SiD MDI & IR Design

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SiD IR & MDI Design Philosophy

SiD has traditionally tried to incorporate self-consistent IR/MDI design based on assumptions that detector would

- **Have solid endcap doors and be self-shielded**

We have assumed push-pull would require

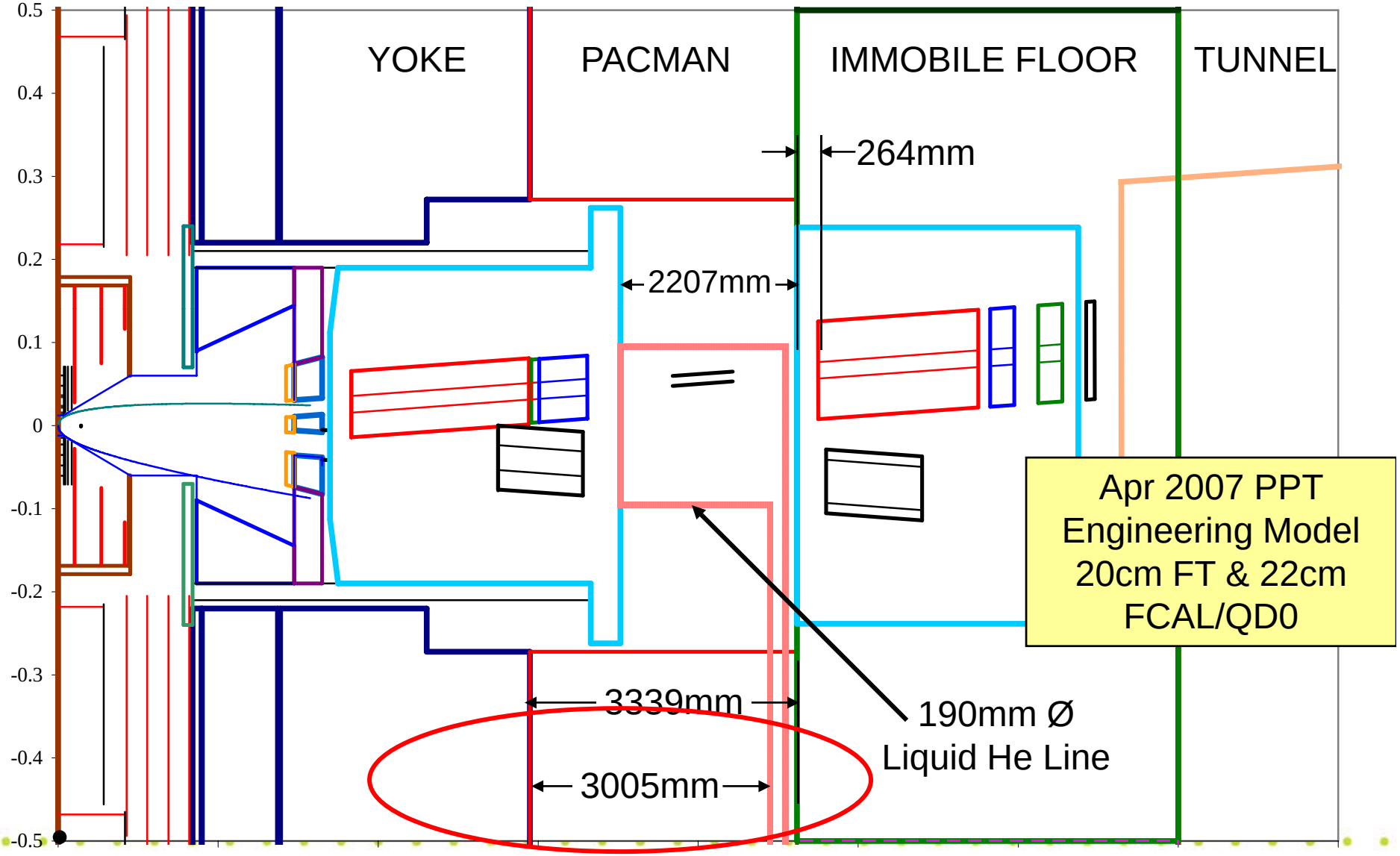
- **No connection of FCAL/Doublet support structure to a fixed point other than the detector**

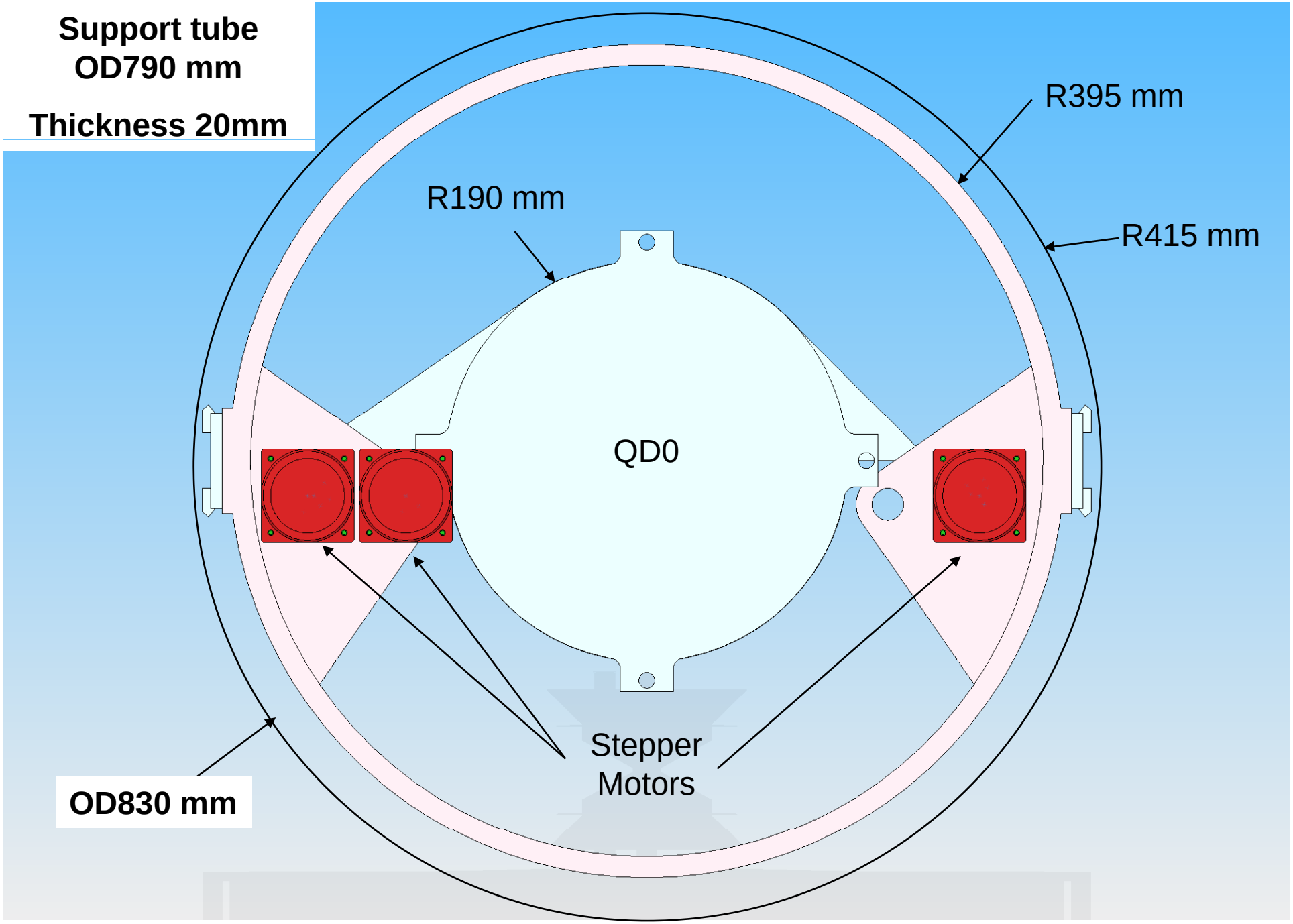
We have tried to

- **Minimize diameter of the FCAL/Quad package**

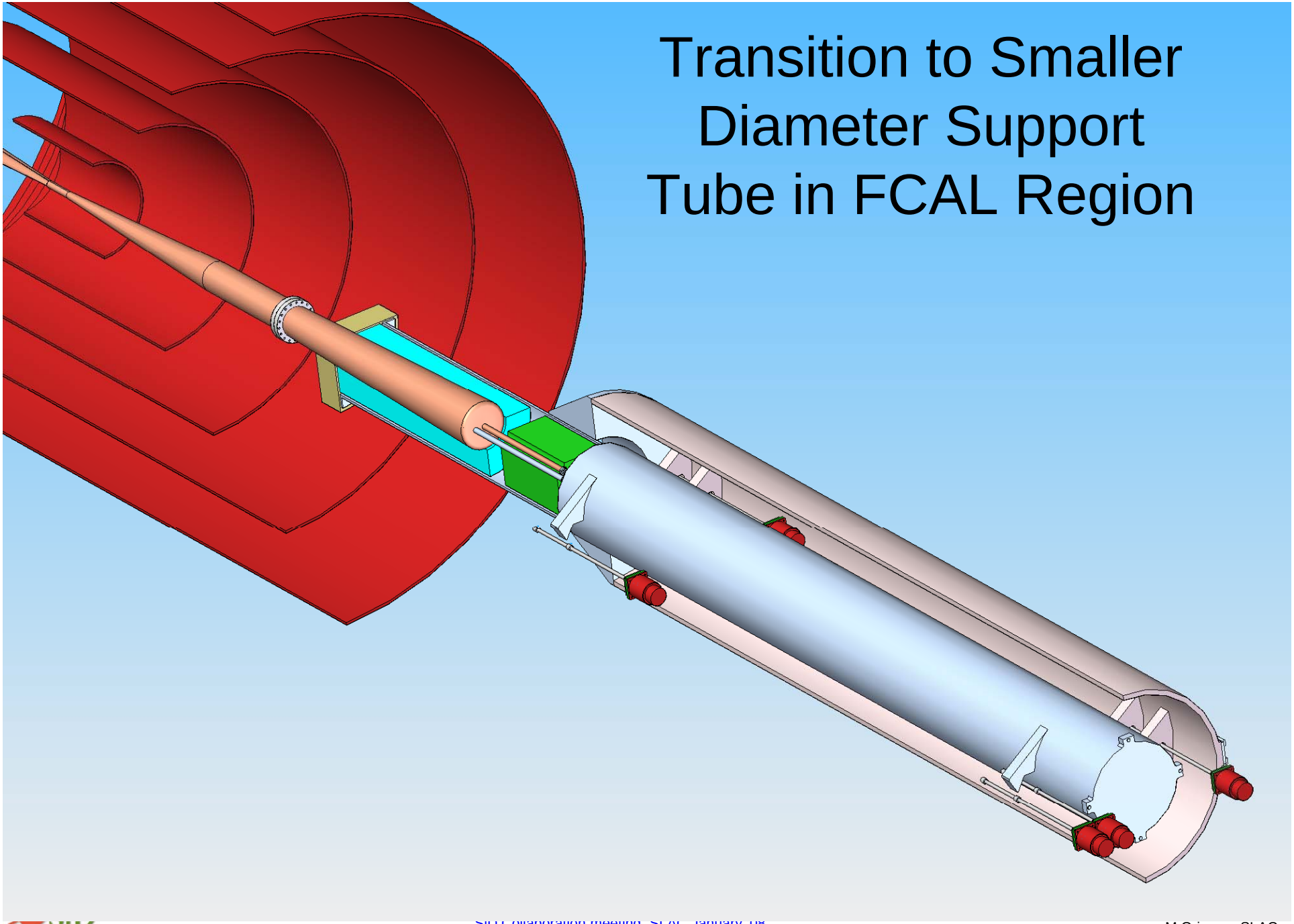
But until recently (M. Oriunno & SiD Eng. Group) only "PowerPoint engineering" was possible

SiD r<50cm, L*=3.664m, 14mrad, Push-Pull, QF@9.5m, Door Closed

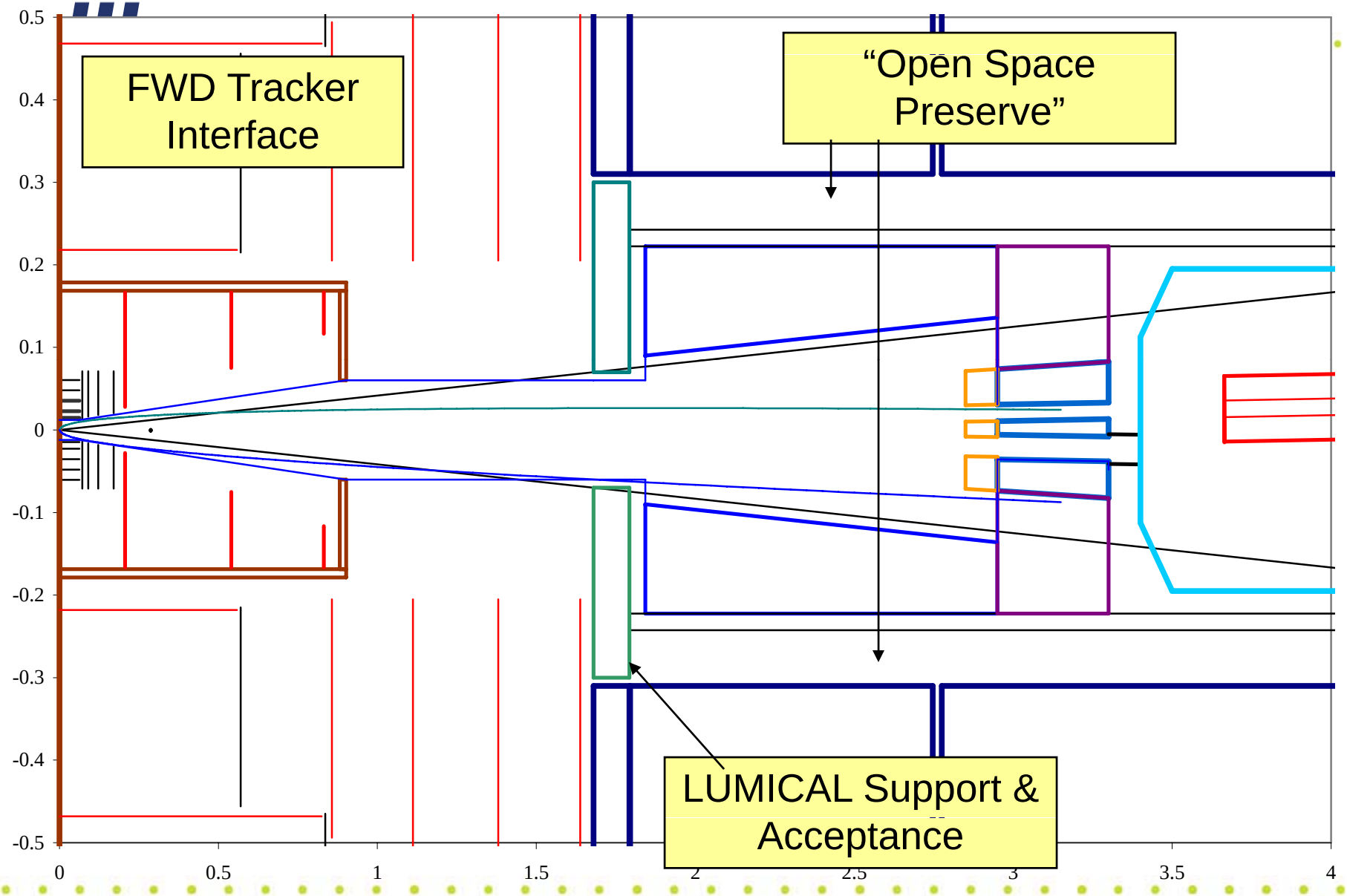



Support tube
OD790 mm
Thickness 20mm
R395 mm
R190 mm
R415 mm
QD0
Stepper
Motors
OD830 mm

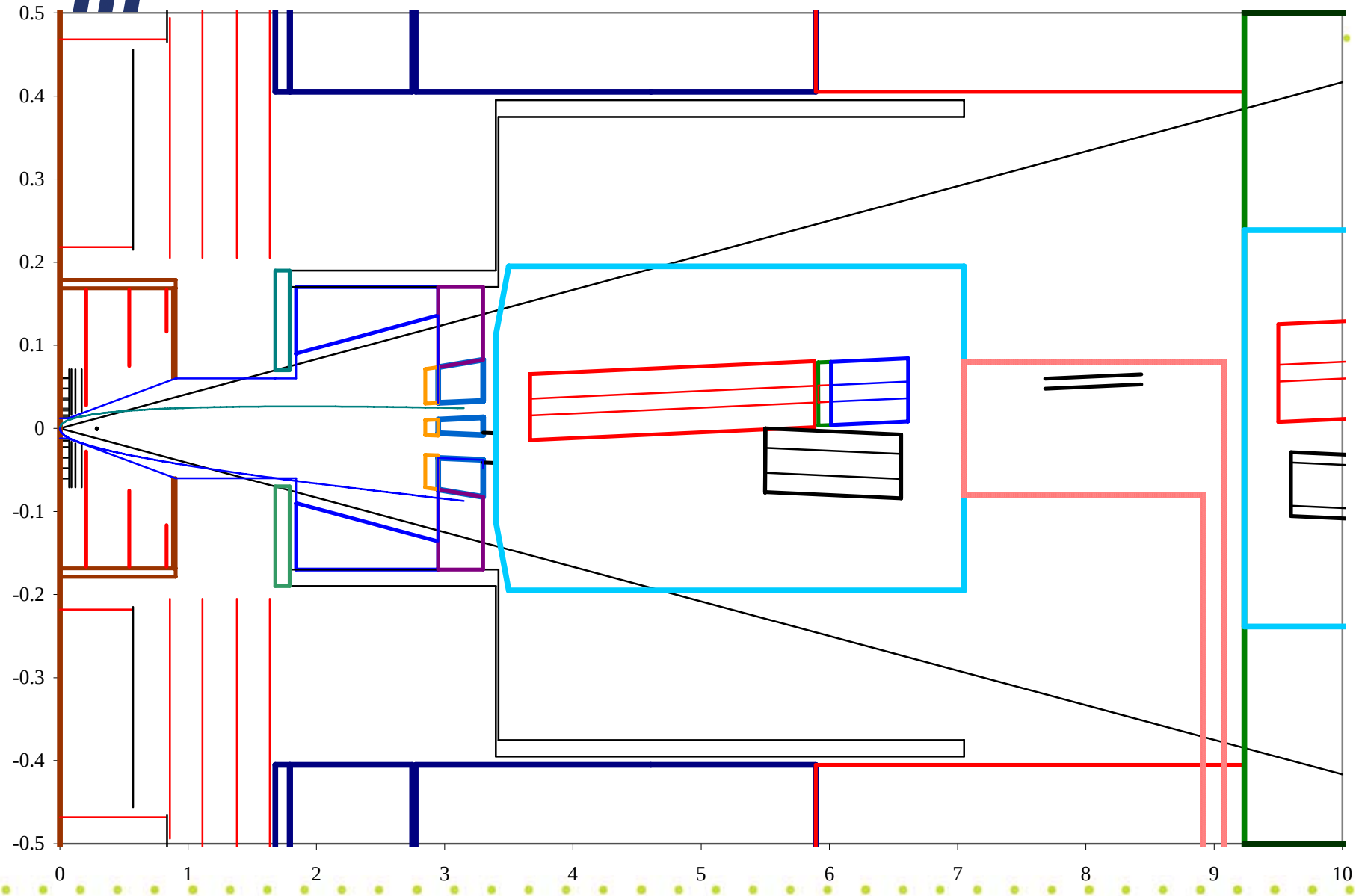
Transition to Smaller Diameter Support Tube in FCAL Region



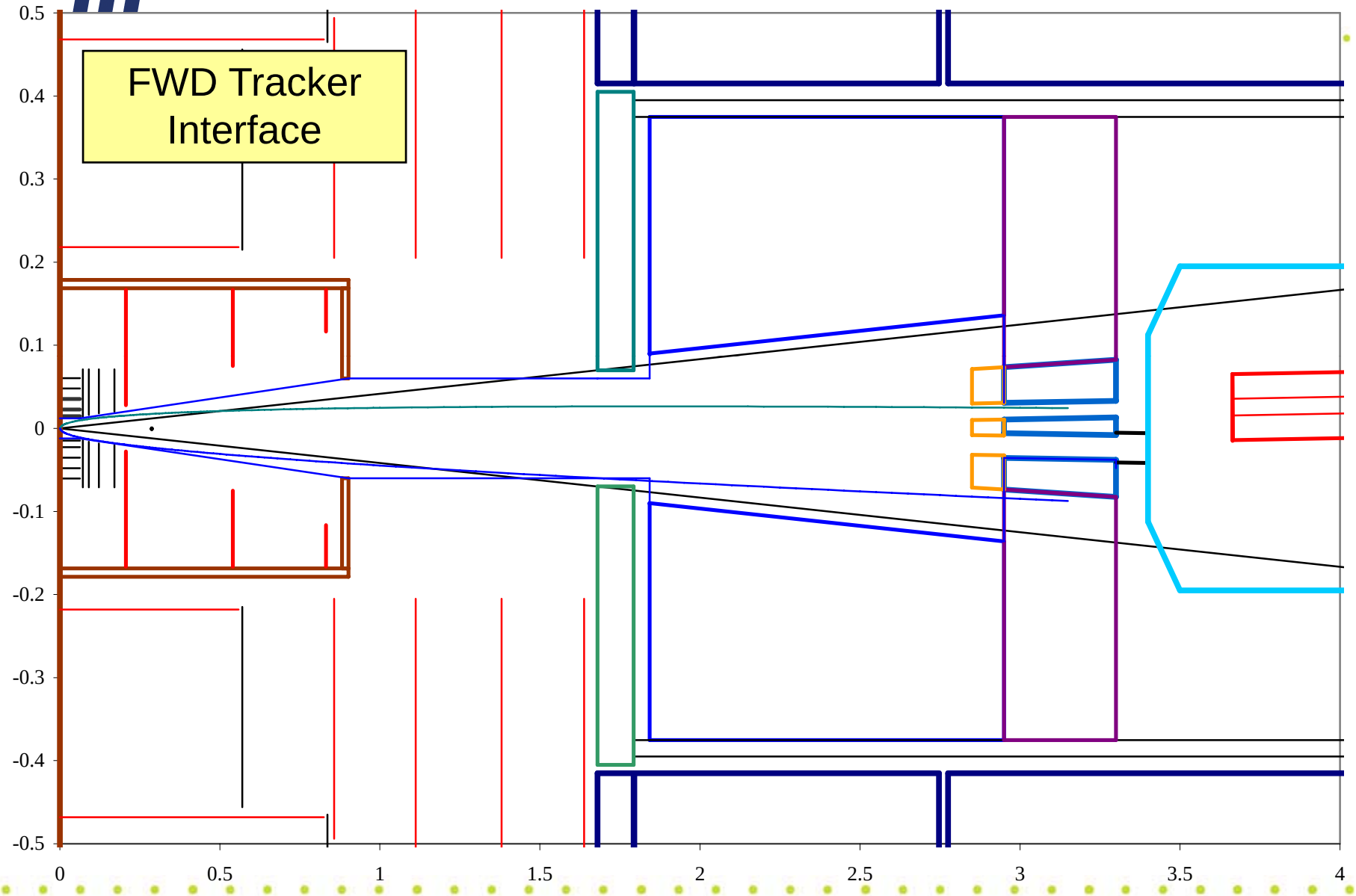
EXCEL pix of Marco's January 2008 Design



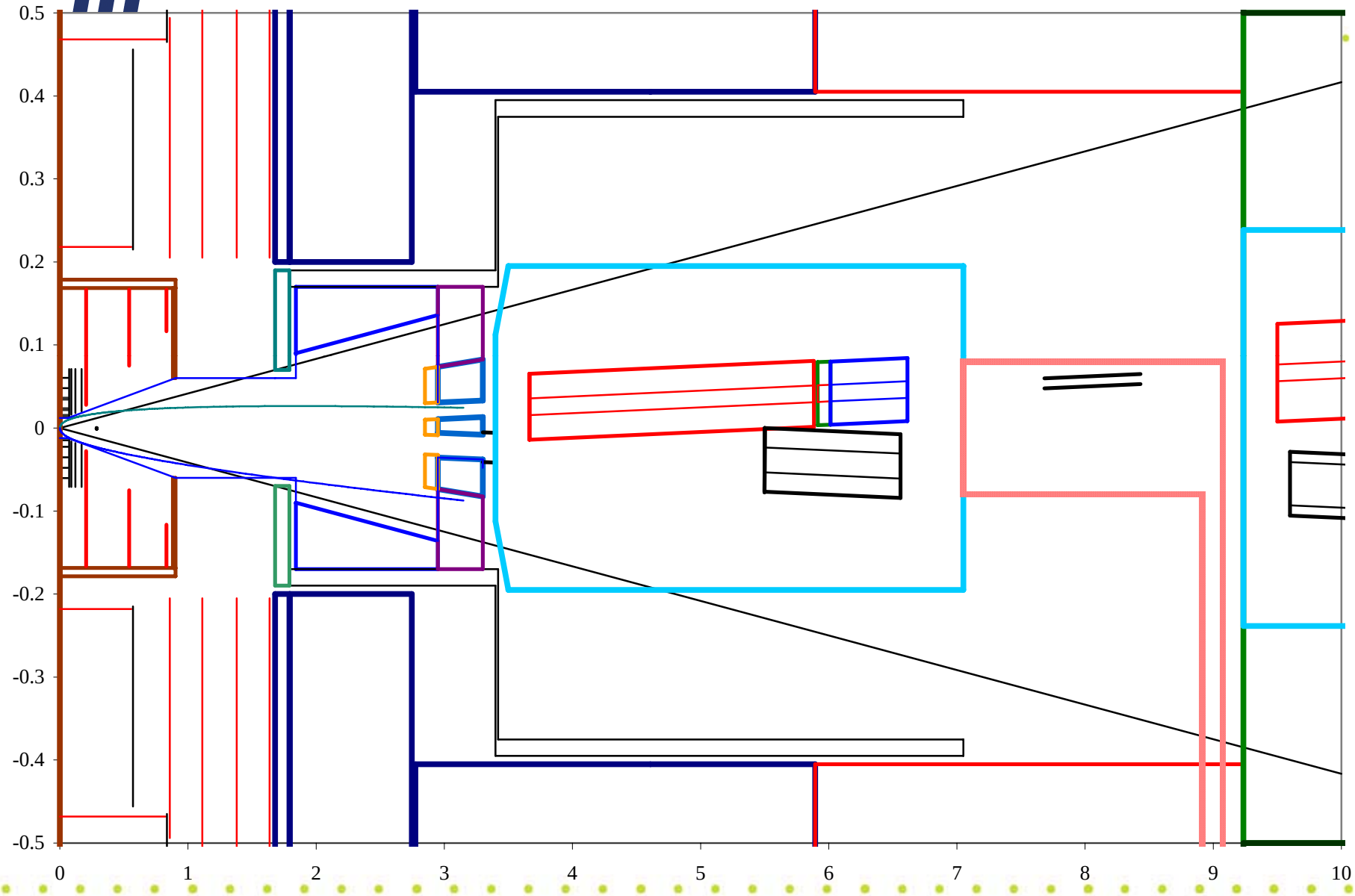
EXCEL pix of Marco's April 2008 Design respecting FT but ignoring Hermaticity



EXCEL pix of Marco's April 2008 Design Modified for Full Calorimetry

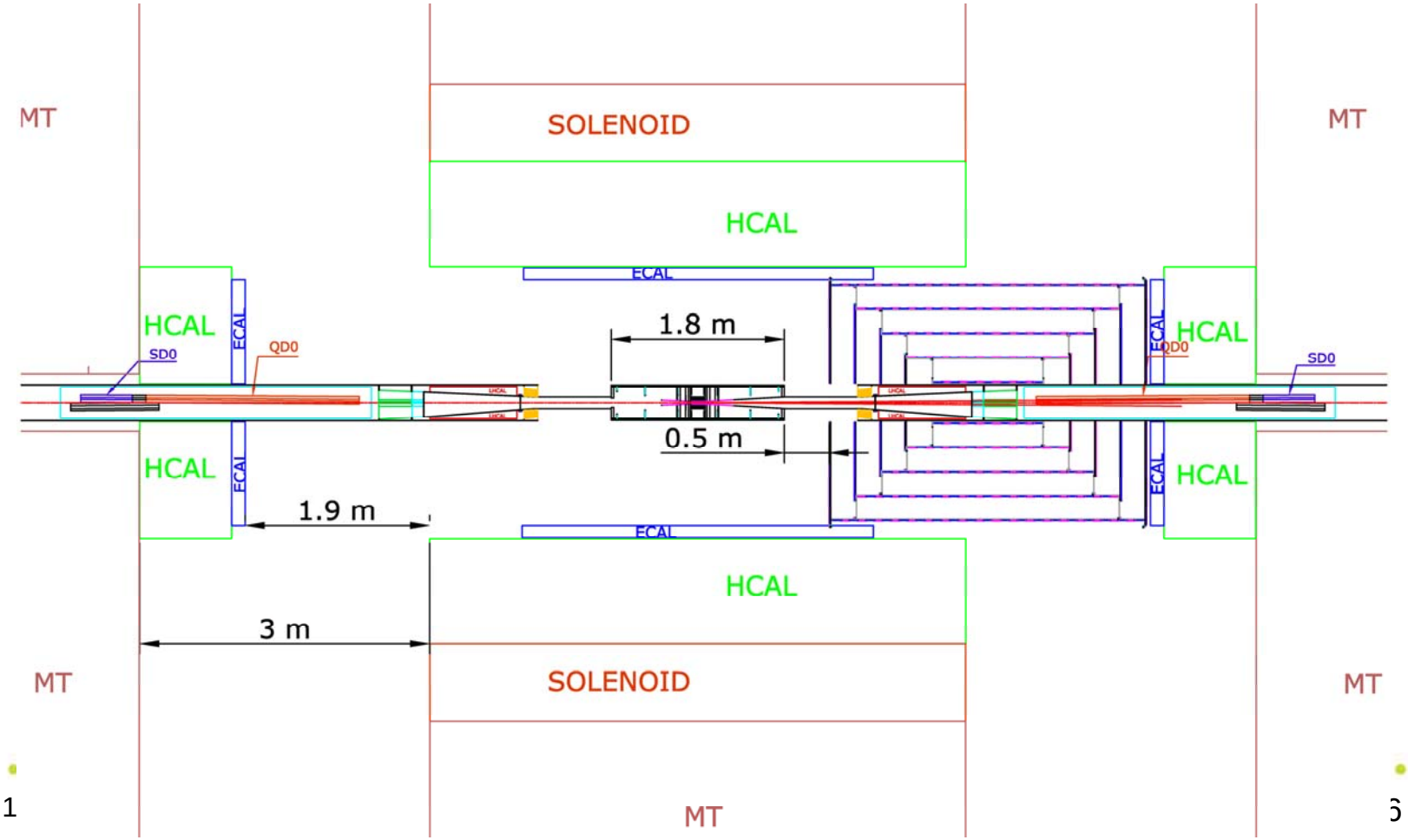


EXCEL pix of Marco's April 2008 Design Modified for Limited Door Opening



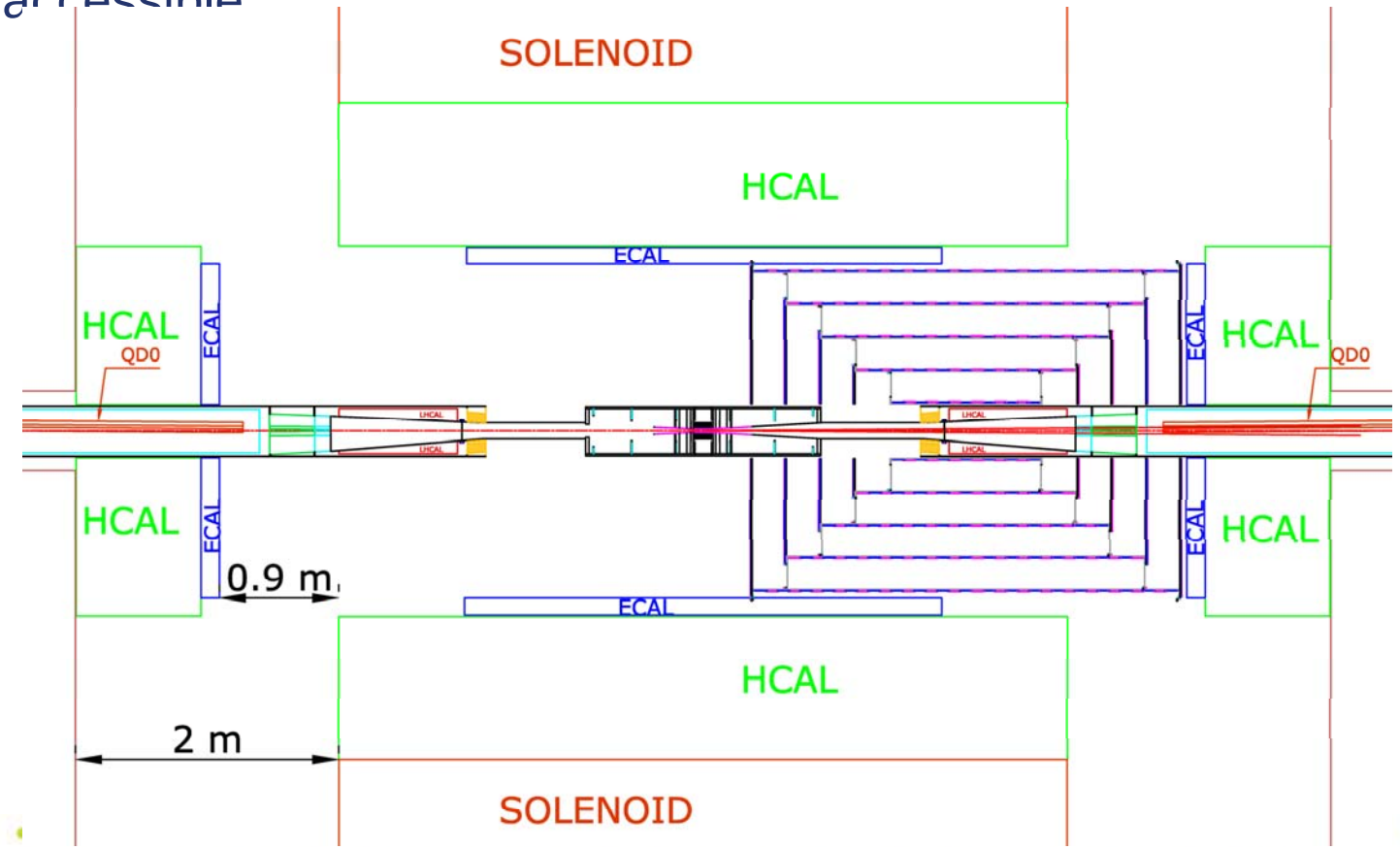
Servicing Vertex Detector & Tracker

- Detector open 3 m for off-beamline servicing
- Vertex detector can be removed / replaced.



Servicing Vertex Detector & Tracker

- Detector open 2 m for on-beamline servicing
- Ends of tracker and outer surfaces of vertex detector are accessible



MDI For the LOI

- Yamada's MDI Organization
  - **Brett Parker & Tom Markiewicz on GDE "IR Integration" Box**
    - With Andrei Seryi really driving work
  - **On SiD?: Phil Burrows and Marco Oriunno (?)**
- "MDI Interface Document"
  - **My conception was of a written minimal set of agreed on parameters to bound the MDI design for each concept**
    - Leave details for down the road and for the detector collaborations, especially if site dependent
  - **Andrei's conception is more of a complete set of engineering parameters to define IR region**
    - Changeable, but complete
    - "Baseline IR Model"

MDI Interface Items from SiD Perspective

Essential Items:

- QD0 L* and QF1 L*
- Interface between Pit Wall Mounted PacMan Shielding and Detector Mounted Shielding
- Height Difference in ILC and SiD and Question of Moving Platform vs. Hillman Rollers
- ?

Matters of Secondary Importance:

- Crane Capacity Above & Below Grade
- ?

Conclusions

In the FCAL/QDO zone, it will likely require more radial space than 20cm built into current ECAL & Tracker designs to support and align package

- SiD Exec Committee Choice

A discussion of interface issues will need to begin once Yamada-san has announced the MDI contacts and the BDS Integration Team

- PacMan Interface Platform and hall depth

Other major SiD-FCAL questions related to MDI are

- FCAL geometry (OD, ID) of Lumical and Beamcal
- Beam Pipe shape, flange & bellows and pump locations