

1.1 Design and Procedure

1.1.6 Magnet

1.1.6.1 Magnet Steel

- 1.1.6.1.1 Yoke
- 1.1.6.1.2 Upstream Endcap
- 1.1.6.1.3 Downstream Endcap
- 1.1.6.1.4 Nose Extension
- 1.1.6.1.5 Downstream Coil Collar

The design of the magnet steel allows for modification/reuse of some of the original CLEO II steel (1.1.6.1.1 – Yoke). The remaining parts of the magnet steel will require new steel. The lab has recent experience with designing large pieces of magnet steel for the Hall C SHMS spectrometers. Labor estimates were based off of this experience.

1.1.6.2 Magnet Support and Alignment

- 1.1.6.2.1 Design new magnet support & vertical alignment system
- 1.1.6.2.2 Design endcap support and motion system

The support and alignment of the magnet will be similar to the design used by CLEO II at Cornell University. The support and alignment of the endcap, which includes the system used to separate the two halves for purposes of detector installation and service, have many similarities to the large spectrometers in Hall A, B & C.

1.1.6.3 Control

1.1.6.4 Power Supply

1.1.6.5 Cryogenic

The design and integration of the magnet's controls, power supply and cryogenic utilities into Hall A's existing systems is a fairly straightforward process and one in which the lab's experience will be relied upon. The Lab's experience with the SHMS in Hall C was used for guidance on labor estimates.

1.1.6.6 Magnet Testing

The design and planning for testing the magnet after final assembly is a common practice that the lab has experience in. The Hall D solenoid magnet testing provides recent commissioning experience with a large superconducting solenoid magnet.

1.2 Construction

1.2.6 Magnet

1.2.6.1 Magnet Steel

- 1.2.6.1.1 Yoke
- 1.2.6.1.2 Upstream Endcap
- 1.2.6.1.3 Downstream Endcap
- 1.2.6.1.4 Nose Extension
- 1.2.6.1.5 Downstream Coil Collar

The lab has procured new large steel castings and finish machining services in recent years that are comparable in size and complexity. Procurement estimates were based on judgement and experience from these recent procurements at the Lab.

1.2.6.2 Magnet Support and Alignment

- 1.2.6.2.1 Procure new magnet support & vertical alignment system
- 1.2.6.2.2 Procure endcap support and motion system

The Hall A engineering and design group has experience procuring support mechanisms that facilitate both movement and alignment capabilities. Hall A's work with the support and movement of the SBS magnet provides similar experience. The procurement estimates were based off of the group's judgement.

1.2.6.3 Control

1.2.6.4 Power Supply

1.2.6.5 Cryogenic

The procurement of control, power supply and cryogenic utilities is a typical part of new large experiments. Lab experience and judgement was used for estimations. Examples include procurements in Hall C during 12 GeV upgrade with their new superconducting magnets on SHMS.

1.2.6.6 Magnet Testing

The cost estimates for testing the SoLID magnet as based on lab experience with other large superconducting magnets in Hall C and D.