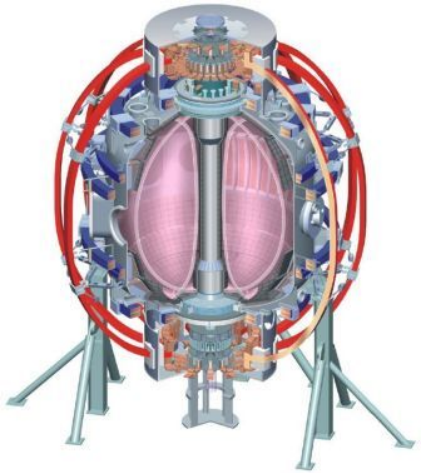
Beam Relocation

College W&M
Colorado Sch Mines
Columbia U
CompX
General Atomics
INEL
Johns Hopkins U
LANL
LLNL
Lodestar
MIT
Nova Photonics
New York U
Old Dominion U
ORNL
PPPL
PSI
Princeton U
Purdue U
SNL
Think Tank, Inc.
UC Davis
UC Irvine
UCLA
UCSD
U Colorado
U Illinois
U Maryland
U Rochester
U Washington
U Wisconsin

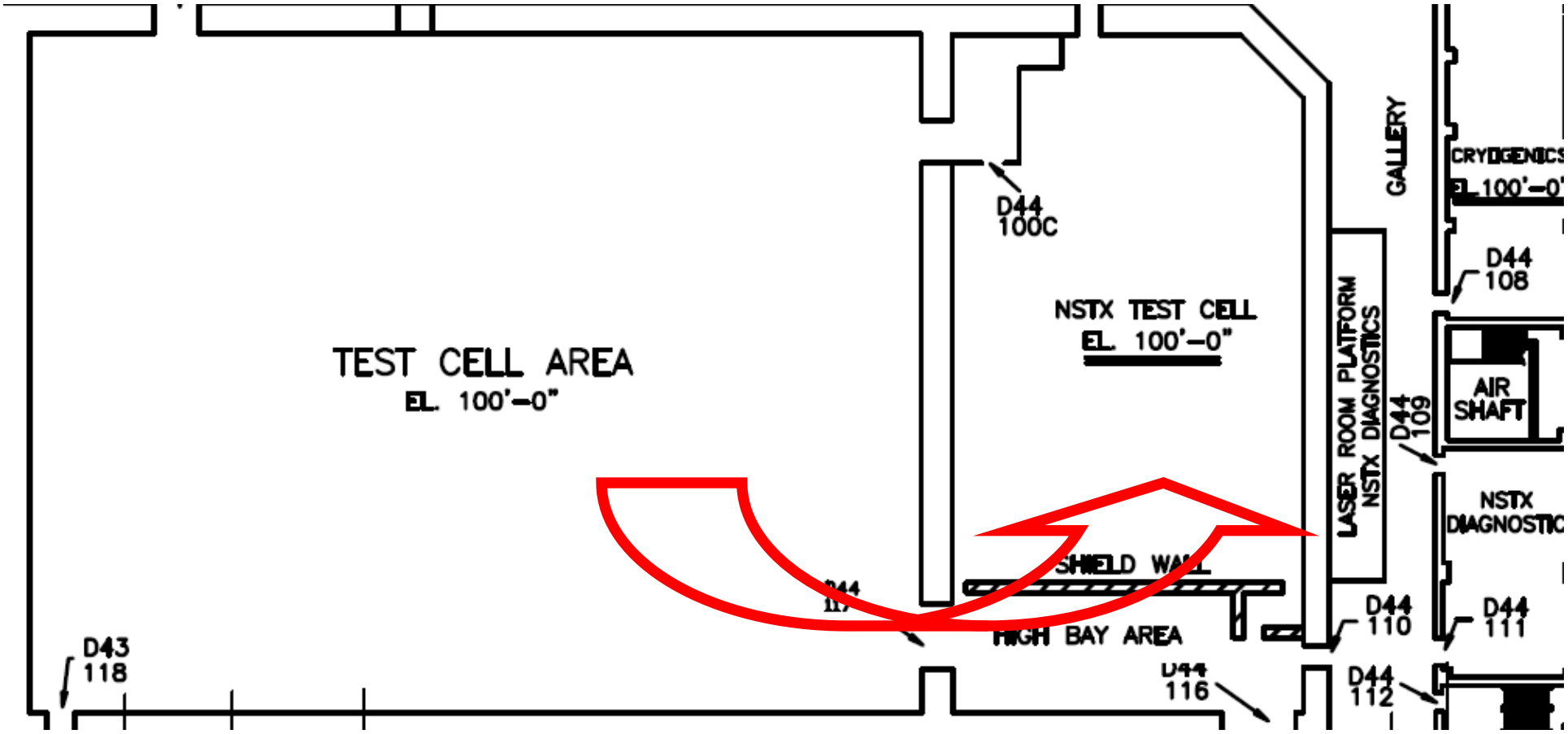
Martin Denault

Culham Sci Ctr
U St. Andrews
York U
Chubu U
Fukui U
Hiroshima U
Hyogo U
Kyoto U
Kyushu U
Kyushu Tokai U
NIFS
Niigata U
U Tokyo
JAEA
Hebrew U
Ioffe Inst
RRC Kurchatov Inst
TRINITI
KBSI
KAIST
POSTECH
ASIPP
ENEA, Frascati
CEA, Cadarache
IPP, Jülich
IPP, Garching
ASCR, Czech Rep
U Quebec

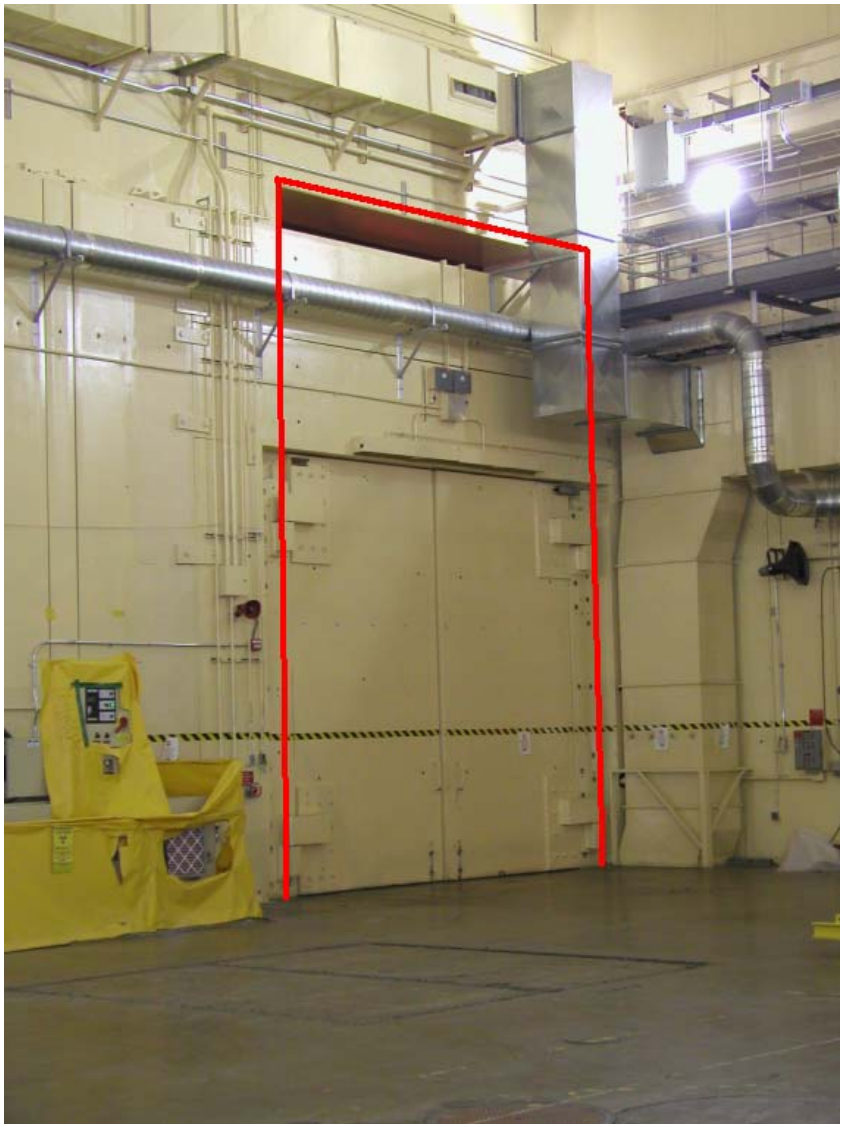
NSTX Upgrade Project
Conceptual Design Review
LSB, B318
October 28-29, 2009



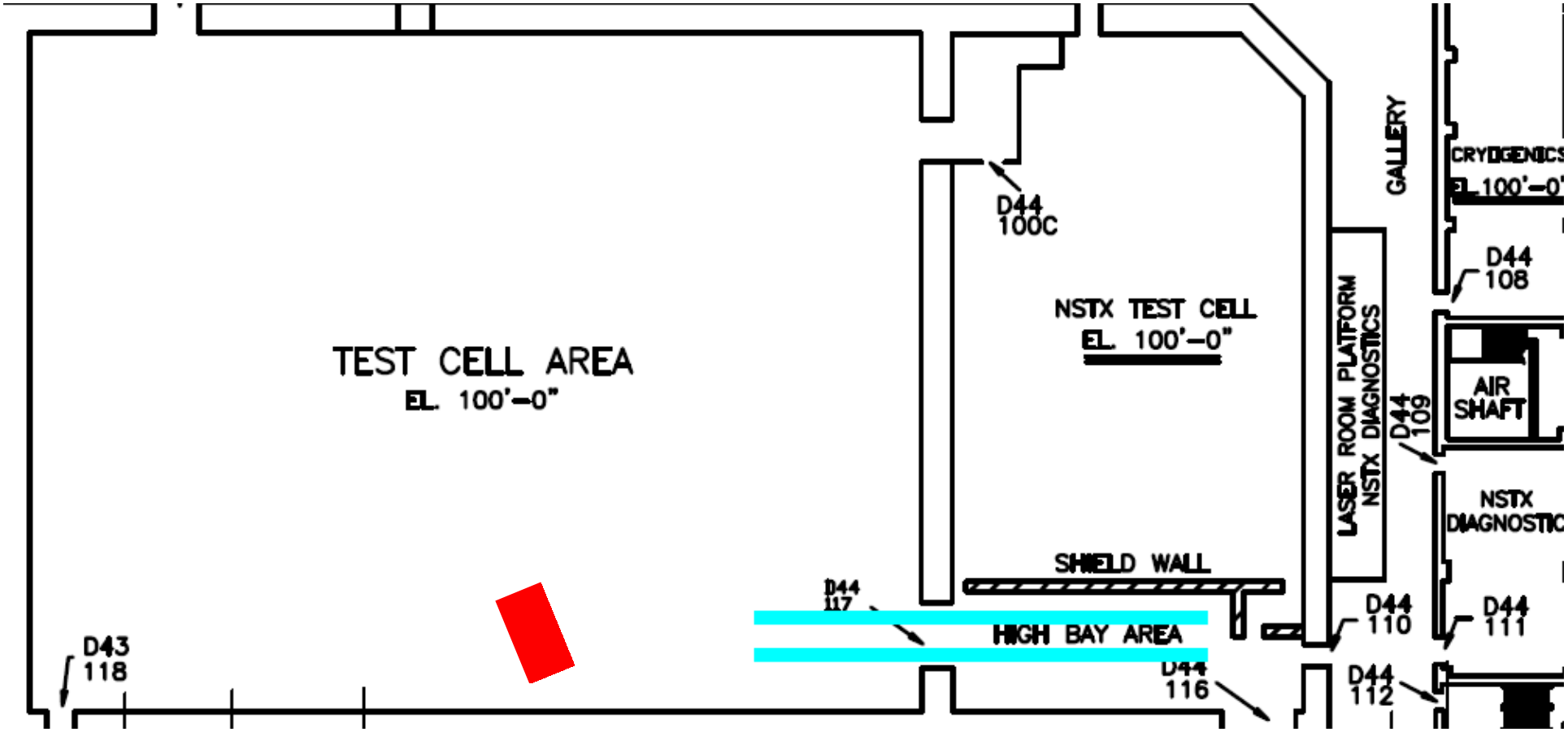
Move Components From TFTR to NSTX test cell



Clear Door
Remove duct work and lintels



Relocation Path



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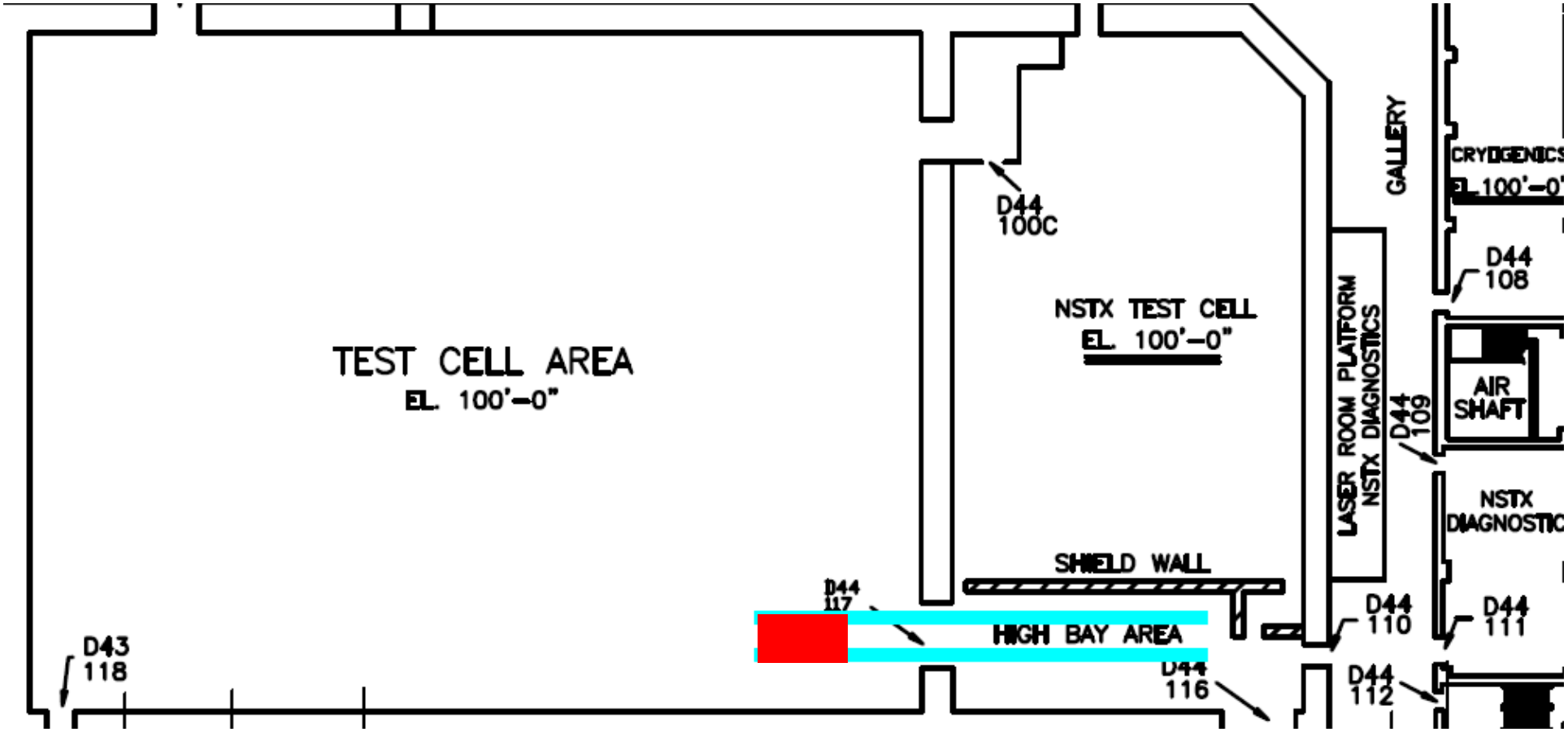

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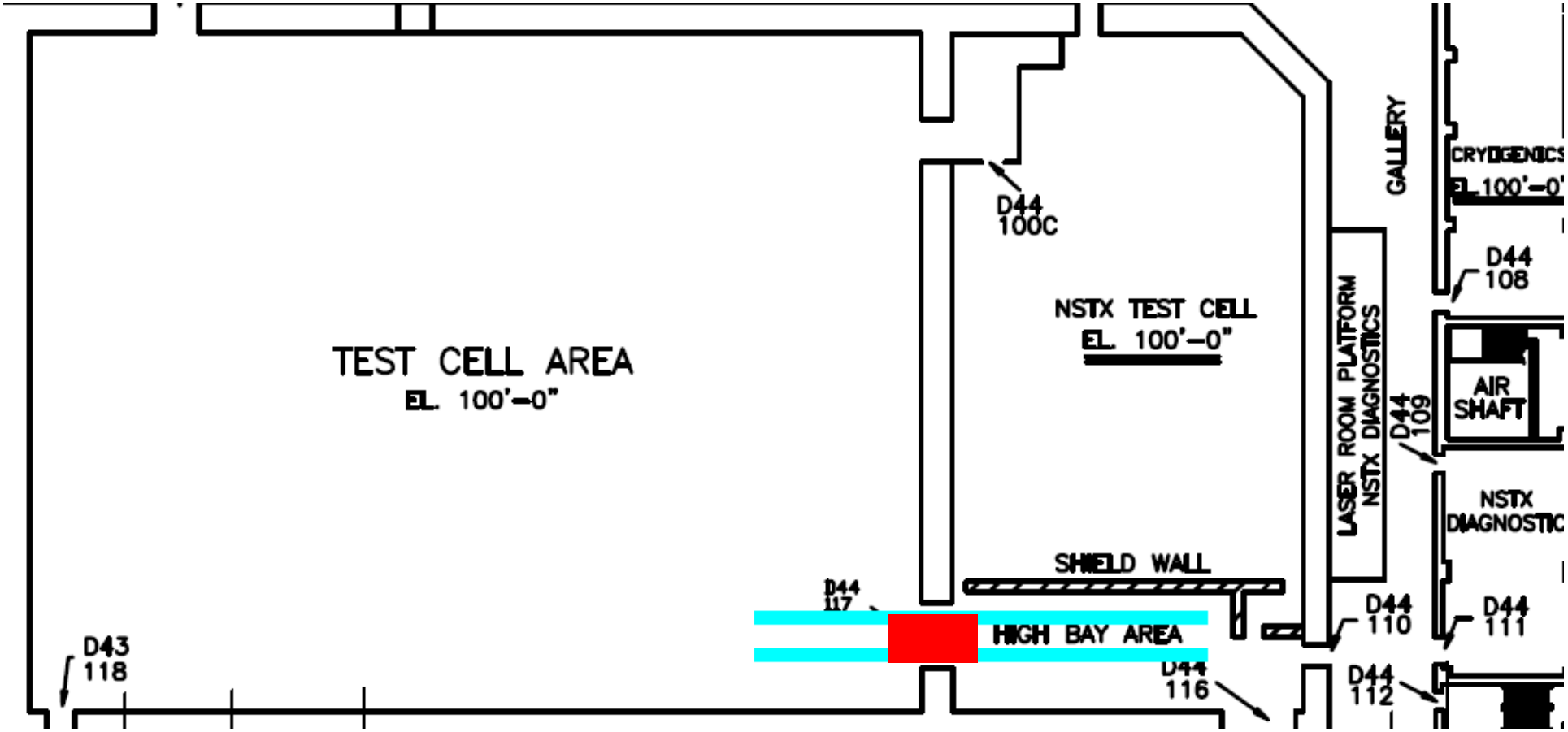

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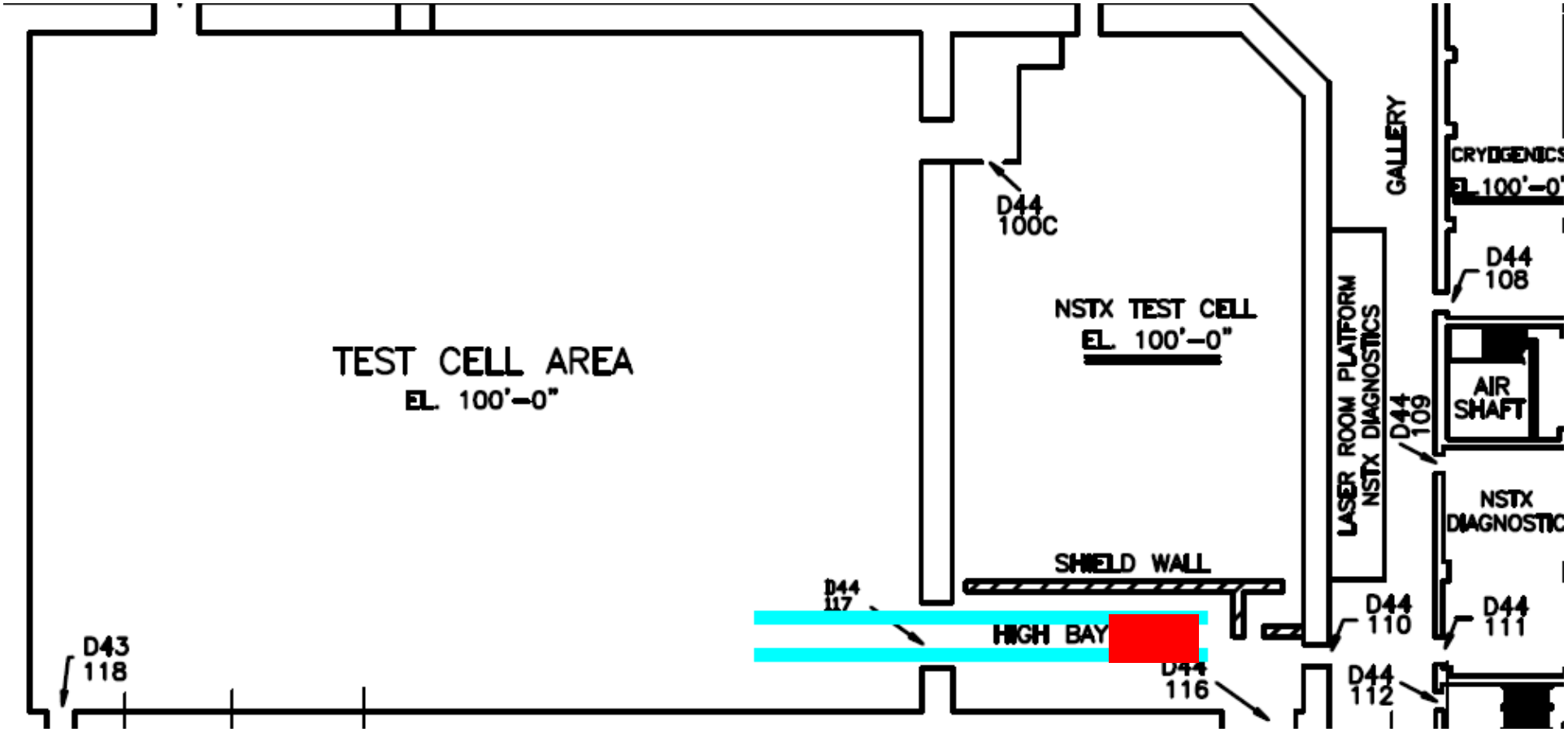

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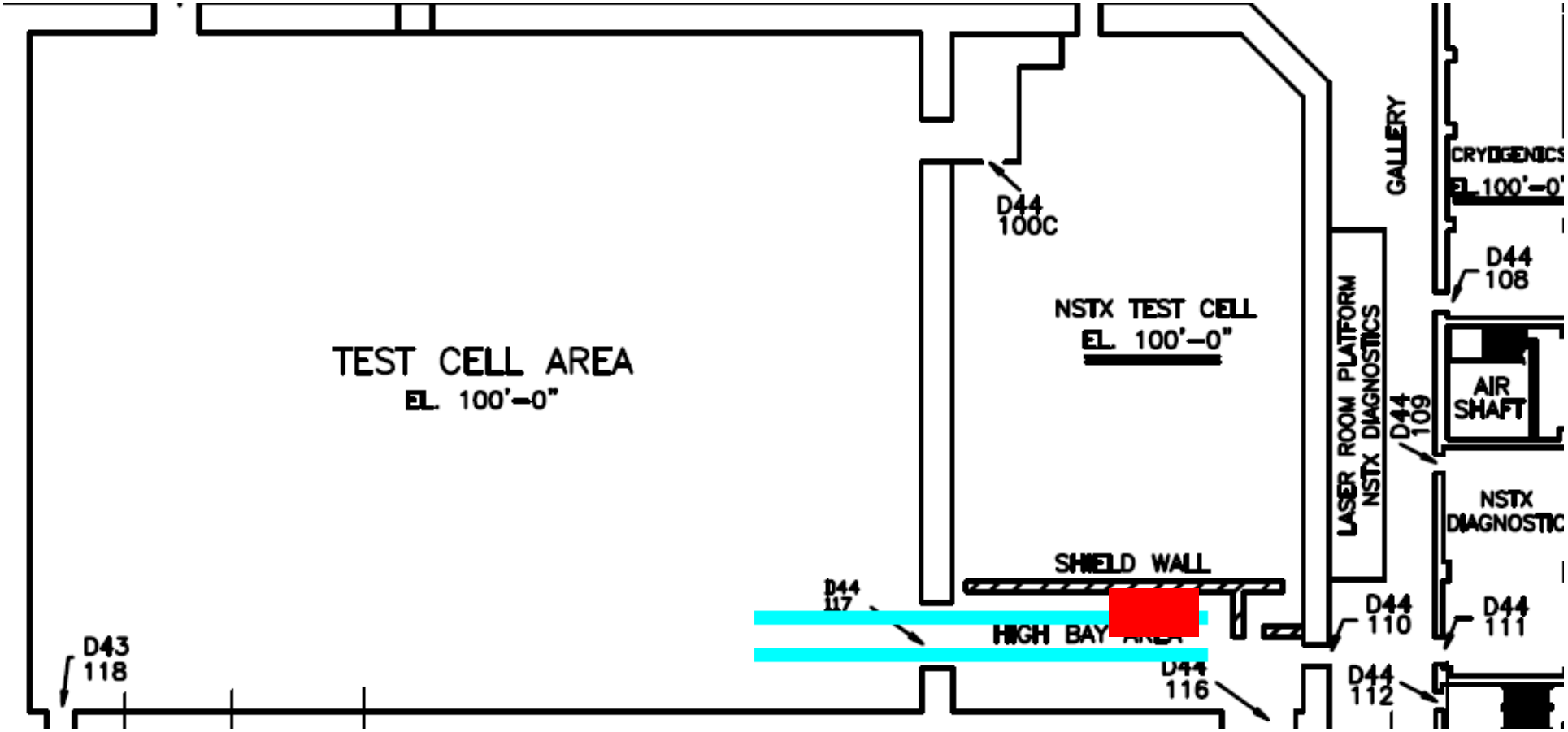

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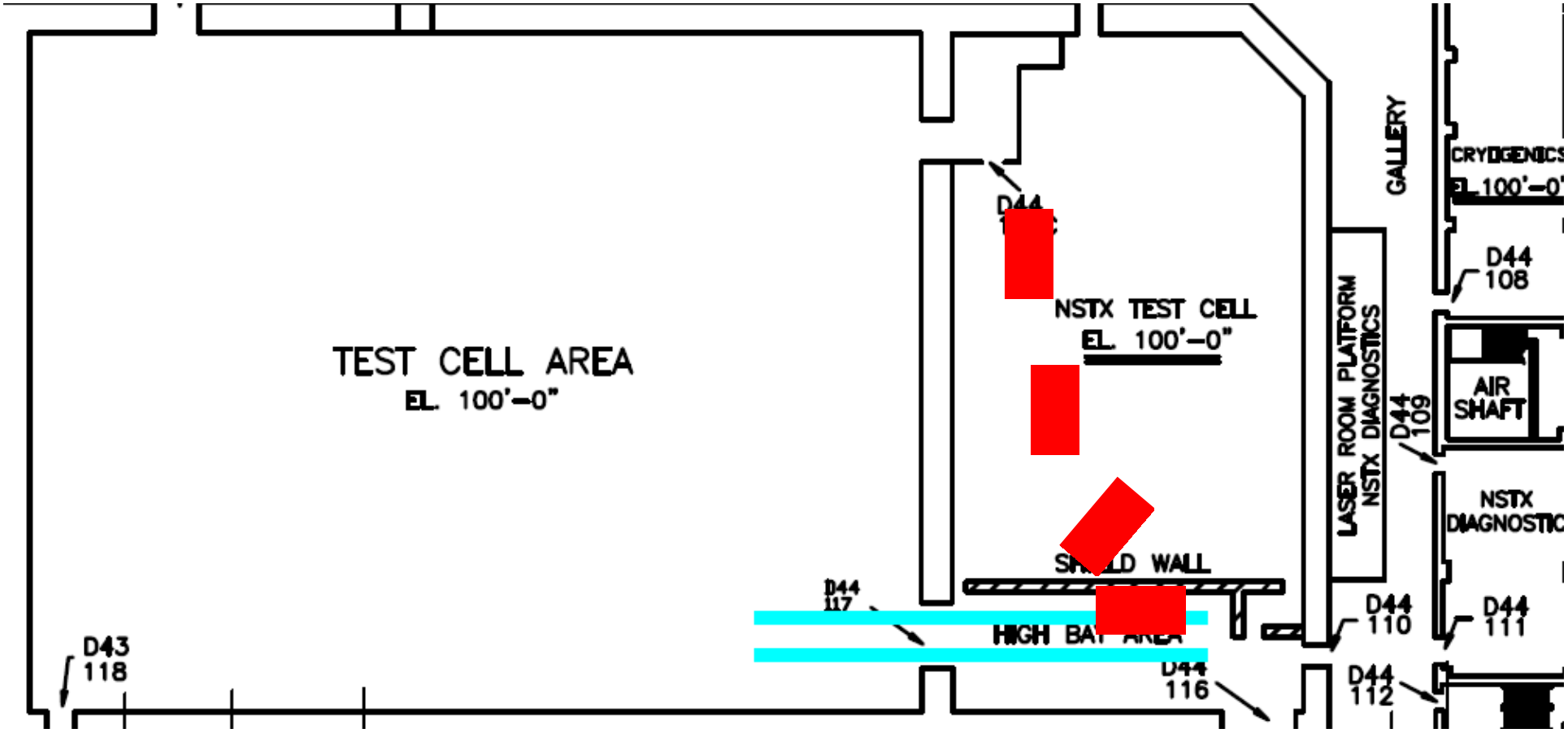

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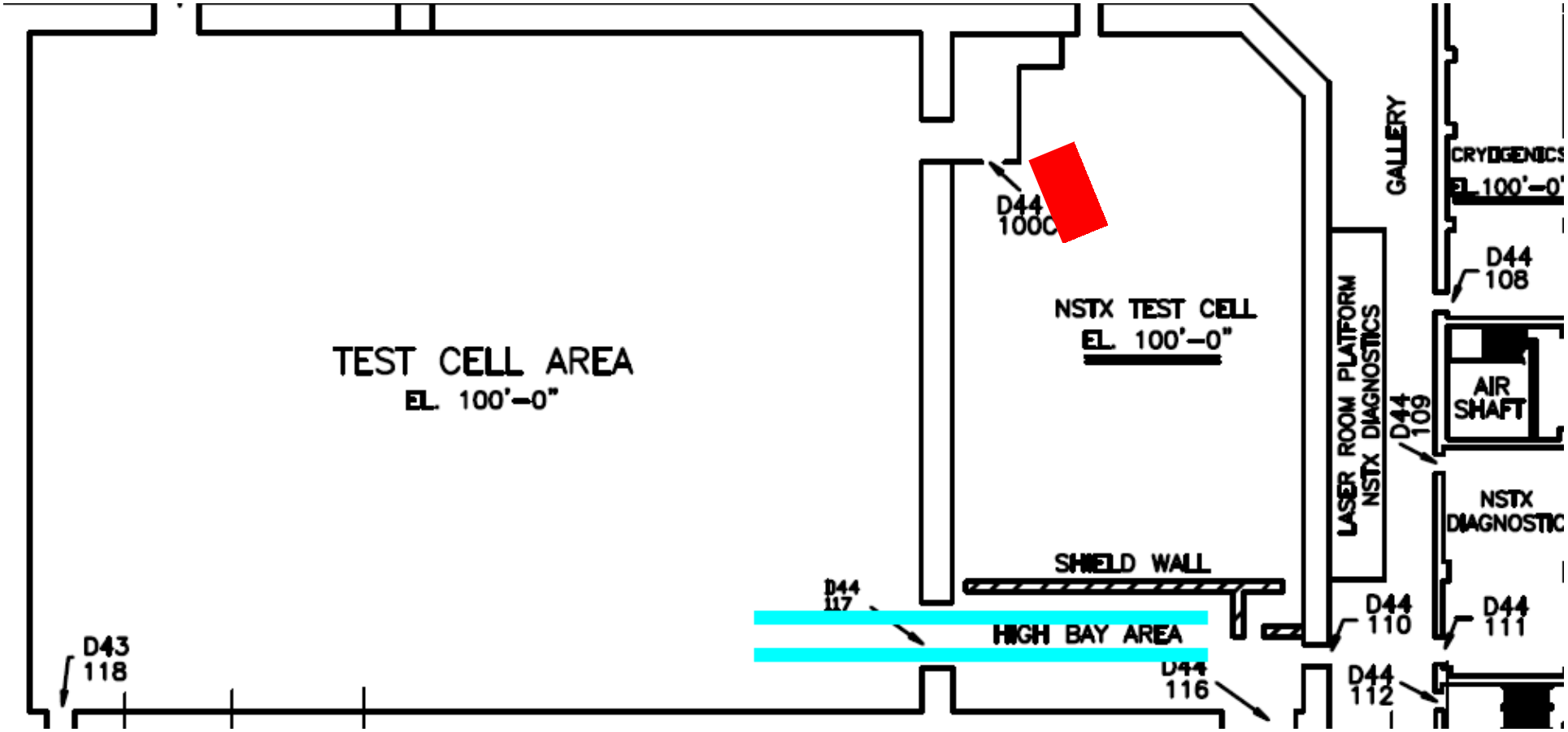
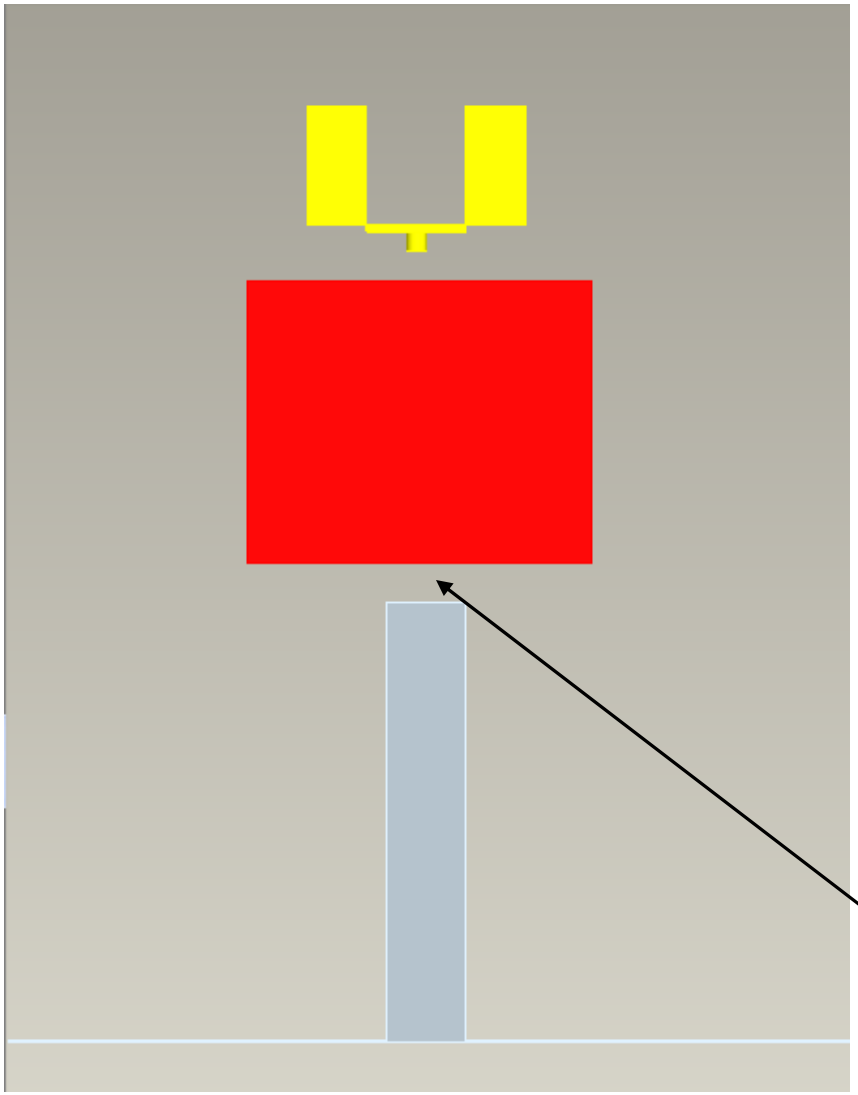
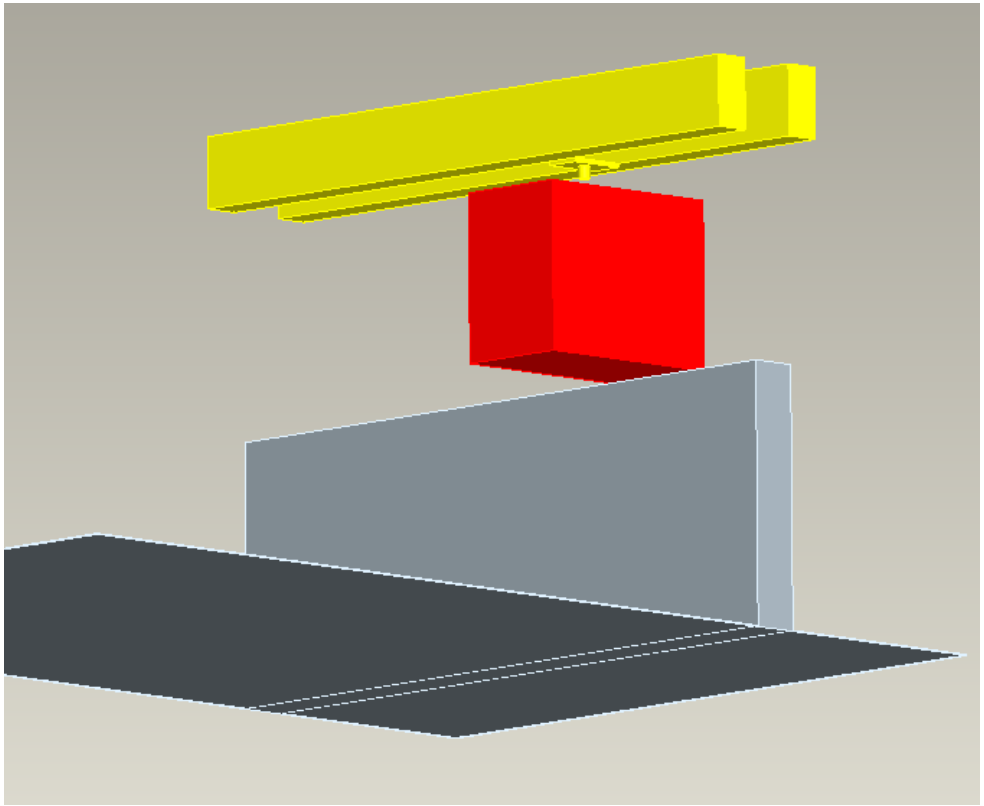


Model of NBI box lifted over shield wall

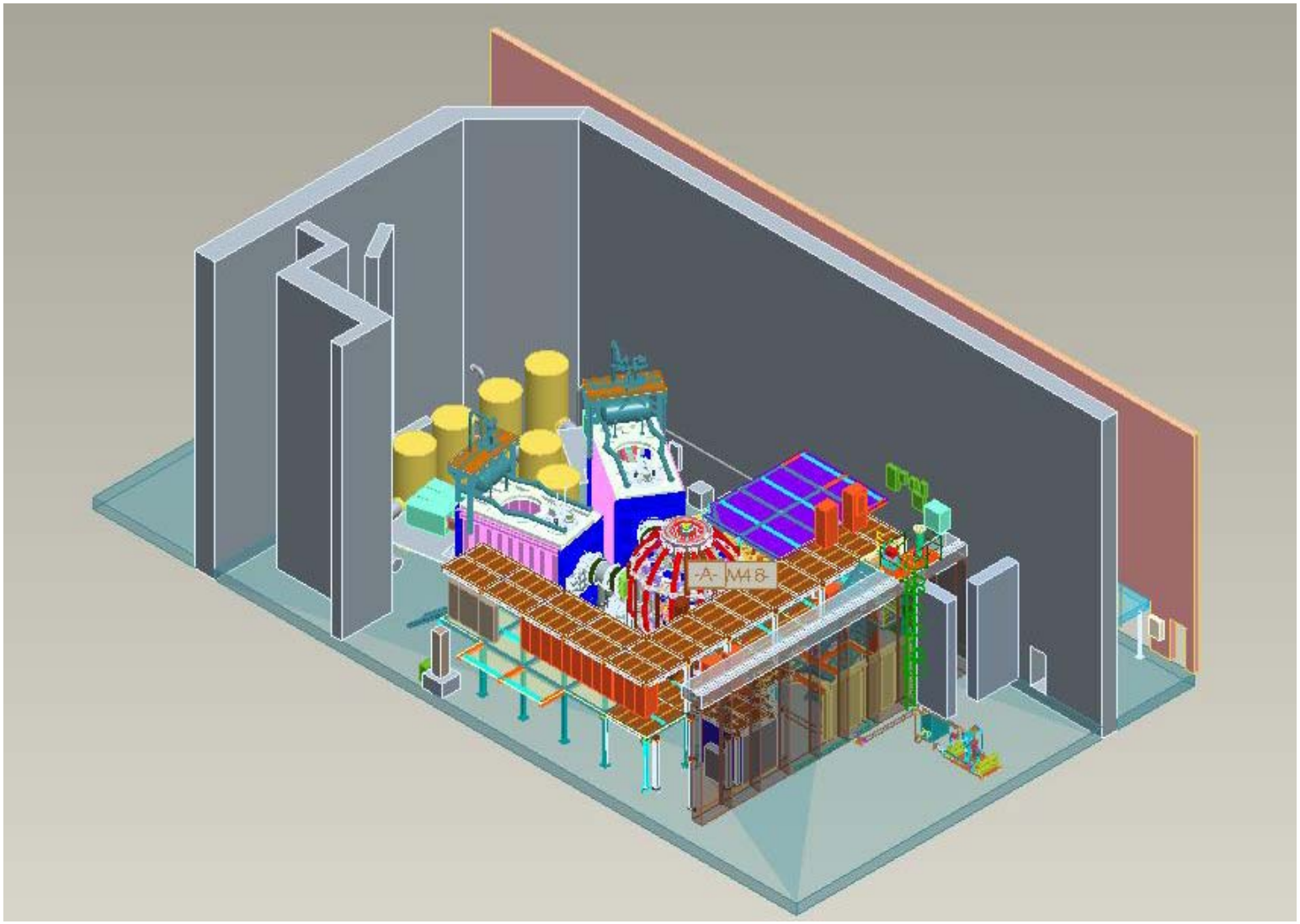




Two feet of clearance

Legs for NBI BL2 identical to BL1

NSTX Test Cell



Beam Services

College W&M
Colorado Sch Mines
Columbia U
CompX
General Atomics
INEL
Johns Hopkins U
LANL
LLNL
Lodestar
MIT
Nova Photonics
New York U
Old Dominion U
ORNL
PPPL
PSI
Princeton U
Purdue U
SNL
Think Tank, Inc.
UC Davis
UC Irvine
UCLA
UCSD
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U Illinois
U Maryland
U Rochester
U Washington
U Wisconsin

Martin Denault

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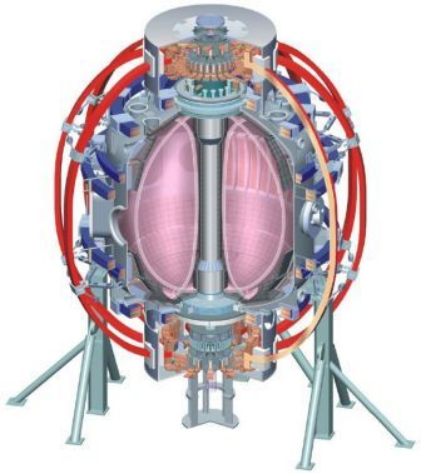
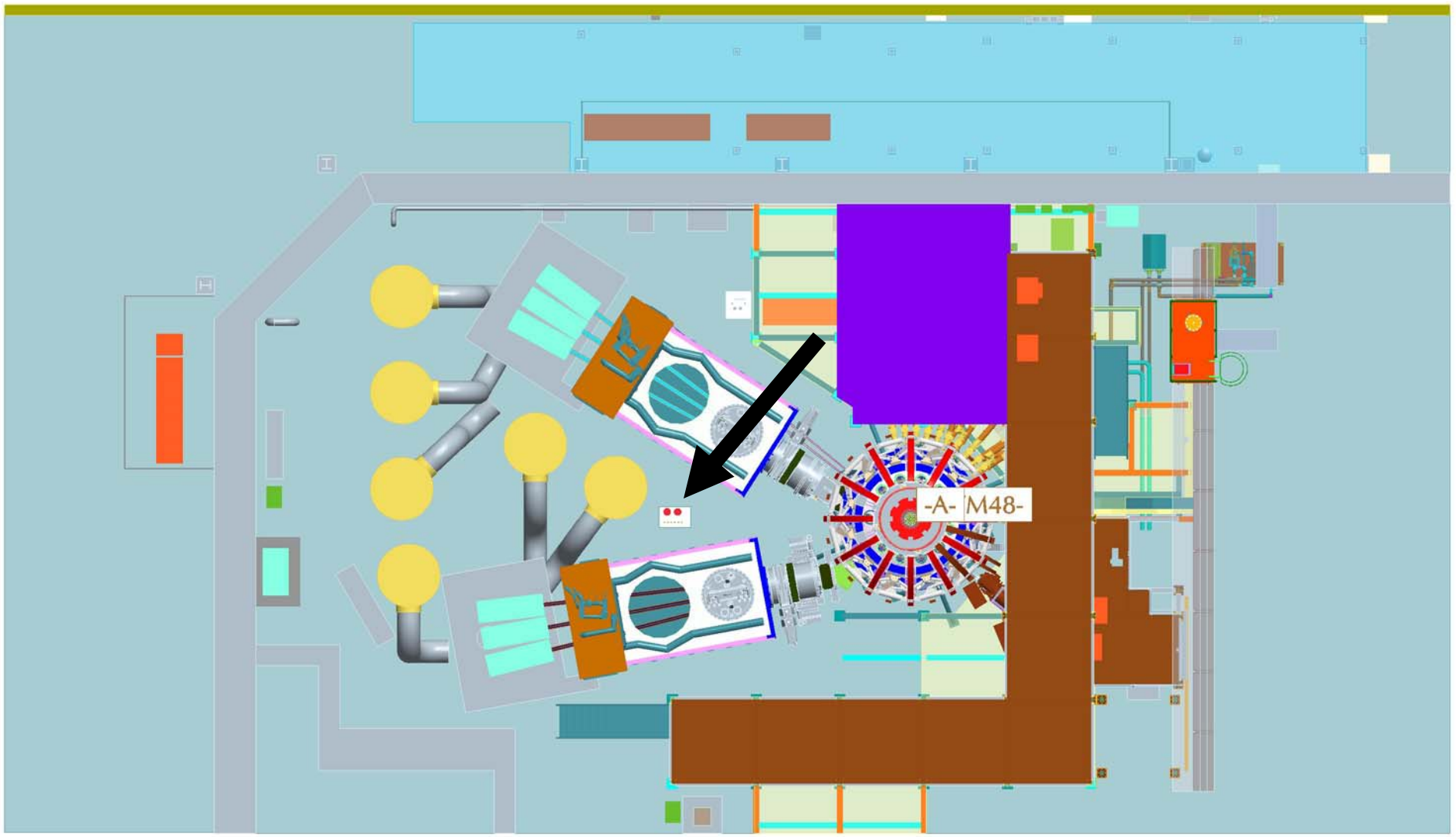


Culham Sci Ctr
U St. Andrews
York U
Chubu U
Fukui U
Hiroshima U
Hyogo U
Kyoto U
Kyushu U
Kyushu Tokai U
NIFS
Niigata U
U Tokyo
JAEA
Hebrew U
Ioffe Inst
RRC Kurchatov Inst
TRINITI
KBSI
KAIST
POSTECH
ASIPP
ENEA, Frascati
CEA, Cadarache
IPP, Jülich
IPP, Garching
ASCR, Czech Rep
U Quebec

Beam Services

- High Voltage Enclosure Cooling Water
- Ion Dump Cooling Water
- Ion Source Cooling Water
- SF6
- Liquid Nitrogen
- Liquid Helium
- Vacuum Backing
- Gas Injection System

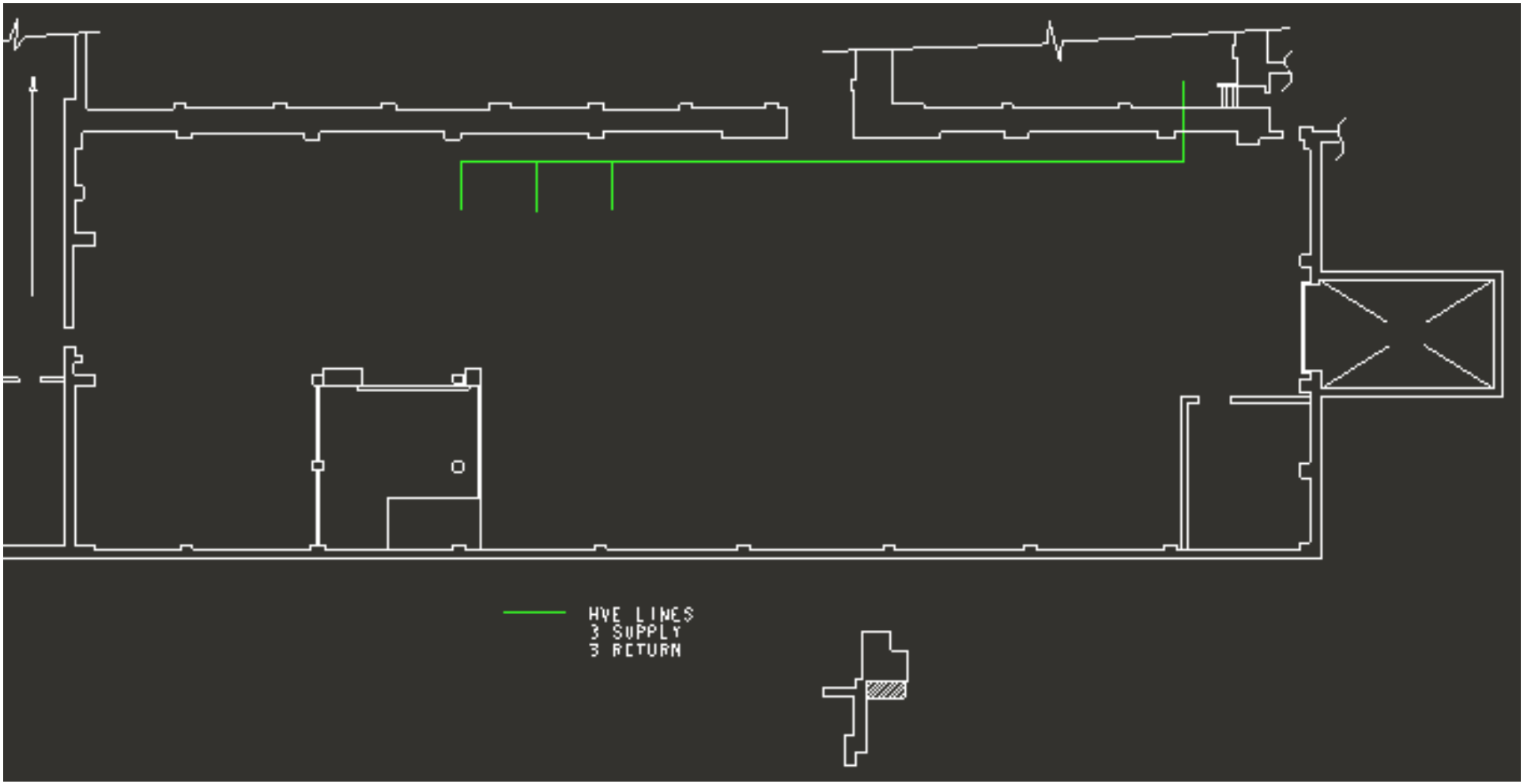
BL2 Penetrations



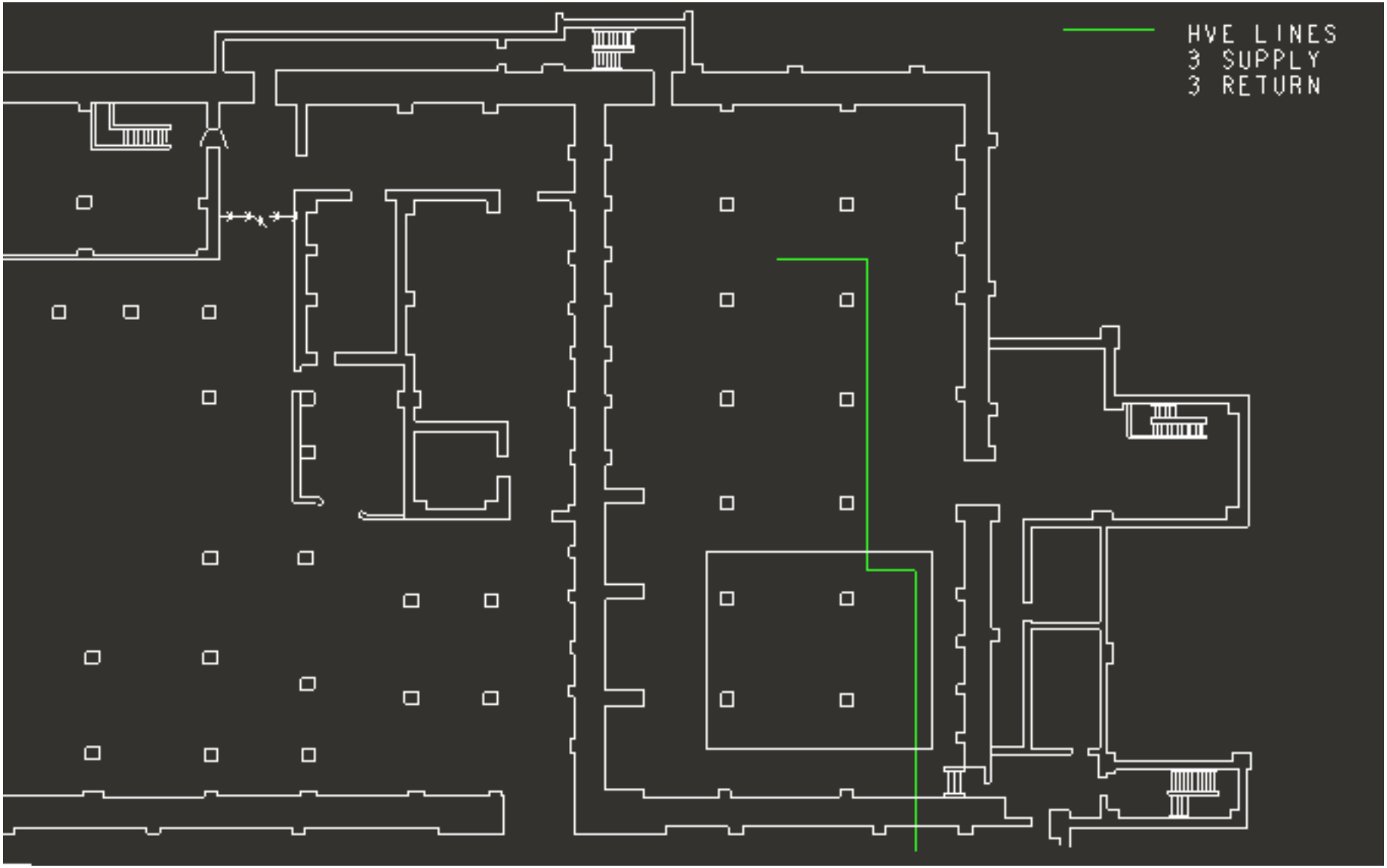
High Voltage Enclosure Cooling Water

- Pumps
  - Reuse existing pump skids.

High Voltage Enclosure Cooling Water Pump Room



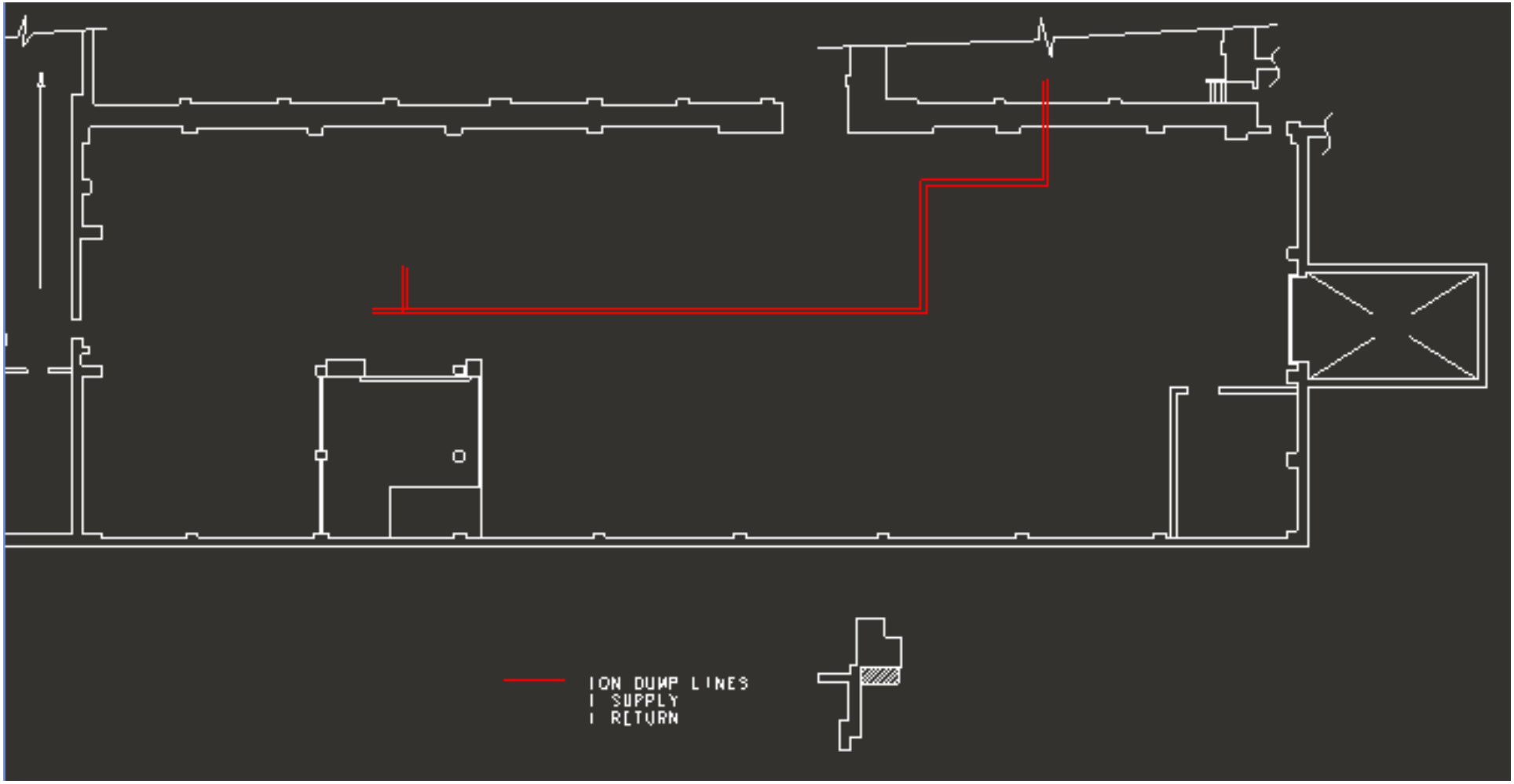
High Voltage Enclosure Cooling Water Mechanical Equipment Room



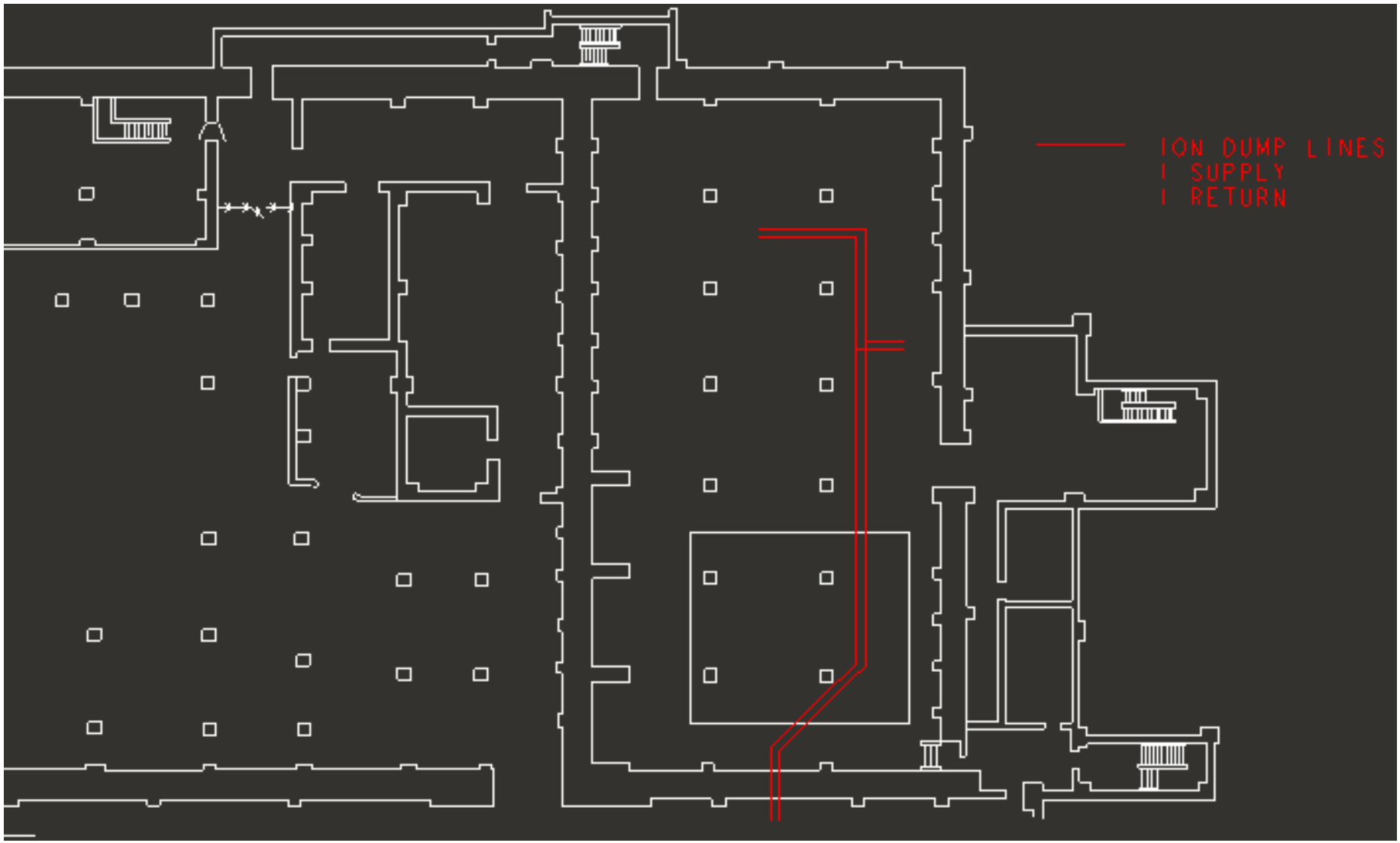
BL Ion Dump Cooling Water

- Pump
  - Current pumps sized for only one Beam
  - Purchase new pumps

BL Ion Dump Cooling Water Pump Room



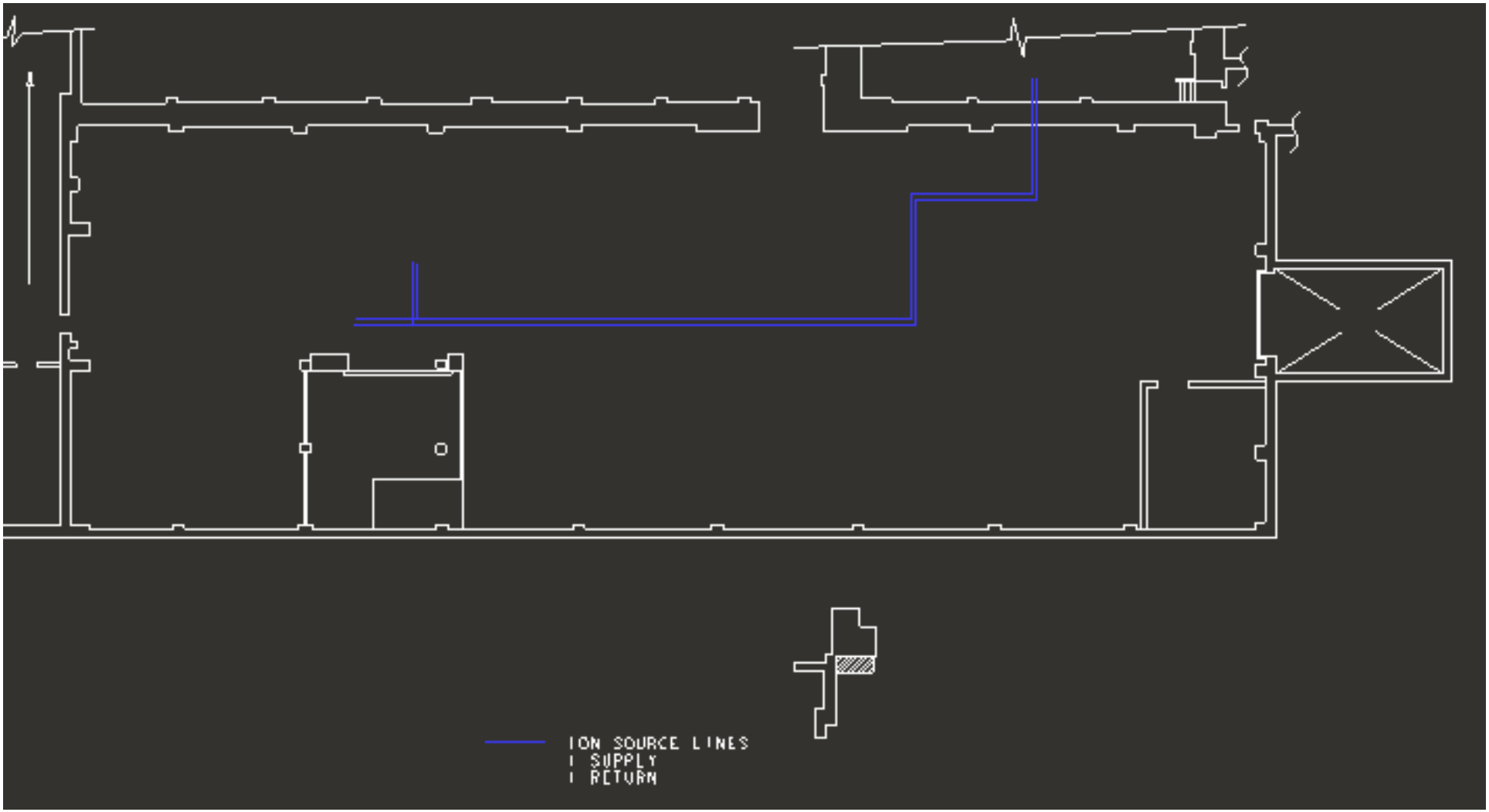
BL Ion Dump Cooling Water
Mechanical Equipment Room



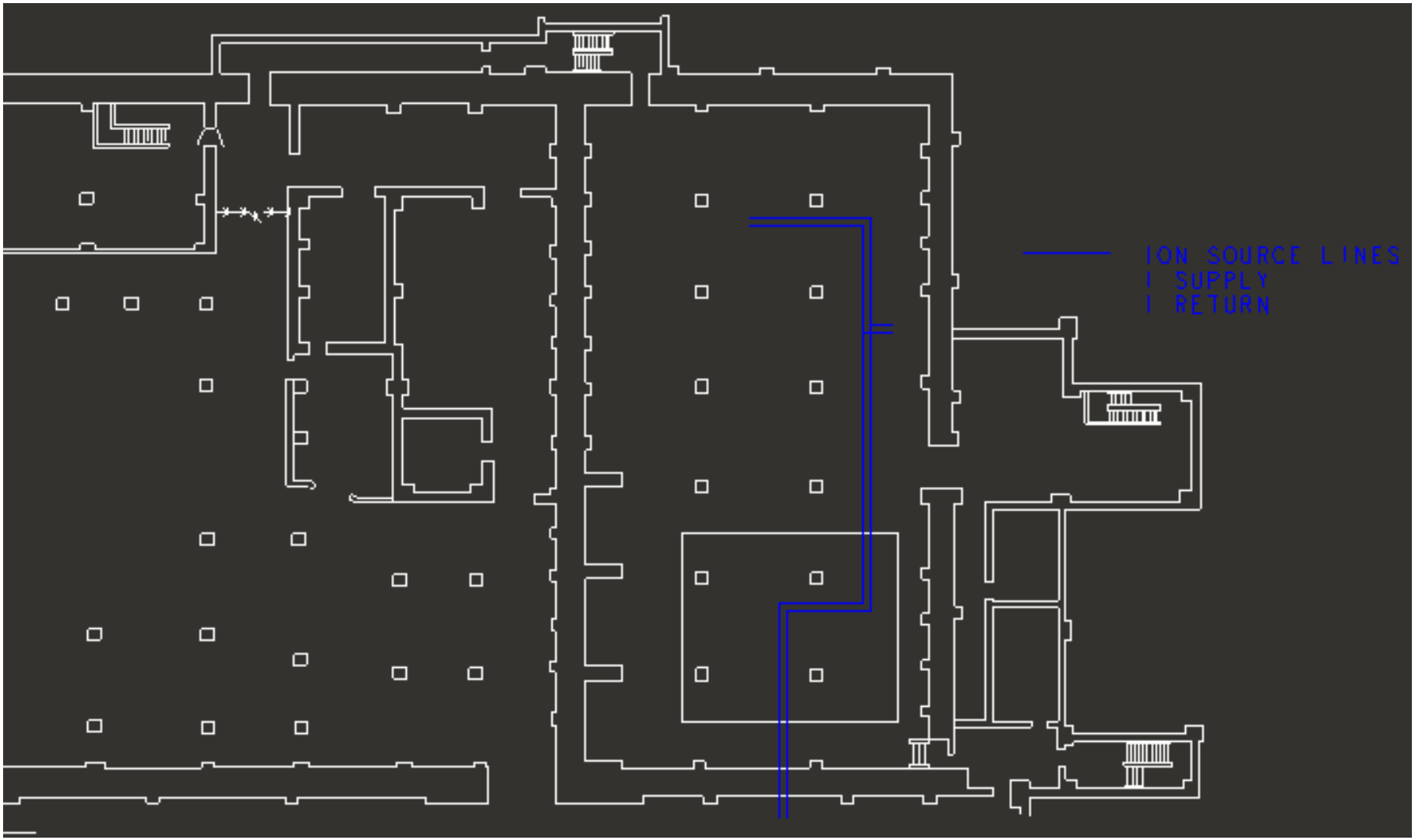
BL Ion Source Cooling Water

- Pump
  - Current pumps sized for only one Beam
  - Purchase new pumps

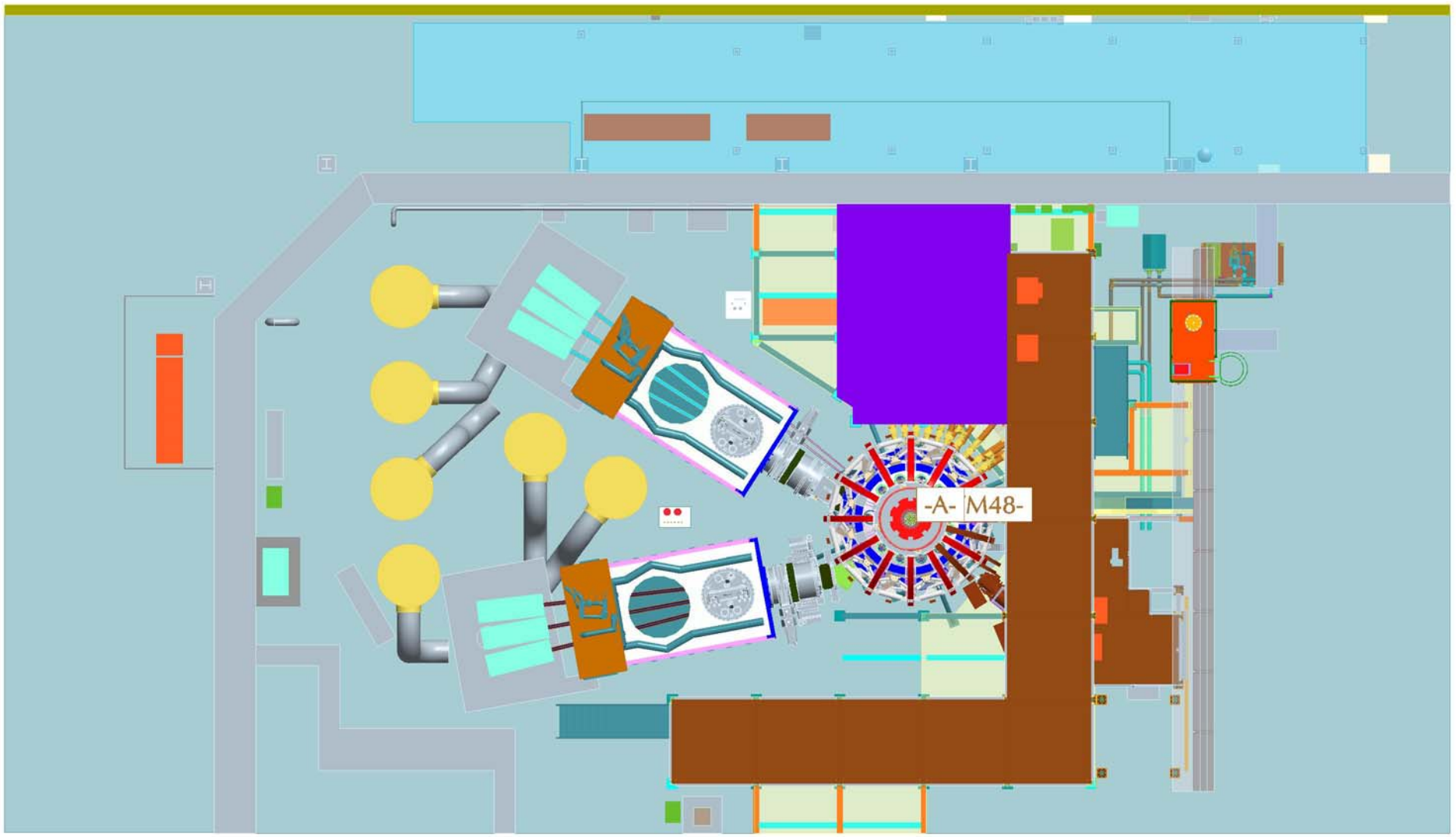
BL Ion Source Cooling Water Pump Room



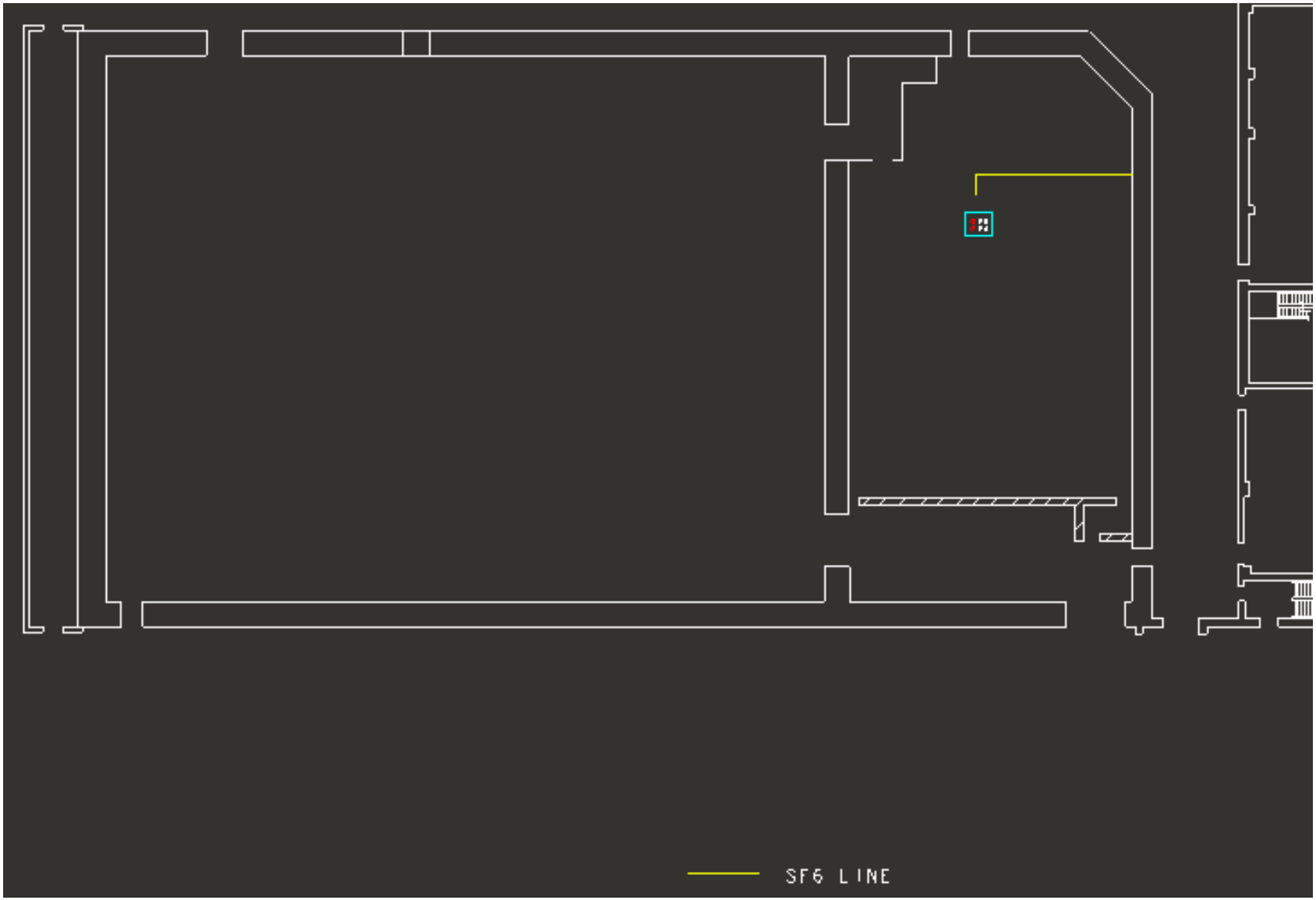
BL Ion Source Cooling Water Mechanical Equipment Room



General Arrangement

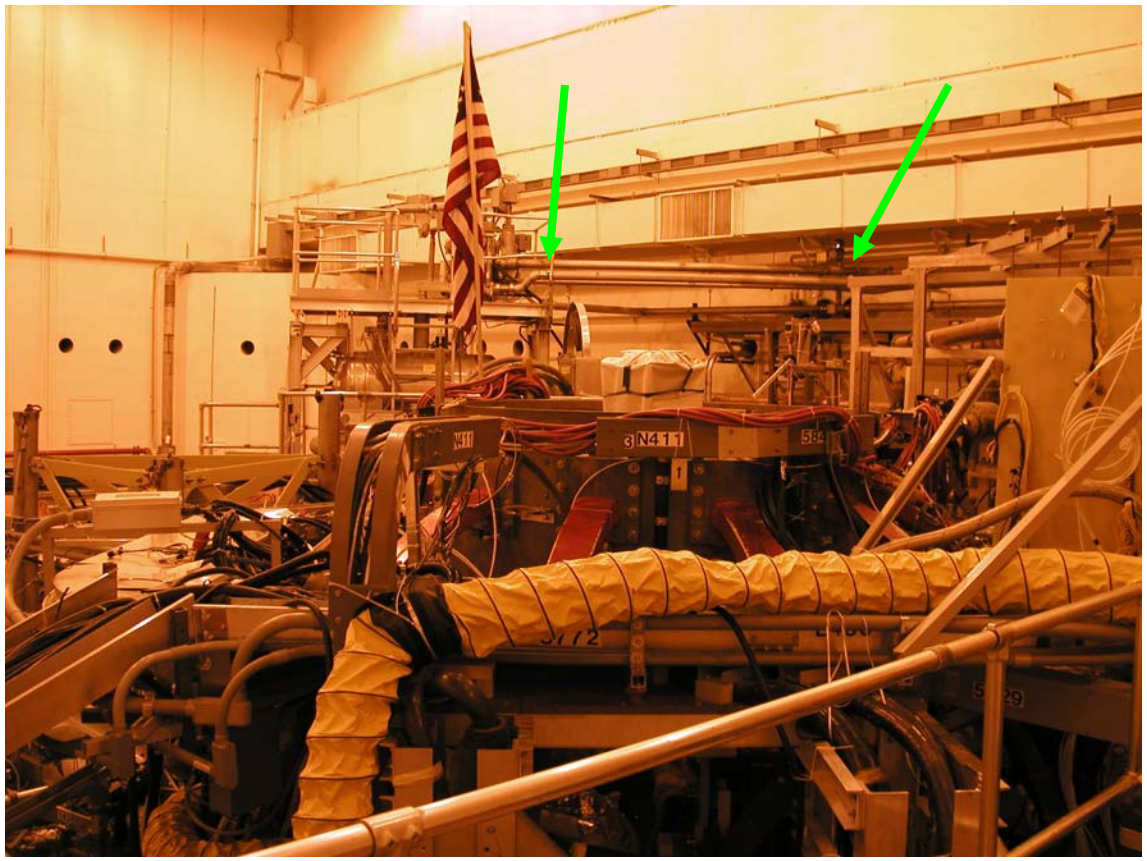


SF6

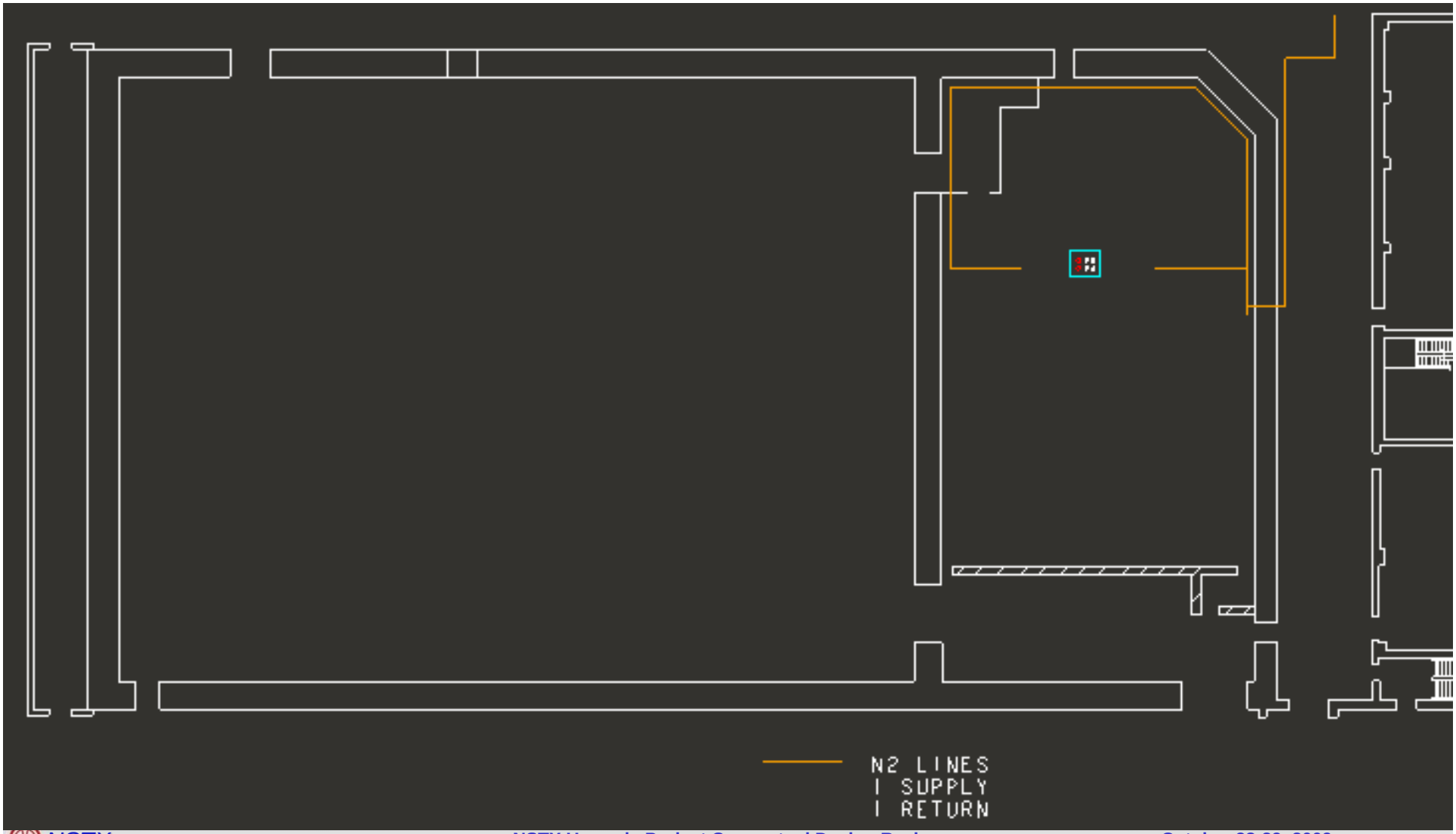


Cryogenic Lines

- Paths chosen to minimize pipe runs and heat loads
- Calculations show we can use current refrigeration system for two beam lines.

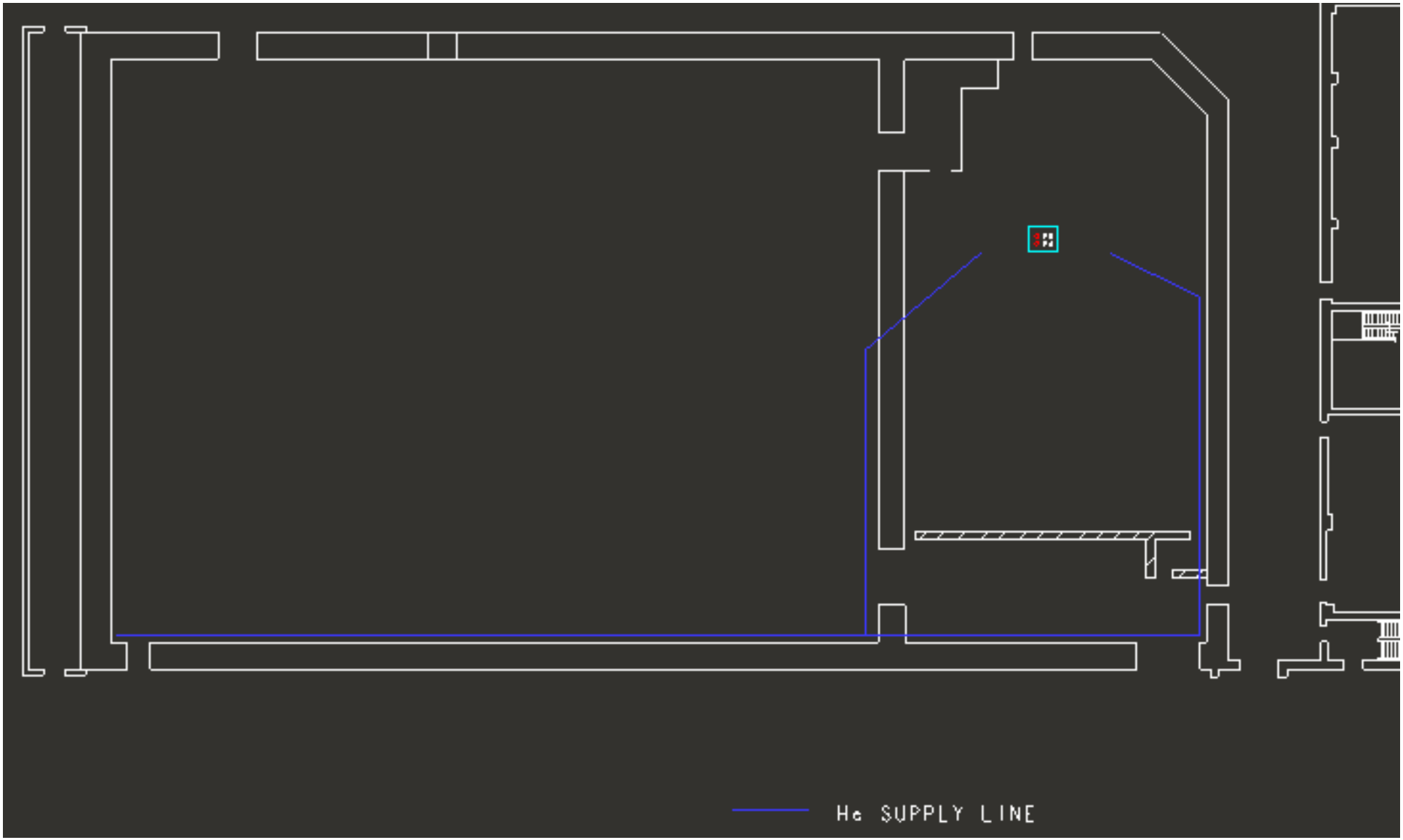


Liquid Nitrogen
NSTX Test Cell

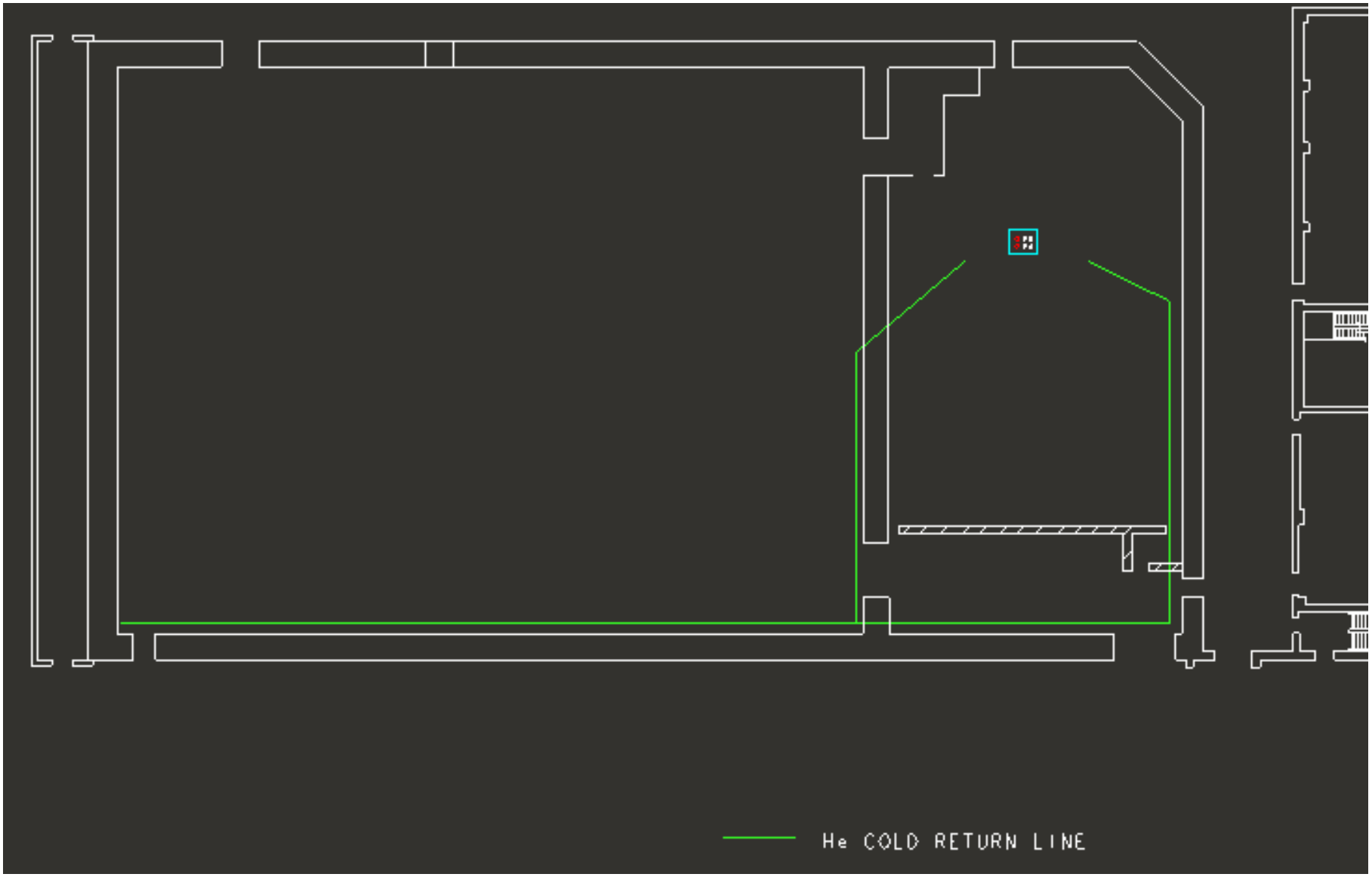


Liquid Helium
TFTR Test Cell

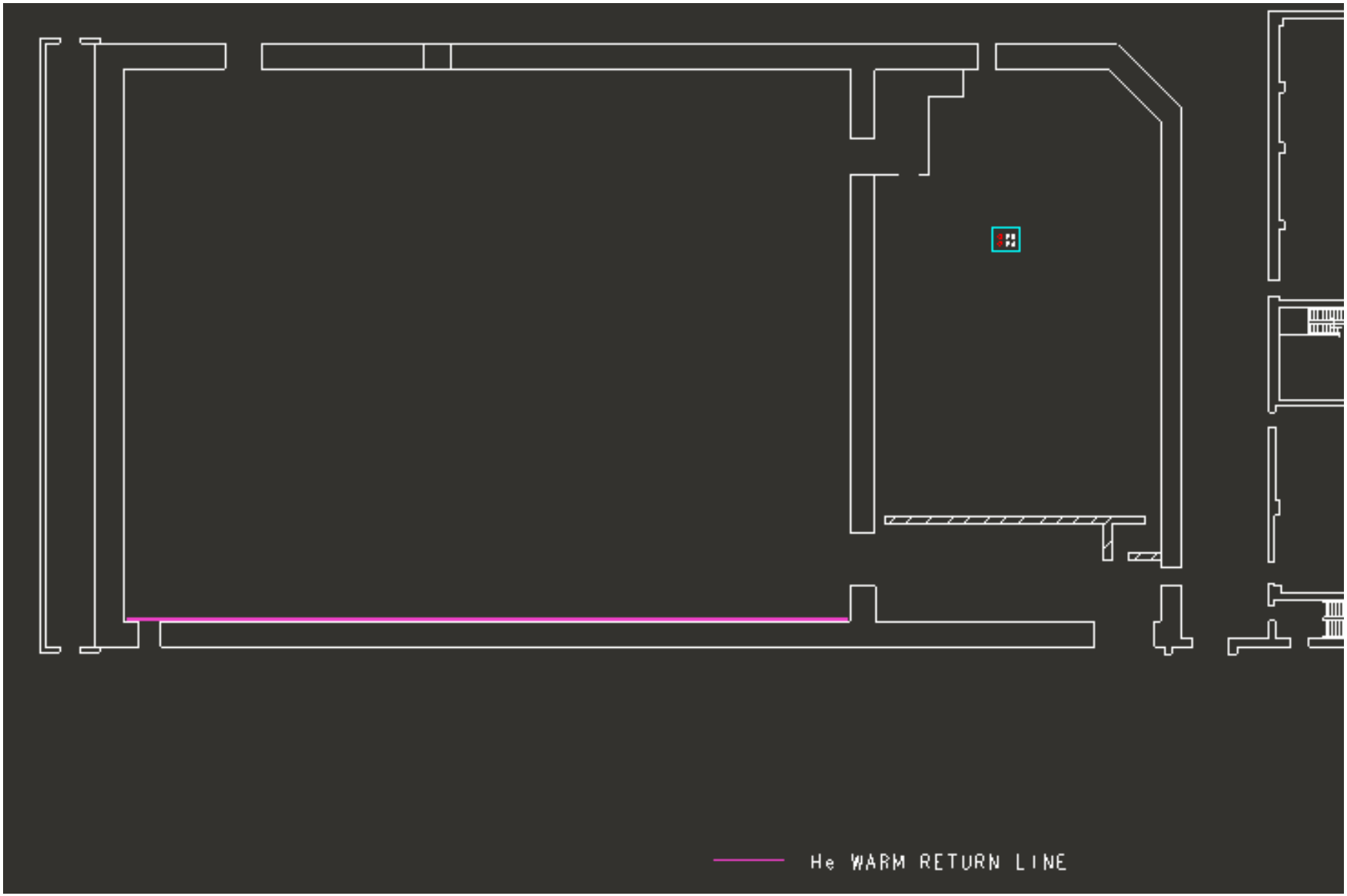
Liquid Helium
TFTR & NSTX Test Cell



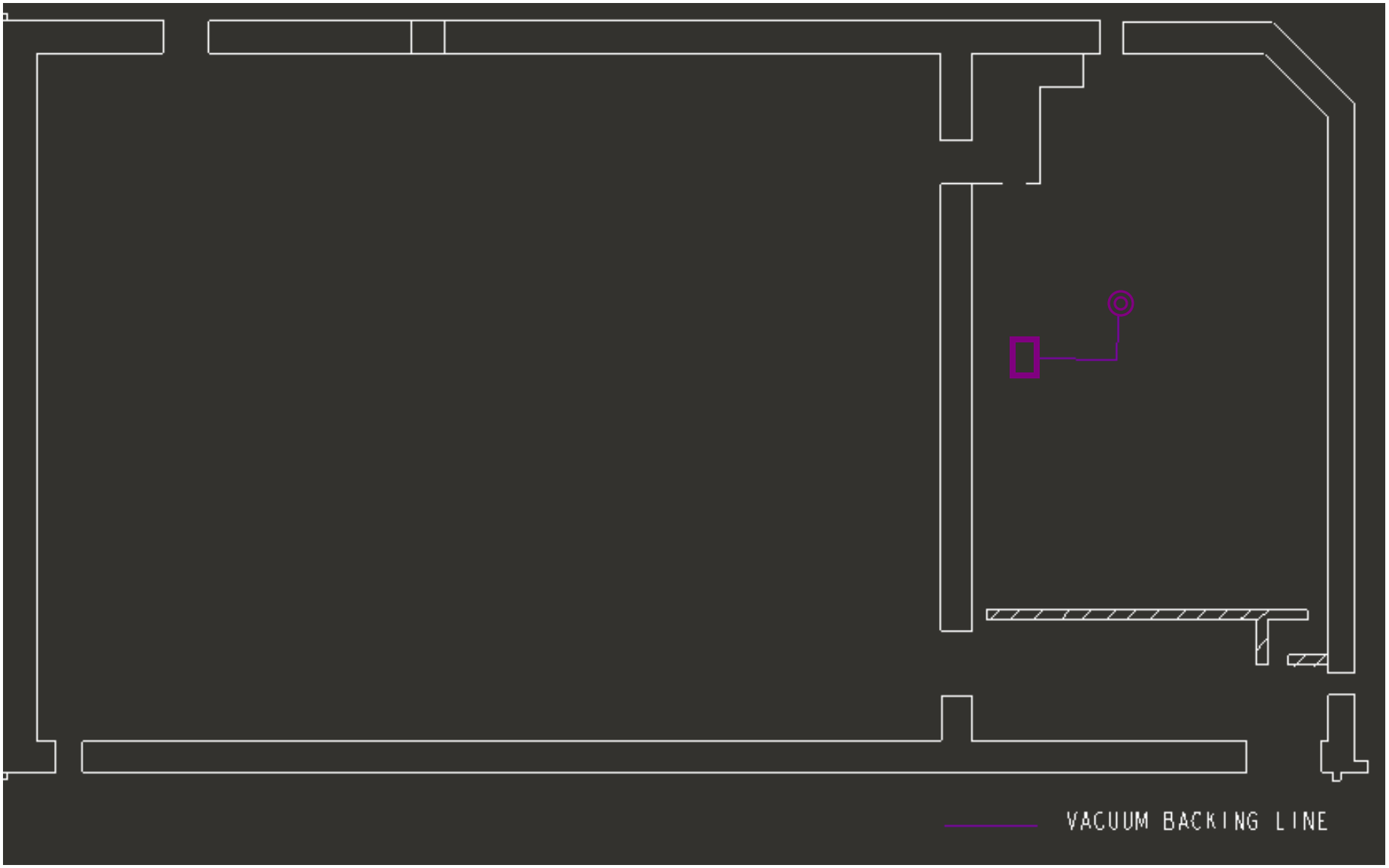
Liquid Helium
TFTR & NSTX Test Cell



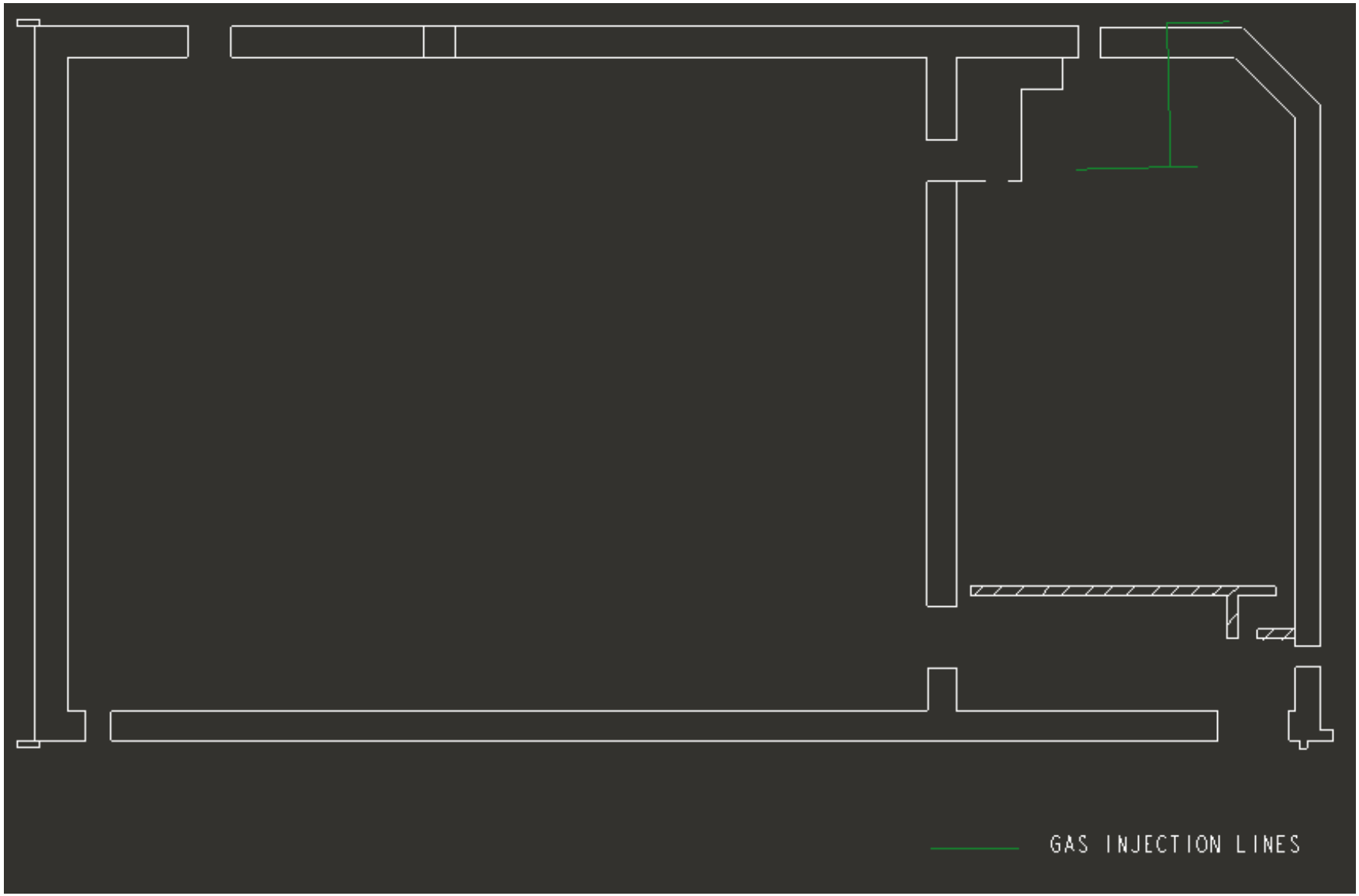
Liquid Helium
TFTR & NSTX Test Cell



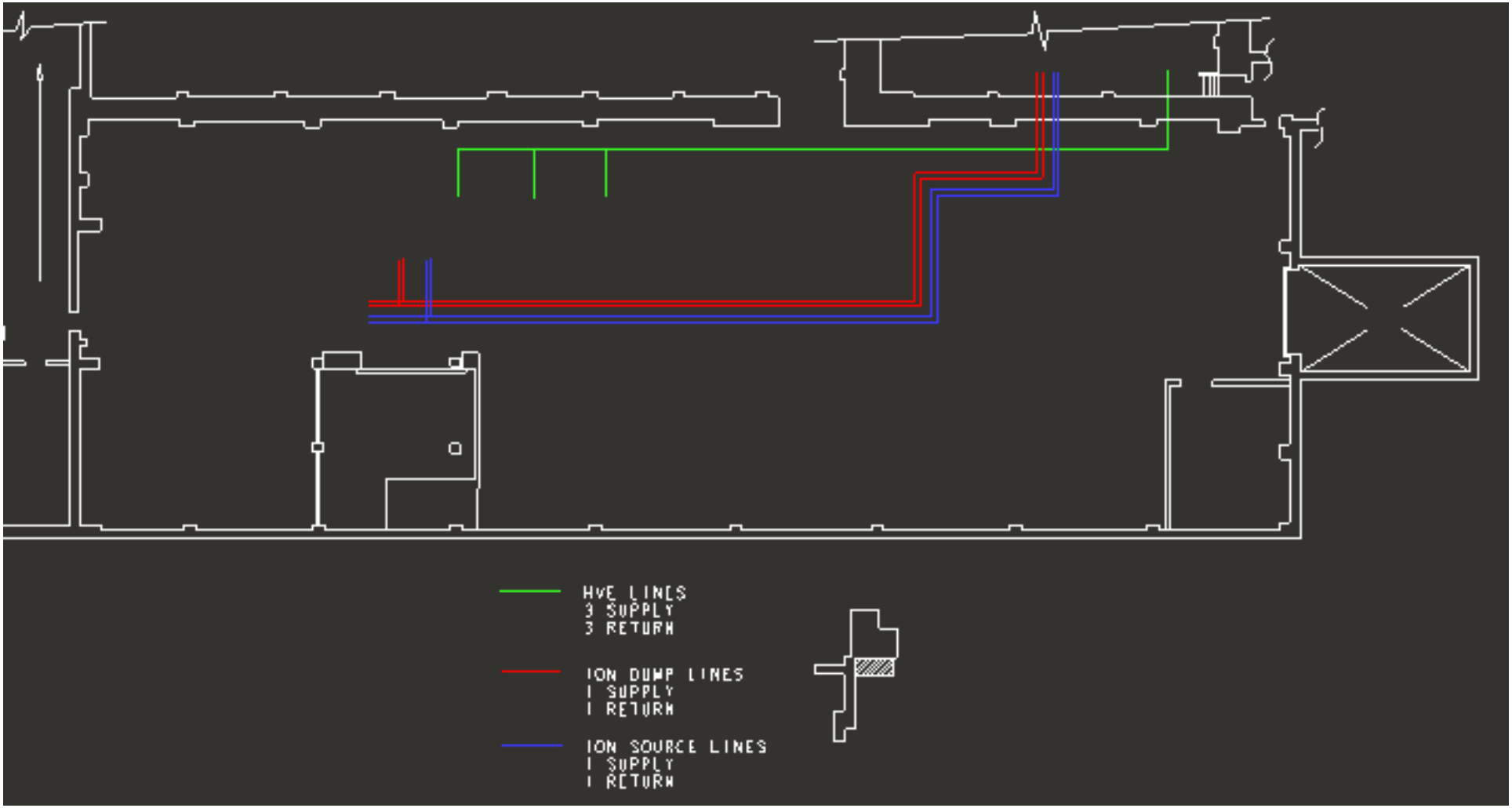
Turbo Pump Vacuum Backing
NSTX Test Cell



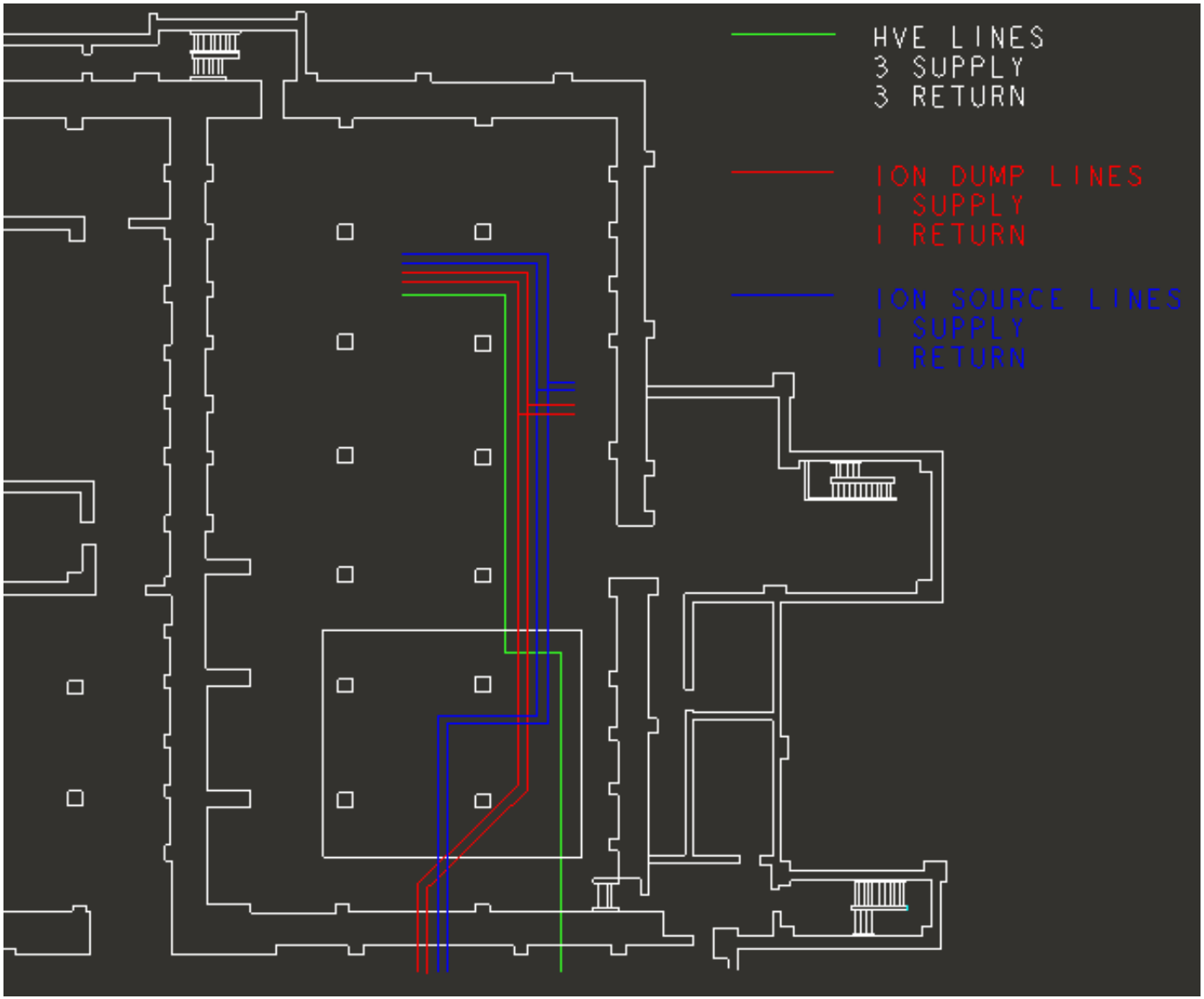
Gas Injection
NSTX Test Cell



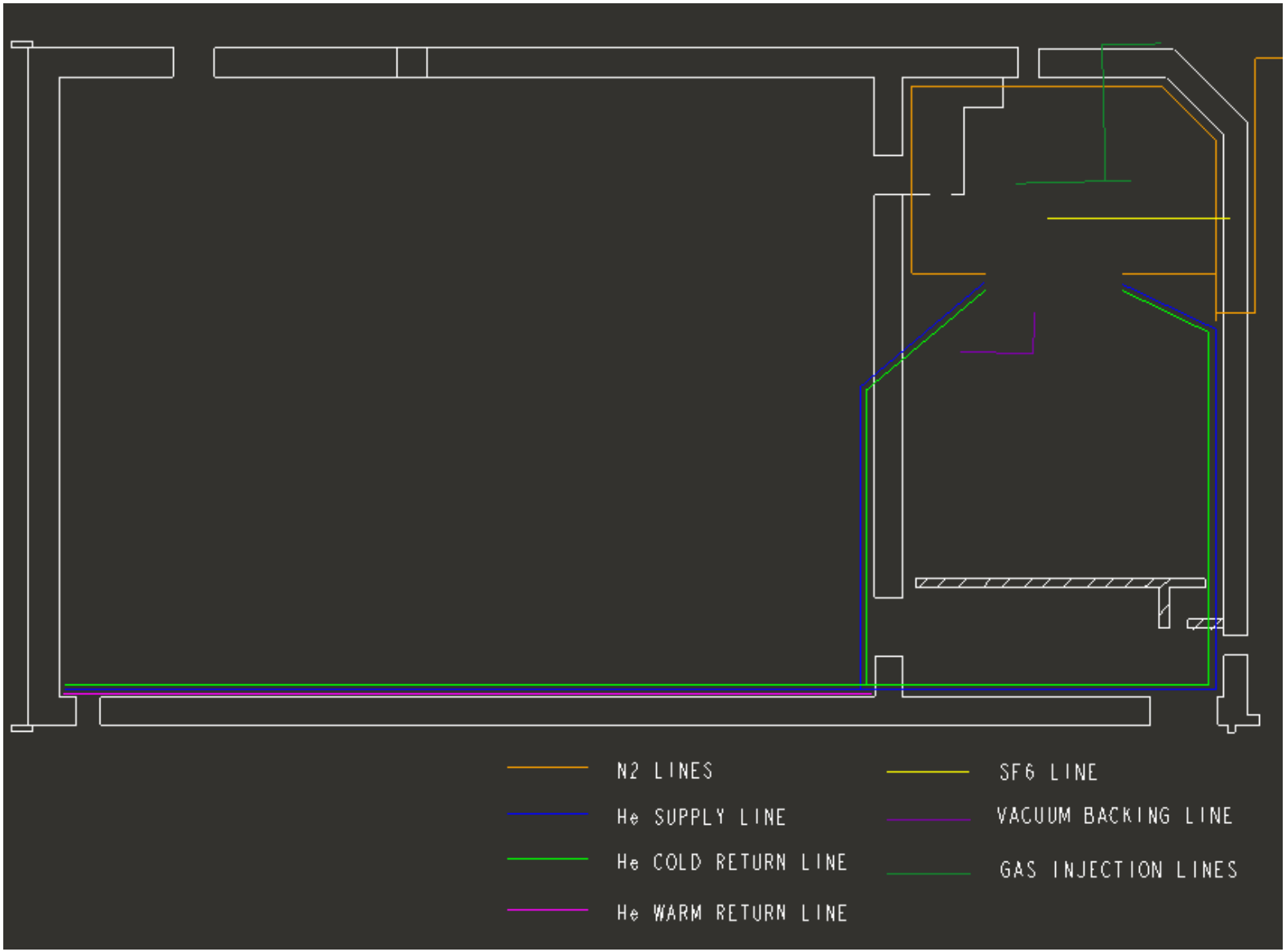
Over View
Pump Room



Over View
Mechanical Equipment Room



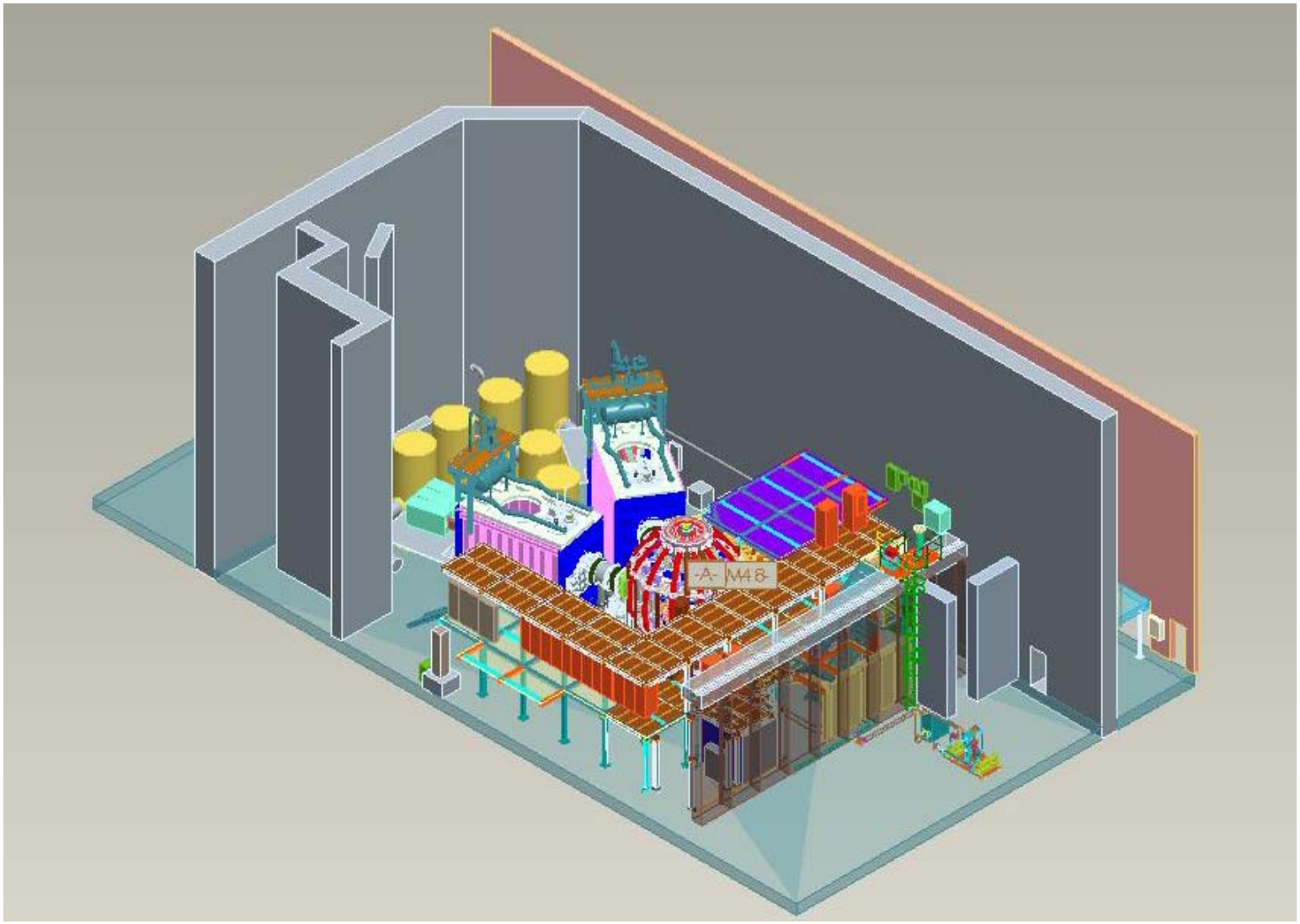
Over View
TFTR & NSTX Test Cell



NBI2 Services Summary

- All services accounted for
- All walk throughs completed, routes mapped
- Heat and flow calculations performed for water systems
- Pipes, pumps, and runs sized accordingly
- Cryogenic loads minimized and acceptable
- All penetrations identified and locations approved

NSTX Test Cell



General Arrangement