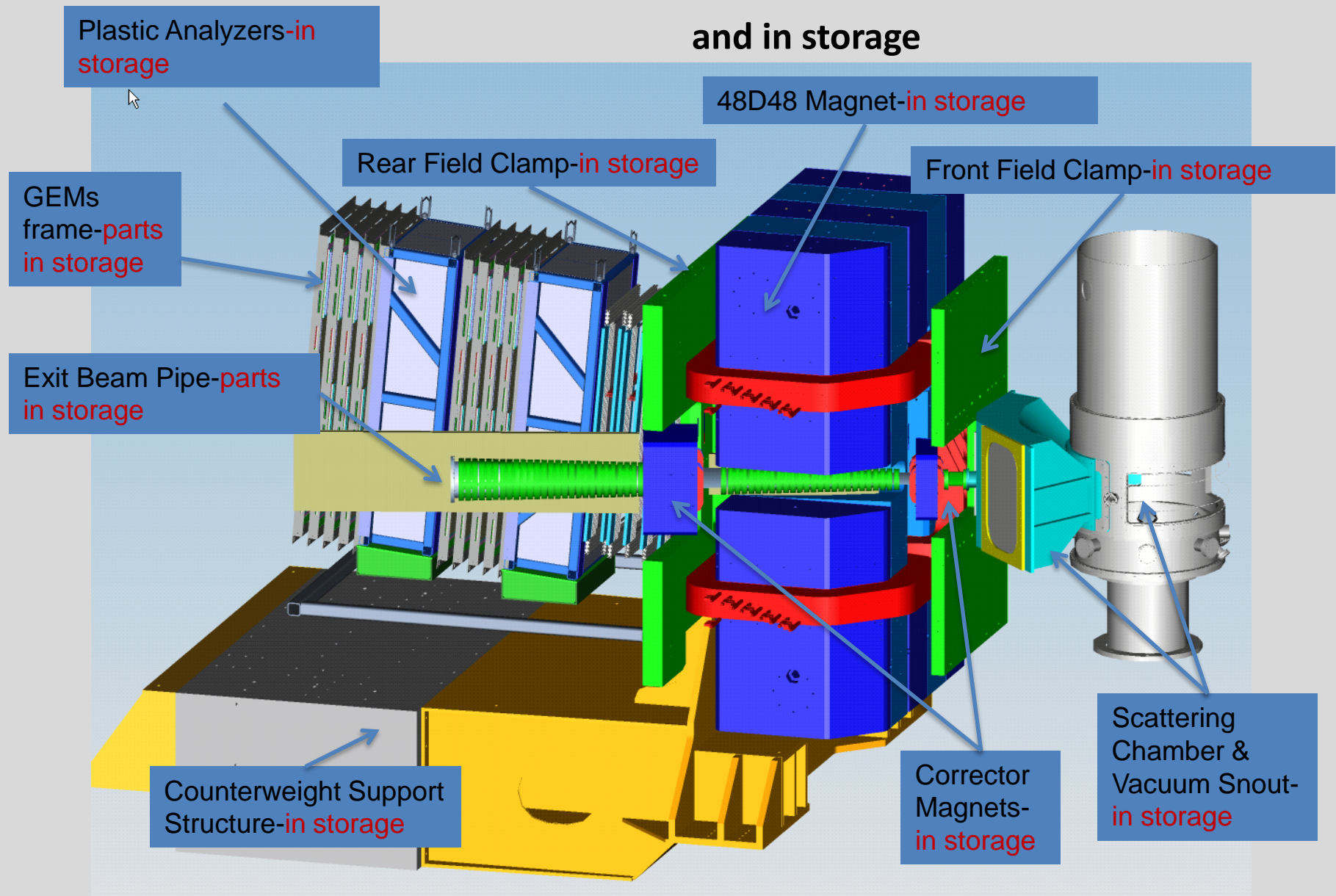


SBS Engineering Status

Whit Seay

February 2018

SBS status- main components complete and in storage



Counterweight Support

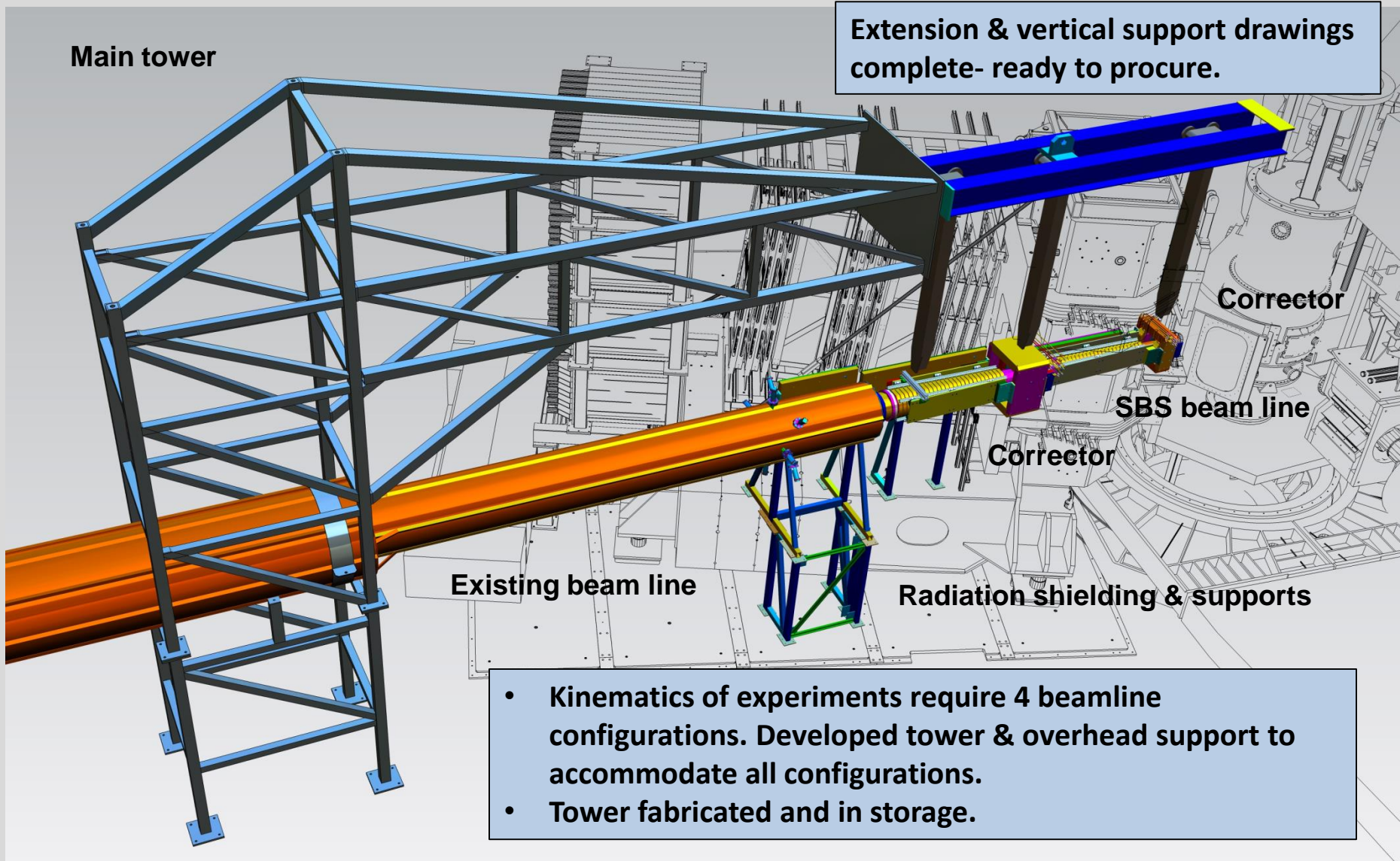


- **Counterweight blocks under contract to be sandblasted & painted to allow completion of counterweight assembly**

Beamline Support

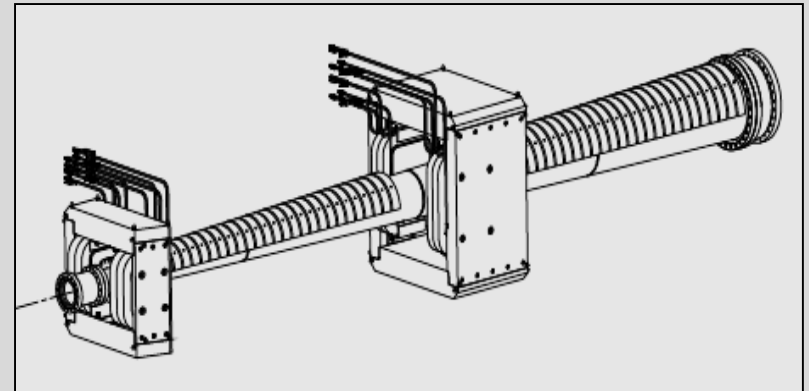
Main tower

Extension & vertical support drawings complete- ready to procure.

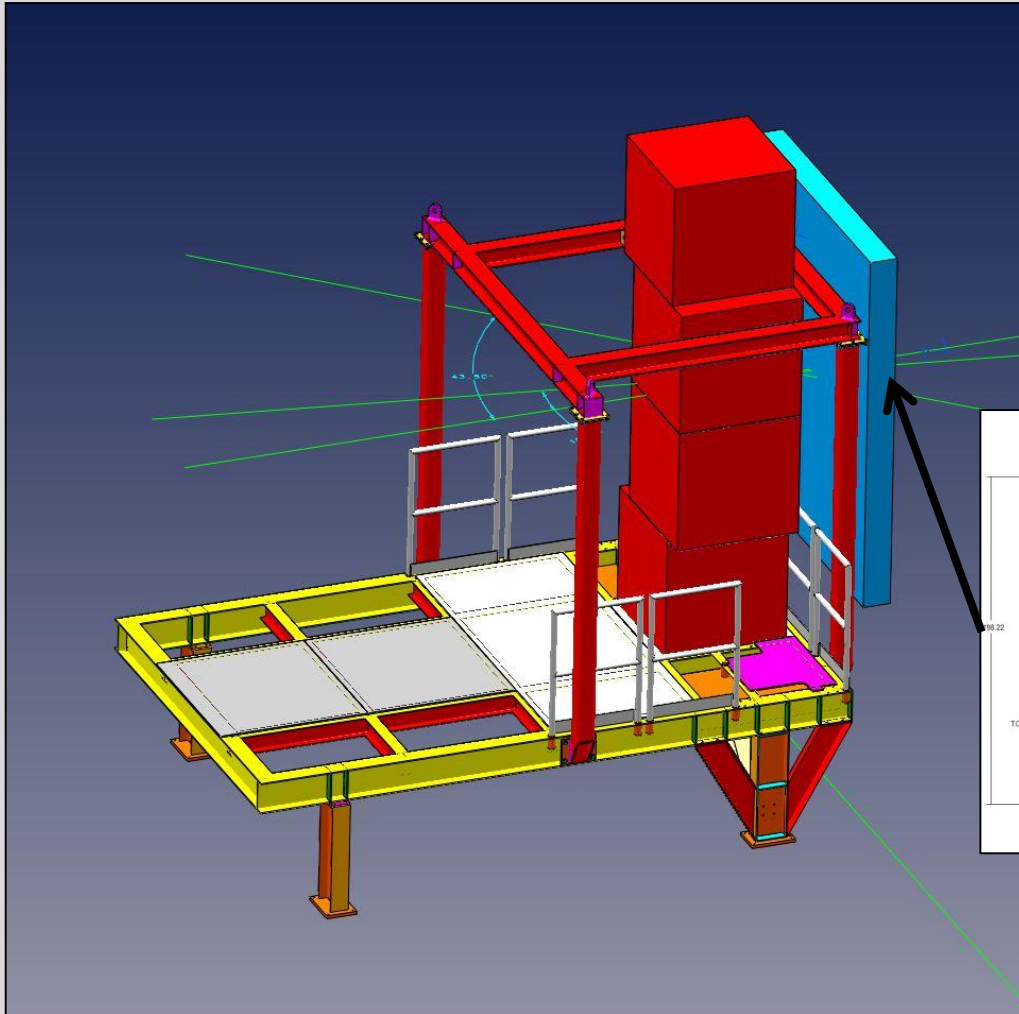


Beamline Shielding

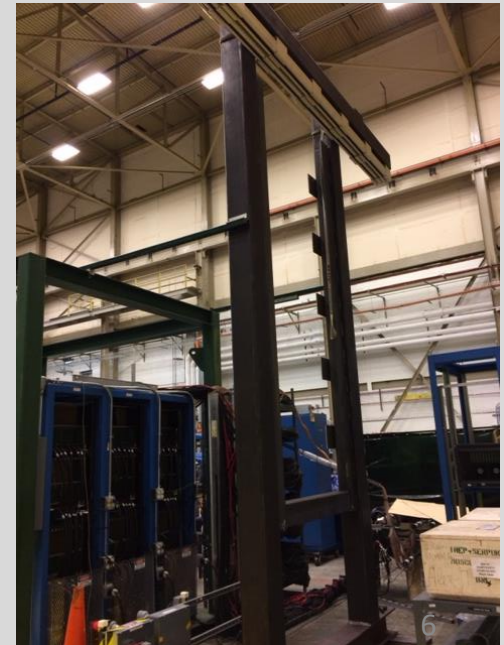
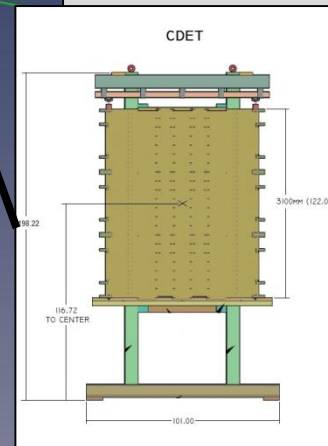
- Conical beam pipe, correctors and shielding pieces are in storage.
- Assembly drawings complete.
- Trial assembly to be completed, then order remaining assembly parts.



ECal & CDet Support

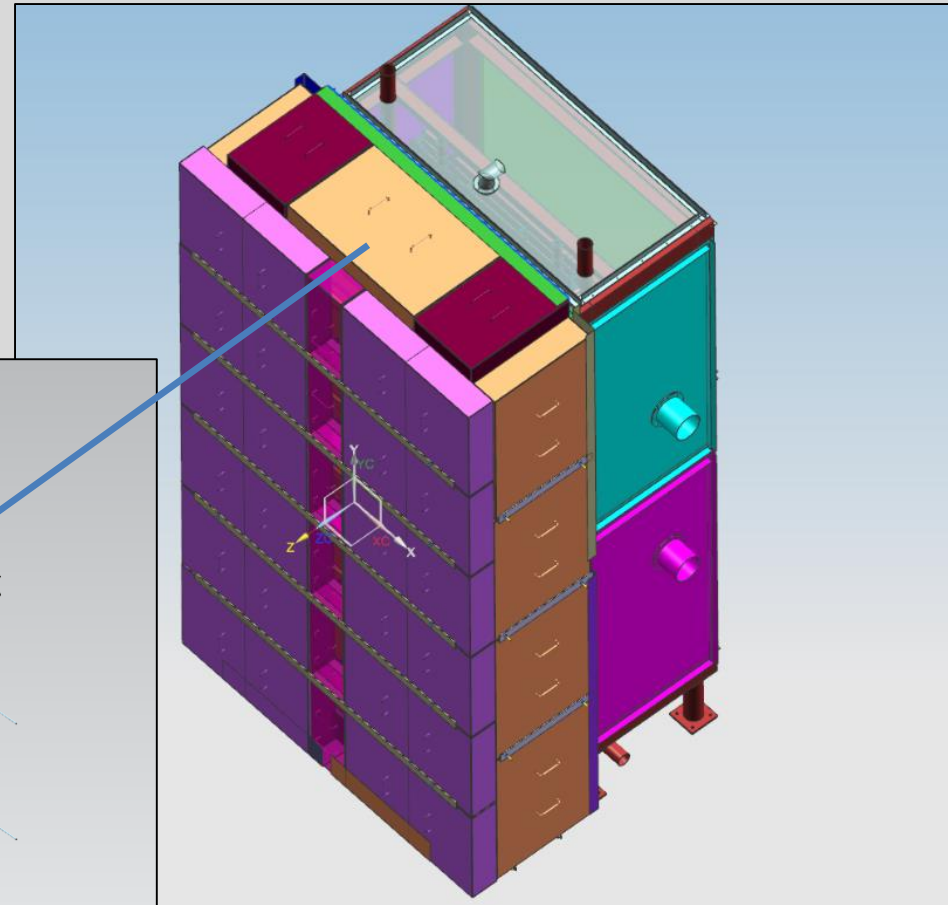
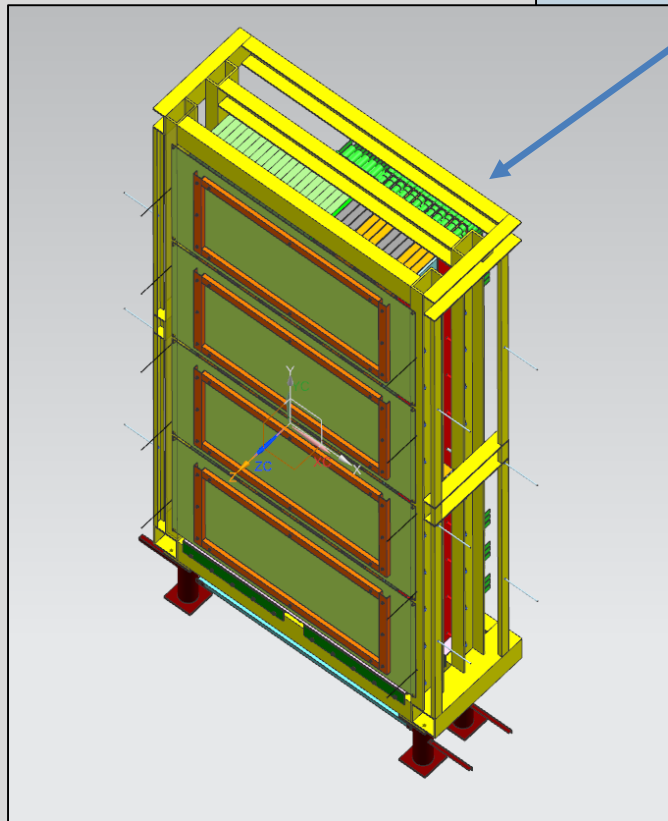


- Existing frame to be used for supporting ECal and CDet support.
- Integrated CDet geometry into CAD model. CDet frame approved for use.

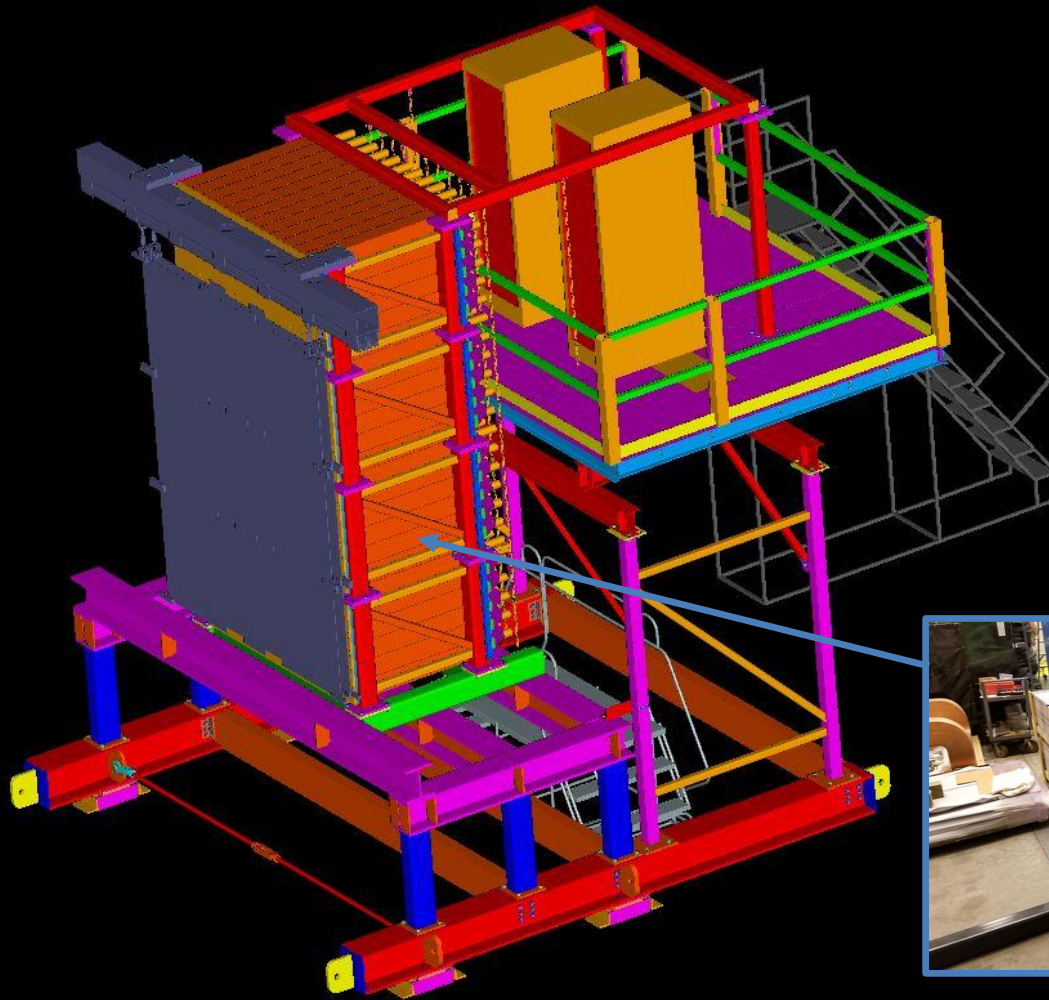


ECAL

- Completed front frame drawings- ready for purchase
- Continue design of back frame and assembly parts



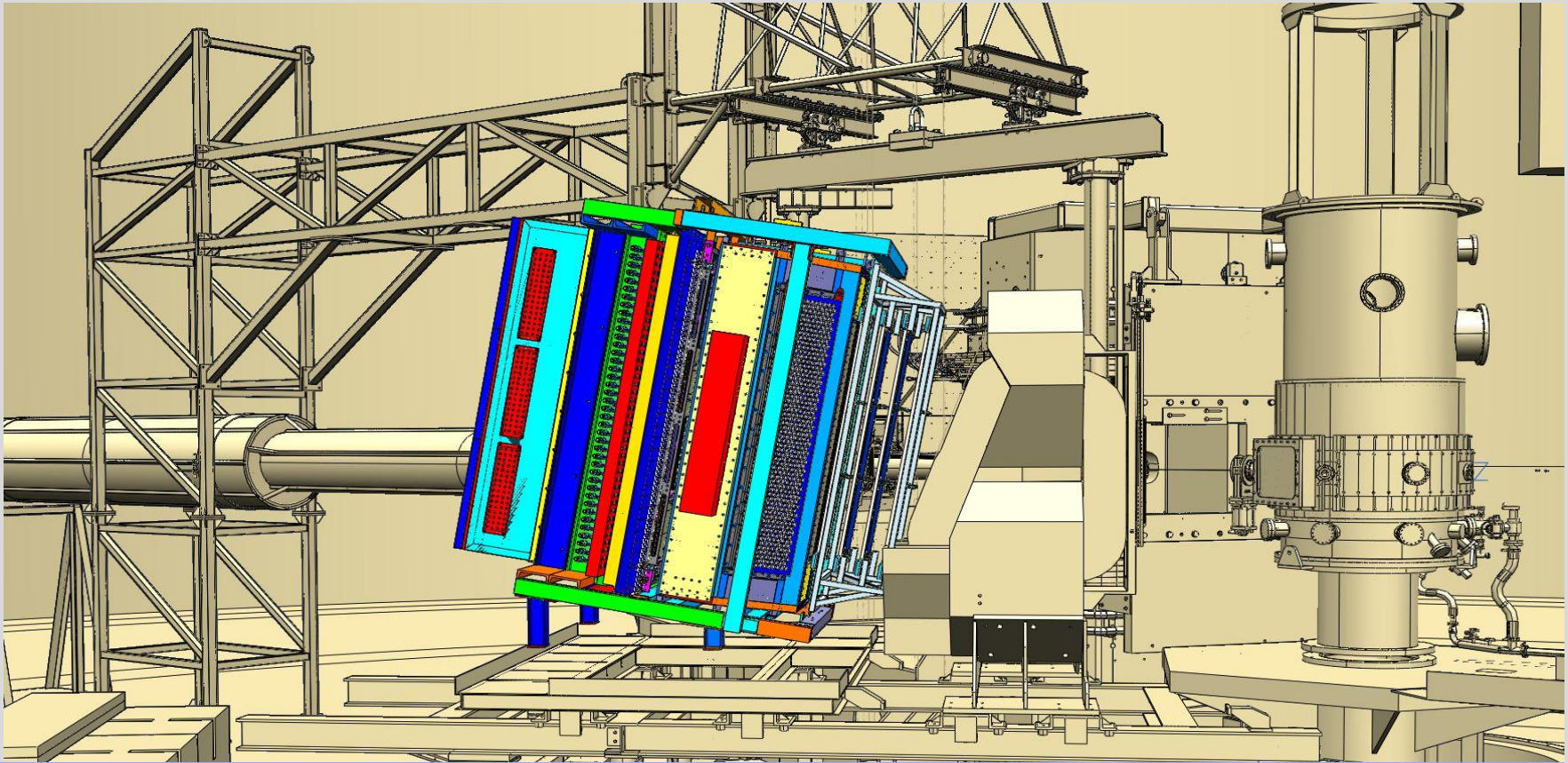
HCAL & CDET Support/ Access Platform



- HCAL is being assembled
- Design of Support & access frames complete



BigBite

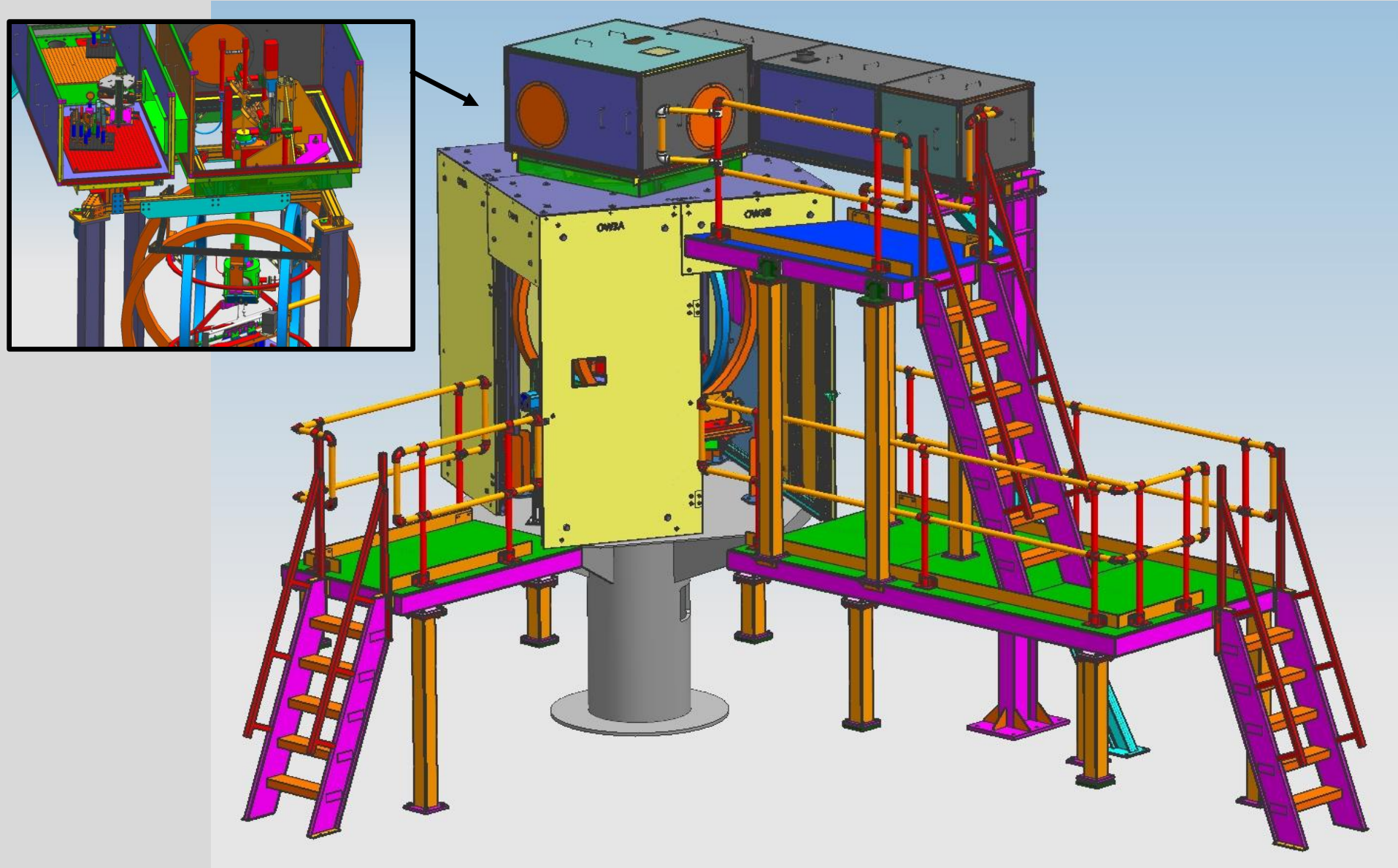


- BigBite detector frame modifications are defined to include GEMs and GRINCH. Drawings are complete. Modifications arranged to be done in-house

Polarized 3He target Engineering/Design Tasks

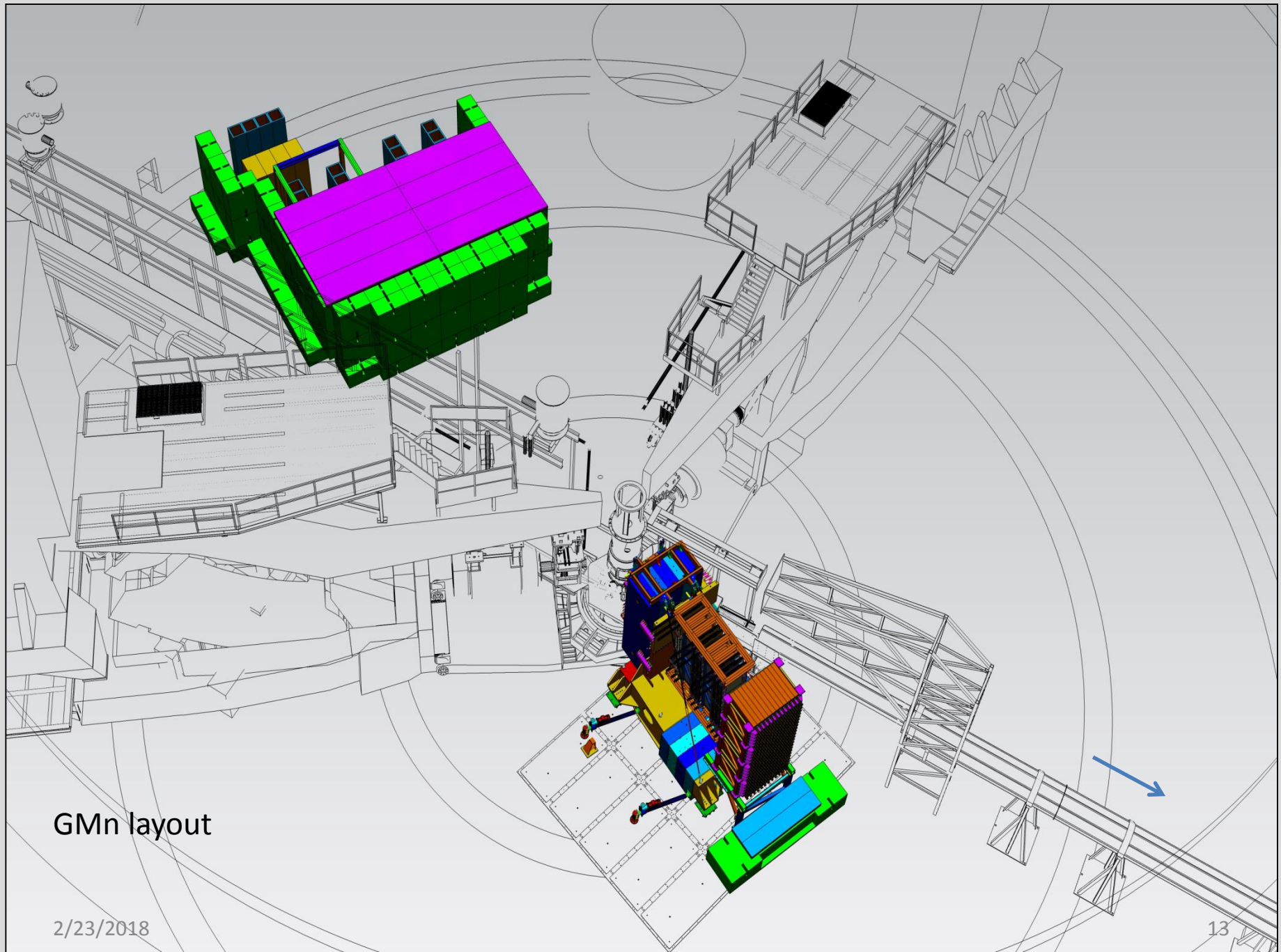
	ENG	DES	Status
	FTE	FTE	% complete
Heater system to pump cell	0.03	0.05	90 drawings
Oven	0.15	0.30	60 drawings
Oven support	0.25	0.50	90 drawings
Support for target drive, lasers and holding field coils	0.25	0.80	90 drawings
Target ladder	0.10	0.15	70 drawings
Pick up coils	0.05	0.13	100
Collimator(4 sets) and alignment bench	0.20	0.80	70 drawings
Model target and bottom plate (per cell)	0.03	0.03	70 drawings
Fixture to mount cell	0.05	0.15	90 design 10 drawings
RF coils	0.03	0.10	70 drawings
Reference cell gas system	0.05	0.10	75drawings
Laser enclosure	0.05	0.13	70 drawings
Magnetic shielding	0.20	0.30	100
Field direction measurement and field mapping	0.03	0.15	0
Access platform	0.10	0.30	90 design 10 drawings
Magnetic shield support	0.20	0.10	0

Polarized ^3He Target



SUMMARY

- **Items remaining :**
 - **Complete modifications to BigBite Detector frame**
 - **Design ECal and CDet support**
 - **Design ECal back frame and assembly**
 - **HCal access platform and cabling support procurement**
 - **GEp lead shielding wall procurement**
 - **Beamline/corrector magnet vertical support procurement**
 - **Beamline assembly hardware procurement**



GMn layout

2/23/2018

Kinematics of SBS

•SBS Program is defined by three experiments, each with multiple configurations of equipment. Each configuration has been modeled and the required layout of the Hall has been determined.

G_E^n 09016 Polarized He3

Q^2 [GeV ²]	θ_{BB} [deg]	d_{BB} [m]	θ_{48D48} [deg]	d_{48D48} [m]	d_{HICAL} [m]	Beam Line Configuration #
1.46	40.0	1.50	39.4	2.8	17	2
3.68	34.0	1.50	29.9	2.8	17	2
6.77	34.0	1.50	22.2	2.8	17	2
10.18	34.0	1.50	17.5	2.8	17	2

G_E^p 07109 Hydrogen

Experimental Points

40cm Hydrogen

Q^2 [GeV ²]	$\theta_{electronarm}$ [deg]	θ_{48D48} [deg]	d_{48D48} [m]	$d_{electronarm}$ [m]	d_{HICAL} [m]	Beam Line Configuration #
5.0	29	25.7	1.6	9	6.8	1
8.0	26.7	22.1	1.6	6.5	6.8	1
12.0	29.0	16.9	1.6	4.5	6.8	1

G_M^m 09019 Hydrogen/Deuterium

Experimental Points

10cm Deuterium

Q^2 [GeV ²]	θ_{BB} [deg]	d_{BB} [m]	θ_{48D48} [deg]	d_{48D48} [m]	d_{HICAL} [m]	Beam Line Configuration #
3.5	32.5	1.80	31.1	2.0	7.2	3
4.5	41.9	1.55	24.7	2.25	7.2	3
5.7	58.4	1.55	17.5	2.25	11	3
8.1	43	1.55	17.5	2.25	11	3
10.2	34	1.75	17.5	2.25	13	3
12.0	44.2	1.55	13.3	2.25	14	3
13.5	33.0	1.55	14.8	3.1	17	4

Calibration Points:

10cm Deuterium

Q^2 [GeV ²]	θ_{HRS} [deg]	θ_{48D48} [deg]	d_{48D48} [m]	d_{HICAL} [m]	Beam Line Configuration #
3.5	34.1	31.1	3.1	17.	4
3.5	30.9	31.1	3.1	17.	4
6.0	69.1	14.9	3.1	17.	4
6.0	65.9	14.9	3.1	17.	4
6.0	62.7	14.9	3.1	17.	4
6.0	59.5	14.9	3.1	17.	4