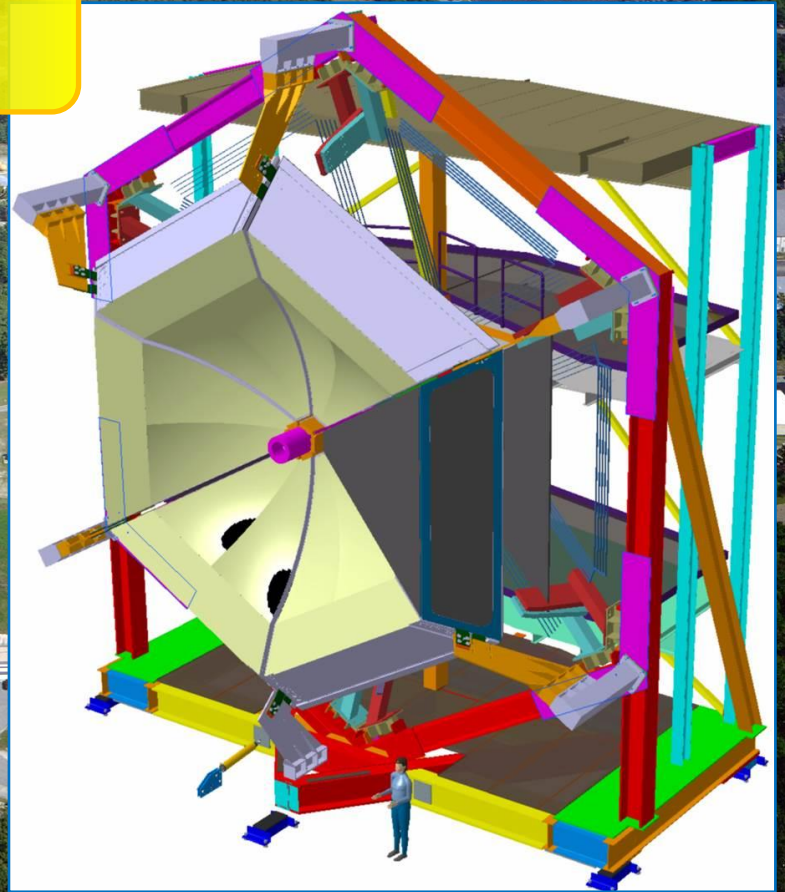
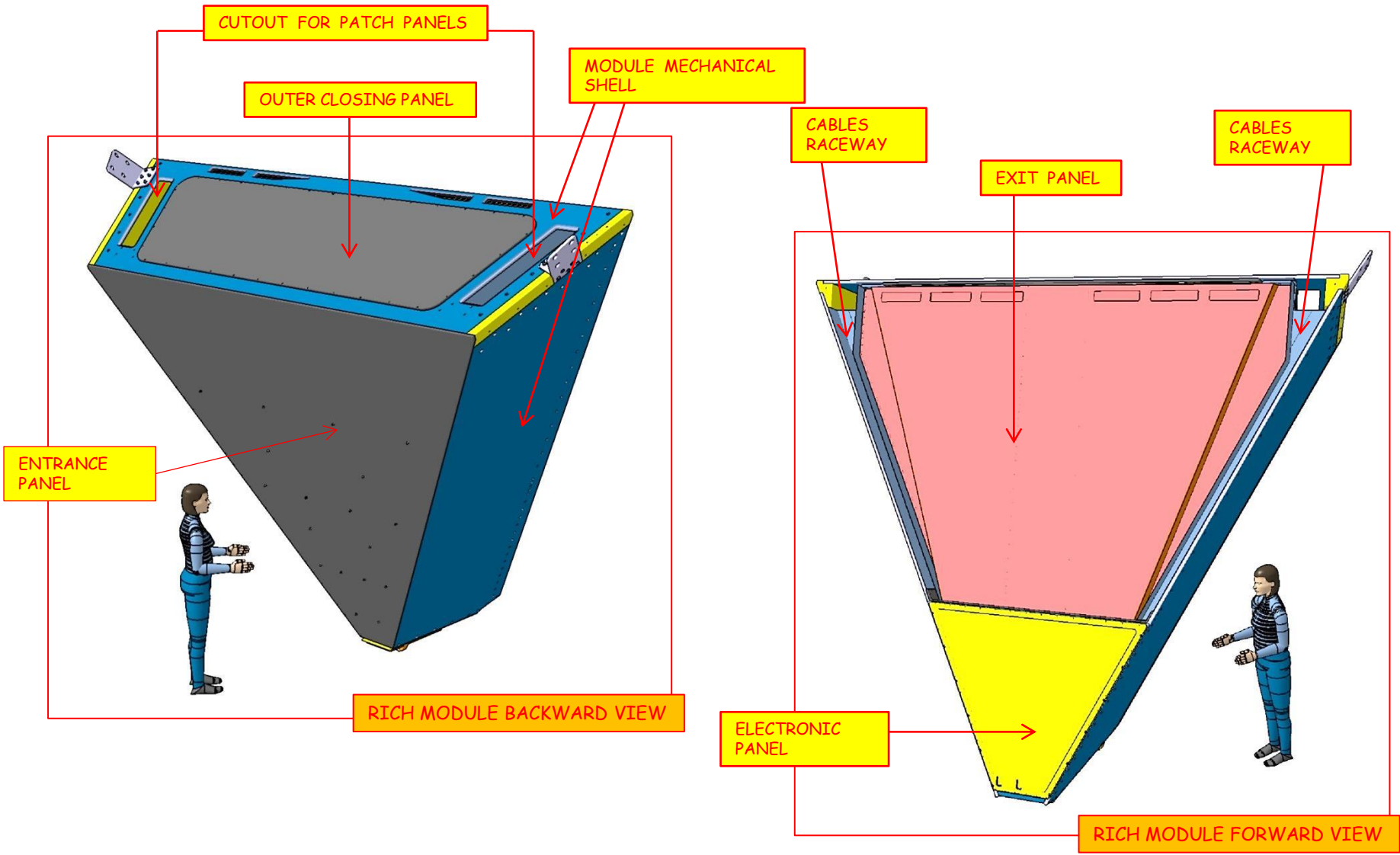


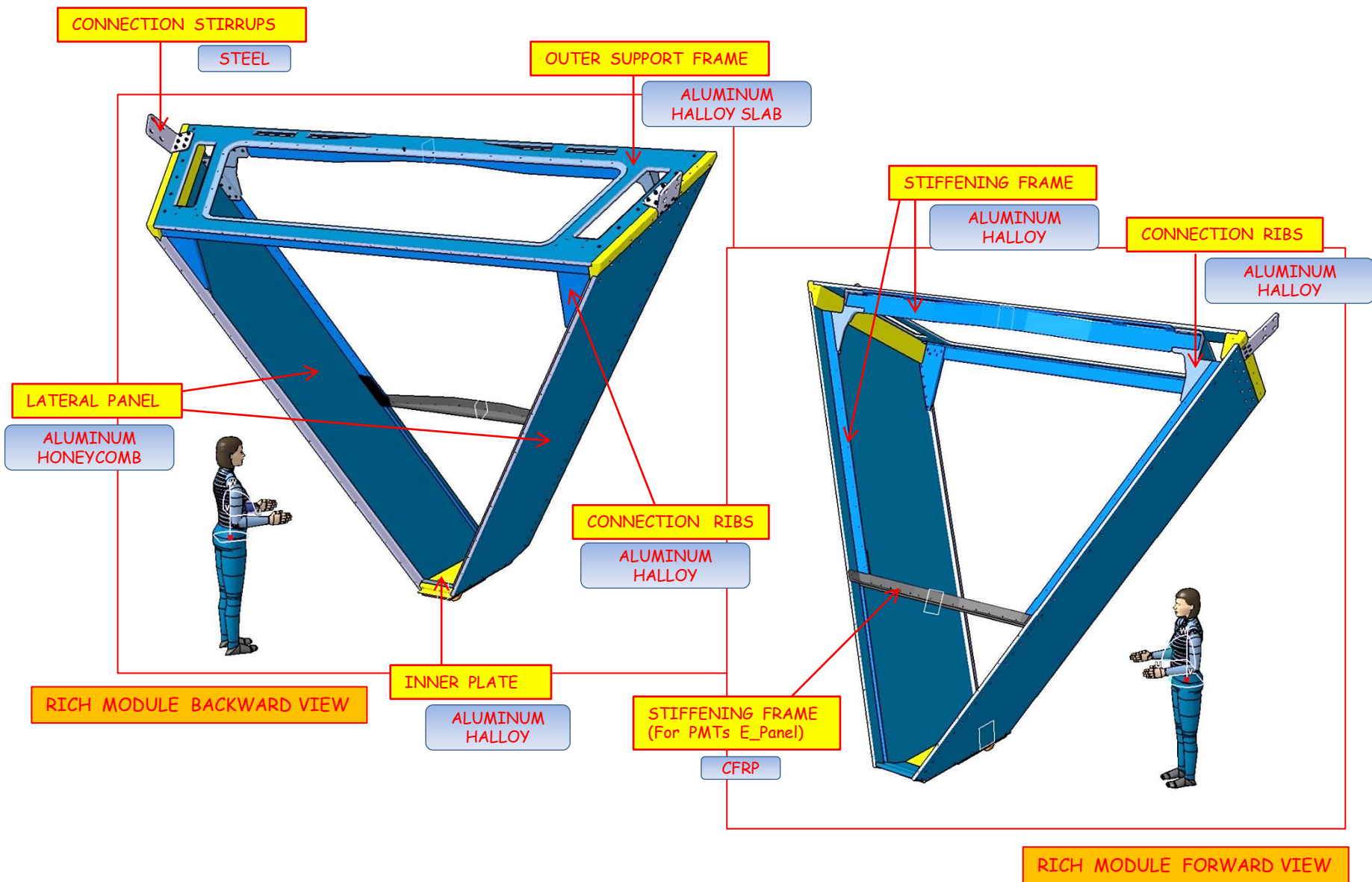
➤ RICH MECHANICAL SHELL DESIGN.



THE RICH Module: *General Overview.*

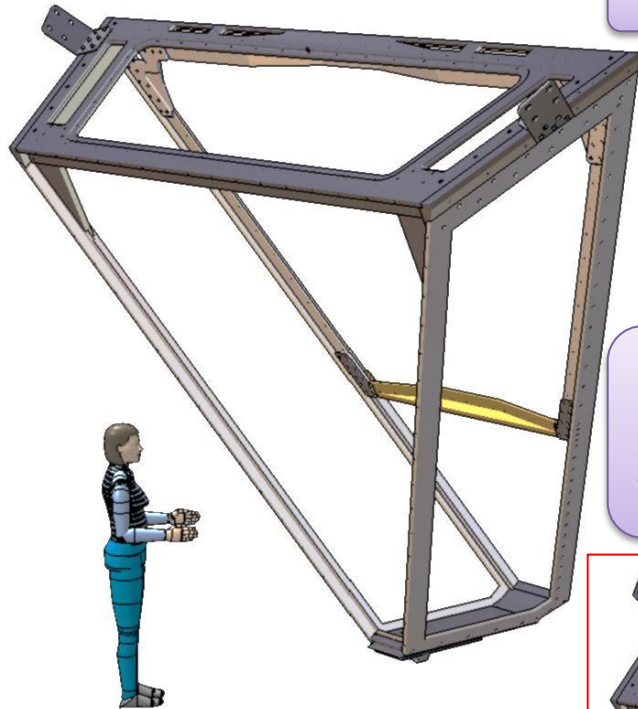


THE RICH Module: Mechanical Shell Overview.



THE RICH Module: Mechanical Shell Overview.

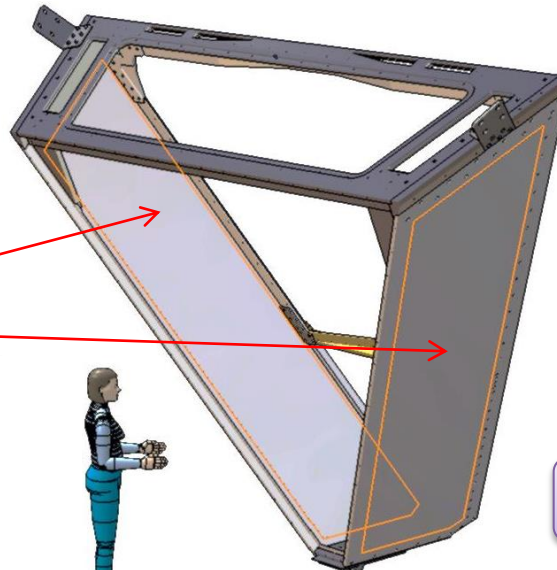
STRUCTURAL FRAME WITHOUT SANDWICH PANELS (HONEYCOMB)



RICH MODULE BACKWARD VIEW

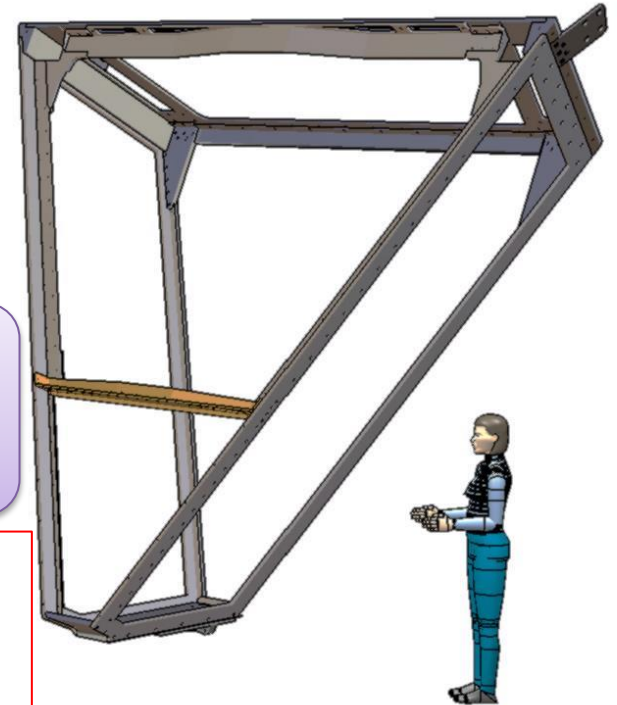
HYPOTHESIS FOR LATERAL PLATES:
WEIGHT COMPARISON

MONOLITIC SLABS: 17mm Th.:400Kg (Both)
SANDWICH PANELS: 25mm Th.:180Kg (Both)
(220Kg LESS)



LATERAL PANEL

ALUMINUM HONEYCOMB

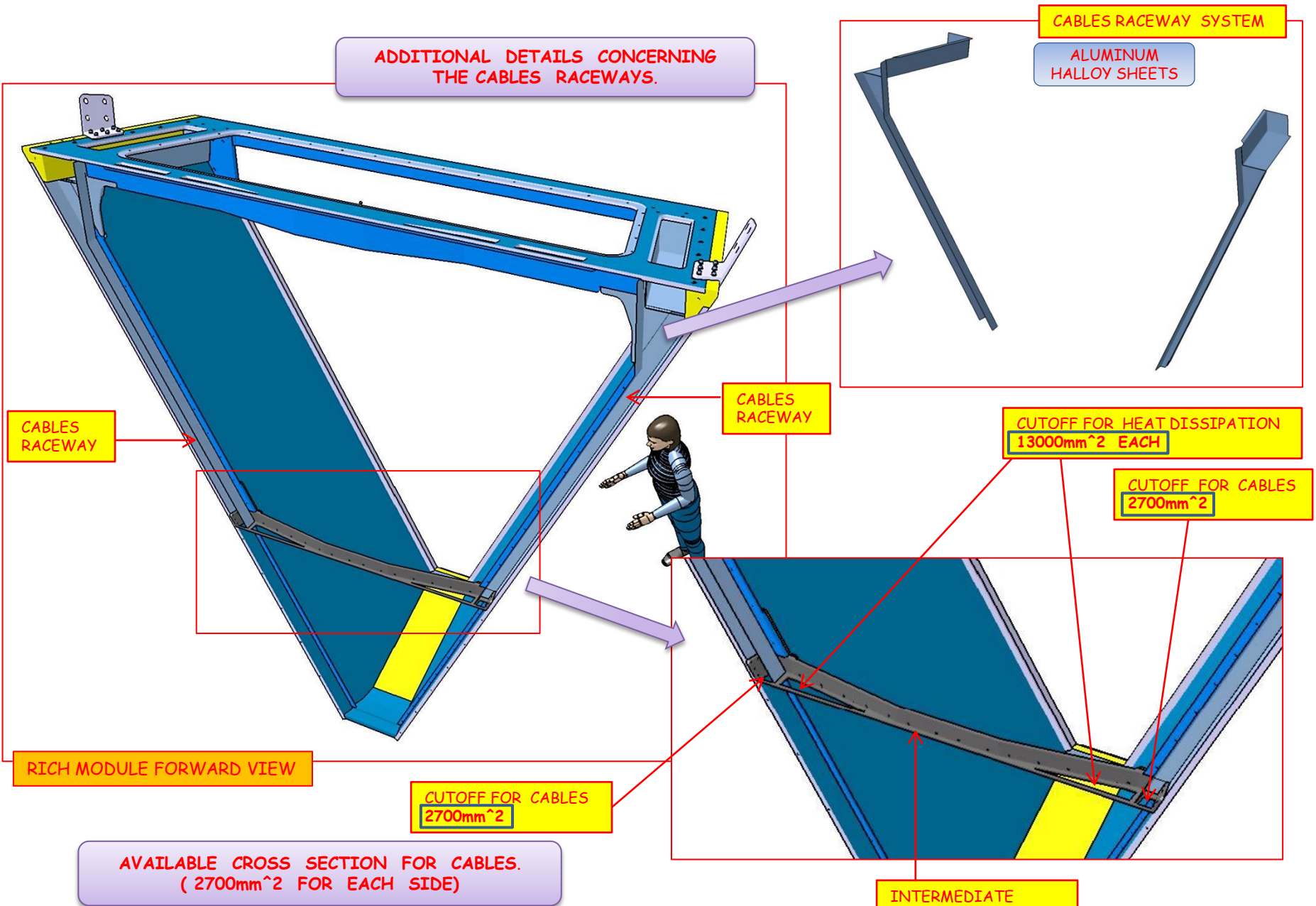


RICH MODULE FORWARD VIEW

STRUCTURAL FRAME WITH SANDWICH PANELS (HONEYCOMB)

NB. FEM ANALYSIS RESULTS IN SANDRO TALK.

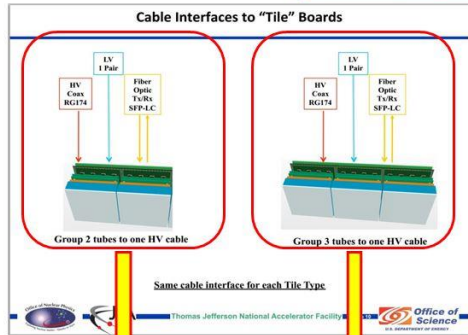
THE RICH Module: Cables Raceways System Details.



CFRP

THE RICH Module: Cables Raceways System - Cables Needed Cross Section.

PMTs ELECTRONIC PANEL: CABLES QUANTIFYING



4mm dia > 16mm² each > 16x2x23 layers = 736mm²

- 115 + 23 = 138 HV COAX CABLES → 3mm dia > 9mm² each > 9x138 = 1242mm²
 - 115 + 23 = 138 LV CABLES → 1,32mm dia > 1,75mm² each > 1,75x138 = 242mm²
 - 115 + 23 = 138x2 = 276 FIBER OPTIC CABLES → 2mm dia > 4mm² each > 4x276 = 1104mm²
- For conservative reasons, the areas of the cables have been considered as square shape.
- TOTAL REQUIRED CROSS SECTION: 3324mm²**

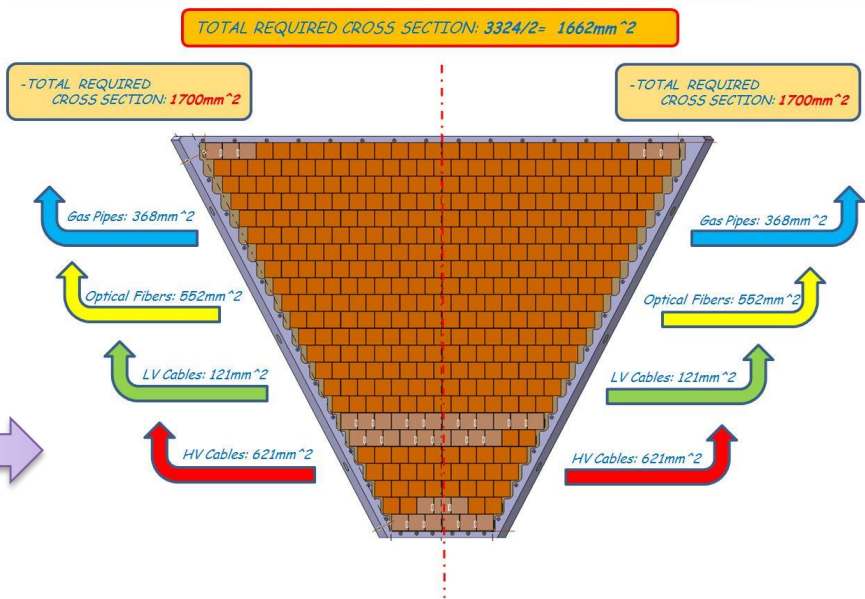
SLIDE 12 GLAS - Collaboration Meeting: 03/05/2014 INFN-LNF / Orecchini Dario - Tommasini Sandro

HAS BEEN QUANTIFIED THE NEEDED TOTAL CROSS SECTION.
(3400mm² / 1700mm² FOR EACH SIDE)

HAS BEEN ANALYZED THE CABLES AND THE GAS PIPES.

PRELIMINARY

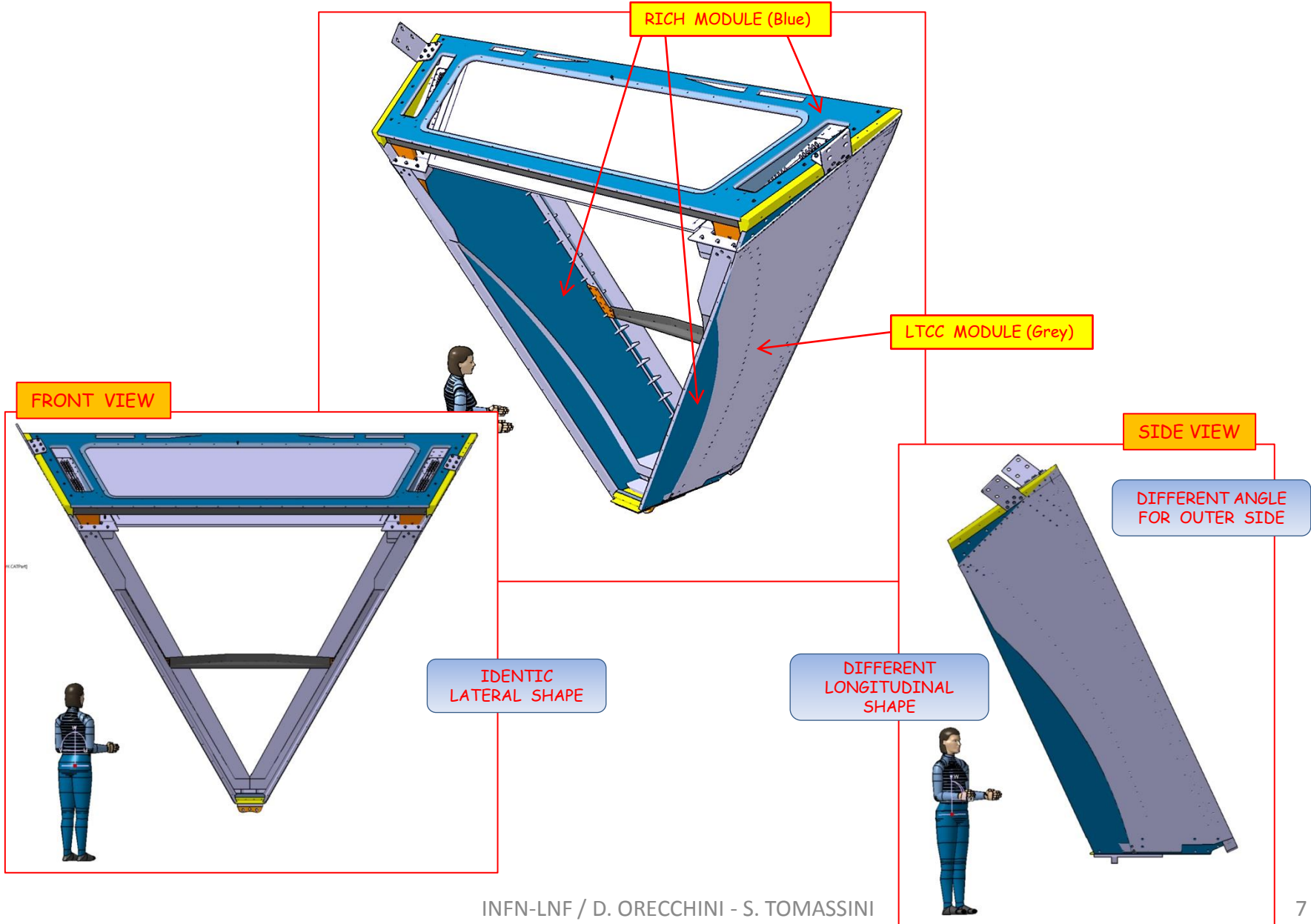
PMTs TRACKER- CABLES & GAS PIPES REQUIRED CROSS SECTION FOR EACH SIDE



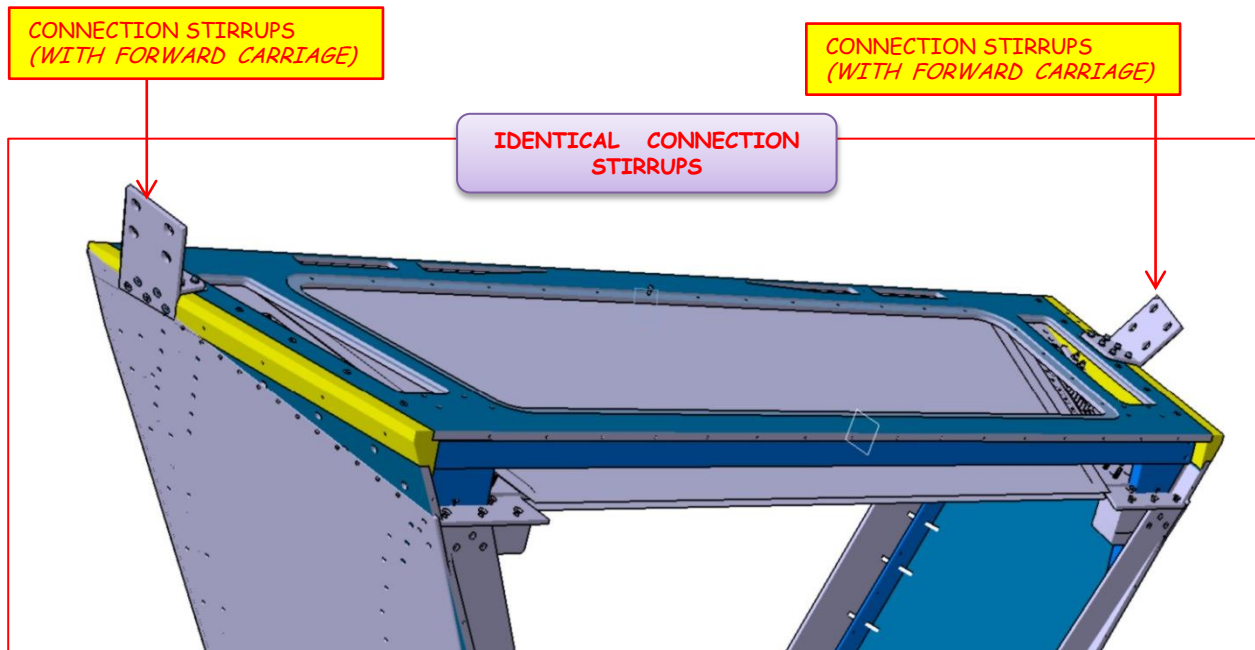
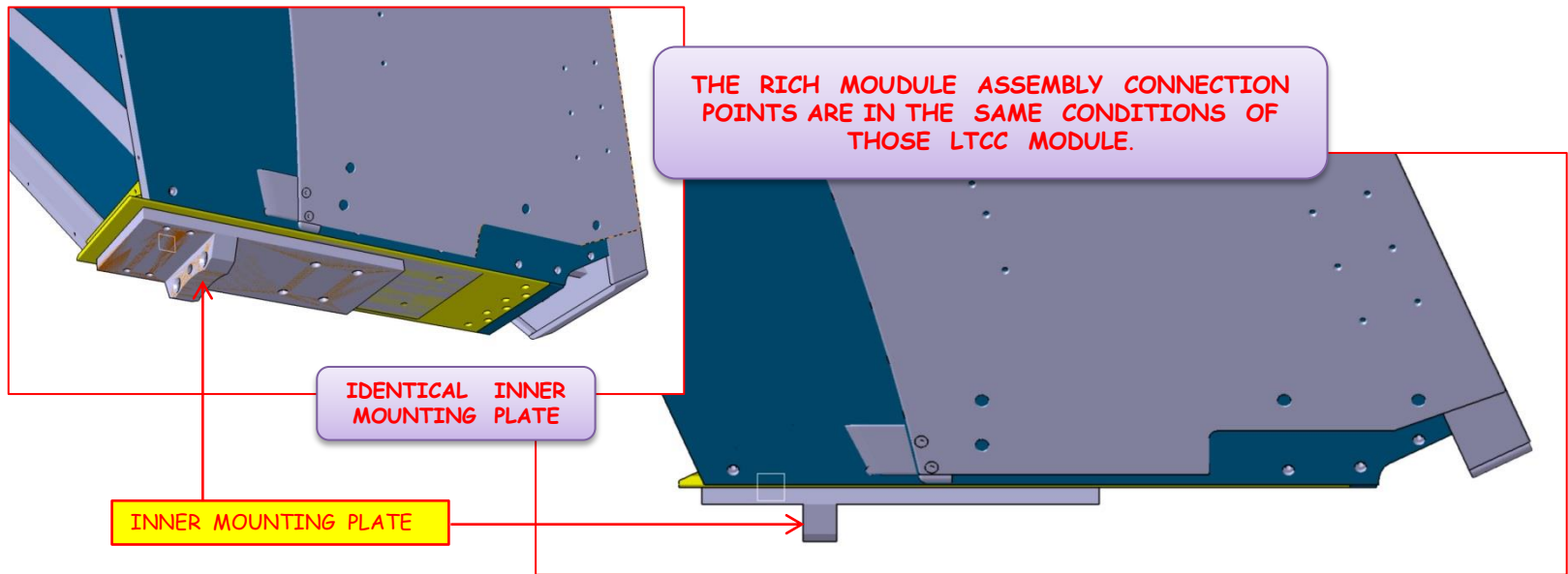
SLIDE 11 GLAS_12 RICH - Phone Meeting: 17/04/2014 INFN-LNF / Orecchini Dario - Tommasini Sandro

- THE RICH Module: Inside the LTCC Available Volume / Integration Study.

NB. LTCC 3D MODELS PROVIDED BY JOE GUERRA

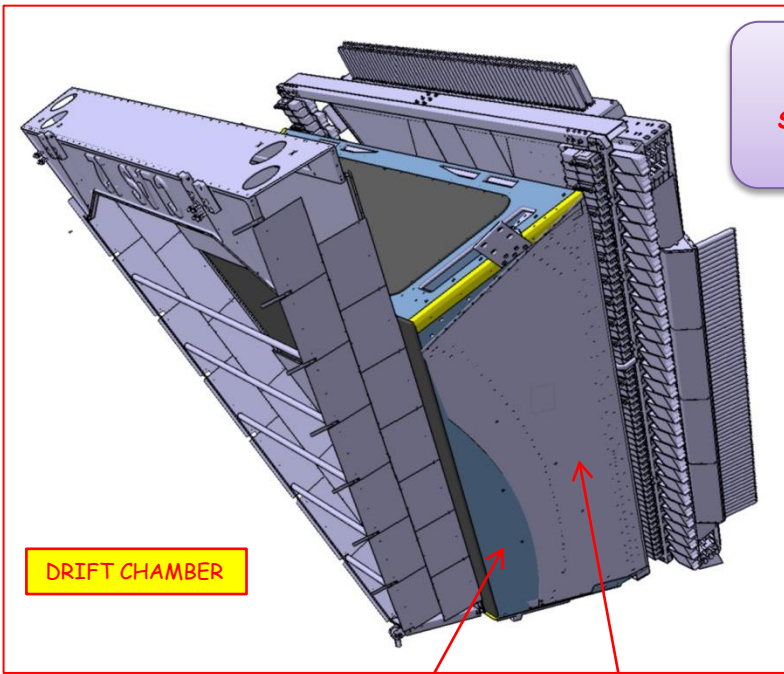


THE RICH Module: *LTCC Assembly Connections / Compatibility Study.*



- THE RICH Module: Inside the CLAS 12 Available Volume / Integration Study.

FORWARD TOF

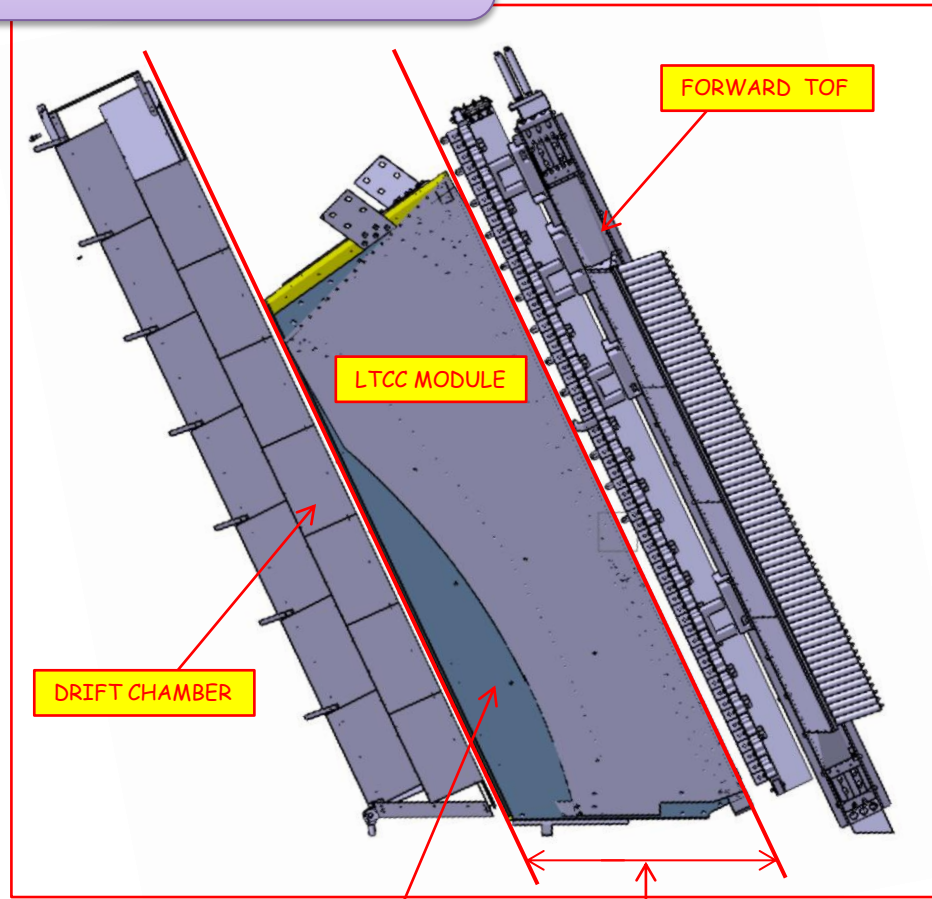


DRIFT CHAMBER

RICH MODULE

LTCC MODULE

THE RICH MODULE IS FULLY COMPATIBLE WITH THE AVAILABLE SPACE BETWEEN THE DRIFT CHAMBER AND THE F_TOF.



FORWARD TOF

DRIFT CHAMBER

RICH MODULE

RICH MODULE ENCUMBRANCE

NB. DRIFTS CHAMBERS & F_TOF 3D MODELS PROVIDED BY JOE GUERRA

- THE RICH Module: Inside the CLAS 12 Longitudinal Material Shadow Study.

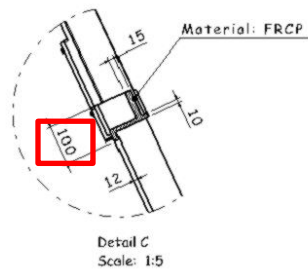
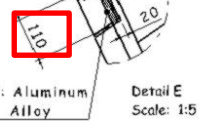
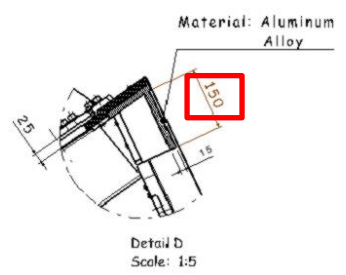
AN ANALYSIS OF THE SHADOW DUE TO THE PROJECTION OF THE COMPONENTS PLACED IN THE AREA OF ACCEPTANCE OF DRIFTS CHAMBERS AND THE F_TOF HAS BEEN DEVELOPED.....

ANGLES DEFINED BY THE PROJECTION FROM THE I.P. TO THE LONGITUDINAL SHADOW COMPONENTS.

6565
5425
???

ALUMINUM HALLOY

OUTER STIFFENING FRAME



INTERMEDIATE STIFFENING FRAME

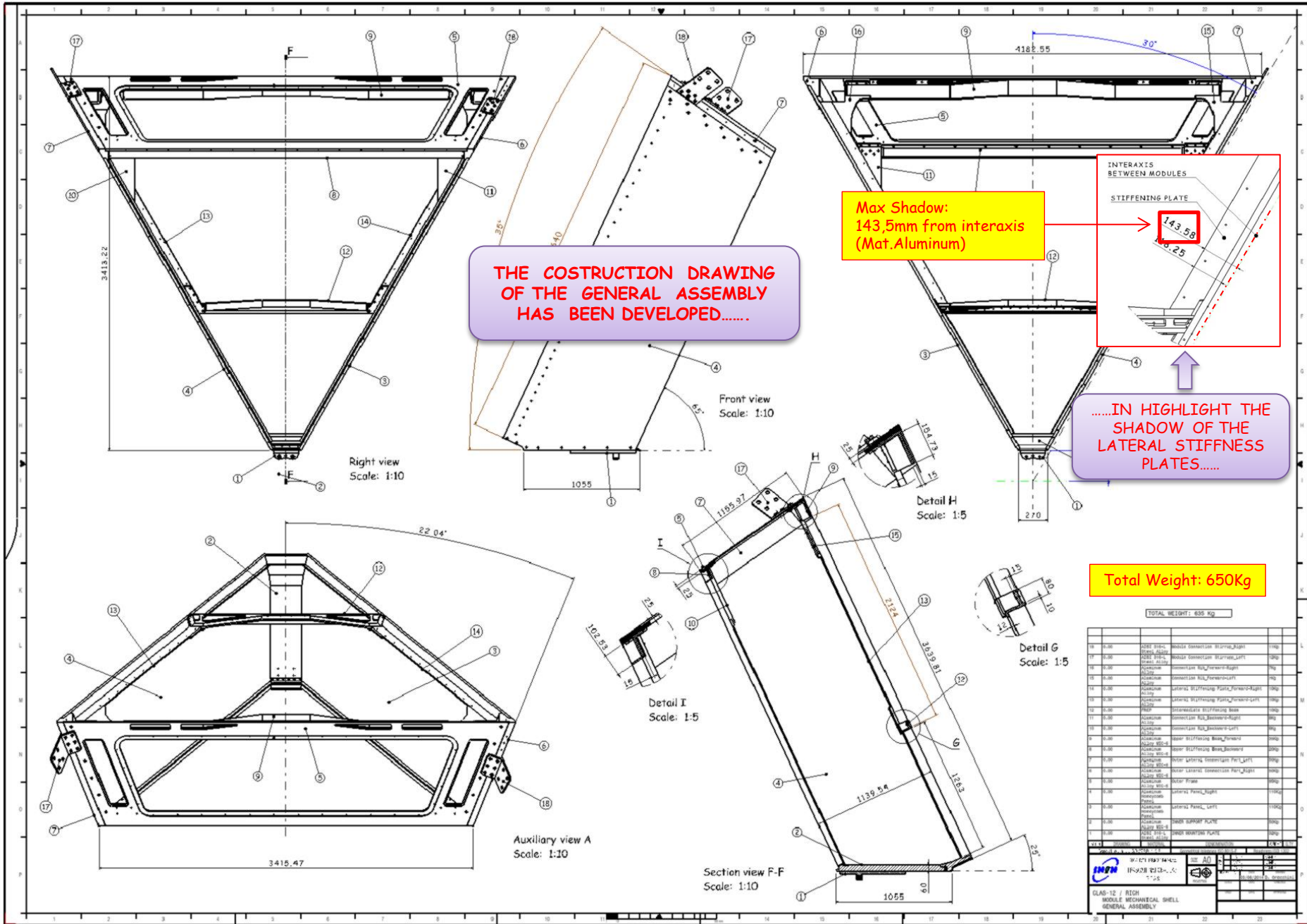
CFRP

I. P.

..... BUT, FROM A POINT OF VIEW OF PHYSICS, REMAINS STILL OPEN, THE VALIDATION OF THE DISTANCE OF THE RICH MODULE FROM THE IP.

Section view B-B Scale: 1:10

THE RICH Module: Mechanical Shell Assembly Constructive Drawing.



Total Weight: 650Kg

TOTAL WEIGHT: 655 Kg

NO	QTY	DESCRIZIONE	UNITA'	VALORE
13	0.00	ALUMINIO		
14	0.00	ALUMINIO		
15	0.00	ALUMINIO		
16	0.00	ALUMINIO		
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99	0.00	ALUMINIO		
100	0.00	ALUMINIO		

*- BY MECHANICAL POINT OF VIEW, THE
TARGET OF THE "MECHANICAL REVIEW" IS*

..... is the proposed RICH mechanical design well integrated into the CLAS12 detector?

..... I.e. are all the mechanical constraints imposed by the CLAS12 detector be taken into account?

AS SOON AS WE WILL BE APPROVED FROM THE J_LAB GROUP OF MECHANICAL ENGINEERING, WE WILL PROCEED TO DEVELOP THE EXECUTIVE DRAWINGS.