

# Potential changes to BSI (N2VE, DAQ, others)

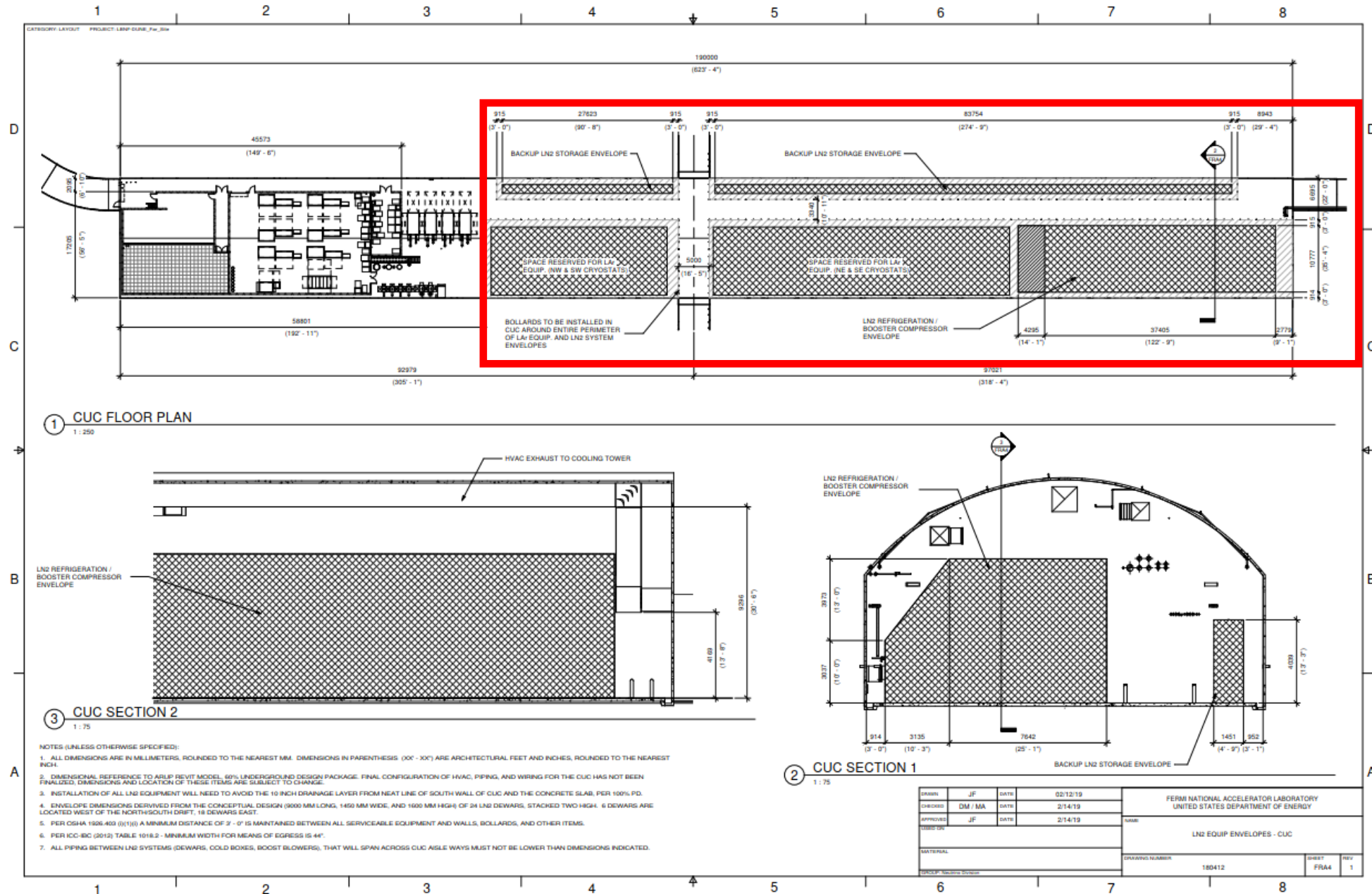
Jack Fowler

# Outline

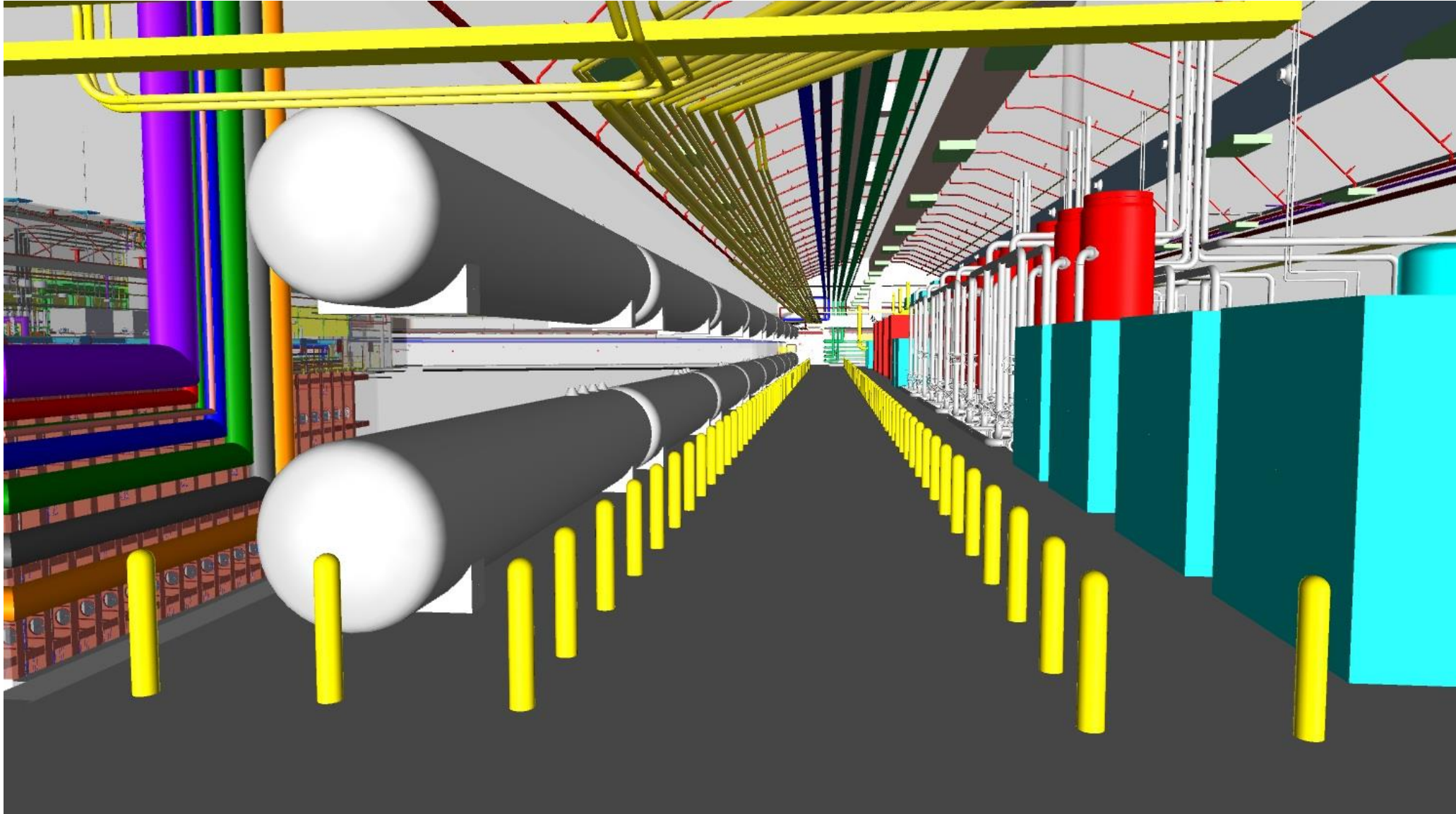
- N2 VE implications
- DAQ movement implications
- Other potential items

# N2 Value Engineering Proposal

# Current Envelope drawing of CUC for Cryogenics

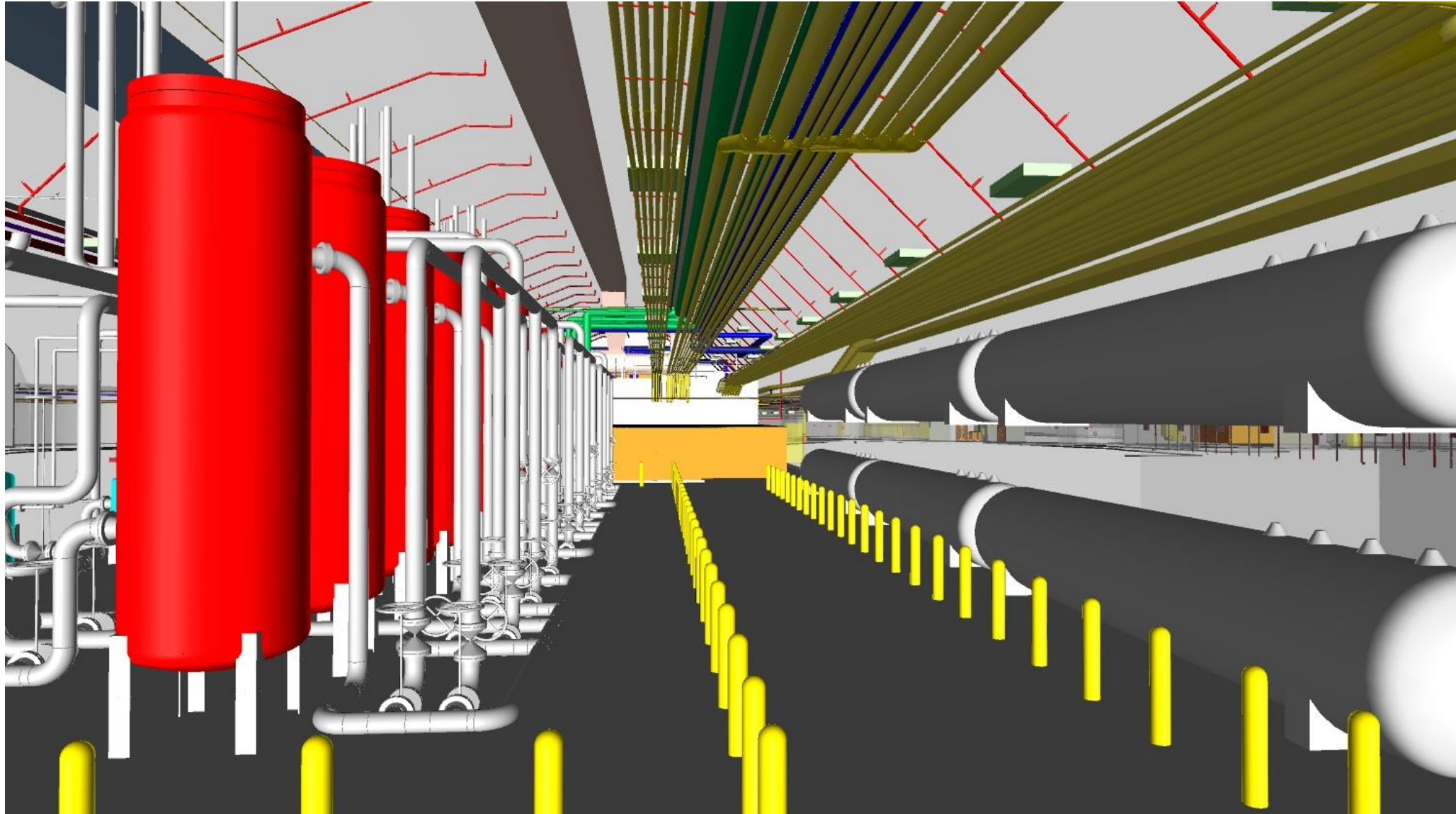


# View of CUC in current model

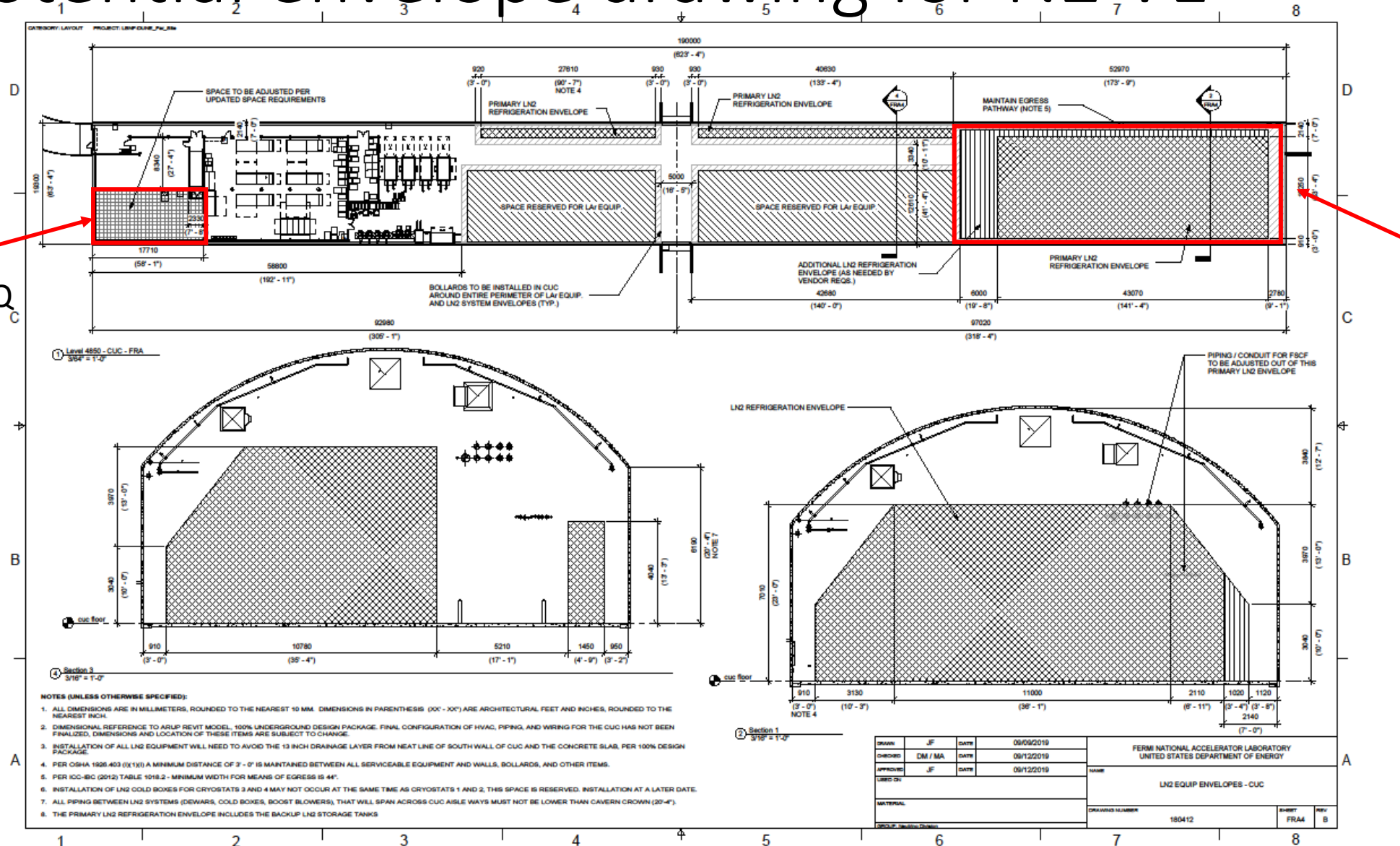




# More CUC infrastructure

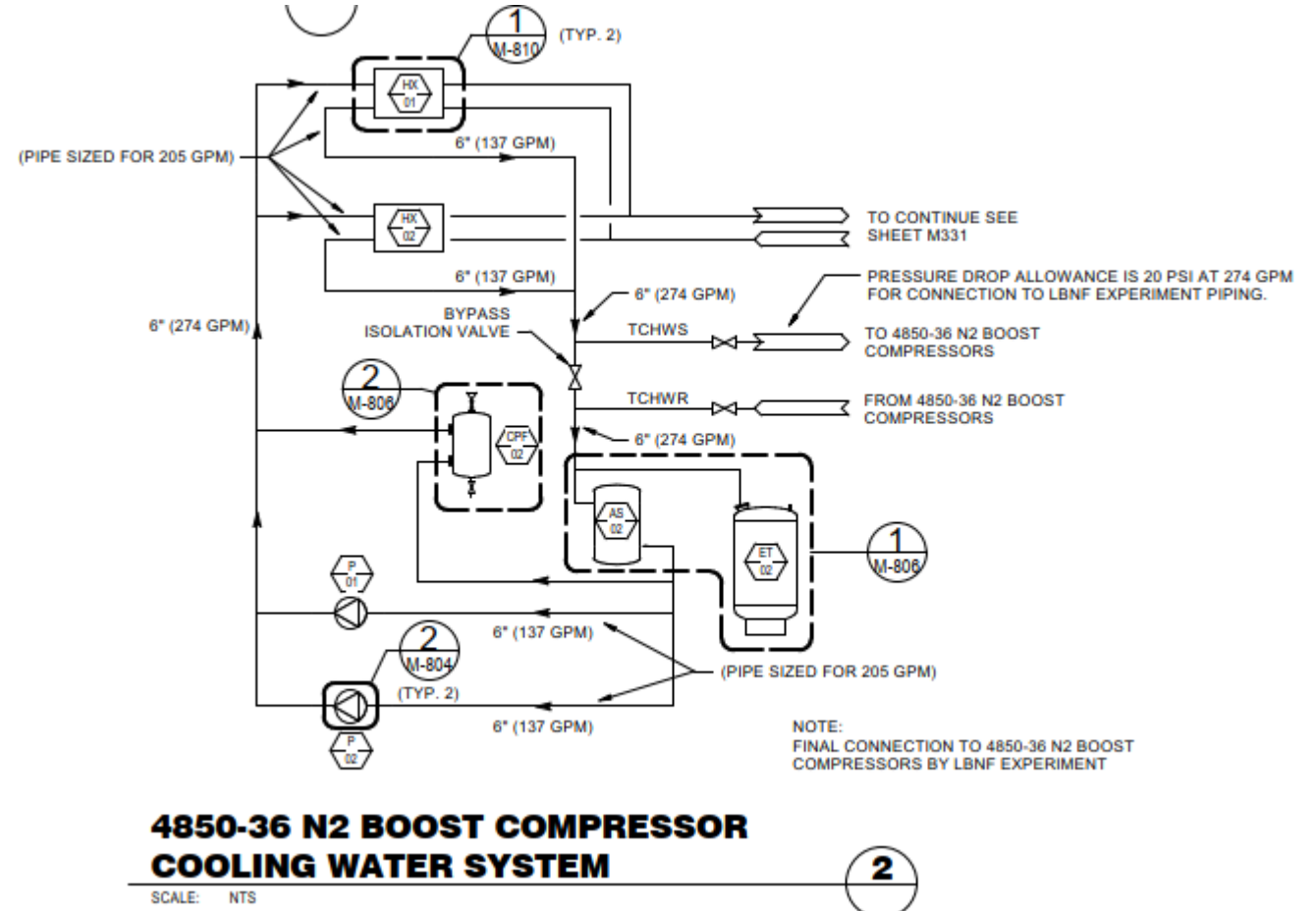


# Potential envelope drawing for N2 VE



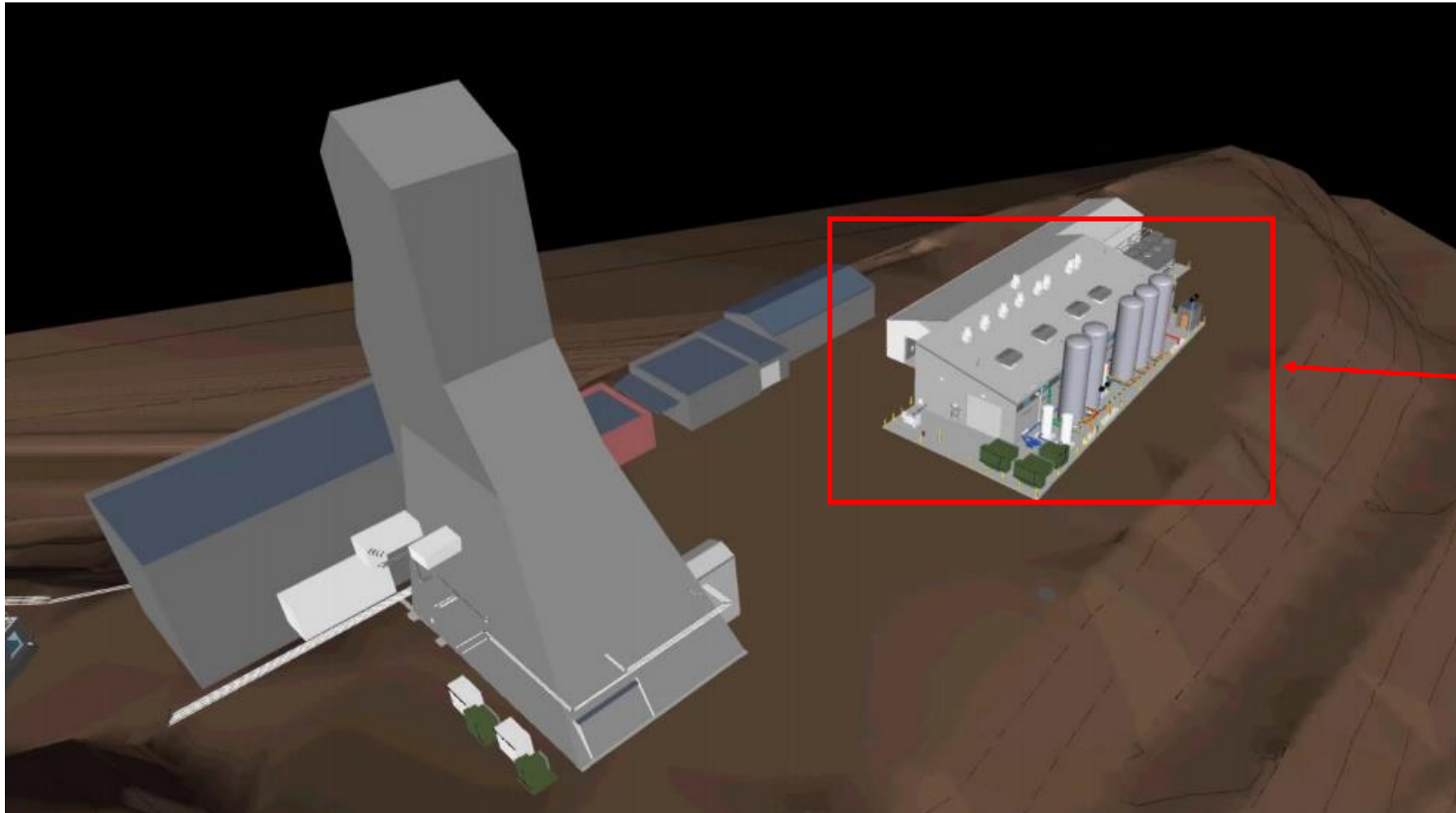
# Potential changes to the underground BSI

- Redistribute chilled water
- Redistribute power
- Conditioned air in the CUC
- Physical space layout to accommodate the addition equipment





# Potential changes to surface infrastructure



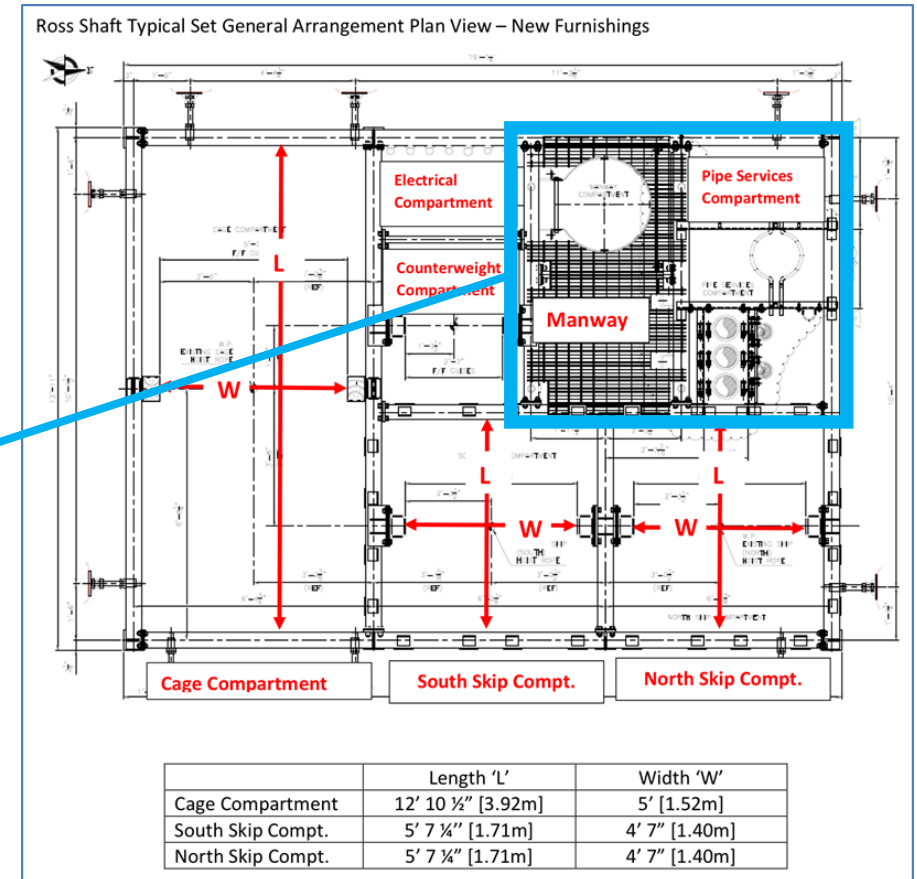
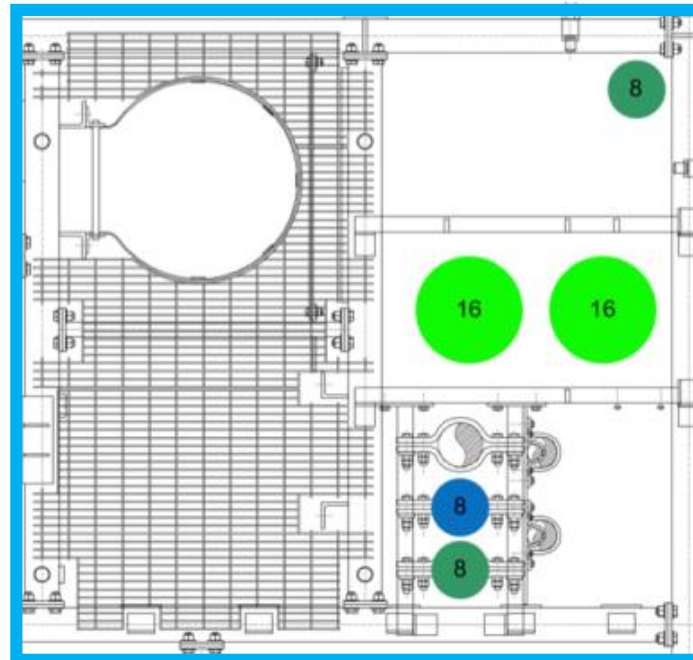
Surface  
cryogenic  
receiving  
facilities would  
be eliminated  
or greatly  
reduced

# Potential changes to Ross shaft piping

- Current cryogenic piping in the Ross would be reduced

CF will provide:

- Two 16 in NPS Sch 40 pipes for the low-pressure (max 50 Psig) return GN<sub>2</sub>.
- Two 8 in NPS Sch 40 pipes for the high-pressure (max 700 Psig) GN<sub>2</sub>.
- Shaft piping shall include Victaulic (or similar) couplings every 18 vertical feet.



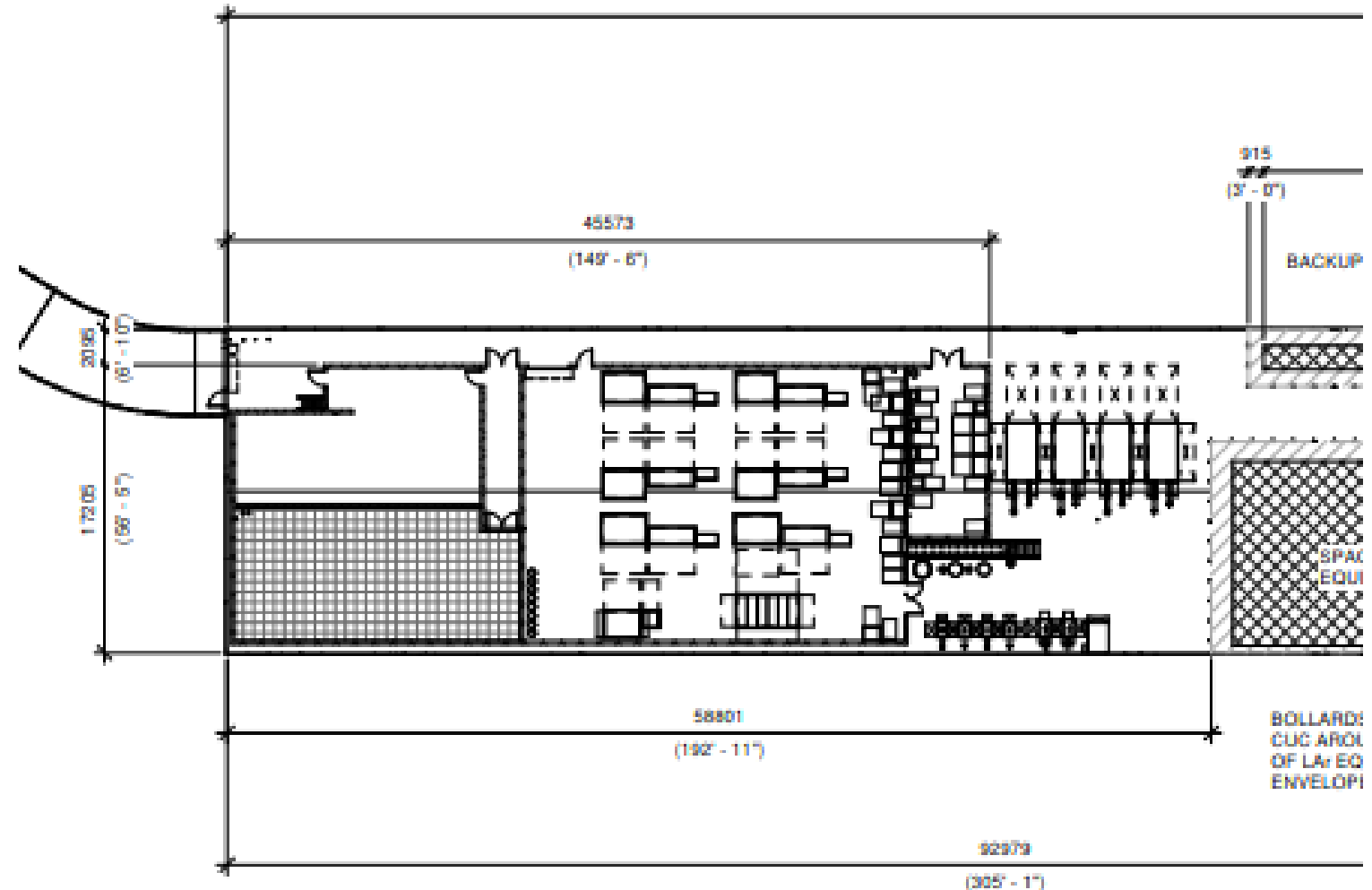
# Cooling implications summarized

Total cooling provided underground	5600				
<b>All loads are in kW</b>	Loads at AUP	Loads for Det 1 filling	Loads for Det 1 operation	Loads for Det 1 operation Det 2 filling	Loads for Det 1 operation det 2 operation
Heat load from rock surfaces	176	176	176	176	176
Total heat load from non detector equipment	492	492	492	492	492
Estimated Detector rack load per detector	0	0	240	240	480
Estimated DAQ rack load per detector	0	0	100	100	200
Estimated heat load for N2VE during filling	0	2550	0	2550	0
Estimated heat load for N2VE during operation	0	0	1275	0	1275
Sum of the heat loads	668	3218	2283	3558	2623
<b>Cooling available</b>	<b>4932</b>	<b>2382</b>	<b>3317</b>	<b>2042</b>	<b>2977</b>

# Relocation of DAQ

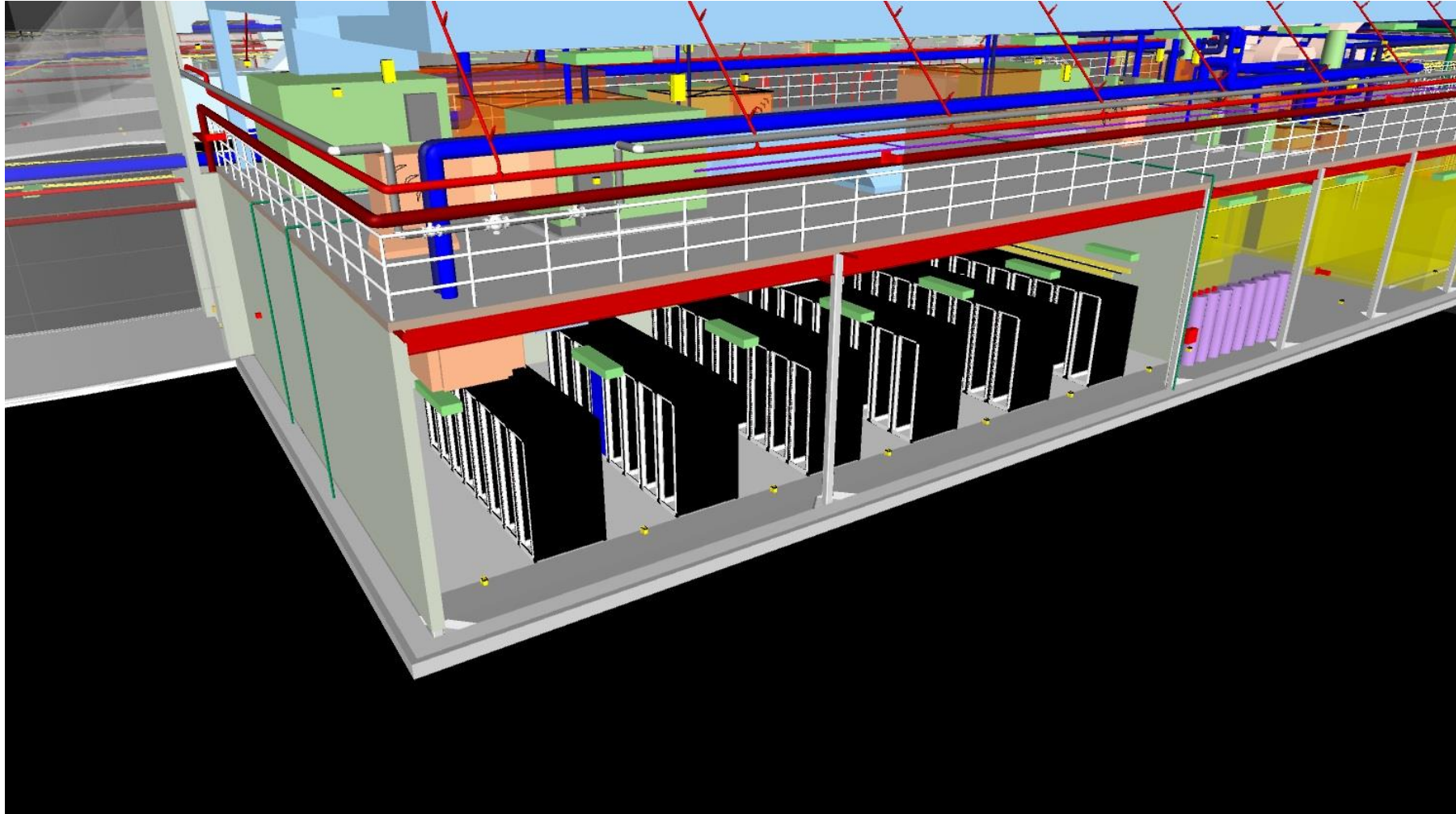
# Current DAQ space in CUC

- The current DAQ space supplies the infrastructure to support  $\sim 60$  racks
  - Power
  - Cooling
  - Fire suppression
  - Cable trays

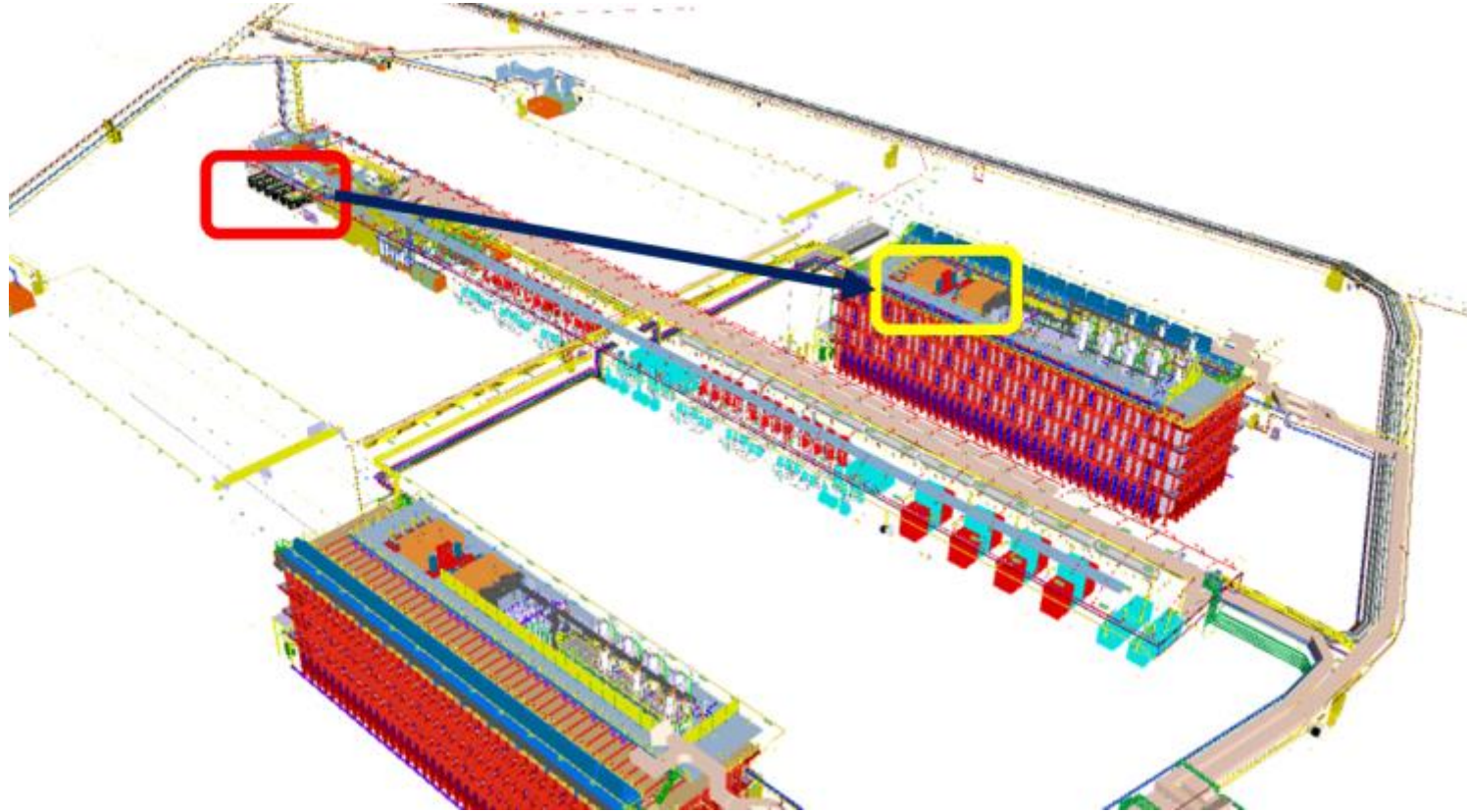




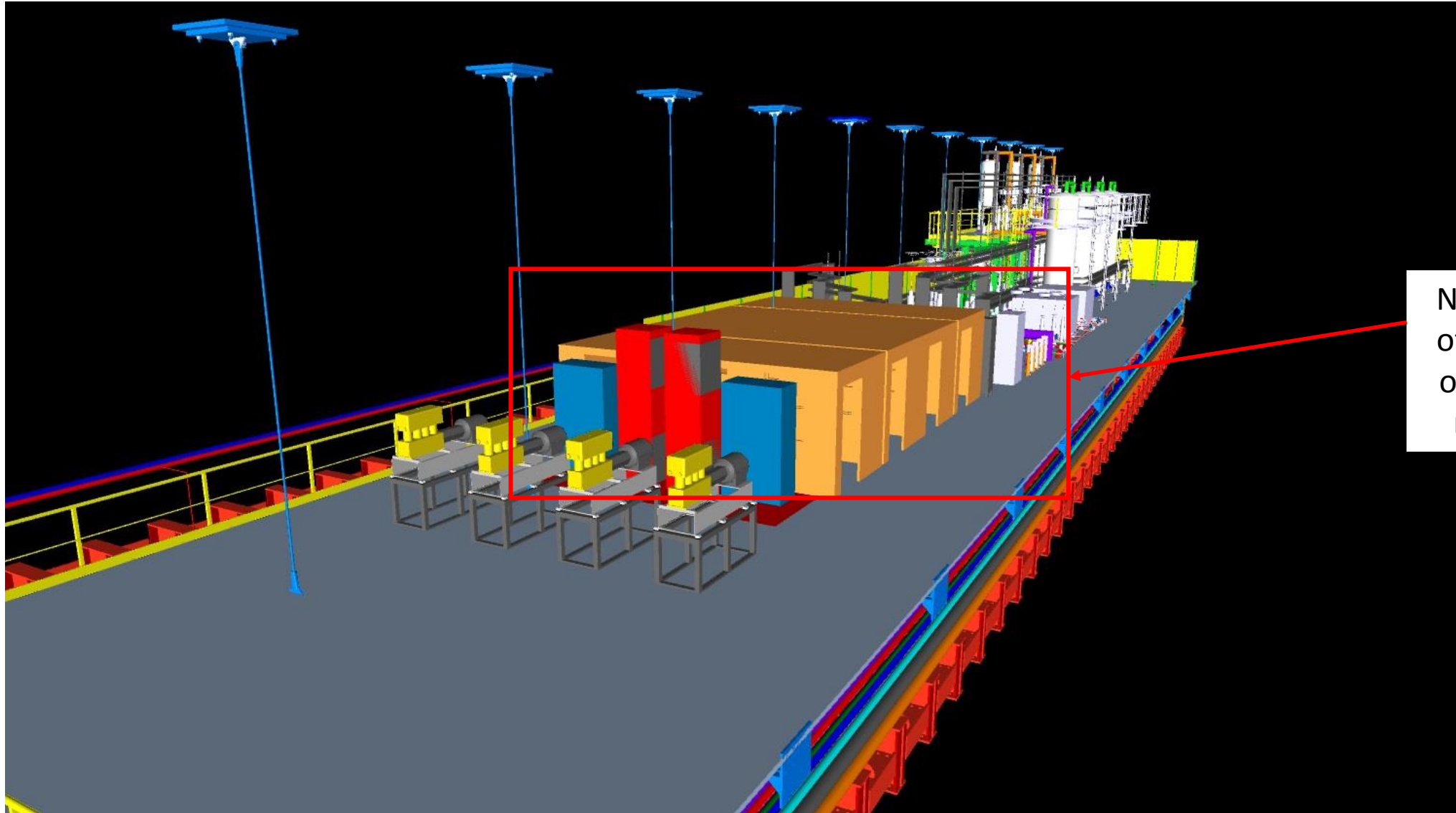
# Current layout inside DAQ room in CUC



# Planned moved of CUC to detector caverns



# New DAQ location



New location  
of DAQ room  
on cryogenic  
mezzanine

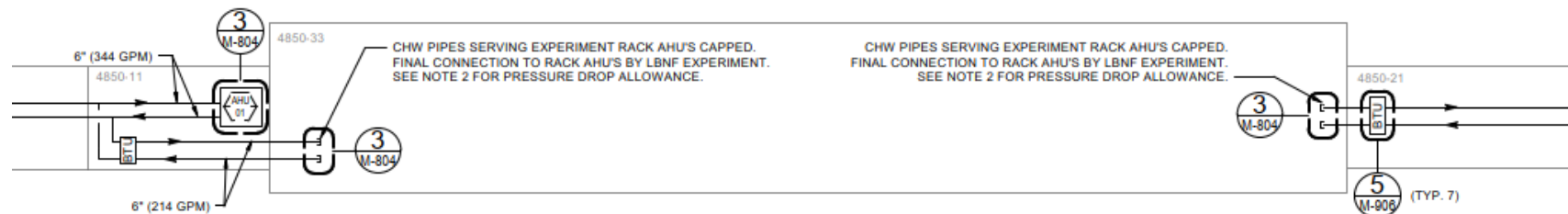
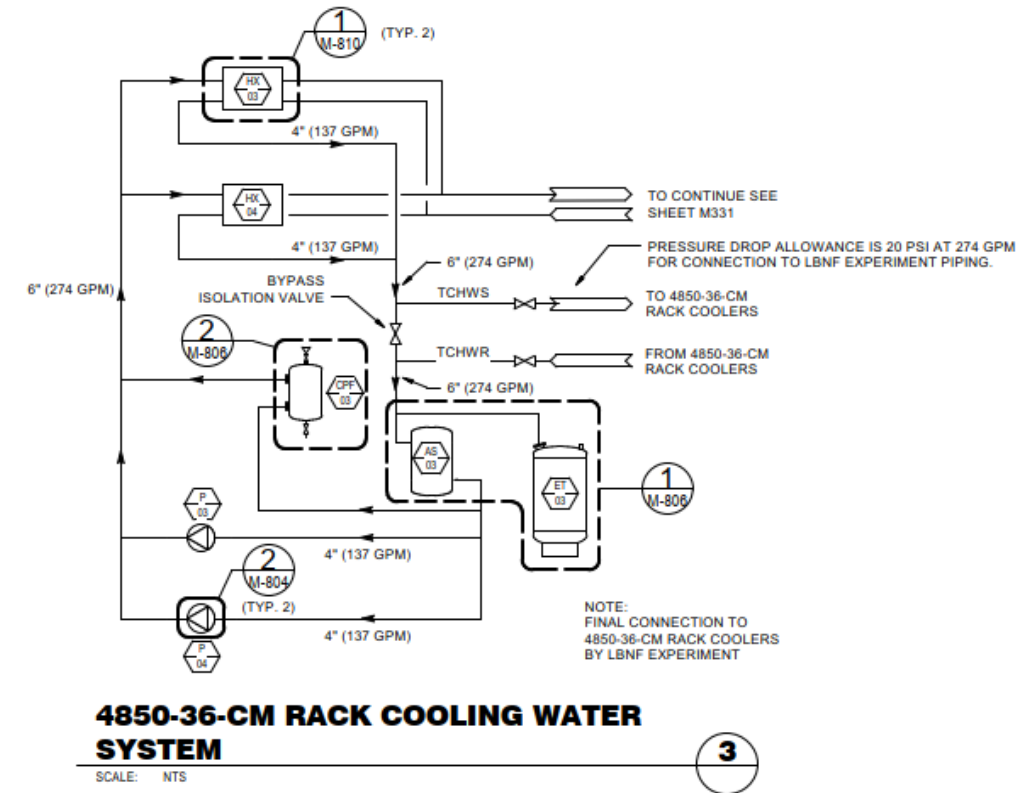
# New DAQ room model to be added in V6





# Implications to BSI for DAQ move

- Reduce or eliminate the chilled water to existing DAQ room
- Redistribute the power from CUC to detector caverns
- Utilized the current chilled water in detector caverns to cool new DAQ locations
- Mezzanine layout and support
- Termination/routing of fibers





# DAQ relocation path forward

- Replace barracks with real DAQ model
- Determine cooling method for racks and changes to chilled water supply
- Layout cable/fiber routing to/from DAQ room
- Address ESH issues – egress, fire suppression, etc
- Retain space in CUC for detector UPS system. Redistribute power and cooling to support UPS
- Document power and cooling distribution needs to BSI
- Added scope of infrastructure not in CF – AHU, DAQ room
- To proceed a change request will be required

# Others

- Clean room mechanical support
- Electrical distribution to cleanroom and detector caverns
- Logistics items at cross headframe and 4850 station
- Are there more?

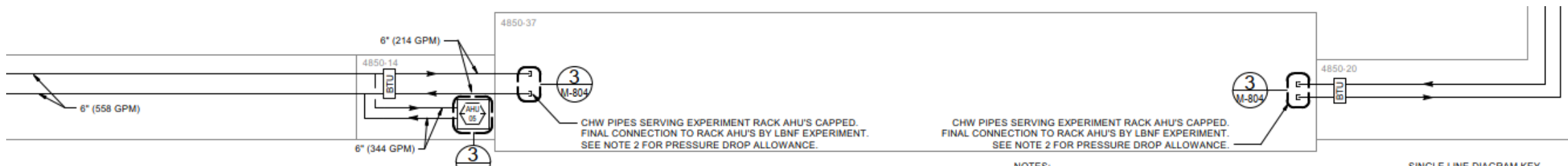
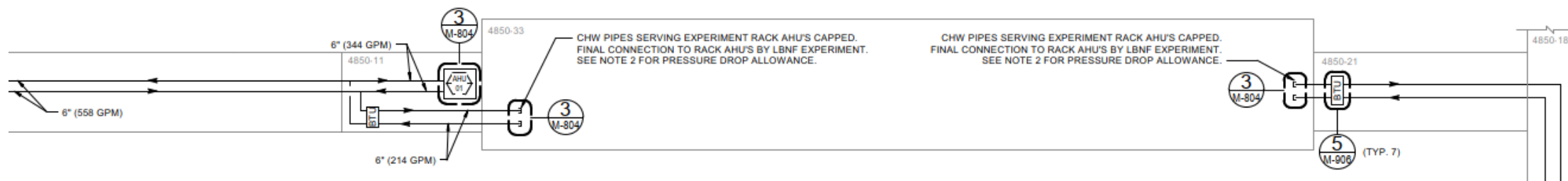




# Backups







NOTES:

PIPE LINE DIAGRAM KEY