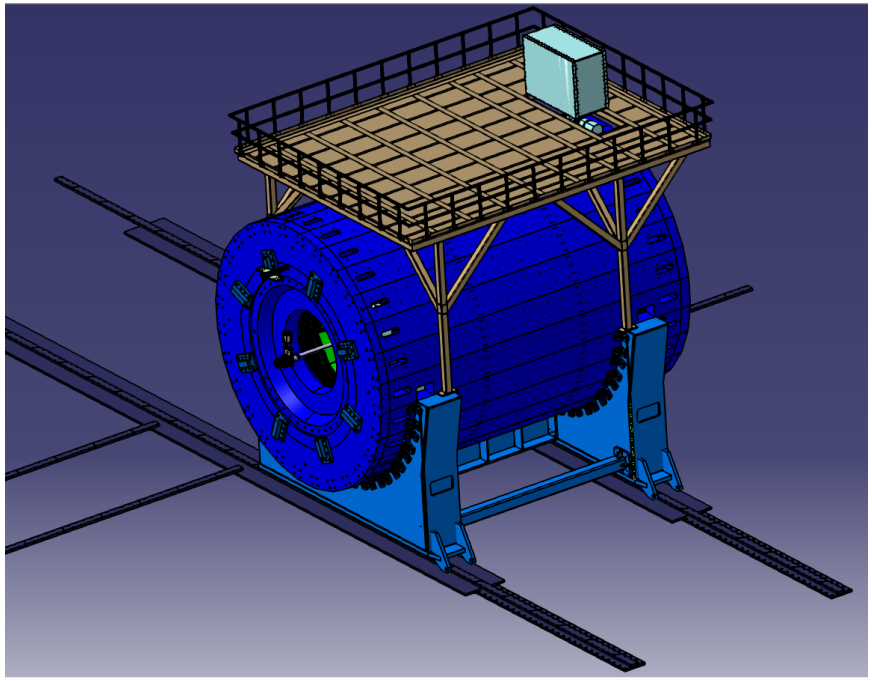
MPD Integration



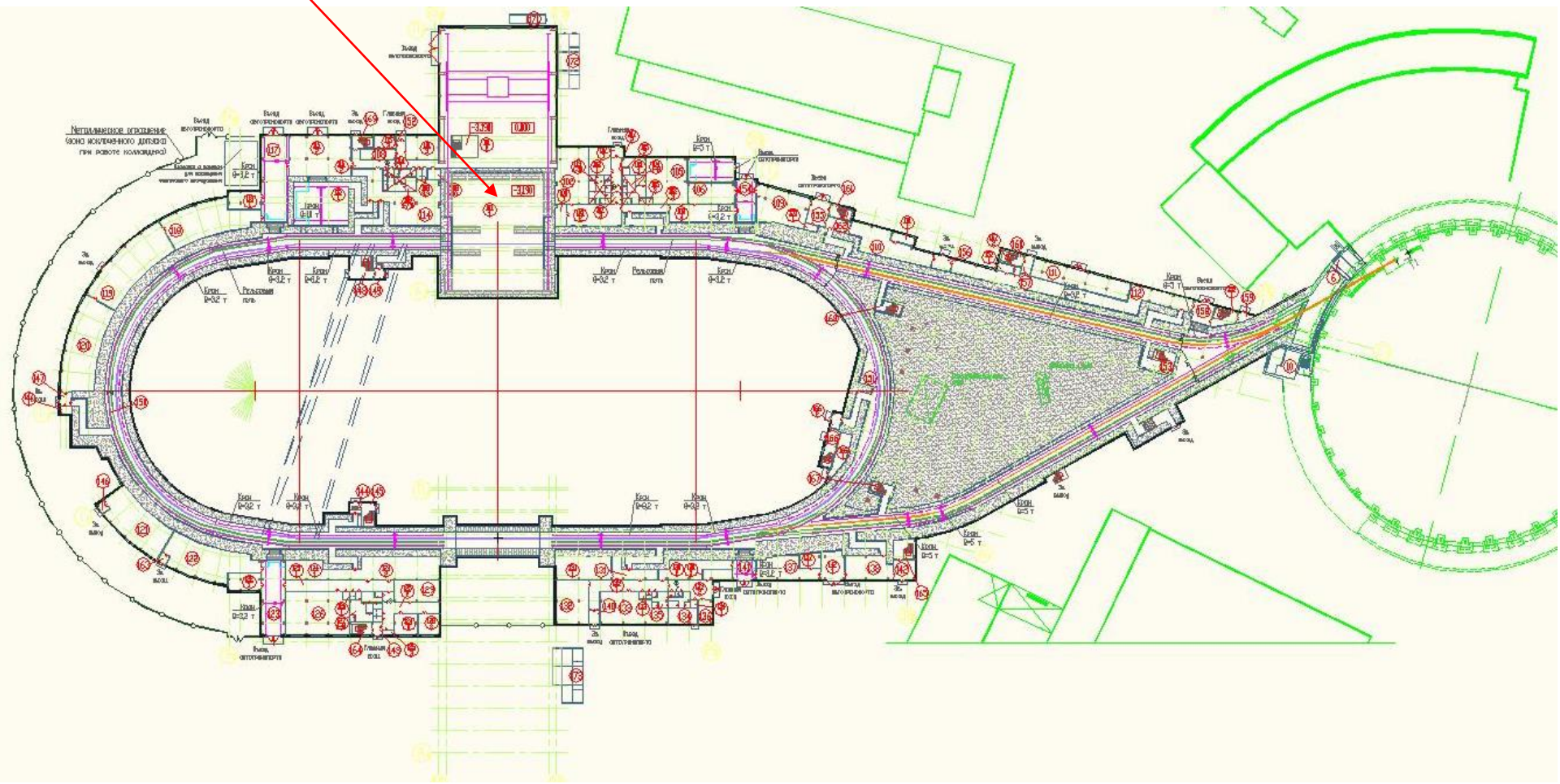
Warsaw, November 3-7, 2015

N.Topilin on behalf of VBLHEP DD
JINR, Dubna

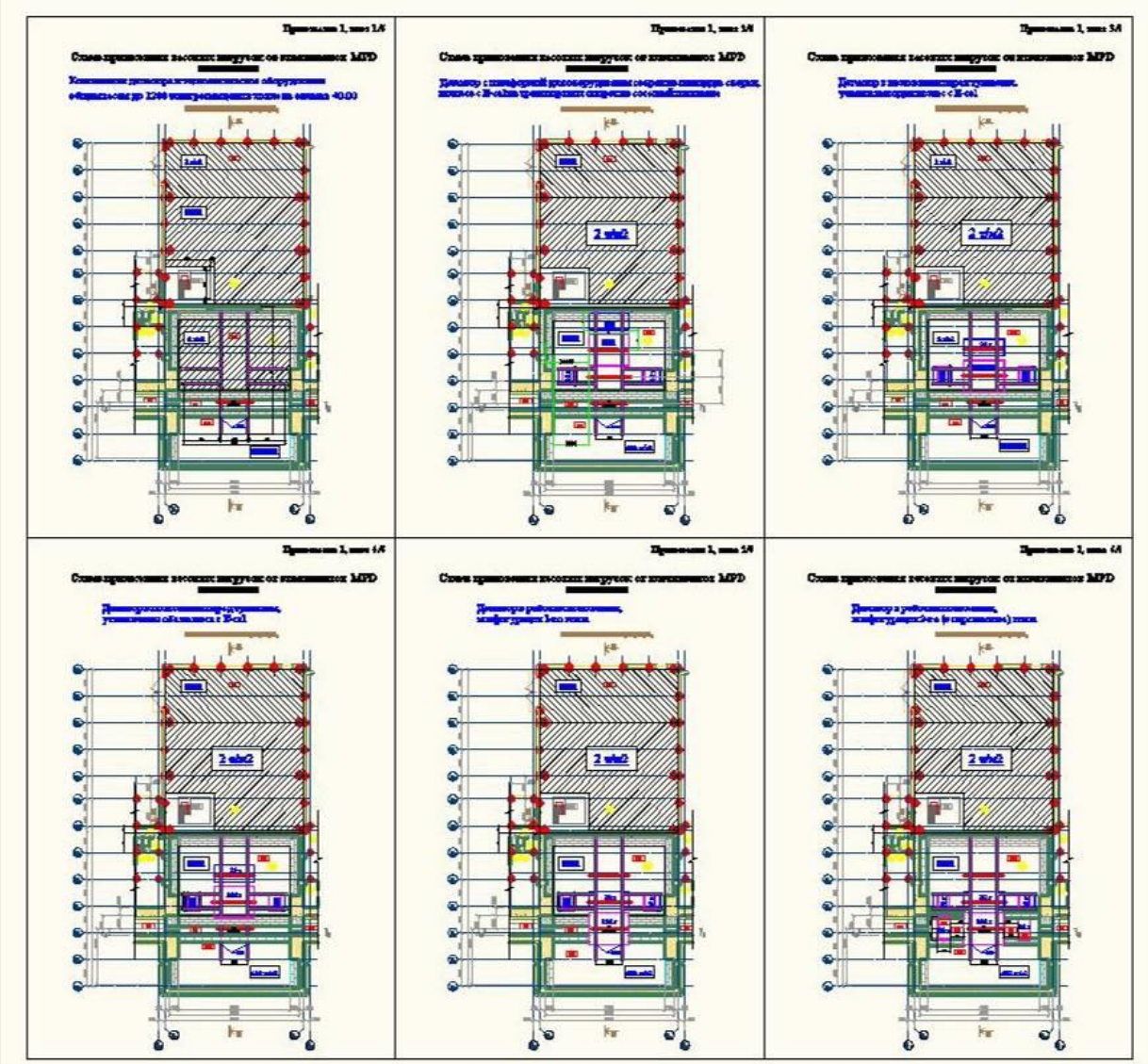
VBLHEP JINR Dubna, 2009

VBLHEP JINR Dubna today

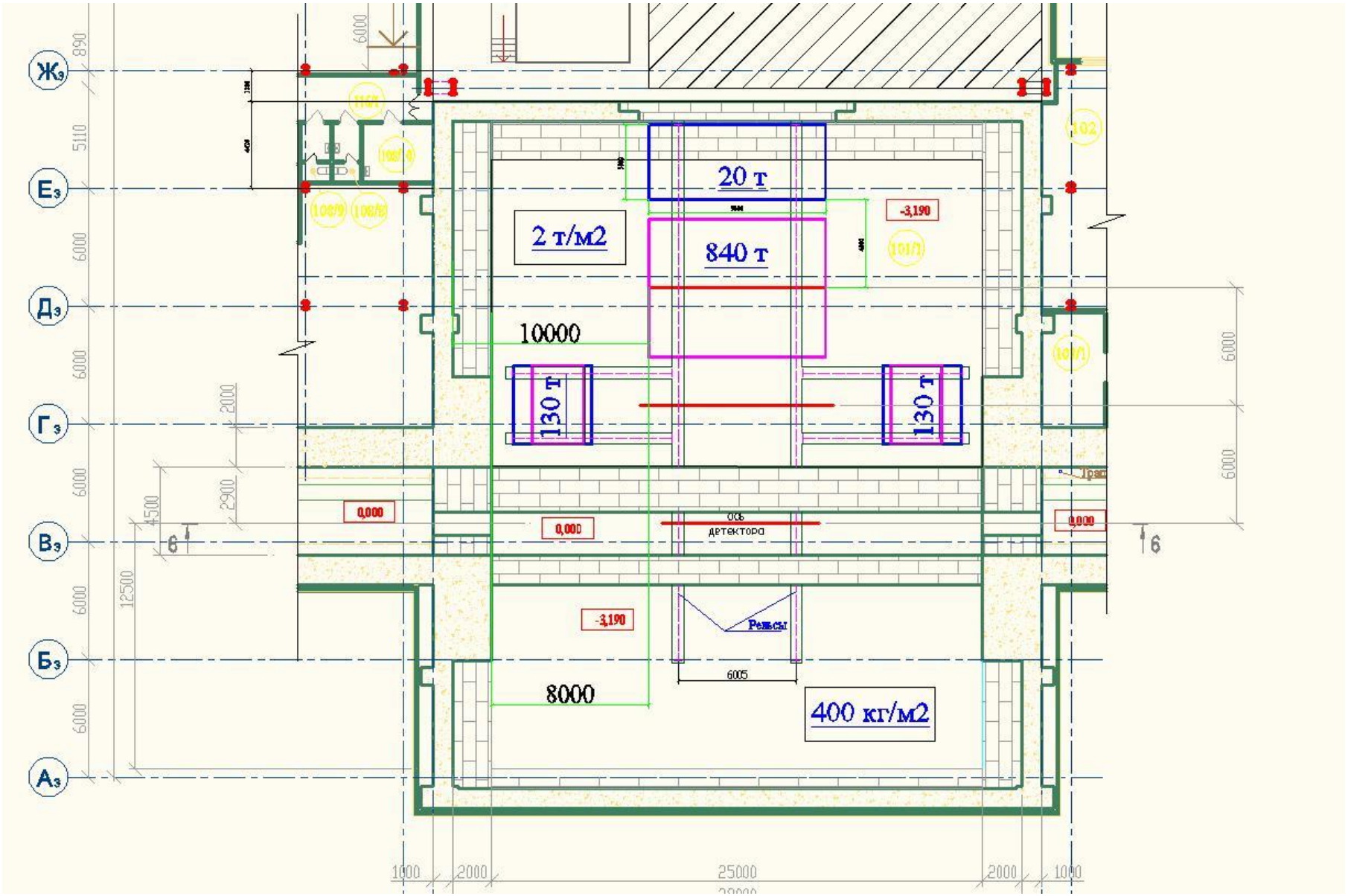
ZAO “Kometa”: NICA-MPD lay out



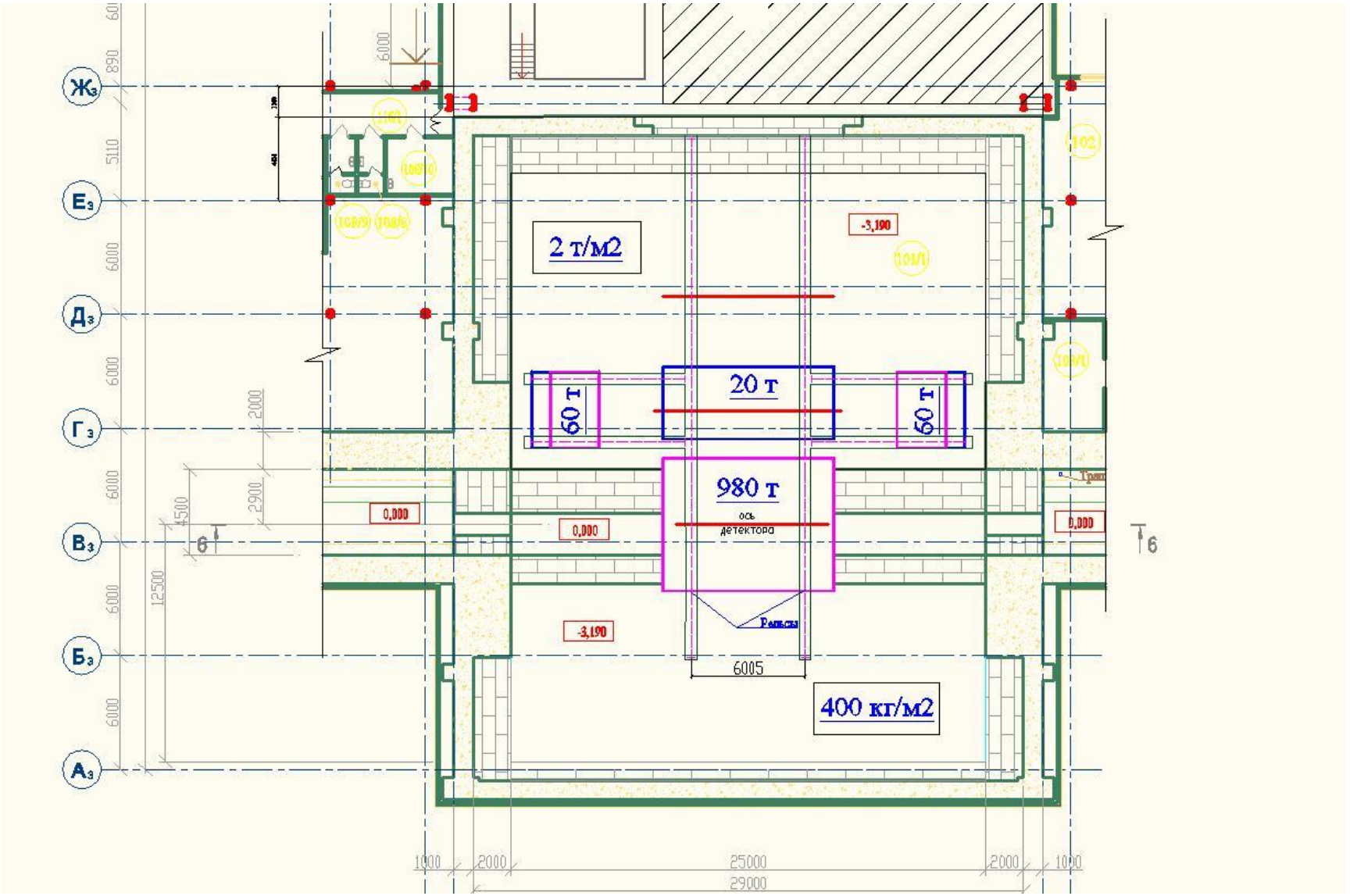
JINR-STRABAG: MPD Hall floor loads (all steps)



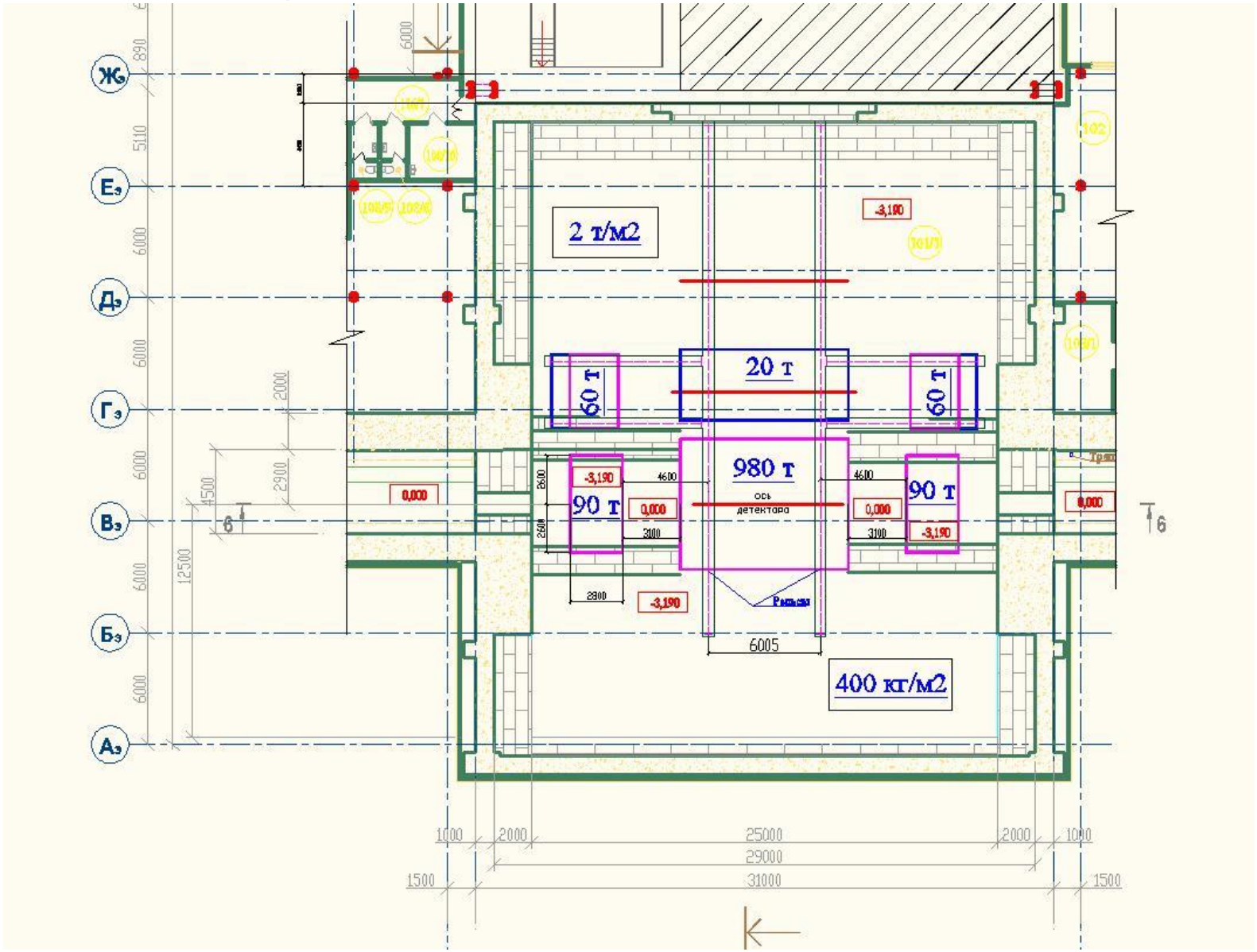
JINR-STRABAG: MPD Hall floor loads (assembly position)



JINR-STRABAG: MPD Hall floor loads on final position (variant of nearest future)

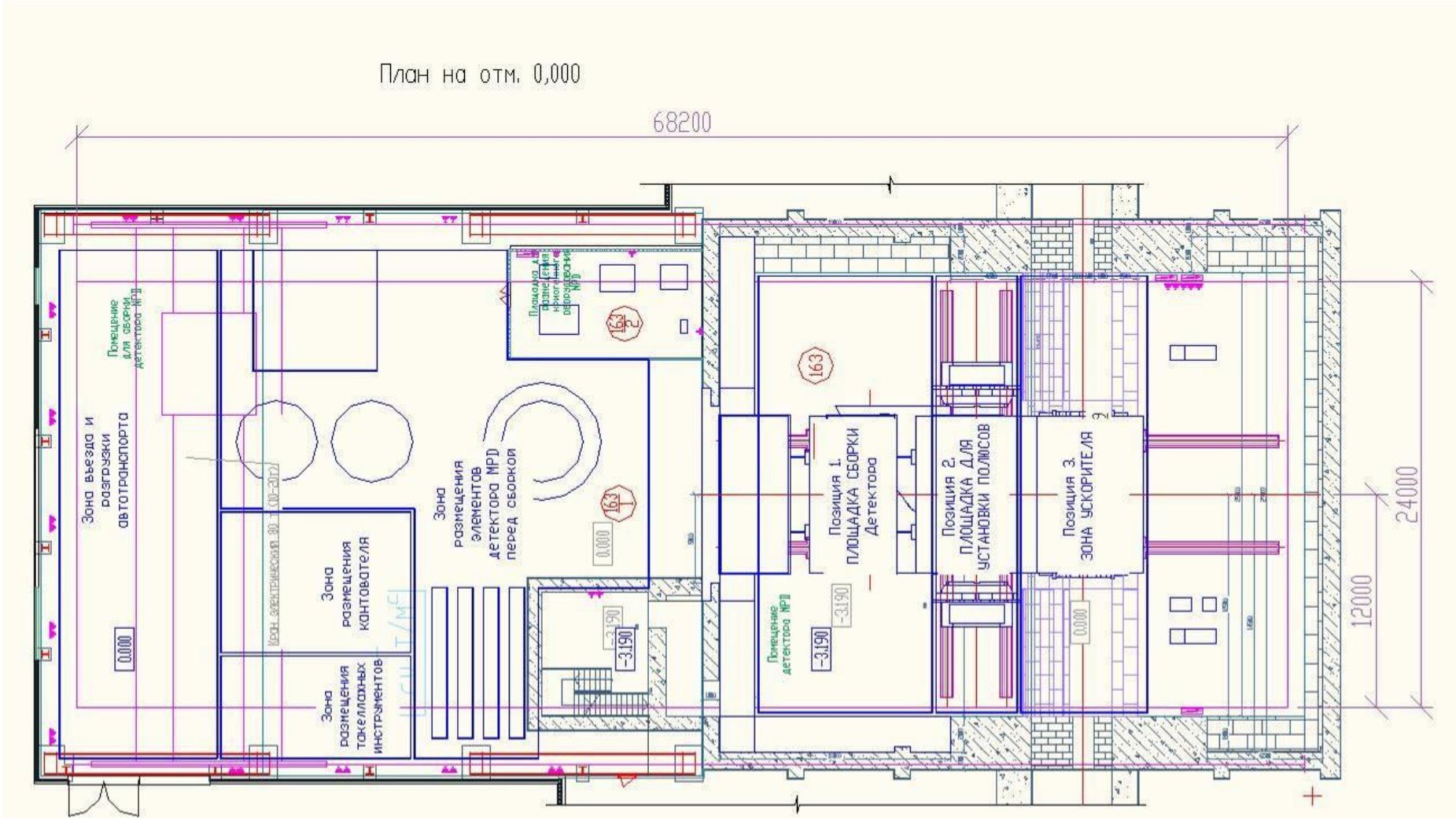


JINR-STRABAG: MPD Hall floor loads on final position (variant of “not so far away” future)



MPD Hall lay out

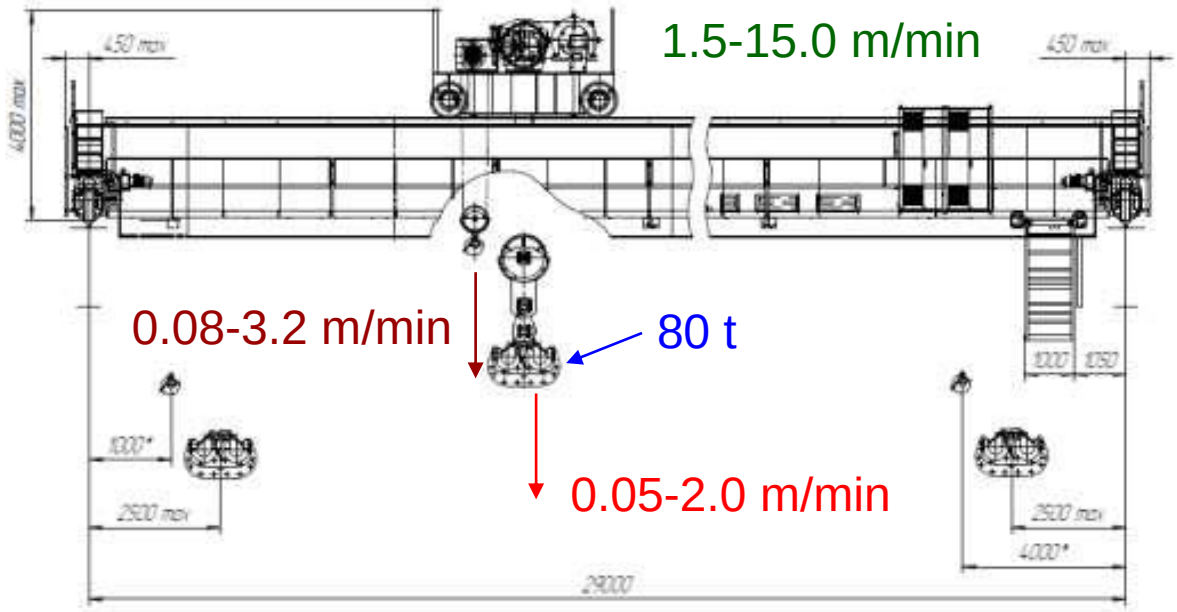
(Work drawing of ZAO “Kometa”, Moscow)

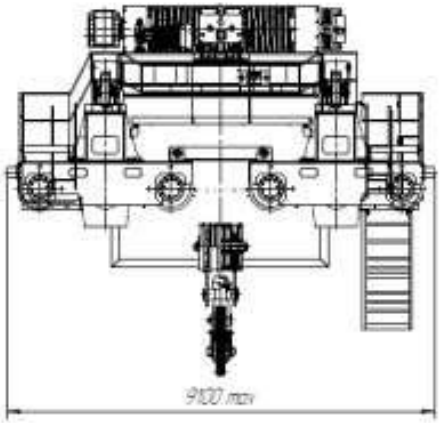


80/20 t crane for MPD Hall

3.0-30.0 m/min

1.5-15.0 m/min

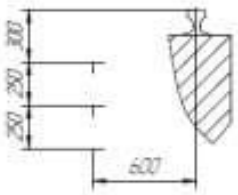




Грузоподъемность т		Режим работы крана	Высота подъема т		Пролет крана т	Скорость м/мин				Управление краном	Максимальная нагрузка на колесо крана кН не более	Конструктивная масса т не более
Главного	Вспомогат.		Главного	Вспомогат.		Подъема		Передвижения				
						Главного	Вспомогат.	Тележки	Крана			Крана
80,0	20,0	А3	15,2	15,2	29,0	0,05-2,0	0,08-3,2	1,5-15,0	3-30,0	радиусное	355,0	100,0

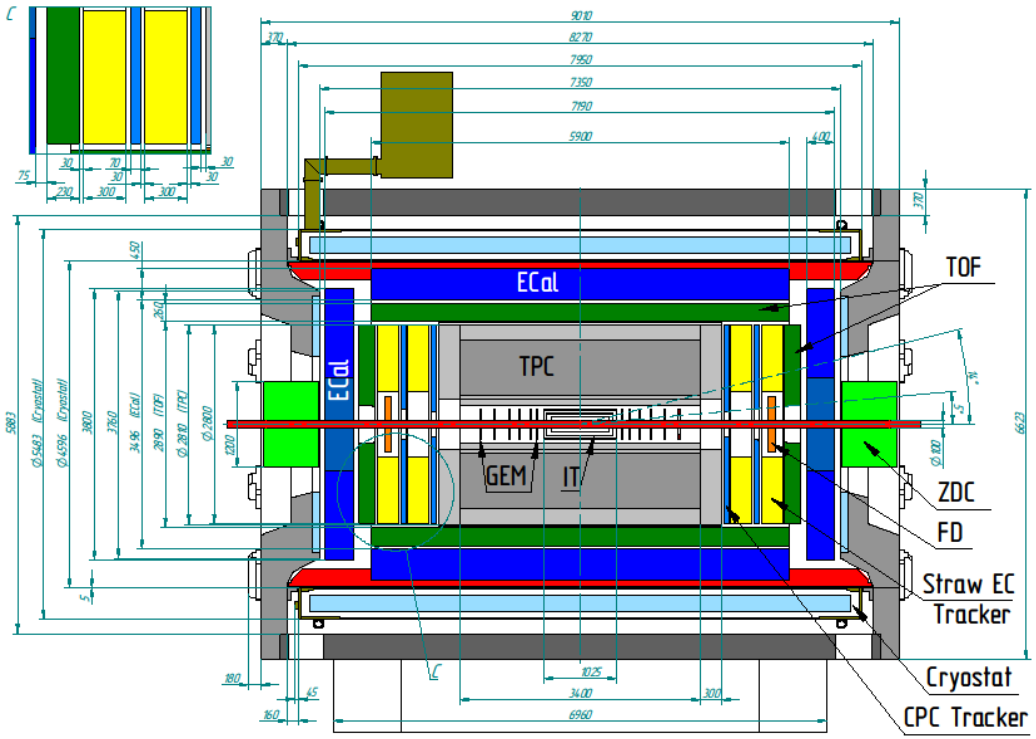
Расположение проушин

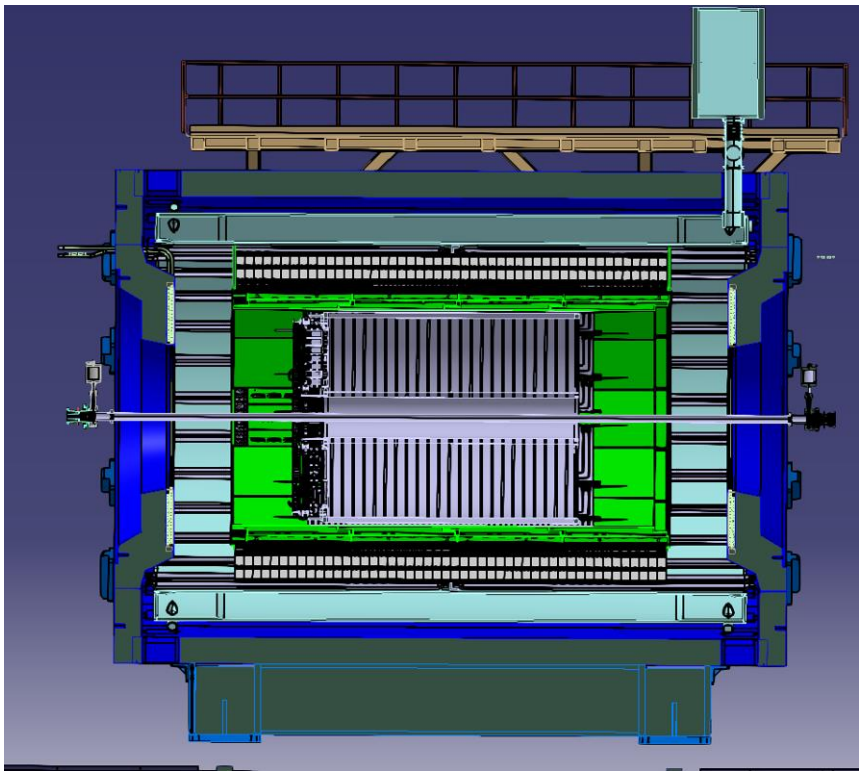
Данный чертеж не определяет конструкцию крана
* Размеры уточняются при проектировании



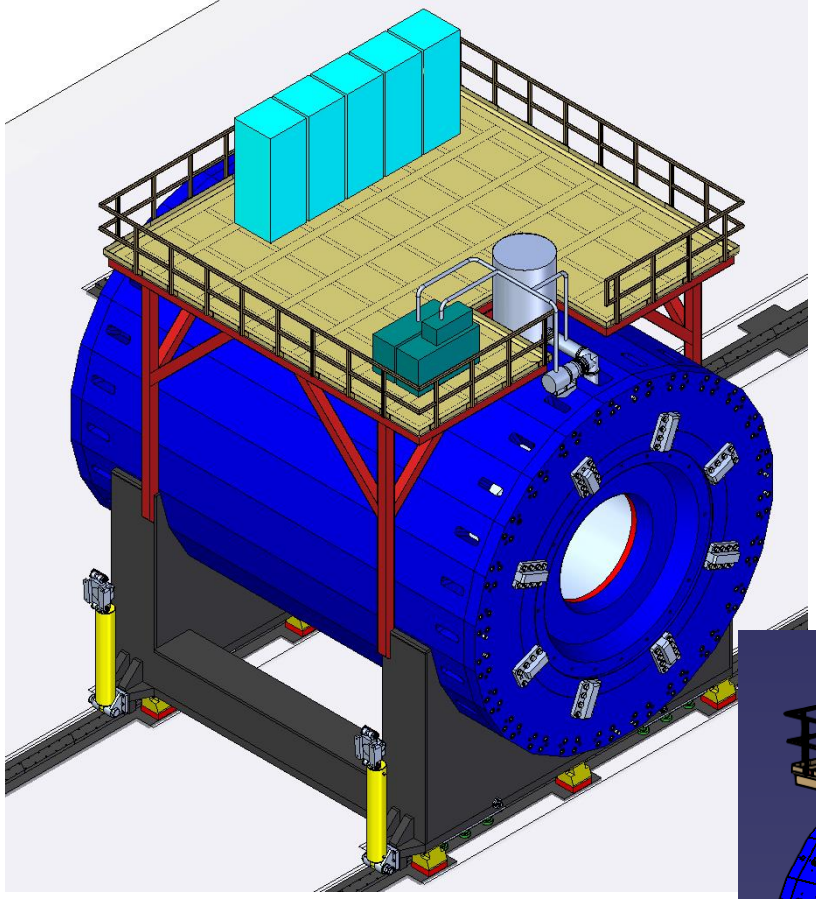
Proposal from Crane Factory, S-Peterburg

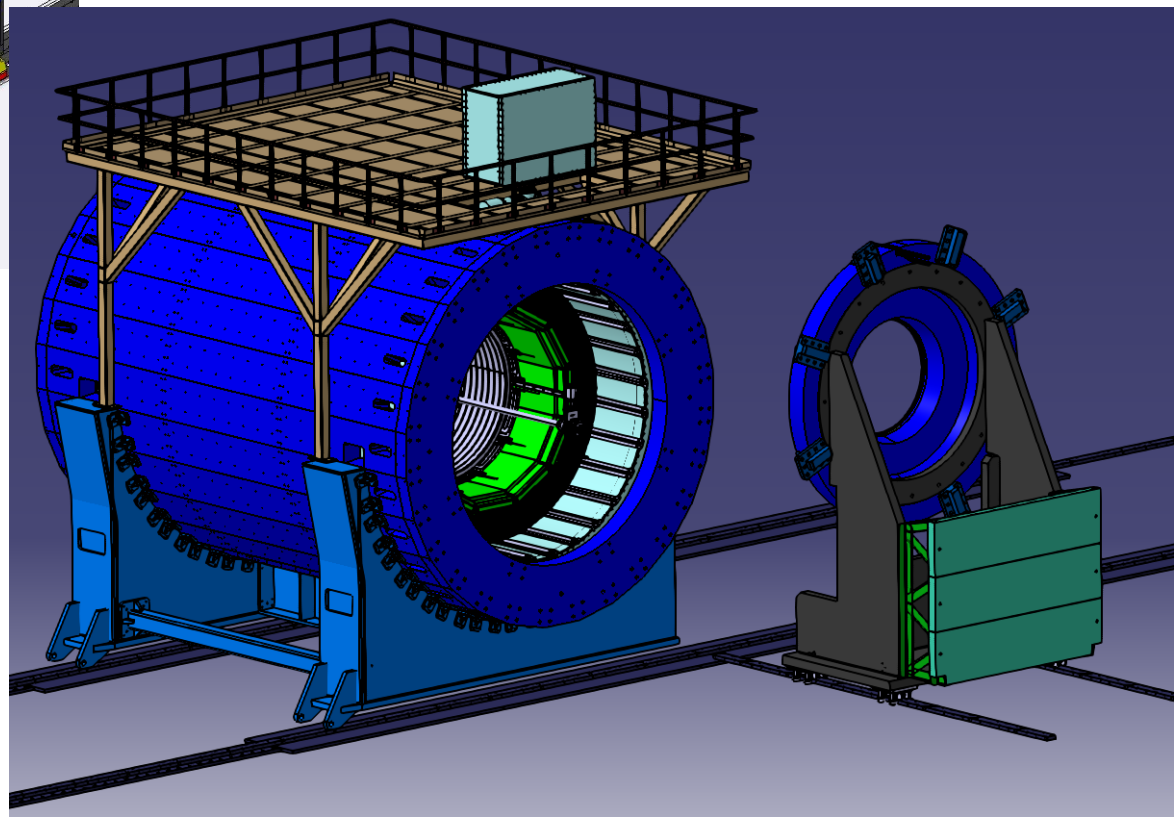
MPD longitudinal cross-section



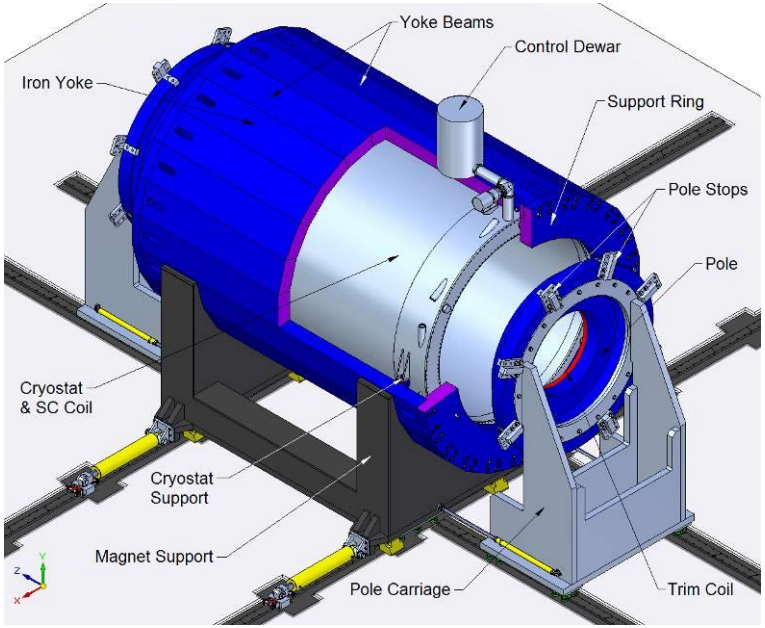


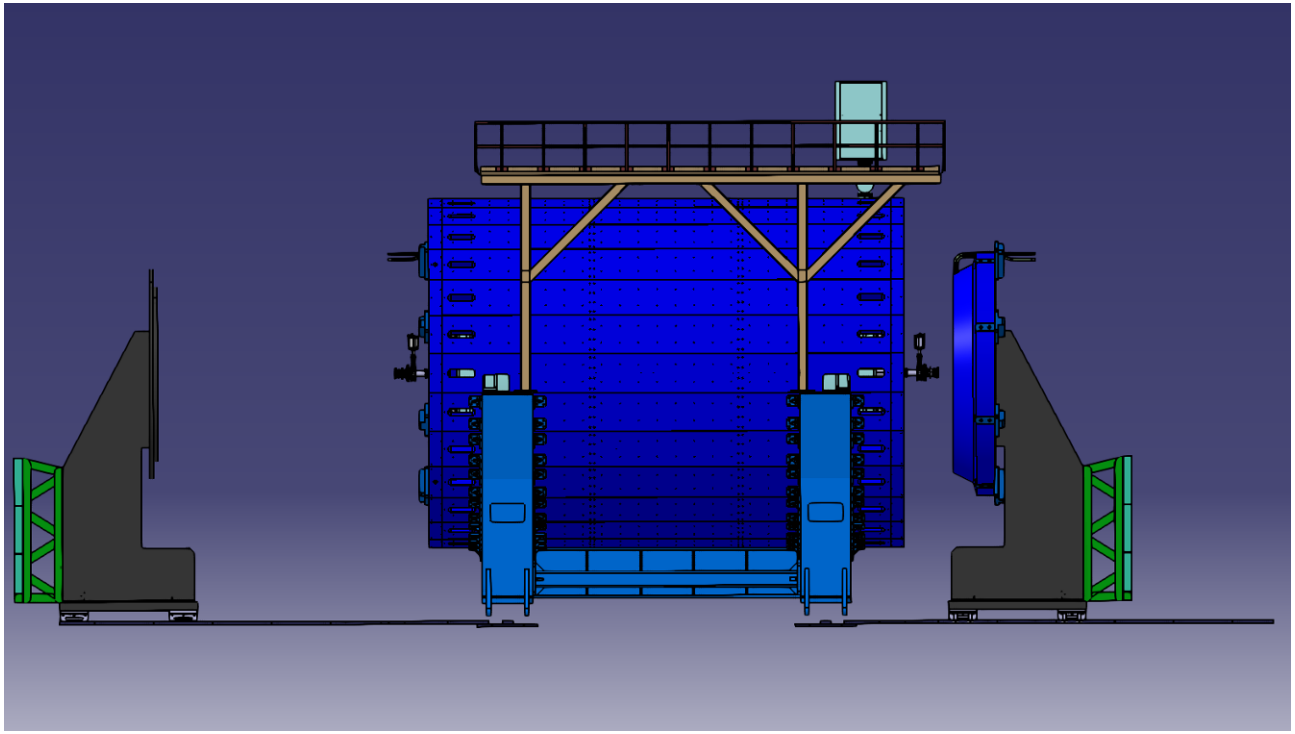
MPD yoke



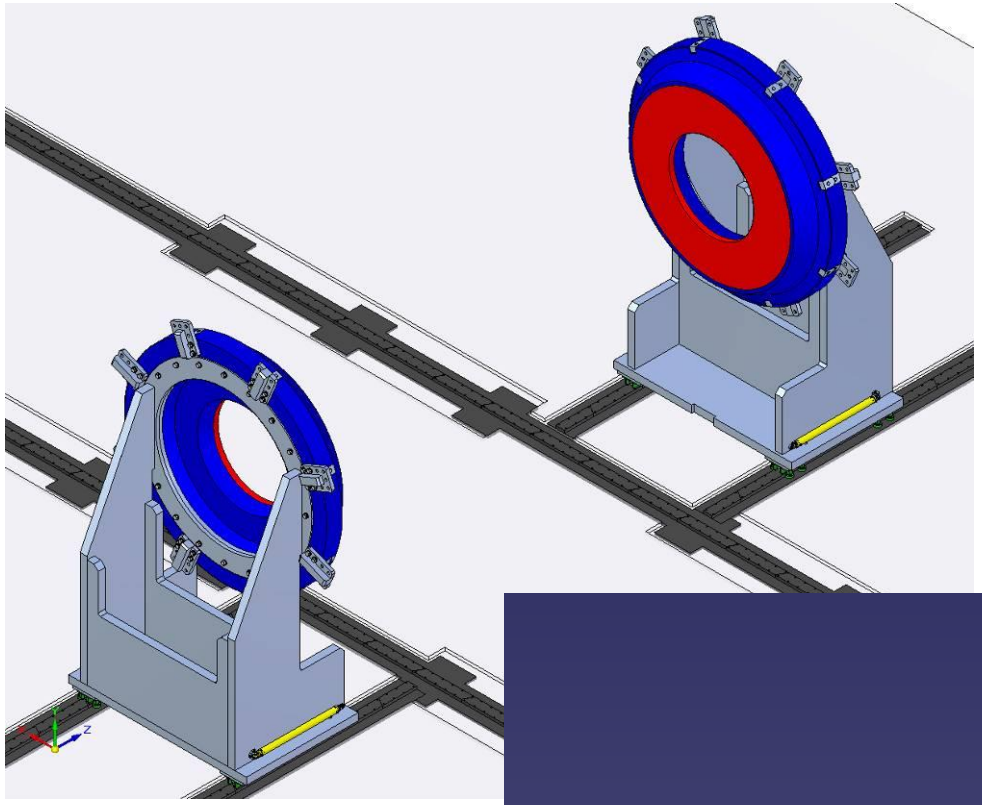


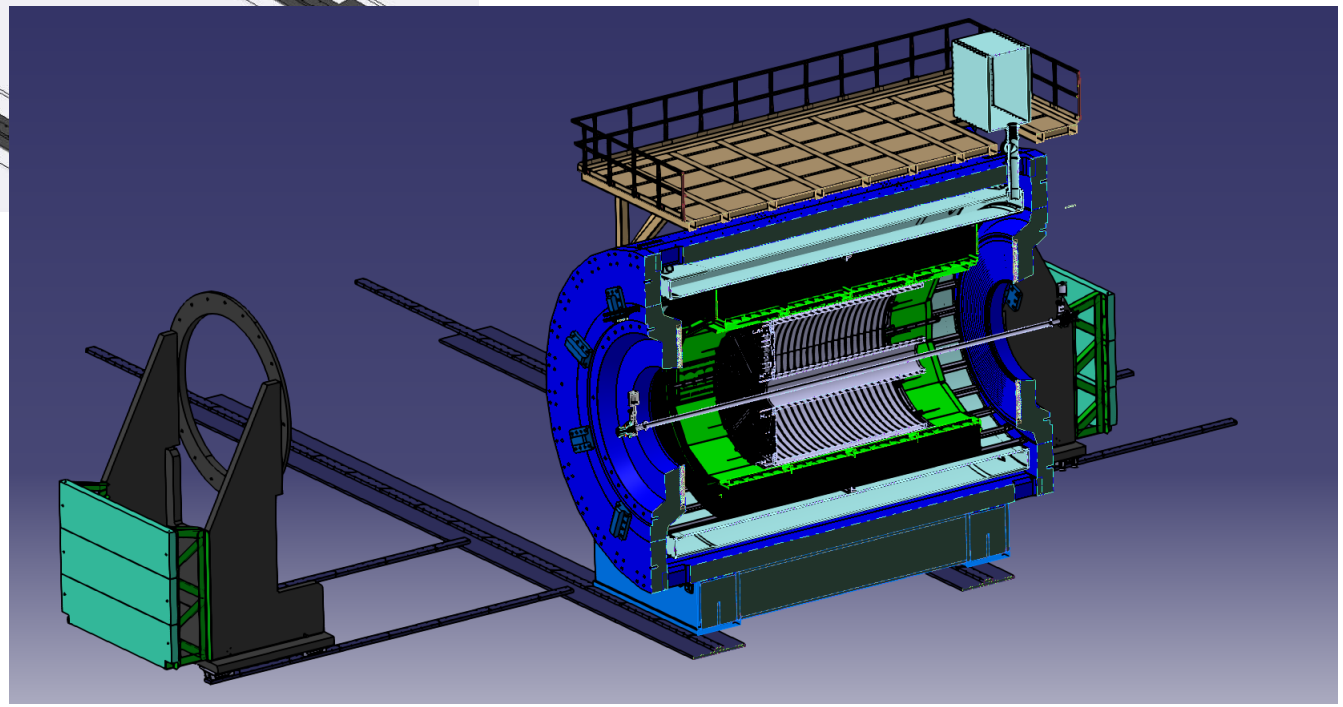
MPD magnet


Yoke Beams
Control Dewar
Iron Yoke
Support Ring
Pole Stops
Pole
Cryostat
& SC Coil
Cryostat
Support
Magnet Support
Pole Carriage
Trim Coil

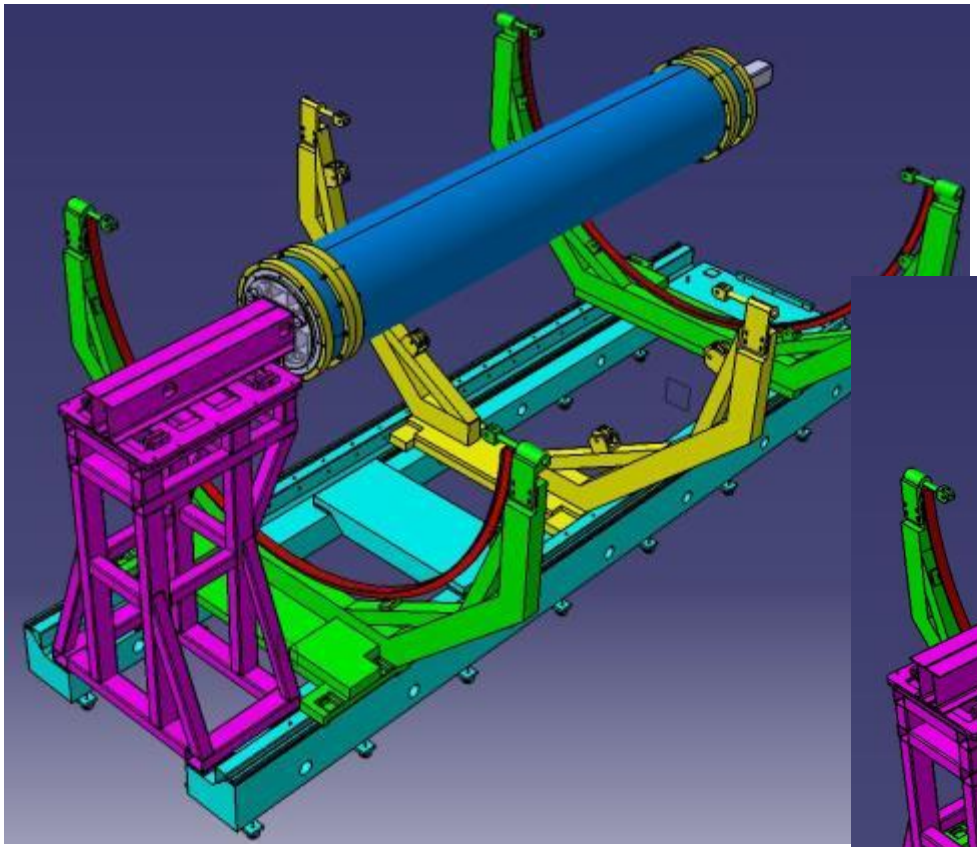


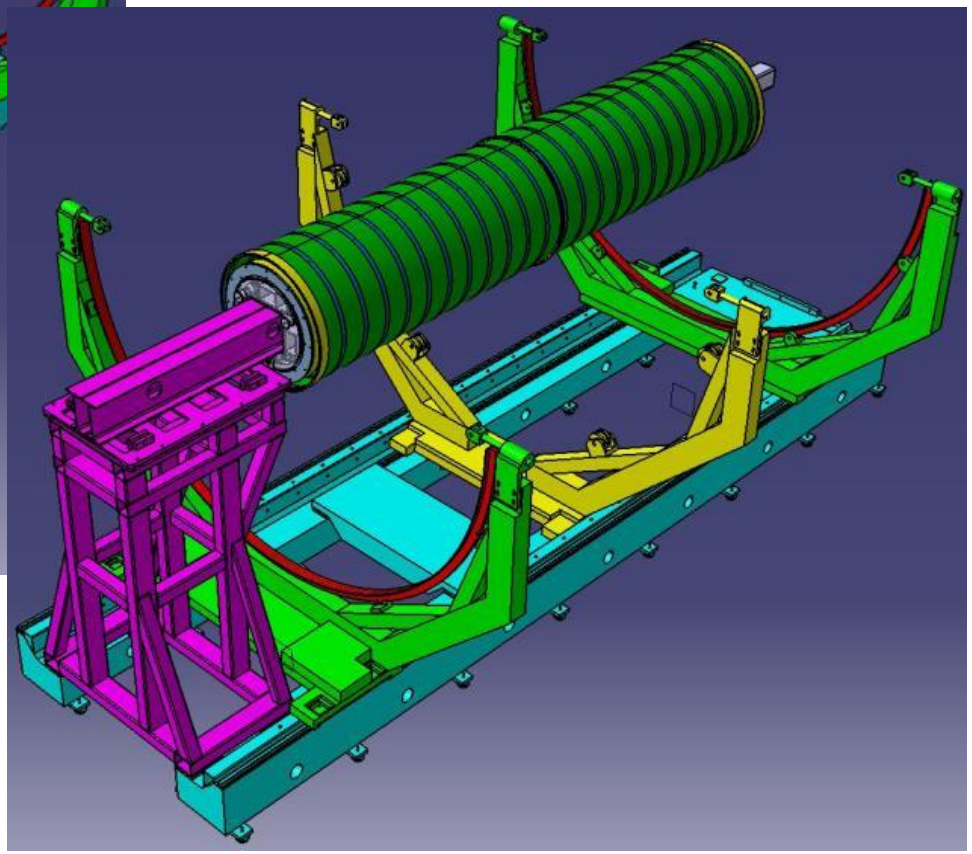
MPD poles on transport supports



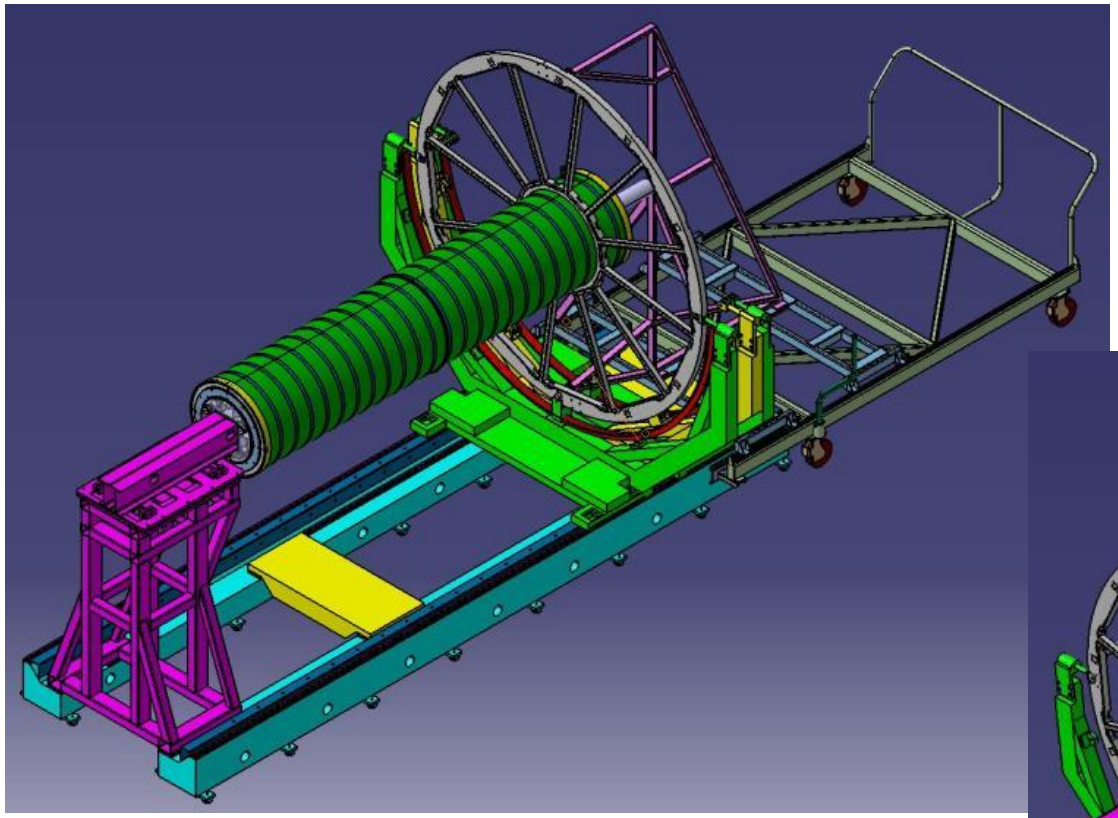


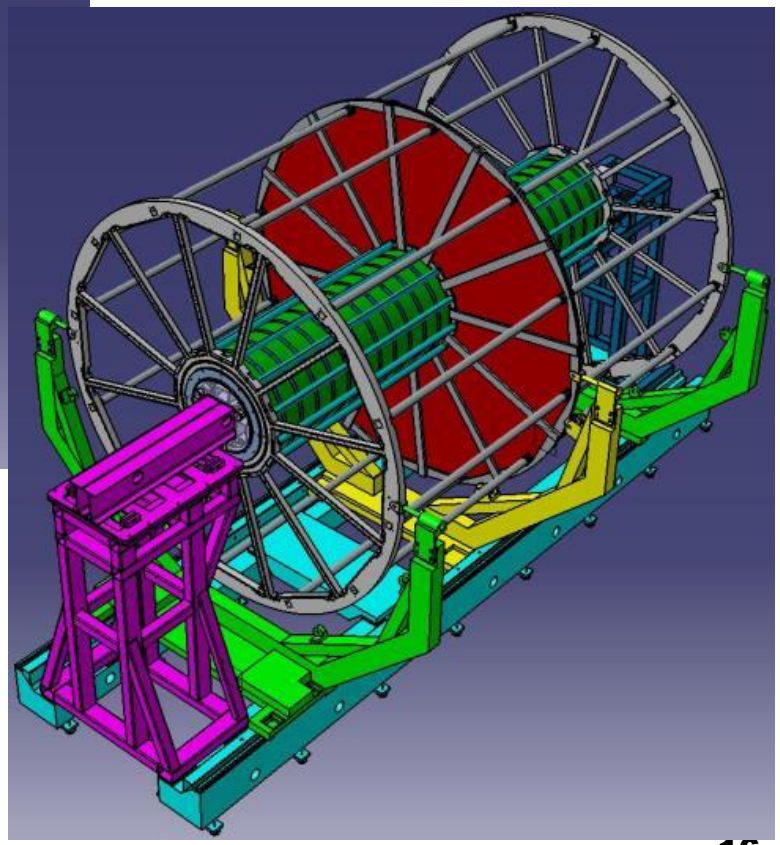
PROGRESSTECH-DUBNA: Tool design for TPC assembly



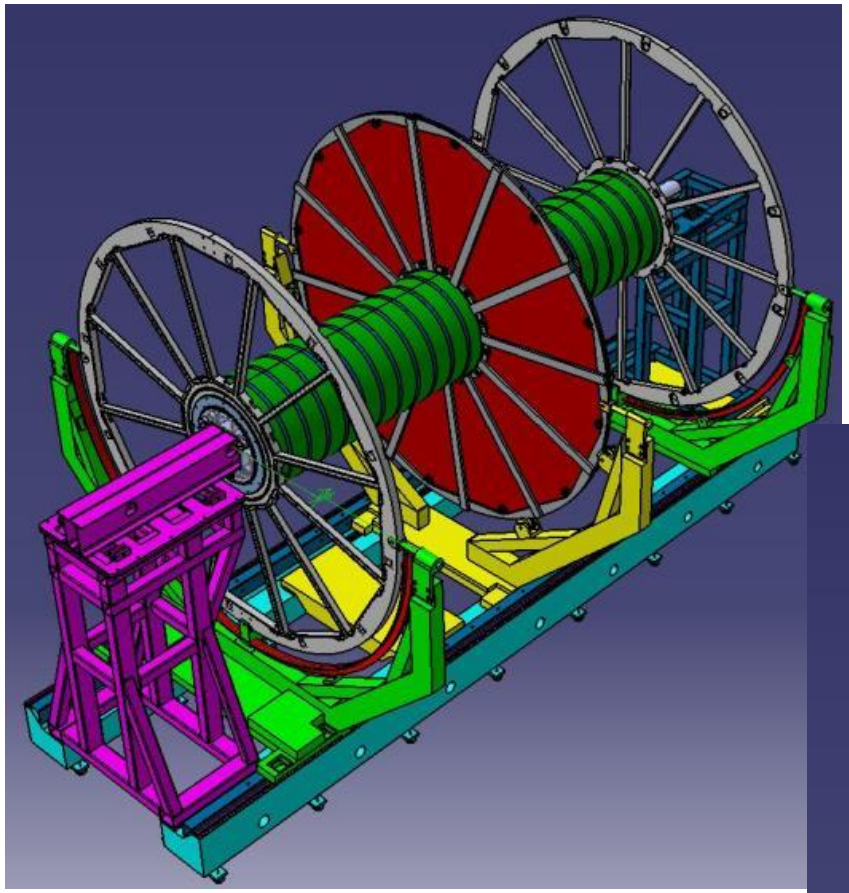


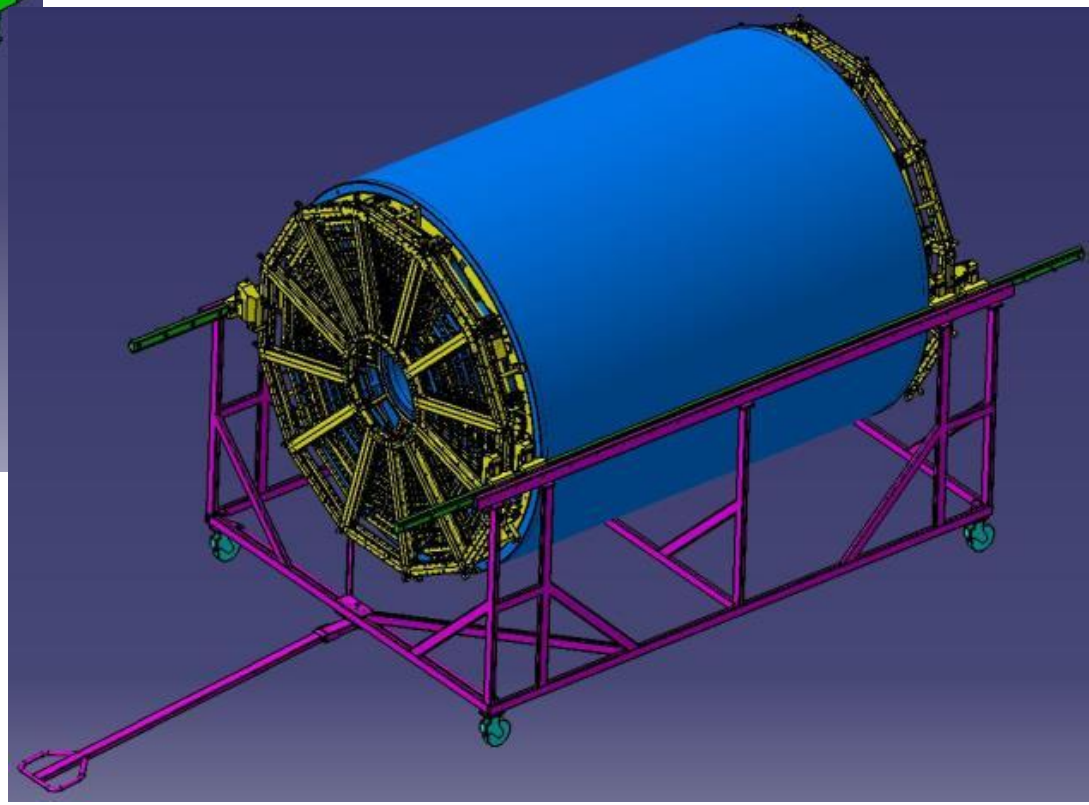
PROGRESSTECH-DUBNA: Tool design for TPC assembly



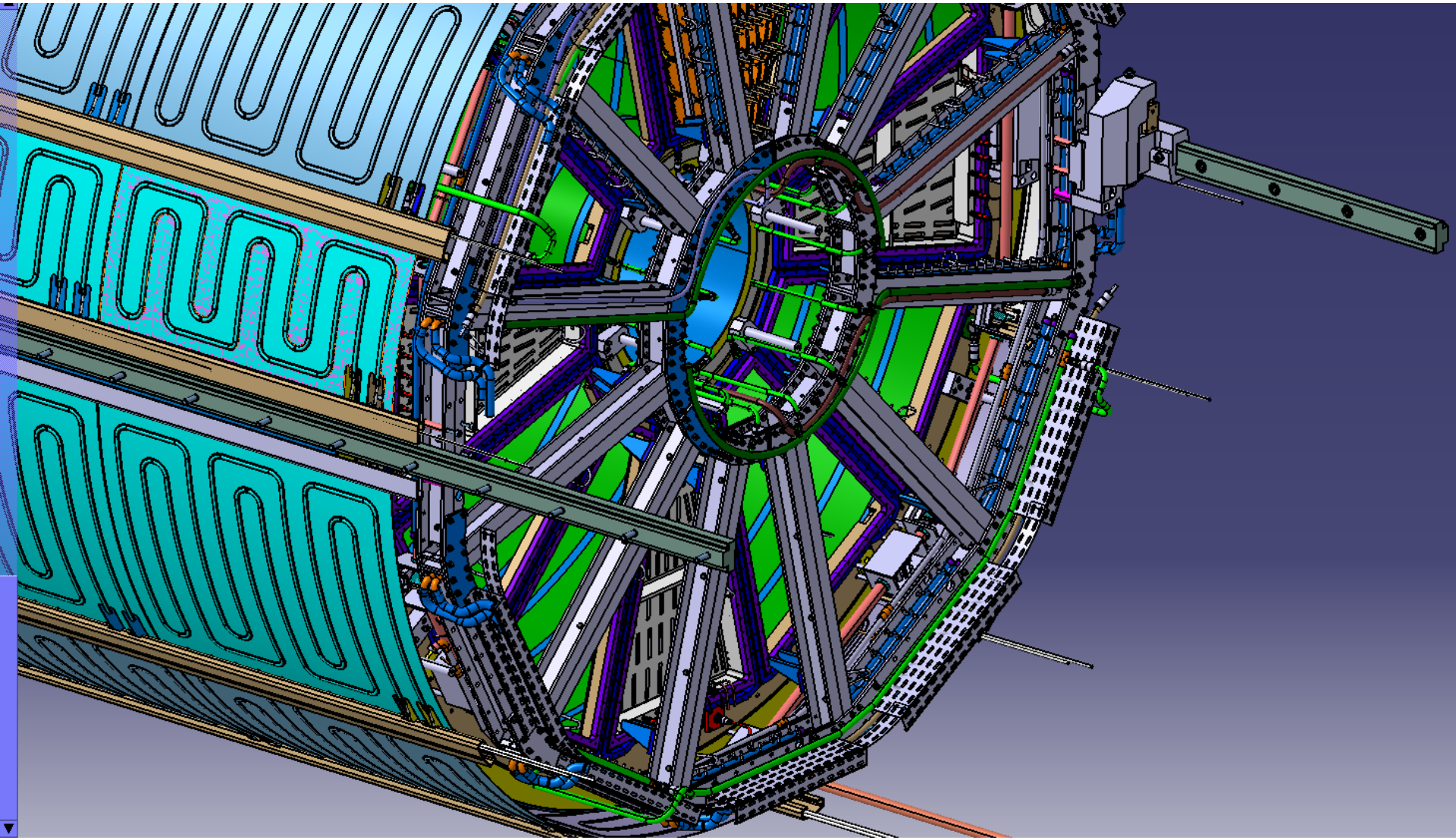


PROGRESSTECH-DUBNA: Tool design for TPC assembly

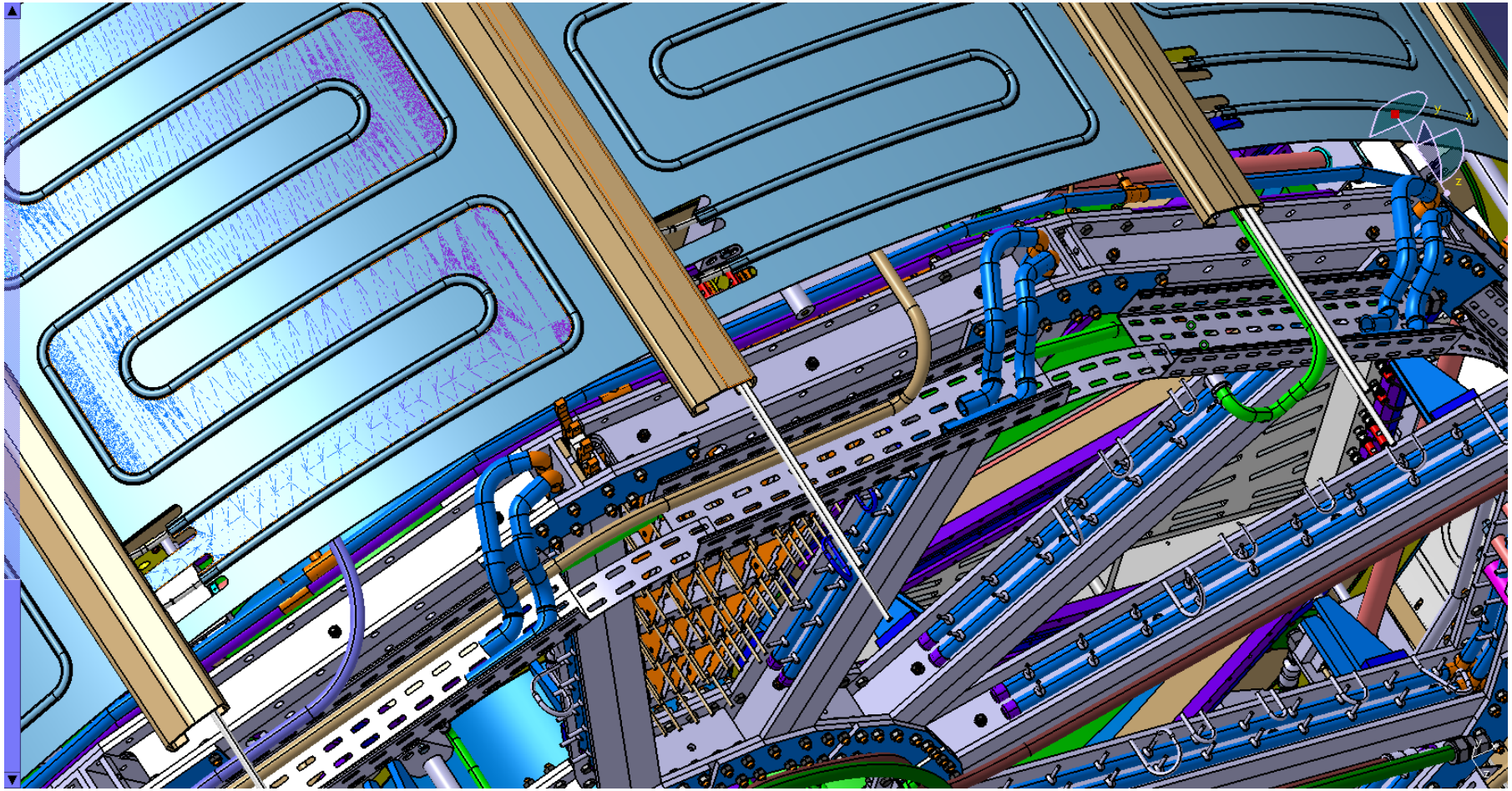




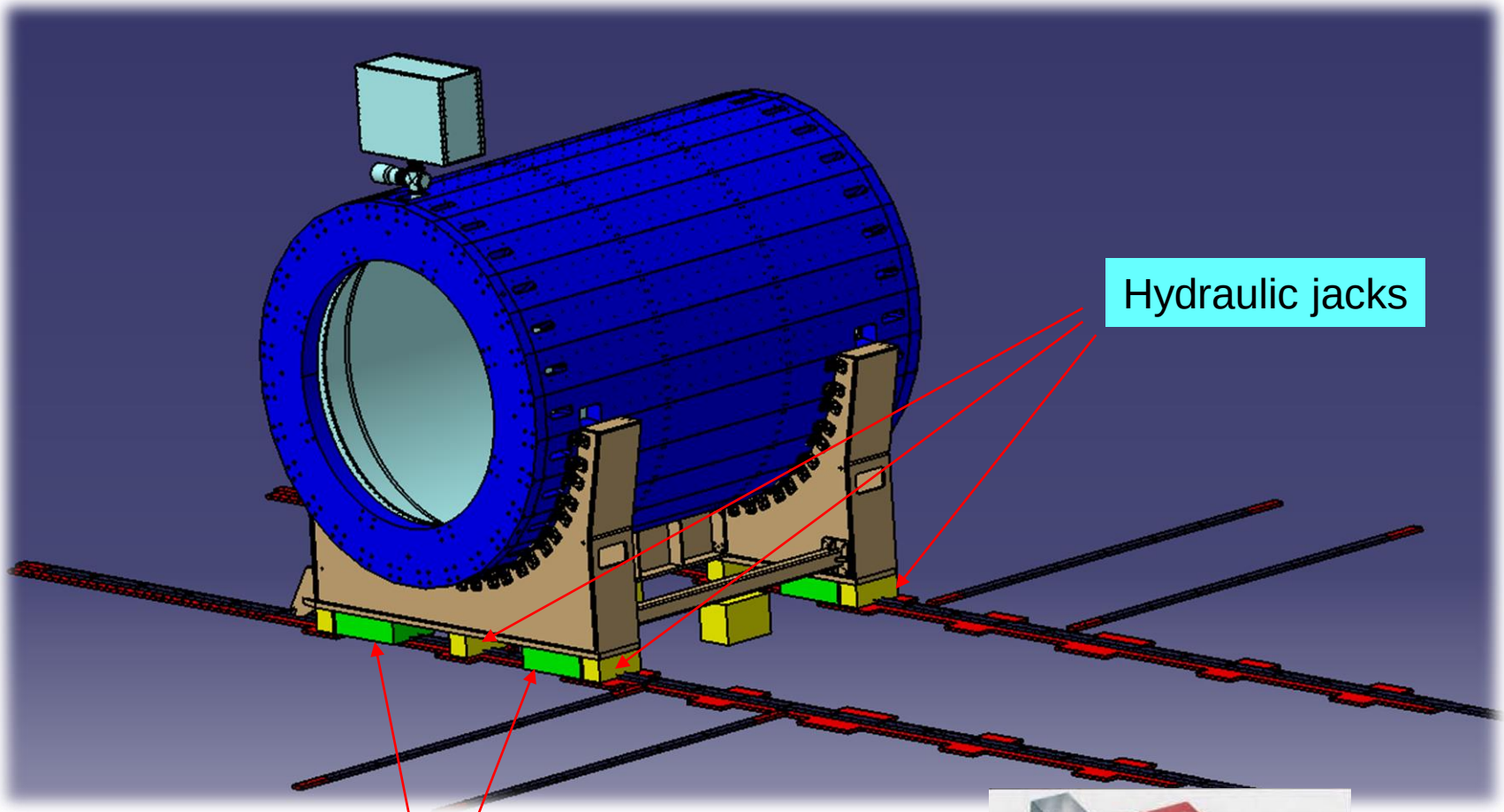
V.Samsonov: TPC services



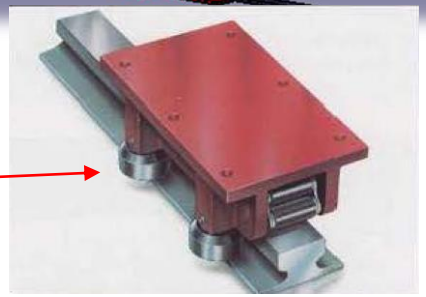
V.Samsonov: TPC services



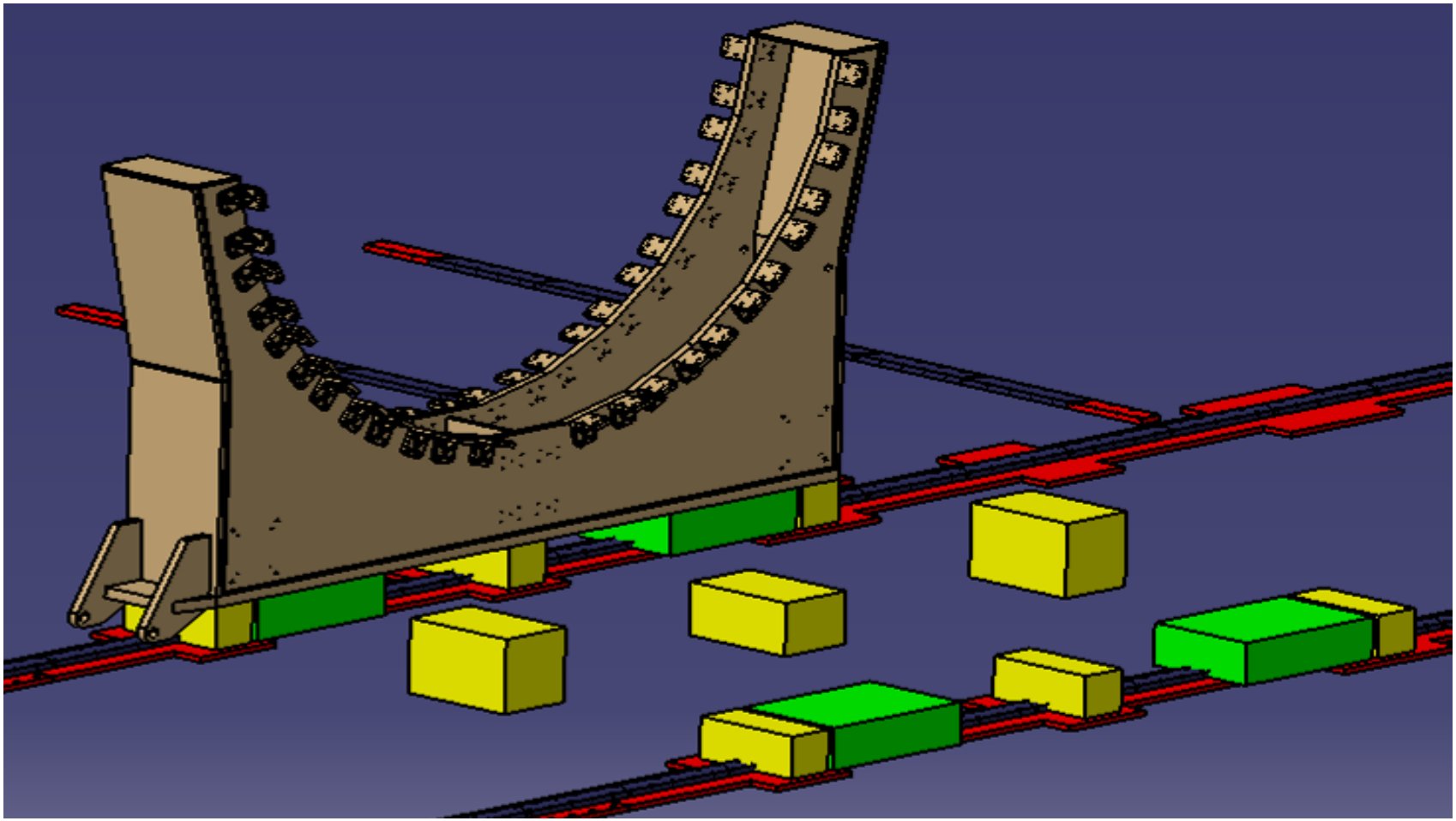
MPD Yoke assembly, final view



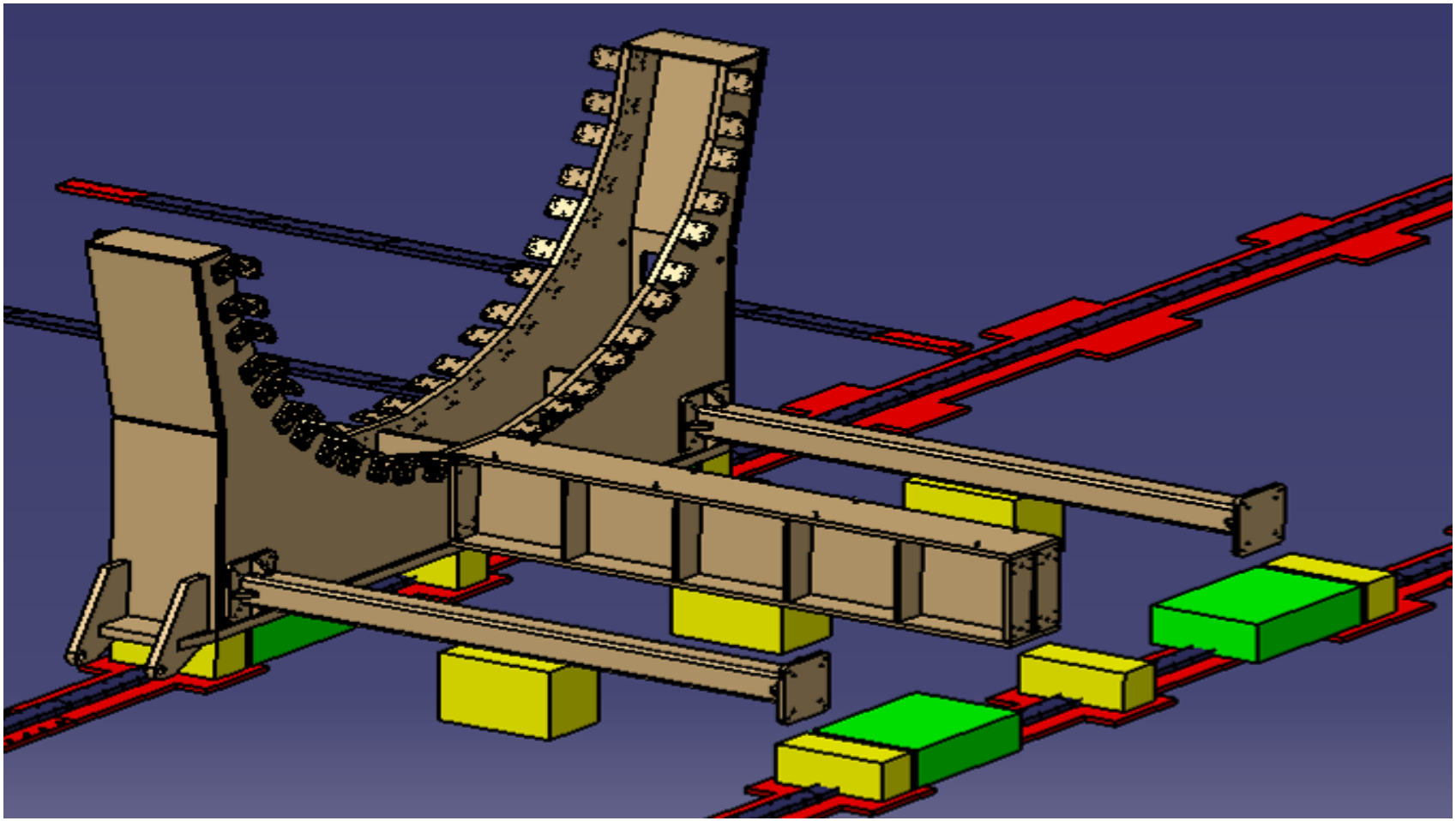
500 t capacity Roller Skate (Boerkey)



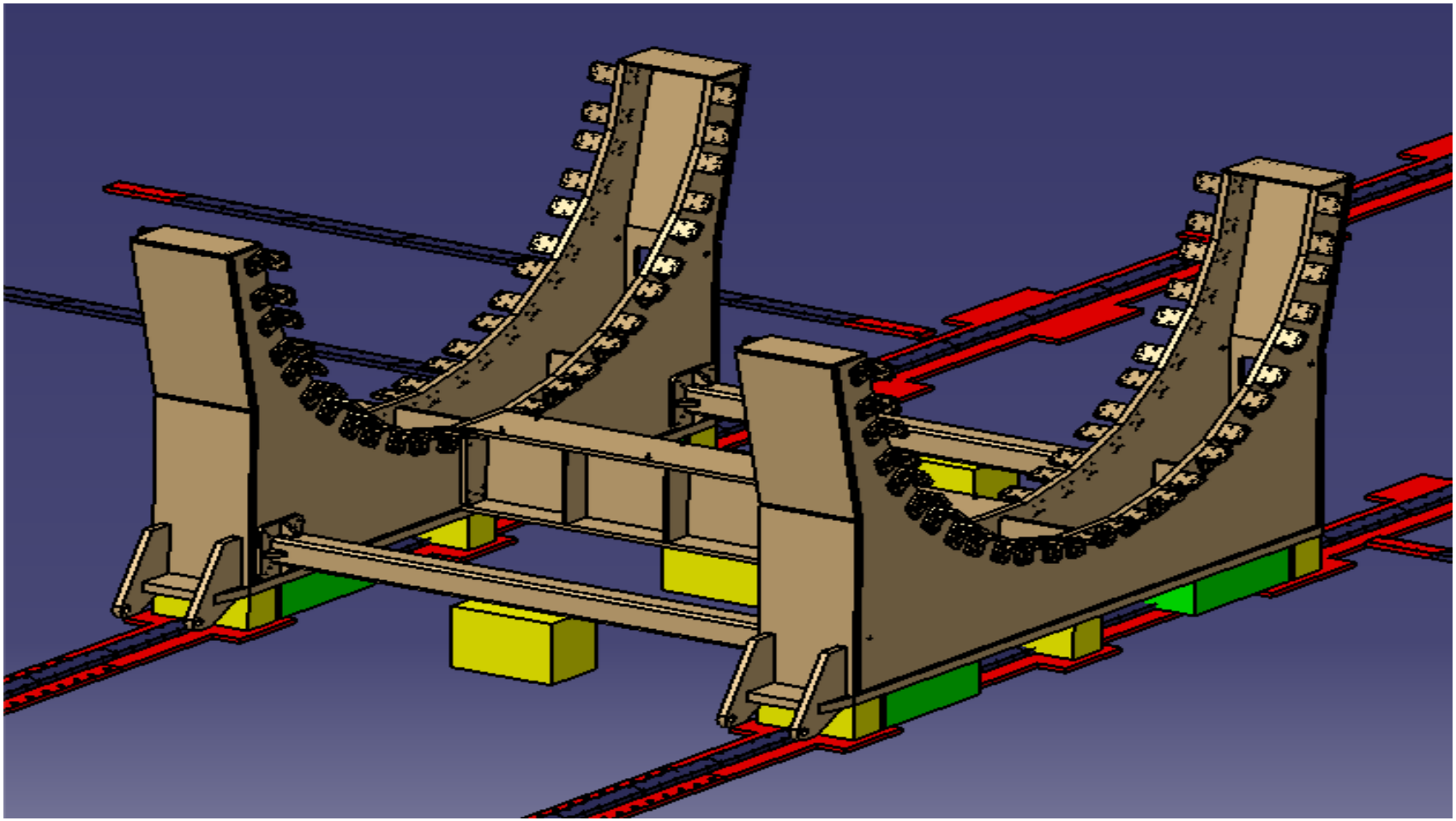
MPD Yoke assembly, step 1



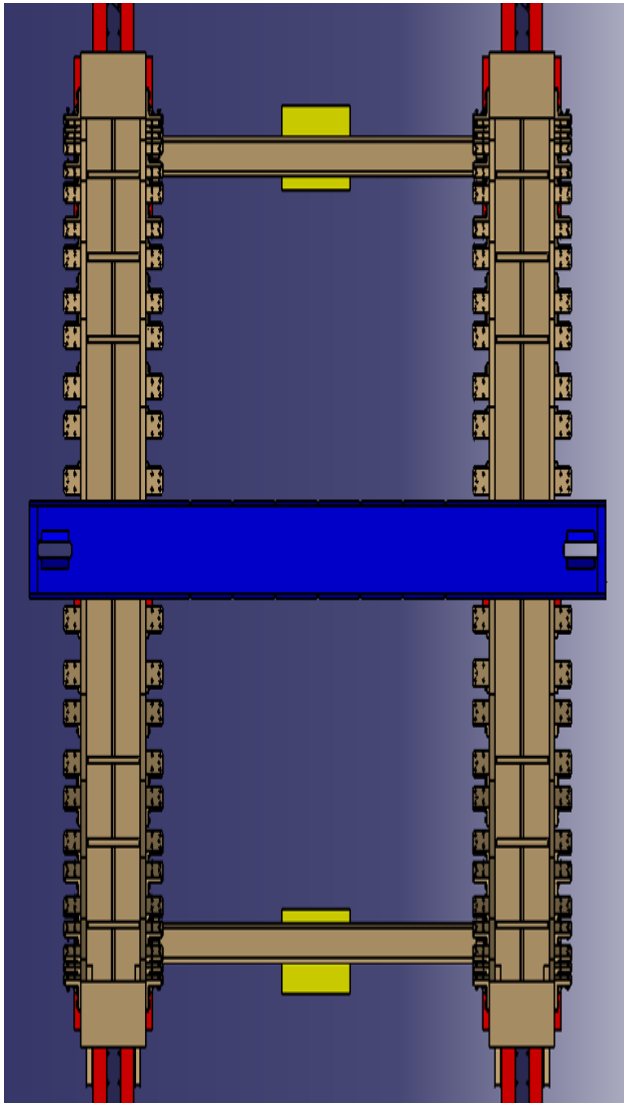
MPD Yoke assembly, step 2

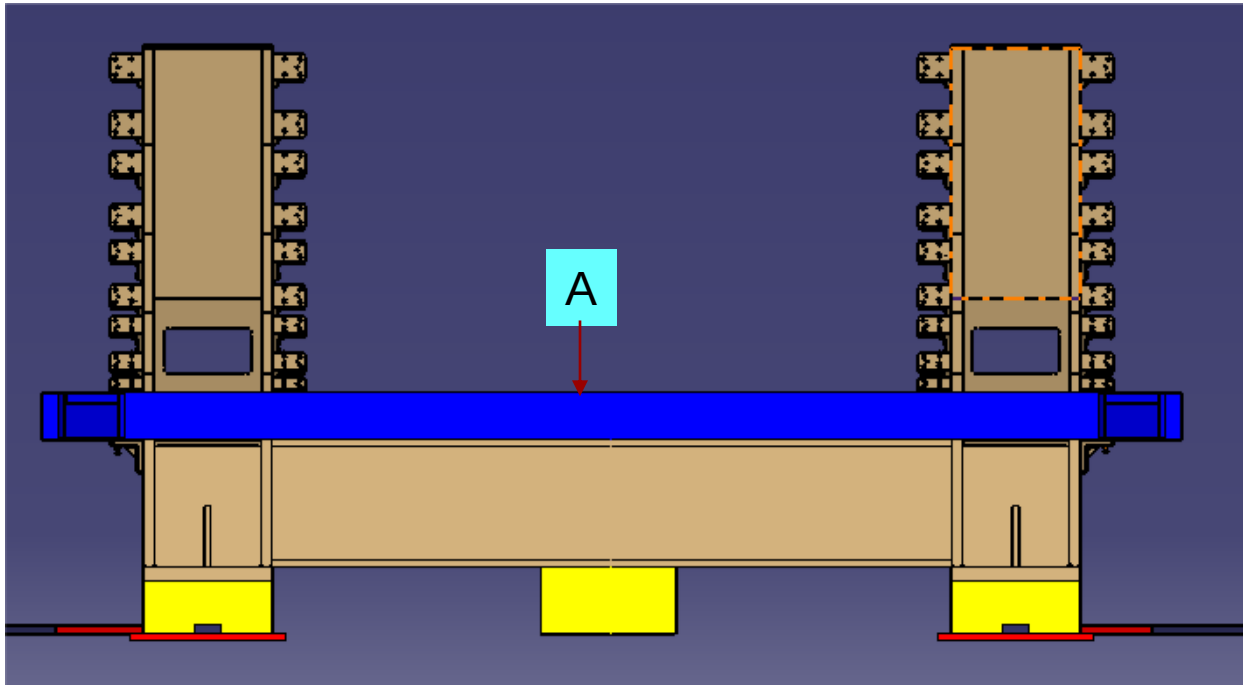


MPD Yoke assembly, step 3

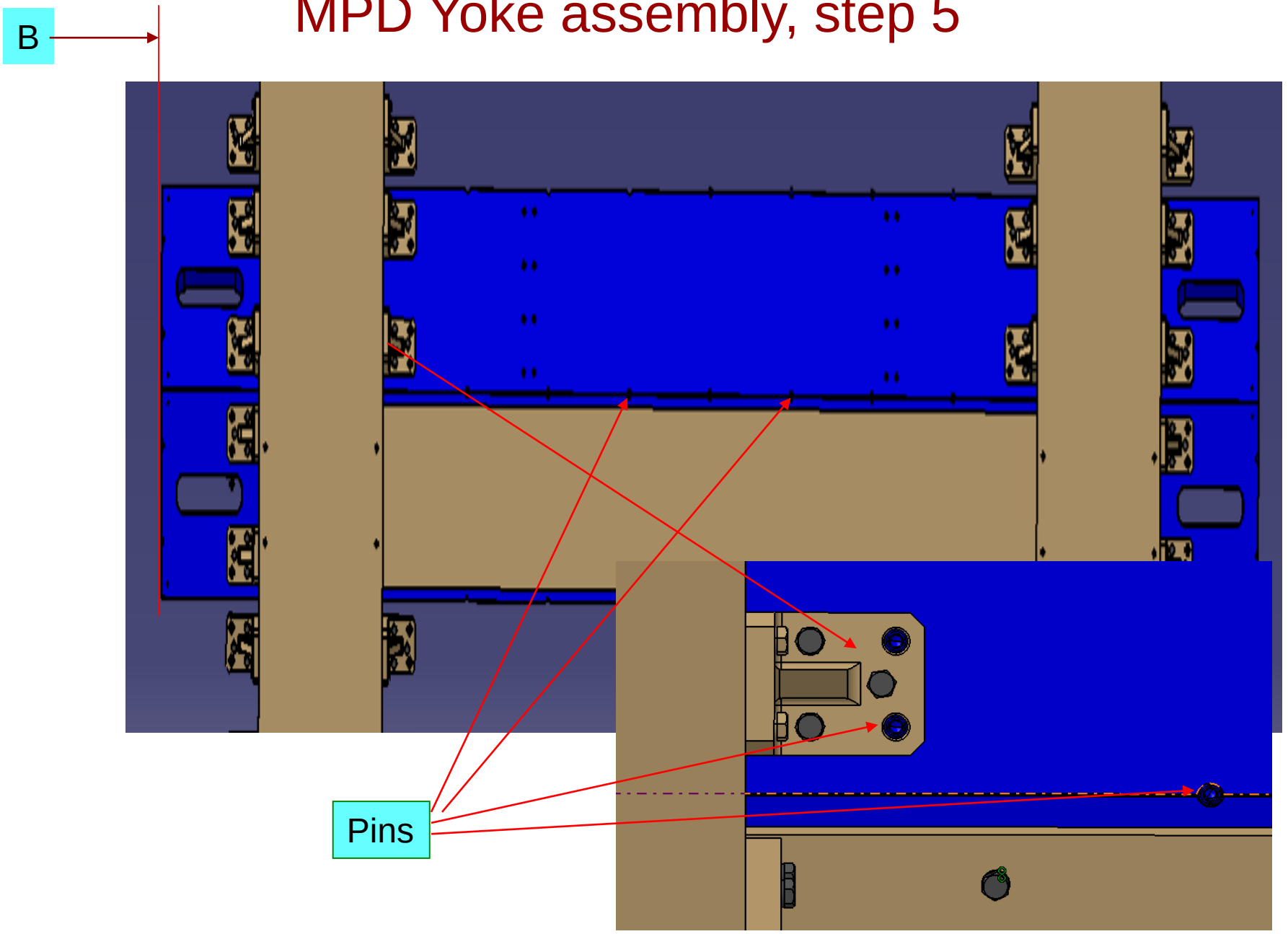


MPD Yoke assembly, step 4

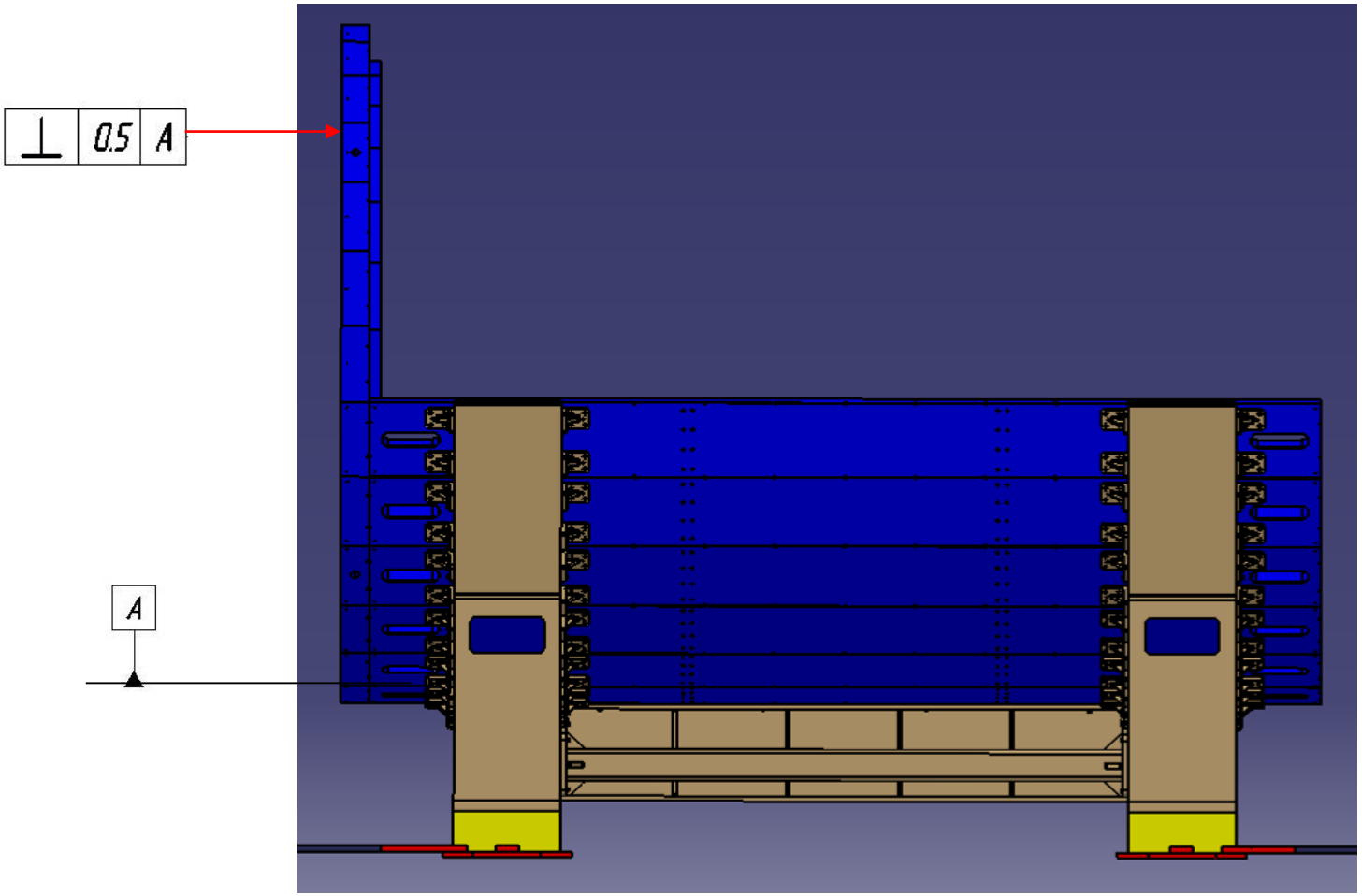




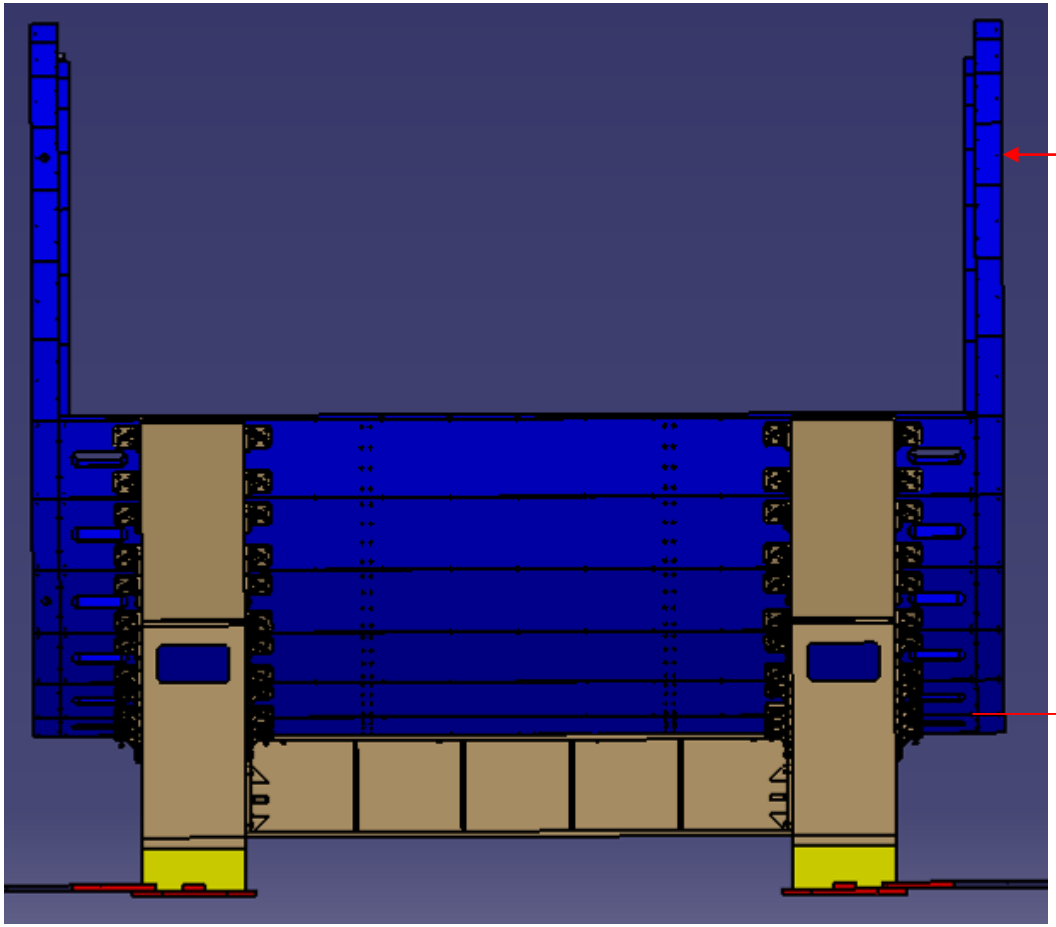
MPD Yoke assembly, step 5

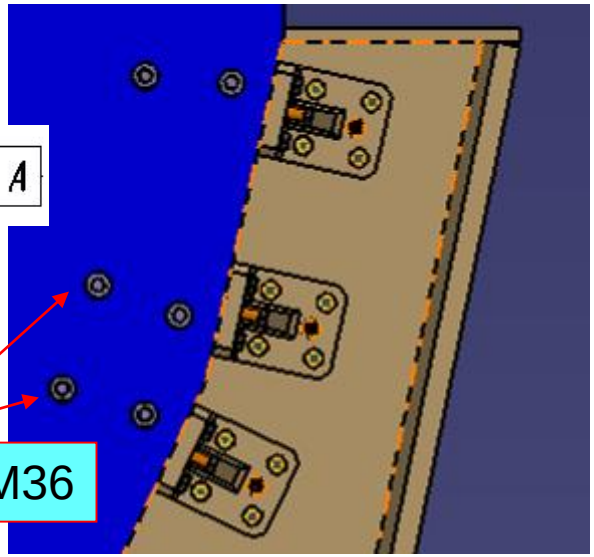


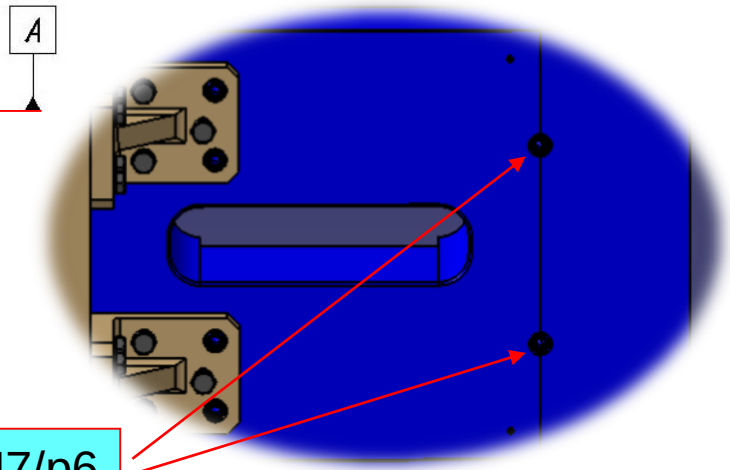
MPD Yoke assembly, step 6



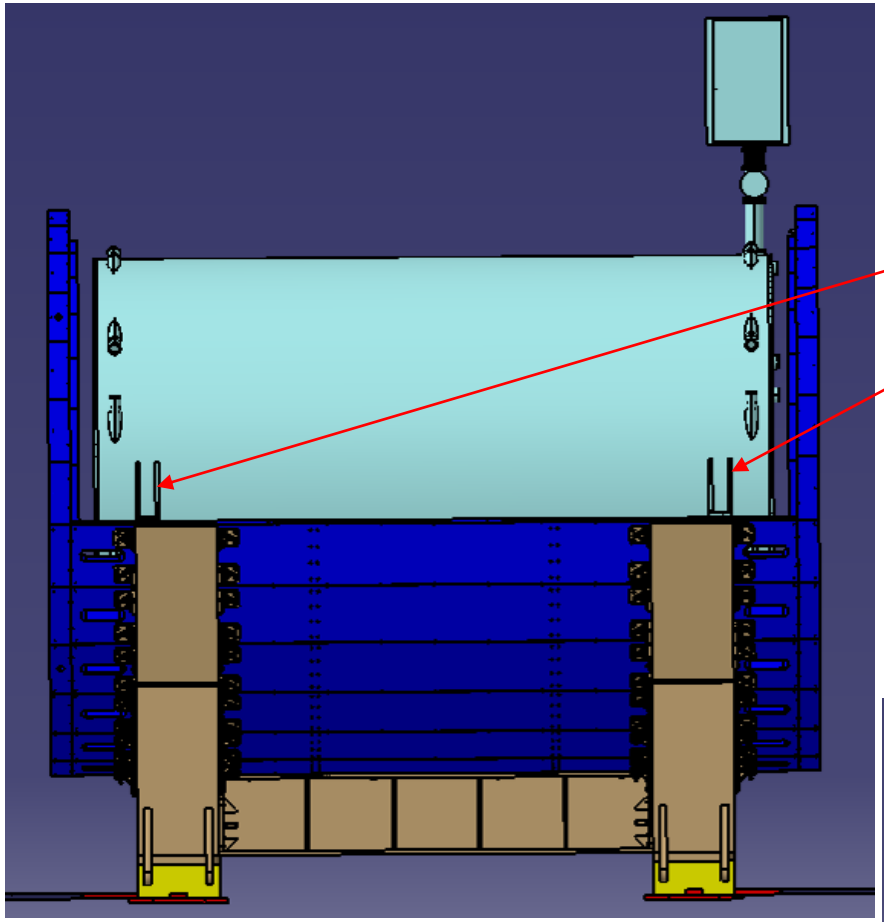
MPD Yoke assembly, step 7

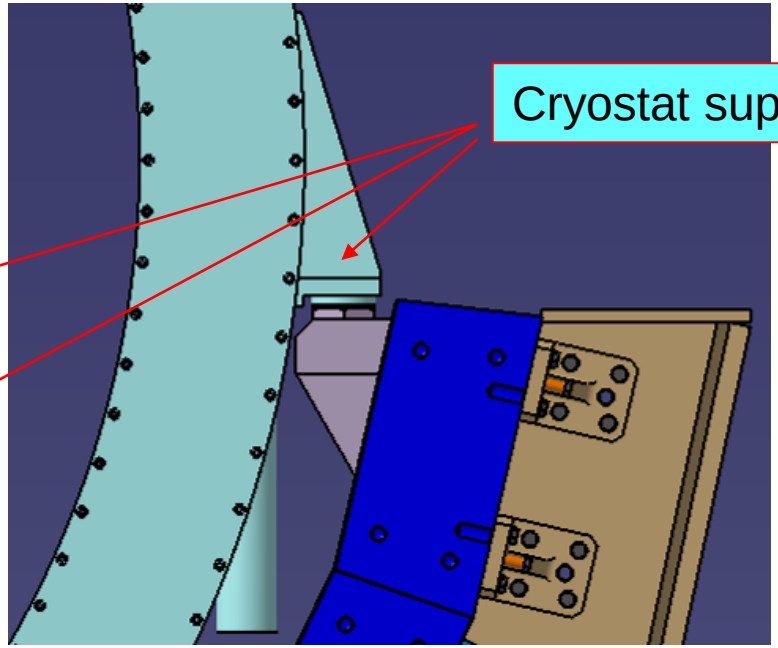


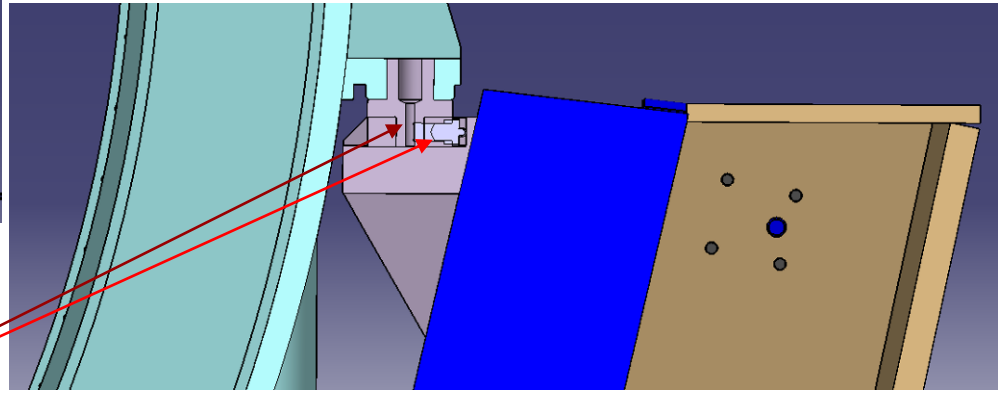




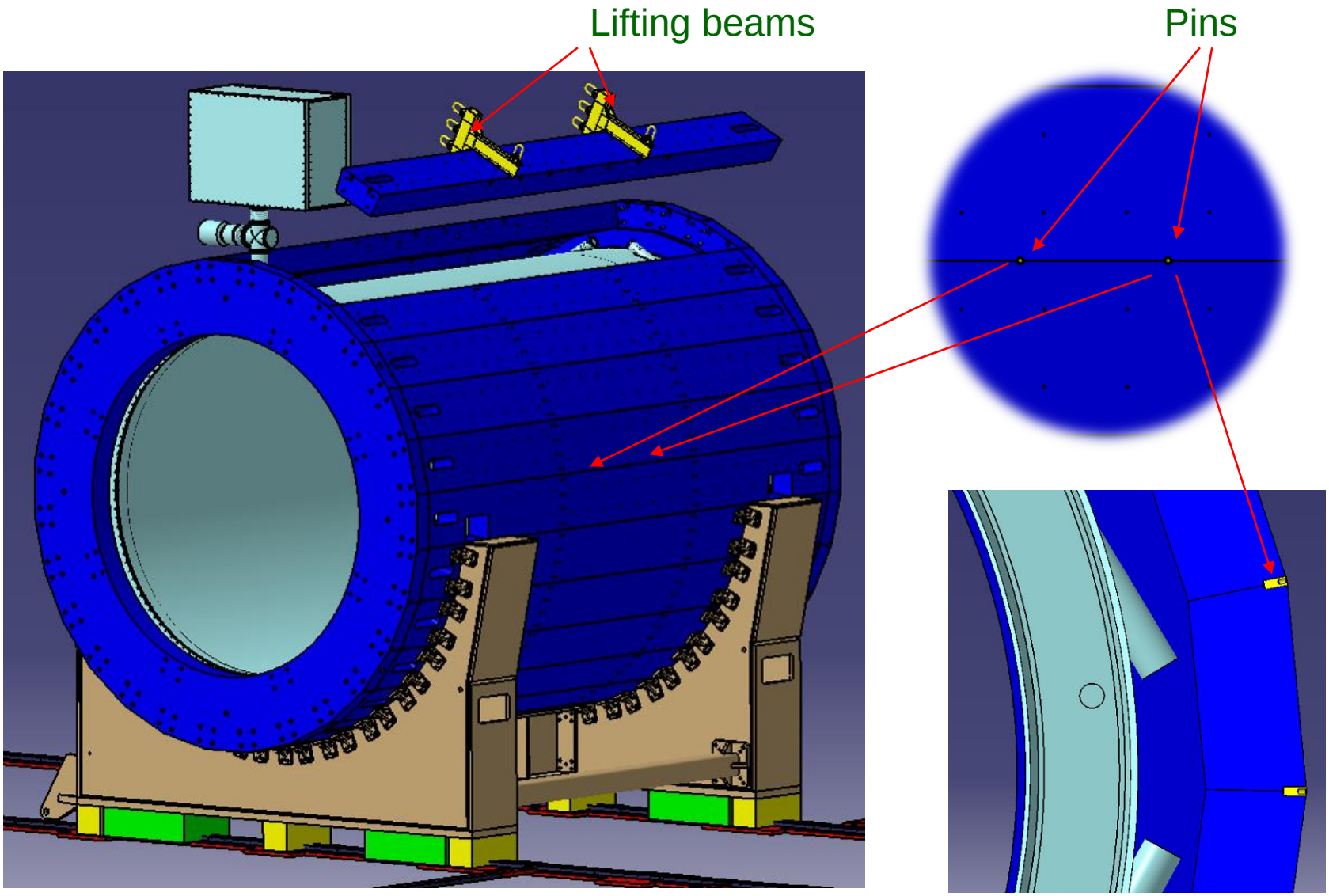
MPD Yoke assembly, step 8



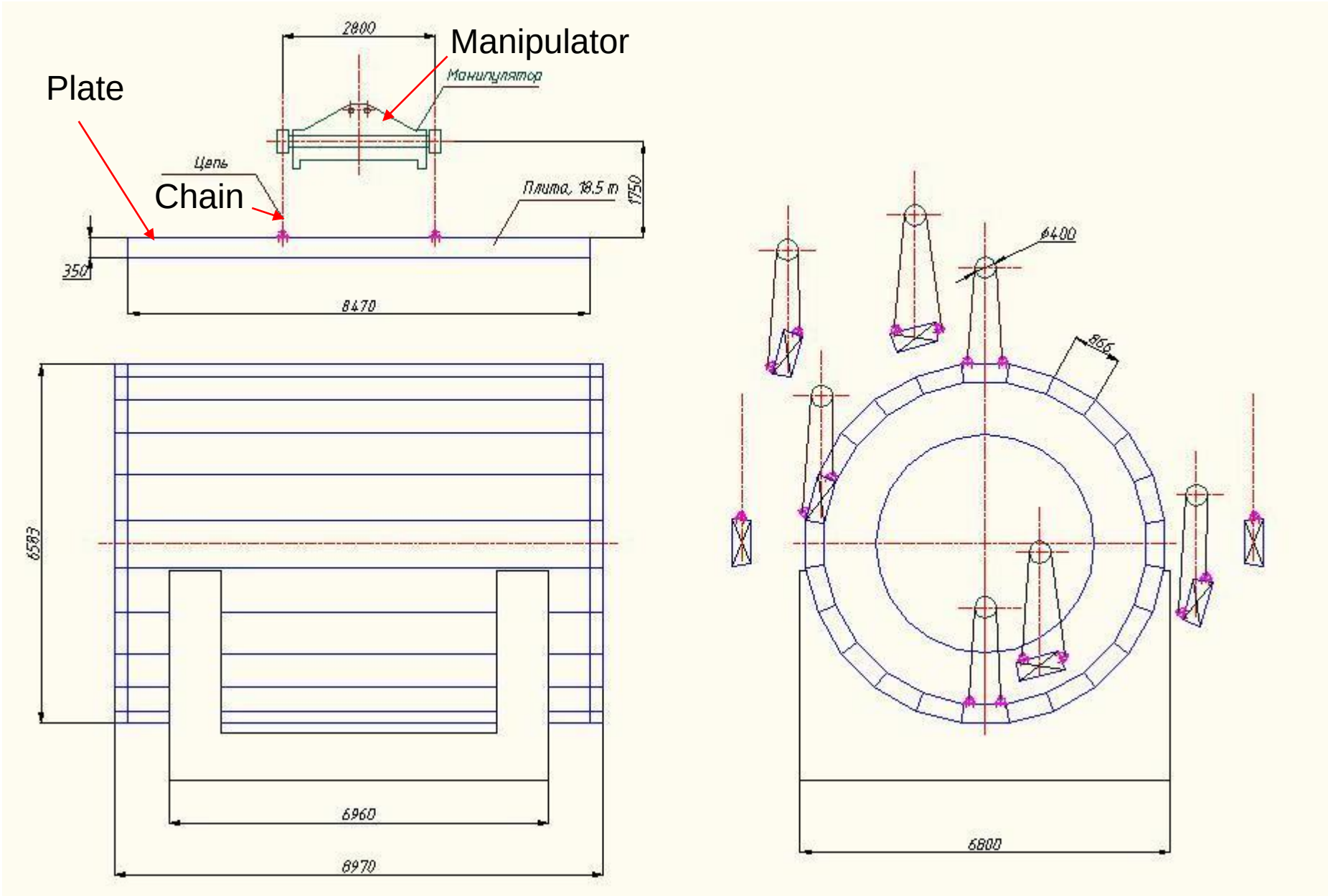




MPD Yoke assembly, step 9

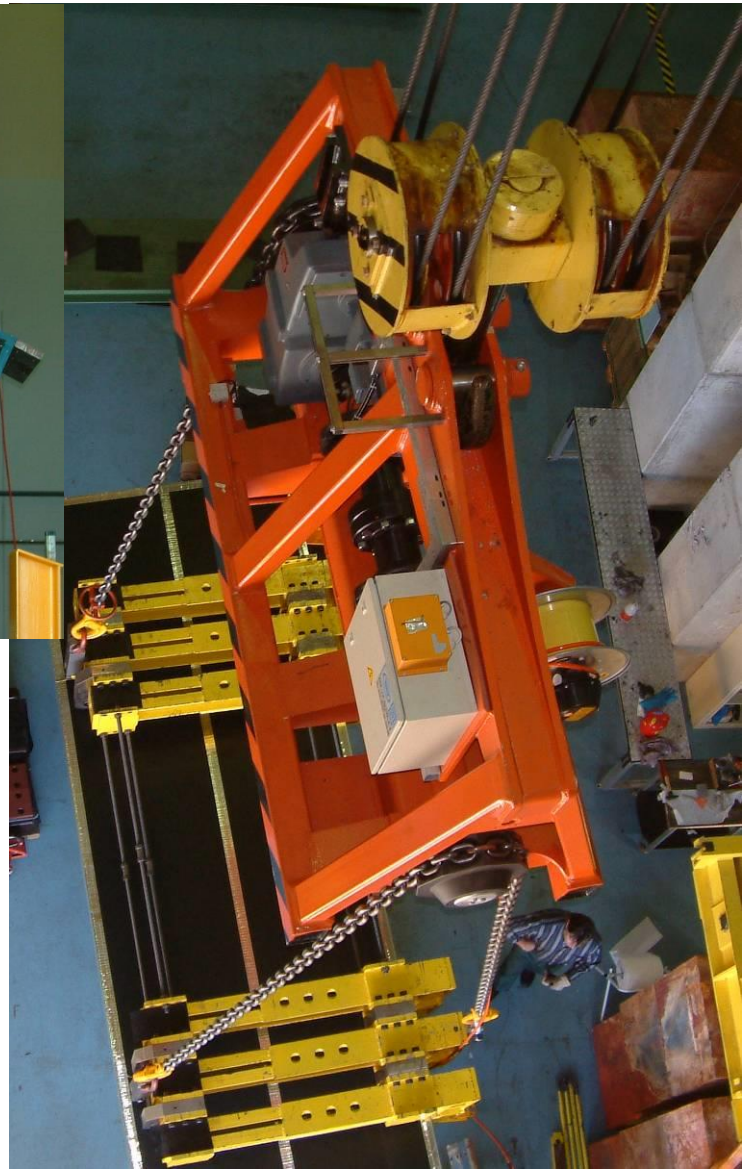


Driving use manipulator to build MPD



VBLHEP Bldng 205; July 05, 2013

Made in 2002 in Slovakia contracted with JINR - ZTS (Dubnica nad Vahom) for the project ATLAS (CERN).
It was used at CERN from October 2002 to May 2006
(before the end of the installation modules tile calorimeter is in the underground hall).
It is at JINR at that moment.

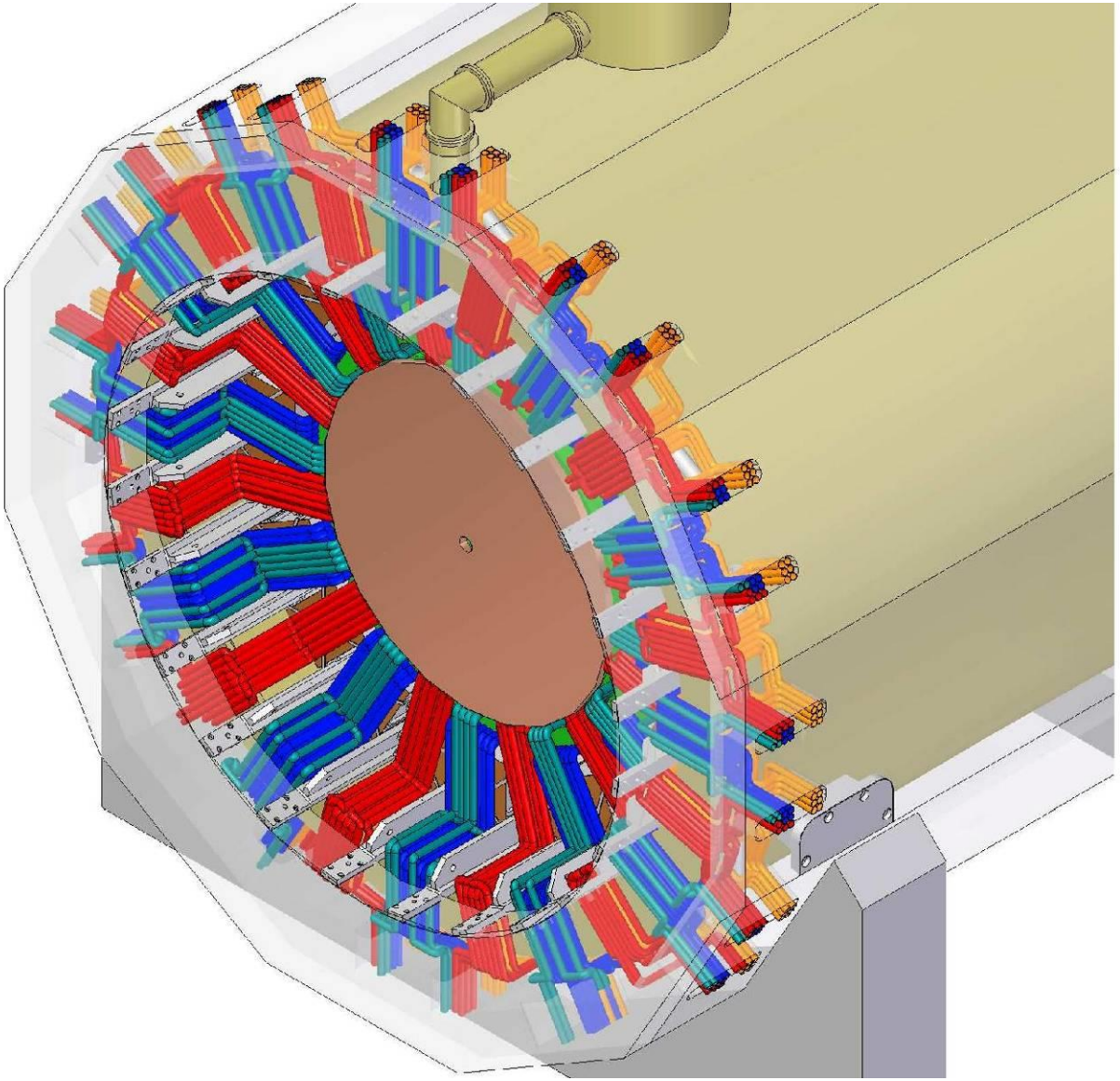


Examples of Manipulator using

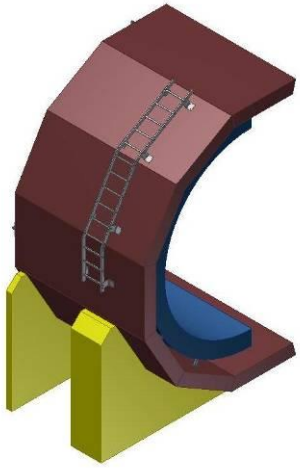
MPD Yoke assembly: plan for 2018 step 10

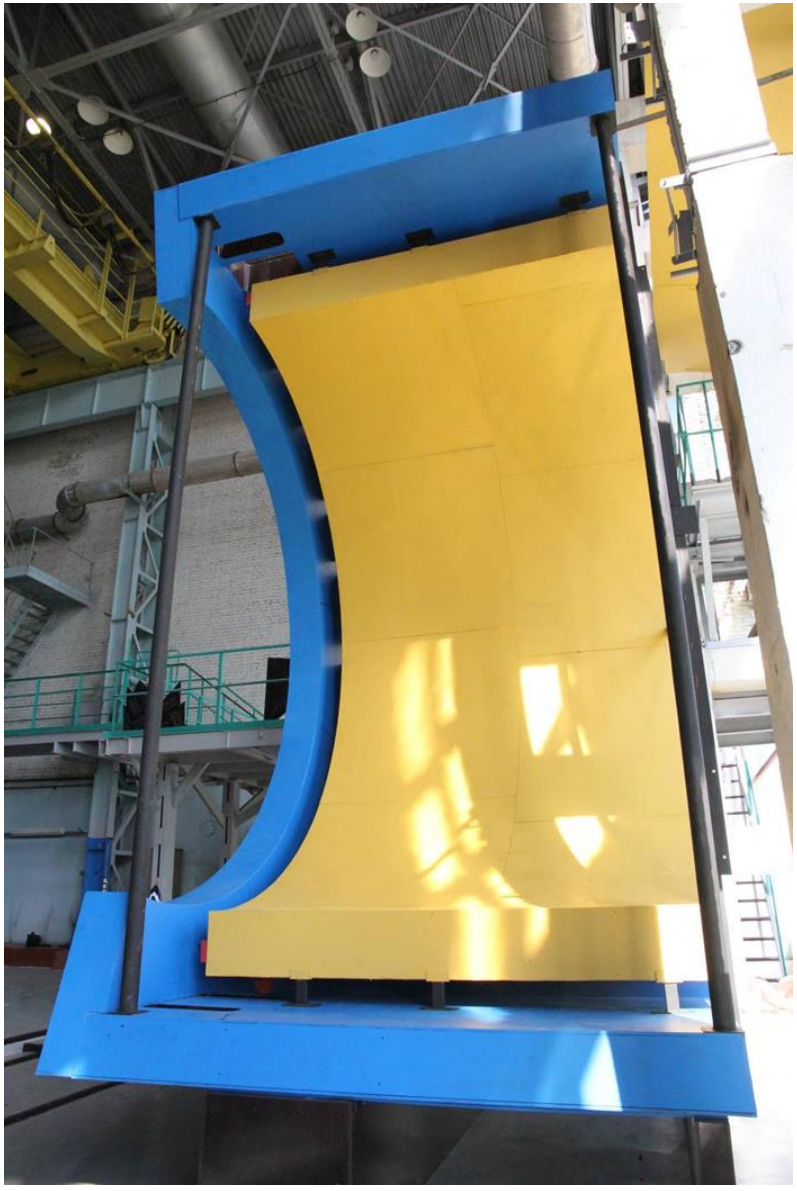
MPD Yoke assembly: plan for 2018 step 10 (final)

Important step: Cables lay out

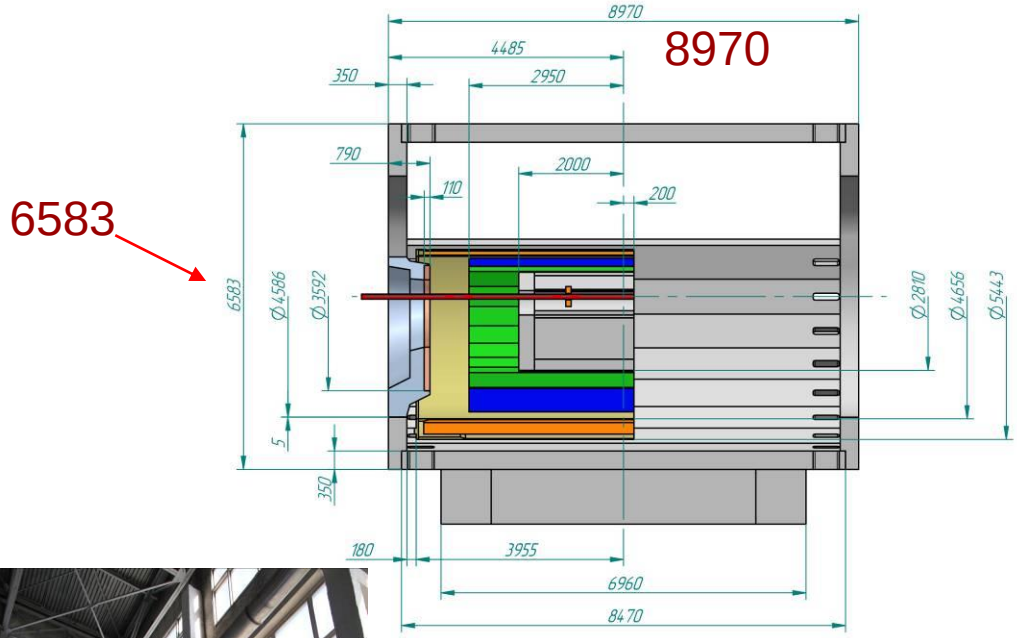


Mock-up MPD (1:1) – version 2012





Full size MPD Mock-up proposal (G.Titova)



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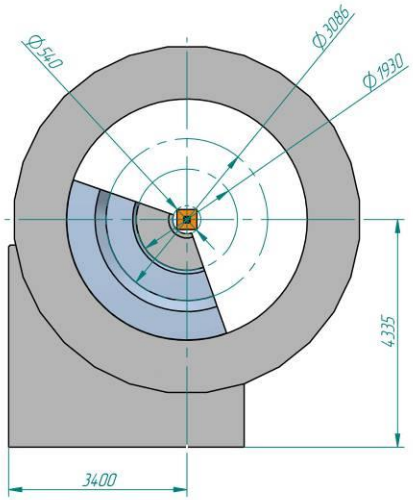
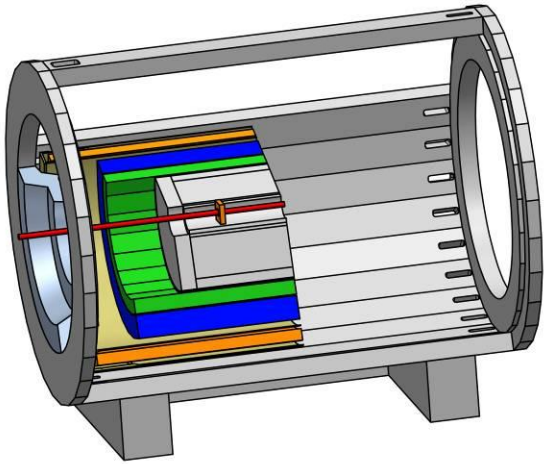
6583



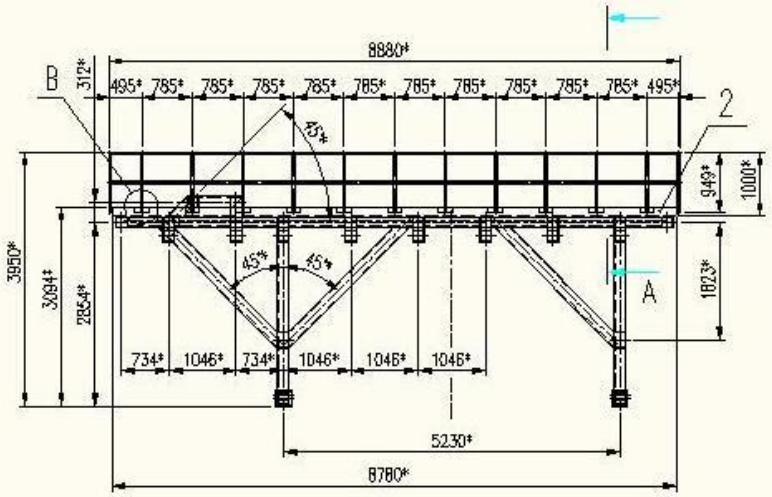
5544

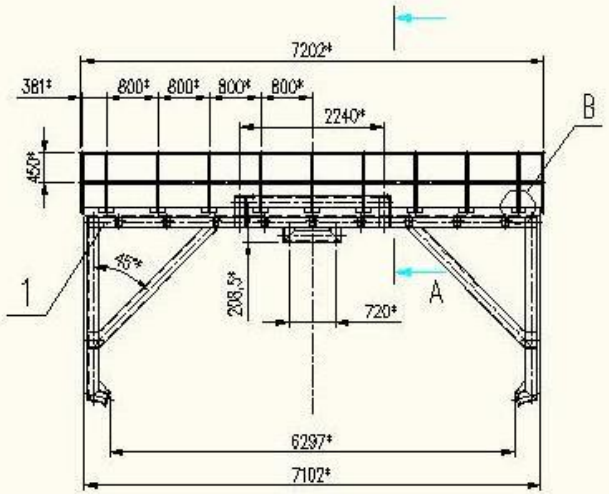
2012

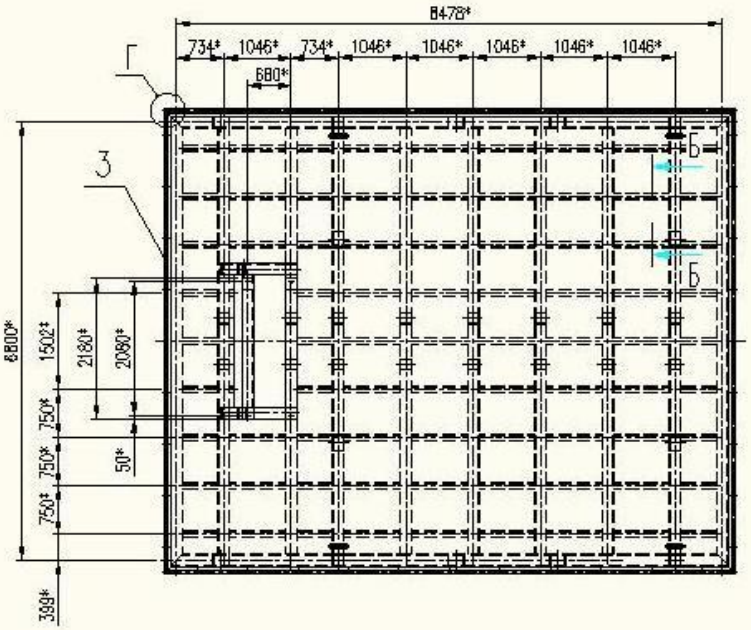
3000

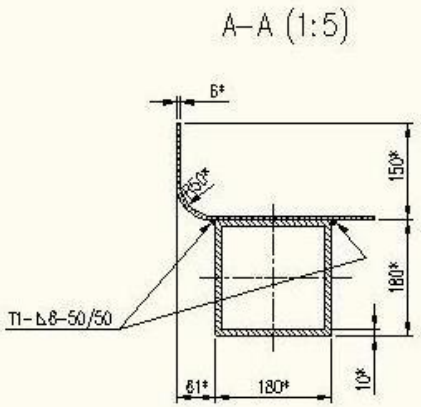


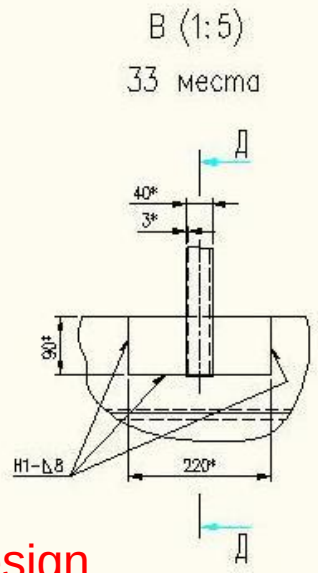
Assembly and installation of the upper platform





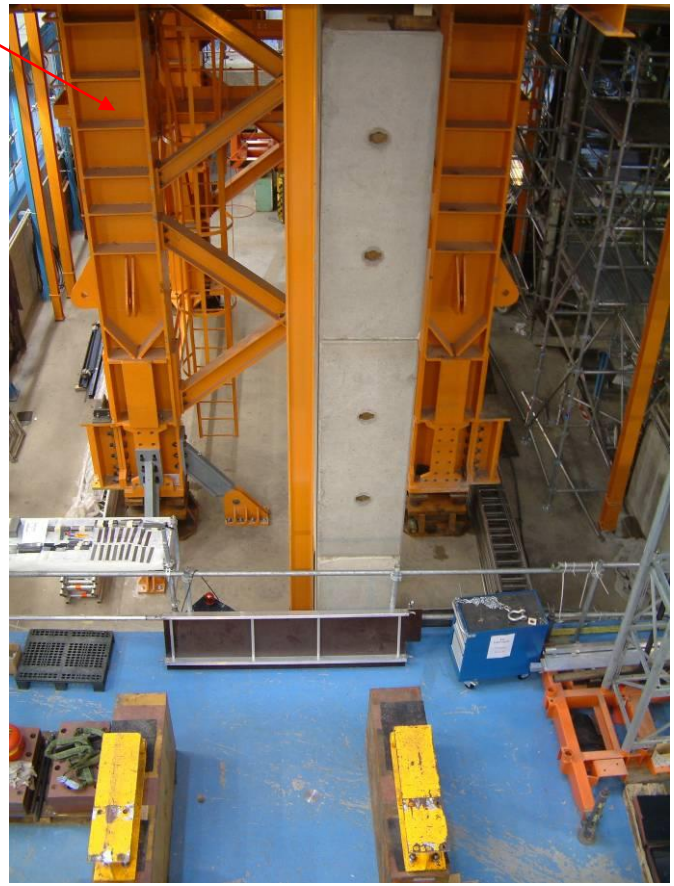






It is an assumed modular design using bolting (Polish engineers?)

CERN, LHC, ATLAS: **Krakow Frame (2 ps): 15 m height, 1600 t capacity**

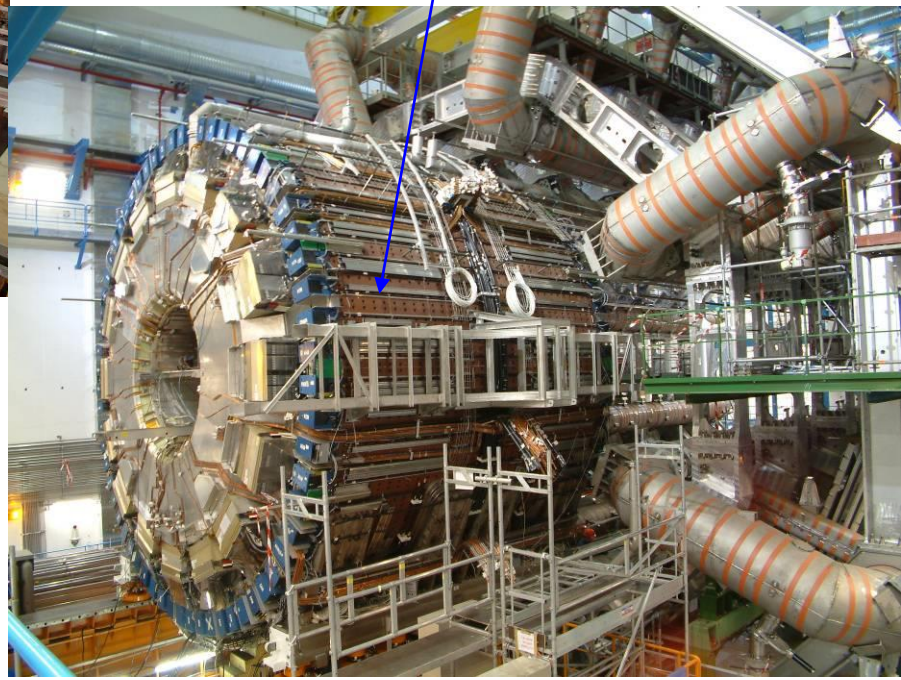


CERN, ALTAS pit

← March 01, 2004

1600 tons

Krakow Frame

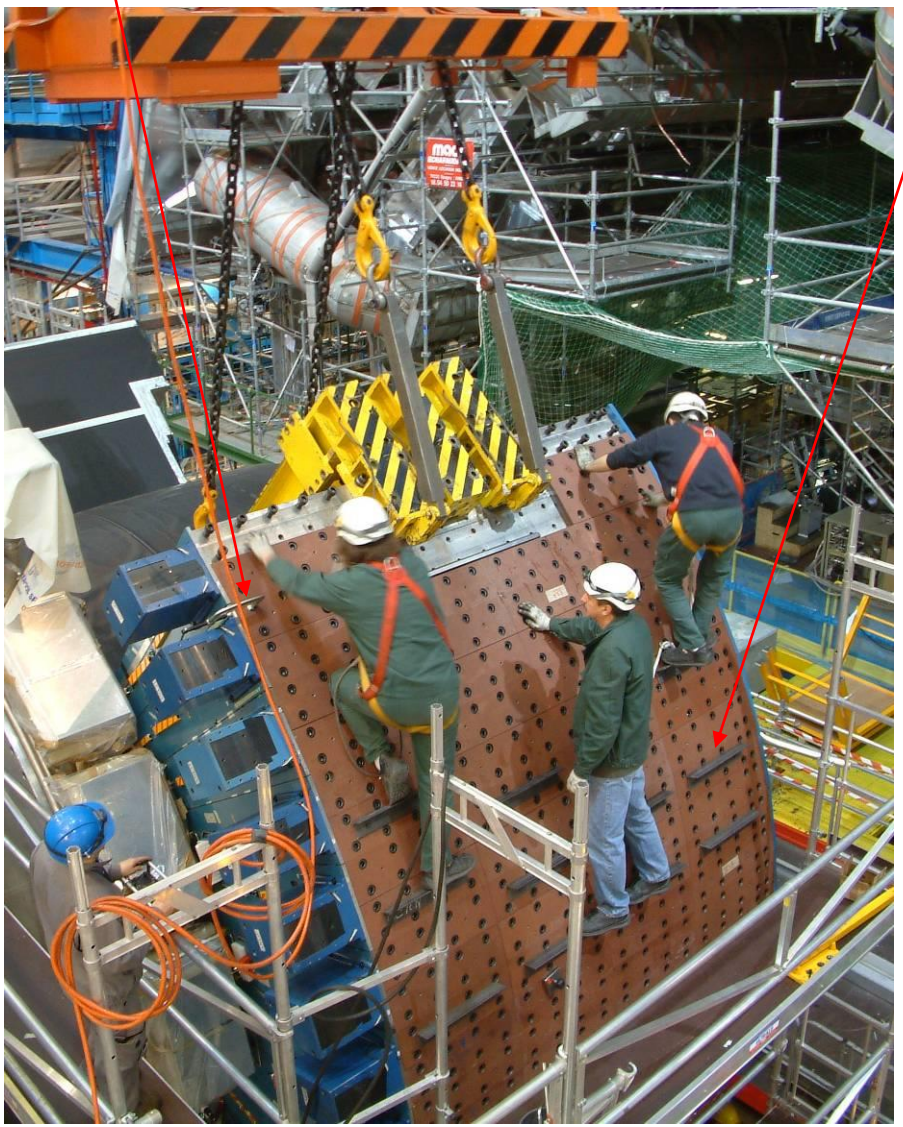


November 04, 2005 →

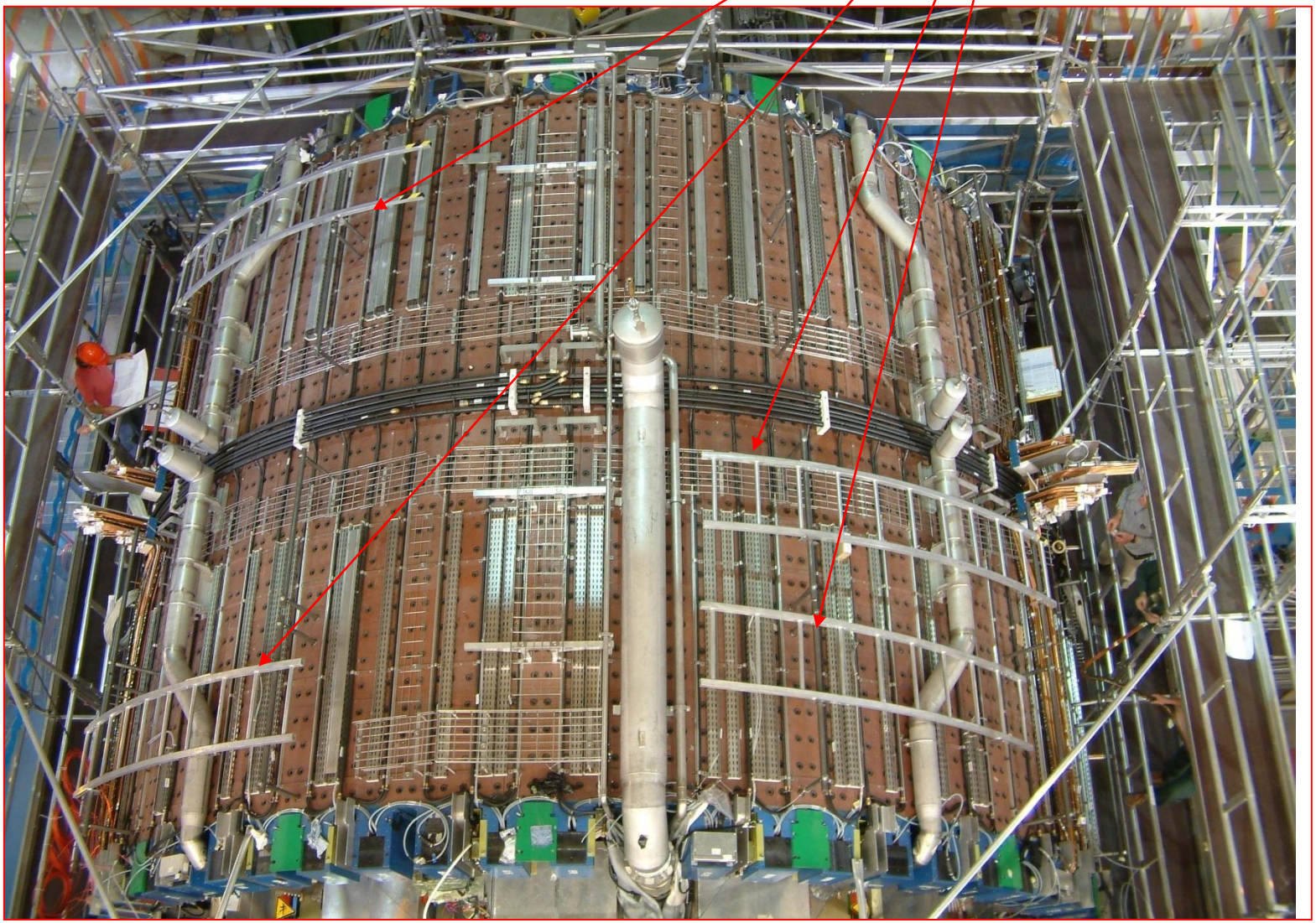
Thanks for your attention

An example of using the supports on inclined surfaces

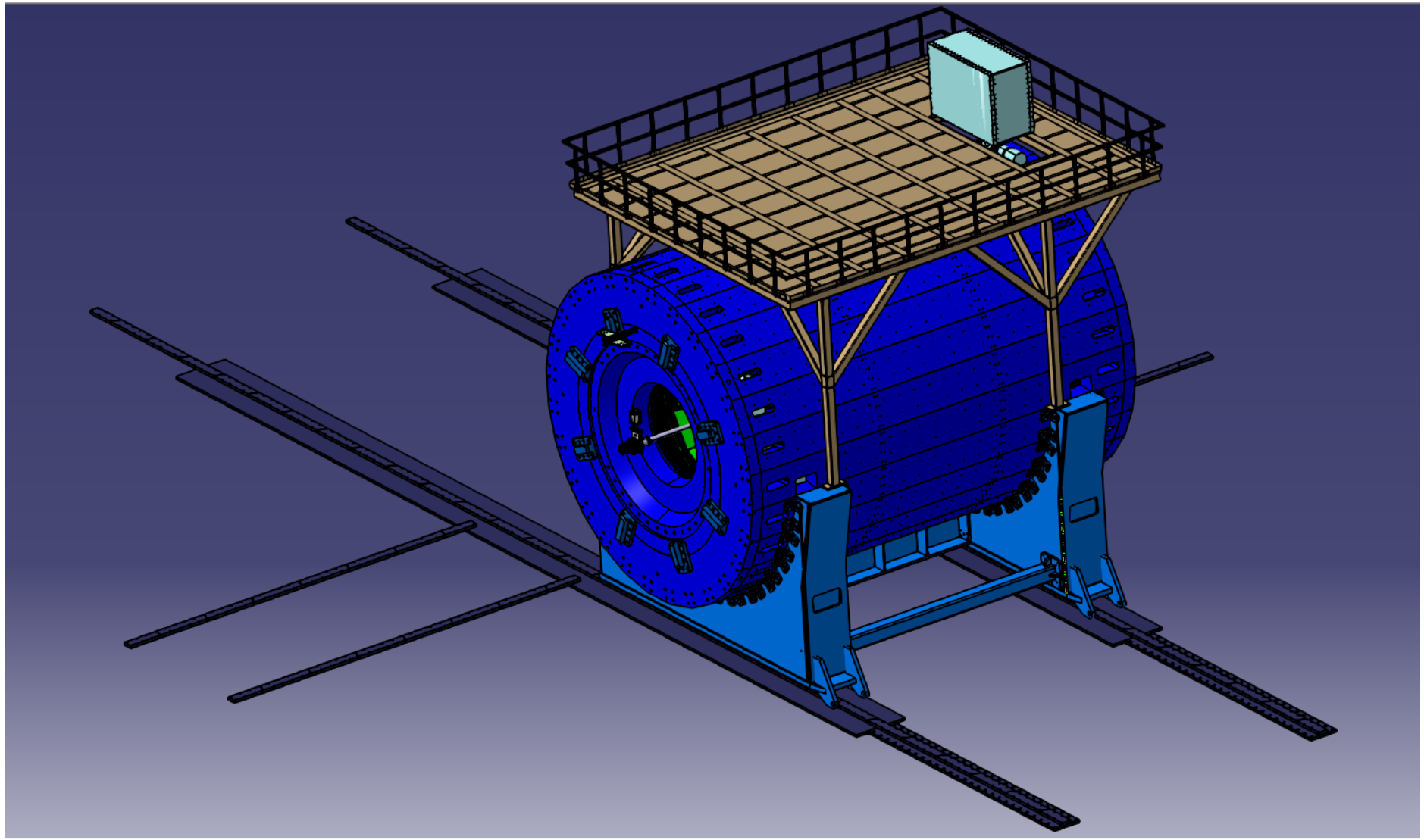
(!)



Example of location technology ladder for installation of cables at the upper and inclined surfaces

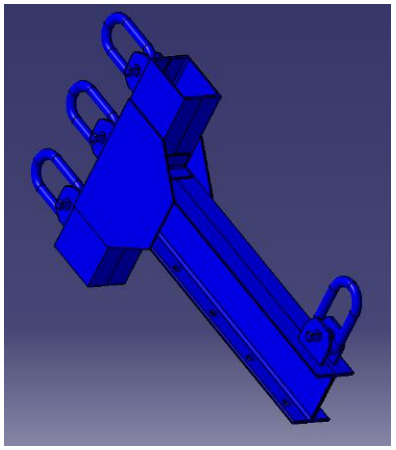


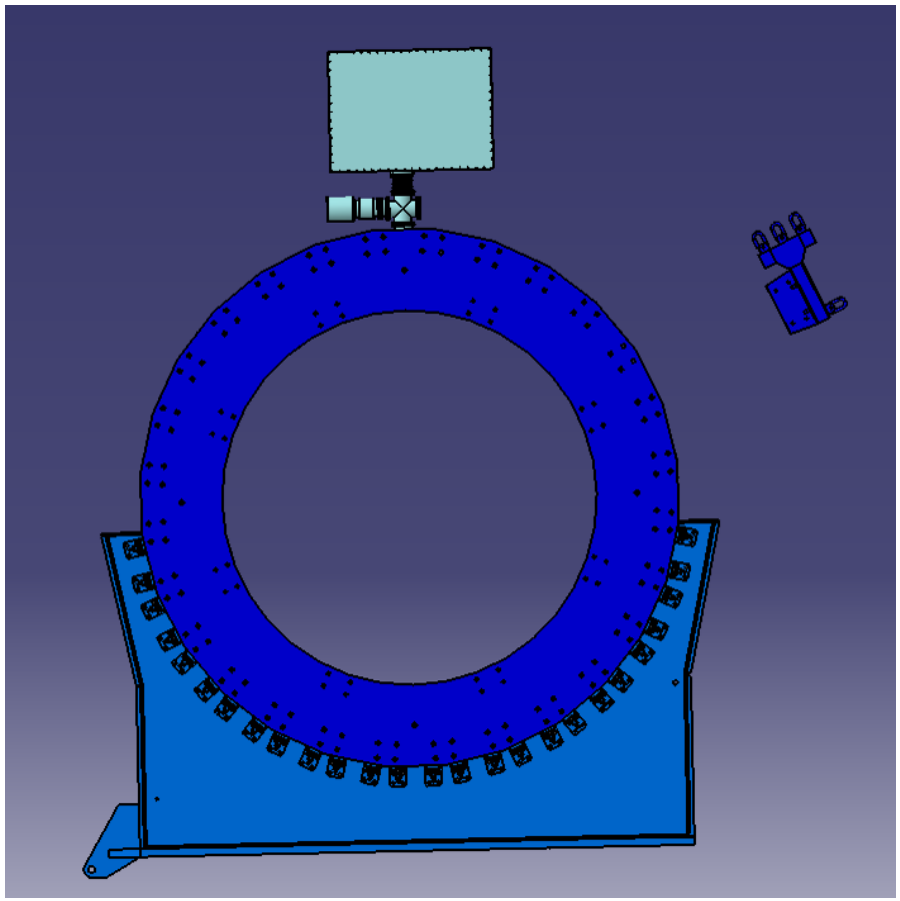
Appendix 2

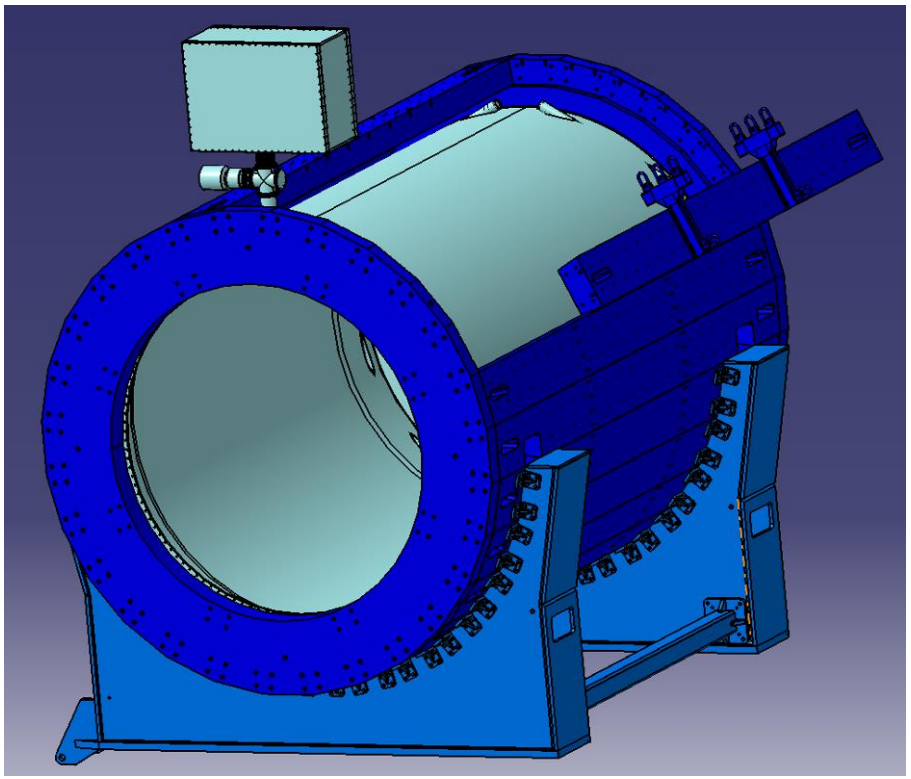


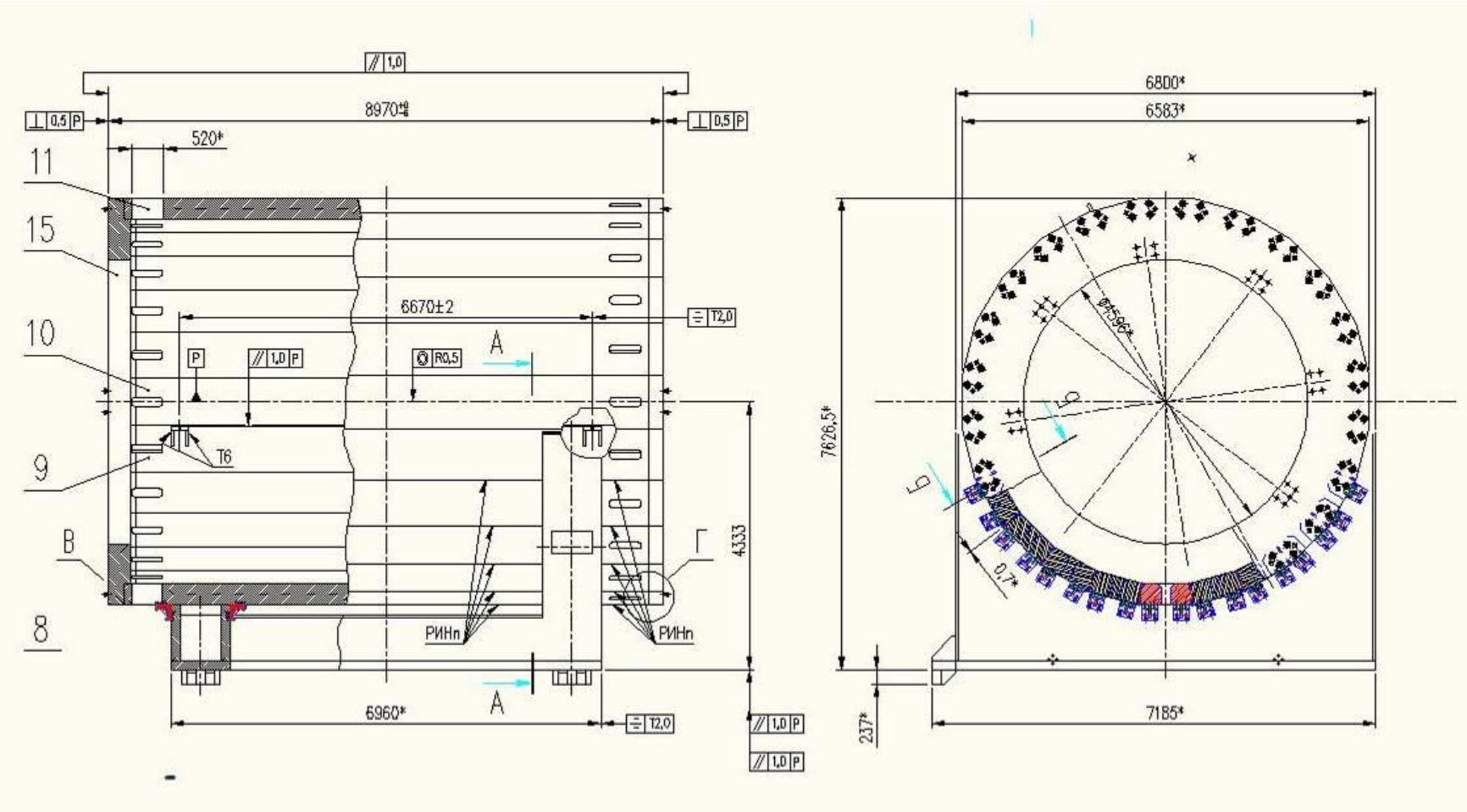
Assembly tool (lifting brackets) – S.Gerasimov

Appendix 2

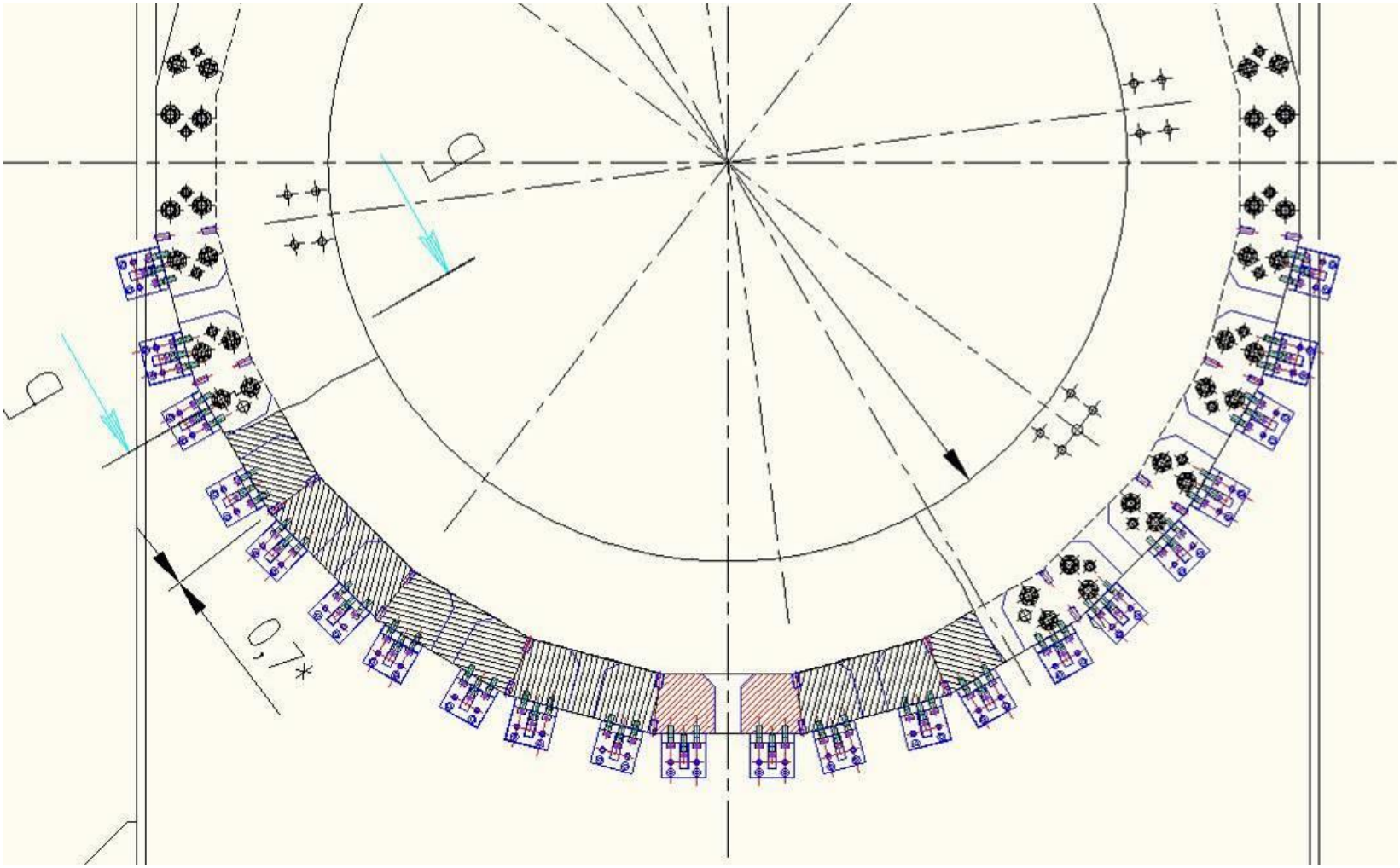




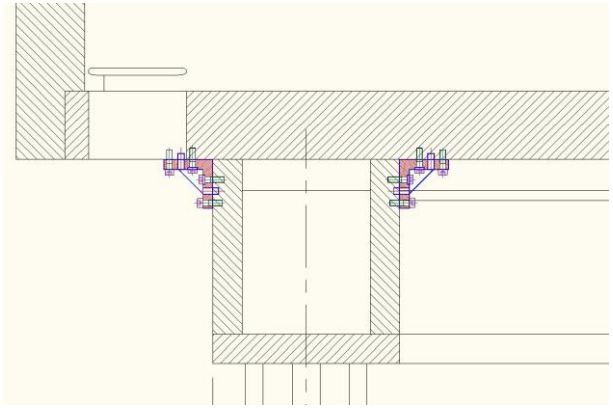


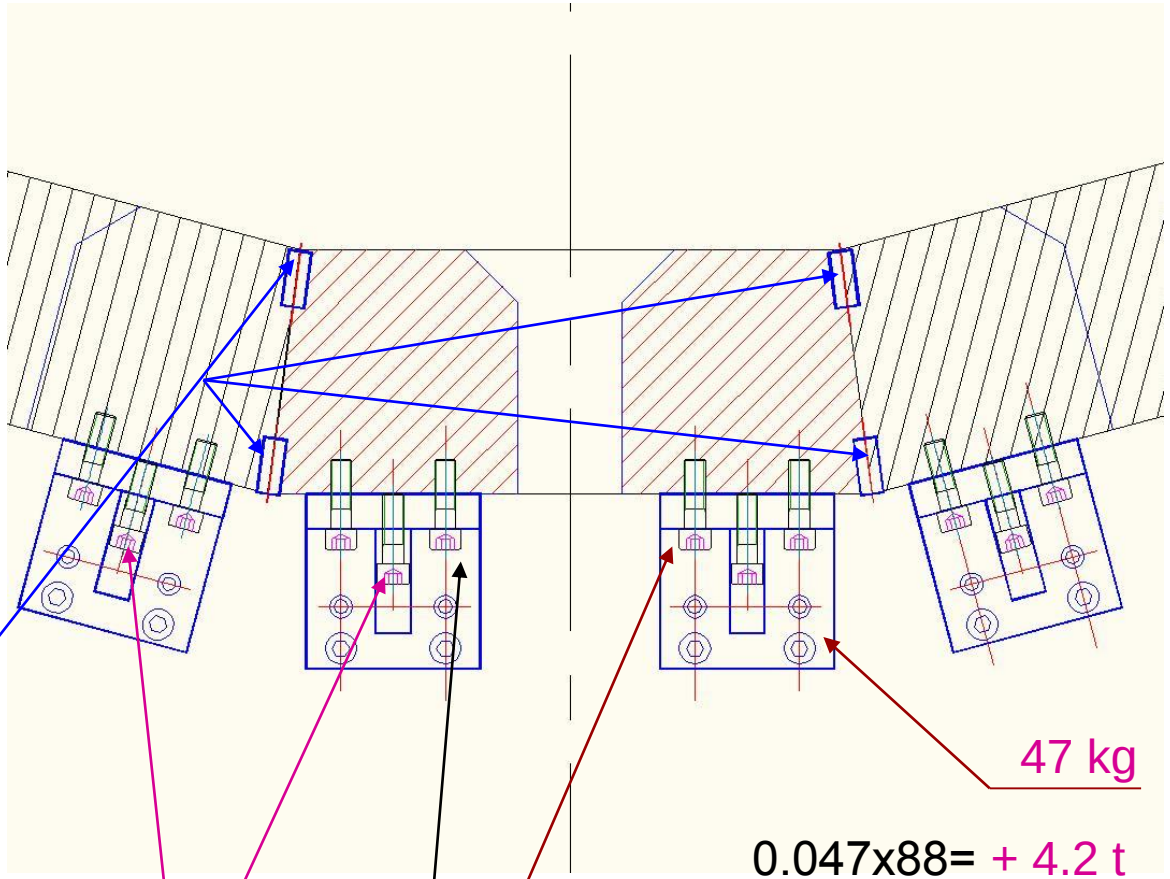


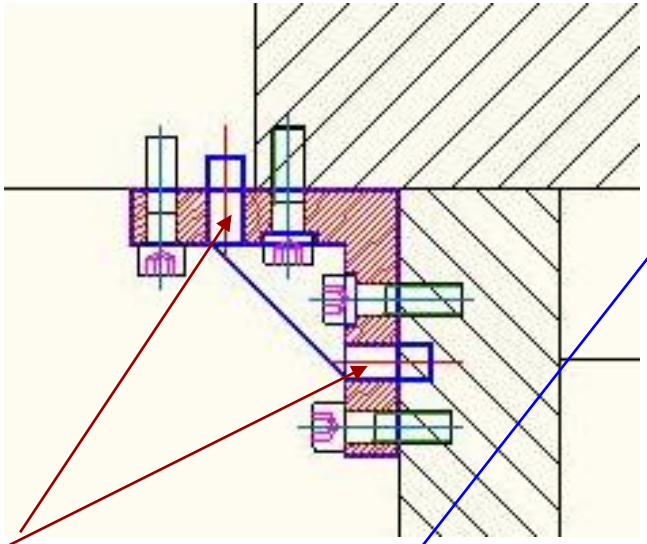
Fixing the lower plate 11 to the lodgement (cradle) through the brackets (22*4 = 88 pcs.) by means of bolts M30 class 10.9 and pin diameter 33 mm (interference fit H7 / p6)



Material for pins: steel 40X (Shear stress - 1850 kg / cm2).
Cross-sectional area 8.5 cm2, load capacity 15.8 tonnes.
The total shear strength on one cradle 632 tons.

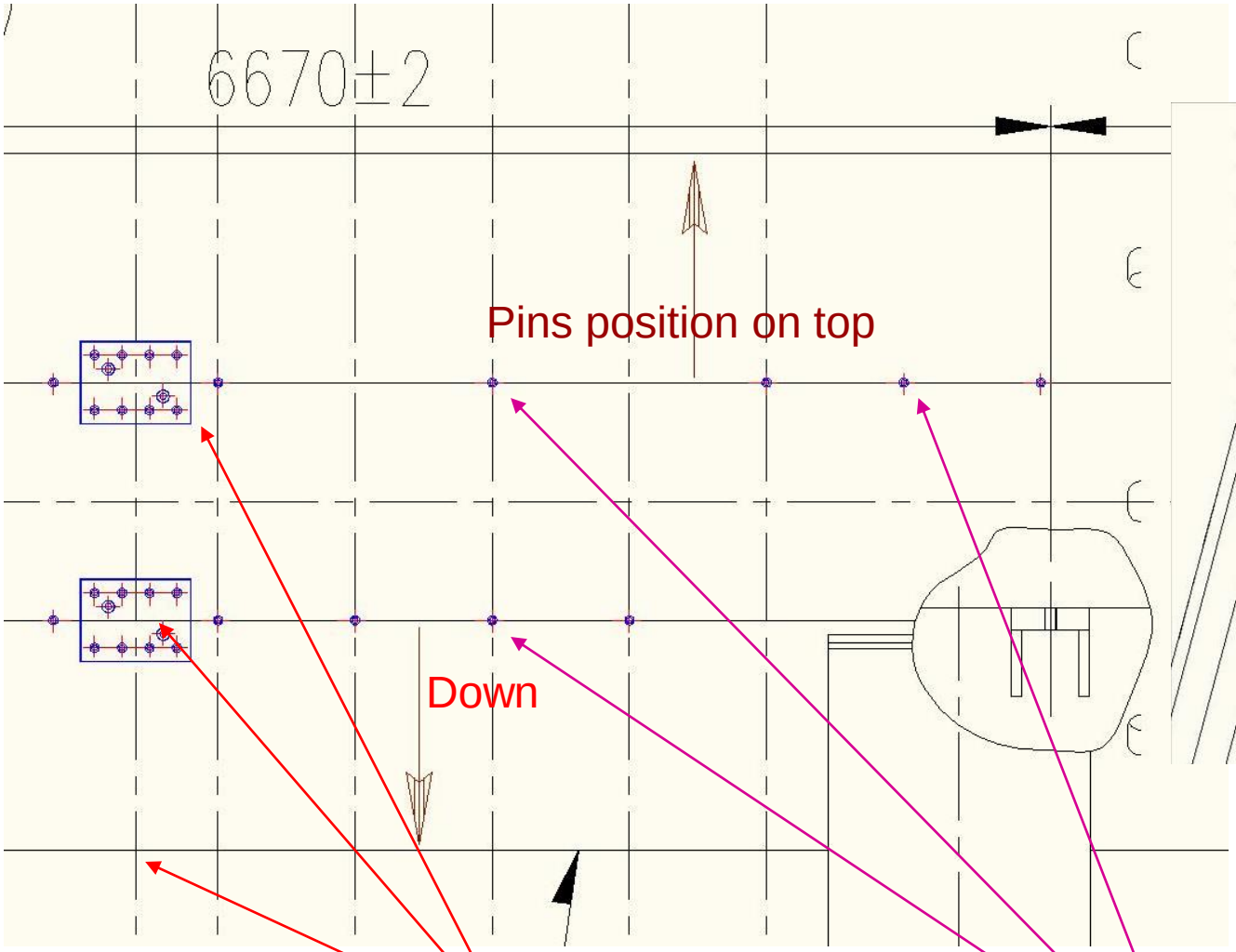


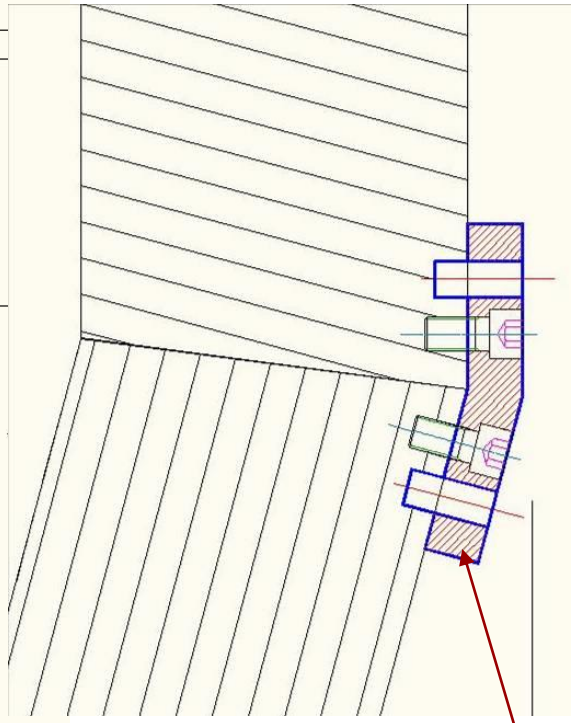




The brackets are provided with the M30 screws to adjust the position of the plate radially and clamping bolts.

After adjustment, tightened bolts are installed fixing the position of pins in brackets and between the plates.



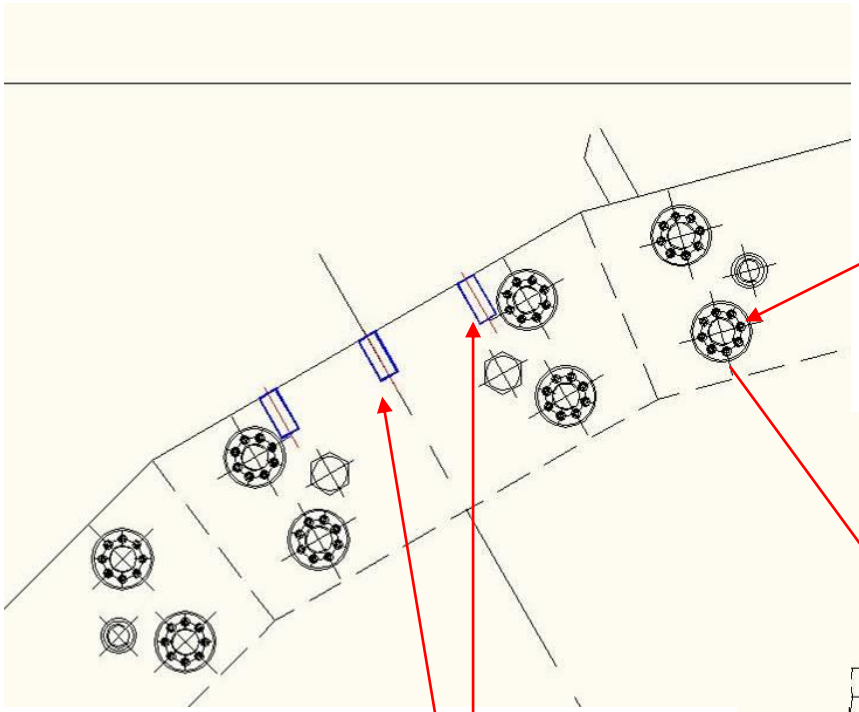


47 kg

0.047x24= + 1.2 t

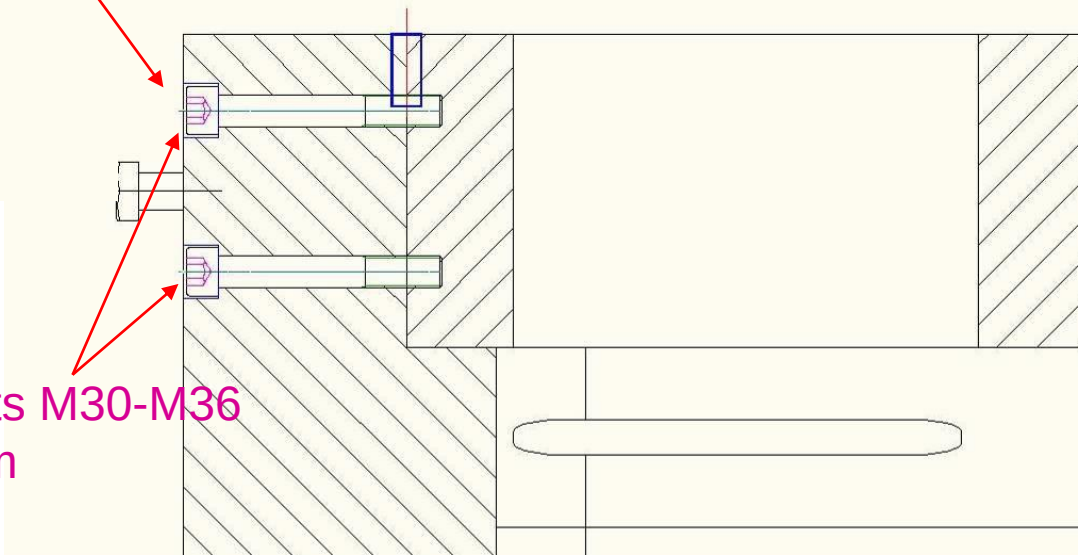
Additional overhead plate to provide rigidity and pins to weight transfer plates from the stove to the plate. The pins run on collapse: Square contact 3.3x8 x 10 = 240 cm2, the permissible load on the crushing 384 tons, Less far as possible from the 6 plates (18.5x6 = 111 tonnes).

Replacing supernuts (superbolts)



Now: 8x4x2x24=1536 supernuts

Tightening strictly according to program



Replace conventional bolts M30-M36 and add pins diam. 33 mm