

LSE

Welcome to the Life Safety Evaluation (LSE) Training Seminar

June 11th and 12th 2012



Presented by
City of Chicago
Department of Buildings & Fire Department

MAJOR ORDINANCES CONCERNING EXISTING HIGH RISE BUILDINGS

Ordinance	Requirement	Required Deadline
13-196-204	<p>Voice Communication Systems in Existing Buildings Requires the installation of One Way and Two Way Communications Systems in existing high rise buildings</p>	January 1 st , 2015
13-196-205	<p>Automatic Sprinkler System Installation in Existing High Rise Buildings Requires retro-fitting of sprinklers in existing (pre-1975 High Rise Buildings). Allows existing class A-2 residential and landmark commercial high rise buildings to use the Life Safety Evaluation Process instead of automatically retro-fitting the building with sprinklers.</p>	January 1 st , 2017
13-196-206	<p>Life Safety Evaluation of Existing Buildings Establishes deadlines and parameters for the LSE Process.</p>	January 1 st , 2015
13-196-209	<p>High Rise Buildings---Stairs --- Doors Requires that stairway, doors, frames, (and enclosure walls) for existing high rise buildings have a minimum one hour fire rating.</p>	January 1 st , 2015

EXISTING LIFE SAFETY EVALUATION SAFETY PARAMETER SCORE

April 10, 2012

Building address:
 Building owner:
 Building owner address:
 Building owner phone number:
 Building owner e-mail address:
 Building manager (if different from owner):
 Building manager address:
 Contact phone number:
 Professional of Record:
 Professional of Record address:
 Professional of Record phone:

Safety Parameters	Fire Safety	Means of Egress (ME)	General Safety (GS)
10.1 Building Height	0	0	0
10.2 Construction Type	16	16	16
10.3.1 or 10.3.2 Compartment Area	6	6	6
10.4.1 Dwelling Unit Separations or 10.4.2 Tenant Separations	5	5	5
10.5.1 or 10.5.2 Corridor Partitions/Walls	0	0	0
10.6 Vertical Openings	-10	-10	-10
1.07 HVAC Systems	0	0	0
10.8.1 or 10.8.2 Smoke Detection	6	6	6
1.09 Communications	0	0	0
10.10 Smoke Control	2	2	2
10.11.1 or 10.11.2 Exit Capacity	10	10	10
10.12.1 or 10.12.2 Dead End Corridors	0	0	0
10.13.1 or 10.13.2 Maximum Exit Travel	5	5	5
10.14 Elevator Controls	3	3	3
10.15 Emergency Lighting	2	2	2
10.16.1 or 10.16.2 Mixed Occupancies	0	0	0
10.17 Automatic Sprinklers	0	0	0
10.18 Auxiliary Uses	0	0	0
TOTAL			
Building Score	45	45	45
Minimum Passing Score - Residential	27(FS_R)	36(MS_R)	36(GS_R)
Minimum Passing Score - Commercial	25 (FS_C)	22 (ME_C)	22 (GS_C)
Pass/Fail	Pass	Pass	Pass

10.1 Building Height

- Provide the Building height in Feet
- Provide the number of stories above grade

Seminar



10.2 Construction Type

- ❑ Fully describe the overall construction materials of the building (IE. Poured in place concrete structural flat plate frame with 8 inch structural slabs and brick masonry exterior walls).
- ❑ Provide a table documenting / listing the number of hours of fire resistance rating for the main structural elements of the building –Beams Girders, Columns, Exterior Walls and Floors. The number of hours should match the minimum required hours of Table 13-60-100 of the CBC for the selected Construction Classification. Provide UL, FM fire ratings or fire ratings from the Federal Register of Archaic Building Materials next to the fire rating of the buildings structural assemblies you are listing in order to justify the fire rating you are stating for a building element.

10.2 Construction Type (continued)

PLEASE NOTE:

Use existing plans for the building to research the construction type.

If plans are not available, perform invasive inspections and testing as required to determine the materials, dimensions and fire rating of the building elements.

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Fire Ratings



- U.L. UNDERWRITERS LABORATORIES FIRE RESISTANCE DIRECTORY – VOLUME 1
- U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FIRE RATINGS OF ARCHAIC MATERIALS AND ASSEMBLIES
- INTERNATIONAL BUILDING CODE (IBC) –
CHAPTER 7- FIRE RESISTANCE RATED CONSTRUCTION

10.3 Compartment Area

- List the size of the fire compartments for the building (see the comment for this category)
- Using the table for Category 10.3 in the published rules, select the appropriate size range for your building and state the number of points.


PLEASE NOTE: For most buildings the compartment area will be the total floor plate of the building, Unless the building is subdivided into true fire compartments by 2 hour slab to slab walls with any door openings through the 2 hour wall protected by self-closing B-Label (90 Min.) Doors and Frames.


10.4 Tenant/Dwelling Unit Separations

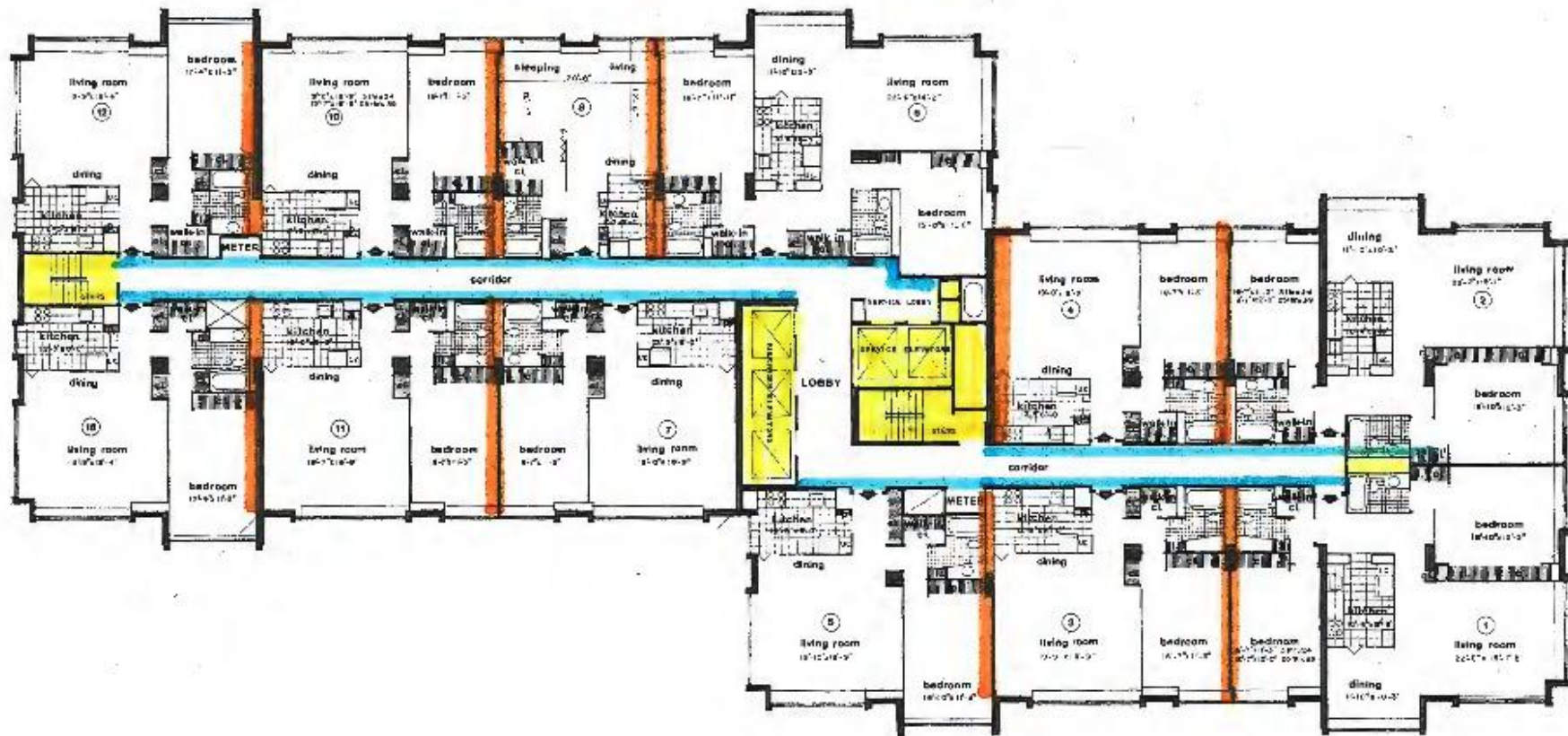
- Fully describe the separation assembly - IE the materials, thickness, is the assembly complete slab to slab, and the fire rating. Provide a U.L, F.M. or Federal Register of Archaic Building Materials design number for the wall assembly to justify the fire rating you are stating.

PLEASE NOTE: Many reports confuse tenant separations (the demising wall between dwelling units with the requirements for of category 10.5 the wall between the dwelling unit and the public corridor.

 Dwelling Unit Separation Walls – Category 10.4

 Corridor Separation Walls – Category 10.5

 Vertical Openings (Shafts) – Category 10.6



10.5 Corridor Separation

- ❑ Fully describe the separation assembly - IE the materials, thickness, is the assembly complete slab to slab, and the fire rating. Provide a U.L, F.M. or Federal Register of Archaic Building Materials design number for the wall assembly to justify the fire rating you are stating.
- ❑ Fully describe all corridor doors and door frames. Describe door and frame material. Describe door thickness. Describe if the door or door frame are labeled (what is the rating of the label?) Describe the fire rating of the door assembly. Describe if the door has a self-closing device and latches upon closure and describe the type of closer. Are there louvered openings, transfer air grilles or transom windows in any doors which compromise the fire rating?

10.6 Vertical Openings

Vertical Shafts Include:

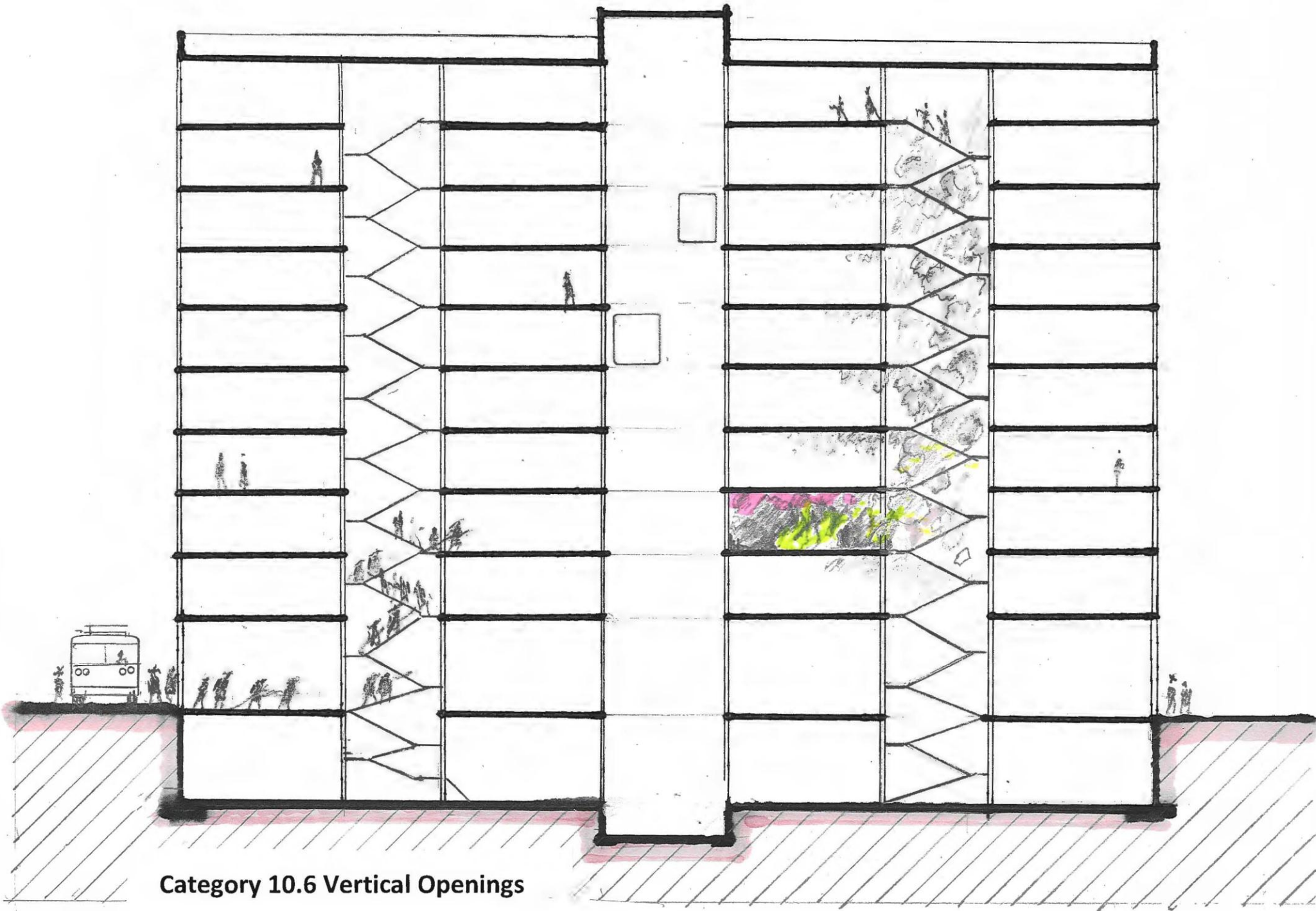
- **Stairwells**
- **Elevator Shafts**
- **Trash Chutes**
- **Mechanical Shafts**

- ❑ Fully describe the Stair Shaft and Elevator Shaft enclosure assemblies - IE the materials, thickness, is the assembly complete slab to slab, and the fire rating. Provide a U.L, F.M. or Federal Register of Archaic Building Materials design number for the wall assembly to justify the fire rating you are stating.
- ❑ Fully describe Stair Shaft entry doors and door frames. Describe door and frame material. Describe door thickness. Describe if the door or door frame are labeled (what is the rating of the label). Describe the fire rating of the door assembly. Describe if the door has a self-closing device and latches upon closure and describe the type of closer. Are there louvered openings or transfer air grilles in any doors which compromise the fire rating?

10.6 Vertical Openings (continued)

- ❑ Fully Describe the material, thickness and fire rating for the elevator doors
- ❑ Similar to Stair enclosures and doors, if applicable, fully describe the trash chute shaft materials and fire rating and fully describe the trash chute door and fire rating. Verify that the Trash chute doors fully close. If the trash chute is abandoned, verify that it has been permanently sealed up.
- ❑ Verify if there are un-sealed / non-fire-stopped holes or penetrations into the stair or elevator enclosures.
- ❑ If the stair is a scissor type stair, verify that the standpipe that penetrates between stairs has been fire-stopped .Verify if there are no non-rated access panels between the stairs or in the stair walls.

PLEASE NOTE: This category is intended to describe and document the completeness of the fire rated enclosures for stair, elevator and duct shafts that run vertically through the building.



Category 10.6 Vertical Openings

The Integrity of Vertical Shafts

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10.7 HVAC System

- Fully describe the heating and air conditioning system that serves the dwelling unit (Example- 4-pipe hot and chilled water system to individual fan coil units in each apartment.).
- Describe if there is a corridor make-up air system or kitchen and or bath exhaust riser systems.
- Describe the number of floors served by the heating/cooling units or the number of floors connected by ductwork for exhaust or make-up air systems.

PLEASE NOTE: Many reports fail to evaluate existing kitchen and bath exhaust or corridor make-up air risers which usually run up the full height of the building. Greater than 5 floors. If your building contains these risers, and they connect more than 5 floors, than the score for this category will be zero (0).

10.8 Smoke Detection

- Verify and describe the location of smoke detectors for the subject building: verify that they are located within dwelling units (15' - 0" max. from bedrooms) , are S. D's located in corridors, elevator lobbies, at the top of stairwells, in duct returns
- Describe if smoke detectors are hard wired or battery type.
- Verify and describe if the detectors are individual single station or part of a fire alarm smoke and heat detection system.

PLEASE NOTE: Smoke Detectors in this category may be either hardwired or battery type.

10.9 Voice Communication System.

If System is Installed Current Test Results Must be Included!

- Verify and describe if the building has installed a one way/two way voice communication system in conformance with Code Section 13-196-204.
- If the building has not installed a system, state what the buildings schedule is for coming into conformance with this requirement by January 1st of 2015.

PLEASE NOTE:

- Buildings which are 15 stories or less in height and contain 60 or less dwelling units do not need to provide a two way voice communication system. Per Code Section 13-196-204 (D).
- Existing one way notification systems conforming to the requirements of section 13-196-204 (C) (1) may be acceptable in lieu of a new one way voice system.

10.10 Smoke Control

If Smoke Proof Tower System is installed current test results must be included!

- As allowed by the rules for this category, please describe the building's smoke control system.
- If the building is provided with a smoke proof tower (s). Provide test results showing the smoke control system of the tower is in good operating order.

PLEASE NOTE

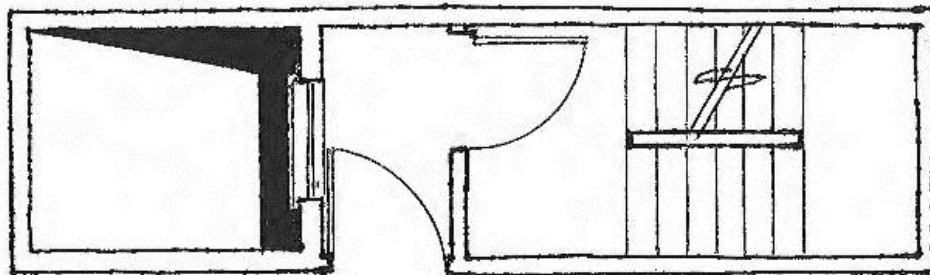
For most buildings the only smoke control system is operable windows used for natural ventilation in the individual dwelling units. To claim the points for windows on exterior in exit stairwells, these windows must be readily operable and not painted or screwed shut.

SMOKE EXHAUST SHAFT

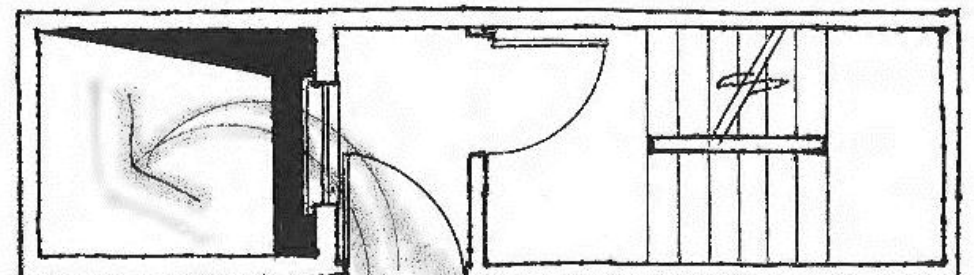
- Sized by Code
- Continuous shaft to roof

SMOKE VESTIBULE

- Louvers or operable window
With fusible link allow smoke to be sucked into exhaust shaft.
- 2 -90 Minute 'B' Label Doors
In series.



CORRIDOR



CORRIDOR

10.11 Means of Egress

- ❑ Verify and describe the number and kind of stair exits, exterior stairs and fire escapes provided for each floor or level.
- ❑ Clarify how exterior exit stairs or fire escapes and their exit paths come to the ground / grade level.
- ❑ State the width of the stairs or fire escapes,
- ❑ Verify and state if the door hardware for the exit stair complies with Section 13-196-084. (Failure to address stairwell door unlocking and re-entry will be viewed as a major failure for the submitted LSE).
- ❑ Provide a basic egress width calculation for floor level with the highest occupant load as well as a typical residential floor level.
- ❑ Calculate the floor plate area minus elevator and stair shafts and duct shafts.
- ❑ Divide the floor plate area by 125 Square feet per occupant to determine the floor total occupant load.
- ❑ Using the egress width criteria of Sections 13-60-200-220.determine if there is sufficient exit widths for the floor occupant load. List the calculation and its results.

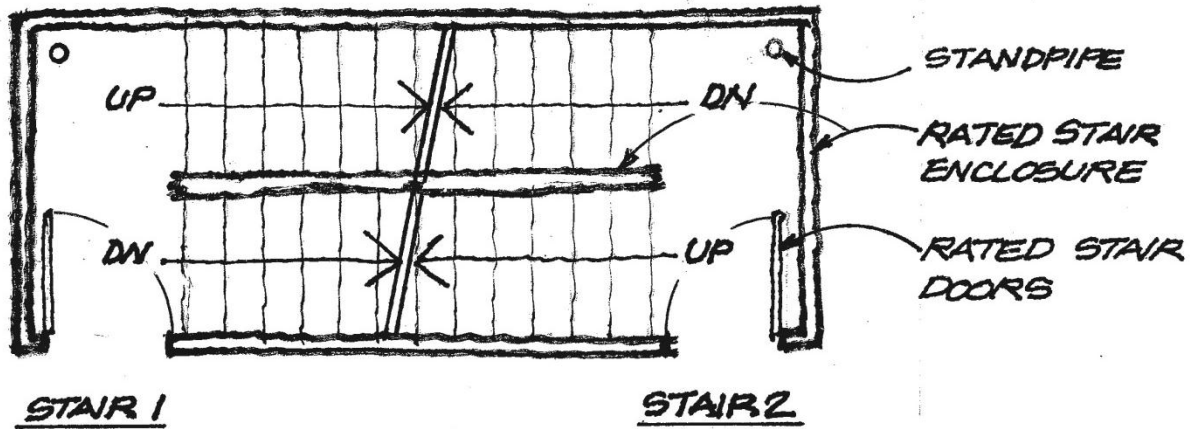
10.11 Means of Egress (continued)

PLEASE NOTE: This category is used to evaluate the adequacy, quantity and egress capacity of the building's interior stairs and exterior exit stairs or fire escapes for all floor levels and to verify that stair door hardware complies with the requirement of Section 13-196-084 for Stairwell Door Re-entry.

This category does not evaluate the completeness and fire ratings of the stair enclosure which must be done in Category 10.6 (Vertical Openings)

However, PLEASE NOTE: if a building fails category 10.6 because exit stairs are open with no protective enclosure than category 10.11 will consider two unprotected stairs or an unprotected stair and a protected stair as only one stair because of their openness.

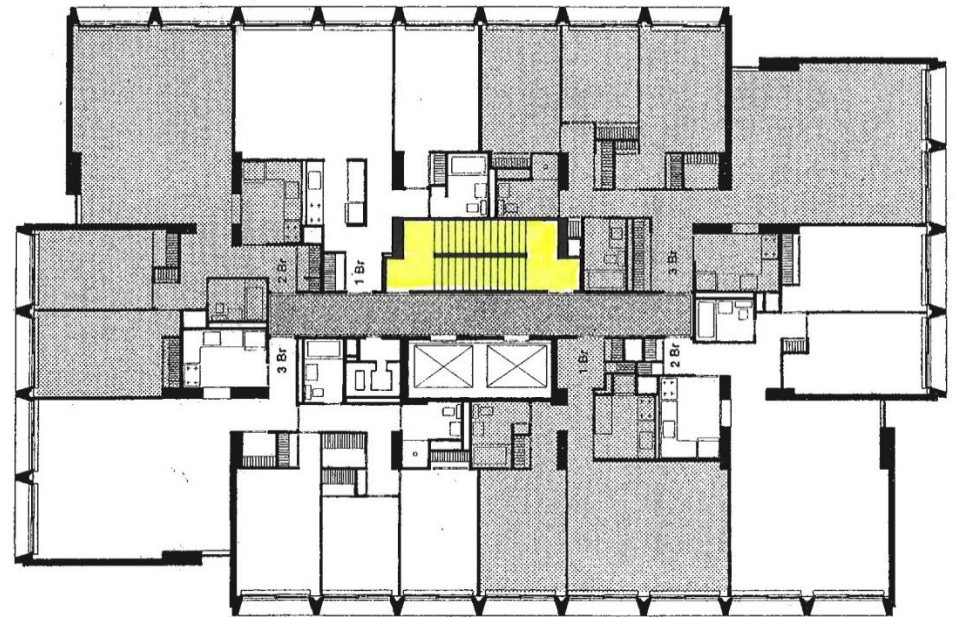
PLEASE NOTE: In order to claim the highest number of points for this category you must be able to demonstrate that the number of exits provided exceed the requirements of the CBC the occupant load.



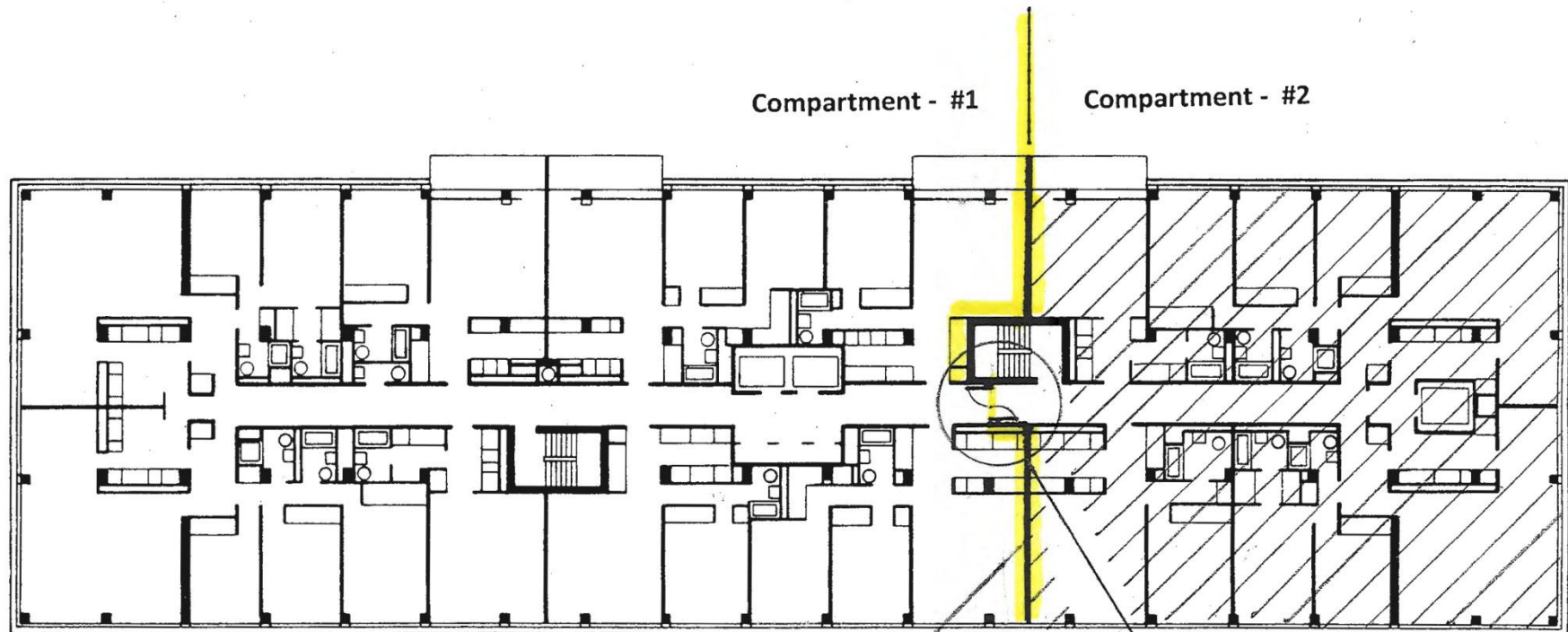
SCISSOR STAIRS

Scissor Stairs were used by architects and design professionals primarily from the 1950's thru to the 1980's to satisfy code requirements for 2 independent exit stairs in a minimum floor area or short corridor area. Two completely independent and separated stairs wind around each other like a double helix. This eliminates intermediate stair landings and increases the length of the two single run stairs.

Because the stairs are intertwined, a breach, hole or un-fire-stopped penetration through the floor or ceiling or interior separation wall of one stair will connect and compromise the integrity of both stairs. For this reason, the City of Chicago requires that the annular space around a standpipe penetrating the landing of one stair and the ceiling of the other stair be properly fire-stopped.



HORIZONTAL EXIT



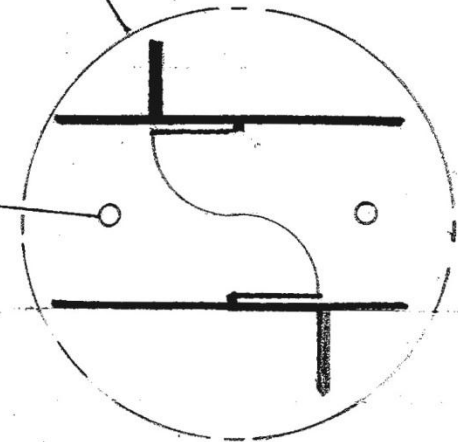
(1) 2 Hour rated continuous slab to slab walls.

(2) 90 Minute rated 'B' label cross corridor doors

(3) Smoke detectors each side of the doors

(detectors will trigger doors to close)

(4) Access to an Exit Stair provided for each compartment



10.12 Dead End Corridors

- ❑ Verify the dead end corridor lengths for the building on all floors (including basement floors, first floor and residential floors). Accurately state the length of the longest dead end corridor condition in the building as the Maximum Dead End Corridor. Select the appropriate score.

Please make sure to state the location and floor where the maximum dead end corridor is located.

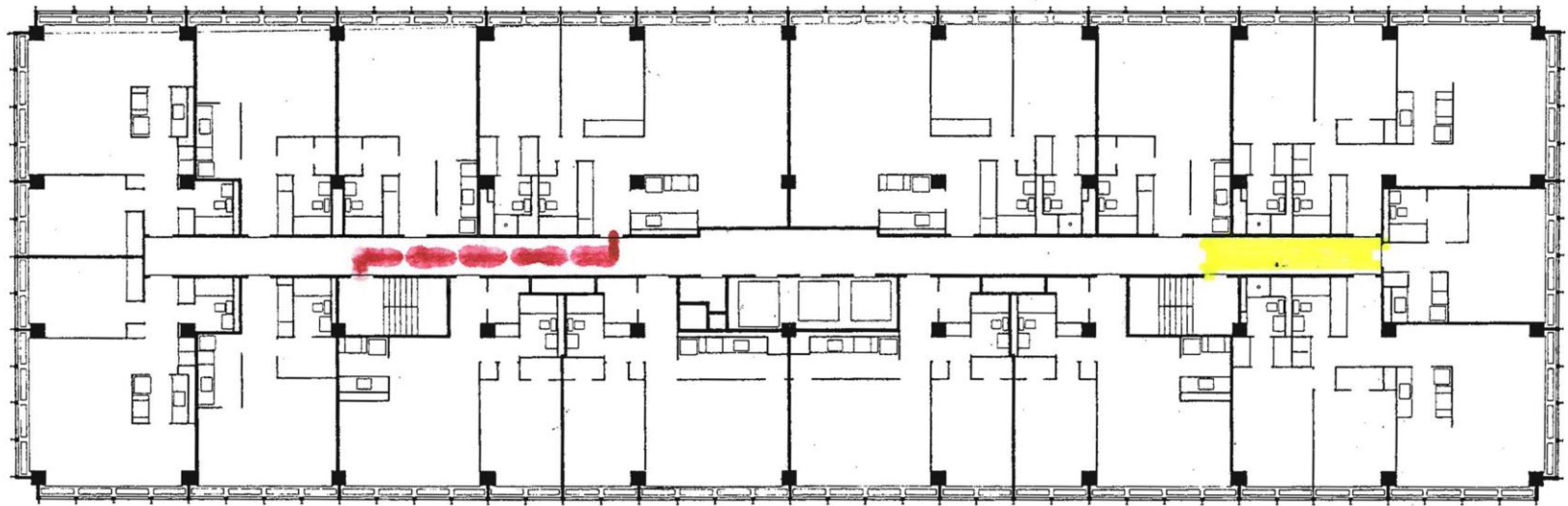
On the submitted floor plans show the location and dimension the length of the Dead end Corridor.

10.13 Travel Distance

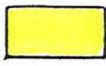
- ❑ Verify the travel distance lengths on all floors including the basement, parking garage etc. Accurately state the length of the longest travel distance dimension in the building and select the appropriate score.

Please make sure to state the location and floor where the maximum travel distance is located.

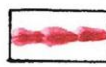
On the submitted floor plans locate and dimension the Maximum Travel Distance



1. Dead End Corridor



2. Exit Travel Distance



10.14 Elevator Controls

- Verify if all elevators or elevator banks are equipped with manual (Key Operated) phase I and II elevator recall. Verify the location of the Fire Department wall mounted key box. State the description of the recall system for all elevators or elevator banks on the LSE report.
- For Automatic Elevator Re-Call , verify the location of system smoke detectors in the elevator lobby.

For a building to claim the +3 additional points for Elevator re-call. PLEASE NOTE: All elevators must be equipped with automatic re-call.

10.15 Emergency Lighting

- ❑ Verify the type, Example - (battery pack lights or EM generator connected to dedicated EM lights) the location and adequacy of the buildings emergency lighting system. Describe the type and locations of EM lighting on the report. If applicable describe the type of EM generator.
- ❑ If EM lighting is missing from corridors, inside enclosed stairs or public spaces or the lighting units fail to function when tested the lower (minus10) point category shall be chosen. The EM lighting system and units must be in good operating order to receive the +2 point score.

10.16 Mixed Use

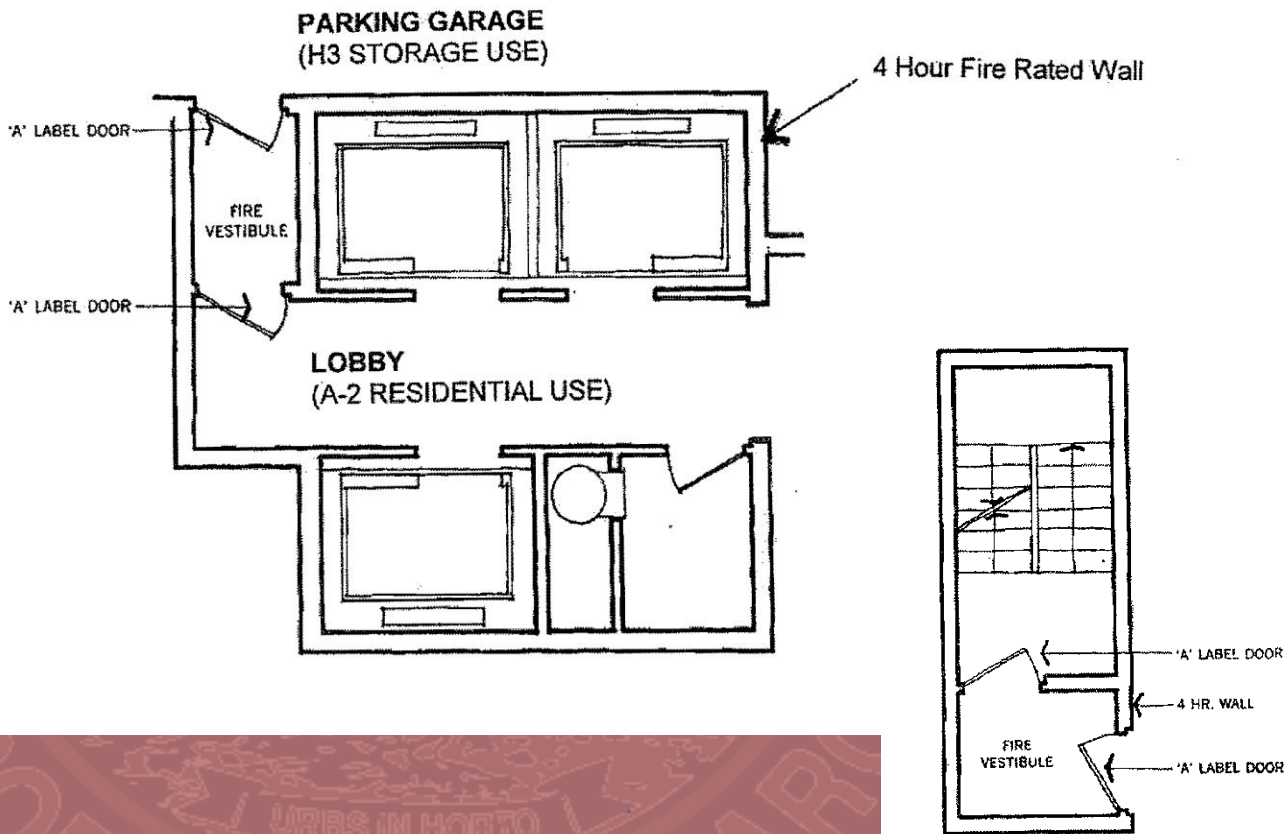
- ❑ Verify if the building has mixed use components or spaces. These may include type E Office spaces or Type F Retail Stores spaces or restaurant type C spaces rented out for profit to parties not under the control and management of the building. Mixed Use may often times also include an enclosed H3 parking garage.
- ❑ Using Table 13-56-280 verify if the mixed use space has the proper fire rated separations from the residential portion of the building by evaluating the separation floor, wall, door and window assemblies.
- ❑ Evaluate if there are non-fire stopped penetrations or other non-rated openings between the different use groups.

PLEASE NOTE: The CBC requires a four hour fire separation between an H3/parking garage and the residential A2 portions of the building. Door openings connecting these two uses are required to be 2 – A Label Doors (3 Hours each) arranged in sequence as a fire vestibule.

Mixed Use Separations

The Chicago Building Code for more than 50 years has required that the Parking Garage portions of building (Use group - H3) be separated from the Residential portions of the building (Use Group -A2) by a mixed-use separation with a four (4) hour fire rating. To meet this fire rating in non-sprinklered building, egress doors between the garage and the residential portions of the building were arranged to create a "Fire Vestibule" with 2 - "A" Label (Three Hour Fire Rated) Doors arrange in series to create a vestibule capable of providing a four hour fire rating.

Other required mixed use separations in a high-rise residential building may include separations between retail stores and the lobby, separations between rental office space and residential units in the building or separations between restaurants and the building lobby.



Mixed Use Stair Doors

In the parking garage, egress stairs from the building's H3 Parking Garage which also connect to and serve A-2 Residential portions of the building (such as the high rise residential tower) should be protected by mixed-use occupancy separations including a fire vestibule

10.17 Sprinklers

- Current Fire Pump Test Results Must be Included!
- Does the building contain a full or partial sprinkler system.
Describe the components of the system such as the location of the system and what areas it serves. Describe the location and capacity in gallons per minute GPM of the fire pump(s) serving the sprinkler system.
- Describe the building standpipe system; describe the location and type of standpipes (wet standpipe, dry standpipe). For wet standpipe systems describe the location and capacity in gallons per minute GPM of the fire pump(s) serving the standpipe system.
- If the building has a functioning trash chute, describe if the trash chute and the trash collection room are sprinklered.
- If the building has an enclosed or attached parking garage/H3 describe if the garage is fully sprinklered.

10.17 Sprinklers (continued)

Per Code Section 13-196-190 - Standpipes must be provided in high rise buildings as a Retro-Active Code Requirement. High Rise buildings that do not have standpipe systems must provide them and should contact the Chicago Fire Prevention Bureau for more information on the type of standpipe to be installed and to provide the Bureau with a timetable for installing the required standpipes and related equipment.

10.18 Auxiliary Spaces

- ❑ Evaluate the quantity and location of Auxiliary rooms and or spaces within the building.
- ❑ List each auxiliary space and calculate and list its square footage.
- ❑ Add up the combined square footage of the auxiliary spaces. If the combined square footage is less than or equal to 5% of the total building gross square footage than these spaces qualify as Auxiliary Spaces and do not need to be separated from the residential portions of the building with Mixed Occupancy separations. (Table 13-562-80)

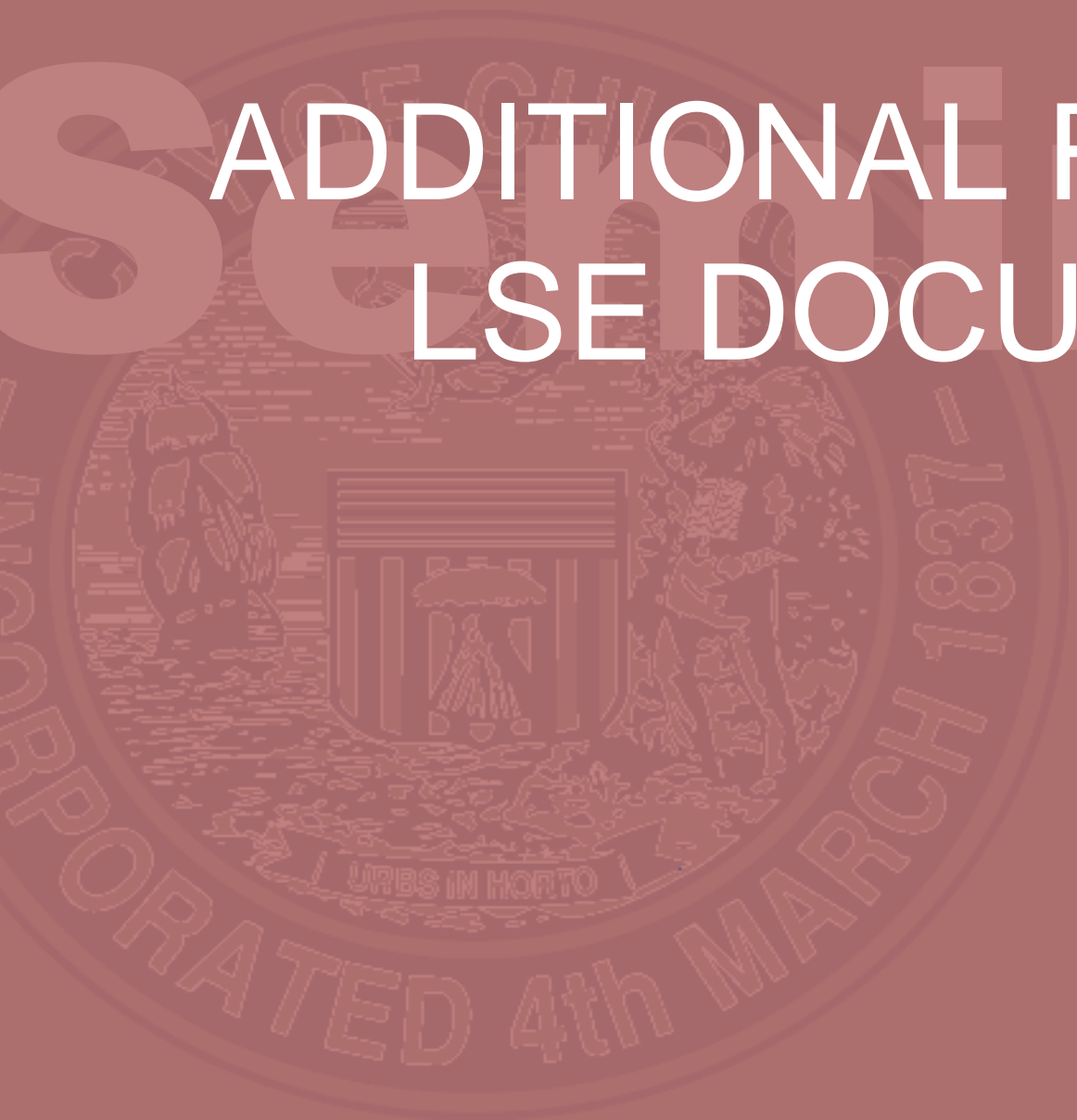
10.18 Auxiliary Spaces

PLEASE NOTE: Auxiliary spaces are rooms and spaces normally provided and incidental to the principal use of the building and under the direct control and supervision of the building. In a residential high rise building such spaces may include: building management offices, exercise rooms and associated lockers and showers (if provided), building party rooms or common meeting room, laundry rooms and tenant storage rooms.

PLEASE NOTE: Certain Auxiliary spaces such as storage rooms or boiler rooms must still be enclosed with code required fire rated assemblies even if they don't require the more restrictive mixed use separation assemblies.

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ADDITIONAL REQUIRED LSE DOCUMENTS



Building Floor Plans

The Submitted Floor plans shall minimally include:

- Basement Floor Plan (where applicable)
- Ground Floor Plan
- Typical Residential Floor Plan
- Residential Penthouse Plans (if Applicable)

The use of color or shading to graphically demarcate stairs, elevators, separate dwelling units or other building elements is helpful.

Building Floor Plans (continued)

The plans need to be legible and show:

- ❑ All exterior stairs and fire escapes and how the exit paths they serve terminate or get to the ground level
- ❑ Maximum dead end corridor and travel distance dimensioned on the floor plans.
- ❑ If the building has a basement, ground floor or attached parking garage, the garage must be shown on the plans along with any entry drive ways etc. and the egress doors into the garage from the residential portions of the building must also be shown on the plans.
- ❑ Mixed use spaces such as offices, stores or assembly spaces should be demarcated or called out on the plans.

Building Photographs

- ❑ Minimally there must be photographs showing the building in full profile or elevation.
- ❑ Elevations showing fire escapes (when possible) are required.
- ❑ Photographs must show how fire escapes or exterior stairs terminate at the ground level.

Photographs of the following elements are very helpful:

- A typical corridor door and frame
- A typical residential floor corridor shot
- A typical exit stair door , frame and closer
- A shot of the elevator doors showing the Fire Department keybox for manual re-call and phase II operation.
- Typical Exit signage and emergency lighting.
- Existing standpipes
- Existing fire pump (if applicable)
- Photographs of any open / non enclosed stair conditions.
- Typical smoke detectors in dwelling units, corridors, lobbies.

Building Photographs (continued)

- Fire Alarm system photos including corridor smoke detectors, one way voice communication speakers, fire alarm panels in the lobby etc.
- Any special problem or non-conforming areas, assemblies etc.

Seminar



Test Reports

The following most current test reports of building safety systems are required to be submitted with the LSE Report:

- Fire Pump Test Result.
- Fire Alarm System Test Results.
(If the building has a fire alarm system)
- Testing of Smoke-proof Tower Ventilation System.
(If Applicable).

Scoring Matrixes

Your LSE Report must include the required scoring sheets and matrixes for:

- The initial assessment of the building's life safety status
- A revised scoring matrix for any proposed life safety upgrades required to achieve a passing score

On the 2nd matrix showing the revised scores for additional life safety upgrades it is suggested that those categories that have been changed with life safety upgrades be graphically bolded, circled or graphically distinguished to call them out.

EXISTING LIFE SAFETY EVALUATION SAFETY PARAMETER SCORE

April 10, 2012

Building address:
 Building owner:
 Building owner address:
 Building owner phone number:
 Building owner e-mail address:
 Building manager (if different from owner):
 Building manager address:
 Contact phone number:
 Professional of Record:
 Professional of Record address:
 Professional of Record phone:

Safety Parameters	Fire Safety	Means of Egress (ME)	General Safety (GS)
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1.07 HVAC Systems	0	0	0
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TOTAL			
Building Score	45	45	45
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Minimum Passing Score - Commercial	25 (FS_C)	22 (ME_C)	22 (GS_C)
Pass/Fail	Pass	Pass	Pass

- Resubmitted LSE reports should be mailed to the following building inspector.

Mr. Jose Aparicio

Department of Buildings

120 N. Racine

Chicago, IL 60607

- Resubmitted LSE reports are due by August 13, 2012.
- Questions can be emailed to DOBLSE@cityofchicago.org.
- Failure to resubmit a report will result in enforcement action in Circuit Court.

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Questions

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Answers

