

SiD and IR/MDI Issues

Philip Burrows
John Adams Institute
Oxford University

Response to BDS CCB request

SiD Advisory Group met 14/8/06 to consider BDS request

- IR crossing angles: 2/20 \rightarrow 14/14 mrad: **support with enthusiasm**
 - downstream monitoring of energy and polarisation
 - control of backgrounds with anti-DID
 - small loss of acceptance for (some) SUSY searches
- Single IR hall at $z=0$ shared by both detectors: **acceptable**
 - concerns about mechanical interferences between detectors: vibrational coupling, esp. during installation, repairs, upgrades
 - would like to understand better single IR hall layout + size, access/installation issues (eg. shafts, shielding walls) ...

IR hall issues: underground assembly

Current baseline hall for single IR costed by CFS:

72m (x) 32m (z) 35m (y)

accommodates SiD comfortably

SiD DoD specifies hall:

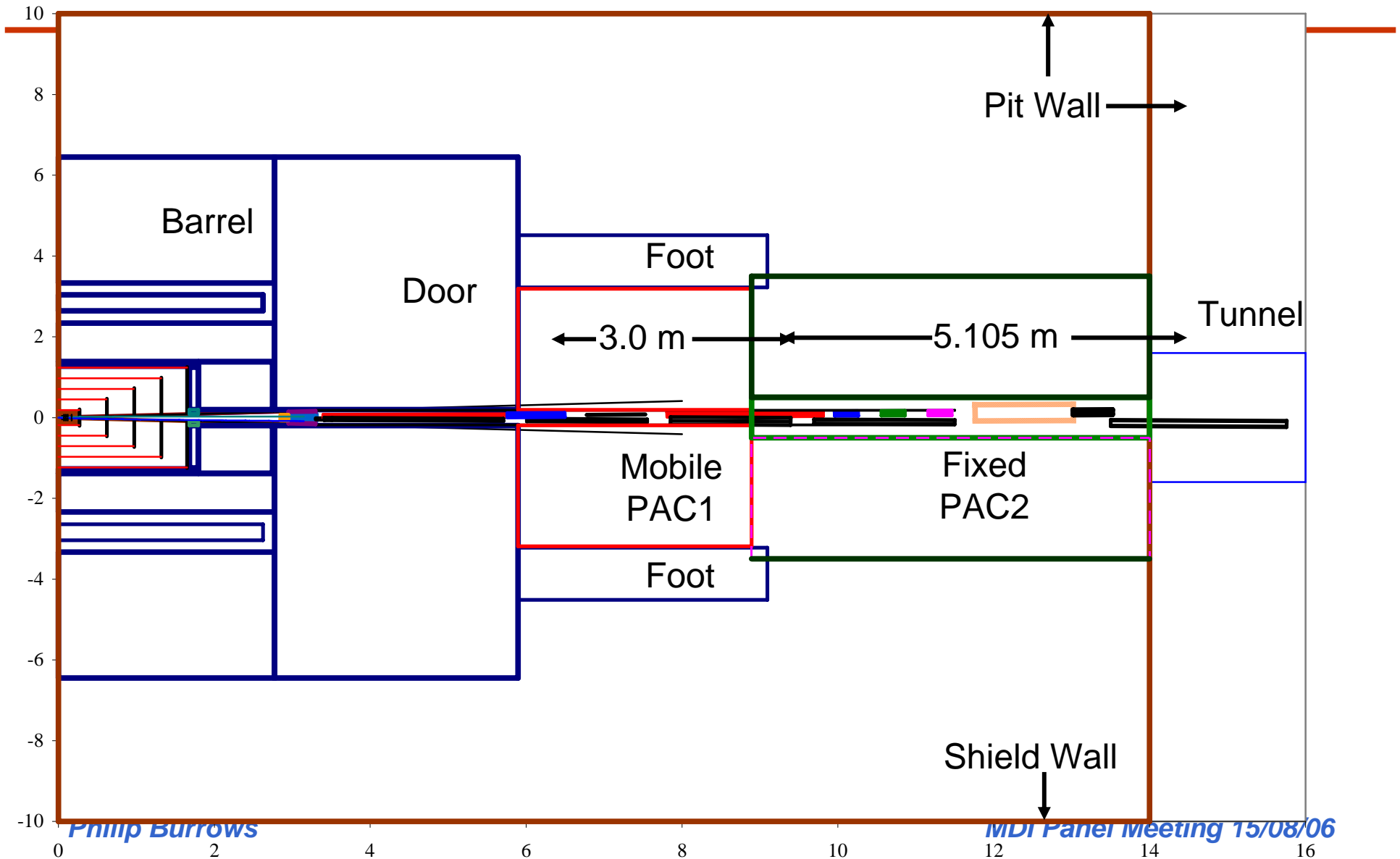
48m (x) 28m (z) 30m (y)

assuming assembly underground

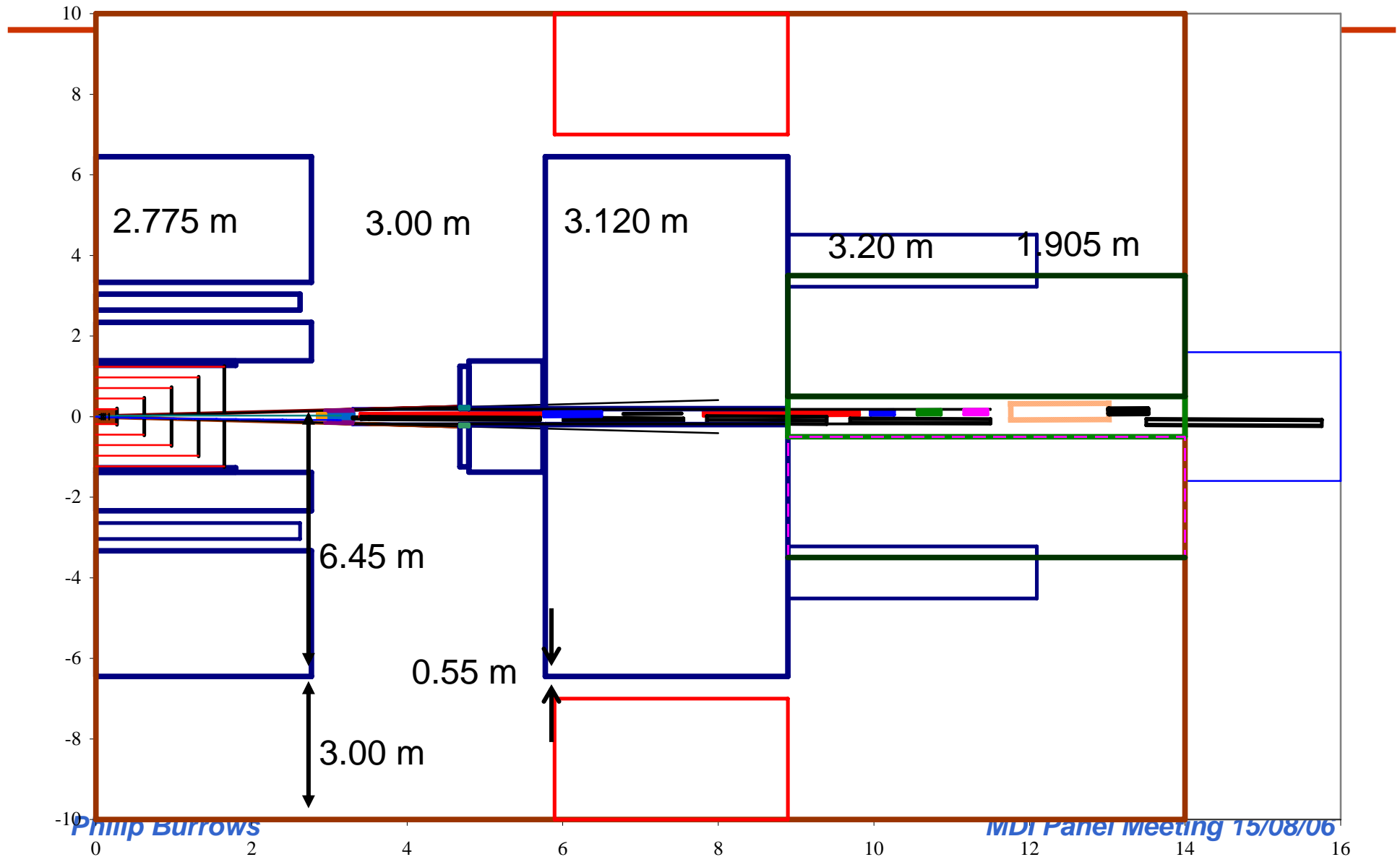
(18m in z may be acceptable)

If CCB approves single IR hall for 2 detectors would like to understand CFS model in new paradigm

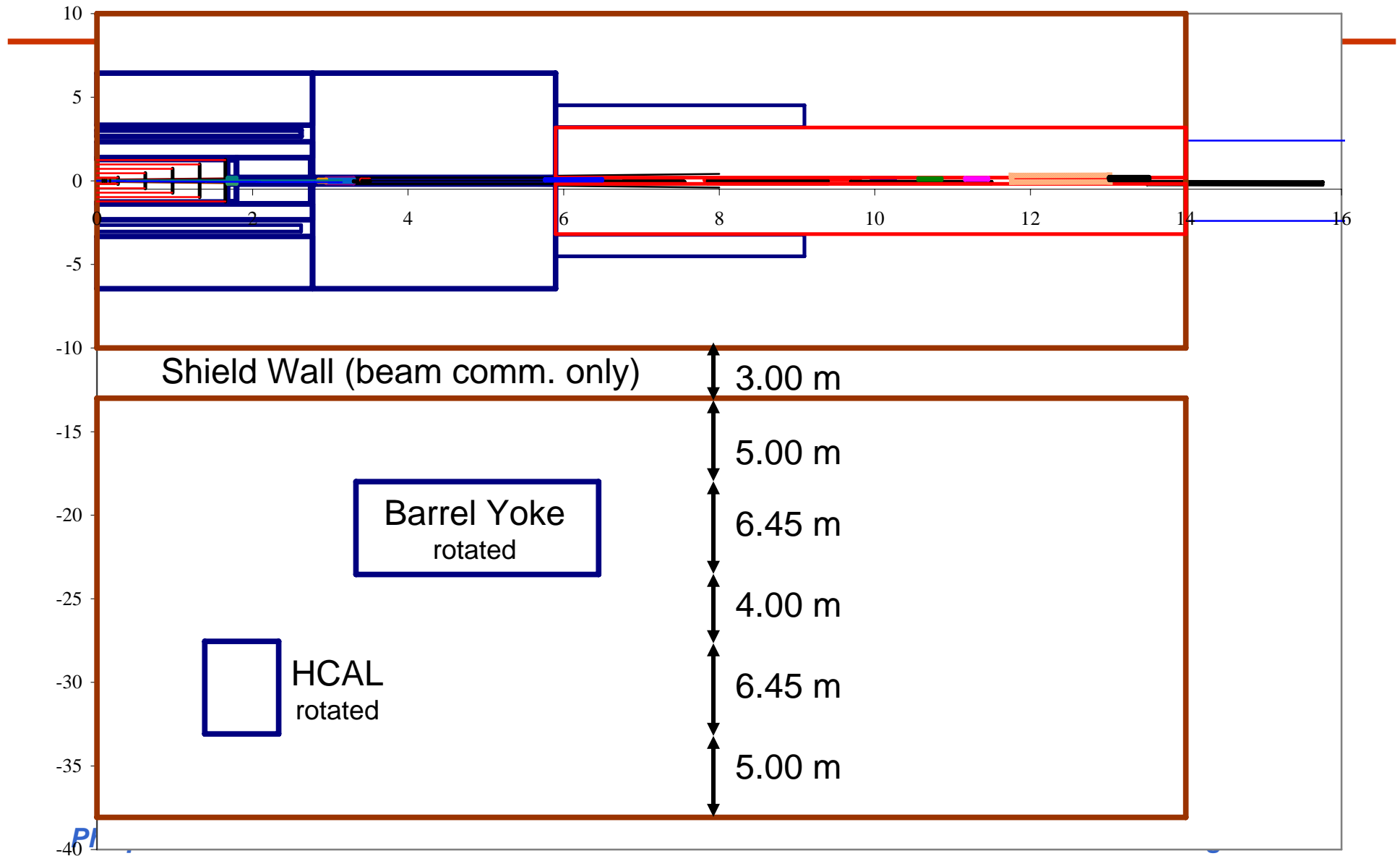
SiD closed, on beamline, in 20m x 28m area



SiD open, on beamline, in 20m x 28m area



Underground assembly space

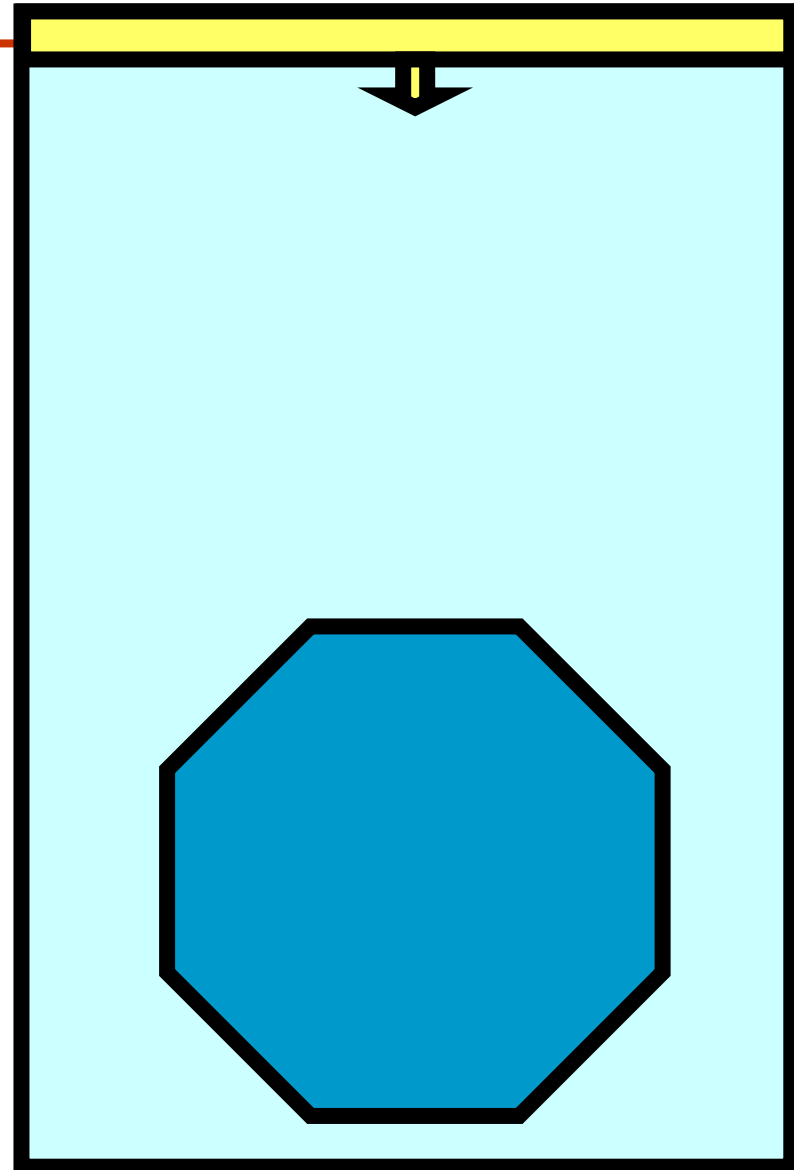


Elevation View

Hall height: 30m ?

- 1.000 Barrel-floor
- 12.90 Detector diameter
- 12.90 Free space above detector
- 3.000 Crane bridge and hook

NB need to know elevation of beamline rel. to floor (CFS assumes 8.6m, above assumes 7.5m)



Surface assembly model (1)

- **No objection in principle to surface assembly**
- **Like to understand implications for cost savings, schedule, 'CMS model' ...**
- **Given it some initial consideration (MIB 1/8/06)**
- **No detailed plan yet for assembly procedures -> size of surface hall or underground IR hall; happy to consider**

Surface assembly model (2)

Some initial considerations:

- **surface crane capacity:**
 - barrel iron 2-3000T / n segments ($8 < n < 16$)
 - coil package: c. 600T
 - Hcal: c. 400T
 - complete endcap door: c. 2000T / 6 pieces**1000T crane capacity may be OK**
- **shaft diameter: 9m may be OK**
- **2-3 years of IR hall access needed for final assembly**

Summary

- **SiD supports BDS request for 14/14 mrad Xing with single IR hall at $z=0$:**
 - like to understand CFS IR hall model in this case**
- **SiD has no objection to concept of surface assembly:**
 - like to understand implications for cost savings, schedule, learn more about ‘CMS model’**
- **Suggestion (for discussion) that respective hall + shaft costs be assigned to each detector concept rather than machine**