

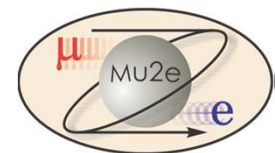


Mu2e Conventional Facilities Life Safety

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Objectives

- Provide successful evacuation
- Provide effective fire fighting and rescue operation
- Limit spread of fire and smoke by:
 - Fire suppression systems
 - Fire alarm systems
 - Smoke abatement

Requirements (Determined)

- AON's recommendations (Mu2e Doc DB- 1314) are based on codes/orders/standards that Fermi has stipulated:
 - DOE Order 420.2C Safety of Accelerator Facilities
 - IBC (International Building Code)
 - IFC (International Fire Code)
 - NFPA (National Fire Protection Association)
- Aim of Life Safety
 - Get the occupants out (egress)
 - Get the fire fighters personnel in (ingress)
- Fire Protection approach is based on experience from previous projects at the laboratory

Salient Design Features

- Less than 30 feet below level of exit discharge, omitting the requirements for smoke control and stairway pressurization
- Two Exit stairways enclosed by 2 hour fire rated construction
- Means to separate Enclosure from Detector Hall
- Maximum travel distance 300 feet
- Minimum aisle width 36 inches
- Automatic fire sprinkler system, preaction type (Detector Hall)
- Linear heat type detection
- Beam Type Smoke Detection & Spot Type Detection
- Air sampling smoke detection
- Manual pull stations

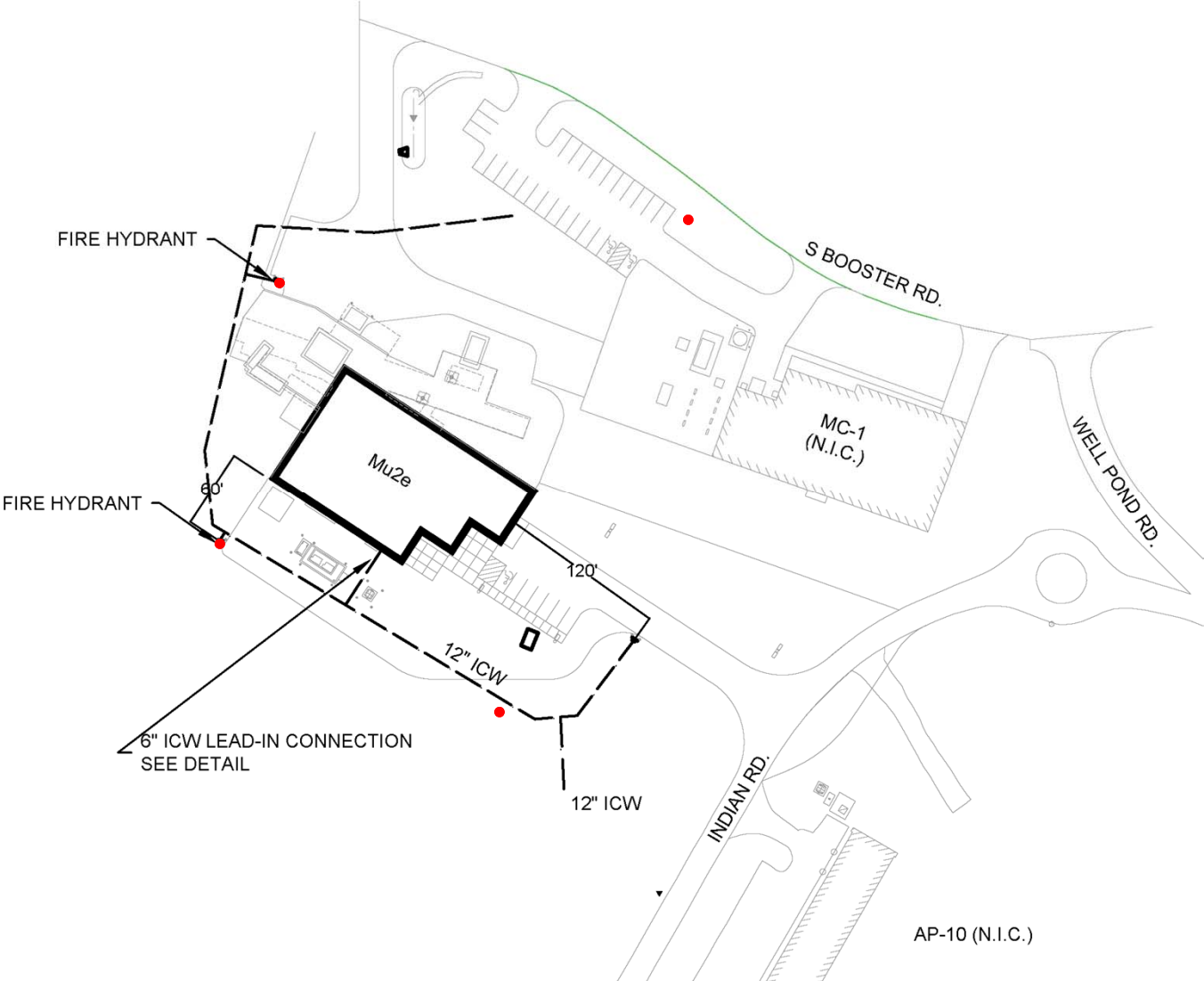
Salient Design Features , Continued

- Fire Alarm will have Emergency Voice Alarm system enable to interface with Fermilab's Site-wide Emergency Warning System
- Emergency and exit signage
- Emergency/Standby power systems for
 - Fire alarm system
 - Exit sign Illumination
 - Emergency Lighting
 - Elevator & Elevator Car Lighting
 - Sump System

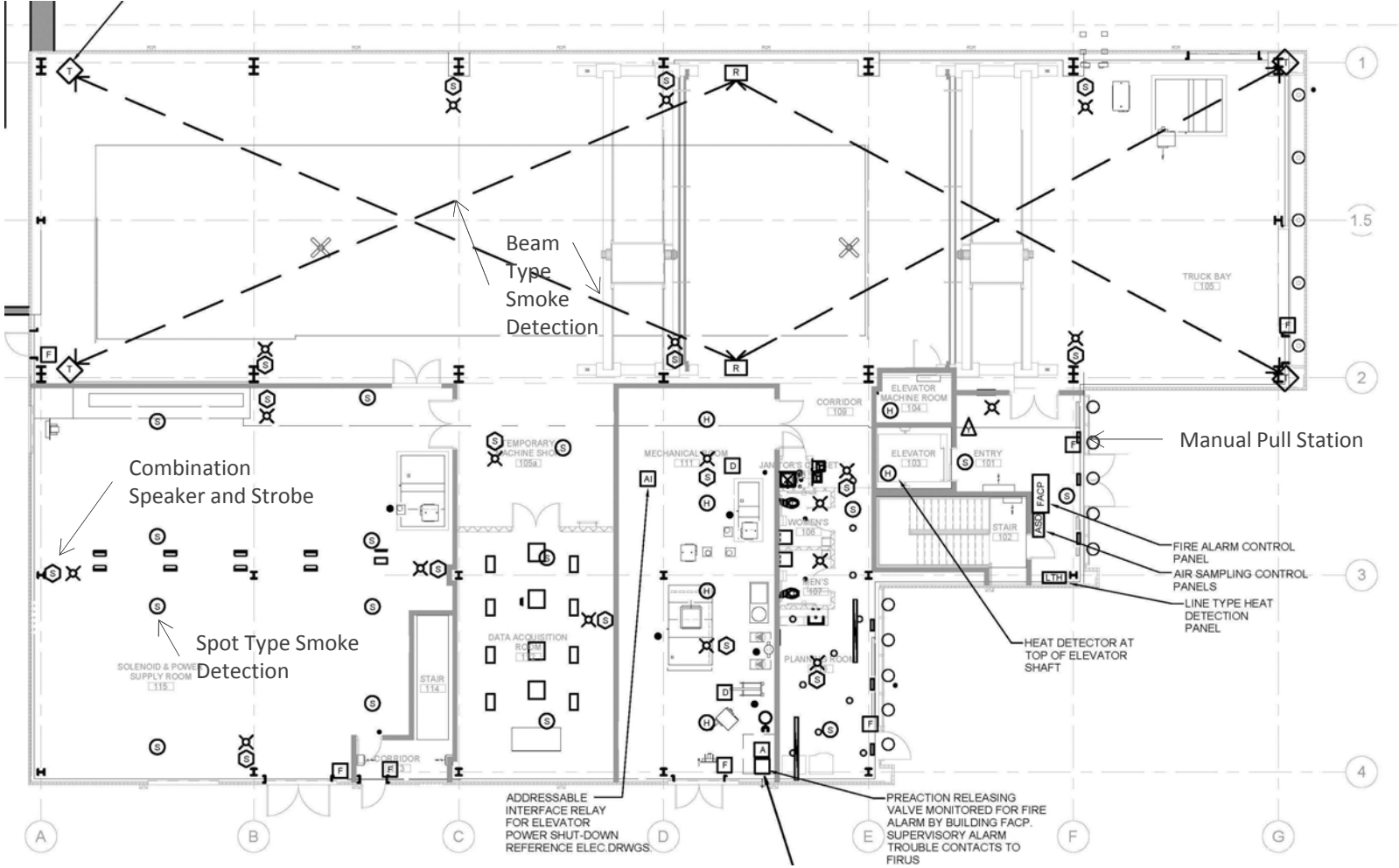
Final Review

- The completed contract documents were forwarded to Rick Glen of AON to perform a “Building Department” style document life safety review.
- Mu2e Doc db- 1314 contains the letter indicating compliance with the applicable fire protection/life safety requirements of the *2009 International Building Code (IBC)*, the *2009 Life Safety Code*, NFPA 101, and for compliance with the *mu2e Fire Protection/Life Safety Assessment* dated June 12, 2013

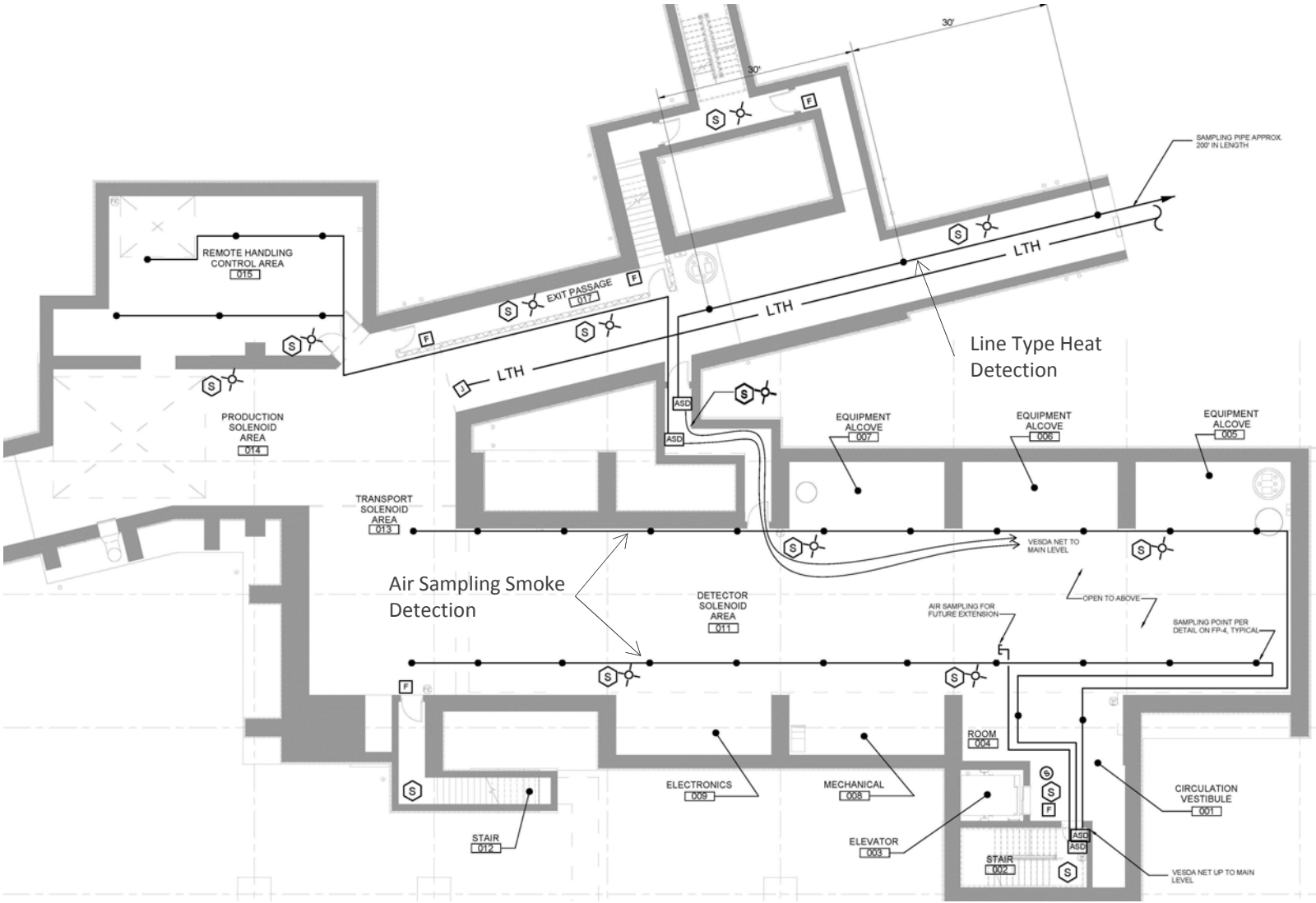
DESIGN (Site Plan)



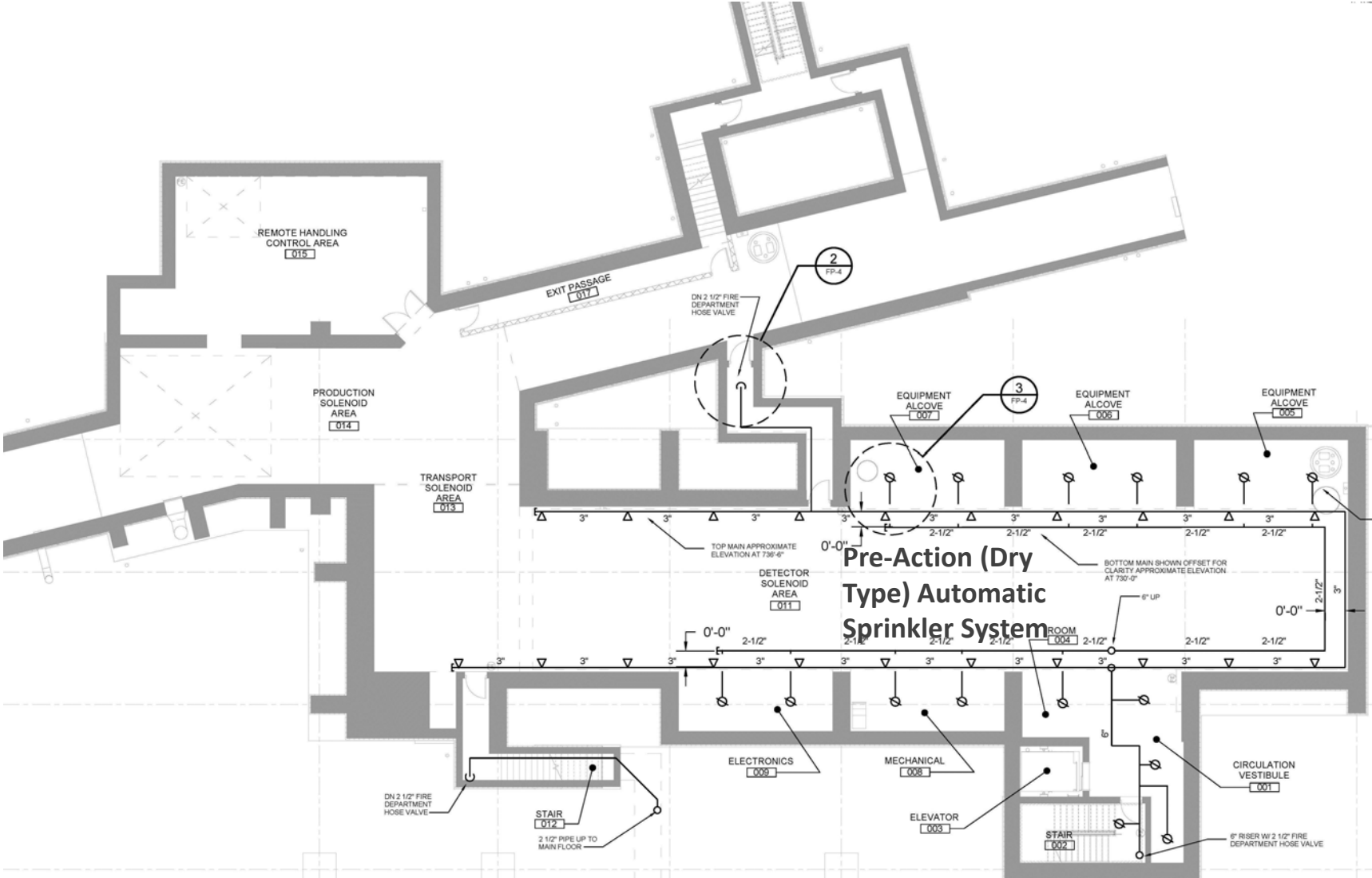
Fire Detection – Main Level



Fire Detection – Lower Level

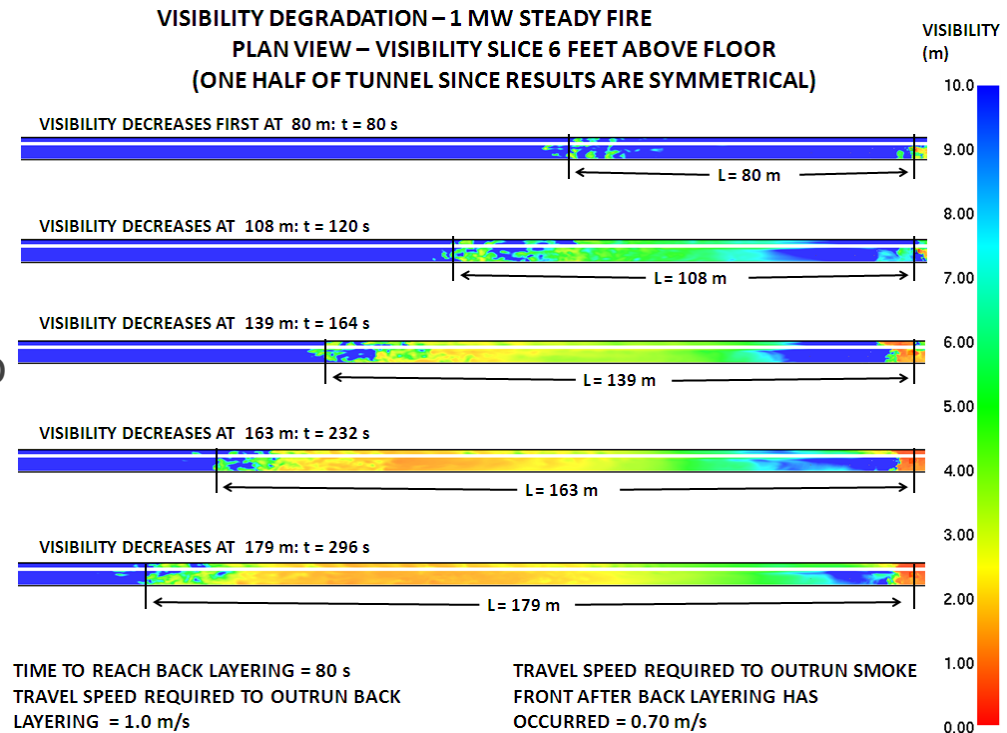


Fire Suppression – Lower Level

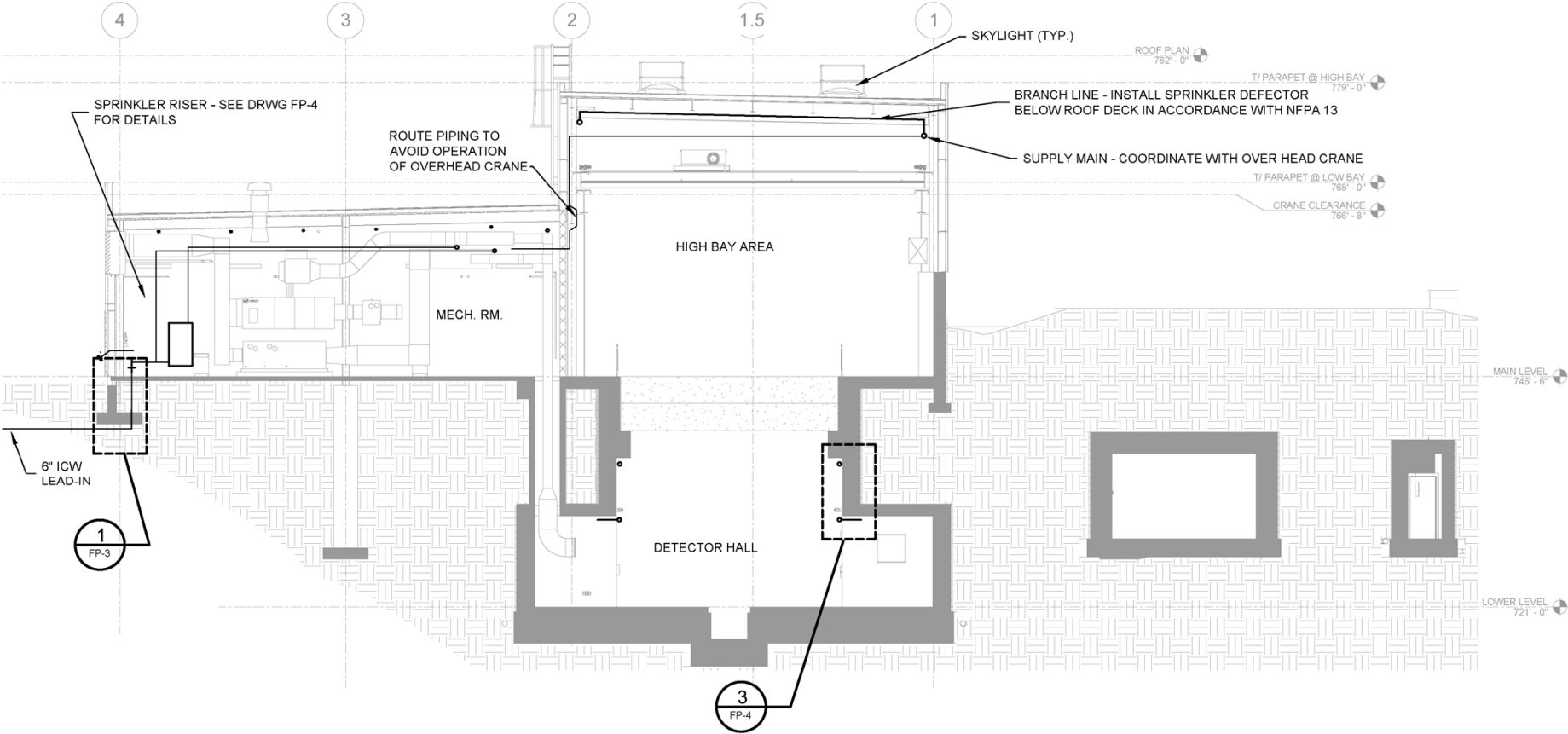


Validation of Exiting Distances

- Code required exiting distances for a beam enclosure was verified to insure safe evacuation with a smoke model that concluded that an able bodied person can reach an exit prior to being overcome by smoke.
- Egress Analysis
- Required Safe Egress Time (RSET)
- Available Safe Egress Time (ASET)
- If ASET is greater than RSET, occupants have enough time to evacuate safely.
- Study concluded that NFPA standards/Codes is a feasible approach in single tunnel / enclosure design.



Design (Building Section View)



Design (Detector Hall Section under hatch)

