

# Far Detector Infrastructure Grounding

- Recent questions from Josh Wilhite on 8/14/2018

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Terri and Paul,

We're in the midst of a cost reconciliation of the excavation part of the project. We're discovering that the requirement for welded wire mesh in the caverns above the 4850L is driving costs. The discussions we're having are that this is only required for grounding purposes, and will not be used for ground support, which will be provided by the shotcrete and long bolts. A few questions:

- 1) How convinced are we that this is necessary?
- 2) Is it necessary for the entire cavern surface area, or can it be limited to a specified surface area?
- 3) Would it be possible to use steel fiber in the shotcrete rather than mesh?
- 4) Any other thoughts?

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## 1) How convinced are we that this is necessary?

**We are convinced that we require a low impedance ground path for BOTH the Detector and the Cavern/Ufer grounds. The mesh treatment specified in docdb 285 allows for this by providing a uniform low impedance return path for Cavern ground (welded wire mesh) as well as reducing the coupling capacitance between the system grounds by calling out non-conductive mesh in the lower areas near the cryostat walls.**

## 2) Is it necessary for the entire cavern surface area, or can it be limited to a specified surface area?

**It would be our preference to treat entire cavern surface, the building services are distributed and may evolve. It is best to have a common plan for constructing these areas.**

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3) Would it be possible to use steel fiber in the shotcrete rather than mesh?

**No, see Paul's comments below.**

**From Paul Bauer -**

**"Steel fiber would not provide a reliable, continuous ground path. It is not a substitute for an UFER ground."**

4) Any other thoughts?

**We would prefer stay with plan in docdb 285. We *may* want to put in a requirement that any point measured between the wire mesh and the bus bars which run along the cavern wall be 1 ohm or less. This will assure us that the welded wire mesh meets the requirement that the individual sheets are electrically well bonded.**