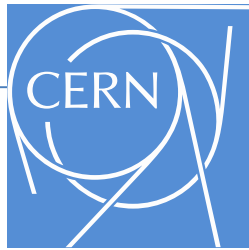




ARRAD

Association romande de radioprotection



The reconversion of CERN Synchro-Cyclotron into a Visit Point

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More than 50 people have been involved in the project, from contracting companies and several CERN groups:

HSE-RP Radiation protection & Project leader

HSE-SEE General safety

PH-EDU Exhibition

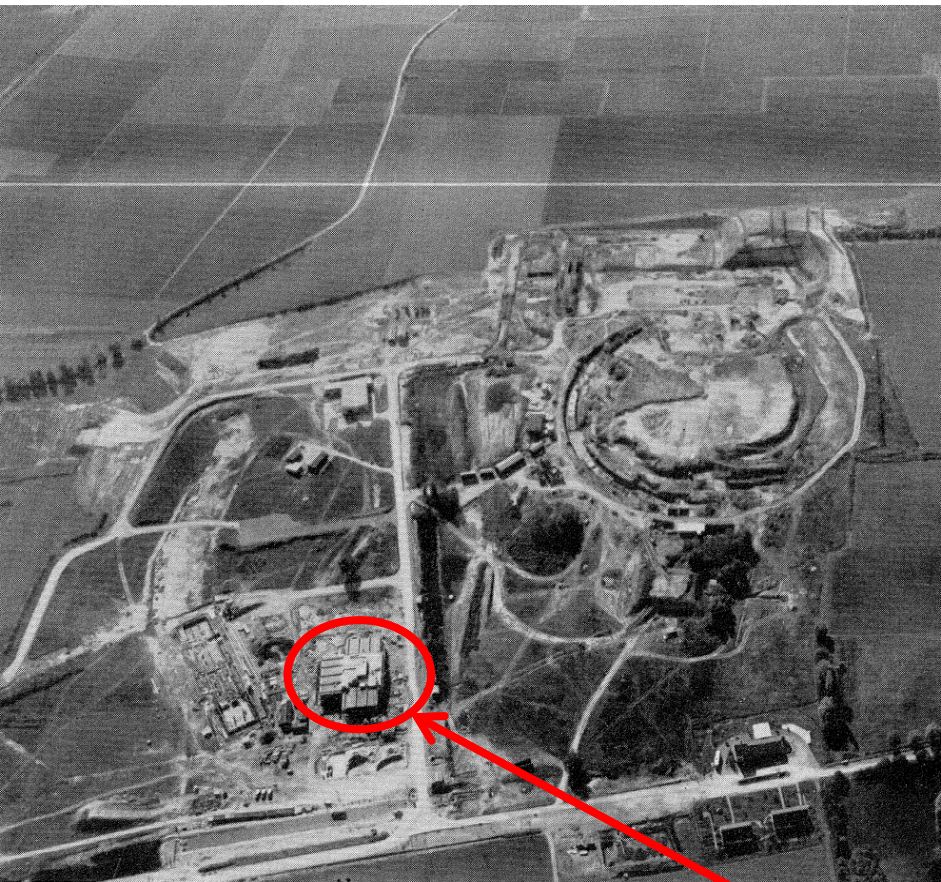
EN-HE Heavy handling and transport

TS-MSD Magnet and cooling circuits

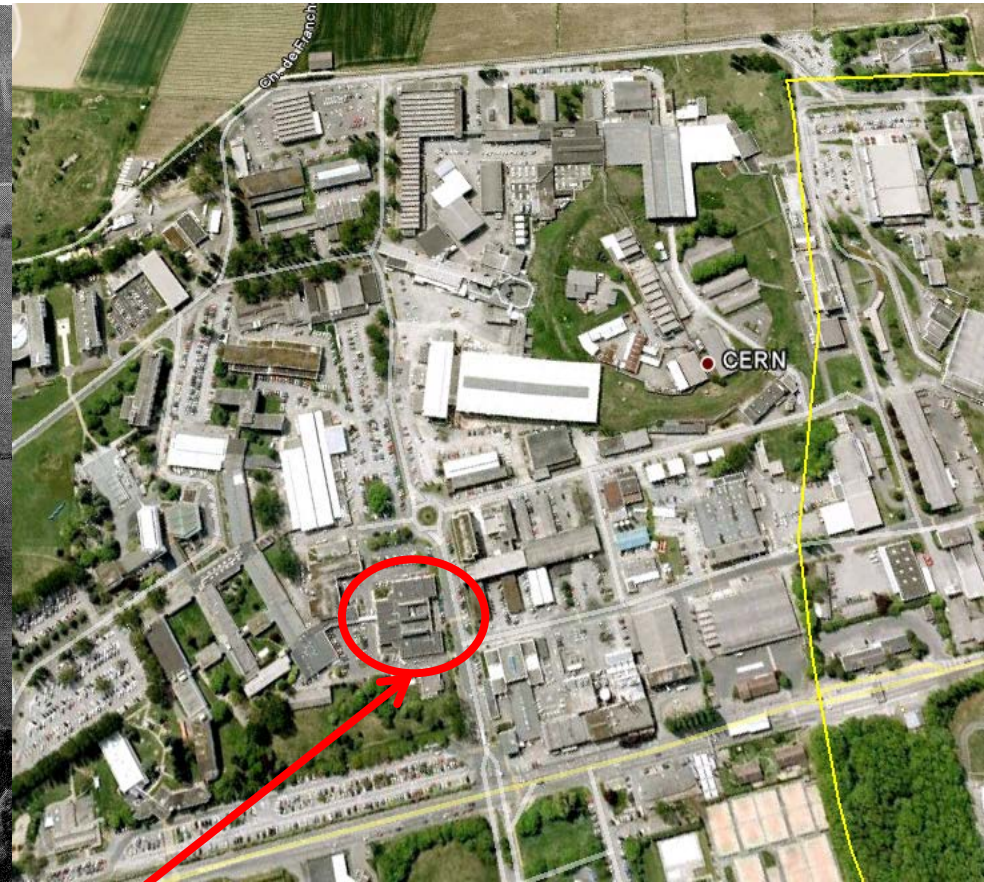
GS-SE Civil engineering and services

Thanks to the Directorate who approved the project and provided the funding

The SC on the CERN site



October 1955



Today

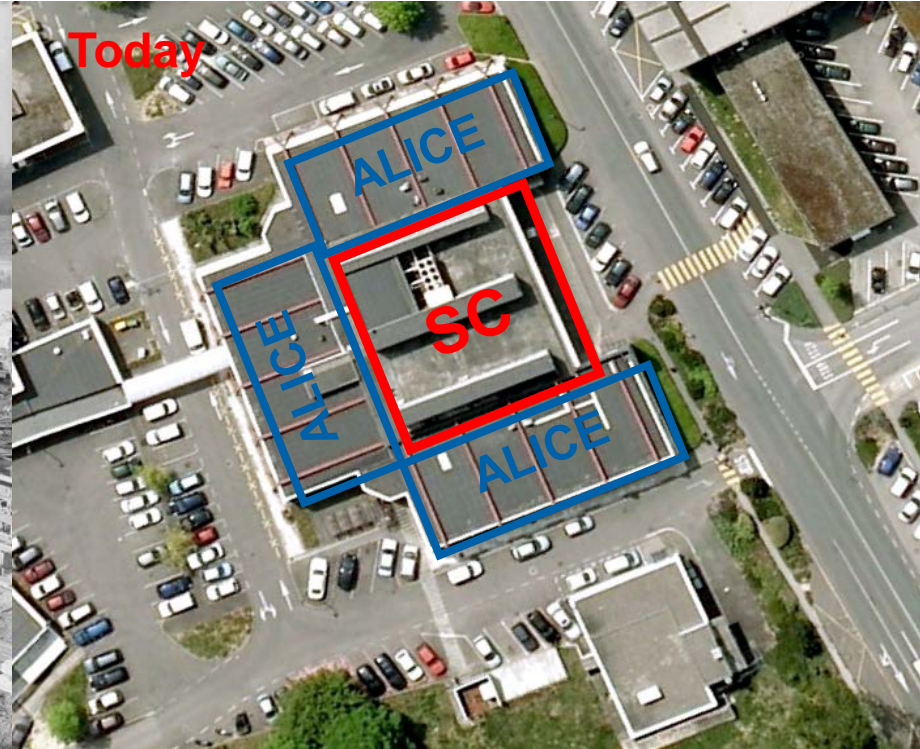
Synchrocyclotron building

The SC on the CERN site

1955



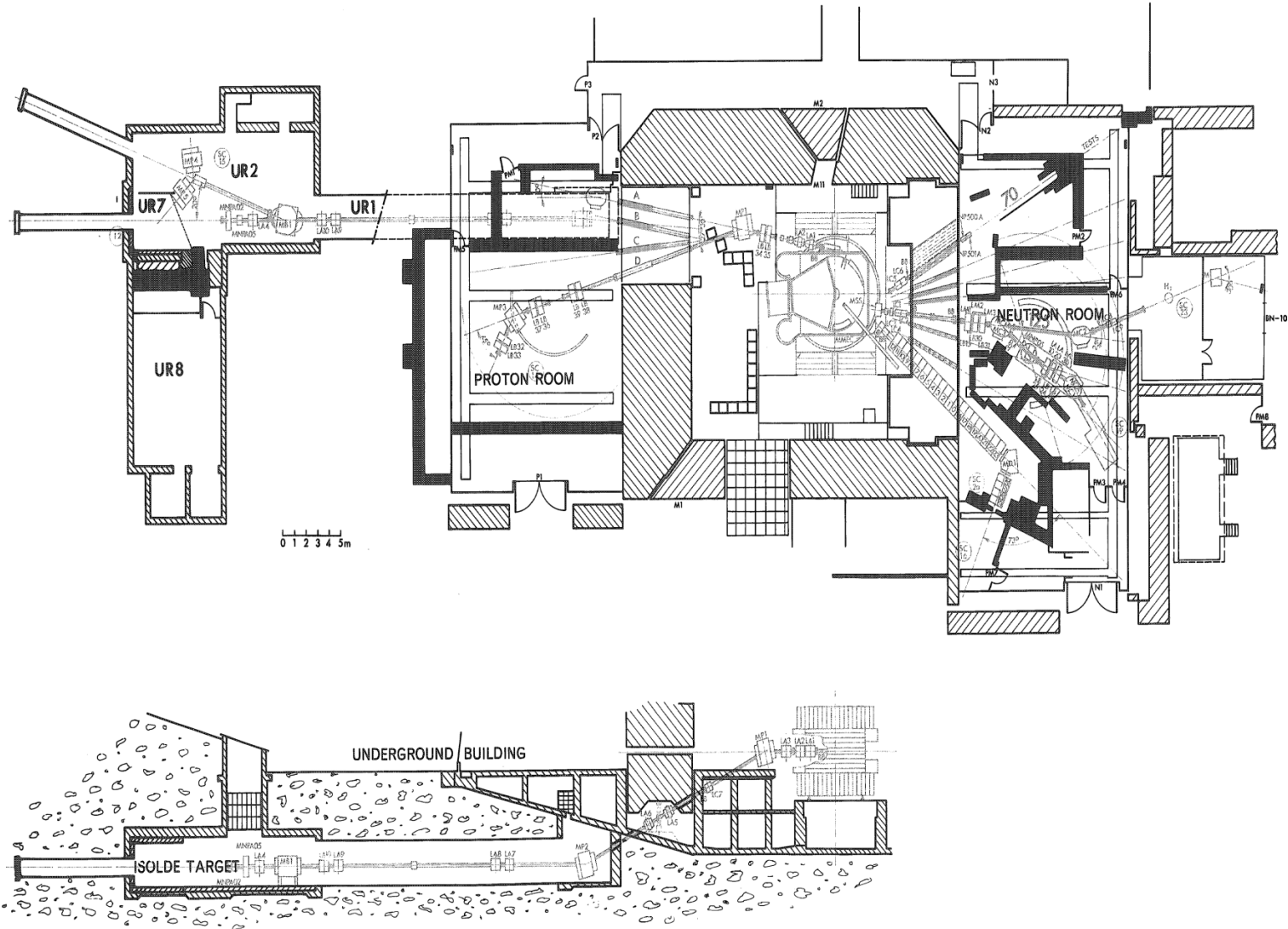
Today



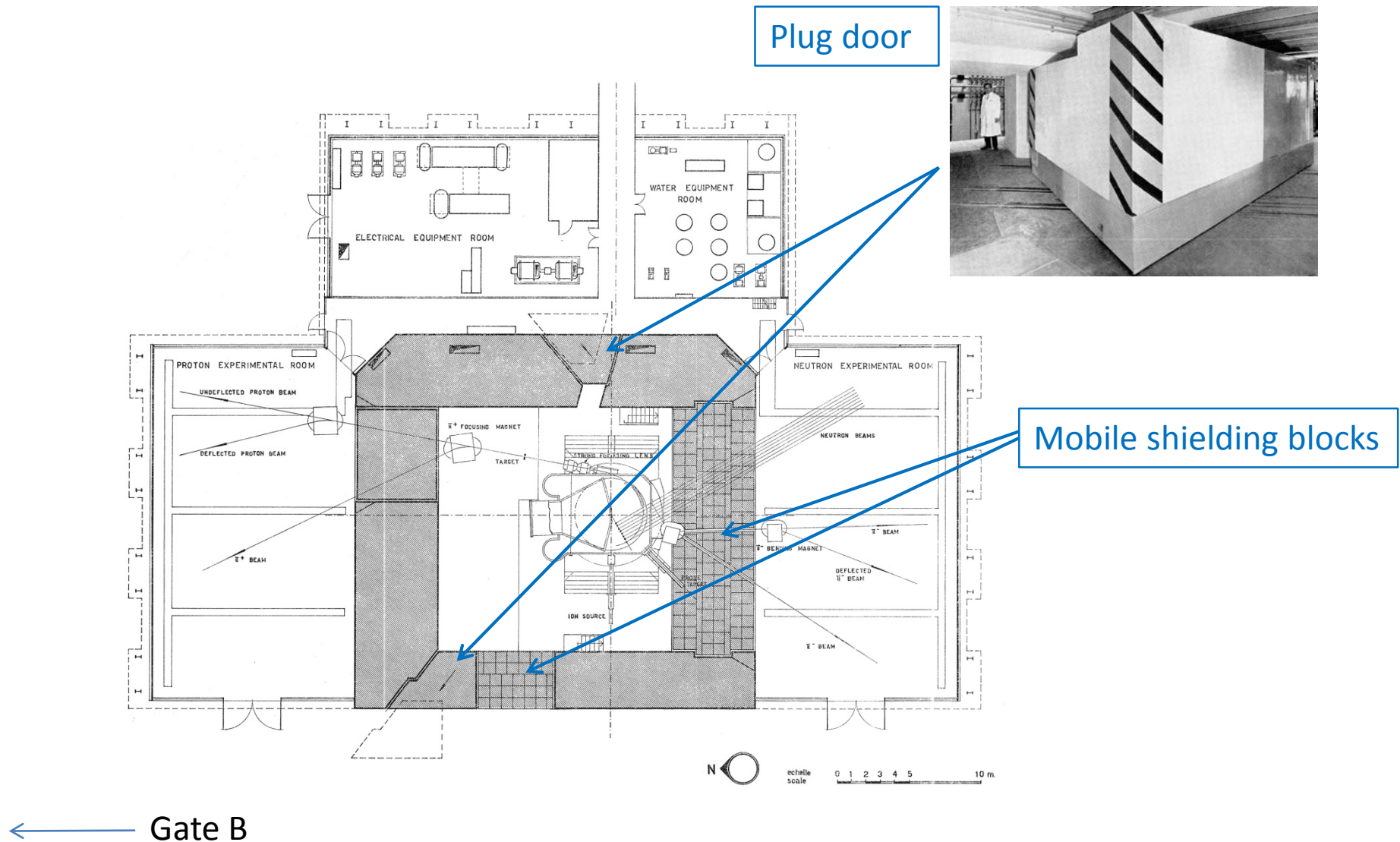
The SC was in operation from 1957 until 1990.

The experimental rooms were decommissioned in the mid-90's and this part of the building reconverted into office space for the ALICE collaboration (1995).

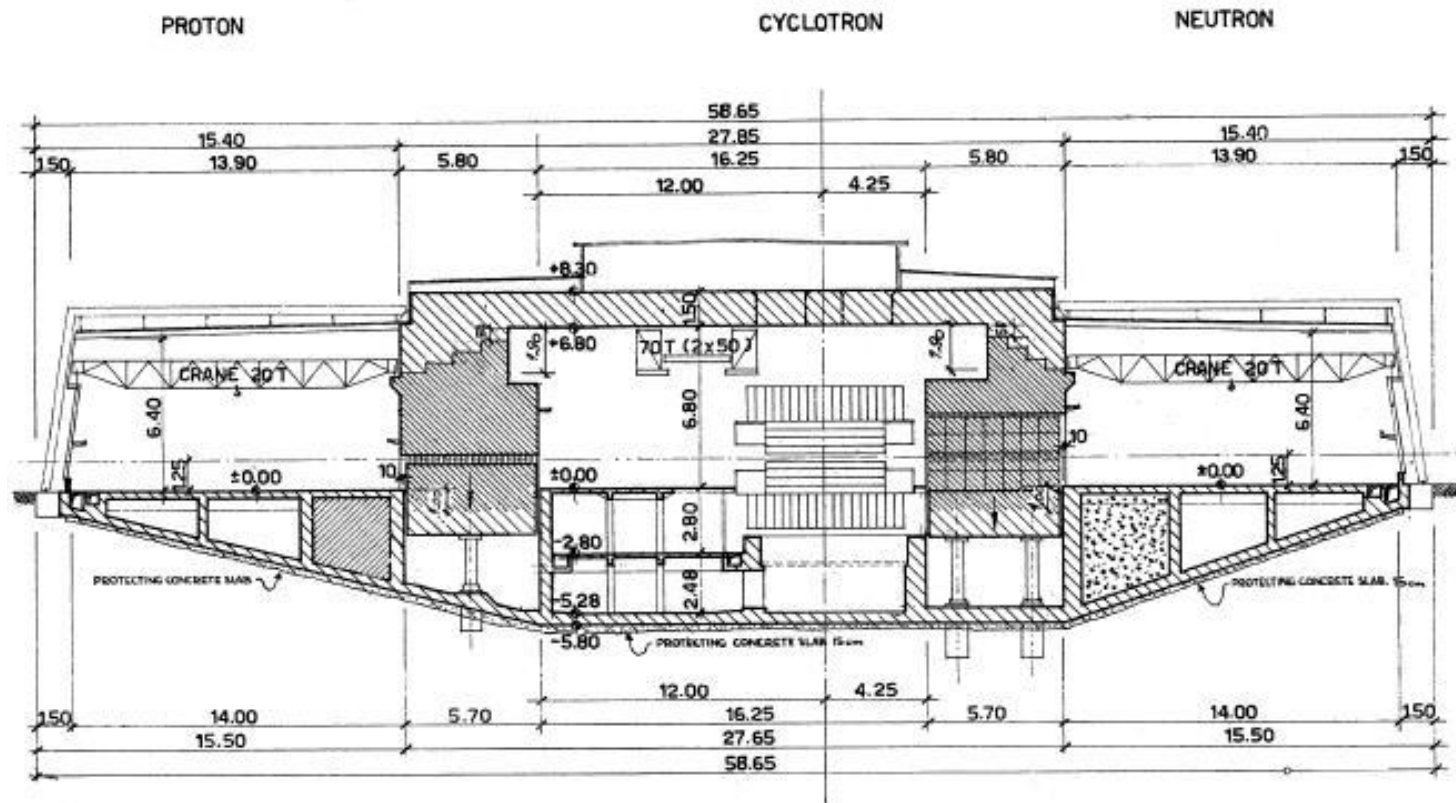
Original layout of the SC hall and experimental rooms



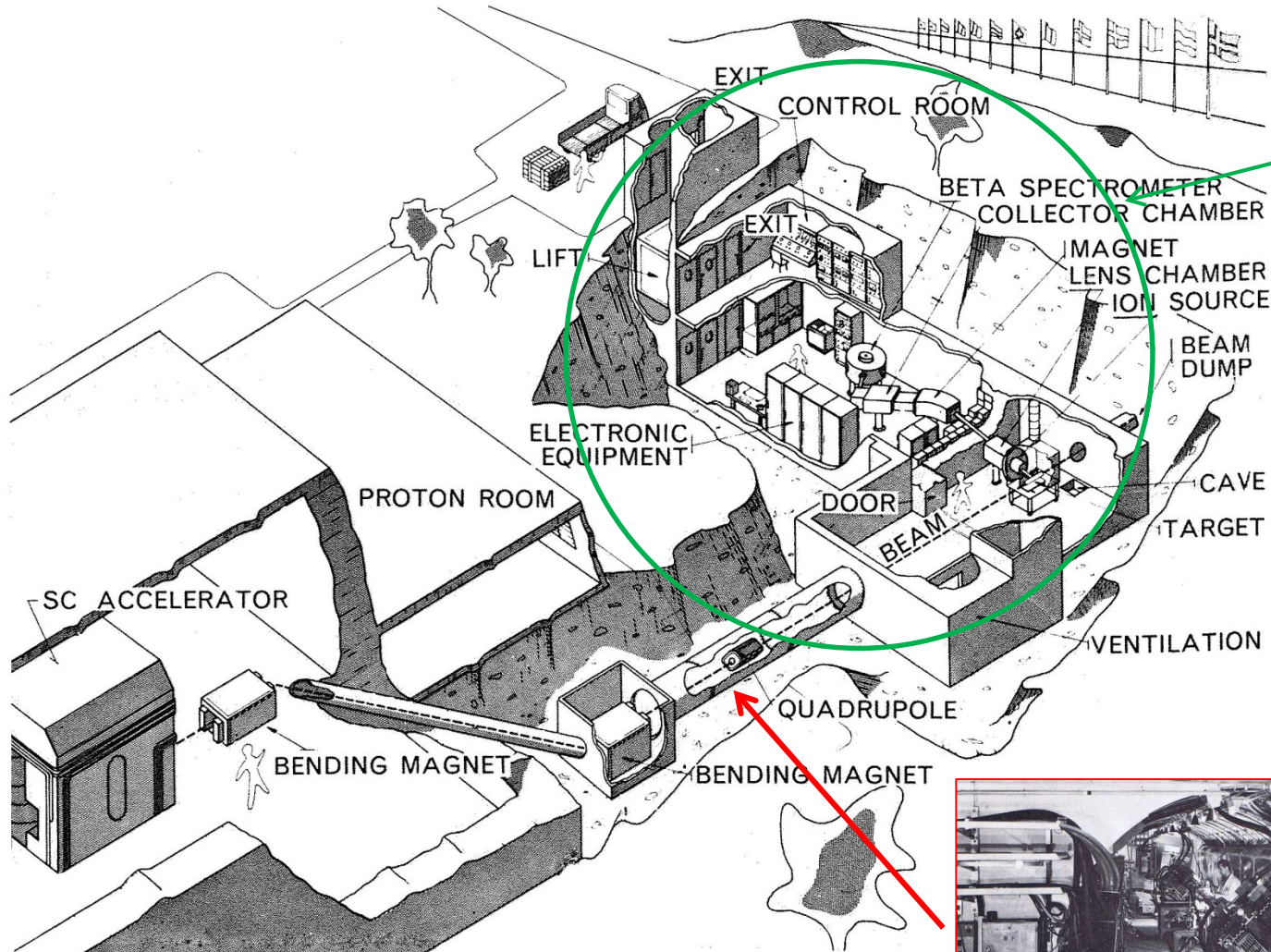
(Former) access to the SC hall



Vertical cross-sectional cut of the SC building

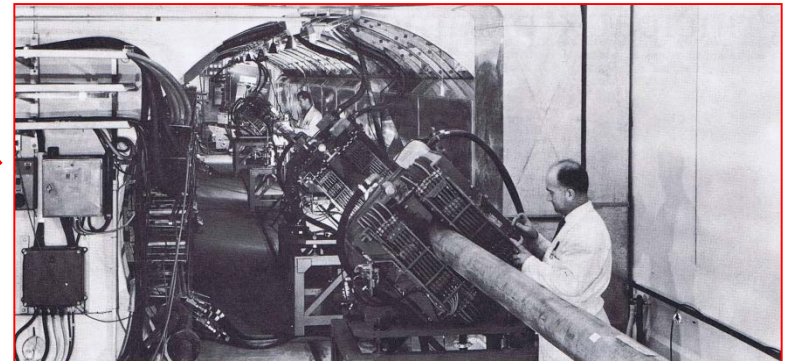


The ISOLDE underground experimental area commissioned in 1967



ISOLDE
underneath
present Bldg 172

Underground transfer line



The SC in its third year of operation, 1959

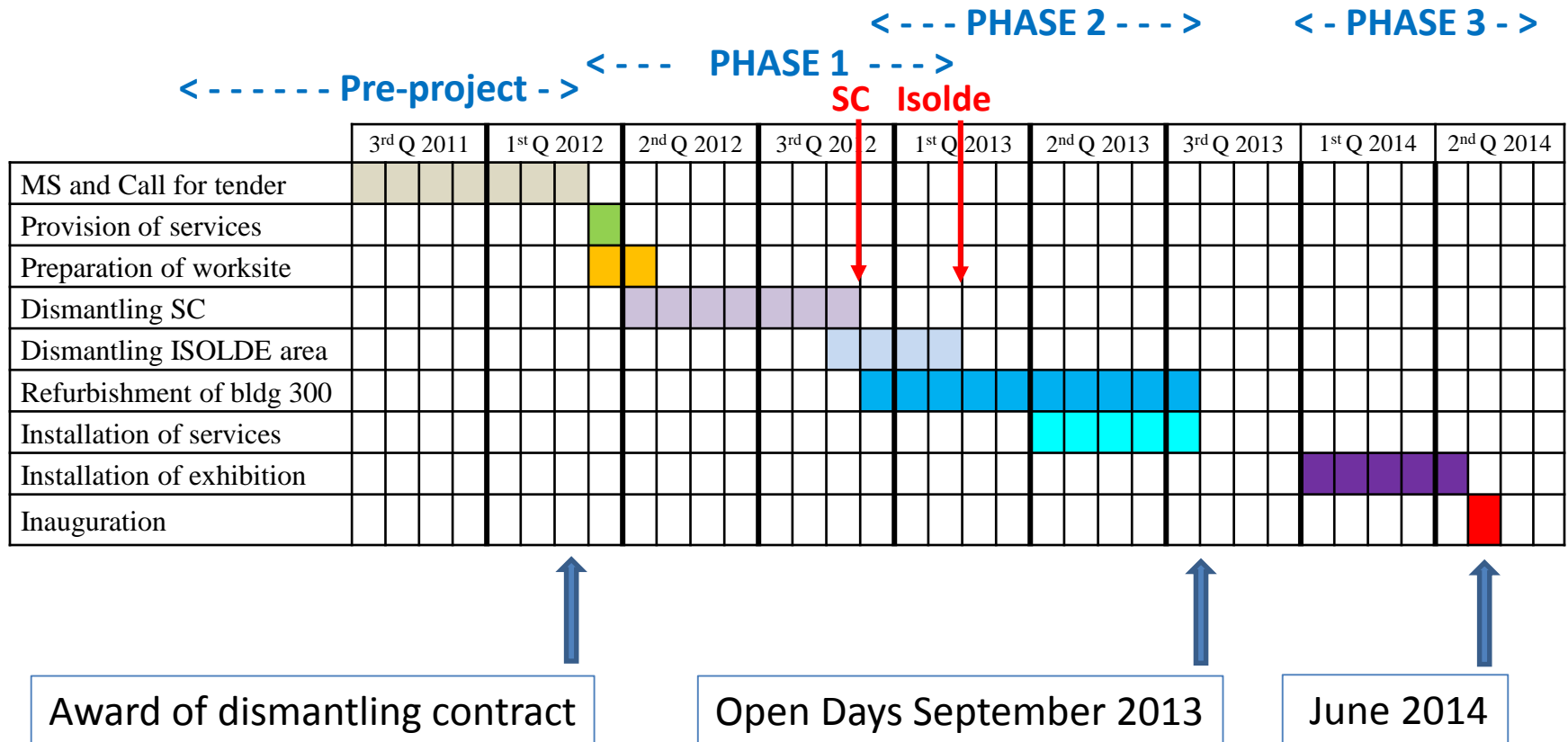


- 20 years represents a sufficient cool down period
- The SC was the **first accelerator** designed, built and operated by CERN, an important piece of CERN history
- It is CERN's policy to preserve the most important of its instruments for posterity, and to provide them for public display where possible at CERN

Excellent opportunity to combine two actions towards a single goal...

... refurbish the accelerator vault keeping in place only the cyclotron with its main components (magnet, RF system, vacuum pumps, ion source) and transform it into a ***public exhibition hall***

SC project schedule



PHASE 1: radiological clean-up (SC + ISOLDE 2)

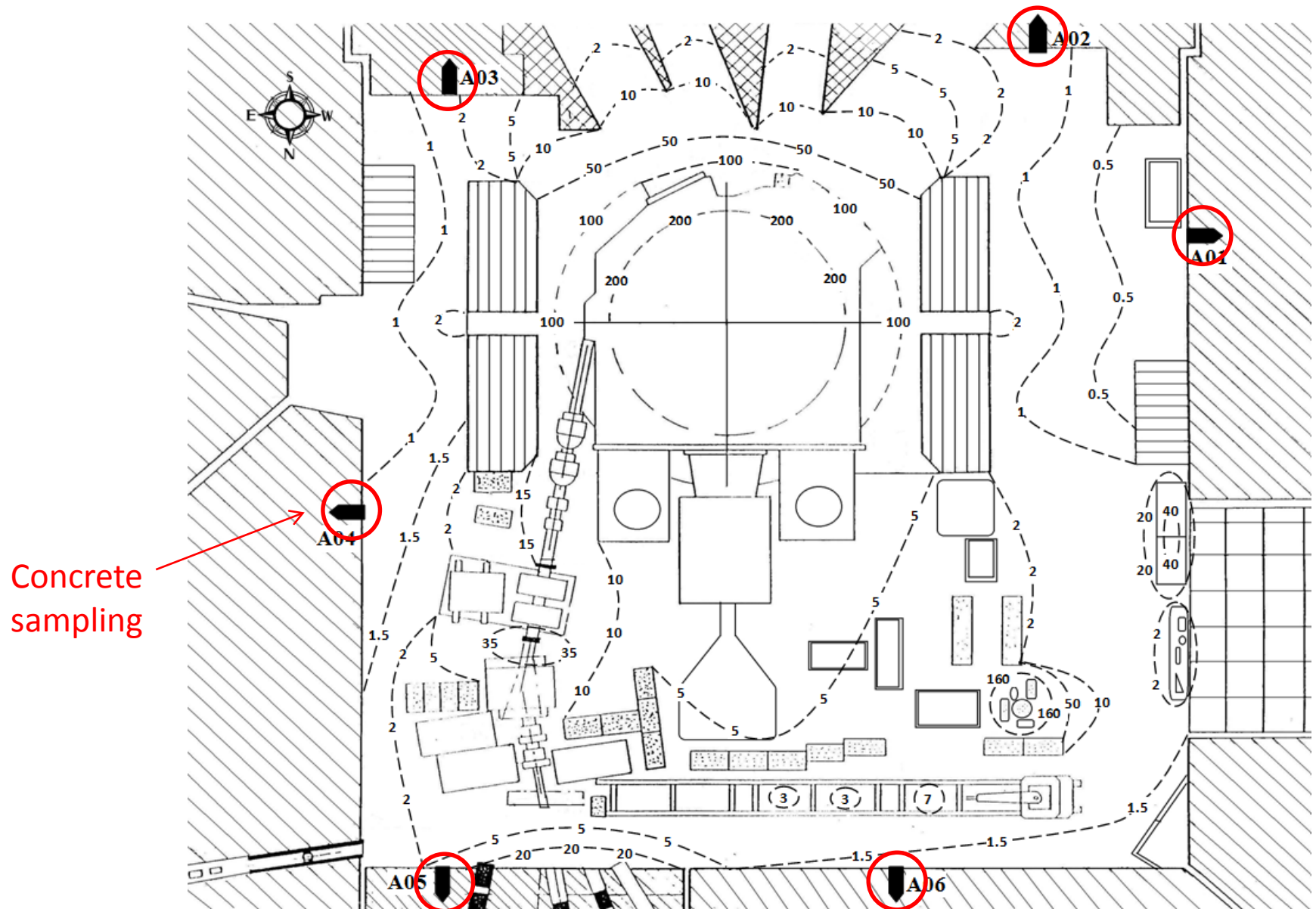
PHASE 2: refurbishment of building

PHASE 3: installation of exhibition and 3D projection

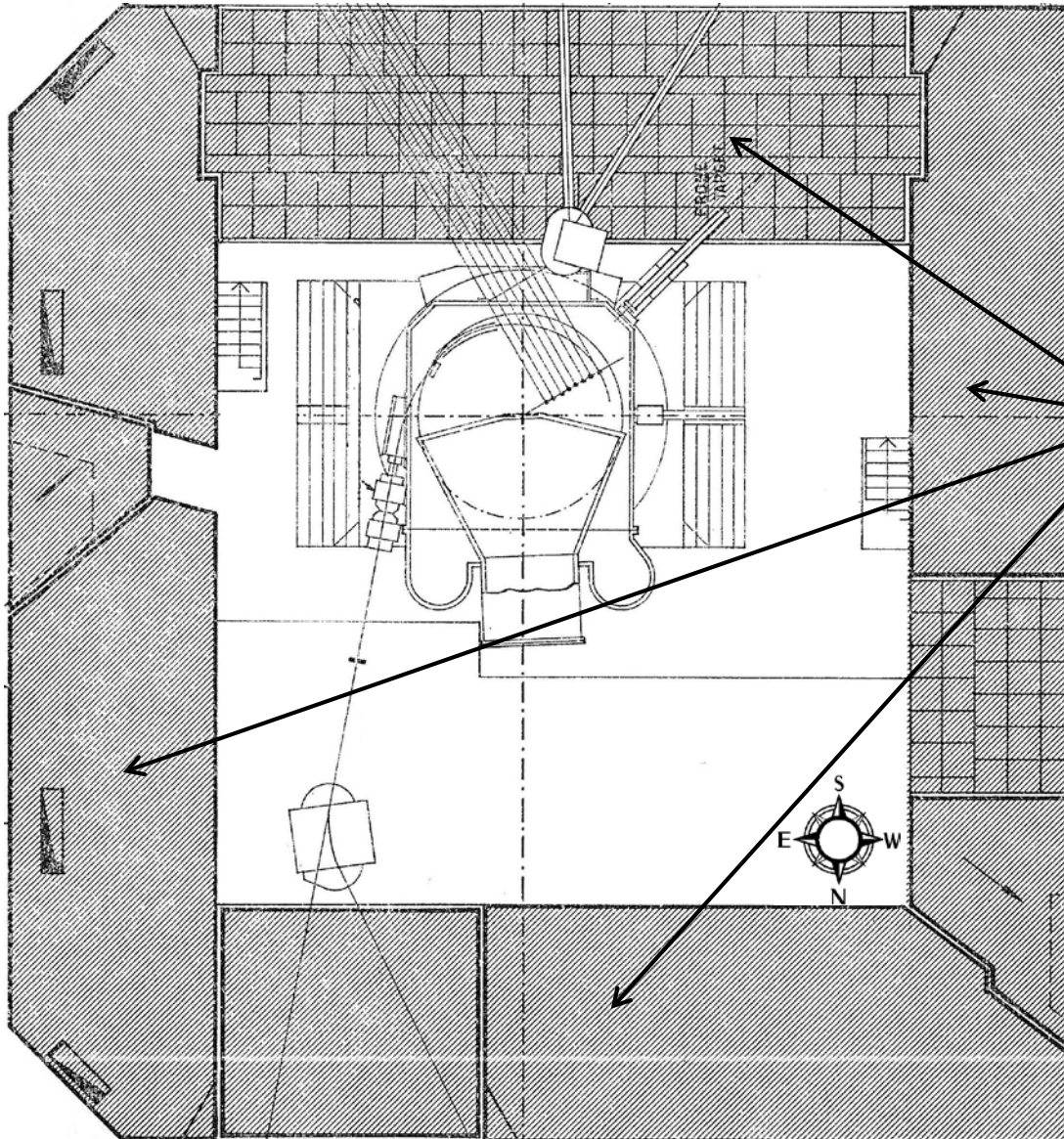
Inauguration

- Complete radiological characterisation of the vault:
gamma-spectrometry measurements on samples and in-situ, contamination checks and radiological survey
 - Project whether the vault could be made accessible to the public
 - Anticipate measures to be taken during decommissioning
 - Estimate the amount of radioactive waste expected
- Removal of old ISOLDE 2 transfer line (summer 2011)
- Market Survey, Invitation to Tender, Selection of contracting company for dismantling (March 2012)

Dose rates on ground level



Sampling of concrete

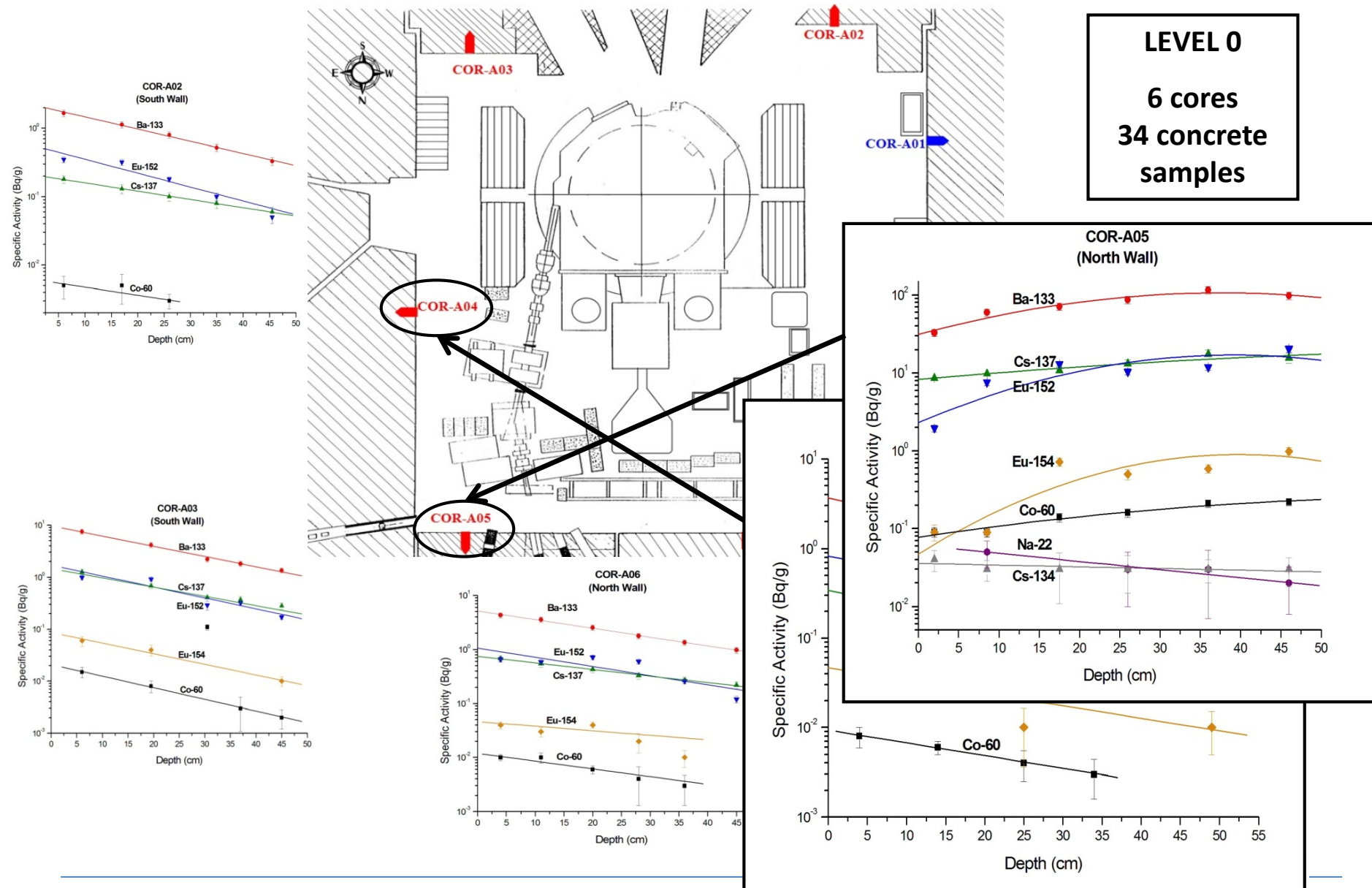


50 cm deep – 5 cm Ø

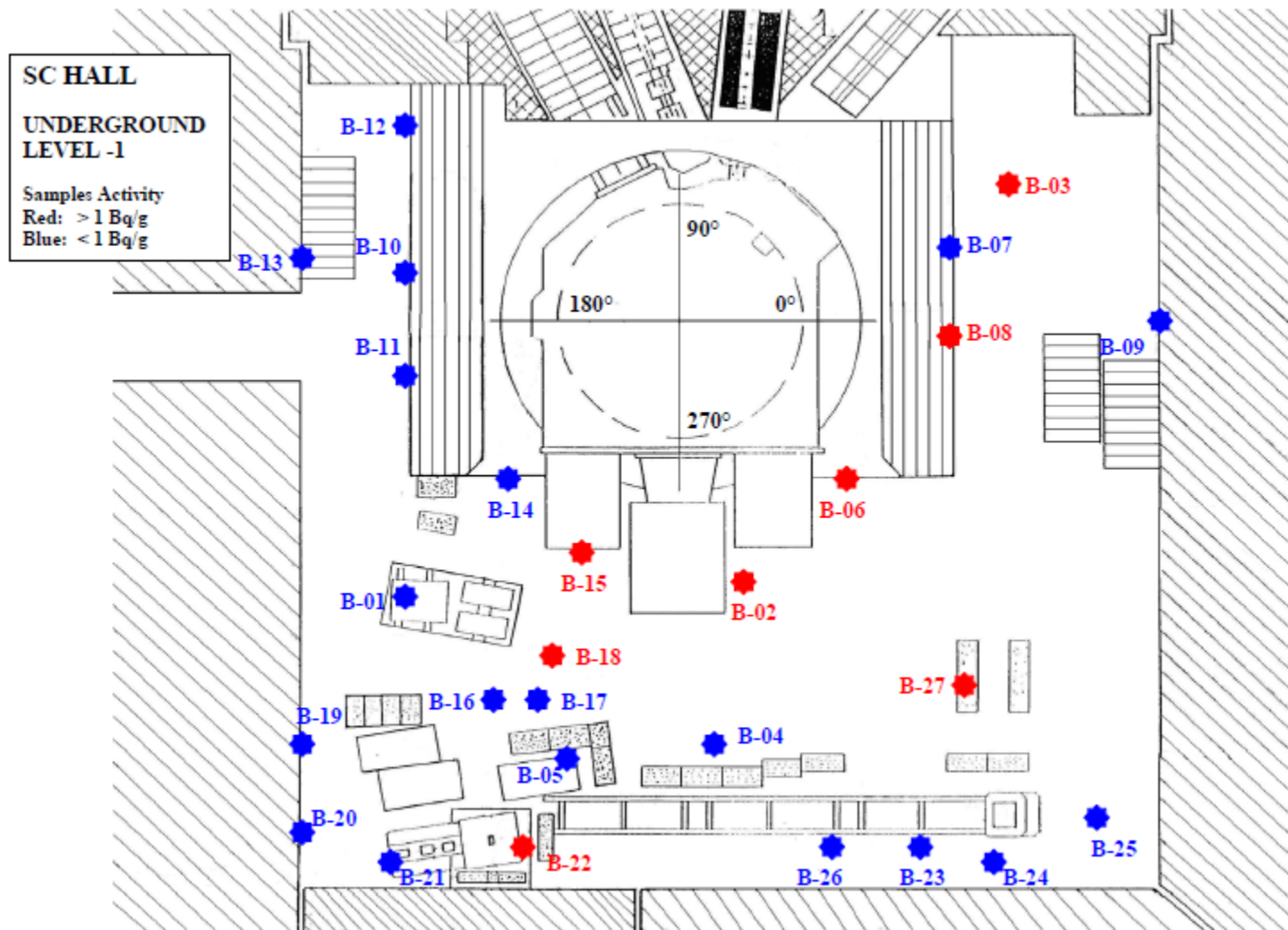


10 cm deep – 5 cm Ø

Sampling of concrete

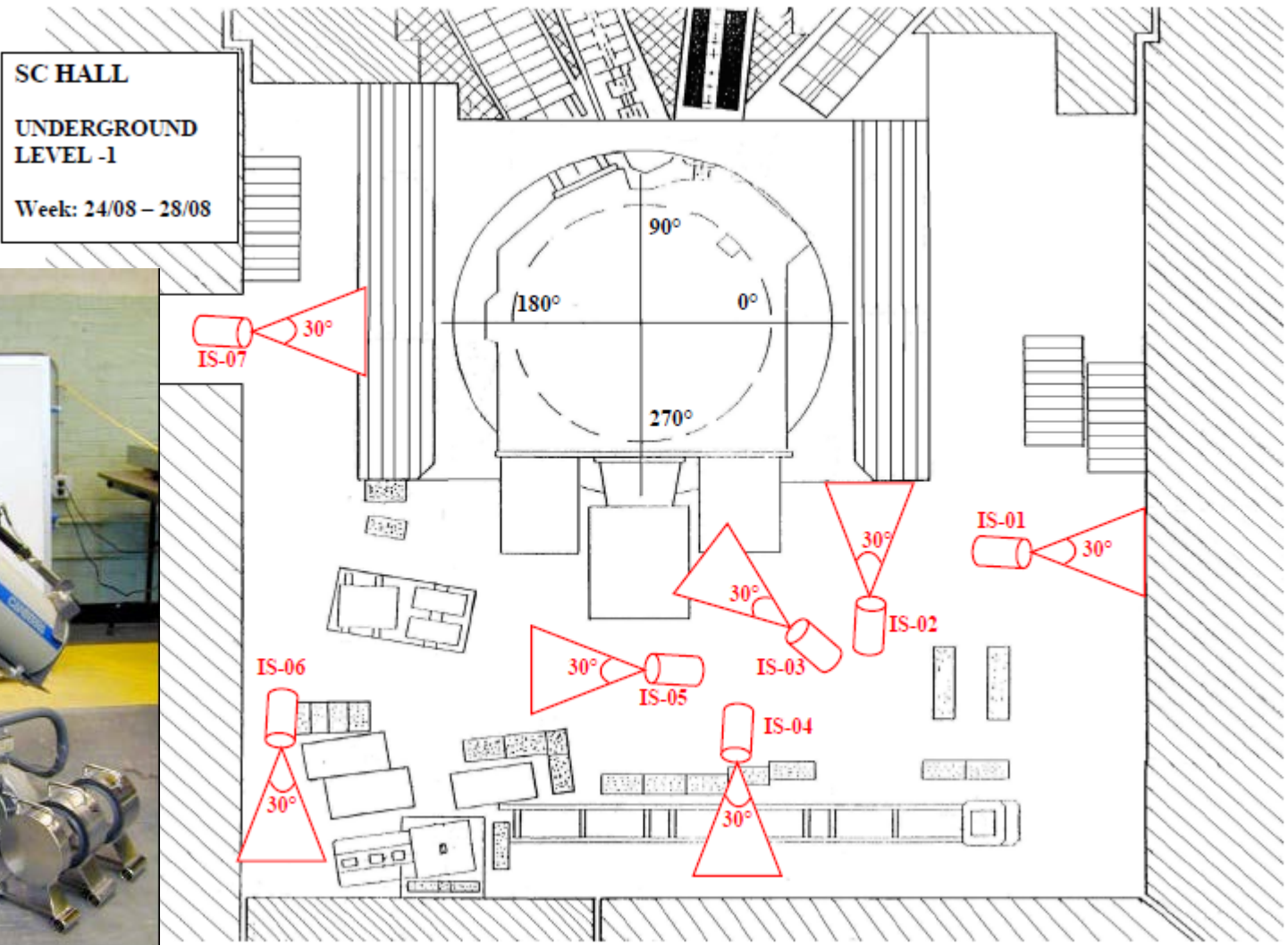


Sampling for gamma-spectrometry measurements



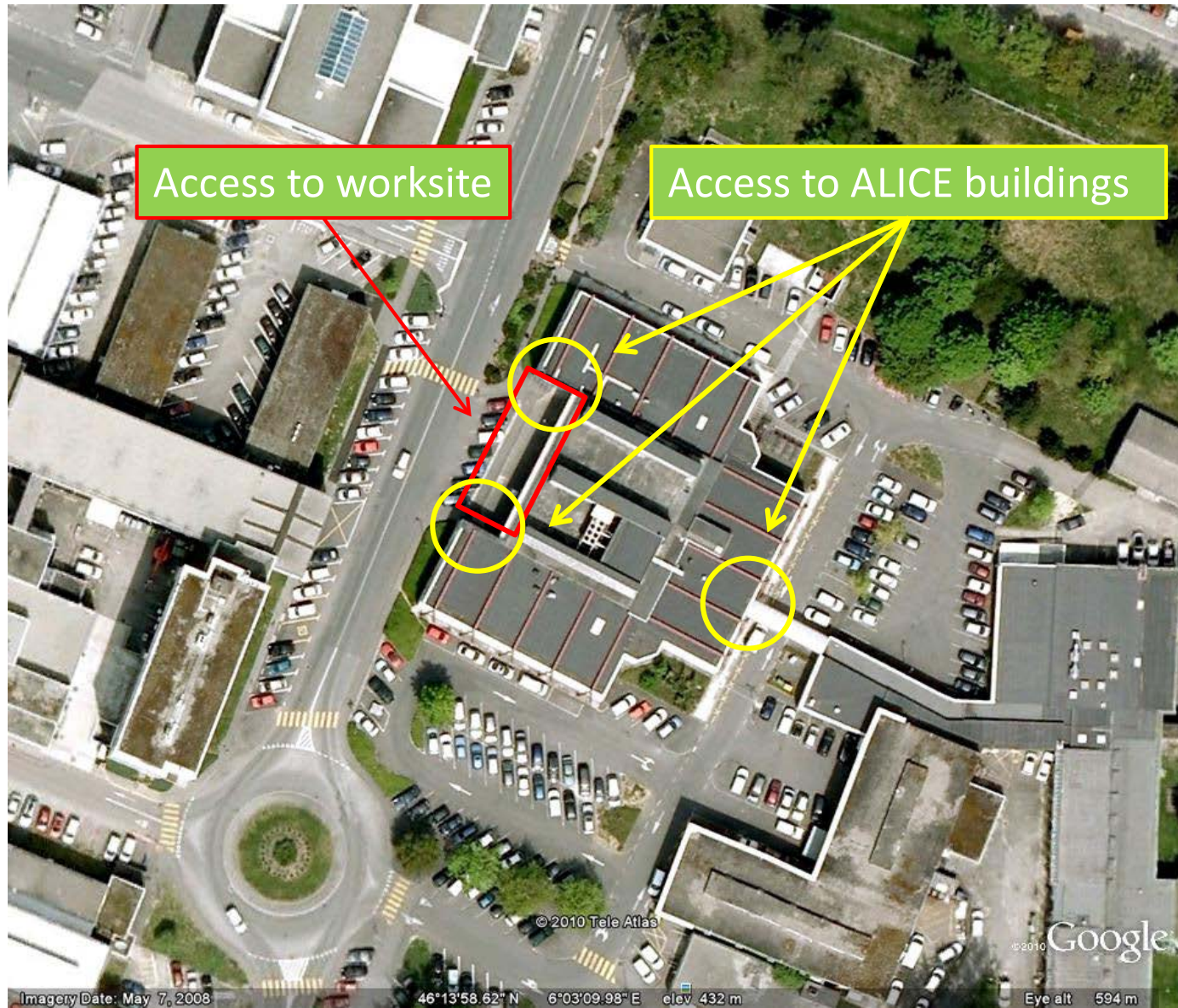
About 120 samples taken from the three levels of the SC building and from the ISOLDE area

In-situ gamma-spectrometry (ISOCS)

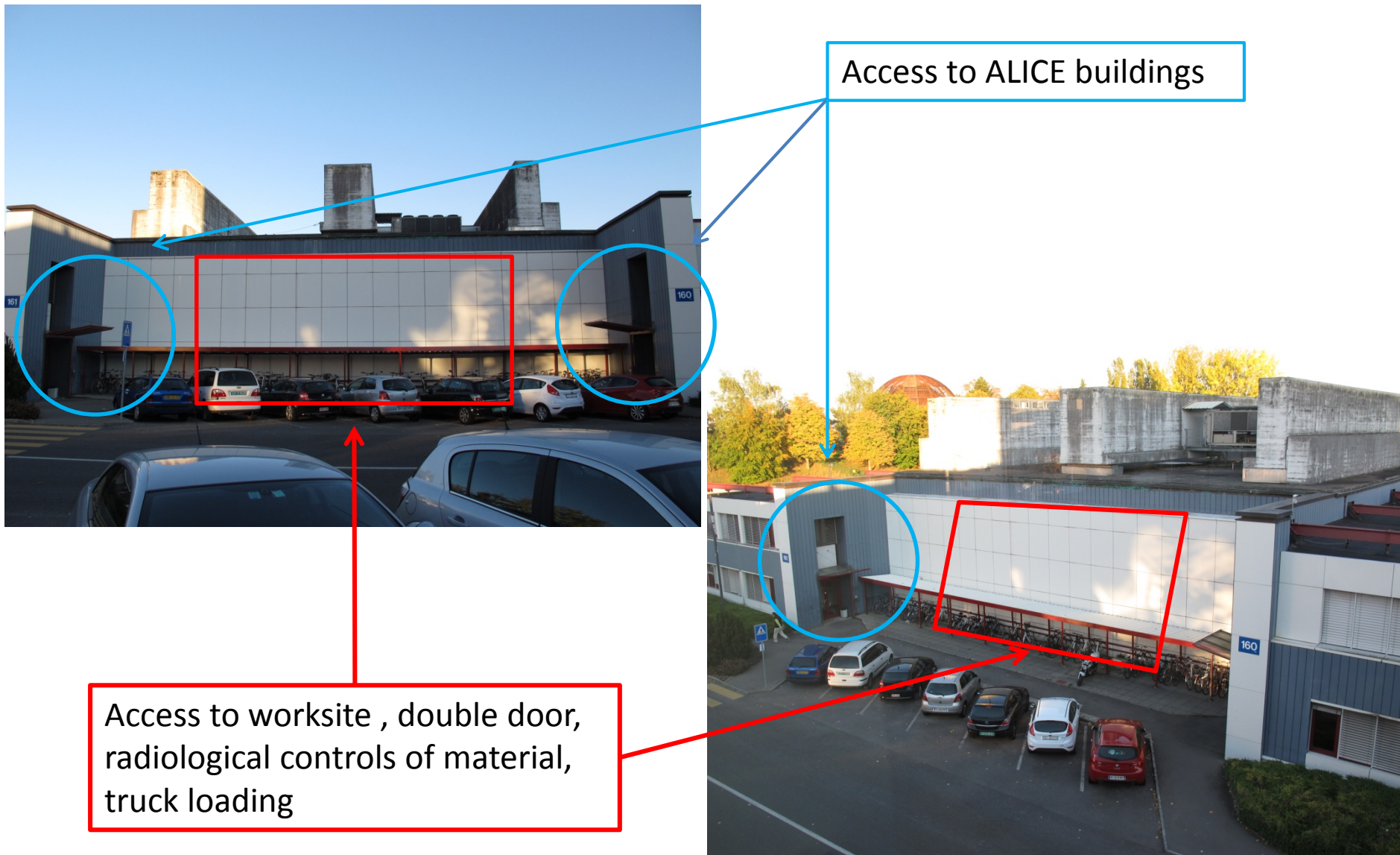


- **Worksite preparation for dismantling (April 2012)**
- Removal and radiological control of all material by a specialized contractor (May – November 2012)
- Dismantling of ISOLDE 2 (November 2012 – early March 2013)
- Refurbishment of the building for its reconversion into a visit point (January – September 2013)
- Opening of the Visit Point for Open Day September 2013
- Installation of exhibition and 3D projection (January-May 2014)
- Inauguration (19 June 2014)

Access to the worksite



Access to the worksite



Opening of the wall (April 2012)



Worksite fence and SAS (May 2012)



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Level 0 before beginning of cleaning-up intervention



Removal of ROTCO 2



Removal of the "Blue Box"



Generated waste: building 300 (SC)

Total number of containers	286
Containers with radioactive waste	188
Containers with material candidate for free release	98
Total mass of waste (kg)	209,434
Masse of material candidate for free release (kg)	26,972
Masse of radioactive material (kg)	182,462
Containers candidate for free-release (% of total)	34.27%
Masse of material candidate for free-release (% of total)	12.88%

Total number of containers	109
Containers with radioactive waste	81
Containers with material candidate for free release	28
Total mass of waste (kg)	39,467
Masse of material candidate for free release (kg)	7,322
Masse of radioactive material (kg)	32,145
Containers candidate for free-release (% of total)	25.69%
Masse of material candidate for free-release (% of total)	18.55%

SC

Collective dose: 3.09 mSv

Minimum individual dose: 0.02 mSv

Maximum individual dose: 0.61 mSv

ISOLDE

Collective dose: 1.01 mSv

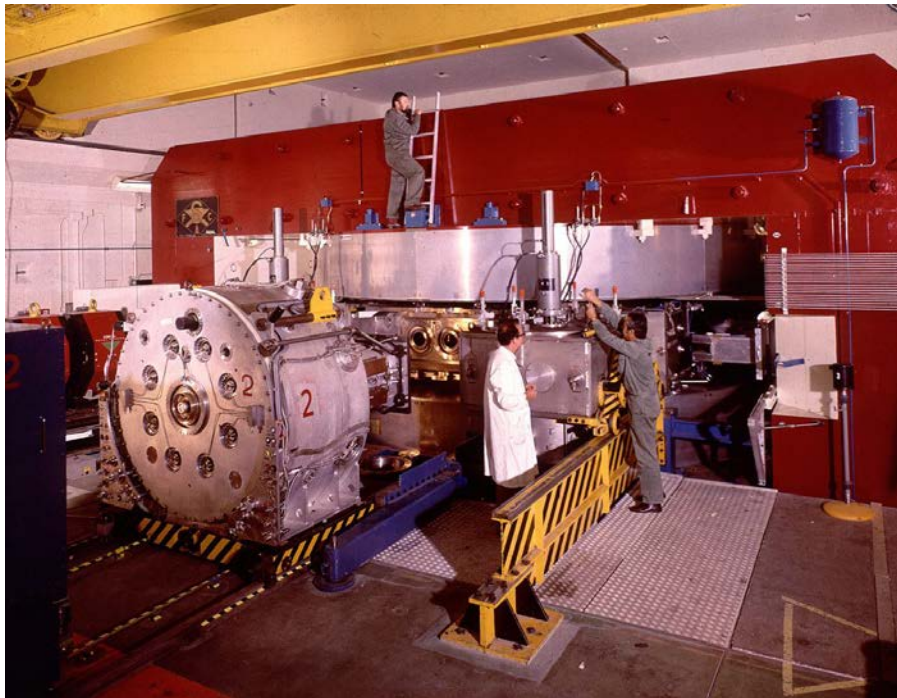
Minimum individual dose: 0.02 mSv

Maximum individual dose: 0.24 mSv

TOTAL: 4.10 mSv

Estimated at the planning stage: 4.35 mSv

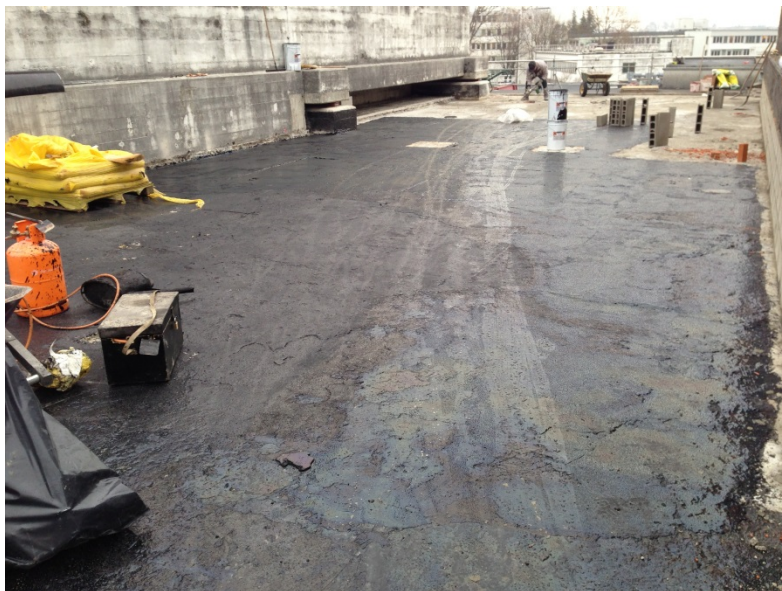
The SC in 1975 and in December 2012



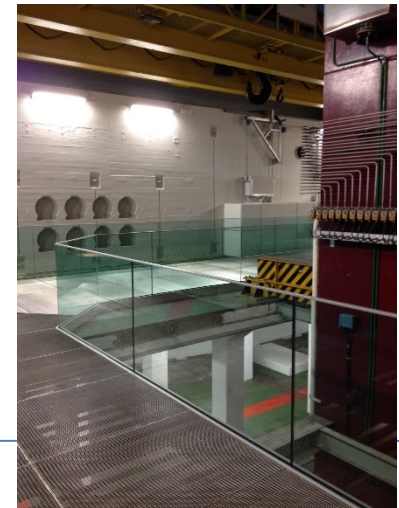
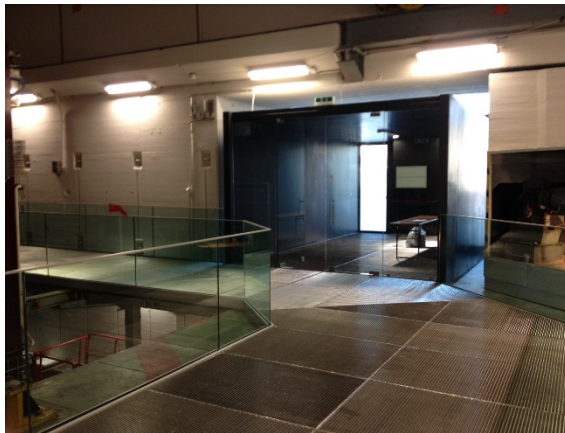
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- Water proofing of the roof
- Painting of walls and SC magnet
- Temporary heating system to dry walls
- Permanent protection barriers on the roof
- Electrical network, lighting and safety lights inside the SC hall
- Ventilation system
- Opening of the section of the floor around the SC
- New floor and handrail
- New entrance
- Overhead crane secured
- Outside pavement refurbished

Water-proofing of the roof (March 2013)



The SC hall after refurbishment, September 2013

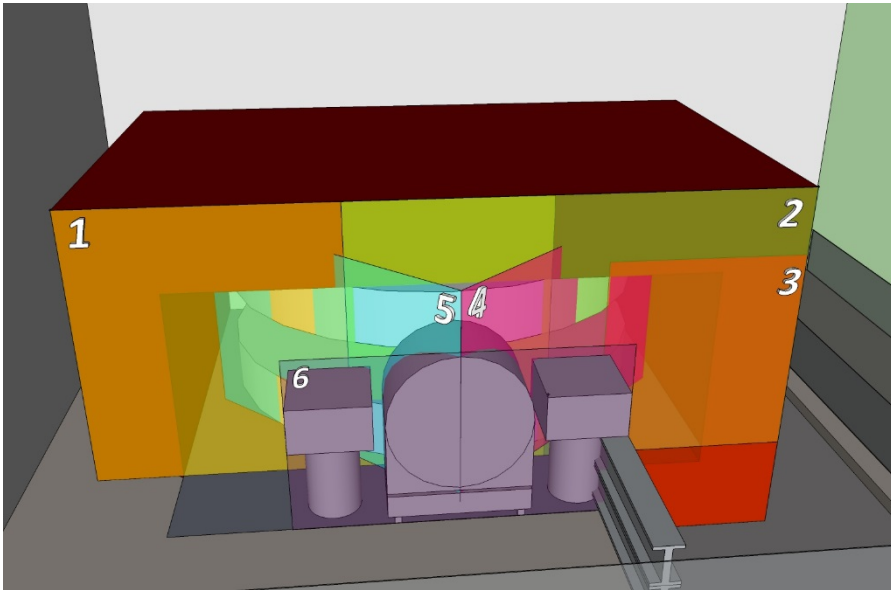
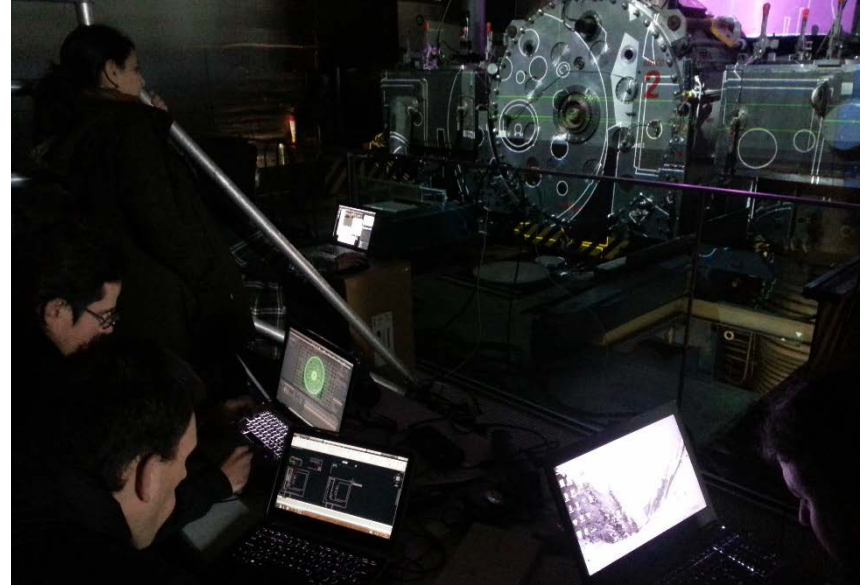
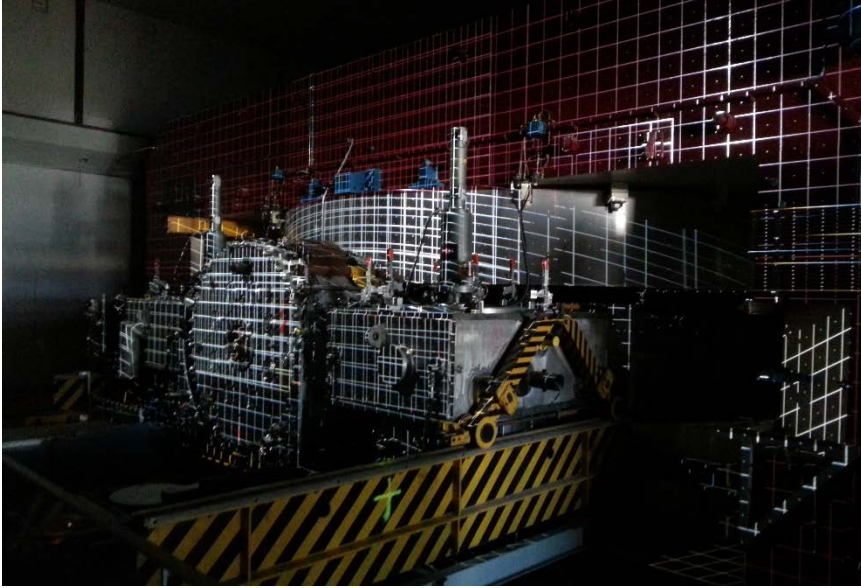


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Setting up the 3D projection system (January-May 2014)



Inauguration the SC Visit Point, 19 June 2014



Statistics on visits in the first three years

19 June 2014 – 08 Nov. 2017: 6786 visits / 136425 visitors

SC Visitors - 19 June 2014 - 17 November 2017

