

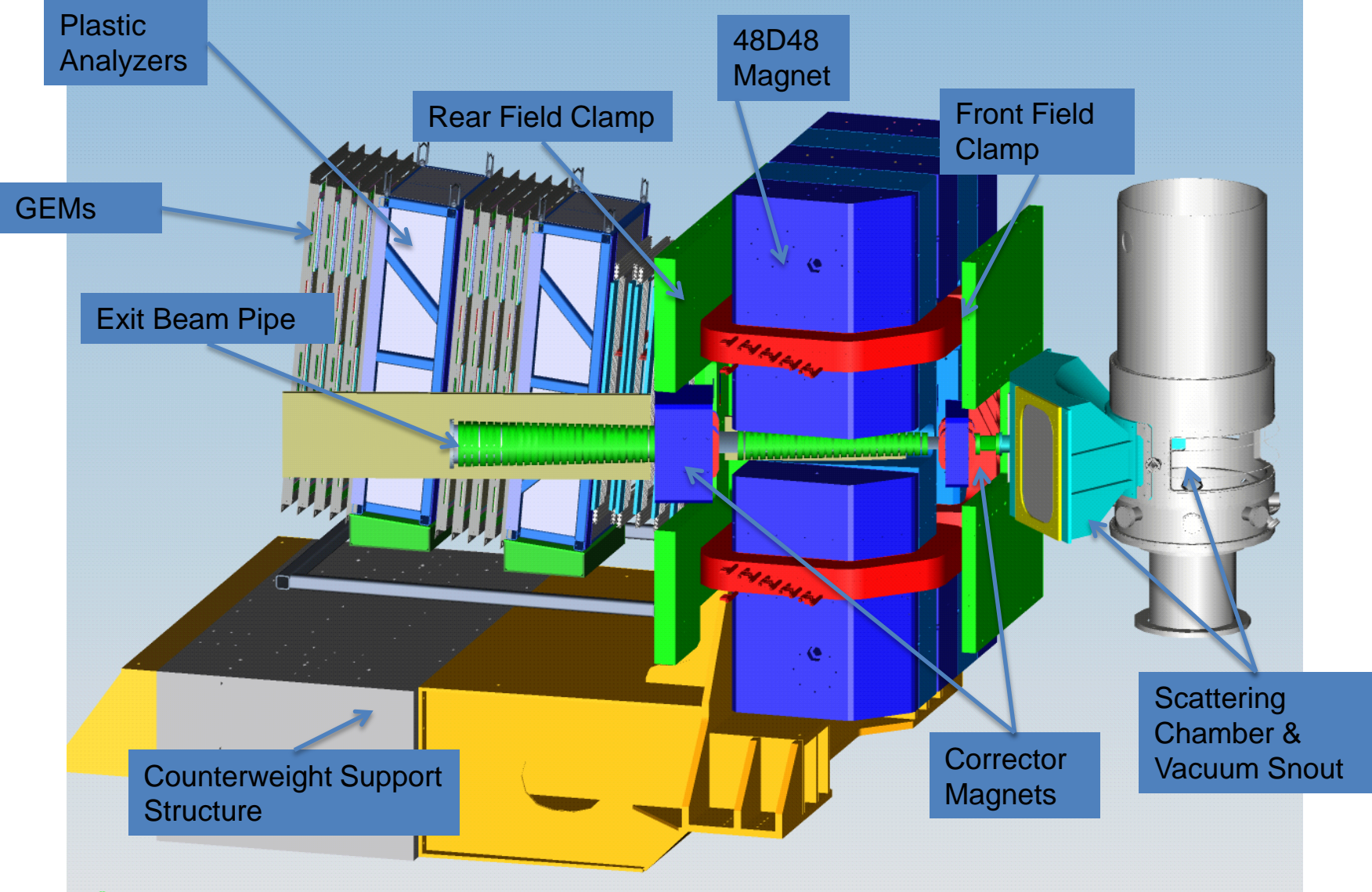


SBS WBS 2.2 & 2.3

Magnet and Infrastructure

Robin Wines

SBS



WBS 2 FY16 Scope of Work

WBS 2

- Procure Rear Field Clamp
- Procure Pole Shims
- Complete beamline and shielding supports
- Procure Electronics Hut materials
- Design and Procure Detector Frames

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

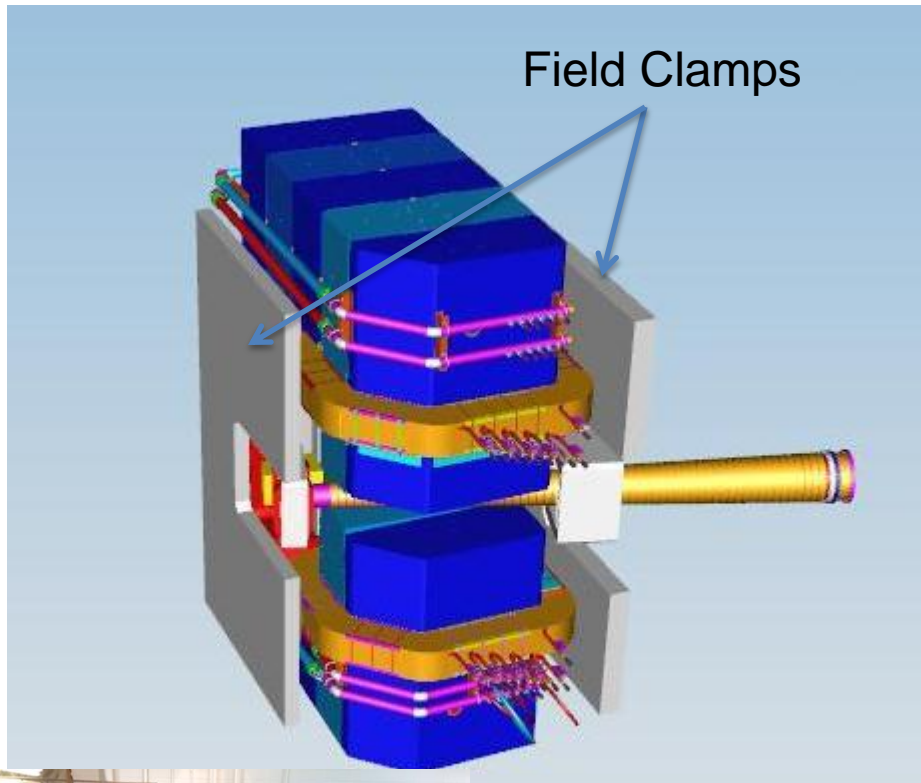
Q^2 [GeV ²]	θ_{BB} [deg]	d_{BB} [m]	θ_{48D48} [deg]	d_{48D48} [m]	d_{HICAL} [m]	Beam Line Configuration #
3.5	32.5	1.80	31.1	2.0	7.2	3
4.5	41.9	1.55	24.7	2.25	7.2	3
5.7	58.4	1.55	17.5	2.25	11	3
8.1	43	1.55	17.5	2.25	11	3
10.2	34	1.75	17.5	2.25	13	3
12.0	44.2	1.55	13.3	2.25	14	3
13.5	33.0	1.55	14.8	3.1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

1.1 and 2.3 Field Clamps



- Front field clamps needed to limit target field, less than 40 G. Designed as 4 pieces bolted together.
- Rear field clamps needed to limit detector field. Designed as two pieces bolted together.
- Field clamp supports designed for adjustability. Field clamp supports are in storage.
- Front and rear field clamps are in storage.

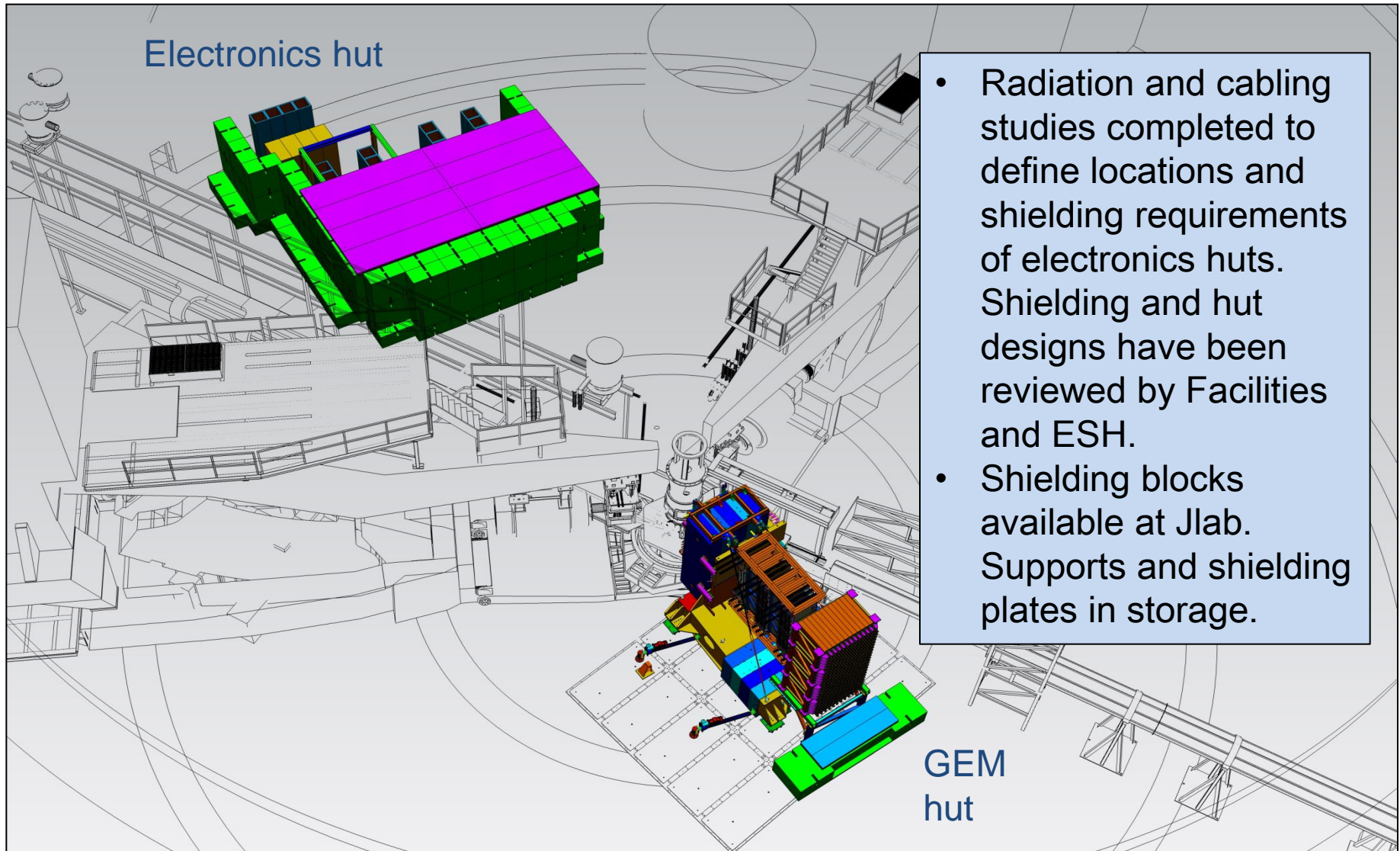


2.3 Pole Shims

- Pole shims are required in GEp configurations to increase field integral.
- Pole shims -In storage.
- Installation device required to insert into Magnet gap.
- Installation cart- In storage.

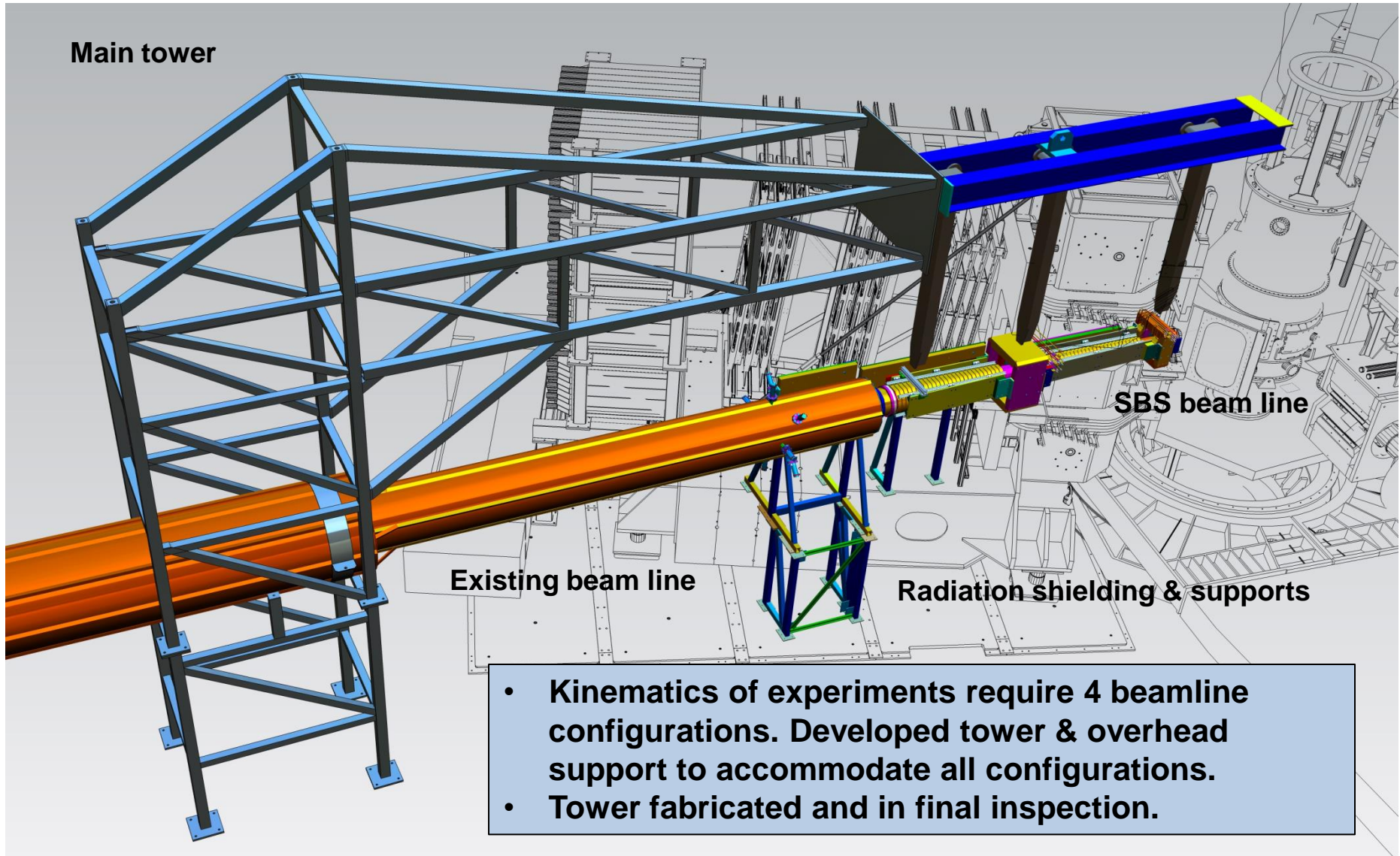


2.2 Electronics Huts and Shielding



2.2 Beamline Shielding

Main tower

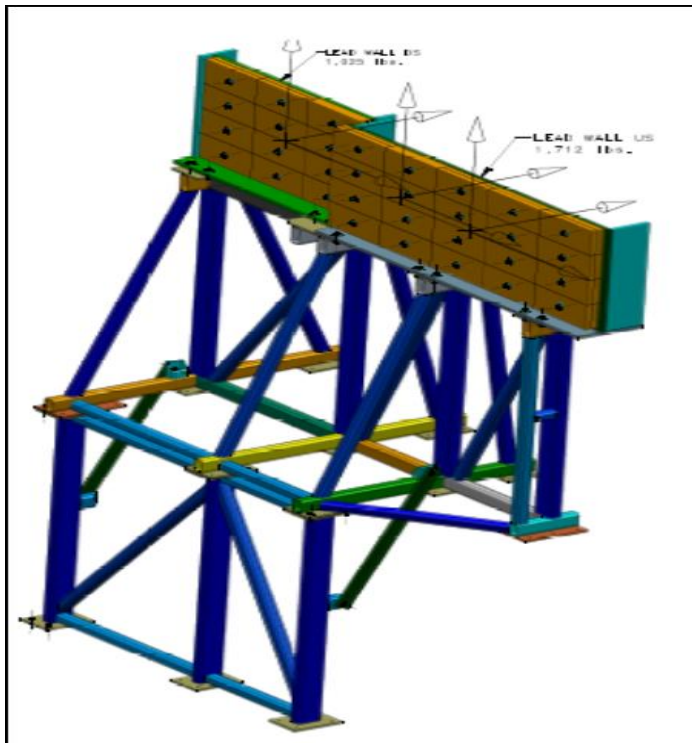


- Kinematics of experiments require 4 beamline configurations. Developed tower & overhead support to accommodate all configurations.
- Tower fabricated and in final inspection.

2.2 Beamline and Radiation Shielding

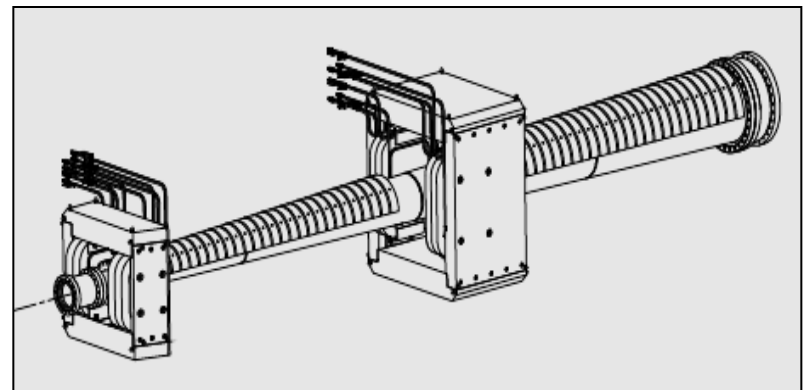
Radiation Shielding

- GEp requires lead wall to shield detectors from background created by beam to dump halo.
- Lead bricks in-house. Design complete for support of lead. Fabrication to be complete December 2016.



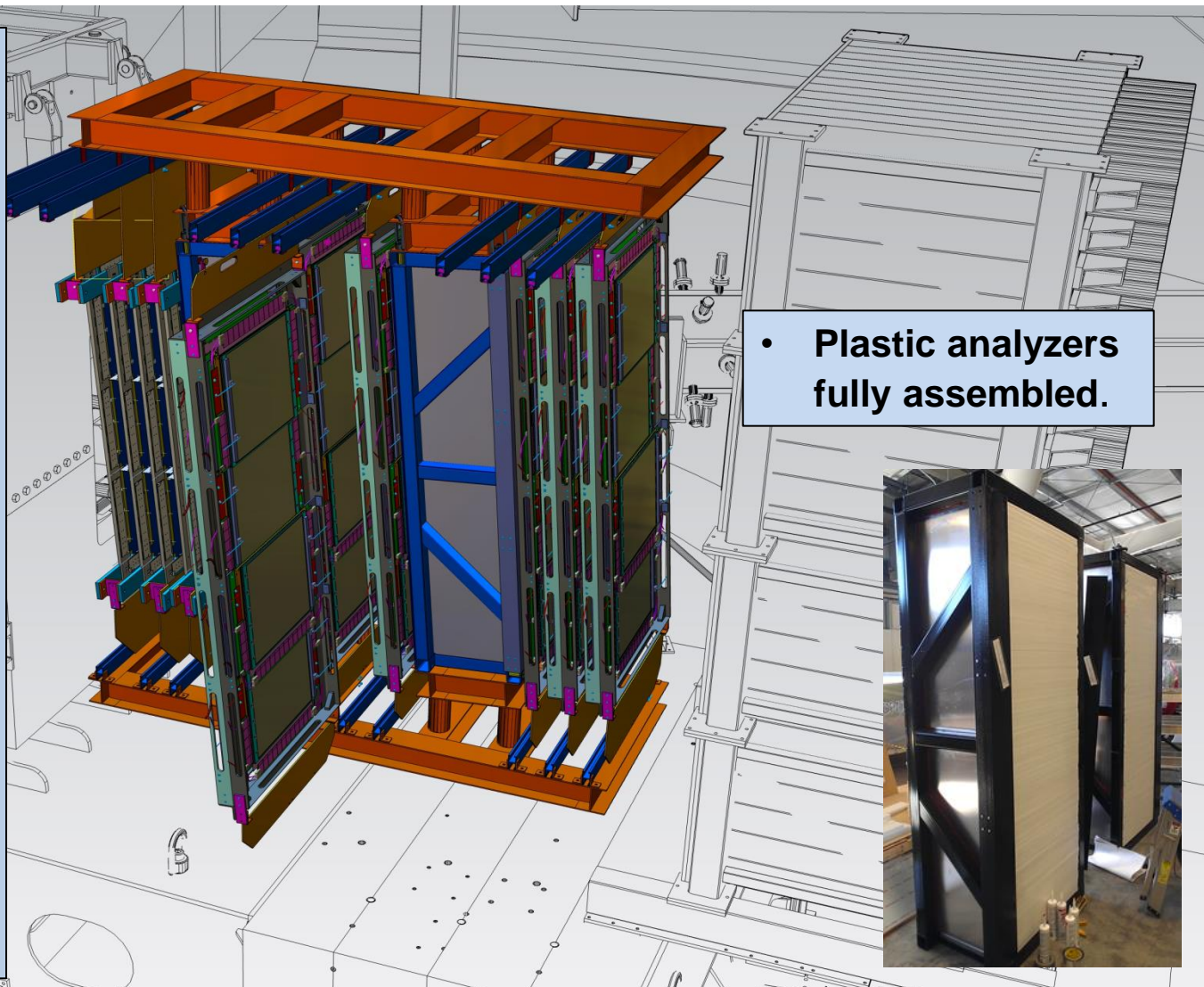
Beamline Shielding

- Conical beam pipe and shielding pieces in storage.
- Assembly concept complete. Assembly hardware in fabrication.

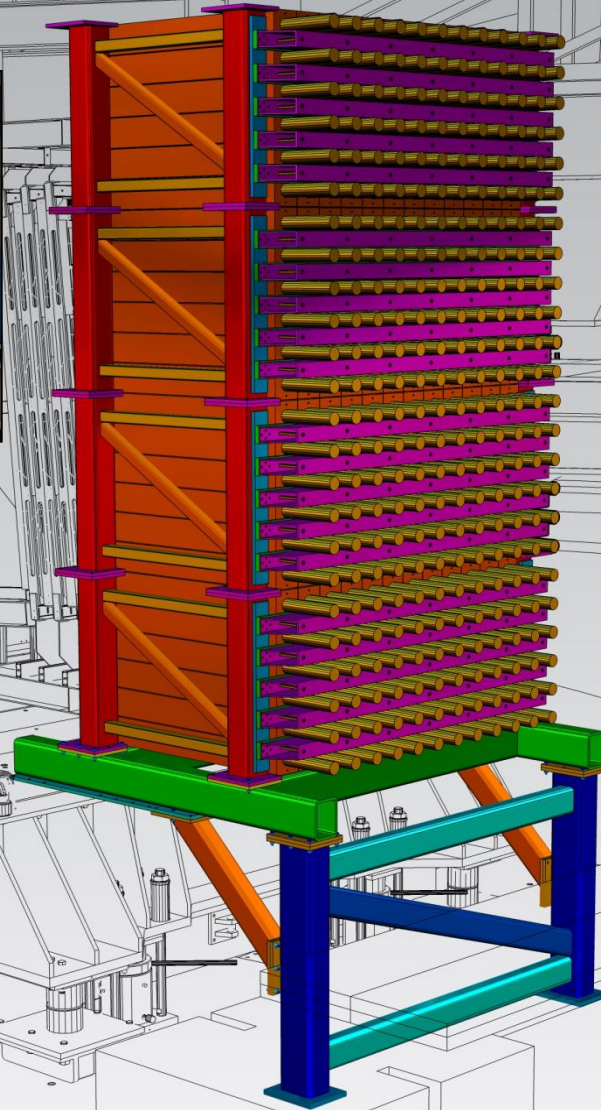


2.2 Detector Supports – GEMs & Plastic Analyzers

- Support platform for SBS detectors in fabrication to be delivered November 21, 21, 2016.
- UVA GEM frames in fabrication to be delivered December 15, 2016.
- INFN GEM frames incorporated into platform design.



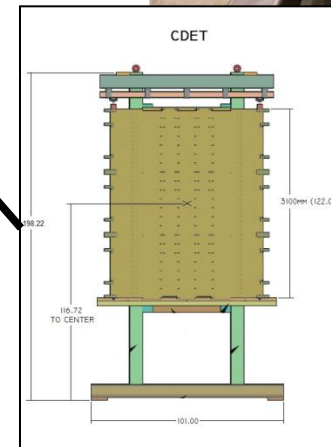
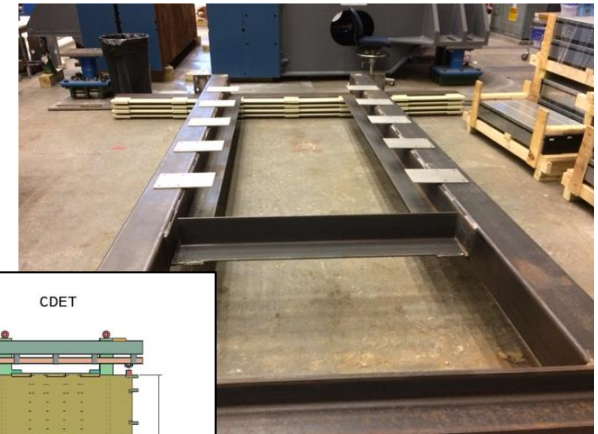
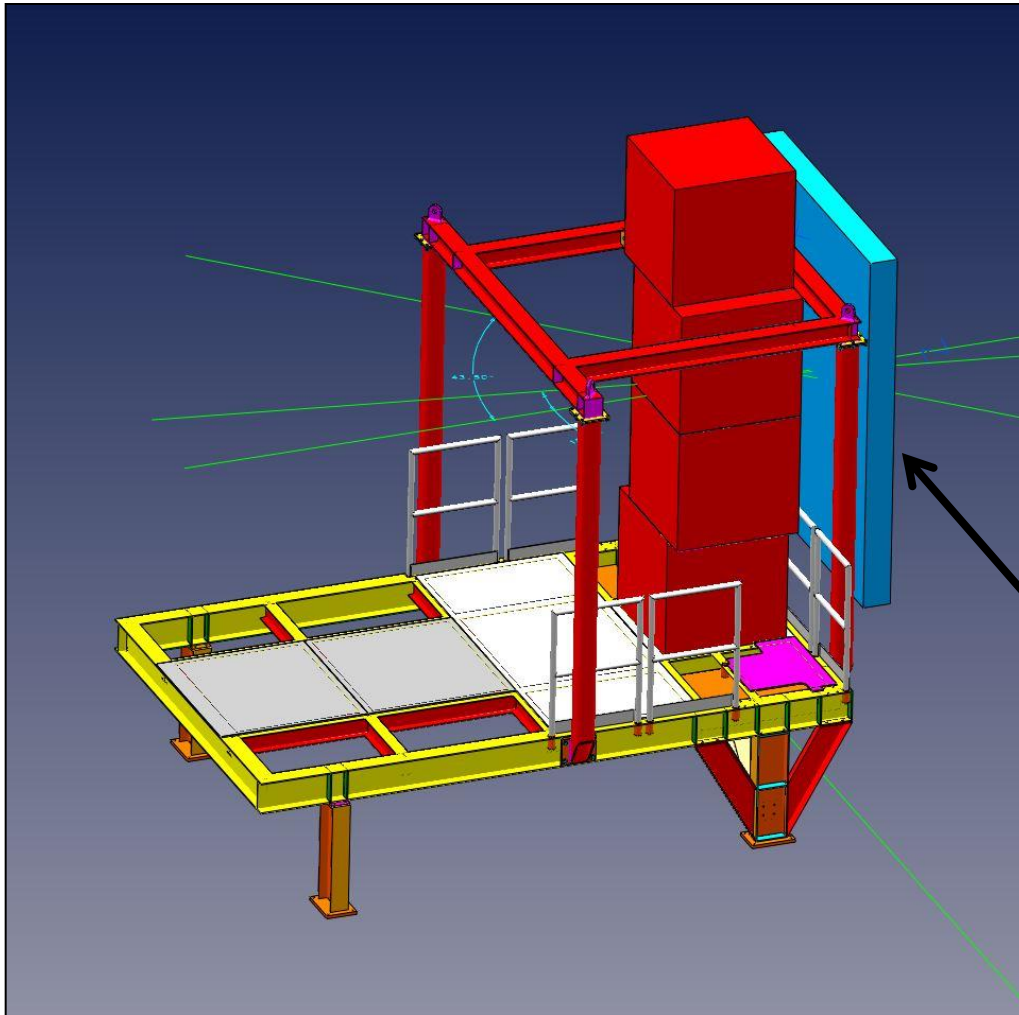
2.2 Detector Supports - HCal



- Frames, front plates, back plates and rotation/lifting device in storage.
- Ready for assembly.
- Concept for cable scaffolding and base support in Hall is being detailed.

2.2 Detector Supports - ECal & CDet

- Existing platform to be used for supporting ECal and CDet support.
- CDet support frame fabricated and ready for assembly.



SBS Program

Manpower

- Hall A Design/Engineering available resources – 5 designers, 2 engineers, 1 engineering associate, Hall Coordinator and 6 technicians
- Remaining SBS equipment requirements are experiment specific and thus incorporated into Hall operations manpower planning.

Installation

- Assembly and installation of equipment in Hall A is dependent on Experiment schedule. Typical new installation takes 4-6 months.
- General interaction of SBS with other experiments or hall infrastructure is done under Hall operations.
- After program completion, installation is Hall operations.

SBS ESH & Q

Fully integrate ESH&Q into planning ,design, fabrication and installation

- Conducting design and safety reviews of major subsystems before fabrication and installation; such as engineering review of support structure, review of equipment supplied by Collaborators and electronics hut.
- Coordinating work of outside institutions to insure Jlab policies are followed; Collaborators present designs for review in weekly meetings.
- Utilizing Jlab screened vendors and requiring vendor's to have quality program in use; Jlab approved vendor list for weldments.

As program has progressed into fabrication and installation,

- Perform hazard analysis and utilize Jlab safety system for all testing and commissioning activities; such as load testing, weld inspection, TOSPs, coil acceptance tests, window testing, pre-assembly and testing of magnet and supports.
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- Each SBS Experiment will be required to complete the Jlab Readiness Review process.

Summary

- All components of SBS have been defined.
- All WBS 2 items are completed or in process of delivery by December 15, 2016.

WBS 1		
Level ID	Milestone	Status
		All Complete
WBS 2		
2	Receive exit field clamp	Complete
2	Electronics hut assembled	Complete