

Chapter 6

Civil Construction Off-Project

The experimental hall is funded as a General Plant Project (GPP), as part of the Muon Campus Program. The beamline and tunnel from the delivery ring to the hall are separate GPP and Accelerator Improvement Projects (AIP). The locations of the buildings on the muon campus is shown in Fig. 6.1.

6.1 The MC1 Building

The muon storage ring will be located in the MC-1 Building on the Muon Campus, which is shown in Fig. 6.2. While it is a general purpose building, the design and features are extremely important to the success of E989. The principal design considerations are a very stable floor, and good temperature stability in the experimental hall. Both of these features were absent at Brookhaven, and presented difficulties to the measurement of the precision field. This design serves E989, and subsequent experiments well. One portion of the MC1 building will house beamline power supplies and cryo facilities for the two initial experiments on the muon campus: ($g - 2$) and Mu2e.

The floor in the experimental area is constructed from reinforced concrete 2' 9" (84 cm) thick. The floor is 12' below grade. Core samples show that the soil at the location is very compacted, the floor settling is expected to be about 0.25" fully loaded.

This floor will be significantly better than the floor in Building 919 at Brookhaven, where the ring was housed for E821. That floor consisted of three separate pieces: a concrete spine down the middle of the room, with a concrete pad on each side of the spine. Thus the foundation of the ring will be much more mechanically stable than it was at BNL.

Even more important is the temperature stability available in MC-1. The HVAC system will hold the temperature steady to $\pm 2^\circ$ F during magnet operation and data collection. This stability, combined with thermal insulation around the magnet will minimize the changes in the field due to temperature changes in the experimental hall.

A floor plan of MC-1 is shown in Fig. 6.4. The experimental hall is 80' \times 80' with a 30 ton overhead crane. The loading dock in the lower left-hand corner is accessed through the roll-up door labeled in Fig. 6.2. Unlike in BNL 919, the crane coverage is significantly larger than the storage-ring diameter, simplifying many tasks in assembling the ring.

A detailed MC-1 document is available from FESS, titled "MC-1 Building", dated March



Figure 6.1: The layout of the Muon Campus, which lies between the former Antiproton Rings and the Booster Accelerator. The locations of the $(g - 2)$ and Mu2e experiments are labeled.

2012.



Figure 6.2: A rendering of the MC-1 building.



Figure 6.3: A photograph of the MC-1 building on April 18, 2014. Installation of various ring-related components began in the spring of 2014 and will continue throughout the summer.

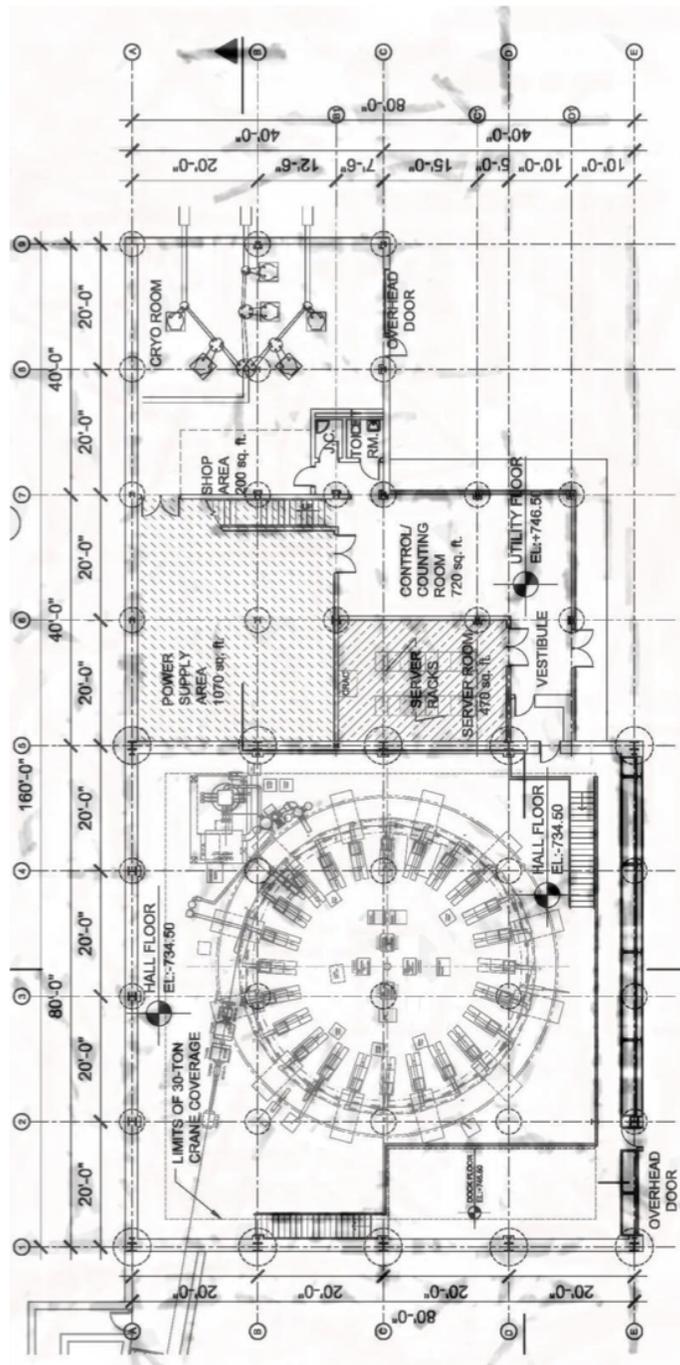


Figure 6.4: The first-floor layout of the MC1 building.