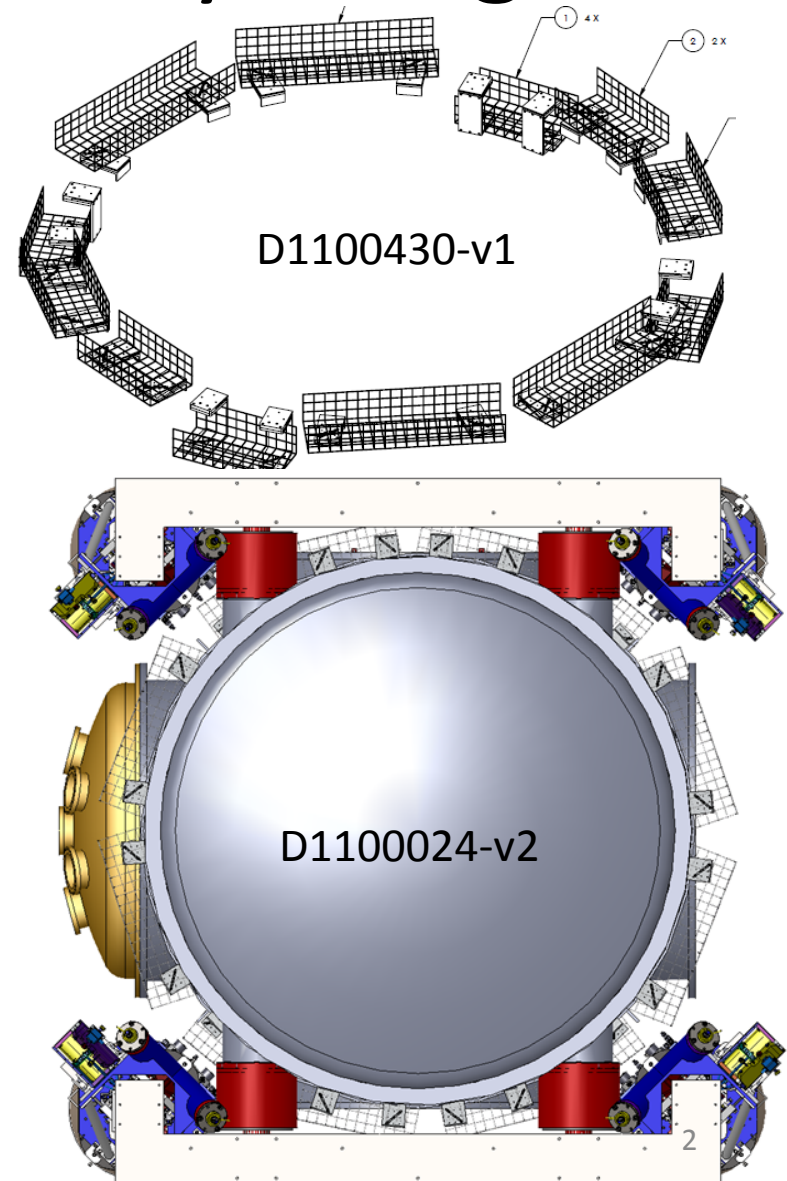


# BSC Cable Trays ... again:

Evaluation of an LLO Proposal for an Alternative Design

# Baseline BSC Cable Tray Design

- Design calls for wire frame tray cut in sections, supported from the welded stiffener ring (just below the electrical feed-through ports) via custom machined brackets
- Tray sides are cut away in front of feed-throughs
- Tray proximity to feed-throughs provides strain relief (cable weight does not hang from the connector as in iLIGO)

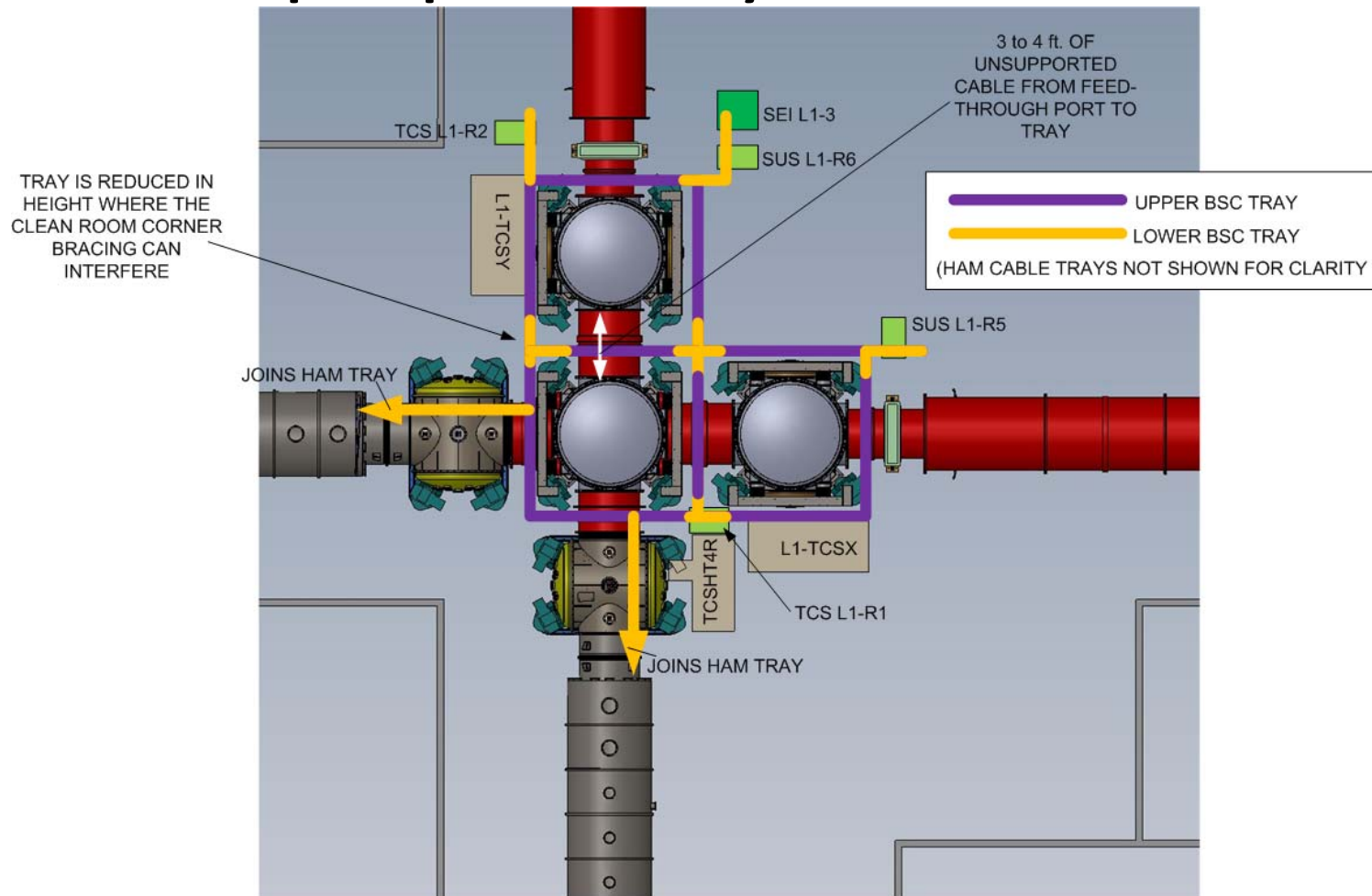


# Baseline BSC Cable Tray Design

- Implementation at LHO on WBSC8 and WBSC6 uses a mix of custom machined brackets and use of off-the-shelf hardware
- Design approach is flexible enough to accommodate chamber-to-chamber differences, e.g. annulus ion plumbing interference
- Found location for SEI CPS Demodulation modules on extended tray supports just outboard of tray (photo would help)
- LHO experience?
  - Any problems? **No**
  - Adequate capacity? **Yes**
  - Difficulties implementing? **No**
  - Difficulty replacing conflat flange feed-throughs with tray in place? **No**
  - Difficulty removing BSC chamber door with the engine hoist? **No, but the engine hoist end was modified.**



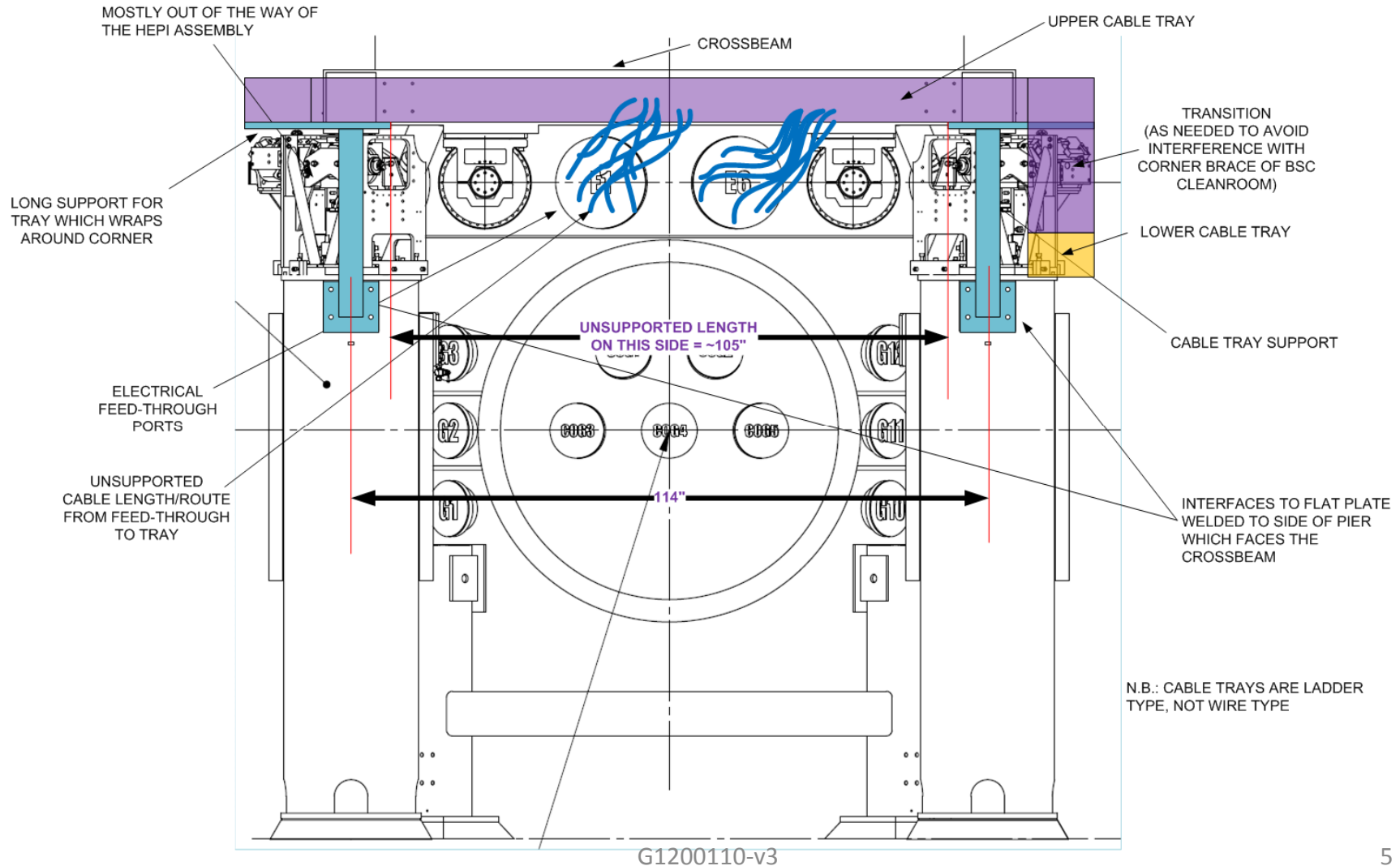
# Alternative BSC Cable Tray Design proposed by LLO Staff



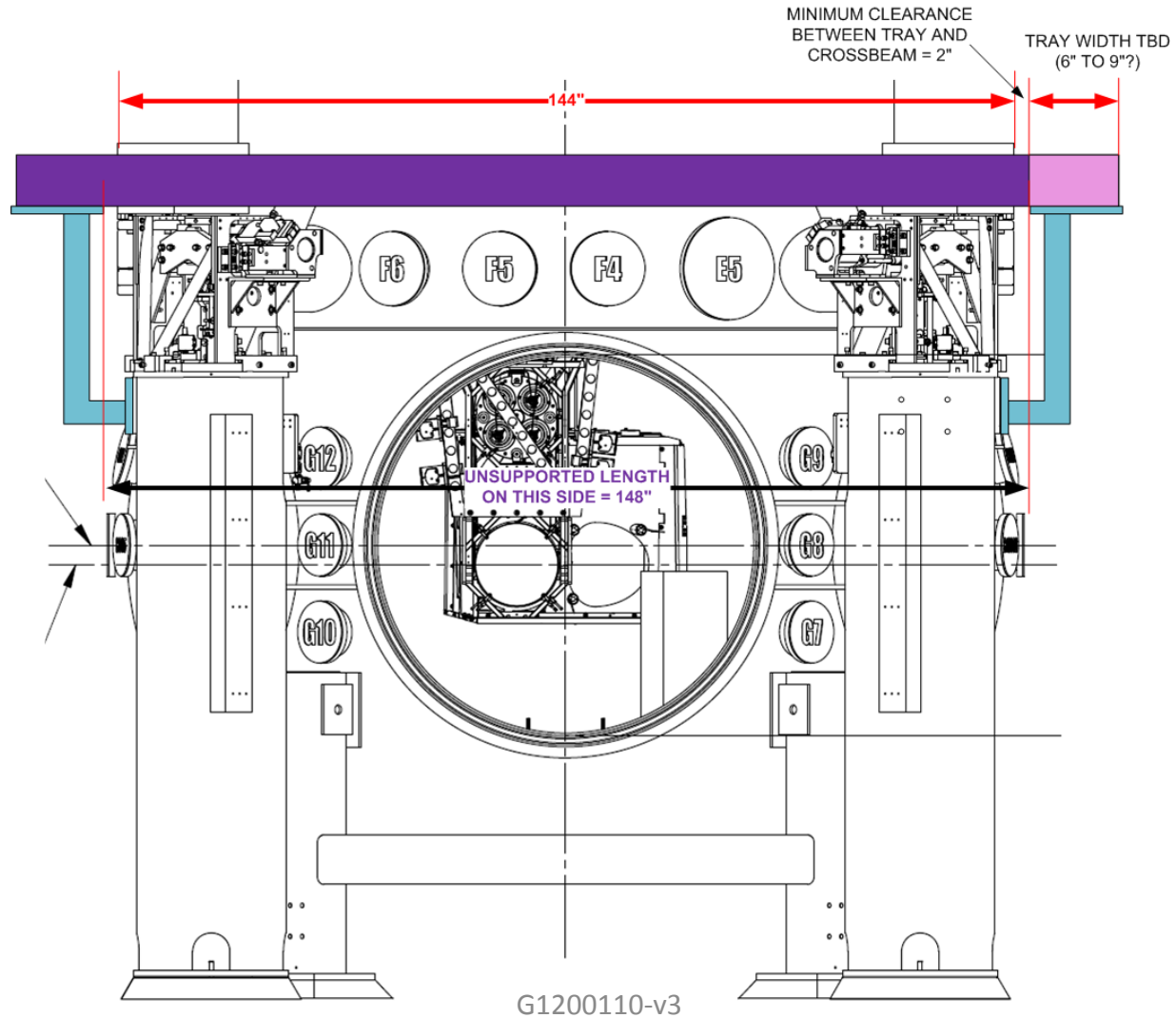
From the LLO Corner Station Layout, D0901466-v4, and (in lieu of L1 LVEA Rack & Cable Tray Layout, D1003141) the H1 H2 LVEA Rack & Cable Tray Layout, D1100024-v2

G1200110-v3

# Alternative BSC Cable Tray Design



# Alternative BSC Cable Tray Design

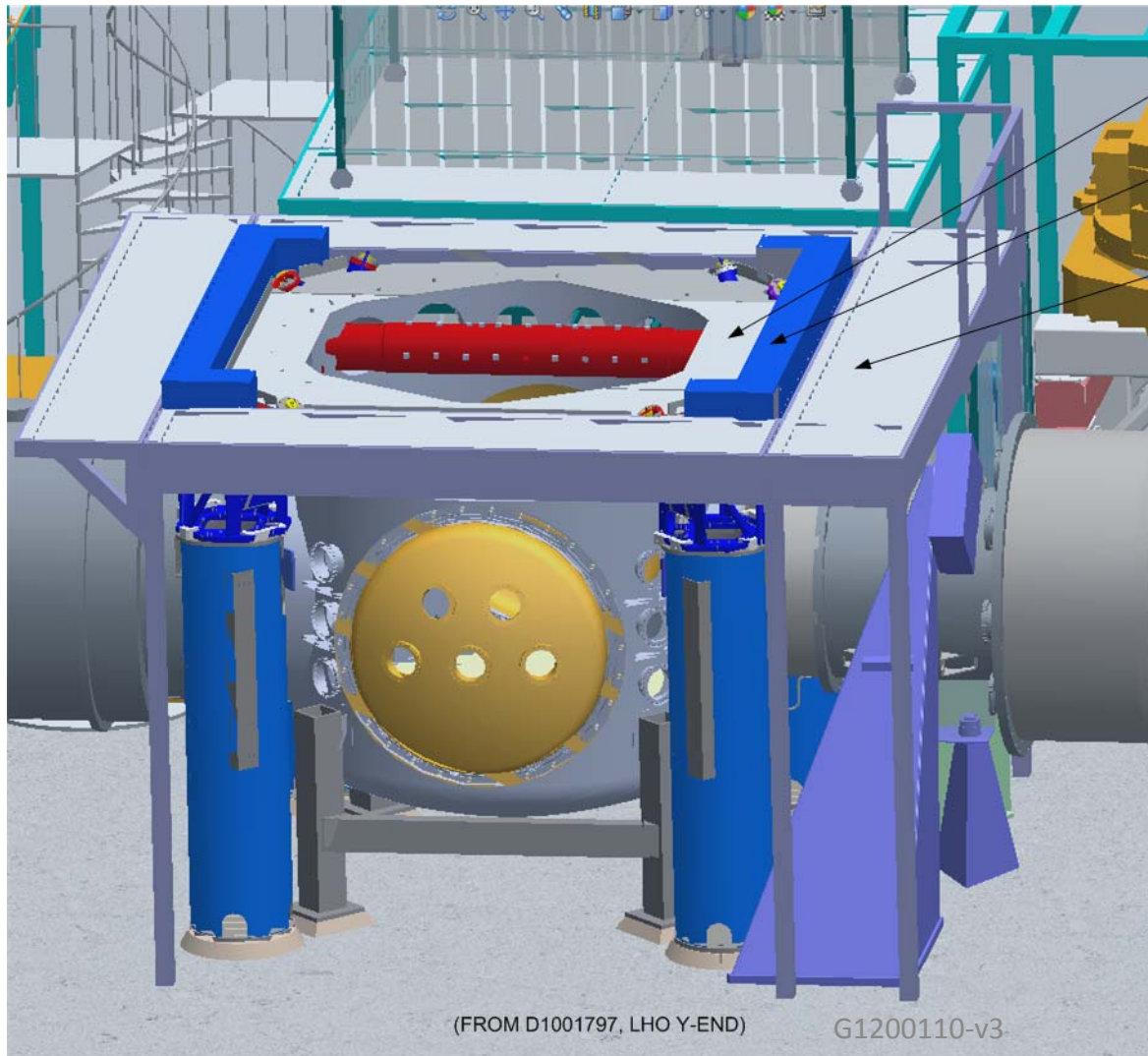


# Alternative BSC Cable Tray Design

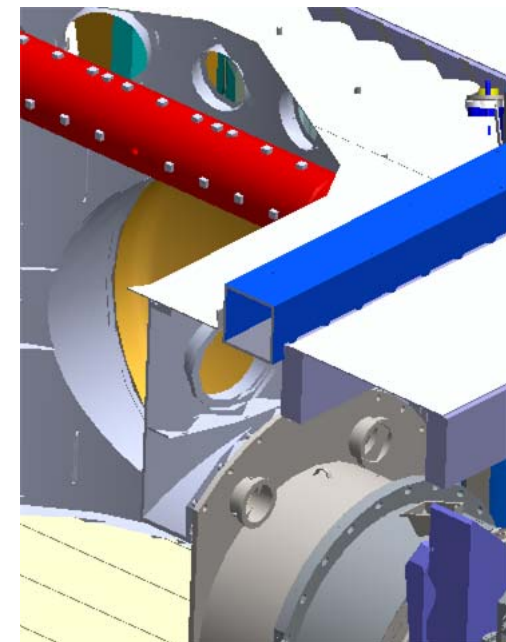
- Pros
  - Easier installation
  - Easier access to the feed-throughs
  - Easier to route cable?
  - Easier to clean (will we ever clean the cable/tray?)
  - When cabling is disturbed, the accumulated particulates which will shower down are further from BSC door
  - Less expensive (iff we can re-use iLIGO tray)
  - Potentially allows for greater cable tray capacity (assuming no interference with Cleanroom or Work Platform, etc.)
- Cons
  - No cable restraint
  - 3 to 4 ft long unsupported cable lengths from feed-through to tray
  - Limits the positioning of the BSC Cleanroom – OK?
  - Interferes with Work Platform → Fatal Flaw, but see possible modifications
  - Interferes with BSC Cleanroom corner braces → Fatal Flaw, but see possible modification
  - Unsupported tray length likely too long → but see possible modification
  - Adds significant mass to HEPI support piers which effect dynamics → potentially fatal flaw



# Interference with Work Platform (D1001990)



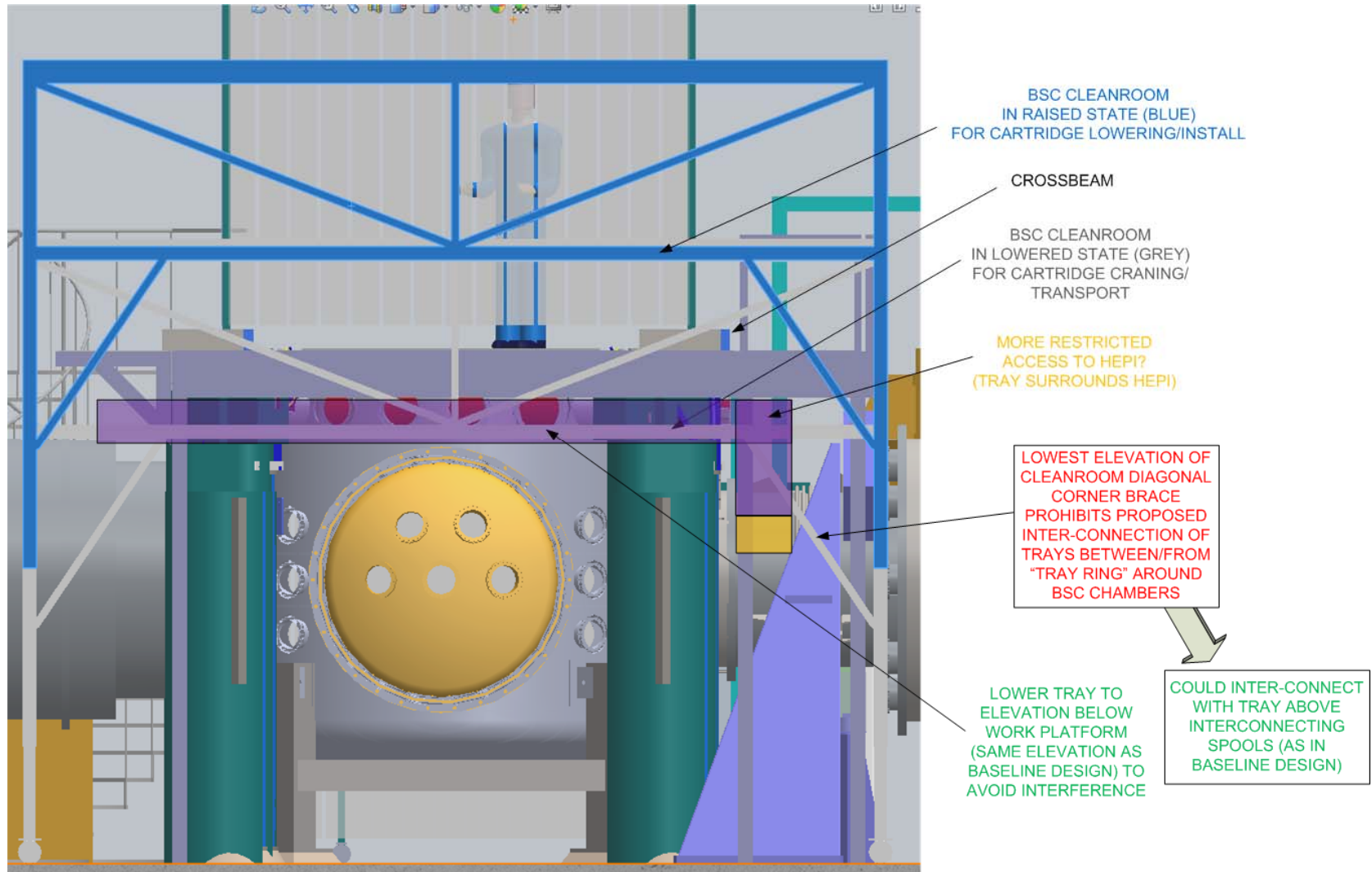
WALKING PLATE  
CROSSBEAM  
WALK PLATFORM  
INTERFERES WITH  
PROPOSED BSC CABLE  
TRAY LOCATION



CROSS-SECTION

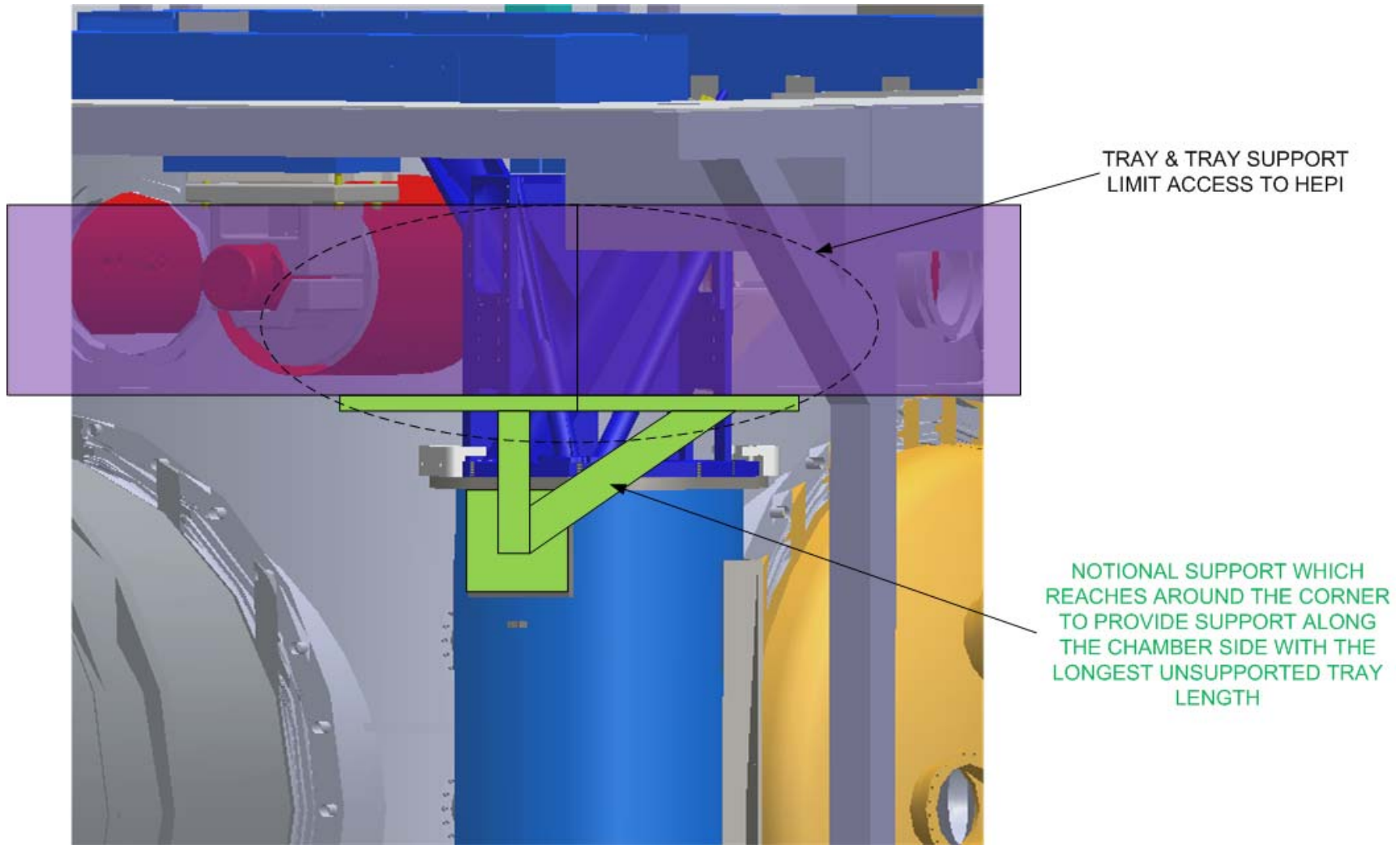


# Lower the tray to avoid interference with Work Platform?



G1200110-v3

# Reduce Unsupported Tray Length





# Modified, Alternative BSC Cable Tray Design

- Possible problems:
  - Is ~3-4 ft. of unsupported cable length OK?  
Not if there is no cable restraint at feed-through
  - Can cable restraint be added to this design concept?  
Likely yes, but no design or concept in hand
  - Limits the positioning of the BSC Cleanroom – is this OK?  
Don't know

# Evaluation of Modified, Alternative BSC Cable Tray Design

- Is the alternative proposal an attempt to solve any problem(s) with the baseline design?
  - Not really. Confusion about what the baseline design is. Follow-up actions:
    - Revise BSC tray drawing set (D1100430) to indicate final design, as implemented at LHO
    - Complete the drawings specifically for LLO (don't rely upon LHO versions) and cite minimum tray size & point to BSC tray drawing set (D1100430)
- Are there any significant risks with the baseline design?
  - No
- We need a decision now (can't wait for additional evaluation)
  - Decision is to proceed with the baseline design