

# **PUBLIC SCHOOL CAPITAL PROJECTS CODE REVIEW TRAINING**

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# **Building Aid Overview**

- **Third-Party Vendors need to watch for items not eligible to receive building aid**
- **Review Scope of Proposed Project Form**
  - **Does scope description match what is on drawings?**
- **Be familiar with items listed on pg 31 of State Aid for Public Schools & BOCES guidance**
- **If questions about aidability arise – email the district’s SED project manager**

# Building Aid Overview

- **Watch out for:**
  - **Scope form says ‘reconstruction’ but drawings show ‘additions’**
  - **Scope form says ‘reconstruction’ but drawings show sitework only – need \$10K work on bldg**
  - **Constructing new Press Box / Concession / Storage – but do not have separate SED Building Number**
  - **Artificial Turf Fields – no groomers in spec**

# Building Aid Overview

- **Watch out for:**

- **LED Lighting Retrofit – need to follow guidelines in order to be eligible for aid**
- **Items described as ‘repairs’ – ex: painting only**
- **Pavement – need to mill top/binder or remove – cannot just install ‘seal coating’**
- **Equipment in specs – ex: lawnmowers, tractors, snow blowers, etc.**

# Pre-Screening Process

- **Project submissions pre-screened by SED for completeness**
- **Paperwork – FP Forms, Letters, Certifications, State Agencies and local government approvals**
- **Construction Documents – Drawings are finished, contain necessary information for code review and constructability and are signed and sealed.**
- **Pre-Screening Checklist – Available on FacPlan website**

# **Codes, Laws and Regulations**

- **NYSED Manual of Planning Standards 1998**
- **Commissioner's Regulations Part 155**
- **Section 155.5 - Safety During Const. & Renovations**
- **Section 155.7 - Min. Standards for Public Schools**
- **Asbestos 12NYCRR Part 56 & AHERA**
- **Americans with Disabilities Act**
- **NYS Parks, Recreation and Historic Preservation**
- **DEC – SEQRA, FEMA – Flood Plain Restrictions**
- **2016 Uniform Fire Prevention and Building Code**
- **2017 Uniform Code Supplements**
- **Energy Code of NYS (2016 & 17 Supplements)**
- **2015 ICC Family of Codes**

# Forms & Regulations

## **Paper Work: Review documents in project file:**

- **Evaluation of Existing Building Form**  
Minimum standards for occupancy  
NC = non-conformances – described  
Must be corrected!
- **Asbestos Certification Letter**  
“as evidence by bulk or destruct testing”
- **Highway Letter – TPR SHOULD CONFIRM -**  
consistent with work of project
- **SHPO Approval or SHPO Review Exemption Form**  
consistent with work – documents meet requirements of  
SHPO approval – TPR SHOULD CONFIRM

# Forms & Regulations

## Paper Work (Cont.)

**TPR**

- **Code Compliance Checklist**
- **Flood Plain Certification: A/E provide certification from local authority that the building, addition, sitework which includes filling, excavation or paving is not in flood plain. TPR SHOULD CONFIRM**
  - **Wetlands: confirm work does not impact -or- approval received from DEC/Corps of Engineers**
- **Statement of Special Inspections: TPR SHOULD CONFIRM**



# Codes, Laws and Regulations

- **NYSED Manual of Planning Standards 1998**
- **Public School Requirements which preceded the code, differ from and exceed the code:**
  - **Corridor Travel Distances**
  - **Main and Secondary Corridor Widths**
  - **Rescue Windows/smoke zones & exiting**
  - **Required Exit Units - R.E.U.s**
  - **Folding, Rolling, sliding doors not exits**
  - **Space of Occupancy without Corridor Concept**
  - **Door – Stair Enclosures and Smoke Barriers**
  - **Fire Resistant Construction**
  - **MEP Requirements**

# Codes, Laws and Regulations

- **Uniform Fire Prevention and Building Code of NYS includes the 2017 Uniform Code Supplement**
- **2015 ICC Family of Codes as amended by the 2017 Supplement:**
  - **Chapter 1 - Scope, Admin., Modularity, Etc.,**
  - **Chapter 2 - IRC**
  - **Chapter 3 – IBC 16 pages: 30 +/- amendments**
  - **Chapter 4 – IPC**
  - **Chapter 5 – IMC, Chap. 6 – IFGC,**
  - **Chapter 7 – IFC, Chap. 8 – IPMC**
  - **Chapter 9 – IEBC**
  - **Chapter 10 – Reference Standards**

# Codes, Laws and Regulations

- **2017 Uniform Code Supplement**
- **Chapter 3 – Amendments to the IBC:**
  - **3.2 – Definitions; Intl Symbol of Accessibility**
  - **3.6 – Small change to Table 716.6, rated window assemblies**
  - **3.10 – Carbon monoxide requirements located in FC Section 915 (7.21 in this supplement)**
  - **3.11 & 3.12 Accessible parking requirements**
  - **3.18 & 3.19 – Ground Snow Loads**
  - **3.20 – Flood Hazard Areas**
  - **3.27 – IBC Sect. 3109 (Swimming Pools, spas, Hot tubs): includes pool alarms**

# Codes, Laws and Regulations

- **2017 Code Council adopted a rule amending the 2016 Supplement to the NYS Energy Code**
- **DOS, Division of Standards and Codes Web Site Guidance: The 2017 Energy Code Rule has no significant changes to the 2016 Supplement to the NYS Energy Code.**
- **The rule requires that all references in 2016 Energy Code Supplement to the 2016 Uniform Code Supplement are deemed to be references to the 2017 Uniform Code Supplement – it does not replace the 2016 Energy Code Supplement – it is still in full force.**

# Codes, Laws and Regulations

- **2016 Energy Code Supplement: Amends the 2015 IECC**
  - **Chapter 1: Titles, Scope, Intent, Mandatory provisions, Limitations**
  - **C101.6.2 Energy Code shall not apply...(4) where roof, wall or floor cavity is not exposed; (5) reroofing where neither the sheathing nor insulation is exposed; roofs without insul. in cavity and where the sheathing or insulation is exposed shall be insulated... above or below the sheathing”**
  - **Table C402.4 – Amends Building Envelope Max. U-Factor & SHGC Requirements**

# Codes, Laws and Regulations

- **2016 Energy Code Supplement – Changes to Commercial Provisions:**

**TPR**

- **Section C401.2: Amendments to Compliance Path Methods**
  - 1 – ASHRAE Compliance Path (2013 Edition)
  - 2 – Prescriptive Compliance Method (Comprehensive)
  - 3 – Performance Compliance Path
- **C501.6 Historic Buildings – No provisions of Energy Code are mandatory**
- **C501.7. Compliance Alternative: ASHRAE 90.1 provisions in lieu of C502 – C505**
- **Amendments to ASHRAE section of Chapter 6**

# Codes, Laws and Regulations

- **2015 International Energy Conservation Code:** **TPR**
- **C402.1 - 402.4.4: Prescriptive Envelope Provisions – Common compliance path**
- **R-Value Method: Table C402.1.3**
- **Assembly U-Factor Method: Table C402.1.4**
- **Fenestration Maximum U-factor: Table C402.4 (max. fenestration area 30% w/ exceptions)**
- **402.5 Air Leakage Mandatory – air barrier required – 402.5.1.2.1**
- **Air Leakage of Fenestration – Table 402.5.2**
- **C103.2 Info on Const. Documents: R-values, Fenestration & area weighted U-Factors, thermal envelope depiction**

# Codes, Laws and Regulations

- **2015 International Existing Building Code (IEBC)**
- **2017 Uniform Code Supplement:**
  - Limited number of amendments to IEBC; Scope, Symbol of Accessibility & single exit buildings.
- **Chapter 1 - Scope/admin., Chapter 2 – Definitions**
- **Chapter 3 - Compliance Methods**
  - **Chapter 4 - Prescriptive Method – Compliance with many IBC provisions. Also includes extensive structural requirements, others**
  - **Work Area Method – Follow Chapters 5 - 13 on Repairs, Alterations Level 1 - 3, Change of Occupancy, Additions and Historic Buildings**
  - **Chapter 14 - Performance Compliance – Investigate, evaluate existing building. Use a scoring method to determine level of acceptable safety and compliance**



# Codes, Laws and Regulations

- **2015 International Existing Building Code (IEBC)**
  - **Chapter 5, 6: Classification of Work, Repairs**
  - **Chapters 7, 8, 9: Alterations Level 1, 2, 3**
  - **Chapter 10: Change of Occupancy**
    - **Requirements for application of chapter, Special Uses, structural, electrical....**
    - **Section 1012.1.1 Chapter 9 IBC Fire Protection Systems**
    - **Section 1212.2.1 Fire Sprinkler System**
    - **Table 1012.4 Egress Hazard Changes**
    - **Table 1012.5 Building Heights and Areas**
    - **Section 1012.7.2 Stairways**
  - **Chapter 11: Additions – Building Area Limitations - Fire Separation Requirement - Comply with IBC, Structural**
  - **Chapter 12, 13: Historic Buildings, Relocated Buildings**

# Code Compliance Drawings

## Temporary Exiting Plans / Phasing Plans

TPR

- Alterations and additions: Projects where existing exits are blocked by construction:
- Provide temporary exiting floor plans
- Include; corridor, door widths, fire ratings of temporary exit passages, exit signs, hardware, exit discharge, egress capacity.
- Provide phasing plans for larger projects

# Code Compliance Drawings

- **Required Information:**

**TPR**

- **Level 1 Alterations; Overall floor plan with doors, windows & work areas, Legend for symbols, If door replacements show fire ratings of partitions, windows, temporary construction separations for buildings occupied during construction.**
- **Level 2 & 3 Alterations & Change of Occupancy; Overall Floor Plan at scale, Level 1 info., work areas &/or areas with Change of Occupancy, Existing and new Fire Walls, Fire Barriers, Building Areas and Fire Areas. Occupant load of all spaces. Door swings & widths, stair widths & egress capacity, rescue windows, corridor travel distances to exterior exit doors & stair enclosure doors.**

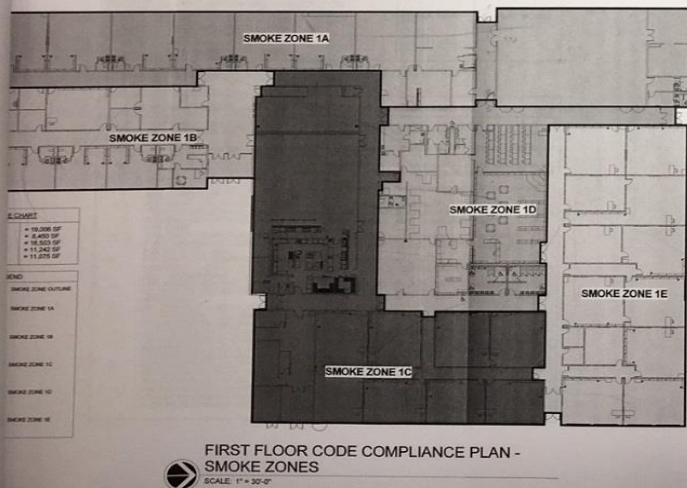
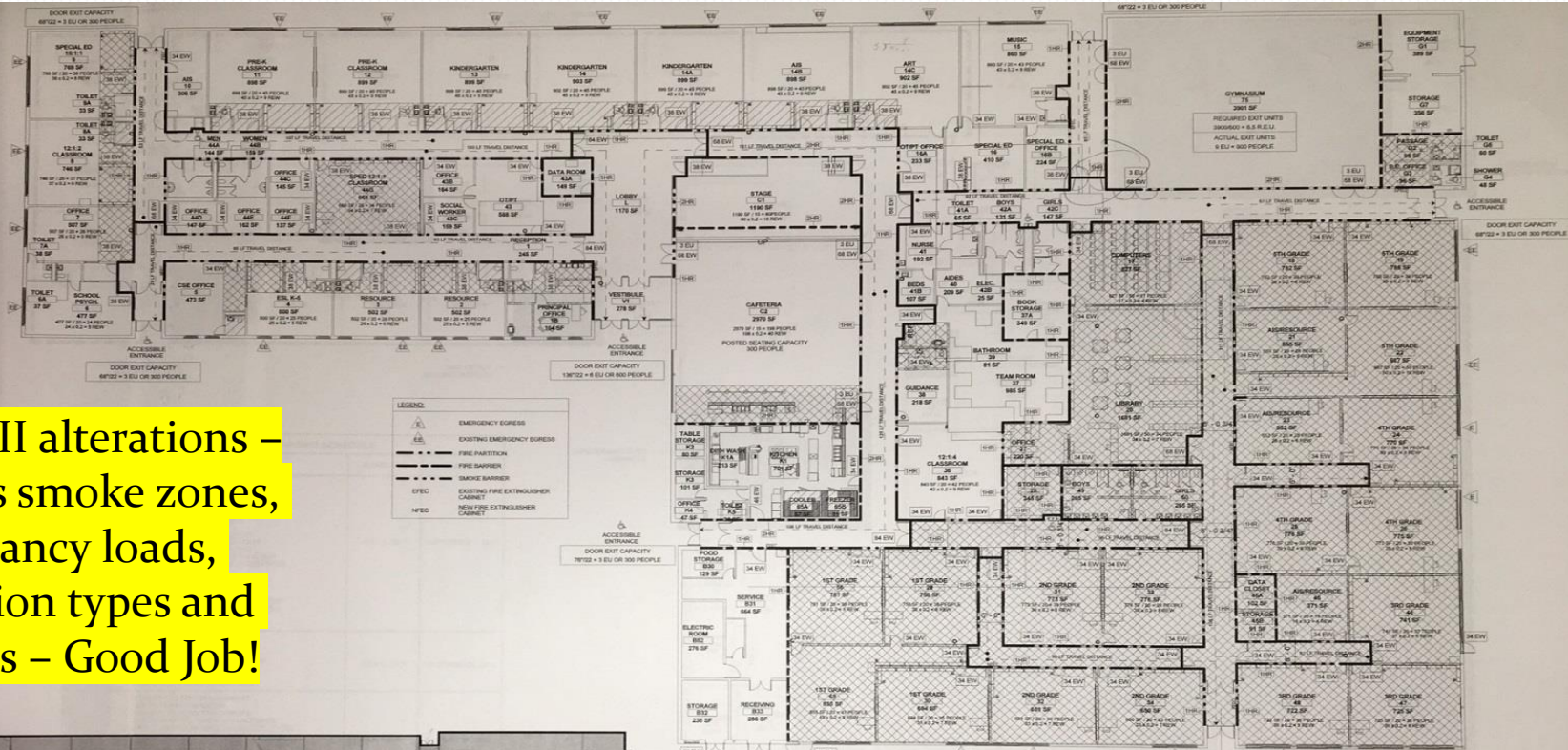
# Code Compliance Documents

- **Additions and New Buildings -** **TPR**
  - **Required Information: Information for Level 1, 2 & 3 Alterations & Change of Occupancy.**
  - **New Addition(s) indicated clearly w/ Areas.**
  - **Construction & Occupancy Classifications. Allowable Building Area (With Frontage & Sprinkler Increases.**
  - **Structural information required by BC 1603**
  - **Site Plan w/ roads, parking, walks, fire apparatus access roads, hydrants. (Structural Drawings)**
  - **Energy Code compliance path & R values/U-factors/thermal envelope depicted.**



# Smoke Zones & Level II Alterations

Level II alterations – Shows smoke zones, occupancy loads, partition types and ratings – Good Job!



### FIRST FLOOR CODE COMPLIANCE PLAN

SCALE: 1/16" = 1'-0"

BUILDING CODE COMPLIANCE INFORMATION  
AS PER ADOPTED CODE ON NYS 2010 EDITION

**SCOPE**  
PROJECT INVOLVES RENOVATIONS AND ALTERATIONS TO EXISTING BUILDING WORK WHICH INVOLVE CHAPTER 8 AND CHAPTER 9 OF THE EXISTING BUILDING CODE OF NEW YORK STATE.

**V. MEANS OF EGRESS**  
MAXIMUM OCCUPANCY BASED UPON EGRESS WIDTH PER OCCUPANT (TABLE 1006.1.1) WITHOUT SPRINKLER (3.3 STAIRS & 3.2 OTHER COMPONENTS AS PER TABLE 1006.1.1)  
GROSS AREA: 2,300 SQ. FT. PER PERSON + 700 PEOPLE  
NET AREA: 7,900 SQ. FT. (3,000 SQ. FT.)  
ACTUAL EGRESS WIDTH: 110 FT.

MAXIMUM OCCUPANCY BASED UPON EGRESS WIDTH PER OCCUPANT (SEE STANDARDS) WITHOUT SPRINKLER (3.3 STAIRS & 3.2 OTHER COMPONENTS AS PER TABLE 1006.1.1)  
CAPACITY PER 22" UNIT OF EGRESS WIDTH:  
DOORS: 400  
NOT MORE THAN 1000  
100 FT. MAXIMUM TRAVEL DISTANCE WITHOUT SPRINKLER SYSTEM (TABLE 1006.1.1)  
100 FT. MAXIMUM TRAVEL DISTANCE AT GROUND FLOOR WITHOUT SPRINKLER SYSTEM (SEE STANDARDS)

**VI. FIRE CODE**  
AUTOMATIC SPRINKLER SYSTEM REQUIRED THROUGHOUT FOR ALL FIRE AREAS GREATER THAN 20,000 SQUARE FEET AND FOR SECTION 906.2.2 OF THE BUILDING CODE OF NEW YORK STATE. HOWEVER, THIS IS AN EXISTING NONCOMPLIANT CONDITION UNLESS OCCUPANCY IS MAINTAINED AT LESS THAN 50% OF THE EXISTING BUILDING CODE WORK AREA PERCENT OF THE FLOOR AREA.

PORTABLE FIRE EXTINGUISHERS ARE PROVIDED SUCH THAT THE MAXIMUM TRAVEL DISTANCE TO AN EXTINGUISHER IS 75 FEET AS PER TABLE 906.3 OF THE FIRE CODE.

**VII. SMOKE ZONE**  
BUILDING ENVELOPE REQUIREMENTS - CLIMATE ZONE 6A (MONTICNEY COUNTY) AS PER THE WEATHER CONSERVATION CODE, (TABLES C402.1.3 & C402.1.4)  
TABLE C401.1 OF THE ENERGY CONSERVATION CODE (TABLES C402.1.3 & C402.1.4)  
B. FIXED FENESTRATION U-FACTOR: 0.36 (R-2.78)  
C. OPERABLE FENESTRATION U-FACTOR: 0.41 (R-2.44)  
D. ENTRANCE DOORS U-FACTOR: 0.27 (R-3.70)  
E. OPERABLE DOORS U-FACTOR: 0.28 (R-3.57)

**VIII. TOILET ROOM CALCULATIONS**  
MINIMUM NUMBER OF PLUMBING FIXTURES REQUIRED FOR EDUCATION E AS PER TABLE 2002.1 OF THE BUILDING CODE & TABLE 401.1 OF NYS PLUMBING CODE:  
MALE: (1) WATER CLOSET PER 50 OCCUPANTS (1) LAUNDRY PER 50 OCCUPANTS  
FEMALE: (1) WATER CLOSET PER 50 OCCUPANTS (1) LAUNDRY PER 50 OCCUPANTS  
NET: (1) SINK/FOUNTAIN PER 100 OCCUPANTS  
MINIMUM NUMBER OF PLUMBING FIXTURES REQUIRED FOR EDUCATION E AS PER TABLE 2002.1 OF THE BUILDING CODE & TABLE 401.1 OF NYS PLUMBING CODE:  
MALE: (1) WATER CLOSET PER 50 OCCUPANTS (1) LAUNDRY PER 50 OCCUPANTS  
FEMALE: (1) WATER CLOSET PER 50 OCCUPANTS (1) LAUNDRY PER 50 OCCUPANTS  
AREA C-27 STUDENTS & 18 CLASSROOMS = 448 STUDENTS  
AREA C-28 EACH GRADE  
GIRLS V.C. (1.50) URINALS (1.50)  
BOYS V.C. (1.50) LAVS (1.50)


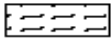
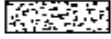
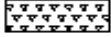
FIXTURE	REQ'D	ACTUAL	REQ'D	ACTUAL
GIRLS	6	7	6	7
BOYS	6	7	3	6

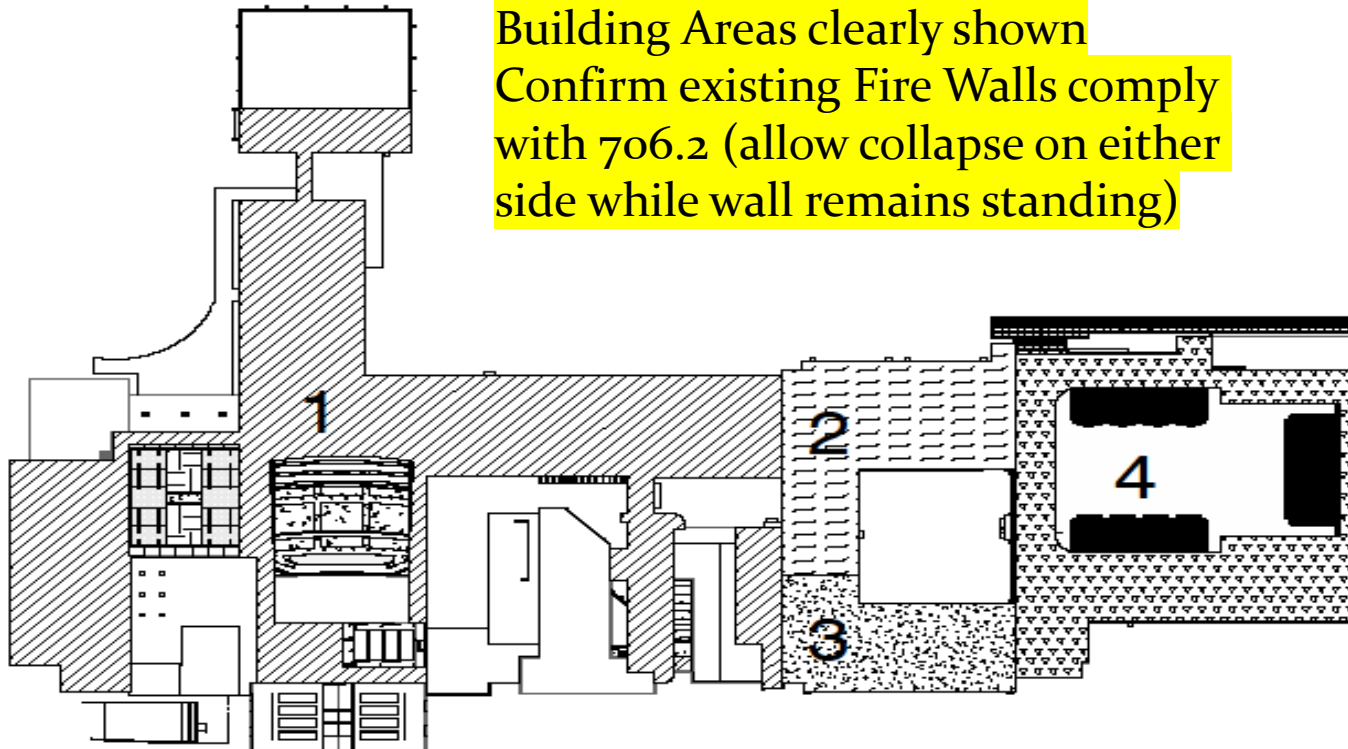
**IX. HEIGHT & AREA SUMMARY**  
ACTUAL GROSS BUILDING AREA = 85,400 SF  
FIRST FLOOR, EXISTING AREA A (1970) = 46,400 SF  
FIRST FLOOR, ALTERATION AREA A (1970) = 28,900 SF  
FIRST FLOOR, ALTERATION AREA B (1970) = 14,500 SF PER STORY  
MAXIMUM OVERALL BUILDING HEIGHT ABOVE GRADE GROUP E201 P7 - (3) PARAGRAHS, 1 STOREYS  
LIMITED BUILDING HEIGHT (TABLE 508) GROUP E (TYPE III) = 2 STOREYS, 30 FT.





# Symbols, Occupancy Loads, Egress Capacity

	<b>BUILDING AREA #1</b> (EXISTING CONDITION)	BASEMENT = 0 SF. FIRST FLOOR = 199,458 SF. SECOND FLOOR = 69,106 SF.	TOTAL = 200,140 SF.
	<b>BUILDING AREA #2</b>	BASEMENT = 0 S.F. FIRST FLOOR = 10,200 SF. SECOND FLOOR = 10,164 SF.	TOTAL = 32,422 SF.
	<b>BUILDING AREA #3</b>	BASEMENT = 0 S.F. FIRST FLOOR = 11,070 SF. SECOND FLOOR = 11,117 SF.	TOTAL = 22,196 SF.
	<b>BUILDING AREA #4</b>	BASEMENT = 0 S.F. FIRST FLOOR = 49,446 SF. SECOND FLOOR = 28,674 SF.	TOTAL = 78,519 SF.
			<b>GRAND TOTAL = 330,476 SF.</b>

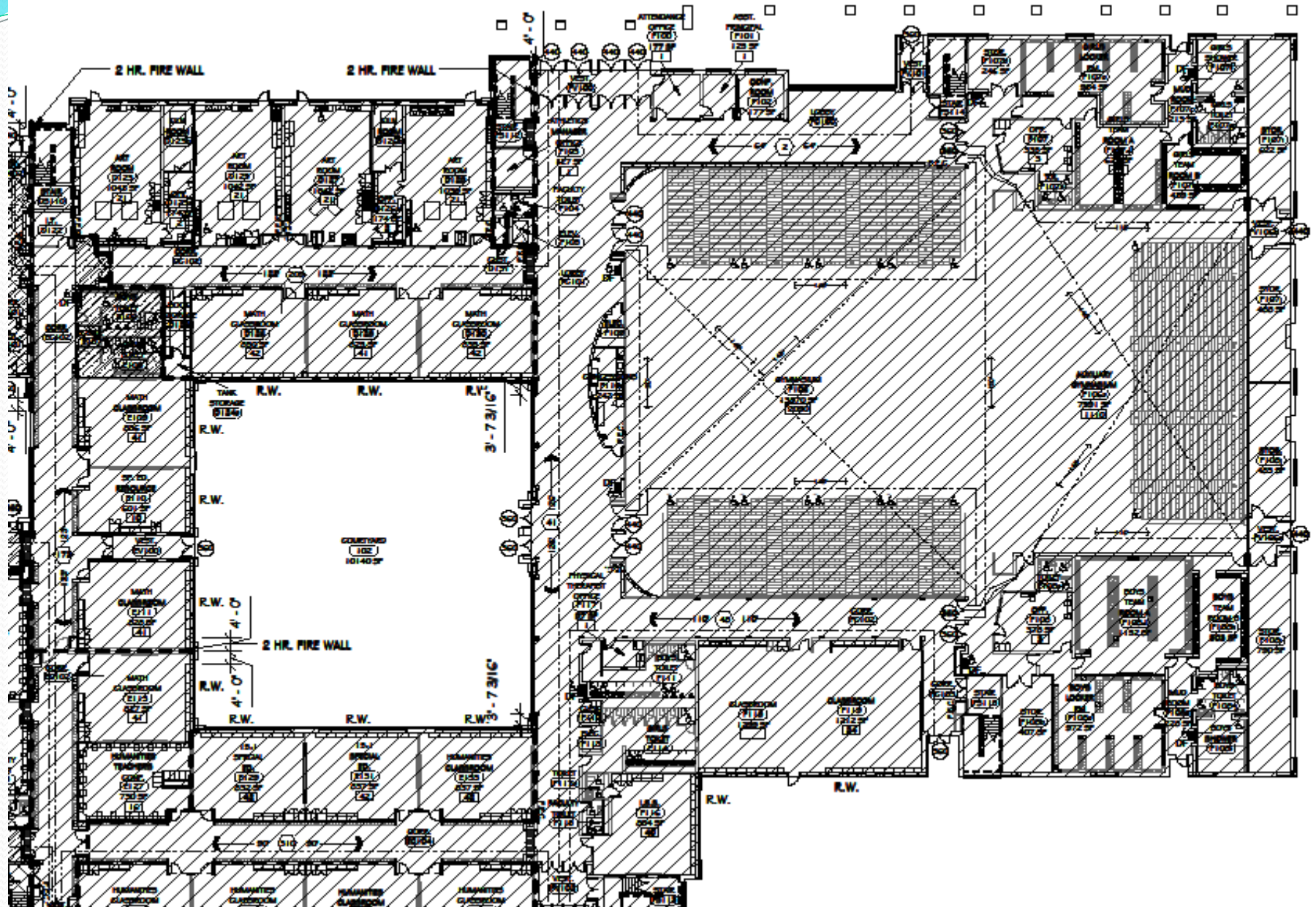


Building Areas clearly shown  
Confirm existing Fire Walls comply  
with 706.2 (allow collapse on either  
side while wall remains standing)

Area 4 (new  
addition) is  
about 49,000 sf  
**REQUIRED:**  
calculations for  
area increases  
due to frontage  
& sprinkler



# Symbols, Occupancy Loads, Egress Capacity





# Site Review

- **Fire Code Section C 503 Fire Apparatus Access Roads – New Buildings / Additions**
  - “provide for every building or portion of building hereafter constructed or moved into...apparatus access road shall **...extend to within 150 feet of all portions of facility...**”  
distance can be increased by code official (see Exceptions)
- **Fire Protection Water Supply**
  - FC 507, 507.1 Type of Water Supply, A water supply shall consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems. 2017 Uniform Code Supplement: Alternate water supply – NFPA 1142

# Site Review

- **Fire Code Section C 507.5**

- **Fire Hydrants**

- “where a portion of a facility or building hereafter constructed...or within the jurisdiction is more than 400 feet from a hydrant on a fire apparatus access road...on site fire hydrants shall be provided where required by the fire code official.
- Exceptions: R-3, U occupancy and sprinklered buildings
- Fire Code Commentary indicates code official can determine and approve hydrant location or permit alternate water fire protection water supply

# **Site Review**

- **Site Features Required on Site Plans:**

- **Site Plans drawn to an appropriate scale. Property Lines, New Building/Addition location-clearly depicted & fully dimensioned.**
- **Locations of existing structures, roads and parking, new roads & parking, new walks, curb cuts, curb ramps, Handicap Parking, existing & new topography. All utilities shown, including new storm drainage.**
- **Electric services are required to be buried.**
- **New driveway entries from public streets must be noted in the Highway Letter and drawn/detailed on Site Drawings.**

# Site Review: Bleachers

- **BC 1025.1.1: Bleachers, grandstands, and folding and telescopic seating shall comply with ICC 300. FC 304.1.3 - Spaces underneath grandstand and bleachers shall be kept free from combustible and flammable materials. Except where enclosed in not less than 1 hr. rated enclosures.**
- **FC 1029.1.1.1 - ticket booths & toilets permitted below bleachers w/ out separation.**
- **Toilets are required for Bleachers; Provide at least 50% of required fixtures as permanent within 500' of new bleachers. 50% may be Portables - if used provide pads.**
- **If seating count is same, existing toilets facilities are sufficient.**

# Occupancy Class - BC Chapter 3

- **Assembly (A-1, A-2, A-3, A-4, A-5) sub-categories, A-3 Libraries, A-5 grandstands**
- **Business – (B)**
- **Educational (E) through the 12<sup>th</sup> grade.**
- **Factory Group: (F-1, F2 Moderate & Low Hazard).**
- **High Hazard (H)**
- **Institutional (I) Some Daycares**
- **Mercantile (M), Residential (R)**
- **Storage (S-1 & S-2 Moderate & Low hazard) S-1 motor vehicle repair garage – bus maintenance buildings. S-2 includes parking garages (bus garages). BC chapter 9 Fire Protection for sprinkler requirements.**
- **Utility and Misc. (U) barns, green houses, sheds, small storage.**

# Heights and Areas - BC Chapter 5

- **Determine Maximum Allowable Building Area and Building Height in feet & stories above grade plane. Used to determine maximum size of building, based on Occupancy & Construction Classification. – REQUIRED FOR: New Buildings & Additions** **TPR**
- **Chapter 5 also regulates mixed occupancies, i.e., Maintenance Building/office area (S-1 and B occupancies). Leased schools: when a portion of a school building is leased to a day care (group I) and/or a business (group B) the Code may require fire rated separations or sprinklers**

# Heights and Areas

- **New Additions – Require Building Area Analysis**
  - Exist Building Code Section 1102; **TPR**
  - Area limitations: No addition shall increase the area of an existing building beyond that permitted in Chapter 5 of the IBC for new buildings unless fire separation as required by the IBC is provided. IBC REQUIRES A **FIRE WALL!**
  - Exception; Infilling of floor openings and non-occupiable appendages such as elevator and exit stairway shafts. Building Area Separations required by the IBC are typically Fire Walls although Fire Barriers could be used where building is sprinklered.





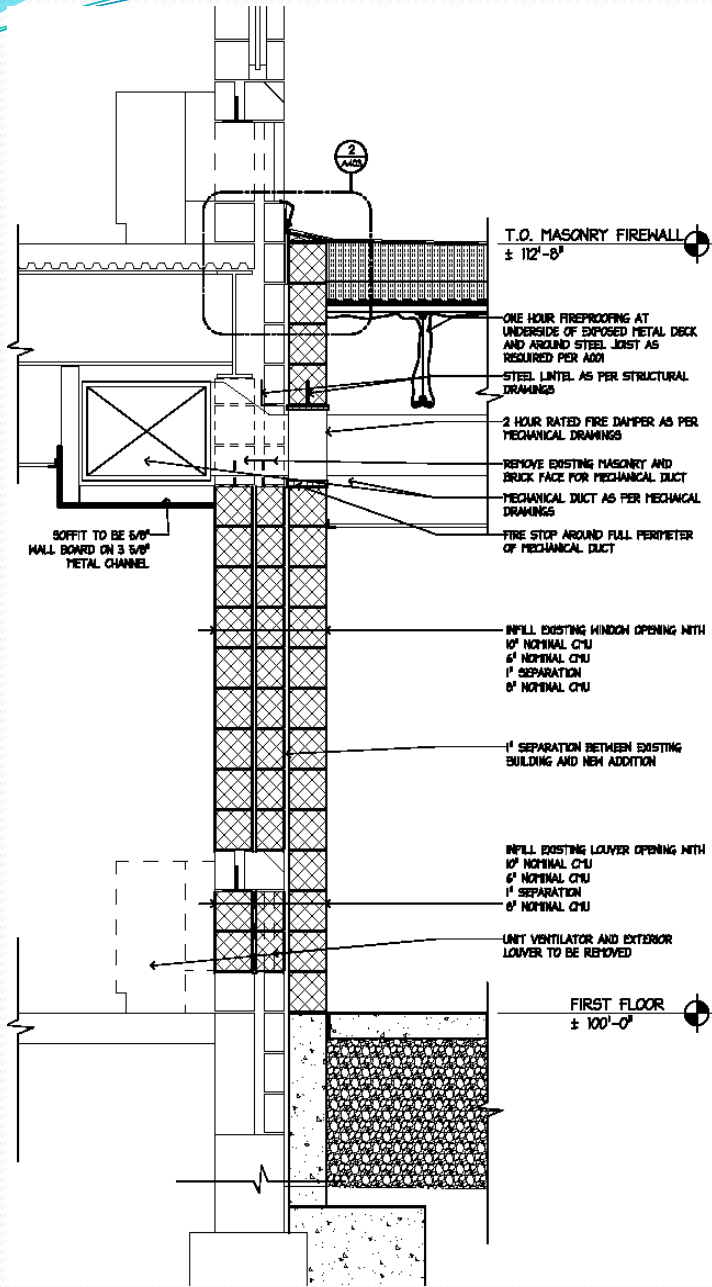
# Heights and Areas - Additions

## • Fire Wall

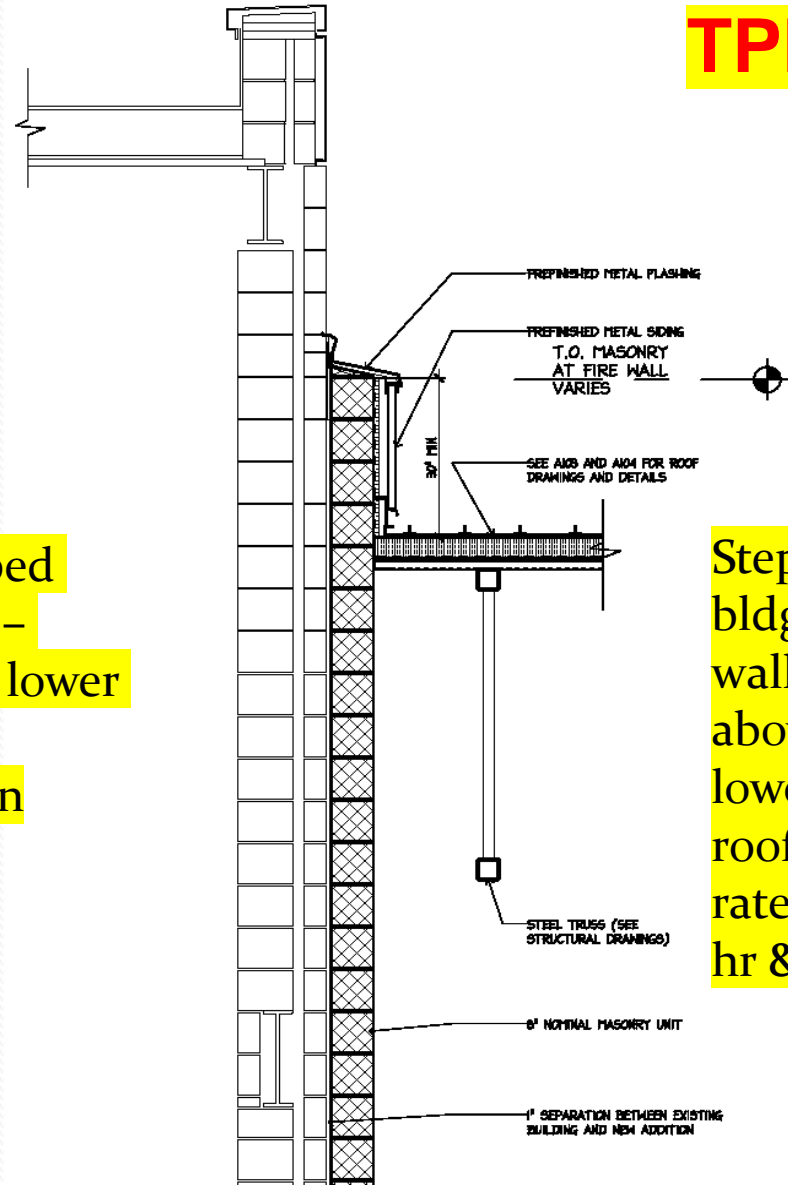
**TPR**

- EBC 1102 and BC 506: Determine if new addition needs to be separated from existing Building. The Existing Building Area(s) must be defined and the areas determined. Verify if there are fire walls in the existing building.
- The New Addition Building Area cannot increase the Existing Building Area beyond that permitted by the Building Code Chapter 5.
- Fire Wall Construction (**new & existing**) confirm compliance with BC 2015 706.2, Structural Performance & Sections 706.5, 706.6

# Fire Wall Sections



Stepped  
bldg. –  
rated lower  
roof  
option



TPR

Stepped  
bldg. –  
wall  
above  
lower  
roof fire  
rated 2  
hr & 1 hr.

# Heights and Areas - Additions

- **Fire Wall (continued)**

**TPR**

- **EB 1102 and BC 506: If the new addition needs to be separated from existing Building a Fire Wall must be constructed.**
- **If the addition is large it may need its own fire walls to create compliant Building Areas.**
- **The Fire Wall structure must comply with BC Section 706.2, Structural Performance & Sections 706.5, 706.6. The drawings must contain wall sections of the fire wall extending from the foundation to roof at various conditions along the wall.**

# Heights and Areas

- **Building Areas: Maximum Allowable**
  - **BC 506.1 General. 506.2 Allowable Area Determination**
  - **506.2.1 -Single occupancy-one story buildings** Many School Buildings
  - **$A_a = A_t + (NS \times I_f)$  Equation 5-1**
  - **$A_a$  = Allowable Area**
  - **$A_t$  = Tabular Allowable Area taken from appropriate row (NS, S1 OR S13R)**
  - **NS = non-sprinklered, S13R Sprinklered building in accordance with BC 903.3.1.2**
  - **$I_f$  = area factor increase due to frontage.**

# Heights and Areas

- **Building Areas: Maximum Allowable**

- **506.2.2 - Mixed occupancy-one story building, Allowable area determined in accordance with 508.1, which is the Section on Mixed Use Buildings.**
- **First is 508.2, Accessory Occupancies – The allowable building area is based on 506 for the main occupancy. The aggregate area of the accessory occupancy must be less than 10% of the floor area.**
- **If overall Building Area is less than the allowable for the main occupancy: No Separation is required between the occupancies.**

# Heights and Areas

- **Building Areas: Maximum Allowable**

- **506.2.3 - Single Occupancy Multi-story Building - Most School Buildings!**
- **$A_a = [A_t + (NS \times I_f)] \times S_a$       Equation 5-2**
- **$A_a$  = Allowable Area**
- **$A_t$  = Tabular Allowable Area taken from appropriate row (NS, S13R OR SM)**
- **NS = non-sprinklered, S13R Sprinklered building**
- **SM= Sprinklered Building**
- **$I_f$  = area factor increase due to frontage.**
- **$S_a$  = number of stories above grade plane not to exceed three.**

# Heights and Areas

- **Building Areas: Maximum Allowable**

- 506.2.3 - **Single Occupancy Multi-story Building (Cont.)**

- **$Aa = [At + (Ns \times If)] \times Sa$       Equation 5-2**

- So if you have a two story school the total allowable building area (both floors)=

**$[At + (Ns \times If)] \times \underline{2}$**

- No individual story shall exceed the allowable area (Aa) as determined by Equation 5-2 using the value of  $Sa = 1$

# Heights and Areas

- **Building Areas: Maximum Allowable Example:**

**2 Story, E Occupancy, IIB Const., Sprinklered, Full Frontage**

- **$Aa = [At + (NS \times If)] \times Sa$       Equation 5-2**

- **$[At + (Ns \times If)] \times \underline{2}$**

- **$At = 43,500 \text{ SF} = \text{SM value in table}$**

- **$NS=14,500 \text{ SF}, If = 75\%, Sa=2$**

- **$[43,500 + (14,500 \times .75)] \times 2$**

- **$[43,500 + 10,875] \times 2$**

- **$54,375 \times 2 = 108,750 \text{ SF}$**



# Heights and Areas

- Maximum Allowable Building Areas:
- Increase for Frontage

TPR

- **BC 506.3 Building Frontage Increase**

Frontage formula - same as in 2010 code:

$$I_f = [F/P - 0.25] \times W/30 \text{ Equation 5-5}$$

F= length of building wall with frontage

P= total length of building wall

W= See Code for New Formula for W (width of frontage).

F does not include length of Fire Wall boundary

# Heights and Areas

- **Building Areas: Maximum Allowable**
  - **506.2.4 - Mixed Occupancy-Multi-story Buildings:** Each story shall individually comply with Section 508 (Mixed Occupancies)
  - 508.1 accessory occupancies (no separation)
  - 508.3 Non-separated occupancies (no separation)
  - 508.4 Separated occupancies (separations constructed with fire barriers, possibly fire walls)
  - 508.4 “In each story, the building area shall be such that the sum of the ratios of the actual building area of each separated occupancy divided by the allowable building area of each separated occupancy shall not exceed 1.”

# Fire and Smoke Protection

- **Wall Ratings**

- **FIRE WALLS, BC 706 Table 706.4 for fire ratings**
- **706.2 – Structural Stability: Designed to allow collapse of structure on either side without collapse of the wall. Vertical continuity: wall shall terminate 30" above deck or at underside of roof if non-combustible deck & both buildings have Class B roof covering per BC 706.6**
- **FIRE BARRIERS BC 707 – Table 707.3.10 gives required fire ratings based on occupancies**
- **FIRE PARTITIONS BC 708.2 (See Code) 1 hour required rating for corridors. (found in Means of Egress Chapter 10)**

# Fire and Smoke Protection- BC Chapter 7

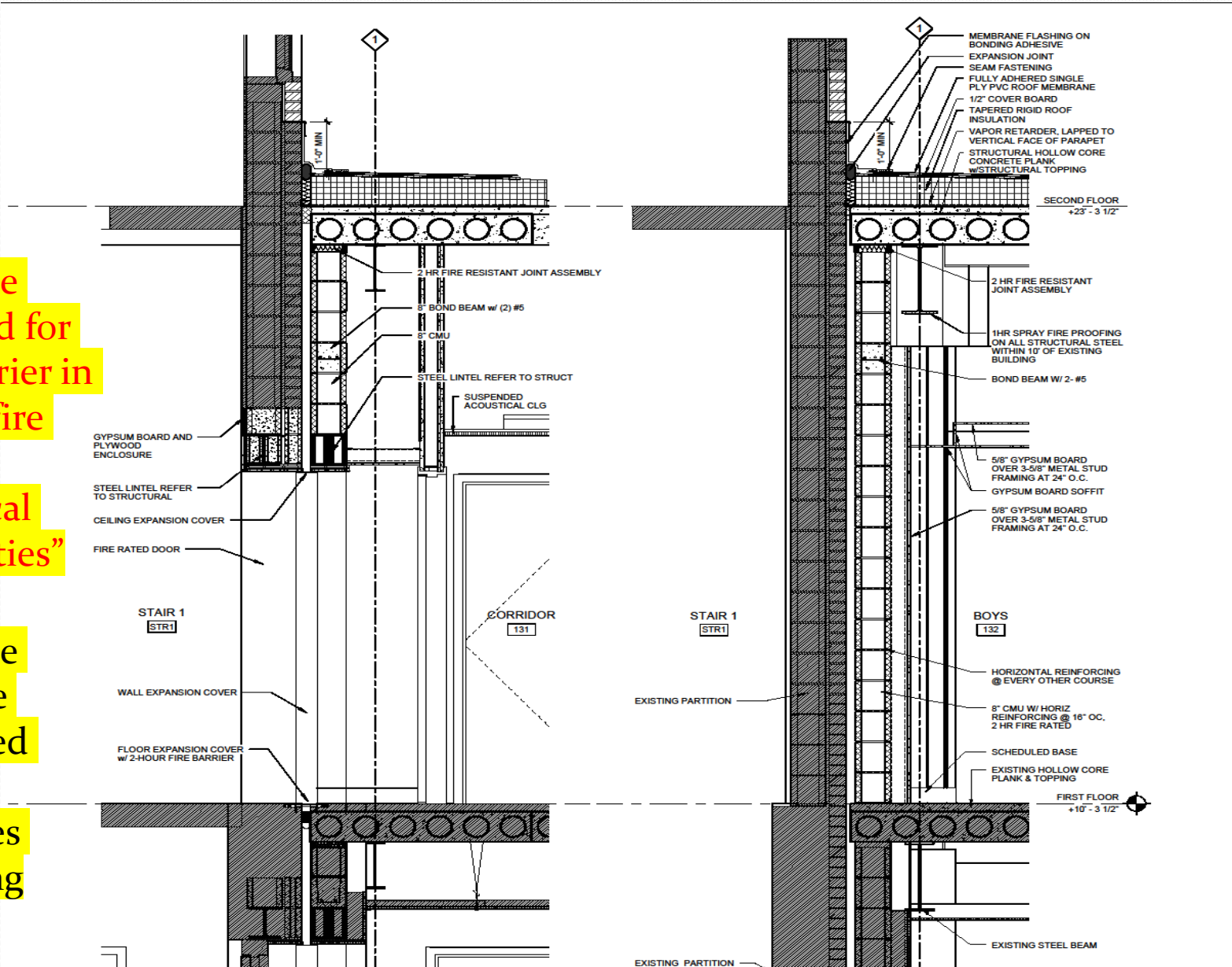
- **Table 716.5 “Opening Fire Protection Assemblies, Ratings and Markings”** **TPR**

- Contains requirements for fire ratings of doors and door glazing
- 1 hr. corridor walls require 1/3 hour rated doors
- 1 hr. exit stairways require 1 hour rated doors.
- 2 hr. Fire Walls & Fire Barriers require 1 ½ hour doors.
- 1 hr. Fire Barriers require ¾ hour doors
- See Table 716.5 & Section 716.2 for fire resistive glazing requirements, see Table 716.6 for Fire Window Assembly Fire Protection ratings.

# Fire Wall Sections

Variance required for fire barrier in lieu of fire wall - "practical difficulties"

Variance must be approved by Facilities Planning



# Fire and Smoke Protection

- **Wall Ratings**
  - **Glass block in Fire Rated Assemblies**
    - **§2110.1.1 for limitations - cannot use in any fire walls, fire barrier or fire partitions. Exception 1: glass-block assemblies having a fire protection rating of not less than 3/4 hour shall be permitted as opening protectives in accordance with Section 716 in fire barriers, fire partitions and smoke barriers that have a required fire-resistance rating of 1 hour or less and do not enclose exit stairways and ramps or exit passageways., Exception 2: glass-block assemblies as permitted in Section 404.6, Exception 2.**

# Fire and Smoke Protection

## • Windows and Door Ratings

**TPR**

- Fire rated doors and & glazing requirements in rated wall assemblies. See Section 716 OPENING PROTECTIVES - determine wall or partition type (fire wall, fire barrier, fire partition) determine required fire rating of the wall and go to Table 716.5
- BC 716.5.5 Doors in interior exit stairways and passageways: Fire Door assemblies shall have a max. transmitted temperature rise of not more than 450F above ambient at the end of 30 min.s of standard fire test
  - Exception (building sprinklered throughout).



# Fire Protection Table 716.5

TPR

TABLE 716.5  
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL RATING ASSEMBLY (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE <sup>b</sup>	FIRE-RATED DOOR GLAZING MARKING VISION PANEL <sup>d</sup>	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELIGHT/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire walls and fire required barriers having a fire-resis- greater than 1 hour tance rating	4	3	See Note b	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3 <sup>a</sup>	See Note b	D-H-W-180	Not Permitted	3	Not Permitted	W-180
	2	1 1/2	100 sq. in.	≤ 100 sq. in. = D-H-90 > 100 sq. in. = D-H-W-90	Not Permitted	2	Not Permitted	W-120
	1 1/2	1 1/2	100 sq. in.	≤ 100 sq. in. = D-H-90 > 100 sq. in. = D-H-W-90	Not Permitted	1 1/2	Not Permitted	W-90
Enclosures for stairways and shafts, interior exit inte- rior exit ramps.	2	1 1/2	100 sq. in.	≤ 100 sq. in. = D-H- > 100 sq. in. = 90D-H-T-W-90	Not Permitted	2	Not Permitted	W-120
Horizontal exits in fire walls <sup>e</sup>	4	3	100 sq. in.	≤ 100 sq. in. = D-H-180 > 100 sq. in. = D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3 <sup>a</sup>	100 sq. in.	≤ 100 sq. in. = D-H-180 > 100 sq. in. = D-H-W-180	Not Permitted	3	Not Permitted	W-180
Fire barriersresistance rating having a required fire- of 1 hour: Enclosures for stairways, exit shafts, exit access ac- rior exit stairways ramps; cess ramps, inte- and interior exit and exit passageway walls	1	1	100 sq. in. <sup>c</sup>	≤ 100 sq. in. = D-H-60 > 100 sq. in. = D-H-T-W-60	Not Permitted	1	Not Permitted	W-60
					<b>Fire protection</b>			
Other fire barriers	1	3/4	Maximum size tested	D-H	3/4		D-H	

# Fire and Smoke Protection

- **Doors in Exit Stairways and Exit Passageways:**
  - **BC 716.5.5.1 Glazing in Doors: Fire protection rated glazing in excess of 100 square inches is not permitted. Fire-resistance-rated glazing in excess of 100 sq. inches is permitted in fire doors (shall meet temp rise requirements above and NFPA 252 or UL 10C.)**
  - **Listed fire-resistance-rated glazing in a fire door shall have a maximum transmitted temperature rise in accordance with Section 716.5.5 when the fire door is tested in accordance with NFPA 252, UL 10B or UL 10C.**

# Fire and Smoke Protection

- **Window Assemblies (Interior windows)**
- **Fire Protection Rated**
  - **BC 716.6.7.2 - The total area of the glazing in fire-protection rated window assemblies shall not exceed 25% of the area of a common wall with any room (or corridor). Applies to 1 hour Fire Barriers and Fire Partitions.**
  - **However if you use temperature rise resistant glazing (meeting ASTM E 119) you can exceed the 25%**

# Fire and Smoke Protection

## • Fire Separations – Special Occupancies

TPR

- High School and Middle School art rooms - considered laboratories (similar to the Uniform Code incidental use spaces) - enclosed with one hour fire barriers
- Home and Careers – One hour fire barriers
- Science Rooms (labs) BC Section 509 Incidental Uses: Lab in E occupancy: 1 hr. fire barrier.
- Shops (industrial arts) 2 hour fire barriers. Separate rooms from each other and corridor (one accessory classroom may be approved without separation)
- Horizontal (floor-ceiling) assemblies must be rated.

# Fire and Smoke Protection

- **Fire Separations – Special Occupancies**
  - **Boiler Rooms - Provide 2 hour fire barrier enclosure (walls and floor/ceiling assembly). 90 minute fire rated door. Second exit may be ladder through roof or ships ladder.**
  - **Commercial Kitchens - Enclosed with 1 hour fire barriers (walls & floor/ceilings assemblies) when the building is non-sprinklered. A fire-rated enclosure is not required when the building is sprinklered throughout.**

# Fire and Smoke Protection

## • Fire & Smoke Separations at Corridors

**TPR**

- **New construction: Corridor walls are required to be 1 hour fire-rated by Code. However in a fully sprinklered building, the BC Table 1020.1 allows corridor walls to be non-fire rated.**
- **If the Building is sprinklered throughout SED will allow corridor doors to be non-rated but will require that each door has a closer.**
  - **Even though the walls are not required to be fire-rated by code, SED requires a smoke partition separating the corridor from the rooms (all renovated spaces and new const.)**

# Fire and Smoke Protection

## • Fire Separations – Corridors

**TPR**

- Any building or addition built after 1984 required door closers on corridor doors. If closers were removed or omitted, or hold open devices installed (with the exception of automatic) they are illegal. If corridor door is held open, it must be held open by an automatic door holder connected to the F.A.
- Corridors - Buildings built before 1984 are considered pre-existing non-conforming and are not required to have closers on corridor doors. However, if the doors are being replaced the new doors are required to have closers.



# Fire and Smoke Protection

- **Fire Separations – Special Occupancies**
  - **Elevator Lobby – Smoke Protection, smoke protected lobby or smoke guard on door only required if elevator connects more than 3 stories**
  - **Corridors Ratings BC Table 1020.1- 1 hour fire partition required (greater than 30 occupants in A, B, E, F, M, S, U occupancies)**
  - **MPS Requirements (differ from code – enforce most restrictive). See MPS S203 & S106 for door requirements.**

# Sprinkler Requirements - BC Chapter 9

- **Sprinkler Protection Requirements**
  - **Determine Occupancy and refer to Section 903**
    - **A Occupancies: A-1 Theaters: Fire Area exceeds 12,000 SF sprinklers required**
    - **A-3 – Libraries & Gymnasiums without spectator seating (also only when not connected to an education building): Fire Area exceeds 12,000 SF sprinklers required**
    - **BC 903.2.3: E occupancy when NEW Fire Area greater than 12,000 SF Sprinklers Required throughout building.**

# **Sprinkler Requirements - BC Chapter 9**

## **• Sprinkler Protection Requirements**

- Sprinklers also required throughout every portion of educational buildings below the lowest level of exit discharge serving that portion of the building. Exception: where every classroom in building as exit door to exterior at ground level.**
- BC 903.2.9.1 Group S-1 Fire Areas larger than 5,000 SF used for the repair of commercial motor vehicles (buses!) require sprinklers. S-1 fire areas greater than 12,000 SF require sprinklers**
- BC 903.10.1 Group S-2 Commercial Parking Garage (Bus) Fire Area larger than 5,000 SF requires sprinklers throughout**

# Sprinkler Requirements - BC Chapter 9

## • **Sprinkler Protection Requirements**

- **In all occupancies .... as set forth in 903.2.11.1 through 903.2.11.6**
- **Stories without openings of a floor area exceeds 1,500 SF. Basements without windows or openings as described.**
- **Buildings - with 30 or more occupants located 55 feet or more above the lowest level of fire department vehicle access.**
- **BC 903.2.6 Group I Occupancies- “In buildings where Group I-4 day care is provided on levels other than the level of exit discharge”. *Schools may lease to I-4 Day Cares.***

# Means of Egress - BC Chapter 10

- **BC Sections 1005.1 & BC 1006.1 “Minimum Egress Width & Number”** **TPR**
  - Determine Occupant Load – Table 1004.1.2
  - Determine Means of Egress Sizing:
    - 1005.3.1 Stairways factor = .3” per occupant, if building sprinklered = .2”
    - 1005.3.2 Other than stairways = .2” per occupant, if building sprinklered = .15”
  - Check plans for occupant loads, door schedule for door widths
  - Determine Minimum Number of Exits - Table 1006.2.1 – E occupancy 2 exits required if space has > 49 occupants or common path of egress travel >75’

# Means of Egress - BC Chapter 10

**TPR**

## • Occupant Load Calculations

- Determine Occupant Load – Table 1004.1.2
- Assembly
  - Fixed Seating – See Section 1004.4
  - Concentrated Chairs Only 7 SF/Occupant
  - Concentrated Standing (gymnasiums) – 5 SF/Occupant
  - Unconcentrated tables & chairs 15 SF/Occupant
- Educational
  - General Classroom 20 SF/Occupant
  - Vocational Classroom (Science, Special Ed., Art, Shops, Home & careers 50 SF/Occupant or actual anticipated number if larger
- Exercise Rooms (fitness rooms) 50 SF/occupant
- Locker Rooms 50 SF/occupant

# Means of Egress - BC Chapter 10

**TPR**

- **Occupant Load Calculations**

- Determine Occupant Load – Table 1004.1.2
- Cafeteria 15 SF/occupant
- Offices 100 SF/occupant (each space calculated separately)
- Stages & Platforms 15 SF/occupant
- Storage 300 SF/occupant
- Natatorium 50 SF @ Pool, 15 SF/occupant on deck

- **Manual of Planning Standards**

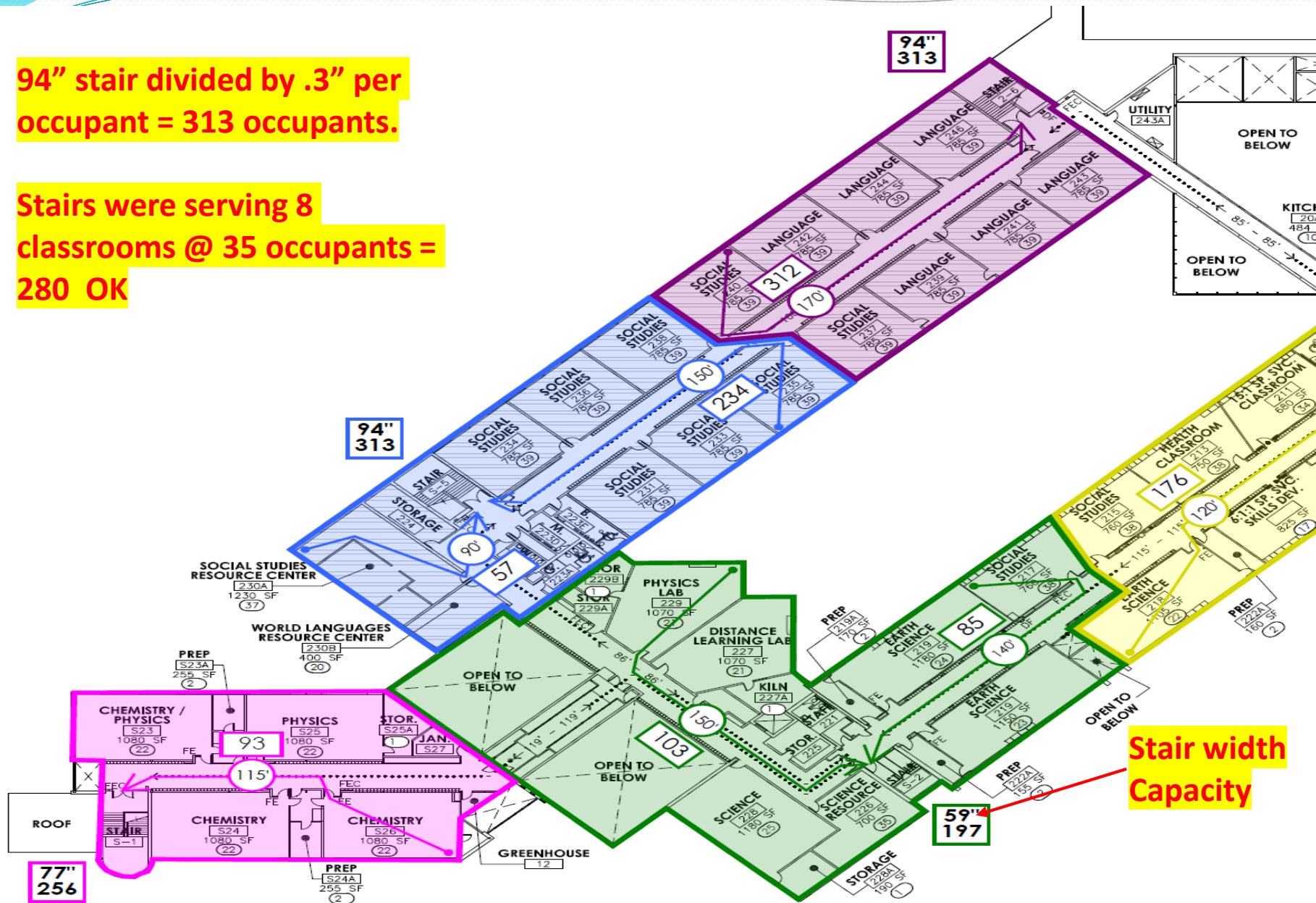
- Section S104-2 b. contains requirements for egress widths for Auditoriums, Stages, Cafeteria, Gymnasium and Natatoriums. Minimum Required Exit Units (R.E.U.) are calculated
- R.E.U. = 22”
- These spaces must meet Code & MPS egress requirements



# Stair Capacity Analysis

94" stair divided by .3" per occupant = 313 occupants.

Stairs were serving 8 classrooms @ 35 occupants = 280 OK



- **When 2 or more exits are required from a space:**
  - **Code requires: panic bars, exit signs, the space must have emergency lighting and the exits must be remote.**
  - **BC & FC 1010.1.10 Panic & Fire Exit Hardware: Required on doors serving rooms or spaces with an occupant load of 50 or more.**
  - **Check Door schedule & hardware sets for means of egress requirements, widths, locksets & panic devices, door swing, etc.) Check ADA approach clearances and width. Level landing on each side.**

# Means of Egress

TPR

- **BC1028.1 Exit Discharge**, exit discharge cannot reenter the building - SEE section for restrictions and exceptions. **Note:** New Additions can not enclose exist stair enclosure exit doors which discharge to the exterior.
- **Accessible Means of Egress: Areas of Refuge & Exterior area of Rescue Assistance** in combination with stairways, elevators, lifts, exterior stairs, etc **REVIEW** Section 1009.1, In new construction Spaces that require 2 or more means of egress require two of more accessible means of egress.

# Means of Egress

- **Corridor Dead Ends**

**TPR**

- **BC Section 1020.4 Dead ends.**

- **Where more than one exit is required (Corridors and halls which serve greater than 49 occupants or common path of egress travel exceeds 75 feet) exit access shall be such that there are no dead ends in corridors >20 feet in length.**
- **NYSED Requires Max. length less than 1 ½ x width of the corridor, (1 1/2 x 8 ft = 12 ft) - more restrictive than code requirement of 20 feet!**

# Means of Egress

- **Smoke Zone Exiting: SED REQUIREMENT**
  - **Commissioner's Regulation Part 155.7 and MPS Section S104-5.d.**
  - **Every space of pupil occupancy over 500 sf in area shall have two separate means of egress from such space.**
    - **A space of pupil occupancy is any room or self-contained space housing pupils on a regular basis, other than a place of assembly or small rooms where no more than 10 pupils are under direct, responsible, adult supervision.**
    - **Each means of egress shall be in a separate smoke zone, unless immediately adjacent to an approved exit.**

# Means of Egress

- **Smoke Zone Exiting**

- **The primary exit is the door to the corridor.**
- **The second means of egress may be a door into a separate smoke zone, or directly to the exterior, or a window of such size ...that will facilitate egress, or a door providing egress through adjacent spaces where approved.**
- **Required emergency egress windows shall be of a size and design, including hardware and, in appropriate instances, steps ...to high sills, that ...facilitate emergency egress.**
- **Such windows shall be free of obstructing screens or storm sash.**

# Means of Egress

- **Smoke Zone Exiting; Rescue Windows - MPS S104-7**
  - Such windows shall be free of obstructing screens or storm sash.
  - (i) The minimum clear opening area for such windows shall be six square feet, with a minimum dimension of 24 inches,
  - MPS - S104-7, hardware (operating mechanism) shall be a maximum of 54" above finished floor.
  - “...one such window in each space of pupil occupancy shall be marked with a sign identifying it as an emergency egress window.”



# Means of Egress

## • Smoke Zone Exiting

- MPS S109-3.b.3 -smoke zone exit not required if exit from space is directly related to exterior door, stair enclosure, or approved exit passageway
- Exit - Smoke Zone - NOT THRU POOL
- The pool cannot be used as an emergency egress route to conform to smoke zone exiting.
- Smoke Zone Exit – Spaces greater than 1500 SF
- MPS S104-5.e & Comm. Reg 155.7 – Space >1,500 sf - remote exits into separate smoke zones - except can be into same smoke zone if no point exceeds 50' straight line distance to an exit & rescue window provided

# Means of Egress

- **Press Box Exiting**

- The primary exit from a press box shall be a conventional stair or access to a noncombustible grandstand in which case the egress path from the press box must connect with a bleacher aisle.
- A safe remote (second) means of egress shall be provided from each floor level.
- The second means of egress may be a Rescue Window or Vertical Ladders to grade or access directly to bleachers or grandstands.
- Primary exit stairs need not be enclosed, risers, treads and handrails must comply with code.

# Means of Egress

- **Press box Roof:** Primary exit from a useable roof may be a ship's ladder if the roof has an area of 250 SF or less and a maximum occupancy of 5 persons. Otherwise a conventional stair is required. Maximum occupancy signs shall be posted.
- **Press boxes with an aggregate area greater than 500 SF** require handicap access (elevator) per BC 104.3.2. (Useable Roof area is included)
- **Stage Egress:** Where 2 exits are required in accordance with Section 1006.2, no fewer than one exit shall be provided on each side of a stage – Section 410.6.1.

# ADA Compliance - BC Chapter 11

## • Chapter 11 – Accessibility

**TPR**

- Scoping Requirements for accessible spaces.
- Requires conformance with: ICC A117.1-2009 Accessible and Usable Buildings and Facilities
- Accessible Route - ADA 2010 & BC 1104,
- Provide accessible route from HC parking & curb ramp to building entries and to all newly constructed or renovated sports fields, recreational features or playgrounds. BC 1106 Parking and passenger loading facilities: parking spaces and drop off aisles per code (8ft x 18ft min). Curb ramps for cross walks & wheelchair access through lots, across roads and onto all sidewalks.

# ADA Compliance - BC Chapter 11

- **Existing Building Code, Chapters 4, 7 & 14**
  - 410.6, 705.1 & 1401.2.5 “a facility that is altered shall comply with Chapter 11 of the IBC unless it is technically infeasible...alteration shall provide access to the maximum extent feasible”
  - So...all spaces that are altered must be made accessible (to the maximum extent feasible).
  - Section 705.2 “Where an alteration affects the accessibility to a, or contains an area of, primary function...the route to the space shall be accessible.” (the route shall include accessible toilets serving the area of primary function)
    - Exceptions: 1. if the costs of providing the route exceed 20% of the costs of the alterations to the primary function.

- **Fixtures and Built-in elements**

- If a room is required to be accessible then all elements in the room must be accessible.
- Science room demo table, kitchen sink & a work counter in a FACS Classroom.
  - Science Lab work stations, work & art rooms, technology shops, etc.
  - At least one sink if one or more sinks are provided in a room.
- Reception / service counters - ICC A117.1 Sect 904.3: provided with a Handicap accessible station with a maximum 34" high top.
  - Reception desks at main office areas, concession counters, Library circulation desks, etc.

# ADA Compliance

- **Toilet Rooms:**
  - Drawings must show all requirements; grab bar details, lavatory, urinal, water closet & shower stall dimensions and wheelchair access space & door clearances.
  - Room dimensions!
- **Swimming Pool Requirements:**
  - 2010 ADA Standards; Sect. 242.2 Swimming Pools.
  - Accessible means of entry shall be provided for swimming pools.
- **Bleachers, Auditoriums, Large Group Instruction Rooms, 1108.2.2:**
  - Wheelchair & companion spaces.
- **Locker – Rooms:**
  - accessible bench & lockers



# ADA Compliance

- **Ramps: Max. pitch 1:12** If a grade is greater than 1:20 slope then you must construct an accessible ramp, requires handrails, landings, handrail extensions, edge protection. These elements must be detailed to show compliance.
- **Stairs: 7" risers, 11" treads, handrails at proper heights and extensions at top and bottom of runs.**
- **Spaces: All primary function spaces must be accessible. In a school that means practically every room. Exceptions: in existing buildings, rooms that are difficult to make accessible but the function can be conducted in accessible rooms.**

# Roof Assemblies - BC Chapter 15

- **New Roof compliance:**
  - **Minimum Pitch: Single-ply, Spray Poly. Foam roofs, Liquid applied roofs - 1/4" per ft.**
  - **Pitch – Re-Roofing 2015 Existing Building Code (EBC) Section 706.1 Exception: Provide “positive drainage”. (No minimum pitch required) look for tapered insulation @ 1/8" per foot or existing sloped structure**
  - **Secondary drainage ( emergency overflow) roof drains or scuppers shall be provided where water will be entrapped if the primary drains allow buildup for any reason.**

# Roof Assemblies

- **Recovering vs Replacement:**
  - **Existing Building Code 706.1 General.** Materials and methods of application used for recovering or replacing an existing roof covering shall comply with the requirements of Chapter 15.
  - **EB 706.3** New roof covering shall not be installed without first removing all existing roof coverings down to the deck where any of the following conditions occur: ..roof is water soaked (deteriorated and not adequate); where the existing roof is wood shake, slate, clay, cement or asbestos cement tile: where the existing roof has 2 or more layers of any type of roof covering: (with exceptions)

# Roof Assemblies

- **Various Conditions:**

- **Structural Evaluation for Added Loads - EBC Section 707.2**
- **Bracing for Masonry Parapets – EBC Section 707.3.1 (seismic design cat. D, E, F)**
- **Roof - Ballasted low-slope uplift and ballast material requirements - IBC Section 1504.4**
- **Roof - Edge Securement IBC Section 1504.5 Test Methods RE-1, RE-2 & RE-3 of ANSI/SPRI ES-1,**
- **Photo-Voltaic Panels: Sign off on the SED structural responsibility checklist - A/E takes responsibility for the analysis and design for the solar PV roof loads.**

# Roof Assemblies

- **Coated Foam: 10 year warranty on re-coated foam roofs /  
New coated foam - need 15 year warranty**
- **Insulation requirements - Re-roof**
- **(2016) & (2017) Energy Code Supplement Section C106.2  
Types of roofing work where the 2016 International Energy  
Code does NOT apply:**
  - **Where the existing roof, wall or floor cavity is not exposed;**
  - **reroofing for roofs where neither the sheathing nor the  
insulation is exposed;**
  - **However, roofs without insulation in the cavity and where the  
sheathing or insulation is exposed during reroofing shall be  
insulated above or below the sheathing**

# Roof Assemblies

- **Roof Insulation Values – Energy Code:**
  - (2016) IEC Section C402.1 Building Envelope Requirements General (Prescriptive)-Comply w/ R-value method, U factor method or component performance method of C402.1.5
  - C402.1.3: R value method; 2015 IEC Table 402.1.3 based on the climate zone.
  - Zones 4-6 with Insulation entirely above the deck: R-30, Metal Buildings R19 & R11 LS
  - Zone 4 & 5 attic insulation = R-38, Zone 6 = R-49
  - Section C402.1.4, Assembly U factor method; Table C402.1.4
  - Skylights Insulation requirements IEC E402.4.1. Skylights limited to 3% of the gross roof area & max. U-factor of .50, (Climate Zones 4 - 6).

# Roof Assemblies

- **Various Requirements:**
  - **Class A Fire Classification -BC 1505.1**
  - **MPS S205-3.c.4 Class A roof classification.**
  - **BC 1507 Requirements for Roof Coverings**
  - **BC 1508.1- Roof Insulation (general requirements and standards for above deck insulation)**
  - **BC 1509.1 - Radiant barrier installed above deck - roof covering and system must comply with FM 4550 or UL 1256**



# Roof Assemblies

- **Thermal Barrier - Low Slope Roofs:**
  - Foam plastic insulation continuous above deck.
  - IBC Chapter 26, Section 2603.4.1.5 Roofing; thermal barrier not required for foam plastic insulation that is a part of a Class A, B or C roof-covering assembly, installed in accordance with the code and the manufacturer's instructions and is either constructed as described in Item 1 or tested as described in Item 2. (Item 1 - roof assembly is separated by not less than .47 inch thick wood, Item 2 roof assembly is tested per NFPA 276 or UL 1256). Check Specifications!
  - Many systems use a ½" or 5/8" gypsum underlayment deck material.

# **Roof Assemblies**

- **Wind Uplift Resistance:**

- **IBC Chapter 16, Section 1609.5.1 uplift resistance - must meet pressures designed in accordance with ASCE 7.**
- **Pressures determined by A/E & put on documents for contractor/roof manufacturer to meet.**
- **BC 1603.1.4 Wind Design Data:**
  - 1. Ultimate design wind speed (3-second gust)**
  - 2. Risk Category**
  - 3. Wind exposure**
  - 4. Applicable internal coefficient**
  - 5. Wind pressures for external component and cladding**

# Structural Design - BC Chapter 16

- **Structural Information required on the Construction Documents:**
  - IBC Chapter 16, Section 1603
  - 1603.1 – show size, section and locations of structural members
  - Floor & Roof live loads, Snow Load data
  - Wind design data – 1603.1.4
  - Earthquake design data
  - Geotechnical
  - Flood design data
  - Special loads

# Structural Design Data

## B. DESIGN LOADS

### 1. GRAVITY – DEAD LOADS

<u>AREA</u>	<u>PSF</u>
CLASSROOM ADDITION ROOF	25 PSF

### 2. GRAVITY – FLOOR LIVE LOADS

<u>AREA</u>	<u>PSF</u>
SLAB-ON-GRADE, TYPICAL U.N.O.	100 PSF

### 3. GRAVITY – ROOF LIVE LOADS

- a. ROOF LIVE LOAD – NEW ADDITIONS 31 PSF+ DRIFTING (WHERE APPLICABLE)  
(SNOW LOADING)  
\* EXISTING ROOF DESIGN SNOW LOAD = 31 PSF+ DRIFTING (BUILDING CATEGORY III)

- b. ROOF SNOW LOAD 31 PSF+ DRIFTING (WHERE APPLICABLE)

- {1} GROUND SNOW LOAD ( $P_g$ ) = 40 PSF  
{2} EXPOSURE FACTOR ( $C_e$ ) = 1.0 (EXPOSURE B, PARTIALLY EXPOSED)  
{3} THERMAL FACTOR ( $C_t$ ) = 1.0  
{4} IMPORTANCE FACTOR ( $I$ ) = 1.1

### 4. WIND LOADS

- a. ULTIMATE DESIGN WIND SPEED: 120 MPH  
b. WIND IMPORTANCE FACTOR 1.0  
c. BUILDING CATEGORY III  
d. WIND EXPOSURE CATEGORY B  
e. BUILDING HEIGHT COEF. 1.0

- f. COMPONENTS AND CLADDING DESIGN WIND PRESSURES (PRESSURES GIVEN TO  
ACT IN EITHER DIRECTION)

# Finishes

## • Interior Finish

- **IBC Chapter 8 Section 803. Interior floor finish & and floor covering, wall finishes: see Table 803.1**
- **Sect. 804 Interior floor finish and covering exception: Floor coverings of a traditional type, such as wood, vinyl, linoleum or terrazzo, & resilient floor covering materials not comprised of fibers.**
- **MPS Section S205 Plastic: requirements for finish ratings. Section S205-3 and Table S205-3 should be reviewed for plastic materials such as skylights, toilet partitions, Table S205-3 has footnote “Plastic toilet partitions...” Conclusion Class C is OK**

# Plumbing, Mezzanines, FRP Doors

- **Various Code Requirements:**

- **PC405.3.1 Water closet compartments shall not be less than 30" x 60"**
- **Urinal Partitions: PC 405.3.5 – urinal screens required**
- **PC 405.3.1 Water Closets, urinals, lavatories and bidets: separate by 30" center-to-center spacing**
- **Mezzanines in F, H and S occupancies: If area is not more than 250 SF - alternating tread device per 1011.14 – is permitted**
- **FRP Doors: (Exterior) with Plastic Foam Insulation - must comply with BC §2603.4.1.7**
- **Assembly Area Seating Meets California Technical Bulletin 117-2013**

# Pool Alarms, Stages

- **Pool Alarms:**
  - Requirements in 2017 Uniform Code Supplement Section 3.27 which amends BC 3109
- **Stages, Platforms – BC Section 410**
  - 410.5.1 – Stage shall be separated from dressing rooms, scene docks...workshops, storerooms appurtenant to the stage by fire barriers not less than 2 hour for stage heights greater than 50 feet and 1 hour for stage heights of 50 feet of less
  - 410.5.3 Separation from each other: Dressing rooms scene docks, workshops, storerooms shall be separated from each other by ...1 hour fire barriers.



# Glazing

- **Replacement Glazing:**

- EBC 602.3 "....Replacement Glazing in Hazardous locations shall comply with safety glazing requirements of the IBC..." (conforming to CPSC 16 CFR 1201) Traditional wire glass does not comply

- **Safety Glazing – BC Section 2406.4**

- Safety standard: CPSC 16 CFR 1201
- 2406.4 defines hazardous locations. Also Commissioner's Regulation 155.7(c) & MPS S204-1 defines additional hazardous locations: check door schedule, interior windows, door types and glazing specifications.

# Turf, Windows

- **Synthetic Turf:**

- Certification from the manufacturer that lead or lead chromate is not used in the manufacture

- **Windows – Insulated Panels**

- BC Section 2603.4 - ½” gyp. Bd. (thermal barrier) on interior of foam plastic insulated opaque panel, EXCEPT 1-story bldgs with sprinkler per BC2603.4 & 2603.5.21.4 OR if special approval per 2603.9 (Insulation tested to meet one of four fire tests)
- Window Thermal Requirements: 2017 Energy Code Supplement; Table C402.4, U Factors: Fixed Fenestration: .38 for zone 4, 5 - .36 for Zone 6,
- Operable: .45 for zone 4, 5 - .43 for zone 6. SHGC .40

# Asbestos

- **Asbestos Designer: Licensed P.E. or R.A.**
  - **Certification letter: States that no ACBM shall be used in the construction. Also states “Work will NOT involve known ACBM as evidenced by bulk or destruct testing” - OR - work involves known ACBM & will be done in accordance with Industrial Code Rule #56**
- **Construction Documents:**
  - **Scope of work must be clearly indicated: quantities, areas and locations of all types of asbestos materials to be abated must be on drawings - Dwgs and specs. must be signed and sealed by the asbestos designer**

# Asbestos

- **Specifications: Require the following standards:**
  - EPA Title 40 CFR, Part 763, AHERA regulations
  - NYS DOL Code Rule 56, Asbestos Licensing Handling
  - OSHA Title 29 CFR, Part 1910 (Specific Sections, 1001 asbestos, 134 Respiratory Protect, 1926.2, and 1926.1200)
  - EPA Title 40 CFR, Part 64
  - NYS DEC, Title 6, Part 364
  - NYS DOH, Title 10, Part 73
  - (TEM) air clearance must be specified (as req'd by AHERA)

# **Modulars & Shipping Containers**

- **Modular Building - Code Requirements: 2017 Uniform Code Supplement, Section 106**
  - Insignia of Approval by the Secretary of State submitted for approval
  - Compliant with the Building Code and the requirements of the SED MPS (typical occupancies, E, B & S).
  - Temporary Modular Space: If used for swing space - Building still needs to be submitted and code compliant. If E occupancy see MPS.
  - Shipping Containers – Minimum Requirements: ventilation, free egress from inside, approved site
  - See Newsletter 104 - Steel Shipping Containers Used for Storage Buildings

# Extra Work 😊

- **BC 410 Stages: Proscenium Curtain, Appurtenant room separations, sprinkler requirements**
- **BC 414 Hazardous Materials Table 414.2.5 Maximum Allowable Quantities**
- **BC 416 Application of Spray Finishes (Spray Booths)**
- **BC 721 – Prescriptive Fire Resistance – Tables use to determine materials used to construct beam/column protections and partition floors and roofs ratings**
- **BC 1011 Stairways. Risers and Treads, Handrails required Handrail extensions**
- **BC 1023 Interior Exit Stairways; fire ratings of enclosures, exit discharge, openings – “from normally occupied spaces”**

# Review Reminders ☺

- **Drawings & Specs must be kept Bound and orderly. Including Addenda.**
- **Variances: Confirm approved by NYSED. Full application and DOS Approval shall be kept with the documents.**
- **Addenda: Remind the designer: revisions should be clouded**
  - **Paper/Hard Copy Reviews, Signed/Seal Addendum Document required, full size S/S drawings - kept organized/together**
  - **Electronic Reviews, All revisions or comments shown on new version of drawing uploaded to LF – No Addenda responses are to be found in “Fields, History/Notes” area of LF. Addendum Document uploaded into “Other Documents” folder**
- **TPR Comments: Do not comment on non-code issues. Constructability comments restricted to missing information/systems. No grammar comments, No suggestions – reviewers are not to assist with design**



# Design Professional Reminders ☺

- Drawings & Specs must be securely bound, including Addenda.
- Provide **reasonably sized** bound sets of drawings – just because the printer can bind them does not mean we can lift them!! Please create more than one volume of drawings if large set.



# Design Professional Reminders ☺

- **Variations:**

- **Must be approved by NYSED. Full application shall be submitted to SED for review and possible support.**

- **Addenda: Revisions should be clouded**

- **Paper/Hard Copy Reviews:**

- **Signed/Sealed Addendum Document required**
- **Full size signed/sealed drawings**

- **Electronic Reviews:**

- **Show all revisions or comments on new version of drawing or spec uploaded to LF**
- **Addenda responses and revisions are not to be placed in “Fields” area of Laserfiche**
- **Addendum Document is Optional, upload it into “Other Documents”**

**We need to work as partners to ensure safe,  
healthy, comfortable, and  
exceptional educational facilities  
which promote effective and efficient learning  
for all New York State students.**

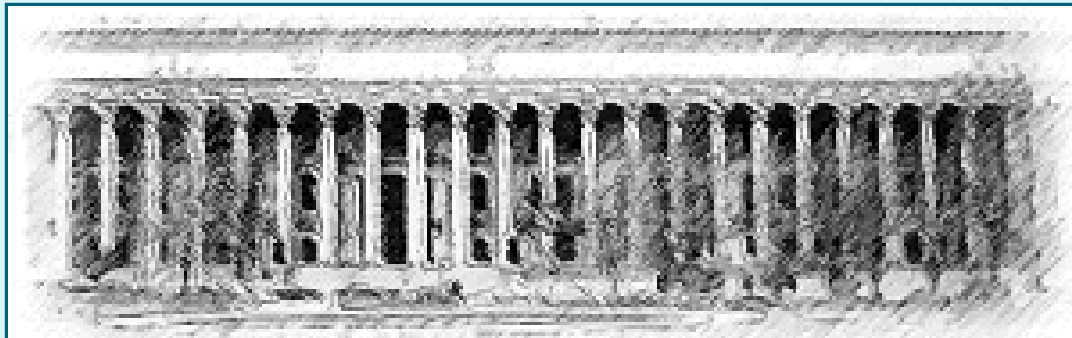


# Thank You!

**Office of Facilities Planning**

**518-474-3906**

**[www.p12.nysed.gov/facplan](http://www.p12.nysed.gov/facplan)**



The New York State Education Department