

Update on Installation Planning

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R3B Collaboration Meeting July 2024

- Installation planning
- Update on media supply
- Relevant Routes into and inside the FAIR Buildings

Installation Progress Q2 2022



08/06/22

Installation Progress Q4 2023



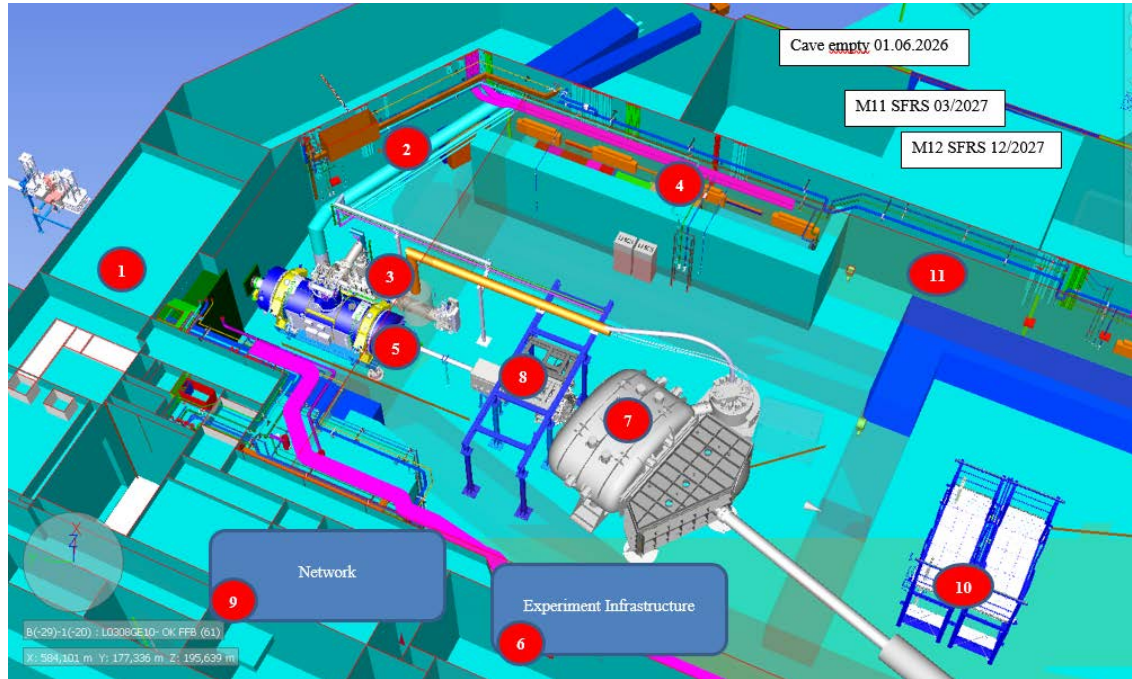
30/10/23

Installation Progress Q3 2024



04/07/24

Current Installation Dates

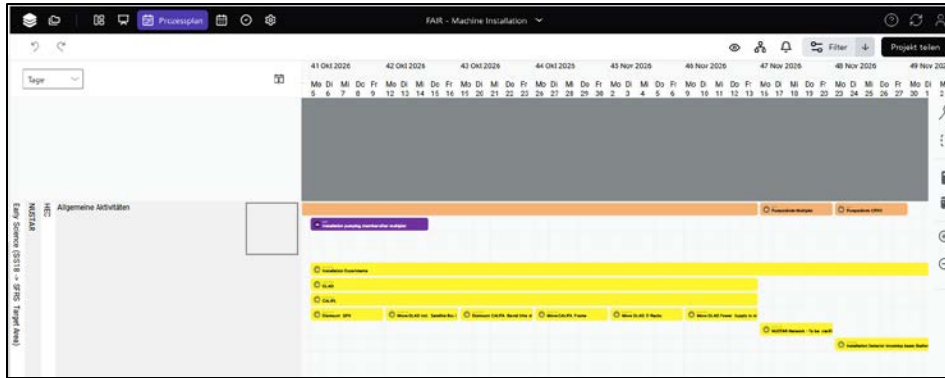


Cave empty 01.06.2026

- 1) Mobile wall 06-07/26
 - 2) Cryo Distribution Line 08/26
 - 3) Local Cryo 08-09/26
 - 4) Racks and cables (machine) 08/26
 - 5) Multiplet (inc. connections to media) 09-11/26
 - 6) Experiment Infrastructure
 - 7) GLAD
 - 8) CALIFA
 - 9) Network
 - 10) NEULAND
 - 11) Closing of outside wall 03/27
- 10-12/26
(..03/27)

R3B Commissioning w/o beam 11/26 – 09/27

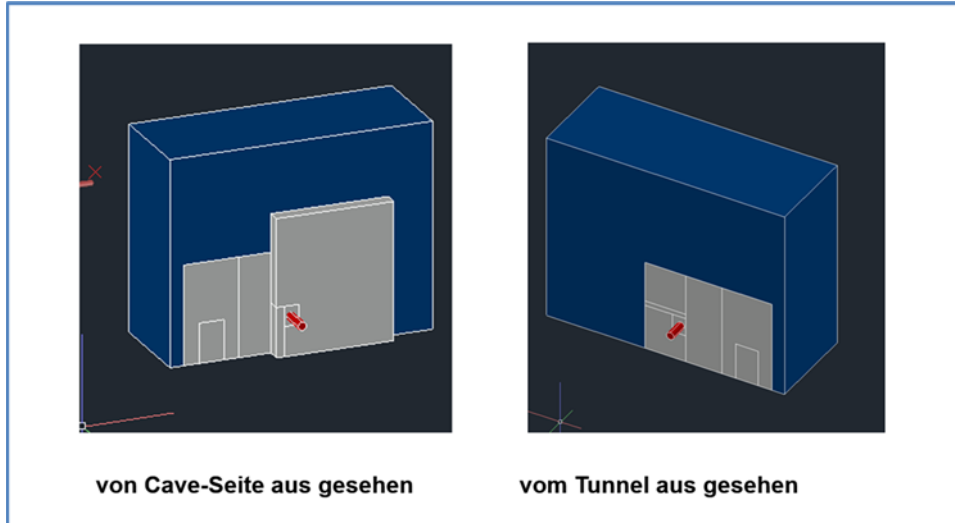
LCM goes digital !



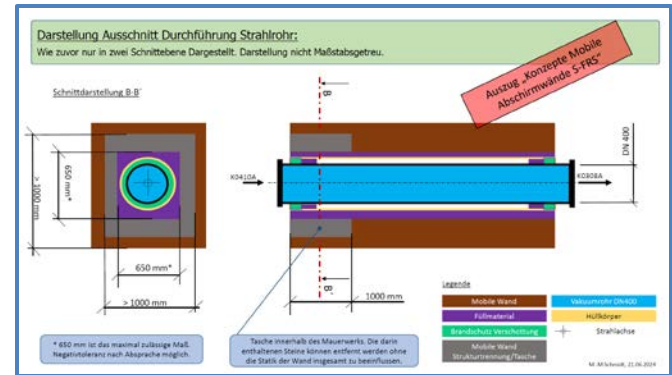
- Same tool for TBI and for machine installation
- Latest workshop HEC 2nd of July 2024

- Overview of all main activities in cave available
- Discussion and clarification ongoing for:
 - Dependencies
 - Duration
 - Preconditions
 - Who is doing it ?
 - Work instructions
 - Open questions -> list of open points for tracking

Mobile Wall between Cave and Tunnel



- The wall will be built in two steps.
- The first part comes early (2025). The remaining opening allows transports between cave and tunnel.
- After complete closing, the partial opening for maintenance and alignment is possible.



- Recently CBM has hang a banner in their cave
- We are asked from management to install banners also in our cave, showing NUSTAR ES components
- Banners shall be positioned on blank areas of wall
- Banners shall hang latest for the next AFC and remain afterwards
- Idea is, to have one banner with one of the fotorealistic models of the future R3B setup and further banners with motives of components from other NUSTAR collaborations
- Installation will be done under the installation rules for the FAIR site
 - GBU
 - written installation concept
 - pre audit by DEKRA
 -

Installation of banners in Cave



- VL_5171_Rev_03_Muster_Arbeitsmittelverzeichnis.doc
- VL_3211_Rev_03_Fragenkatalog_Voraudit.doc
- VL_2402_Rev_04_Personalmeldebogen.doc
- VL_2401_Selbstauskunft_Formular.docx
- PA_3211_Rev_04_Voraudit.pdf

	Document Title Installationskonzept CBM Cave Banner	Page 6 of 8
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3 Montagekonzept im Cave

3.1 Einbringung Arbeitsbühne

Für die Einbringung der Arbeitsbühne in das Cave steht nur der HEBT Tunnel zur Verfügung. Dazu muss die Arbeitsbühne zwischen der Cavewand und Upstream-Plattform abgelassen werden. Anschließend fährt die Arbeitsbühne an der Wand entlang bis zum Personeneingang, wo ein Schwenken der Arbeitsbühne möglich ist.

Figure 4 Schritt 1: Arbeitsbühne Ablassen ins Cave

Figure 5 Schritt 2: Parallel zur Wand fahren und Einschwenken in Personeneingang

Fotorealistic models



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Pictures:

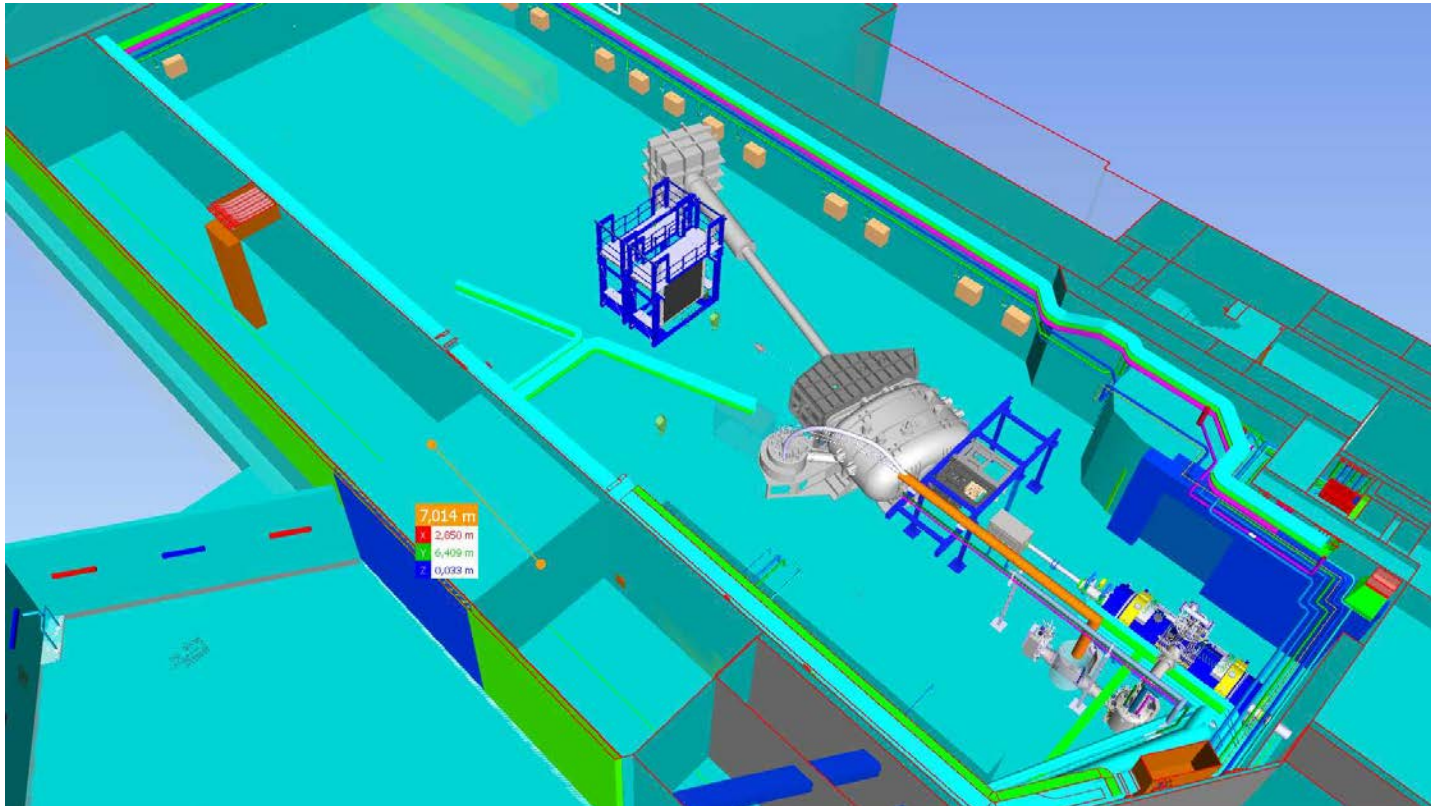
<https://sf.gsi.de/d/fbf3312348c348f88a09/>

Videoclips:

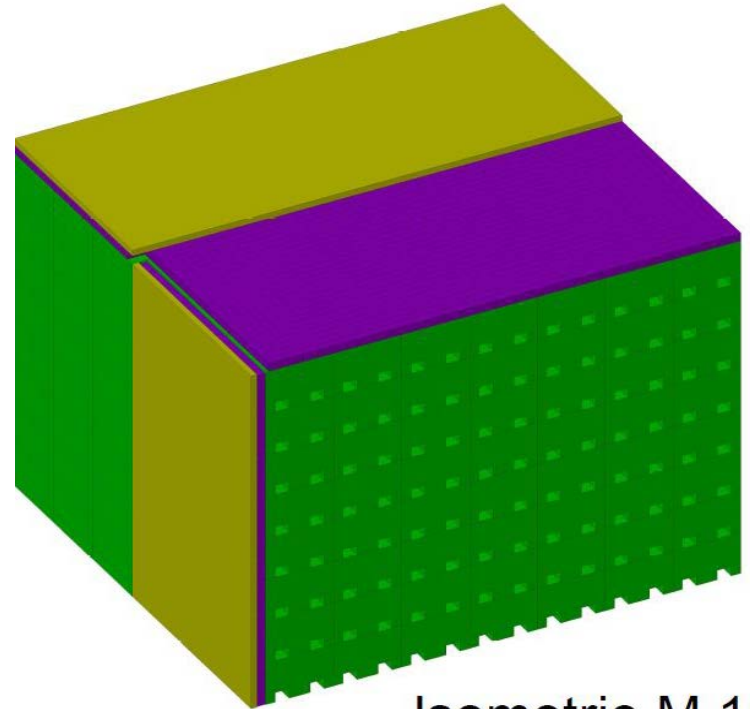
<https://sf.gsi.de/d/345289c2b3244037a8dc/>

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Mobile wall to outside

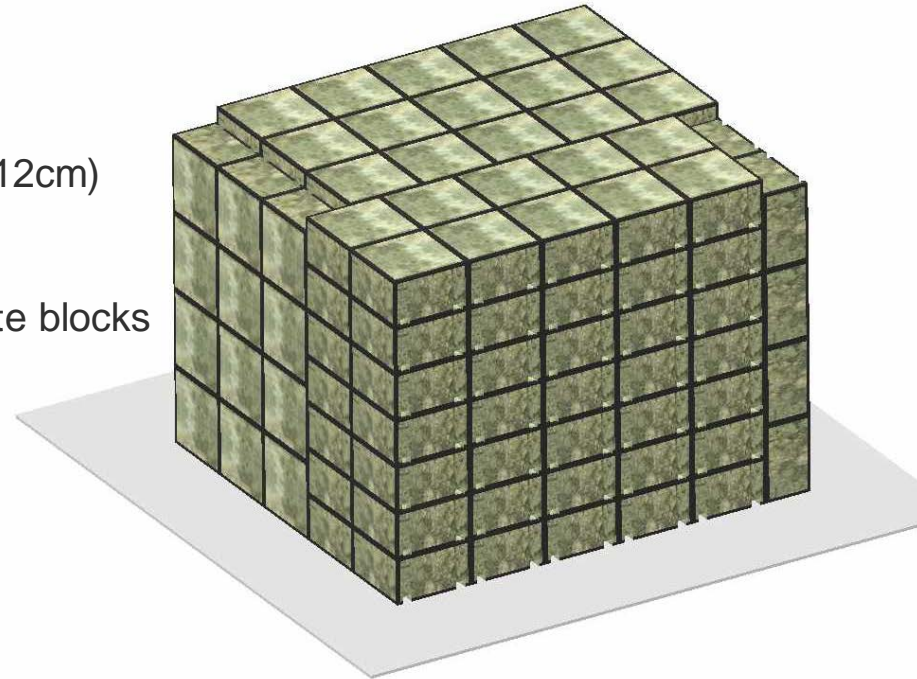


- $6,5\text{m} \times 7\text{m} \times 5,5\text{m} = 250\text{m}^3 \approx 600\text{ t concrete}$
- **Concept (FSB)**
 - 336 pcs. x $1,045 \times 0,97 \times 0,66\text{ m}^3$ ($\sim 1,6\text{t}$)
 - already bigger than before
 - 145 square meters paving stones ($t=12\text{cm}$)
 - 14,5 qm hematite
 - 2 months time for installation

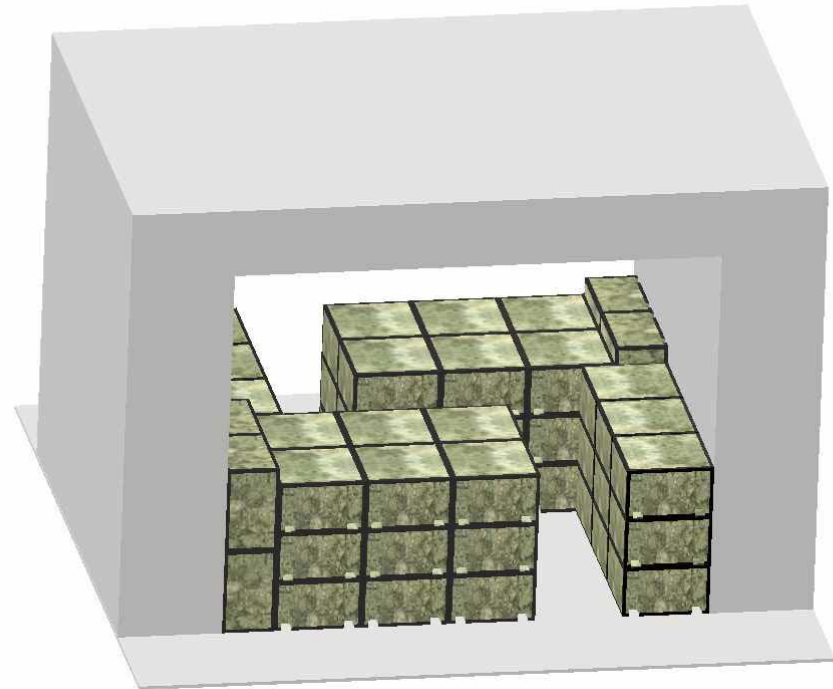


Isometric M 1:50

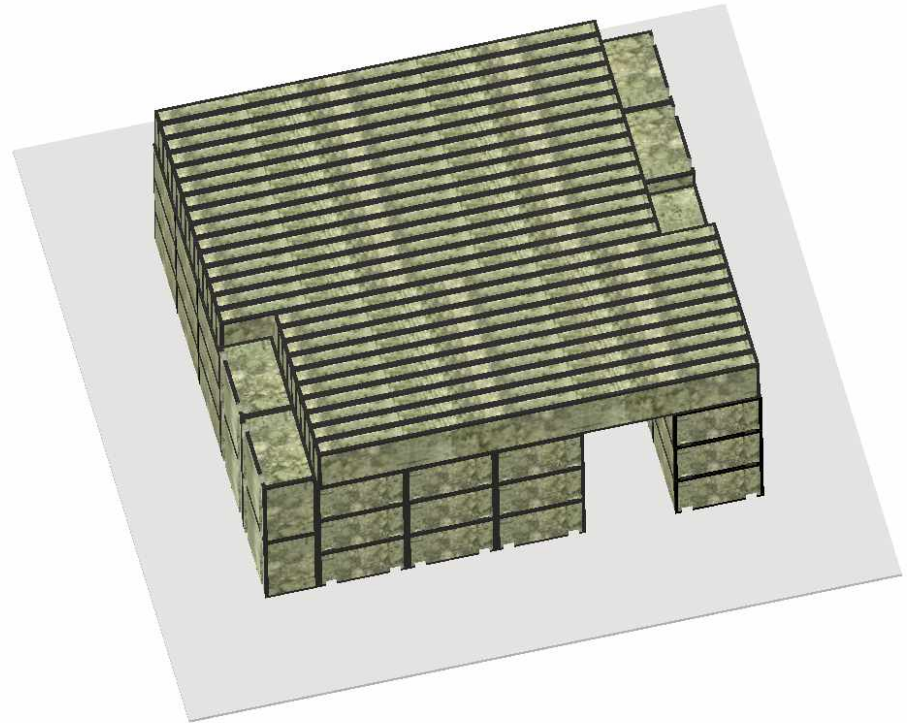
- **6,5m x 7m x 5,5m = 250m³ ≈ 600 t concrete**
- **Concept (R3B)**
 - 195 pcs. x 1,25 x 1,25 x 0,75 m³ (~2,8t)
 - few square meters paving stones (thickness 12cm)
 - few qm hematite
 - faster than the other concept
 - easy combination with standard FAIR concrete blocks
 - upright (20) and lying (175)
 - other future options are open



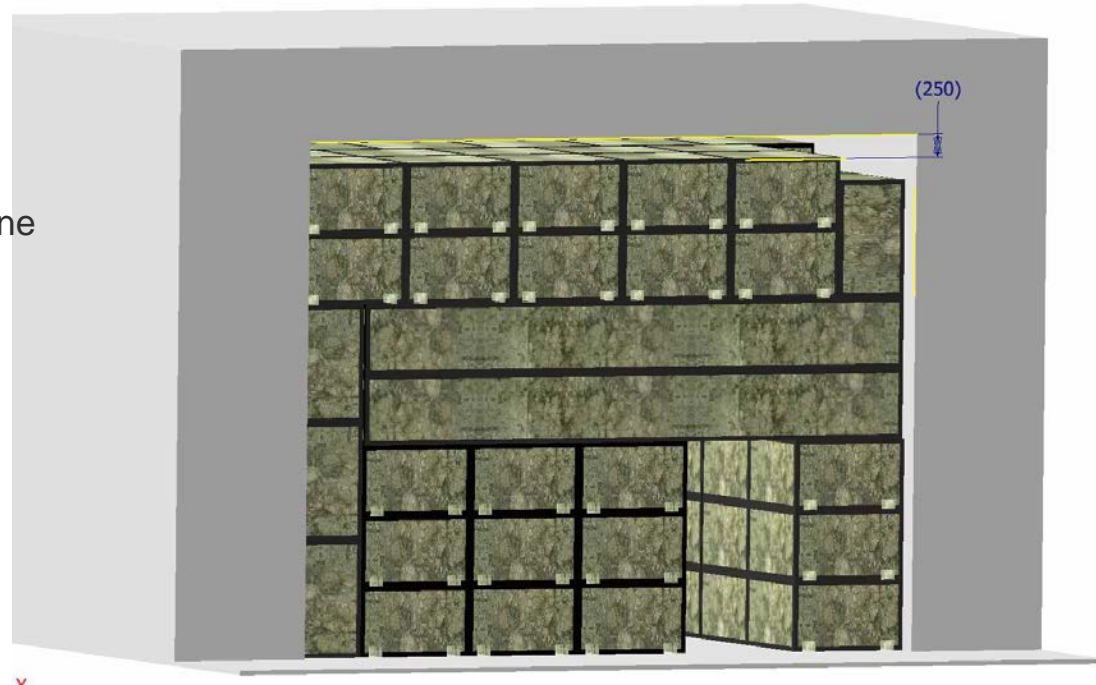
- **Future options (2030++)**
 - feasibility study
 - Fire protection concept
 - Ventilation system
 - Escape route concept
 - Radiation (Sullivan estimation done
FLUKA calculation ongoing)



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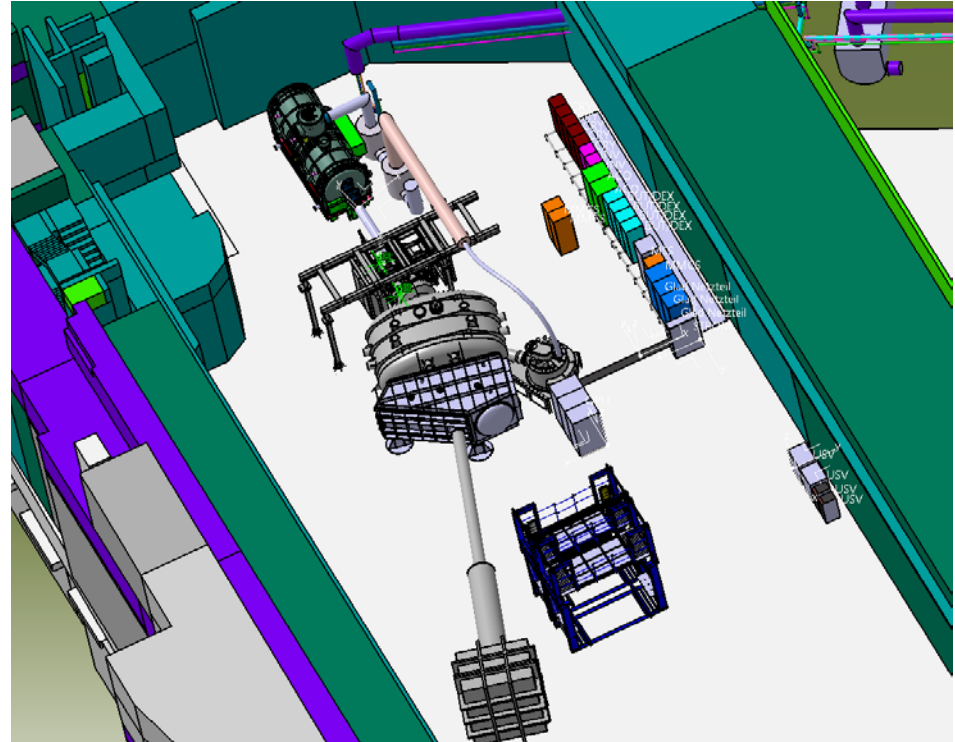
Mobile wall to outside

- lifting tests has been performed



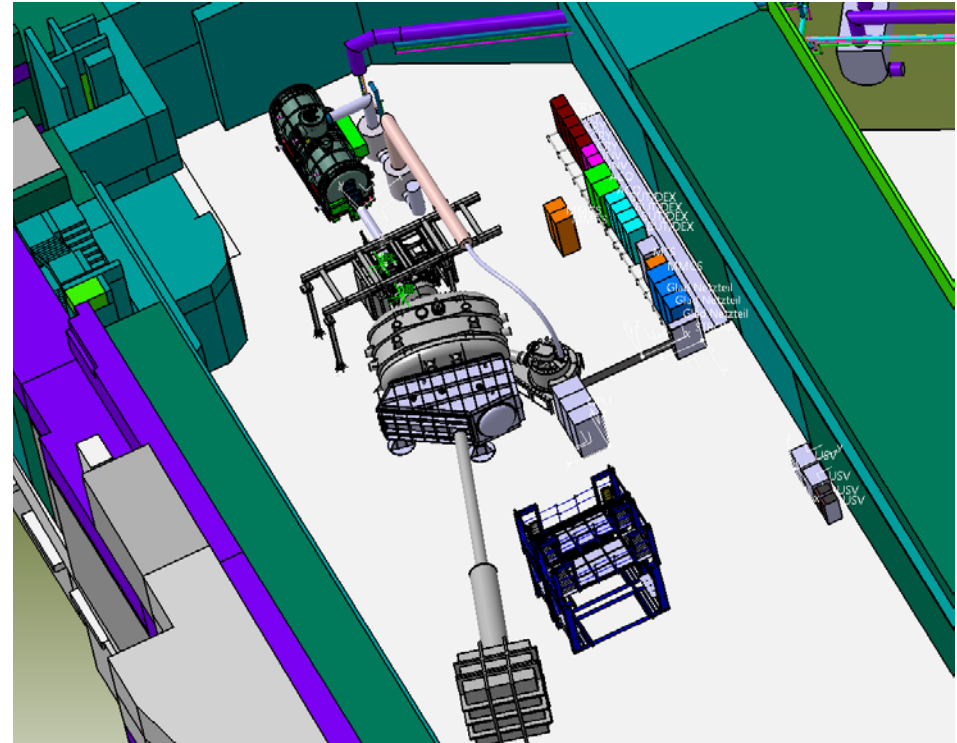
Mobile wall: Rack niche

- **40m³ ≈ 100 t concrete**
 - ~35 Blocks (1,25 x 1,25 x 0,75 m³)
 - E.g. shielding wall
 - 0,75m thick and 2,5 m high
or.
 - 1,25m thick and 2,25m high

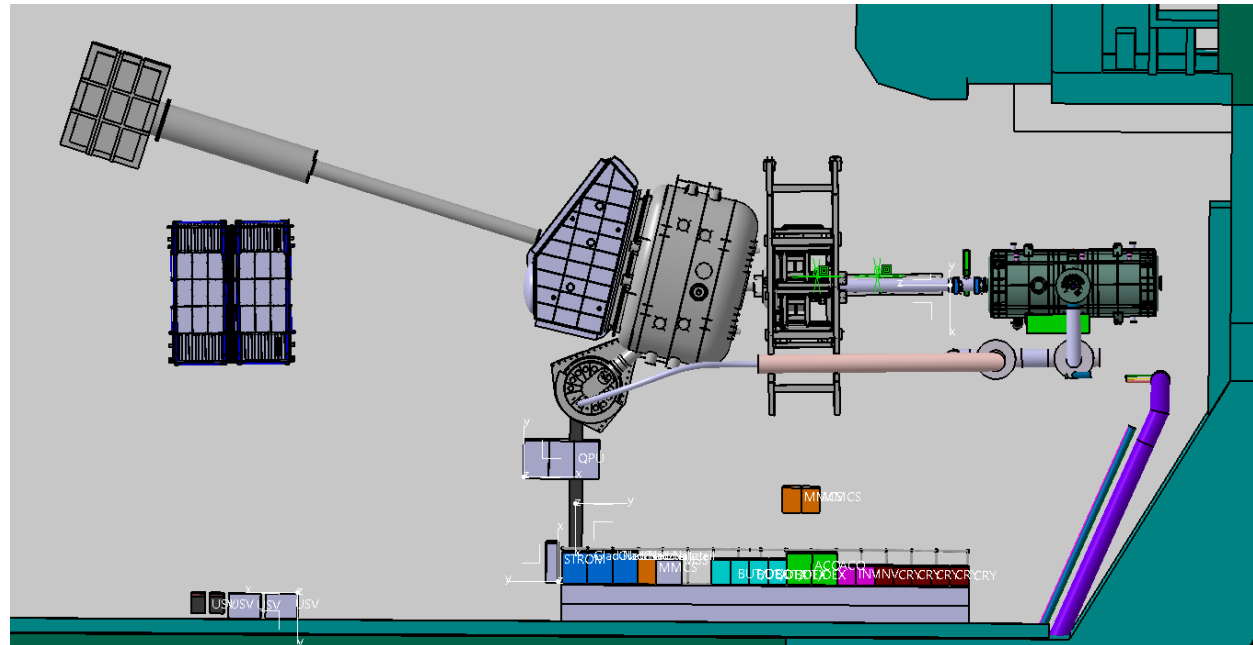


Rack baseframe and double floor

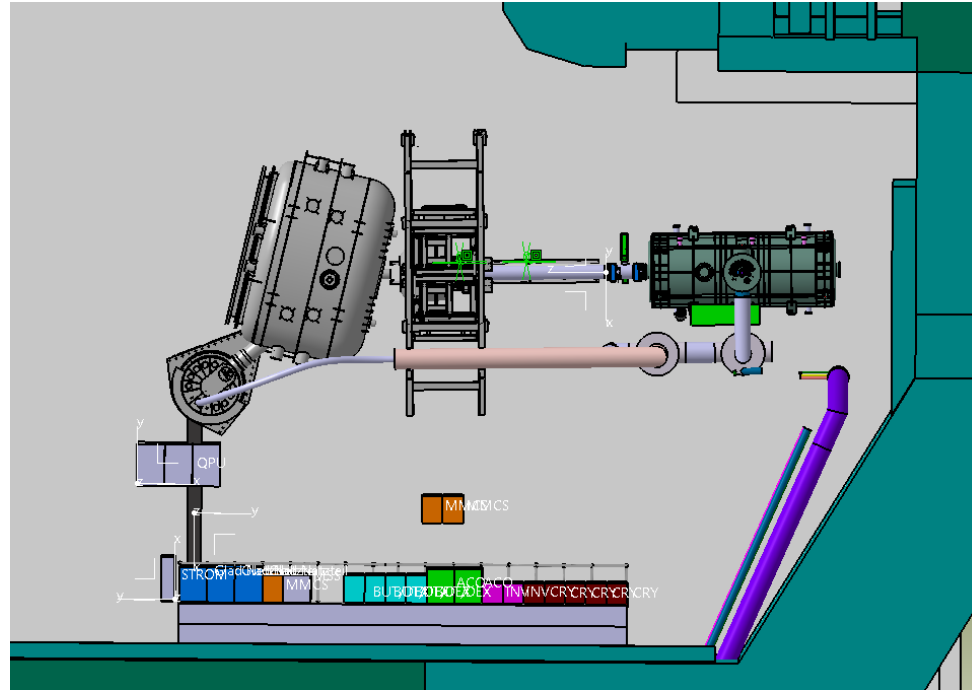
- **Rack baseframe**
 - will be provided by R3B
- **double floor**
 - will be provided by R3B



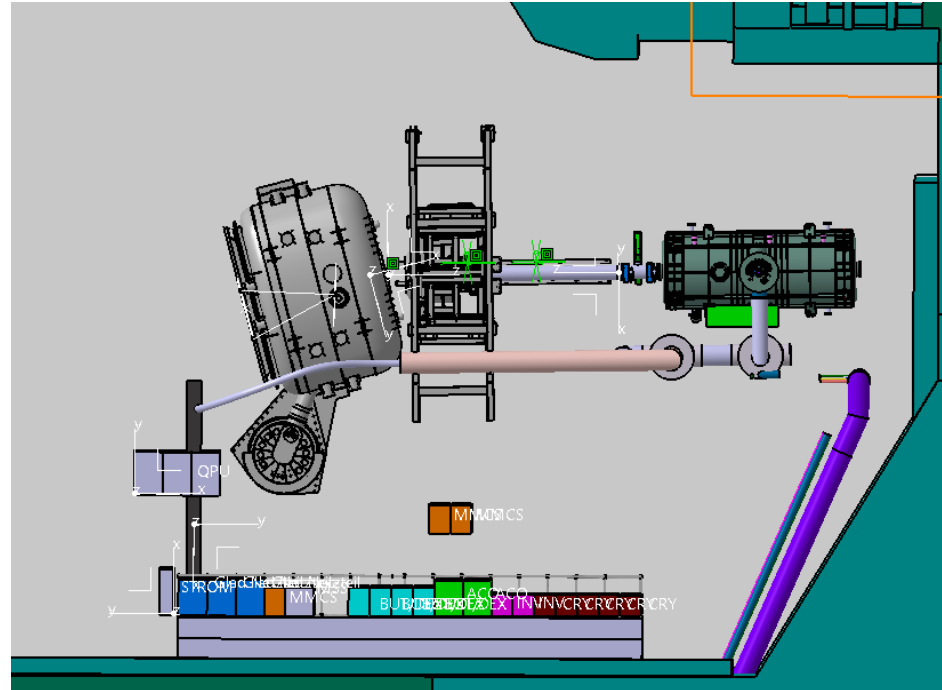
- Standard mode
 - 14°



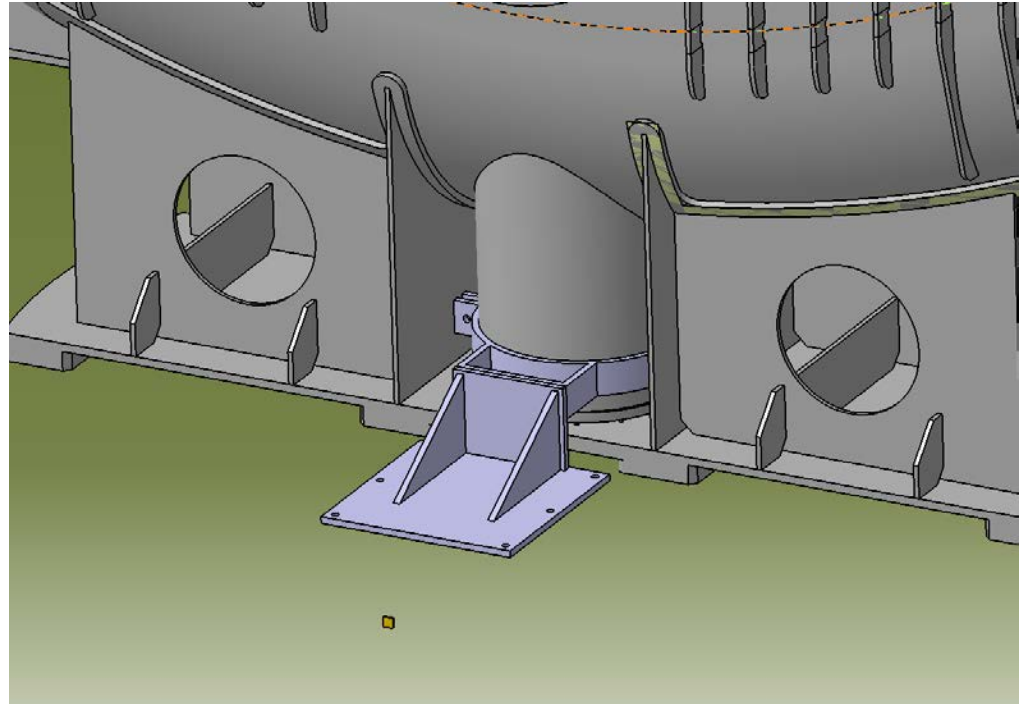
- Standard mode
 - 14°



- HSR mode
 - -14°

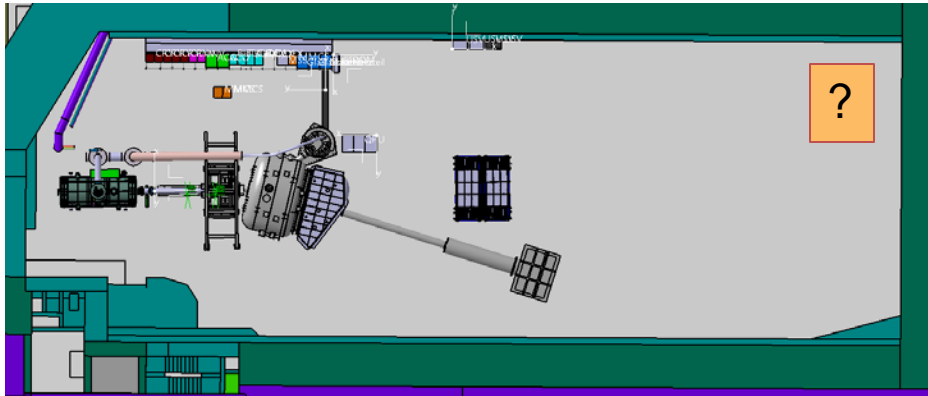


- **Rotation support tool**
 - Design in progress



Vertical Lift Module in HEC

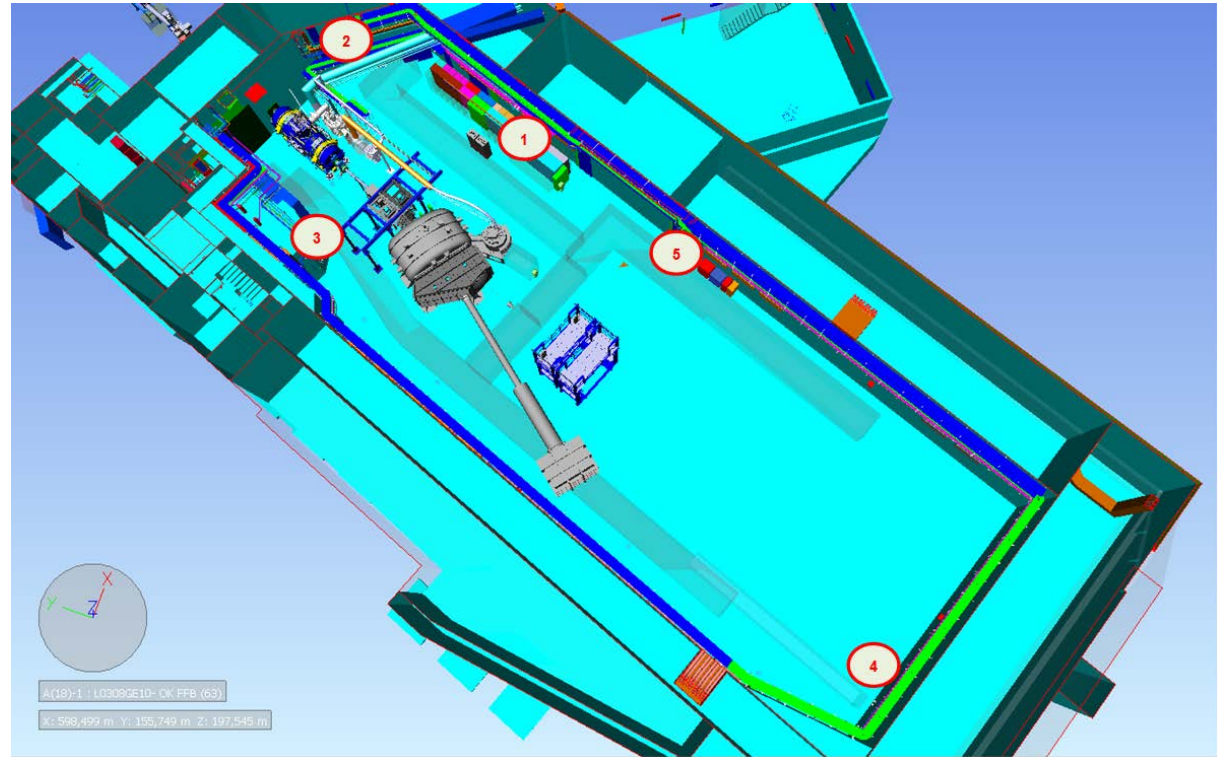
- Vertical Lift Module
 - As soon as it is possible to install



Source: pad-jena.de/

Media supply

- Available media at several supply points:
 - Pressurized air
 - Cooling water
 - Vacuum exhaust pipes
 - Technical gas supply
 - different detector gases, LN₂ and N₂ for flushing of detectors. The according exhaust pipes will be provided as well
 - Gaseous nitrogen
 - for usage of vacuum breaking of the accelerator components, the quality is lower than the quality of the N₂ for flushing of detectors
- There is a document in preparation which gives an overview and details of the media supply and infrastructure



Electrical power – planning status 2023

- Power distributors of Type A and B for general usage
 - Type A: 4xSchuko + 1x16A CEE + 1x32A CEE
 - Type B: 4xSchuko + 1x16A CEE
- Additional dedicated supply for (machine) racks in niche
- Additional 150 kW were requested for experimental units
 - details how to distribute still open



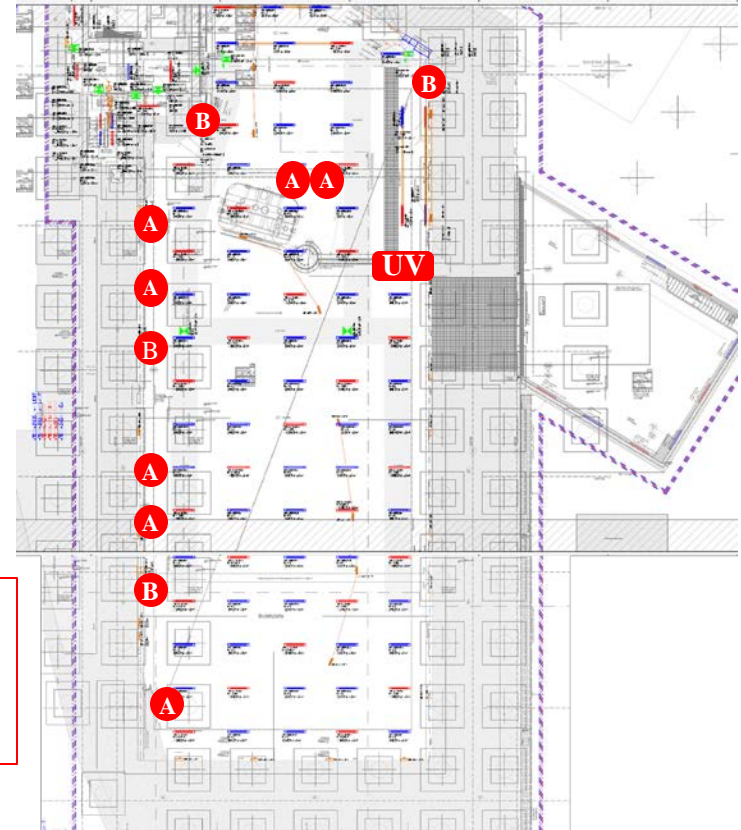
Electrical power – planning status 2024

- The 150 kW for the experimental units will be provided by
 - additional power distributors Type A for experimental components
 - additional subdistributor cabinet („UV“) for GLAD power supply / control and for the UPS units

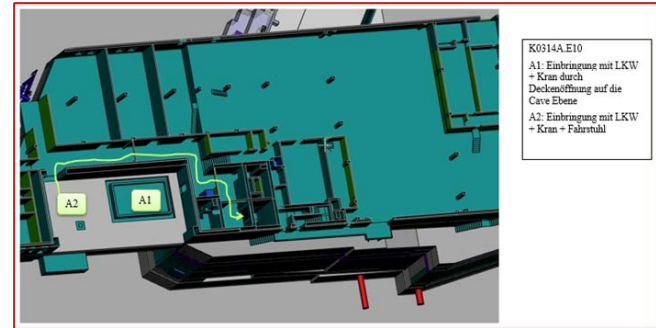
Type A: 4xSchuko + 1x16A CEE + 1x32A CEE

Type B: 4xSchuko + 1x16A CEE

UV: Sub-distribution



- Document has been created with information how to access the NUSTAR caves from in- and outside the buildings
- Recently the information for the access to the tunnel focal planes was added
- Document contains:
 - Description of routes
 - 3D and 2D views of routes
 - Measures
- Document published on EDMS:
<https://edms.cern.ch/document/3060325/1>
- WPLs are asked to check feasibility for transport of their components
- Closer investigation of how to realize transport if necessary



*Thank you
for your
attention*

