Beamline Status

- Response to Previous Readiness Review
- Updated Radiation Budget
- Upstream beamline
  - Chicane
  - SEM
  - Rasters
  - Girder
- Downstream beamline
  - Helium bag
  - Extension piece
  - Beam dump

Previous Readiness Review Beamline Recommendations

- There should be a low current (nA) diagnostics package of some kind to verify beam position from the target to the dump.
  - Install two ion chambers (left and right of the beam) between the temporary dump and the rear window of the helium bag
- The read backs from the Secondary Emission Monitor (SEM) should be made available to the MCC through EPICS.
  - MCC will get an RS232 signal which will be connected to a read out box showing the average position of the beam on the SEM. Need to work on EPICS signals.
- Additional FSD protection for the total beam current, the BE and BZ magnets, rasters, and beamline components between the target and the dump.
  - FSD meeting between the relevant people (e.g., B. Vulcan from Hall C) has yet to occur, but they will consider monitoring the voltage signals from the chicane magnet power supplies, an ion chamber between the last chicane magnet and the target, hall probe at target, and the two ion chambers mentioned above.
- TOSP for hall access including the Hodoscope platform and 5T magnet area.
  - ESAD and COO for run; COO and TOSP for installation period.
- The new SEM system should be checked in the noisy environment of the hall as soon as possible so that additional cable shielding can be provided if required.
  - This will be done.
- The value for the highest running energy depends on the progress with the accelerator and is still unclear. The collaboration should provide a set of energy points in a range of 5.6-6.0 GeV, optimal for maximizing the beam polarizations in all three halls.
  - Scheduled energy 5.9 GeV corresponds to 0.8 longitudinal spin at target for Halls A and C.

Recommendation 1:

- There should be a low current (nA) diagnostics package of some kind to verify beam position from the target to the dump.
  - Install two ion chambers (left and right of the beam) between the temporary dump and the rear window of the helium bag

Recommendation 2:

- The read backs from the Secondary Emission Monitor (SEM) should be made available to the MCC through EPICS.
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Recommendation 3:

- Additional FSD protection for the total beam current, the BE and BZ magnets, rasters, and beamline components between the target and the dump.
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Recommendation 4 and 5:

- TOSP for hall access including the Hodoscope platform and 5T magnet area.
  - ESAD and COO for run; COO and TOSP for installation period.
- The new SEM system should be checked in the noisy environment of the hall as soon as possible so that additional cable shielding can be provided if required.
  - This will be done.

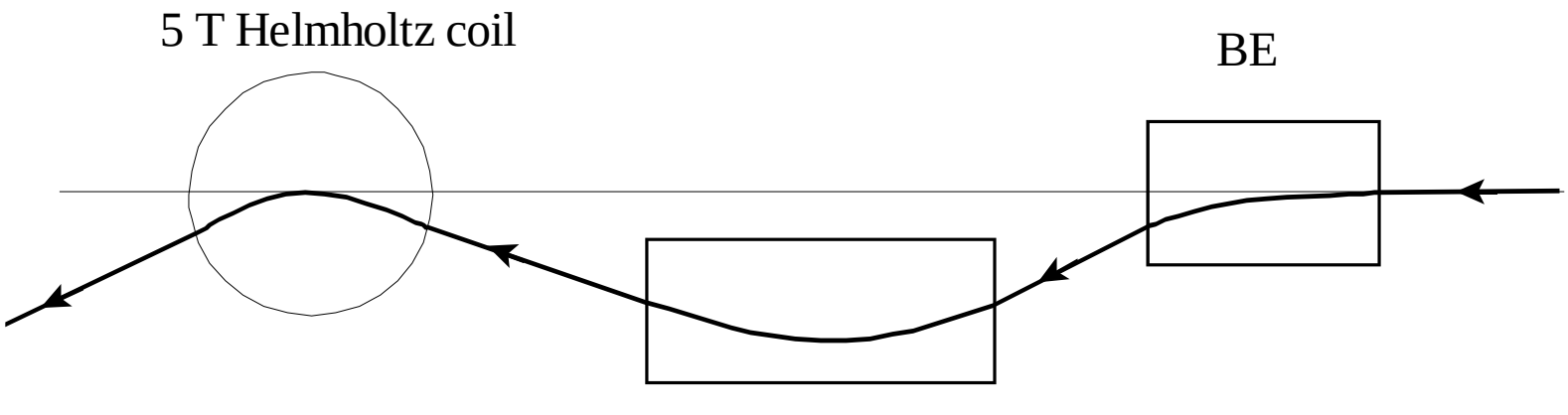
Recommendation 6:

- The value for the highest running energy depends on the progress with the accelerator and is still unclear. The collaboration should provide a set of energy points in a range of 5.6-6.0 GeV, optimal for maximizing the beam polarizations in all three halls.
  - Scheduled energy 5.9 GeV corresponds to 0.8 longitudinal spin at target for Halls A and C.

Updated Radiation Budget (see RSAD)

- Dose per setup is completely dominated by the transverse running using the temporary beam dump in hall.
  - 288 μrem for ~4 GeV running (3% of annual)
    - 6% of total run time for experiment
  - 504 μrem for ~6 GeV running (5% of annual)
    - 11% of total run time for experiment

Chicane



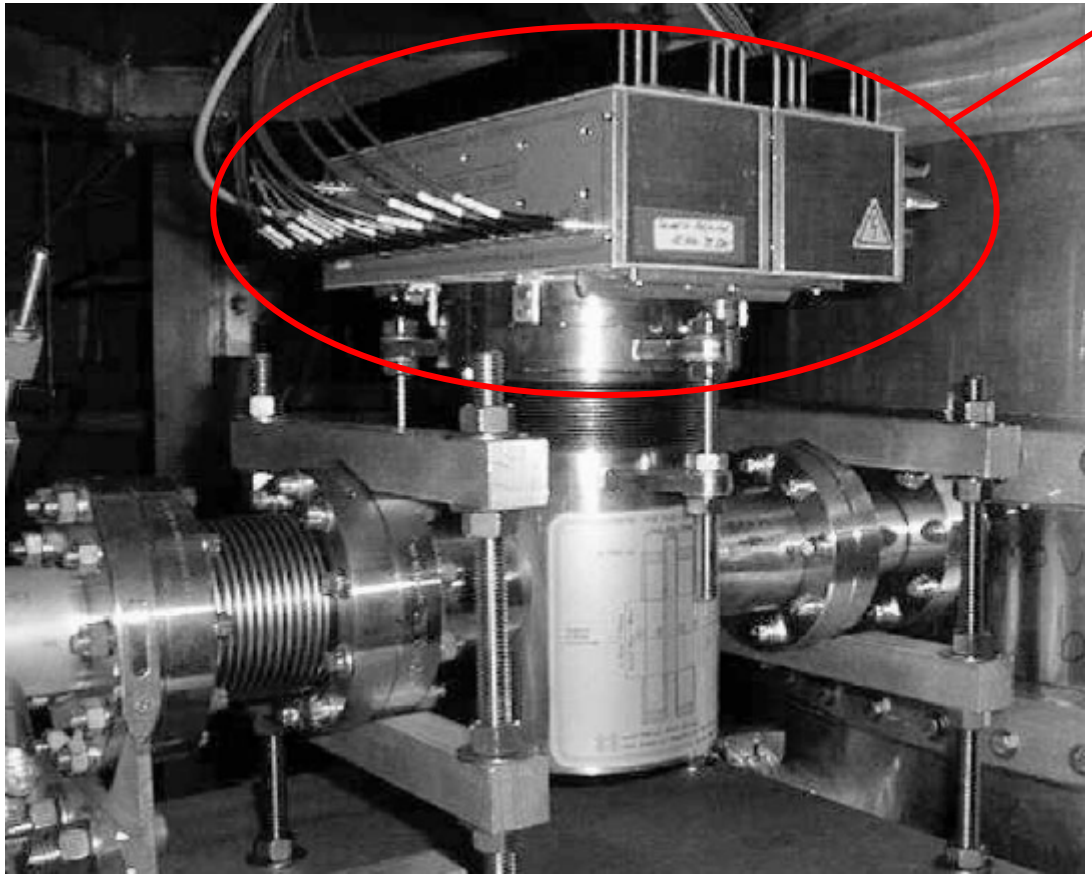
- BE dipole magnet
  - Max. current: 300 A
  - Eff. Length: ~ 1 m
  - Gap: 2.54 cm
  - Power Supply: 40V/320A
- BZ dipole magnet
  - Max. current: 500 A
  - Eff. Length: ~ 2 m
  - Gap: 3.81 cm
  - Power Supply: 40V/500A

Chicane Settings

(sent to Alex Bogacz)

E (GeV)	BE exit angle	BZ bend	Target exit angle	∫Bdl BE (T•m)	∫Bdl BZ (T•m)	∫Bdl Target (T•m)
4.734	0.878	3.637	2.759	0.513	1.002	1.521
5.9	0.704	2.918	2.214	0.519	1.002	1.521

SEM



Electronics moved away from beam line

SEM is at JLab now.

Will be tested this week

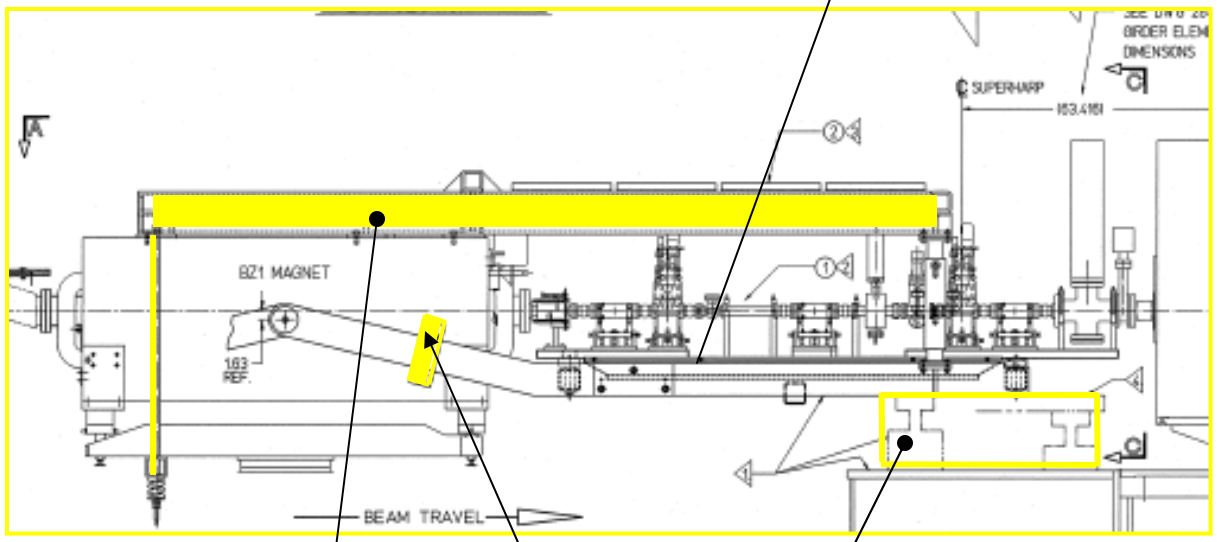
Rasters

- Fast Raster: 2 x 2 mm
- Slow Spiral Raster
  - Re-installed last summer
  - X and Y ~ 100 Hz
  - Amplitude modulation 30 Hz synchronized
    - See Chen Yan's progress report Jan. 2004 Hall C meeting
    - Re-commissioning needed

Polarized Target Upstream Beam Girder

EXISTING pre-TARGET CONFIGURATION

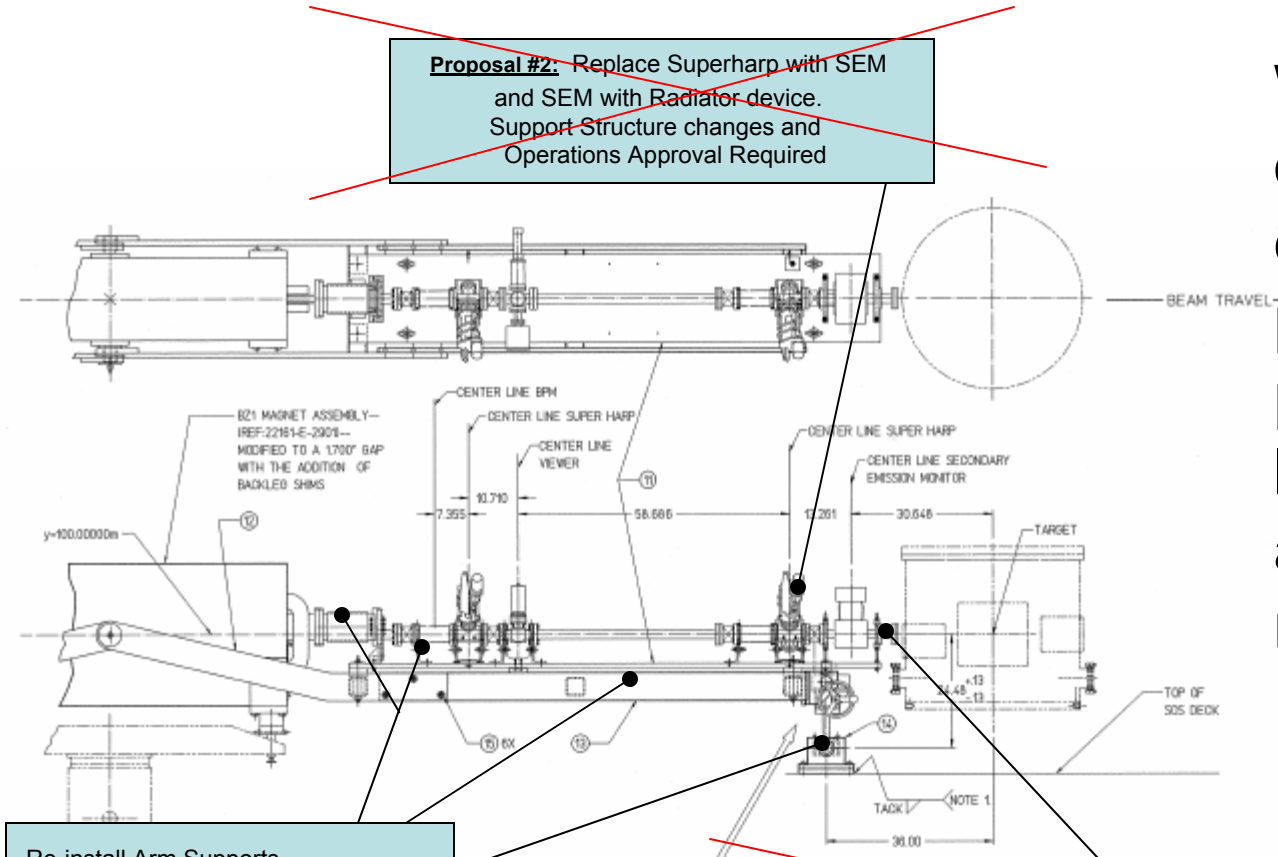
Ref (JAB drawing 28401-E-0818)



Polarized Target Upstream Beam Girder

Planned pre-TARGET CONFIGURATION

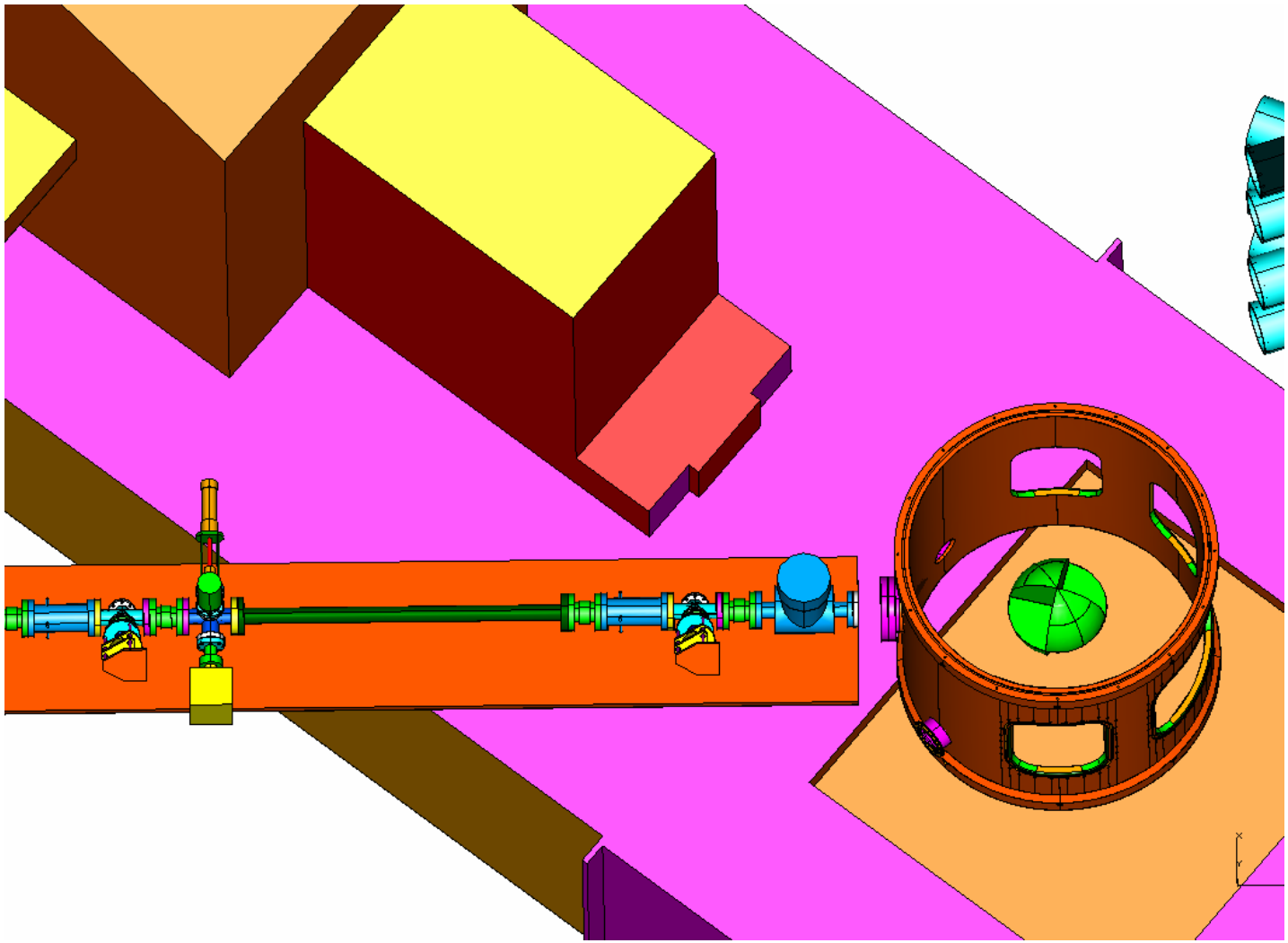
Ref (JAB drawings 28401-E-0087 & 28401-E-0937)



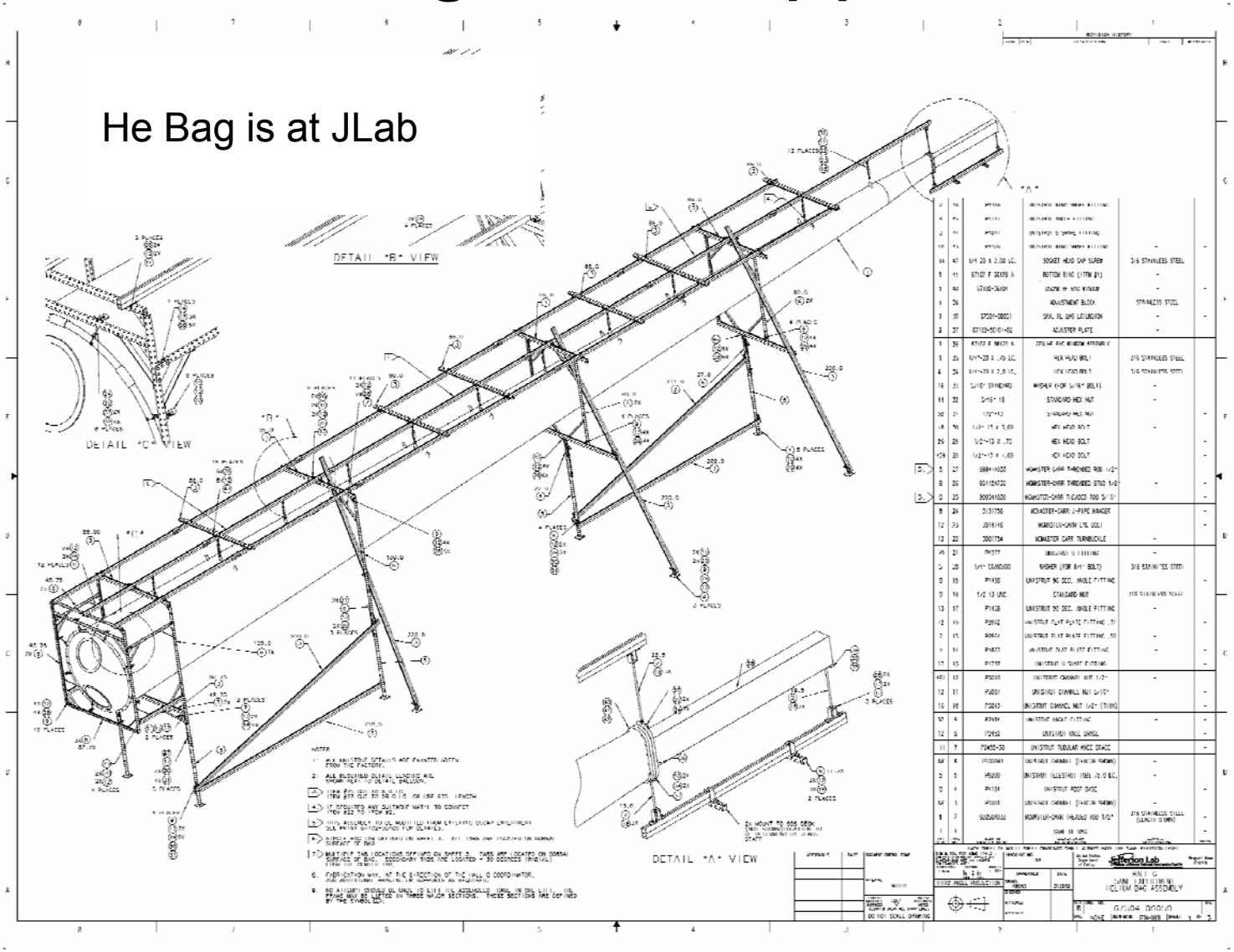
With little chance of WACS experiment to run, plan is to leave polarized beam line girder as is and not install the radiator.

Polarized Beam Girder

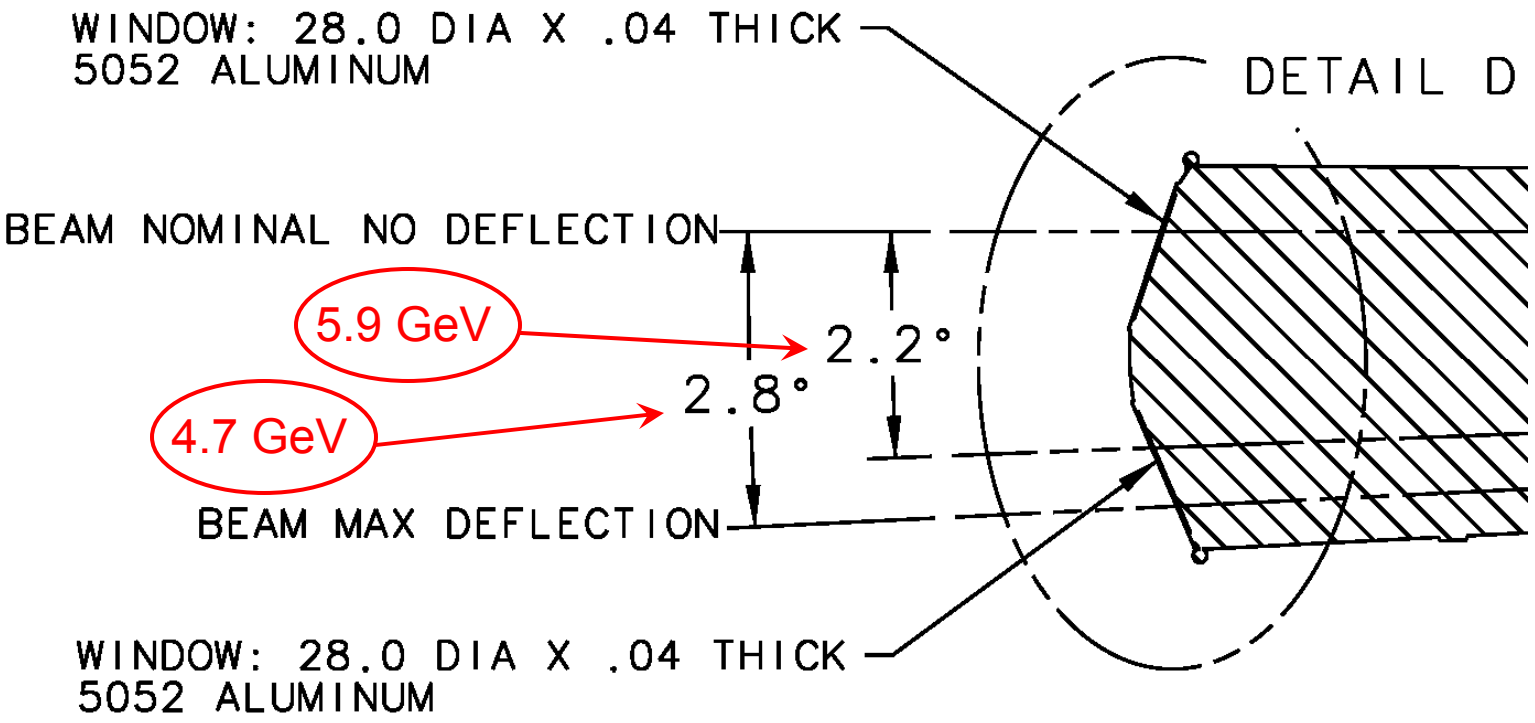
If Be window attached to end of SEM without spool piece, there is 2+ inches of clearance.



Helium Bag and Support

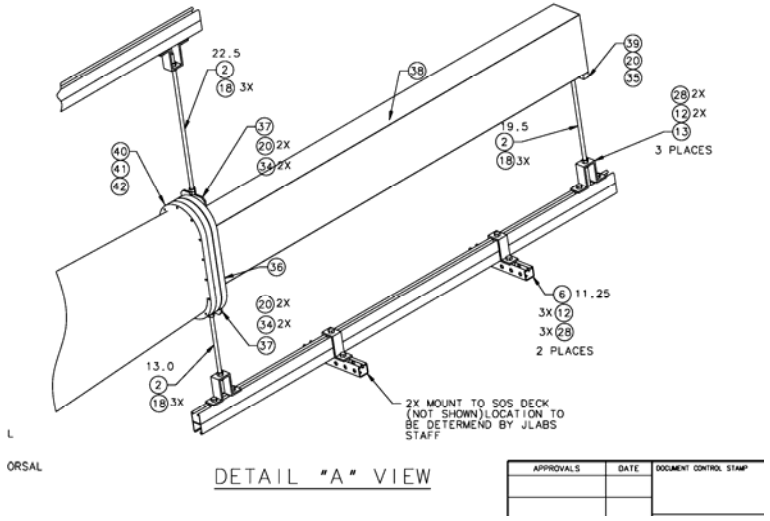


Rear Windows of Helium Bag



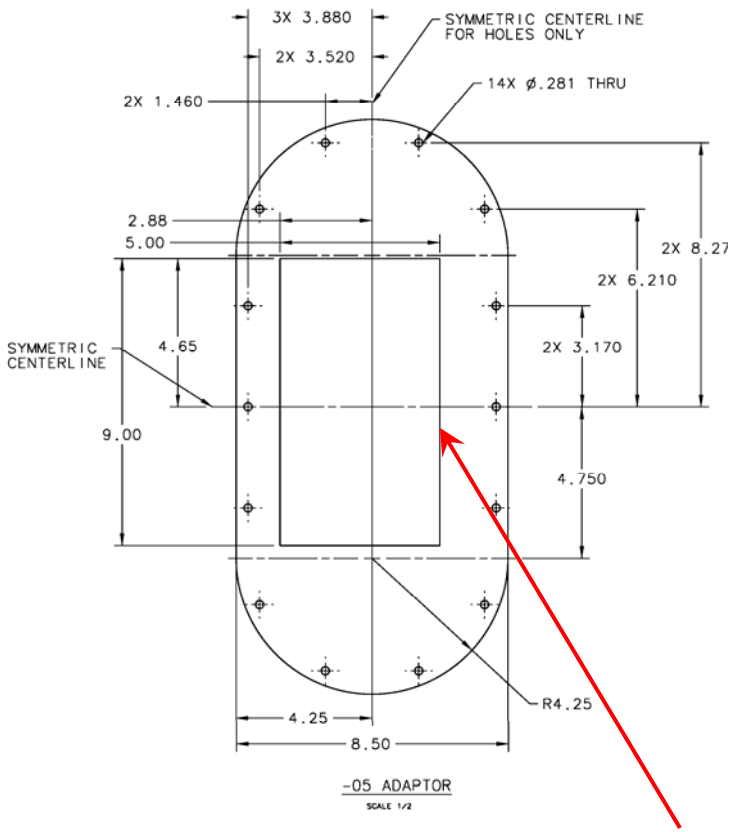
Extension Piece

Frame built by Hampton Sheet Metal and is at JLab. Still needs 16 mil aluminum sides epoxied on frame.

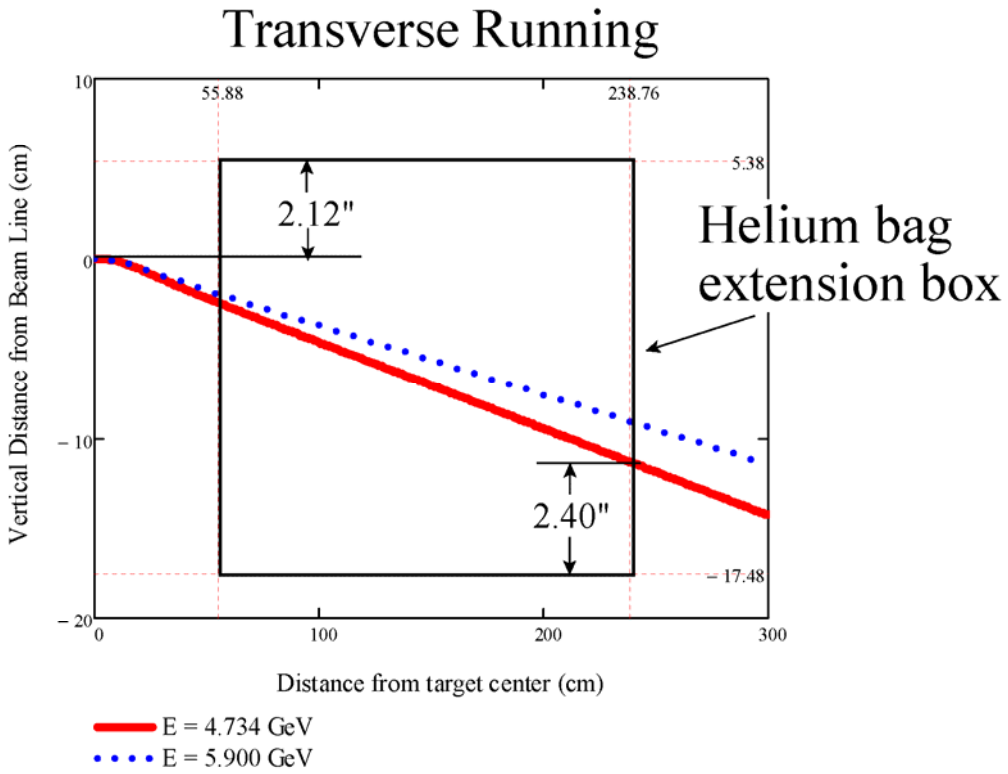


Extension Piece

Adaptor



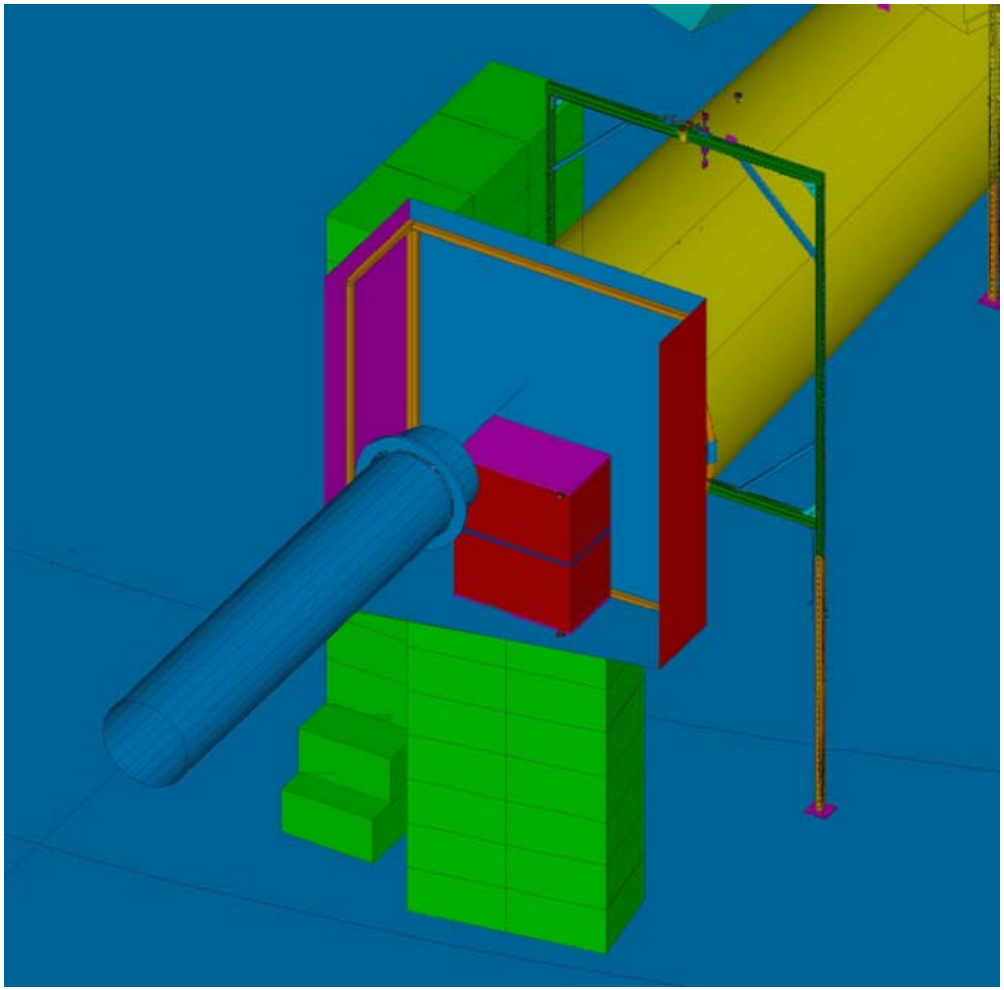
Beam Deflection through Extension Piece



Min. HMS angle: ~ 14.4°

Beam Dump

Walter has drawings for dump, will be installed after the G0 magnet is removed.



Two ion chambers tied to FSD's will be to the left and right of the beam between the temporary dump and the rear window of the helium bag.