
LEADING THE WAY
CampusEnergy2022
Feb. 15-18 | Westin Boston Seaport District Hotel | Boston, Mass.
INTERNATIONAL DISTRICT ENERGY ASSOCIATION

One Shutdown Allowed

Boston College, Central Heating Plant Expansion

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A Division of Consigli Construction Co., Inc.

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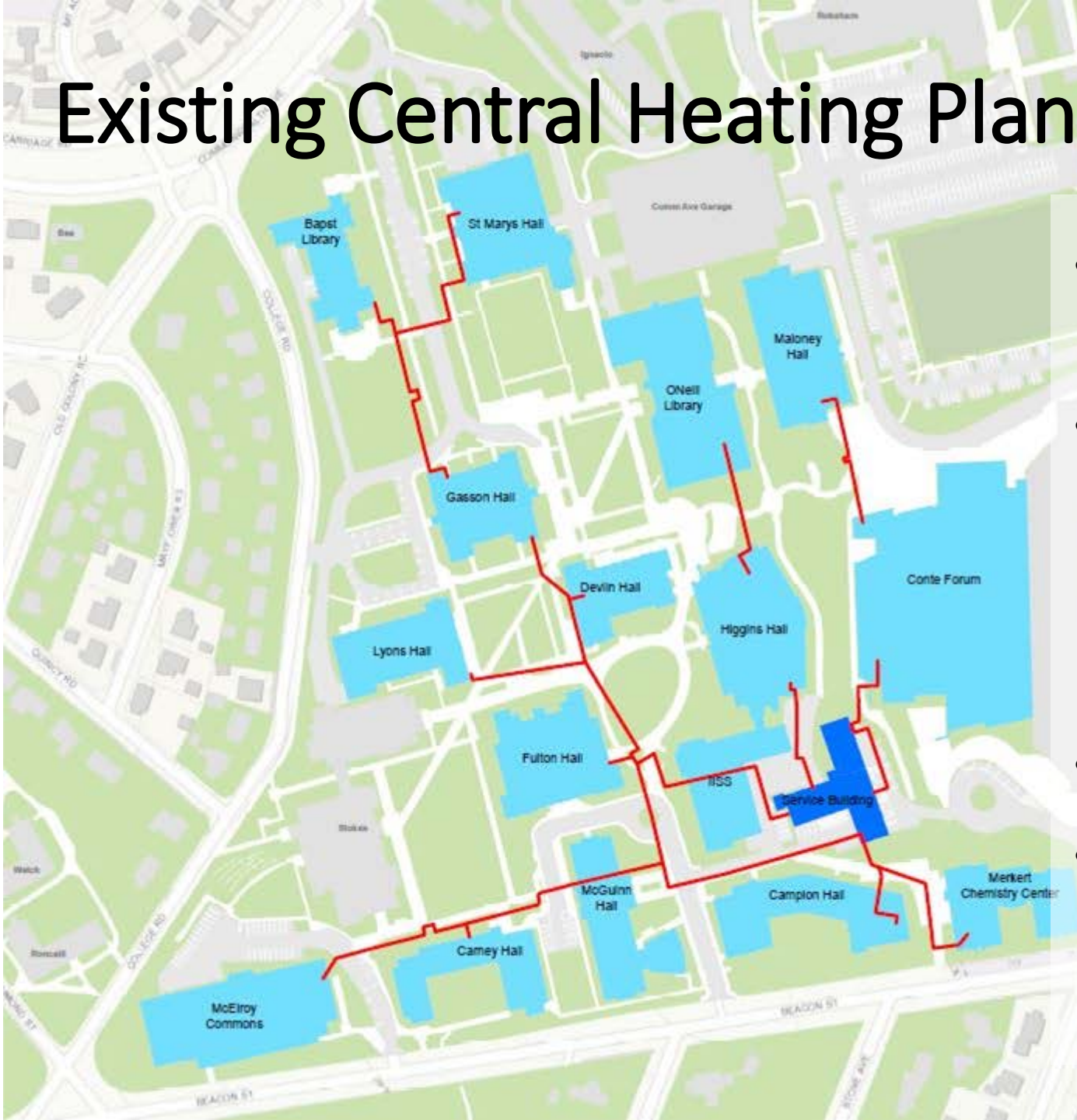
CampusEnergy2022
Feb.15-18 | Westin Boston Seaport District Hotel | Boston, MA

CONSIGLI
Est. 1905

BOSTON COLLEGE

INTERNATIONAL DISTRICT ENERGY ASSOCIATION

Existing Central Heating Plant



- Provides steam to approx. **2.4M sq. ft.**
- 3 existing boilers
  - **40-50 years** old
  - **38,000 lbs/hr** of steam each
  - **62,000 lbs/hr** firm capacity
- **24/7/365** operation
- **1 weekend shutdown** per year for maintenance (Memorial Day Weekend)

Project Purpose

- Increase firm capacity to meet **peak load**; **100,000+ lbs/hr**
- Long-term firm capacity = **116,000 lbs/hr**
- **Defer replacement** of existing boilers
- Accommodate **Institutional Master Plan** timeline & uncertainties

Project Scope Overview

- **8,900** sq. ft. 2-story addition
- New **140-ft.** boiler/generator exhaust stack
- **2** new 40,000 lbs/hr, dual-fuel boilers
- Removal of oldest existing boiler
- **Integration of new boiler systems into existing heating plant**

ENR NE BEST PROJECT
Energy/Industrial, 1st Place

LEGEND

- CONSTRUCTION ACCESS
- SECONDARY CONSTRUCTION ACCESS
- CONSTRUCTION ACCESS
- LOADING DOCK ACCESS
- PEDESTRIAN TRAFFIC
- SERVICE EGRESS POINTS
- SITE FENCE
- A — PRIMARY GATE
- B — LIMITED ACCESS GATE

NOTES

CONSIGLI FIELD OFFICE TO BE LOCATED IN EXISTING SERVICE BUILDING IF SPACE PERMITS

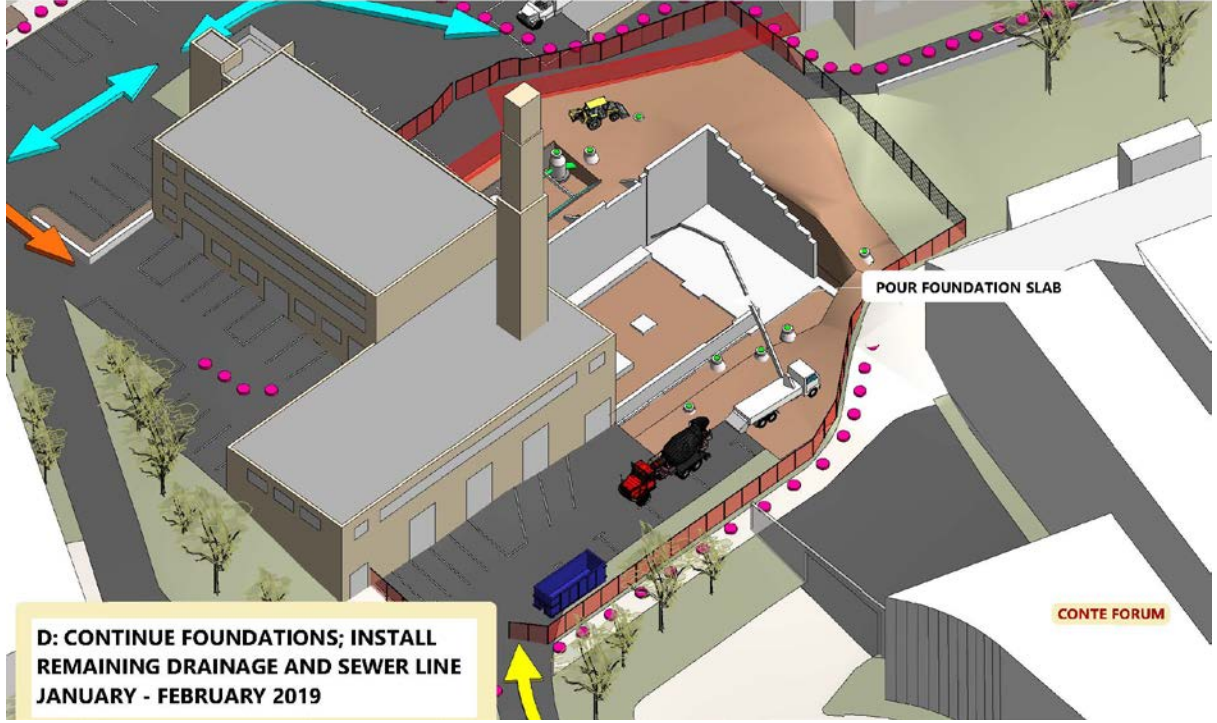
JUNE 2019 - DECEMBER 2019 CONSTRUCTION SITE LOGISTICS TO BE COORDINATED WITH IISS PROJECT

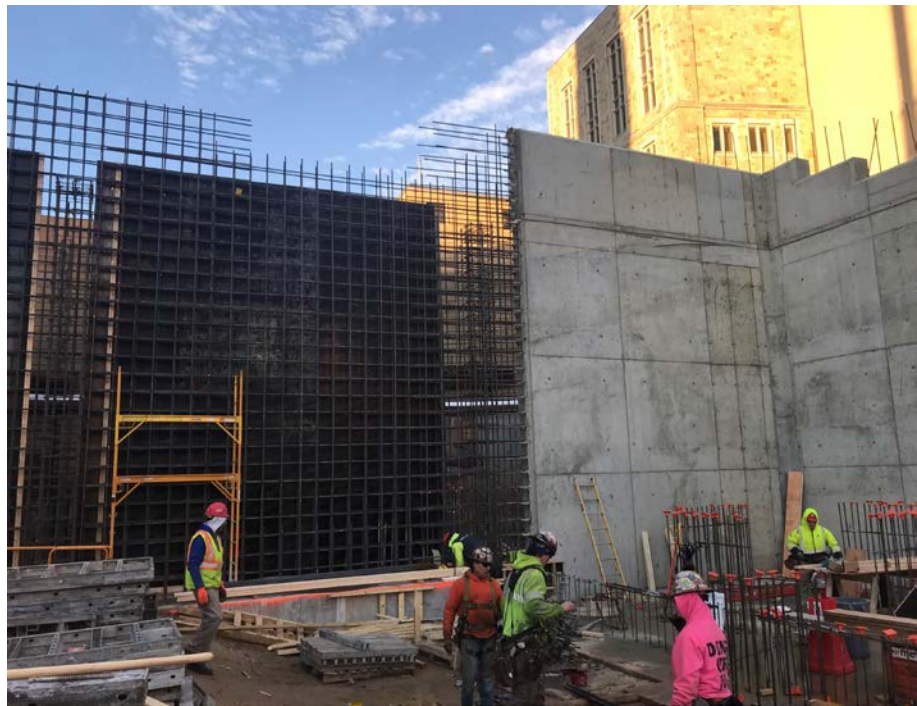
GASSON HALL
DEVLIN HALL
HIGGINS HALL
CONTE FORUM
EAGLES
EAGLES
FENCE TO BE RELOCATED INWARD MAY 2019
ACCESS TO LOADING DOCK MAINTAINED
NEW ADDITION
RED FENCE LIMITS FOR PRIMARY CONSTRUCTION AUGUST 2018 - AUGUST 2019
FULTON HALL
CUSHING HALL
CENTRAL HEATING PLANT
EGRESS POINTS TO BE MAINTAINED TO ASSOCIATED LEVELS
PANELIZED CONSTRUCTION FENCE FOR EXTERIOR FACADE REPAIRS ON EXISTING BUILDING FEBRUARY 2019; ACCESS TO BE LIMITED AND WORK ZONES TO BE SEQUENCED
MERKERT CHEMISTRY CENTER
McGUINN HALL
CAMPION HALL
STOKES HALL
CARNEY HALL
BEACON STREET

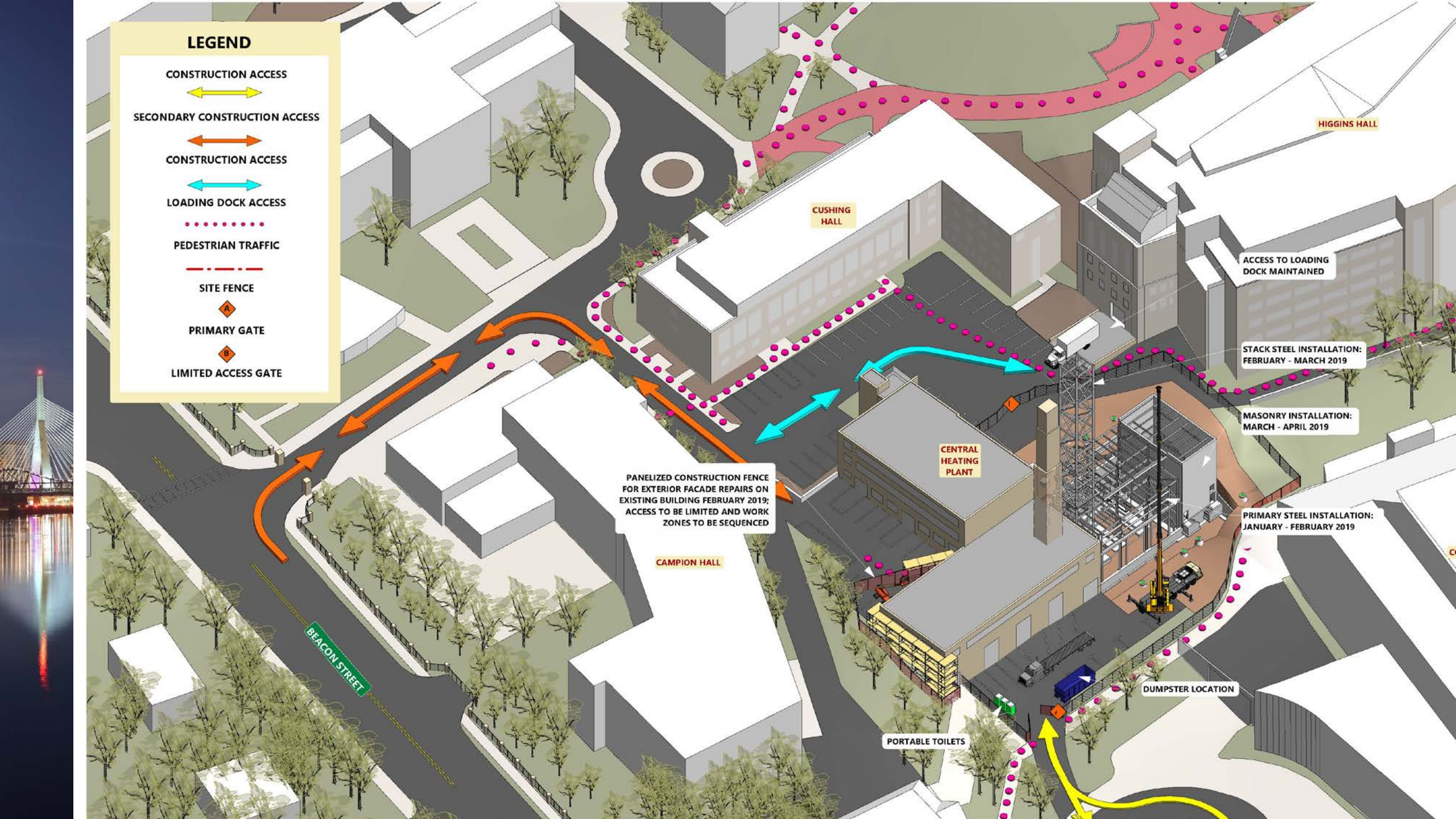

CAT
FRENCH
BRUTE
BRUTE


EXISTING STEAM TUNNEL
SOE PLACEMENT
PROTECT EXISTING DRAINAGE LINE
CONTE FORUM
A: INSTALL SOE AND BEGIN EXCAVATION
SEPTEMBER 2018


INSTALLATION OF NEW
DRAINAGE UTILITY
BOTTOM UP
CONTE FORUM
B: INSTALL AND TIE IN DRAINAGE
UTILITY; CONTINUE EXCAVATING
SEPTEMBER - NOVEMBER 2018
FRENCH
CAT
FRENCH


POUR FOUNDATION SLAB
CONTE FORUM
D: CONTINUE FOUNDATIONS; INSTALL REMAINING DRAINAGE AND SEWER LINE
JANUARY - FEBRUARY 2019




LEGEND
CONSTRUCTION ACCESS
SECONDARY CONSTRUCTION ACCESS
CONSTRUCTION ACCESS
LOADING DOCK ACCESS
PEDESTRIAN TRAFFIC
SITE FENCE
A
PRIMARY GATE
B
LIMITED ACCESS GATE
HIGGINS HALL
CUSHING HALL
ACCESS TO LOADING DOCK MAINTAINED
STACK STEEL INSTALLATION: FEBRUARY - MARCH 2019
MASONRY INSTALLATION: MARCH - APRIL 2019
CENTRAL HEATING PLANT
PANELIZED CONSTRUCTION FENCE FOR EXTERIOR FACADE REPAIRS ON EXISTING BUILDING FEBRUARY 2019; ACCESS TO BE LIMITED AND WORK ZONES TO BE SEQUENCED
PRIMARY STEEL INSTALLATION: JANUARY - FEBRUARY 2019
CAMPION HALL
BEACON STREET
DUMPSTER LOCATION
PORTABLE TOILETS

Challenge: One Shutdown Allowed

Migration of Existing & New Boiler Systems

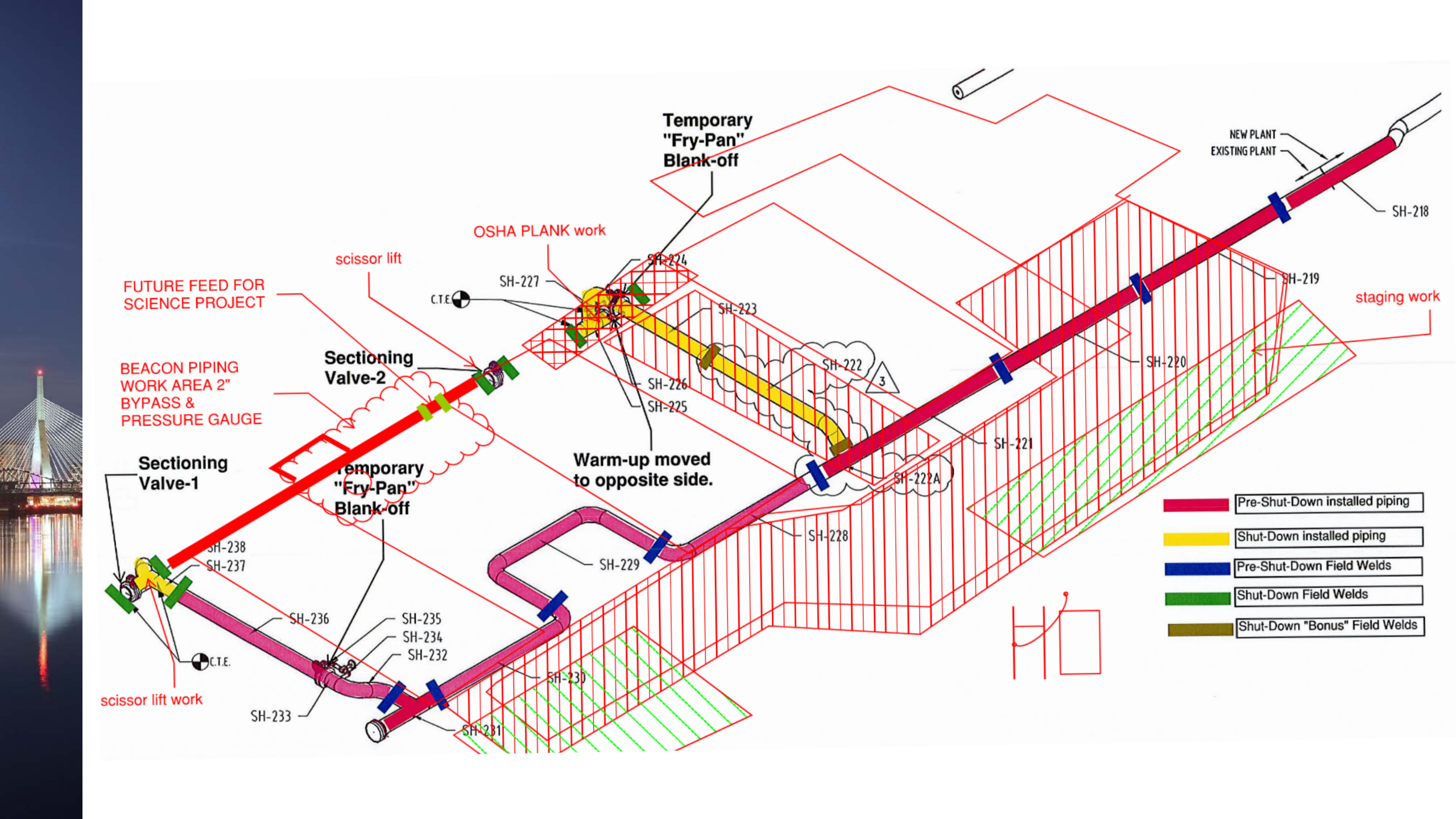
- Integration of new boiler system into existing steam distribution
- Connection of old boiler exhaust breaching into new stack
- **Critical:** Requires total steam plant shutdown
- Annual Memorial Day Weekend Plant Shutdown

How We Did It: Pre-construction Accuracy

1. Coordination & Safety
2. Scheduling for Success
3. Budgeting for Cost Certainty

Solution 1: Coordination & Safety

- Multiple stakeholders and CMs
- Preparing temporary services
- Lock-out/Tag-out


Temporary
"Fry-Pan"
Blank-off
OSHA PLANK work
scissor lift
FUTURE FEED FOR
SCIENCE PROJECT
BEACON PIPING
WORK AREA 2"
BYPASS &
PRESSURE GAUGE
Sectioning
Valve-2
Sectioning
Valve-1
Temporary
"Fry-Pan"
Blank-off
Warm-up moved
to opposite side.
NEW PLANT
EXISTING PLANT
SH-218
SH-219
SH-220
SH-221
SH-222
SH-222A
SH-223
SH-224
SH-225
SH-226
SH-227
SH-228
SH-229
SH-230
SH-231
SH-232
SH-233
SH-234
SH-235
SH-236
SH-237
SH-238
C.T.E.
C.T.E.
staging work
scissor lift work
Pre-Shut-Down installed piping
Shut-Down installed piping
Pre-Shut-Down Field Welds
Shut-Down Field Welds
Shut-Down "Bonus" Field Welds

Solution 2: Scheduling for Success

- Hour-by-hour schedule
- Shutdown timelines
- Daily updates to BC with Daily Work Plans:
  - Each area's work & assigned workers

72-HOUR SHUTDOWN

COOL DOWN	36-HOUR WORKING ACTIVITIES	START-UP/CX

5/24: Boiler turned off @ 12PM

5/25: Work started @ 2AM

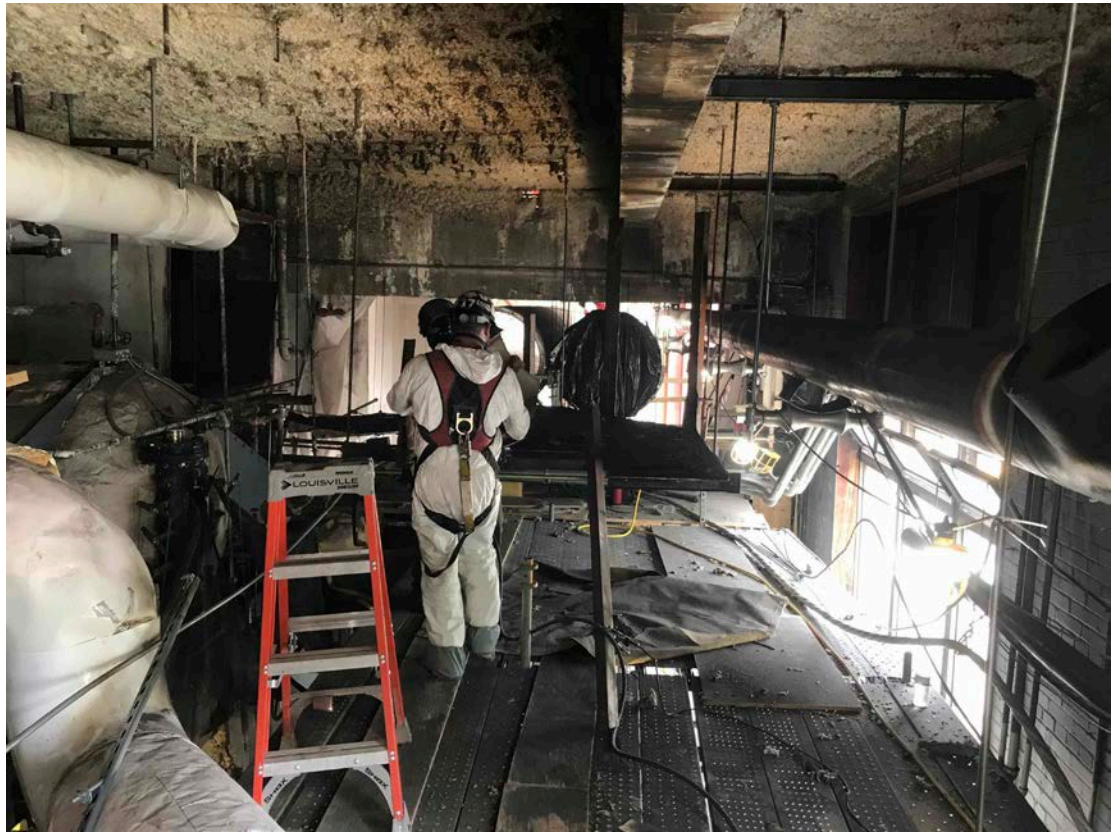
5/27: Work complete @ 8AM

5/27: Boiler turned on @ 10AM

Look Ahead BC Central Heating Plant												
Last Updated:	***5/23/2019***											
SUB CONT	***Renovation***	**Friday**	**Fri/Sat**	**Saturday**	**Saturday**	**Sat/Sun**	**Sunday**	**Sunday**	**Sun/Mon**	**Monday**	**Monday**	**Mon/Tues**
		2nd shift	**3rd shift**	**1st shift**	**2nd shift**	**3rd shift**	**1st shift**	**2nd shift**	**3rd shift**	**1st shift**	**2nd shift**	**3rd shift**
	Existing Boiler Plant											
BC	Shutdown Boiler Plant - Boiler #3 - 3:00 PM, Isolate Gas Main	X										
JC Higgins	Strip Insulation at steam header, mark out cuts, demo Boiler #3 spence station	X										
JC Higgins	Cut in section Valve #1 and crossover tee south end, tack in fab and flange		X									
JC Higgins	After section valve tacked in, start section valve #2, weld out Valve #1		X									
JC Higgins	Weld out Section Valve #2, Cut in cross over #2 tee and tack in			X								
JC Higgins	Weld out Crossover Tee, Bolt all welded valves south to north			X	X							
JC Higgins	Weld Noew North Crossover Main (Bonus Weld)				X							
JC Higgins	All Final Connections Check. Start final connections smaller systems & cleanup					X						
JC Higgins	Continue Welding, removal of temp haners/Rigging. Install permanent hangers					X	X					
Baker Testing	UT Inspection of steam header welding							X	X	X		
Atlantic	Insulation of existing main									X	X	
JC Higgins	Foreman Support for Startup											X
Cyn	Clean interior of ductwork	X										
McCusker	Strip Insulation at existing ductwork	X	X									
McCusker	Torch Cut Existing Duct out of building			X	X							
JDC Demo	Removal of Demo Debris			X	X							
McCusker	Installation of stack breeching at new addition slab tie in over control room			X	X							
McCusker	Installation of breeching to Boiler #2 in Existing Plant					X	X	X	X	X		
McCusker	Installation of Breeching to Boiler #1 in Existing Plant									X	X	
McCusker	Foreman Support for Startup											X
Ostrow	Electrical Support for Memorial Day Work	X	X	X	X	X	X					
Ostrow	Electrical Support for Memorial Day Work (On Call)							X	X	X	X	X
BC	Boiler Startup											X

Solution 3: Budgeting for Cost Certainty

- Estimating vs. Reality
- Planning for Holiday Work
- Unforeseen conditions



How We Did It: Pre-construction Accuracy

1. Coordination & Safety
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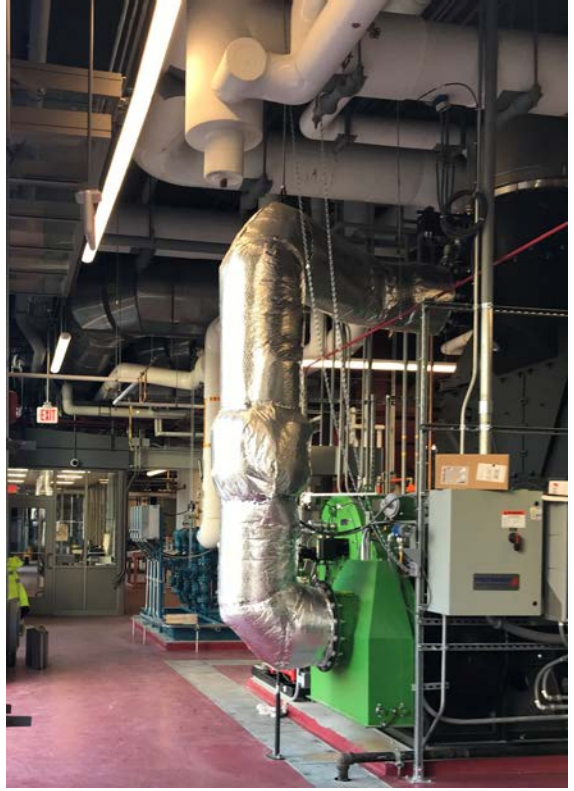
Lessons Learned

- ✓ Extensive, detailed pre-planning
- ✓ Continuous collaboration between all involved parties
- ✓ Established chain of communication



Questions?

Thank you!

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