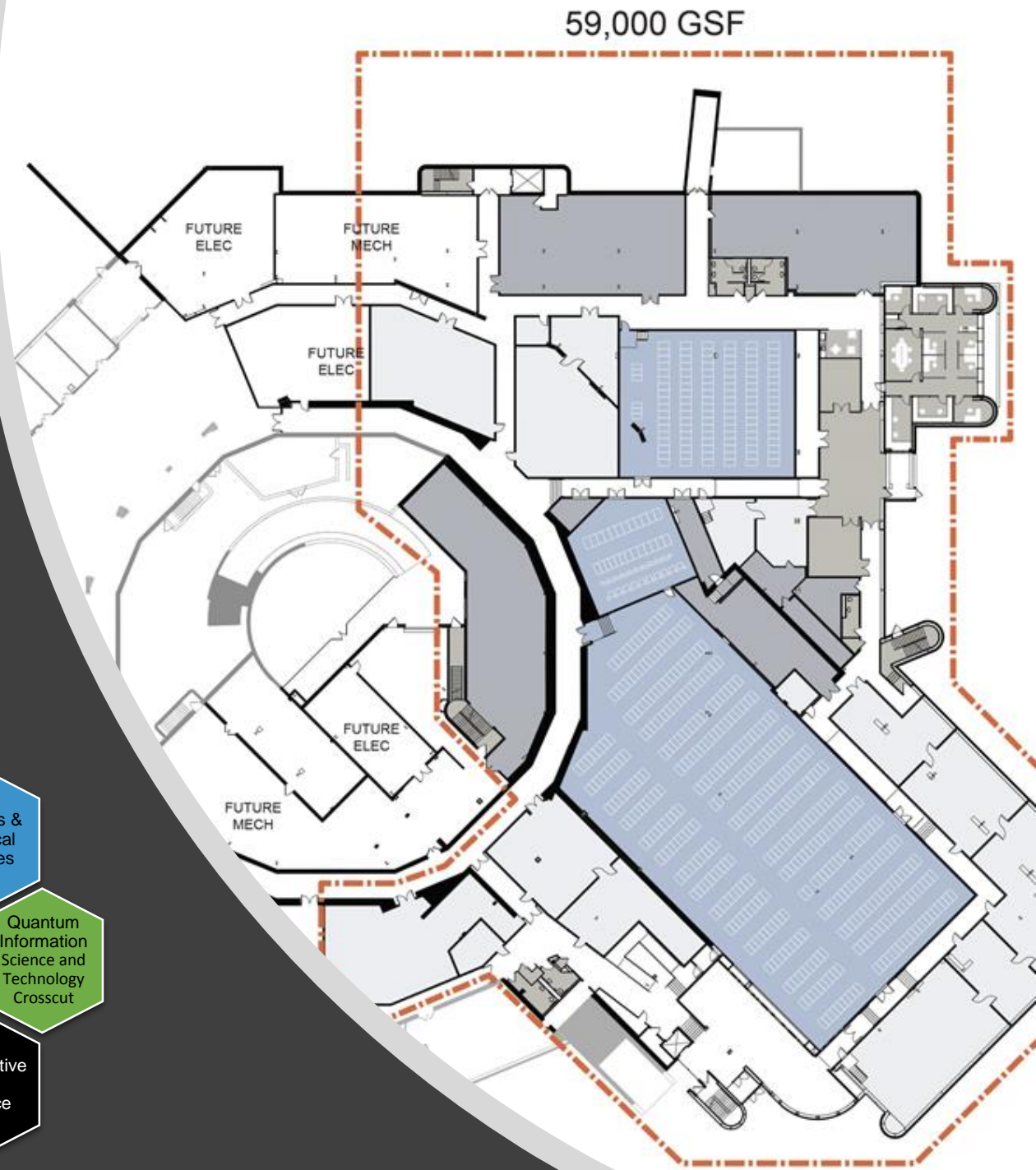
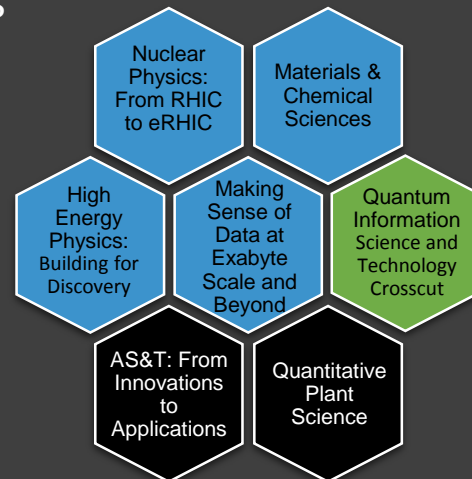
Main concrete pathway (diagonal composition)



Proposal for Open
Space Public Project
Final Phase

Core Facility Revitalization (CFR) Project

- The CFR Project will provide high-quality computational infrastructure and data storage for BNL programs, including current and planned experiments at RHIC, the ATLAS detector at CERN, NSLS-II, Belle-II.
- Project facilitates consolidation and leveraging of BNL's computational science expertise and data centric activities into a single facility to optimize computing research capabilities

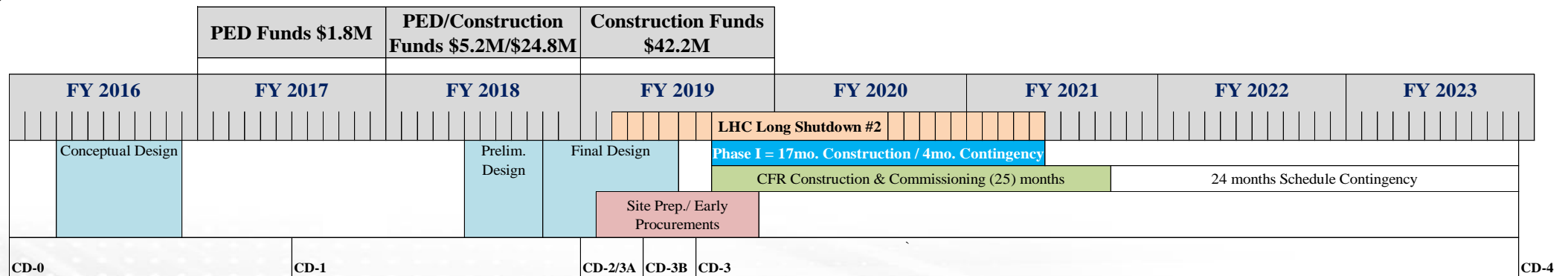


CFR Project Status

- **Project Status**

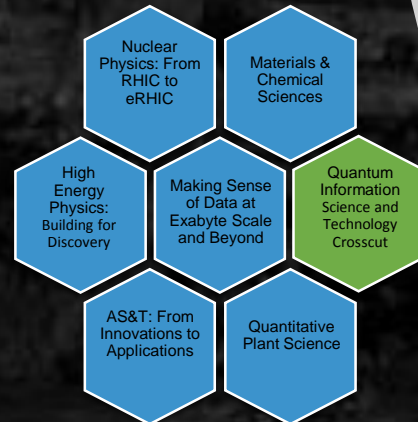
- CD-0 (Approve Mission Need) – September 1, 2015
- CD-1 (Alternative Selection and Cost Range) – April 18, 2017
- CD-2/3A (Approve Performance Baseline) - October 11, 2018
- CD-3B (Approved Additional Site Prep Activities) – January 25, 2019
- CD-3 (Approve Start Construction) – June 2019 Planned
- CERN’s LHC Long Shutdown #2 remains a primary schedule driver. This shutdown supports the execution of the High-Luminosity LHC (HL-LHC) upgrade project
- TPC: \$74.85M, fully funded

- **Schedule**



Critical Utilities Rehabilitation Project 2nd Priority (SLI)

- Cost - \$85M
- Utility infrastructure dates back to the 1940's
- Utility Reliability Index has been steadily declining due to frequent failures of underground utilities
- **Scope:**
 - Upgrade steam distribution system
 - Replace three 29-year-old central plant chillers
 - Potentially install an additional chilled water storage tank
 - Electrical distribution upgrades including a new feeder to replace a 60-year-old underground feeder and 13.8 kV switch gear
 - Replace sanitary system piping and upgrade lift stations
- Included in FY20 President's Budget Request
- DM reduction estimated at ~\$40M, with additional elimination of repair and modernization needs
- CD-1 IPR targeted for Aug 2019



Science & User Support Center (SUSC)

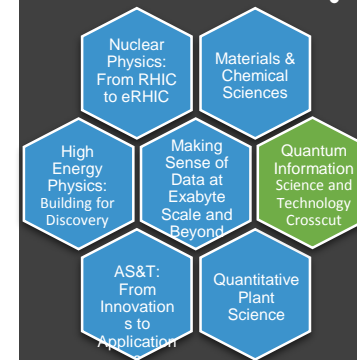
1st Priority (SLI)



- CD-0 Approved – December 12, 2016
- CD-1 Approved – December 18, 2018
- TPC Cost Range \$73.2M–\$96.2M
 - 70,000–120,000 GSF
- **Scope:** A Signature Facility filling two key mission gaps
 - *Science User Accommodation:* Combines visitor badging, training & conferencing, enhancing the User experience.
 - *Infrastructure Renewal:* Consolidates support staff from 10 existing inadequate buildings - promoting operational efficiency by staff colocation

Schedule:

PED Funds \$7M				PED/ Construction Funds \$1M/ \$8M				Construction Funds \$25M				Construction Funds \$30M				Construction Funds \$14M							
FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
				CR				CR															
				Prelim. Design				Final Design				SUSC Construction (30 months)								Schedule Contingency (18) months			
				Site Prep																			
CD-1				CD-3A				CD-2				CD-3				CD-4							



- Enables demolition of approximately 85,000 GSF of inadequate, mostly WW-II era buildings and trailers, and elimination of \$18M in repair and ESH/Code issues

Discovery Park Progress



Questions?

