

BRIDGING THE GAP

SoCal SFPE 10/22

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General categories for discussion

- Tenant improvement projects
- System replacement projects
- Various common issues

Tenant Improvements (TI)

- LAFD allows scheduling of pre-walks to address items that frequently come up during TI inspections. Purpose of pre-walks are to minimize changes after construction is completed and customer expects to occupy the space.
- Could be useful for complex projects, full or multi floor TI projects
- For continuity always best for same inspector to conduct pre-walk and actual inspection for occupancy. Especially important for projects that are phased.
- Complex phased projects (TI or base building) may require written phasing plan to be reviewed by LAFD/LADBS

TI common issues #1

- Assembly requirements. Cumulative occupant load calculation requirements (FC/BC section 1004.2.1)
- Assembly requirements include door swing in direction of travel, panic style hardware required to public way.
- “Fire exit” labeled hardware required on fire rated doors when panic type hardware is required. Cannot use “panic” labeled hardware on fire rated doors.
- Stairwell doors need to be electrified if building is provided with stairwell locking system installed per BC section 403.5.3. Doors to unlock but not unlatch.
- Field modified fire rated assemblies need to be re-certified and labeled by an approved service if altered as part of installing a door locking system.
- Fire extinguishers should be placed at exits from floor (NFPA 10 section 6.1.3.2) and then consider travel distance and special hazards to protect.
- Exit signs/emergency lighting in buildings that have an emergency generator in Los Angeles must be connected to the emergency generator. No inverters, nuclear exit signs or unit equipment can be used.

CONFORMS TO STANDARDS
UL 10C AND UBC 7-2 (1997)
CAL-ROYAL PRODUCTS INC.

R25175



FIRE EXIT HARDWARE
CAL-ROYAL PRODUCTS INC
LOT NO:0111905

TI common issues #2

- Fire alarm panels in high rise buildings need to be connected to dedicated emergency circuits with breaker locks. Occasionally panels are incorrectly connected to normal power circuits during TI. This applies to strobe power supplies and releasing panels for pre-action or clean agent systems.
- Fire alarm strobes required in “common use” areas. This includes single person rooms such as, phone rooms, restrooms, visitor, hoteling office spaces.. (FC/BC section 907.5.2.3.1 and definition of common use areas)
- Audio shunt, if required, needs to occur upon both fire alarm activation and voice evacuation activation.
- High rise elevator lobbies in Los Angeles require magnetic door holders. (LAFC section 4705.1.2) Exceptions are: electrical, mechanical, restroom doors. Required even for access controlled doors into TI spaces. Missed in design and plan check occasionally.

TI common issues #3

- Non enclosed/non rated convenience stairs between building levels open multiple floors to each other. (FC/BC section 1019.3 #4 allows unlimited number of floors for sprinklered Group B and M occupancies and maximum 4 floors other occupancies w/exceptions)
Note for Los Angeles; if the heliport for new high rise is being omitted then a maximum of two floor levels can be connected without providing an approved two hour separation per LAFD FPB Requirement #10. High rise sequence of operations needs to be adjusted so that the floors that are open to each operate as a single “zone” for life/safety purposes. Includes: fire alarm audible/visuals, voice evacuation paging zones, damper operation, HVAC shutdown, audio shunt, door mag release, door lock release. Voice evacuation paging buttons for the floors need to be combined to a single button/switch labeled for the merged floors or both of the existing buttons/switches for the floors need to be programmed to work together. Strobe coverage should be provided in non exit convenience stairs.

TI common issues #4

- Door locking systems need to be shown in detail on the LAFD architectural approved plans. Not just a general note on the door schedule. FC/BC section 1010 details requirements for types of door locking systems. Note that delayed egress door locking systems require full area smoke detection coverage per FC/BC section 907.3.2.1
- For inspectors a motion sensor or card reader installed on the egress side of doors are conditions to look into. Any type of obvious locking system, such as a mag shear lock at the top of an egress door, needs to be investigated.
- High rise office building elevator lobby door locking systems are addressed in FC/BC section 1010.1.9.13. State uses previous LA City “Method B” with a few changes. Cannot be used if path of travel from outside elevator lobby passes through lobby-only allowed for lobby exiting. Requires door lock release ability from the fire control room. Allows two way communication to connect to off site monitoring, if able to remotely unlock the doors.

IN CASE OF
EMERGENCY
PUSH PALM
BUTTON. DOOR
WILL UNLOCK
AND SECURITY
ALARM WILL
SOUND.



TI common issues #5

- HVAC shutdown required for air supply systems over 2000 CFM aggregate. (FC/BC section 907.2.12.1.2, CMC section 608) Aggregate is determined by adding CFM of all “systems” supplying air to a common volume.
- HVAC shutdown can be accomplished in two ways:
 - A. “Full area coverage” in area served by HVAC system. Plenum issues.
 - B. “System” duct/in duct detectors (low rise = supply detection only, high rise requires detection on both supply and return sides of each HVAC unit that requires shutdown)







TI common issues #6

- Duct detection:
 - A. “System” (powered by/supervised by/reset by fire alarm control panel) devices listed for CFM of HVAC system
 - B. Sampling tubes properly installed for air flow direction
 - C. Extend inlet sampling tube through duct with cap if duct over 3’. Support sampling tubes if duct over 10’ wide. Check manufacturers installation instructions.
 - D. Duct detector not installed on bottom of ductwork
 - E. Remote LEDs

TI common issues #7

- Smoke/fire dampers required in locations per BC section 717
- Detection required to control smoke/fire dampers. Similar to HVAC shutdown this could be accomplished with “full area coverage” in the area served by the smoke/fire damper OR properly located detectors need to be provided to operate the smoke/fire dampers.
 - A. Within 5’ of the smoke/fire damper if in ductwork. Within 1’ if “transfer” damper and no ductwork.
 - B. Additional devices required if damper opening is over 3’ in dimension.
 - C. In Los Angeles these detectors are programmed as alarming devices and display as “duct detectors” on the fire alarm annunciator.
 - D. Remote LEDs

TI common issues #8

- Derating of existing one hour corridors for sprinklered office buildings shouldn't be allowed for multi tenant floors where a new TI requests to de-rate corridor where existing tenant areas were built and approved as one hour construction.
- Horizontal exits. Minimum two hour condition.
 - A. Openings protected by minimum 90 minute assemblies (BC section 716)
 - B. Cross corridor conditions require doors to be automatic closing by smoke detection (FC/BC section 1026.3)
 - C. Dampers required (FC/BC section 1026.2) Smoke/fire dampers in horizontal exits that affect smoke control must monitored for position and power for active smoke control areas.
 - D. Standpipe outlets may be required (FC/BC section 1026.5. FC/BC section 905.4 require outlets if over 100' path of travel + 30' hose stream to existing standpipe outlet) Tampered control valve with ID sign required. Floor plan map at control valve with horizontal hose valve locations shown is a good practice.

System replacements

Fire Alarm #1

- Could be a planned and budgeted project or an emergency replacement due to equipment failure.
- If the replacement project is planned in advance it could be a situation where the system is completely replaced all at once or a “parallel” system approach where floors/devices are systematically removed from the existing FACP and new devices are connected to the new FACP and tested by the AHJ. Parallel approach may save fire watch expense.
- Requires LAFD plan check and inspection and in Los Angeles also requires LADBS plan check and inspection. LADBS electrical inspector wiring approval required prior to any LAFD testing. LAFD tests 100% of devices if: FACP or CPU replacement. 10% test acceptable if scope of work is only a site specific software update. (NFPA 72 section 14.4) Entire sequence of operations is tested.
- In Los Angeles a strobe upgrade is required for buildings if the fire alarm system is being replaced.

NOTIFIER PANEL (NEW)

Active Floors:
Level 1-3, P1, P2

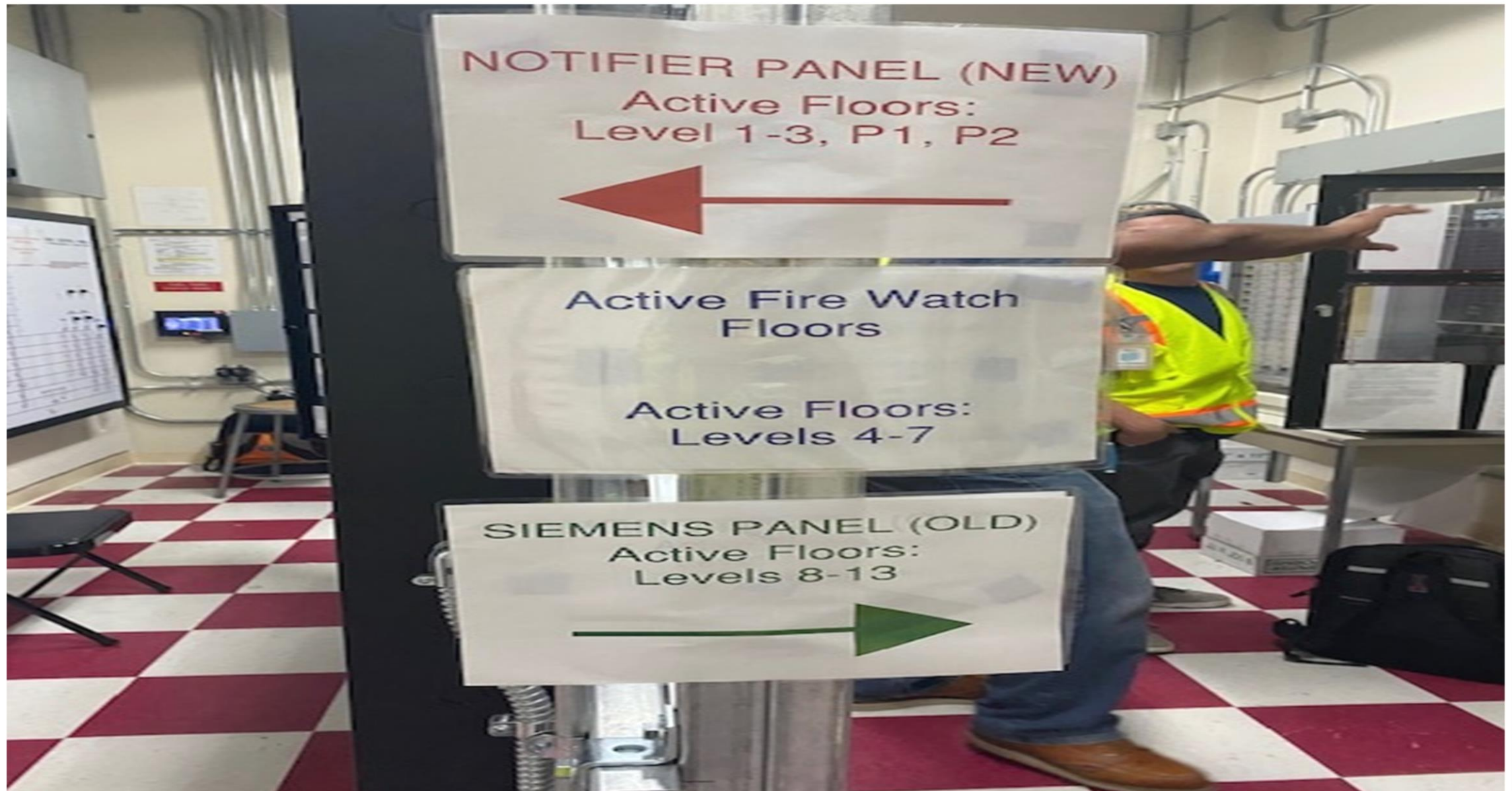


Active Fire Watch
Floors

Active Floors:
Levels 4-7

SIEMENS PANEL (OLD)

Active Floors:
Levels 8-13



System replacements

Fire alarm #2

- In Los Angeles a replacement of the fire alarm system (but not a FACP replacement) may trigger the requirement to provide Emergency Responder Radio Coverage System/DAS/BDA (LAFD FPB Requirement #105) Conversion of existing sound powered firefighter phone jack system to an amplified system under a Modification could be considered in lieu of a new DAS/BDA system.
- The fire alarm annunciator may need to be replaced as part of the fire alarm replacement project, especially if equipment status such as fire pump, water storage tank levels, generator, fuel low and leak status is not displayed on the existing fire alarm annunciator. Matrix type annunciator required for buildings over two levels.

System replacements

Fire alarm #3

- Programming changes required during a Los Angeles high rise building fire alarm replacement typically include:
 - A. Strobes to stop flashing when alarm is silenced
 - B. Notification zones to include at least the zone of alarm and the levels/zones directly above and below the alarm zone. (FC section 907.5.2.2) If fire alarm notification devices are being activated the entire sequence of operations needs to occur.
 - C. Voice evacuation paging zones, in addition to each floor level, to be provided for: elevator groups and interior exit stairs. These dedicated paging zones are frequently missed in design for base buildings also. Requires vertical riser-not connected to floor notification devices. No alarm tones in elevator or stairs-paging only. Voice evacuation paging to override fire alarm tone function.
 - D. Fire alarm notification audibility/voice evacuation intelligibility to meet current code requirements.

System replacements

Fire alarm #4

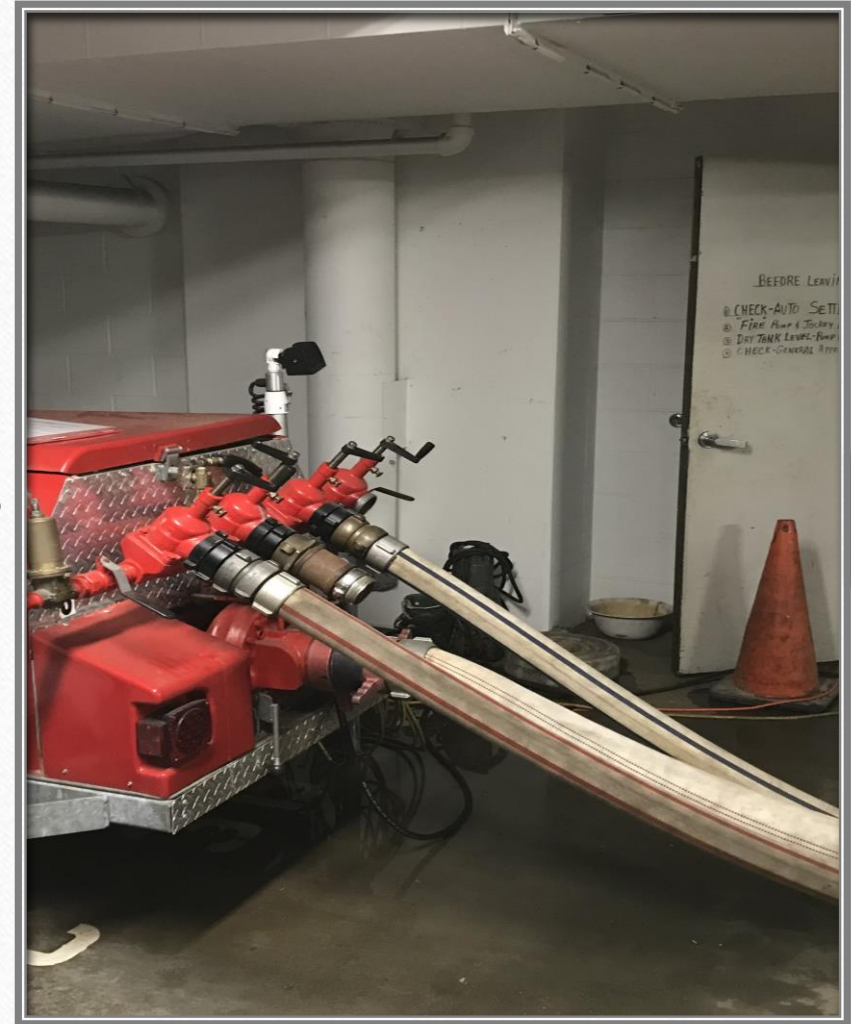
- Need to maintain elevator hoistway detection if top of elevator shaft smoke/fire dampers exist. Occasionally detectors are removed as part of fire alarm replacement and LAFD becomes aware later.
- Evacuation signs for buildings may need to be replaced if alarm tone is modified from what is stated on the existing evacuation signs, voice message added or strobes newly provided. High Rise Emergency Manual for the building may require revisions.
- 24 hour fire alarm battery test required at end of replacement (5 or 15 minutes, depending on if building has voice evacuation or not) Contractor should meter batteries after time elapses to recharge post 24 hour battery test. Contractor should be required to provide this documentation to the AHJ.
- Occasionally high rise office buildings request to program multiple messages for voice evacuation system. “Relocate” and “prepare to receive” messages. Challenges to acceptance testing and maintaining system over time as TI’s come and go.
- NFPA 72 Record of Completion

System replacements

Fire pumps

Approved standby fire pump is required if the occupied building has a single fire pump that is out of service, fire pump controller is out of service, master PRV is out of service, water supply is out of service if fire pump takes suction directly from City supply or the pump takes suction directly from the water storage tank and the water storage tank is out of service. (LAFD FPB Requirement #73)

LAFD and LADBS sprinkler plan check/permits/inspections required depending on level of repairs performed. Any replacement of fire pumps, drivers or controllers require 100% acceptance testing, including status to the FACP and fire pump remote annunciator.



System replacements

Emergency generators

- Occupied buildings would require an approved temporary generator approved by LAFD and LADBS electrical inspectors.
- Functional full load test of temporary generators witnessed by LAFD
- Repaired generators require inspections by LADBS electrical and functional test by LAFD, depending on level of repairs performed. Possibly Chief's Regulation #4 test may be required.
- Replacement generators require at least: LADBS electrical plan check, LAFD fuel system approval, NFPA 110 load bank test, LAFD test of generator status signals to FACP and generator status panel, LAFD full load functional test.



System replacements

Smoke control

- Occasionally smoke control panels are replaced as part of a fire alarm replacement project
- In Los Angeles replacements require LAFD and LADBS mechanical inspector involvement. If the project involves only automation controls and/or smoke control panel replacement then typical inspections would only involve manual system activation at smoke control panel and testing automatic smoke control equipment activation via fire alarm devices, display of equipment status and standby power operation. Deputy smoke control inspector is required for complex systems prior to City testing. If changing design, fans, or air distribution a full LADBS plan check is required, Rational Analysis, deputy inspector and City test are all needed.

System replacements

Elevator modernizations #1

- High rise modernization projects:
 - A. Elevator status panel for fire control room to be approval by LAFD inspector
 - B. Need to discuss if MRL or destination dispatch type elevators are being provided and specific issues for those types of elevators
 - C. Elevator standby power requirements for ‘modern’ high rise buildings plan checked after 7/1974 (LAFC section 4705.1.6 and BC section 3003) Elevator machine/control room lighting and ventilation requirements, HVAC and smoke/fire dampers serving the rooms need to be programmed as “local” shutdowns.
 - D. Hoist way relief damper concerns

System replacements

Elevator modernization #2

- E. Voice evacuation paging zones
- F. All elevators in building to be keyed alike for fire service and appropriate number of identified keys to be placed into LAFD access key boxes.
- G. Firefighter phone jacks in elevator machine/control rooms, elevator car and lobbies.
- H. Access control issues. Common failure point when transferring to standby power. Need access control cards/fobs for LAFD access key boxes.
- I. In Los Angeles any modern high rise lobby smoke detector must activate phase I and recall all elevators serving the floor- not just the bank or group. (LAFD section 4705.1.3)

Elevator emergency phone s
 Calling Elevators
 Elevator "A" Dial *01
 Elevator "B" Dial *02
 Machine room "A-B,RS1-RS2" Di
 Elevator "C" Dial *04
 Elevator "D" Dial *05
 Elevator "E" Dial *06
 Machine room "C, D, E" DIAL *
 Elevator "P1" Dial *08
 Elevator "P2" Dial *09
 Elevator "P3" Dial *10
 Elevator "P4" Dial *11
 Elevator "P5" Dial *12
 Elevator "RS1" Dial *
 Elevator "RS2" Dial *
 Elevator "WS4" Dial *
 Press "1" to talk, Press "2" for L

MASTER STATION
 JANUARY

EMERGENCY COMMUNICATIONS
 1. PICK UP PHONE
 2. FOLLOW VOICE INSTRUCTIONS, IF ANY
 3. PRESS "1" TO ALERT PERSONNEL
 4. AT THE END OF CALL, HANG UP PHONE

CALLING AN ELEVATOR
 1. PICK UP PHONE
 2. PRESS "1" AND THE NUMBER OF ELEVATOR
 3. PRESS "2" AND THE NUMBER OF FLOOR TO WHICH YOU WANT TO GO
 4. AT THE END OF CALL, HANG UP PHONE

151 S. OLIVE STREET

RS1 - RS2 ARE FIRE SERVICE ACCESS ELEVATORS

RS1

P2

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

RS2

27

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

A IS FIRE SERVICE ACCESS ELEVATOR

A

8

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

B

18

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

↑

C

1

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

D

9

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

E

22

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

ELEVATORS RS1 - RS2 ELEVATORS A - B ELEVATORS C - E

P1

4

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

P2

4

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

P3

4

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

P4

--

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

P5

1

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

WS4

6

CAR AT LOBBY WITH DOORS OPEN

STANDBY POWER

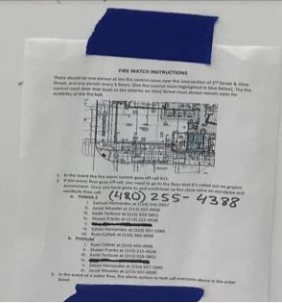
ELEVATORS P1 - P2 ELEVATORS P3 - P4 ELEVATOR P5 ELEVATOR WS4



THE GRAND, TOWER 2 (151 S. OLIVE STREET)

ELEVATORS	A	B	C	D	E	P1	P2	P3	P4	P5	RS1	RS2	WS4
FLOORS SERVED	P2-*1, 3-12, 14-MR	*1,3-4, 10,29-45	*1,3-12,14-28			P2-P1,3-*4,6,8		P2-P1,3-*4,6,8		*1,3-4	P2-*1,3-12,14-MR		*1,4,6,8
PRIMARY RECALL LEVEL	*1		*1			*4		*4		*1	*1		*1
ALTERNATE RECALL LEVEL	3		3			8		8		4	4		6
MACHINE/CONTROL ROOM LOCATION	ROOF		30			2		3		P1	ROOF		8
SPRINKLER IN HOISTWAY	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
SPRINKLER IN MACHINE ROOM	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
SHUNT TRIP BREAKER LOCATION	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RATED CAPACITY IN LBS	3500	3500	3500	3500	3500	3500	3500	3500	3500	3000	4500	4500	5000
FIRE FIGHTER ELEVATOR	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	NO
GURNEY ELEVATOR	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES
MACHINE ROOM LESS (MRL)	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	NO	NO	YES

Elevator emergency phone system
 Calling Elevators
 Elevator "A" Dial *01
 Elevator "B" Dial *02
 Machine room "A-B,RS1-RS2" Dial *03
 Elevator "C" Dial *04
 Elevator "D" Dial *05
 Elevator "E" Dial *06
 Machine room "C, D, E" DIAL *07
 Elevator "P1" Dial *08
 Elevator "P2" Dial *09
 Elevator "P3" Dial *10
 Elevator "P4" Dial *11
 Elevator "P5" Dial *12
 Elevator "RS1" Dial *13
 Elevator "RS2" Dial *14
 Elevator "WS4" Dial *15
 Press "1" to talk, Press "2" for Location



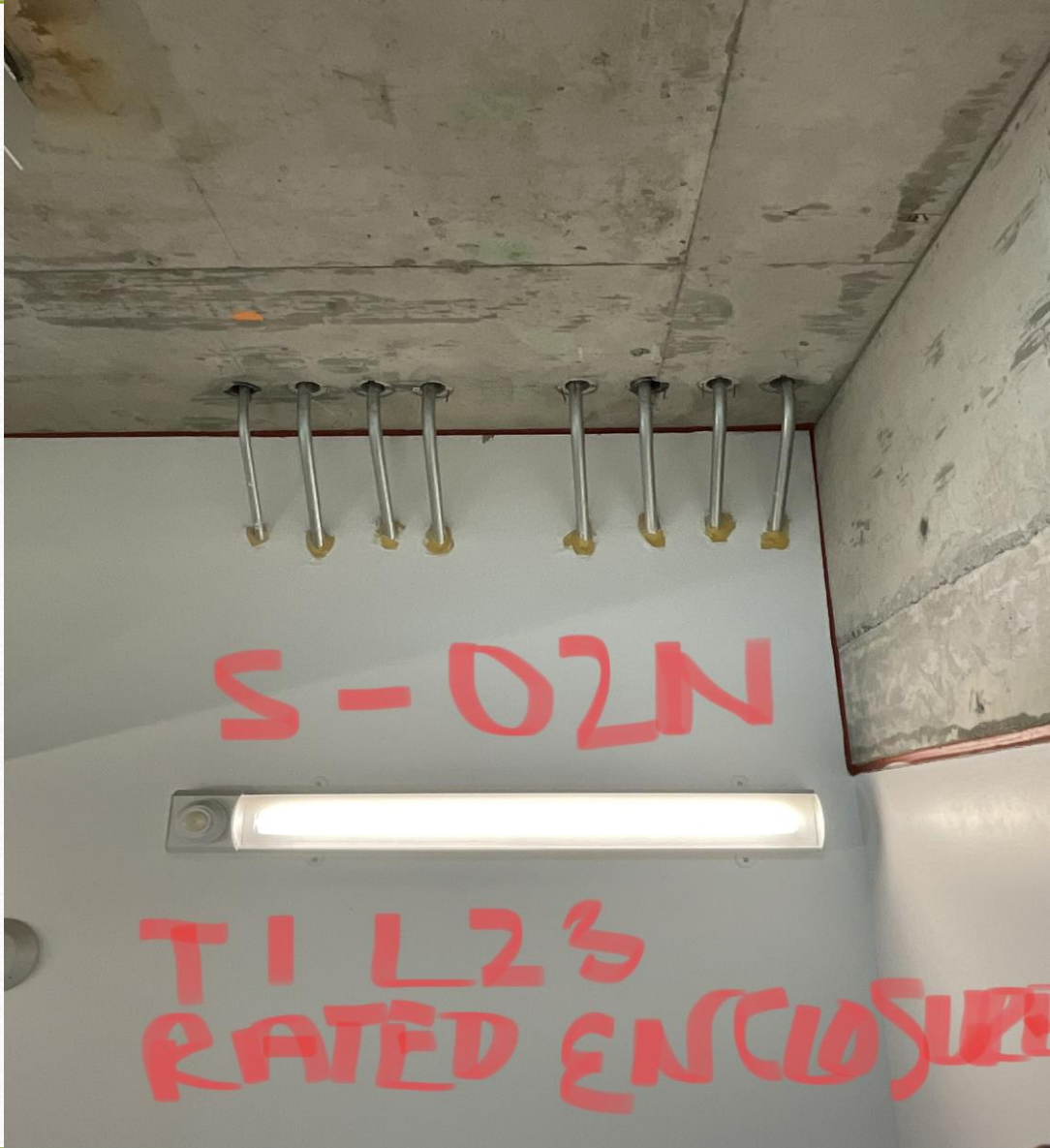
Penetrations (special locations #1)

- Fire Control Room. (FC section 508 and BC section 911) LAFD has more restrictive memo stating no penetrations of FCR by items not required to operate the room.
- Fire pump rooms. (FC and BC section 913 and NFPA 20 section 4.13.1) No items allowed in fire pump rooms that could potentially cause interruption of service. Low rise and high rise retrofit buildings = 1 hour and new high rise projects = 2 hour. Diesel fire pumps cannot take combustion air from other building areas-must be shafted to the exterior w/o dampers)

Penetrations (special locations #2)

- Generator rooms. 2 hour construction required if inside building. Cannot be installed open to garage or other building areas. Must take combustion air from exterior, no dampers allowed in generator combustion air. No penetrations allowed of generator rooms (NFPA 110 sections 7.2 and 7.11)
- Stairwells, stair vestibules, exit passageways. No penetrations allowed besides items required to operate the space such as fire sprinklers, standpipes, lighting, stairwell pressurization. Frequently require two hour soffits for penetrating items (FC/BC sections 1023.5, 1024.6) Exit passageways are frequent problem areas for non stairwell MEP penetrations.
- Possible to construct rated enclosures to “build out” non permitted penetrations of these special locations.
- FC chapter 7 has requirements for maintaining fire-resistive construction.



A photograph of a metal enclosure, possibly a server rack or control panel. The enclosure is light-colored and has a long, horizontal fluorescent light fixture mounted on its front. Above the light fixture, there are several vertical metal rods or screws protruding from the top edge. The background is a rough, grey concrete wall. The entire photograph is framed by a white border, which is itself set against a light brown background.

S-02N

T1 L2'S
RATED ENCLOSURE



R 1N
ACCESS
9
THRU 2
DOES
LEVEL



Halloween



EXIT



Mechanical subduct systems

- Shaft protection typically requires smoke/fire dampers with appropriate fire alarm detection devices. Exception to smoke/fire damper requirement are “subduct” systems. (BC section 717.5.3 exceptions) Used for exhaust systems such as: residential kitchen, bathroom, clothes dryer, janitor or electrical rooms.
- Subducts require:
 - continuous upward airflow to exterior (generator required, even for low rise projects)
 - steel ductwork (26 gage minimum) extends not less than 22” vertically into exhaust shafts.
 - part of smoke control for status monitoring if building has smoke control (BC section 717.5.3 exception 2.3)

Various items-final slide

- Locking of top of stairs not permitted in Los Angeles unless complies with LAFD FPB Requirement #102. (LAFD section 1010.1.9.12.1)
- Inverters used for life/safety need to be monitored per NFPA 111 section 5.3.3
- Fuel supply pumps need to be interlocked with appliance served such as generator or diesel driven fire pump in Los Angeles, not just a low fuel level on appliance day tank. (LAFD section 1203.1.1.1)
- Fuel lines in high rise buildings serving generators need to be protected by approved minimum 1 hour construction. (FC section 1203.1.2 and BC section 403.4.8.2)
- Standpipe outlets for high rise buildings with smokeproof enclosures need to be located in stair vestibules (FC/BC section 905.3.9 and BC section 909.20.2.3)
- Use heat detectors in place of smoke detectors in locations where subject to false alarms such as: exterior locations, generator rooms, diesel driven fire pump rooms, trash/recycling/linen chute termination rooms, garage areas. (NFPA 72 section 17.7)
- New buildings that start TI construction prior to core/shell TCO can be problematic. TI would have to be completed to allow core/shell TCO since life/safety systems would be impacted by the TI construction.