New York State Department of State
Division of Building Standards and Code

EXISTING BUILDING CODE: PERFORMANCE ALTERNATIVE

Objectives

- Understanding what the performance alternative is
- Identifying qualifiers to use it
- Overview of process
- Discussion on projects that benefit
- Introduction of forms

What is the performance alternative?

- A relative comparison document to value attributes that are below new code requirements as well as overbuilt items
  - Recognizes legacy attributes
    - Building height and area
    - Compartmentation
    - Vertical opening protections
  - Values are based upon:
    - Severity of nonconformance
    - Latitude in code compliance
    - Comparative protection goals

What is the performance alterative?

- Can be used for repairs, alterations, changes of occupancy, and additions
  - Really only has value for change of occupancy
  - Other sections of the Existing Building Code provide much more flexibility for repairs and alterations

Attributes that are evaluated

- Building area
- Building height
- Compartmentation
- Fire separations
- Corridors
- Vertical openings
- HVAC system
- Smoke control
- Fire detection
- Fire alarm system
- Means of egress
- Dead ends
- Travel distance
- Elevator control
- Emergency lighting
- Mixed occupancy
- Sprinkler
- Standpipe
- Incidental uses

Quick example (calculations discussed later)

- A two-story row building has a restaurant downstairs and a residential unit upstairs. The owner wishes to convert the upstairs to expand the restaurant.
- The owner would prefer not to install a sprinkler system
- Particulars
  - Type IIIb construction
  - 4,500 square foot per floor
  - Two exits from grade for first floor
  - Second floor to utilize new unenclosed stair and existing exterior stair to grade
  - Occupant load to be 175 people upstairs

Quick example (calculations discussed later)

- Area: 9,500 (allowed) – 4,500 (actual)=
  - 5,000 sf divided by 1,200 = +4.16 points
- Building: 2 (allowed) – 2 (actual)=
  - 0 sf divided by 12.5 = 0 points
- No sprinkler when required = -4 points
- Travel distance: 200 (allowed) – 125 (actual)
  - (allowed-actual)/allowed X 20 = +7.5 points

If you modified else to meet the Building Code requirements, the relative size of the building compared to the construction type provides value of reusing buildings!

Sounds great! What's the catch? (rules of engagement)

- Must be an existing building!
  - That is a legally existing building
    - Either has a certificate of occupancy for the current use or it's use has been continuous prior to the adoption of any code (at least 1982)
    - This would include the multiple residence law
- Must be structural analyzed and meet the minimum load requirements of the Building Code (1301.4.2)
  - No 5% allowances

Sounds great! What's the catch? (rules of engagement)

- Elevators must meet Phase 1 recall and Phase 2 fire service operation if over 25 feet (1301.6.14)
- If sprinkler and standpipe systems are both required, one must be provided (1301.6.17 and 1301.6.18)
  - This would get you back to a sprinkler system in an area without a 'really good' municipal water supply due to the unsprinklered standpipe requirements

Sidebar: Using real numbers

- The formulas use real numbers to the values, not absolute numbers
- Example (building area):
- 7,500 (actual) – 6,000 (allowed) =
- -1,500, divided by 1,200 = -1.25 points
- The biggest mistakes is the assignment of the positive value when it should be negative!

The 19 steps- A brief overview

- Occupancy independent
  - Building height-
    - For buildings at or lower than Building Code:
      - +1 point per every 12.5 feet or every story
    - For buildings taller than permitted:
      - -1 point per every 12.5 feet or every story multiplied by a construction factor
  - Building area-
    - 1 point (+ or -) for every 1,200 square feet from the Building Code allowances

The 19 steps- A brief overview

- Vertical openings (not permitted by Building Code)
  - +1 point for 1 hour, +2 points for 2 hour
  - Less than 1 hour: -1 points multiplied by construction factor
  - None: -2 points multiplied by construction factor
- Travel distance
  - 1 point (+ or -) for every 20 feet for the Building Code allowances
- Incidental uses
  - Assume that the building will meet new requirements
    - Only negative points for nonconformance on a chart

The 19 steps- A brief overview

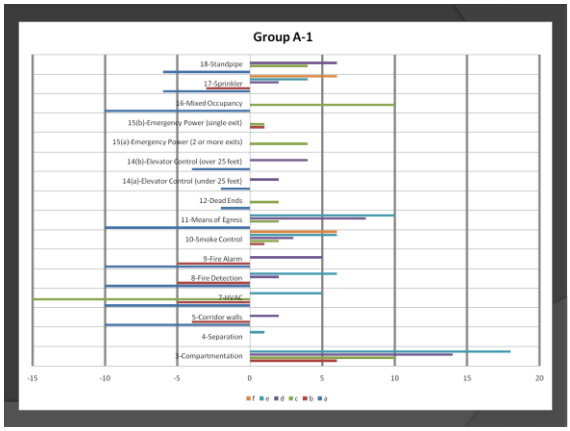
- Occupancy based items

TABLE 1301.6.4 SEPARATION VALUES

OCCUPANCY	CATEGORIES				
	a	b	c	d	e
A-1	0	0	0	0	1
A-2	-5	-3	0	1	3
R	-4	-2	0	2	4
A-3, A-4, B, E, F, M, S-1	-4	-3	0	2	4
S-2	-5	-2	0	2	4

The 19 Steps- A brief overview

- Categories
  - Can be a-c through a-f
  - Generally a is the Building Code requires something and the building doesn't have it
  - The highest category is the building has an attribute that the Building Code doesn't require



Step #3- Compartmentation

TABLE 1301.6.3 COMPARTMENTATION VALUES

OCCUPANCY	CATEGORIES				
	a Compartment size equal to or greater than 15,000 square feet	b Compartment size of 10,000 square feet	c Compartment size of 7,500 square feet	d Compartment size of 5,000 square feet	e Compartment size of 2,500 square feet or less
A-1, A-3	0	6	10	14	18
A-1	0	4	10	14	18
A-4, B, E, S-2	0	5	10	15	20
F, M, R, S-1	0	4	10	16	22

Step #4- Dwelling and Tenant Separations

TABLE 1301.6.4 SEPARATION VALUES

OCCUPANCY	CATEGORIES				
	a	b	c	d	e
A-1	0	0	0	0	1
A-2	-5	-3	0	1	3
R	-4	-2	0	2	4
A-3, A-4, B, E, F, M, S-1	-4	-3	0	2	4
S-2	-5	-2	0	2	4

Single tenant gets 0 points

- A- No fire partitions or rated doors
- B- Fire partitions and floor less than 1-hour rated
- C- Fire partitions and floors 1-hour
- D- 1-hour walls and 2-hour floors
- E- 2-hour walls and floors

Step #7- HVAC system

- A- Plenums not in accordance with Mechanical Code Section 602: -10
- B- Air movement in egress elements not in accordance with Building Code Section 1017: -5
- C- If a and b or both applicable: -15
- D- a and b both not applicable: 0
- E- Systems serving single stories or central boiler/chiller without ductwork connected two or more stories +5

Step #8- Smoke detection

TABLE 1301.6.8 AUTOMATIC FIRE DETECTION VALU

OCCUPANCY	CATEGORIES				
	a	b	c	d	e
A-1, A-3, F, M, R, S-1	-10	-5	0	2	6
A-2	-25	-5	0	5	9
A-4, B, E, S-2	-4	-2	0	4	8

- A- None
- B- Duct detection
- C- Ducts detection per the Mechanical Code
- D- Smoke detectors throughout common spaces
- E- Smoke detectors throughout

Step #9- Fire Alarm

TABLE 1301.6.9 FIRE ALARM SYSTEM VALUES

OCCUPANCY	CATEGORIES			
	a	b[a]	c	d
A-1, A-2, A-3, A-4, B, E, R	-10	-5	0	5
F, M, S	0	5	10	15

- A- None
- B- Pull boxes and bells
- C- Fire Alarm per Building Code
- D- Category C plus EVACS and fire command center

Step #10- Smoke Control

TABLE 1301.6.10 SMOKE CONTROL VALUES

OCCUPANCY	CATEGORIES					
	a	b	c	d	e	f
A-1, A-2, A-3	0	1	2	3	6	6
A-4, E	0	0	0	1	3	5
B, M, R	0	2[a]	3[a]	3[a]	3[a]	4[a]
F, S	0	2[a]	2[a]	3[a]	3[a]	3[a]

For B,F,M,R, and S, must have a smoke detection system

'Natural Openings' is 20 square feet per 50 linear feet

'Old' smoke control system is 6 air changes per hour

- A- None
- B- Sprinkler system and natural openings
- C- Enclosed stairway from each floor and natural openings
- D- Smokeproof stairway plus natural openings
- E- Sprinkler system plus 'old' smoke control system

Step #11- Means of Egress

TABLE 1301.6.11 MEANS OF EGRESS VALUES

OCCUPANCY	CATEGORIES				
	a[a]	b	c	d	e
A-1, A-2, A-3, A-4, E	-10	0	2	8	10
M	-3	0	1	2	4
B, F, S	-1	0	0	0	0
R	-3	0	0	0	0

To qualify, means of egress must meet # and capacity of exits; current occupant load, emergency escape and rescue opening, exit discharge, escalator/elevator usage, common path, and intervening space requirements

- A- Egress capacity and # of exits achieve by fire escape
- B- Building complies with Building Code 1004 and 1019
- C- Meets 125% of capacity and 1019
- D- Number of exits exceeds 1015
- E- Meets D and E

Step #12- Dead Ends

- A- 35 feet in nonsprinklered, 70 feet in sprinklered:
  -2 points
- B- 20 feet in nonsprinklered, 35 feet in sprinklered:
  0 points
- C- No dead ends, or ratio is more than 2.5 to 1

Step #14- Elevator

TABLE 1301.6.14 ELEVATOR CONTROL VALUES

ELEVATOR TRAVEL	CATEGORIES			
	a	b	c	d
Less than 25 feet of travel above or below the primary level of elevator access for emergency fire-fighting or rescue personnel	-2	0	0	+2
Travel of 25 feet or more above or below the primary level of elevator access for emergency fire-fighting or rescue personnel	-4	NP	0	+4

- A- No elevator
- B- Elevator without Phase I and II
- C- Elevator with Phase I and II per the Fire Code, or a single story building
- D- All meet category C, or where allowed by B, and at least one elevator meets the Building Code to all floors

Step #15- Egress Lighting

TABLE 1301.6.15 MEANS-OF-EGRESS EMERGENCY LIGHT

NUMBER OF EXITS REQUIRED BY SECTIONS 1018.1 AND 1018.2 OF THE *BUILDING CODE OF NEW YORK STATE*	CATEGORIES		
	a	b	c
Two or more exits	NP	0	4
Minimum of one exit	0	1	1

A- Egress lighting and exit signs not provided with emergency lighting

B- Egress lighting and exit signs meet Building Code 2702

C- Emergency power to the site or building

Step #16- Mixed Occupancy

TABLE 1301.6.16 MIXED OCCUPANCY VALUES[a]

OCCUPANCY	CATEGORIES		
	a	b	c
A-1, A-2, R	-10	0	10
A-3, A-4, B, E, F, M, S	-5	0	5

A- Minimum 1-hour barriers

B- Per Building Code

C- Twice the Building Code

This is just for separated uses. For unseparated uses, assign a value of 0 and do an evaluation for each occupancy type

Step #17- Sprinkler

TABLE 1301.6.17 SPRINKLER SYSTEM VALUES

OCCUPANCY	CATEGORIES					
	a[a]	b[a]	c	d	e	f
A-1, A-3, F, M, R, S-1	-6	-3	0	2	4	6
A-2	-4	-2	0	1	2	4
A-4, B, E, S-2	-12	-6	0	3	6	12

Not provided also means wrong type of system or not adequate to protect the hazard

A- Required throughout, not provided

B- Required in a portion of the building, not provided

C- Not required, not provided

D- Required in a portion, installed to the standard at time of installation, maintained and supervised by Building Code

E- Required throughout, provided throughout to Building Code

F- Not required, provided throughout to Building Code

Step #18- Standpipe

TABLE 1301.6.18 STANDPIPE SYSTEM VALUES

OCCUPANCY	CATEGORIES			
	a[a]	b	c	d
A-1, A-3, F, M, R, S-1	-6	0	4	6
A-2	-4	0	2	4
A-4, B, E, S-2	-12	0	6	12

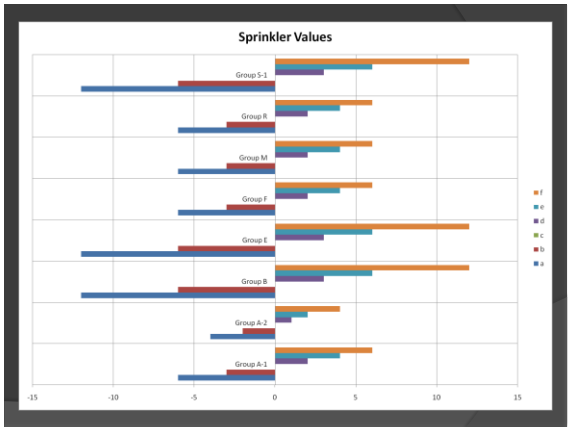
If both standpipes and sprinklers are required, one must be provided

A-Required, not provided or not in compliance with Building Code 905.3

B- Not required, not provided

C- Required, provided

D- Not required, provided



Multiple Story

	Fire Safety	Means of Egress	General Safety	Modifications
1-Building Height				
2-Building Area	(if positive, divide by 2)			
3-Compartmentation				
4-Separation				
5-Corridor walls				For those that qualify for Category c or d, corridors not providing at least one-half the travel distance for all occupants on a floor shall use Category b
6-Vertical Openings				
7-HVAC				
8-Fire Detection				
9-Fire Alarm				For category b values, add +2 if the building has an automatic sprinkler system that is monitored
10-Smoke Control				For Groups B, F, M, R, and S; buildings without a full smoke detection system (excluding tenant spaces and dwelling/sleeping units) shall receive a maximum of 0 points
11-Means of Egress	XXX			For buildings utilizing category a (fire escapes), deduct an additional 10 points for buildings over 6 stories. **MUST MEET MINIMUM REQUIREMENTS**
12-Dead Ends	XXX			Linear extrapolation premitted for distances between categories
13- Travel Distance	XXX			
14(a)-Elevator Control (under 25 feet)	XXX			
14(b)-Elevator Control (over 25 feet)	XXX			
15(a)-Emergency Power (2 or more exits)				
15(b)-Emergency Power (single exit)				
16-Mixed Occupancy		XXX		Linear extrapolation premitted for distances between categories
17-Sprinkler		Divide by 2		Cannot use category a or b if item 18 uses category a
18-Standpipe				Cannot use category e if item 17 uses category e or b
19- Incidental Use				

	Fire Safety (FS)	Means of Egress (ME)	General Safety (GS)
Total Points			

OCCUPANCY	FIRE SAFETY (MFS)	MEANS OF EGRESS (MME)	GENERAL SAFETY (MGS)
A-1	28	31	31
A-2	21	32	32
A-3	22	33	33
A-4, E	23	40	40
B	38	40	40
F	24	34	34
M	23	40	40
R	21	38	38
S-1	19	29	29
S-2	29	39	39

FS-MFS		If greater or equal to 0, Pass
ME-MME		If greater or equal to 0, Pass
GS-MGS		If greater or equal to 0, Pass

Example: Can you have a 3-story wood office building without a sprinkler system?

- Particulars
  - Vb construction, previously a hotel
  - 6,000 per floor
  - 2 hour corridor to remain
  - 2 hour rated stairways to remain
  - Vestibules to stairways to remain
  - 1-hour tenant separations to remain
  - Elevator is Phase I and II
  - No ducted HVAC, all separate heating units
  - No dead ends
  - Travel distance to be 140 feet
- Optional work that could be done:
  - Full fire alarm and detection system
  - Provide building generator
  - All incidental use spaces to be rated

Scores

- Area: (9000-6000)/1200
  - +2.5
- Height (3-2) x 7.0
  - -7
- Compartmentation
  - +10
- Tenant separations
  - -3
- Corridor walls
  - +5
- Vertical openings
  - +2
- HVAC
  - +5
- Smoke Control
  - 0
- Means of egress
  - 0
- Dead Ends
  - +2
- Travel distance
  - +6
- Elevator
  - 0
- Mixed use
  - 0
- Sprinkler
  - 0
- Standpipe
  - 0

Short:
Fire Safety 16.75
Means of Egress 17.5
General Safety 17.5

What to do?

- Fire Detection
  - Common areas +4
  - All areas +8
  - Also gives +3 for smoke control
- Fire Alarm
  - Provided per code 0
  - With EVACS and command center +5
- Generator +4
- To make up 17.5 points: the following would need to be installed
  - Full smoke detection system (8 + 3 points)
  - Full fire alarm system with EVACS and fire command center (5 points)
  - Generator (4 points)

YES! You could have a 3 story office building without a sprinkler system

Could you do 4 stories?

- Height deduction for another -7 points
- Area would go down (6750-6000)/1200 -1.8 points
- Standpipe now required -12 points unless provided (then it would be +6)
- Sprinkler now required -12 points
- This is an additional -33 points that would need to be made up in difficult categories like fire barrier installation and stairways

When to use: Practically

- Single story
- Large margin under allowed area
- To get another story in robust buildings
- Buildings with enclosed stairways and vertical openings
- Non-wood frame and ordinary buildings
- To rationalize not installing sprinklers or standpipes
- Buildings with extra exits

When to use

- Old ducted and plenum HVAC systems
- Buildings that needed the allowances against seismic
- Buildings in high-risk areas (snow, wind, flood)
- Buildings needing exceptions for historic purposes, accessibility, or other Building Code items

When not to use

Questions?

- Forms?
- Navigation?
- Purpose?