Site choices for CERN ERL-TF

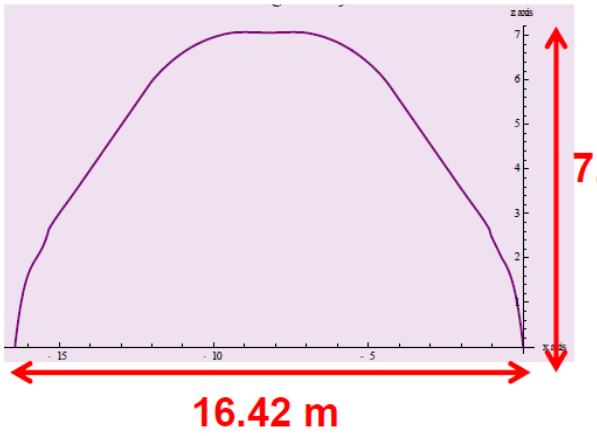
N. Catalan Lasheras

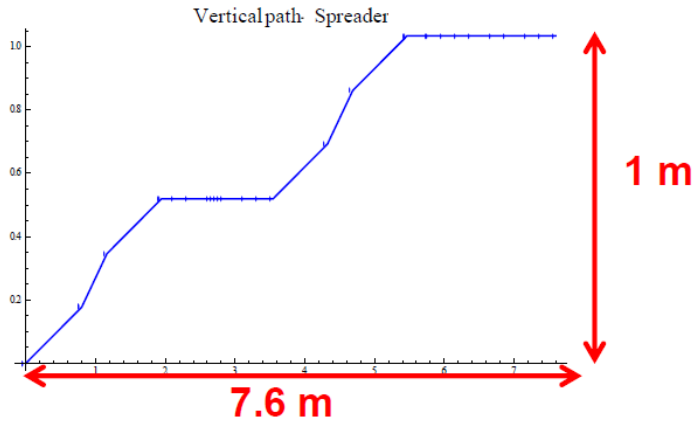
21.01.2014

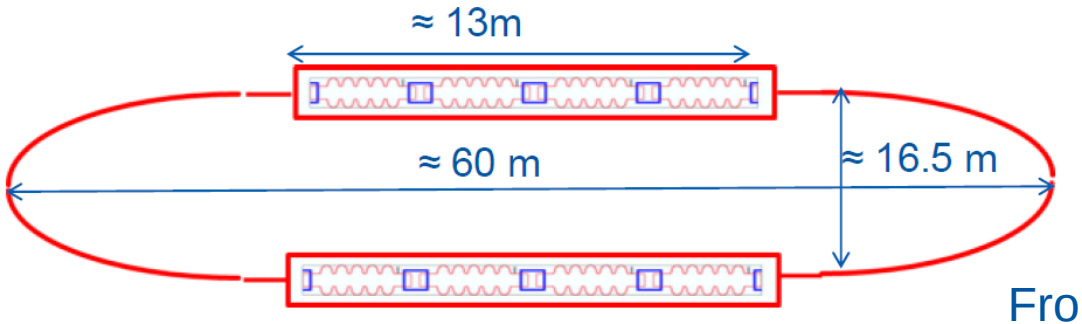
Thanks to A. Valloni and G. Roy

Accelerator footprint

ARC OPTICS (750 MeV)

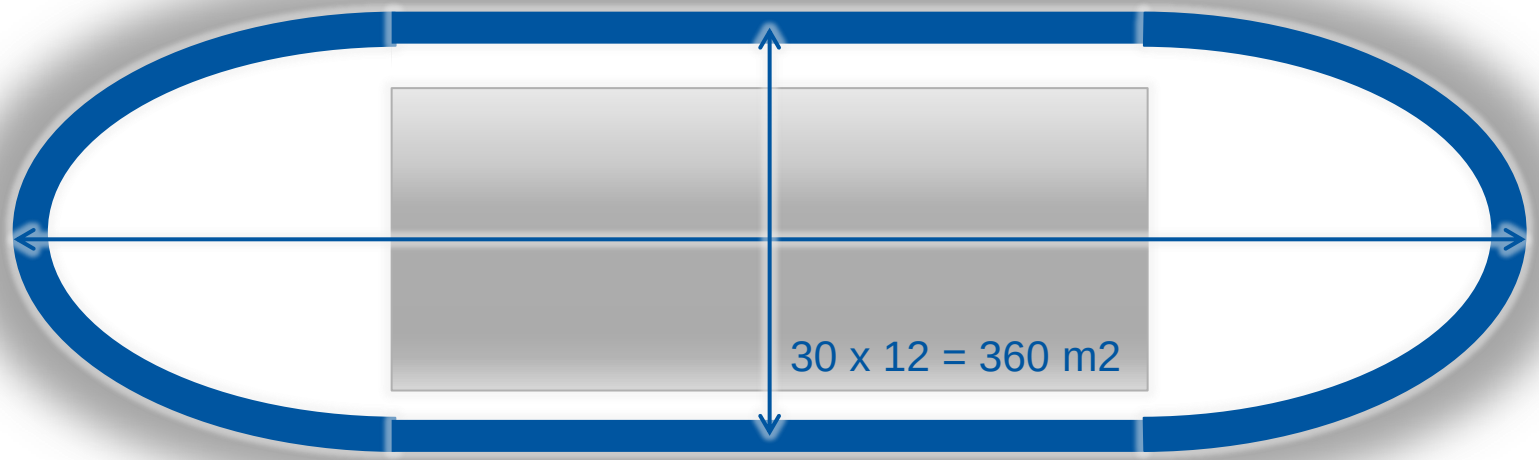






From A. Valloni

Place for other systems



- Shielding and passage +5m on each dimension
- Assuming all other systems can be placed inside the accelerator:
  - RF power (IOTs):
  - Electron source:
  - Electron dump (for 1 GeV)
  - Cryogenics: 50m2 for either a Dewar or a full system
- No more than a rough approximation ~65x20 m
- Extra space for quench tests will will need to be exterior to the accelerator and around 18 linear meters

This is a significant size comparable to CFT3, AD or ISOLDE

How many buildings are there at CERN that can host a facility of that dimensions?

- B. 180 Magnet recovery facility
- B. 112 Brazing + LHC Klystrons
- B. 378 TE/EPC testing
- B. 193 AD + ELENA
- B. 513 Computer Center
- B. 3185 ATLAS shafts

B. 133 Recovery material
B. 170 ISOLDE
B. 150 LEAR
B. 157 EAST HALL
B. 100 Main Workshop
B. 510 Main building
B. 400 LINAC 4

- B. 889 SPS Access point
- B. 897 Central Storage
- B. 867 Radioactive facility
- B. 888 COMPASS
- B. 887 North Hall
- B. 890 EN-CV for North Hall

- B. 2275 LEP converters and Klystrons
- B. 2252 Alice Assembly hall

B. 2173 SM18

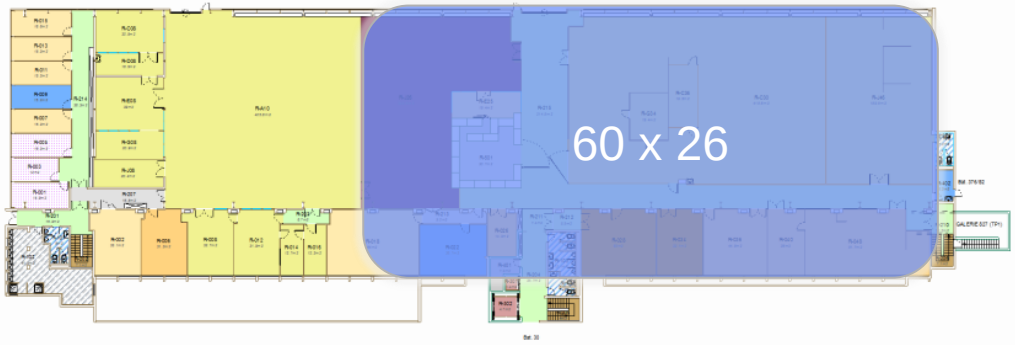
B. 2485 Shaft of point 4

B. 2685 Shaft of point 6

B. 3585 CMS Hall

… most SPS BAs

Building 112



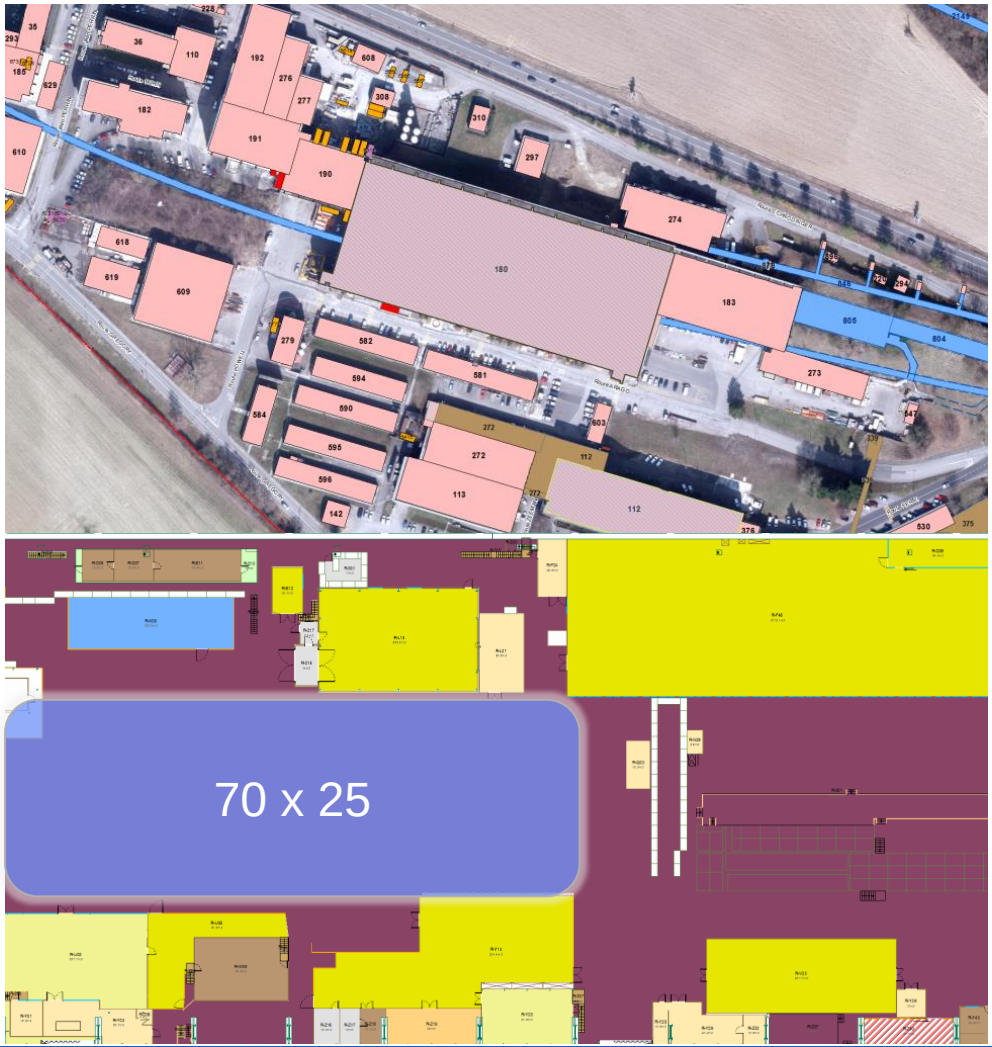
Shared between:
BE-RF (LHC Klystron testing) and
EN-MME (Brazing and welding workshop)
Both long term and essential to current program
May be relocated if necessary?

Required only a bit more than half of the available surface.

Placed around TE and EN activities. Be ready for a political fight

Quench tests difficult to include

Building 180. ATLAS and MRF

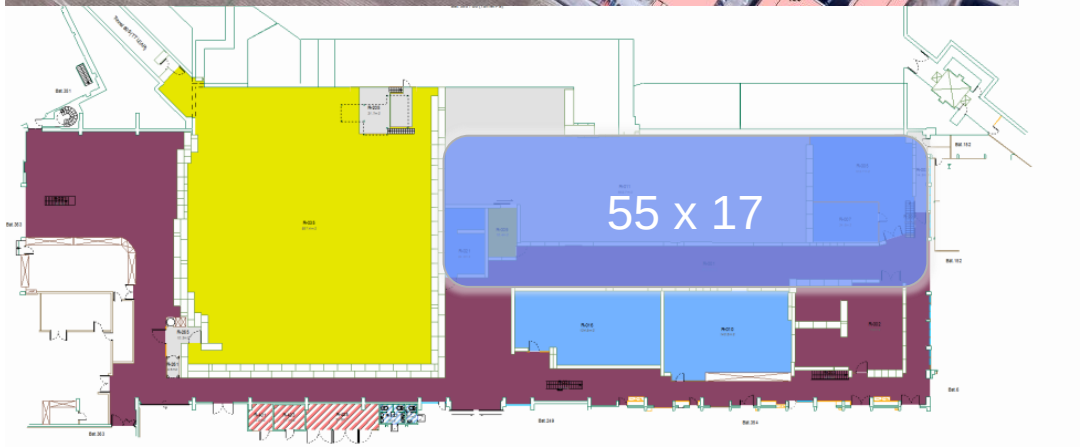


Huge building formerly used for ATLAS detector assembly
Currently partly used for magnets repair and assembly
Rear of the building used for ATLAS storage and clean rooms

Just the “unused” part could host the ERL-TF
Quench tests easy to integrate in the space available

Again, lots of requests by PH and TE

Building 150 (PS Hall)

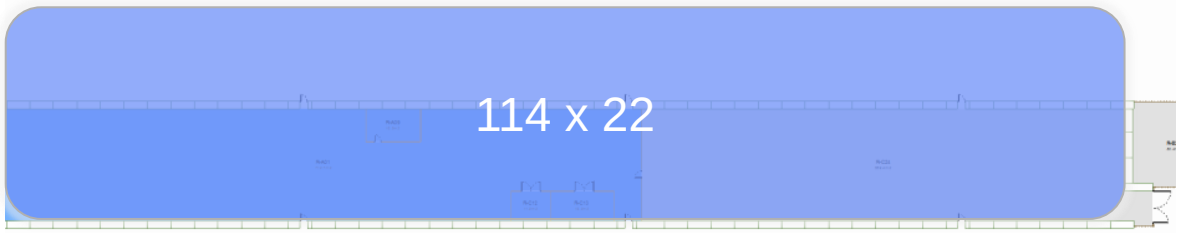


Currently shared between TE and BE for radioactive and non-radioactive storage
CLIC structures and Xband-testing expending

The top part could be freed with some effort.
Quench tests possible at the bottom left

Smaller than the current requirements.

Building 973. Former QRL testing

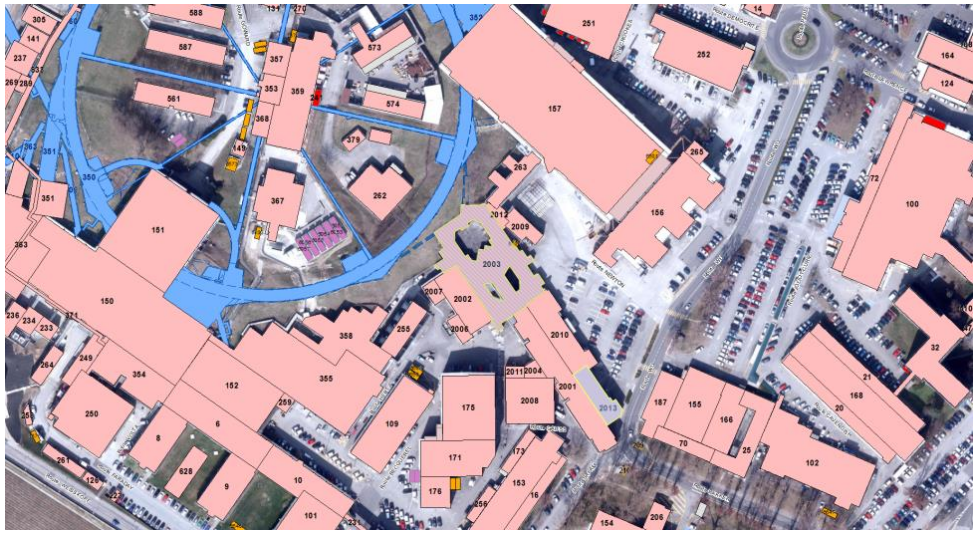


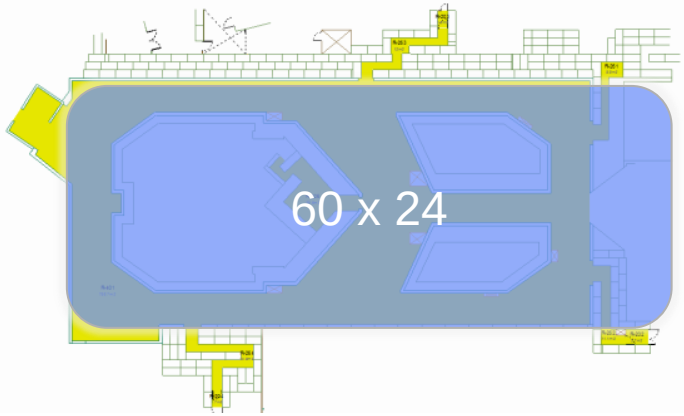
Built for LHC- QRL testing.
Currently used by EN most probably as storage
Constructed from shielding blocks
On the limit of the Prevessin site. Possible extension to be investigated

Some cryogenic infrastructure already available

Smaller than required but may be easily extended/rebuilt?
No crane

Building 2003 CTF3 combiner rings





Currently CTF3 to end operation in 2017
Size could be ok when annexing some parts of the current Linac buildings
Complicated topology.
Could be easier to re-assemble

Could accommodate quench tests in CTF2 and CTF3 buildings

Already crowded area

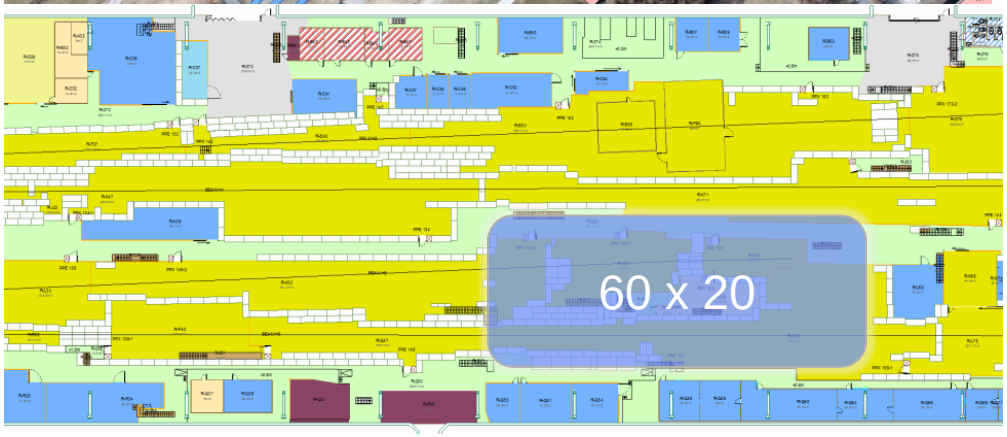
Building 2275. Point 2

LEP power converters and klystrons spares. Current use under investigation.

Power converters already in place.
Geographically perfect as injector for LHeC ERL

Slightly narrower than required
Can it be extended?

Building 887. North Hall



North Hall experimental area.
Space could be asked for quench tests also.

All infrastructure already in place

Difficult to find such the needed area inside a crowded space
Access will be hindered by SPS running

In Summary

- Only two buildings on site could accommodate the facility with only few (or no) works. 180 and 112
  - Both are very demanded buildings that are already the object of heated discussions in the search for space
- Three buildings could be enlarged or modified to host the facility. 973, 2013, 2275
  - Availability and future of this buildings still under investigation
  - Could consider also an extension to 2173 (SM18)?
- Reduced facility could be accommodated in larger spaces. 150, 887. To be studied.

Conclusions

- All options presented here were discussed with BE space manager and are currently under investigation
- We will need political support to get the space even if approved and paid for.
- Building or expanding a building could be a better and faster solution that could be envisaged.
  - Full flexibility
  - Full control of the costs

Thanks for your attention!