



EUROPEAN
SPALLATION
SOURCE

LoKI Engineering Design

Clara Lopez

www.europeanspallationsource.se

September 17th, 2014



Documentation- LoKI



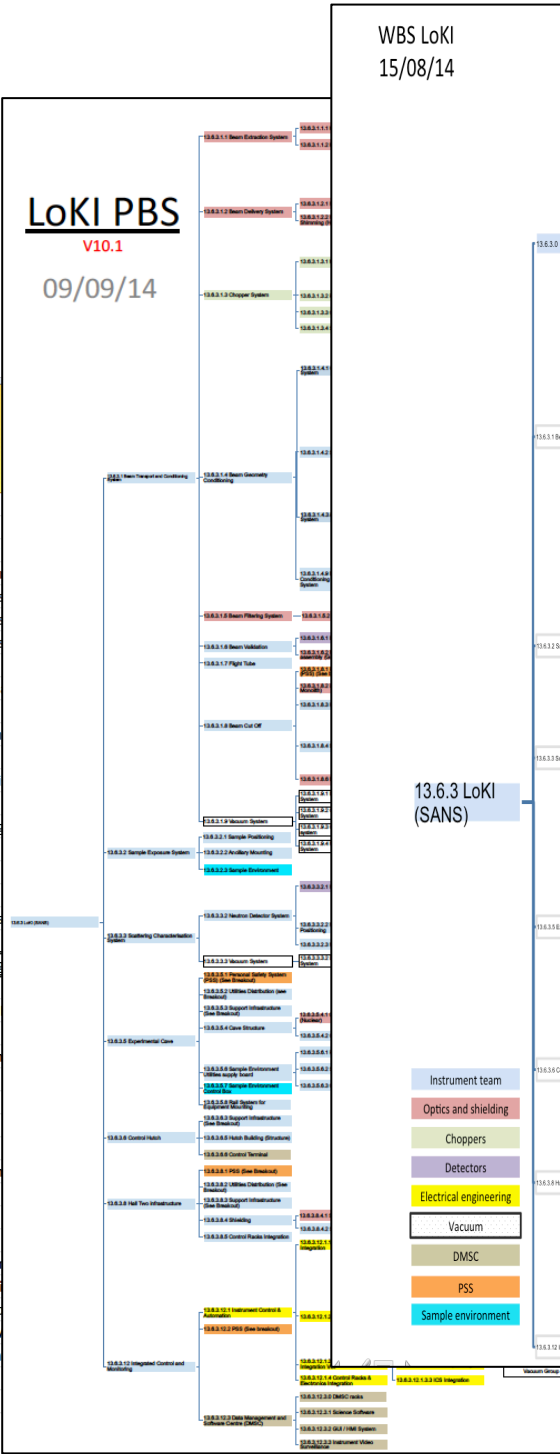
LoKI Table of Motion Axes

Axis Number	Part Description	PBS Element	Axis description	Position	Linear / Rotation	Range	Load	Accuracy
1	Heavy shutter Rotation	13.6.3.1.8.3	X	XX	Rot	180°	≈1000Kg	±0.1°
2	Aperture 1	13.6.3.1.4.3.1	X	xx	Rot	180°	≈10 kg	±0.1°
3	Collimation Guide 1 Movement	13.6.3.1.4.1.1	X	XX	Rot	180°	≈200Kg	±0.1°
4	Aperture 2	13.6.3.1.4.3.2	X	xx	Rot	180°	≈10 kg	±0.1°
5	Collimation Guide 2 Movement	13.6.3.1.4.1.2	X	XX	Rot	180°	≈300Kg	±0.1°
6	Aperture 3	13.6.3.1.4.3.3	X	xx	Rot	180°	≈10 kg	±0.1°
7	Collimation Guide 3 Movement	13.6.3.1.4.1.3	X	XX	Rot	180°	≈300Kg	±0.1°
8	Aperture 4	13.6.3.1.4.3.4	X	xx	Rot	180°	≈10 kg	±0.1°
9	Collimation Gate Valve	13.6.3.1.9.3	Y	XX	Lin	200mm (stroke)	≈10kg	±0.5mm
10	Slit 5	13.6.3.1.4.2.1	Y port	20m	Lin	35mm	≈1Kg	±0.01mm
Y starb.			20m	Lin	35mm	≈1Kg	±0.01mm	
Z upper			20m	Lin	35mm	≈1Kg	±0.01mm	
11	Sample Stage Linear	13.6.3.2.1	X	XX	Lin	2m	≈1t	±1mm
Y			XX	Lin	1m	≈1t	±0.5mm	
12	Sample Stage Rotation	13.6.3.2.1	X	XX	Rot	15°	≈1t	±0.1°
Y			XX	Rot	15°	≈1t	±0.1°	
13	Sample Stage Rotation	13.6.3.2.1	Z	XX	Lin	1m	≈1t	±0.5mm
Z			XX	Rot	45°	≈1t	±0.1°	
14	Detector Tank Gate Valve	13.6.3.3.2.3	Y	XX	Lin	500mm (stroke)	≈30kg	±0.5mm

Planning

LoKI PBS v10.1

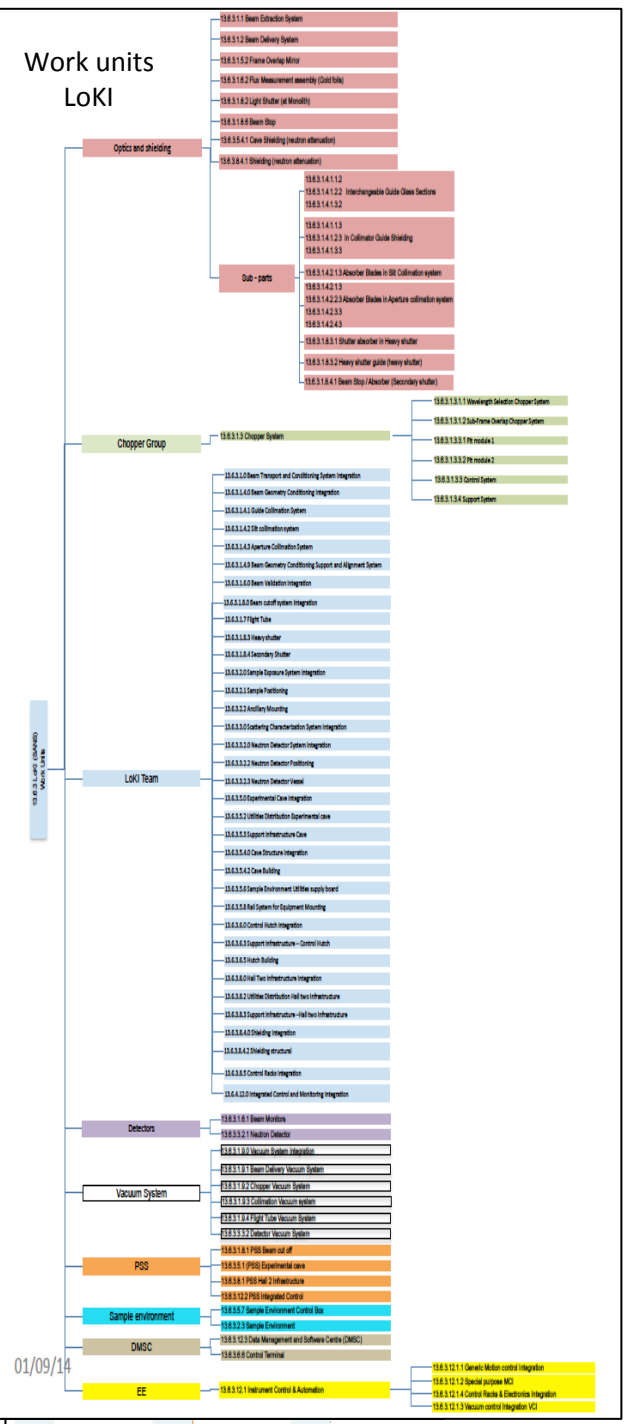
09/09/14



WBS LoKI 15/08/14

13.6.3 LoKI (SANS)

Work units LoKI

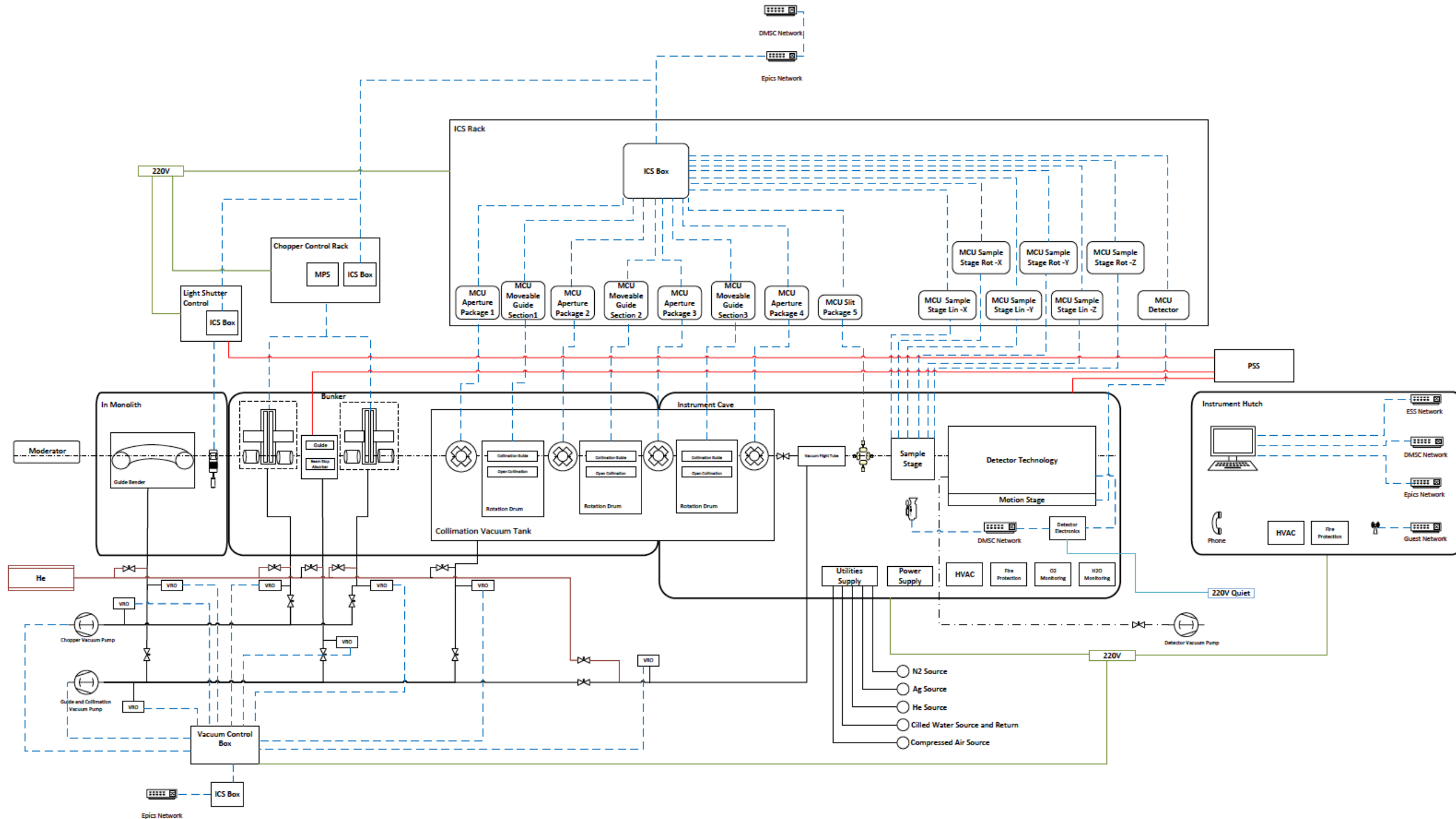


01/09/14

- Instrument team
- Optics and shielding
- Choppers
- Detectors
- Electrical engineering
- Vacuum
- DMSC
- PSS
- Sample environment

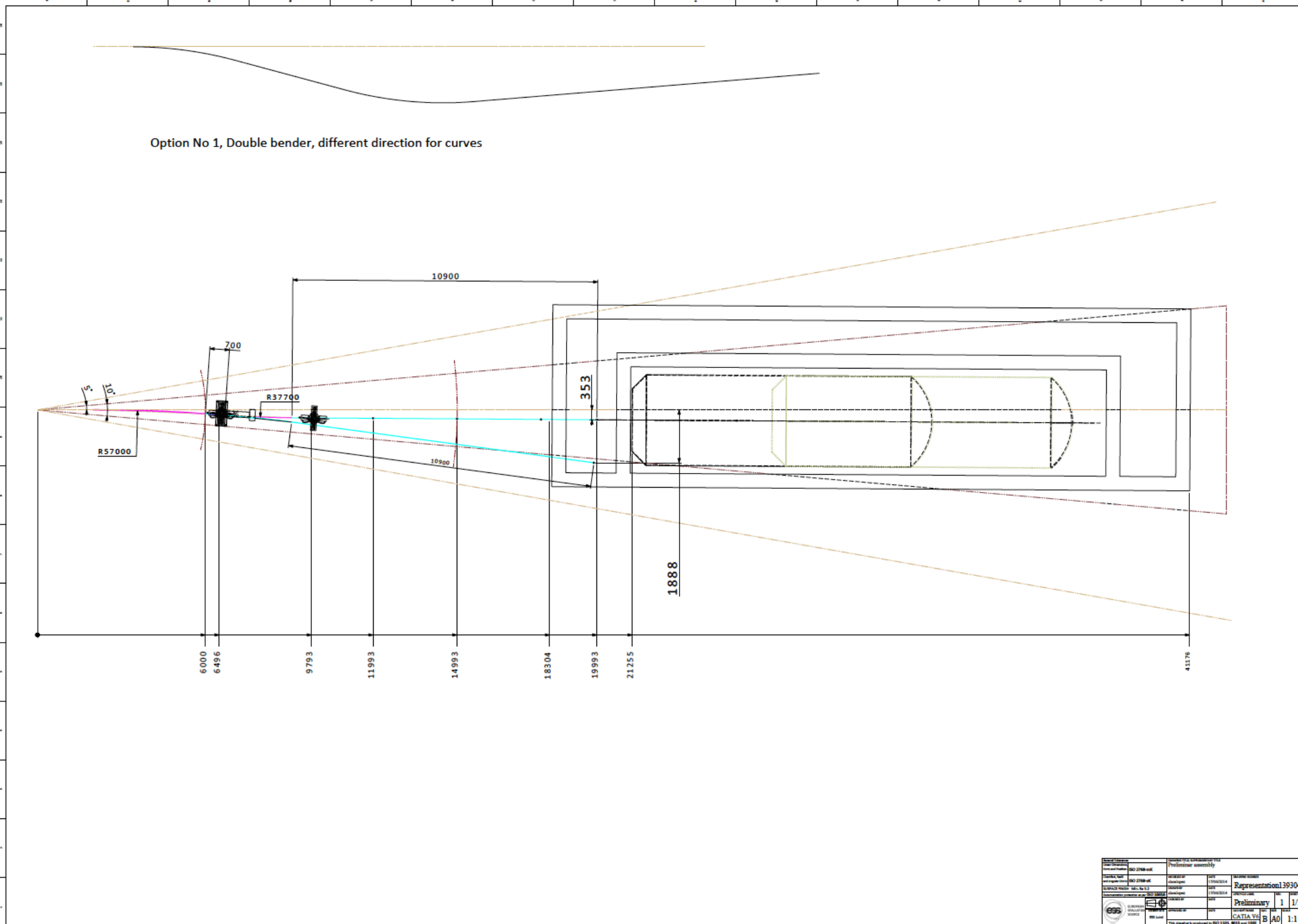


P&ID



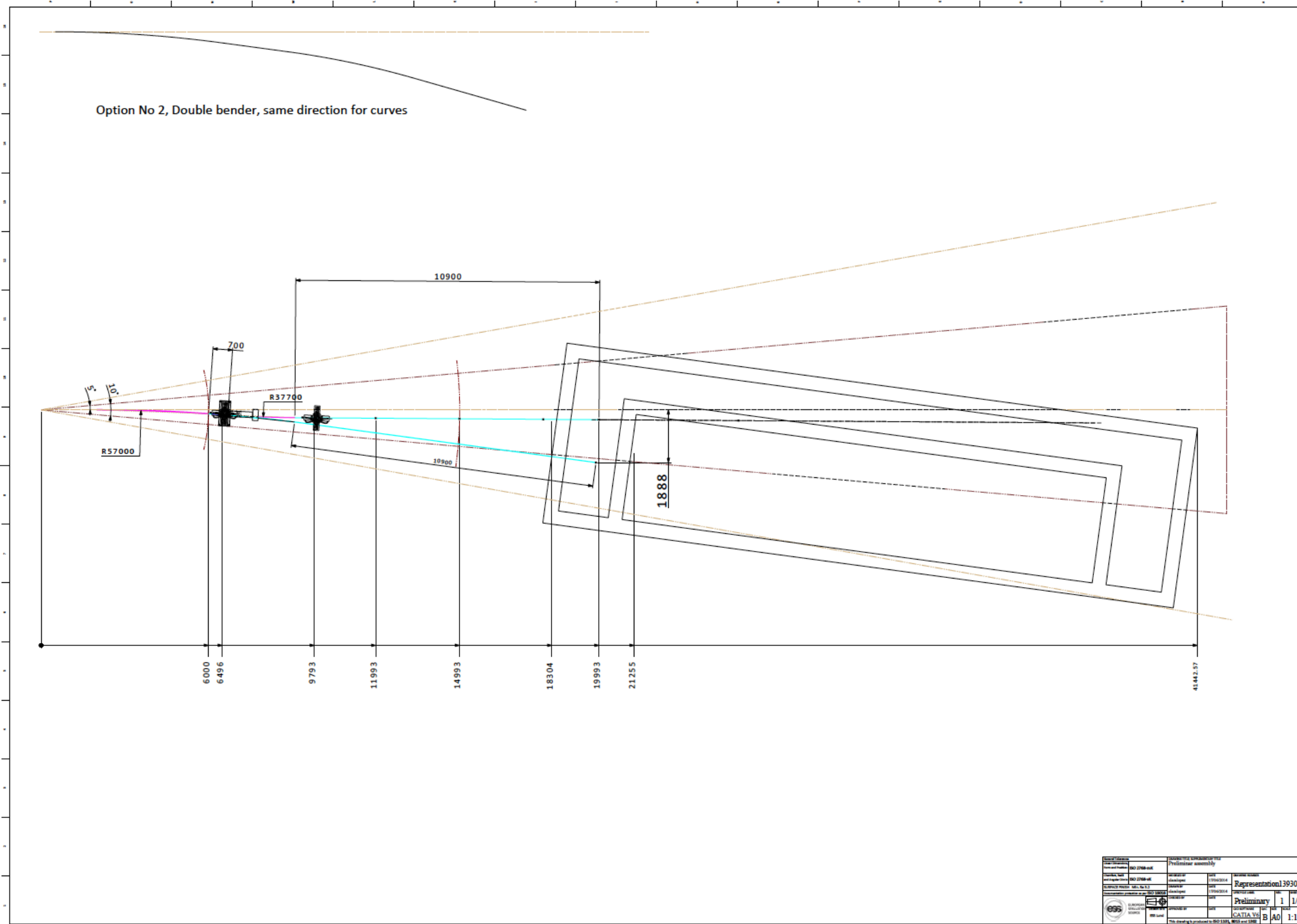


Layout LoKI Double bender S



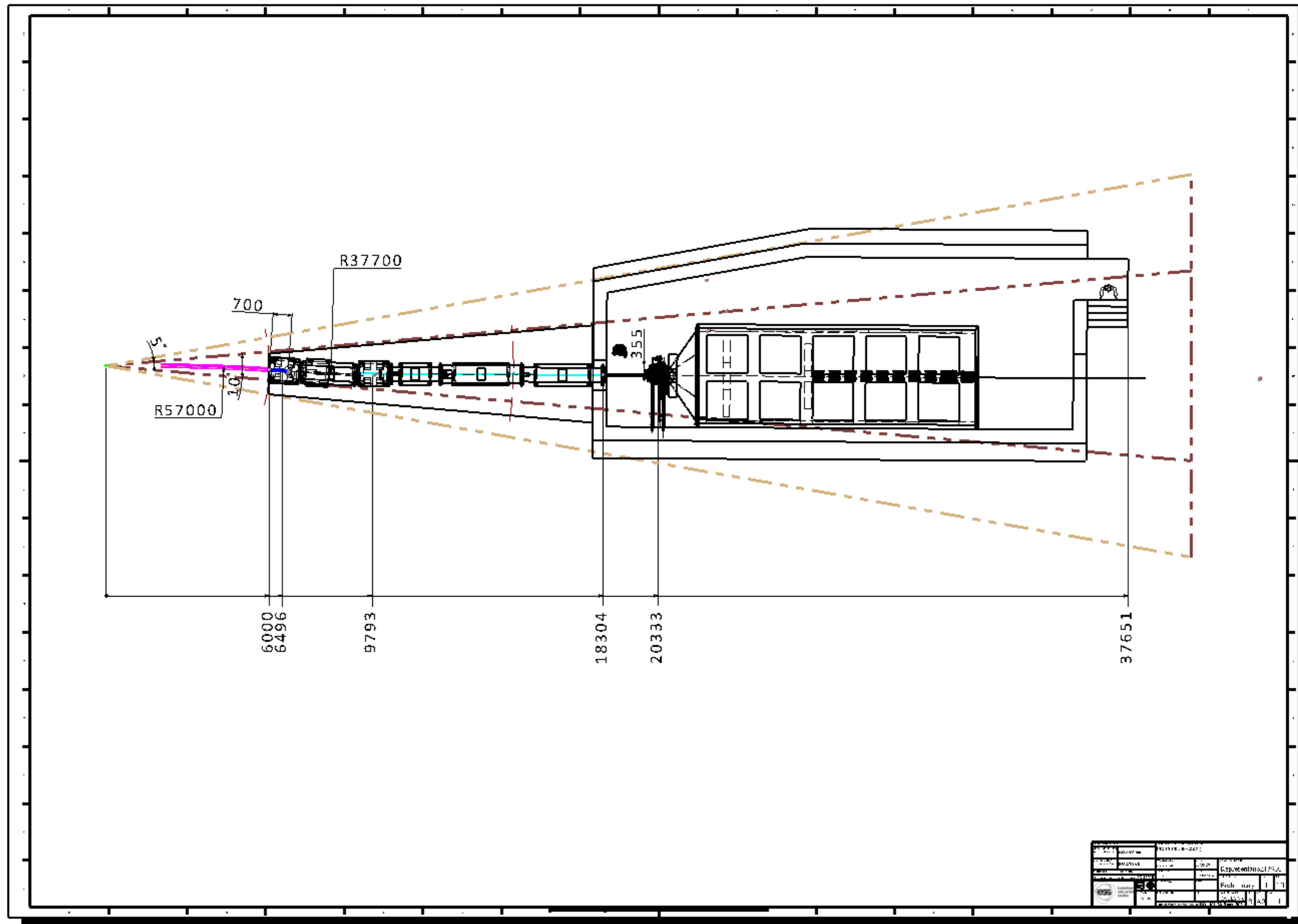


Layout LoKI Double bender same direction



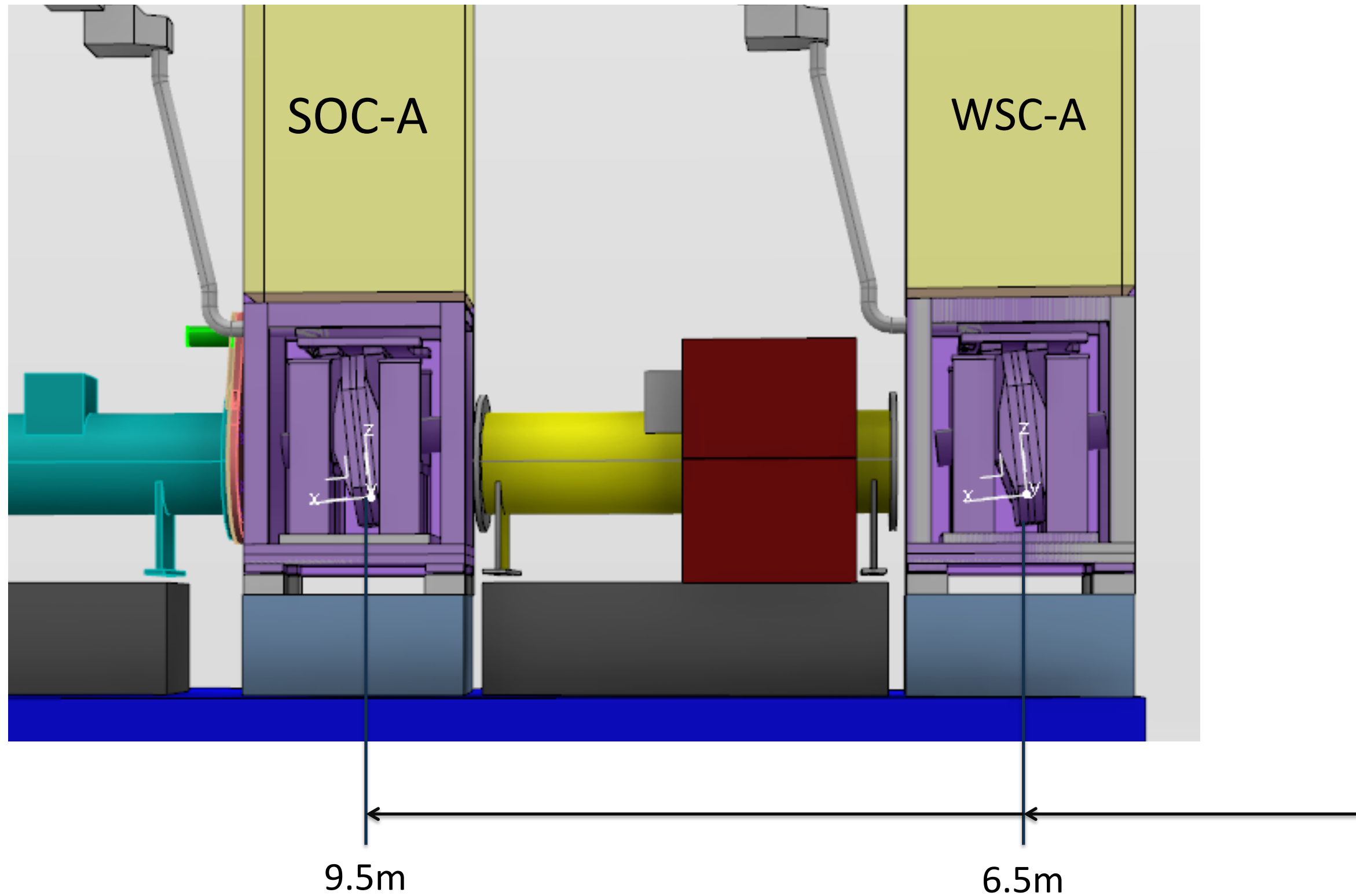


Layout LoKI





Choppers and heavy shutter





Choppers: Design options

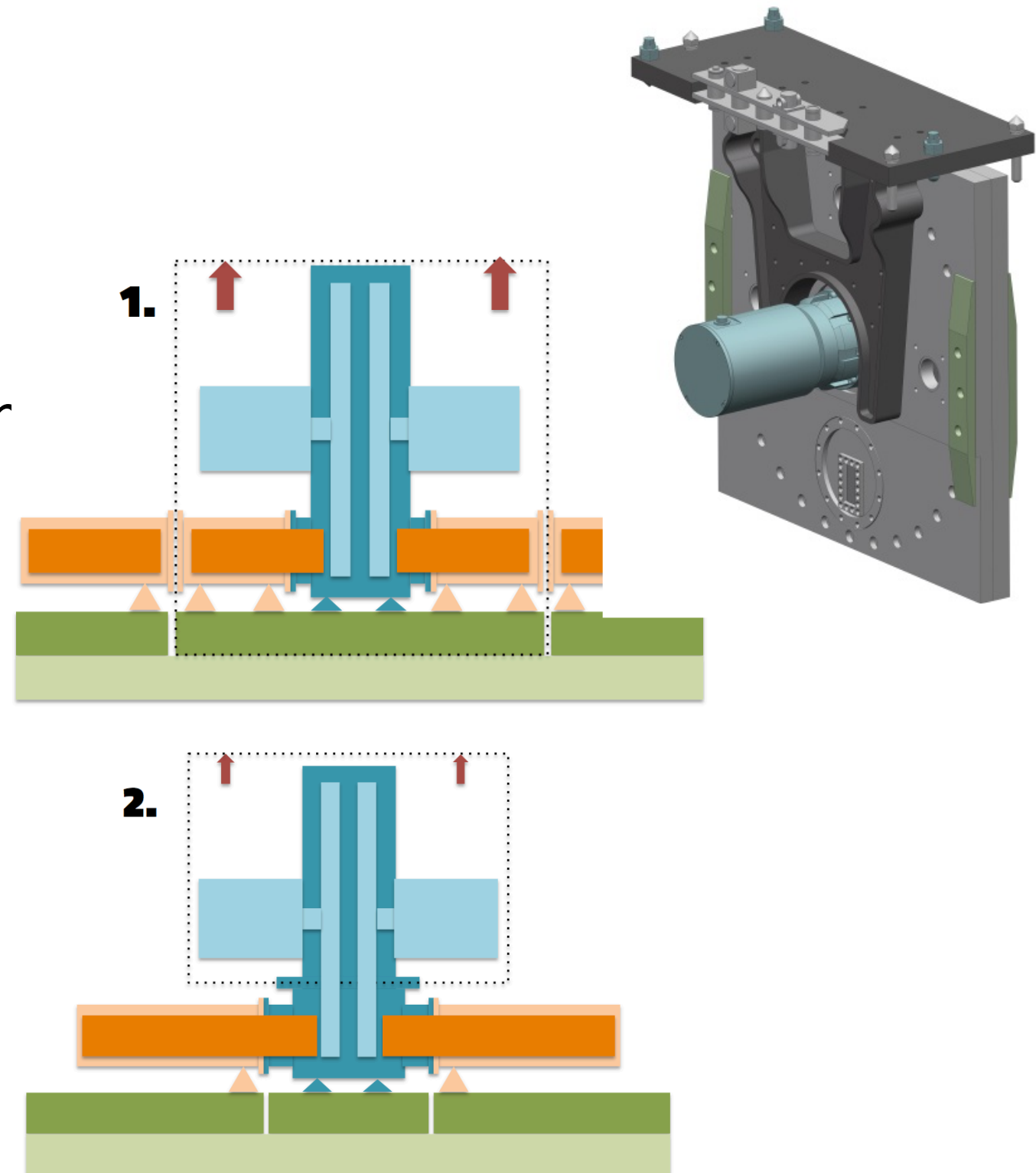
Chopper requirements

- Disc choppers Low speed
- (ESS Type I or type II)

Equipment access zone classification
Black and green

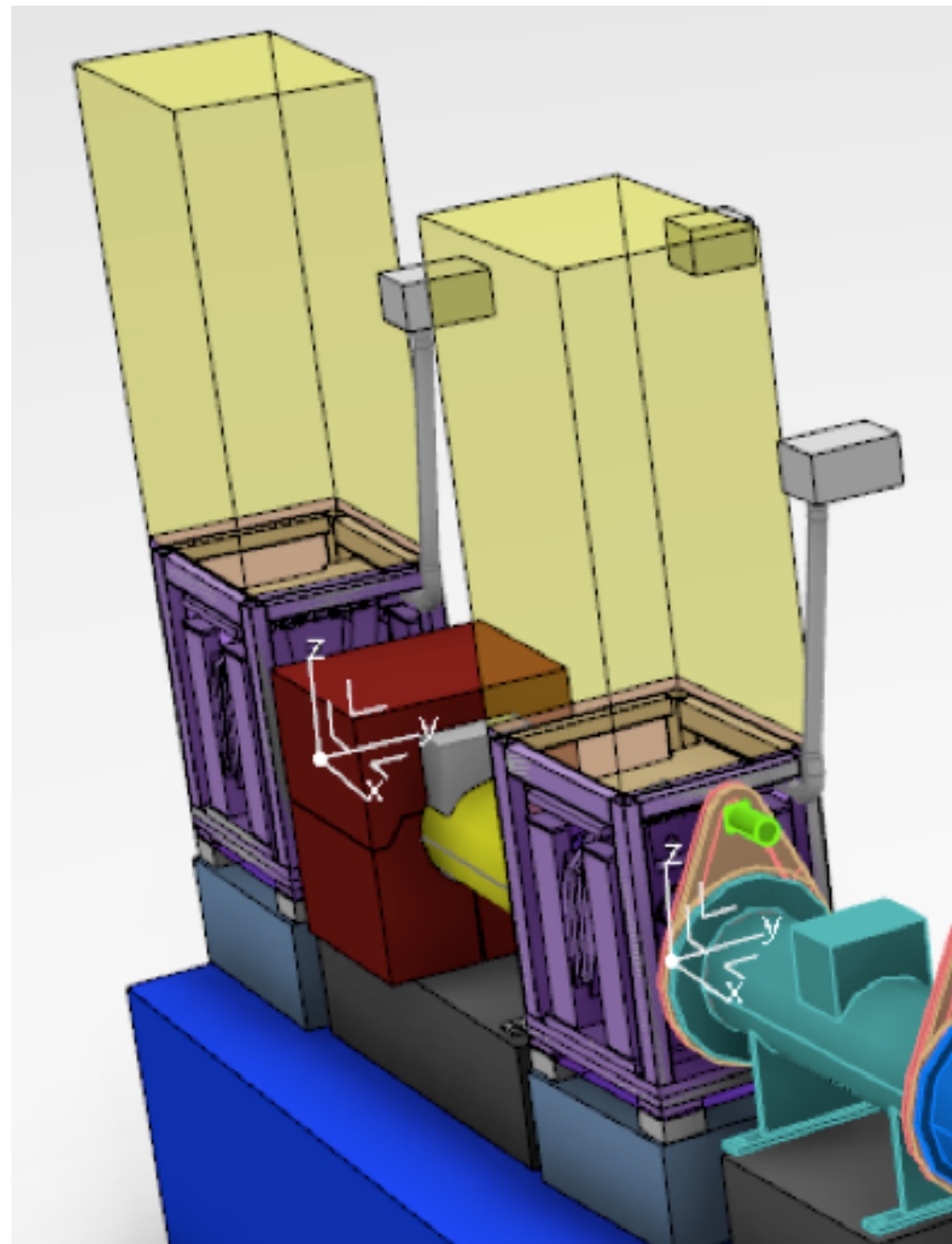
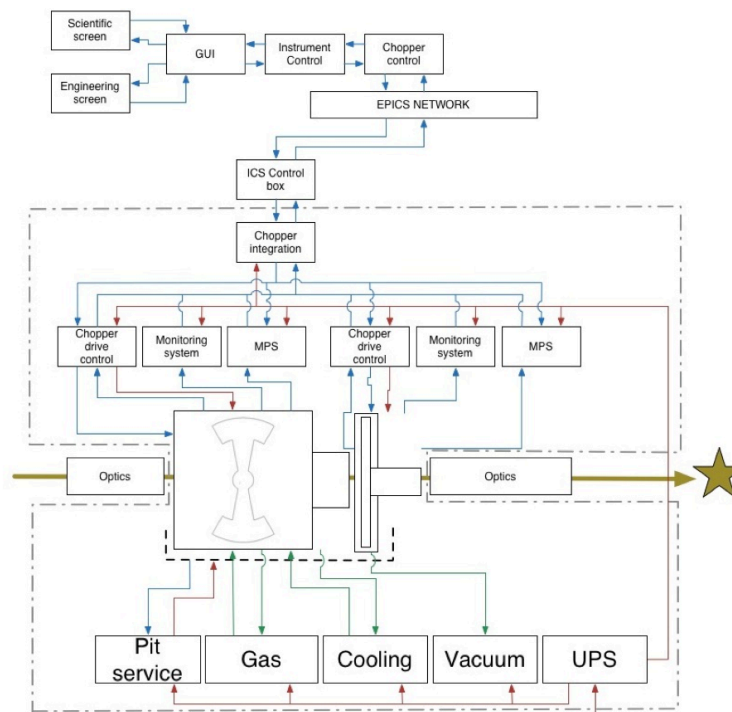
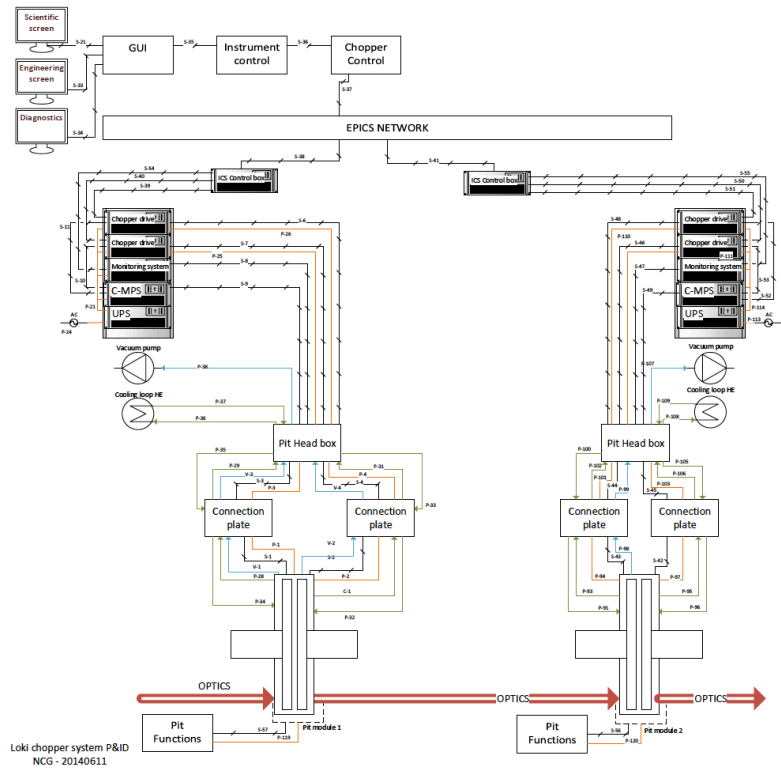
Installation configuration 1 or 2

- All Access from above
- Integrated shielding
- Joint vacuum, full (config 2), or partially (config 1).
- Remote handling ready



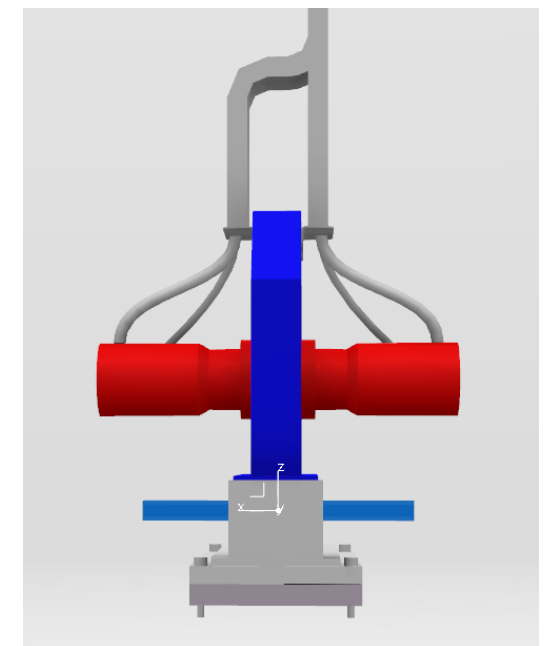


Choppers



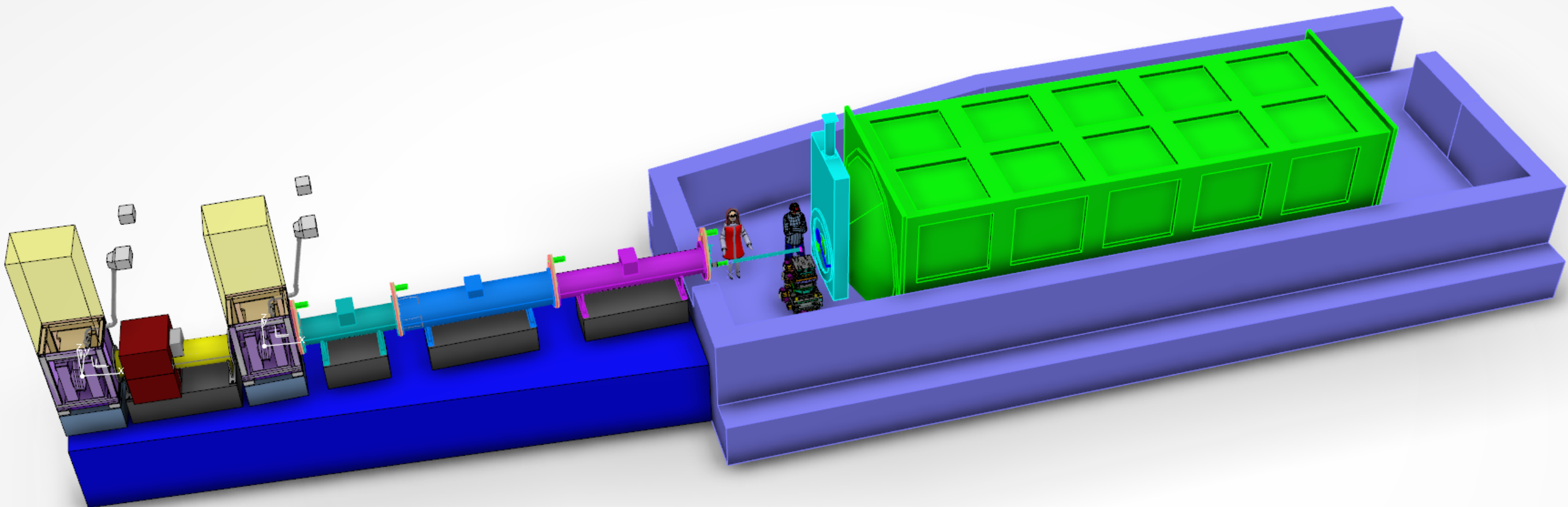
WSC-A Wavelength Selection
Double disc

SOC-A Sub Frame Overlap
Double disc



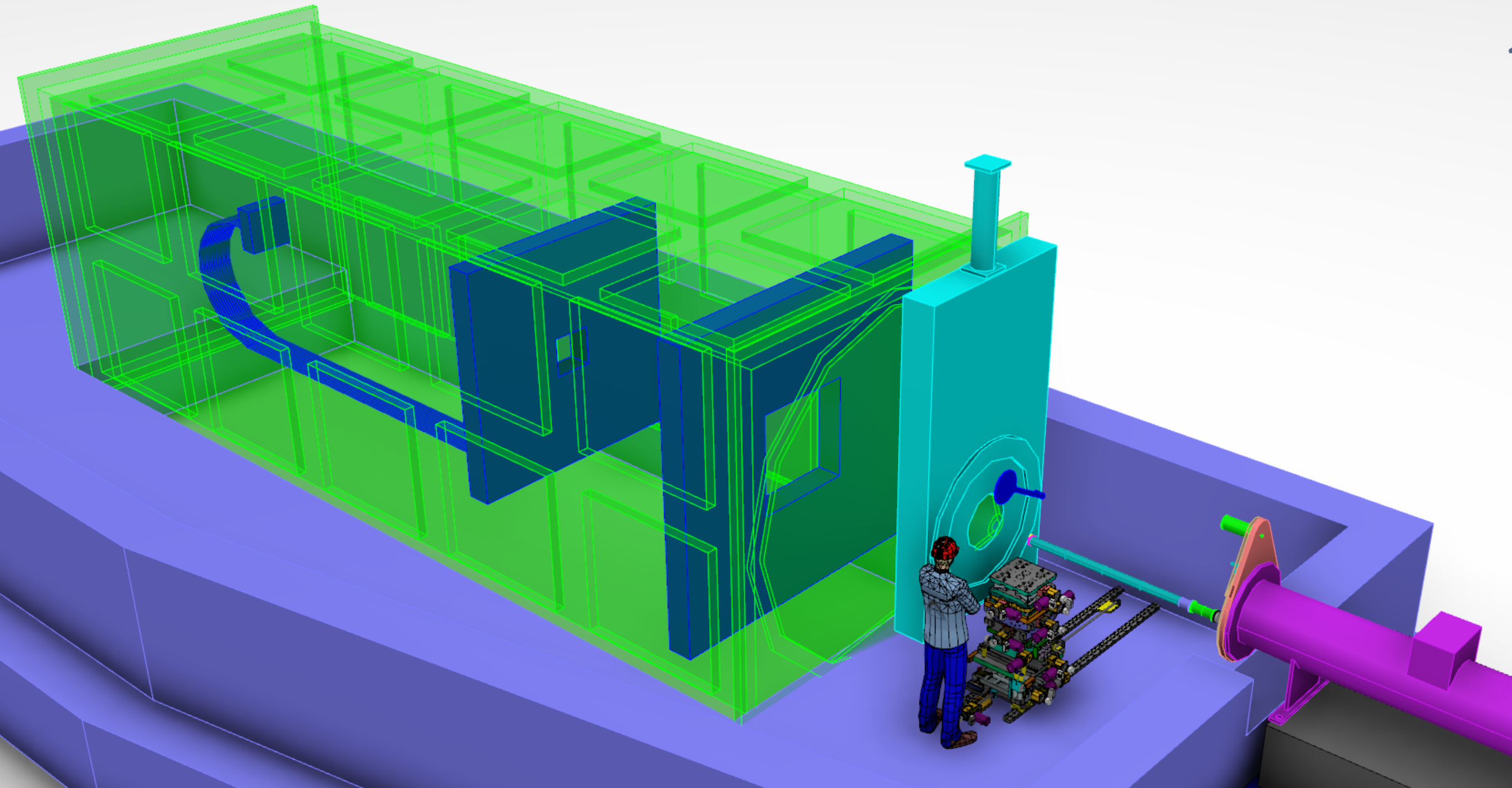


CAD Model - LoKI



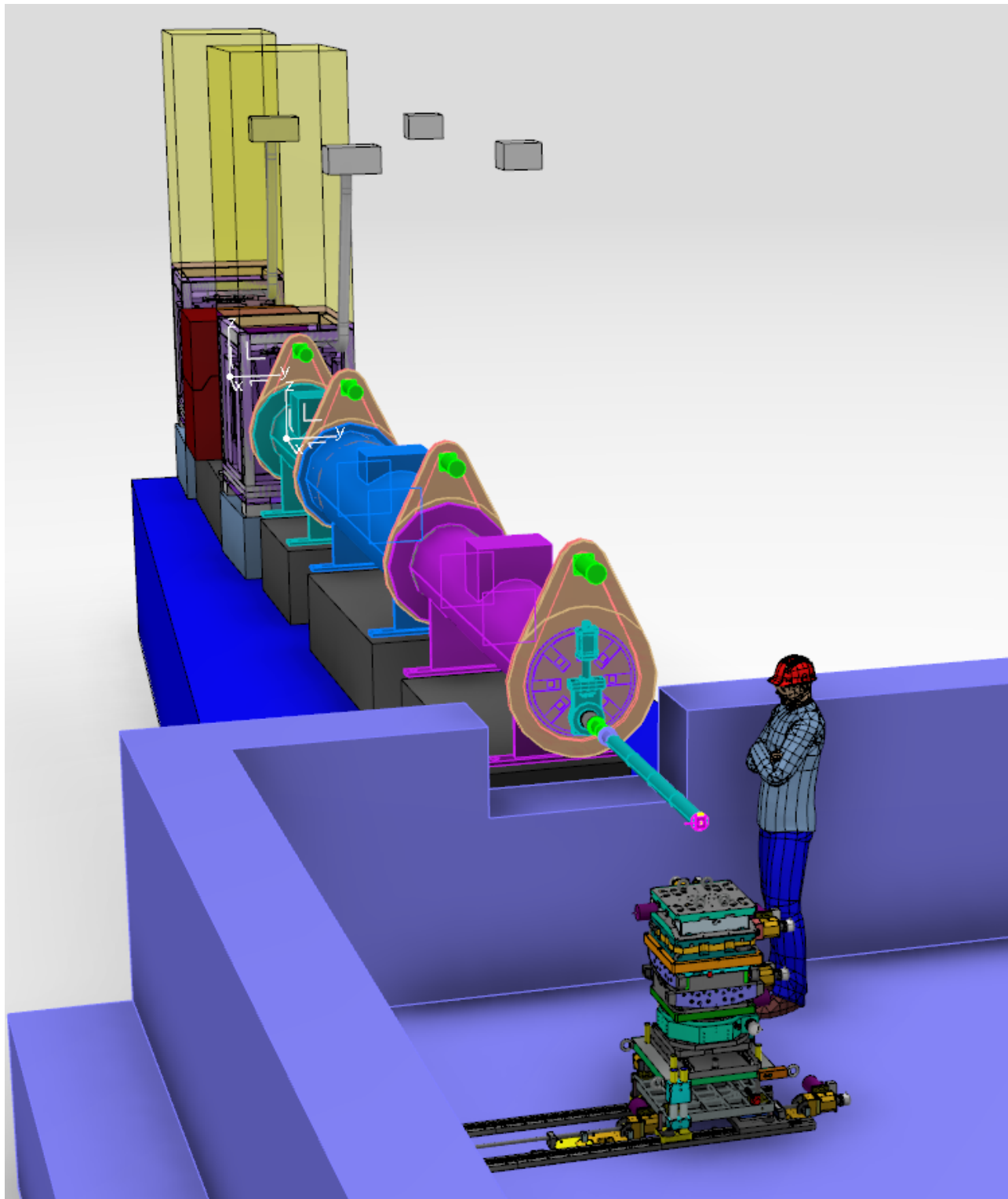


CAD Model - LoKI

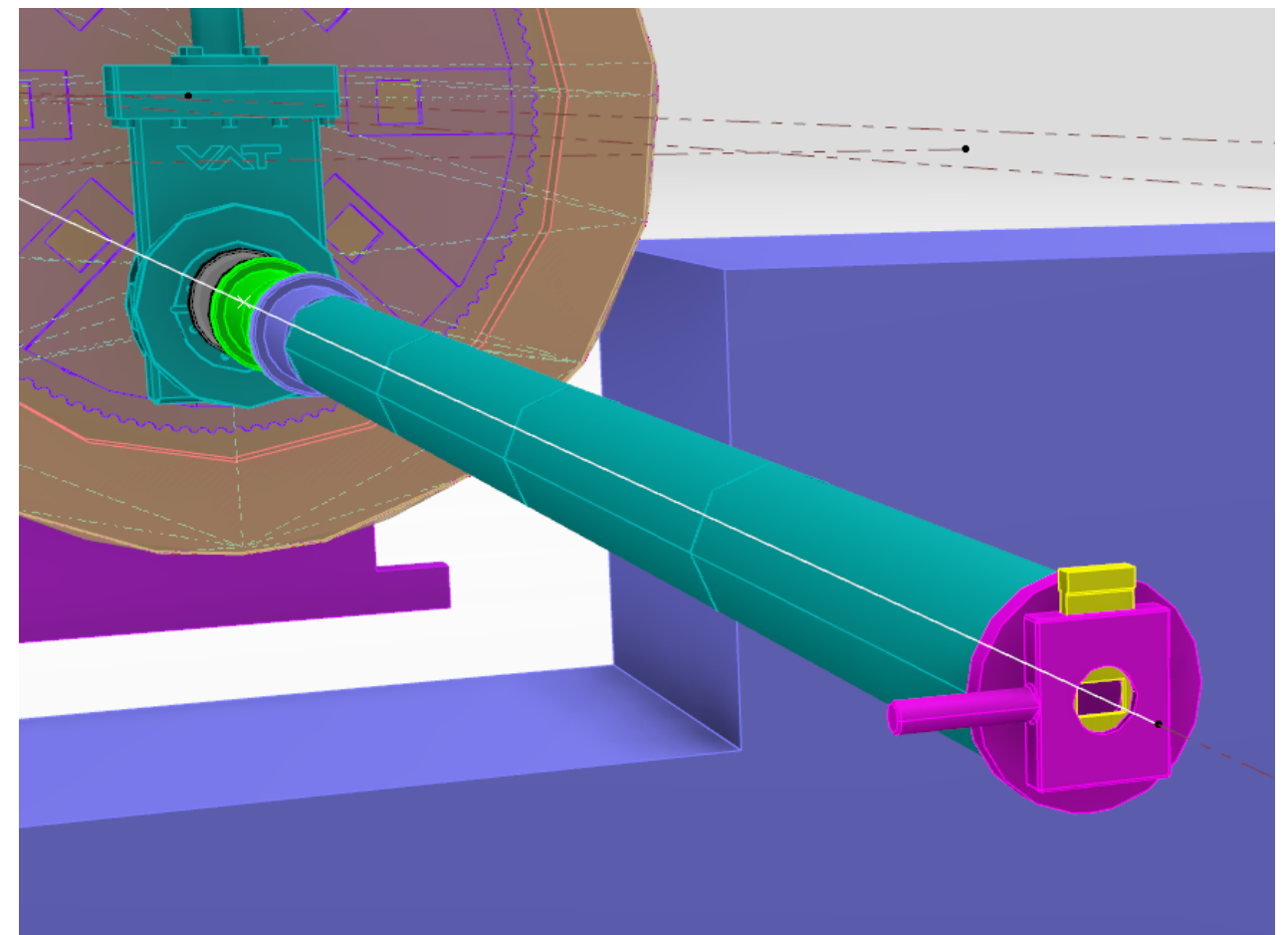




CAD Model - LoKI

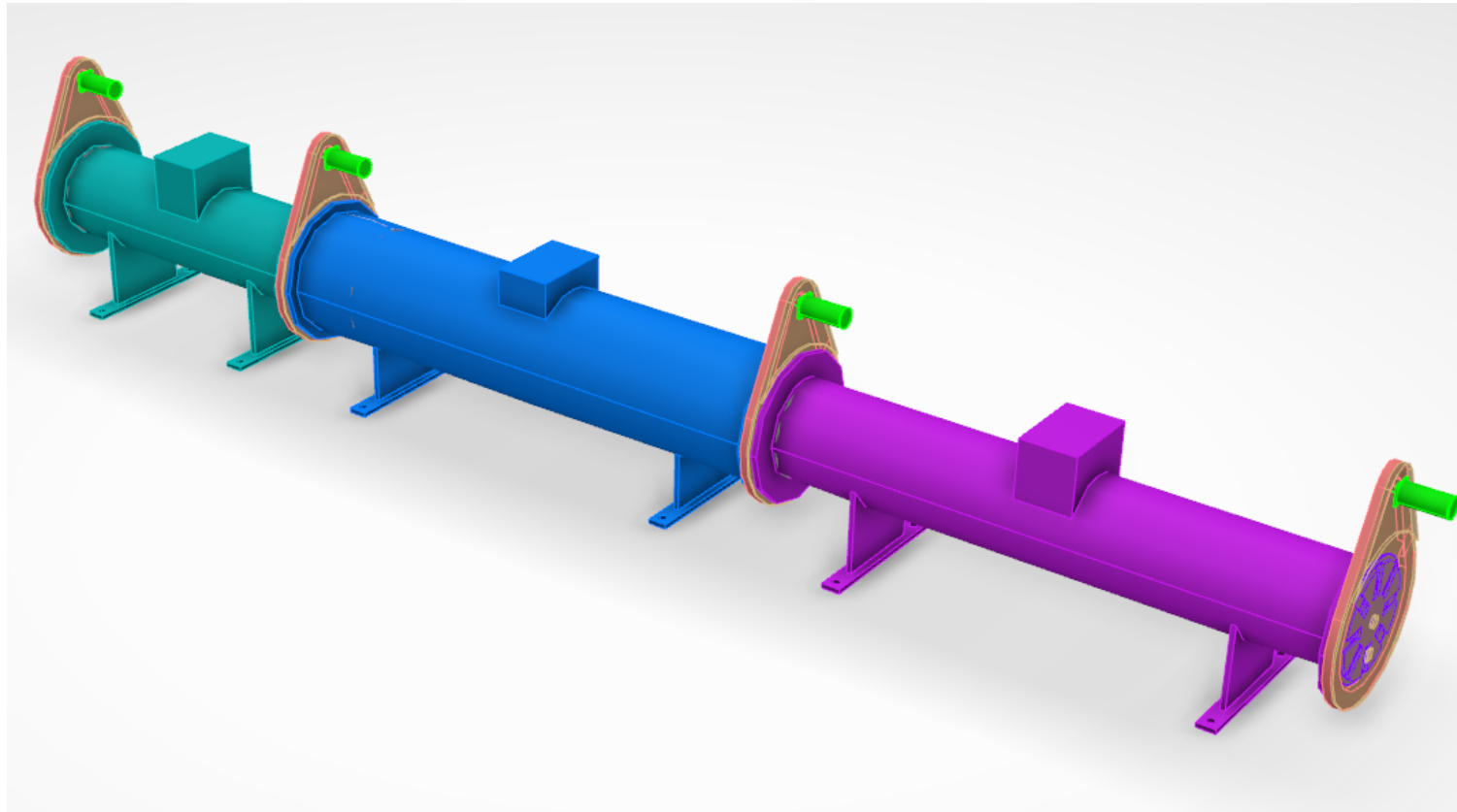


Fixed Slit holder at
sample area

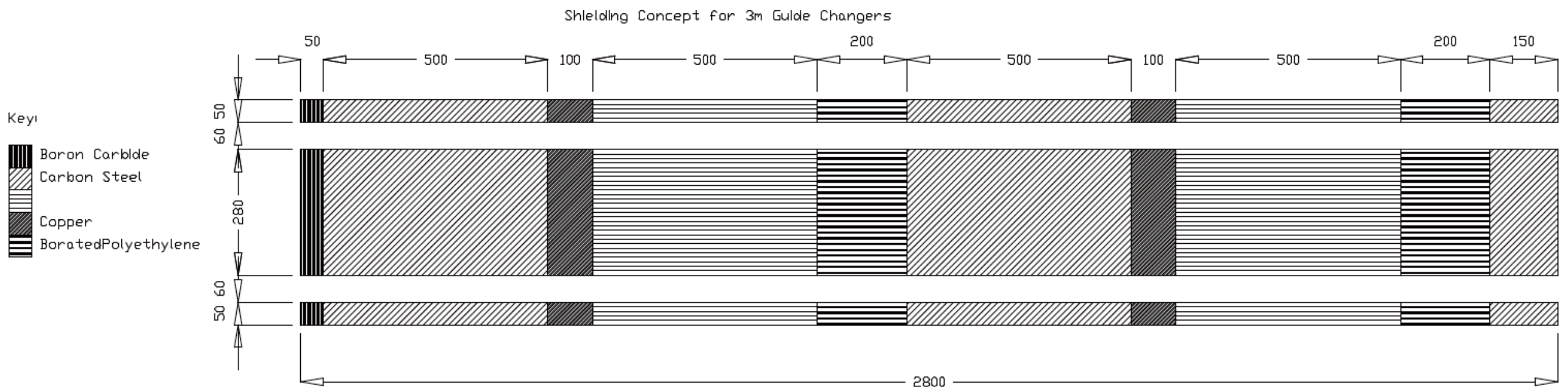
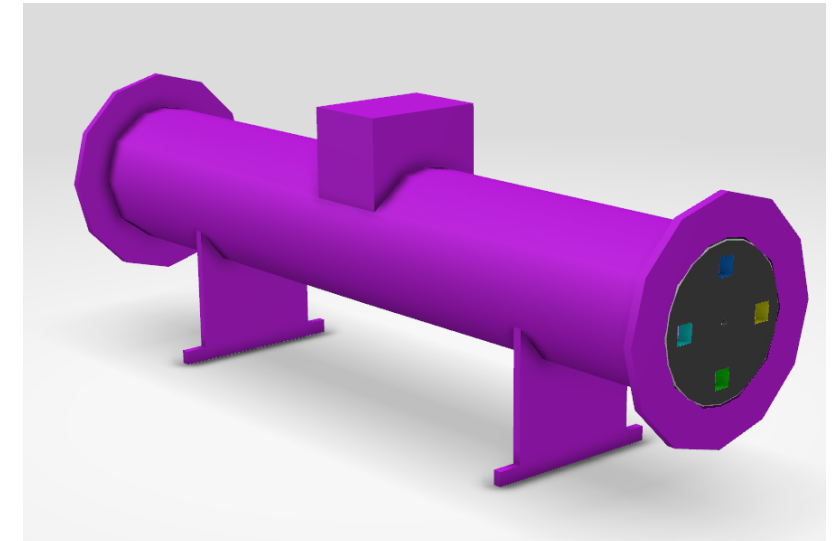




Guide changers- LoKI

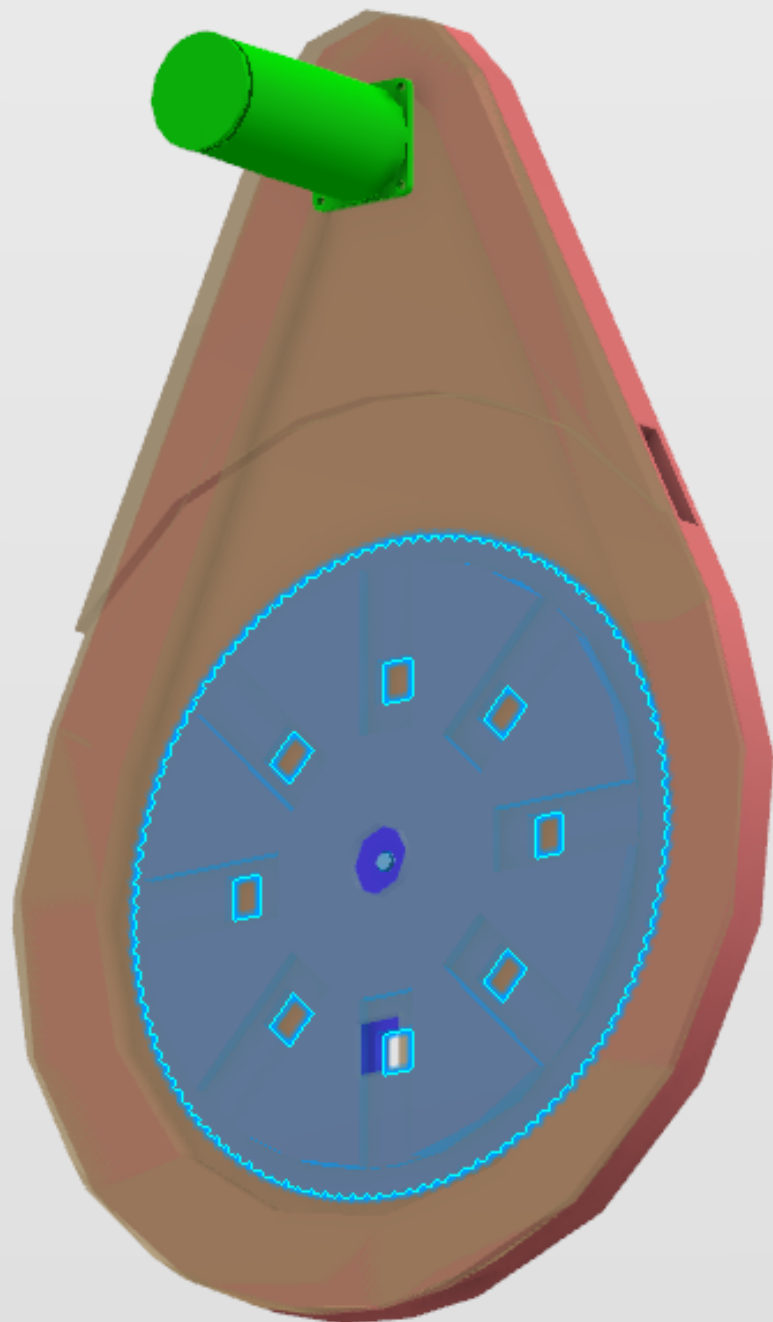


Guide changers
2 and 3 meters

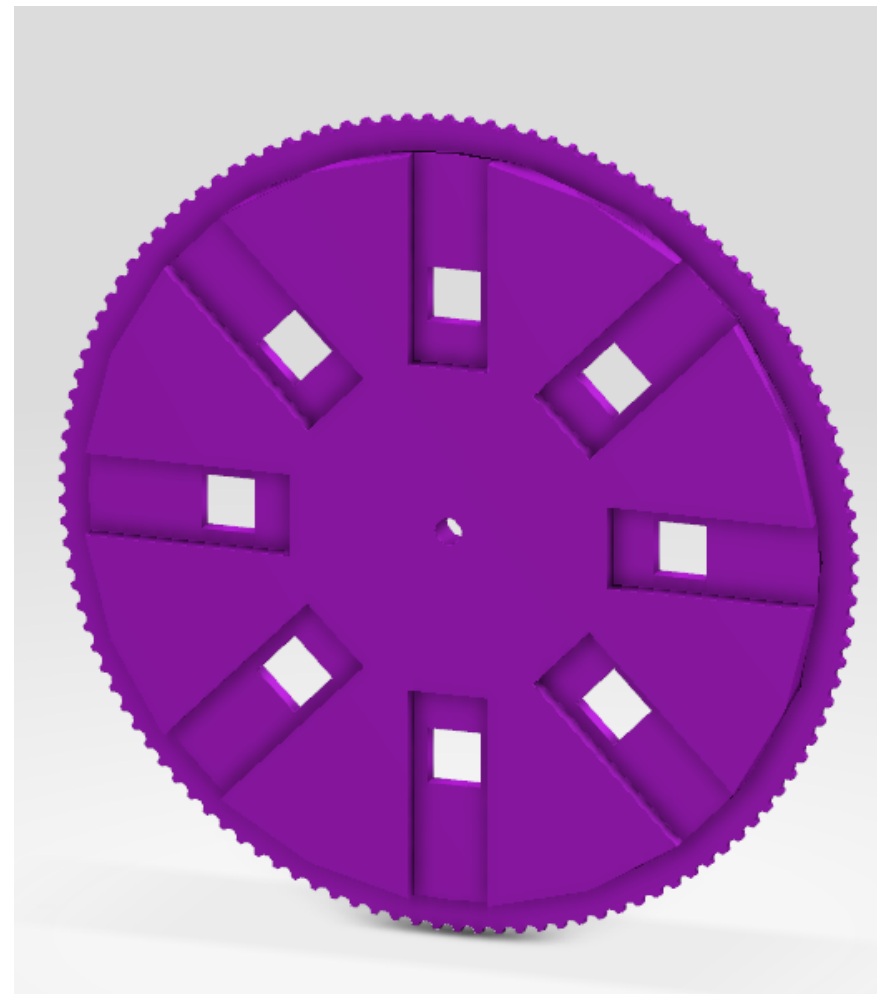




Guide changers- LoKI



Aperture system

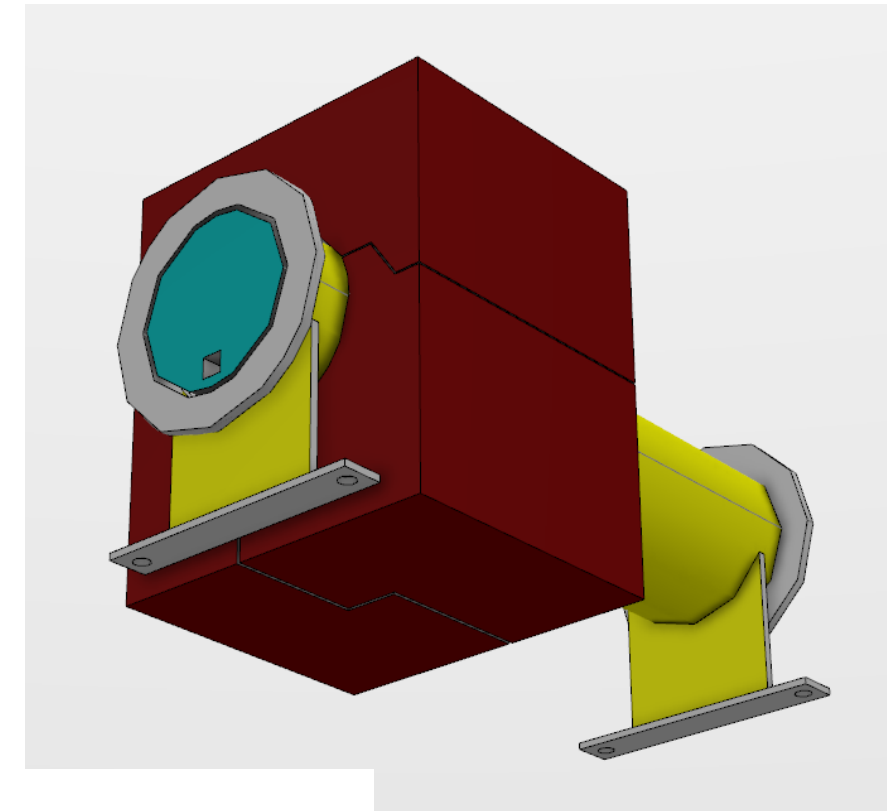




Shielding – Heavy Shutter and Guide Changers

Shielding

- Discussion cost / performance of shielding design for 1x line-of-sight vs 2x line-of-sight bender
- Close shielding of front end (heavy shutter and guide changers)
- Start point for laminate material, paper report expected.



Shielding Concept for Shutter Drum

