



U.S. DEPARTMENT OF  
**ENERGY** Office of  
Science

---

# Mu2e Director's Review Conventional Electrical Construction

Randy Wielgos  
FESS Engineering  
7/8/2014



# Mu2e Site Electrical Loads

---

<b>kVA</b>	<b>Load Item</b>
498	Conventional Electrical
89	Electronic Racks
290	Beamline Power Supplies
928	Solenoid Power Supplies
103	Vac. Pumps
12	RAW System
<b>1920</b>	<b>Total</b>

# Conventional Requirements

---

Majority of the design inputs are determined by FESS Design Guide Standards.

## Lighting

Assembly/High Bay	75 foot-candles
Tunnels	20 foot-candles
Elec, Mech & Planning	30 foot-candles
Miscellaneous	10-20 foot-candles
Automated Controls	

## AC Distribution

120 quad/208 V – 20 Amp Outlets  
480 V – 60 Amp Welding Outlets  
Standby Power System  
Emergency Power System  
Grounding Provisions

# Emergency/Standby Power Systems

---

## Battery

- UPS Battery System
- Fire detection and alarm systems.
- Exit sign illumination
- Emergency lighting
  
- Tech equipment requiring UPS will be provided within that Level-2

## Generator 175 KVA

- Elevators, elevator equipment, and elevator machine room/controller cooling.
- Air handling systems for the ODH.
- Cranes
- Sump Pumps.

# Conventional Power Services

---

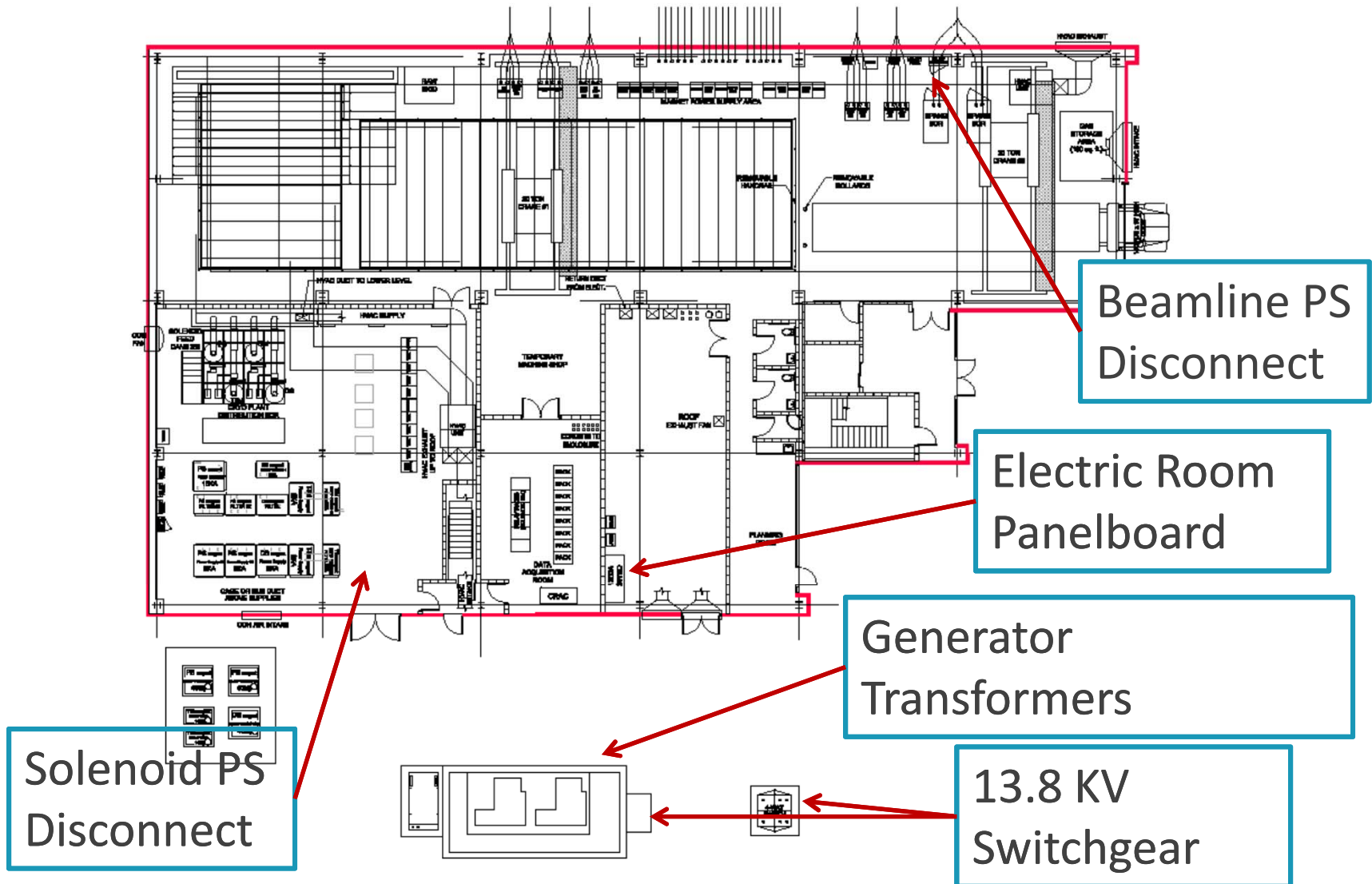
## Above Grade

- 13.8 kV Pad Mount Switchgear
- 750 KVA Oil Filled Power Transformer
- 1200 Amp, 277Y/480 VAC Panelboard
- 150 kW Emergency Generator
- Power Supply Disconnects

## Above and Below Grade

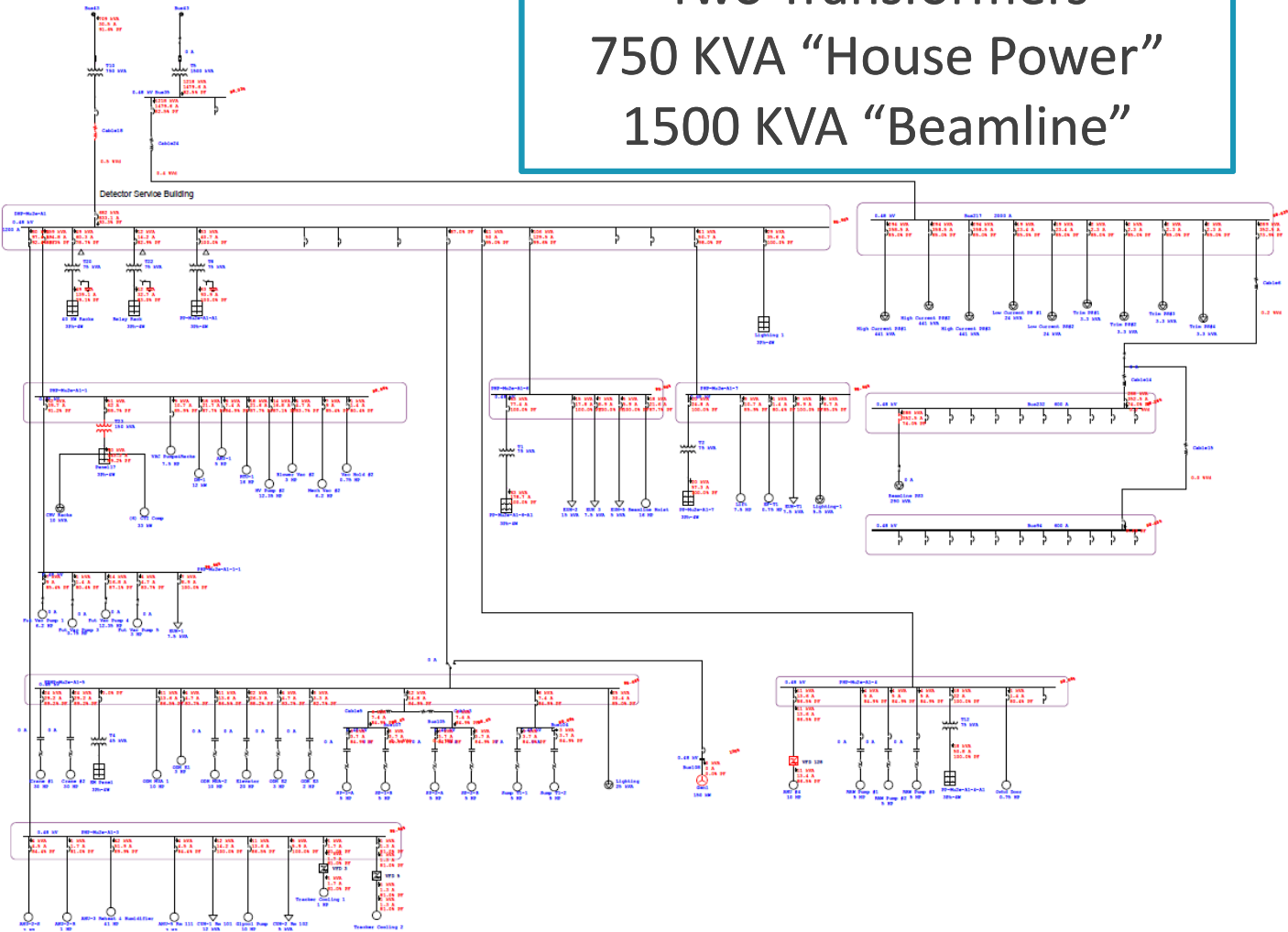
- Power Distribution Panels
  - (Interface with other Sub-Projects)
- Welding Receptacles
- Lighting Distribution Panels

# Electrical Services



# Electrical Load Model

Two Transformers  
750 KVA "House Power"  
1500 KVA "Beamline"



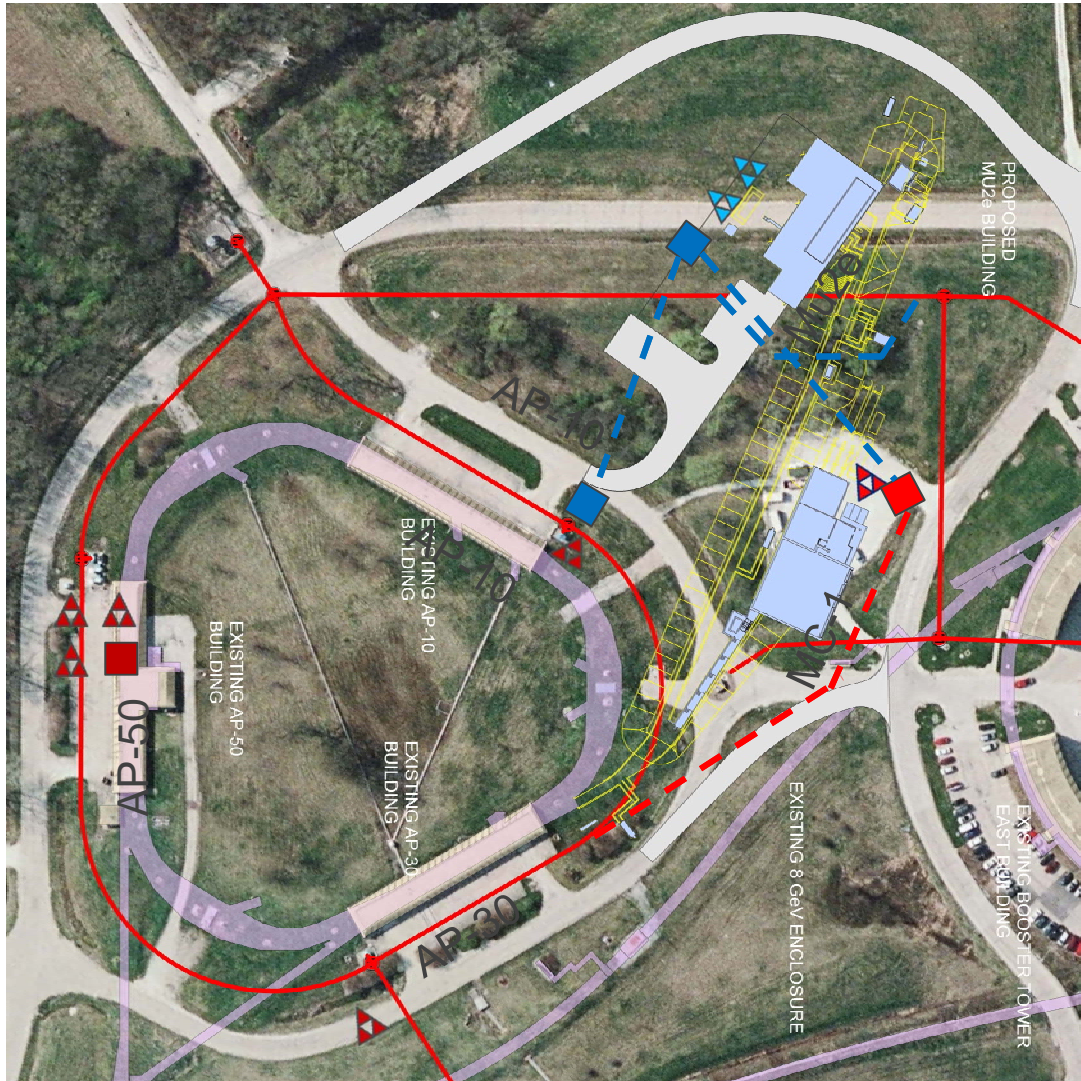
# 13.8kV Power System

---

- Expand existing Delivery Ring (PBar) Feeder 24, fed from Master Substation, (MSS)
  - Current feeder replaced in 2005
  - Breaker at MSS capable of full anticipated load
  - Feeder Cable Loading TBD
- Configure system as Sectionalized Loop
- Reroute Giese Rd. Feeder to CUB



# 13.8kV Power System



## Existing:

- 13.8kV Switch
- ▲ Transformer
- Feeder & Duct

## Proposed:

- 13.8kV Switch
- ▲ Transformer
- - Feeder & Duct

# Status Summary

---

- Final Electrical Design Complete
  - Coordinated with Stakeholders, Users and Operations
  - Design Completed by A/E and Reviewed by FESS
  - Load Flow Model Developed
  - Meets the Design Standards and Requirements
- 2<sup>nd</sup> 13.8kV Feeder Cable may be Needed (GPP Project)
- DocDB Document References
  - Doc # 1088 - Mu2e Conventional Facilities Requirements
  - Doc # 3620 - Mu2e Design Data
- Interface with Other Sub-Project Equipment Determined