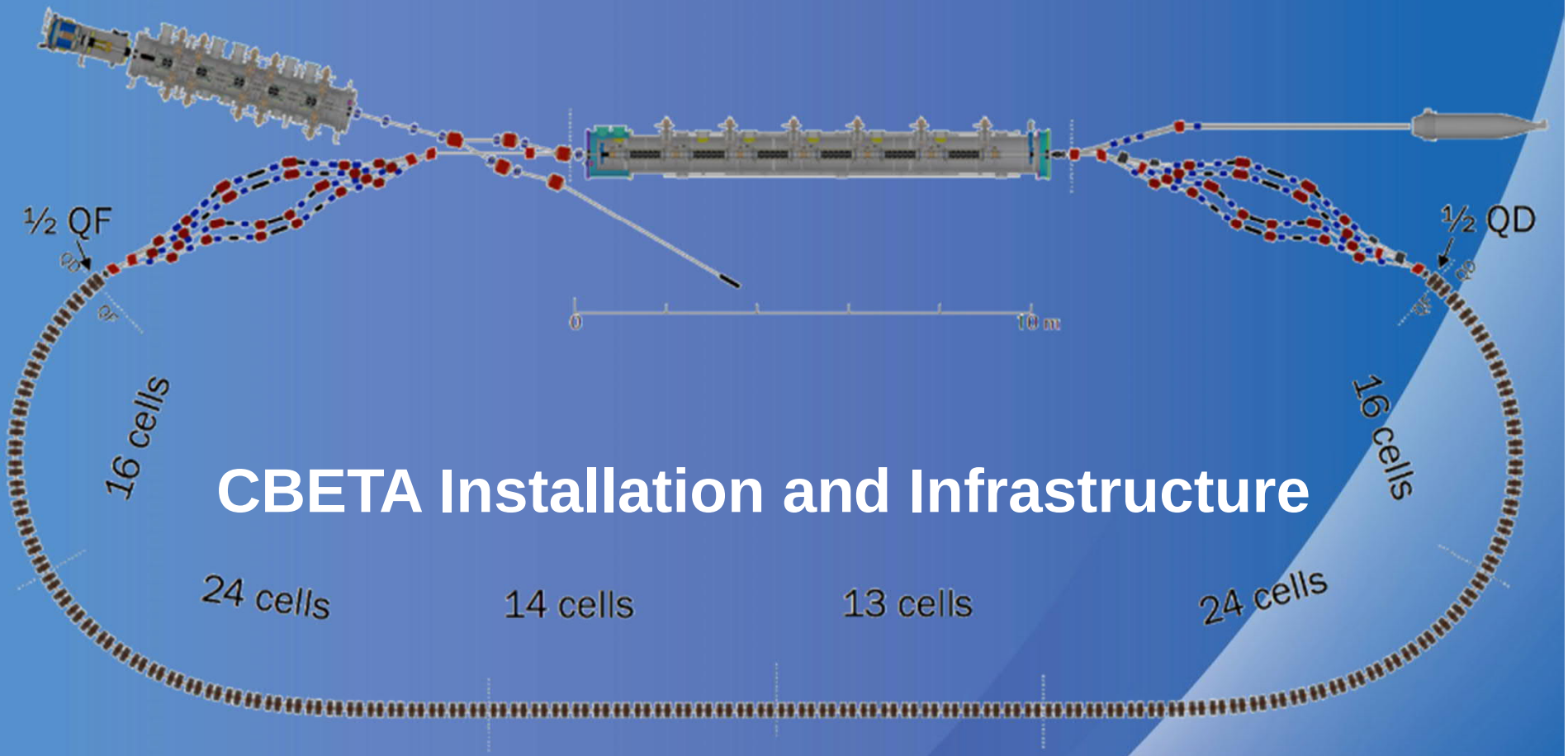


CBETA Installation and Infrastructure

Richard E. Gallagher

Cornell Laboratory for
Accelerator-based Sciences and
Education (CLASSE)

BROOKHAVEN
NATIONAL LABORATORY
a passion for discovery

Office of Science
U.S. DEPARTMENT OF ENERGY

Topics

- Regulatory Compliance
- Reconfiguration of space
- Improvements to facilities
- Sequence of installation
- Personnel Safety Systems

2018 project activities at the Wilson Lab suffered from complications due to municipality overreach.

The Authority Having Jurisdiction (AHJ), the Town of Ithaca, issued declarations:

1. CBETA construction activities are subject the NY State Building Code

2. CBETA construction activities require PE designs submitted to the Town for approval

3. Wilson Lab erroneously classified as an H-4 facility (extreme hazard)

Installation and Infrastructure Compliance

BUILDING PERMIT

TOWN OF ITHACA
215 N. Tioga Street, Ithaca, N.Y. 14850
www.town.ithaca.ny.us

CODE ENFORCEMENT - BRUCE W. BATES, DIRECTOR
Phone (607) 273-1783 Fax (607) 273-1704
codes@town.ithaca.ny.us

Permit No.: 2018-0349

Date of Permit: 6/22/2018
Expiration Date: 6/22/2019

This serves as the OFFICIAL BUILDING PERMIT issued to **Cornell University** to erect, move, demolish, or repair a building as indicated, in accordance with all Laws and Regulations applicable thereto. All work shall be performed in accordance with the construction documents submitted and accepted as part of the application. The Town of Ithaca Code Department MUST be notified immediately in the event of any changes occurring during construction.

Scope of work:

Wilson Lab: renovate the Cornell High Energy Synchrotron Source and construct the Cornell Brookhaven ERL Test Accelerator. This project will involve selective demolition (mostly mechanical and electrical) and construction (mostly mechanical, electrical and equipment) with electrical.

Project Address: 161 Synchrotron Dr
Property Owner: Cornell University
Owner Address: c/o Rich Gallagher, Wilson Lab & Rin
Ithaca, NY 14850
Tax Parcel #: 63.-1-8.1
Occupancy Class: F1-FACTORY **Construction Type:** **Sprinkler:**

Signature: Mark Ho
Code Enforcement Officer

THIS PERMIT MUST BE POSTED ONSITE PRIOR TO WORK COMMENCING. SUPPLEMENTAL NOTES AND PLANS PROVIDED WITH BUILDING PERMIT MUST BE ONSITE AND AVAILABLE DURING INSPECTIONS.

Installation and Infrastructure Compliance

Cornell was aware that a few infrastructure activities required building permits, but the all-inclusive requirement and extreme classification was potentially a major impact to the program

In response to the Town declaration, Cornell established a 3-point strategy to resolve the situation

1. **Enlist multiple Architect-Engineering firms to produce designs and reviews to avoid CBETA project delays**

2. **Review historical records for previous permits, classification and approvals, and perform a formal independent code review**

3. **Conduct high-level Town-Cornell negotiations to resolve the issues**

Installation and Infrastructure Compliance

On September 12, an agreement was reached that corrected the hazard classification (**now B/U occupancy**), but retained permit requirements for ten CBETA activities, currently in various stages, some approved ✓:

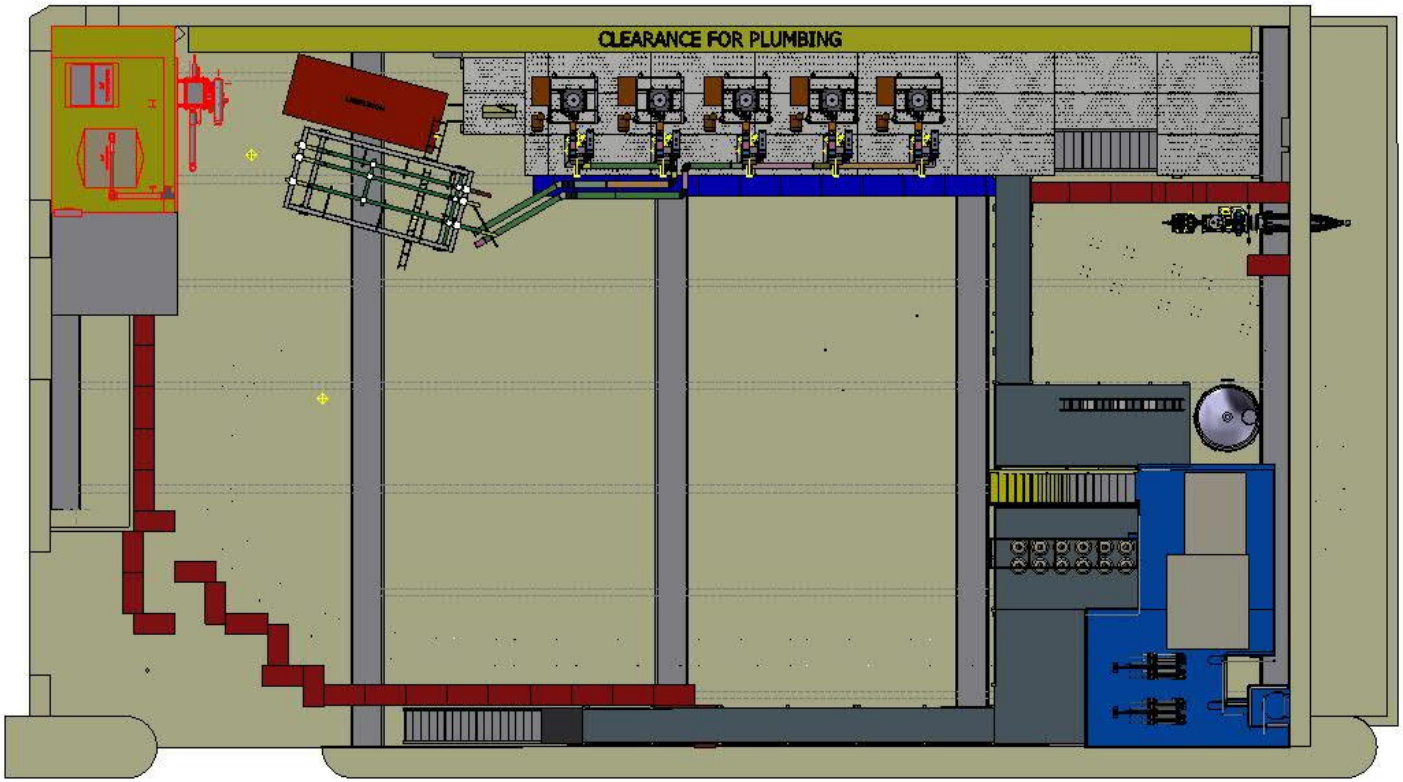
1. 800A/480 service installation ✓
2. Beamline 110/208V circuits (under Town review)
3. New equipment platform (design)
4. Existing platform modifications (design)
5. 65F DI cooling water system ✓
6. 85F water system (design)
7. HVAC duct modifications ✓
8. Egress and occupation plan (under Town review)
9. Fire detection, alarm, exit and lighting (under Town review)
10. 2-hour fire rated perimeter (under Town review)

Installation and Infrastructure Space

The CHESS Upgrade components have moved from the high bay area and modifications are underway

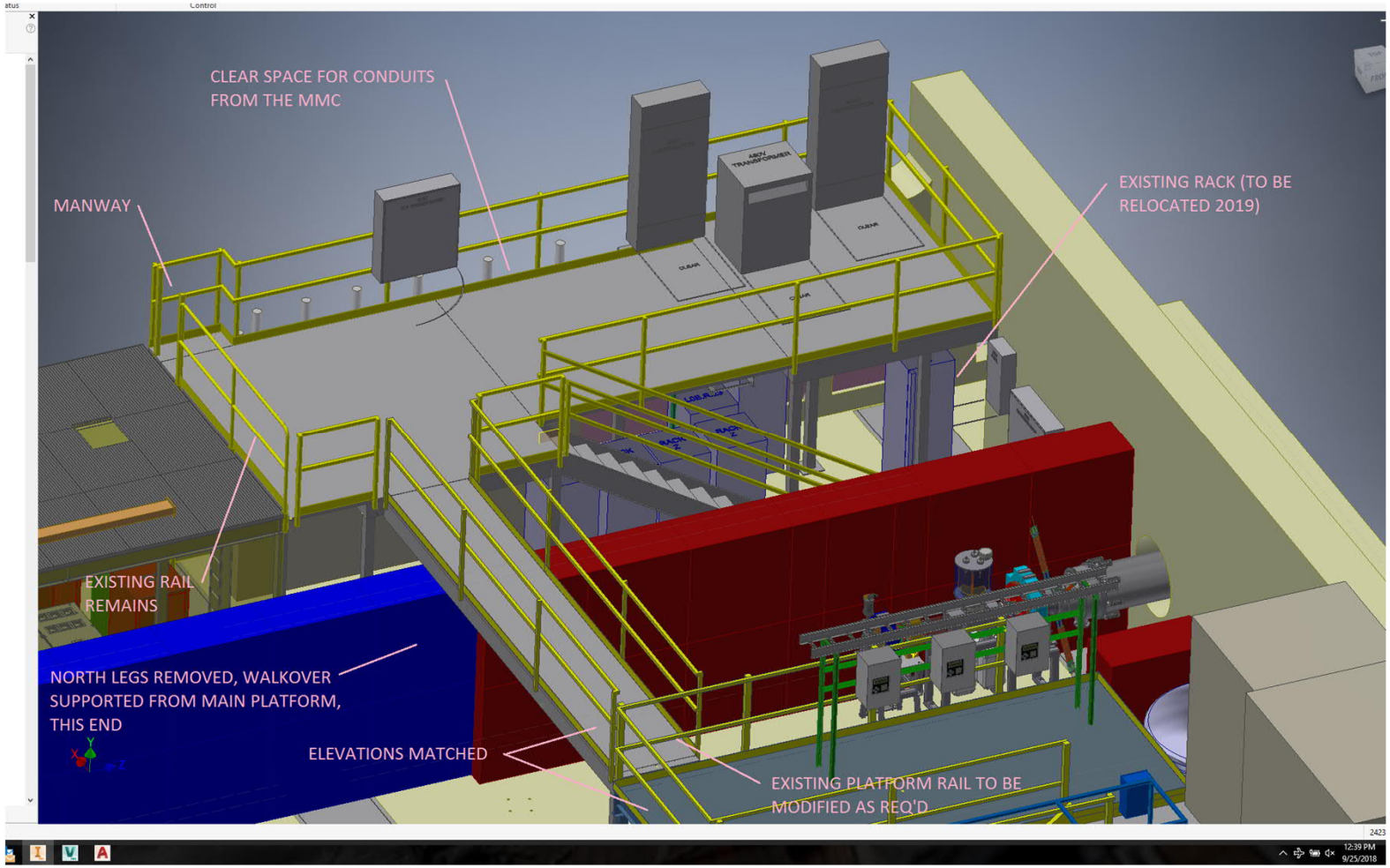
Installation and Infrastructure Space

Radiation shielding will start being installed this week on the northeast, south and west locations. The southwest wall design is under review and will be the last installed section. The northeast platform has nagging design issues, but should be in place by November 23.



Installation and Infrastructure Space

Equipment platform is for new 800A electrical service which will power all new components. It is also needed for access over the beamlines

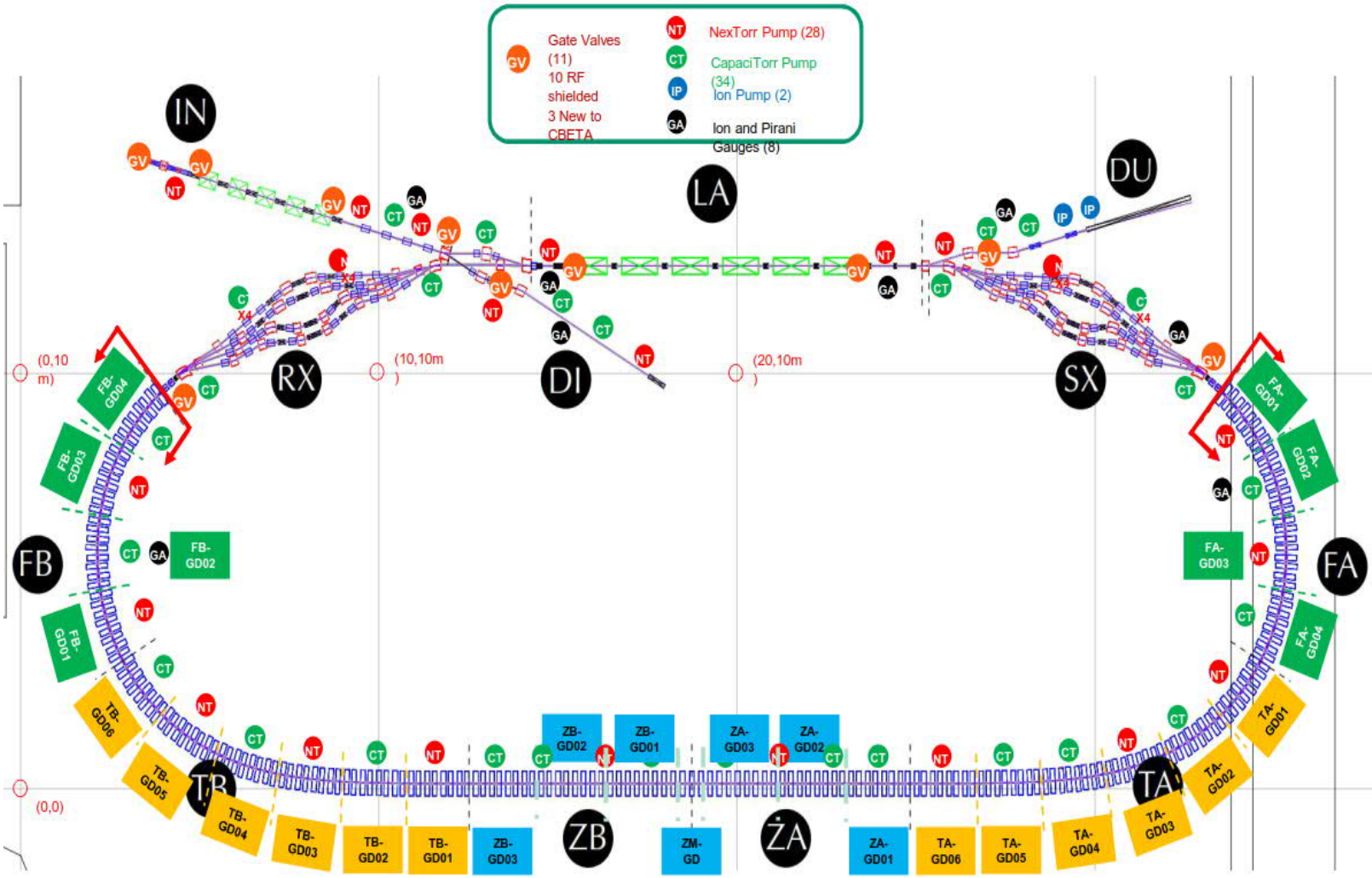


Installation and Infrastructure Improvements

- Design of a **new 480V feed** is approved and installation will start October 15
- **Beamline electrical power** distribution is designed and awaiting approval. Work will start December 1
- Design of the **new platform** is in progress. Installation planned for November 12 start. Schedule delay due to code-related issues. Many reviews and approvals are still required before installation
- **65F cooling** system piping design is approved. Site work starts October 15. Pump, heat exchanger and DI system design are not finished and behind schedule, but with February 1 completion.
- Upgraded **fire detection** and alarm system design is under review. Installation scheduled for December 3 start

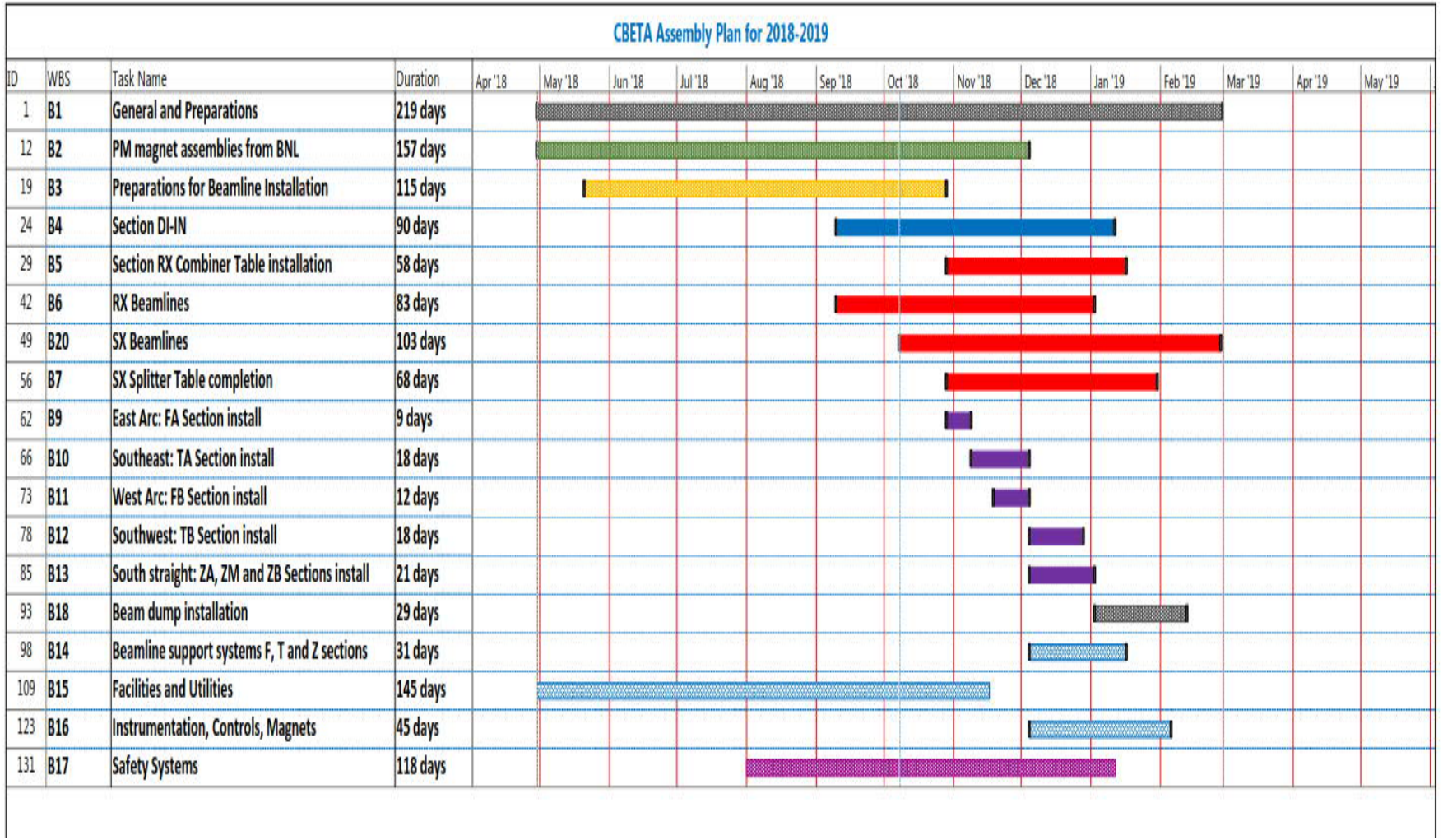
Installation and Infrastructure Sequence

PM beamline installation order: FA – TA – FB – TB – ZA – ZM - ZB



Installation and Infrastructure Sequence

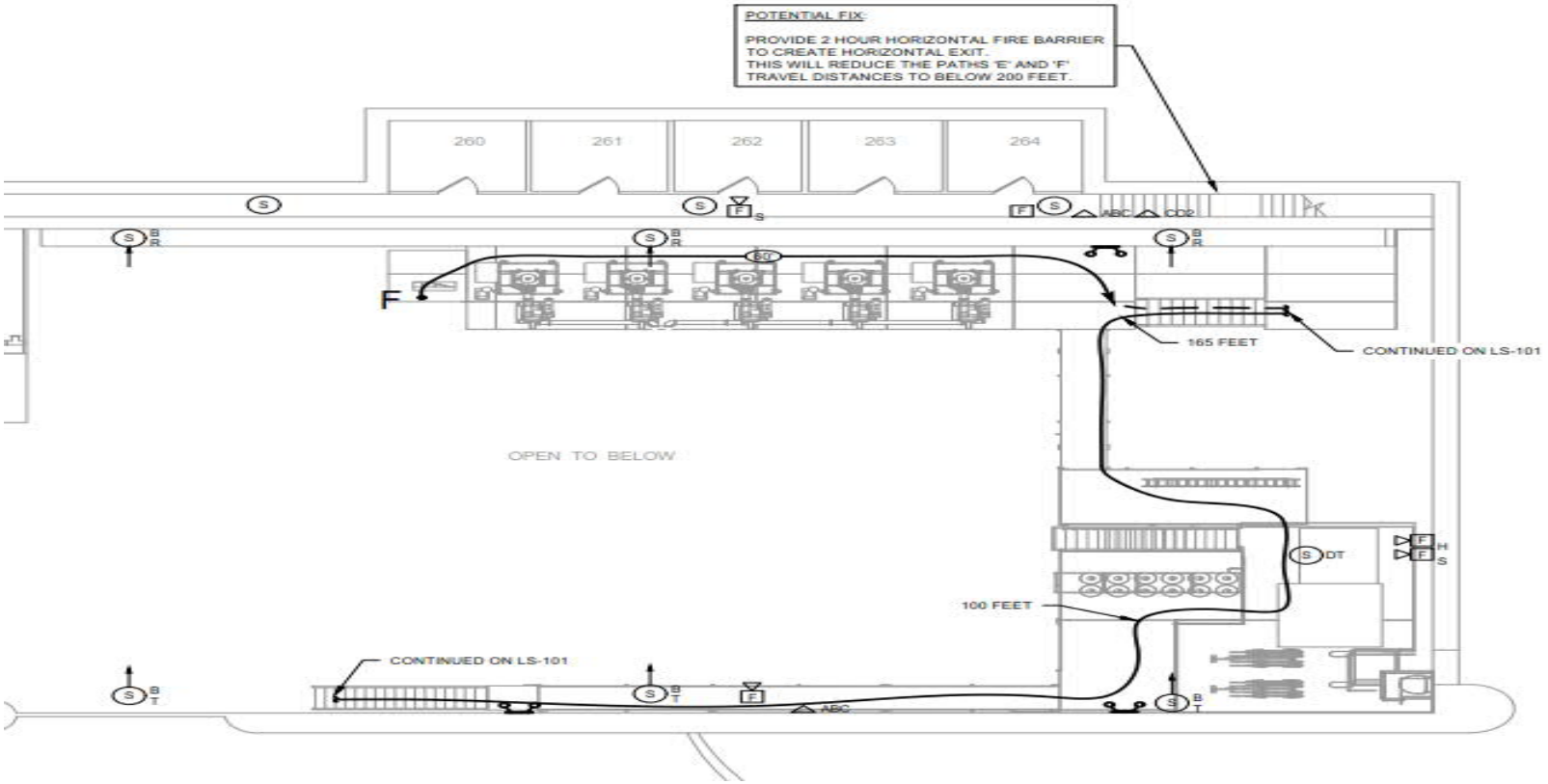
On Schedule for March 1, 2019 Completion



ID	WBS	Task Name	Duration
1	B1	General and Preparations	219 days
12	B2	PM magnet assemblies from BNL	157 days
19	B3	Preparations for Beamline Installation	115 days
24	B4	Section DI-IN	90 days
29	B5	Section RX Combiner Table installation	58 days
42	B6	RX Beamlines	83 days
49	B20	SX Beamlines	103 days
56	B7	SX Splitter Table completion	68 days
62	B9	East Arc: FA Section install	9 days
66	B10	Southeast: TA Section install	18 days
73	B11	West Arc: FB Section install	12 days
78	B12	Southwest: TB Section install	18 days
85	B13	South straight: ZA, ZM and ZB Sections install	21 days
93	B18	Beam dump installation	29 days
98	B14	Beamline support systems F, T and Z sections	31 days
109	B15	Facilities and Utilities	145 days
123	B16	Instrumentation, Controls, Magnets	45 days
131	B17	Safety Systems	118 days

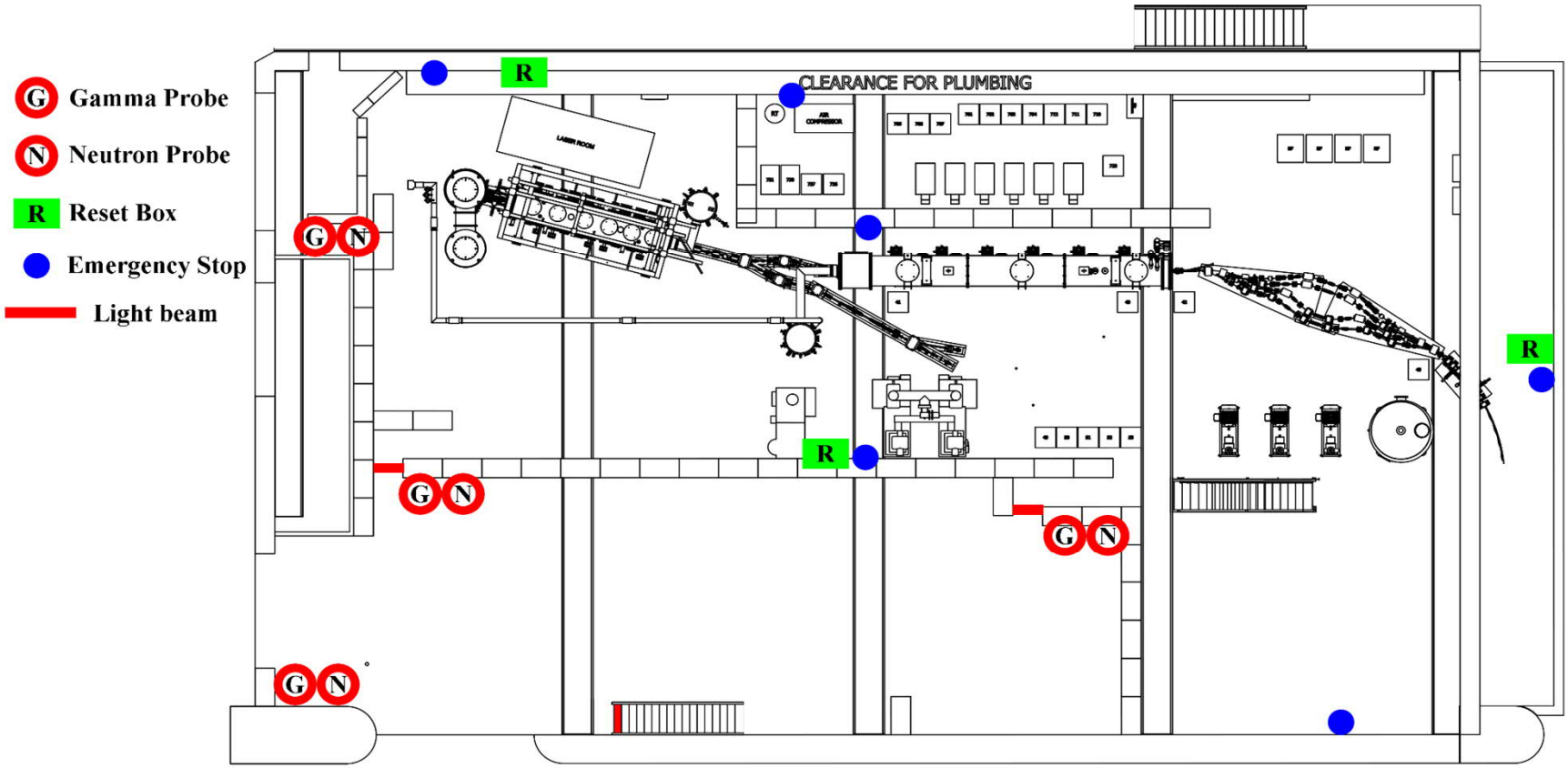
Installation and Infrastructure Safety

The proposed layout of CBETA was analyzed by A/E Code firm (GHD) and one egress problem, and solution was identified (2-hr fire barrier). Corrective action in progress with completion by November 16, 2018



Installation and Infrastructure Safety

Personnel and radiation safety systems will be an extension of the CBETA-FAT layout for access, search points, monitors and interlocks



Review and Approval Process

1. Detailed plan for testing, startup and operations submitted to the CLASSE Safety Committee for approval by December 1, 2018

2. Review of proposal by Cornell EH&S and University Radiation Safety Officer by December 15

3. EH&S/RSO issues an amended operating permit by January 11, 2019

There have been a few roadblocks but there is a clear path to a March 1, 2019, completion