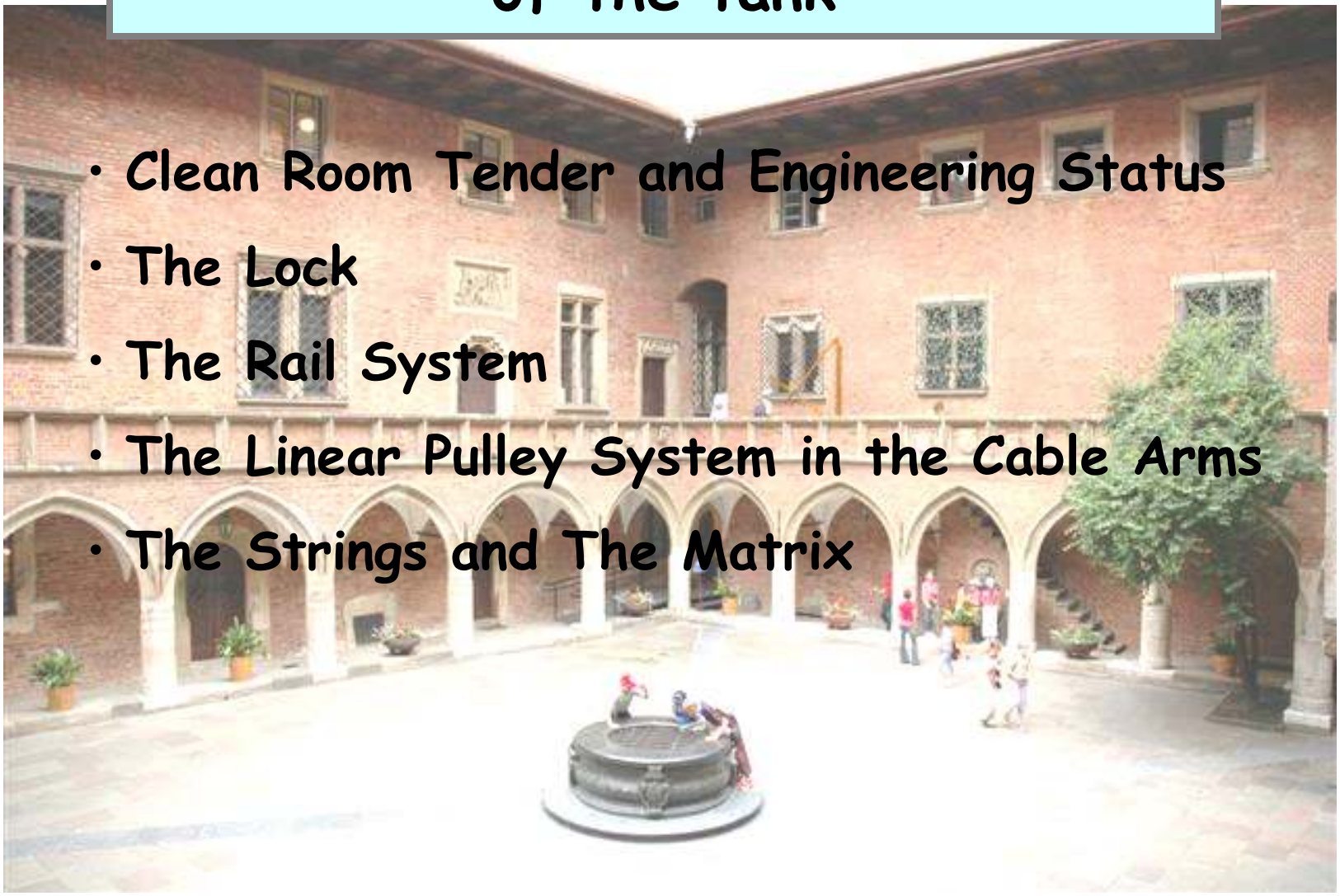
TG5 Review: Infrastructure on top of the tank



- Clean Room Tender and Engineering Status
- The Lock
- The Rail System
- The Linear Pulley System in the Cable Arms
- The Strings and The Matrix

The Clean Room: Tender Status

Engineering company Bergbauer Ingenieure is accompanying the project:

From preparation of the tender documents to clean room certification:

Open tender for participation in limited tender is closed

11 companies participated, 3 companies are invited to submit an offer:

[redacted]

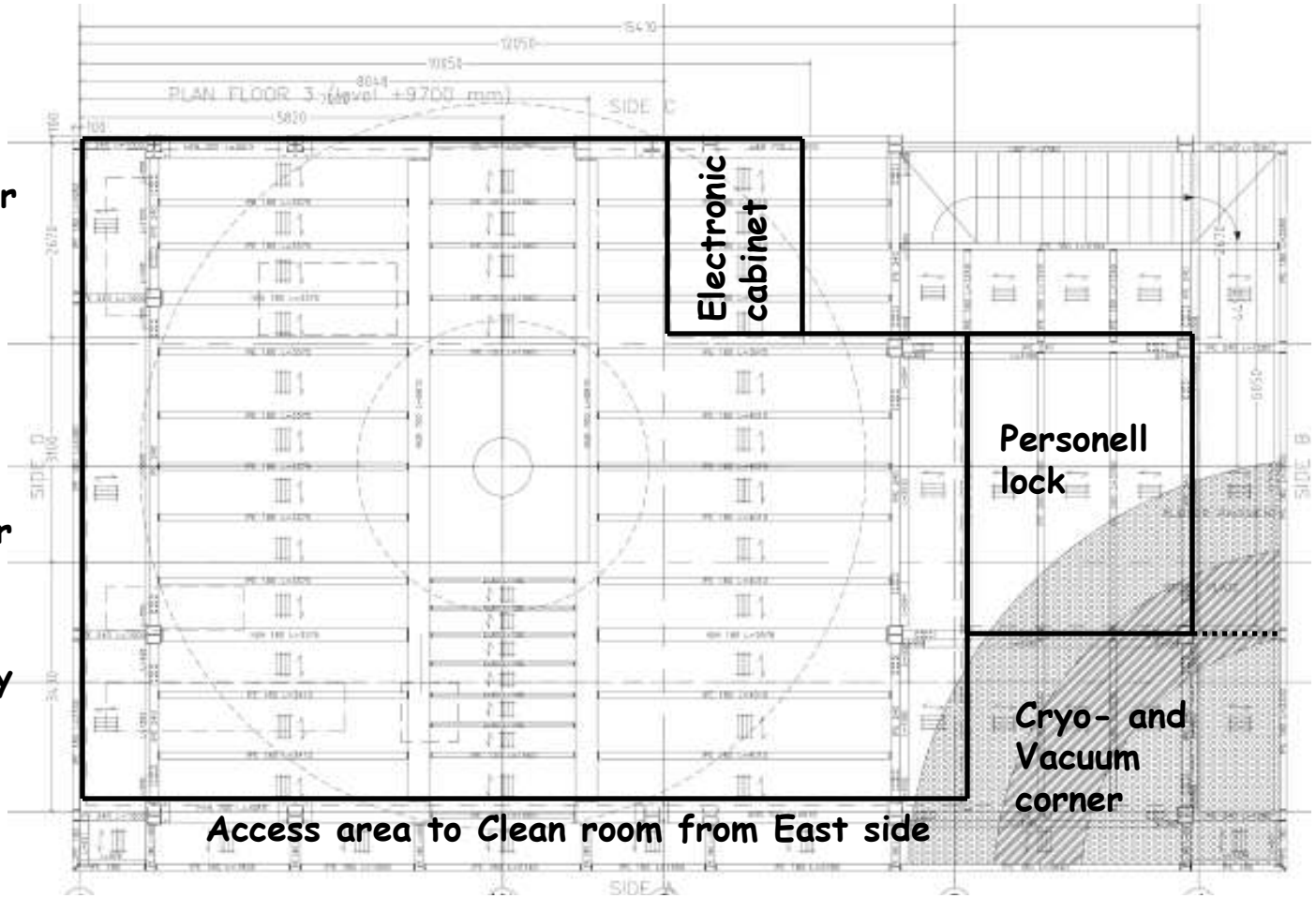
- Tender Specifications are well under way: They will be available to the involved parties (MPI-Physik, MPI-K, LNGS) end of February 2008 for review.
LNGS will receive a version in English.
- All Companies will be invited for observation of LNGS localities.
Envisioned date for visits: March 10,12 and 14, 2008.
Deadline for submission of offer: CW16
Signing of Contract: CW 18 (end of April 2008)
-We will have a dedicated meeting for superstructure-clean room interface:
Participants:
-LNGS: Stefano Gazzana, Matthias Junker (?), Paolo Martella,
-MPI-Physik: Bela Majorovits, K.H. Ackermann (?), Hans Seitz (?),
-MPI-K: K-T Knoepfle (?),
-Superstructure company engineer, Mr. Oberholzner from Bergbauer Ingenieure
Proposed dates: 11th or 13th of March 2008

The Clean Room: Engineering Status

New Footprint of Clean room

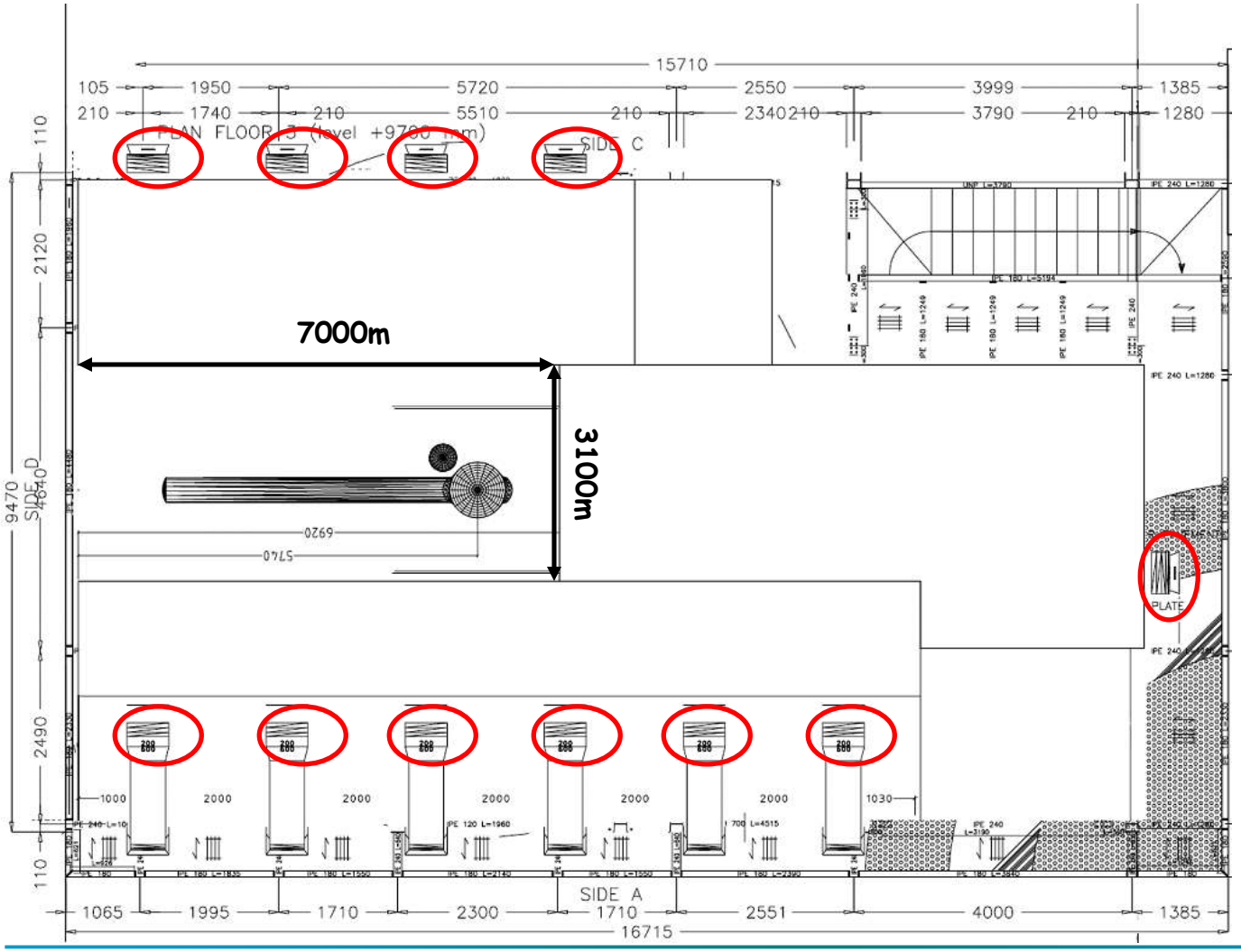
Changes with respect to earlier version:

- No thermal isolation → walls and floor are thinner
- Not gas tight → No Air shower (can be installed later if necessary)
- Access from East side larger → Access to Air-, gas- ad vacuum-pipes → tilt of roof higher, better usage of "low ceiling" space
- Cryo corner seperated by fence → More space available
- Piping for vacuum- and gas-system outside the clean room



The Clean Room: Engineering Status

Air circulation system outside the clean room walls



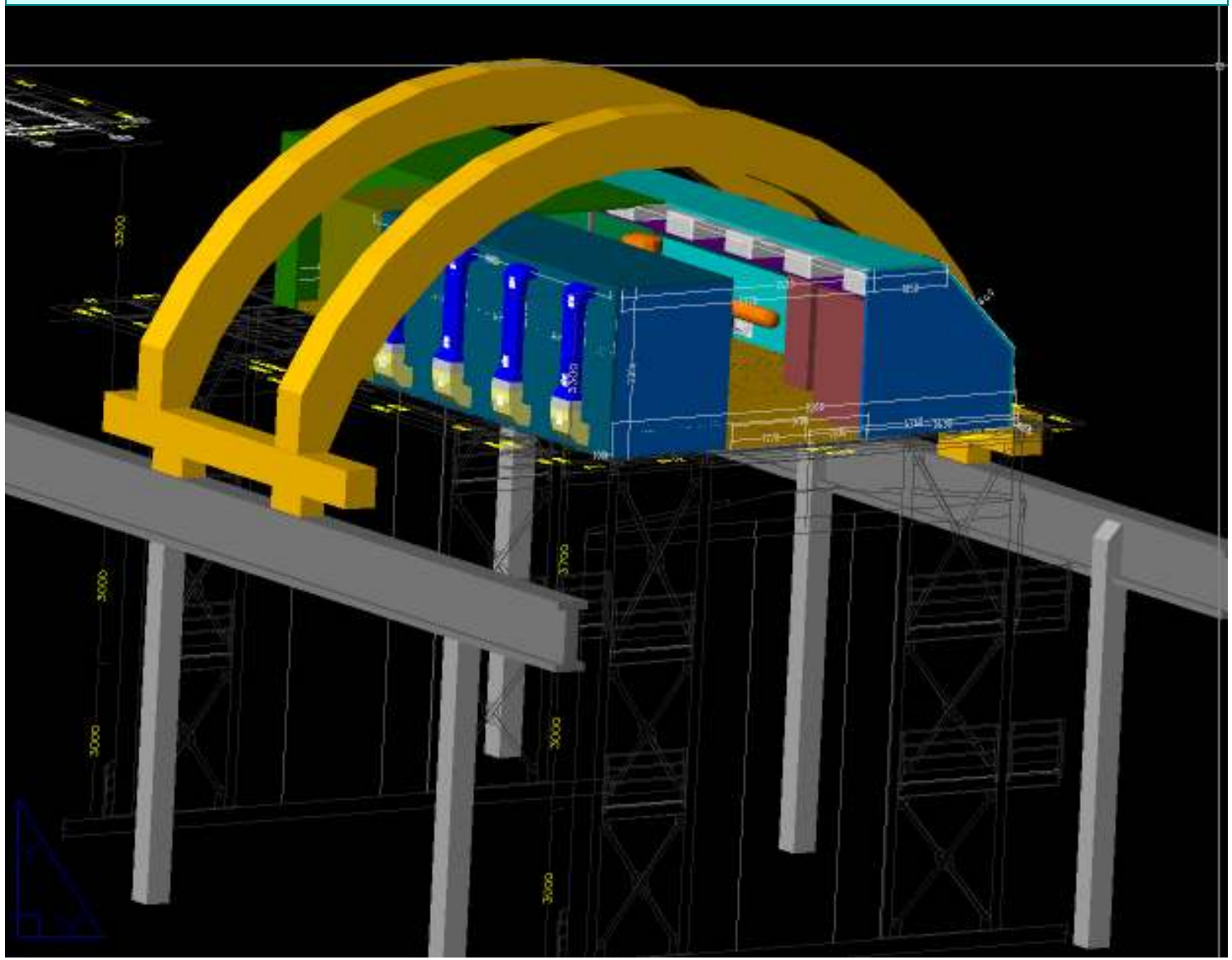
Four chanels on west side
Six channels on East side

One channel for
Personnel lock

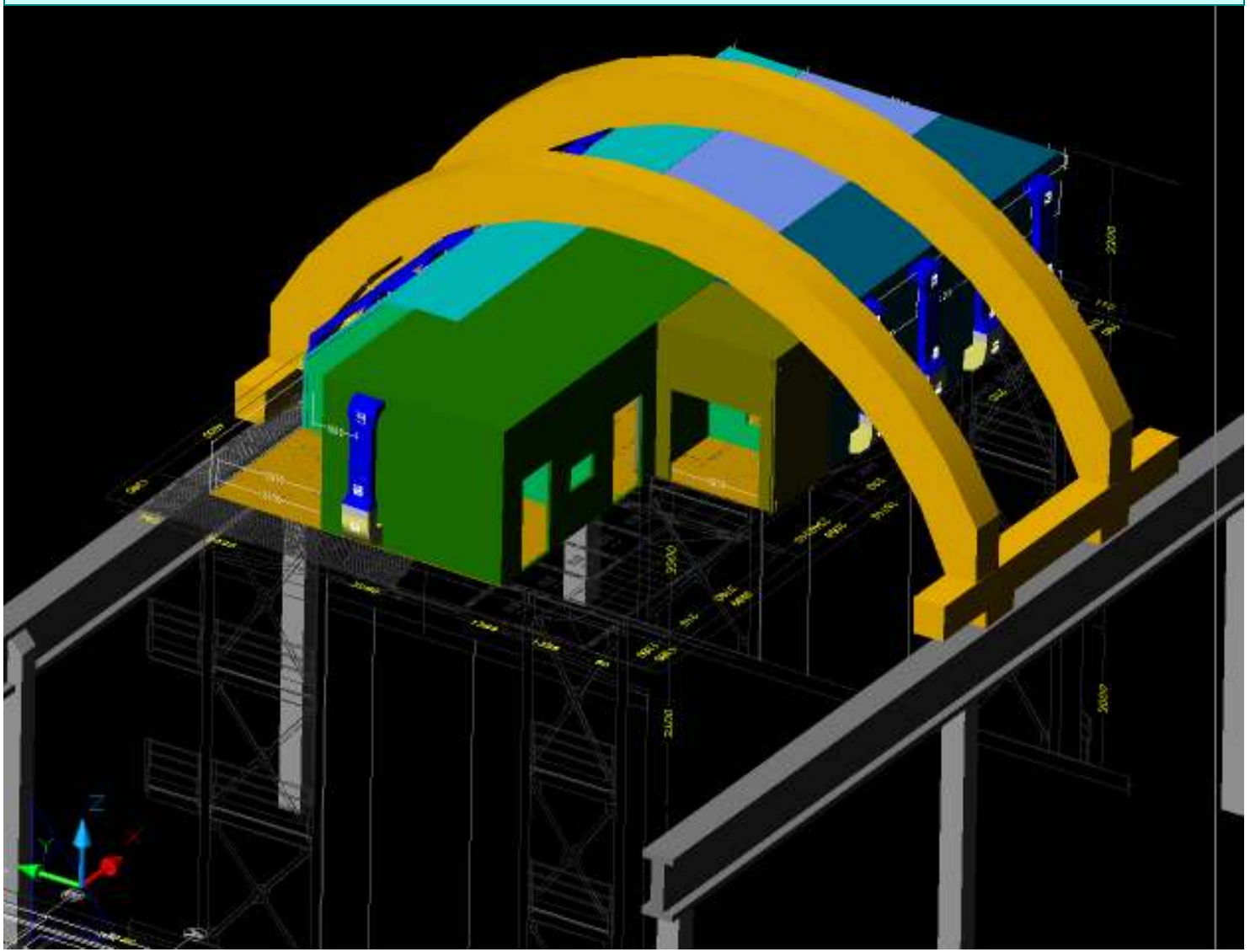
One FFU in Plenum
per cannel

Roof can be removed for installation of lock:
>=7000mm length,
3100mm width

The Clean Room: Engineering Status



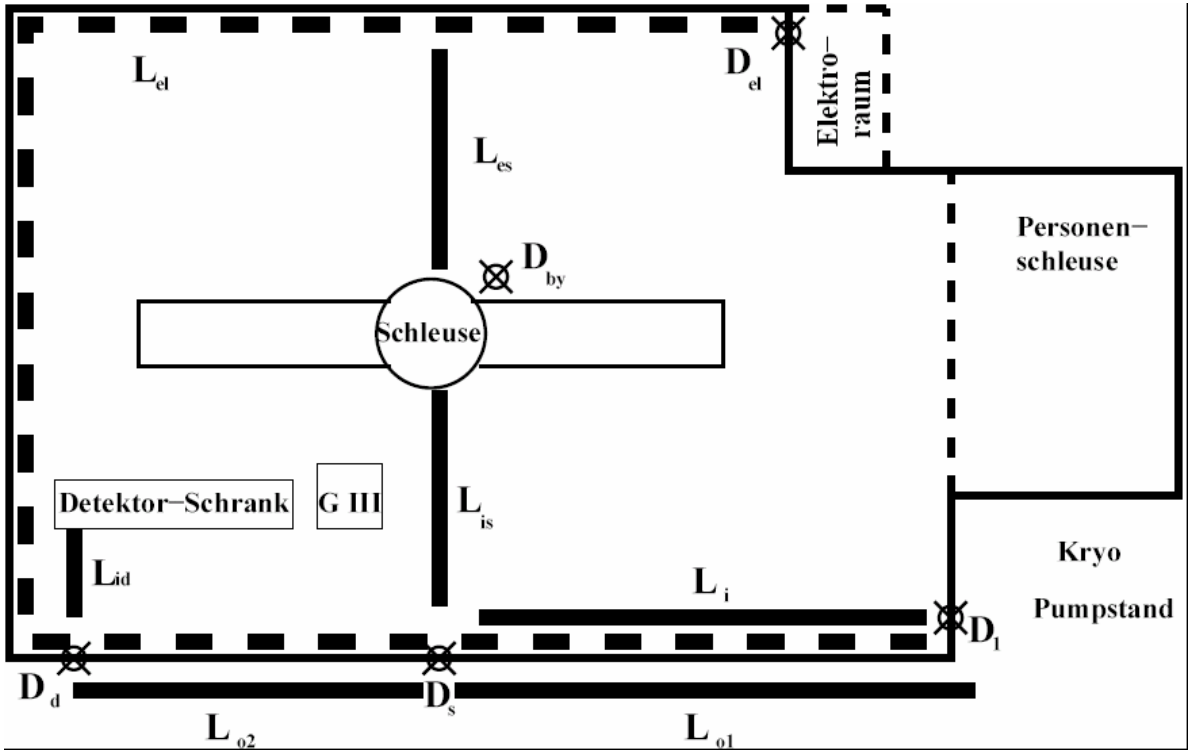
The Clean Room: Engineering Status



The Clean Room: Piping

Piping of Vacuum and gas-system:

1) NW 100 Vakuumleitung fuer innere Schleuse Die Leitung ist nur bis D_s verlegt. Dort sitzt ein Blindflansch. Muss die innere Schleuse gepumpt werden, verlegen wir einen flexiblen Schlauch zur Schleuse.
2) NW 40 Vakuumleitung fuer aeussere Schleuse
3) NW 40 Vakuumleitung fuer Detektor-Storage System
4) NW 40 Vakuumleitung fuer Gerdalinchen III
5) NW 25 Abgas Reinstargon zum Wiederverwerten Schleuse?(ausserhalb des Reinraum dann 1/2" Abzweig fuer Radonmonitor
6) NW25 Abgas Gerdalinchen III
7) 1/4" Gaszufuehrung Reinstargongas fuer Schleuse
8) 1/4" Gaszufuehrung Detektor Storage
9) 1/4" Gaszufuehrung Stickstoff (Druckluft 9bar) aus Flasche oder sonstiges.
10) 1/2"_isol Durchfuehrung Abpumpen LAr aus Gerdalinchen
11) 1/2" Zoll Durchfuehrung fuer Bypass Schieber nicht im Weg, da "direkt in den Reinraumboden - D_by
12) HV und Signalkabel, L_el - D_el
13) HV und Signalkabel von Schleuse zu Wand, L_el, D_el
14) 1/4" Abgas Detektor Schrank
15) 1/2"_isol LAr Zufuehrung Gerdalinchen III



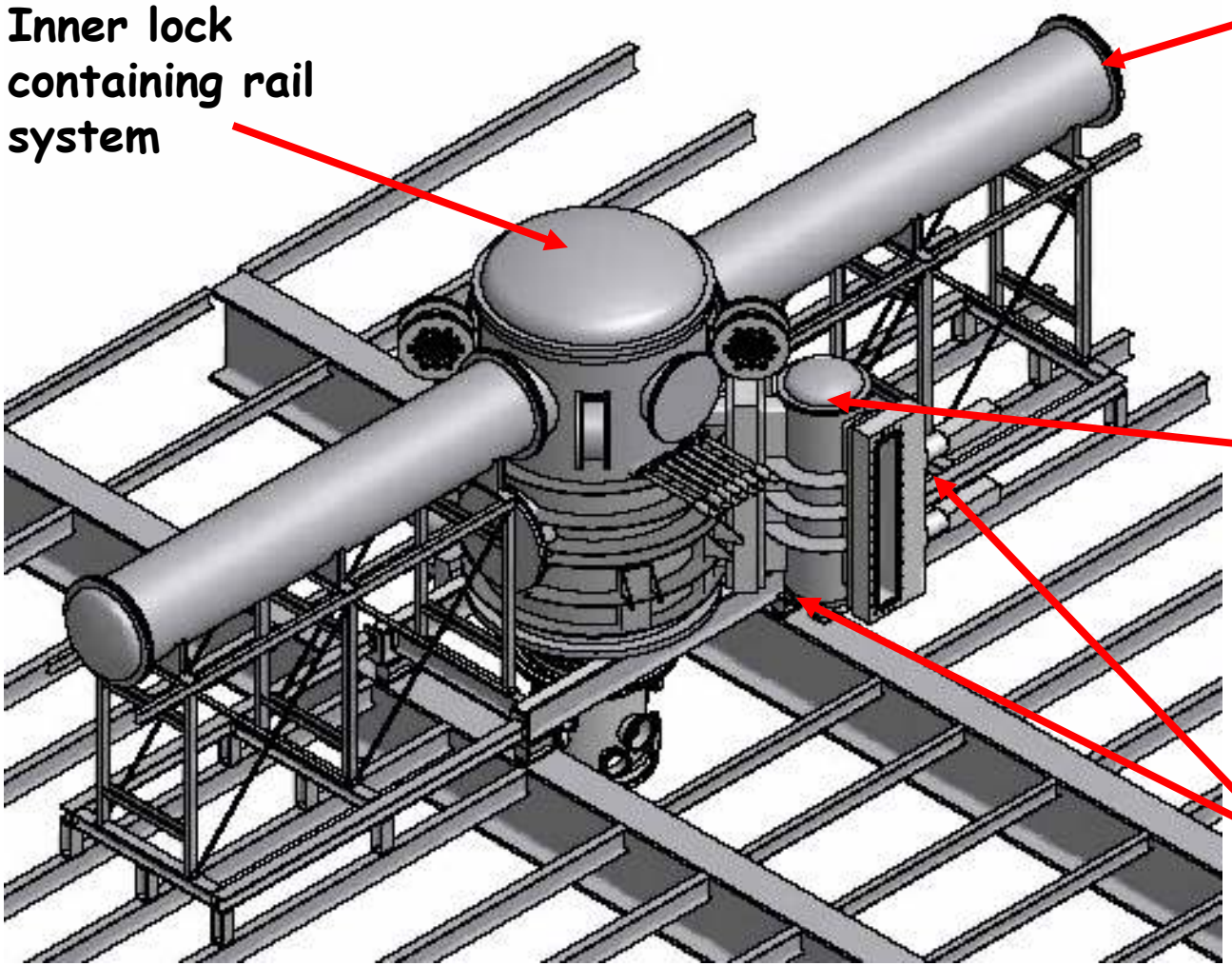
Cable and Piping channels:

L_i: Zuleitung fuer NW 100 Vakuumrohr innerhalb des Reinraums
L_o1: Zuleitung der fest installierten Verrohrungen ausserhalb des Reinraums bis zur Duchfuehrung D_s
L_o2: Zuleitung der Verrohrung fuer Detektorschrank und GII zwischen D_s und D_d
L_is: Zuleitung der fest installierten Verrohrung zur Schleuse von D_s zur Schleuse. Kanal an der Decke gefuehrt.
L_id: Zuleitung zu Detektorschrank, ?von dort Weiterleitung zu GIII? am Boden
L_el: Zuleitung zum Elektronikraum fuer Kabel Phase I und Phase II Drei seperate Kanaele: HV/Signal/Rest

Feedthroughs:

D1: Durchfuehrung zwischen Vakuum- Kryoecke und Reinraum 1m^2 Platte NW 100 Durchfuehrung fuer Vakuumleitung Schleuse hier.
D_s: Durchfuehrung fuer Leitungen zur Schleuse. Diese sollte auf Hoehe der Bruecke fuer Rohre sein.
D_d: Durchfuehrung fuer Leitungen zu Detektoschrank und GIII In der hinteren Ecke am Boden.
D_by: Durchfuehrung durch Reinraumboden fuer Schieber Bypass.
D_el: Durchfuehrung zwischen Reinraum und Elektroraum

Reminder: the Lock

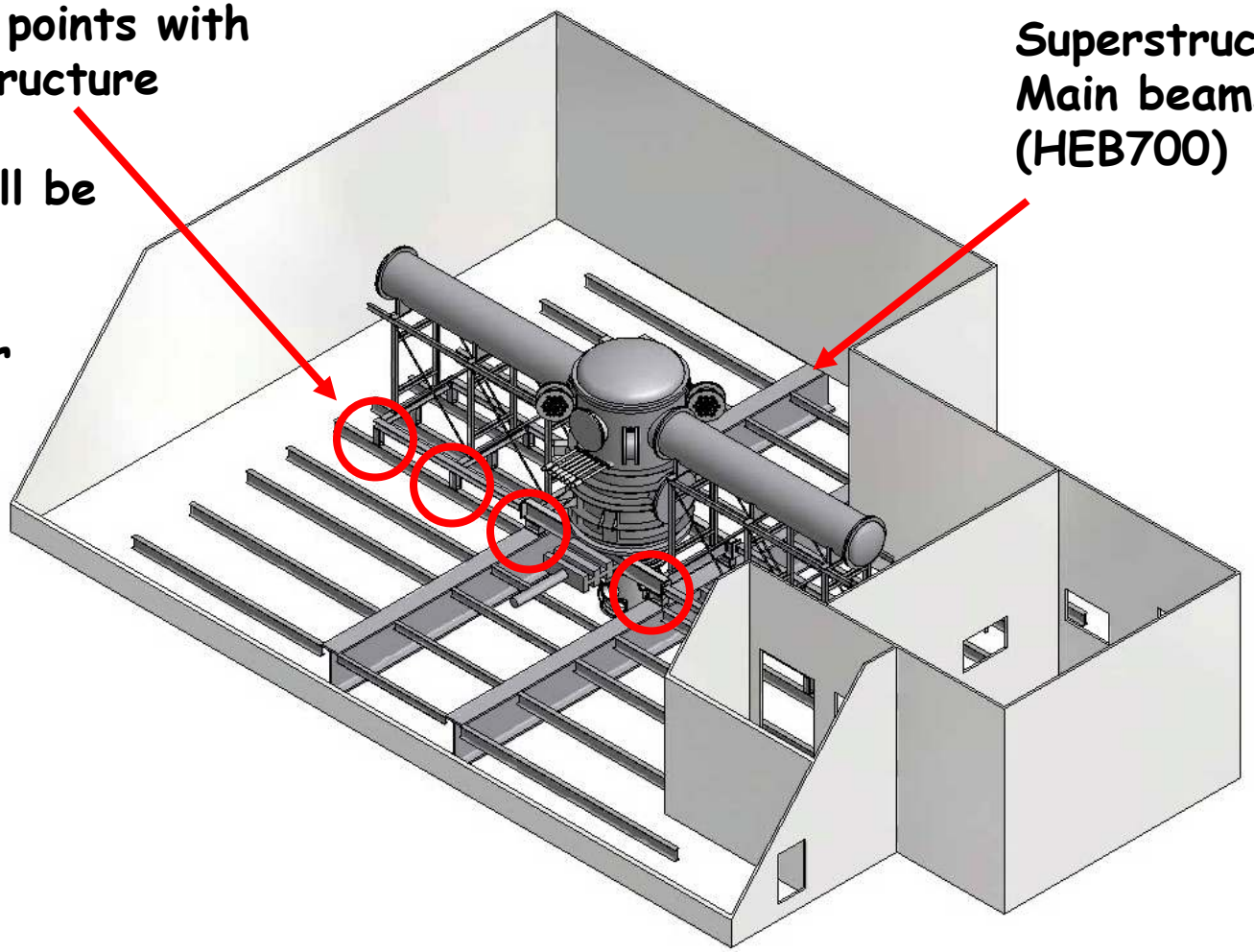


Superstructure-Lock Interface

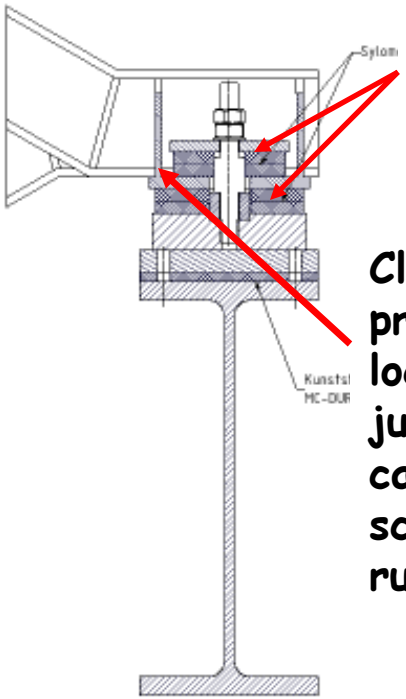
Anchor points with superstructure

Feet will be damped with Sylomer

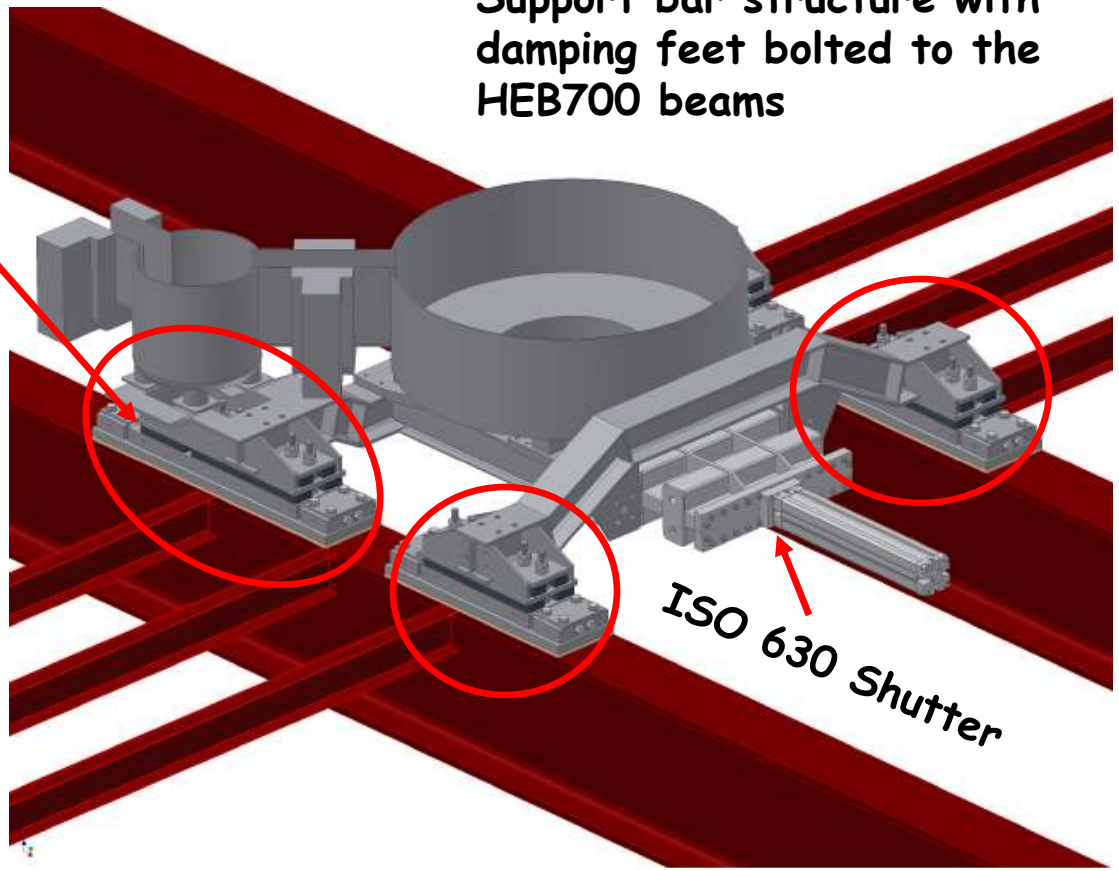
Superstructure Main beams (HEB700)



Superstructure-Lock Interface

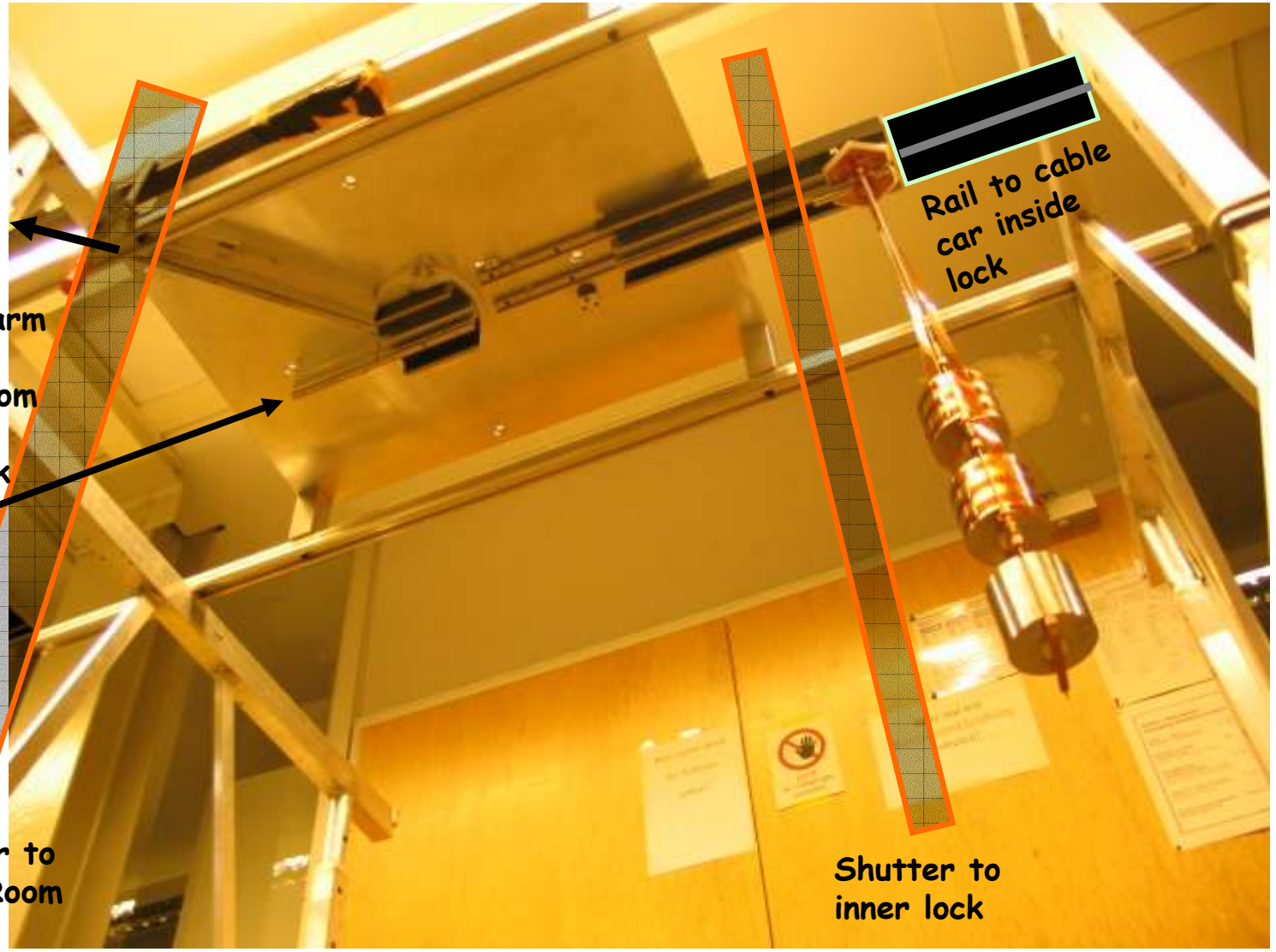


Support bar structure with damping feet bolted to the HEB700 beams



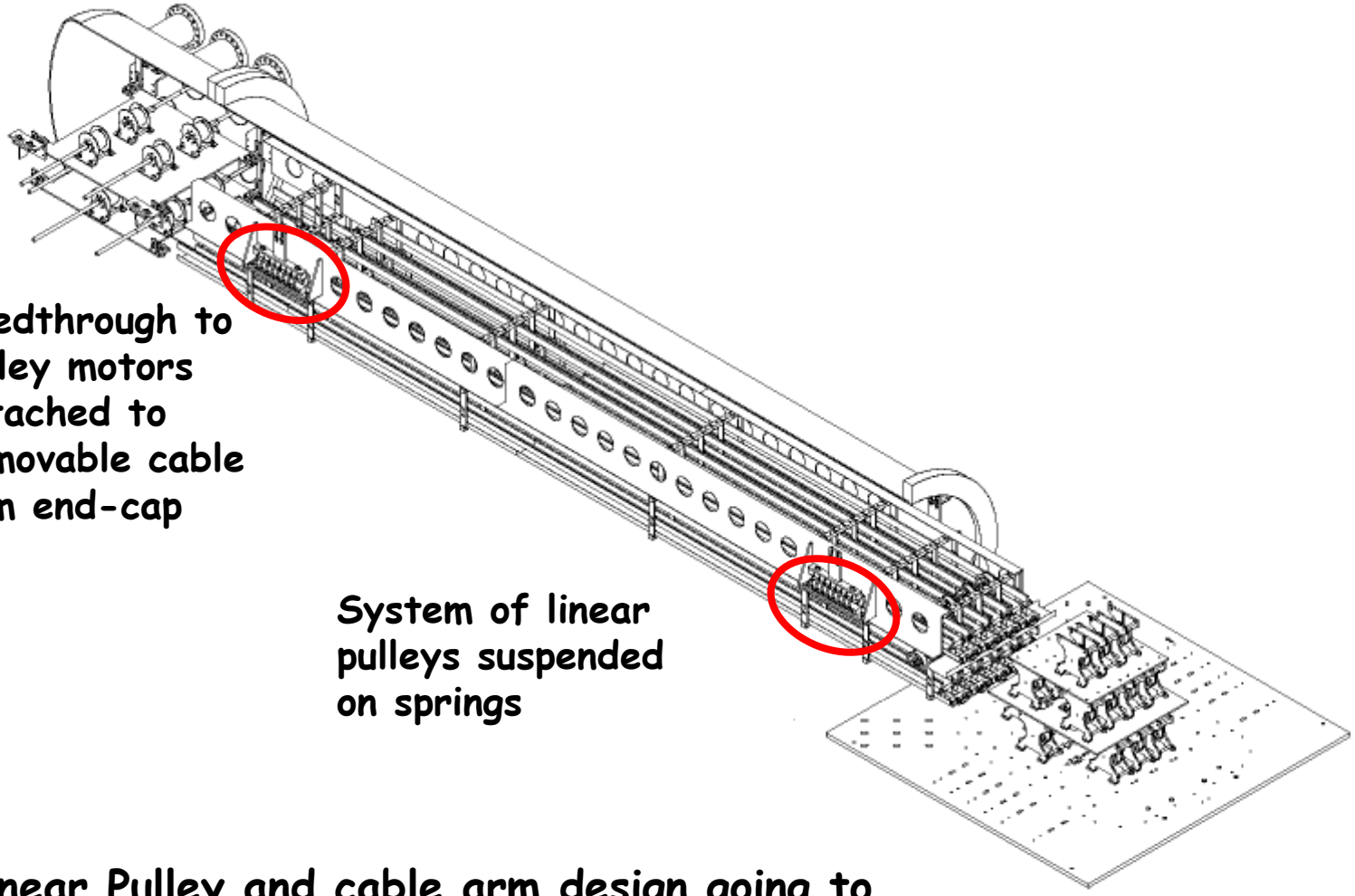
Lock support structure design is finished. Production drawing being made. Structure needs tendering.

Rail System in Outer Lock



Rail System in Inner Lock

The Cable Arms: Linear Pulleys

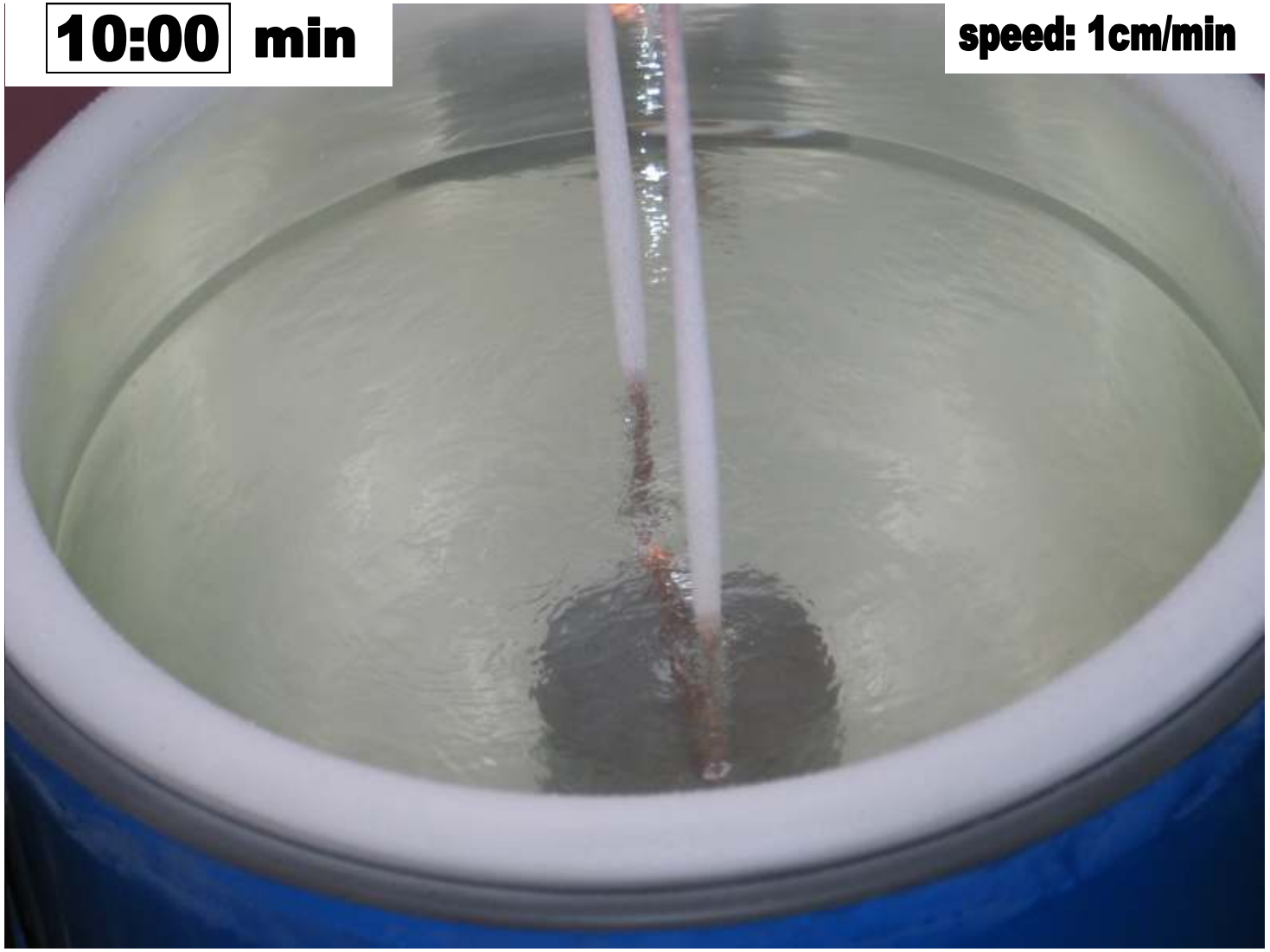


Feedthrough to pulley motors attached to removable cable arm end-cap

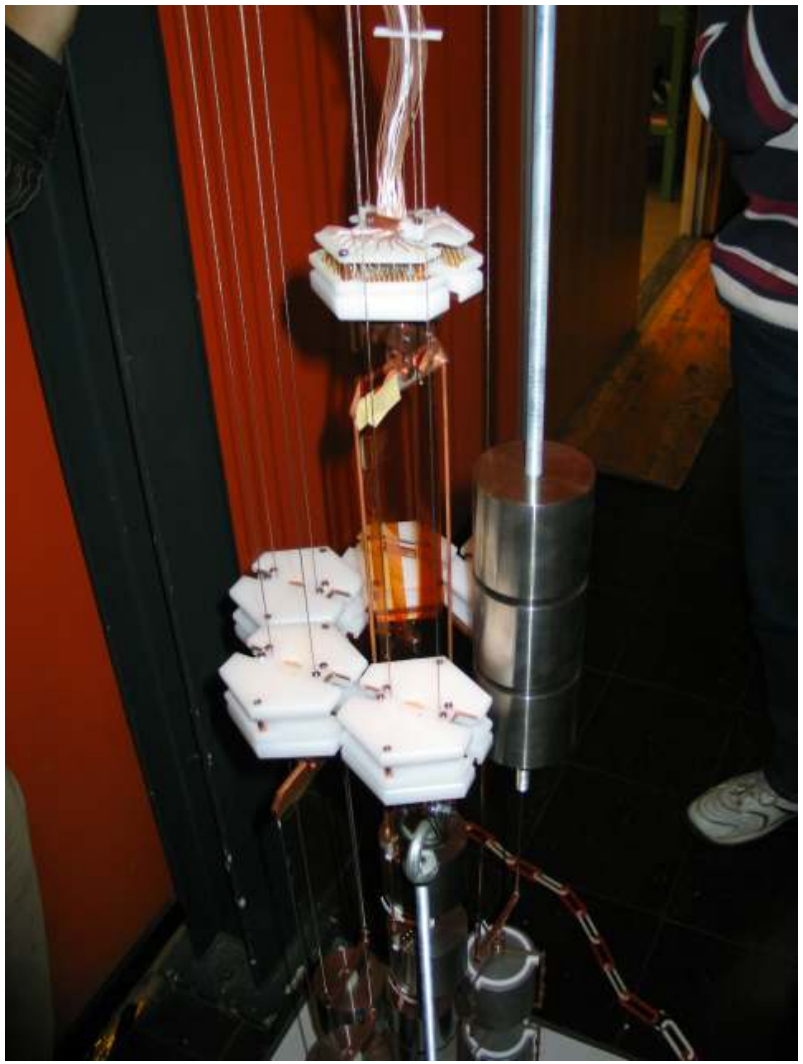
System of linear pulleys suspended on springs

Linear Pulley and cable arm design going to construction end of February.

Submerging a String to LAr

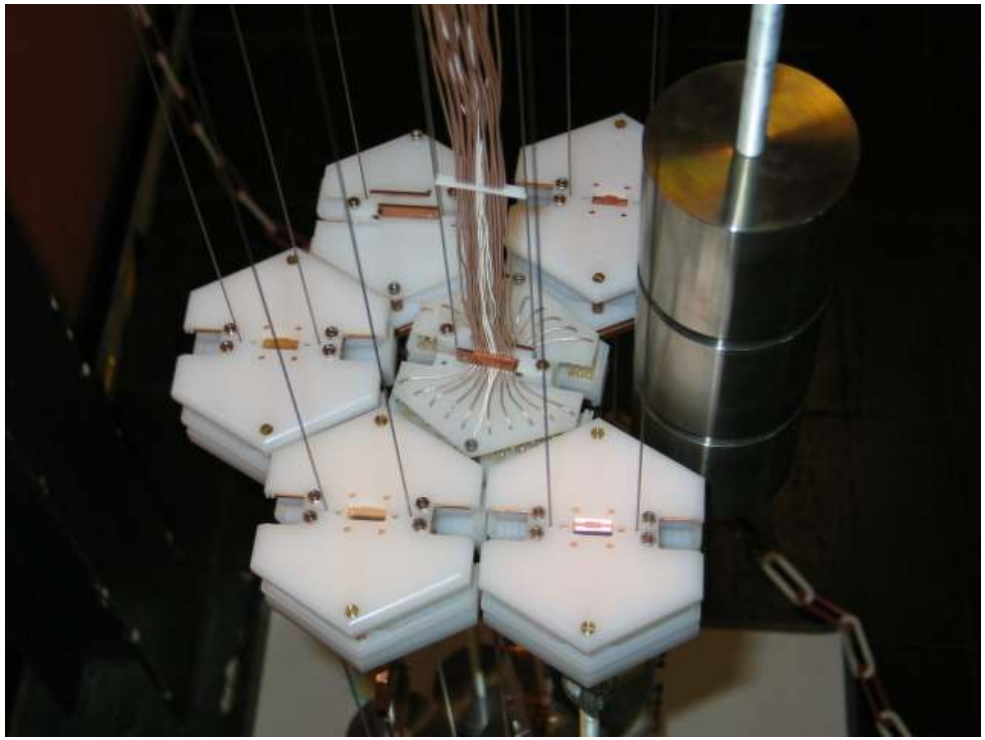


The Array

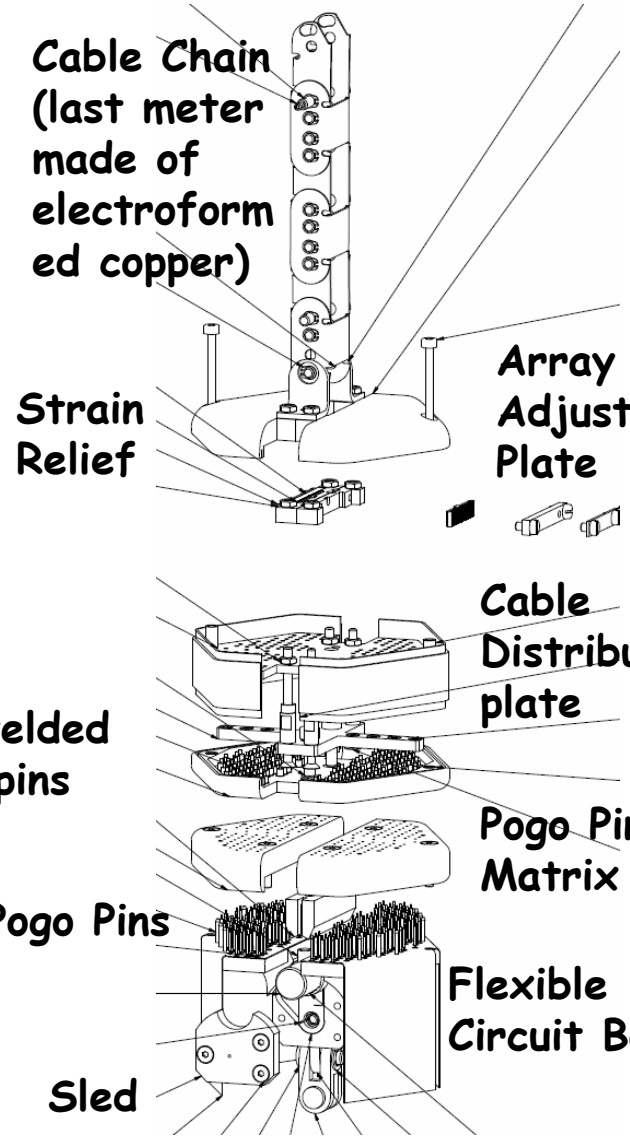


Full array with 7 strings (including Heidlberg one witrh different dimensions) has been tested at mock up system. Two were moving by 4.5m (center and right)

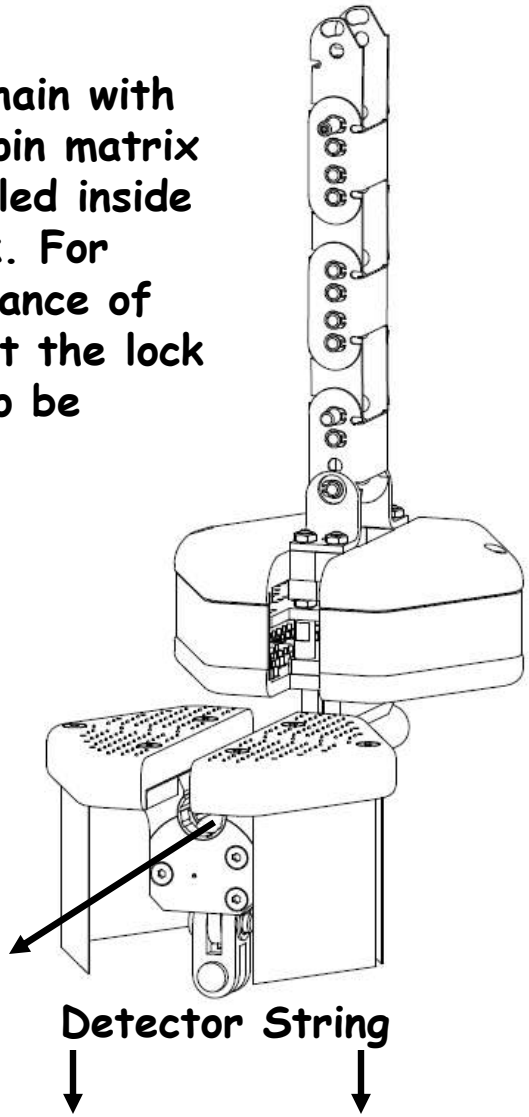
Design finished.



The Connecting Matrix:

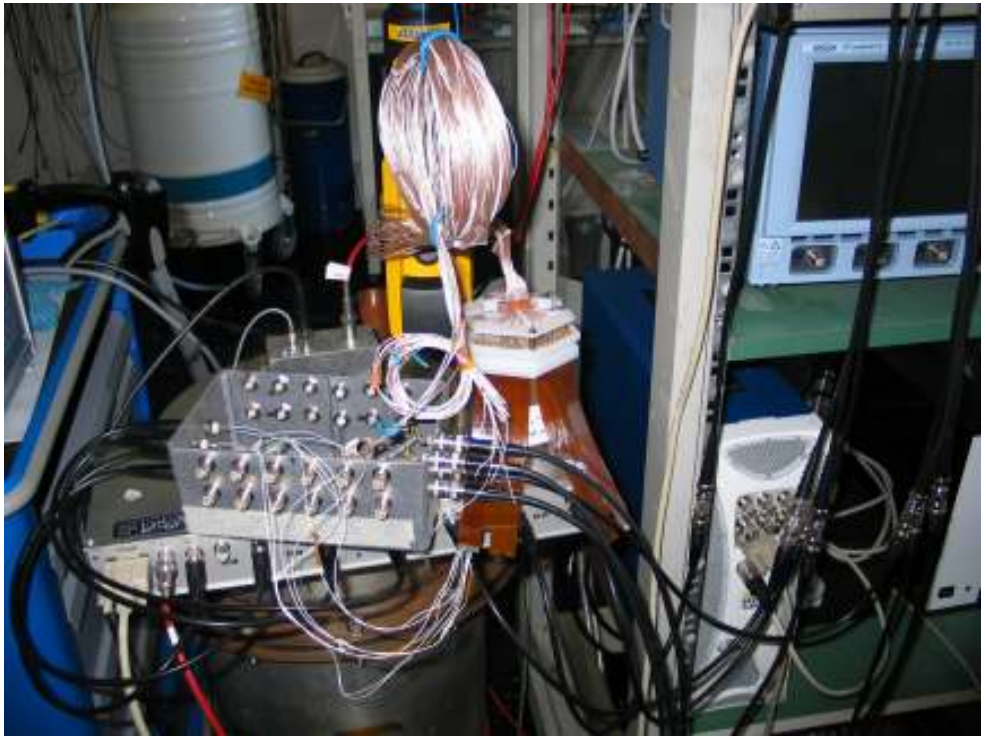


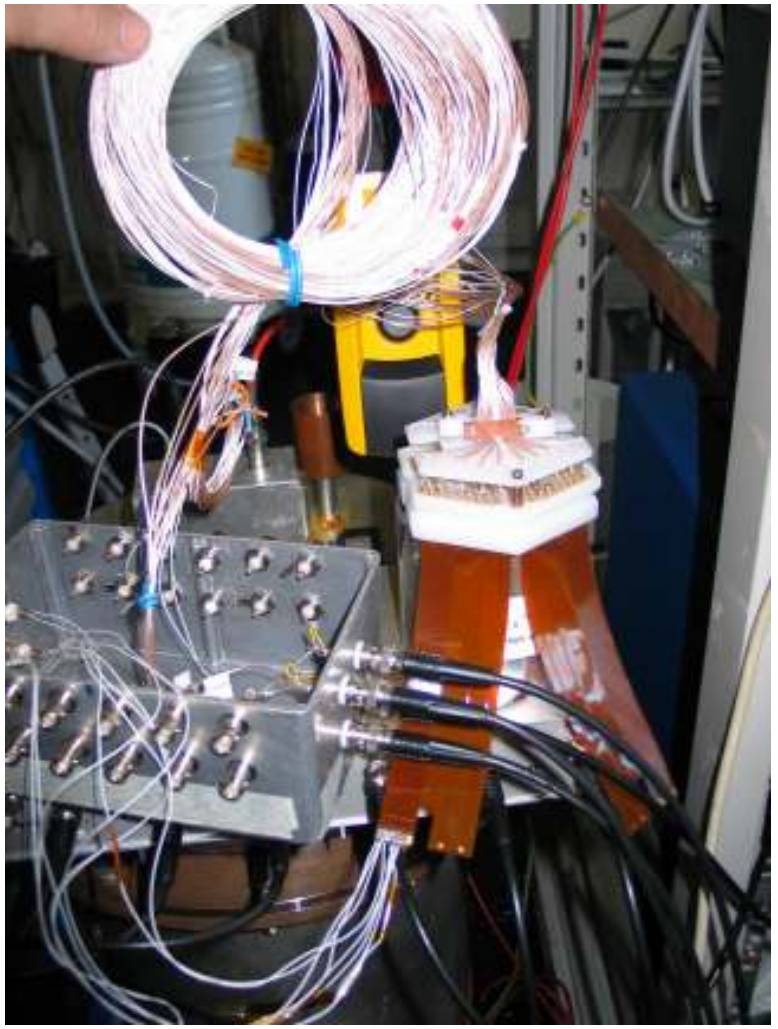
Cable chain with copper pin matrix is installed inside the lock. For Maintenance of this part the lock needs to be opened.



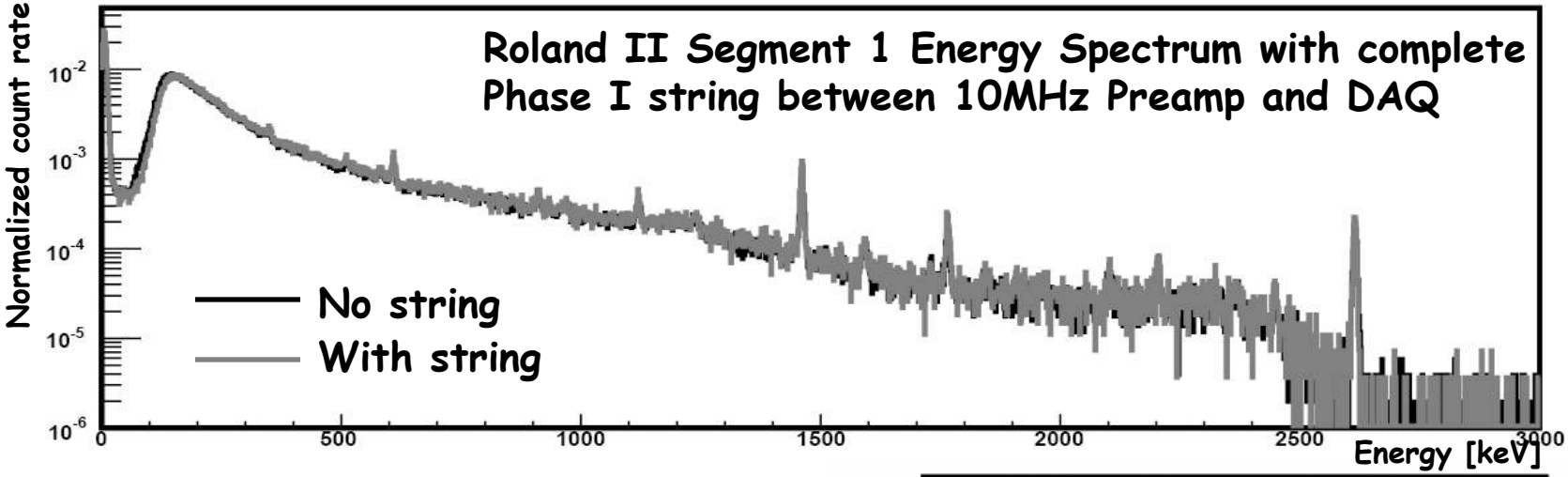
Signal Transmisison Tests:

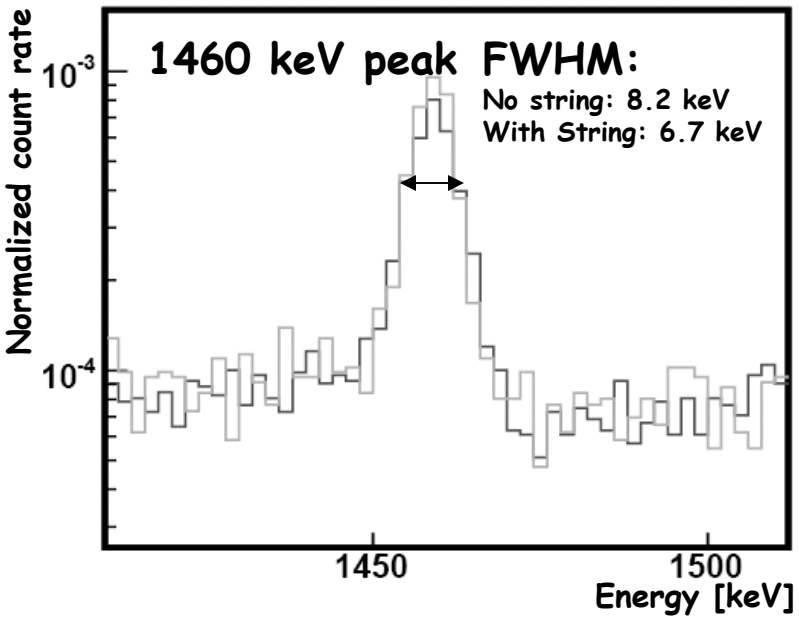
Full Cable Chain tested with HPGe detector:
- 7m of Coaxial signal cable and HV chain
- Cables laser welded to Copper Pin Matrix
- Copper Pin Matrix
- Pogo Pin Matrix
- Flexible Kapton Circuit Board

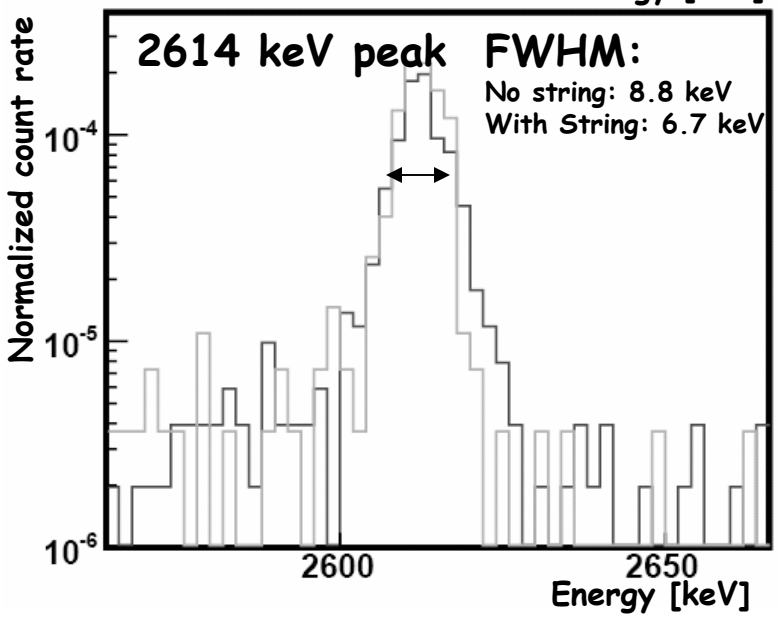




Signal Transmisison Tests:







Conclusion

- Clean Room tender well advanced
- Design and Construction of Lock system very close to being finished
- Production of lock system has commenced
- Phase I Matrix defined and preliminarily tested
- We are on the way !