Muon Cooling Test Facility

Fermilab LINAC Area

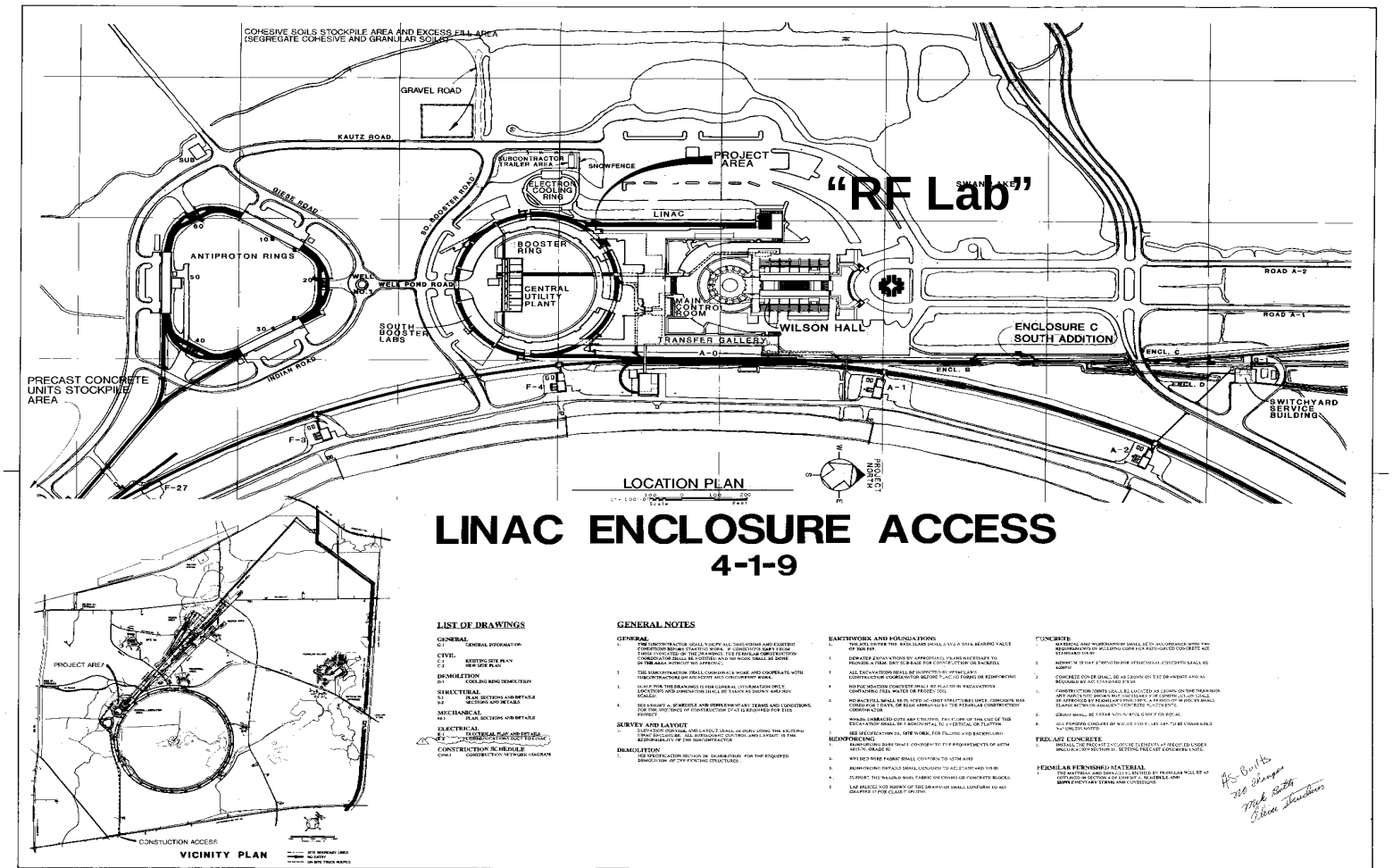
Milorad Popovic

http://www-bdnew.fnal.gov/proton_source/popovic/index.html

Muon Cooling Meeting,

NIU, March. 15, 2001

Location



LINAC ENCLOSURE ACCESS
4-1-9

LIST OF DRAWINGS

GENERAL
G-1 GENERAL INFORMATION

CIVIL
C-1 EXISTING SITE PLAN
C-2 SITE PLAN

DEMOLITION
D-1 COOLING RING DEMOLITION

STRUCTURAL
S-1 PLAN, SECTIONS AND DETAILS
S-2 SECTIONS AND DETAILS

MECHANICAL
M-1 PLAN, SECTIONS AND DETAILS

ELECTRICAL
E-1 ELECTRICAL PLAN AND DETAIL
E-2 ELECTRICAL SECTIONS AND DETAILS

CONSTRUCTION SCHEDULE
CPM-1 CONSTRUCTION NETWORK DIAGRAM

GENERAL NOTES

GENERAL

1. THE SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO ANY WORK. ALL DIMENSIONS SHOWN ON THESE DRAWINGS, THE FERMILAB CONSTRUCTION COORDINATOR SHALL BE NOTIFIED AND NO WORK SHALL BE DONE IN THE AREA WITHOUT HIS APPROVAL.
2. THE SUBCONTRACTOR SHALL COORDINATE WORK AND COOPERATE WITH SUBCONTRACTORS ON ADJACENT AND CONCURRENT WORK.
3. SCALE FOR THE DRAWINGS IS FOR GENERAL INFORMATION ONLY. LOCATIONS AND DIMENSIONS SHALL BE TAKEN AS SHOWN AND NOT SCALED.
4. SEE EXHIBIT A, SCHEDULE AND SUPPLEMENTARY TERMS AND CONDITIONS, FOR THE SEQUENCE OF CONSTRUCTION. EXHIBIT A IS REQUIRED FOR THIS PROJECT.

SURVEY AND LAYOUT

1. ELEVATION CONTROL AND LAYOUT SHALL BE DONE USING THE SECTION 1 PRAC SPECIFICATIONS. ALL SUBSEQUENT CONTROL AND LAYOUT IS THE RESPONSIBILITY OF THE SUBCONTRACTOR.

DEMOLITION

1. SEE SPECIFICATION SECTION 28 DEMOLITION FOR THE REQUIRED DEMOLITION OF TYP EXISTING STRUCTURES.

EARTHWORK AND FOUNDATIONS

1. THE SOIL UNDER THE BASE SLABS SHALL HAVE A SAFE BEARING VALUE OF 3000 PSF.
2. DEWATER EXCAVATIONS BY APPROPRIATE PUMPS NECESSARY TO PROVIDE A FIRM, DRY SUBBASE FOR CONSTRUCTION OR BACKFILL.
3. ALL EXCAVATIONS SHALL BE INSPECTED BY APPROPRIATE CONTRACTOR COORDINATOR BEFORE PLACING FORM OR REINFORCING.
4. NO FOUNDATION CONCRETE SHALL BE PLACED IN EXCAVATIONS CONTAINING FREE WATER OR FROZEN SOIL.
5. NO BACKFILL SHALL BE PLACED AGAINST STRUCTURES UNTIL CONSULTING CONSTRUCTION COORDINATOR.
6. WHEN EMBRACED CUTS ARE EXCEEDED, DISPOSE OF THE CUT OF THE EXCAVATION SHALL BE 1 HORIZONTAL TO 1 VERTICAL OR FLATTER.
7. SEE SPECIFICATION 23, SITE WORK, FOR FILLING AND BACKFILLING.

REINFORCING

1. REINFORCING BARS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615-70, GRADE 60.
2. WIRE MESH FABRIC SHALL CONFORM TO ASTM A185.
3. REINFORCING DETAILS SHALL CONFORM TO ACI STANDARD 315-80.
4. SUPPORT THE WELDED WIRE FABRIC ON CHAIRS OR CONCRETE BLOCKS.
5. LAP SPLICES NOT SHOWN ON THE DRAWINGS SHALL CONFORM TO ACI STANDARD 318 FOR CLASS "B" SPLICES.

CONCRETE

1. MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE ACI STANDARD 318-83".
2. MINIMUM 28 DAY STRENGTH FOR STRUCTURAL CONCRETE SHALL BE 3000 PSI.
3. CONCRETE COVER SHALL BE AS SHOWN ON THE DRAWINGS AND AS REQUIRED BY ACI STANDARD 318-83.
4. CONSTRUCTION JOINTS SHALL BE LOCATED AS SHOWN ON THE DRAWINGS. ANY JOINTS NOT SHOWN BUT NECESSARY FOR CONVENIENCE OF WORK SHALL BE APPROVED BY FERMILAB'S CONSTRUCTION COORDINATOR. JOINTS SHALL BE SEALED BETWEEN ADJACENT CONCRETE PLACEMENTS.
5. GROUT SHALL BE NON-SHRINK, NON-METALLIC GROUT OR EQUAL.
6. ALL EXPOSED CORNERS OF WALLS AND FLOORS ARE TO BE CHAMFERED 3/4" UNLESS NOTED.

PRECAST CONCRETE

1. INSTALL THE PRECAST CONCRETE ELEMENTS AS PROVIDED UNDER SPECIFICATION SECTION 31 - SETTING PRECAST CONCRETE UNITS.

FERMILAB FURNISHED MATERIAL

1. THE MATERIAL AND SERVICES FURNISHED BY FERMILAB WILL BE AS DEFINED IN SECTION 4 OF EXHIBIT A, SCHEDULE AND SUPPLEMENTARY TERMS AND CONDITIONS.

	NAME	DATE
DESIGNED	MIKE GRIMSON	9-9-91
DRAWN	DICK KILLIAN	9-9-91
CHECKED		9-9-91
APPROVED		9-9-91
SUBMITTED		9-9-91

SCALE:

FERMI NATIONAL ACCELERATOR LABORATORY
UNITED STATES DEPARTMENT OF ENERGY
LINAC ENCLOSURE ACCESS
GENERAL INFORMATION
DRAWING NO. 4-1-9 G-1 REV.

REV.	DATE	DESCRIPTIONS
		REVISIONS

Arial View

View from the top of Wilson Hall

Close Up from High-rise

View from the top of Linac Berm

Near Future Activities

Warning

Any usage of the facility should be completely parasitic to Linac Operations and maintenance. Construction will/should require only modest, ~ three weeks of invasive interaction with Linac, which will/should be schedule as part of regular shutdowns.

1. Liquid Hydrogen Absorber test facility

a. Engineering Tests no Beam----Jun-2001

b. Beam Related Hydrogen Absorber test ------Jun-2002

c. Short Fully Integrated Cooling Section, H-Abs., Be-Window RF Cavity, SC Solenoid----Sep-2002

2. High Power RF Test Bed, 200MHz and 805MHz

a. Be Window RF Cavity, High Power RF Test---Sep-2002

b. Grid Based RF Cavity, High Power Test—Sep-2002

c. Cryo Cold Copper Cavity

Future Activities

1. **Superconduting Test Facility**

   200MHz Superconduting Cavity, NSF-Cornell

   SNS maybe

   805MHz Cavity for Linac Energy Upgrade

2. **Any H-, 400MeV Beam Related Experiment**

People&Groups

- **Universities&FNAL**

  D.Kaplan, M.A.Cummings,
  E.Black, J.Norem, D.Summers
  S.Geer, D.Errede,….

- **FESS**

  T.Lackowski-G.Leader
  J.Sims-Structural Eng.
  G.VanZandbergen-Architect

- **Cryo**

  J.Theilacker
  B.Norris

- **Elec.Power**

  J.Ranson, J.Lackey

- **Water**

- **Safety**

  H.Casebolt-G.Leader
  M.Gerardi-Radiation
  M.Ferguson-Linac Area
  B.Fritz-Environment

- **LH2-Safety?**

  J.Kilmer
  W.Smart

- **ProtonSource**

  B.Webber-G.Leader
  C.Schmidt-Linac

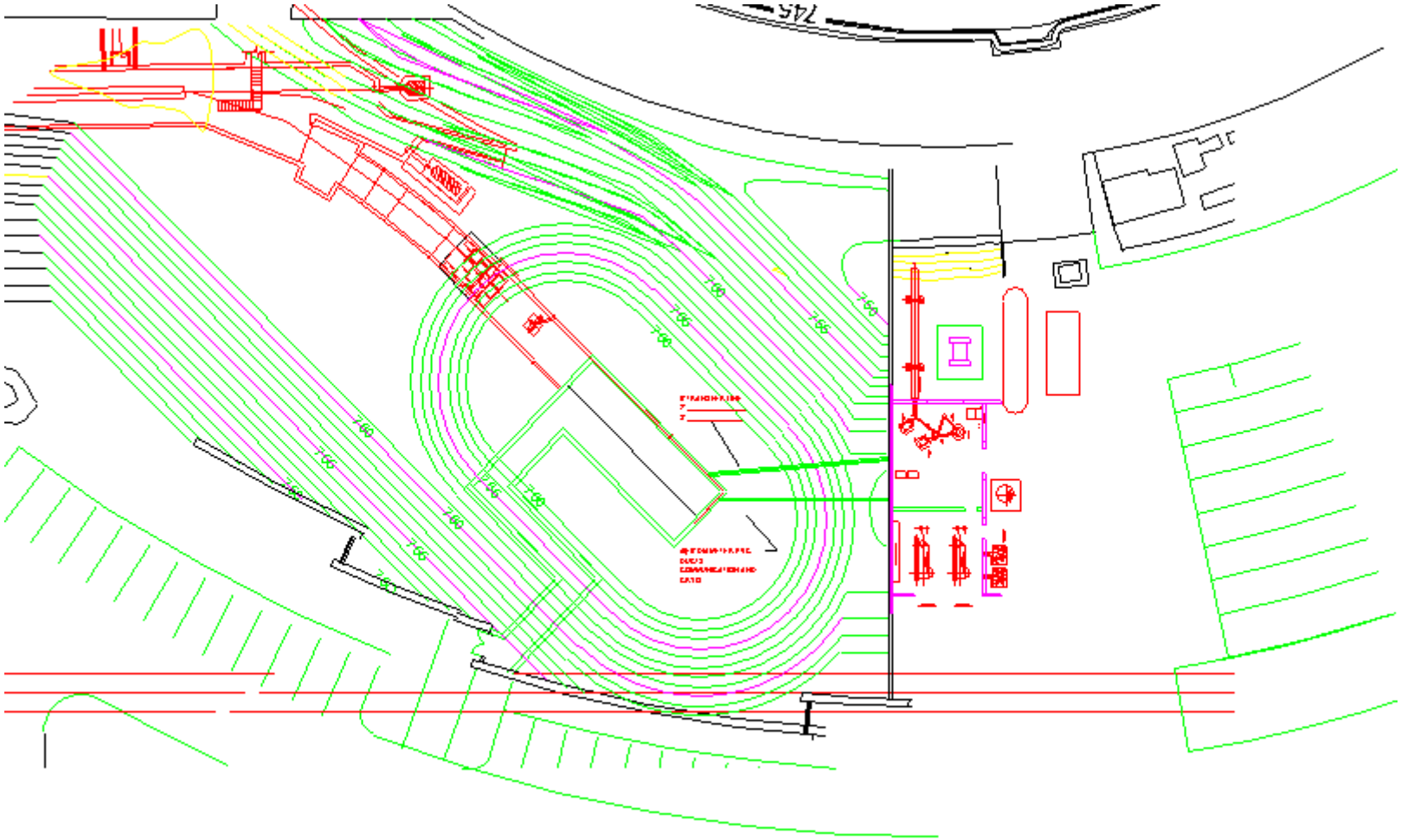
Target Dates

- **1-May-01 End of Civil Construction for Phase I**

  Start LH2 Target Installation

  Start Helium Plant Installation
- 20-April-01 Start Helium Plant Removal from PS4
- 1-April-01 Cryo Moving/Assembly Contracts Awarded
- 15-March-01 Cryo Related Bids Out
- 1-March-01 Cryo Design Ready/Start of Civil Const.
- 15-Feb-01 Civil Const. Contracts Awarded
- 1-Feb-01 Const., LH2, He,.. Safety Issues Defined
- 15-Jan-01 Enclose&Cryo Building Bids Ready/Out
- 20-Dec-00 Enclose&Cryo Building Design Ready
- 15-Dec-00 Architectural Design Review by Lab B.C.

Phase 1&2



Cost&Budget for Phase I

- Access Enclose---------- 89k$

  includes design, land preparation, concrete, power feed, …
- Cryo Building, 50x20@100$ft*ft----------130k$,

  waiting for conceptual design, may be less, but not more.
- Cryo, 400Watts Fridge----------235k$

  includes redesign, removal, moving, reassembling, controls

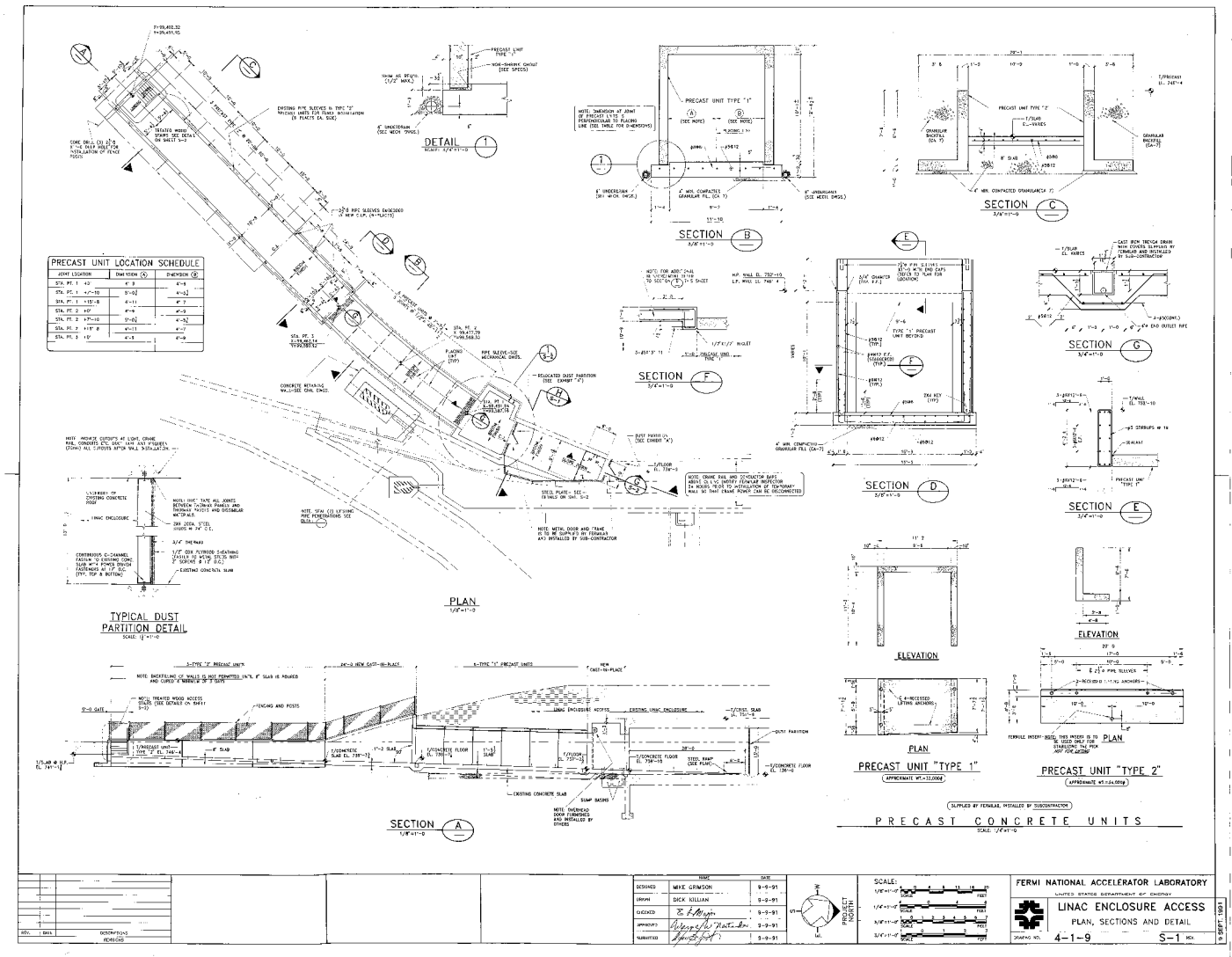
  ~~(50 Watts Fridge ---200k$, but no control, not option any mo~~re.)

Most of the work will done by outside contractors.

- 2months safety person----------20k$
- 3months physicist---------- 30k$

TOTAL----------504k$

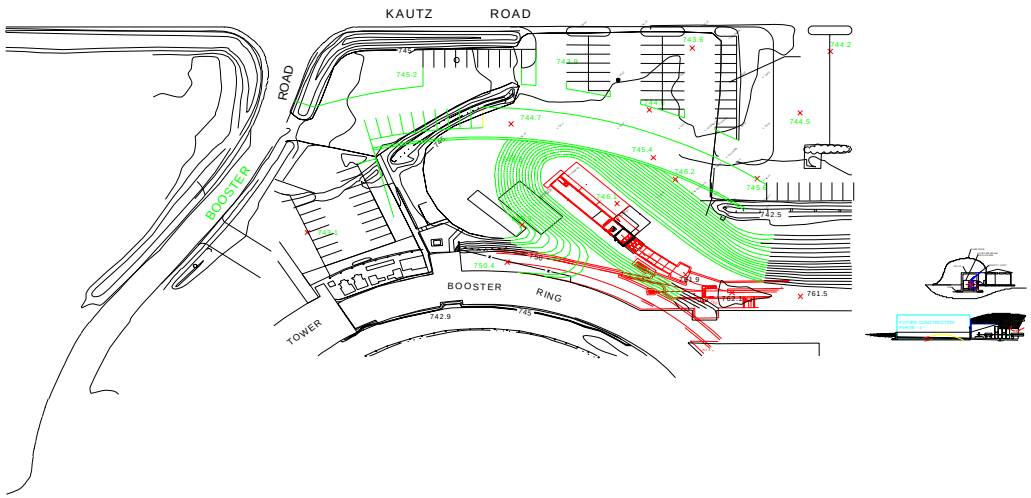
Linac End and Access to Enclosure



History

Jan-30-2001

Architectural Vision



PS4 Building