Near Site

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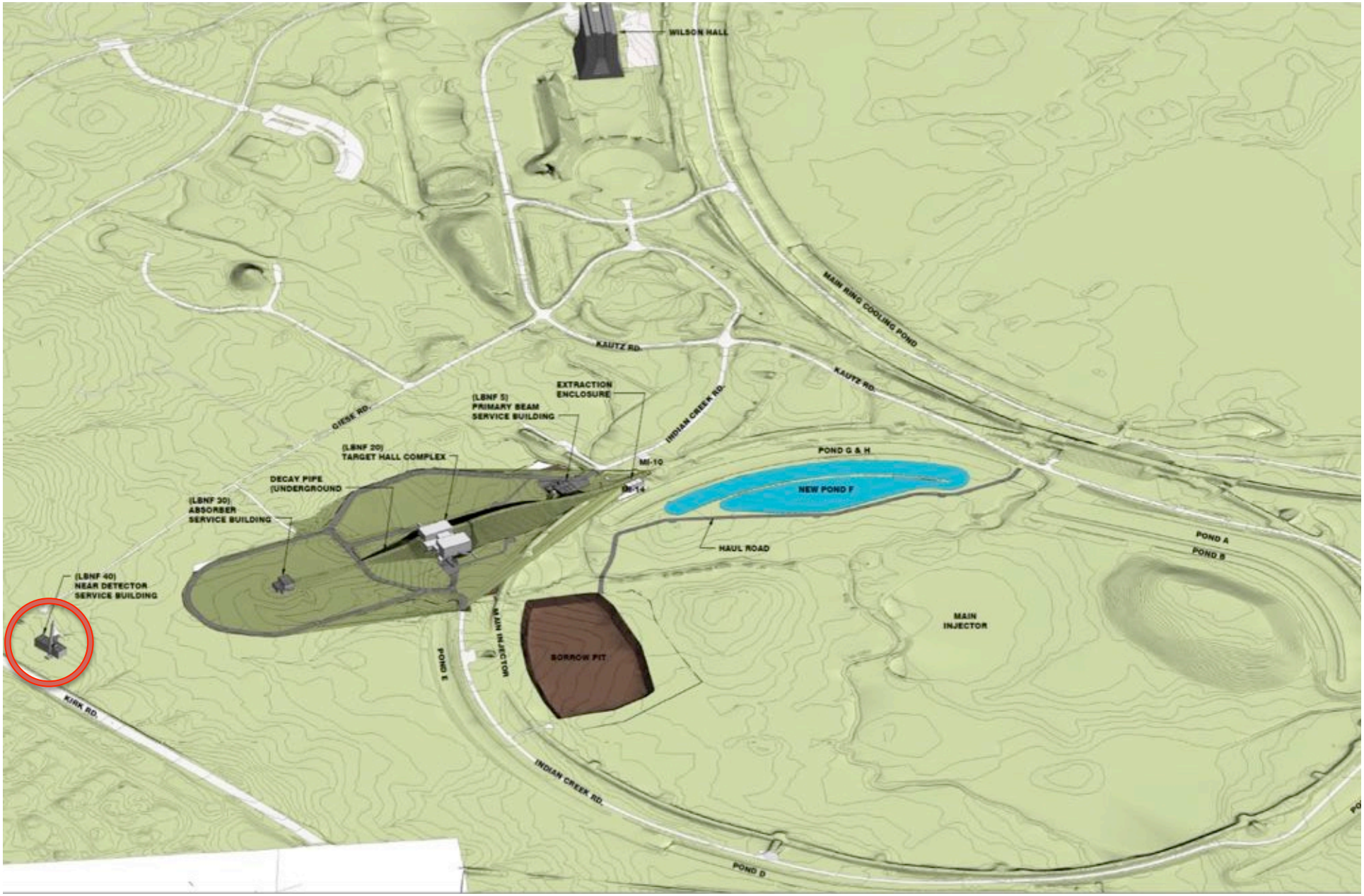
UC Berkeley and LBNL

DUNE ND Workshop, Fermilab, 10 June 2017

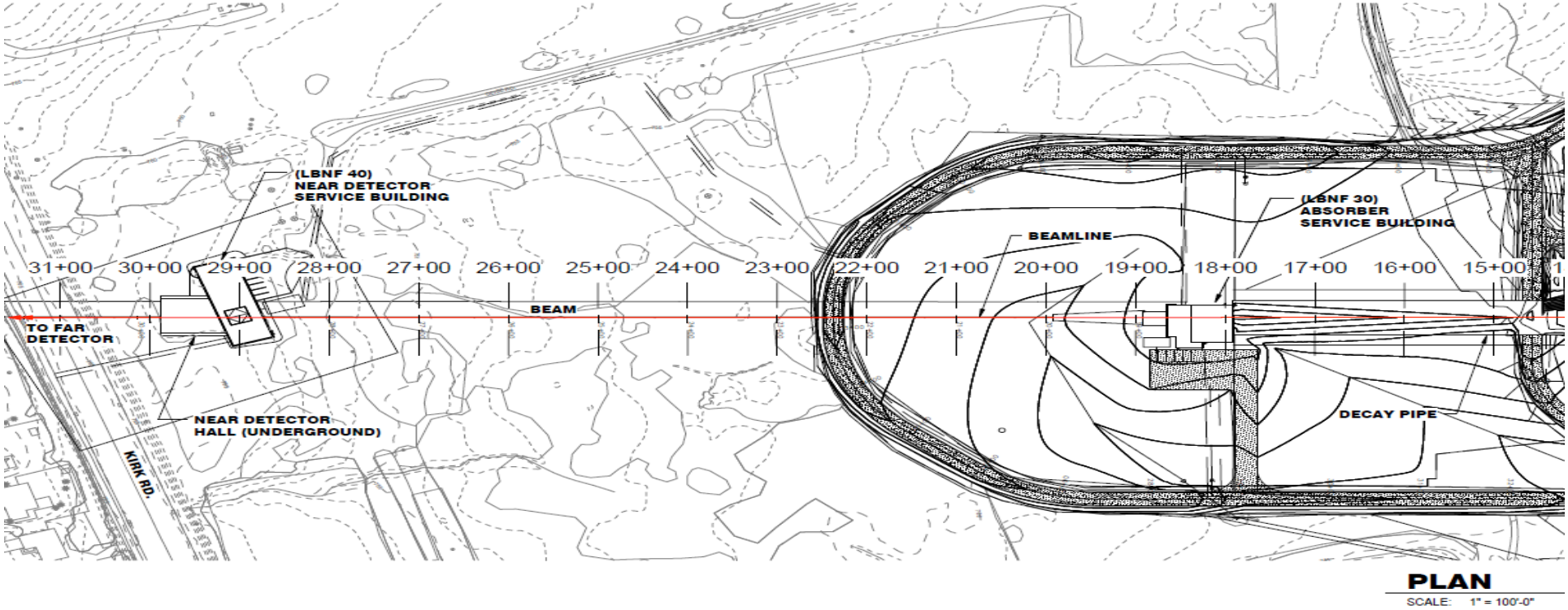
Current Schedule of Near Site

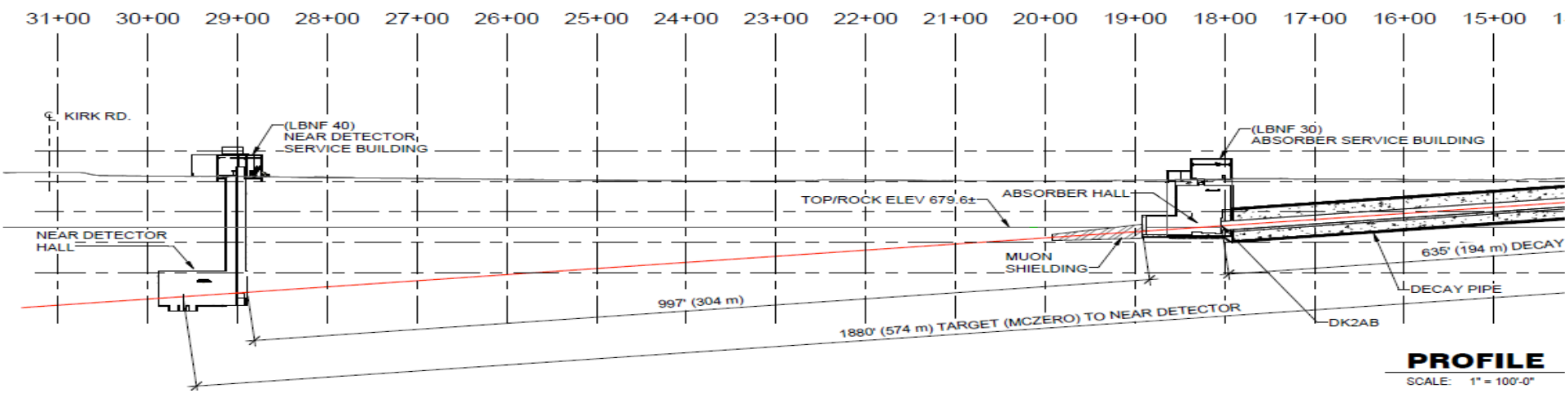
- Geotechnical Investigation Start – November 2017
  - Need to have location of halls and shafts prior to starting
- Preliminary Design Start – March 2018
  - Need preliminary DUNE Near Detector requirements and interfaces 4 months prior to starting Preliminary Design
  - Need updated requirements and interfaces at the start of Preliminary Design
- Final Design Start – March 2019
  - Need FINAL requirements and interfaces at the completion of Preliminary Design / start of Final Design
- Construction Notice-To-Proceed – March 2022
- Final Completion – November 2024

Overview of Near Site

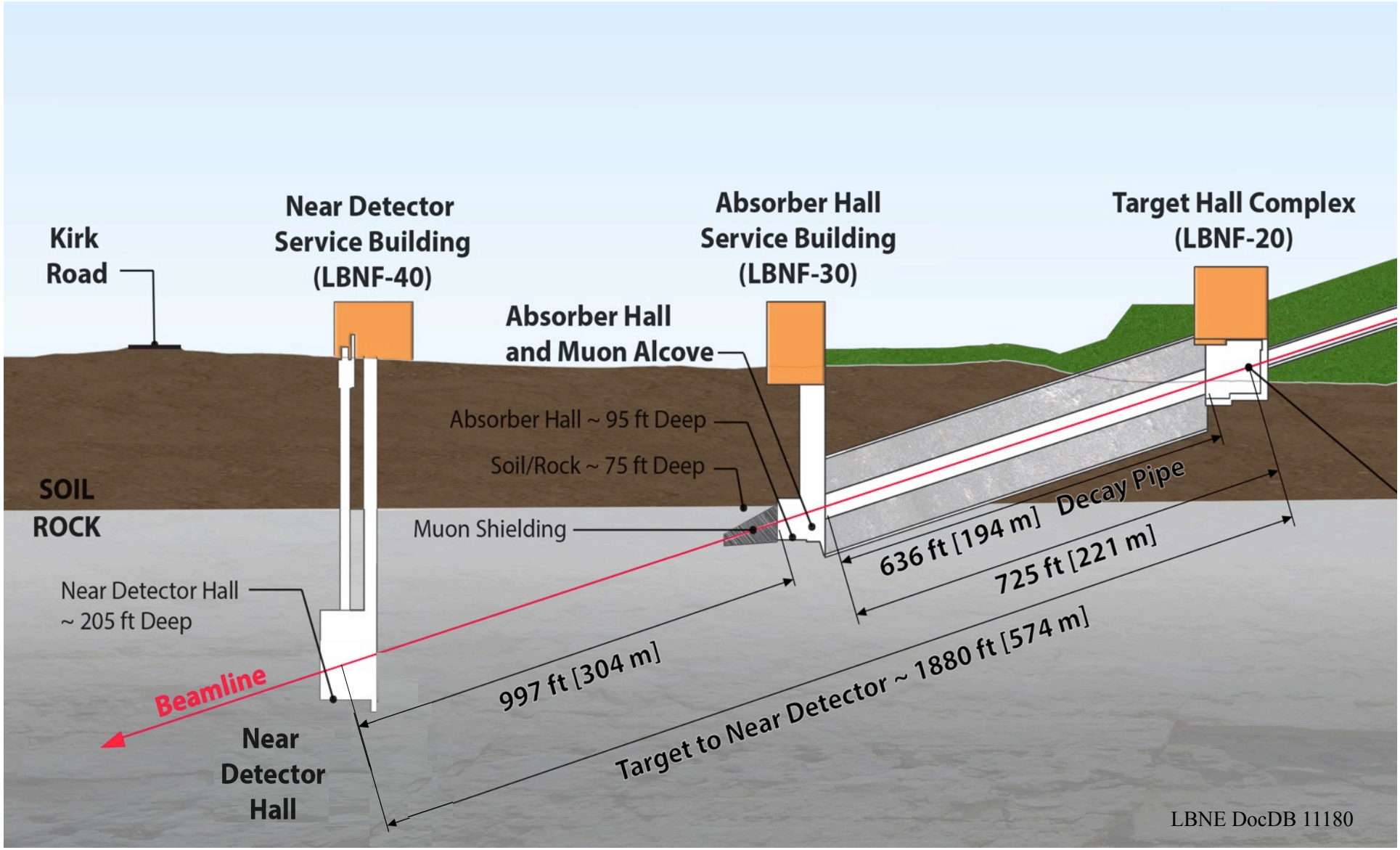


Topographic View & Profile



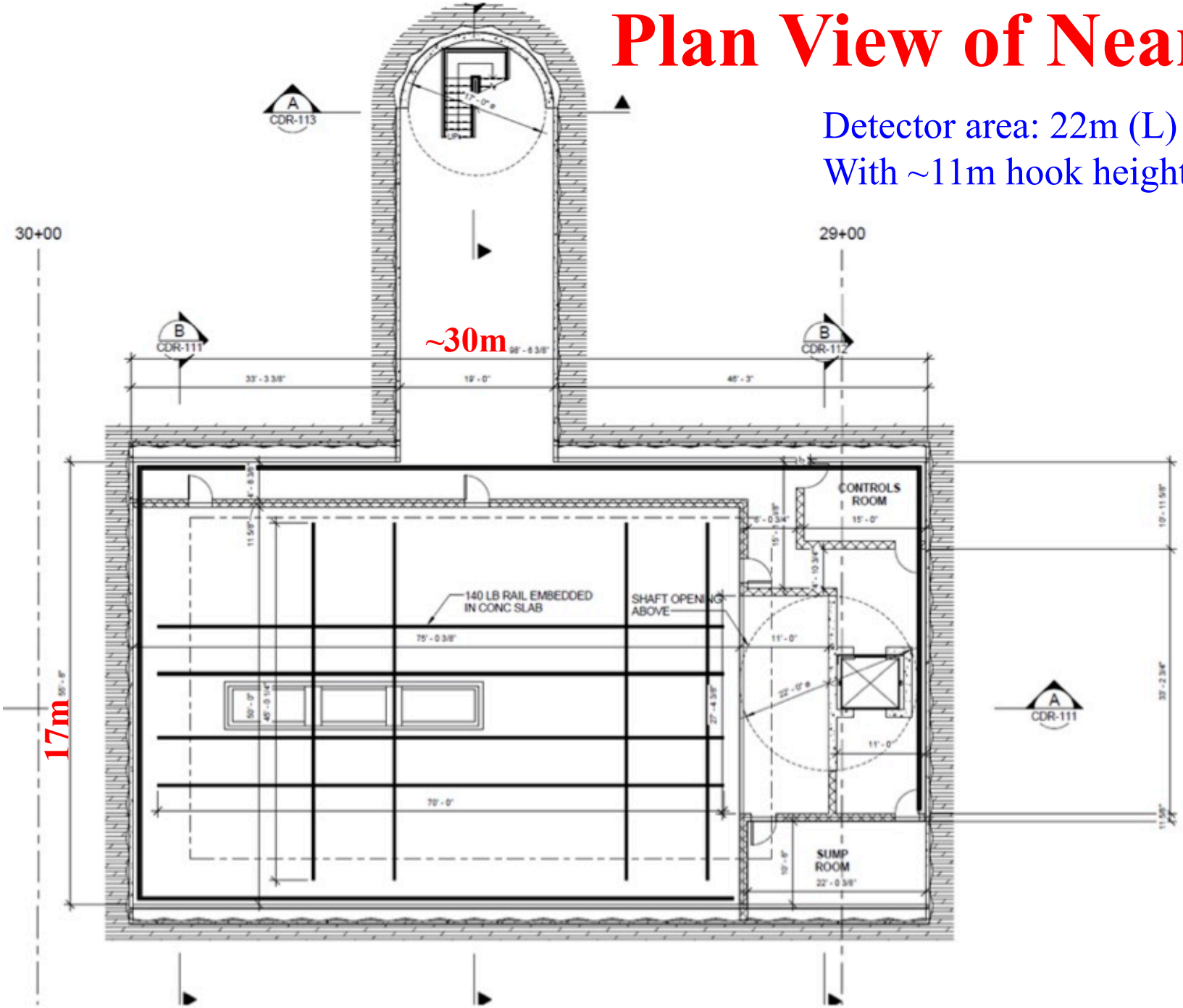


Near Site


Kirk Road
Near Detector Service Building (LBNF-40)
Absorber Hall Service Building (LBNF-30)
Target Hall Complex (LBNF-20)
Absorber Hall and Muon Alcove
Absorber Hall ~ 95 ft Deep
Soil/Rock ~ 75 ft Deep
SOIL
ROCK
Muon Shielding
Decay Pipe
636 ft [194 m]
725 ft [221 m]
Near Detector Hall ~ 205 ft Deep
997 ft [304 m]
Target to Near Detector ~ 1880 ft [574 m]
Beamline
Near Detector Hall
LBNE DocDB 11180

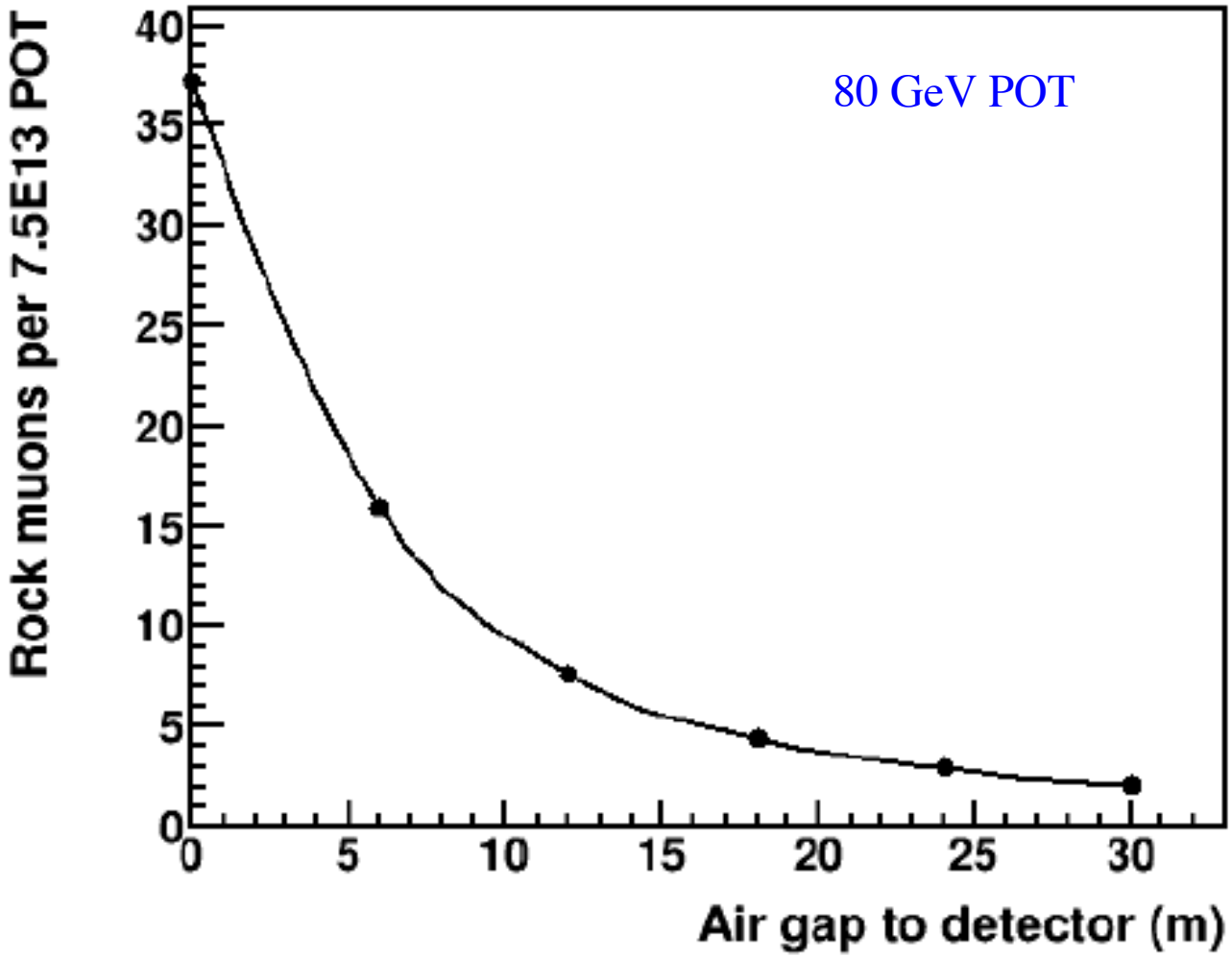
Plan View of Near Hall

Detector area: 22m (L) × 15m (W)
With ~11m hook height



Front-entering Rock Muons

Chris Marshall, ND Wokshop at CERN, 22 Jan 2017

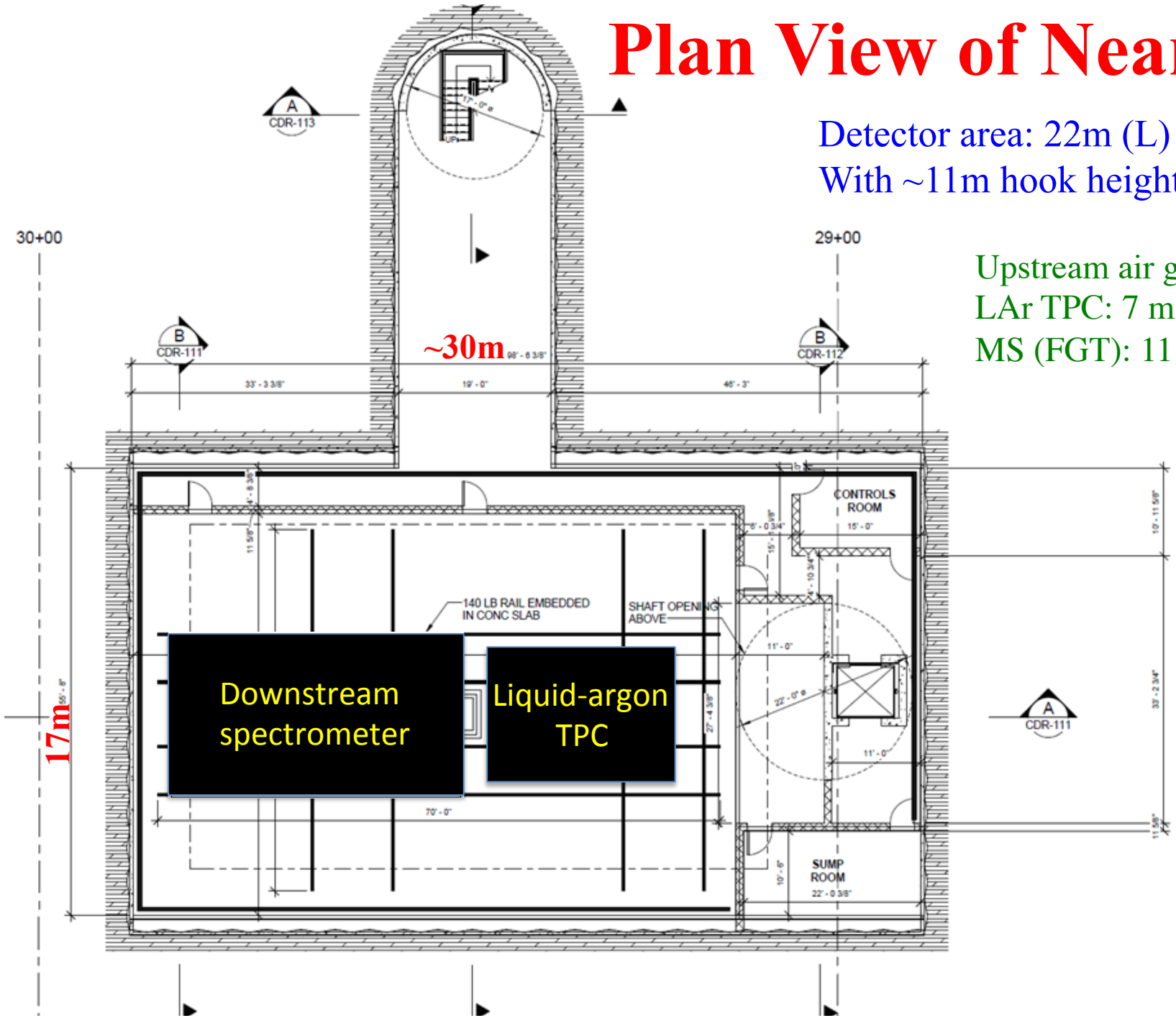


Scaled from the observed rock muons at MINERvA with an air gap of 18 m.

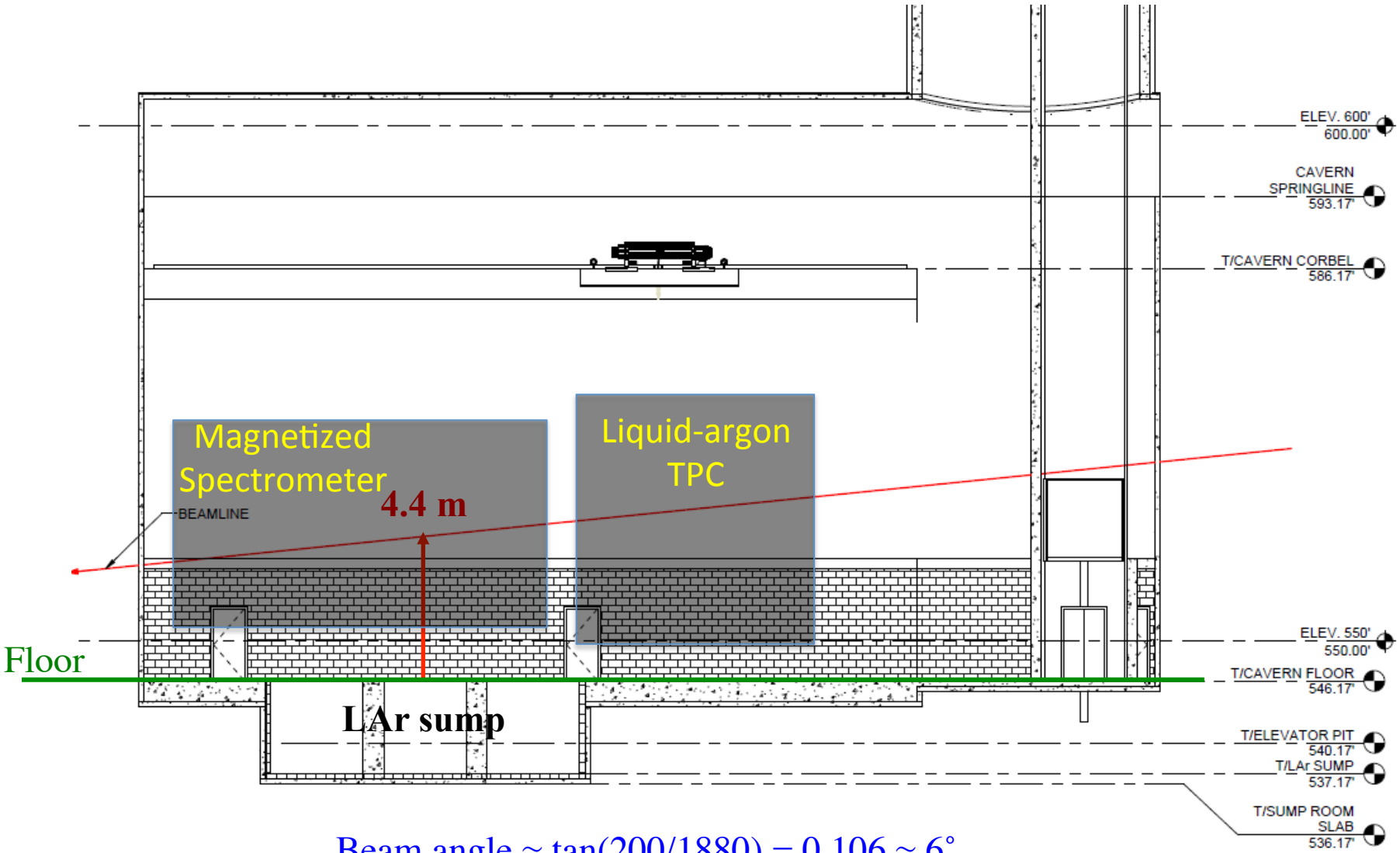
Plan View of Near Hall

Detector area: 22m (L) × 15m (W)
With ~11m hook height

Upstream air gap: 9 m
LAr TPC: 7 m (z) x 5 m (w)
MS (FGT): 11 m x 6 m



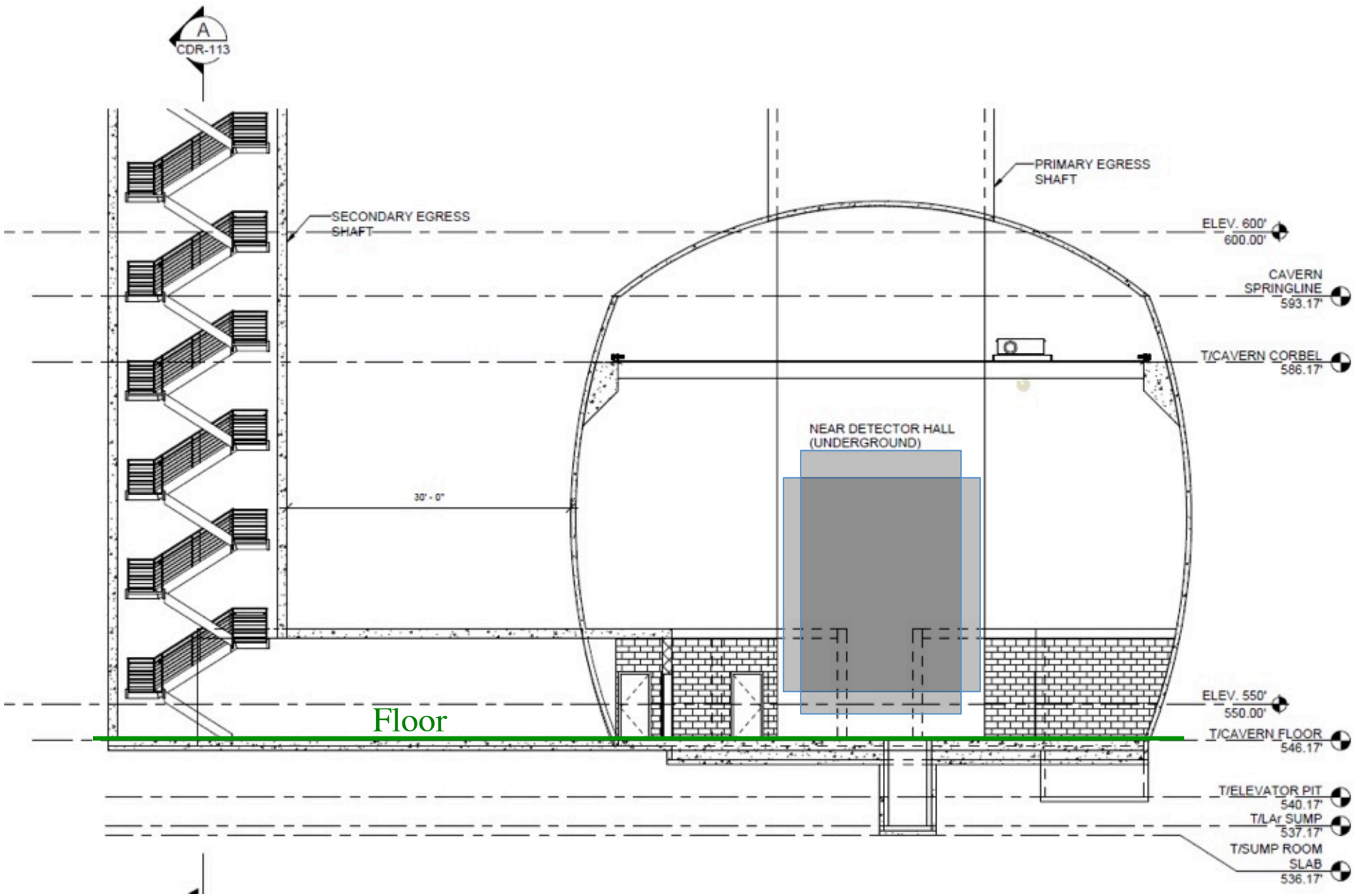
Profile of Near Hall



Beam angle ≈ tan(200/1880) = 0.106 ≈ 6°

Floor elevation set so that beam is 4.4m above center of LAr sump.

Cross Section of Near Hall



Questions

- The neutrino beam does not passing through the levelled detector(s) symmetrically in the vertical (profile) view.
  - How does it impact the acceptance?
- The current size of the hall is a bit small.
  - increase by at least 50%
- Primary egress shaft, sump room and control room should be located at the end of the hall?
- Liquid-argon sump pit should be off to one side, closer to the secondary egress shaft?