

February 2014

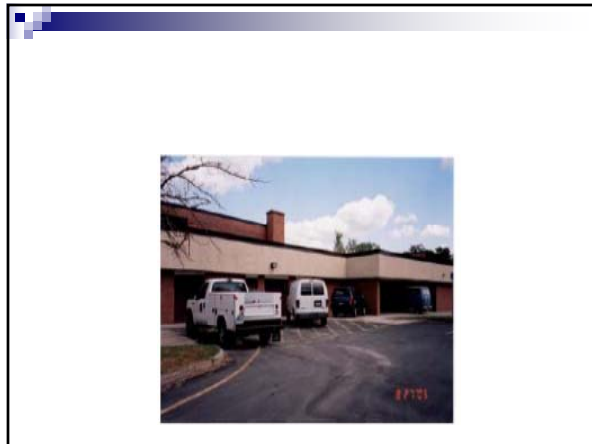
Code Requirements and Inspections in Educational Occupancies

Presented By:

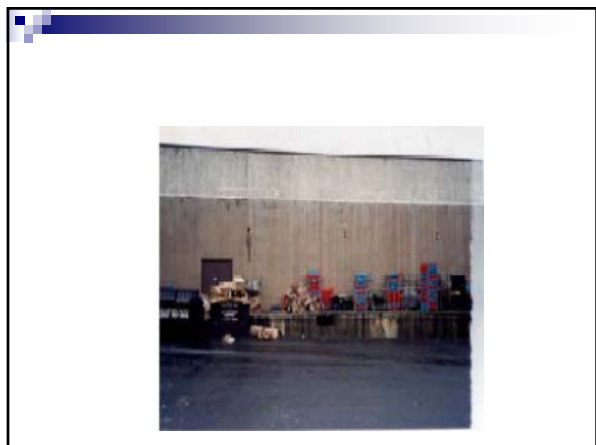
Barry W. Rickert
Fire Marshal
Town of Southbury

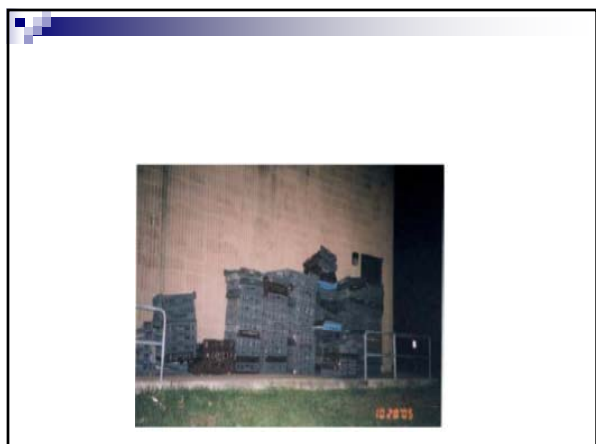
Douglas M. Schanne
Training Program Supervisor
Office of Education & Data Management











Educational

- Application
 - Part III applies to new buildings, or portions thereof, constructed, renovated, altered or undergoing a change of occupancy as educational

Educational-Existing

- Application
 - Part IV Chapter 15 applies to existing buildings and portions of buildings currently occupied as educational

OCCUPANT LOADS [no change]

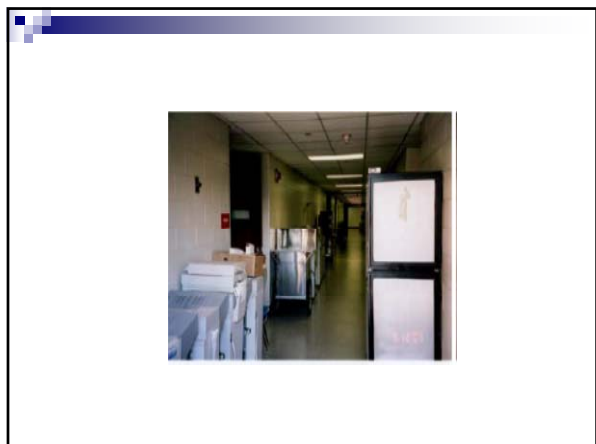
- Classrooms; 1 person/20 net sq. ft
- Shops, laboratories and similar vocational rooms; 1 person/50 net sq. ft.
- Assembly spaces per Chapter 13; Existing Assembly Occupancies
[1/7 sq. ft., 1/15 sq. ft., # of fixed seats etc.]

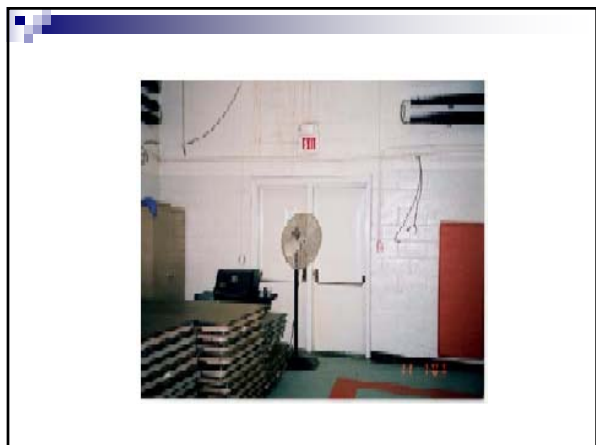


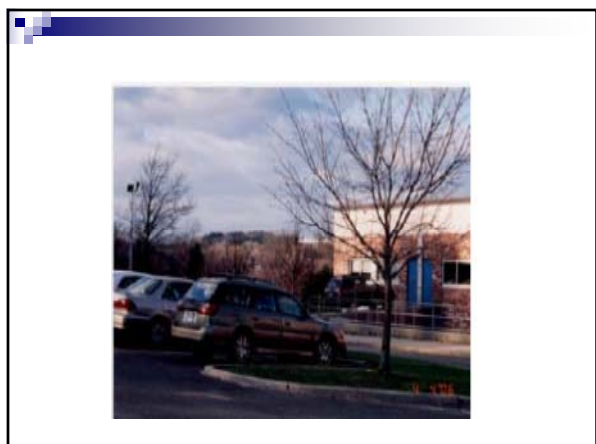


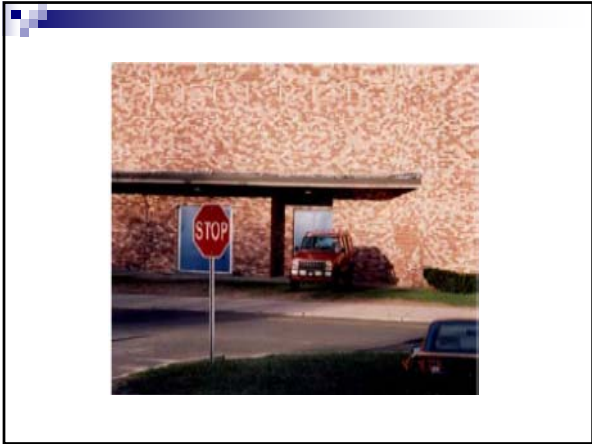
Means of Egress

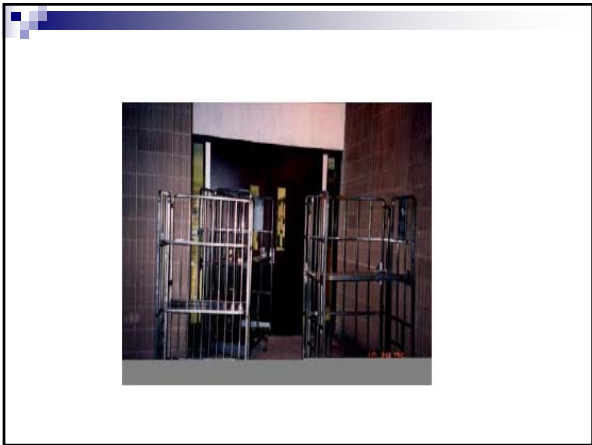
- Preschool, kindergarten or 1st grade students must be located on a level of exit discharge unless by 15.2.1.4.
- 2nd grade students must **not** be located more than 1 story above a level of exit discharge unless by 15.2.1.4.
- Preschool, kindergarten, 1st grade or 2nd grade students where provided with independent means of egress can be located on floor levels other than specified above

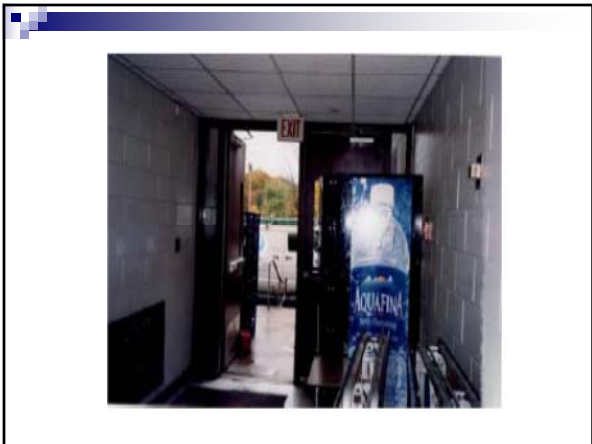


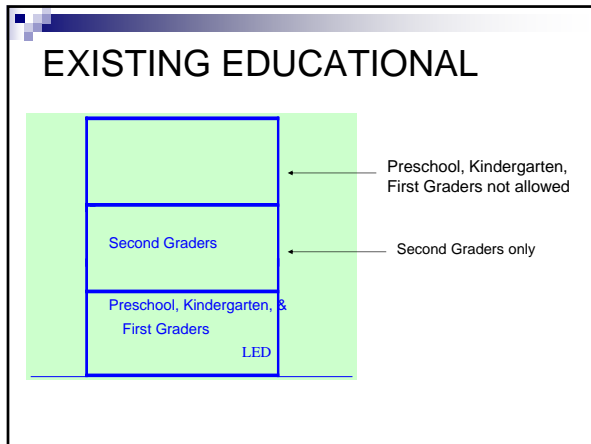


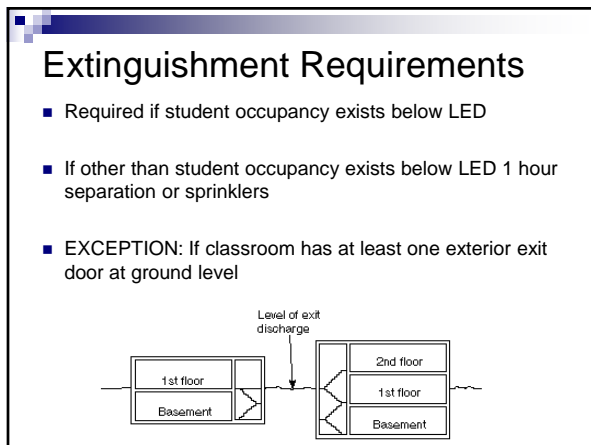


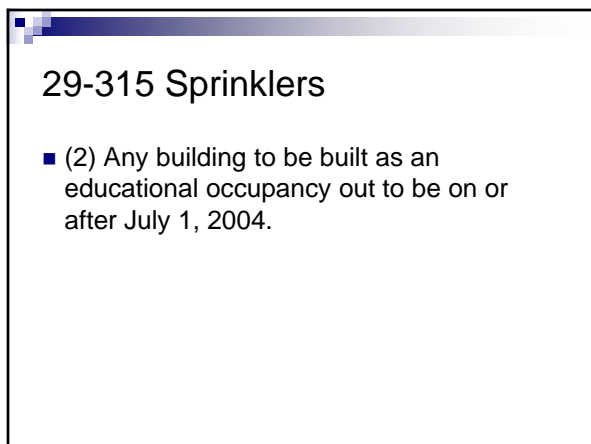












Windows for Rescue

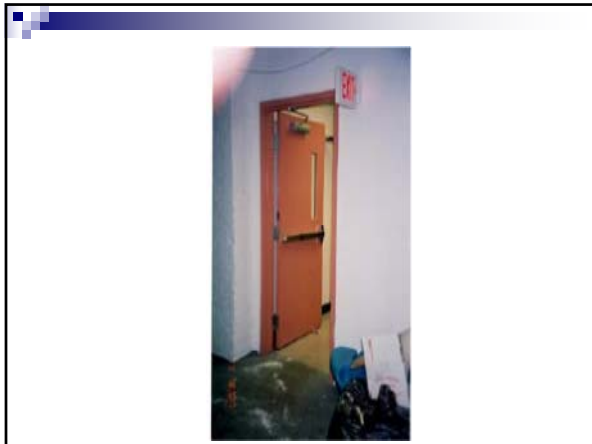
- Every room or space greater than 250 sq. feet used as classroom or other educational purpose, or subject to student occupancy must have not less than one window for emergency rescue unless otherwise permitted by 15.2.11.1.2

Emergency Lighting

- Per Section 7.9 or unless otherwise permitted by what other Sections ?

Emergency Lighting

15.2.9.3
Is not required if the educational occupancy is permitted to have a single means of egress per 15.2.4.1.

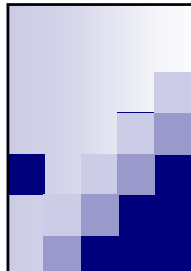




EXISTING EDUCATIONAL
PART V

20.2.3.1 Emergency Egress and Relocation Drills


- 20.2.3.1.1* Emergency egress and relocation drills shall be conducted in accordance with the applicable provisions of Section 10.6 and 20.2.3.1.2 through 20.2.3.1.3. [101:14.7.2.1; 101:15.7.2.1]
- 10-231 Each Board of Ed shall provide for a fire drill to be held in the schools at least once each month, except that once every three months a crisis response drill may be substituted for a fire drill.



Educational


Definition – New

Using part III of the CFSC Guidebook find the definition of a new day care occupancy.



Educational

- Definition - New
 - Educational Group E
 - Using part III of the CFSC Guidebook find the definition of a new educational occupancy, give 3 examples of an educational occupancy and the code flow



Educational

- Application
 - What section of the CSFSC will apply to the following educational occupancies:
 - In a building built in 2009
 - In a building built in 2000 with an addition built in 2008
 - In a building built in 1980 getting a new fire alarm

Educational

- Fire Problem – NFPA (1999-2002)
 - 7070 structure fires in educational properties
 - 113 avg. civilian injuries per year
 - \$112 million avg. in direct property damage per year

Educational

Fire Resistance Rated Construction

- What parts of the building will we be looking at to have fire rated construction?
 - Where would you find it?

Fire Resistant Rated Construction continued...

- What happens if we have to cut into a wall for a door, vent or damper?
 - What are these openings called and where are they found?

Fire Resistant Rated Construction continued...

Section 715 Opening
Protectives (CSBC)

- What type of components does **715** include and or address?

Interior finish, decorative materials & furnishing

- Give the definition and examples of interior finishes and contents for both new and existing educational.
- What do you reference when a new interior finish is installed/applied in an existing educational?
- During a final inspection of a new high school you find drapes covering an exit door. What sections do you reference for any violations?

Fire Protection Systems

- When would a sprinkler be required?
- When would a stand-pipe be required?
- When would a fire alarm be required?

Educational

- Means of Egress
 - Occupant load- **HOW MANY?**

Means of Egress continued...

- Number of exits
 - How many are required?
 - What about travel distance?

Means of Egress continued...

- Is a single exit allowed in a NEW educational occupancy?
- If so what are the requirements?

Means of Egress continued...

- What is the requirement for corridor width in Group E occupancies?

Means of Egress continued...

Means of Egress Illumination Requirements?

Educational

Group E - Special Requirements

- Section 401.16 of IFC refers to Section 419 of CSBC
 - What are the specific CSBC requirements for Group E?

Educational-Existing

■ Definition

- How do we define an existing educational occupancy?
- Cite examples by using the Guidebook

Existing Educational

■ Classification of Occupancy - Per Section 6.1.3

- What are the requirements for an occupancy to be considered as being an educational occupancy ?
- How do the requirements of Chapter 15 apply to preschool age children ?
- How is incidental instruction addressed ?

EXISTING EDUCATIONAL

■ Occupant Characteristics – NFPA

- Regulations are based on the abilities of children in the 3rd through 8th grade with special provisions for younger children
- People in this occupancy vary in ability to deal with an emergency based on
 - Age
 - Mental/physical conditions
 - Facility's physical characteristics

Educational-Existing

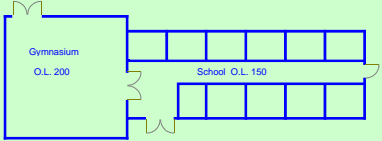
- Application
 - Certain educational facilities do not meet the definition of an educational occupancy and are not required to comply with Chapter 15:
 - Instructional building – business occupancy
 - Classrooms under 50 persons – business occupancy
 - Classrooms, 50 persons and over – assembly occupancy
 - Laboratories, instructional – business occupancy
 - Laboratories, noninstructional - industrial

Existing Educational

- MULTIPLE OCCUPANCY
 - Building or structure in which two or more occupancy classifications occur.
- MIXED OCCUPANCY
 - A multiple occupancy where the occupancies are intermingled.
 - i.e. share egress and other building features
 - More stringent requirement applies

Existing Educational

- COMMON MIXED OCCUPANCIES
 - Assembly; cafeteria, auditorium, gymnasium, multi-purpose room.
 - Industrial; auto shops, carpentry shops.
 - Dormitory or Lodging/Rooming; prep schools, boarding schools.



Existing Educational

- Classification of Hazard of Contents

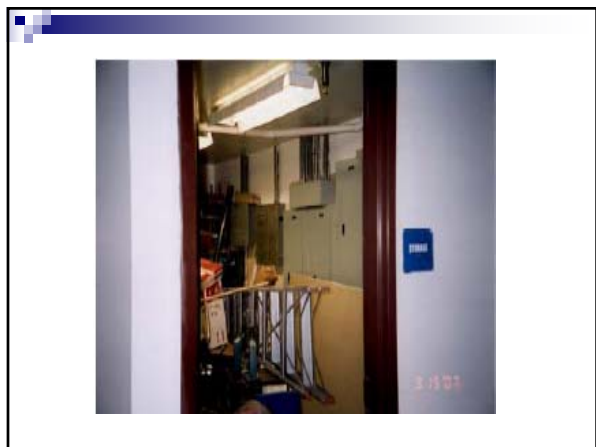
- The contents of educational properties are classified per Section 6.2

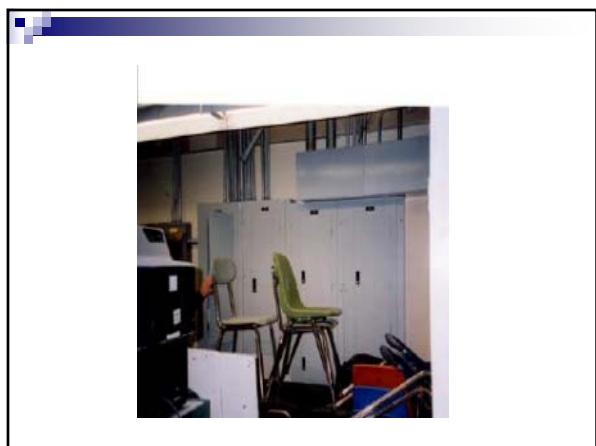


DANBURY HIGH SCHOOL











Our Lady of the Angels School

The Building

- Two-story building, built in 1910
- Remodeled and added to numerous times
- Legally in compliance
- One fire escape located near the North Wing
- No sprinklers
- No automatic fire alarm
- No smoke/heat detectors

- No fire-resistant stairwells
- No fire-rated doors from stairwells to second floor
- Fire extinguishers mounted 7ft. off the floor
- Had to pass through main corridor to reach fire escape

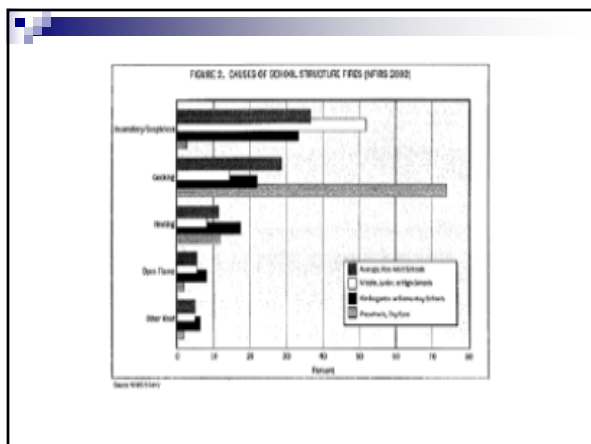
The Fire

- December 1, 1958
- 92 children dead
- 3 nuns dead
- Approximate start time 2:15pm
- Approximate time of discovery, by those in 2nd floor classroom 2:30pm
- First call to fire department 2:41:30pm
- Approximate time of units on-scene 2:44pm
- Approximate time of roof collapse 2:55pm

\$12 Million Dollar Fire at Dogwood Elementary School

Reston, Virginia
November 2000

- Fire occurred at night
- Discovered by police patrol
- No automatic alarm
- No sprinkler system
- Total loss
- Two years to rebuild



**Leading Areas of Origin of School Fires
(NFIRS 2002)**

Structure Fires		All School Fires	
Bathroom	23%	Bathroom	12%
Kitchen	9%	Outside Area, other	12%
Assembly Area (>100 persons)	6%	Open Area, field	8%

**King Street Intermediate School
Danbury High School**
May 2008
Within 15 minutes

- 2 simultaneous bomb threats
- 1 dumpster fire
- 1 bank robbery
- Severe weather

**Educational Properties (NFPA
1999-2002)**

- 7070 structure fires
- 133 average civilian injuries annually
- \$112 million average in direct property damage annually

Fire Resistance Rated Construction

- What parts of the building are required to have fire rated construction?
 - Where would you find it?

Fire Resistance Rated Construction continued...

- What happens if we have to cut into a wall for a door, vent or damper?
 - What are these openings called and where are they found?

Protection of Vertical Openings

- Any vertical opening other than unprotected vertical openings per 8.6.8.2 must be enclosed or protected in accordance with Section 8.6.
- When are stairway enclosures not required ?

Protection from Hazards

- One hour or auto. extinguishing per 8.7
 - Boiler & furnace rooms where any piece of equipment exceeds 400,000 Btu.
 - Rooms/spaces storing combustible supplies in quantities deemed hazardous by the AHJ.
 - Rooms/spaces storing hazardous materials or flammable or combustible liquids in quantities deemed hazardous by AHJ.
 - Janitor closets
 - Laundries over 100 sq. ft.

Protection from Hazards continued...

- One hour and auto. extinguishing per 8.
 - Maintenance shops, including woodworking, and painting
 - Rooms/spaces for processing or use of combustible supplies deemed hazardous by the AHJ.
 - Rooms/spaces for processing or use of hazardous materials or flammable/combustible liquids in quantities deemed hazardous by the AHJ.

Protection from Hazards continued...

- When sprinklers are used to meet the requirements of 15.3.2.1(1) or 15.3.2.1(2) the protection must be allowed per 9.7.1.2.
- Where janitor closets are protected by sprinklers per 15.3.2.1(1) the doors can have ventilating louvers.
- Openings between food preparation areas and dining areas not required to be protected.

EXISTING EDUCATIONAL

INTERIOR CORRIDORS:

15.3.6(4) Lavatories shall not be required to be separated from corridors, provided they are separated from all other spaces by walls having not less than a (½ hour) fire resistance rating PER 8-3.

INTERIOR CORRIDORS continued...

- 15.3.6.1 Self closing devices may be omitted on doors between corridors and classrooms.
 - except rooms or areas used as shops or laboratories.
 - where the facility has a written and practiced fire exit drill policy which provides:
 - for doors to classrooms not in use to be kept closed
 - for the closing of all corridor doors upon evacuation

EXISTING EDUCATIONAL

- Subdivision of Building Spaces
 - Educational occupancies can be subdivided into compartments by smoke partitions under what conditions and with what fire resistance rating ?

Existing Educational

- Interior finish, decorative materials & furnishing
 - During an inspection of a existing educational occupancy you find drapes covering an exit door. What sections do you reference for any violations?

EXISTING EDUCATIONAL

Interior Finish

- Per Section 10.2
- Interior Wall and Ceiling Finish
 - Exits – Class A
 - Corridors/lobbies – Class A or B
 - Low- height partitions not exceeding 5 feet and used in other than exits – Class A, B or C
- Interior Floor Finish – no requirements

Existing Educational

Fire Protection Systems

- When would a sprinkler be required?
- When would a stand-pipe be required?
- When would a fire alarm be required?

Detection, Alarm and Communications Systems

- Fire alarm system
 - Per Section 9.6
- Required unless the following prevails:
 - Building is less than 1000 sq. ft.
 - Building contains a single classroom
 - Buildings at least 50 ft. from another building

Automatic Notification

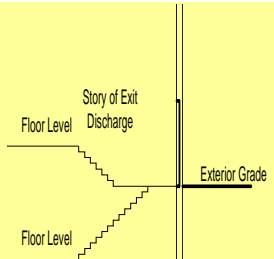
In buildings provided with automatic sprinkler protection the operation of the sprinkler system shall automatically activate the fire alarm system in addition to the initiation means per 15.3.4.2.1

Alternate Protection System

- CFSCGB Part IV, 15.3.4.2.3.1
 - interior corridors include smoke detectors with *alarm verification* per NFPA 72
 - auditoriums, cafes, gyms, etc., are protected by heat or other approved detection devices
 - shops/labs with dusts or vapors are protected by heat or other approved detection devices
 - provision is made at a central point to manually activate the evacuation signal or to evacuate only affected areas

EXISTING EDUCATIONAL

- LEVEL OF EXIT DISCHARGE [LED];
 - (1) the lowest story from which not less than 50% of the req'd # of exits & not less than 50% of req'd egress capacity discharge outside at grade;
 - (2) story with smallest elevation change needed to reach grade where no story can achieve the 50% requirements of above



The diagram illustrates a building's floor levels and exterior grade. A vertical line represents the exterior grade. To the left, two floor levels are shown. A staircase descends from the upper floor level to the exterior grade, labeled 'Story of Exit Discharge'. The lower floor level is also shown.

Arrangements of Means of Egress

- Common Path of Travel
 - What are the limitations to common paths of travel ?

Arrangements of Means of Egress

Exit Access door needs to lead directly to an exit access corridor or exit unless permitted by:

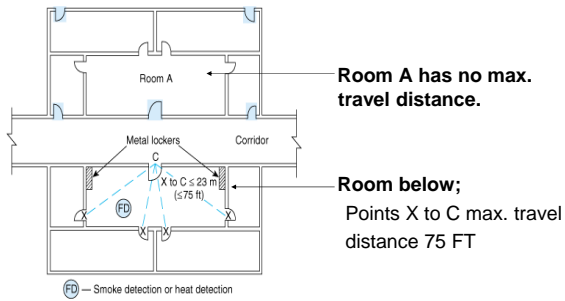
- Exit door opens directly to the outside or exterior balcony or corridor per 15.2.5.8
- One intervening room allowed between occupied student room and exit access corridor provided:

Means of Egress continued...

Intervening Rooms permitted between classrooms and corridor if:

- Max. travel distance through 75 ft. and
- Personal effects, such as coats, within are in metal lockers or space has sprinklers and
- Smoke or heat detection within tied to building fire alarm or sprinklers throughout the building.

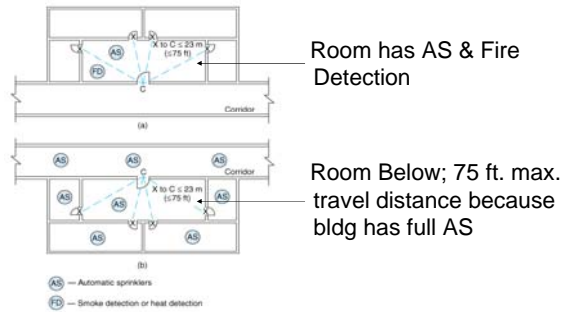
Means of Egress continued... **Intervening Rooms**



Room A has no max. travel distance.

Room below; Points X to C max. travel distance 75 FT

Means of Egress continued... **Intervening Rooms**



Room has AS & Fire Detection

Room Below; 75 ft. max. travel distance because bldg has full AS

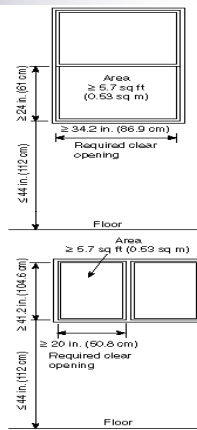
Rescue window continued...

- Operable from inside without the use of tools and have a clear opening of not less than **20"** wide and **24"** high and **5.7 sq. ft.** in area.
 - Bottom of opening not more **44"** above floor and any latch operational from not more than **54"** above floor.
 - Clear opening a solid rectangle with width and height not less than **5.7 sq. ft.** opening and depth not less than **20"** to pass fully through opening.

Rescue window continued...

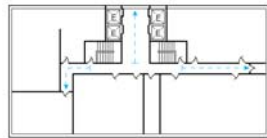
15.2.11.1.2 (3) permits the use of a fixed stair where the window is more than 44" and less than 60" A.F.F

- **Min. width 24"**
- **Max. riser 8"**
- **Landing min. 24"** deep
- **Handrail at least one side**
- **Window max. 44"** above landing

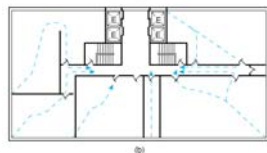


EXISTING EDUCATIONAL

- Length does not exceed 2.5 x the narrowest width of the dead end corridor.



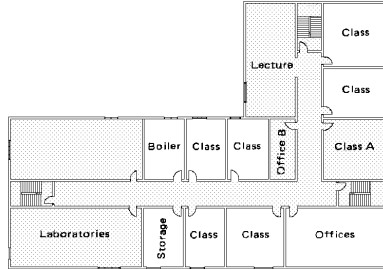
- Min. width of 26 ft x 2.5 = 65 feet



Emergency Lighting

15.2.9.2

Previously approved may remain in use.



Existing Educational

Number of Exits

- Single exits are permitted in certain circumstances
 - What are they?

EXISTING EDUCATIONAL

Special Provisions

- Limited access buildings
- High-Rise buildings
- Flexible plan and Open plan buildings

CT Fire Prevention Code

Chapter 20 – Educational

- Emergency Egress & Relocation Drills
 - Not less than one emergency egress and relocation drill shall be conducted every month the facility is in session unless both of the following criteria are met:
 - In climates where the weather is severe, the monthly emergency egress and relocation drills shall be permitted to be deferred
 - The required number of emergency egress and relocation drills shall be conducted, and not less than four shall be conducted before the drills are deferred

Chapter 20 – Educational

- Drills cont.
 - All occupants of the building shall participate in the drill
 - One additional emergency egress and relocation drill, other than for educational occupancies that are open on a year round basis, shall be required within the first 30 days of operation

Chapter 20 – Educational

- Drills cont.
 - A written report shall be kept by the school administrator describing:
 - The date
 - Time of the drill
 - Time of recall

Chapter 20 – Educational

- Drills cont.
 - Emergency evacuation drills shall be conducted at:
 - Different hours of the day or evening during the change of classes,
 - When the school is at assembly, during the recess or gymnastic periods,
 - Or during other times to avoid distinction between drills and actual fires

Chapter 20 – Educational

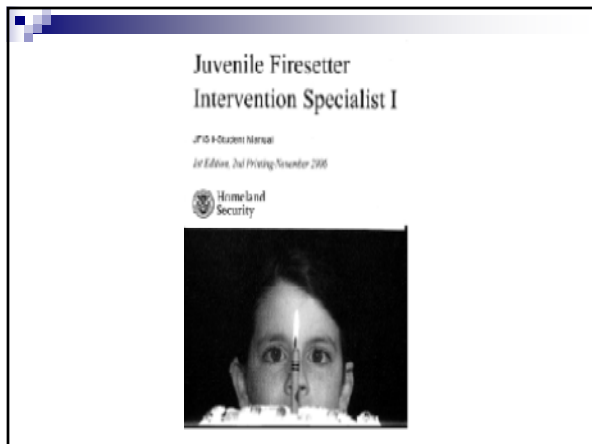
- Drills cont.
 - Outdoor assembly areas for each class shall be designated and located a safe distance from the building to avoid interfering with FD operations

Chapter 20 – Educational

■ Inspections

- It shall be the duty of principals and teachers to inspect all exit facilities daily to ensure that all stairways, doors, and other exits are in proper condition
 - Open plan buildings shall require extra surveillance to ensure that exit paths are maintained clear of obstruction and are obvious





- Schools
 - Crisis Procedures
 - Fire
 - Threats
 - Natural Disasters
 - Students
 - Safety Education – not just at school, but also at home
 - Safety Education to bridge independence

- Public / Government
 - Legislation
 - Awareness
 - Interagency Communication
 - Local
 - State
 - Federal

- Juvenile Firesetter Intervention Program
 - National Certification
 - Statewide Coalitions

- Challenges
 - Language barriers
 - Cultural differences
 - Special education
 - Physical
 - Mobility
 - Sensory

- Tools
 - Audio/Visual
 - Handouts
 - Personnel in Fire Service
 - Fire Prevention Bureau
 - Firefighters
 - Outside Resources

Websites : www.OLAFIRE.com
www.USFA.DHS.gov
www.homesafetycouncil.org
www.nist.gov
www.FEMA.gov
www.collegefiresafety.org
www.firesafe.com
www.UL.com
www.FMGlobal.com
www.CPSC.gov
