EUROPEAN SPALLATION SOURCE

Halls & Utilities

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Lab Coordinator & Conventional Facilities Liason

www.europeanspallationsource.se
2 June 2015

Overview

- Site overview
- Movement
- Access
- Floor Loads & Levels
- Cranes
- Utilities: Gases, Power, Ventilation
- Expert Groups: Cooling Water and Vacuum
- Zoning
- Labs: Scientific & Technical

3D Graphical Rendering

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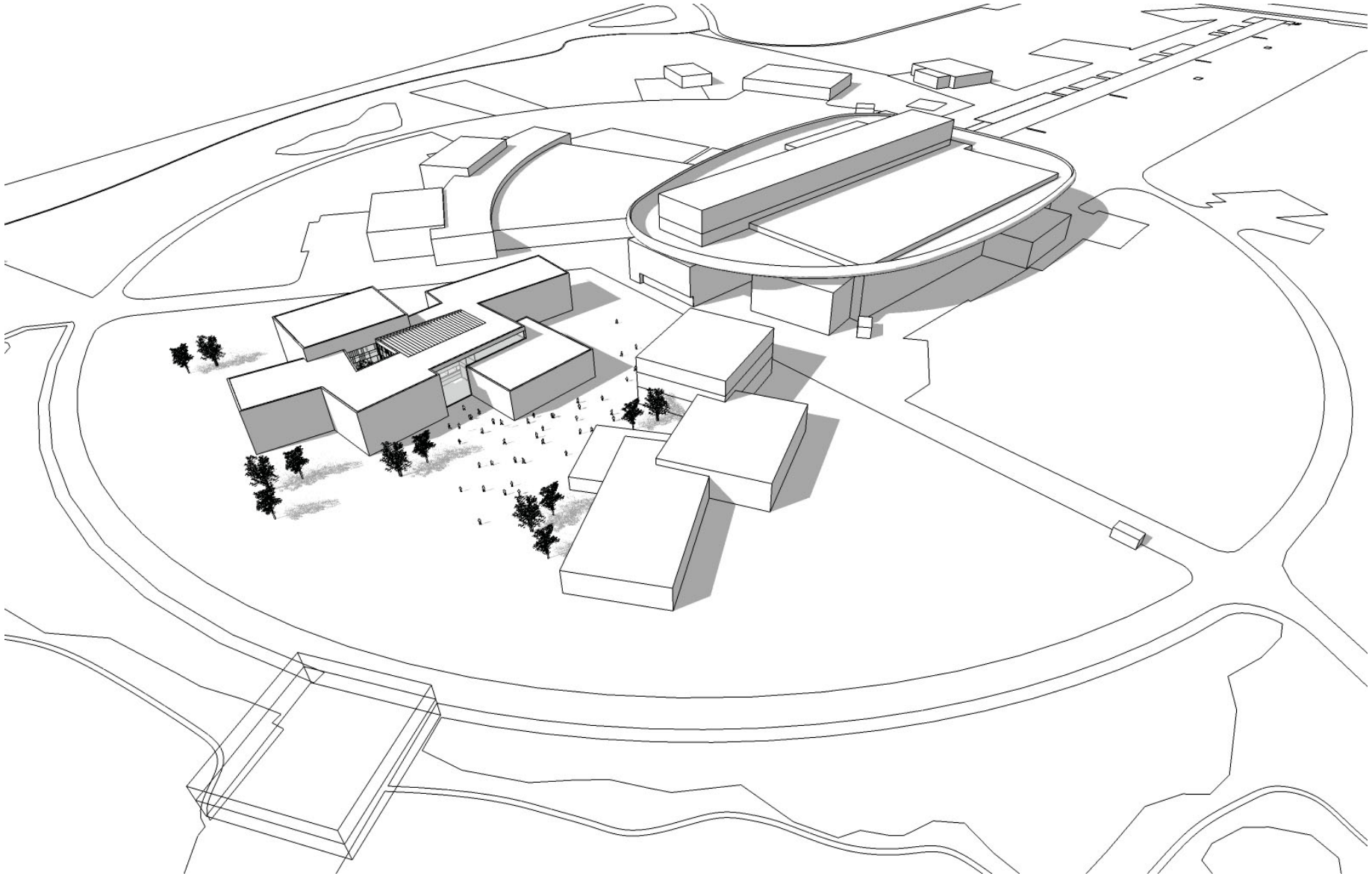
Campus Area Conceptual Design



ESS Site Map

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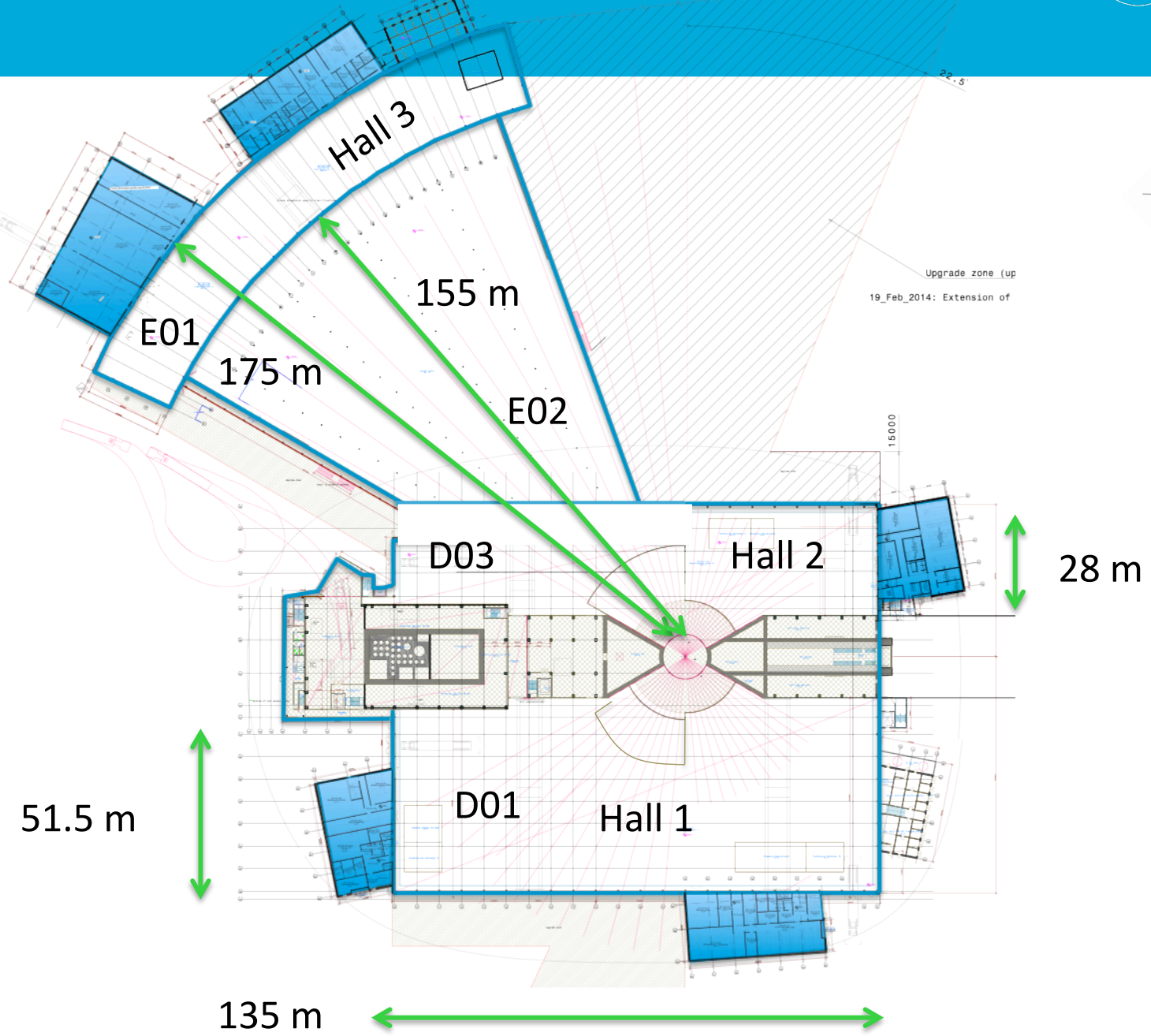
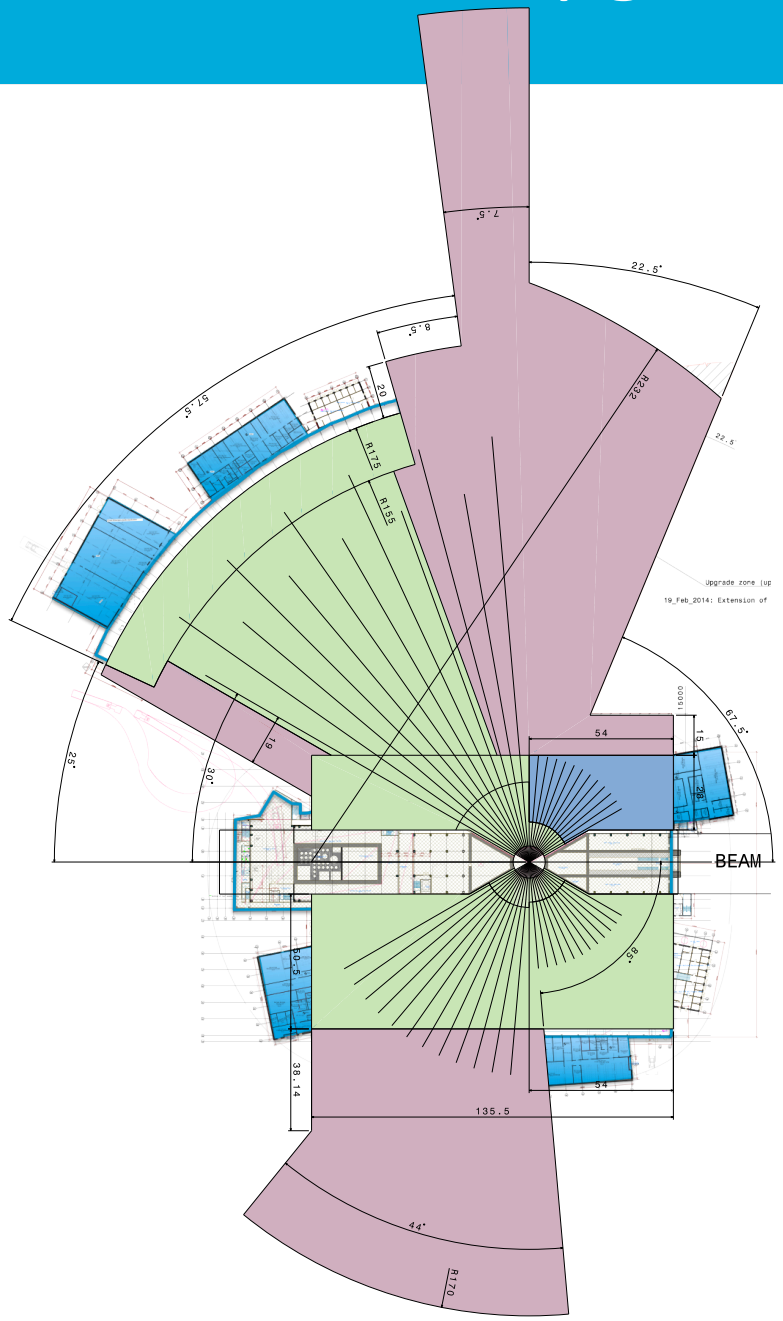
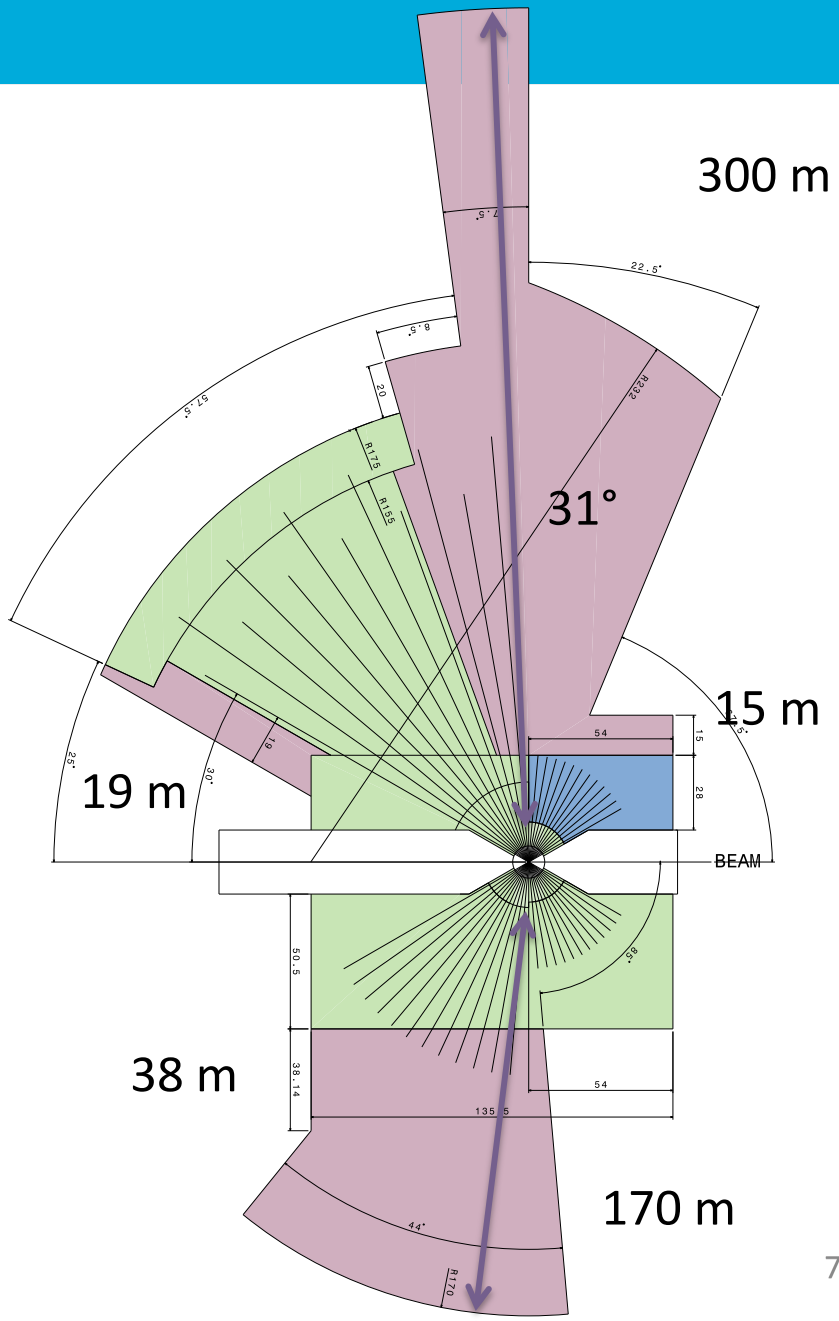
Instrument Halls and their dimensions

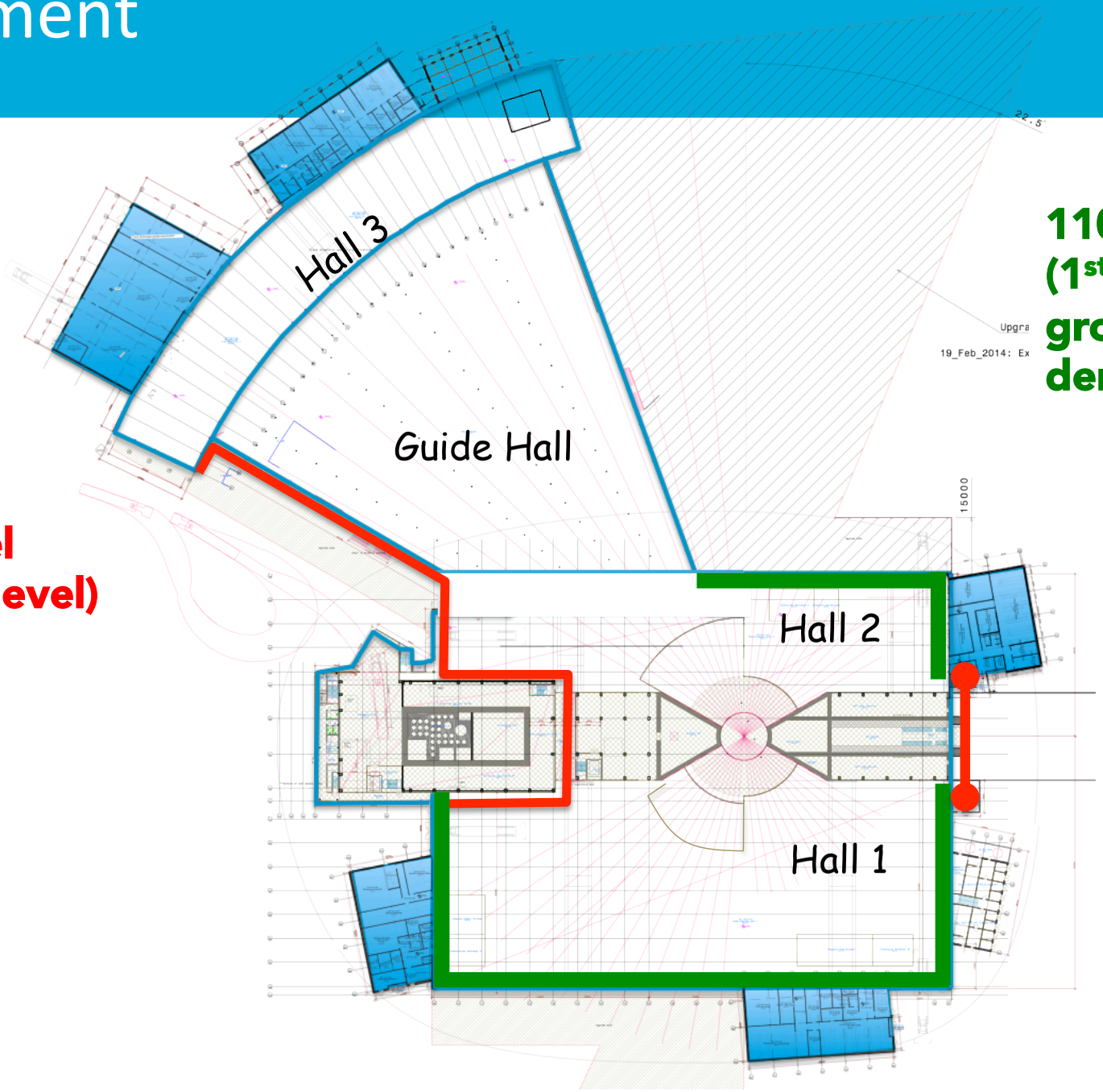


Instrument Upgrade Space





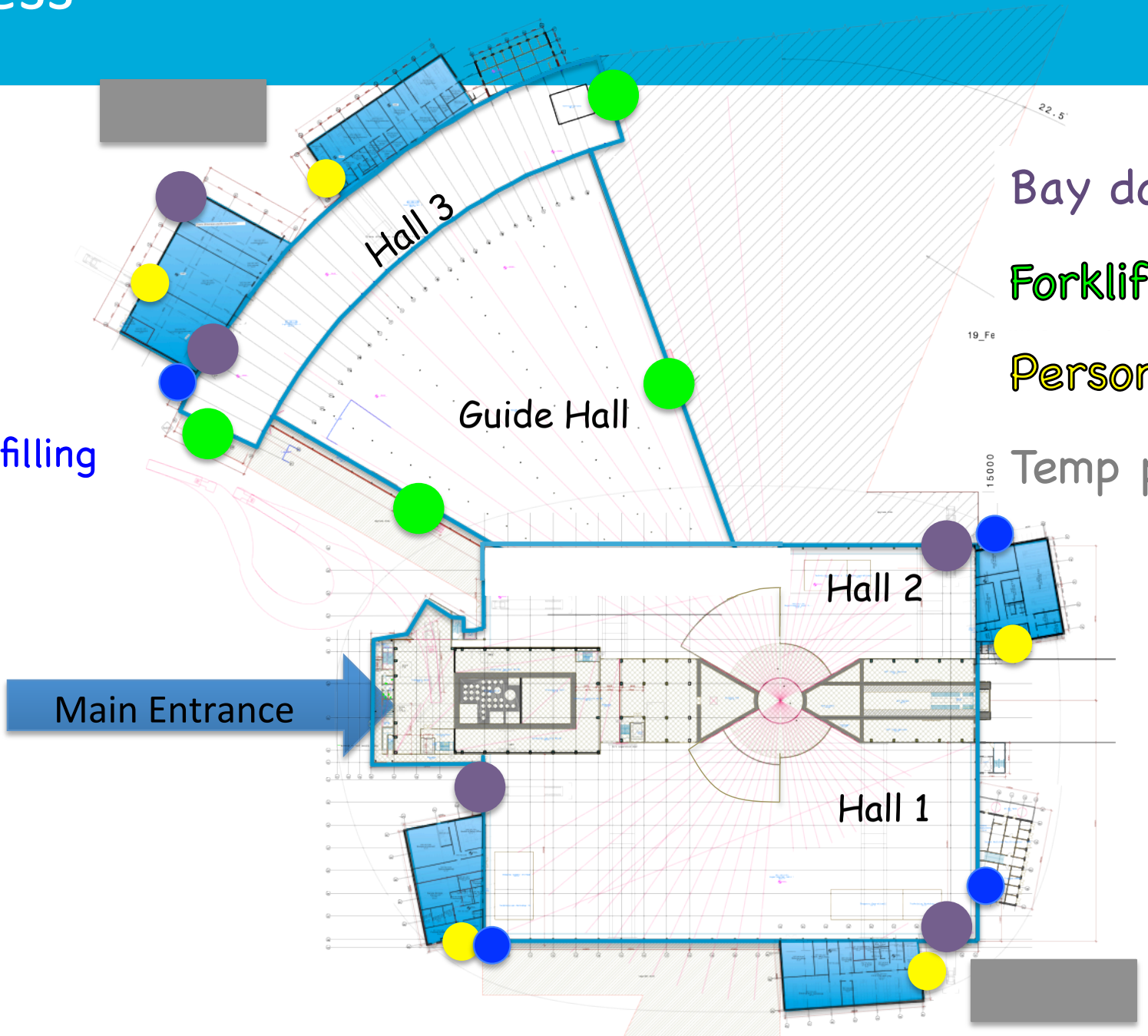
Movement



110 Level (1st floor above ground level - demountable)

100 Level (ground level)

Access


Hall 3
Guide Hall
Hall 2
Hall 1
Main Entrance
Liquid Nitrogen filling station
Bay door
Forklift access
Personnel door
Temp parking

Floors & Environment

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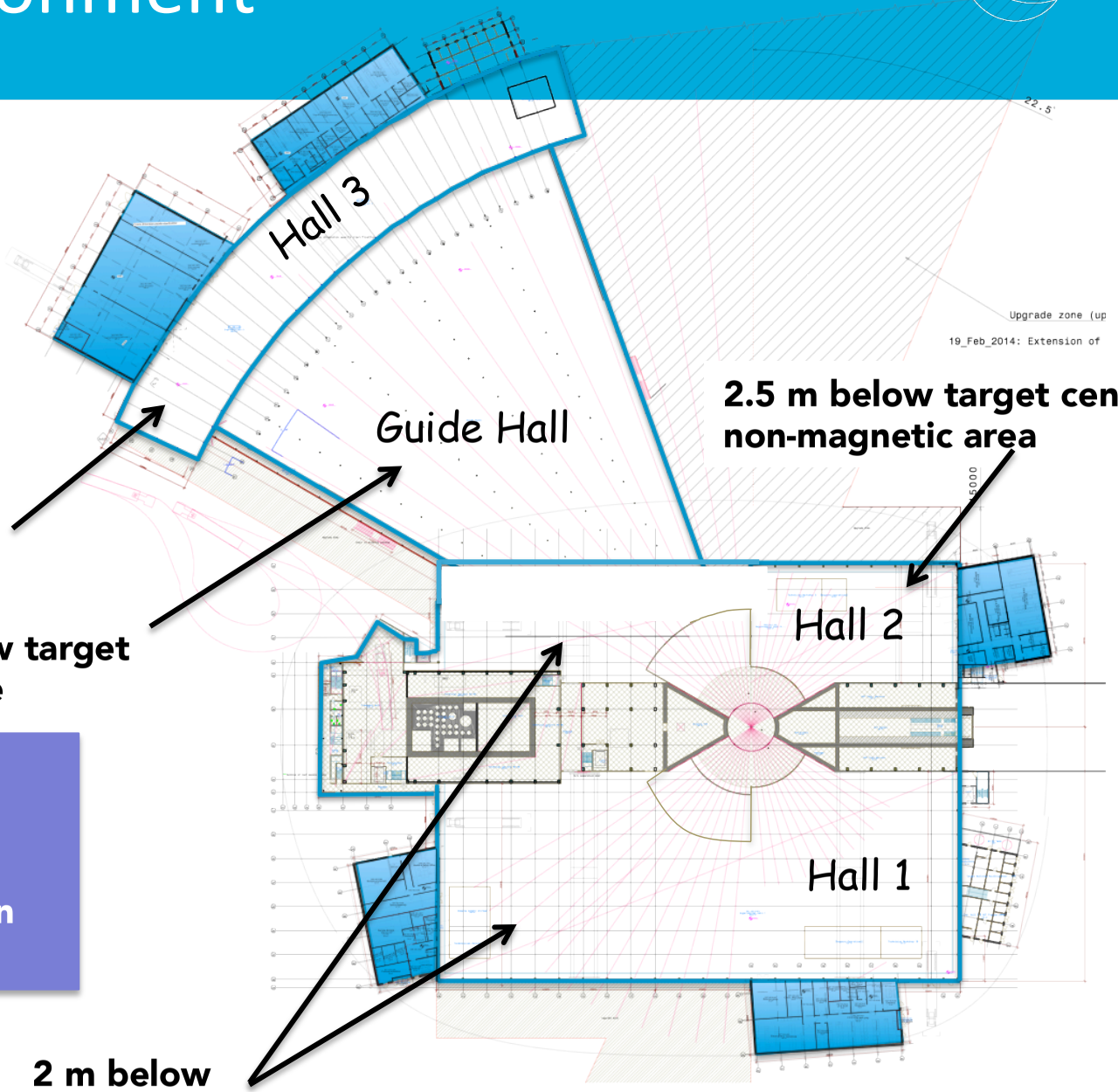
22 °C +/- 2
No humidity requirement

Temperature

Monolith/bunker: 30 ton/m²
Instrument halls: 20 ton/m²
Guide hall: 20 ton/m²
Stability: 3mm initial deflection + 3mm over the lifetime

Capacity & Stability



Cranes in Hall 1, 2, & 3

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10 T capacity Span of 20 m
Hook height 7 m above target centerline

Overhead cranes Hall 3

2 – 30 T capacity Span of 18 m
Hook height 10/10.5 m above target centerline

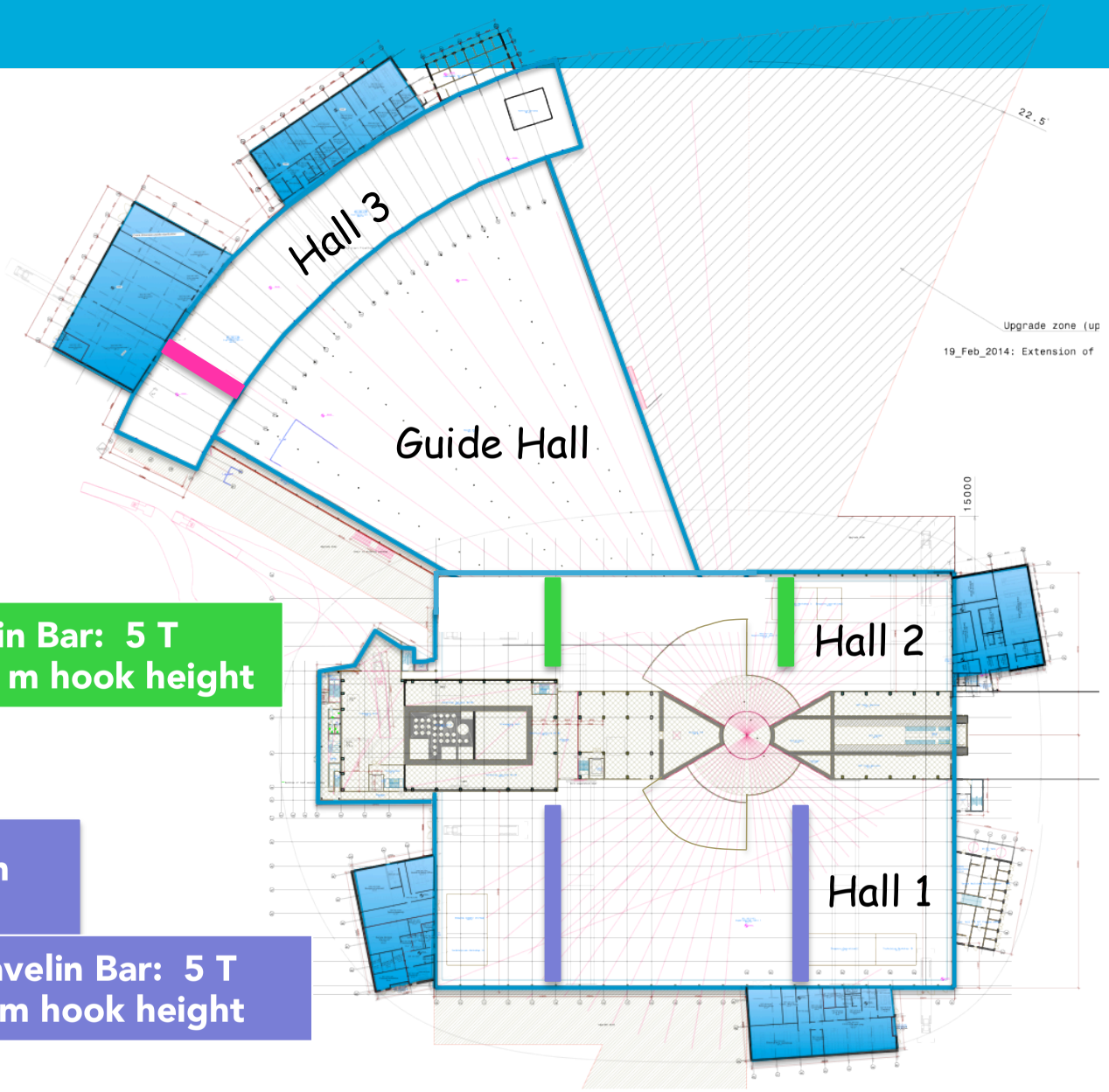
Javelin Bar: 5 T
6/6.5 m hook height

Overhead cranes Hall 2

2 – 30 T capacity Span of 51.5 m
Hook height 10 m above target centerline

Javelin Bar: 5 T
6 m hook height

Overhead Cranes: Hall 1



Monolith Crane

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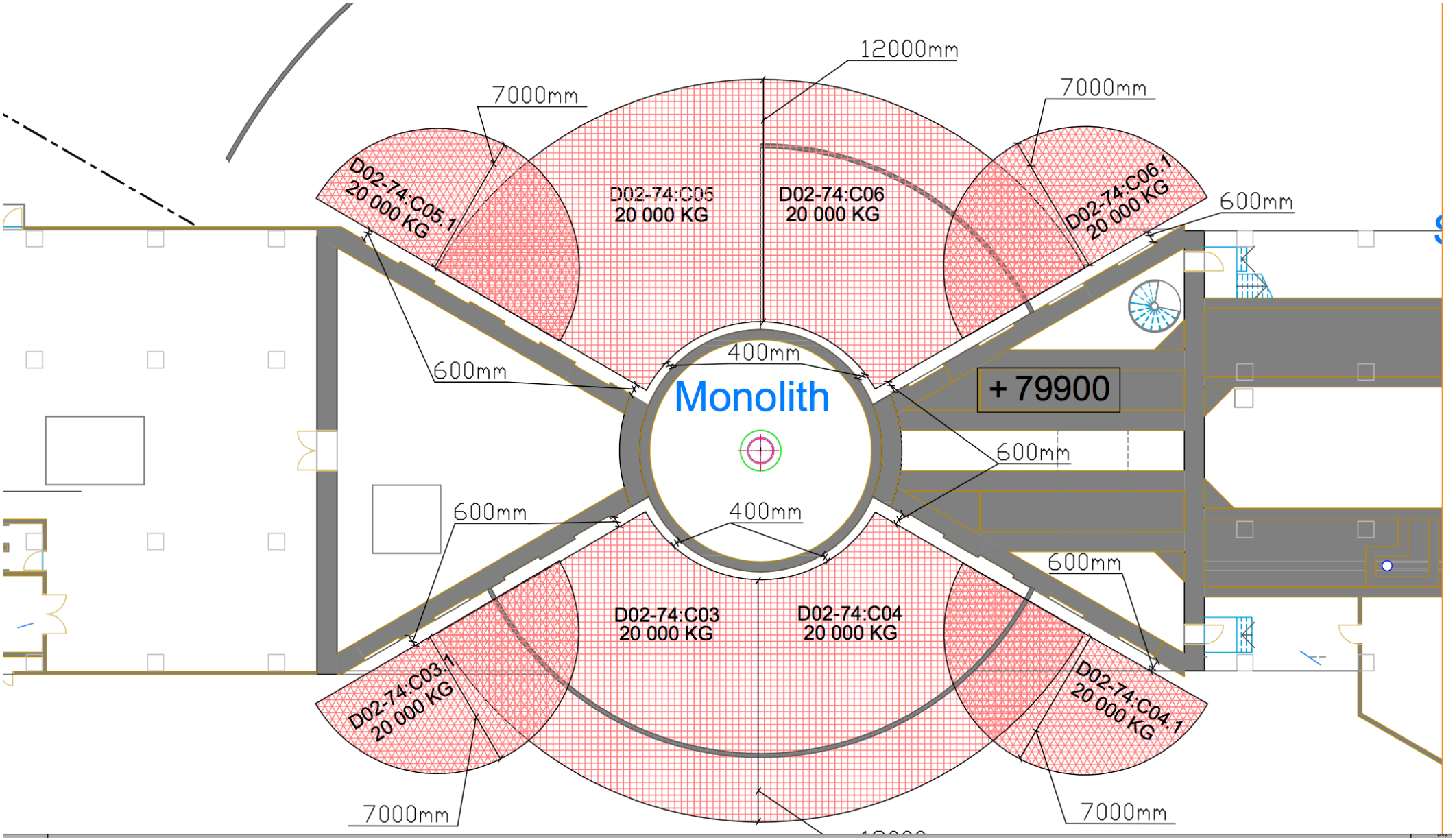
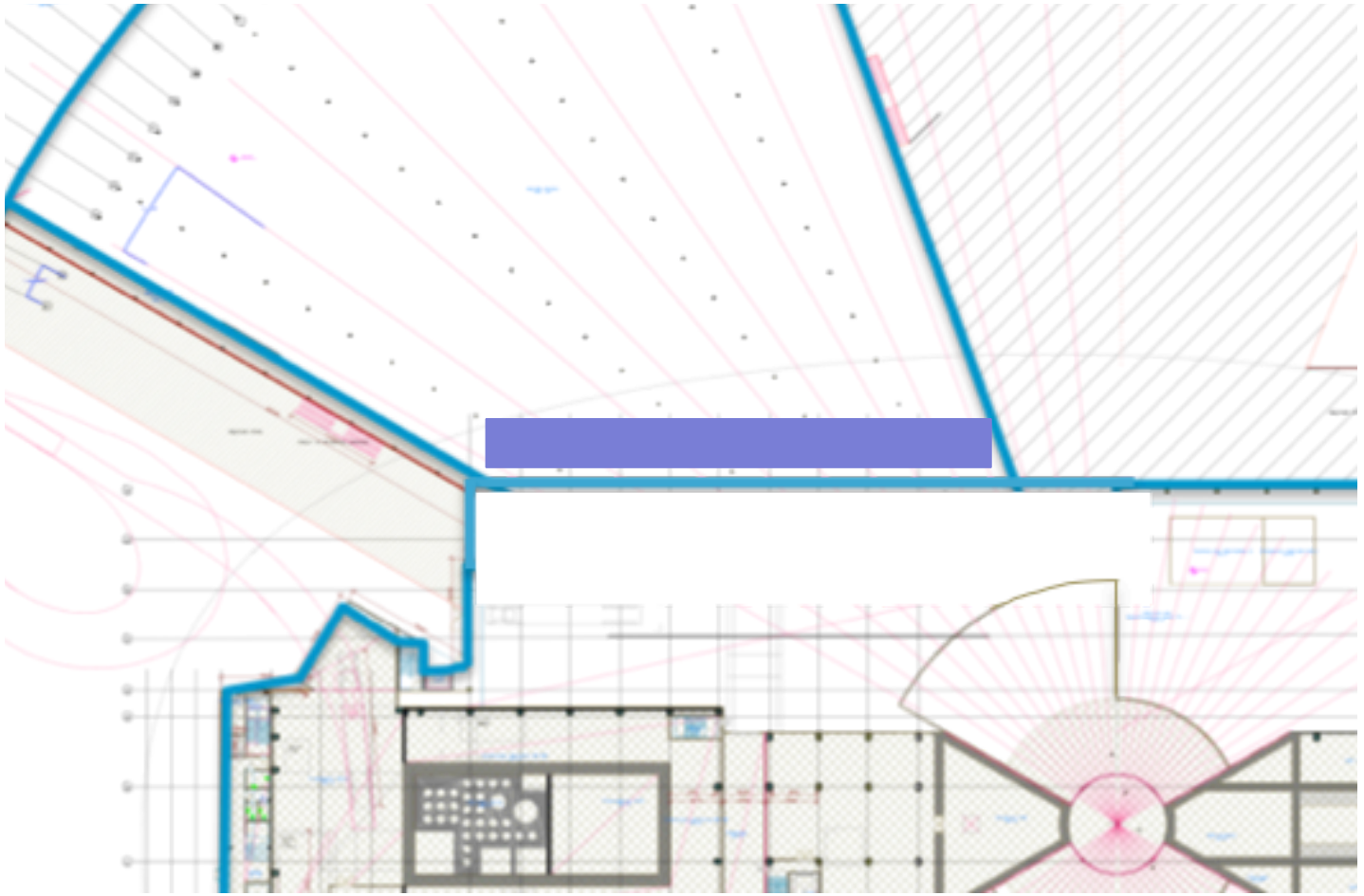


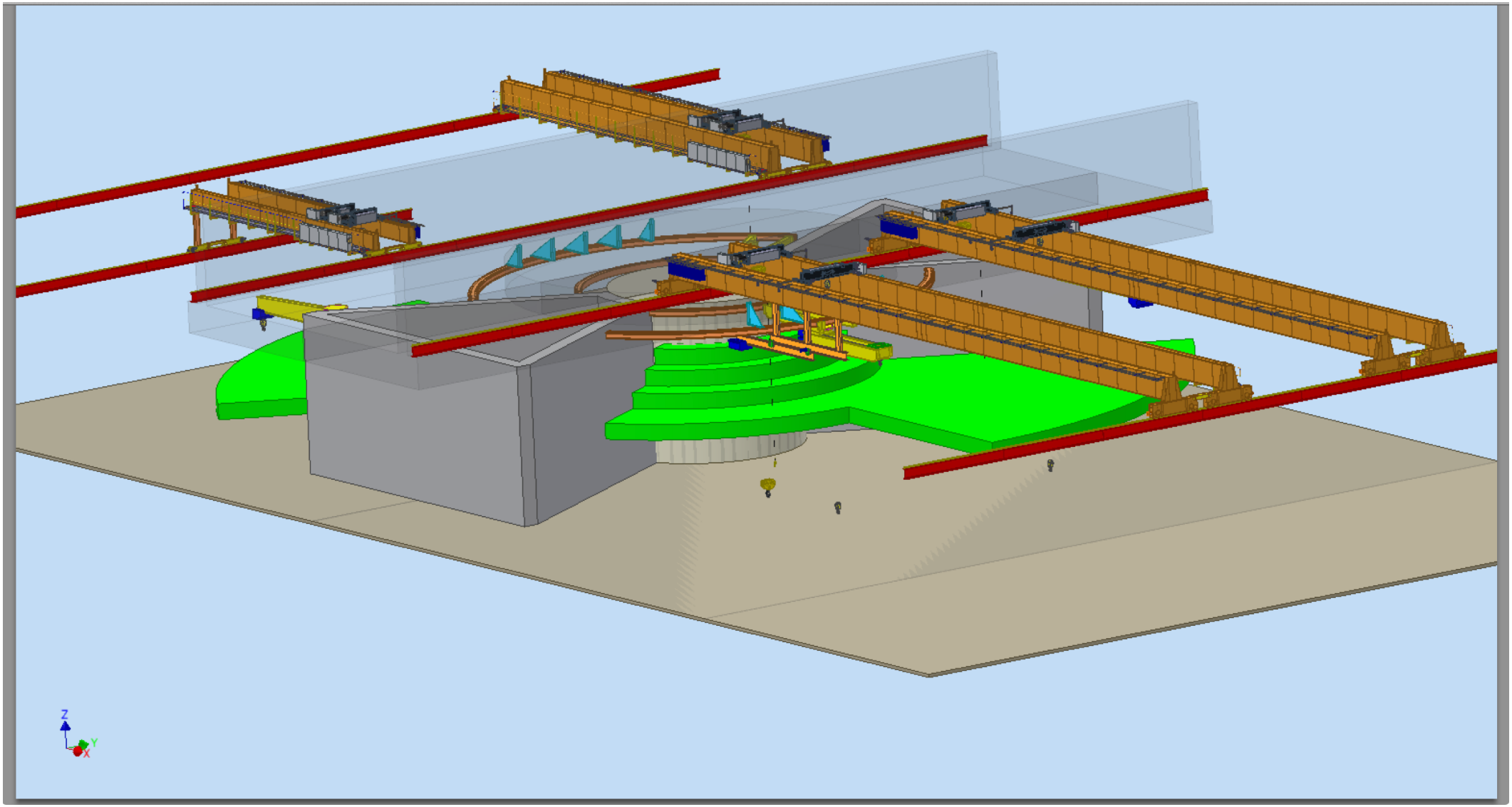
Guide Hall Cranes



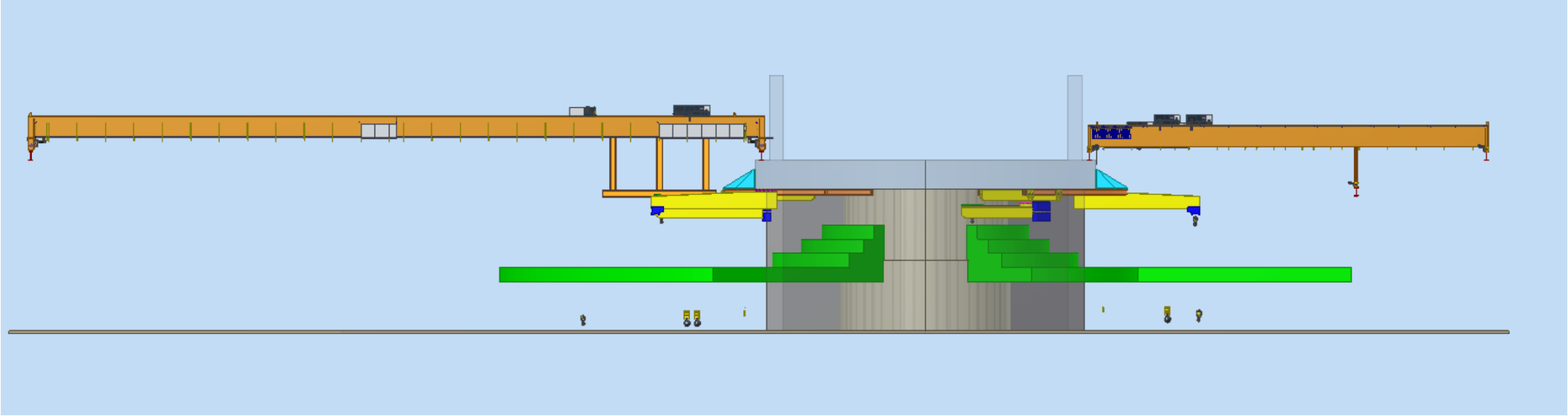
5 T bracket crane
6 m floor to hook

Gantry cranes for beamlines

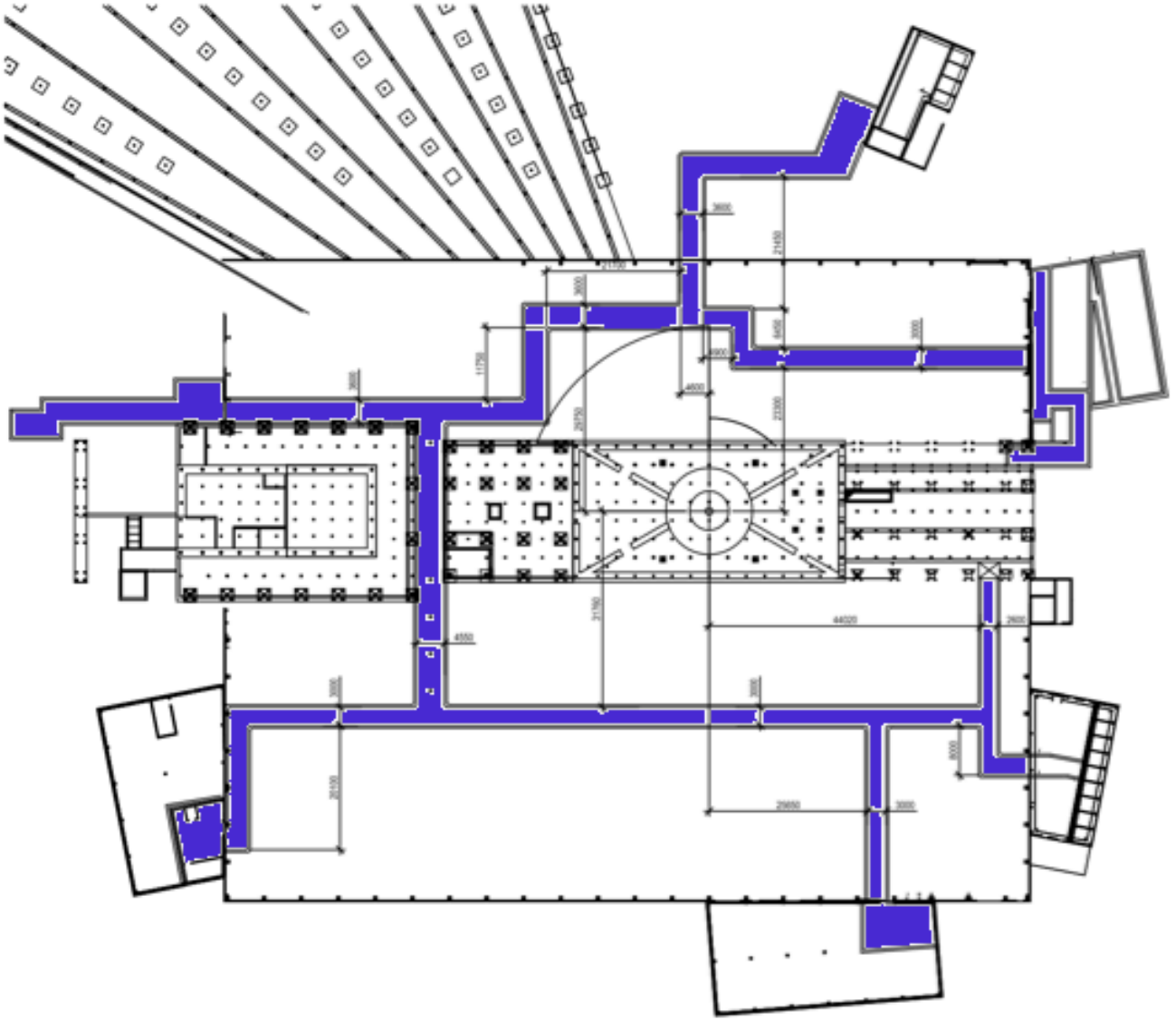
Monolith and Overhead Cranes



Monolith and Overhead Cranes



Gallery: Level 90



Utilities: Gases & Liquids

- N_2 – 10 l/min at 10 bar
- Instrument grade -40 °C compressed air – 16.5 m^3/min at 10 bar
- Helium recovery lines connected to cryo plant for LHe boil off
- Cooling water – 10 °C

Utilities: Power & Network

- 120 kW has been estimated for start up needs
- 85 kW has been estimated for average run needs
- 10 kW of which will go to the air, and 75 kW to water
- DMSC, ICS, IT, MPS, PSS networks

Utilities: Ventilation

- Ventilation access for fumehood (no rad)
- Ventilation access for sample area (rad)

Cooling Water

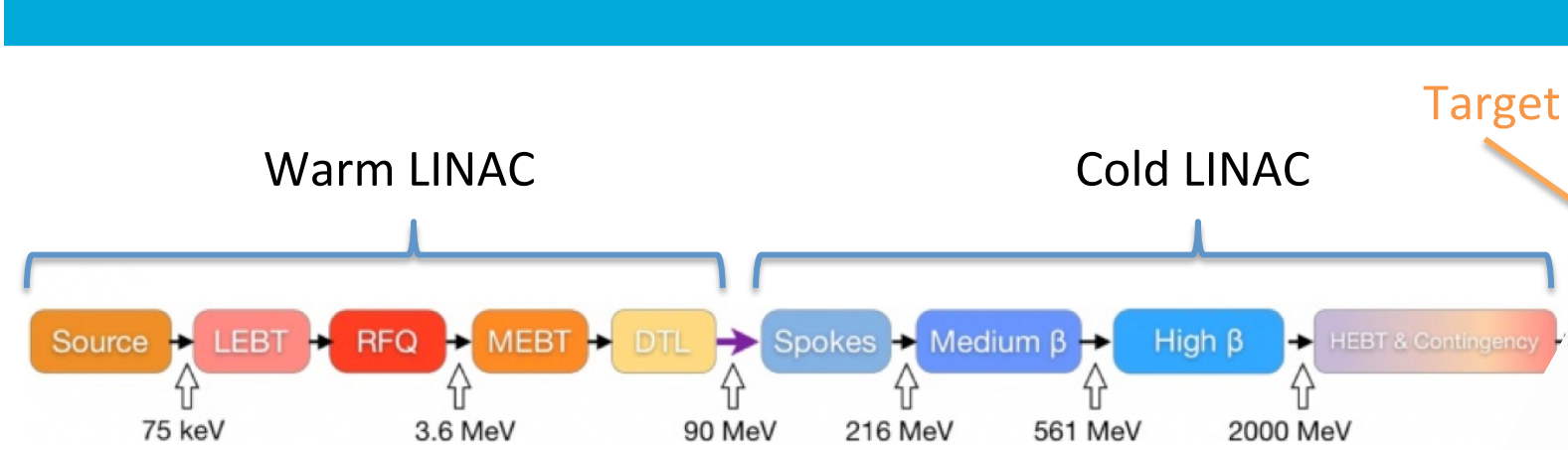
Anton Lundmark
anton.lundmark@esss.se

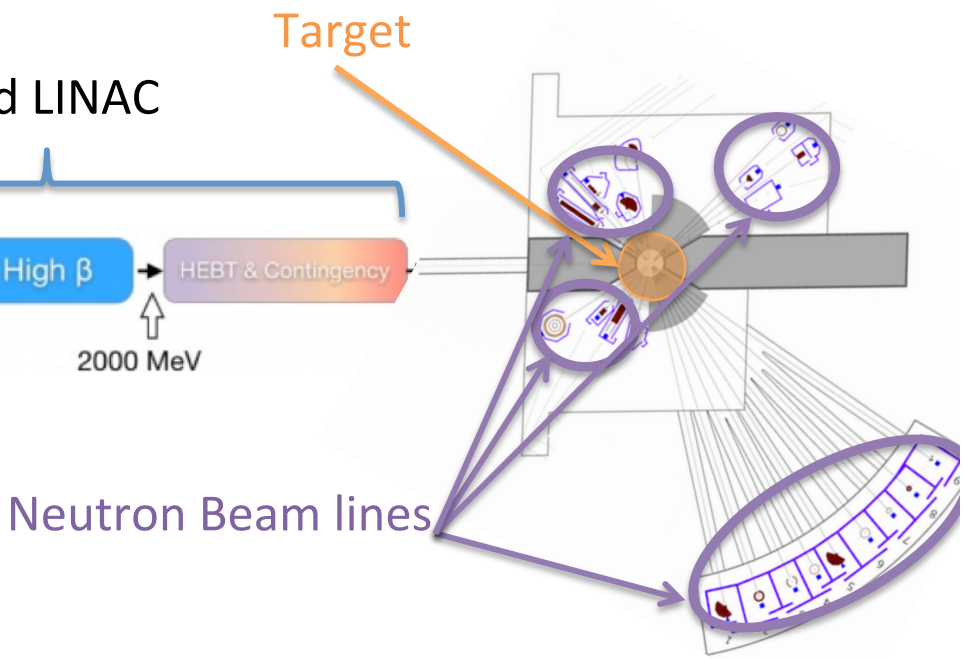
WP16 provides design support and manage the requirements between NSS and CF.

Details regarding installation and final design will follow as we progress

Basic requirements, such as preliminary heat loads and temperature levels are understood and agreed upon.

ESS Vacuum system

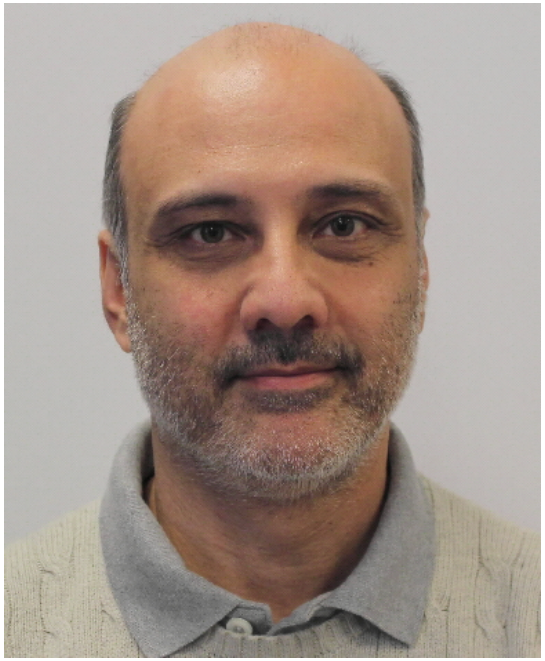




The ESS organization charges the ESS Vacuum Group (VG) with the responsibility for all ESS vacuum systems including not only the Accelerator, but also Instruments and Neutron Beam Lines and the Target.
The main task of the ESS VG is to support the in kind contributions on the vacuum system and the **integrated vacuum design** of the ESS complex.

Vacuum: state of a rarefied gas or the environment corresponding to such a state, associated with a pressure or a mass density below the prevailing atmospheric level (ISO 3529).

Vacuum

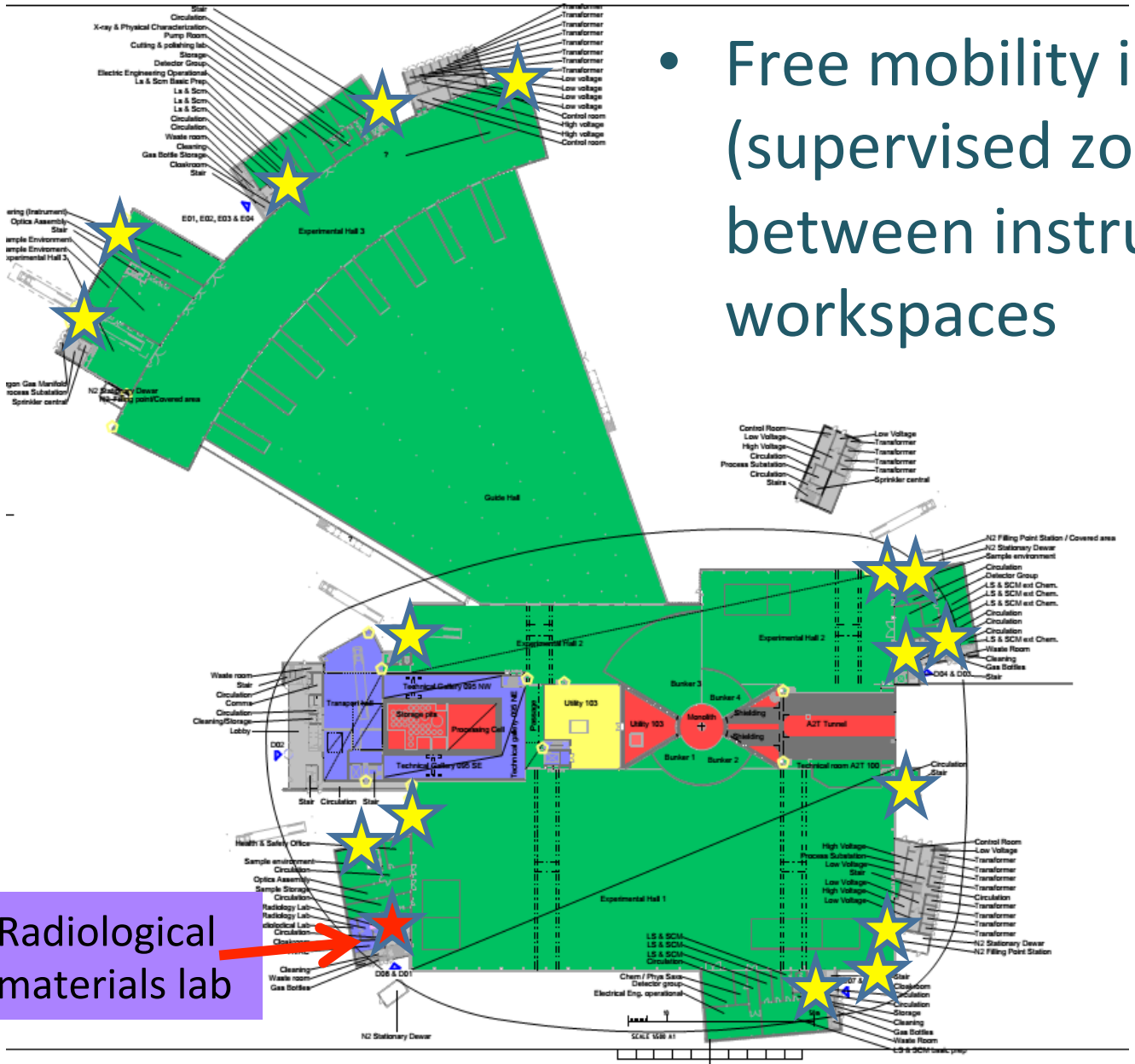


Marcelo Juni Ferreira
marcelo.juniferreira@esss.se

- Vacuum Standardization meeting Feb/2014,
- ESS Vacuum Handbook as main document, cover all requirements for accelerator, target and instruments,
- Vacuum Policy applied for all “in kind” contributions.

http://europeanspallationsource.se/accelerator-documents

Zoning of experimental halls and adjacent buildings during normal operation



- Free mobility in the green area (supervised zone – ESS-0001786) between instrument, labs and workspaces

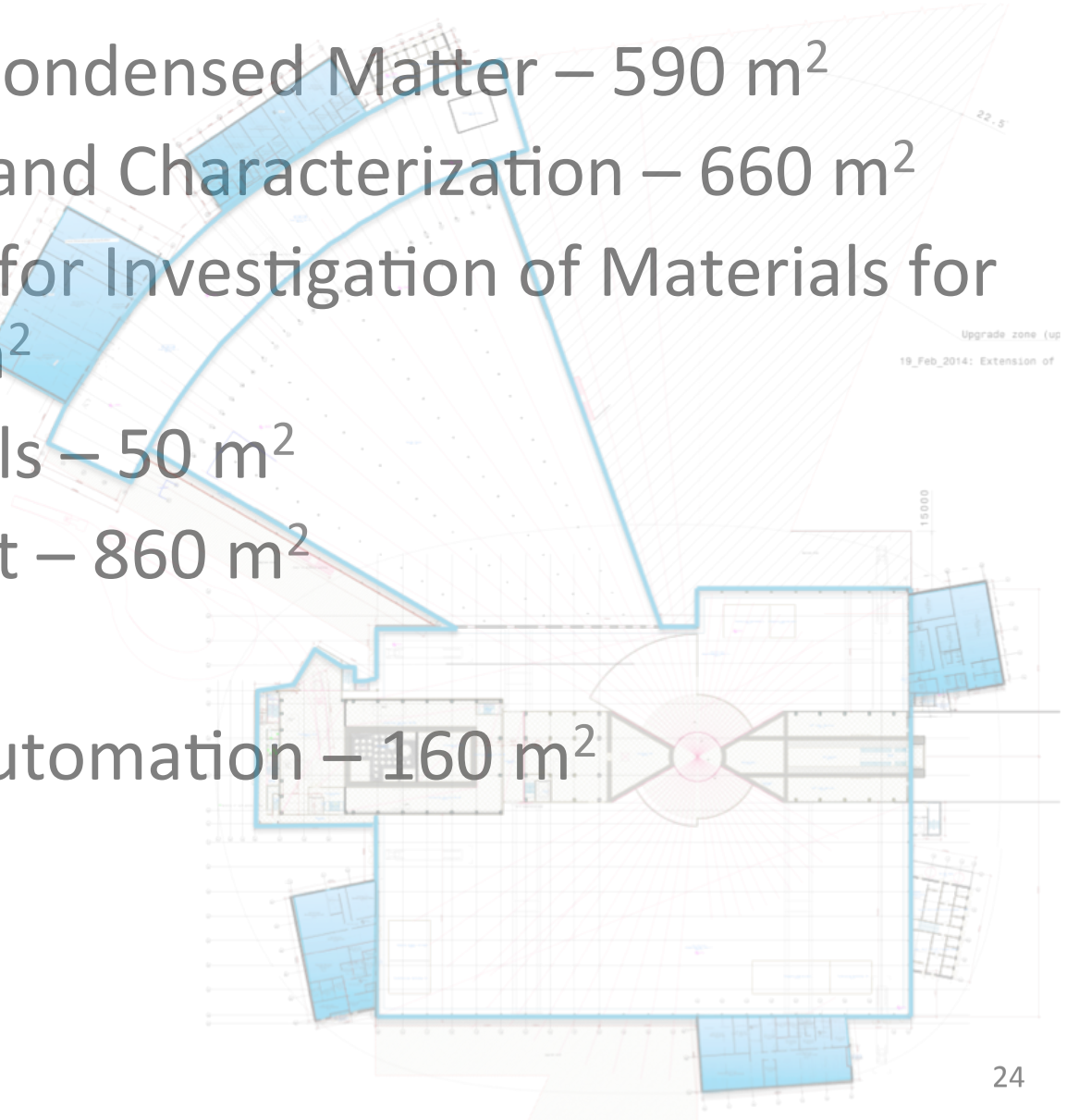
Normal
Supervised <3 µSv/h
Controlled <25 µSv/h
<1000 µSv/h
>1000 µSv/h

Entrances to supervised area: Samples that leave the area and have been in the beam need to be surveyed

Entrance to controlled areas.

Labs & Workshops: Area

- Life Science & Soft Condensed Matter – 590 m^2
- Chemistry, Physics, and Characterization – 660 m^2
- Support Laboratory for Investigation of Materials for Engineering – 200 m^2
- Radioactive Materials – 50 m^2
- Sample Environment – 860 m^2
- Detectors – 230 m^2
- Motion Control & Automation – 160 m^2
- Optics – 170 m^2



Labs & Workshops: Utilities & Climate

- Ar – 10 l/min at 10 bar
- N_2 – 10 l/min at 10 bar
- Instrument and service compressed air
- House vacuum
- DI water
- Cooling water
- Network
- 3 house gases exclusive to each building
- 22 ±2
- Some specific labs 20 – 60% RH

Sample Environment

- Hub in Hall 3 ~650 m^2
  - 2 levels
  - 2 x 2 m hole in upper level into lower level
  - 5 ton crane located on the upper floor with 10 m span, 5 m hook height and reach into ground level
  - Non-magnetic flooring for 2/3 of the ground level
  - Liquid He recovery lines back to the cryo plant
  - Floor loading 5 ton/m^2, lower level
  - Floor loading 1 ton/m^2 distributed and 5 ton point load, upper level
- Hall 1 ~150 m^2
- Hall 2 ~60 m^2

Key Dates and Milestones for Halls 1 & 2

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Building Reference	Building Name	C101 Planned Commencement	C101 Planned Completion
D02	Target Building	12-Jan-15**	28-Jan-19
D01	Experimental Hall 1	2	
D03	Experimental Hall 2	2	
D04	Lab 2	1	
D05	Substation	2	
D06	Substation	2	
D07	Lab 1B	2	
D08	Lab 1A	2	
* Indicates commencement of detailed excav			
** Indicates commencement of temporary sh			

ESS Milestones Buildings D01-D08	
NSS access concrete works Guide Bunker	5-Dec-16
NSS access concrete works Instr. Foundation Hall D01	3-Jul-17
NSS access concrete works Instr. Foundation Hall D03	4-Sep-17
Early Access to Target Bldg D02	2-Oct-17
Target Building Access for Monolith Installation D02	2-Oct-17
Target Building D02 Access for Active Cells	2-Oct-17
Target Building D02 Access for Plugs	2-Oct-17
Early Access to Experiment Hall D01	31-Jan-18
Early Access to Experiment Hall 2 D03	14-Mar-18
Full Access to D04 Lab 2	31-May-18
Full Access to D07 Lab 1B	31-May-18
Full Access to D08 Lab 1A	31-May-18
Full Access to Experimental Hall D01	24-Oct-18
Full Access to Experimental Hall D03	14-Dec-18
Target Building D02 Access for CF Provided Utilities	14-Jan-19
Full Access to Target Building D02	29-Jan-19

Key Dates and Milestones for Hall 3 and the Guide Hall

Building Reference	Building Name	C101 Planned Commencement	C101 Planned Completion
E01	Experimental Hall 3	07-Oct-15 (Piling)	21-Dec-18
E02	Beam Line Gallery	20-Oct-15 (Piling)	21-Dec-18
E03	Lab 3A	18-Jul-16*	31-May-18
E04	Lab 3B	08-Aug-16*	31-May-18
E05	Substation	19-Aug-16*	05-Jul-17

* Indicates commencement of detailed excavation works

ESS Milestones Buildings E01-E05	
NSS access concrete works Instr. Foundation Hall E01	4-Sep-17
Early Access to Experiment Hall 3	27-Mar-18
Full Access to E04 Lab 3B	31-May-18
Full Access to E03 Lab 3A	31-May-18
Full Access to Experimental Hall E01 & Guide Halls E02	21-Dec-18

Questions??