Cable and Service Installation

David Warner
Colorado State University
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Basket in ND-280 Hall

Water Target Tank

Beam

P0D End

Chilled Water System
P0D Cable Tray—Readout Side

- Magnet Slot 1
- P0D B1-SS Hole
# Table of Utilities Installation

<table>
<thead>
<tr>
<th>Item</th>
<th>Magnet Slot</th>
<th>Start</th>
<th>End</th>
<th>Length</th>
<th>Inst. Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>LI Cabling</td>
<td>1</td>
<td>LI Control Box</td>
<td>L1 Floor Hole</td>
<td>30 feet</td>
<td>A</td>
</tr>
<tr>
<td>US ECAL, Target TFB Power</td>
<td>2</td>
<td>US Basket Power Dist. Boxes (2)</td>
<td>L1 Floor Hole</td>
<td>36 feet</td>
<td>A</td>
</tr>
<tr>
<td>US Elect. Cooling Water</td>
<td>3</td>
<td>Upstream Elect. Ladders (3)</td>
<td>Chilled Water Station</td>
<td>50 feet</td>
<td>D</td>
</tr>
<tr>
<td>US Target Emergency Drain Line</td>
<td>3</td>
<td>US Drip Pan Bottom</td>
<td>Water Target Drain</td>
<td>50 feet</td>
<td>C</td>
</tr>
<tr>
<td>US Dry Air Feeds</td>
<td>3</td>
<td>Electronics latter bottom (3)</td>
<td>Unknown</td>
<td></td>
<td>D</td>
</tr>
<tr>
<td>US Target Water Fill/Empty Tubes</td>
<td>4</td>
<td>US Target Side</td>
<td>Water Target Fill Station</td>
<td>50 feet</td>
<td>B</td>
</tr>
<tr>
<td>Cent. Target Water Fill/Empty Tubes</td>
<td>5</td>
<td>Central Target Side</td>
<td>Water Target Fill Station</td>
<td>50 feet</td>
<td>B</td>
</tr>
<tr>
<td>Central Electronics Cooling Water</td>
<td>6</td>
<td>Central Elect. Ladders (3)</td>
<td>Chilled Water Station</td>
<td>50 feet</td>
<td>D</td>
</tr>
<tr>
<td>Central Dry Air Feeds</td>
<td>6</td>
<td>Electronics Ladder Bottoms (3)</td>
<td>Unknown</td>
<td></td>
<td>D</td>
</tr>
<tr>
<td>Central Target Emergency Drain</td>
<td>6</td>
<td>Central Drip Pan Bottom</td>
<td>Water Target Drain</td>
<td>50 feet</td>
<td>C</td>
</tr>
<tr>
<td>Central ECAL, Target TFB Power</td>
<td>7</td>
<td>Cent. Basket Power Dist. Boxes (2)</td>
<td>L1 Floor Hole</td>
<td>40 feet</td>
<td>A</td>
</tr>
<tr>
<td>Signal Out (12 Optical Fibers)</td>
<td>8</td>
<td>RMMs (6)</td>
<td>L1 Floor Hole</td>
<td>44 feet</td>
<td>E</td>
</tr>
</tbody>
</table>

**Installation Order Notes:**

A: Can begin as soon as basket and cable trays are installed
B: Can begin as soon as A tasks are complete
C: Drain pipe should be installed first in curtain slots. Pipes need not connect to drip pans initially. Can begin as soon as A tasks are complete
D: Chilled water lines should follow drain pipe installation
E: Conduit for signal fibers can go in as soon as basket and cable trays are installed. Fibers should wait to be last items installed.
Cables to be routed (by system)

- Detector Readout System
  - Power: 4 bundles of 6 cables each, total cross-section of 1.5” X 3.25” each
  - Readout: 12 Optical fibers (in 1.5” plastic conduit)
- Electronics Cooling system
  - 12 tubes 1” OD (2 per electronics ladder)
- LI system
  - Misc. control and voltage cables, all fitting within four 1” OD plastic conduits
- Water Target System
  - 2 Bundles of 3/8” Polyflow tubing (1 bundle of 52 tubes, 1 bundle of 48 tubes)
  - 2 Emergency drain tubes (2” OD ABS Pipe)
  - (Unknown) backup slow control cables MUST SPECIFY SOON!
- Miscellaneous
  - Six ½” OD dry air feeds MUST SPECIFY AIR SOURCE LOCATION SOON
  - Other?? MUST SPECIFY SOON!
General Notes:

• All cable lengths include approximately 10% spare length
• Cable and pipe routing is currently being inserted into the ND-280 utilities solid model
• Basket-mounted P0D cable trays are currently being designed, to be ready to ship to J-PARC by June 15 (arrival by June 22)
• Water target drip trays will install from LI-side of detector, so will not impact other utilities’ installation schedule.
Other Concerns

• Water source for target system?
• Main drain for target system to sump
  – Tentative route identified
  – 3.5” OD ABS pipe satisfactory?
  – We need to establish the maximum allowed flow rate the sump pumps can handle.
• Trigger Cable routing
  – Path (to top of magnet?) must be defined
  – Disconnect plan for opening magnet must be defined.