Infrastructure Needs for Calibration

Sowjanya, Kendall

Calibration Task Force Meeting

June 12, 2018

Active Discussions

- Active discussions on space/installation/integration needs at the far site going on with consortia

- There was a one day installation/integration workshop held during the last collaboration meeting: https://indico.fnal.gov/event/16892/other-view?view=standard

- A lot of useful information presented. More regular meetings underway. *Subscribe to "DUNE-FD-INSTALL" to keep up with discussions.*

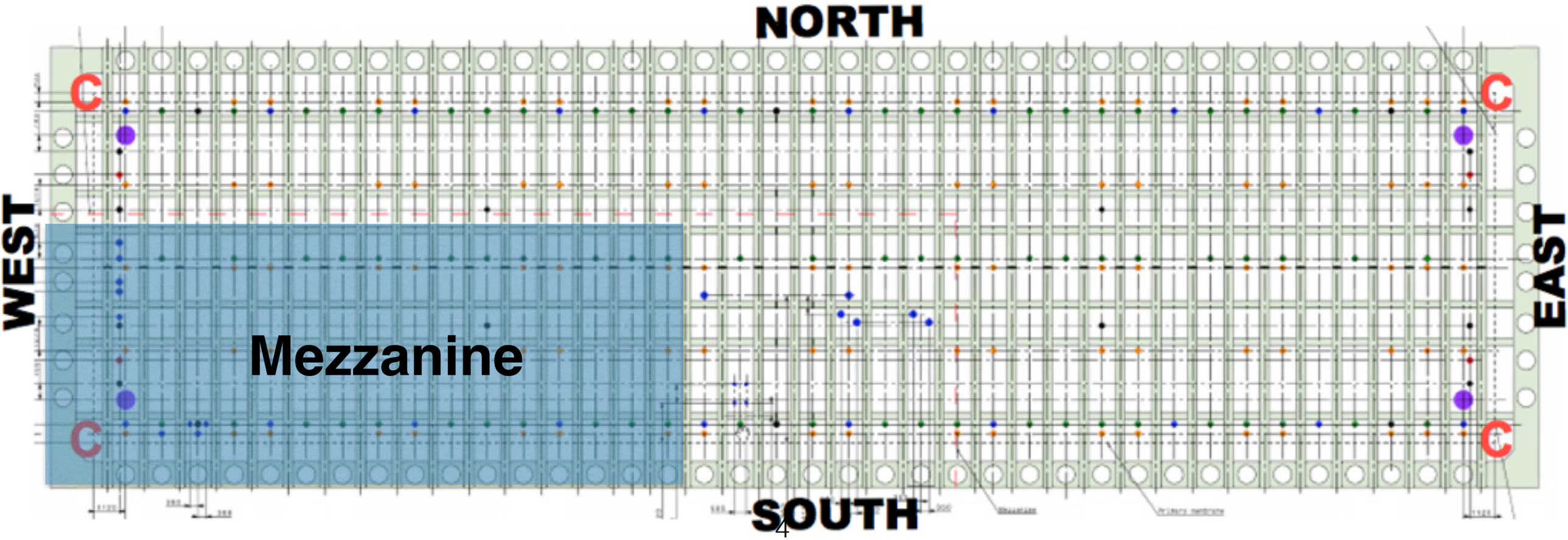
- Calibration is still in early stages (like ND), but it is good to know the existing constraints and start thinking about our needs in terms of space on the cryostat, installation and integration

Construction MileStones

Construction Milestones	1926 days	Mon 9/2/19	Tue 1/19/27
RRB Approval of TDR	0 days	Mon 9/2/19	Mon 9/2/19
Beneficial Occupancy of CUC Counting room	0 days	Sat 4/16/22	Sat 4/16/22
Beneficial Occupancy of Integration Test Facility	0 days	Wed 9/1/21	Wed 9/1/21
Begin integration/testing of Detector #1 components at ITF	0 days	Tue 2/1/22	Tue 2/1/22
Construction of steel frame for Cryostat #1 complete	0 days	Fri 12/17/21	Fri 12/17/21
Construction of Mezzanine for Cryostat #1 complete	0 days	Mon 1/17/22	Mon 1/17/22
Beneficial occupancy of cryostat #1	0 days	Fri 12/23/22	Fri 12/23/22
Cryostat #1 ready for TPC installation	0 days	Mon 5/1/23	Mon 5/1/23
Begin closing TCO for cryostat #1	0 days	Mon 8/26/24	Mon 8/26/24
Cryostat #1 ready for filling	0 days	Mon 11/18/24	Mon 11/18/24
Detector #1 ready for operations	0 days	Thu 11/13/25	Thu 11/13/25
Begin integration/testing of Detector #2 components at ITF	0 days	Wed 11/1/23	Wed 11/1/23
Construction of steel frame for Cryostat #2 complete	0 days	Fri 7/1/22	Fri 7/1/22
Construction of Mezzanine for Cryostat #2 complete	0 days	Mon 8/1/22	Mon 8/1/22
Beneficial occupancy of cryostat #2	0 days	Fri 3/1/24	Fri 3/1/24
Cryostat #2 ready for TPC installation	0 days	Thu 8/1/24	Thu 8/1/24
Begin closing TCO for cryostat #2	0 days	Mon 8/25/25	Mon 8/25/25
Cryostat #2 ready for filling	0 days	Fri 12/5/25	Fri 12/5/25
Detector #2 ready for operations	0 days	Tue 1/19/27	Tue 1/19/27

Space above the cryostat

- There is a Mezzanine on the SW side of the cryostat.
- Only 2.1 m clearance under the mezzanine. This can cause issues to installing/operating straight long things — Is this a problem for our systems?
- The racks are already designed with Mezzanine in mind, so no issue there



Space above the cryostat

- What systems will be sharing the space on the cryostat (Instrumentation, calibration, other detector sub-systems etc.) Any constraints from the I-beam structure? — Kendall/Sowjanya will follow up to better understand

- There may be limitations on where the bridge crane can access overhead — Kendall/Sowjanya will follow up to better understand

- For some of the calibration devices (e.g. Neutron generator), one may want to move the system from one location to other location. Are there constraints in doing so? — Which calibration systems will require such motion on the cryostat?

- If a calibration device has a mechanical system (e.g. motors), those systems will require some space around the flange to allow for mechanical operation — What are the space requirements around flanges on the cryostat?

- Any other (form of) space requirements on the cryostat?

Other Infrastructure Needs (Racks/Power/Air Conditioning/Water/Cables…)

- We also need to start thinking about our needs for no. of racks, rack space, rack power, no. of cables & cable types, network, cranes, forklifts, air conditioning, water etc.
  - The goal is to define these for the far site nominally in Fall, so we need to get our (at least rough) estimates and MAJOR needs in for calibration
- Rack space, water, and power are probably the most important ones now — extrapolations from SBN/ProtoDUNE can give some first estimates
- We will contact you separately requesting this information (in a spreadsheet format) — we will prepare a standard template

Integration & Installation at the Far Site

- Integration/Installation coordinators are gathering information from Consortia on the needs for building(s) near SURF. There is an opportunity to get support for a building near the school of mines in Rapid City, SD, but, the collaboration needs to prepare requirements/needs for buildings by Fall — *hence we want to make sure major needs from Calibration are understood at least at the preliminary level.*

- Building to control material transport to the Ross Shaft, but, also to do some detector assembly and/or component integration and testing at this facility — Integration Test Facility (ITF)

Logistics for ITF (from J. Stewart)

More Specifically:

1. *Storage needs:*
   - — What type of packages will be sent to the ITF (size weight and handling)?
   - — How many packages will be arriving and how much space is needed to process them?
   - — Are there special handling needs (overhead crane, forklift tall load, wide load, …)?
   - — Long term storage? The minimum is 1 month but will you need longer?

2. *Work area needs* (If assembly testing or repackaging is planned).
   - — A basic description of the work should be shown.
   - — The building needs should be the focus: floor space, power, cleanroom, lighting access should be defined.
   - — Do you have testing plans?

3. *Component integration*
   - — If integration and testing of components from different consortia are planned then the requirements from your system should be clearly presented.
   - — What is your schedule?

Installation Planning (from J. Stewart)

1. *Installation plan:*
   — Present the process by which your equipment will be installed?
   — What tooling will be used?
   — How many people do you plan to use for the installation?

2. Underground Infrastructure needs.
   — Needs for underground infrastructure. This would include rack space and rack power needs, network, cable tray needs, any cooling, lighting during installation, power at 4910, cleanroom needs, water, air, laydown space, forklifts, scaffolding scissor lifts, cranes etc.

Any major needs we can think of for ITF and installation from the calibration side?

Existing Infrastructure Constraints at the Far Site

At the one day workshop, the technical coordination team presented current overall plan and what infrastructure constraints are there that we need to take into account as we plan assembly/integration/installation for our systems. Examples:

- 1 month storage near far site;
- The cage from surface to underground has 3.6 m height maximum — *things that are long will probably require segmented design with in-cryostat assembly*

we will plan for a subsequent detailed presentation on existing important constraints/considerations at the far facility in the coming weeks