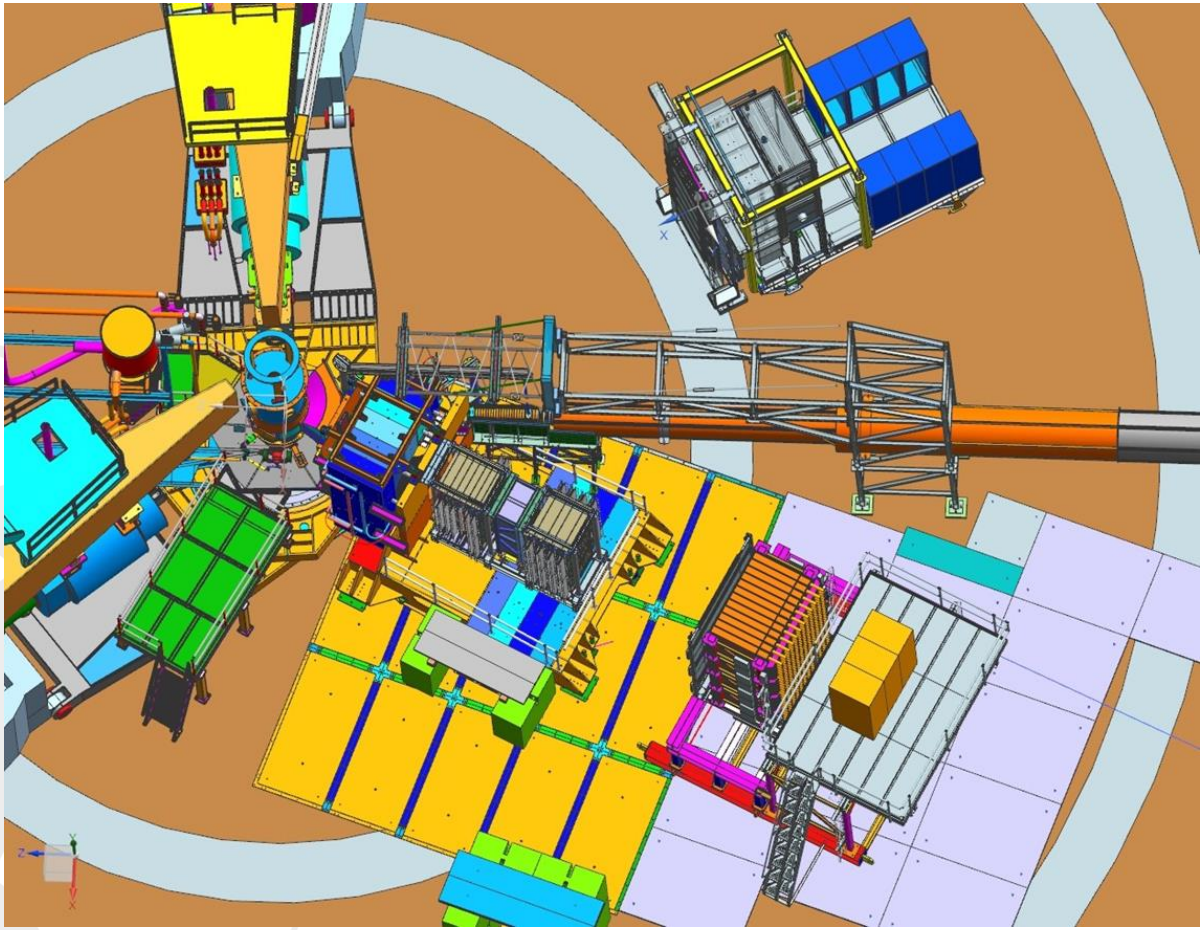
GEp Engineering/Design Status

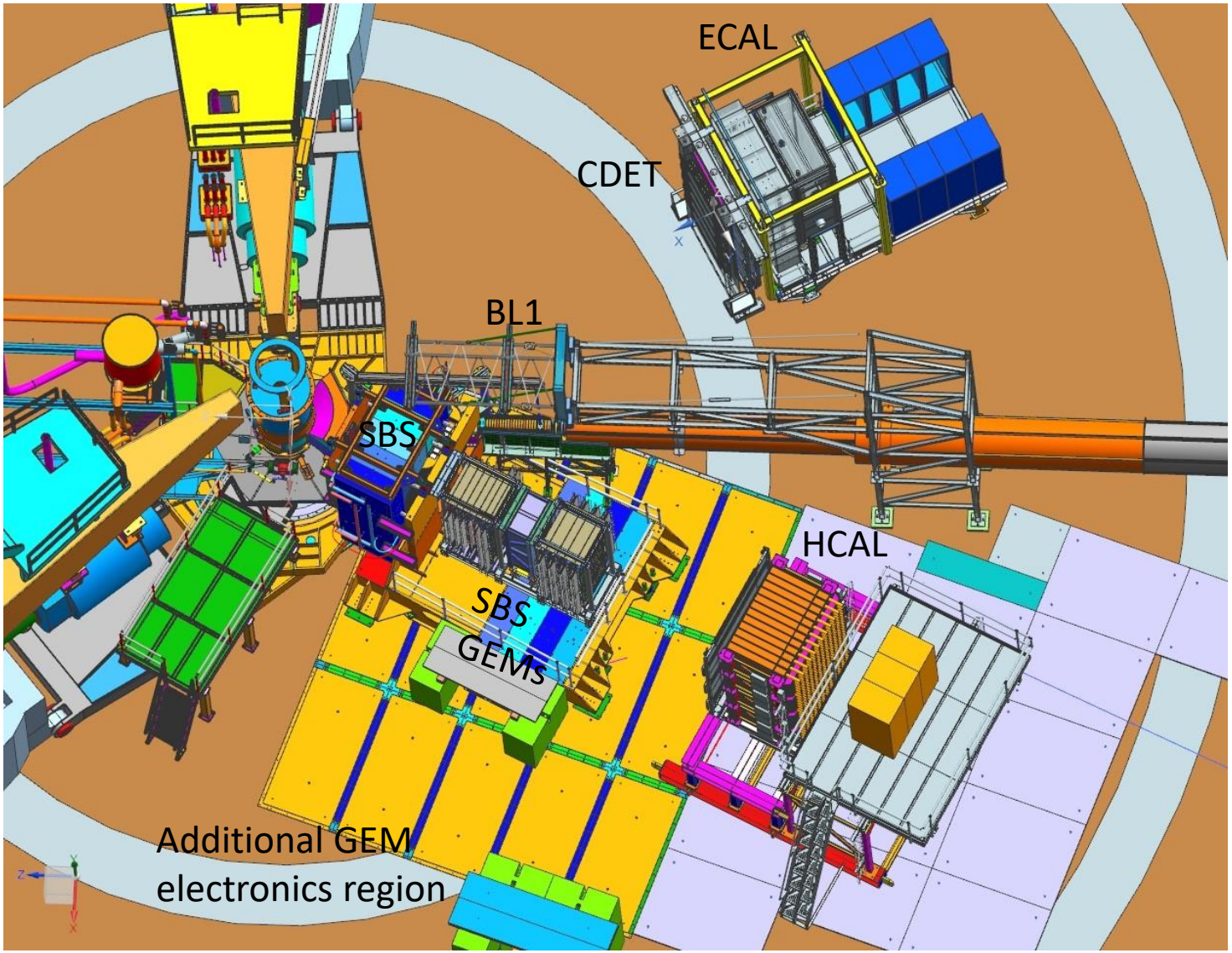


OLD IMAGE

Robin Wines

September 2024

GEp



Jefferson Lab

Kinematics

Date: 2024.08.01

SBS FF Kinematic Settings

GEp 07109 Hydrogen HRS-BR deg. 140.0°

NX ARR.	Energy	Q² GeV²	BB deg.	BB m	SBS deg.	SBS m	HCAL deg.	HCAL m	HRSBL deg.	B line	Flr. Layout	ECAL deg.	ECAL m
GEp-1	6.4	5.7	N/A	N/A	25.7°	1.6	see SBS deg.	10.0	95.0°	1	B	29.47°	8.0
GEp-2	8.5	8.1	N/A	N/A	22.1°	1.6		10.0		1	B	27.27°	6.5
GEp-2a	4.4	N/A	N/A	N/A	28.5°	1.6		10.0		1	B	35.0°	5.0
GEp-3	10.6	12.0	N/A	N/A	16.9°	1.6		10.0		1	B	29.25°	4.7

Note: Pivot Center to Gep Tgt Ctr = 6.5", also all distances are from the GEp tgt gtr., not the Hall/Pivot center.

Table Edits

CHNAGES
NEW

From: Mark Kevin Jones <jones@jlab.org>
Sent: Tuesday, July 30, 2024 8:42 AM
To: Andrew Puckett <puckett@jlab.org>; Bogdan Wojtsekhowski <bogdanw@jlab.org>; Robin Wines <wines@jlab.org>; Lawrence Hurt <lhurt@jlab.org>
Subject: beam schedule

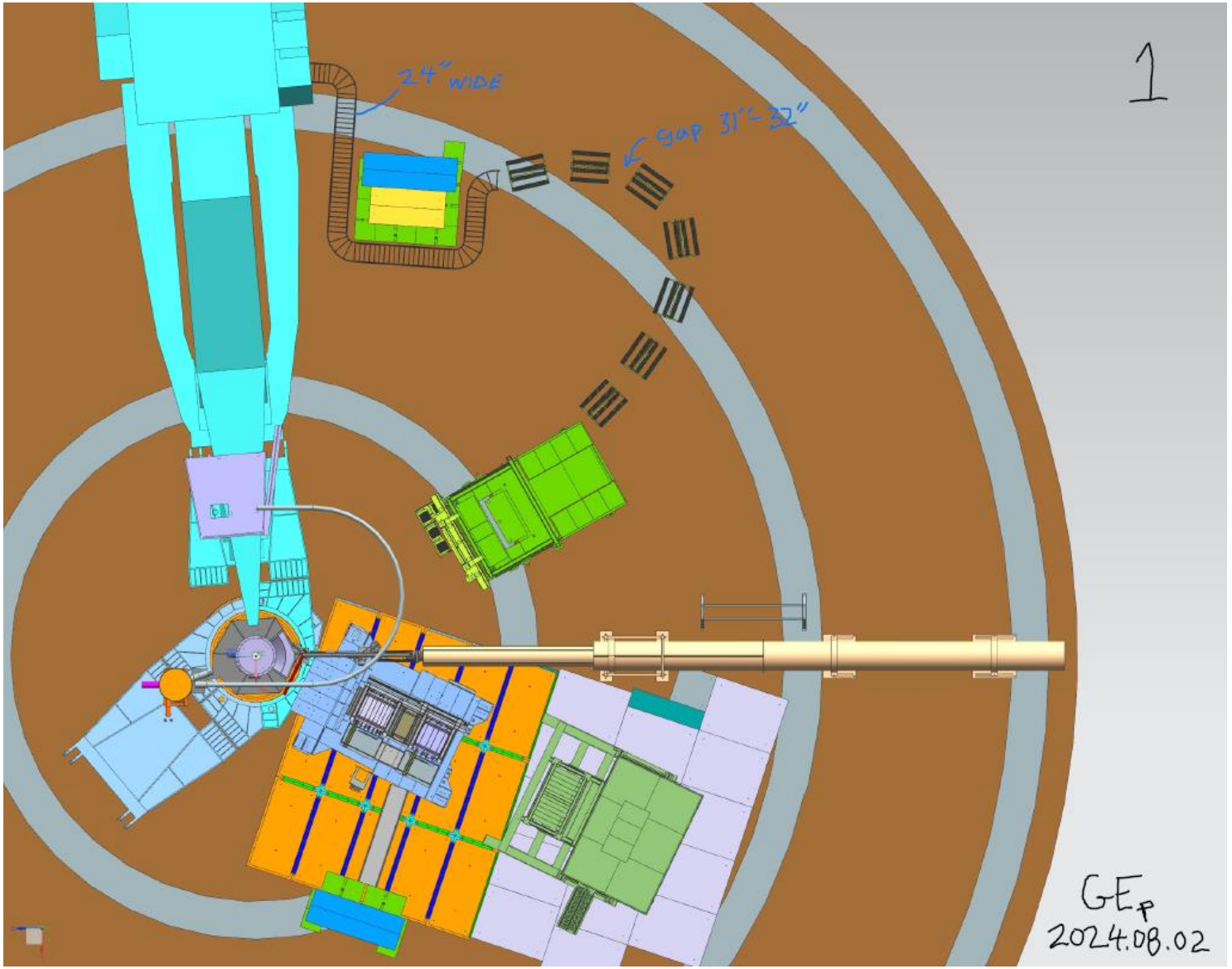
Hi,

I have been setting up the beam schedule with Doug. I have put the low Q2 2pass point after we have run the 3 pass and then 4pass Q2 points. This would mean that we would need to move the SBS back to 28.5 from 22.1 . Having the 2pass point later hopefully means that the system is understood and we can reach the high precision. I have also put in 4 week days for each kinematic change.

Kinematic settings

Setting	Ebeam	Q2	P_p	Theta_p SBS ang	E_E	Theta_E ECAL ang	~~SBS dis~~ ECAL
1	6.4760	5.732	3.8810	25.70	3.422	29.47	8m
2	8.5880	8.127	5.1847	22.100	4.257	27.27	6.5m
2a	4.359			28.5		35.0	5m
3	10.6880	12.039	7.29	16.9	4.273	29.7	4.7m

GEp-1



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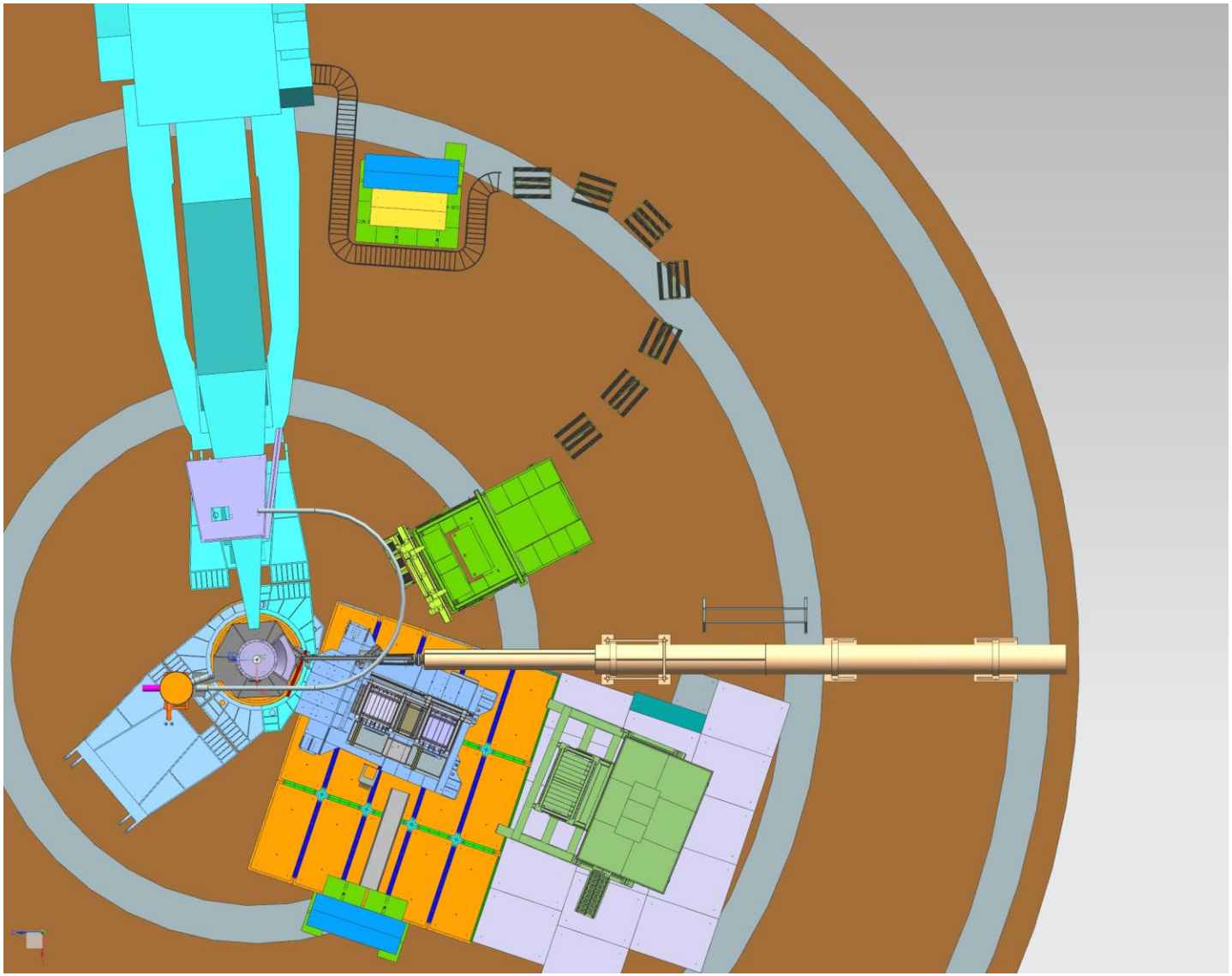
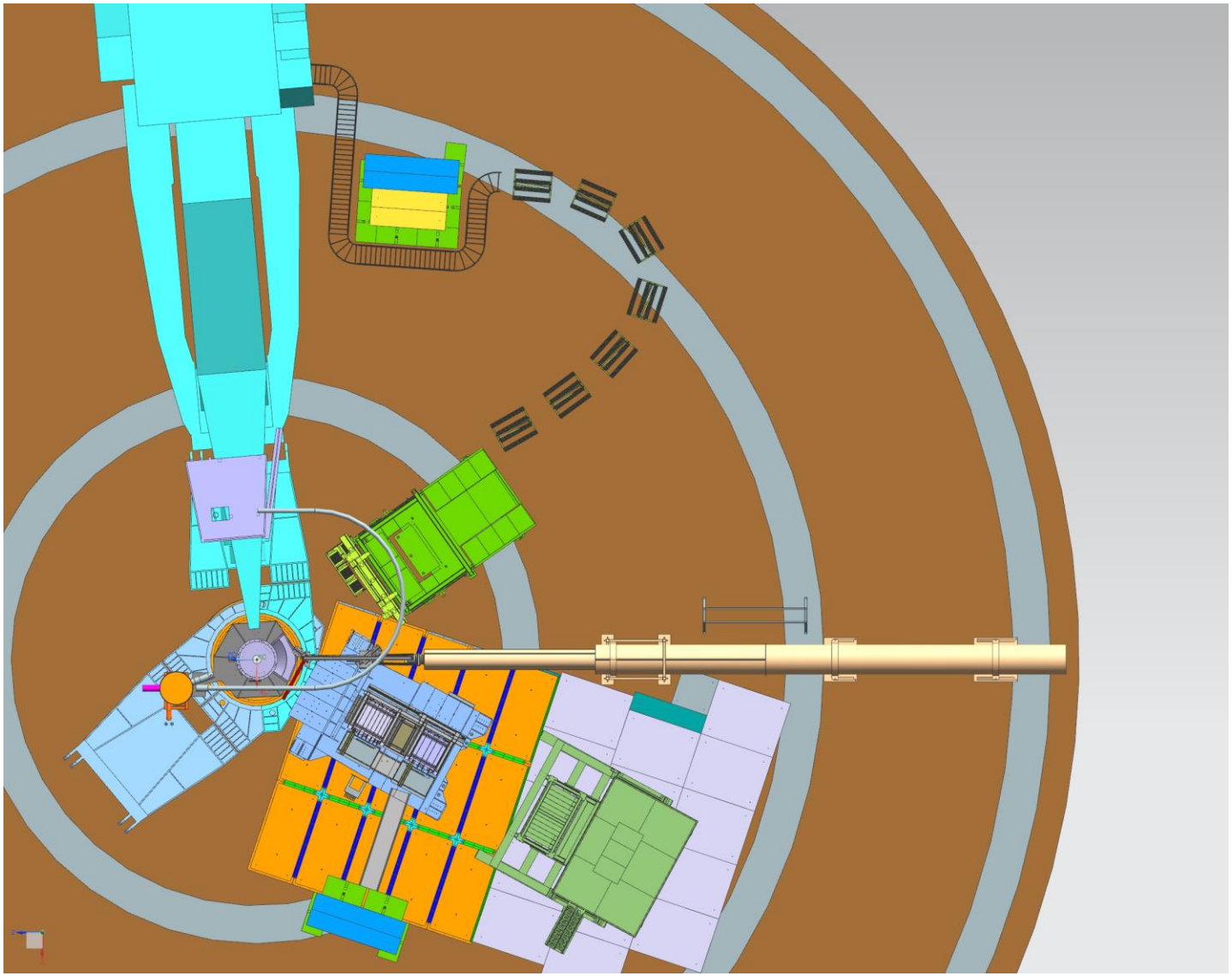
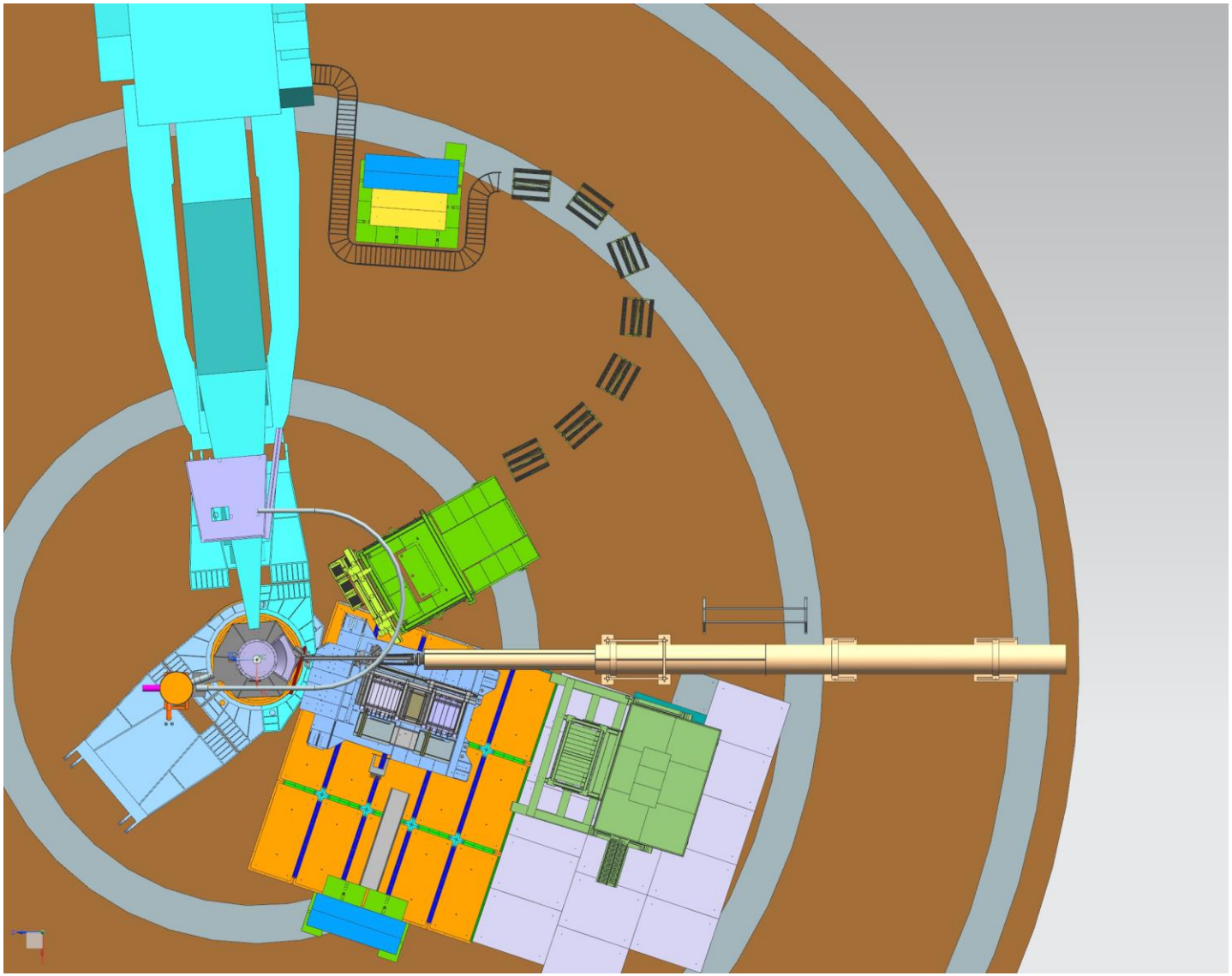
GEp-2



GEp-2a

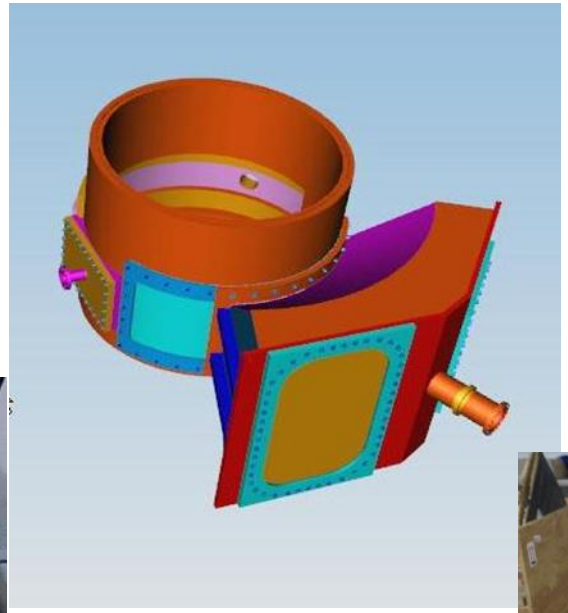


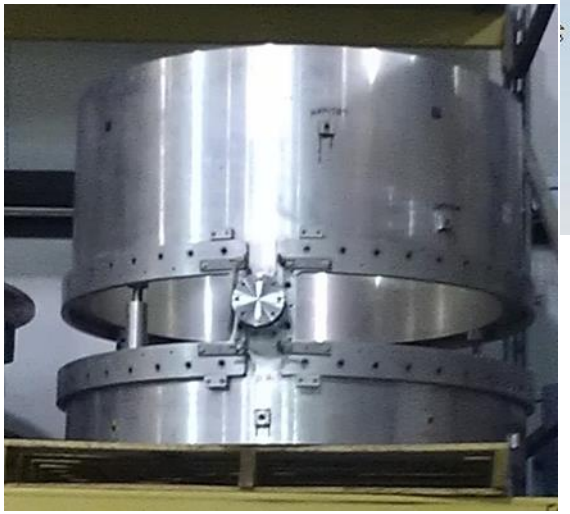
GEp-3



Target

- Pivot platform needs to be modified to allow clearance for configurations
- Windows need to be tested, plan to complete test by end of September.
- Snout to be supported with jack stands.
- Coordinating rotation of chamber, target install and snout fit test now.

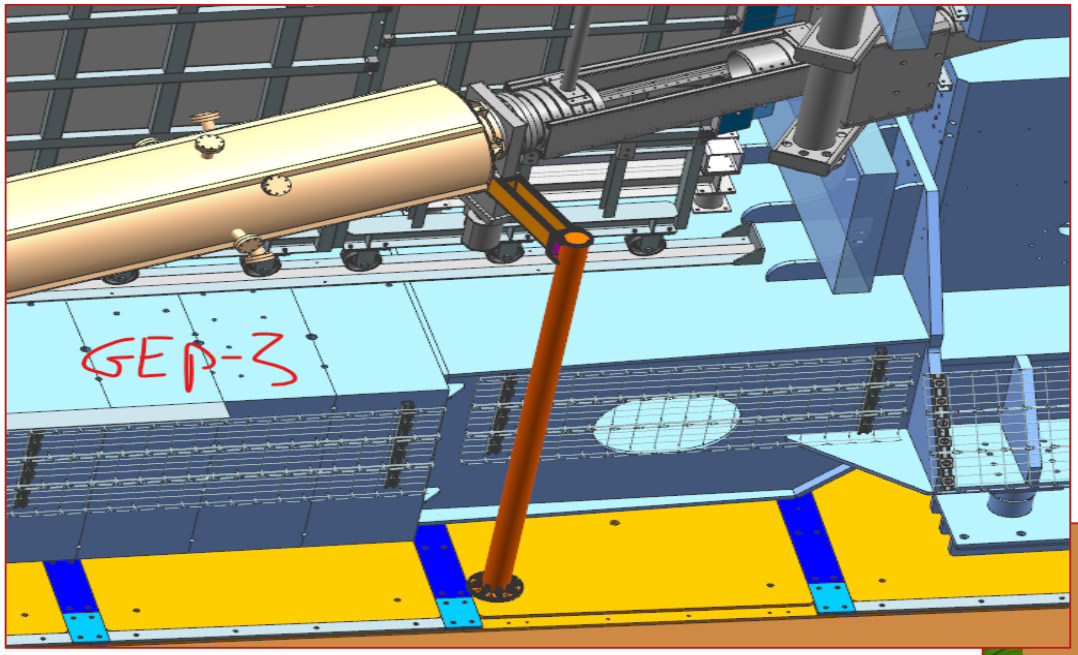


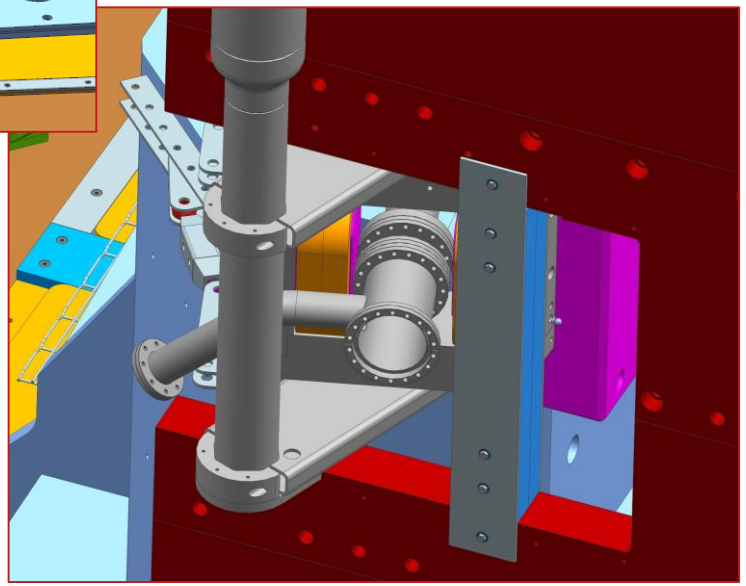


Target Chamber

Vacuum Snout

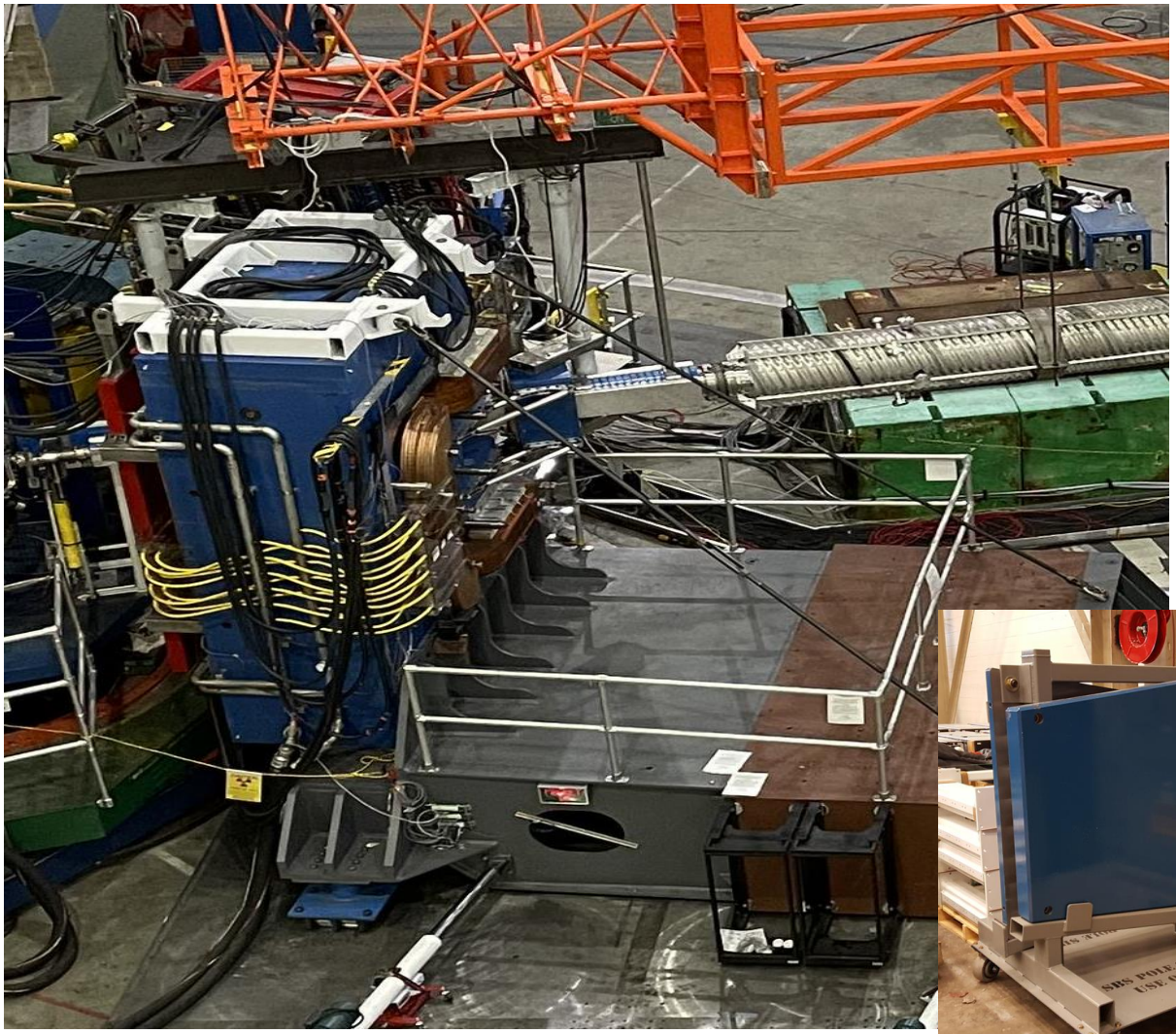
Downstream beamline





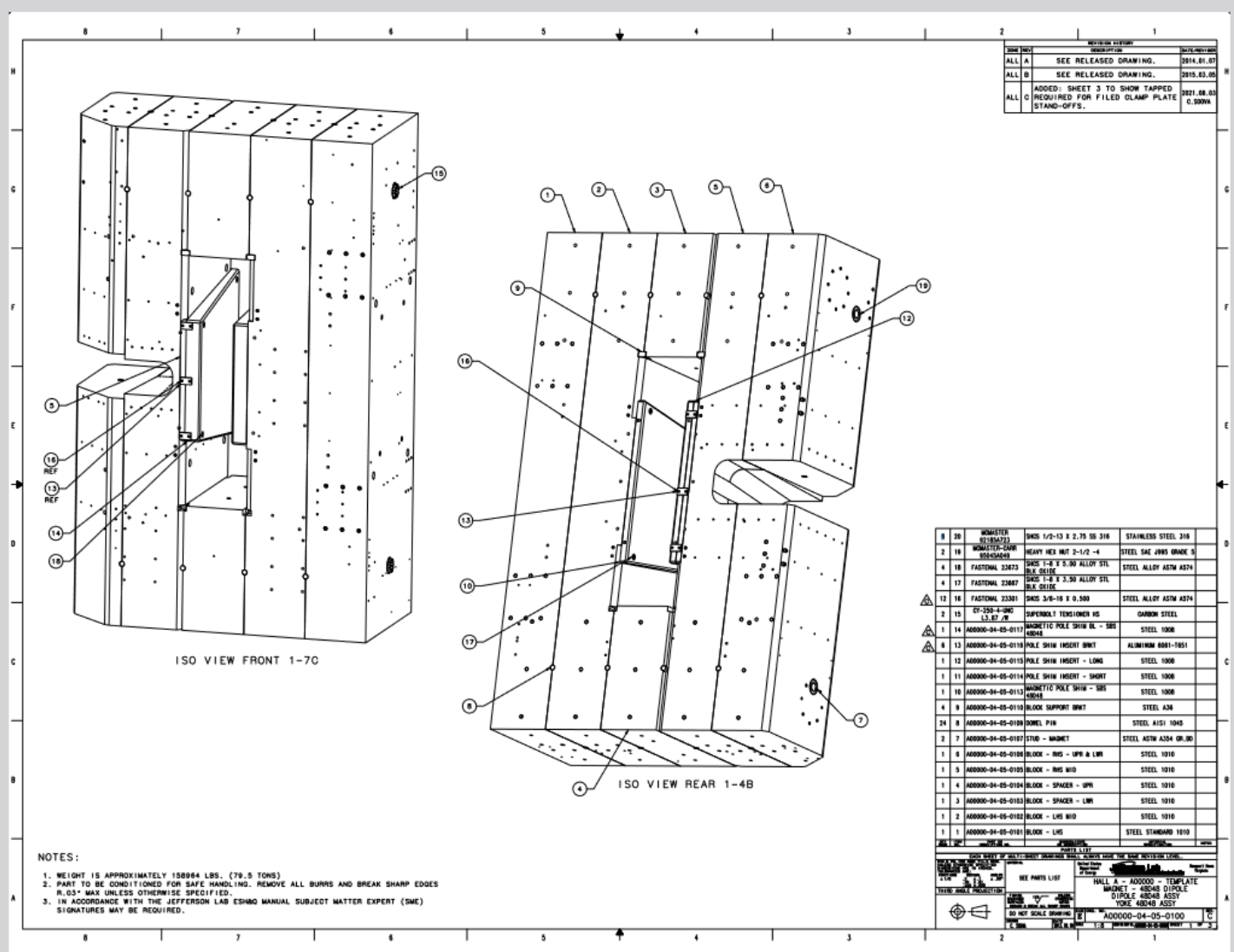
- Gate valve needs support post fabricated.
- All parts in-house for differential pumping section- needs assembly- Target group/Hall A technicians. Bellows needs 4 tabs attached to each conflat.

SBS Magnet, Pole Shims and Field Clamps



- Existing SBS magnet will be needed with all coils powered, both field clamps on and pole shims inserted.
- Are SBS Magnet and Corrector settings tabulated?

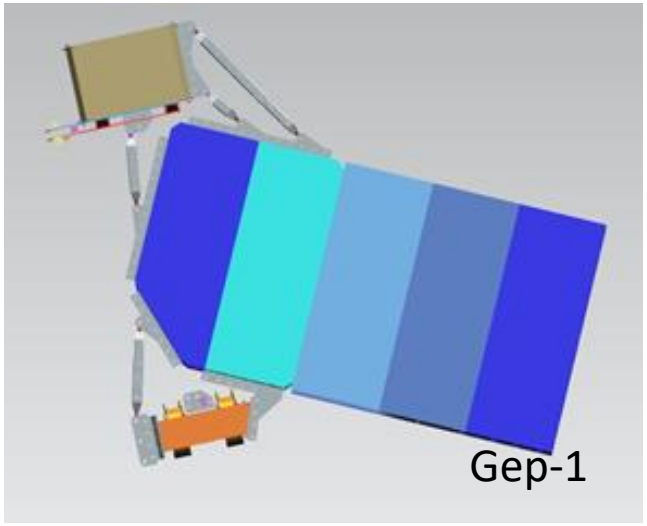
Pole Shim Inserts

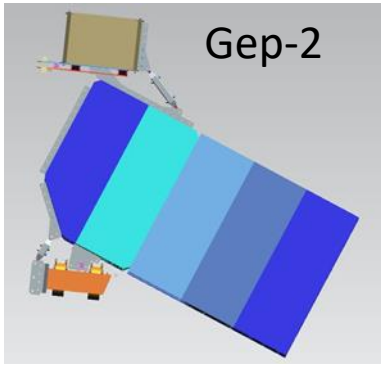


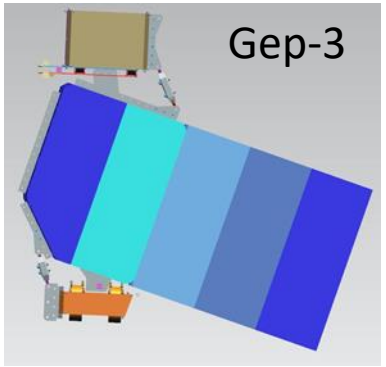
Pole shims are installed.

Correctors

- Existing correctors to be used with existing Beamline-1(BL1) configuration.
- Corrector braces in-house for GEp 1,2 and 3. GEp-2a analyzed and designed, existing piece is being modified.

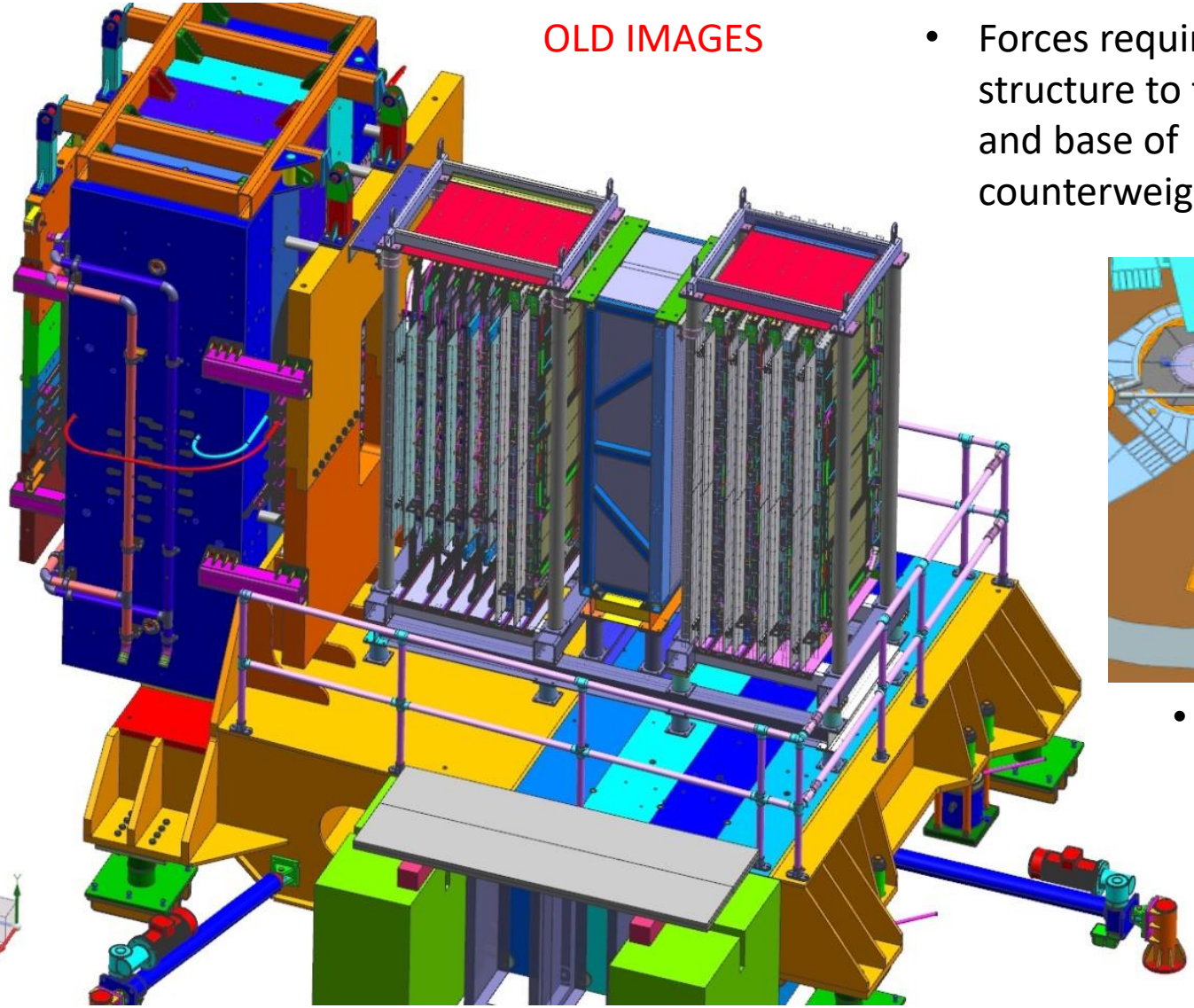




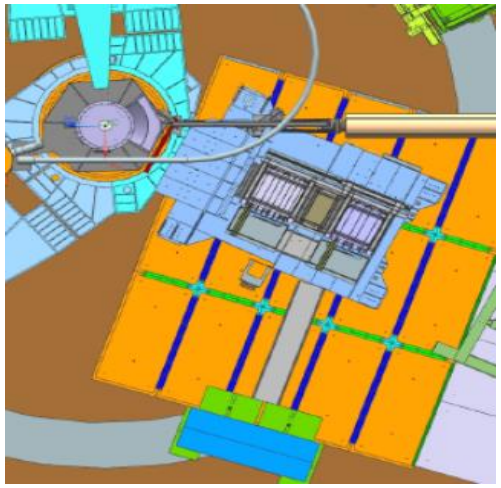


SBS Detector/GEMs

OLD IMAGES



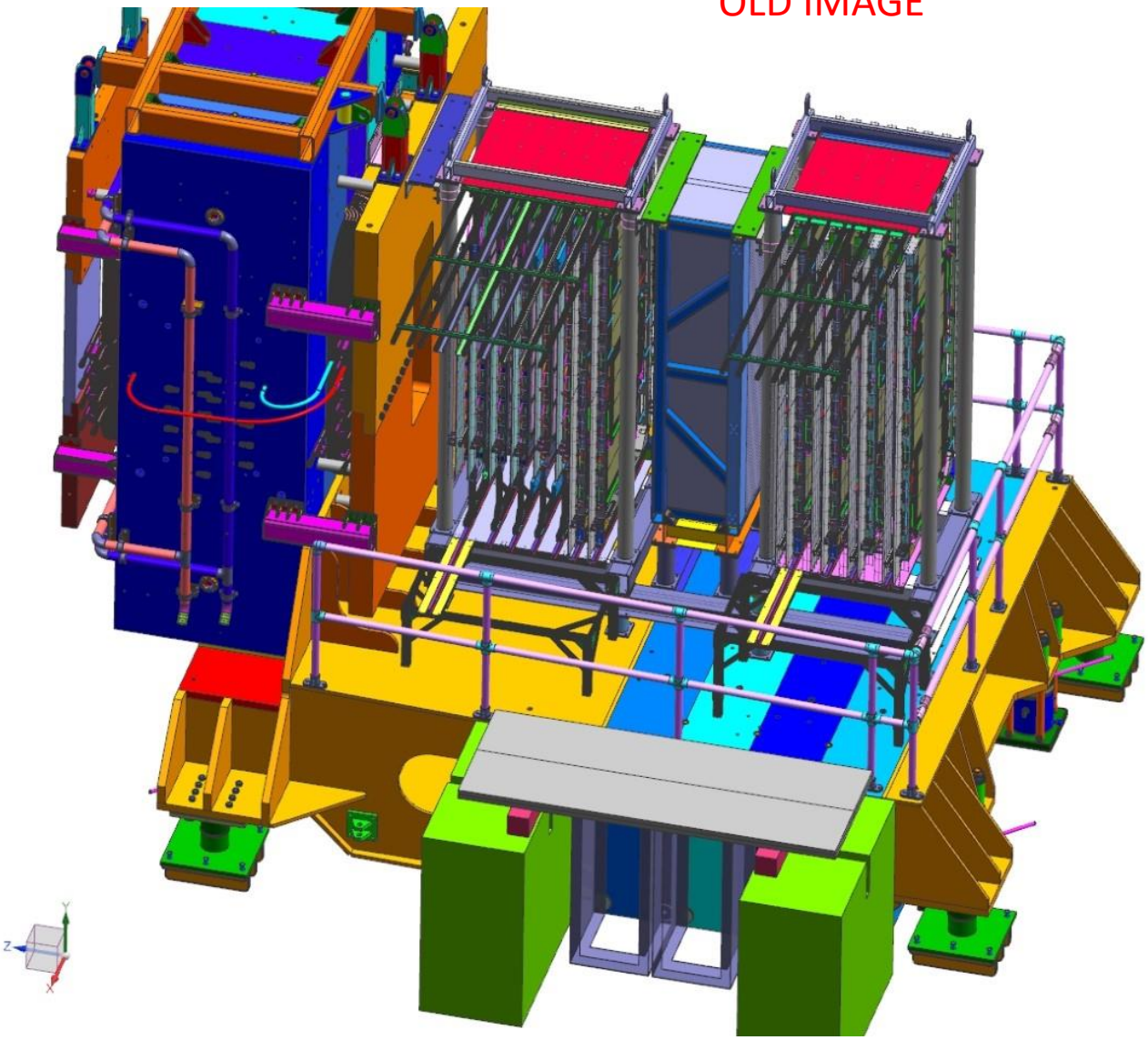
- Forces require bracing of structure to field clamp and base of counterweight structure.



- Cables to run at CW surface height to hut. Need support for cables across floor and cover on CW area

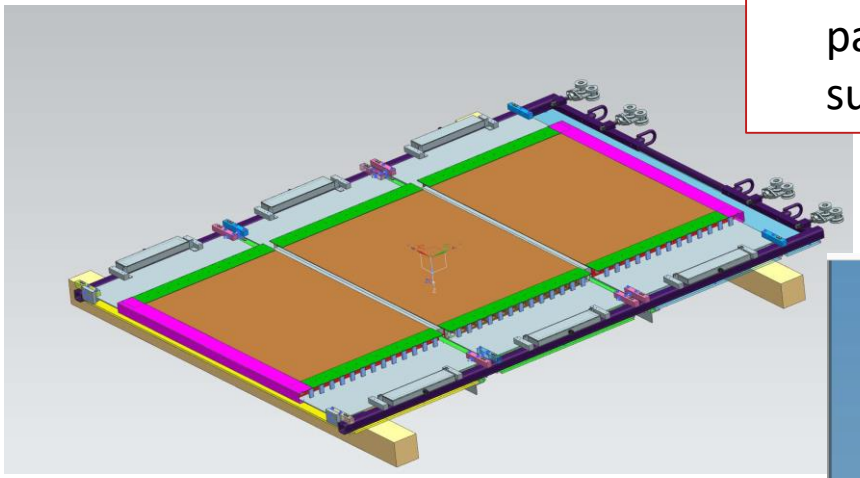
SBS Detector Access

OLD IMAGE

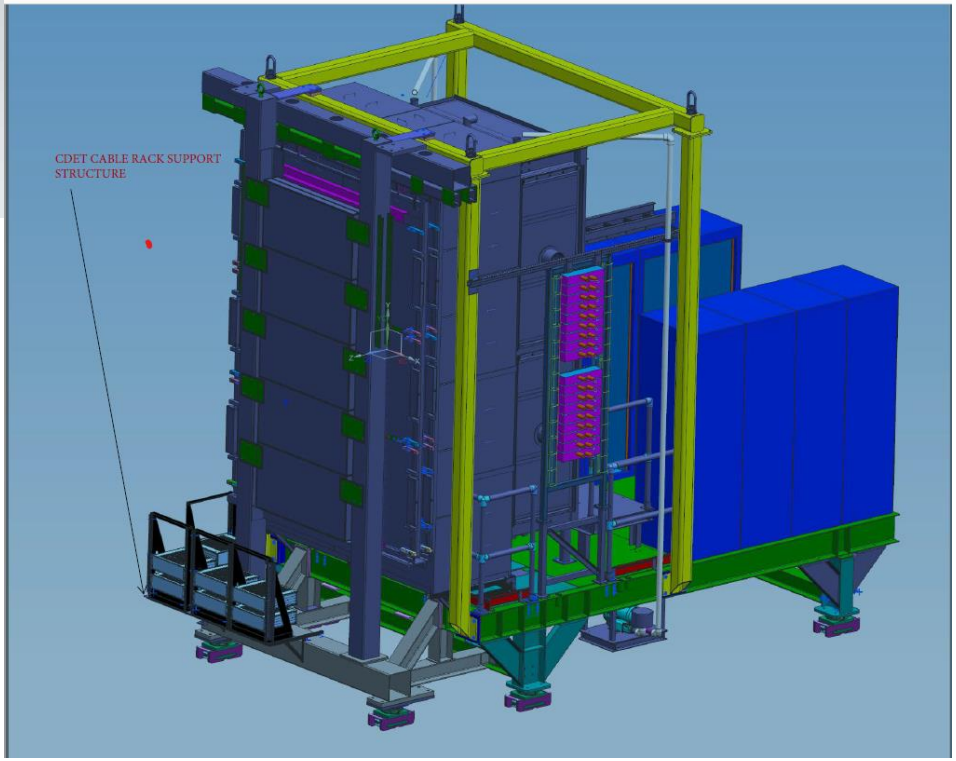


- Detector access remains an issue.
- Trying to configure a fall protection method.

CDET

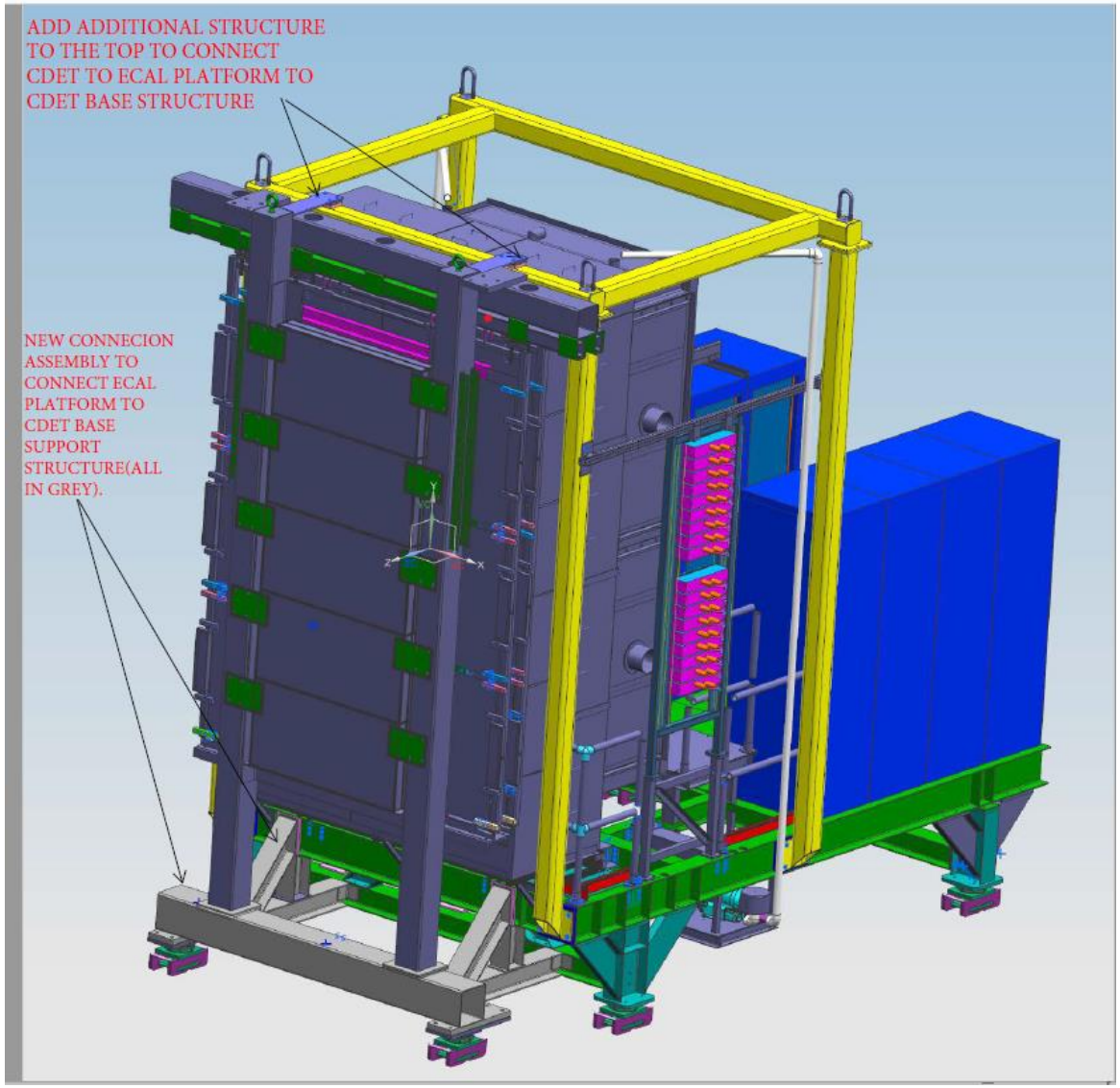


- CDET panel support frame with lifting panel needed for lifting/rotating support. Need to order lifting panel.



- Original frame to be cut to fit through truck ramp.

ECAL and CDET

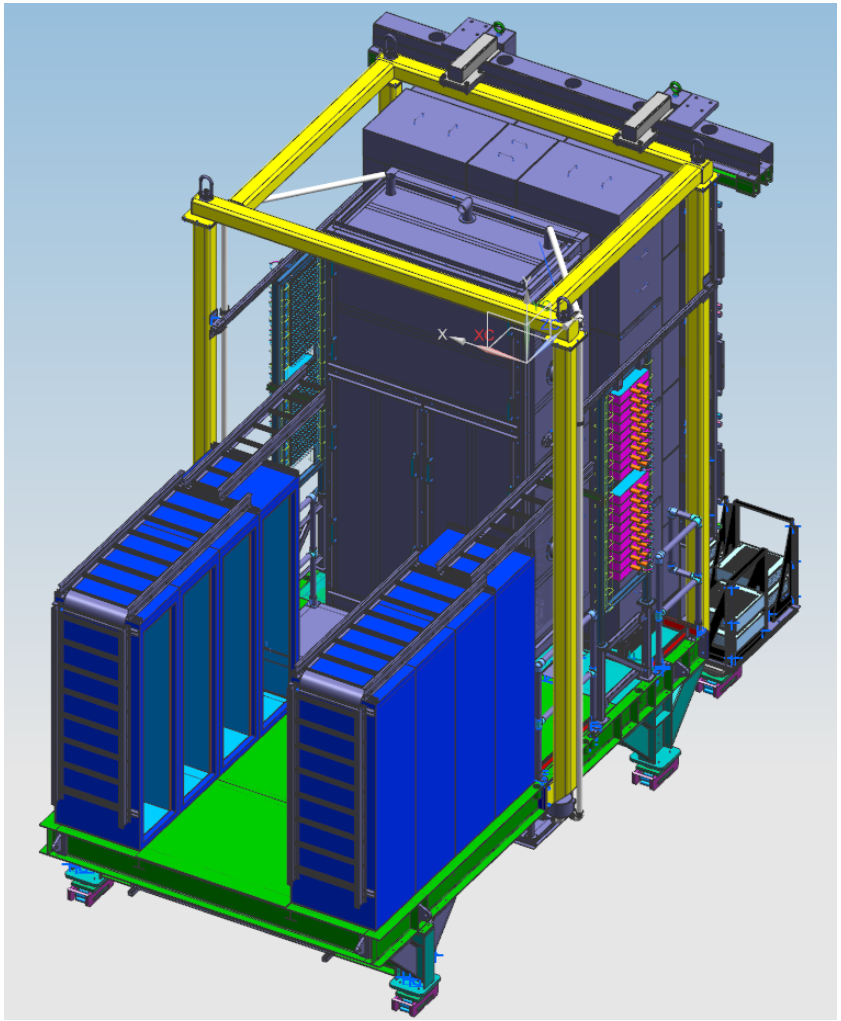


- Constraints in Hall require ECAL and CDET to move together. New supports being designed to connect two detectors and allow motion on Hilman rollers.
- Analysis complete, creating drawings to fabricate.
- Also need anchor points determined for moving into different configurations.
- Goal to have structures modified by end of September for CDET assembly to start.
- Assembly of CDET frame to ECAL frame to be determined by detectors.
- Need stops for fixing positions.

ECAL

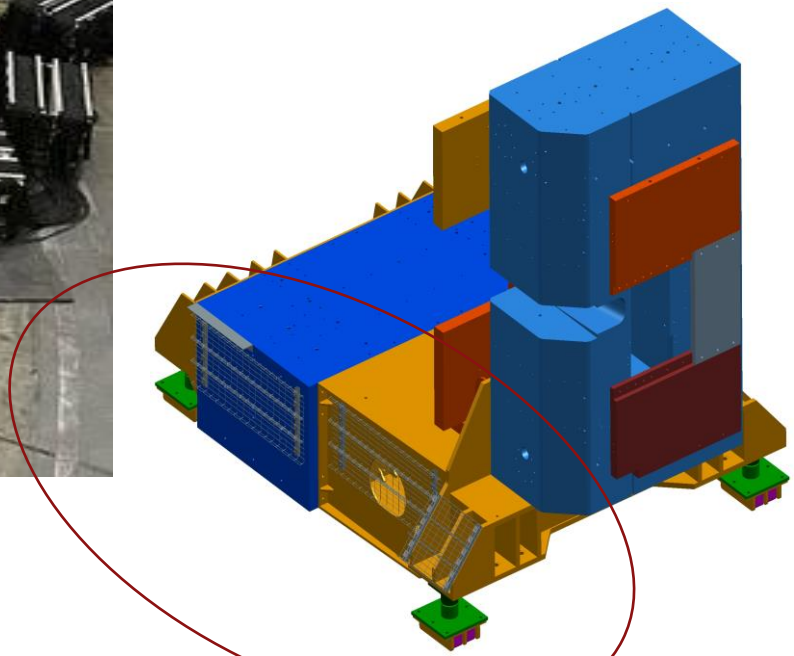
- Adding new cable tray routing

For signal cables.

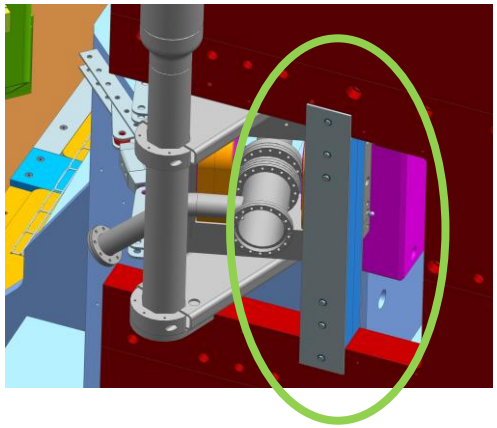


HCAL

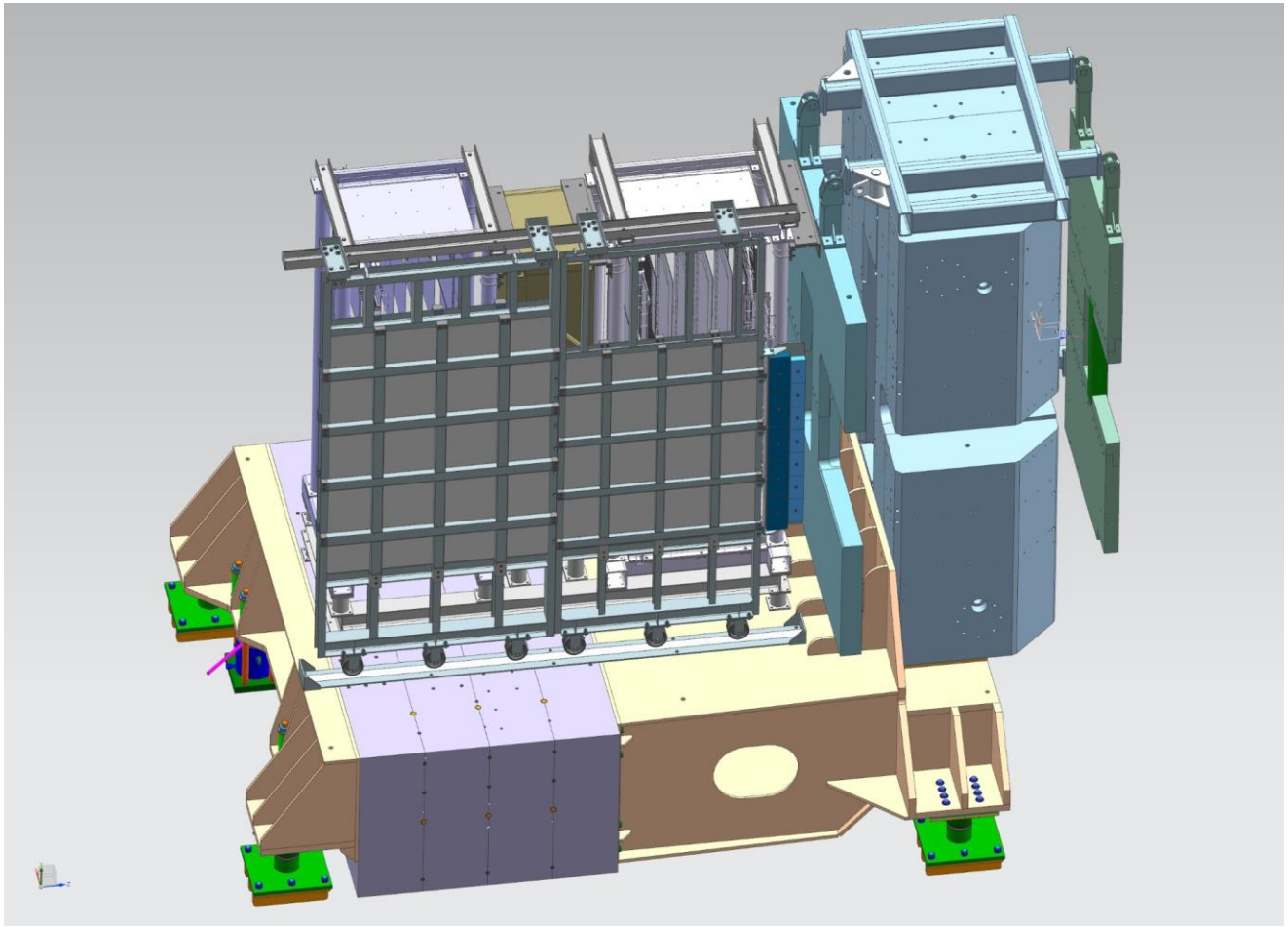
- Existing HCAL to continue use in Hall for GEp.
- Cables continue with use of cart configuration. Cables across floor to be moved to support on side of counterweight structure then under HRS-L.



Lead Shielding

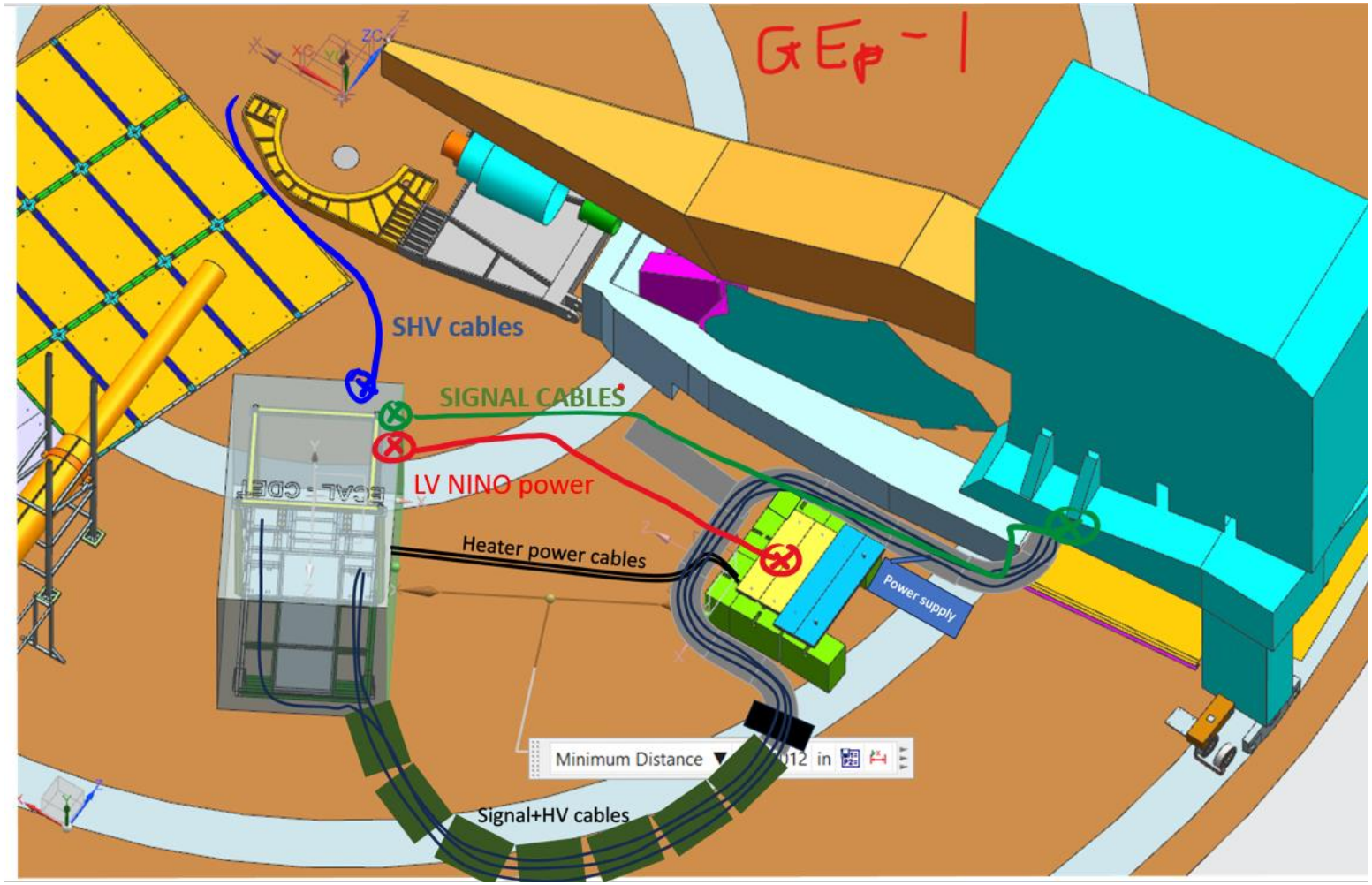


- Lead insert required in upstream field clamp. Fabricated and in-house.



- Lead wall required to be redesigned to be removable in sections and supported on CW in all configurations. Concept developed and analyzed. Detailing designs.

Cable Layout- ECAL and CDET



Summary

- *Design and drawing efforts will be completed by October.*
- *Remaining purchases and fabrications are being split between FY24 and FY25 funds.*
- *Thank you !*
- *Questions ?*