

LLRF – Faraday cage support & Integration

Meeting minutes, 17/08/2016

Presents: Scharif Mehanneche, Alejandro Martinez Selles, Joao Ferreira Bento, Philippe Baudrenghien, G.Vandoni

General Information

Scope of the meeting is to define the specification of the socket for the Faraday cage in SPS BA6. This socket is produced by SMB/SE, during the EYETS. All other supporting structures for the BA6 (surface building) crab-cavity equipment will be produced during the EYETS, because cabling by EN/EL can only be performed during EYETS and with supporting structures already in place.

For information, P.Baudrenghien asks to delegate also the internal layout (rack supports and false floors) of the Faraday cage. These structures are installed inside the finished Faraday cage. Their details will be studied by SMB/SE only after the chosen contractor has communicated the design.

Assembly of a Faraday cage is usually done from inside, but it would be good to have a socket slightly exceeding the maximal dimensions of the FC, in order to better match the internal and the external false floor and to ensure safe working conditions for the contractor.

Date for the start of operation with LLRF: end of YETS 2017-2018.

Dimensions of the Faraday cage and its supporting socket

The Faraday cage is defined with its maximum dimensions. The contractor is free to propose a smaller cage. Applying the example of Linac4, BE/RF will ask for a maximal floor occupation of 5m x 3.8m. CERN will provide to the contractor a clean flat surface according to the specification of planarity and roughness the contractor will define once the contract is placed. The height of this socket will be such that the difference in level between the present false floor and the upper supporting surface will be of 65cm. The dimensions of the socket will exceed the dimensions of the maximal Faraday cage surface by 10cm in all directions, but by 50cm in front of the door.

Technical solutions for the socket

The preferred solution for the socket of the FC is by concrete blocks equipped with a lifting ring. To smooth out the step of the chamfered edge of the blocks, a steel plate of 1cm will be placed on top of it. Blocks can be ordered of custom size. The solution by blocks would permit easy installation and removal, in case of evolution of the scope of the building. However, SMB/SE may propose a different solution if it responds better to the constraints of integration, installation, work execution and removal.

Integration in BA6

All cable trays underneath the proposed position of the FC are empty, with the exception of one – partially filled. To ease installation of the blocks and later of the cover plate, the socket will be displaced slightly towards South (towards the cryogenic compressor), such that the partially full cable tray is not touched. This displacement brings the blocks and plate better under the coverage range of the crane hook.

Integration must also include the ventilation pipework and diffusers on top of the Faraday cage and the air-cooling unit. These, specified to supply cooling power for 5 racks (1.7kW each), will be modelled by EN/CV and the model given to EN/ACE for integration. The air-cooling unit may be integrated above the FC, but the roof of it is not specified for carrying more load than that of 3 persons: in which case a supporting structure must be designed as well.

High noise level (83dB) has been recorded in BA6 from the water pumps behind the wall, close to the future implantation of the FC. The cryogenic compressor will add to the noise and vibrations – although it will be specified with vibration damping feet and noise-reducing cover.

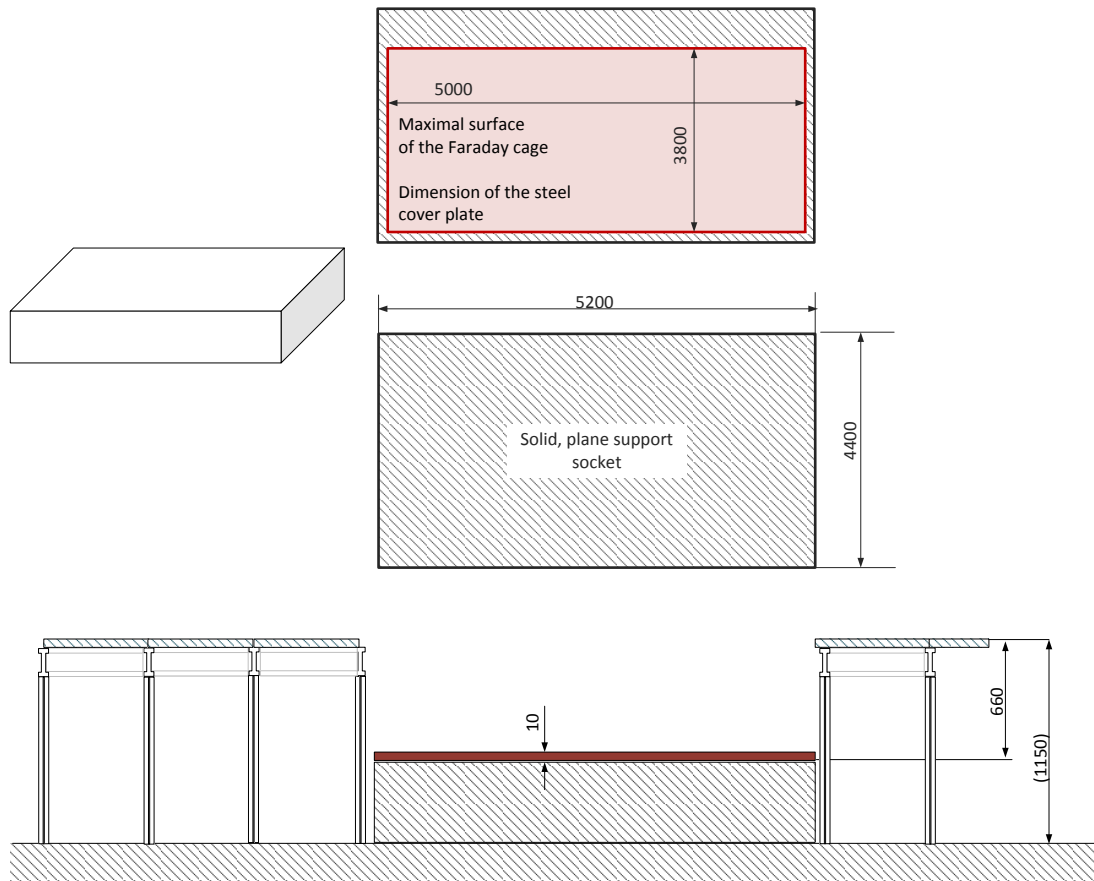


Figure 1 – Dimensions of the Faraday cage supporting socket, maximal surface of the Faraday cage, dimensions of the cover plate. The height of the false floor needs verification.

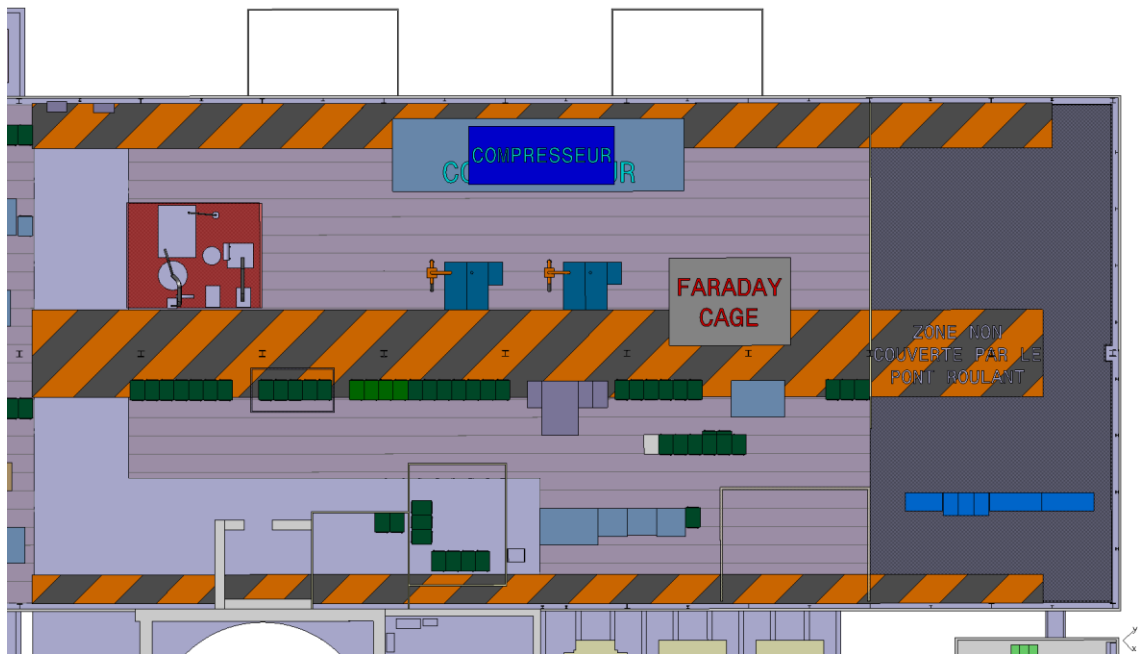


Figure 2 – Present implantation of the Faraday cage in BA6

Actions

A.Martinez:

- Study and propose a solution for the supporting socket.
- Check integration of the proposed solution on site, at latest during the coming TS 13-14 September

S.Mehanneche:

- Provide the new integration, with modified position and envelopes as specified above, for the supporting socket in BA6

P.Baudrenghien/ J.Ferreira Bento:

- Complete the requirements to EN/EL with the Templates transmitted by GV: DIR and Demande de distribution électrique.
- Provide the requirements to EN/CV for controlled ventilation of the Faraday cage

P.Baudrenghien/ G.Vandoni:

- Provide integration information for the air cooling unit and the ventilation piping and diffusers to S.Mehanneche, by meeting (GV to organize) the EN/CV Design Office and HiLumi linkperson.

For reference:

Faraday cage for Linac4, IT-3699/BE/LINAC4: [EDMS 1093765](#)

Faraday cage for Linac4, schematic layout: [EDMS 1085647](#)

Here, the [indico](#) for this meeting.