Conventional Facilities

S. Dixon, L2 Manager

Beam Transfer Line Workshop

November 30, 2022

A Partnership of:

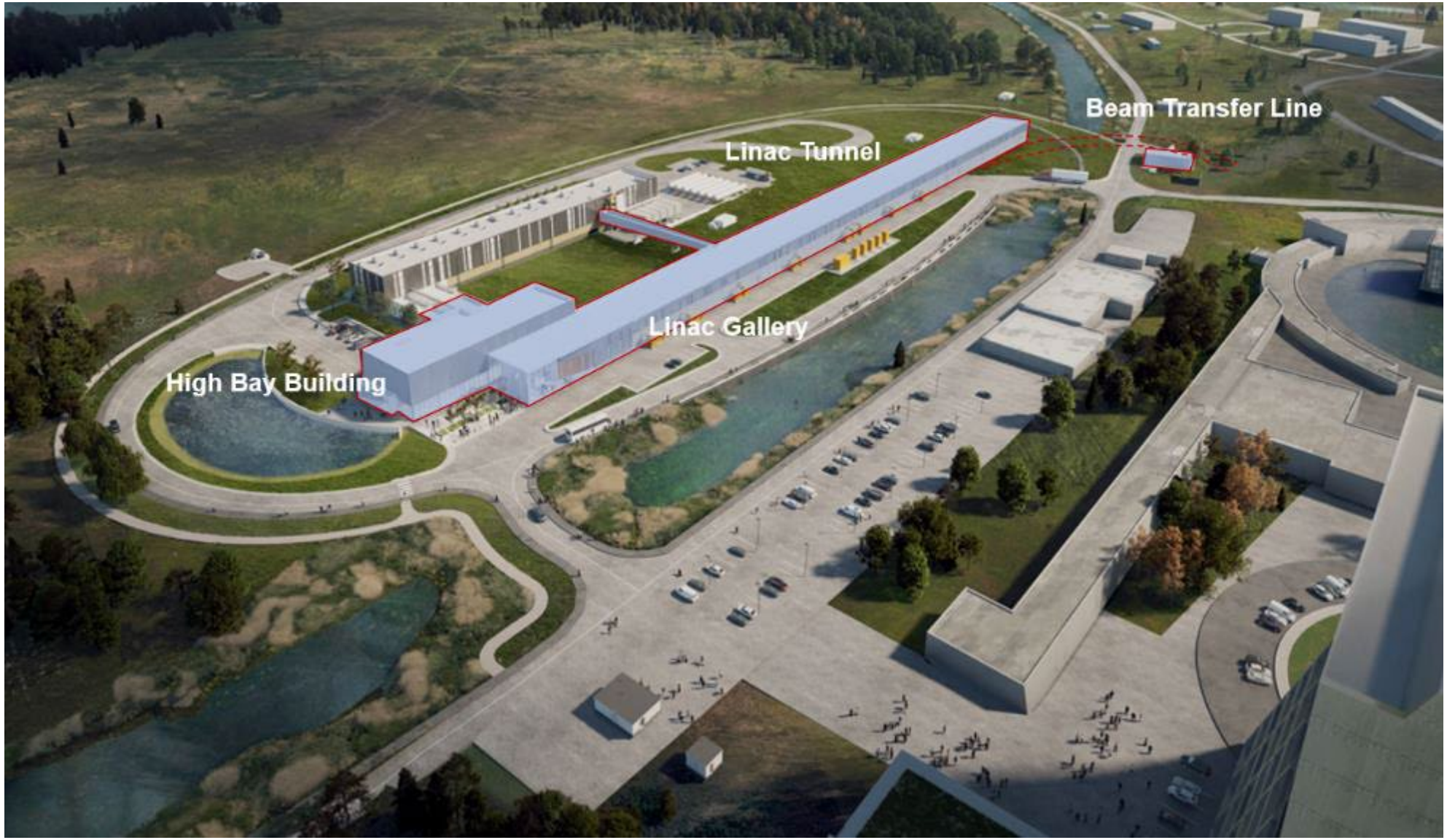
US/DOE
India/DAE
Italy/INFN
UK/STFC-UKRI
France/CEA, CNRS/IN2P3
Poland/WUST

Outline

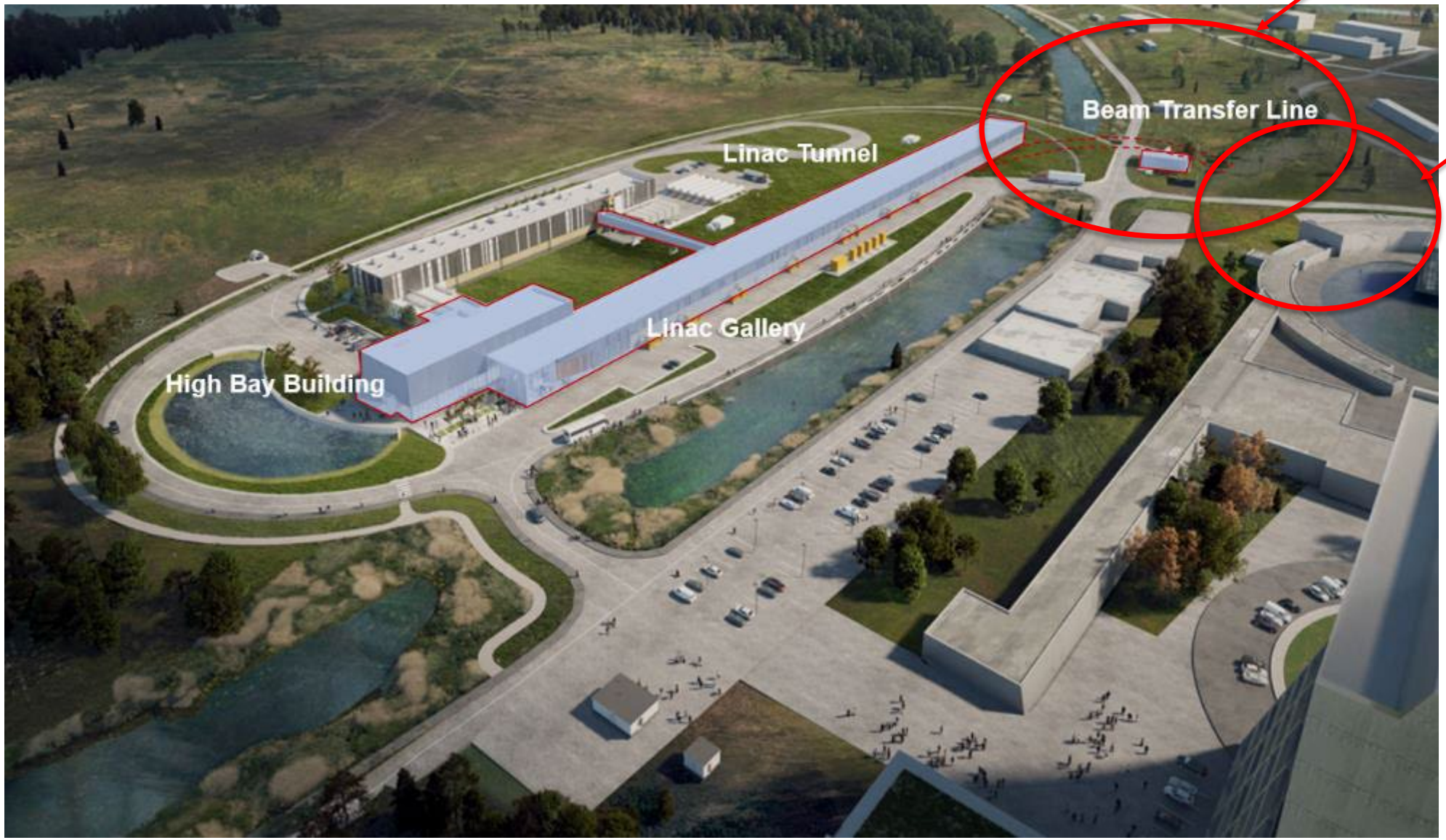
- Linac Complex Scope
- Beam Transfer Line Scope
- Booster Connection Scope
- Milestones
- Modifications
- Possible Changes
- Questions

Linac Complex Scope

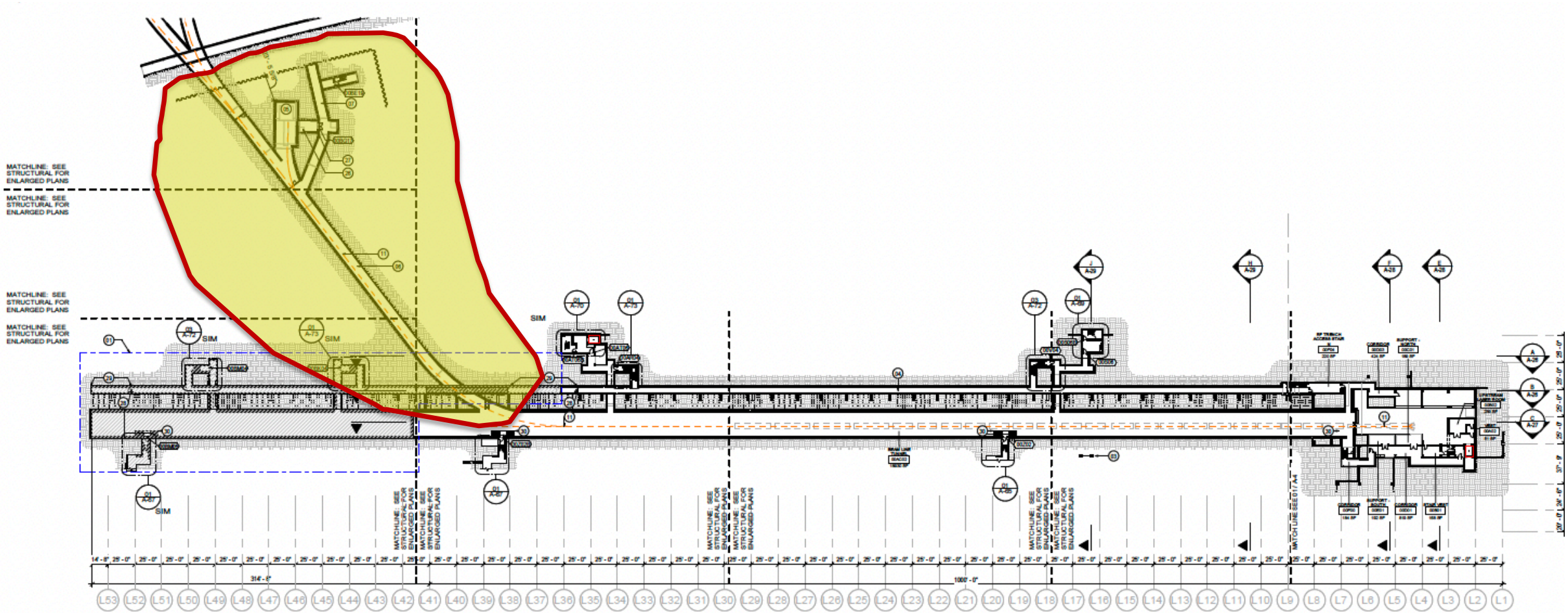
Linac Complex Scope



Linac Complex Scope

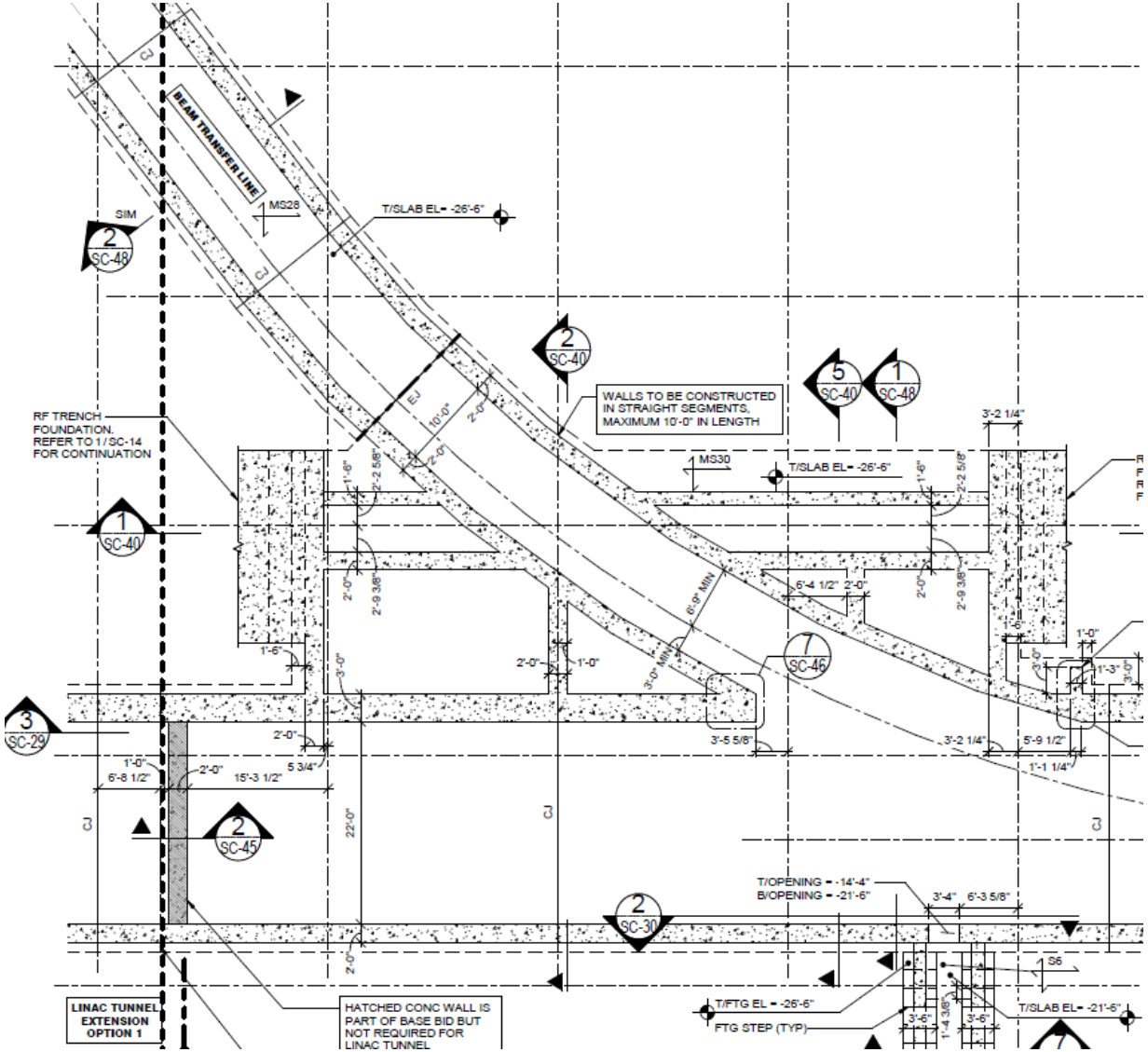


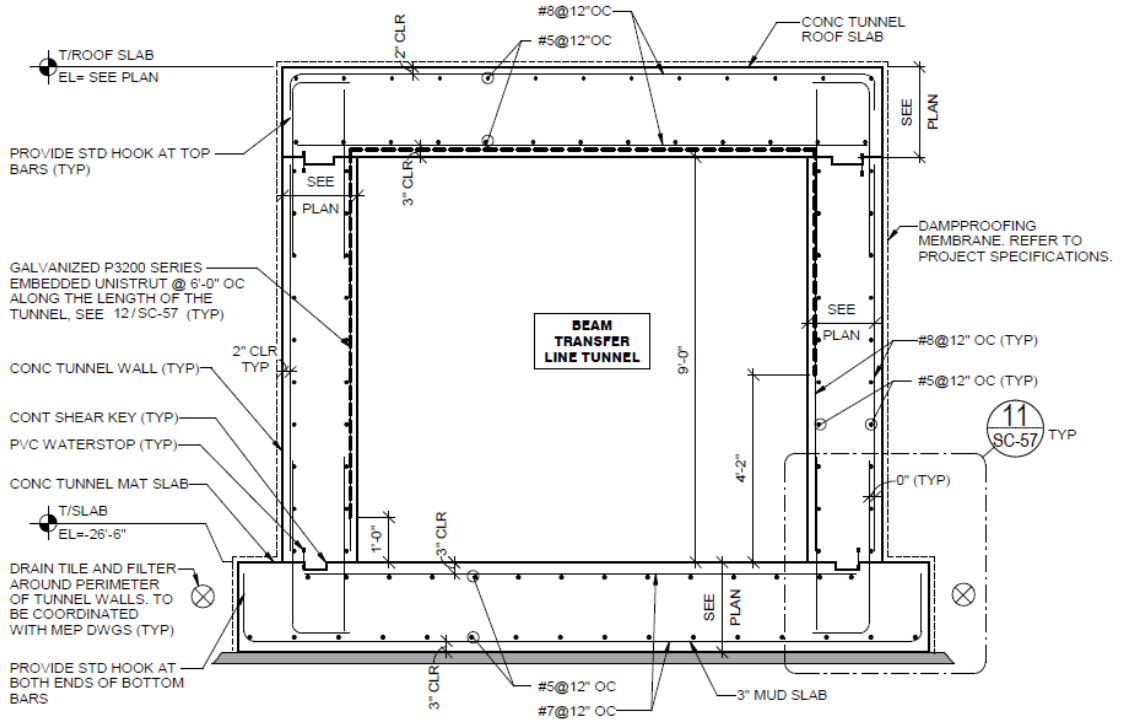
Linac Complex – Tunnel Level Plan



Linac Complex drawings: PIP-II-doc-4770 and Teamcenter ED0012055

Beam Transfer Line - Enclosure





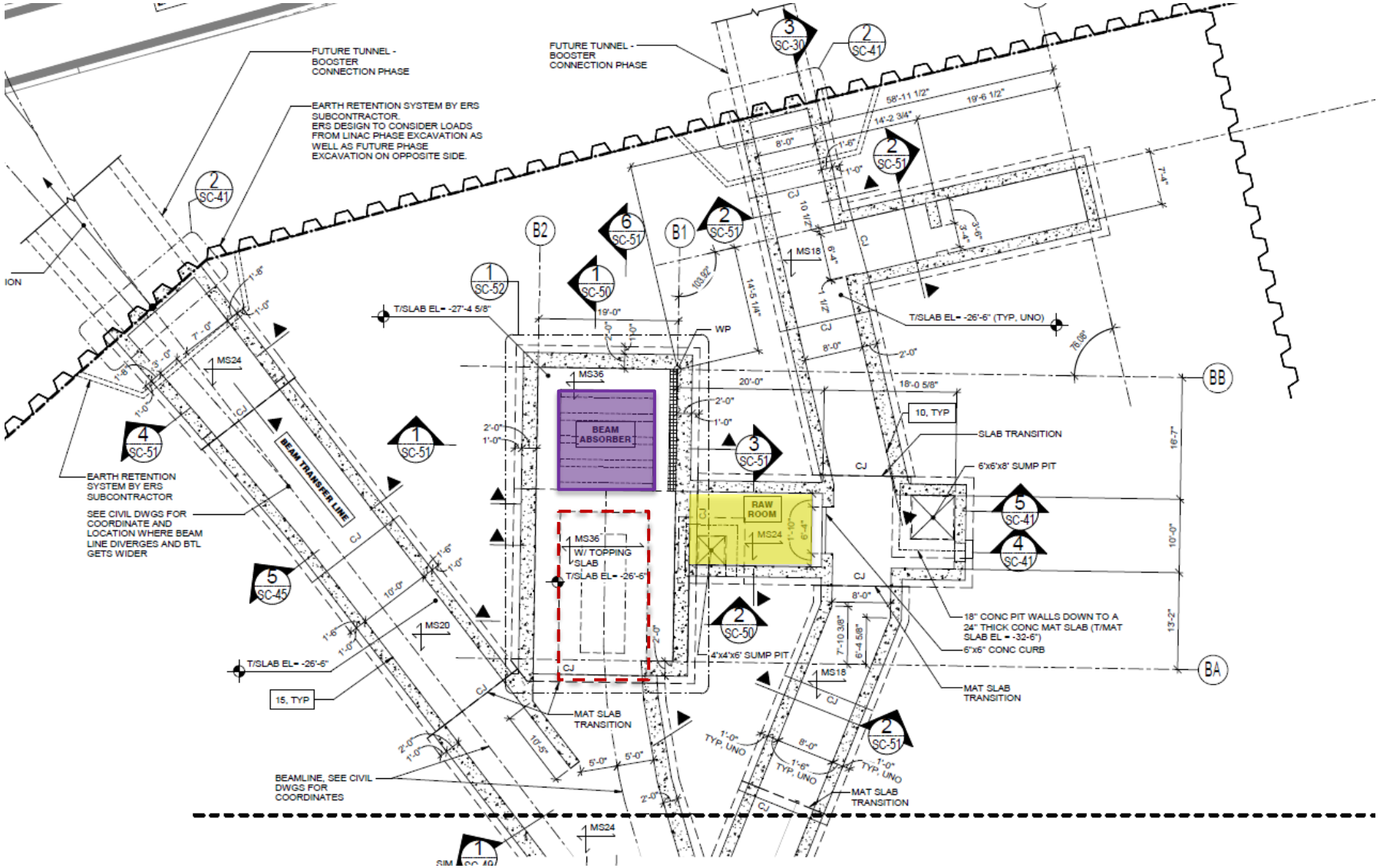
BEAM TRANSFER LINE TUNNEL SECTION

4 SC-8 SC-16

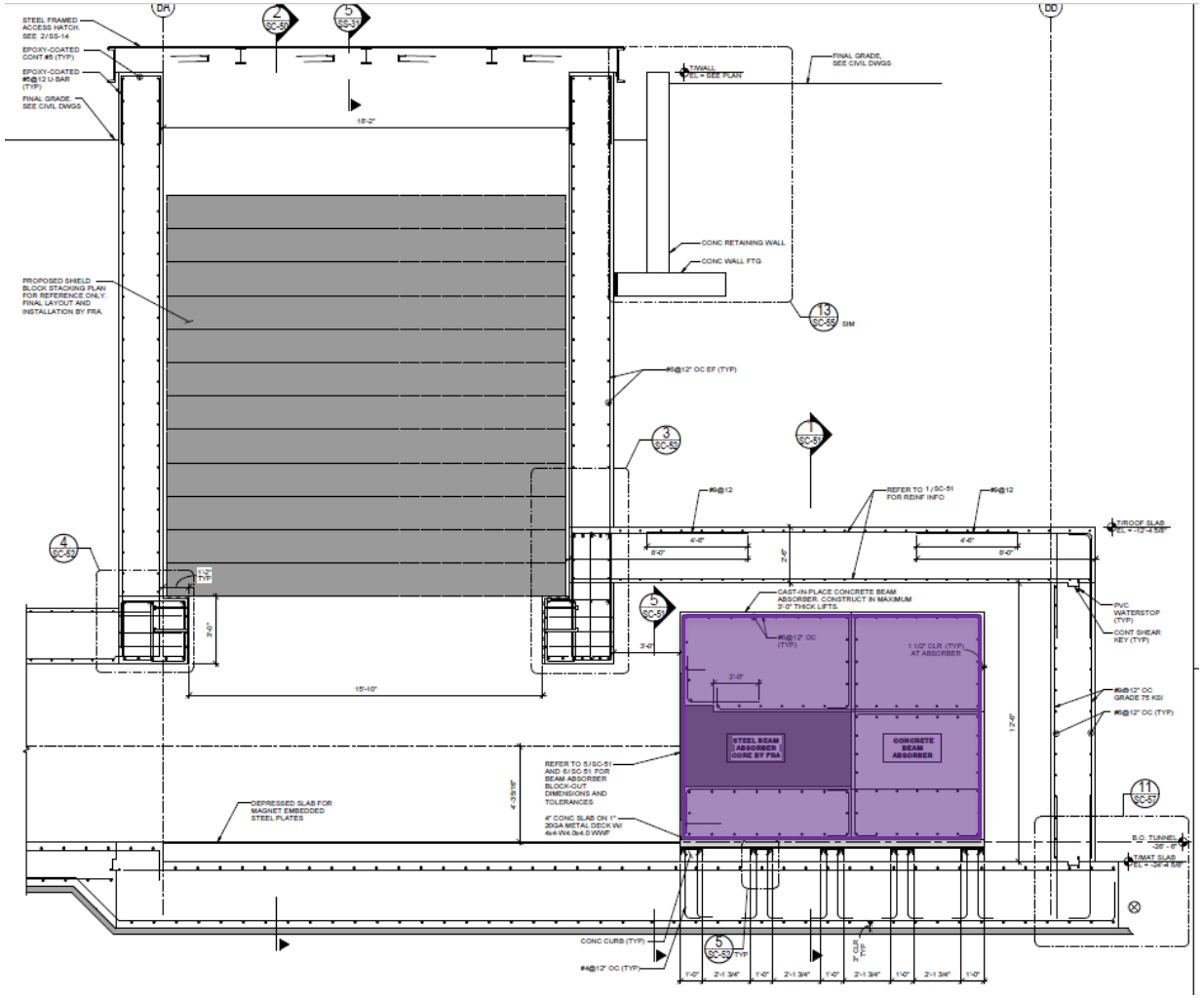
SCALE: NTS

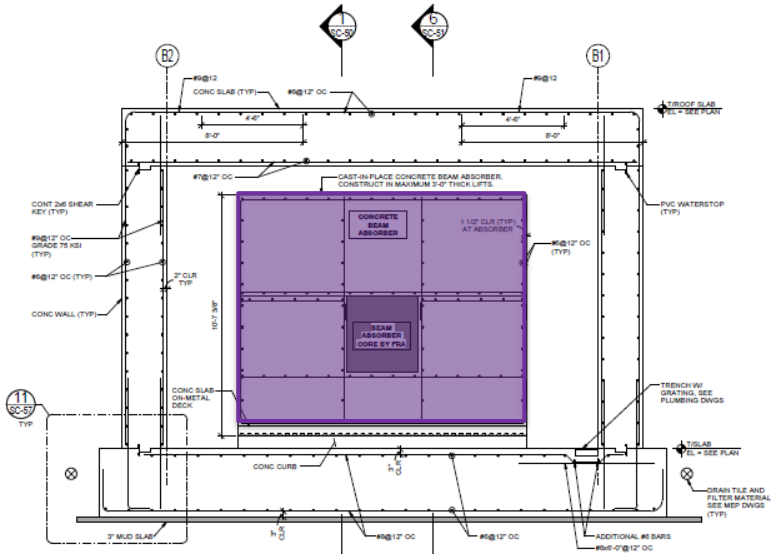
NOTES:
1. REFER TO ARCHITECTURAL GENERAL NOTES AND SPECIFICATIONS FOR DAMPPROOFING REQUIREMENTS AGAINST THE FACE OF ALL BELOW GRADE TUNNEL WALLS, BASEMENT WALLS, AND ROOF SLABS.

Beam Transfer Line – Absorber Area Plan

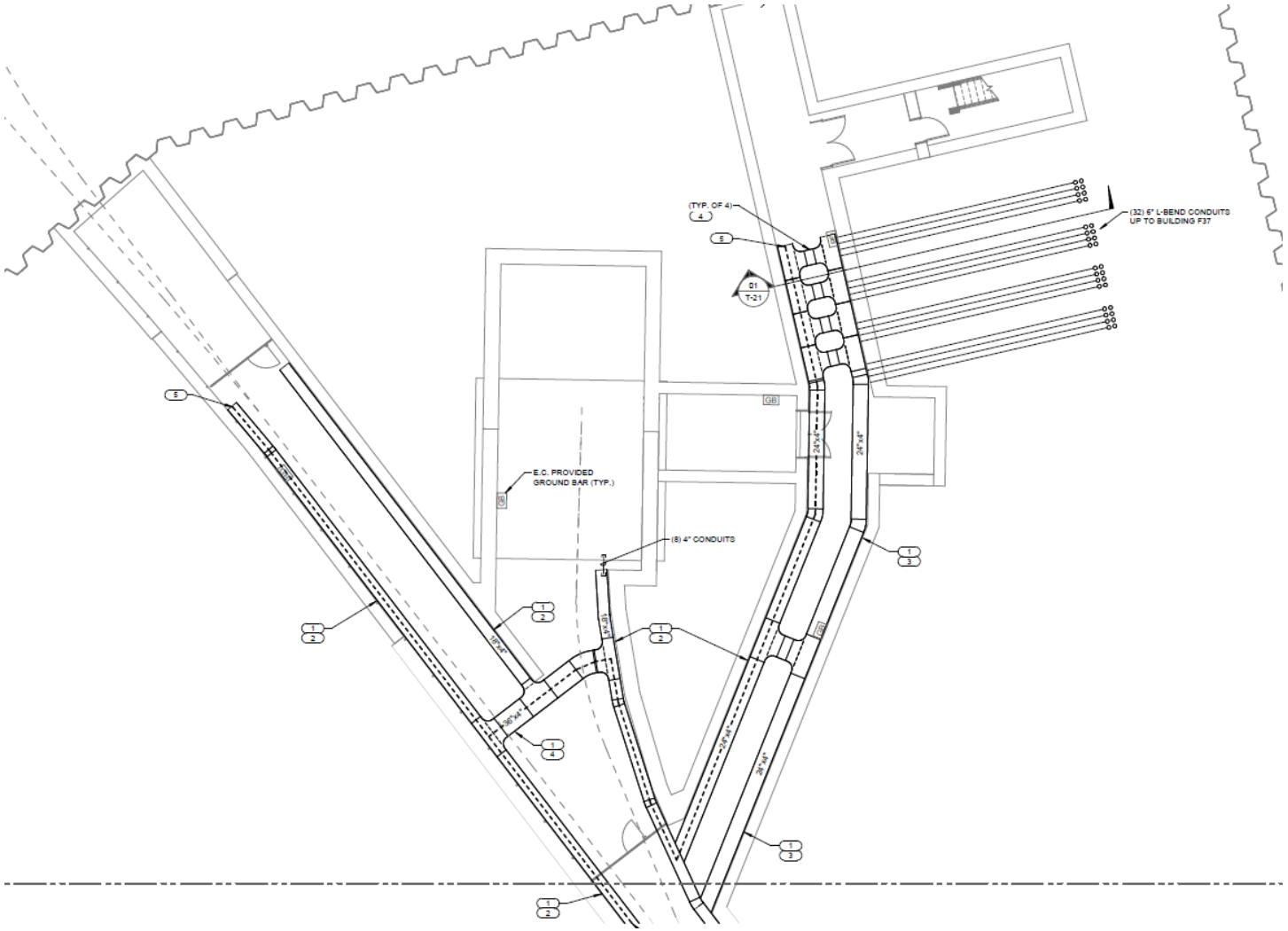


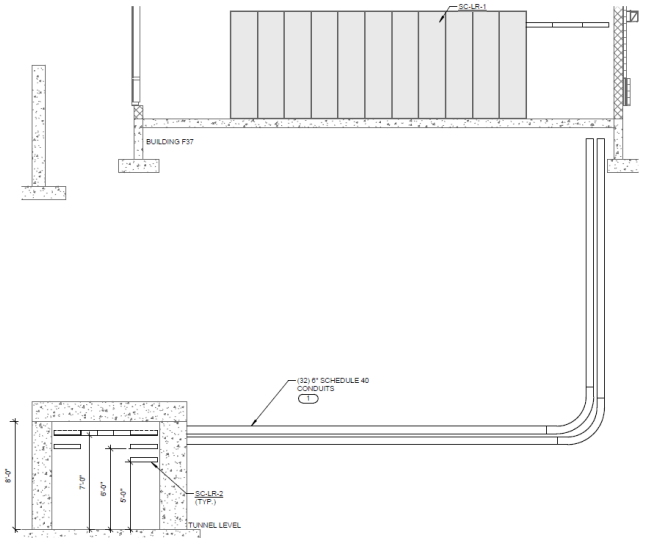
Beam Transfer Line – Absorber Area Sections



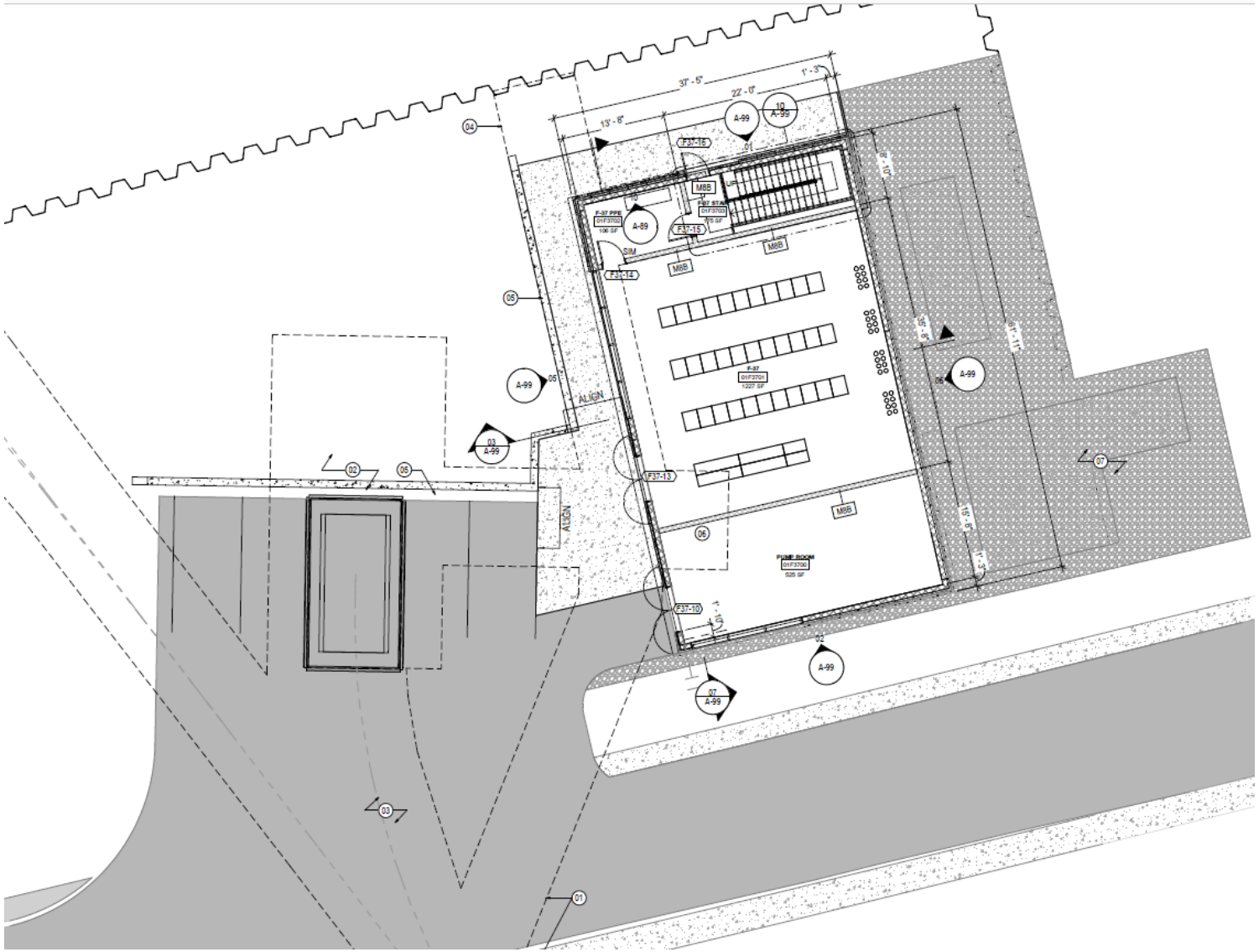


Beam Transfer Line – Penetrations/Cable Tray at Absorber Area

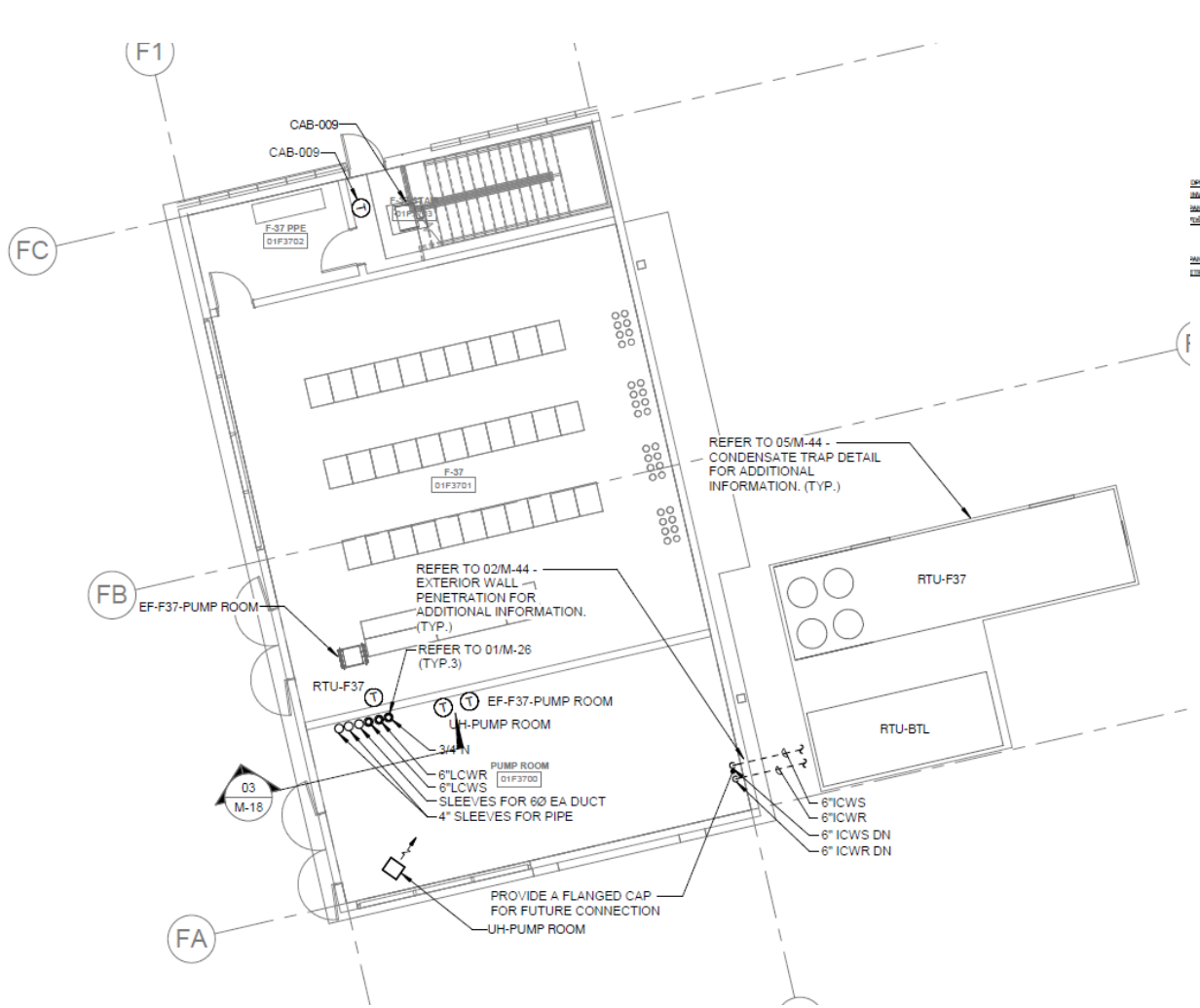




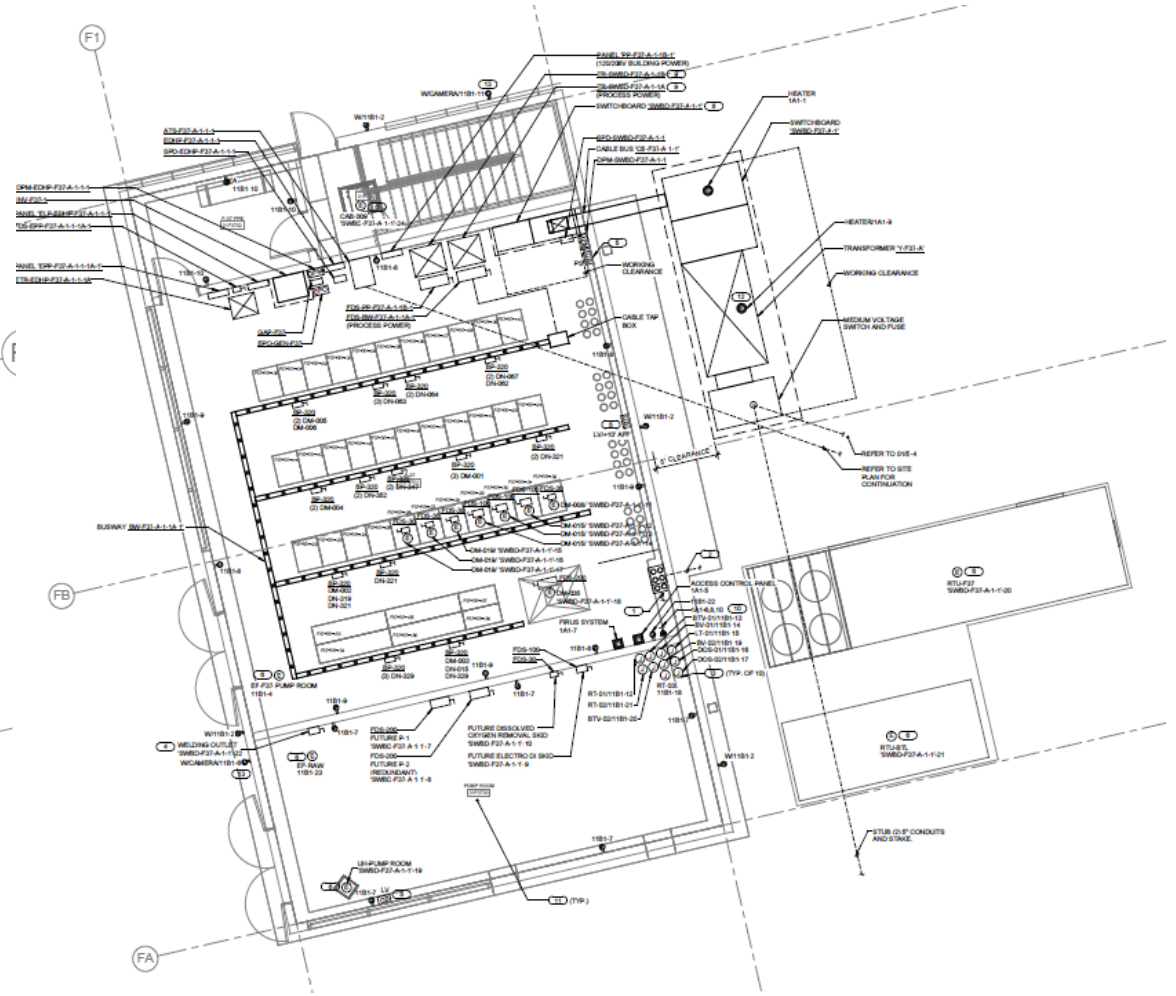
Beam Transfer Line – F37 Service Building



Beam Transfer Line – F37 Service Building

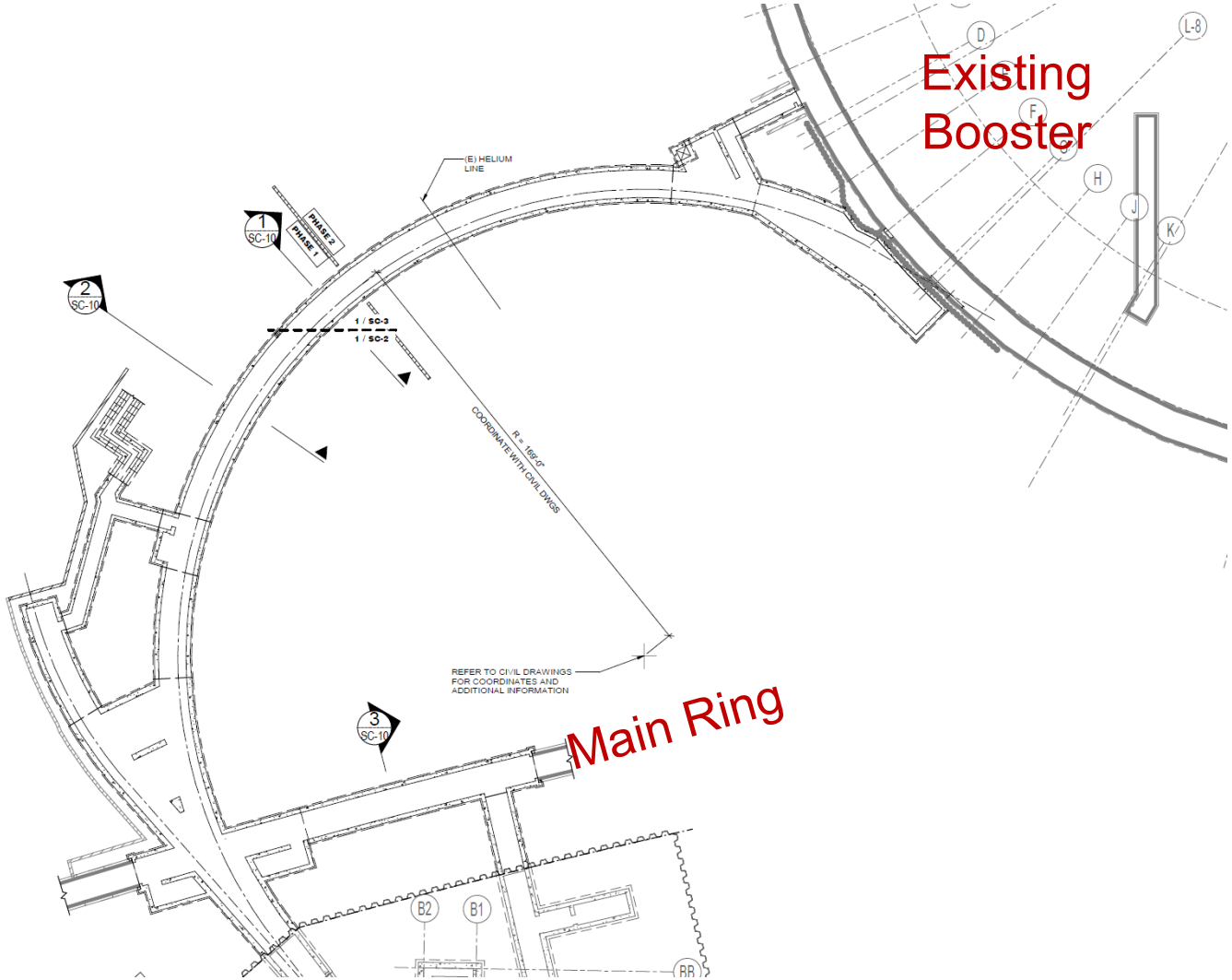


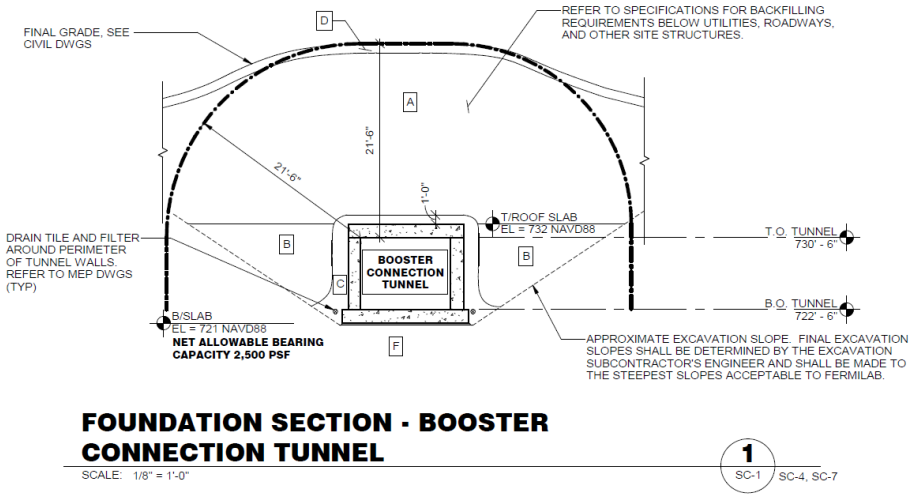
Mechanical



Electrical

Booster Connection – Tunnel Level Plan





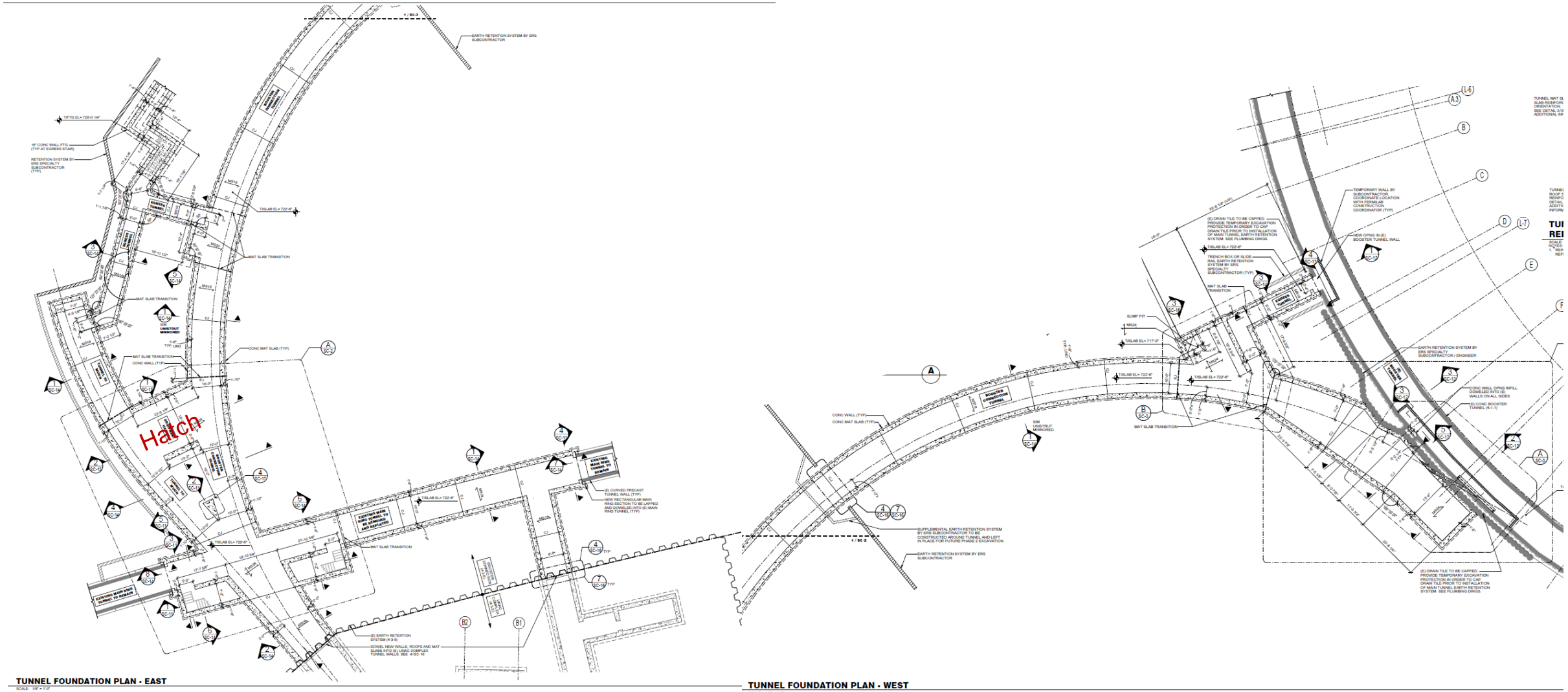
FOUNDATION SECTION - BOOSTER CONNECTION TUNNEL

SCALE: 1/8" = 1'-0"

1 SC-1 SC-4, SC-7

Booster Connection drawings: PIP-II-doc-54400 and Teamcenter ED0014285

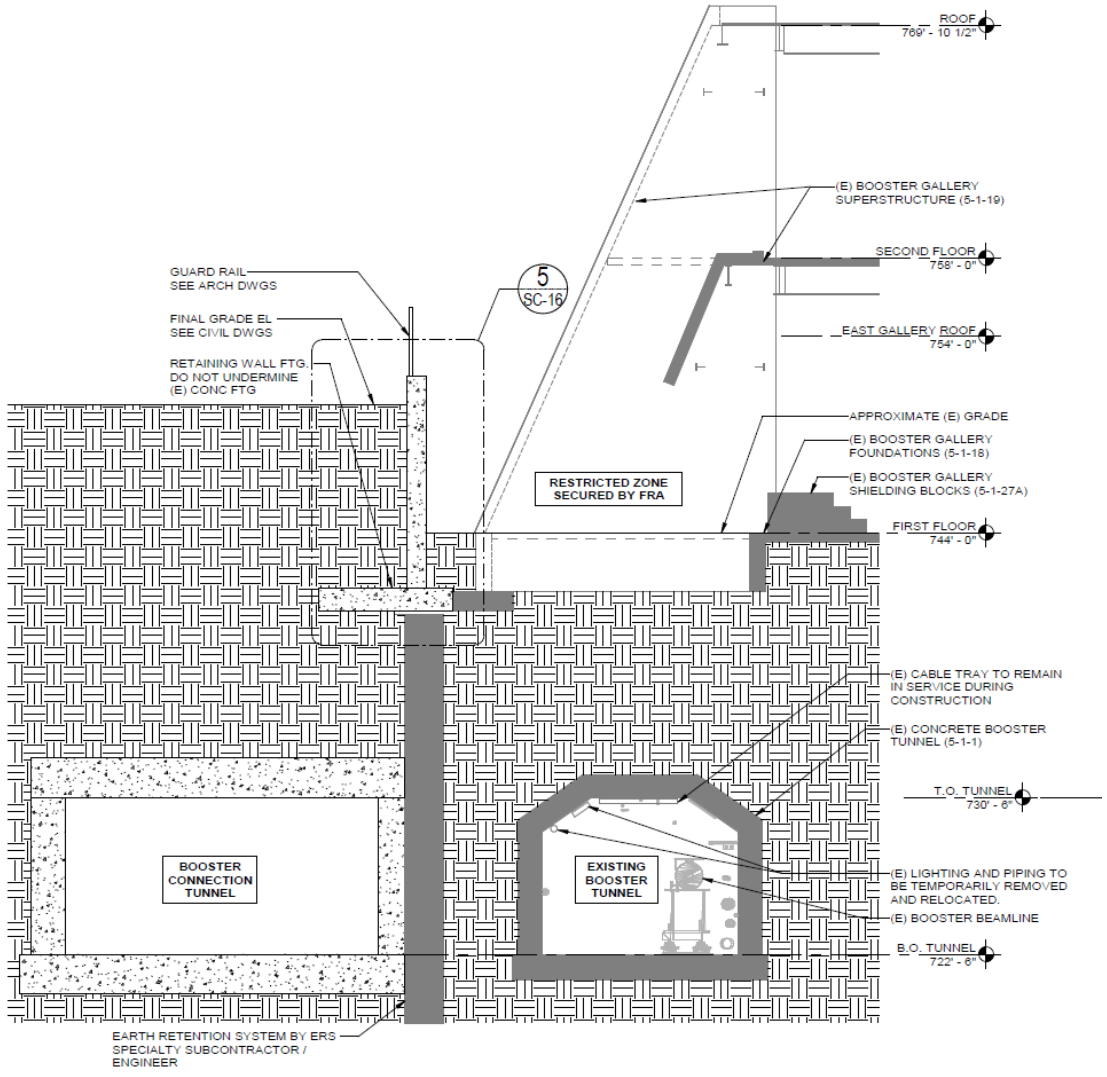
Booster Connection – Tunnel Level Plans



East

West

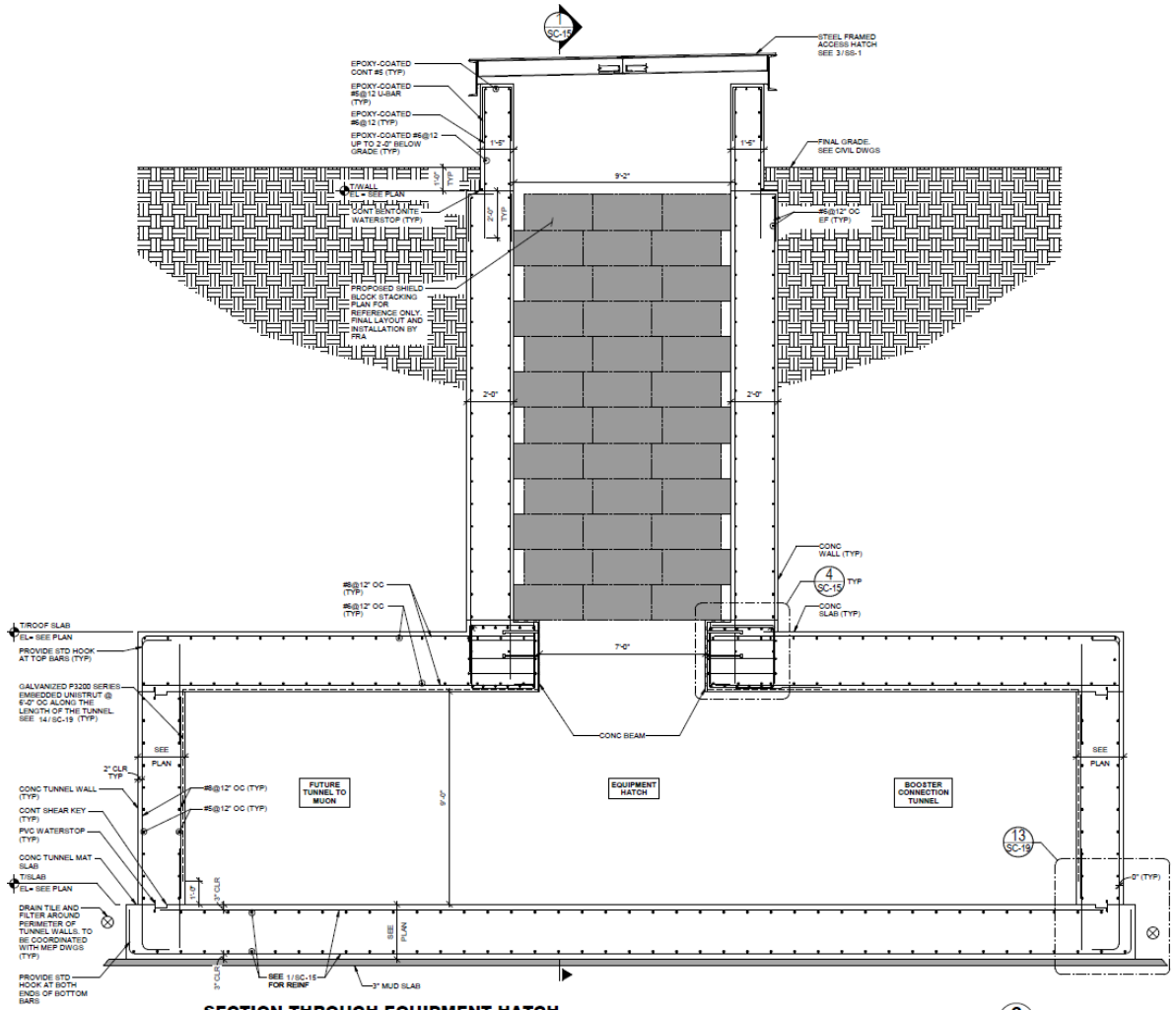
Booster Connection – Section



BOOSTER CONNECTION SECTION

SCALE: 1/4" = 1'-0"

3 SC-3 SC-6,



SECTION THROUGH EQUIPMENT HATCH

SCALE: NTS

NOTES:
1. REFER TO SECTION 1/SC-15 FOR INFORMATION NOT SHOWN.
2. REFER TO ARCHITECTURAL GENERAL NOTES FOR DAMPPROOFING REQUIREMENTS AGAINST THE FACE OF ALL BELOW GRADE TUNNEL WALLS, AND ROOF SLABS.

2 SC-2 SC-6, SC-8, SC-15

Beam Transfer Line Milestones

M. Milestone BTL-01 – XX Calendar Days from NTP – **BTL Material Submittals Complete**
This milestone marks the point when significant materials submittal reviews are complete for foundations, structural steel, building envelope, mechanical, electrical and fire protection systems for the Beam Transfer Line portion of the Linac Complex.

N. Milestone BTL-02 – XX Calendar Days from NTP – **BTL Foundation Complete**
This milestone marks the point when the Beam Transfer Line subsurface work is complete, cast-in-place concrete foundations and walls are complete and ready for backfilling.

O. Milestone BTL-03 – XX Calendar Days from NTP – **BTL Absorber Construction Start**
This milestone marks the point when the Subcontractor is ready to begin work on the Beam Absorber portion of the Beam Transfer Line segment of the Linac Complex. This is defined as any utility, excavation or earth retention system work west of the existing Main Ring Road. This milestone will be used to coordinate the PIP-II Linac Complex work with ongoing Fermilab operations.

P. Milestone BTL-04 – XX Calendar Days from NTP – **BTL Berm Complete**
This milestone marks the point when the shielding berm over the Beam Transfer Line including shield hatch is complete.

Q. Milestone BTL-05 – **775** Calendar Days from NTP – **AUP of Beam Transfer Line**
This milestone marks the point when the Beam Transfer Line is ready for Authorization to Use and Possession (AUP). This milestone marks the point where FRA and its subcontractors may begin to prepare the space for technical equipment This includes the following functioning infrastructure and systems:

- *Mechanical systems*
- *Electrical systems*
- *Shielding hatch*
- *Beam Absorber concrete shielding*
- *Backfill and rough grading complete*

F37 Milestones

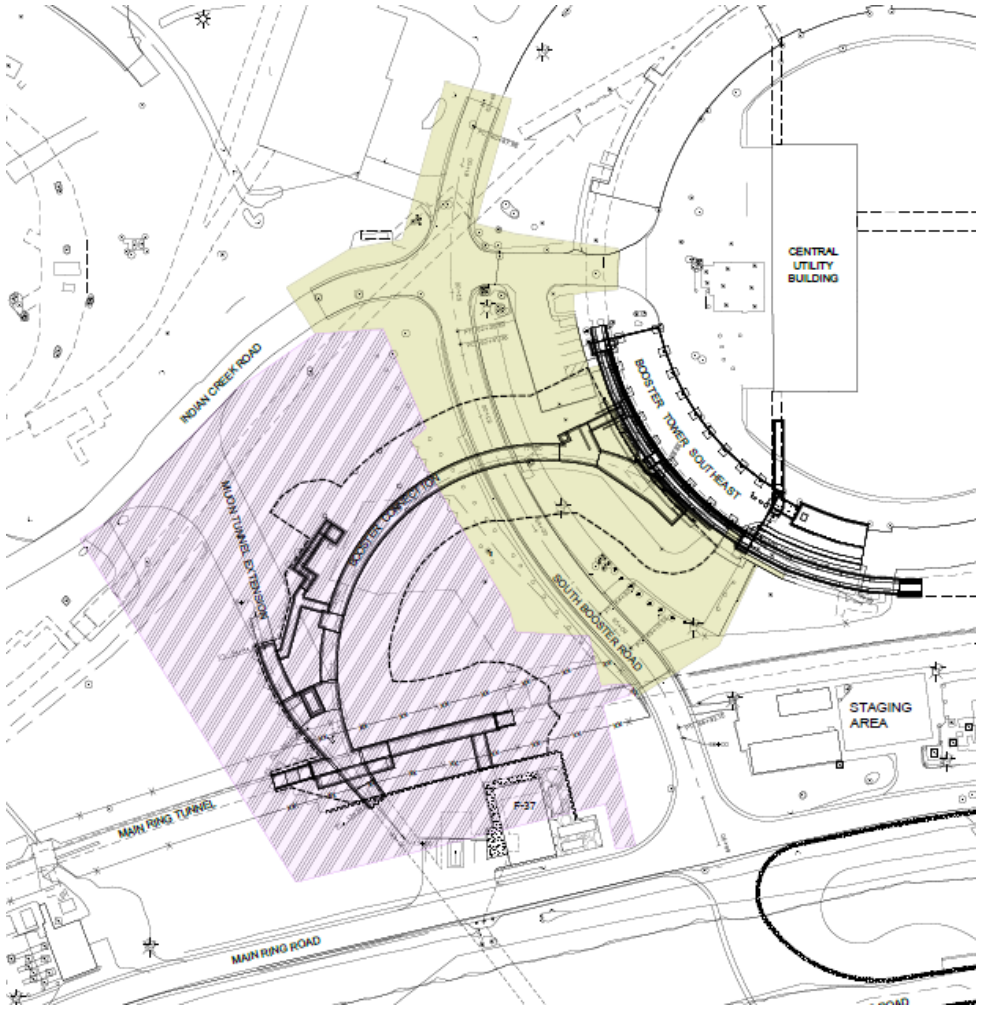
R. Milestone F37-01 – XX Calendar Days from NTP – **F37 Building Envelope Complete**
This milestone marks the point when the exterior building envelope including metal wall panels, siding, windows, doors, skylights and roofing is complete and the F37 service building is weathertight.

S. Milestone F37-02 – **905** Calendar Days from NTP – **AUP of F37 Service Building**
This milestone marks the point when the Linac Gallery is ready for Authorization to Use and Possession (AUP). This milestone marks the point where FRA and its subcontractors may begin to prepare the space for technical equipment This includes the following functioning infrastructure and systems:

- *Mechanical systems*
- *Electrical systems*
- *Fire alarm systems*
- *Door security*
- *Security camera*

Booster Connection Milestones

- Phase 1 – Main Ring Work:
  - CFBC1002470 - Start Construction: **October 2025**
  - CFBC1002490 - Authorization for Use and Possession: **October 2026**
  - CFBC1002500 - Construction Complete: **December 2026**
- Phase 2 – Booster Tie-In Work:
  - CFBC1002520 - Start Construction: **December 2026**
  - CFBC1002550 - Authorization for Use and Possession: **June 2027**
  - CFBC1002100 - Construction Complete: **August 2027**



Linac Complex Modifications Under Consideration

- Shielding Revisions:
  - Increase at storm culvert
  - Storm sewer location
  - Steel shielding at BTL ceiling
- Mechanical
  - LCW systems: location, valve location and quantity
  - Instrument air systems: location, valves, material
- Cable trays
  - Layout
  - Cross over locations
- Air barrier at Absorber Alcove

L2 System Change Log.xlsx (fnal.gov)
(https://web.fnal.gov/project/piptech/ProjectManagment/_layouts/15/WopiFrame2.aspx?sourcedoc={e9d35a22-02da-4432-a8de-b0b0c3ad5b45}l.gov)

Other Possible Changes

- LC: Electrical feed from F37 to F3
- LC: Expansion of F37 to accommodate additional equipment
- BC: Orbump Power Supply Room location

Questions