Fermilab

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Mu2e Accelerator Controls

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External Beamline & Instrumentation Independent Design Review

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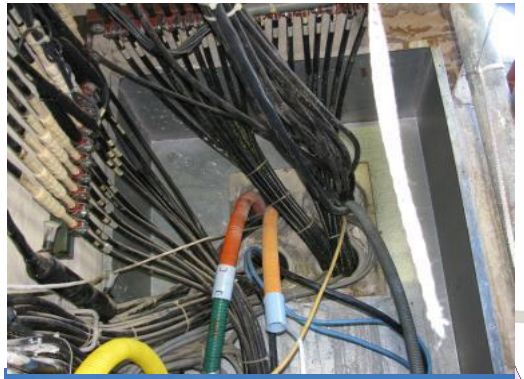
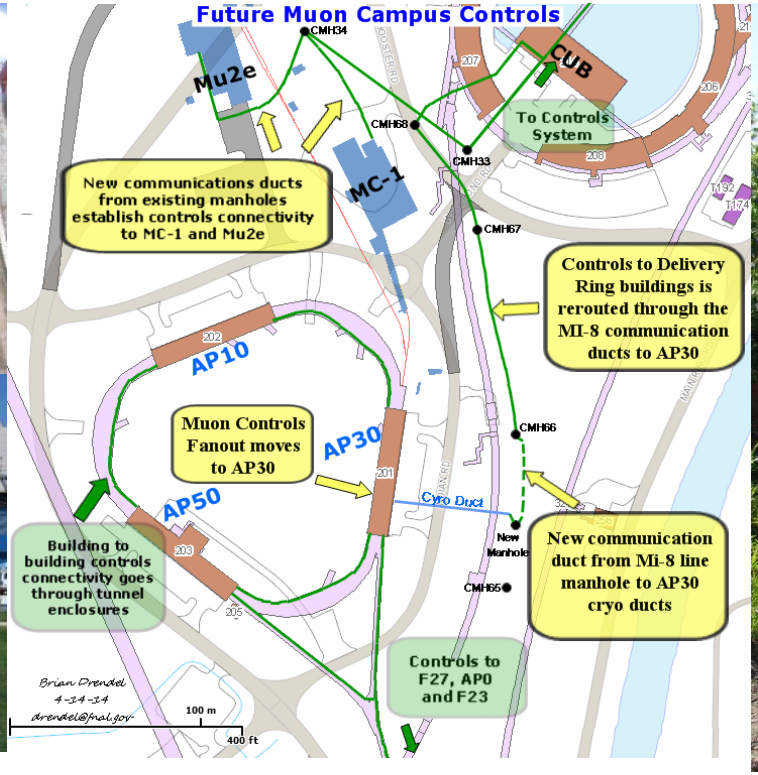
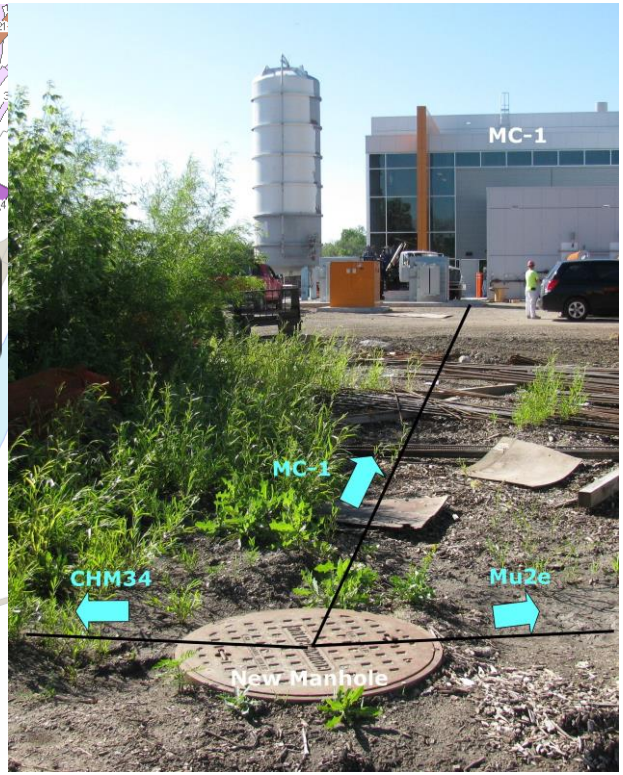
Muon Campus Existing Controls

- Existing service buildings will reuse existing equipment
  - A large CAMAC installation handles analog and digital I/O, timing, etc.
  - Not expected to need additional CAMAC equipment
    - Lots of spare modules and slots available for any new requirements
  - Reusing existing cabling for distribution of TCLK, MIBS, RRBS
  - Some updates required to switch from 53 MHz TVBS to 2.5 MHz RRBS
  - Pbar permit infrastructure will be reused
  - Most infrastructure will be in place for g-2 operation

Mu2e Communication Links







- New controls and communications connectivity will be established from the cross gallery to the Mu2e service building.
  - 96 pair bundle of single mode fiber (Ethernet)
  - 36 pair bundle of multi-mode fiber (Clocks and Permit Loop)

Mu2e Controls

- Mu2e SB will use Hotlink Rack Monitor (HRM)
- Two HRMs will be installed at Mu2e SB
  - Analog I/O
    - 64 Channels Analog Input
      - 16-Bit, -10V to +10V Input
      - 10 kHz Sampling Rate
    - 8 Channels Analog Output
      - 16-Bit, -10V to +10V Output

(continued)

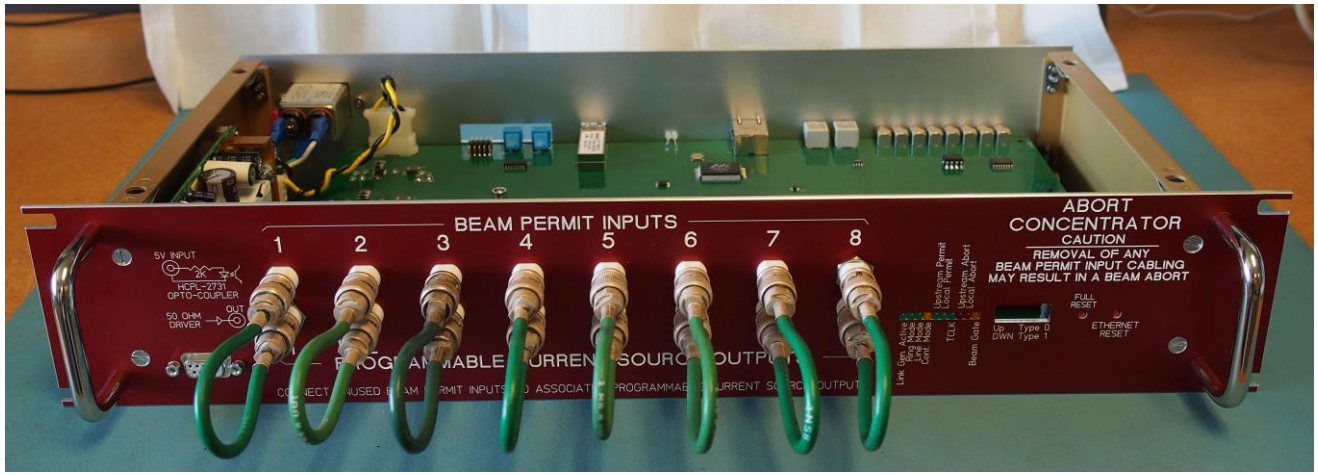
Mu2e HRM Cont.

- 8 Bytes Digital I/O
- 8 Timers
  - TCLK or external TTL Triggered
  - Microsecond resolution
- Hotlink 320 Mbps serial connection to VME Frontend

- More HRMs can be added as required

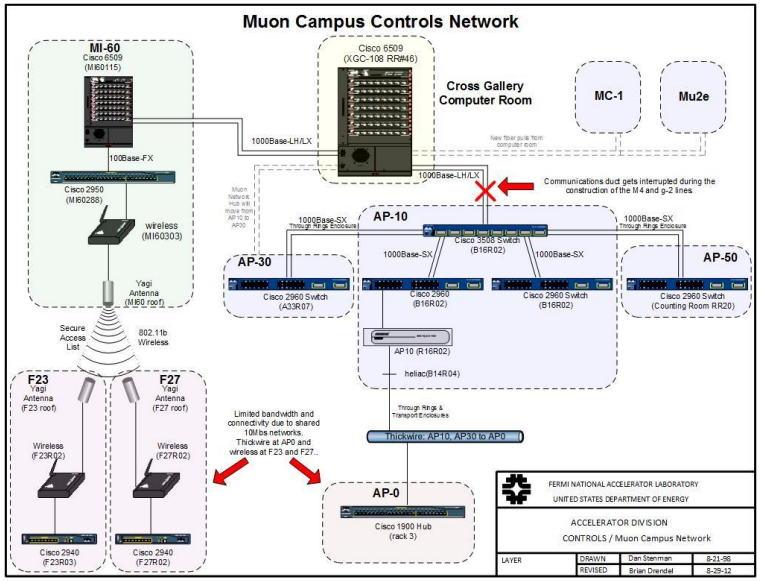
Mu2e Permits

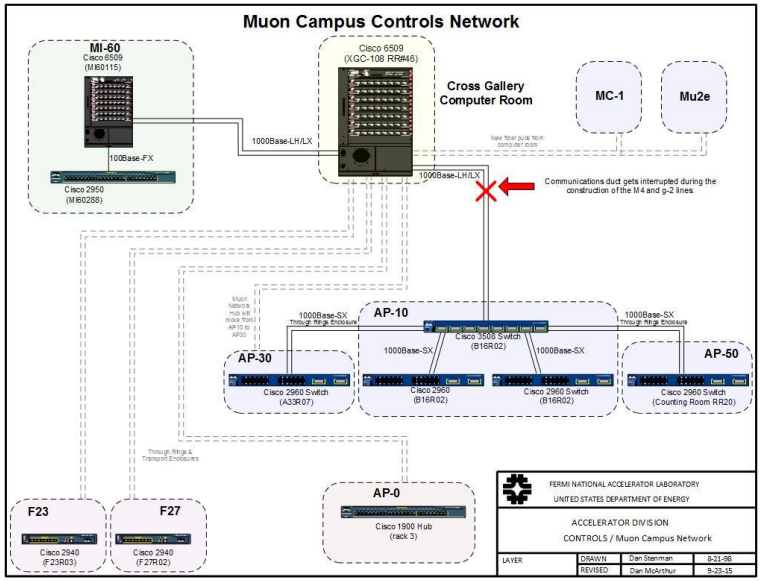
- Ethernet-based Abort Concentrator will be installed
  - 8 Abort Inputs
  - TCLK or Software Resets
  - Microsecond Resolution Timestamps
  - Takes the place of the CAMAC 200
  - Abort link will use one of the 32 multimode fiber pairs mentioned earlier



Mitigation of Legacy Network

- TDR document includes a concern about “Legacy Networks”
  - Wireless links to F23 and F27
  - 10Base5 “Thicknet” link to AP0
  - All replaced by Gigabit Ethernet on singlemode fiber pulled through enclosures back to Cross Gallery





Summary

- Controls Final Design is complete
  - Ready to begin installation when buildings, racks, etc. become available