

SMB-SE Civil engineering in the tunnel

Meeting minutes

Presents: S.Mehanneche EN-ACE-INT, Alejandro Martinez Selles, Richard Morton SMB-SE-CEB, Kurt Artoos, Joanna Swieszek EN-MME-EDM, Mateusz Sosin EN-ACE-SU, Caterina Bertone, Michal Czech, EN-HE-HH, G.Vandoni BE-RF, Serge Claudet TE-CRG

FLOOR

The weight of the transfer table alone should amount to 7 tons if not more. The charge on the table amounts to 7 tons. The sole Service Module will weight 1 ton. This means 14 tons to move, reproducibly, over 510mm. CNC machines, of similar specification and weight, are simply placed on the floor, however, here the choice will be left to the supplier whether anchoring is required. The proposed option in this case is for 200mm deep, chemical dowels.

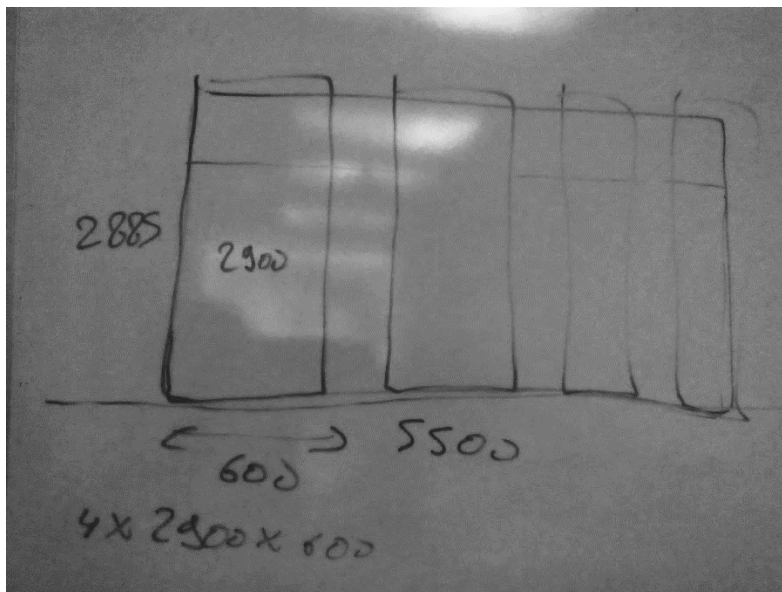


Figure 1:

On the floor, 4 zones would be grinded on 10cm and refilled with high quality mortar. Around this zone, a new surface would be prepared with resin

The table is separated in « table base » and « table top » (Figure 2). The base, depth 2885mm, accommodates rails and end switches, hence its depth – still not impacting the transport lane. The floor should be prepared to accommodate the pieces, by grinding 4 zones of ~600mm each over a depth of 100mm, then filling the gap with high quality mortar or high strength screed. The discreet feet of the table would accommodate on these zones, either simply resting, or –if the supplier requires it – bolted through the newly prepared flooring with chemical dowels. Resin flooring on the remained of the surface would be sufficient to have a clean, dust-free area. No further stabilization will be necessary.

Kurt will shortly prepare two plans and have it approved for storage in CDD : the extent of the 4 zones on which the flooring has to be done and available space for installation of the table.

SMB will proceed to a core sampling during the coming TS, if they estimate it necessary. They will also inspect the trench under the red steel cover (Figure 3), as the integration presently requires the helium pumps to be installed on this steel plate.

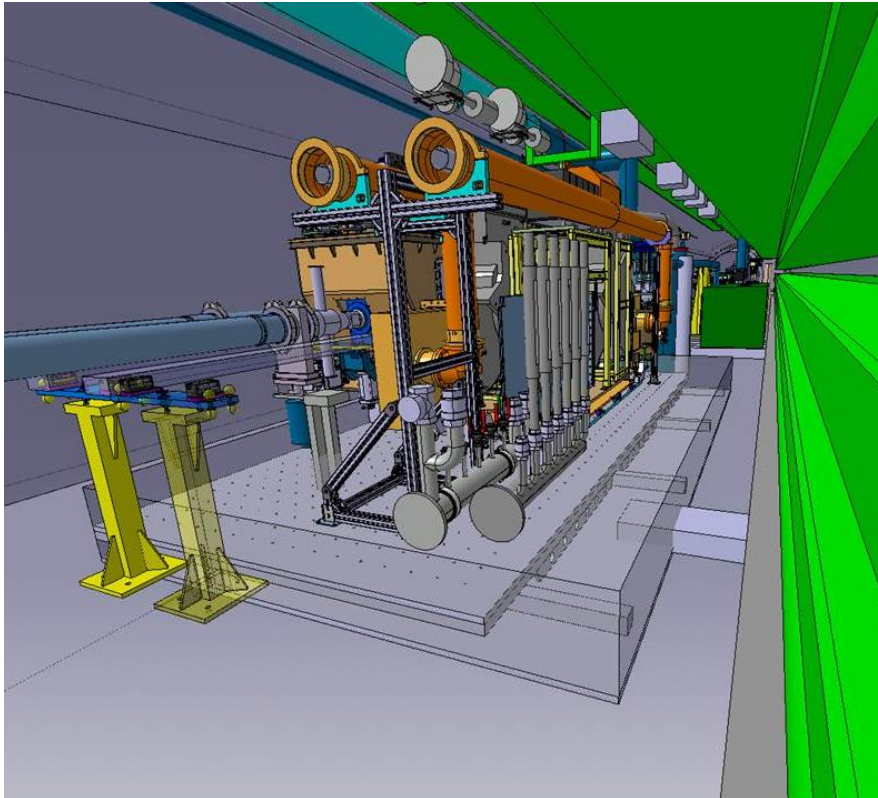


Figure 2:
Transfer table,
parking and
operation position



Figure 3:
Red steel cover, for
inspection during the
coming TS

Mateusz EN-ACE-SU requires two laser tracker sockets in the transport zone. It will host a laser tracker, to have automatic measurements of several targets, thus sparing time for alignment. The support will be levelled with the surface of the transport lane. He proposes a circular trench of 250mm diameter and 70-100mm depth; a supporting steel plate will be anchored by chemical dowel at the bottom of this hole. A steel cover will protect the hole. The counter-proposal of SMB is a standard in SMB-SE: a deeper trench with a 100mm step and a ring protecting the edge and hosting the steel cover, to avoid deforming the laser tracker socket by rolling on it with transport engines.

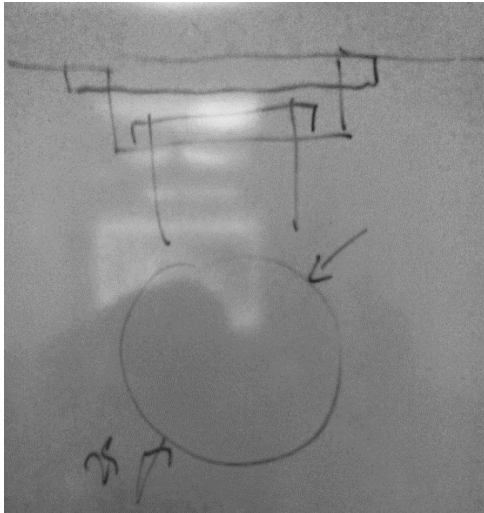


Figure 4:
Sketch of the trench for a laser tracker
socket

Mateusz will prepare a plan with the exact position for the end of August and send it to EN-ACE and SMB-SE.

Serge notices that the heater is placed above two bus-bar protection covers. These will remain, the heater is therefore integrated with feet to straddle the covers. CRG takes note for the design of the heater.

VAULT

The contracting firm is now defined and will come to CERN for an inspection during the September TS. Sections will span ~10m, reducing the number of welds to be done in the tunnel. The present integration of the cryogenic distribution line is still provisional although generically correct. The U-support will also sustain 2 warm pipes for gas recovery. All cryogenic pipework must be inside the U-supports. The last support must be more massive, acting as fixed point for the whole line. Its anchoring to the vault must also be more robust, with a plate for charge distribution. Besides this point, charge is below 200kg/m.

Drilling the vault is done by the contractor, with training provided by SMB-SE. SMB (Alejandro) will be part of the VIC and advice on the maximum depth to drill and the method the contractor plans to use to limit the depth. It is indeed imperative to avoid drilling through the hermeticity limit of the tunnel.

The definitive position of the line itself must be stated in the ECR, under circulation in this very moment.

Action for TE-CRG and Giovanna to finalize and correctly describe this position in the ECR.

Action TE-CRG: A precise position of the supports will be give to SMB-SE by the end of October.

At the position of the cryomodule, EN-HE is presently proposing the installation of 2 short rails for installation of heavy equipment at the cryomodule test stand. More on this below.

CEILING in TA6

No data are available on the « Feralfen » at the ceiling behind the freight lift.

Action: SMB will proceed to a test of the feralfen during the coming TS.

TRANSFER TABLE INSTALLATION

Kurt recalls that the table top has to be inserted onto the rails, from laterally. Weight is estimated at 7tons, or at least no single table block should exceed this value.

M.Czech presents the option of having 2 rails transversally installed at the crab-cavity cryomodule zone. A lifting device would then be added for handling. The option is extensively discussed, with pros and cons listed below:

In favour

Gives the possibility to install the table top in a single piece
More flexibility for transport in installation of all equipment on the table, where Yales may not be sufficient. It may therefore degrade the table top specification, permitting to reduce its weight and cost.
It adds to the value of the test stand for future, yet undefined use

Against

(Moderately) costly solution (50kCHF) for a once-in-a-time installation necessity
It impacts heavily on the vertical space above the cryomodule, especially with the necessary palonnier.
It interferes with a cable tray of which it would require emptying and removal. This cable tray is occupied presumably by unused cables, but may need to be refilled with the cables for the test stand.

Michal and Caterina explain that the rails shown on the study are not optimized. Improving the steel grade, using the I profile as guide for rollers for the palonnier, will reduce its height.

They also propose a solution where an entire section of the rails would be removable. This section would have the full bearing capacity of the rails. However, to be useful also in future this extension must be such that it doesn't interfere with the existing cable tray – if the cable tray is not displaced or removed.

ACTIONS ON THE CEILING RAILS

Giovanna with EN-ACE: check the use of the cable-tray and whether it can be displaced locally towards the wall

EN-HE: optimize the rails for smaller impact on integration. Propose if possible an entirely removable solution.

All: meet again in some days to finalize the analysis of this solution, in order to introduce it in the ECR if possible.