



# *RF Technical Review Design Layout*

*Alan Grant, STFC*

# Overview



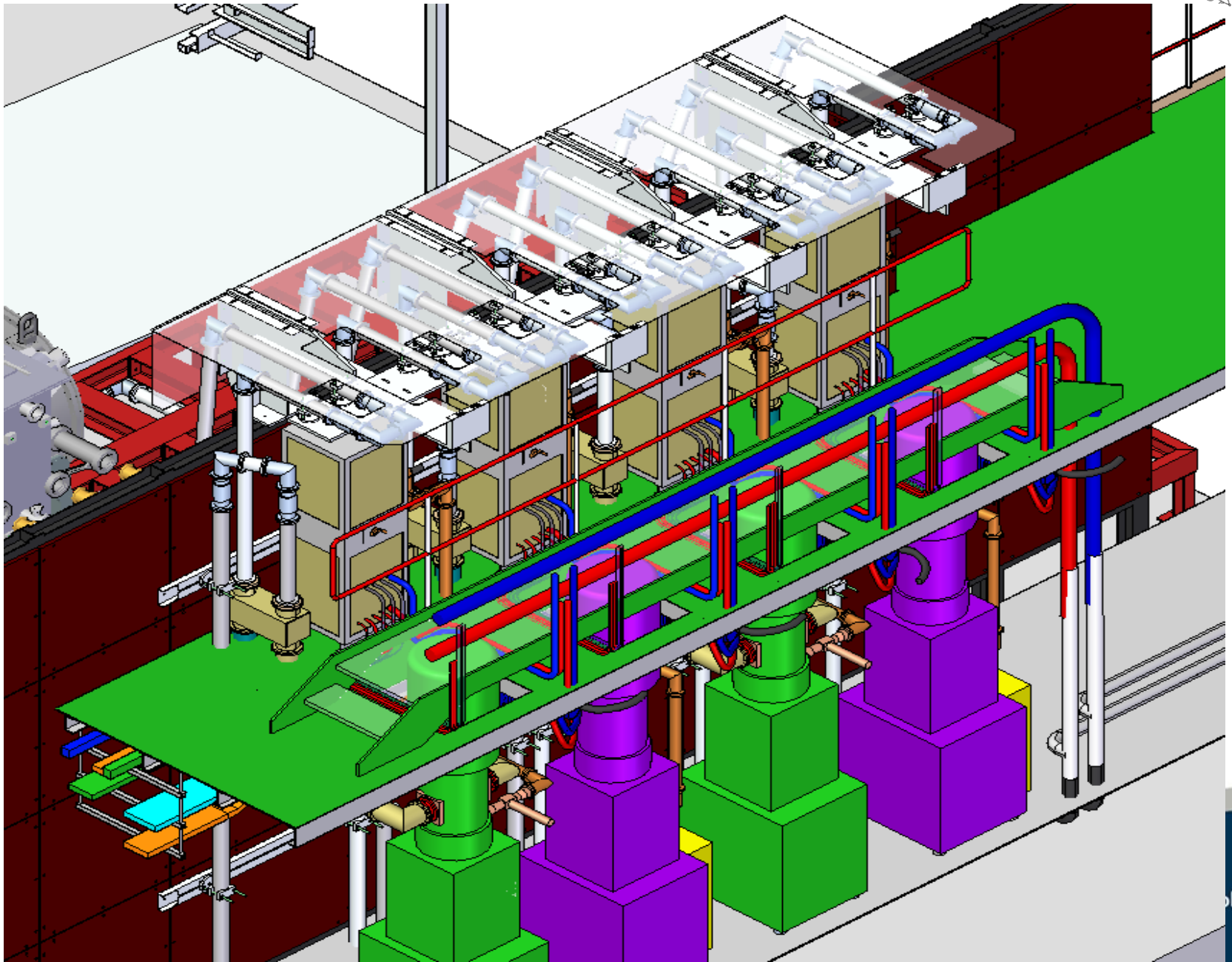
- **RF Layout**
- **Coax distribution**
- **Coax supports**
- **Amplifiers**
- **Services**
- **Access & Egress**
- **AFC Access**
- **Clashes**
- **Summary**



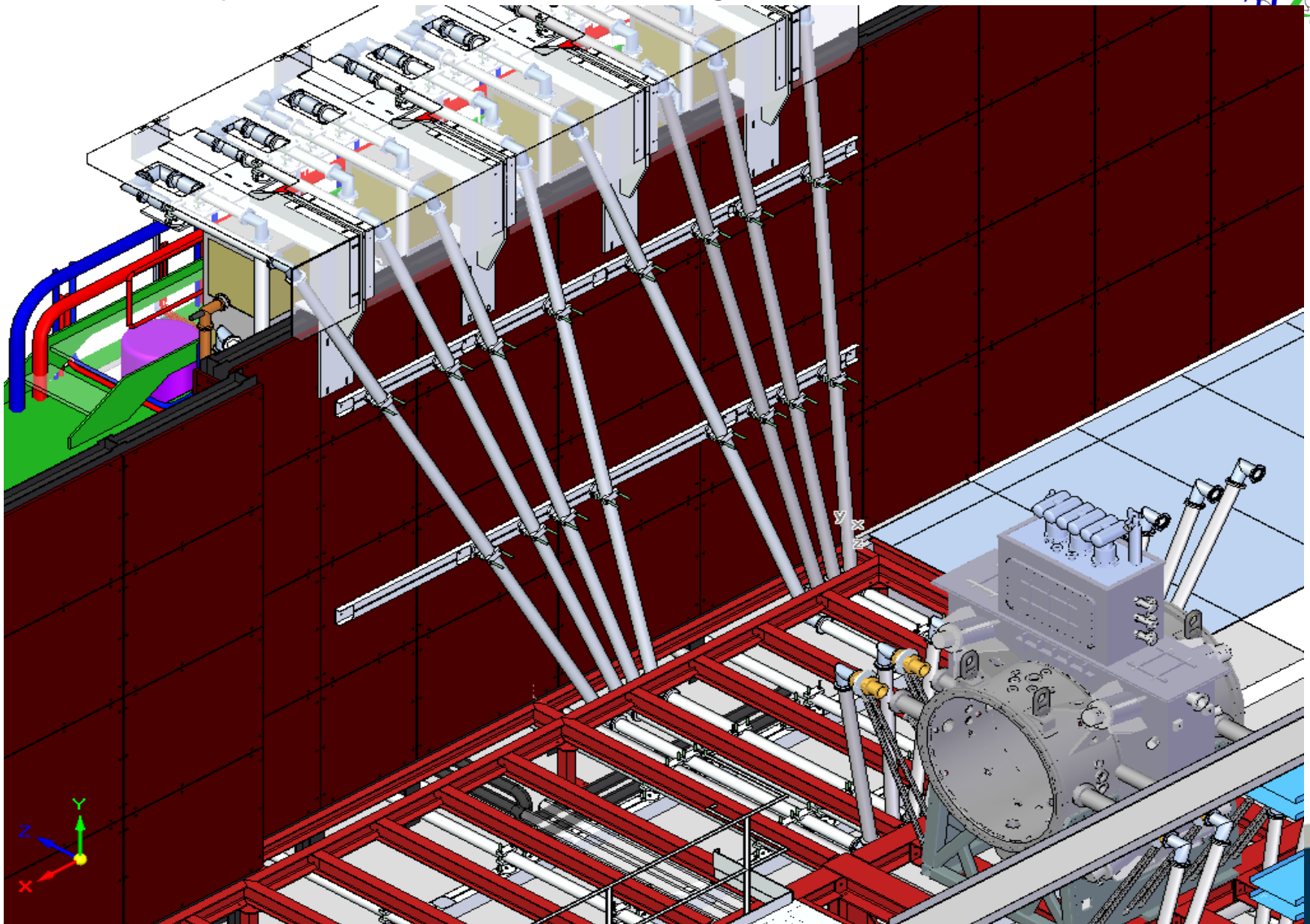
# RF Layout

- *At the beginning of the year it was unclear whether we could fit the RF system in the MICE hall due to the space constraints.*
- *Many systems already in place - shield wall, power supplies & racks, mezzanine floors, false floor support structures. All of which we have had to work around.*
- *A design requirement was also to maintain full access to AFC modules without the need to remove any of the RF system components when moving the AFC modules into the parked position.*
- *Obviously - produce a layout addressing all the requirements of the RF engineers to provide a full working system.*

# RF Layout – view behind shield wall

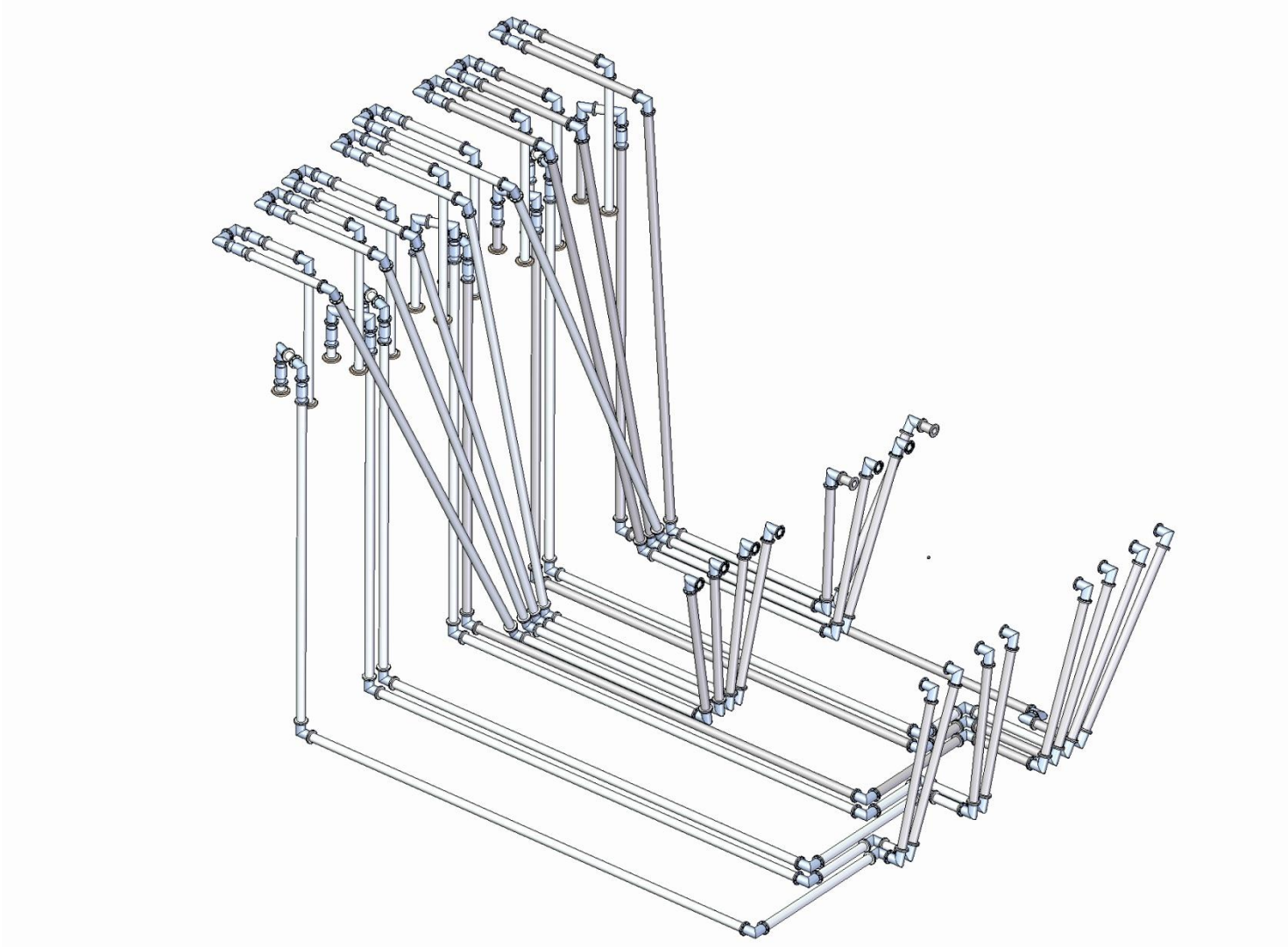


# RF Layout – view from cooling channel side

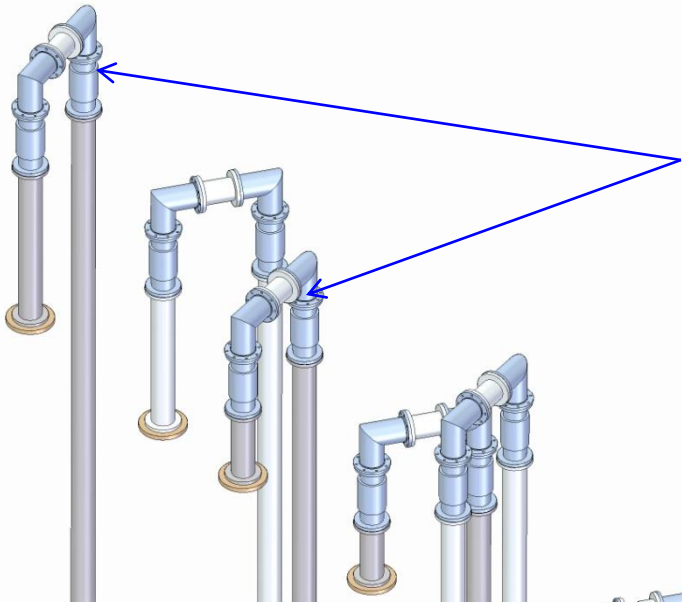




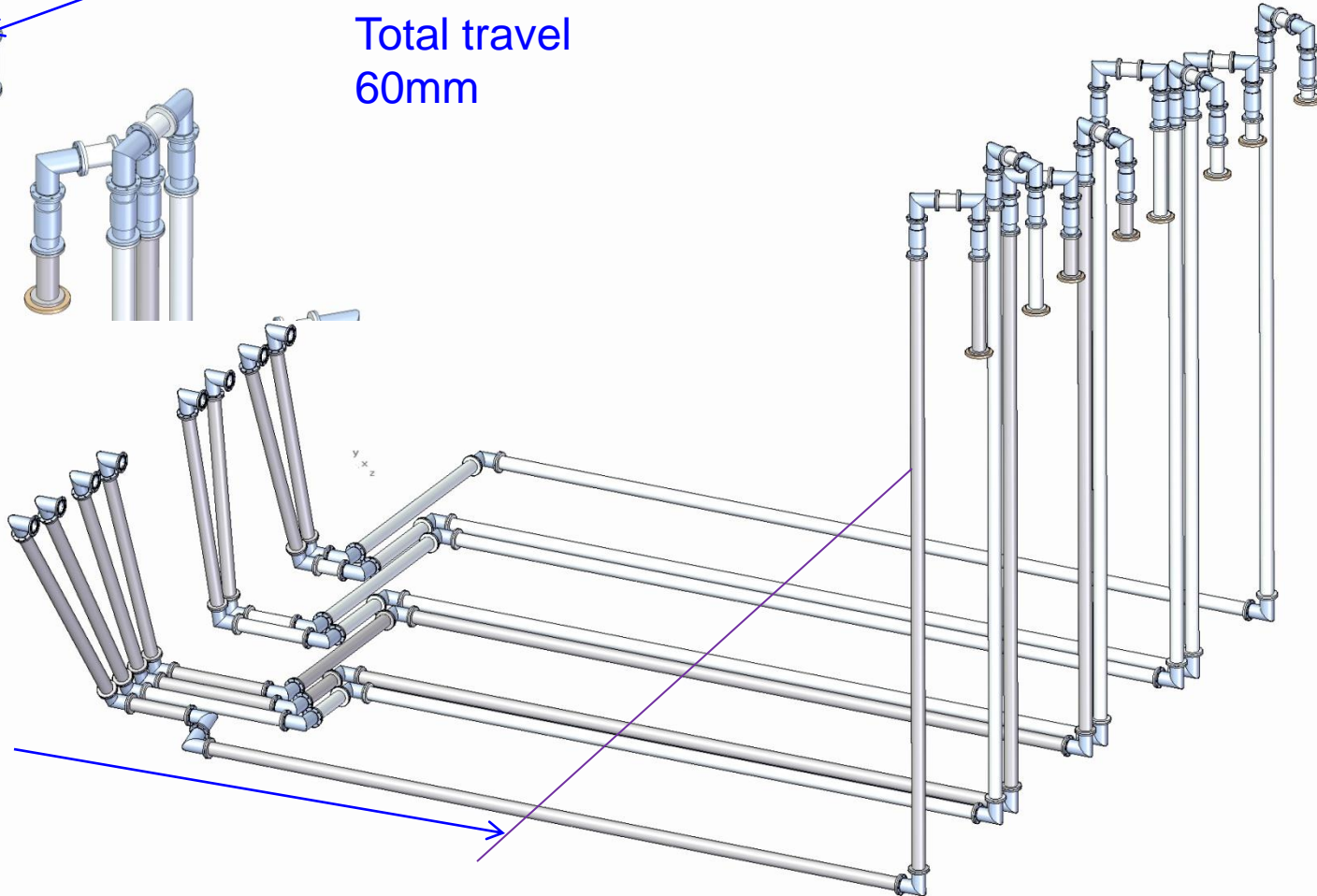
# 4" Coax Distribution



# 4" Coax Distribution – Far Side

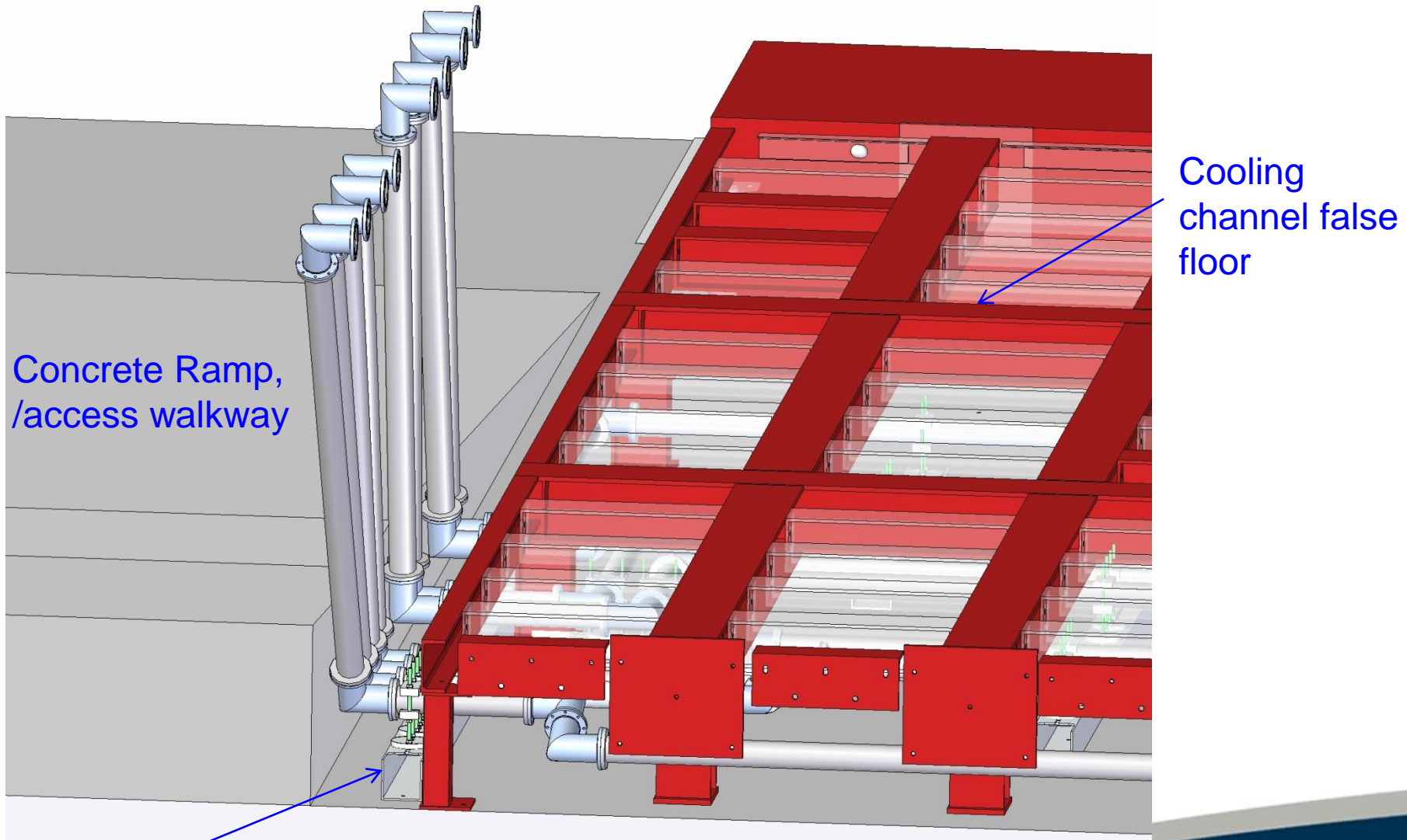


RF tuners.  
These  
represented by  
bellows units.  
Total travel  
60mm



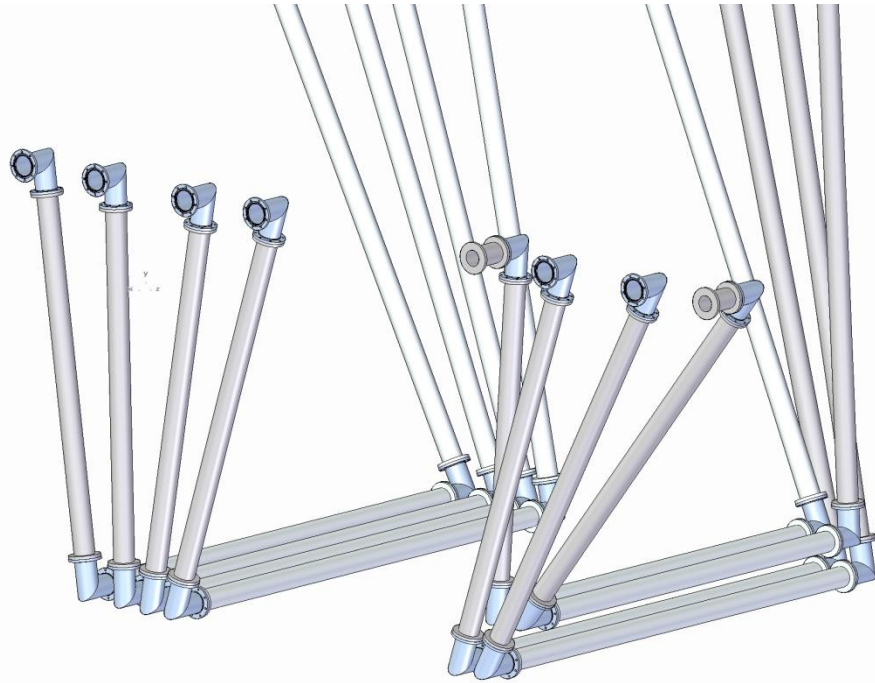
To ease installation  
will consider  
splitting coax's at  
this point before  
cooling channel  
false floor

# 4" Coax Distribution – Far Side

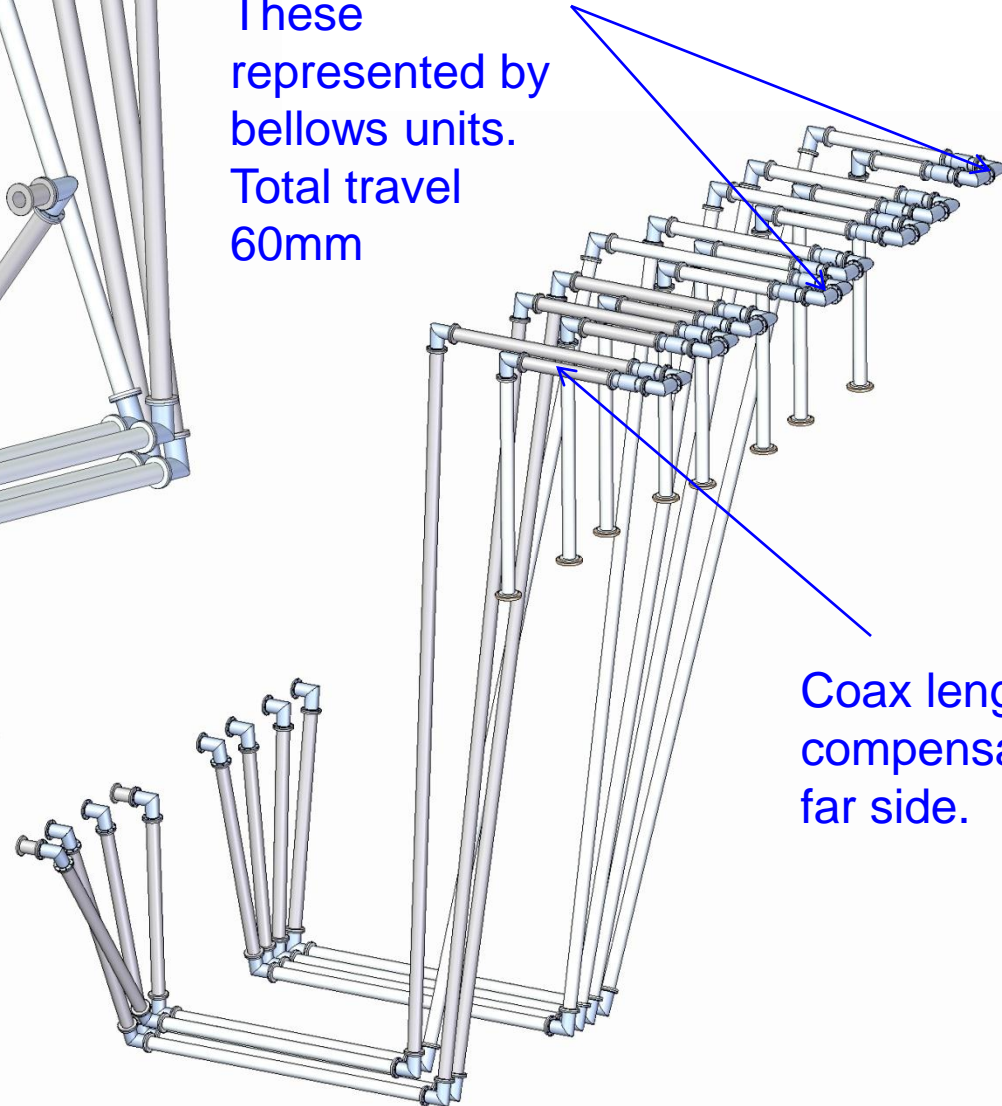




# 4" Coax Distribution – Near Side



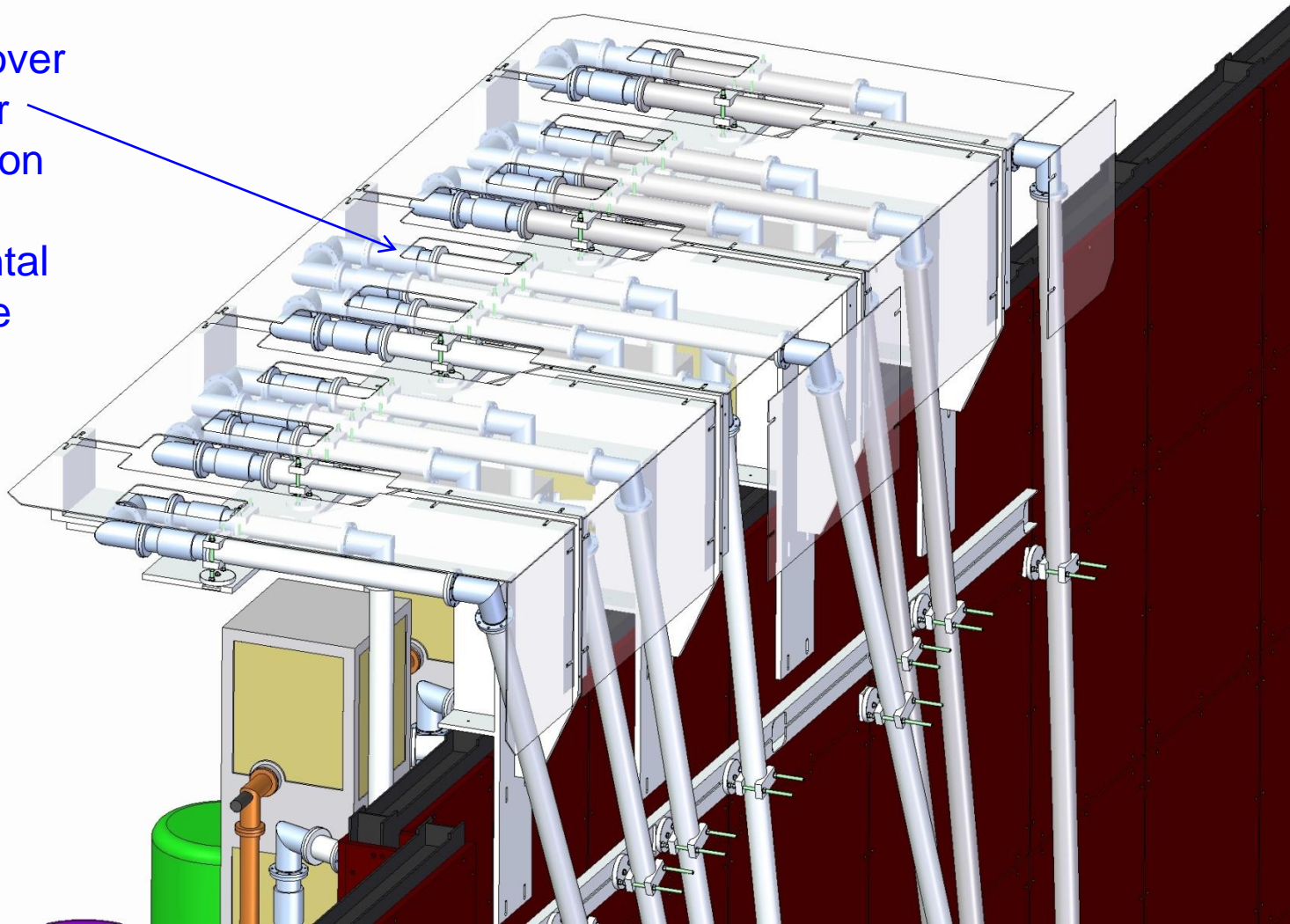
RF tuners.  
These  
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Total travel  
60mm



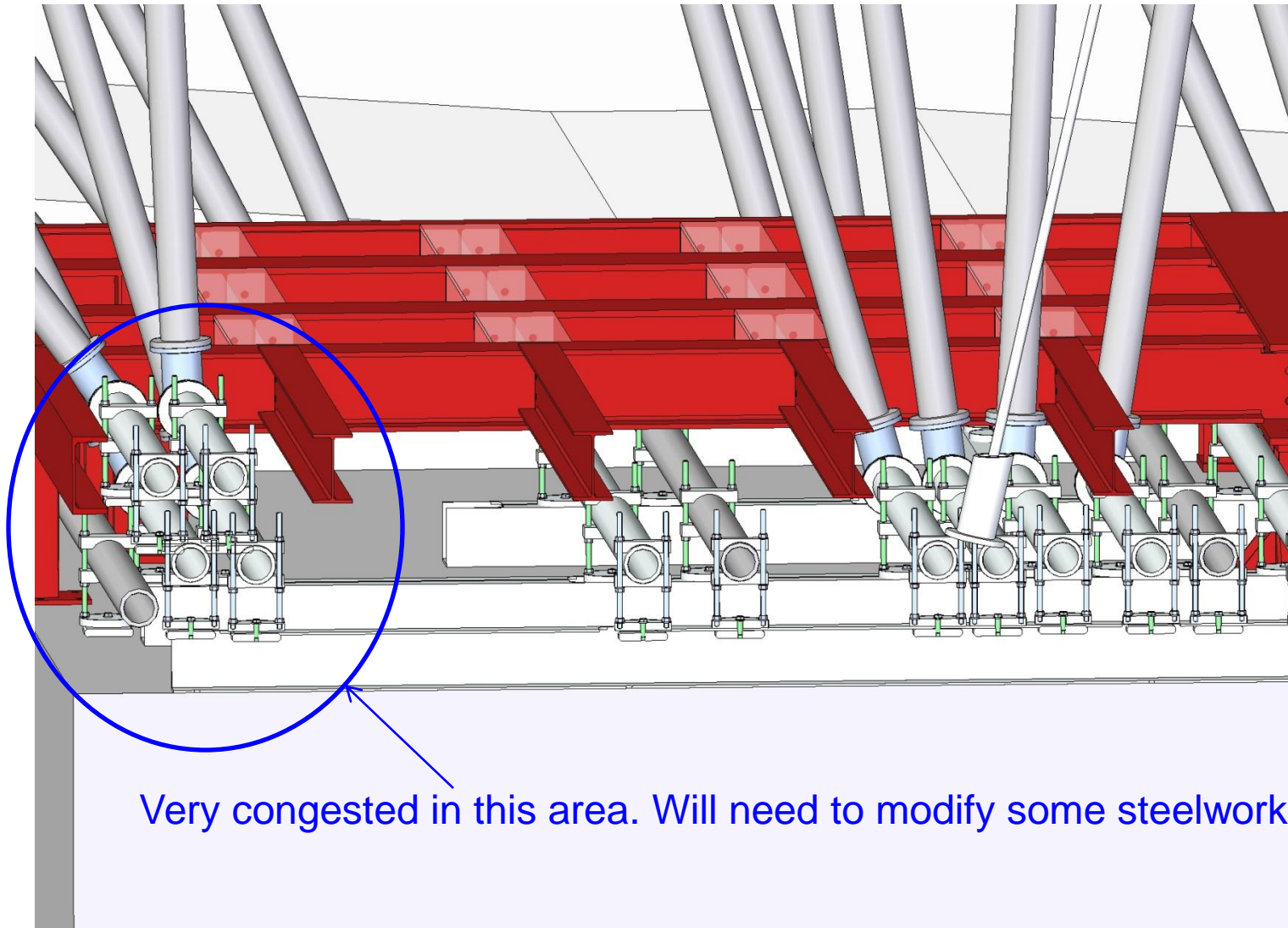
Coax length  
compensation to  
far side.

# 4" Coax Distribution – Near Side

Cover plates over coax for protection from accidental damage



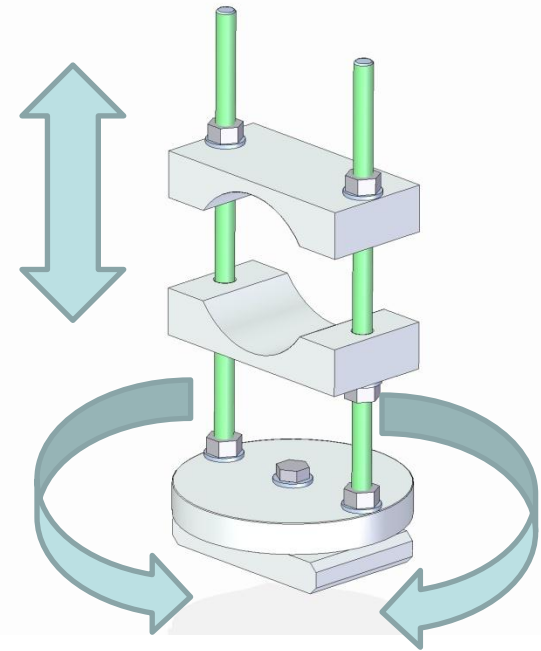
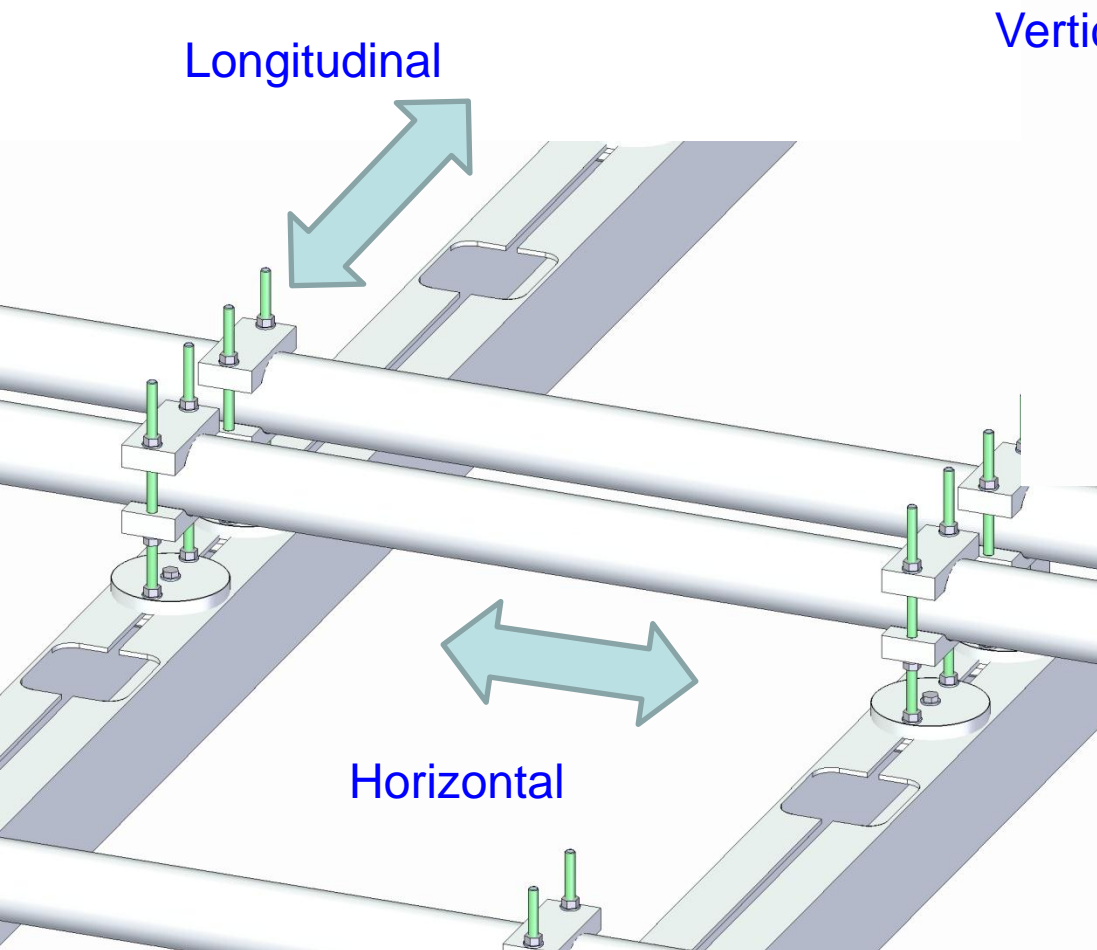
## 4" Coax Distribution – Near Side



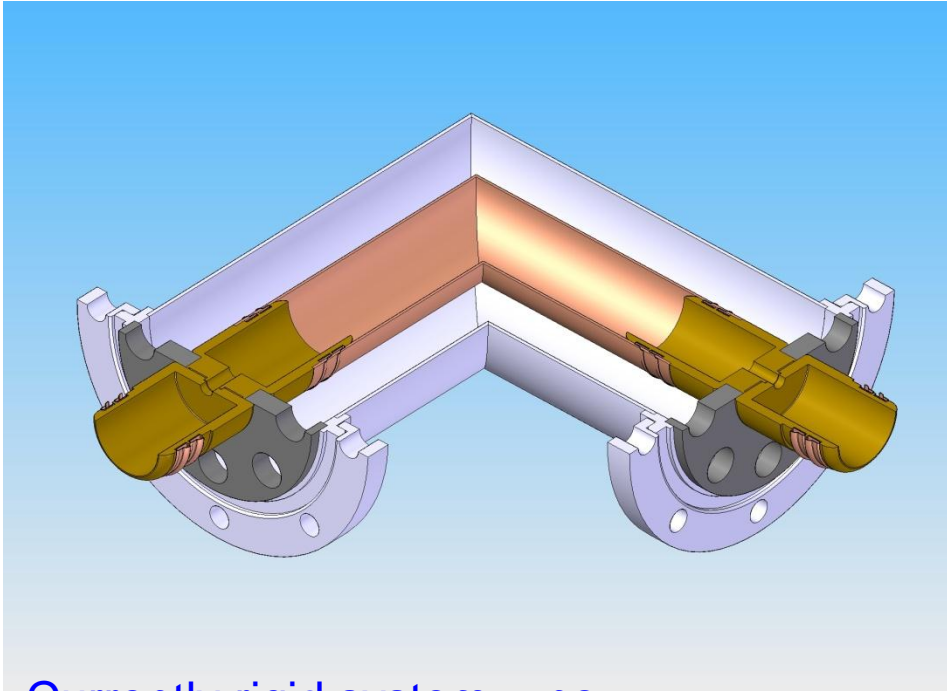


# Coax Supports

## TEE SLOT RAILS



# Coax Sections – Installation/Removal Concerns



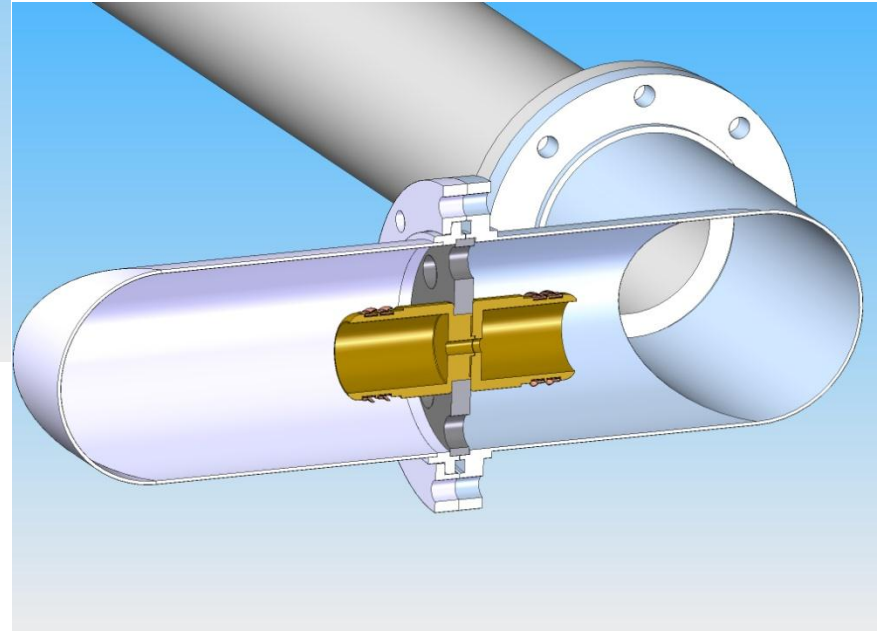
Currently rigid system ~ no flexible sections

Rely on adjustment in clamp system.

Need to speak with supplier to discuss installation options

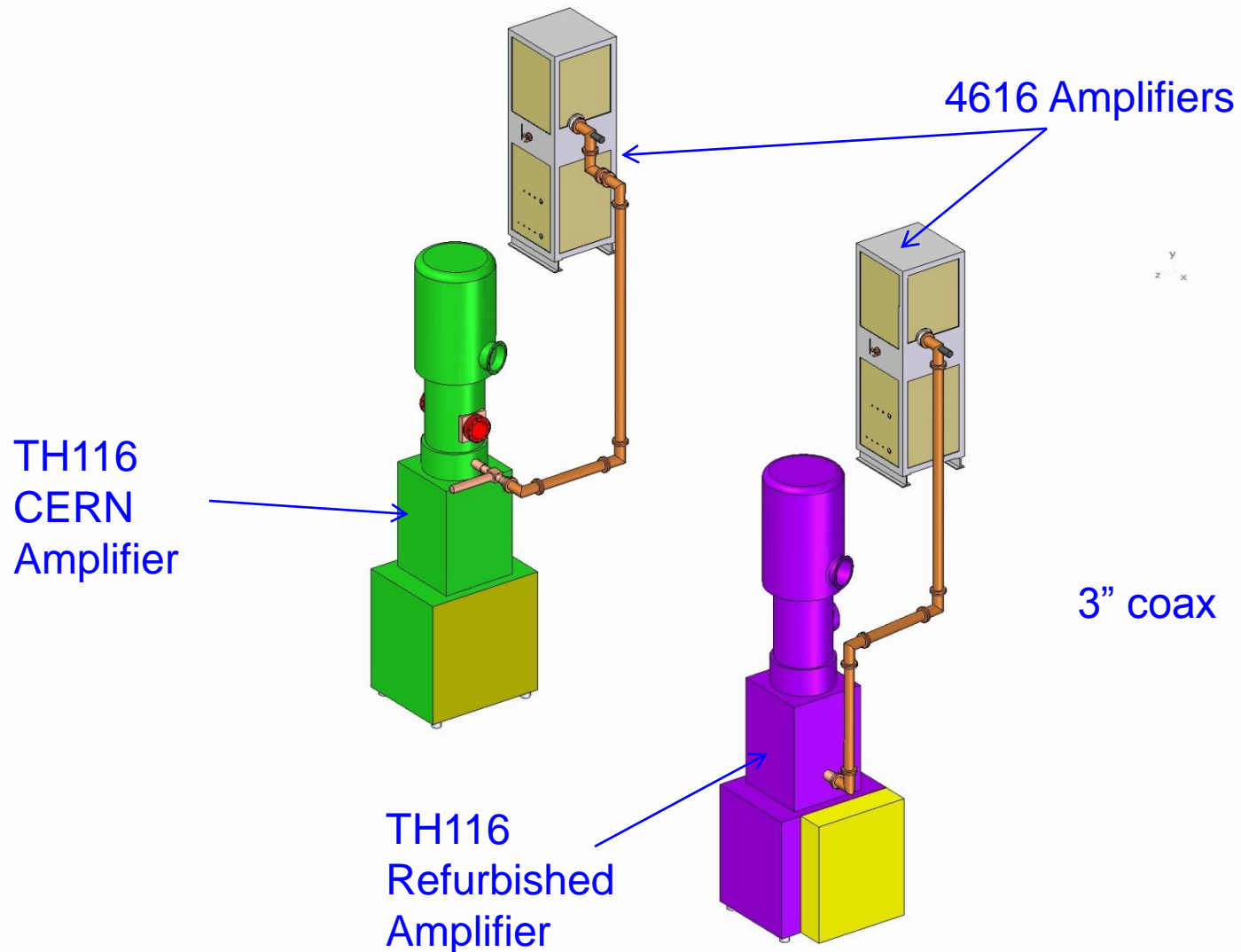
~55mm required to clear mating flange

~35mm to clear copper coax tube





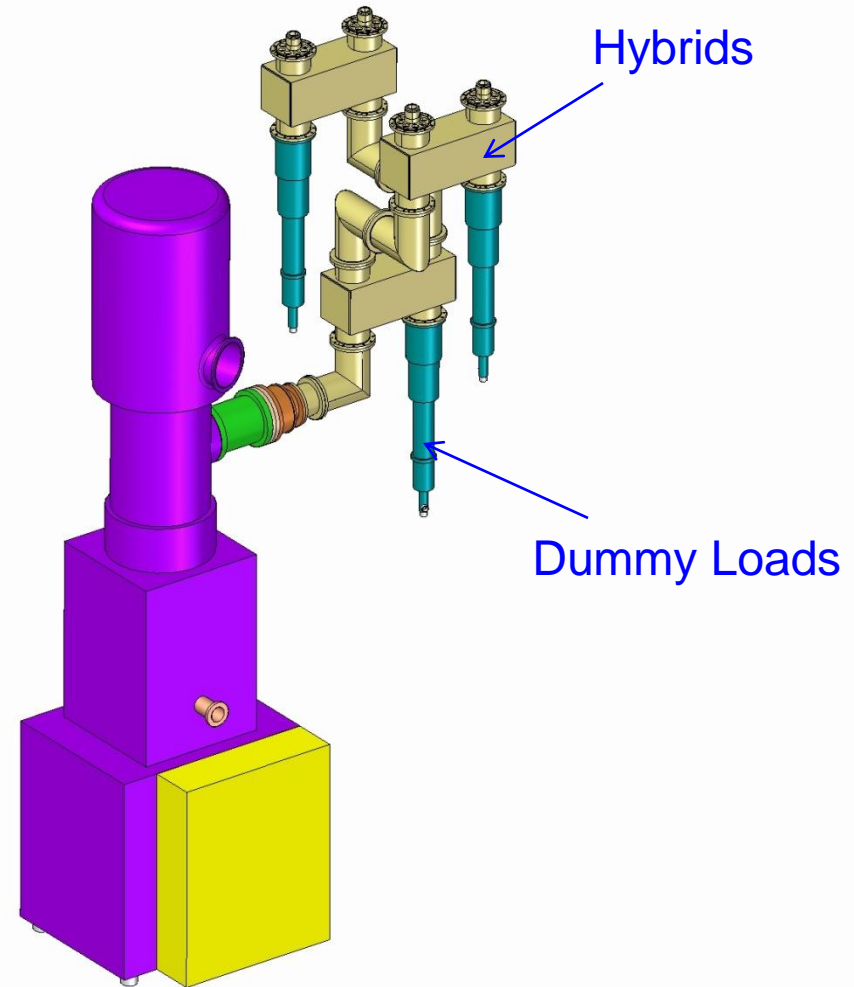
# Amplifiers



# TH116 Amplifiers - Refurbished

TH116 Refurbished Amplifier has 3 hybrids & 3 dummy loads

6" coax from amplifier

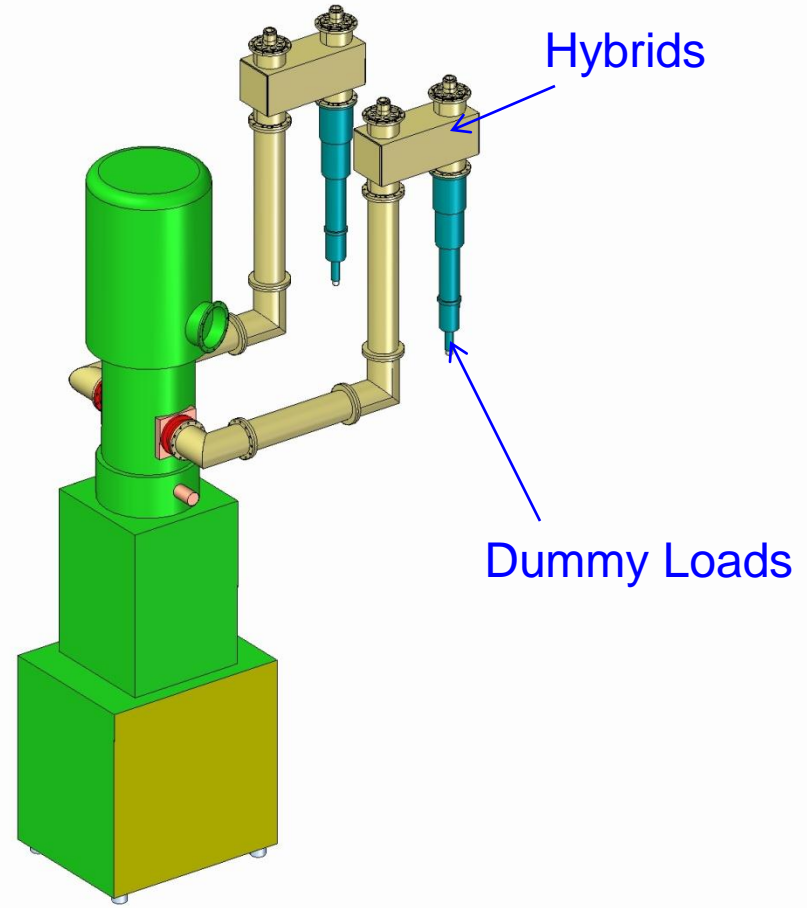


# TH116 Amplifier - CERN

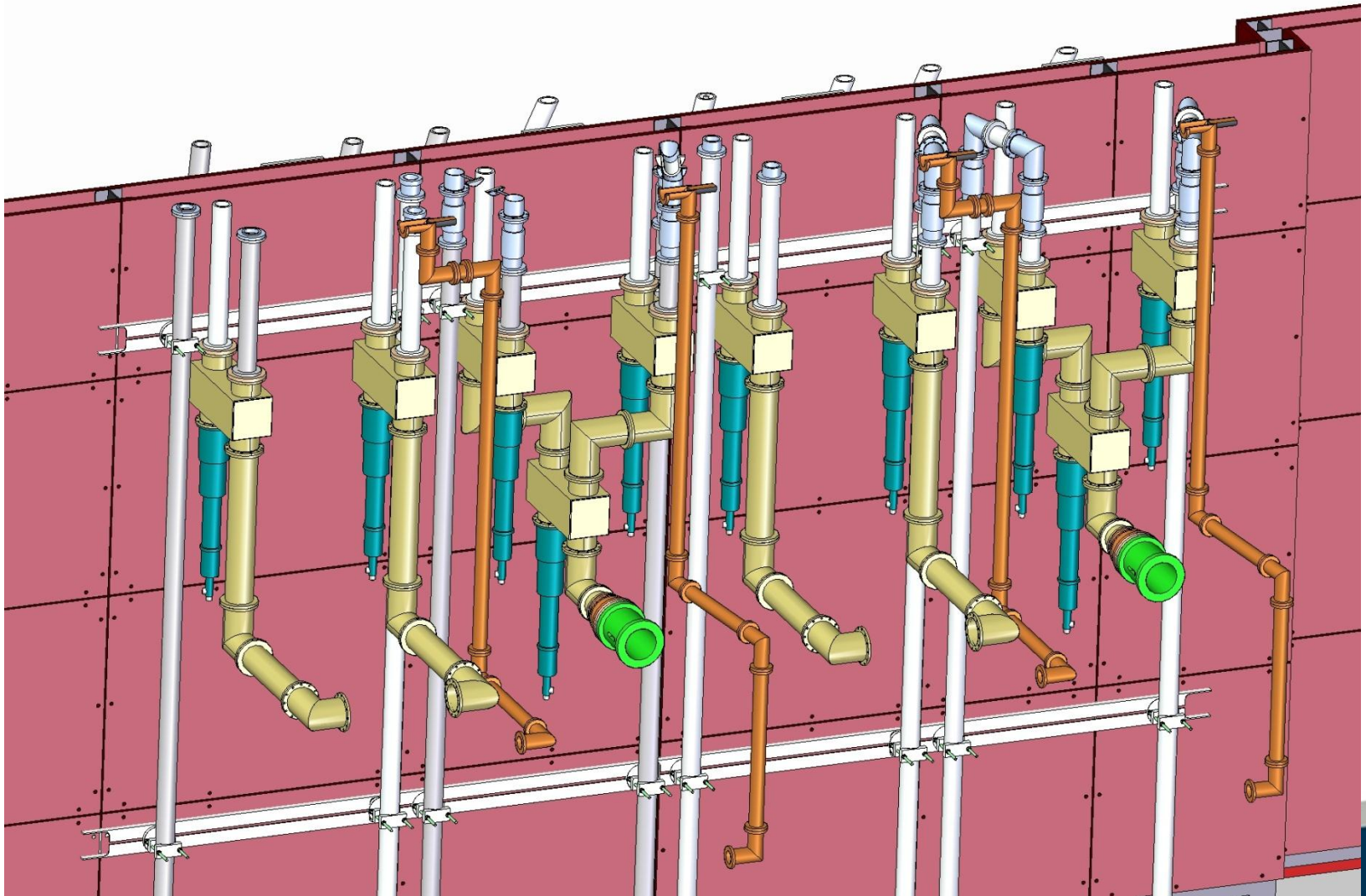


TH116 CERN Amplifier has 2 hybrids  
& 2 dummy loads

6" coax from amplifier

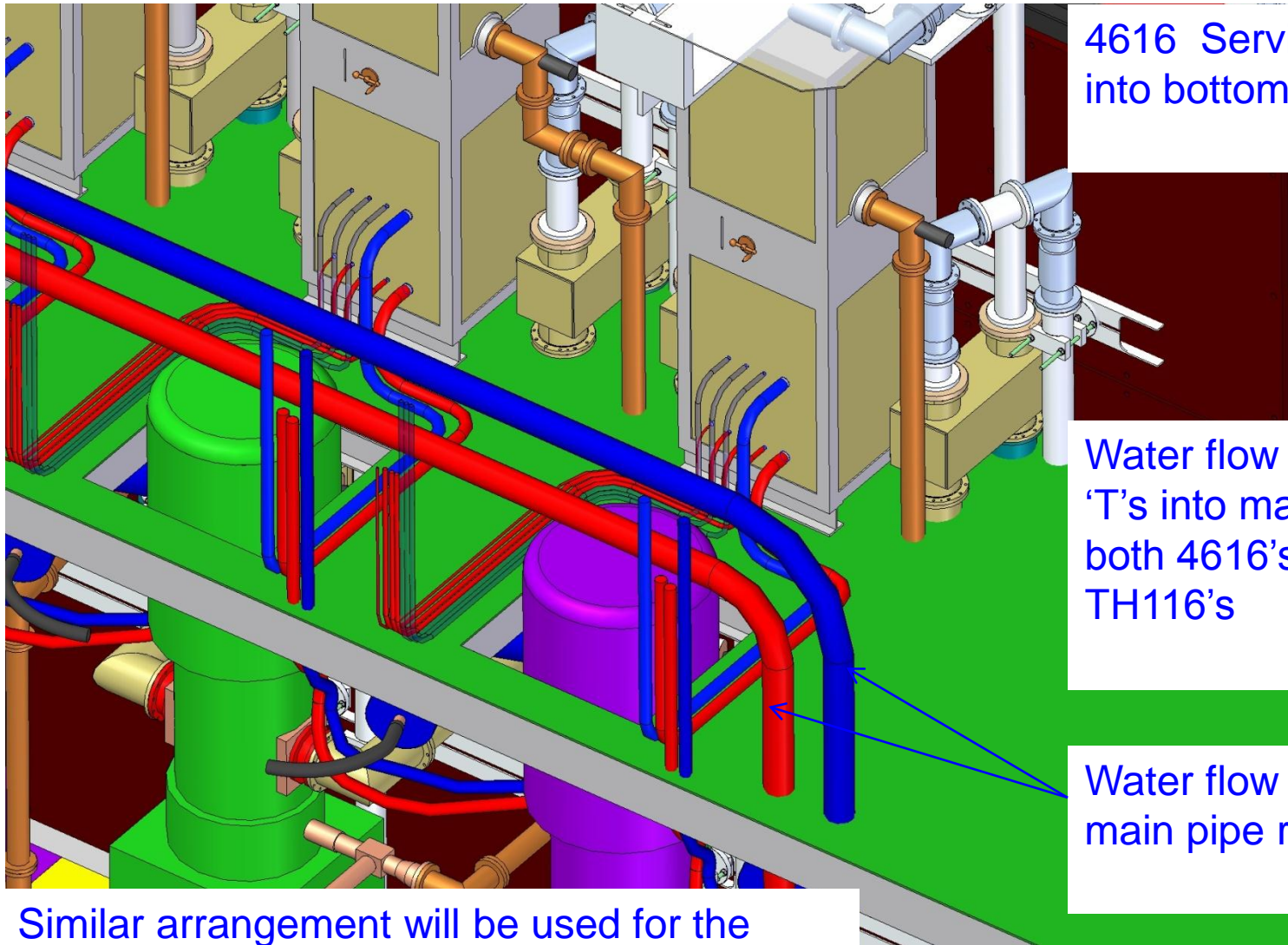


# RF Delivery System behind wall





# Services



4616 Services feed into bottom of amp

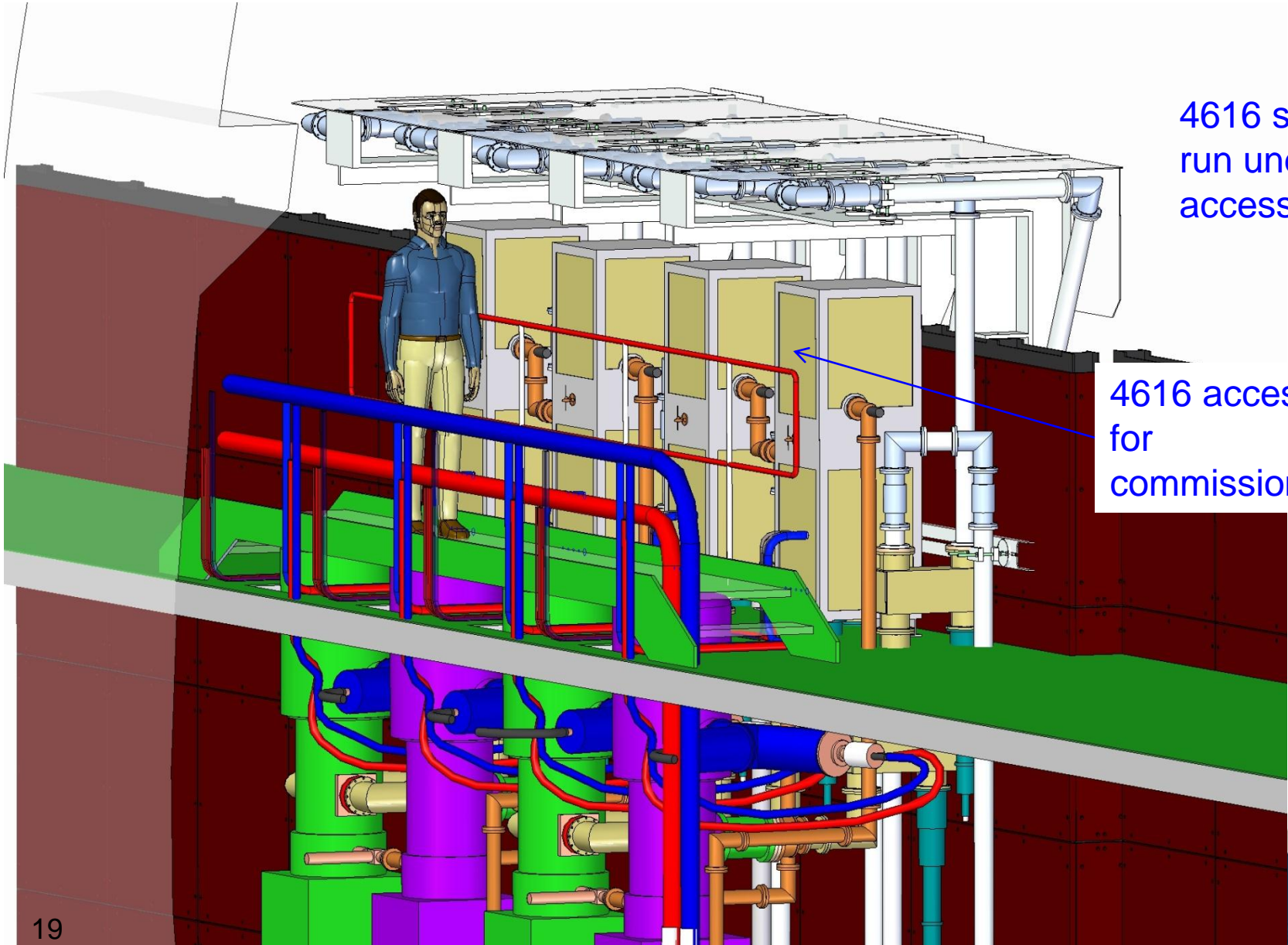
Water flow & return 'T's into main run for both 4616's and TH116's

Water flow & return main pipe run

Similar arrangement will be used for the dummy loads on the shield wall



# Services

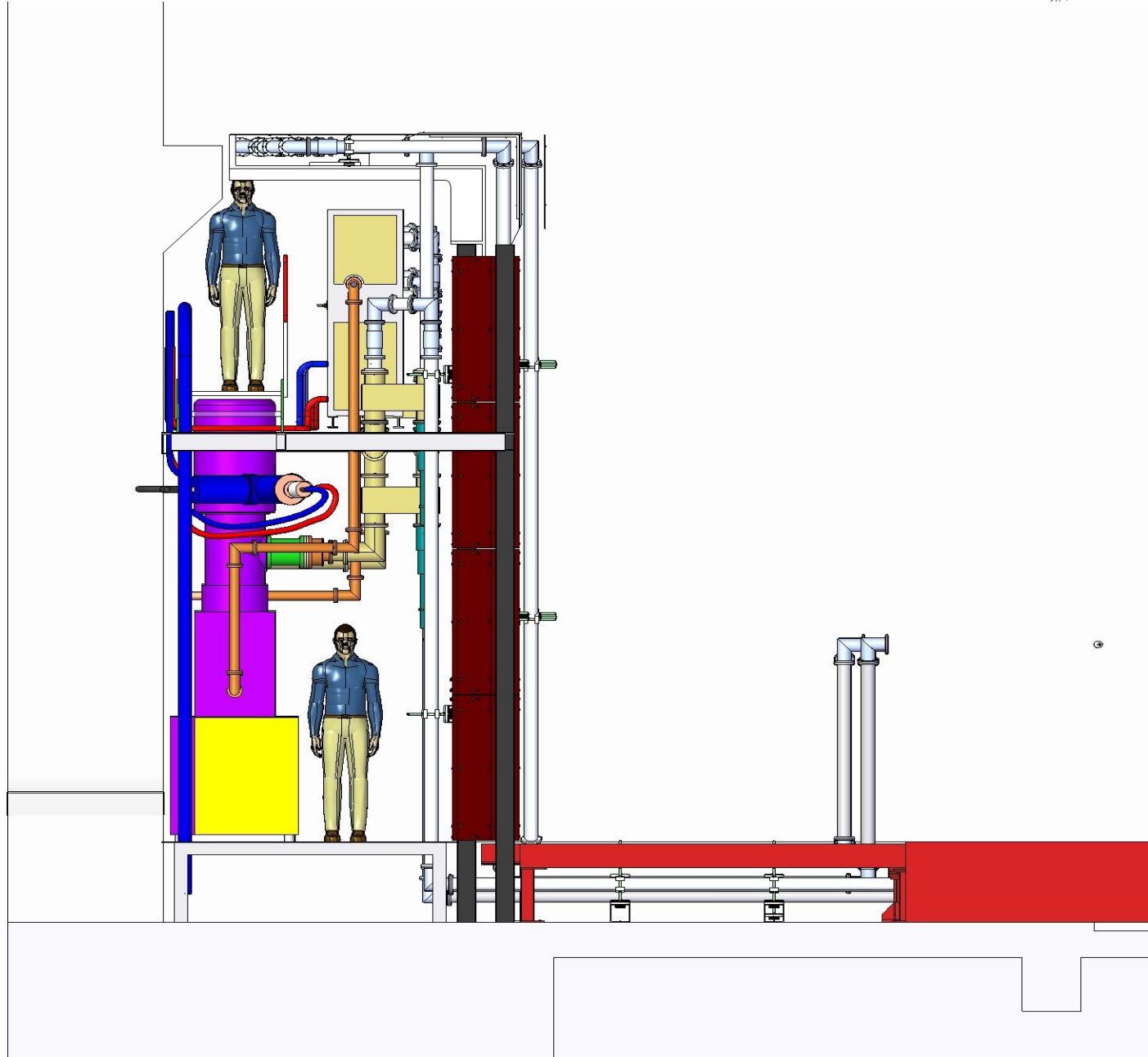


4616 services  
run under  
access platform

4616 access  
for  
commissioning

# Access & Egress

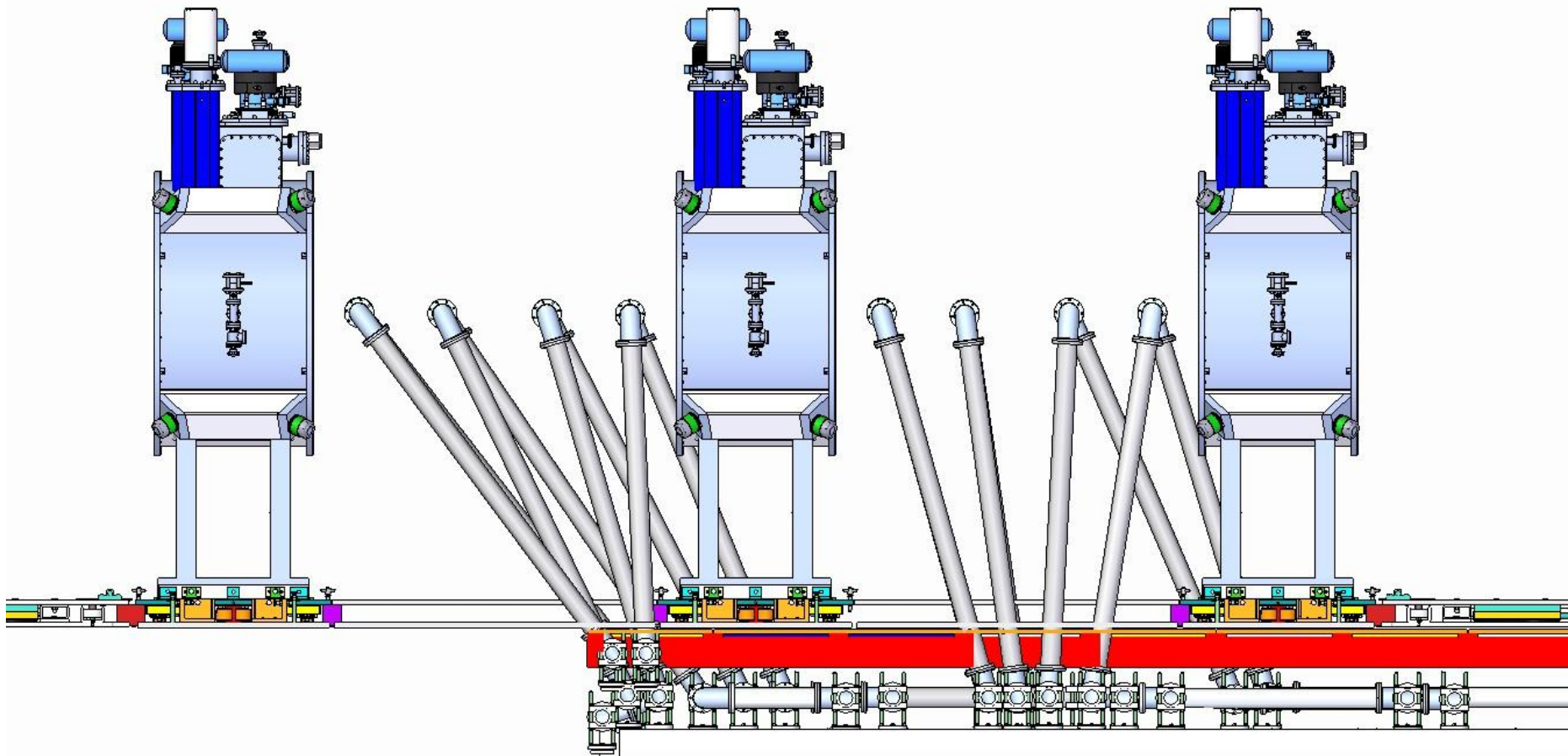
Discussed access & egress with Fire Safety Officer. Agreed this arrangement would be acceptable.



# AFC Access

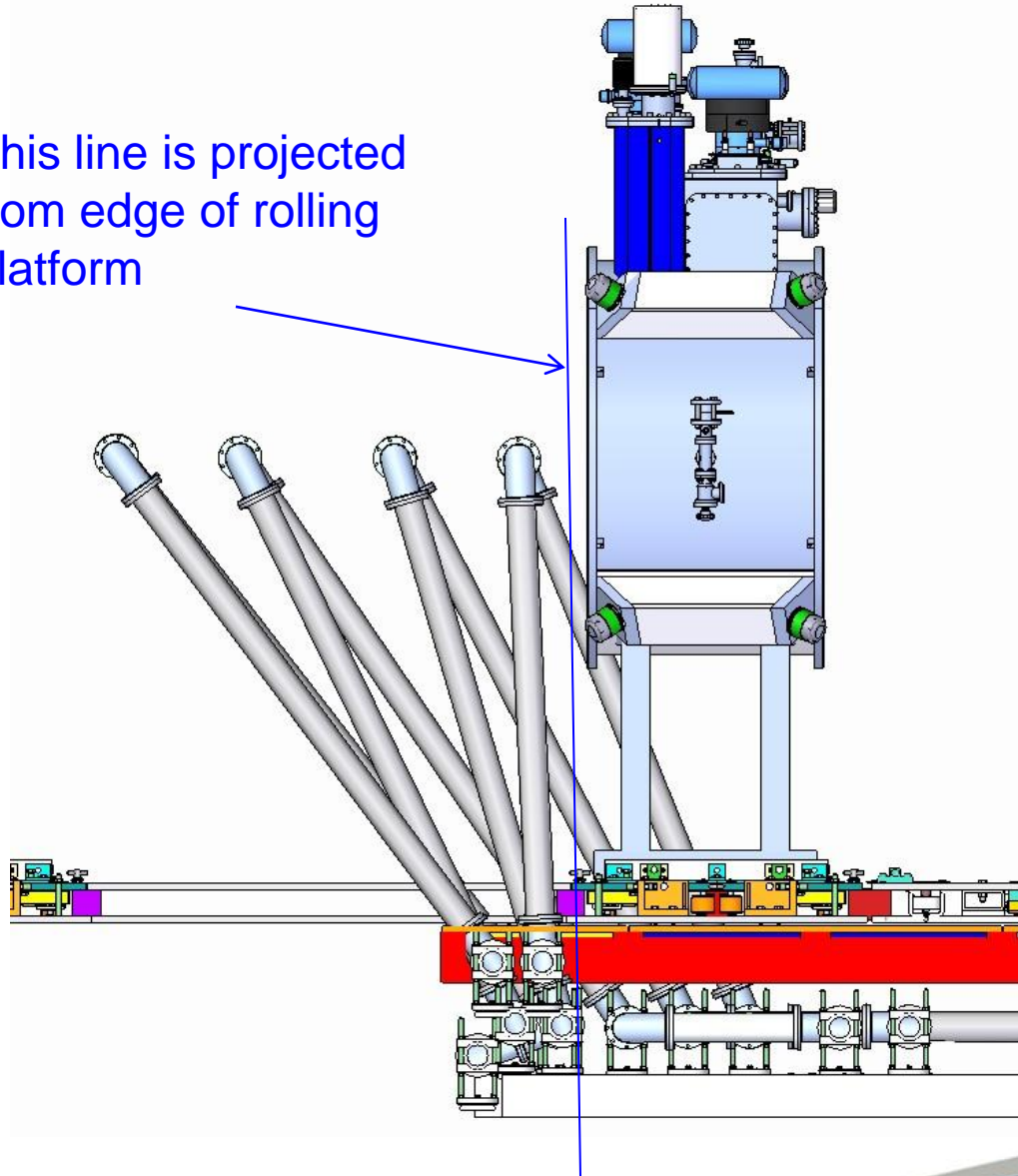
AFC's are moved out of the page on rolling platform into parked position to change absorbers.

Clear pathway is available but AFC module 2 is close.



# AFC Module 2

This line is projected from edge of rolling platform



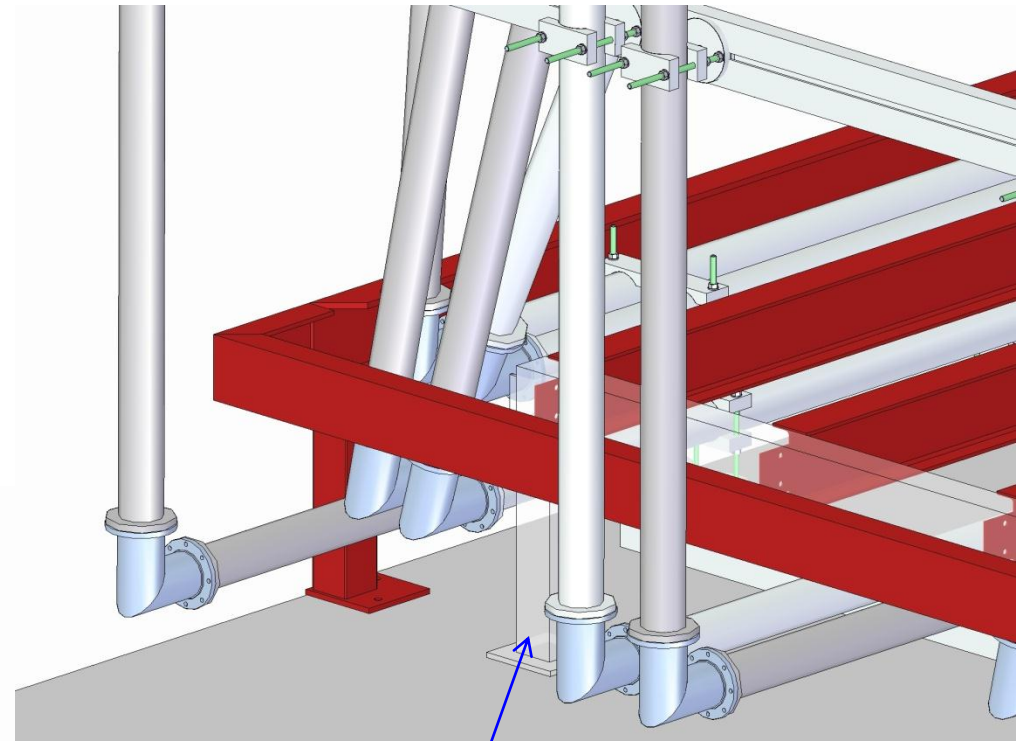
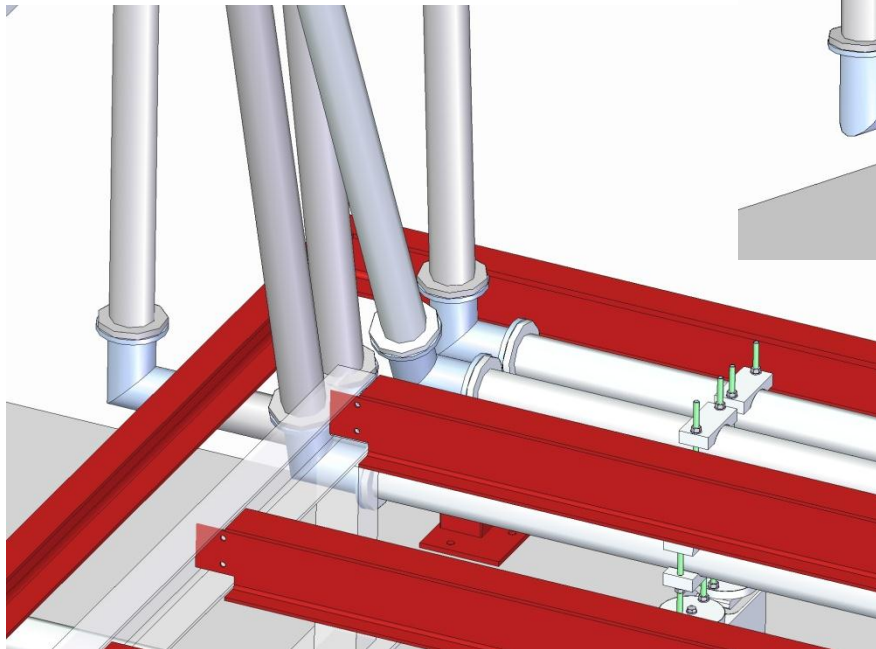


# Clashes

Steelwork Clash

Possible solution ?

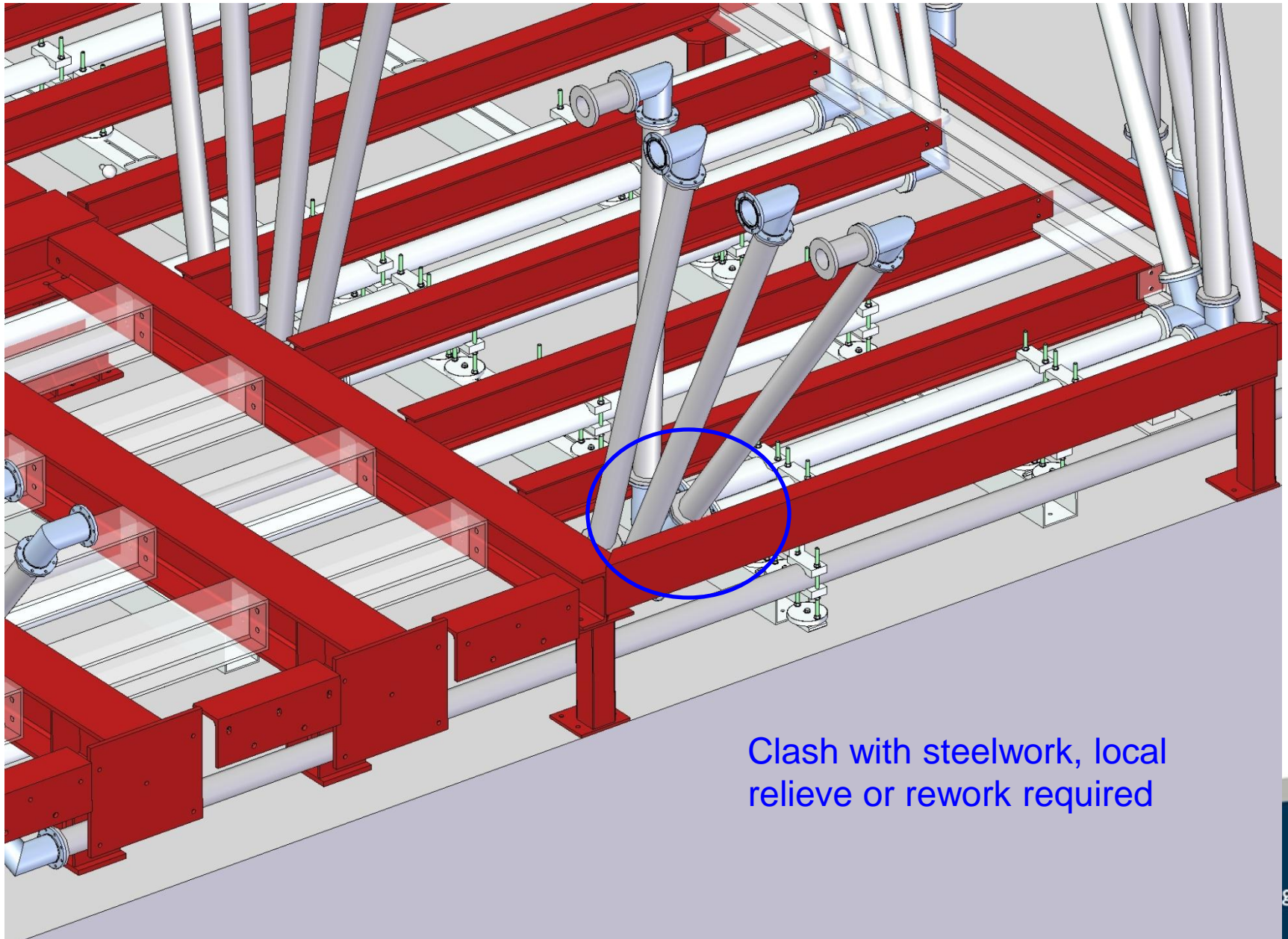
Remove small section and add another support leg.



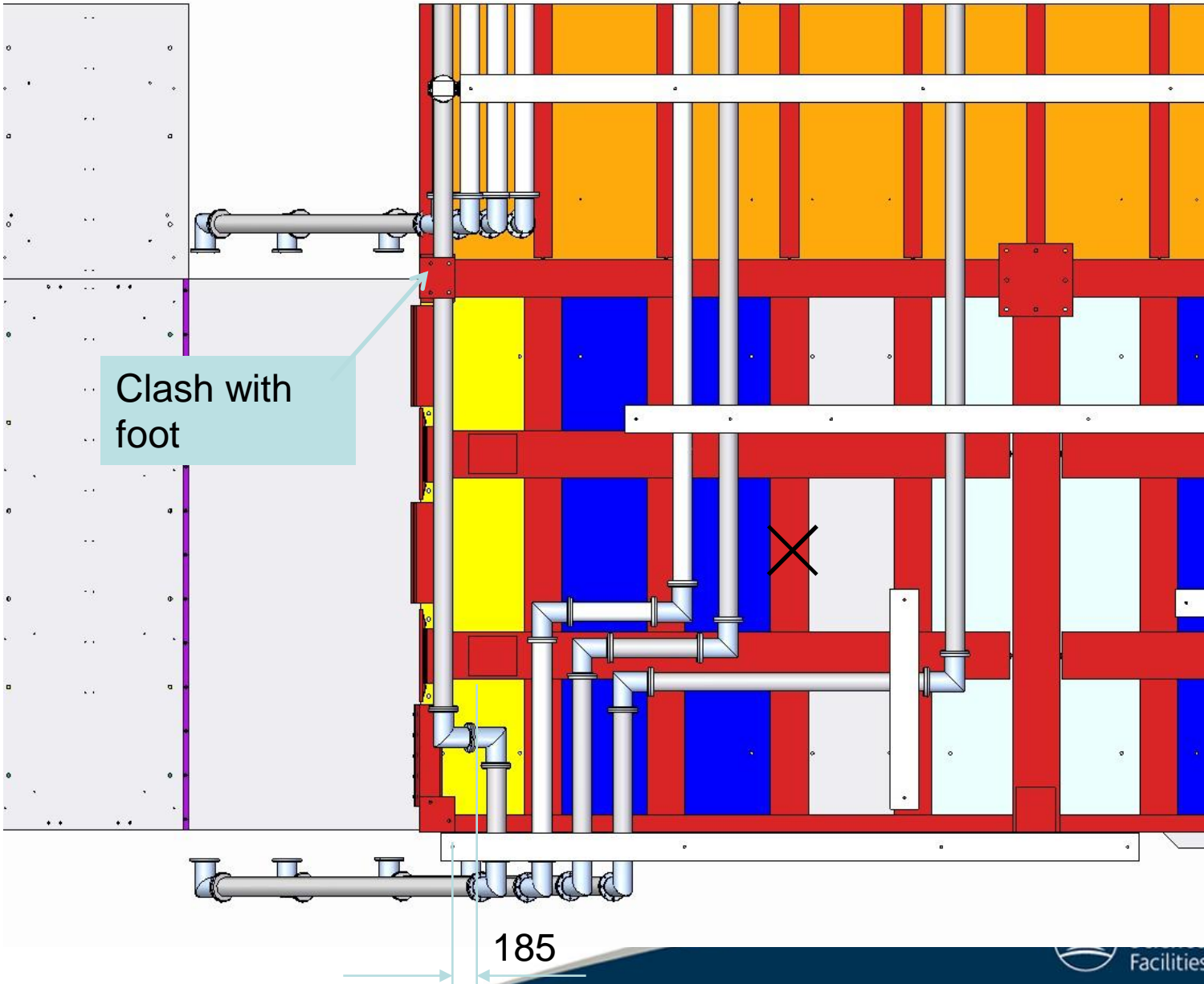
Additional support leg



# Clashes



# RF waveguide clash with the false floor vertical support columns



# Summary

- *Firstly, we believe it is possible to fit the RF system within the MICE hall.*
- *There are some clashes with some steel work on both the cooling channel false floor and the parked position false floor – none of which are show stoppers but will need to be resolved.*
- *Installation will be tricky especially mating the coax lines with no appreciable bellows units or flexible coax's in the current design. – currently relying on degrees of freedom in coax supports. Suppliers may have other suggestions to ease installation and removal of coax tubes.*
- *Will need to survey and check positions of components very closely during installation.*
- *Fire officer has been consulted and agreed that what is proposed causes no access problems or issues.*