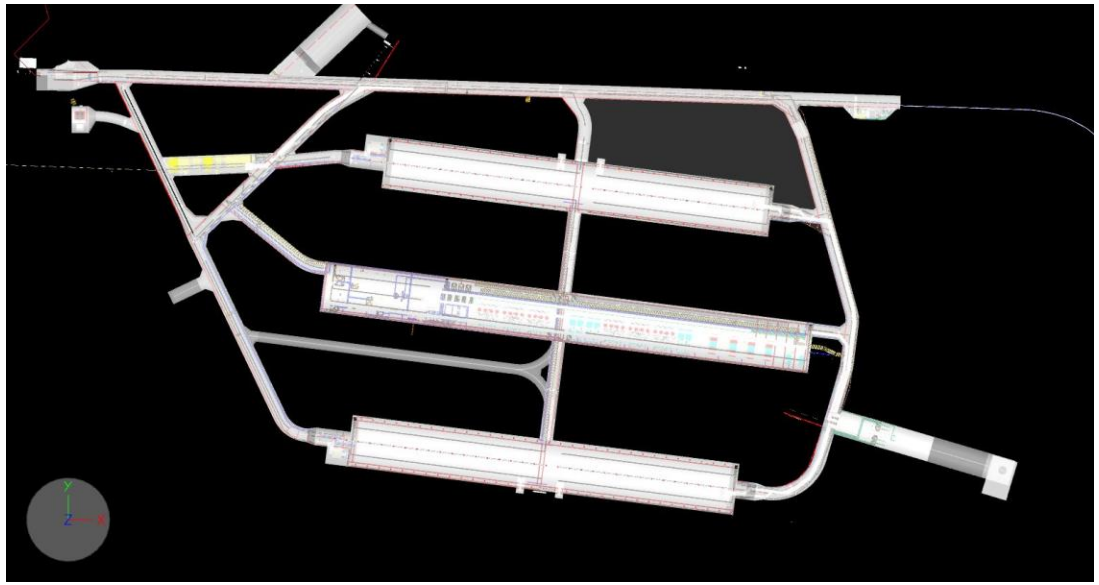
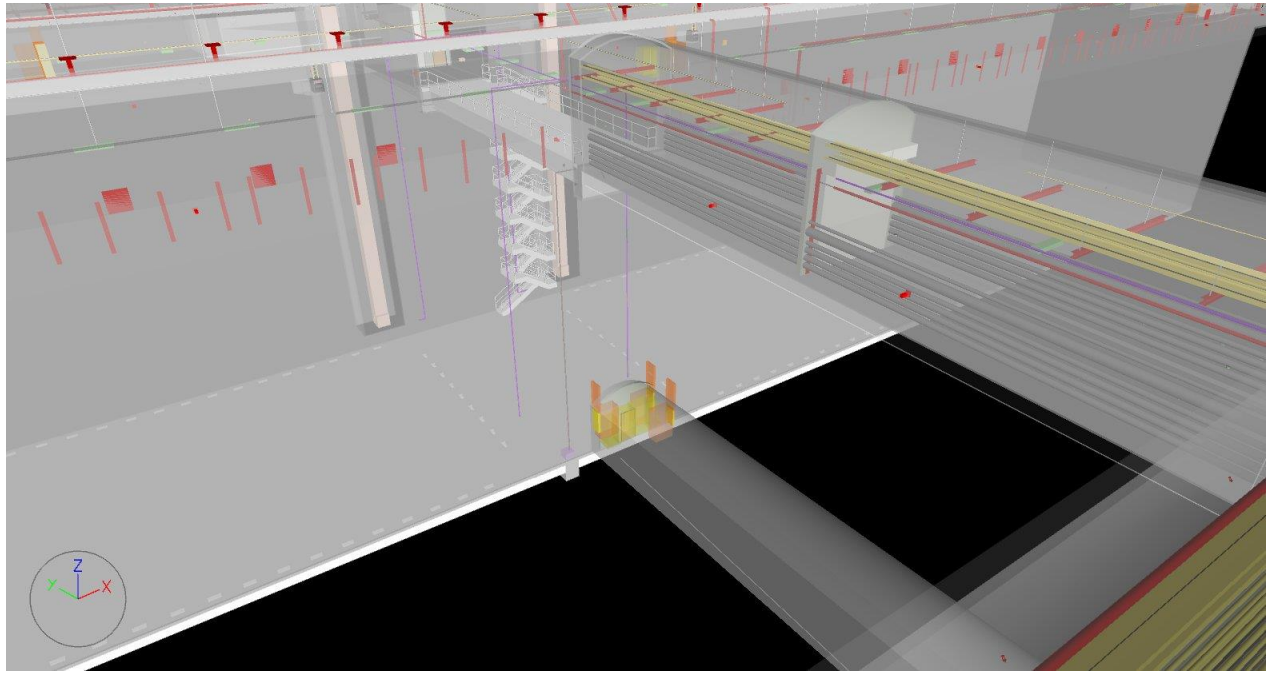
Pre 90% Far Site CF update

Jack Fowler

Justin Freitag

Mucking drift update

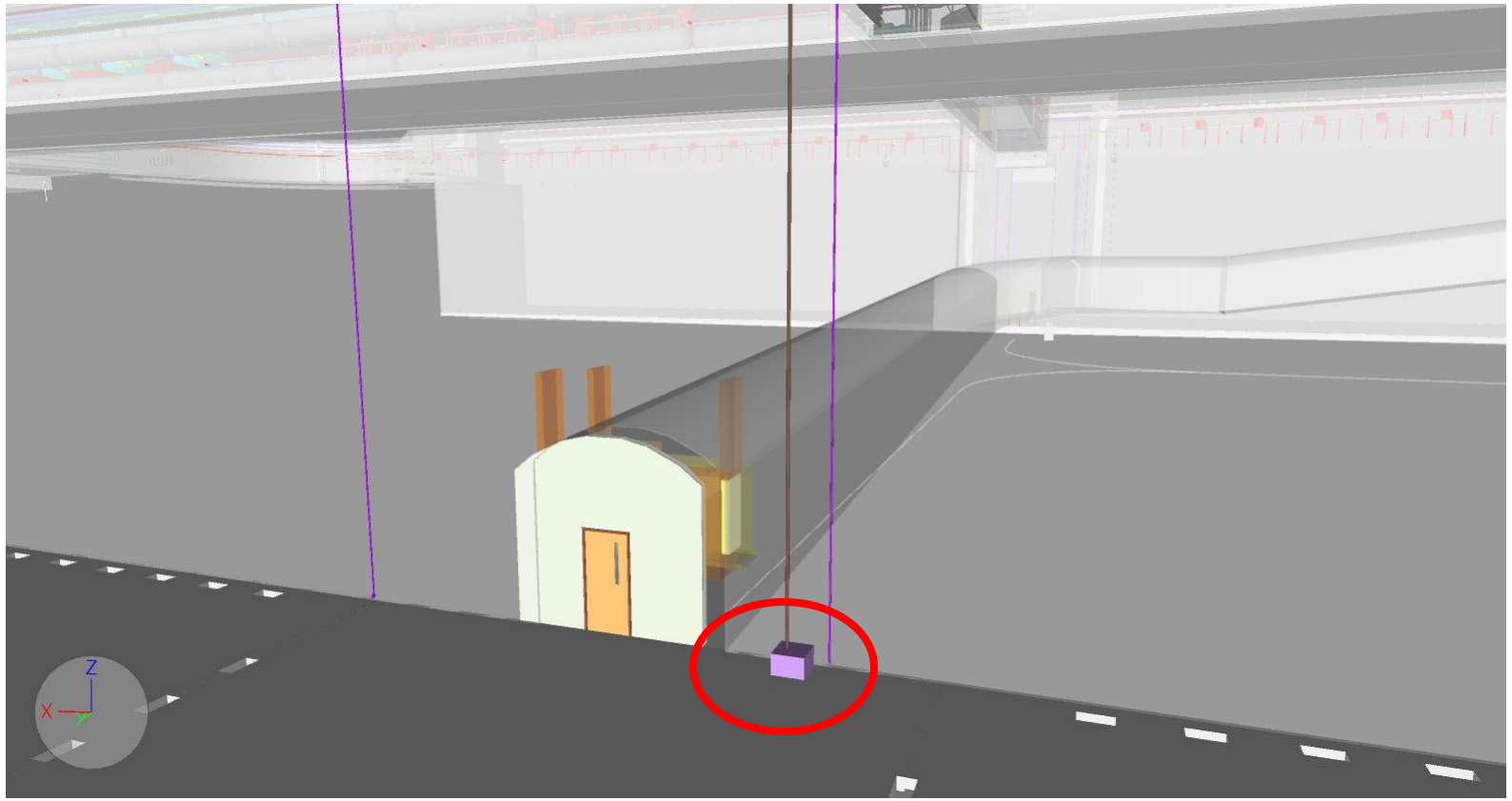




- The mucking drifts have been moved inline with the N-S drifts. This eliminates and interference with the stairs, cryo pumps and cryostat warm structures. It also leave the possibility to access these drifts during later phases of construction, if deemed necessary.

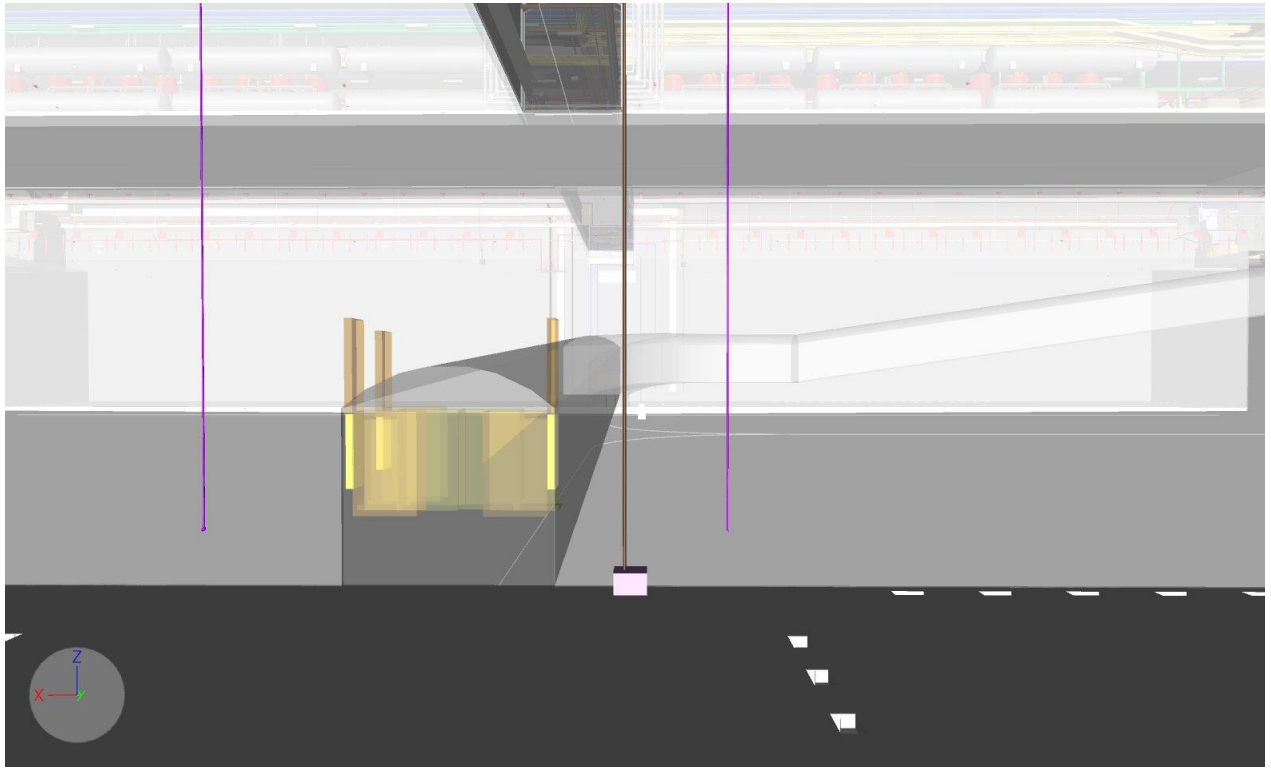
Changes due to mucking drift shift

- The sumps to capture and remove water from the 4910 level were shifted due to the relocation of the mucking drifts.



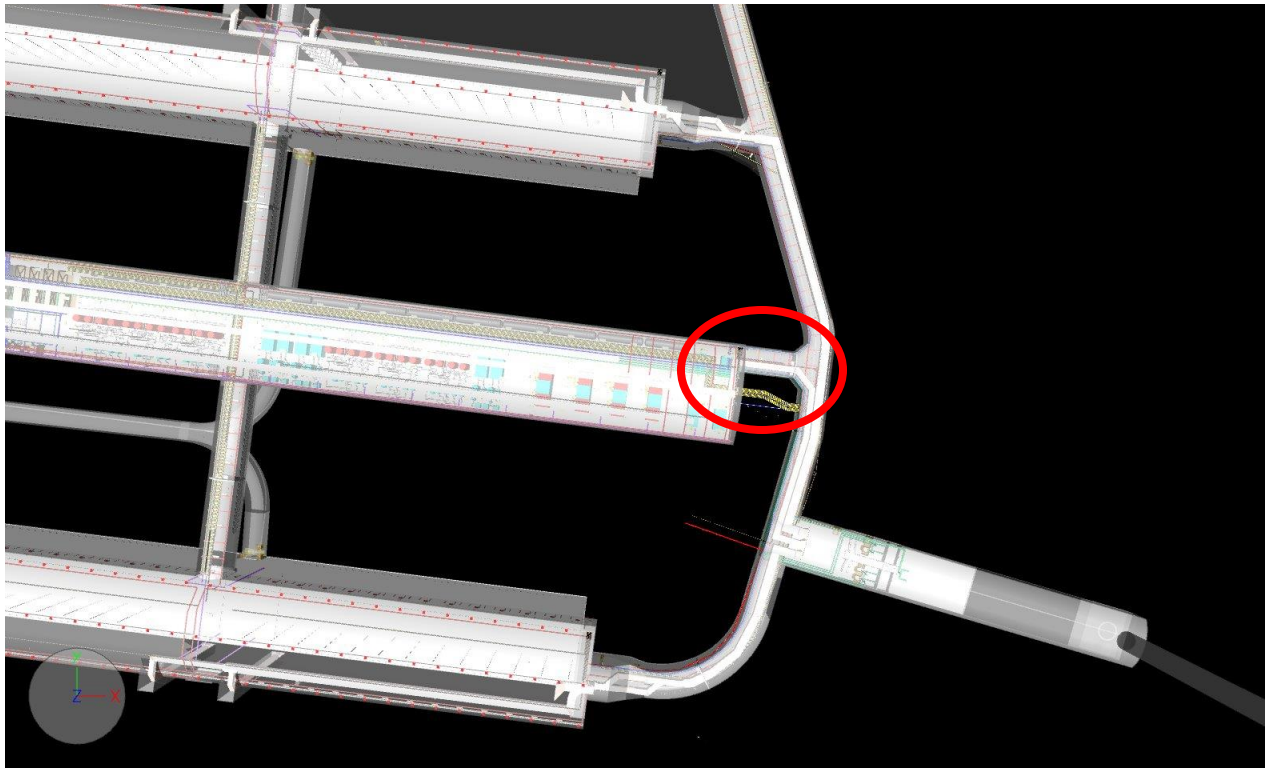
Electrical panels in entrance of mucking drifts

- Previously there were electrical panels populating the walls of the N/S drifts where cryogenics pipes and detector cabling needed to go. These panels will be relocated into a short (4 to 5 m) portion of the mucking drifts.
- Details needed –
  - exactly which panels will be relocated, outfitting required shotcrete, concrete inverts, sprinklers, lighting

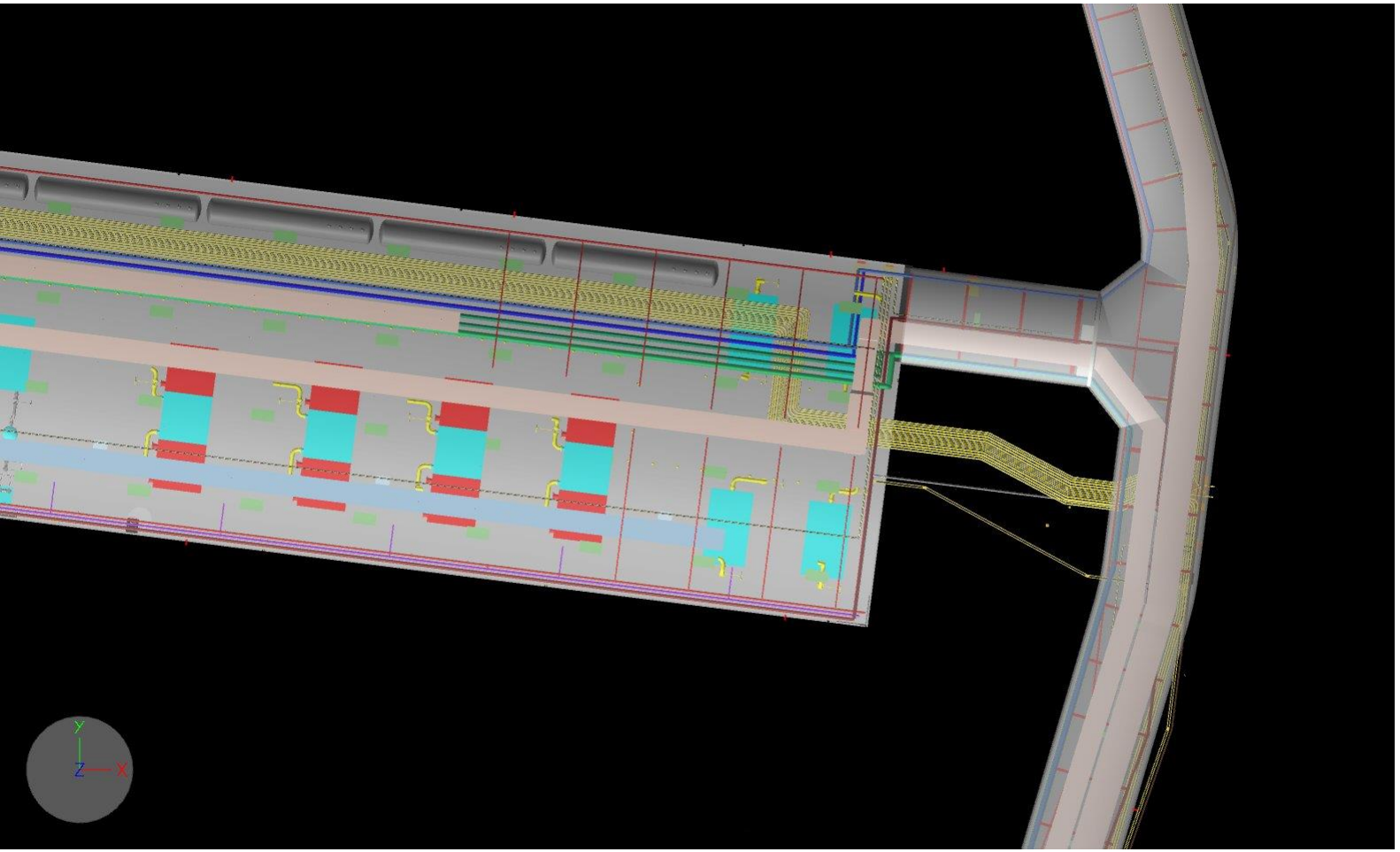


East entrance of CUC

- Previously the east entrance of the CUC was centered, unlike the west entrances that was skewed to the north. This created some unnecessary complications for service routing and material movement.

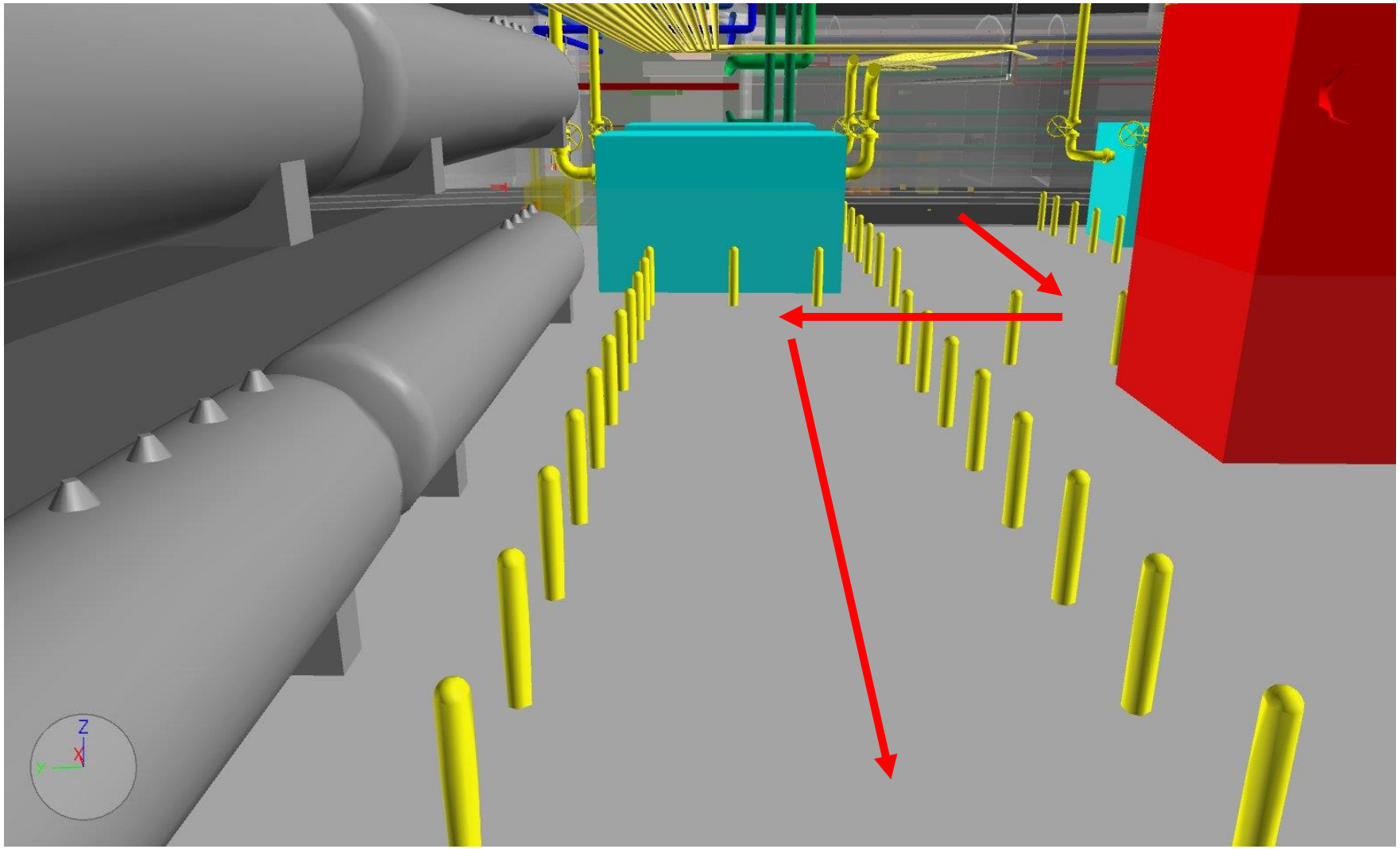


East CUC



- Work still to do from CF in process
  - Reroute all of the cooling pipes from spray chamber to CUC for chillers
  - Reroute ducting and electrical services

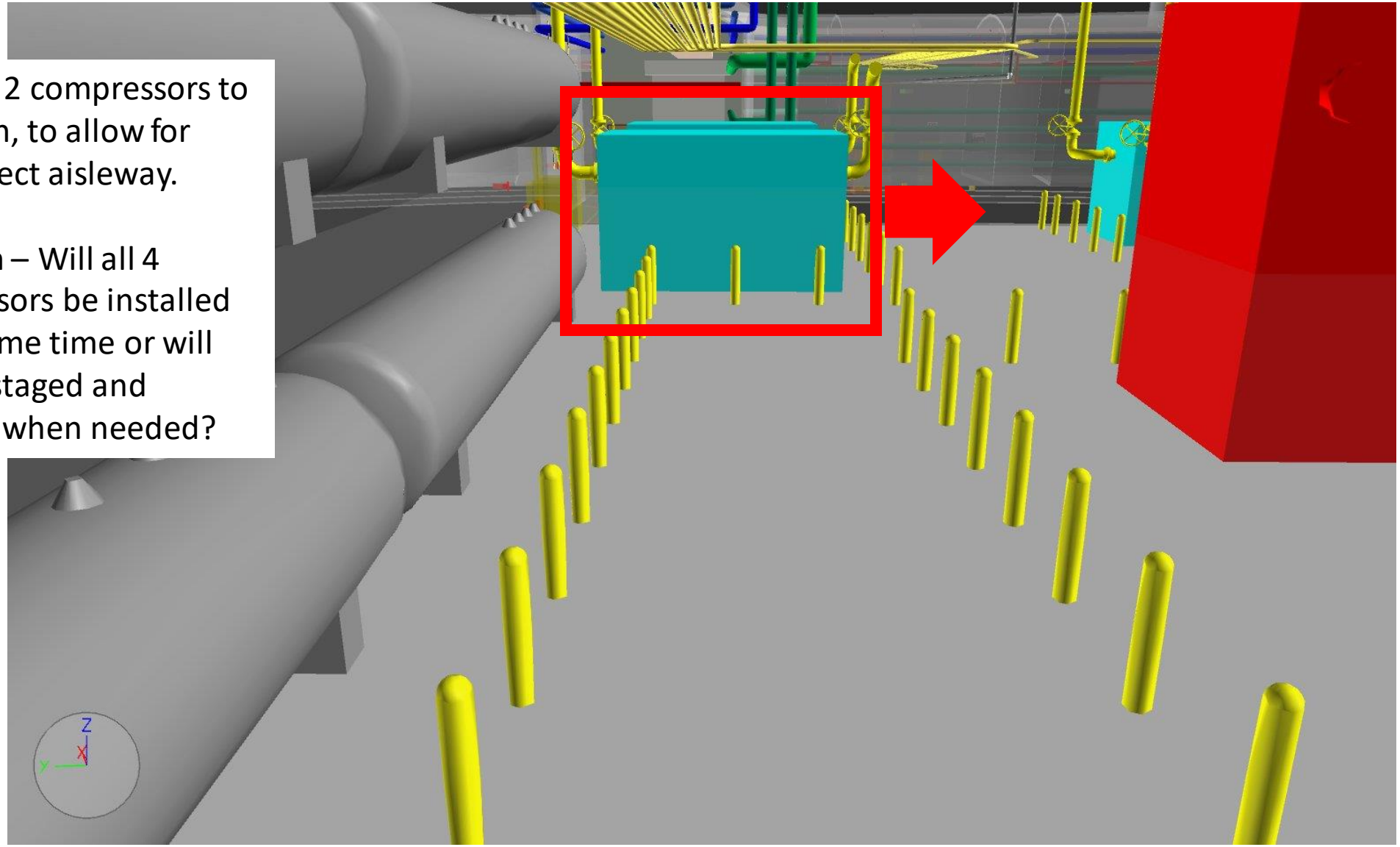
Current path into CUC



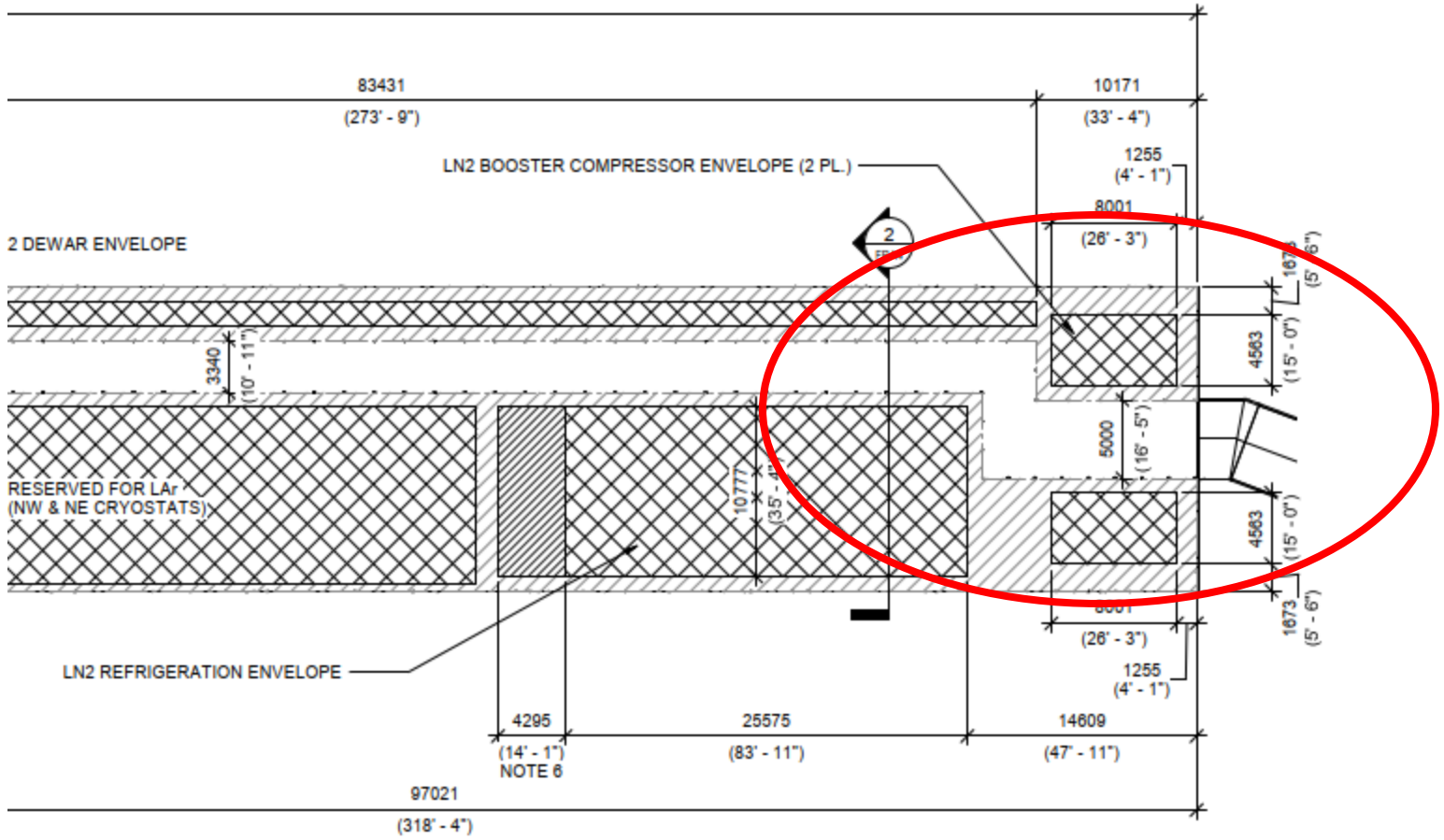
CUC east

Relocate 2 compressors to the south, to allow for more direct aisleway.

Question – Will all 4 compressors be installed at the same time or will they be staged and installed when needed?

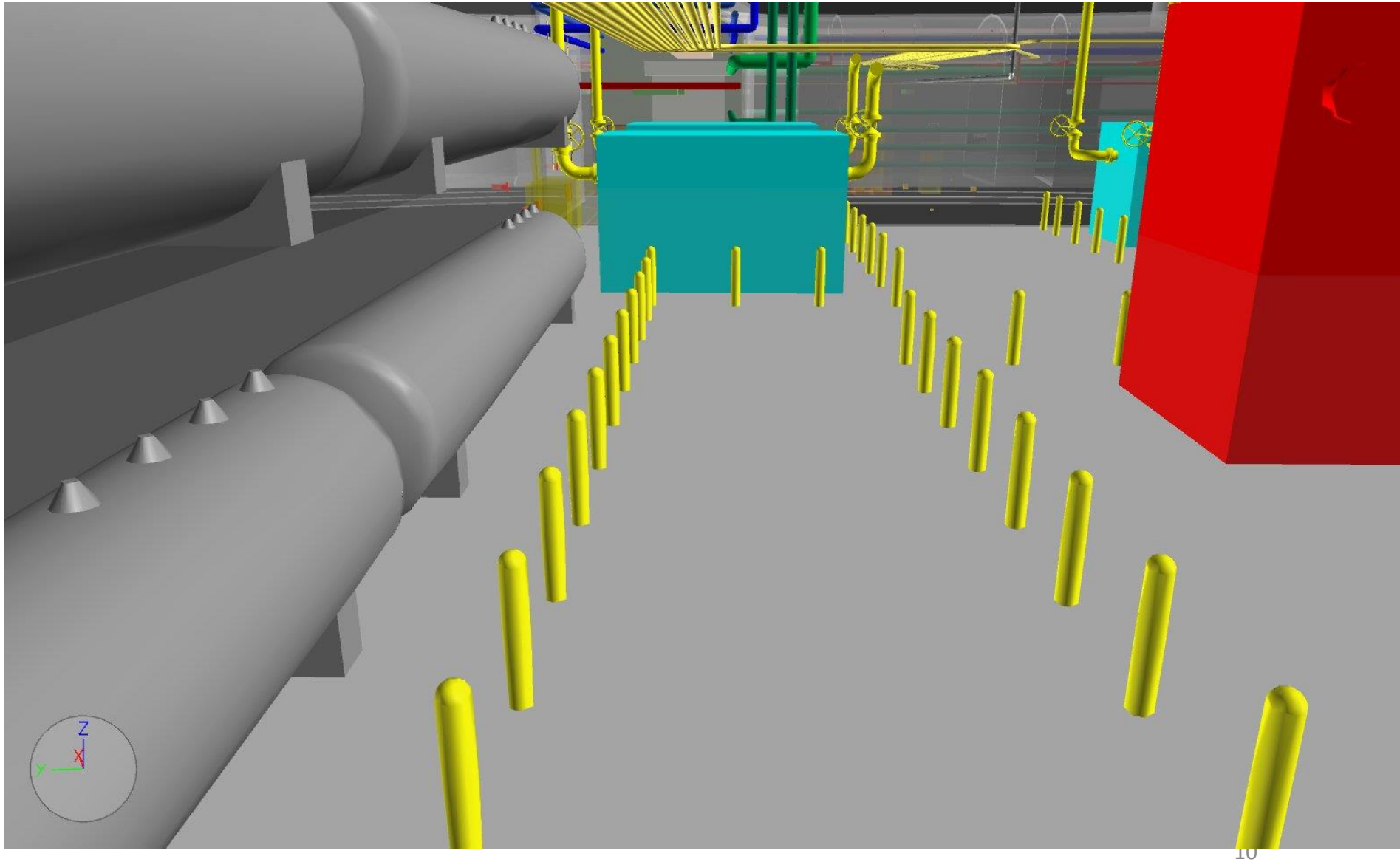


Update CUC envelope drawing

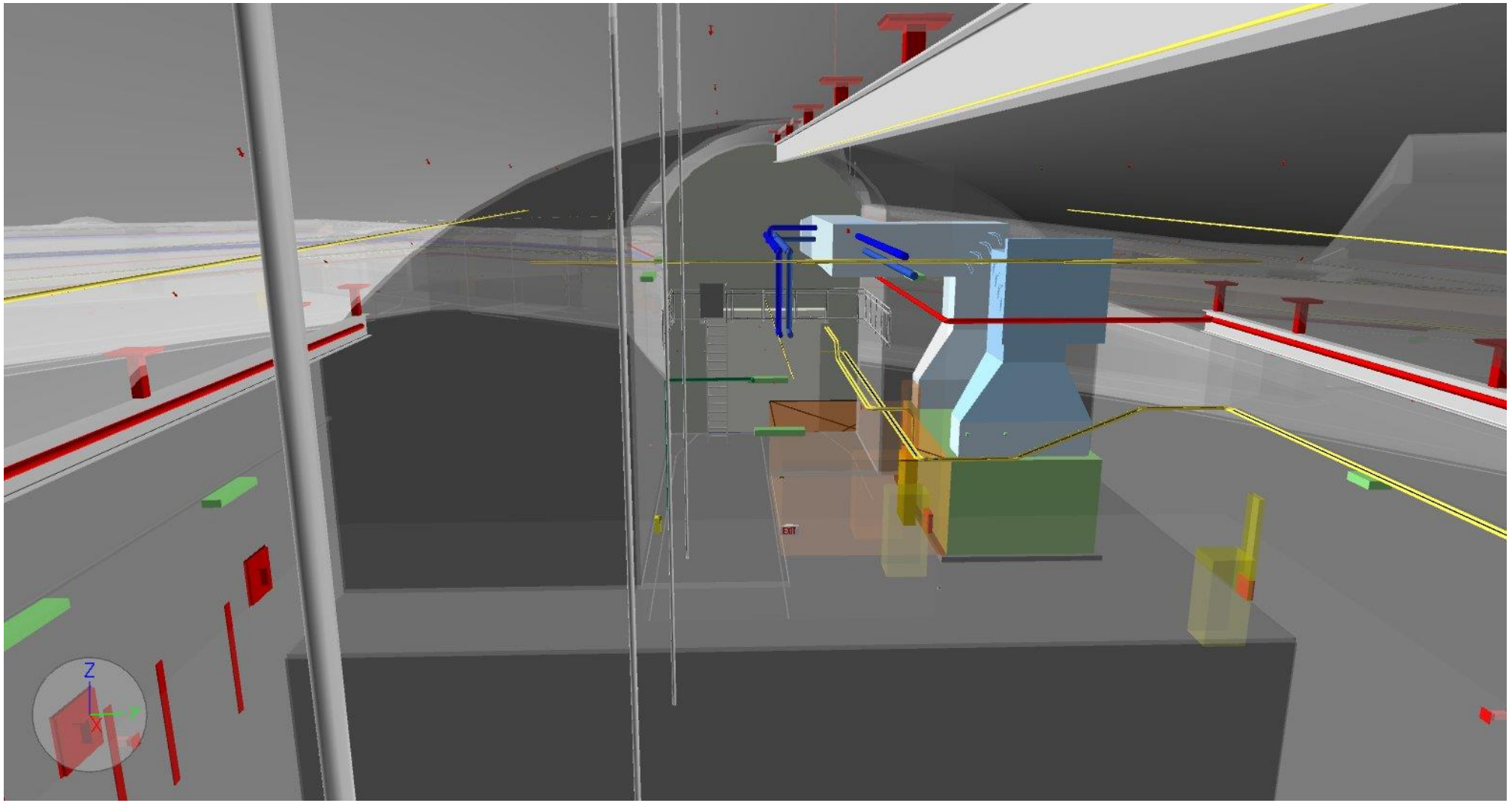


Bollards

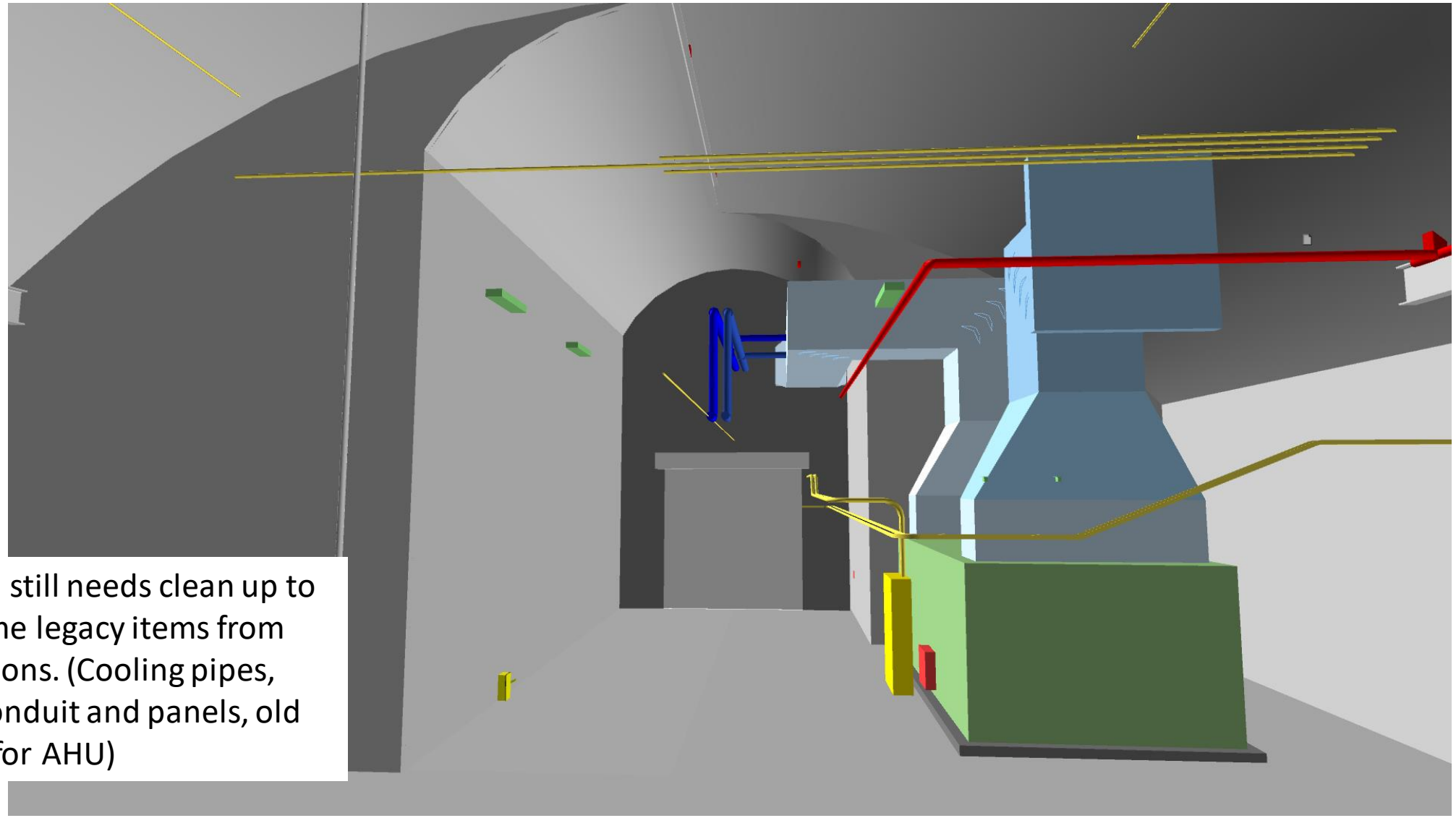
- Also, ARUP asked us to revisit the requirements for the bollards and CF is recommending that the installation is removed from their scope to allow for changes as the designs of the CUC equipment matures. This would move to a post CF requirement.



West entrance of detector caverns

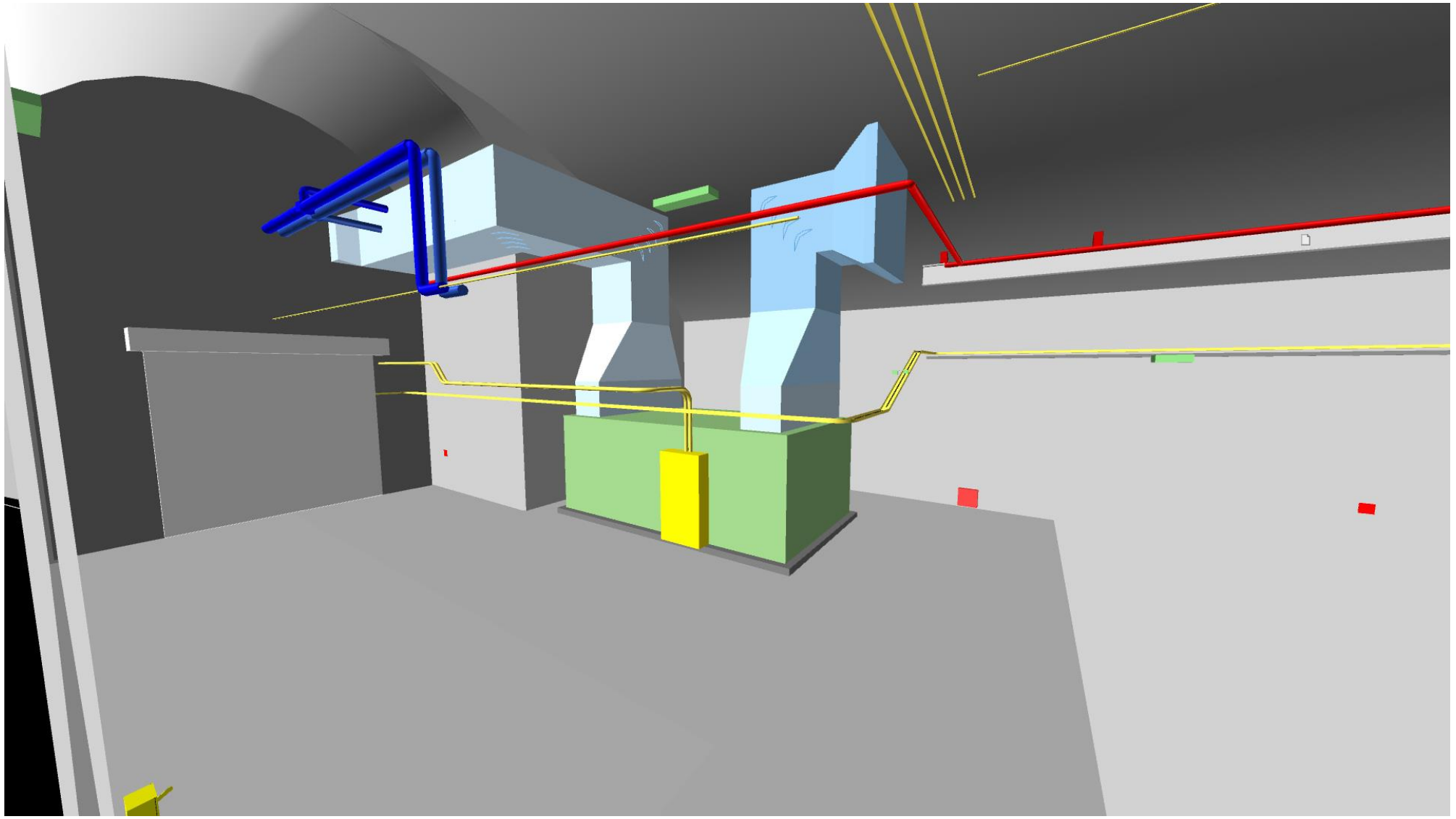


Proximity of monorail to ducting and AHU

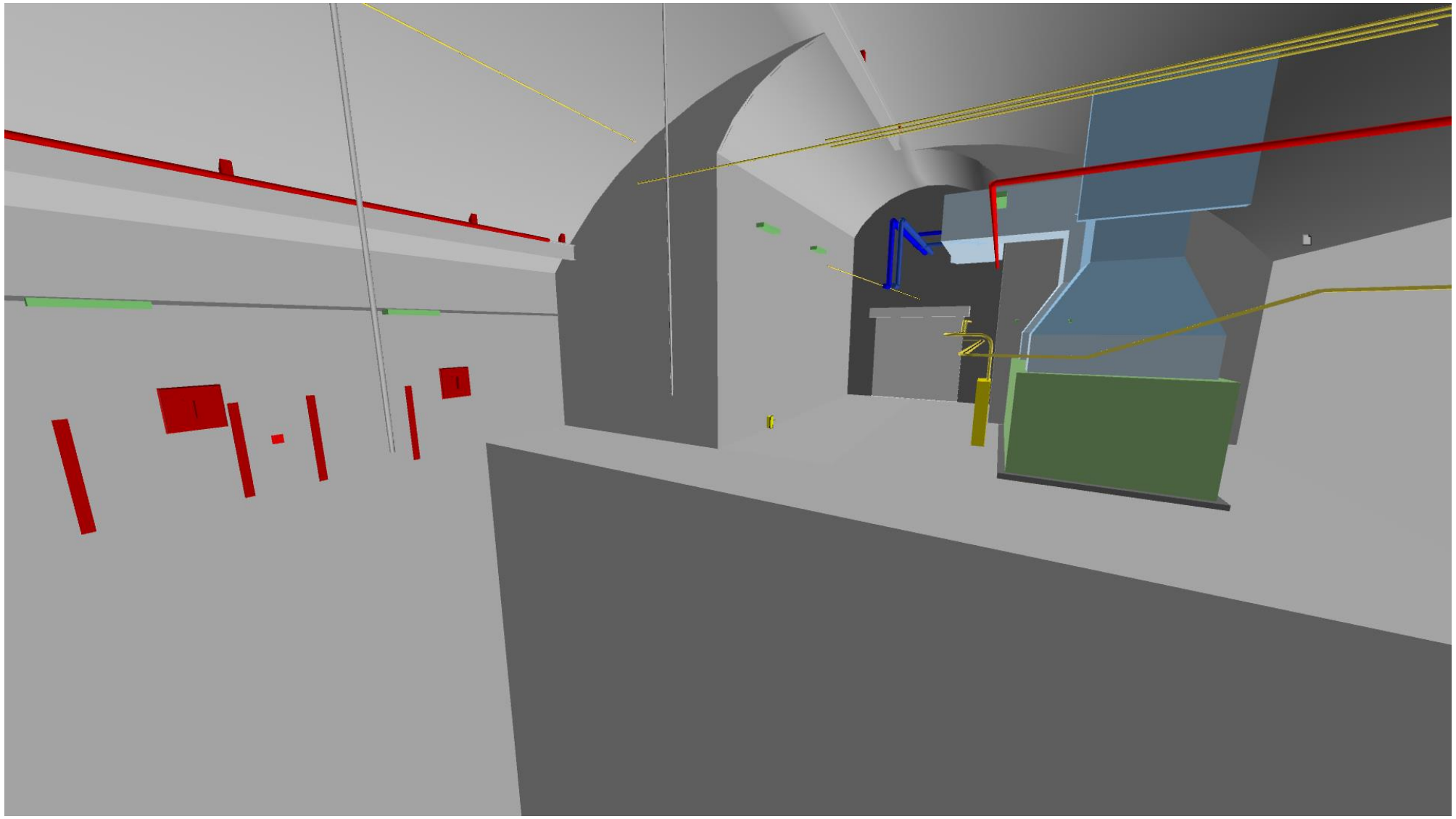


Note model still needs clean up to remove some legacy items from earlier versions. (Cooling pipes, electrical conduit and panels, old mezzanine for AHU)

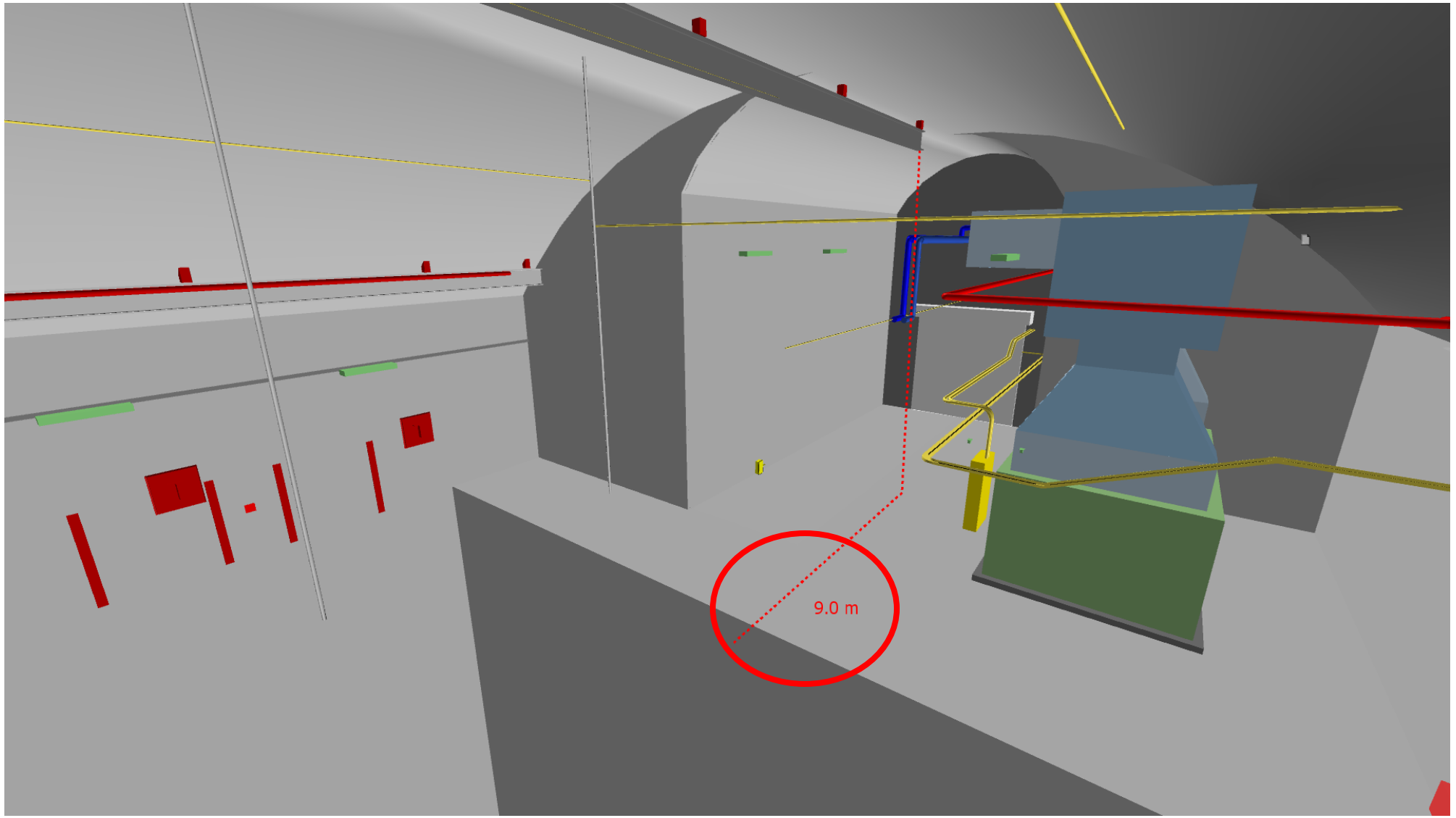
Outer monorails and AHU/ductwork



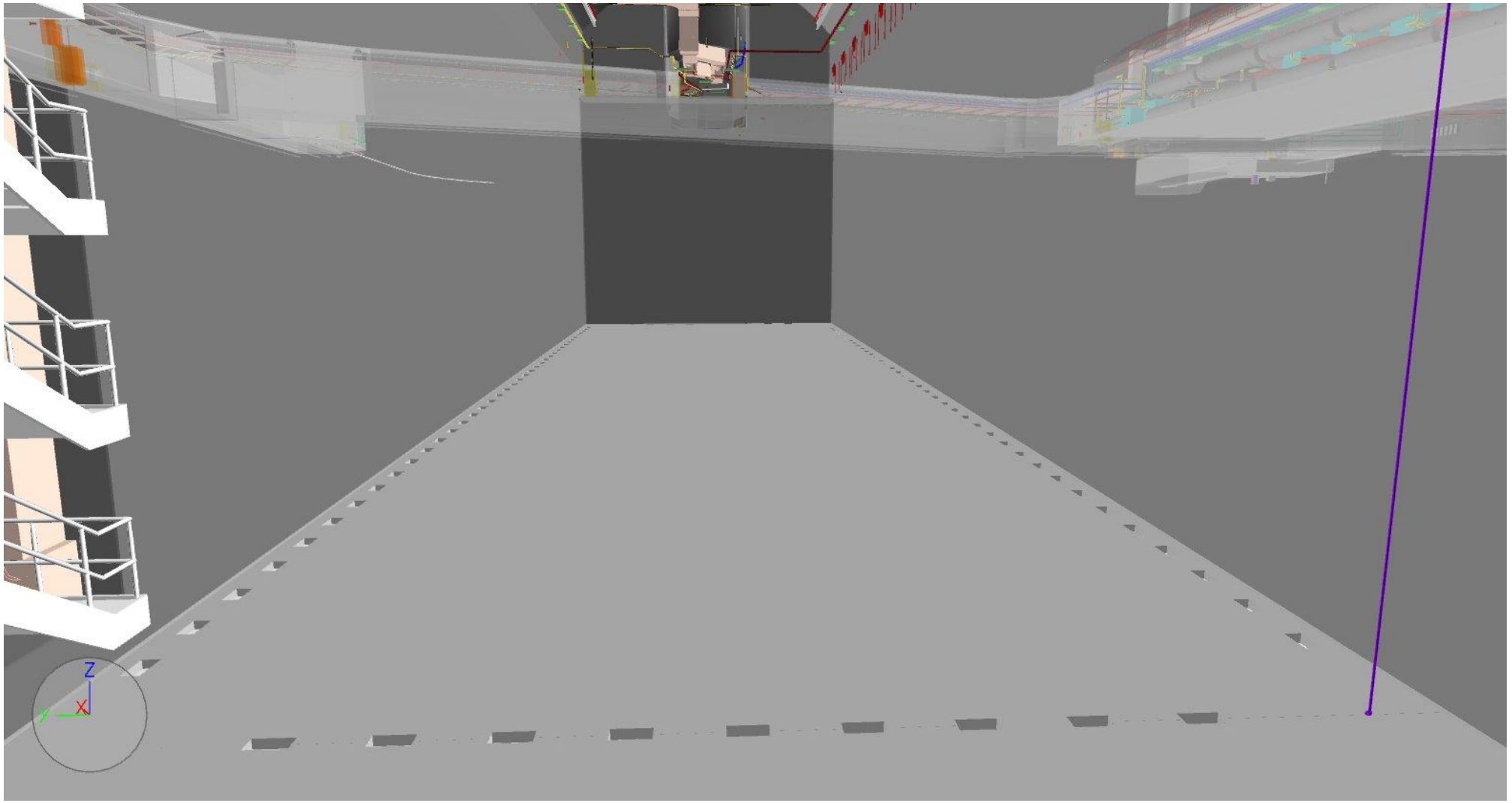
SW corner remains unchanged



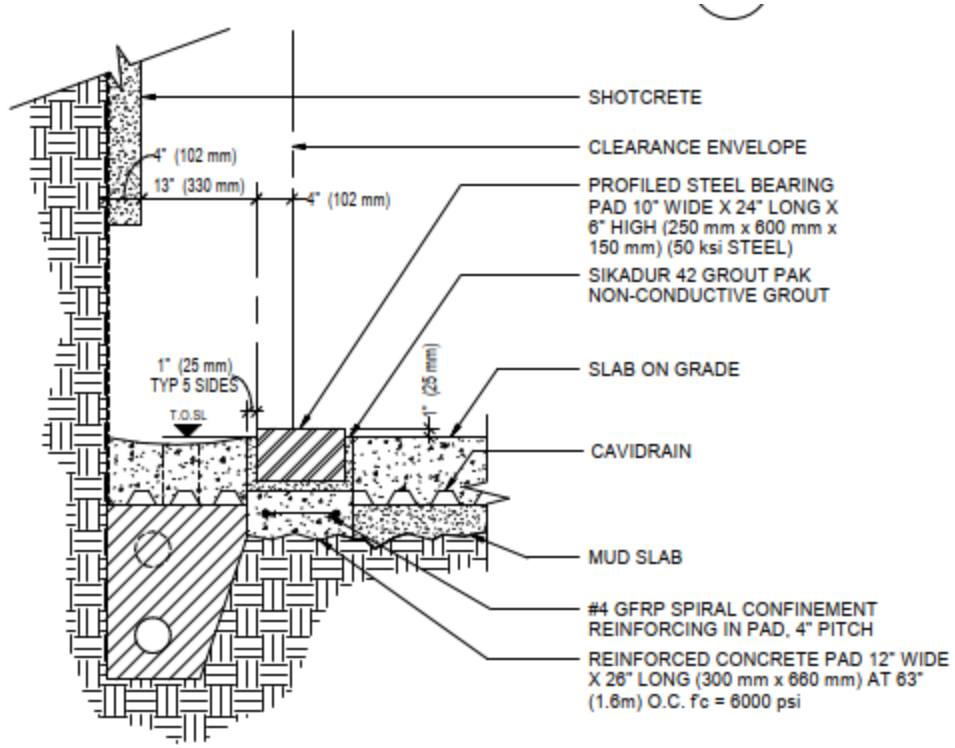
Current dimension to end of center monorail



Cryostat bearing plates



Details from 60%

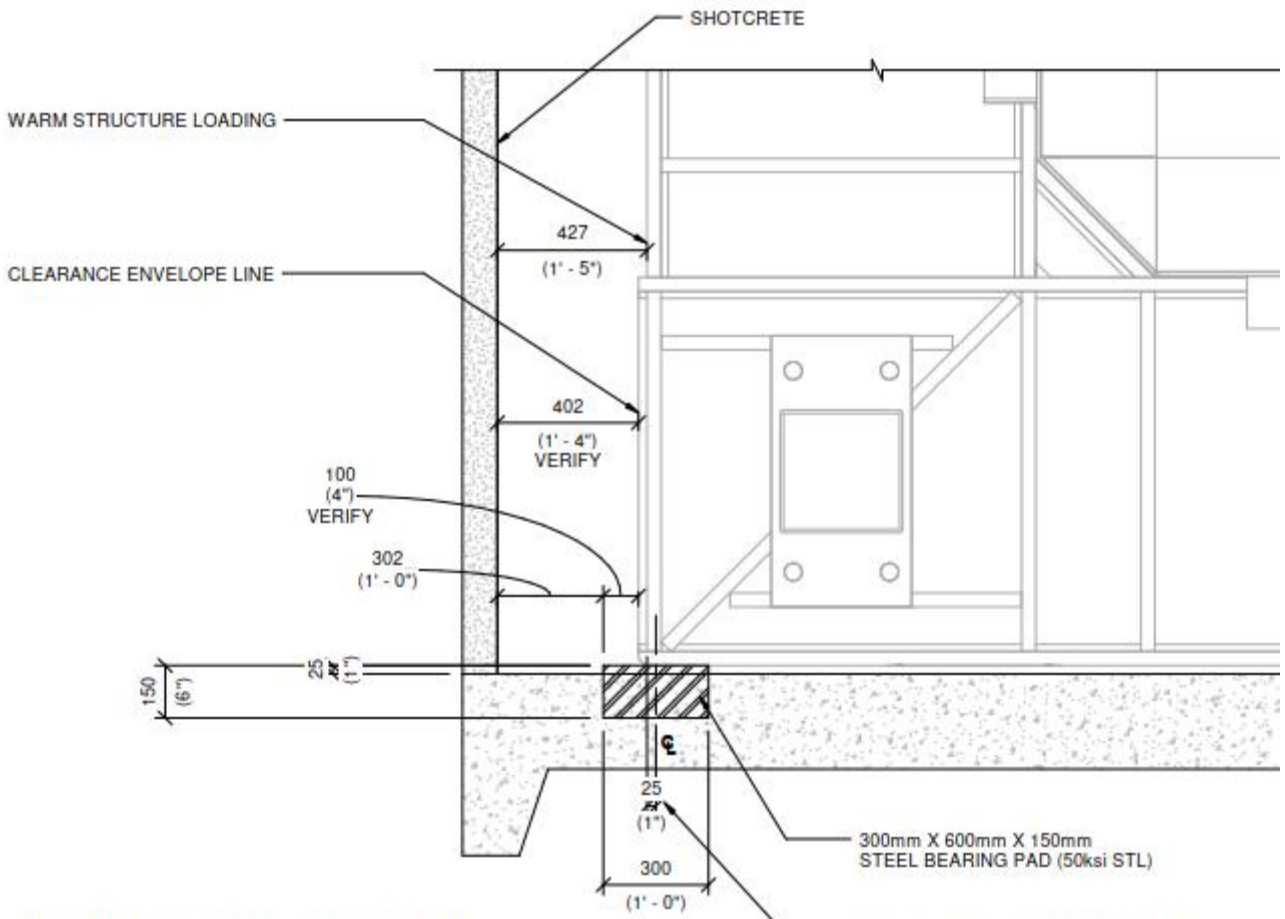


NOTES:

1. FOR INFORMATION NOT SHOWN REFER TO 3/SS-810

DETAIL AT CONCRETE PADS IN EXPERIMENT CAVERN 5

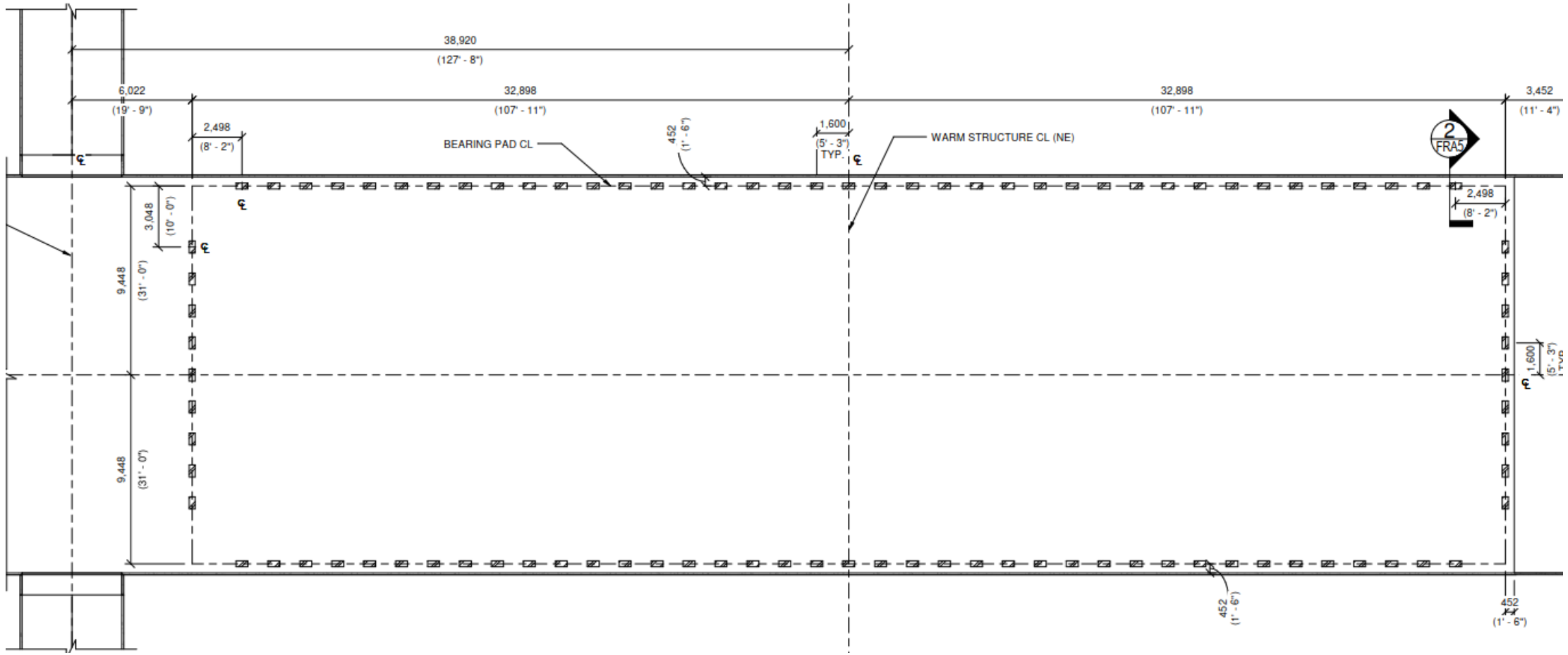
SCALE: 1" = 1'-0"



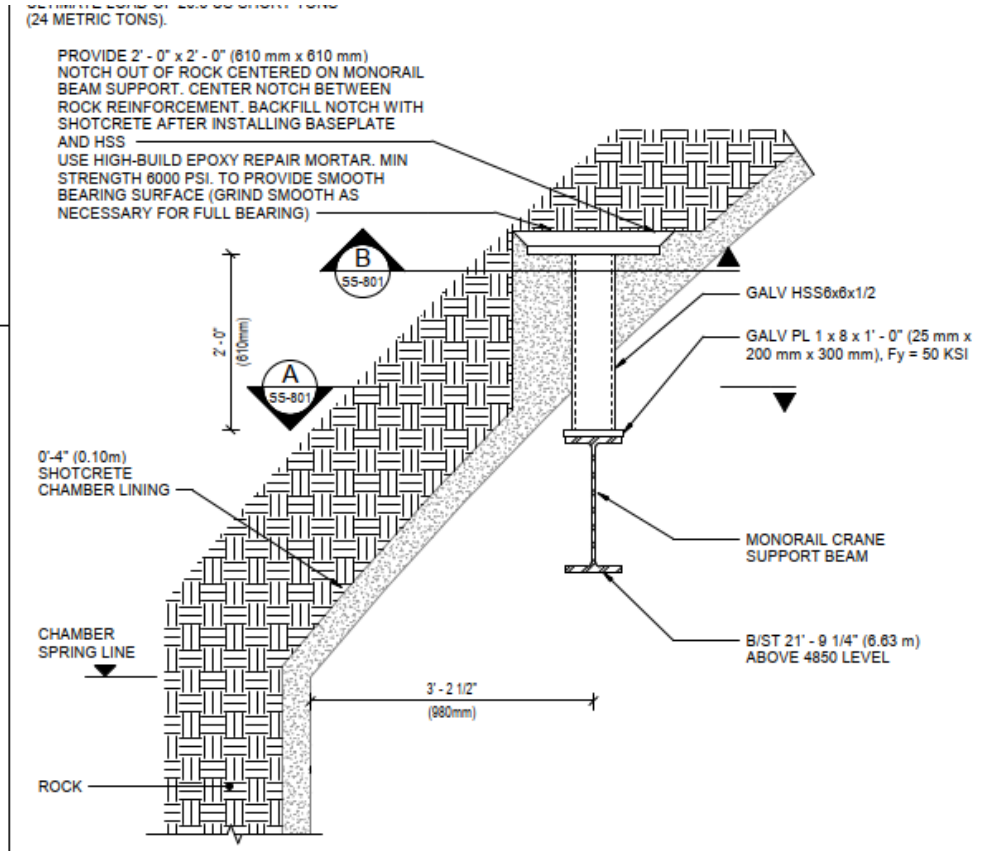
2 BEARING PAD SECTION

1" = 1'-0"

Changes from 60% are being verified



Monorails

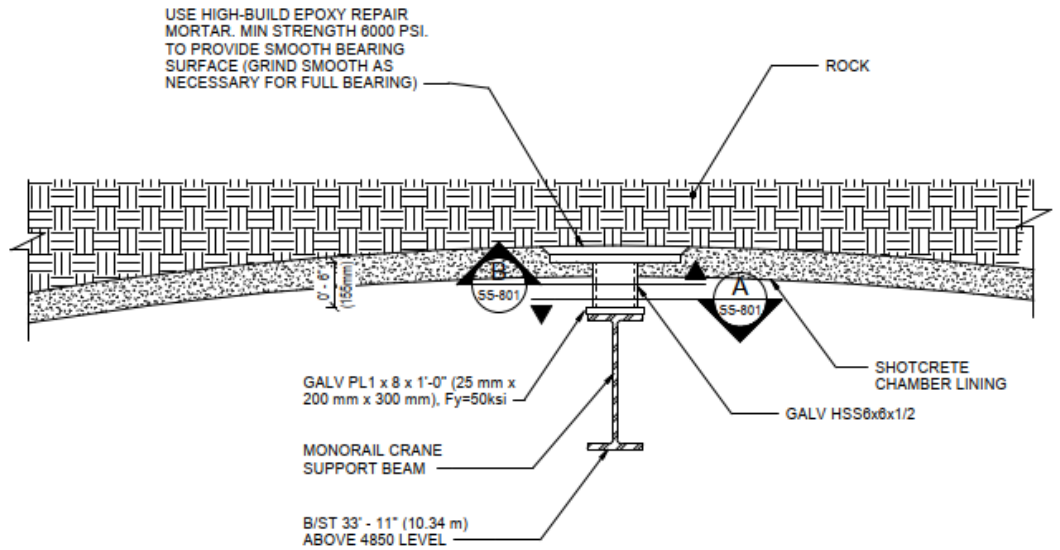


TYPICAL MONORAIL CRANE BEAM SUPPORT 2

SCALE: 1" = 1'-0"

SECTION 1

SCALE: 1" = 20'-0"

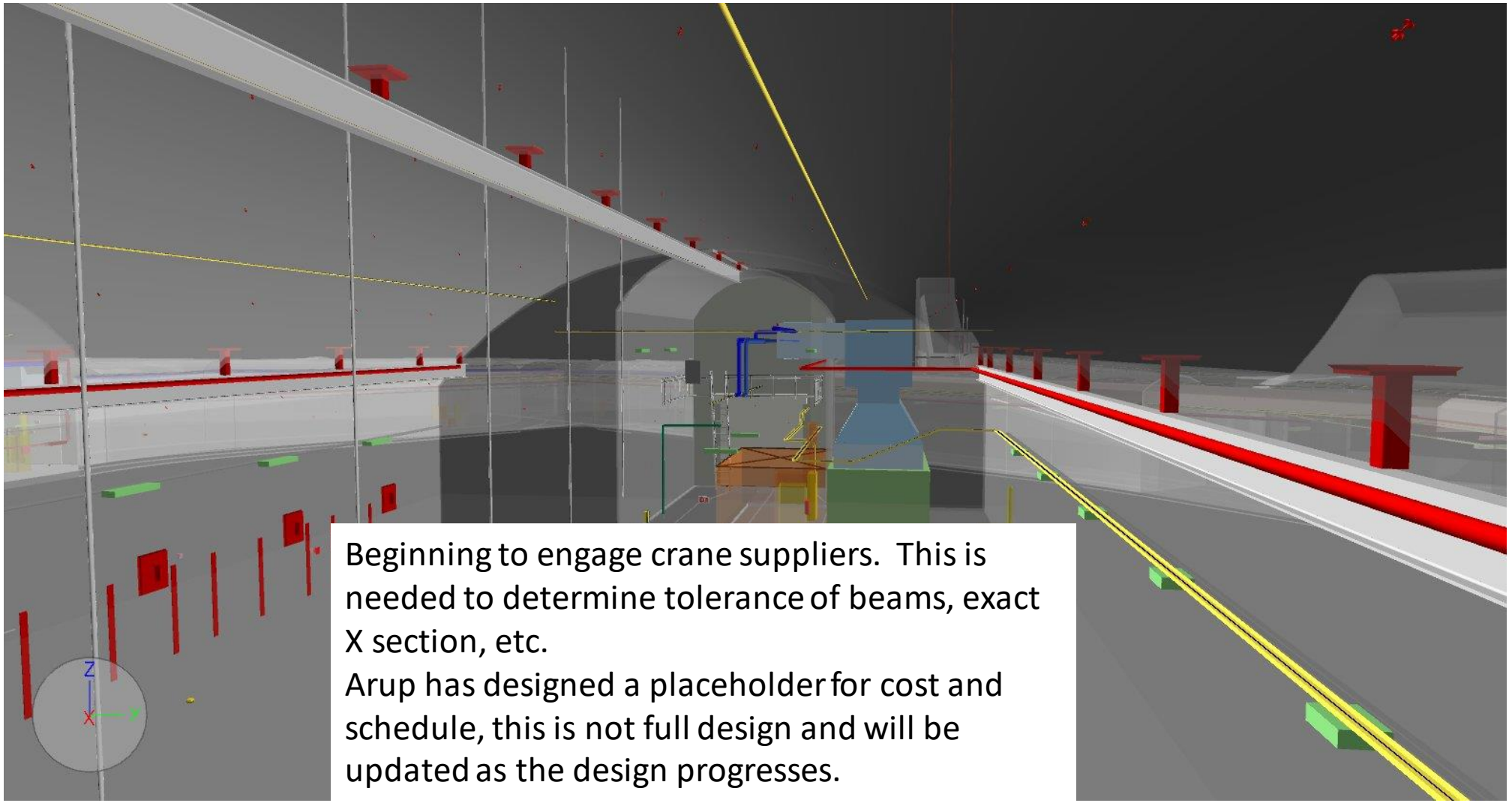


NOTES:
SUPPORT BEAM AT 16'-6" (5 m) o.c. MAX. LOCATE LAST SUPPORT 5'-0" (1.5 m) MAX. FROM BEAM END.

CENTRAL MONORAIL CRANE BEAM SUPPORT 3

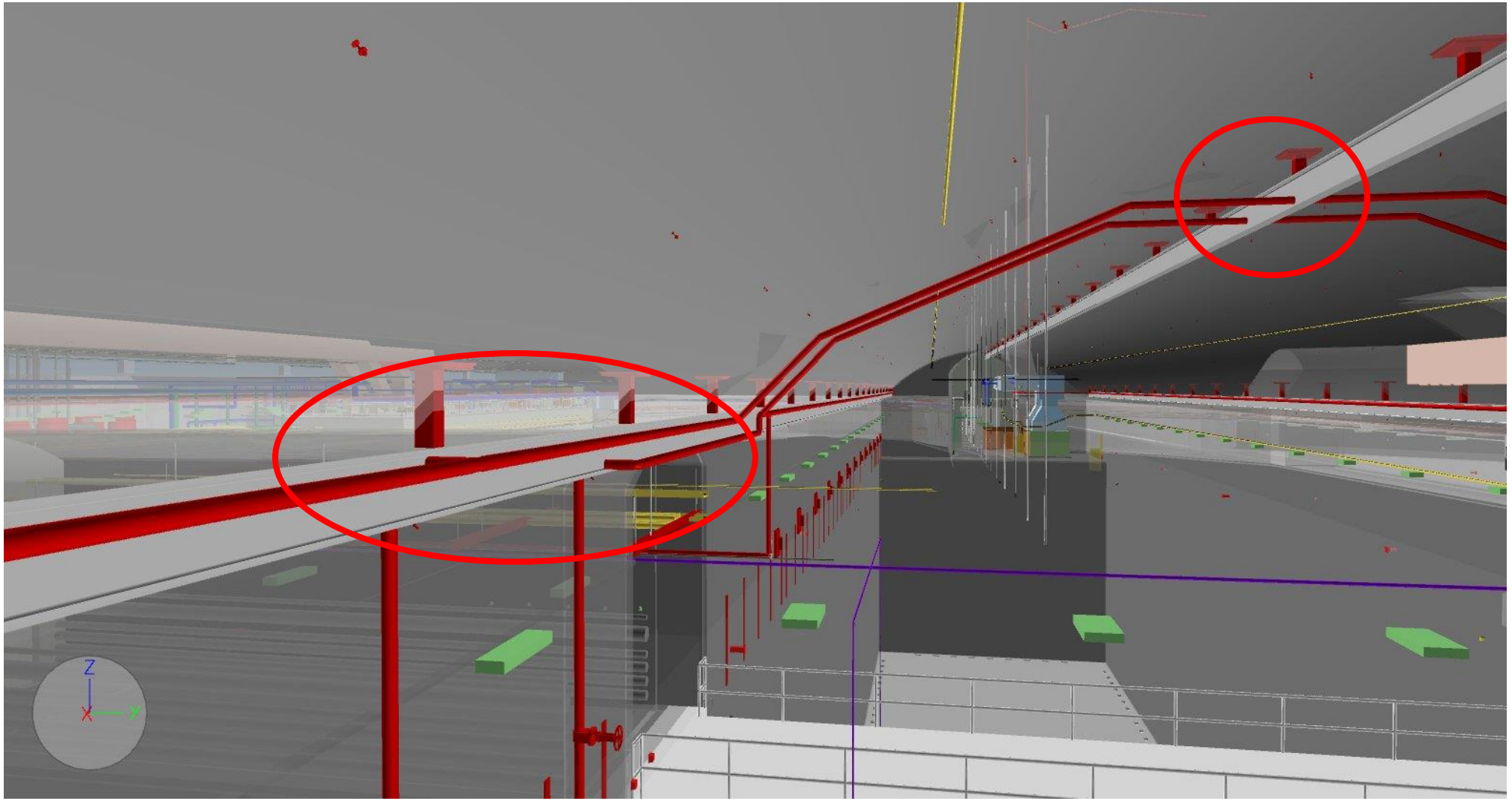
SCALE: 1" = 1'-0"

Hangers are implemented, place holder for rails



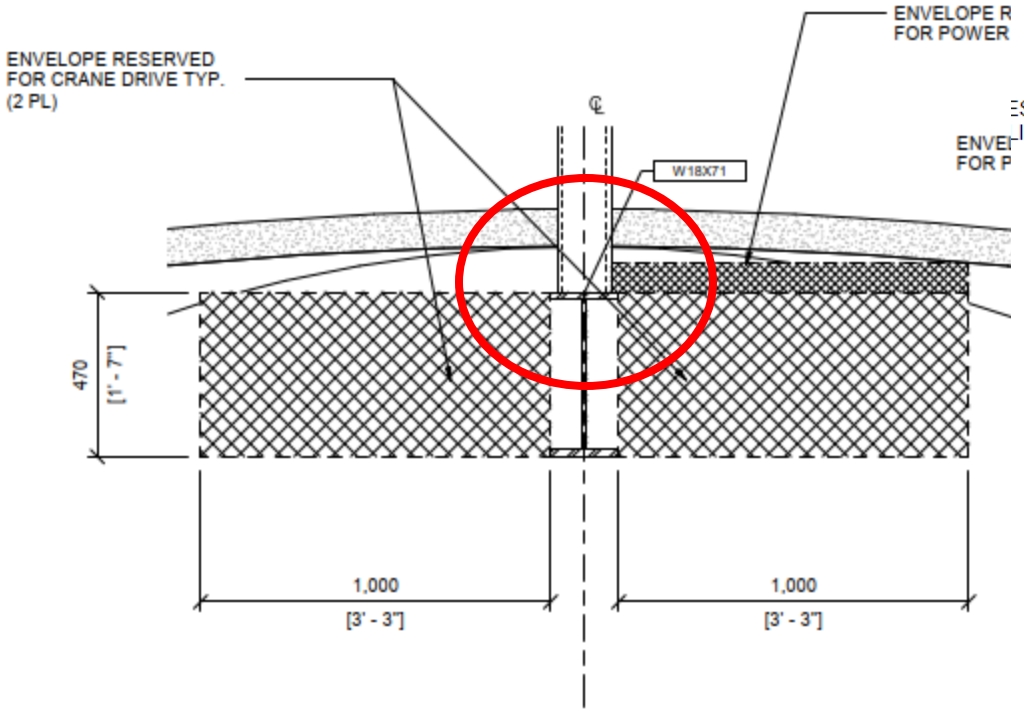
Beginning to engage crane suppliers. This is needed to determine tolerance of beams, exact X section, etc.
Arup has designed a placeholder for cost and schedule, this is not full design and will be updated as the design progresses.

Envelope for routing services

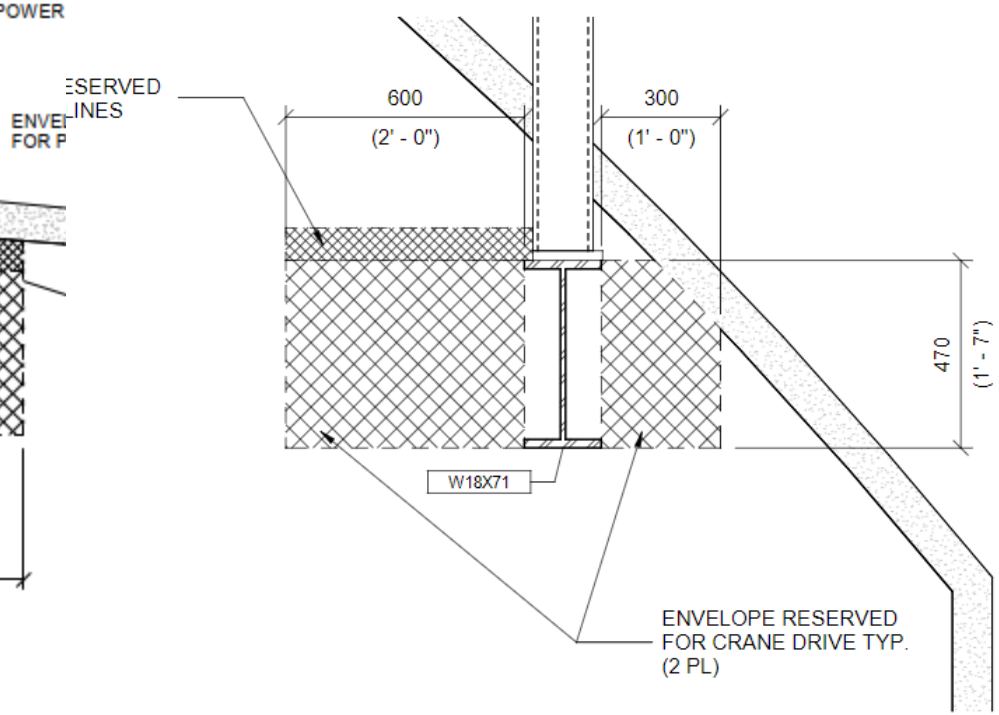


Monorail placement

Center monorail will be shifted 100 mm (4 in) to accommodate. ARUP is working through alternate solutions for outer monorails.

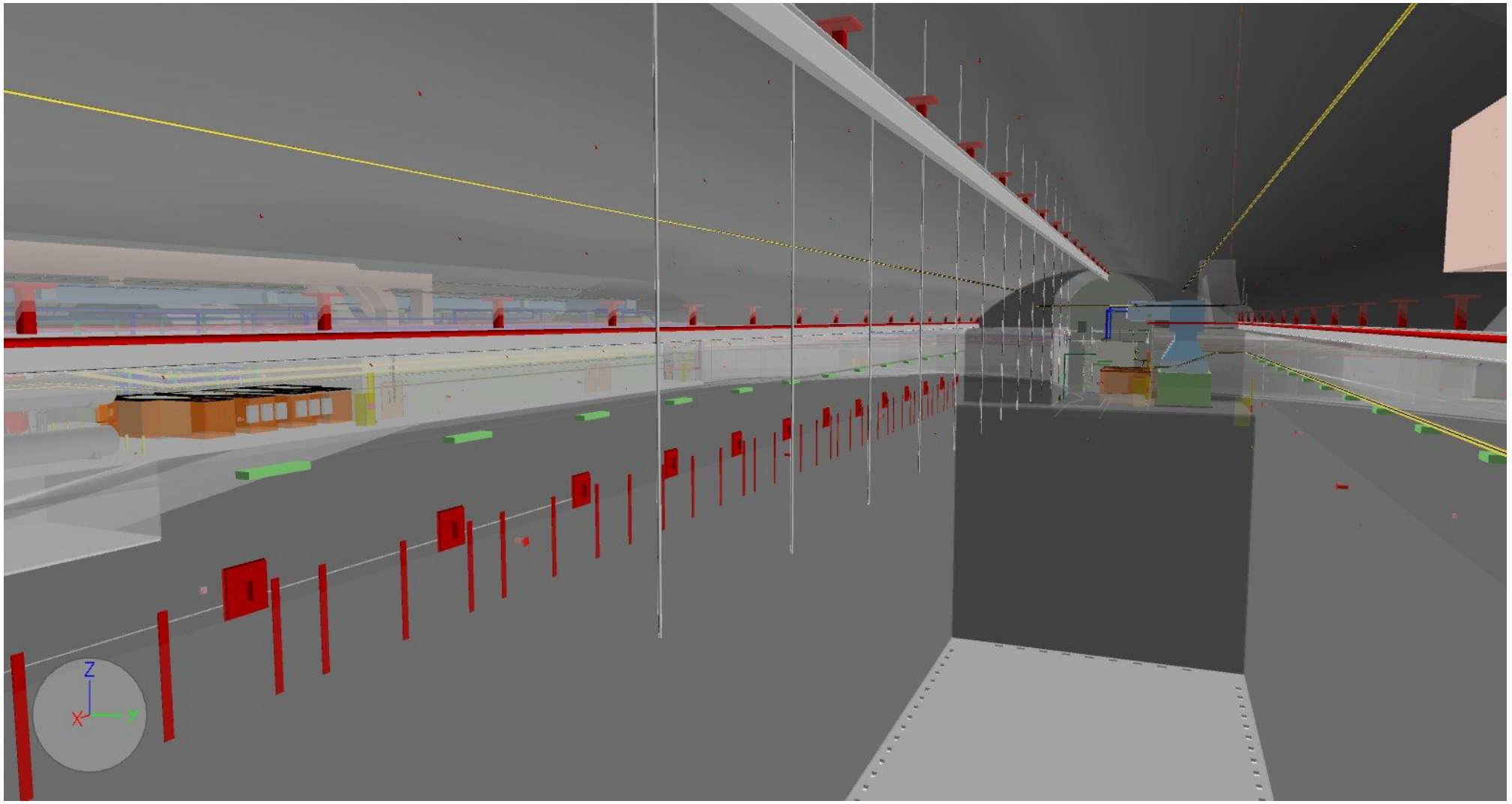


3 CENTRAL MONORAIL EQUIP. CLEARANCE
1" = 1'-0"

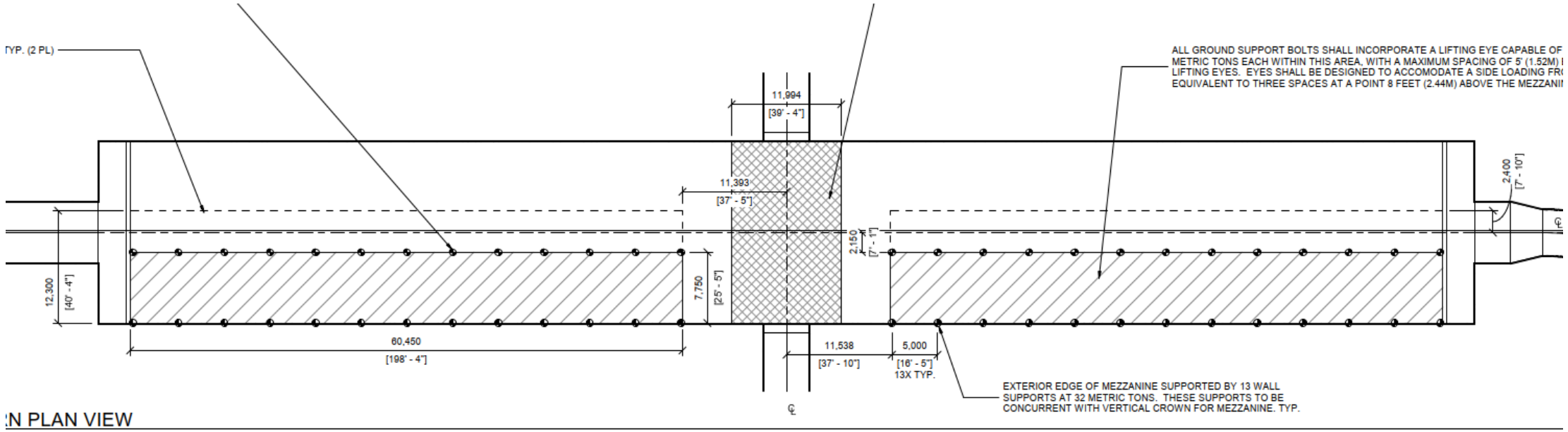


4 BRIDGE CRANE RAIL EQUIP. CLEARANCE
1" = 1'-0"

Mezzanine supports, verify location



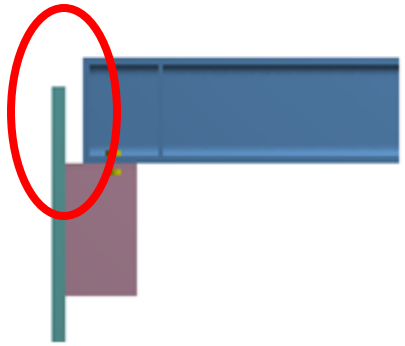
Dimensions below to be confirmed

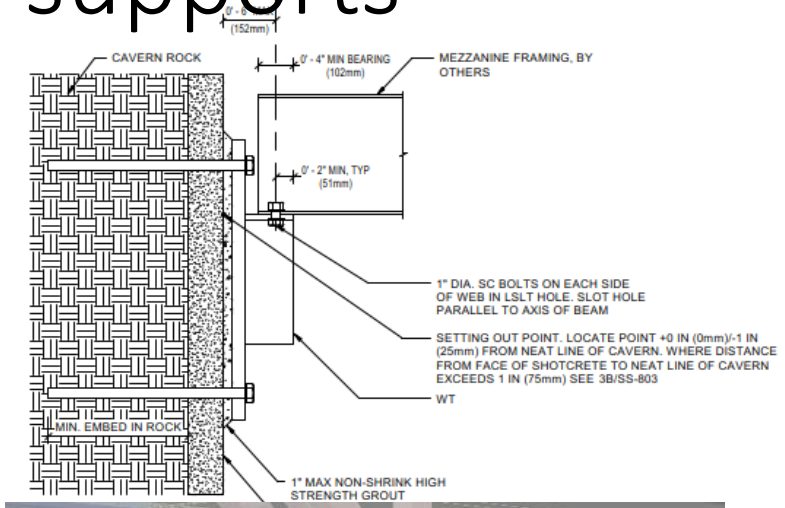


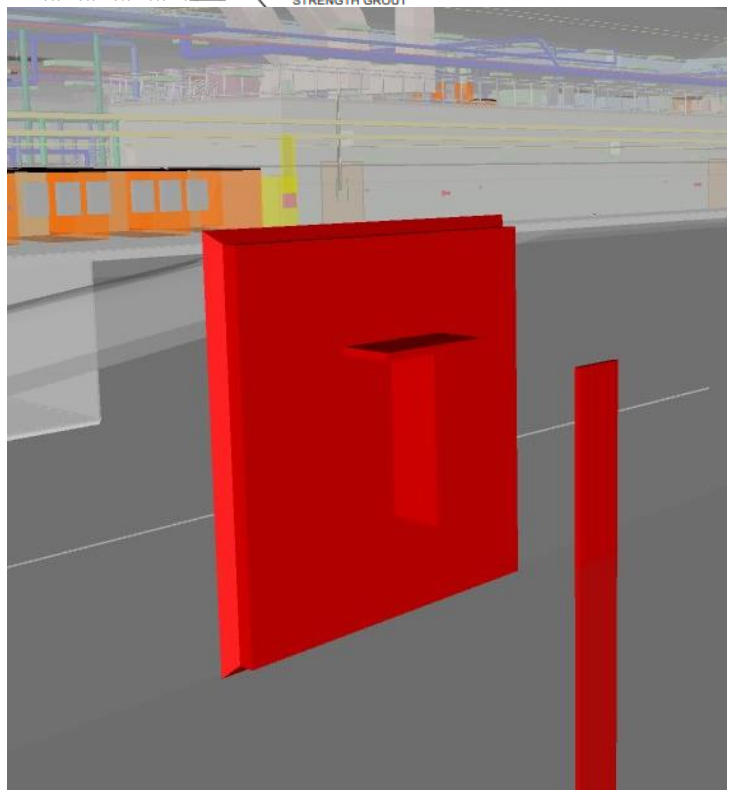
Mezzanine wall supports

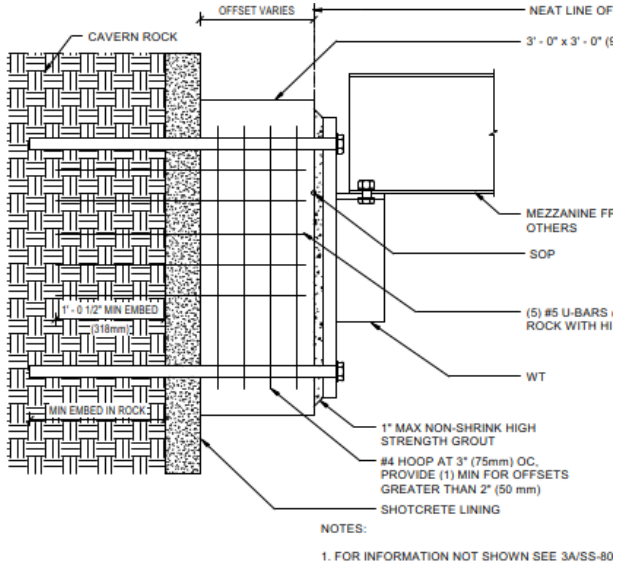
The Tee brackets will be field welded to the flat plates anchored to the rock. This location of the Tee brackets will be surveyed.

The mounting details of the mezzanine below needs to be clarified.



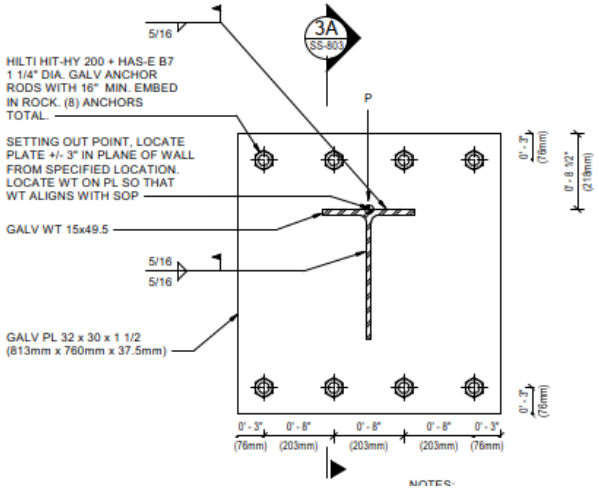






ALTERNATE SECTION 3B

SCALE: 1 1/2" = 1'-0"

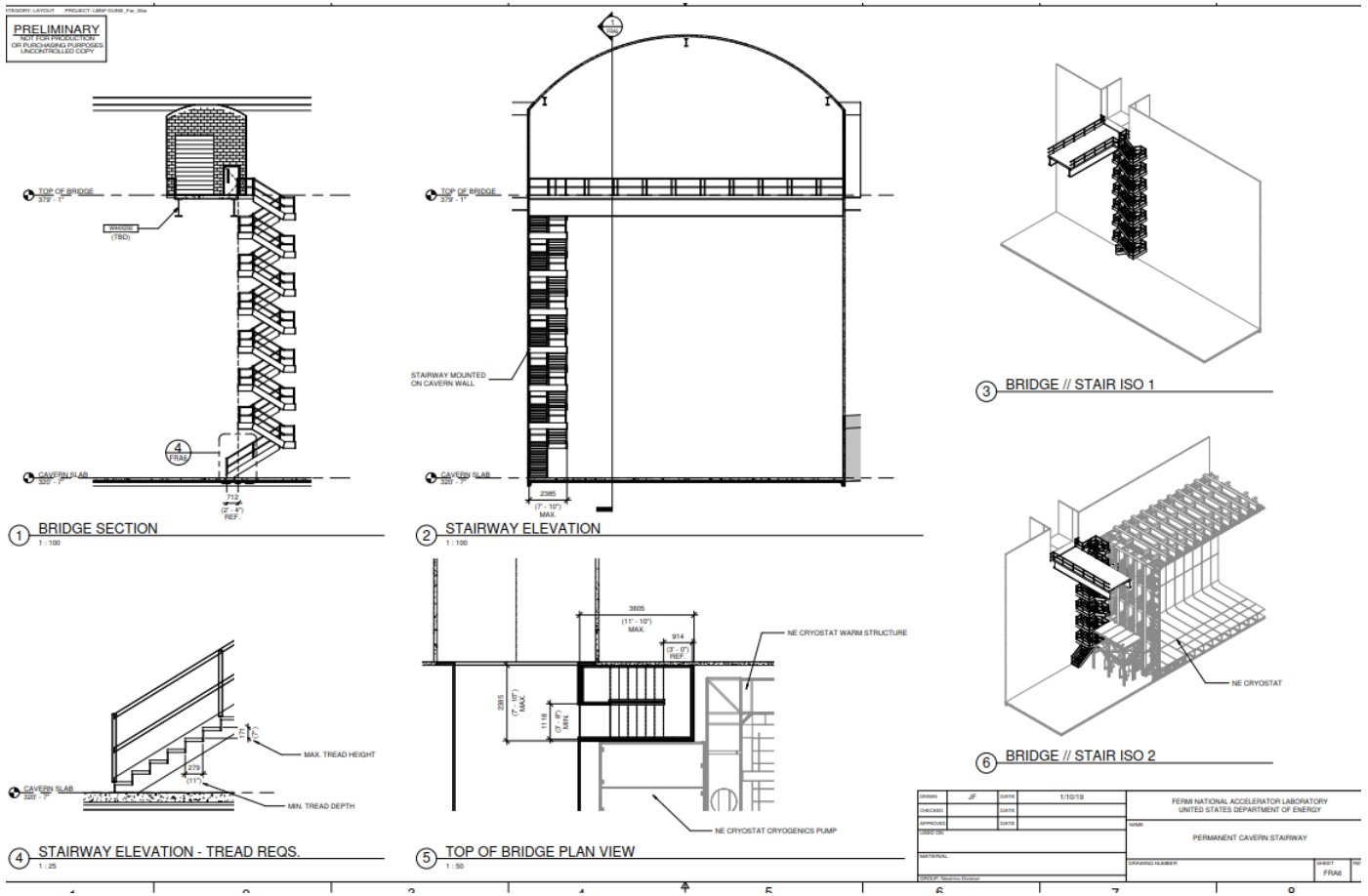


Mezzanine simulation

- ARUP asked if a vibration analysis has been performed from any vibrating equipment, personnel or material movement, etc.
- Need to confirm

4910 egress

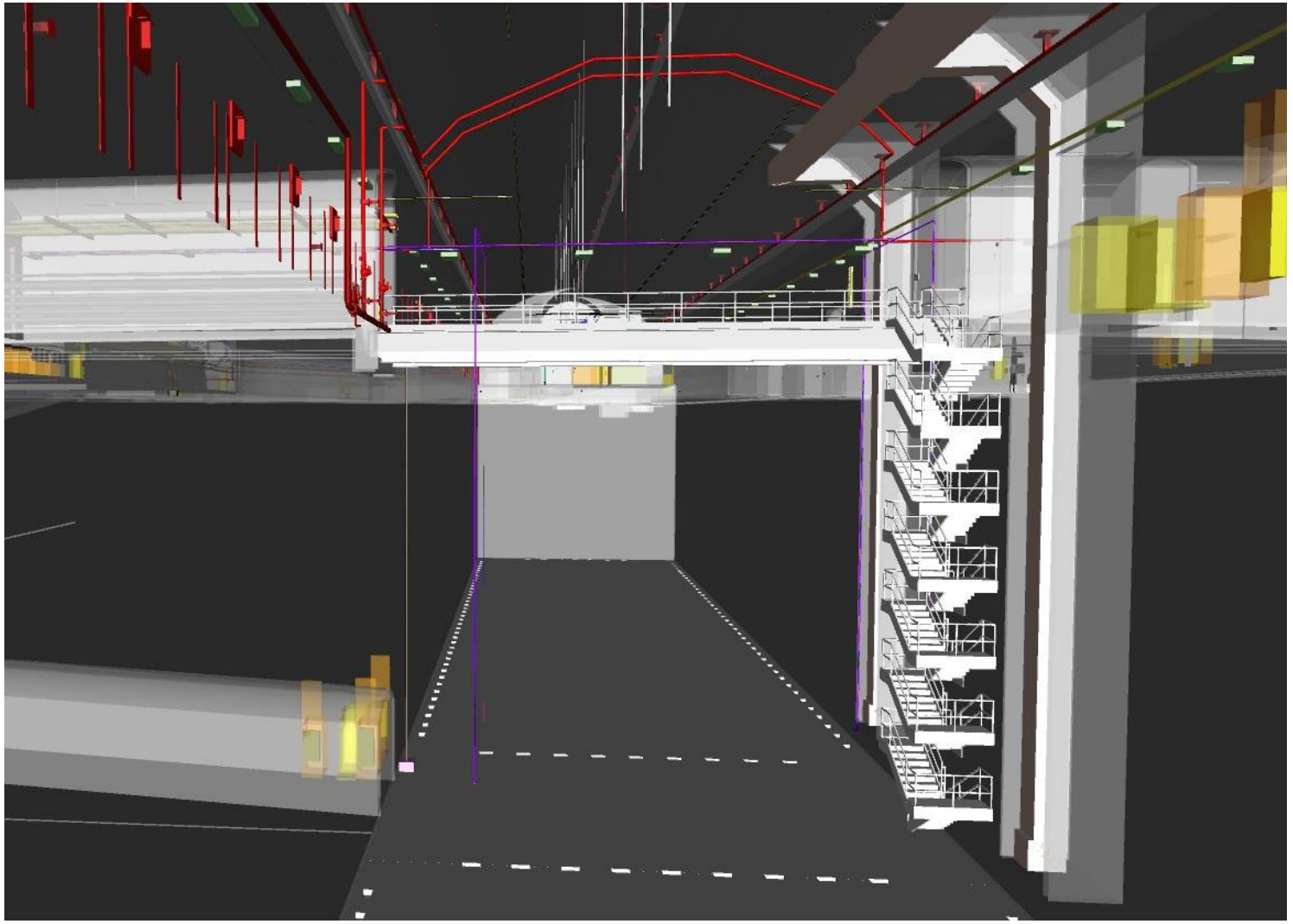
Provided ARUP stair concept and location constraints.



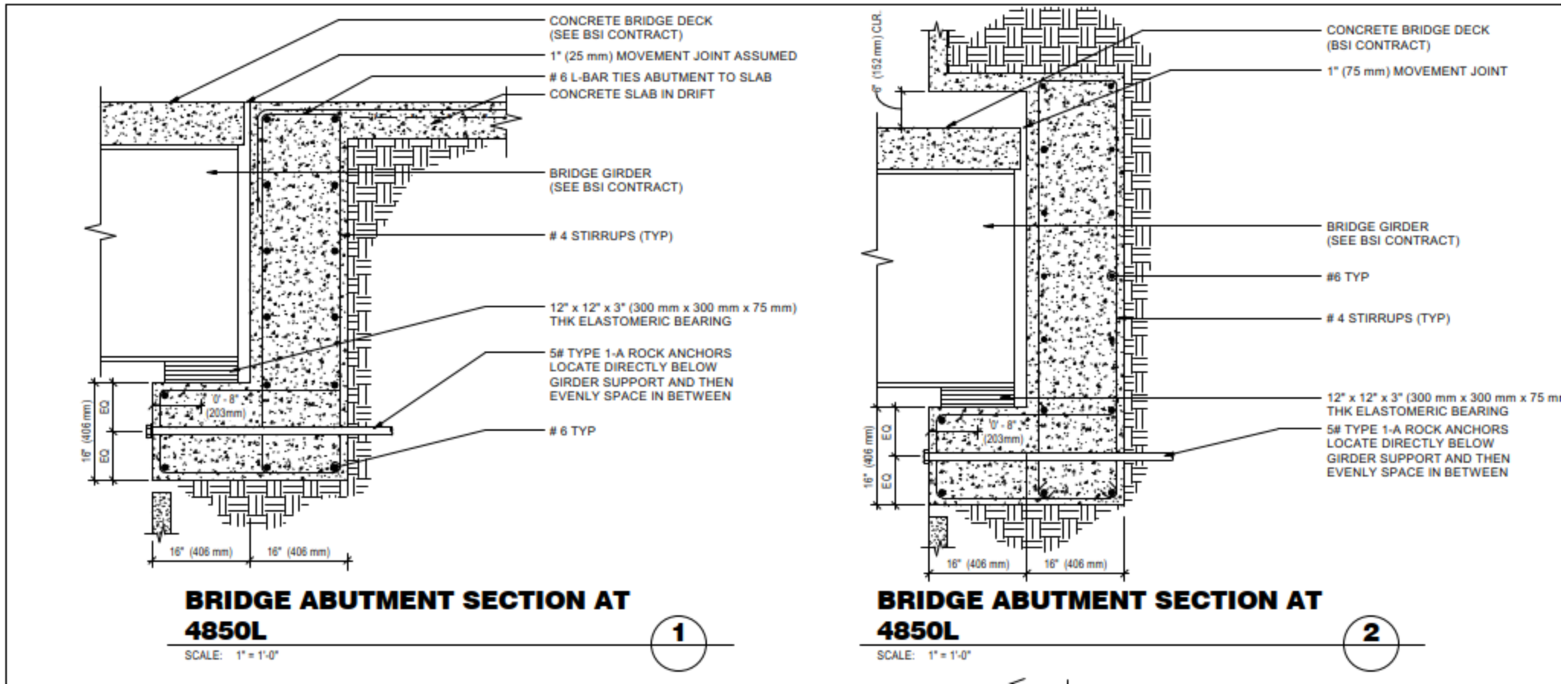
From current ARUP release

The stairs have been implemented in the latest from ARUP. They are working through the code requirements and interface with bridge and drifts.

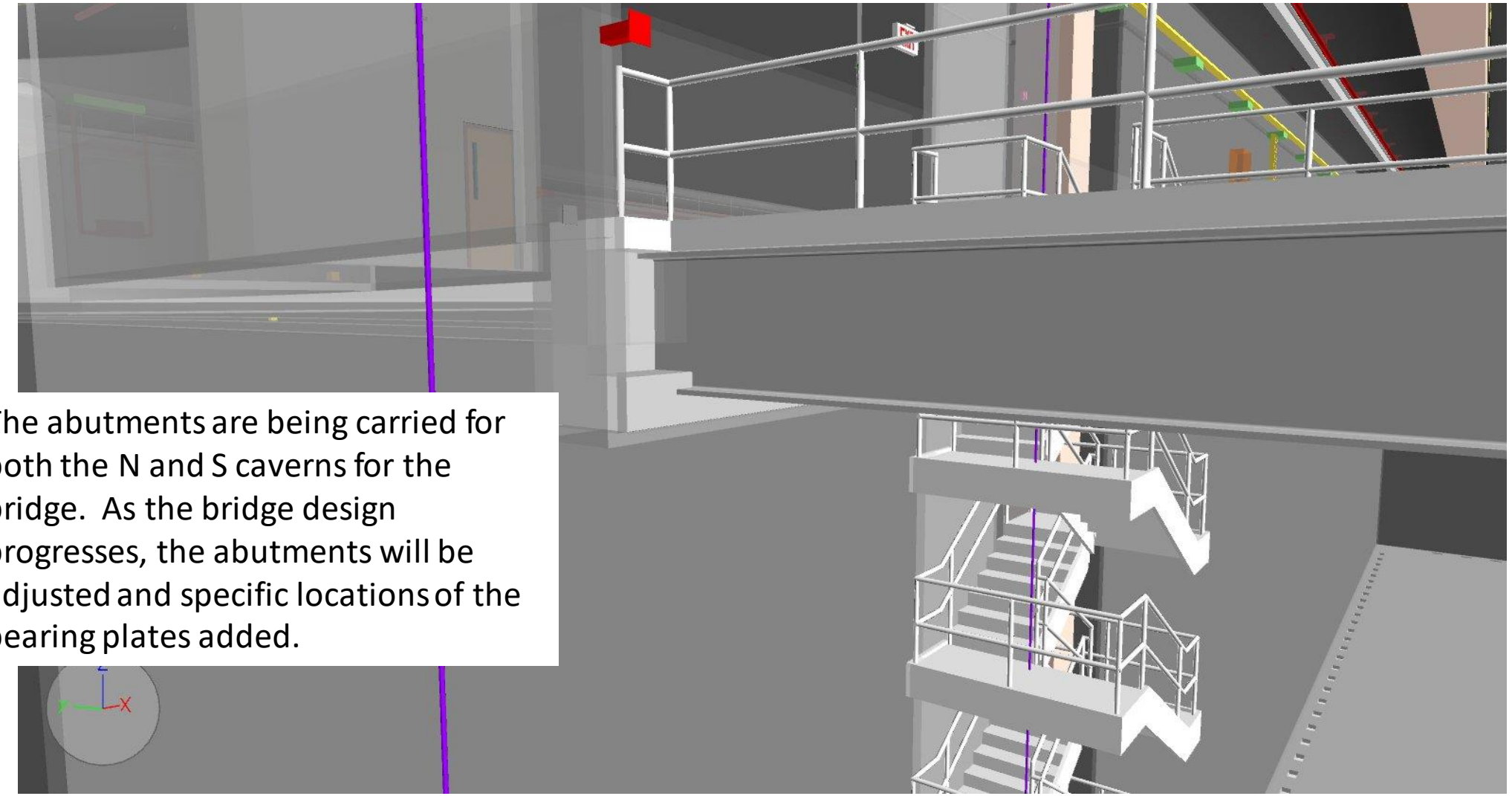
The same (mirrored on the CUC) location is foreseen for the south detector cavern.



Bridge abutments

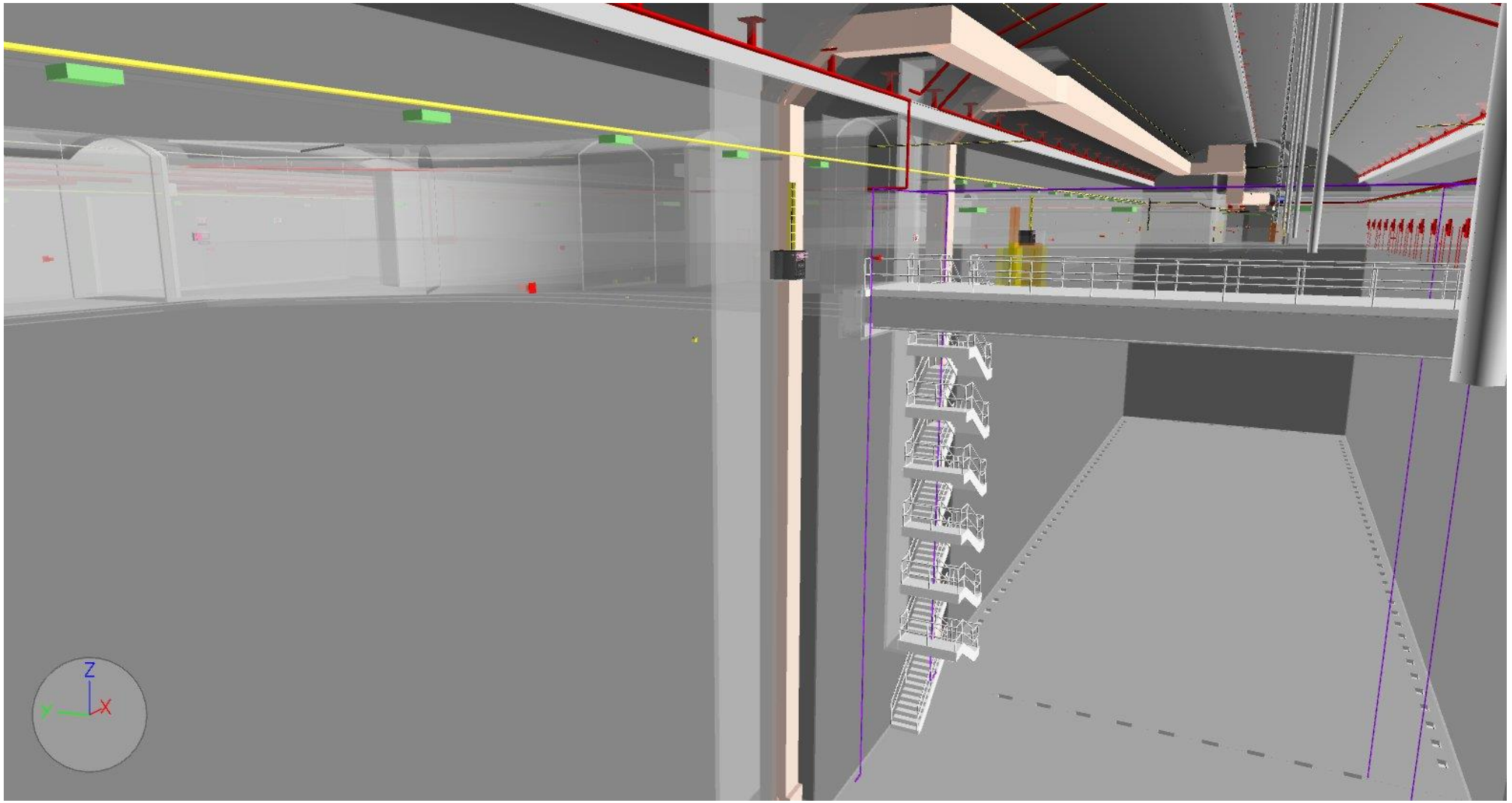


Current model

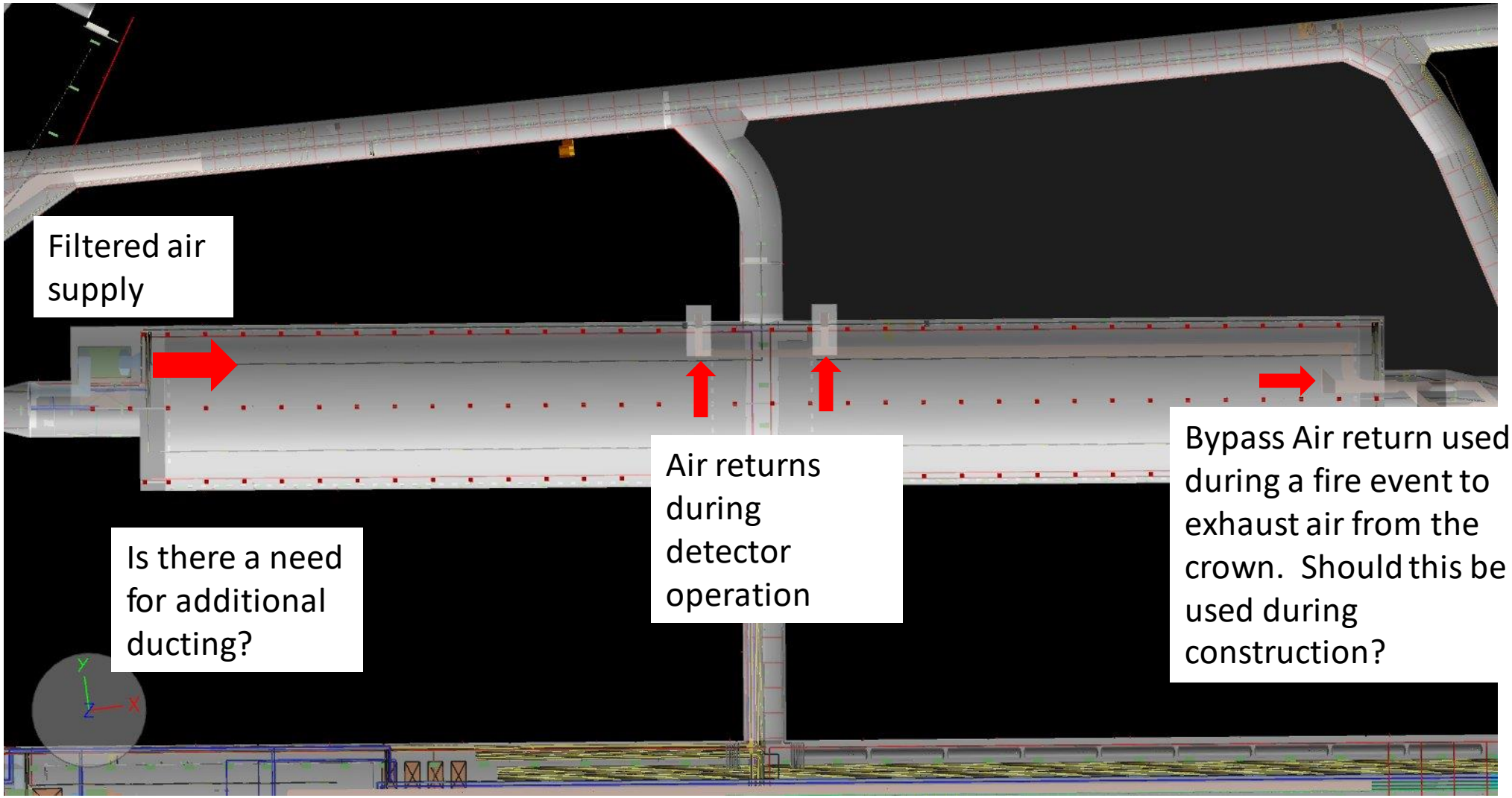


The abutments are being carried for both the N and S caverns for the bridge. As the bridge design progresses, the abutments will be adjusted and specific locations of the bearing plates added.

Ventilation

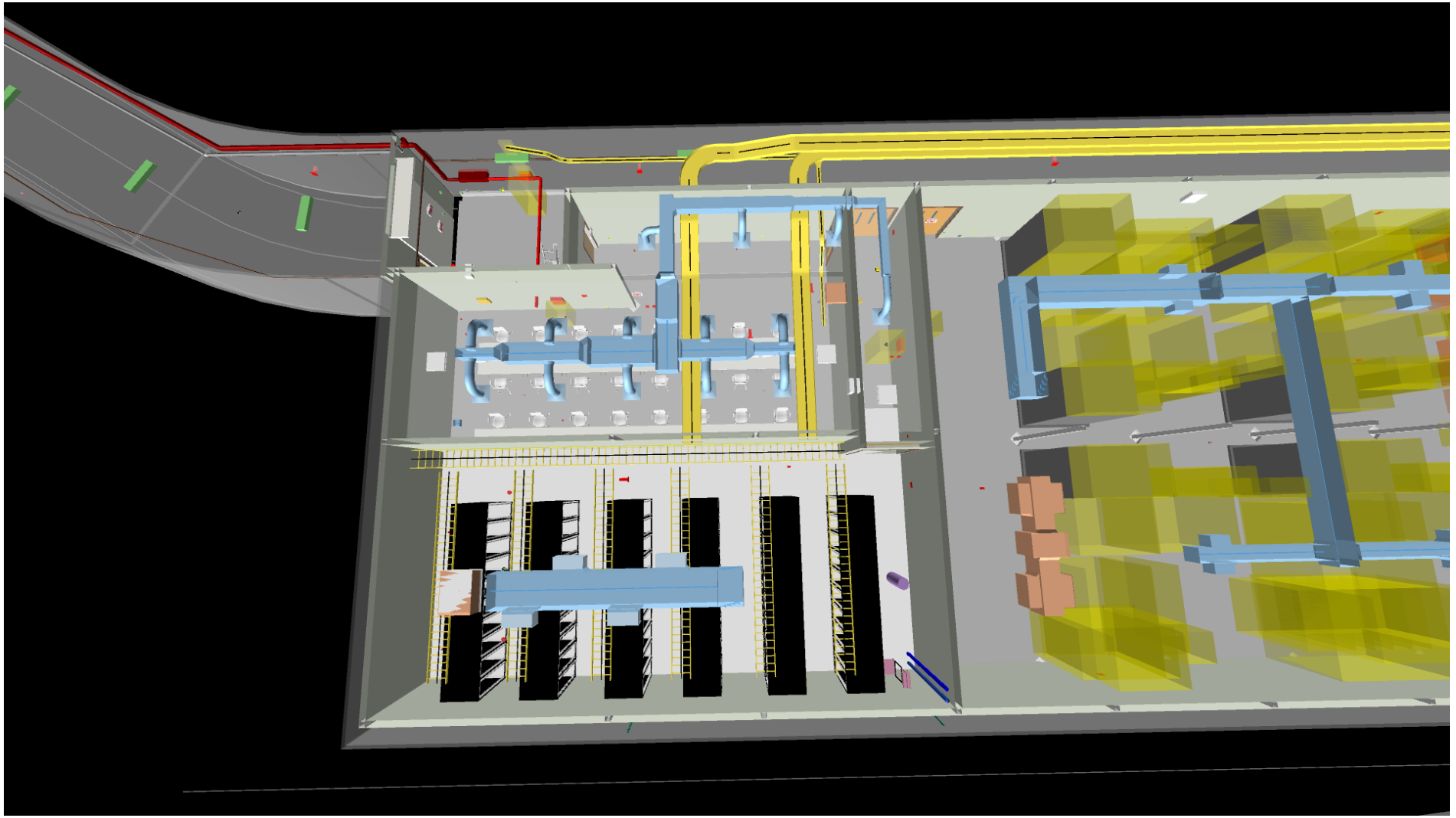


Ventilation consideration



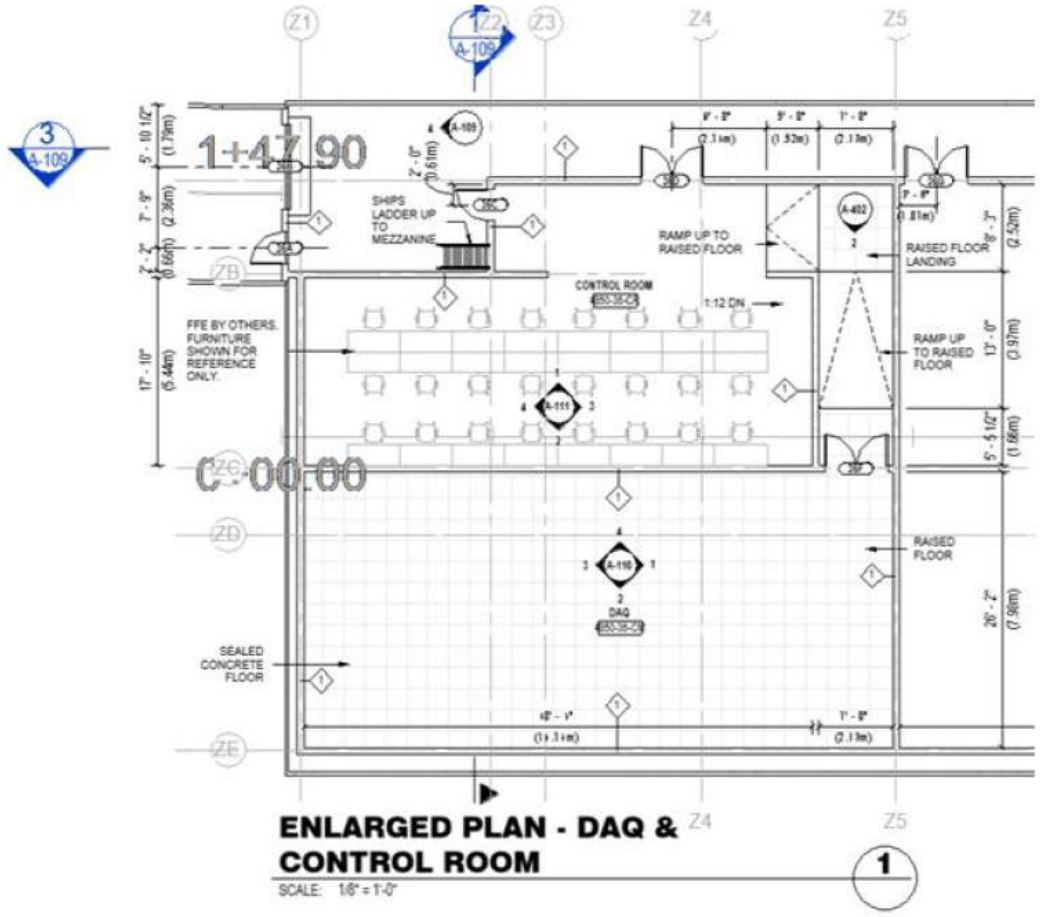
Experiment rooms in CUC update

The orientation of the DAQ room and experiment space has been returned to the 30% state. ARUP added a conceptional layout of the racks in the DAQ room. They have asked if we have an integration file that we can share with our models?



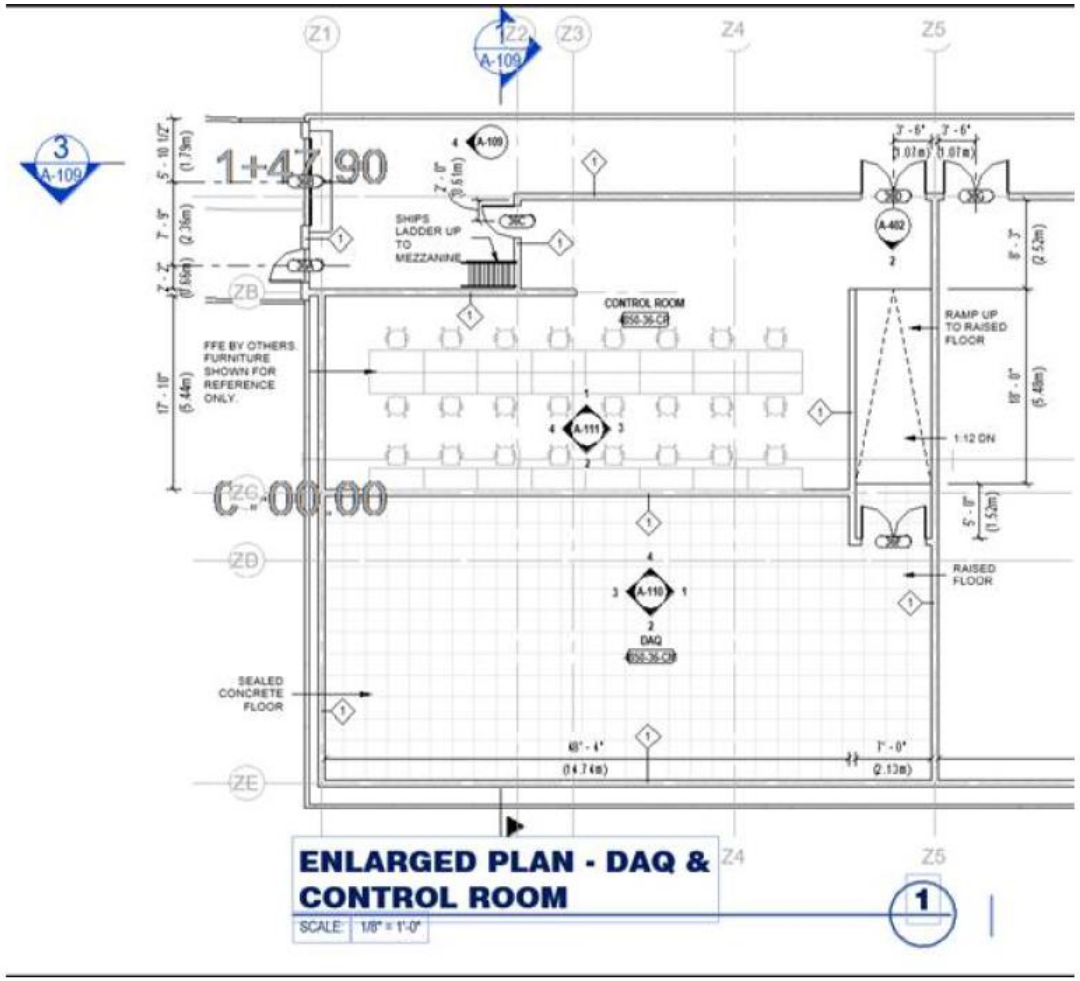
Ramp layouts and implications Option 1

1: This option utilizes the newly removed Kitchenette area to account for the extra length of ramp needed for the 18” raised floor. The benefit of this layout is there is no impact on the DAQ room. The downside is it requires a mid-landing, a 90 turn which may impede maneuverability of equipment up the ramp, as well as through and around the access door at the bottom of the ramp.



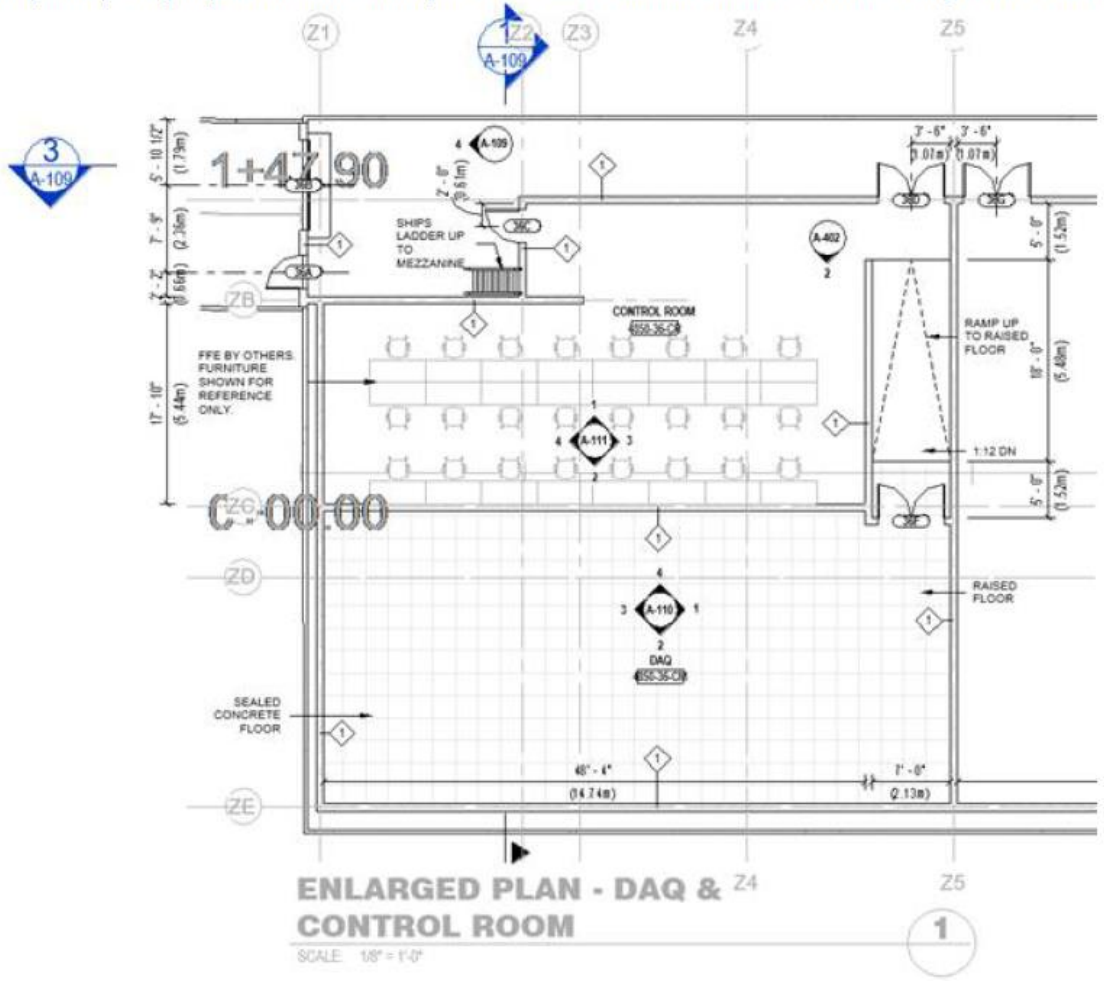
Ramp layouts and implications Option 2

2: This option utilizes space from the DAQ room to fit the entire length of the ramp in the same location as the 30% submission. The benefit of this is it keeps a straight run to the access doors at the bottom of the ramp. The downside is it encroaches on the DAQ room.



Ramp layouts and implications Option 3

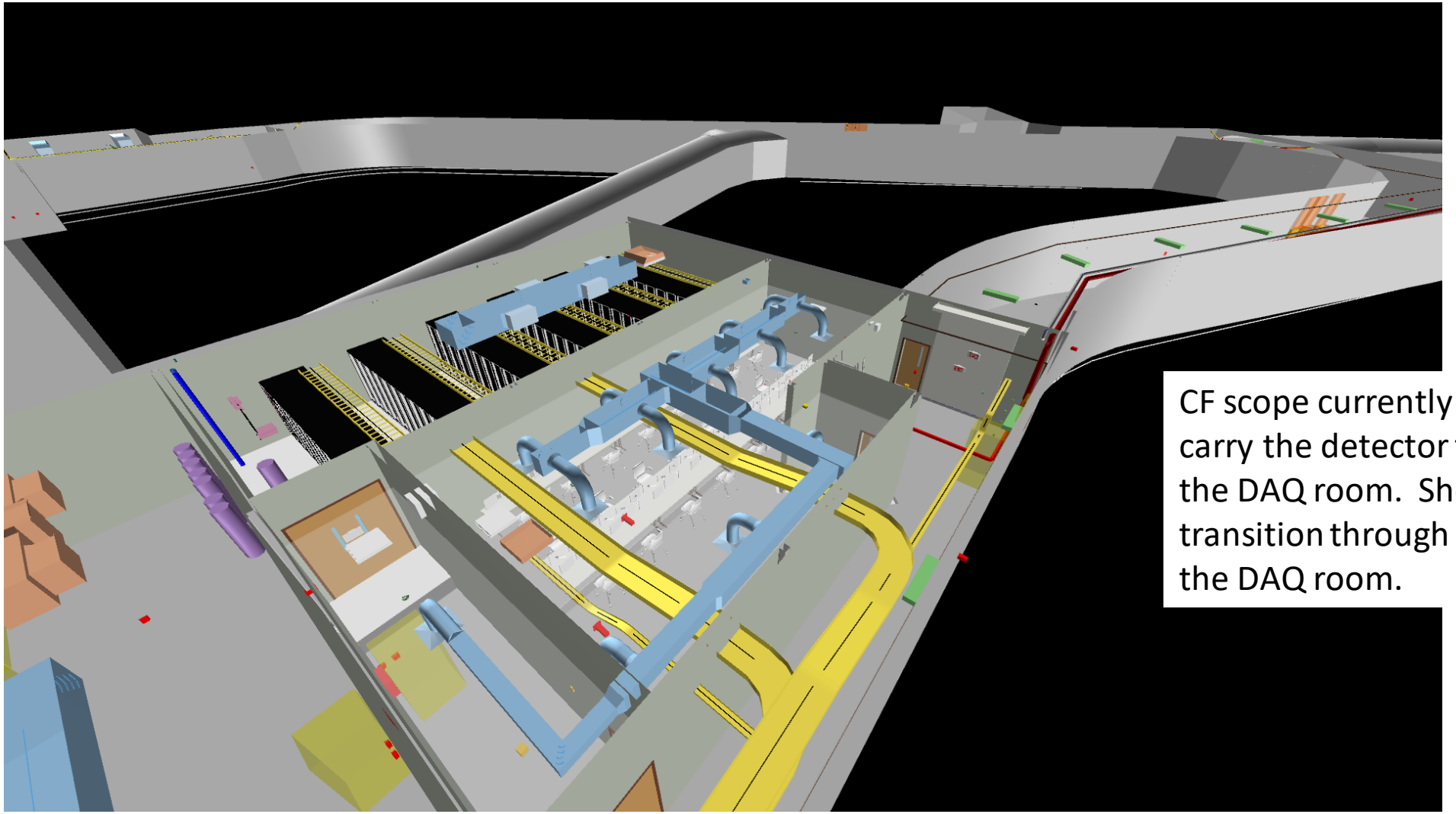
3: This option reduces the amount of space taken in the DAQ room by reducing the bottom ramp landing to 5’-0”. Though this lessens the impact on the DAQ room, it may really impact maneuverability near the access door at the bottom of the ramp where extra room may be desirable.



Ramp layouts and implications DUNE suggestion

- Remove the ramp and use small hydraulic platform to raise items. Have steps/stairs for personnel access.
- Code implications?
- Thoughts?

Fiber trays from N/S cavern to DAQ room

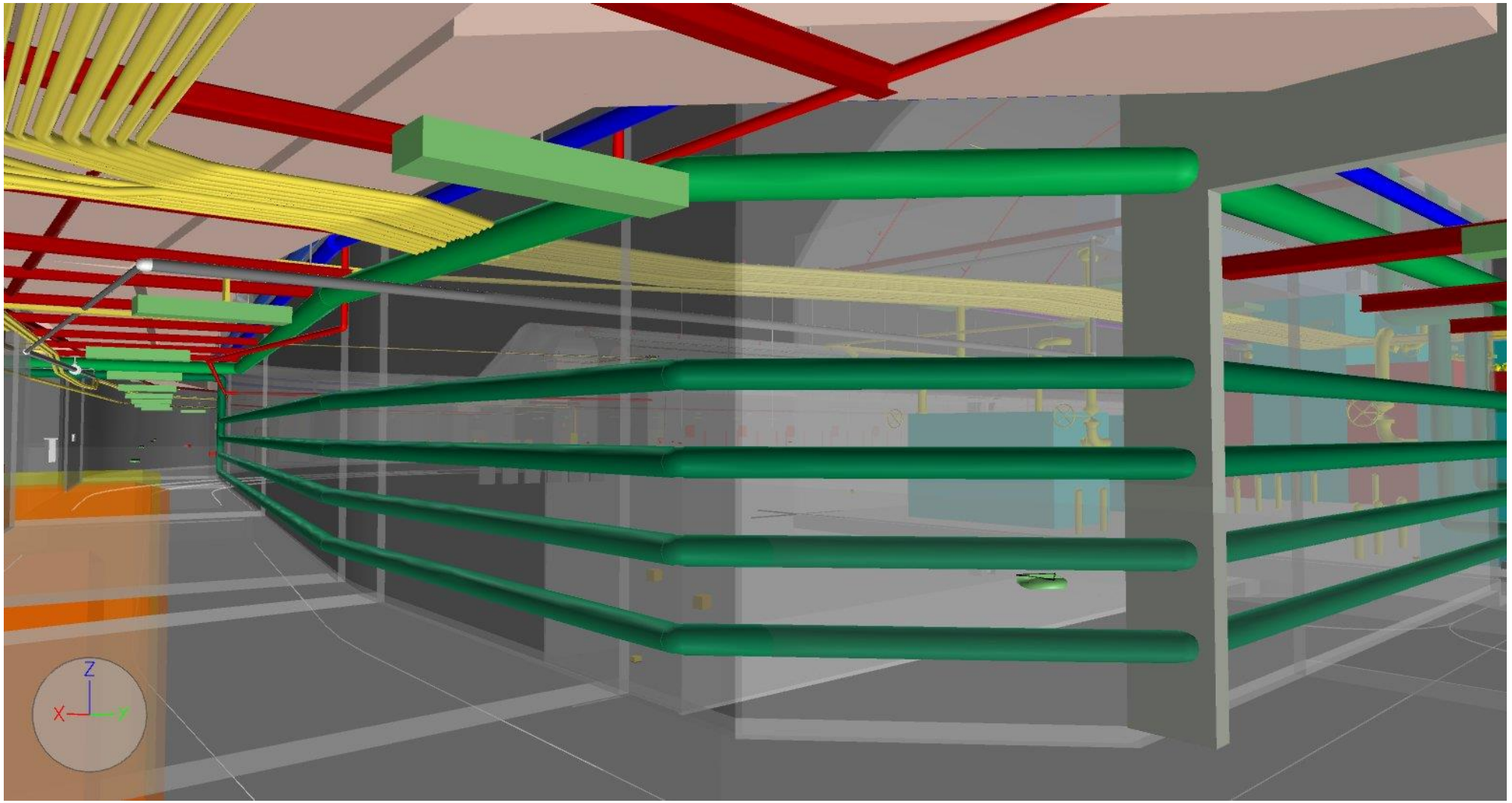


CF scope currently includes the cable trays to carry the detector fibers from the caverns to the DAQ room. Shown is the routing and transition through the experiment room into the DAQ room.

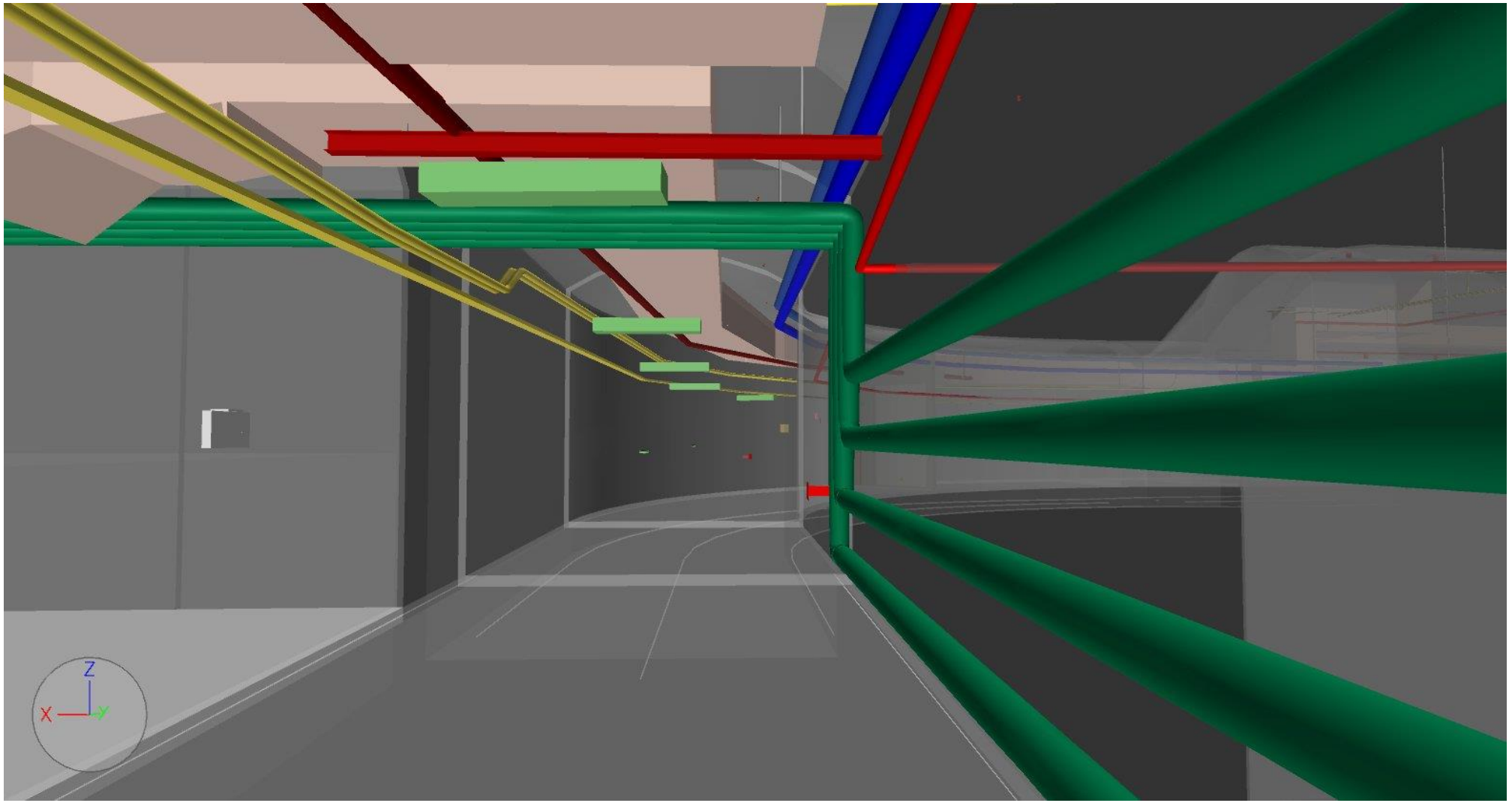
Cooling piping in the east drifts (CUC to spray chamber

To free up space in the crown of the drift for ducting, cryogenics piping, services, etc, ARUP is proposing to move the water cooling pipes to the wall of the drift.

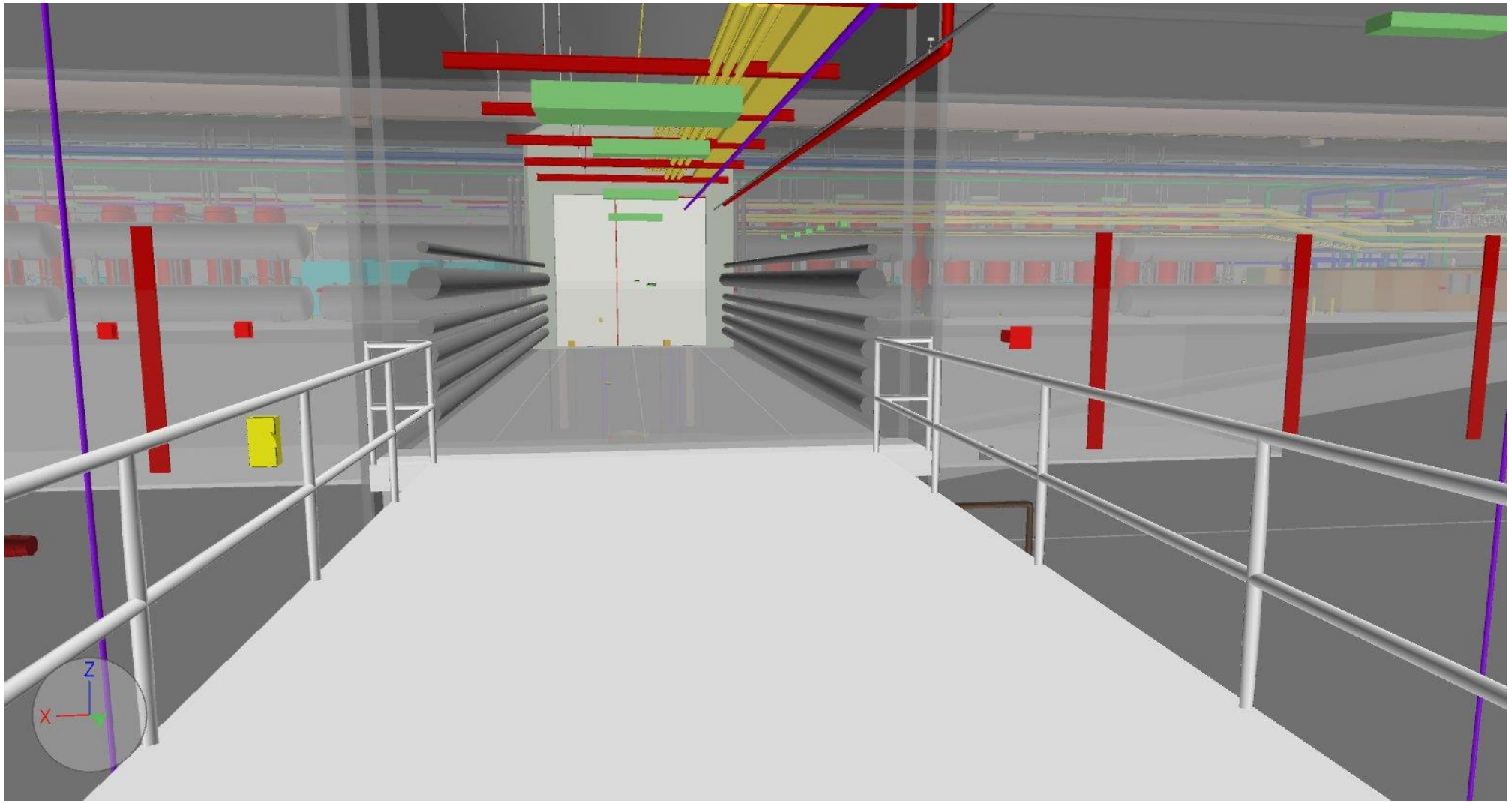
Piping cont.



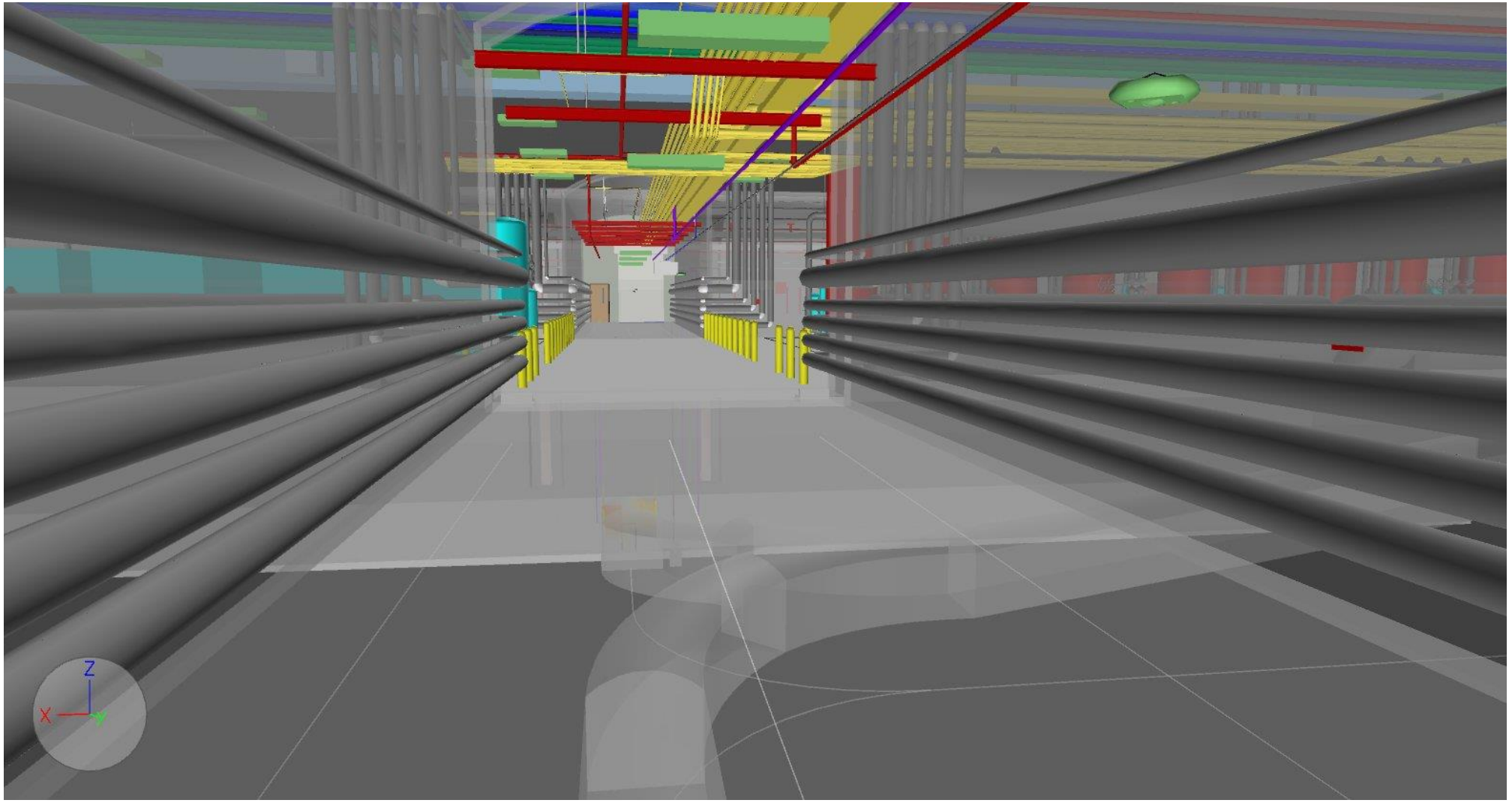
Pipe transition to the spray chamber



Updates from LBNF (cryo piping)



Cryo piping going to CUC



Transition into the CUC