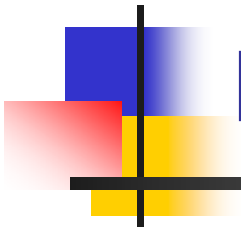


MERIT Beam Collimator Design

Nicholas Olesen

9 August 2006

Contents

- Collimator Role
- Requirement Specifications
- Proposed Design
- Additional Information

Collimator Role

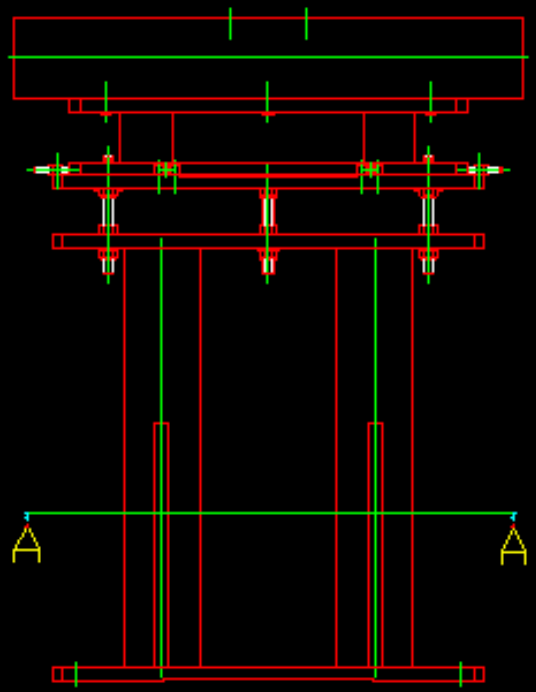
- Beam of ~30 x 10^{12} protons per pulse, integrated power of ~140kW
- Align the proton beam with the mercury target
- Prevent proton beam from hitting and damaging experiment equipment

Requirement Specifications

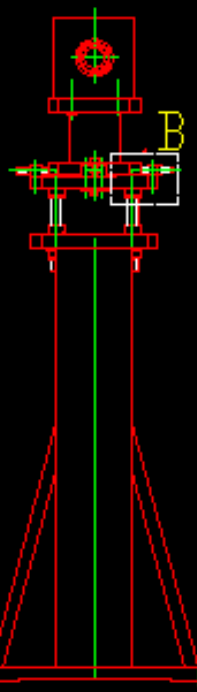
- Nominal position at beam height of 120cm above concrete floor
- Located 2m upstream of magnet – must be non-magnetic material
- Length of 1m
- Collimator block area of at least 150mm x 150mm

Proposed Design

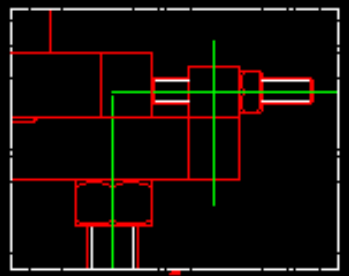
- All requirement specs are met
- Collimator block area of 160mm x 160mm
- Hole radius of 20mm
- Lateral movement (x and y axes) of ±30mm, longitudinal movement (z axis) of ±55mm; manually adjustable
- Uses CERN standard parts wherever possible



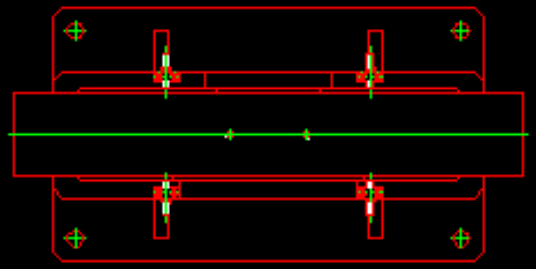
SIDE VIEW



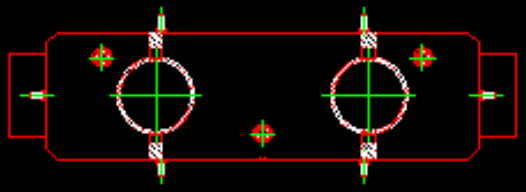
FRONT VIEW



DETAIL B



TOP VIEW



SECTION A-A

Additional Information

- Target dimensions confirmed
- Collimator insert
  - Needs to be exchangeable (e.g. for different sized aperture)
  - Material is tungsten
- Need drawings of CERN standard parts for alignment
- Calculations for energy deposited by beam