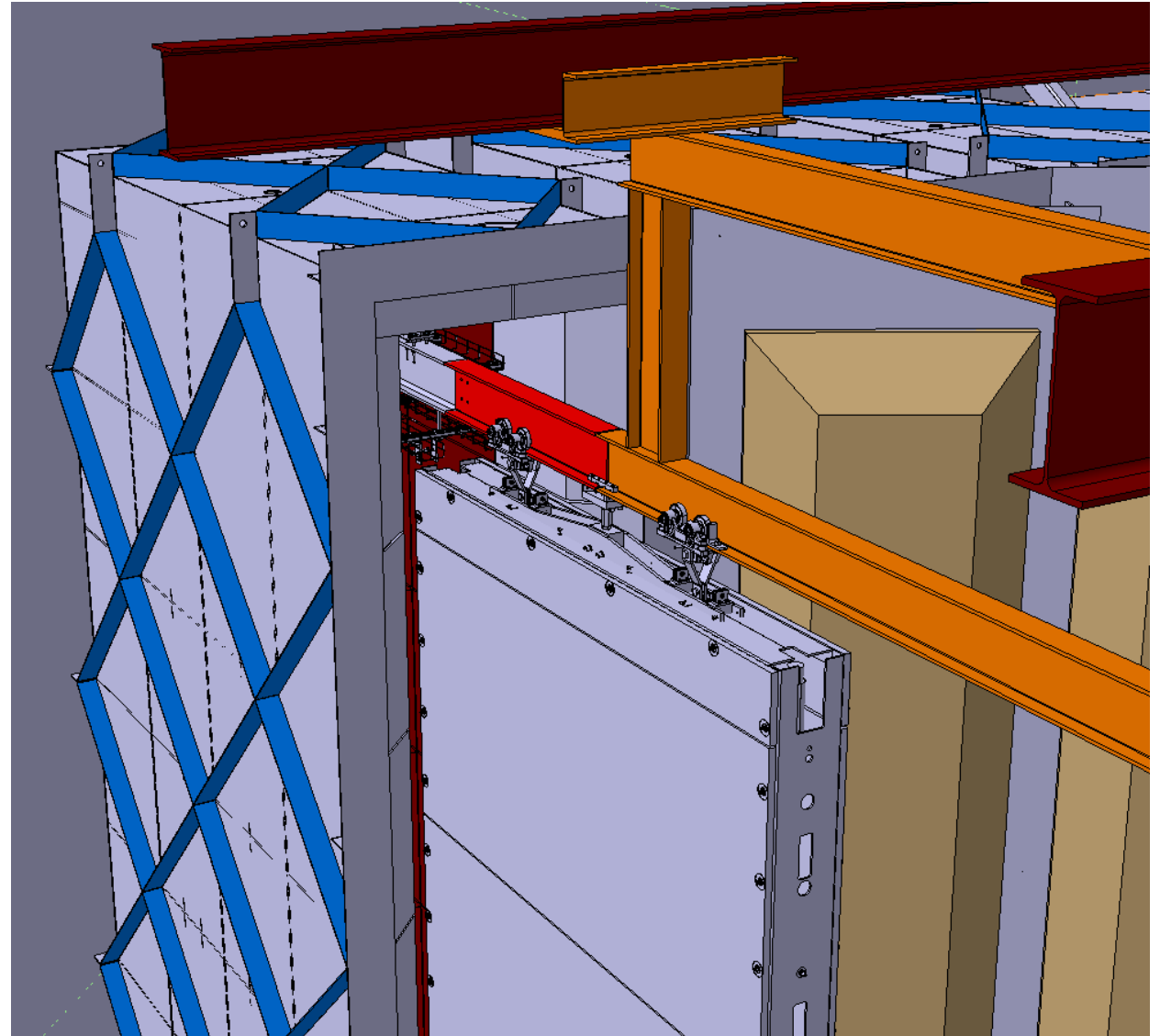


# Cold boxes Requirement Documents

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# Cold Box Requirements Documents

There are three sets of requirements to have an operating Cold Box system:

- #1-Diamanto and I wrote a first draft of a requirement documents for a vertical APA pair cold box. Farshid and David M wrote a second detailed document that describes the required sizes for the box posted on DocDB-10398
- #2-We also need to describe the cryogenic system and how it works and is it operational with people in cleanroom
- #3-Then there needs to be a layout of the constraints in the cleanroom so we understand how we can open the box

- DocDB - 10398

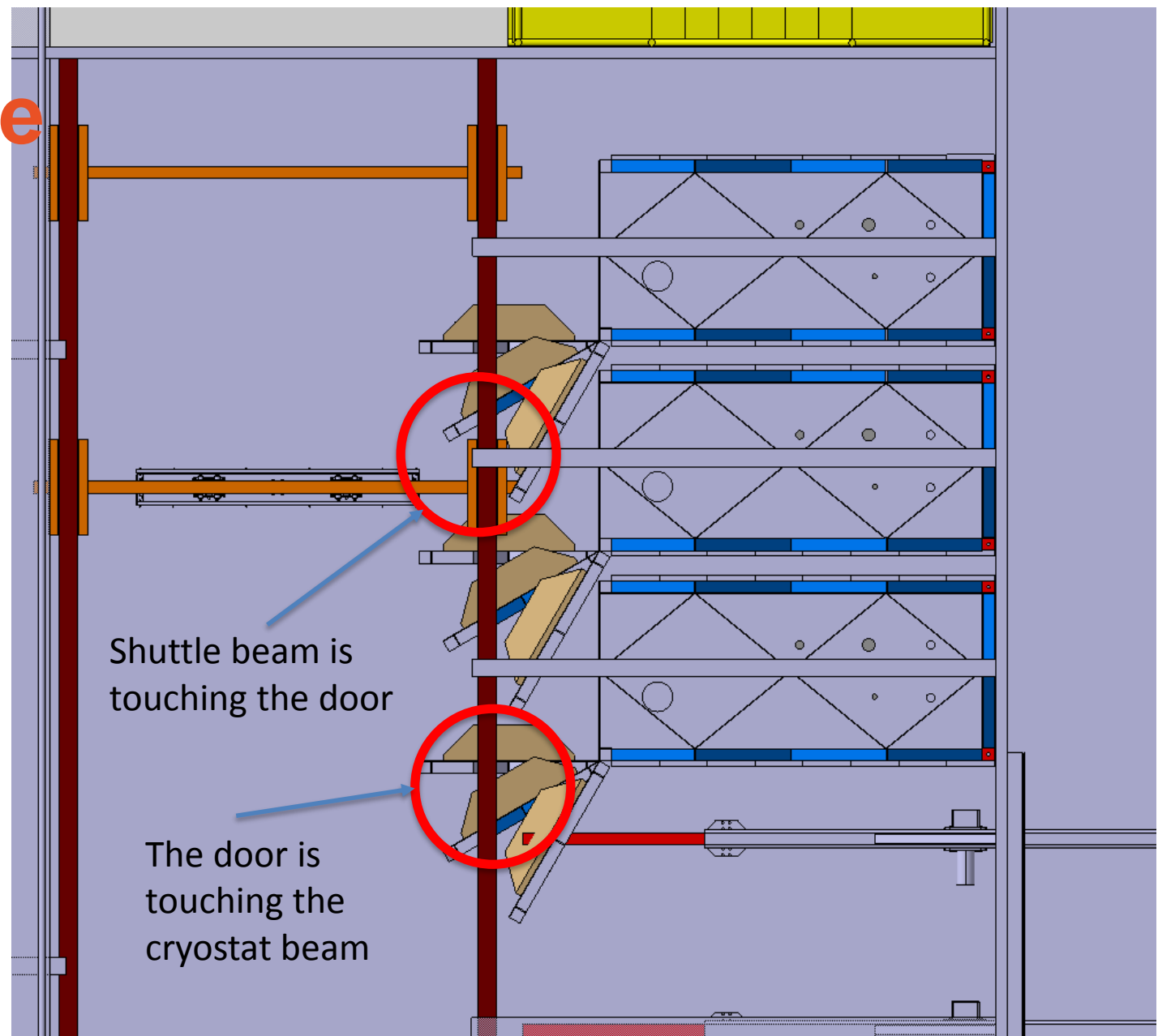
## Requirements:

The following table sets the minimum requirements for the cold boxes for the purposes of conceptual design and cost estimate. The final configuration may be different and will be determined during the design phase.

Number of cold boxes	Two or three
Approximate internal dimensions**	9 m long x 2.4 m wide x 3 m high
Approximate external dimensions**	10 m long x 3.4 m wide x 4 m high
Internal contents	Two APAs mounted on a common frame. Overall size is 6.81 m long x 1.11 m wide x 2.54 m high (See attached drawings).  Overall mass is approximately 2500 kg, nearly all mass is stainless steel, electronic boards present.
Internal environment	Gaseous at 90 K and slightly above atmospheric pressure, there must be sufficient pressure relief as boxes will not withstand internal pressure, moisture must not be present in the box

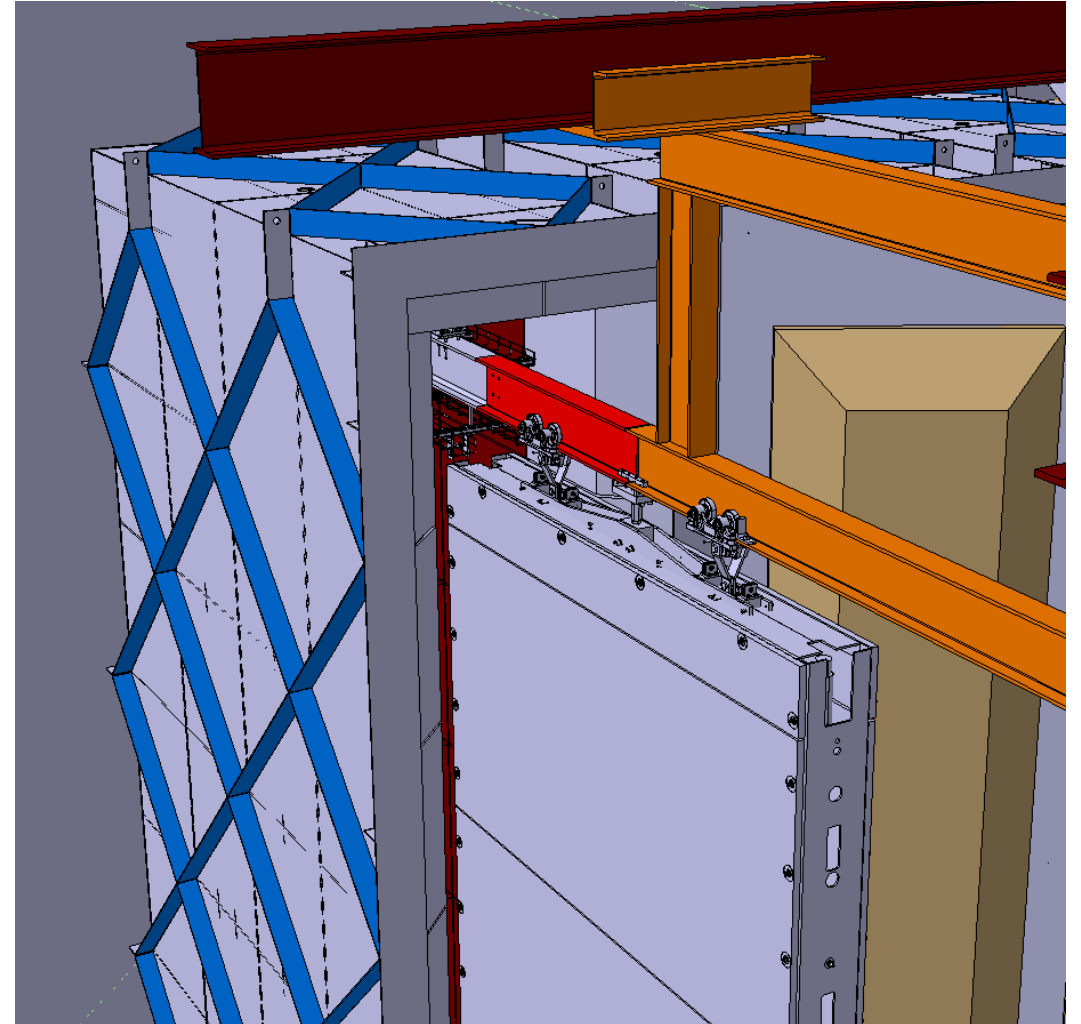
# Doors all on one side

- Spacing on where the Cold boxes can be in the cleanroom
- Which side the refrigerator door opens!
- Access for the scissor lift to make the cable connections
- Can the boxes be moved to allow a second SP detector to be build in the North or South Cavern?

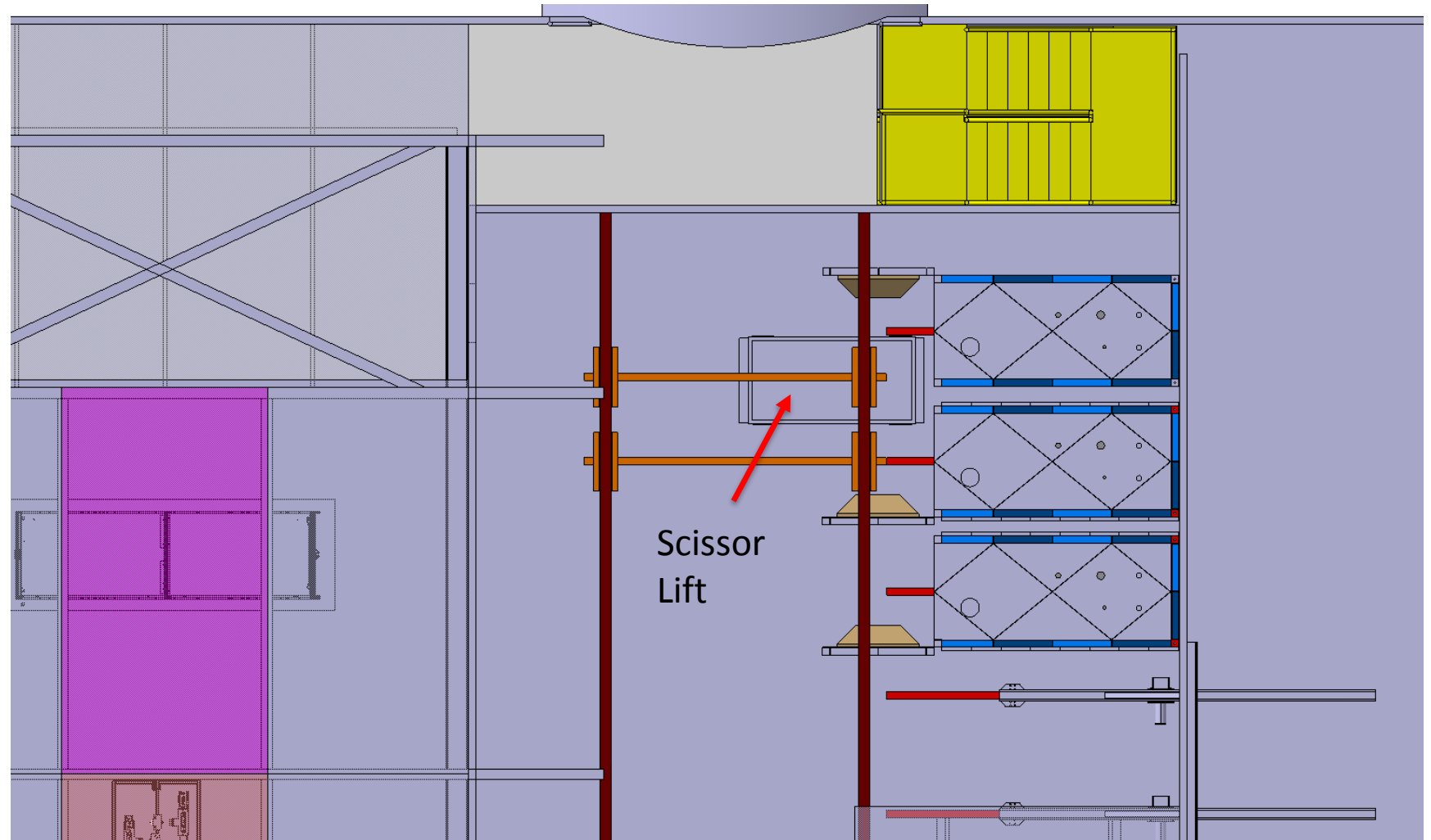


# Connections to cold box

- How does the shuttle beam connect to the beam inside the cold box
- Is there room to make this connection
- Can only one set of cold box door be opened at once?



# Make the north box a left handed box?



# These layouts were very conceptual! We need more Cleanroom design work

