



# MERIT Beam Collimator Design

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## Collimator Role

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



## Requirement Specifications

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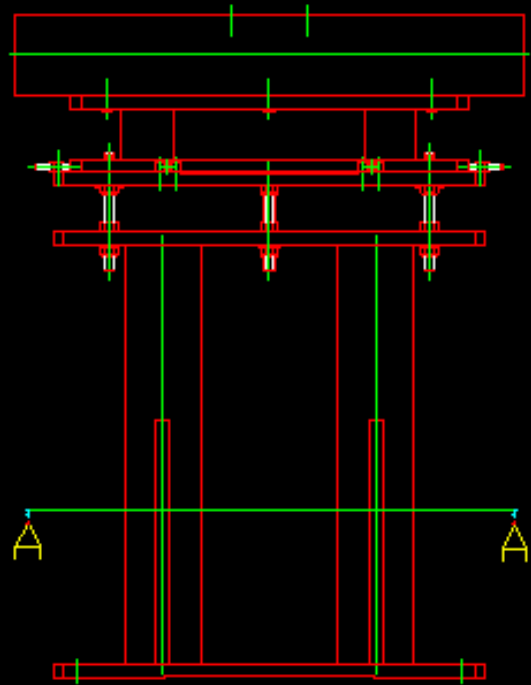
- Nominal position at beam height of 120cm above concrete floor
- Located 2m upstream of magnet – must be non-magnetic material
- Length of 1m
- Collimator block area of at least 150mm x 150mm



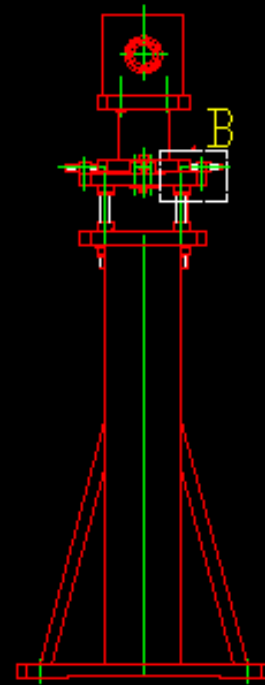
## Proposed Design

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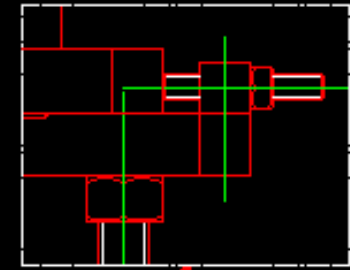
- All requirement specs are met
- Collimator block area of 160mm x 160mm
- Hole radius of 20mm
- Lateral movement (x and y axes) of  $\pm 30$ mm, longitudinal movement (z axis) of  $\pm 55$ mm; manually adjustable
- Uses CERN standard parts wherever possible



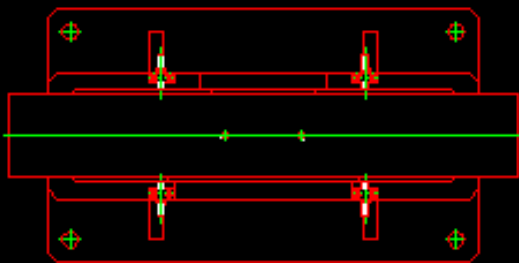
SIDE VIEW



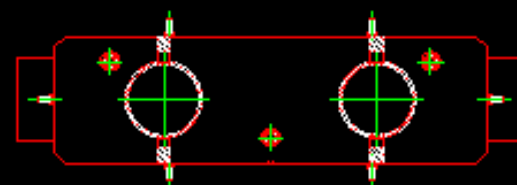
FRONT VIEW



DETAIL B



TOP VIEW



SECTION A-A



## Additional Information

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- 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