Elevator Safety Program - Technical Clarification

T/C #: 22-03

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Topic: MRL-HMRL Clarifications & Testing

As of late, many questions have arisen regarding various configurations for the Use of Machine Room-Less elevators installed in the state after October 1st 2021. Due to the fact that they by design don't have traditional machine rooms that contain all of the elevator equipment away from the general public, in a contained space to be covered by FAID's (Fire Alarm Initiating Devices) dedicated to that single purpose, there has to be a new approach for safety.

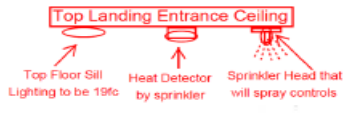
1. Use of Barricades every time control equipment is accessed.

This style of equipment dictates separation from the public while this equipment is being accessed. This equipment can now be located in a shallow, non-full bodily entry closet or cabinet located in the hallway of the building. Additionally these access panels can be incorporated into the elevator door jambs and both shall require that a barricade be in place at all times while open in a public place. Examples below clearly show the need for barricades, left onsite and their location noted where elevator personnel has 24 hour access to it. ADA requires 36 inches roll by clearance in front of the barricades when in use. The requirement for barricades is true for all locations depicted below.

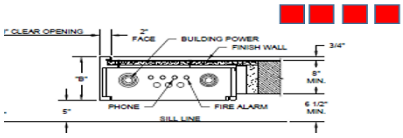
Onsite, 42 inches high.

*Please note on plans the dimensions the working space plus the 36 inch roll-by and barricade storage location.

2. FAID's (Fire Alarm Initiating Devices) properly located.



Now we have left the traditional machine room we now have elevator equipment in public hallways,



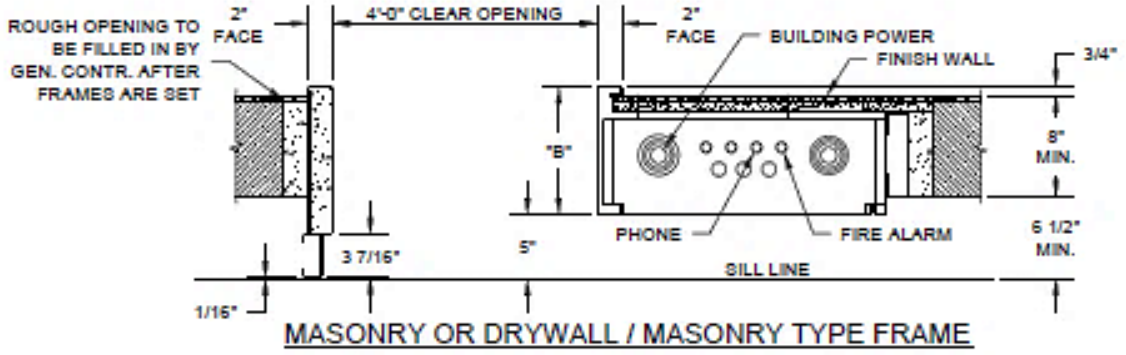
elevator lobbies, and located on various floors of the building. When the building has sprinkler heads that will spray onto energized elevator equipment, regardless of location, it shall qualify for a heat detector within 24" to the sprinkler head(s) and activate the shunt trip breaker. Having the controller located in the hoistway along with the drive machine/pumping unit and tank, NFPA 13: Standard for the Installation of Sprinkler Systems, NFPA 72 National Fire Alarm and Signaling Code, NFPA 70: (NEC), will **all** have to be followed as before. This is true for elevator control spaces, control rooms located in all building locations.

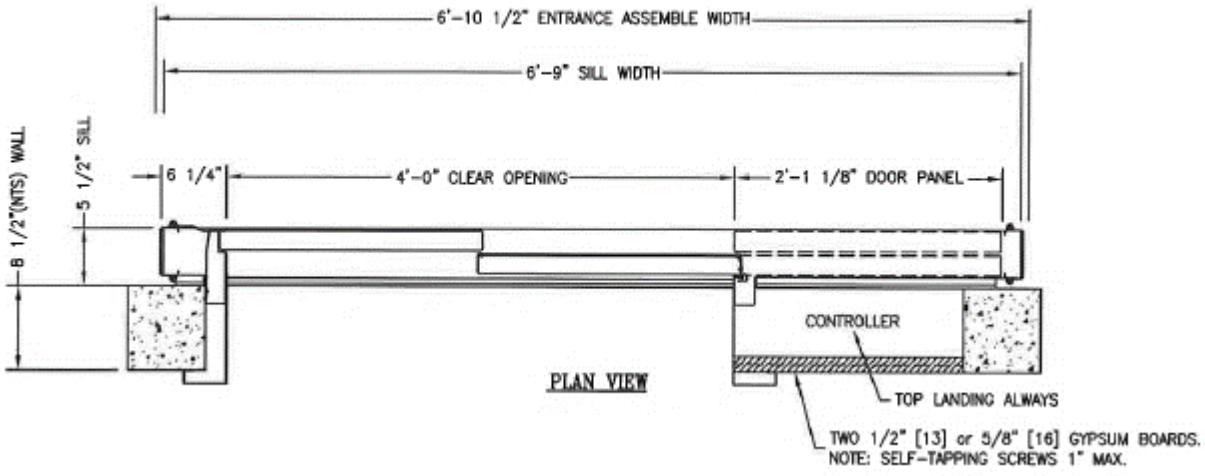
3. Fire Extinguishers located in the Elevator Lobbies at certain floors.

A fire extinguisher shall be conveniently located within the elevator lobbies, control room, by the control space, and on the level of the building where the controller, machine, pit or hoistway access to pumping units is. The style of cabinet or mounting is up to the building, but needs to be permanently mounted at day of inspection. Typically the top entrance of a traction elevator hoistway where you can get to the machine space, and where the hydraulic pumping unit in the hoistway is located (which may or may not be in the pit). **No** fire extinguisher may be permanently located inside the hoistway due to safety concerns, no matter how well it's mounted.

4. Elevator lobby wall depth restrictions.

With MRL designs that have the door jamb containing the actual controller now pose restrictions where lobby mounted signs, fire extinguishers, and fastenings for fire swing-doors would damage the controllers. This sounds like an obvious caution but running mounting screws into energized controls inside wall can be a life safety issue. There is no gap behind the controller for molly bolts or other style fasteners.





(These samples are for illustrating the limited space behind the hall finished. Yours may be different.)

5. MRL and HMRL document access, storage of prints, MCP's etc.

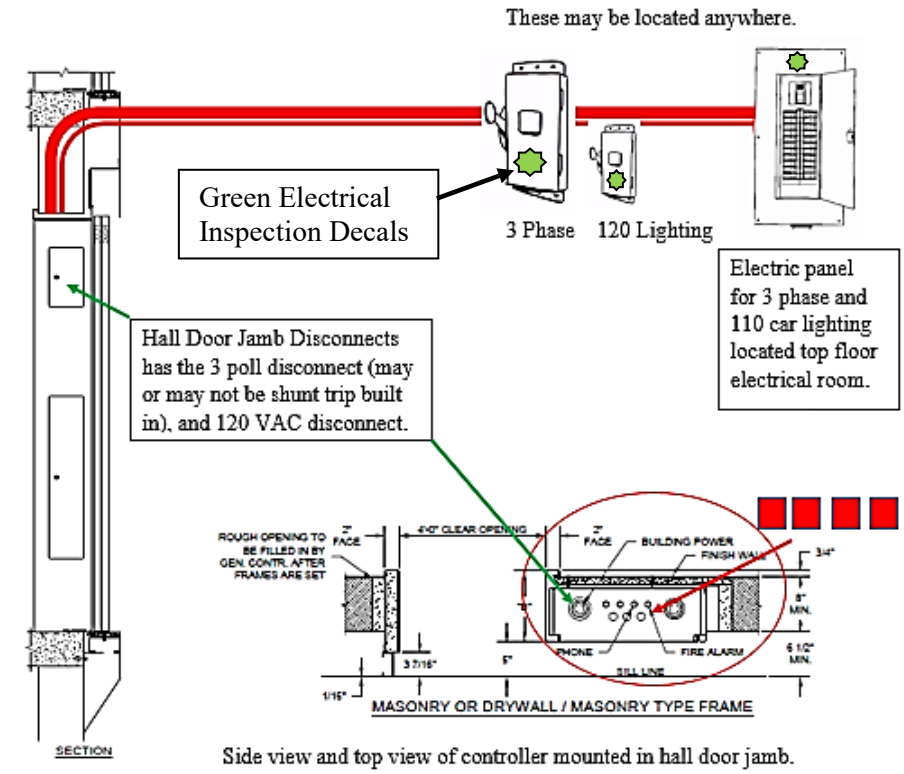
Reasonable access to the required documents needs to be established by the elevator companies and be readily available. ASME A17.1 requires these records to be; "Instructions for locating the maintenance records, (MCP's, Testing results, Call Back records, Prints, etc.) of each unit, for viewing on-site, shall be posted on the controller or at the means necessary for test (see 2.7.6.4). The provided instructions shall be permanently legible, with characters a minimum 3 mm (0.125 in.) high." The State recommends that MRL's accessible via the cartop access, post the metal test tag be safely mounted to the door operator cover and instructions where the on-site location of the document access is located. Some companies utilize a metal document enclosure is attached to the mid handrail so it isn't easily dislodged. **The state conveyance ID number should also be easily read from the MRL cartop on access.**

6. Electrical Requirements.

Note: When the disconnect is located in the controller, the disconnect will be inspected by elevator inspectors. See the agreement listed on the L&I website; [About Inspection of Elevator Installations and Alterations (govdelivery.com)]

New Technology MRL (Machine Room Less) Traction Elevators. Starting October 1st 2021.

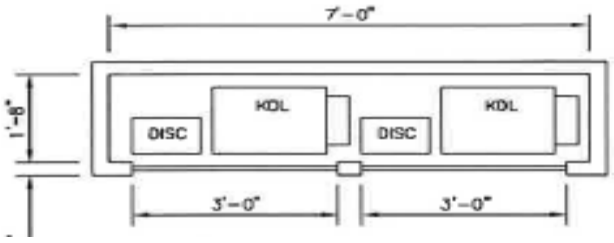
ELECTRICAL CONTRACTOR NOTE:
3 PHASE POWER, 120V 15 AMP CIRCUIT, FIRE ALARM, AND PHONE TO BE ROUTED TO THE TOP OF THE CONTROLLER AT THE CONTROLLER LANDING.

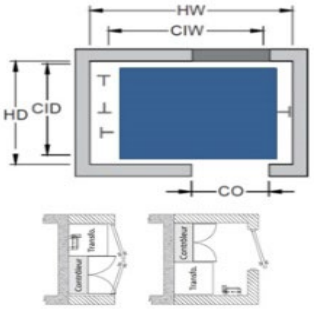


Side view and top view of controller mounted in hall door jamb.

The NFPA 72 will **not** allow the Fire Service Modules to be mounted inside the hoistway as shown above.

ASME A17.1 - Section 2 - 2.27.3.2.7 In jurisdictions not enforcing the NBCC, listed relay(s) or other listed appliance(s) as specified and defined in NFPA 72 for connection to the fire alarm system shall be provided, and shall be *(a)* installed in conformance with the requirements of NFPA 72 *(b)* used to initiate Phase I Emergency Recall Operation *(c)* located outside of any room **or space requiring Group I Security** (see Section 8.1)





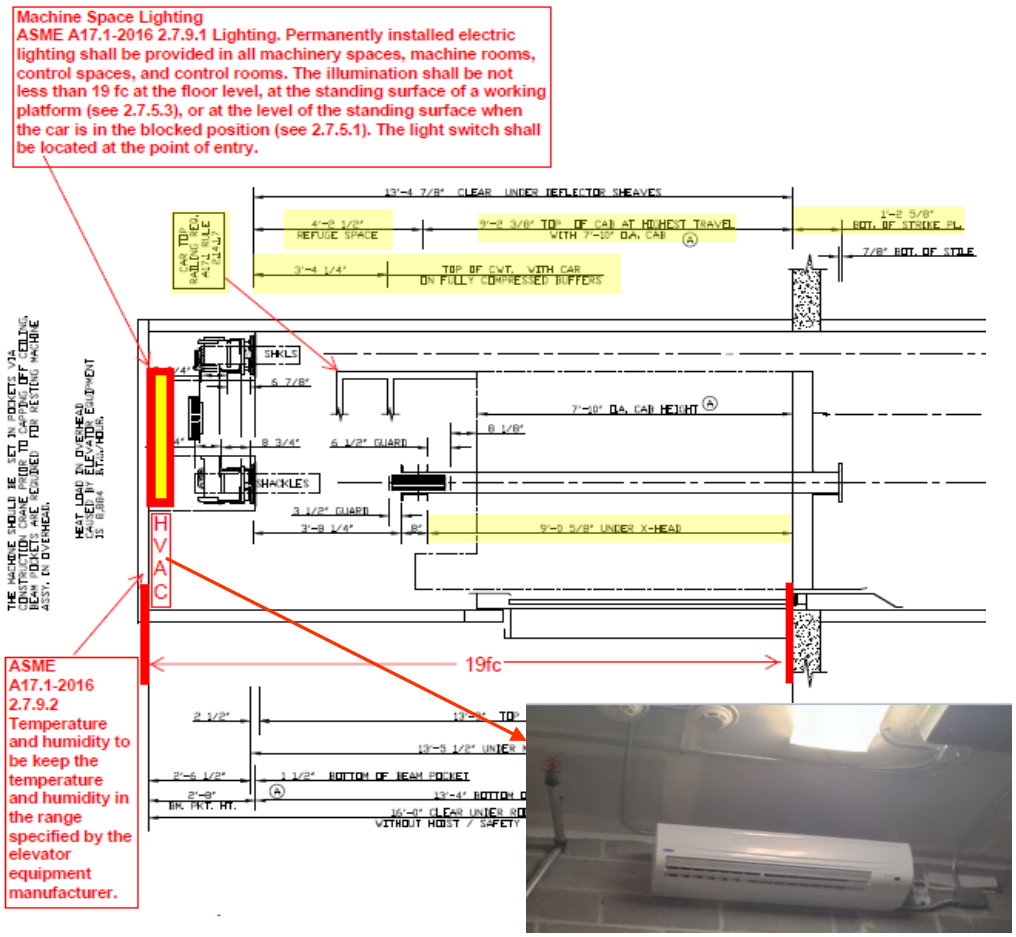
The electrical requirements will follow this basic design but may look different per manufacturer. The use of different configurations of just where the controller is located may be determined by speed and duty of the elevator. Controllers may be located adjacent to the hoistway in control room or control spaces.

7. Inspection Day.

The important thing to remember on the day of inspection is the State is there to see PRE-TESTED equipment. This includes having all the sub-contractors present which includes the plumber (with hose to test the sump again), electrician, fire alarm company (system on test), and the contractor to make sure everything is ready. The elevator should have been previously been tested according to the prescribed methods found in the company documentation. The job barricades need to be onsite, and stay onsite for the life of the elevator.

INSPECTOR: CHECK THESE ITEMS FIRST

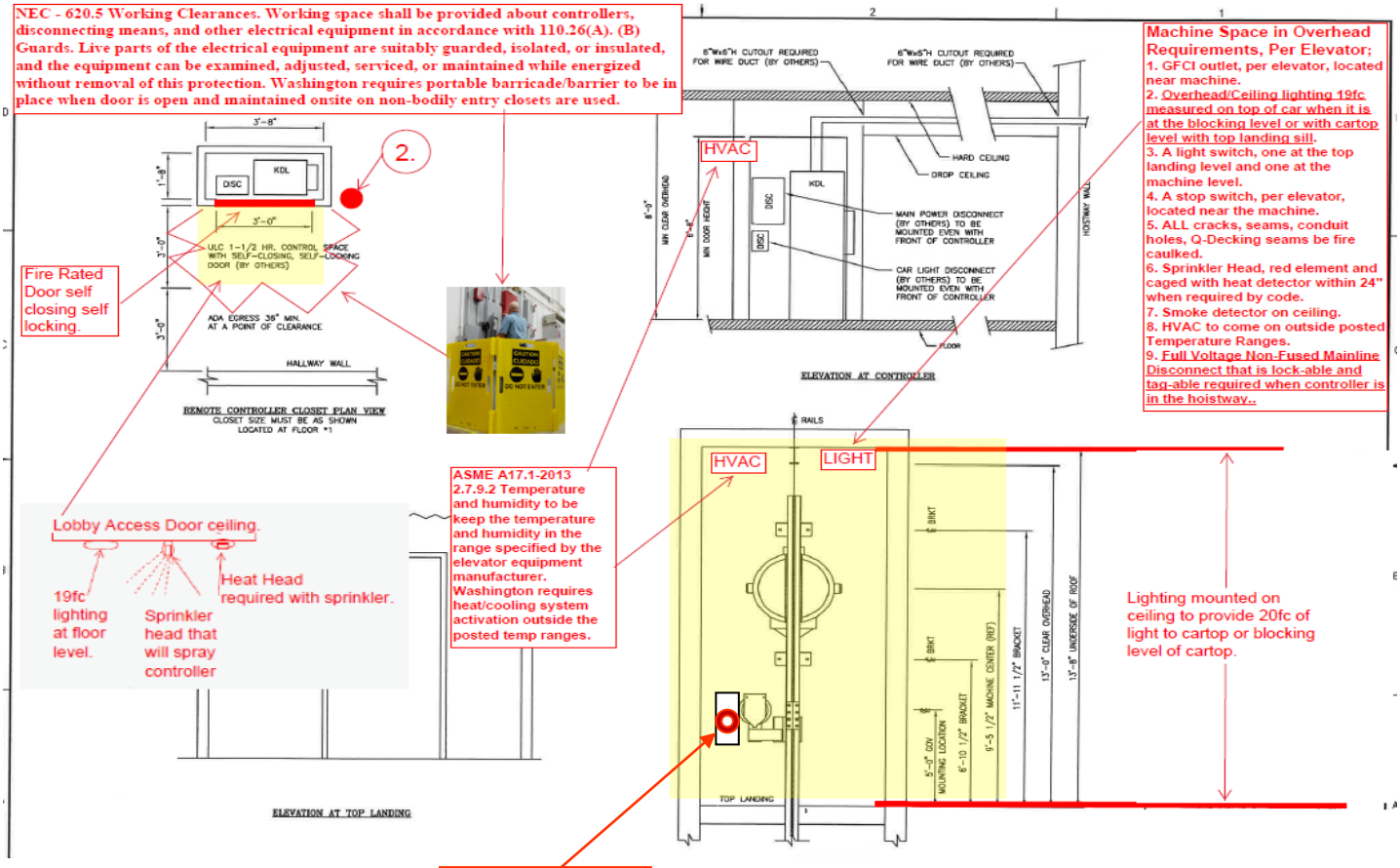
1.) Pit Lighting - 10fc throughout at floor with meter in all four quadrants.
2.) Pit ¾ hp. Sump Pump Recommended - Steel grating – No Oil detection control equipment in pit.
3.) Machine & Control Space - 19fc Lighting throughout - Temperature control working as required.
4.) Hall Door sill lighting must be 10fc with doors closed, 19fc hall sill where inspection panel is located.
5.) NO PVC piping in pit for Sump Pumps as per ASME A17.1 2.1.2.2 fire resistance rating. Must have steel, copper, or cast piping. Piping from sump grate shall be; union, check valve and shutoff valve.
6.) Hoistway overhead lighting is measured from ceiling to blocked cartop position, or level with floor.



It is clear that each manufacturer has temperature, lighting and humidity requirements no matter where the elevator equipment is located. There needs to be a way to satisfy heating and cooling requirements inside hoistways and split units mounted at the top of the hoistway are often the way it's done. They can't be mounted over elevator or electrical equipment and must blow onto the equipment they're protecting. The method and system is up to the contractor.

8. Hoistway Safety Equipment and Lighting.

The cartop and hoistway is now the machine room, machine space, control room, control space. That being the case there has to be additional lighting for overhead machinery and equipment for examination, service, and inevitable repair and replacement of mechanical devices. The lighting requirement starts on the ceiling of the hoistway and extends down to the cartop when it is level with the top landing hall sill. (see yellow highlight on drawing below).

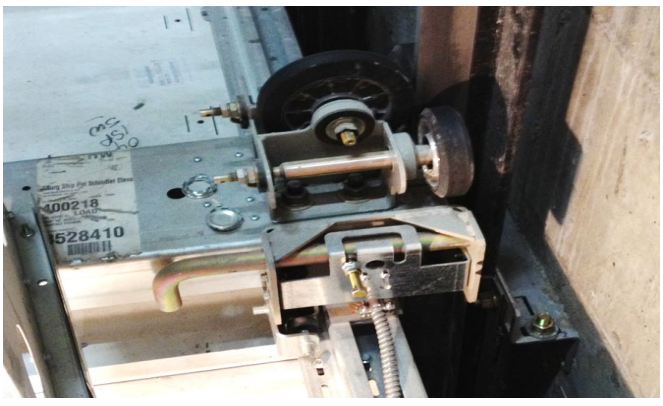


9. Car Blocking Devices shall be required on MRL installations.

MRL Elevators that have equipment in the hoistway that is subject to service, repair, inspection, or replacement shall have a blocking device installed to prevent unintended movement. ASME A17.1-8.6.1.1.1. All devices are subject to examination and replacement and required safe design in WAC 296-96-00500.

2.7.5.1 Working Areas in the Car or on the Car Top. The requirements of 2.7.5.1.1 through 2.7.5.1.4 shall be complied with if maintenance or inspections of the elevator driving-machine brake, emergency brake, elevator motion controller, or motor controller are to be carried out from inside the car or from the car top.

2.7.5.1.1 If maintenance or inspection of the elevator driving-machine brake or an emergency brake, or of elevator motion controllers or motor controllers from inside the car or from the car top could result in unexpected vertical car movement, a means to prevent this movement shall be provided.



10. Inspections, Service, Repairs, Call-Backs and Personnel Training.

There has to be consistency in the approach for safety training in everyone's approach dealing with MRL's in our state. Most of the time companies send just a few people for factory training on new product and the service and repair crews aren't usually at the top of the list. There will be call-backs and emergency repairs that will happen after this equipment is turned over by those who got the factory training. Please make sure that everyone who has to interact with this new style equipment receives the safety and product training necessary to perform their jobs.

No one from elevator equipment companies, their field workers, general contractors and their subcontractors which includes electrical, fire alarm companies, plumbing contractors, architects, engineers, first responders, and elevator inspectors have had experience on these MRL's. There is a lot of information for the many different trade crafts involved in the installation of MRL's that they will need to do their jobs. There will be a big learning curve for all involved. Please take time to budget training time for everyone involved. Invite the stakeholders in this process to the inspections and training you provide.

Having people involved like the fire department for instance will make a big difference when the call comes in for an elevator passenger entrapment. Where do they find the non-existent elevator machine room electrical disconnect to kill the power before extracting people? Is the electrical disconnect on the first floor, second floor for some brands, top floor for others. Is it behind a small locked panel on one of the floor entrance jambs, **and where is the key?** Is it now located in an adjacent room to the hoistway on one of the floors, and how is it labeled? Where do they go?

This life saving information would be very valuable to provide in the lock box that shows this information so there isn't any needless wondering from floor to floor to find where things are located. An index card with a map of where to go and what keys are needed would be one way to go, or writing this information on the inside of the cover of the lock box would be good too. The state will leave this up to the elevator companies to address and encourage that the current elevator service company contact information be in the lock box.

Respectfully,

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