

 *Connecticut*
State Building and Fire Codes 

Building Height and Area Limitations

Office of Education and Data Management
Division of Fire, Emergency and Building Services
Department of Public Safety
State of Connecticut

Career Development Spring 2010

Objective

- Present and discuss Building Height and Area Limitations Issues and their effect on building and fire code requirements.
- Discuss the importance of proper identification of use and occupancy along with construction type on building height and area.

Special Thanks to the International Code Council
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Agenda

- Building Height and Area
- Use and Occupancy
- Types of Construction
- Fire Rated Construction
- Fire Protection Systems
- Means of Egress
- Work through a series of examples associated with building height and area.

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Code References

Building Code Reference

- 2003 International Building Code portion of the 2005 State Building Code (2009 Amendments)
 - Building Height and Area – Chapter 5
 - Use and Occupancy – Chapter 3
 - Types of Construction – Chapter 6
 - Fire Resistance Rated Construction – Chapter 7
 - Fire Protection Systems – Chapter 9
 - Means of Egress – Chapter 10

Fire Code Reference

- 2005 Connecticut Fire Safety Code (2009 Amendments)
 - Part III – New Construction, Renovations & Change of Use
 - Part IV – Existing Building / Occupancies

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Introduction Historical Perception



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Introduction Modernization



General Building Heights and Areas

(IBC Chapter 5)

- The Height and Area for buildings of different construction types shall be governed by the intended use of the building.
- Shall not exceed the limits in Table 503 except as modified by the code.
- Reference IBC Chapter 5, Section 503

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Table 503

Allowable Height and Building Areas

- Height limitations are shown as stories and feet above grade plane
- Area limitations as determined by definition of “area, building” per floor
- Table 503 establishes base values that are the starting points used to determine height and areas based on the type of construction and the group classification.

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Format of Table 503

Allowable Height and Building Areas

GROUP	HGT(Feet) HGT(S)	Type of Construction									
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V		
		A	B	A	B	A	B	HT	A	B	
A-1	S	UL	160	65	55	65	55	65	50	40	
	A	UL	5	3	2	3	2	3	2	1	
A-2	S										
	A										
A-3	S										
	A										
####											

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Major Factors for Determining Height and Area

- **GROUP**
 - Use and Occupancy Classifications
- **TYPE OF CONSTRUCTION**
 - Based on the ability of the building to resist fire
- Automatic Sprinkler System
- Frontage or Open Perimeter

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Use and Occupancy Classification

- The occupancy category of a building is essential to the correct application of Building and Fire Code requirements



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Occupancy Classification
(IBC 302.1) (CSFC Part III - 202)

Groups:

• A — Assembly	• I — Institutional
• B — Business	• M — Mercantile
• E — Education	• R — Residential
• F — Factory	• S — Storage
• H — High Hazard	• U — Utility

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What next?

- Incidental Use Areas
- Accessory Use Areas
- Mixed Occupancy
- Separated Uses
- Separate Buildings



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Incidental Use Areas
(IBC 302.1.1) (CSFC Part III - 202)

- Incidental Use
 - IBC Table 302.1.1
 - Occupancy different from principal occupancy



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Accessory Use Areas (302.2)

- Accessory Use
 - Section 302.2
 - Cannot exceed 10% of floor area nor exceed Table 503



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Mixed Occupancy (IBC 302.3)

- Nonseparated uses

SUPPRESSION REQUIRED

<u>WAREHOUSE</u> (GROUP S-1)	<u>OFFICE</u> (GROUP B)
---------------------------------	----------------------------

A = 15,000 SQ.FT.

SECTION 302.3.1 NONSEPARATED USES
MOST RESTRICTIVE HEIGHT AND AREA OF THE TWO USES APPLIES
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Mixed Occupancy (IBC 302.3)

- Separated uses

<p>3-HOUR FIRE BARRIER</p> <p style="text-align: center;"><u>WAREHOUSE</u> A = 8,000 SQ.FT. NO SUPPRESSION</p>	<p style="text-align: center;"><u>OFFICE</u> A = 7,000 SQ.FT. NO SUPPRESSION</p>
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SECTION 302.3.2 SEPARATED USES
HEIGHT AND AREA BASED ON RATIO OF FLOOR AREAS
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Mixed Occupancy (IBC 302.3)

- Separated buildings

<p style="text-align: center;">HEIGHT AND AREA IN ACCORDANCE WITH GROUPS S-1</p> <p>3-HOUR FIRE WALL</p> <p style="text-align: center;"><u>WAREHOUSE</u> A = 8,000 SQ. FT. NO SUPPRESSION</p>	<p style="text-align: center;">HEIGHT AND AREA IN ACCORDANCE WITH GROUP B</p> <p style="text-align: center;"><u>OFFICE</u> A = 7,000 SQ. FT. NO SUPPRESSION</p>
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SECTION 705 SEPARATED BUILDINGS
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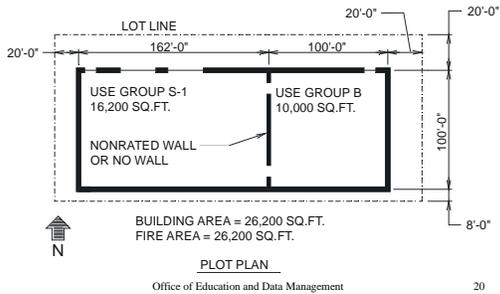
Mixed - Group A-3 and R-1



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Nonseparated Uses (302.3.1)



A Four-Step Process

- Determine the occupancy classifications
- Determine the minimum type of construction
- Apply the most restrictive provisions
- Apply all other requirements of the code

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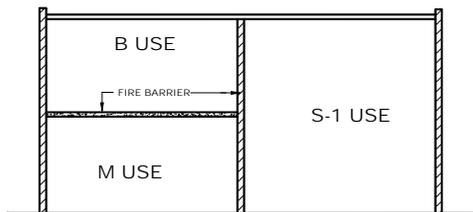
Mixed - Group M and R-2



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Separated Uses (302.3.2)



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Separated Uses

$$\frac{\text{Actual area-1}^{\text{st}} \text{ occupancy}}{\text{Allowable area-1}^{\text{st}} \text{ occupancy}} + \frac{\text{Actual area-2}^{\text{nd}} \text{ occupancy}}{\text{Allowable area-2}^{\text{nd}} \text{ occupancy}} \leq 1$$

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Separated Uses (302.3.2)

- Use separated from adjacent areas by fire barriers walls or horizontal assemblies or both having a fire-resistance rating according to Table 302.3.2

Table 302.3.2 (Partial)

REQUIRED SEPARATION OF OCCUPANCIES (HOURS) ^a										
USE	A-1	A-2	A-3	A-4	A-5	B	E	F-1	F-2	***
A-1	-	2	2	2	2	2	2	3	2	
A-2	-	-	2	2	2	2	2	3	2	
A-3	-	-	-	2	2	2	2	3	2	
A-4	-	-	-	-	2	2	2	3	2	
A-5	-	-	-	-	-	2	2	3	2	
B	-	-	-	-	-	-	2	3	2	
E	-	-	-	-	-	-	-	3	2	
F-1	-	-	-	-	-	-	-	-	3	

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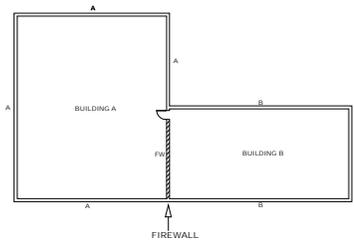
Separate Buildings



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Separate Buildings (705.1)



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Separate Buildings (705)

- Section 705 – Fire Walls
- Fire-resistance rating: Not Less than that required by Table 705.4

Table 705.4

FIRE WALL FIRE-RESISTANCE RATINGS

Group	Fire-Resistance Rating (hours)
A, B, E, H-4, I, R-1, R-2, U	3 ^a
F-1, H-3 ^b , H-5, S-1	3
H-1, H-2	4 ^b
F-2, S-2, R-3, R-4	2

a. Walls shall be not less than 2 hour fire-resistance rated where separating buildings of Type II or V construction.
 b. For Group H-1, H-2 or H-3 buildings, also see Sections 415.4 and 415.5.

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Types of Construction (IBC Chapter 6)

- Based on the ability of the building to resist fire
- Types I, II, III, IV and V



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Type I




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Type II



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Type I and II (602.2)

- Types IA, IB, IIA and IIB
- Noncombustible
- Type I – all structural members protected
- There is an increase in fire-resistance requirements by type
- Combustible elements permitted in Section 603.1

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Type III



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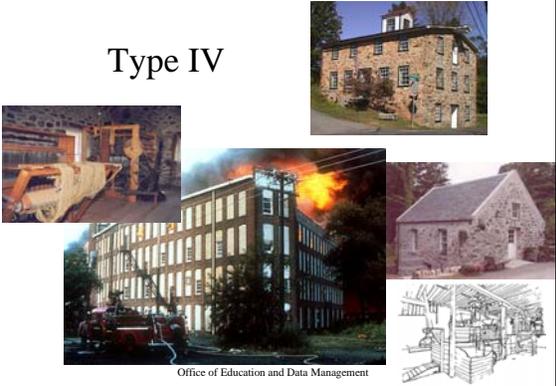
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Type III (602.3)

- Types IIIA and IIIB
- Noncombustible/Combustible
- Exterior walls noncombustible
- Interior elements any material permitted by code

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Type IV



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Type IV (602.4)

- Type IV
- Heavy timber
- Exterior walls noncombustible
- Interior elements combustible
- Unprotected because of element size and no concealed spaces

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Type V



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Type V



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Type V (602.5)

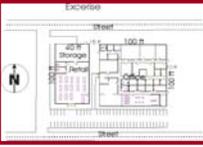
- Types VA and VB
- Combustible
- All structural elements any material permitted by code
- Most commonly dimensional lumber

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General Building Heights and Areas (IBC Chapter 5)

- Allowable Height and Area,
- Area modifications,
- Height modifications,
- Unlimited area structures and
- Special provisions



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Table 503 used to determine Minimum Construction Type

Group		TABLE 503 (partial) Allowable Height and Building Areas Height limitations shown as stories and feet above grade plane. Area limitations as determined by the definition of "Area Building" per floor.									
		TYPE OF CONSTRUCTION									
		TYPE I		TYPE II		TYPE III		TYPE IV		TYPE V	
Hgt(ft)	Area	A	B	A	B	A	B	Ht	A	B	
UL	UL	160	65	55	65	55	65	50	40	2	
B	S	11	14	14	14	14	14	14	14	2	
E	S	5	3	2	3	2	3	1	1	1	
F-1	S	11	4	2	3	2	4	2	1	1	
F-2	S	11	5	2	4	3	5	3	2	2	
H-5	S	3	3	3	3	3	3	3	3	2	
S-1	S	11	4	2	3	2	4	2	1	1	

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Building Height

- Height is given in the table in feet
- Vertical distance from grade plane to average height of the highest roof surface
- Based on construction type and in stories above grade
- Based on both construction type and the Group.

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Basement

- Portion of Building that is partly or completely below grade plane.
- Basement is a story above grade when the floor above the basement is:
 1. More than 6 feet above the grade plane
 2. More than 6 feet above the finished ground level for more than 50% of the total building perimeter
 3. More than 12 feet above finished grade at any point.

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Basement is a Story Above Grade Plane:

1

Grade Plane

Basement

Grade

10'-0" Typical

Greater Than 6'-0"

Because floor of Story A is more than 6'-0" above Grade Plane

2

Grade Plane

Basement

Grade

10'-0" Typical

7'-0"

Because floor of Story A is more than 6'-0" above Finished Ground Level for more than 50% of building perimeter

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Basement is a Story Above Grade Plane:

3

Grade

Basement #1

Basement #2

Story A

Story B

10'-0" Typical

16'-0"

Basement # 1 is a story above Grade Plane Because floor of Story A is more than 12'-0" above Finished Ground Level at One Point

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Height Modifications

Approved Automatic Sprinkler System Increase

- Maximum Height is increased by 20 feet
- Maximum Number of Stories increased by one story
- Permitted in addition to area increases.
- For Group R Buildings 20 feet, one story with a maximum of 60 feet, 4 stories

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Exceptions to Automatic Sprinkler System Increase for Height Modifications

1. Group I-2 of Type IIB, III, IV or V Construction
2. Group H-1, H-2, H-3 or H-5
3. Fire-resistance rating substitution in accordance with IBC Table 601. Note d.

Table 601 Note d. Allows for the substitution of an automatic sprinkler system for 1 hour fire resistance-rated construction provided system is not otherwise required or use for an allowable area or height increase.(506.3 and 504.2)

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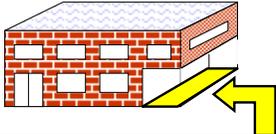
Area, Building

- The area included within surrounding exterior walls (or exterior walls and fire walls) exclusive of vent shafts and courts.
- Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above

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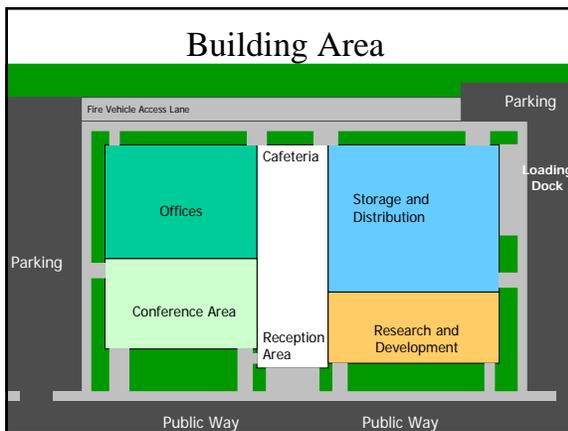
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Building Area - Projected



- Horizontal Projection of the floor above defines additional building area that is included as part of the building area

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Area Modifications Formula

$$A_a = A_t + \left[\frac{A_t I_f}{100} \right] + \left[\frac{A_t I_s}{100} \right]$$

A_a = Allowable area per floor (square feet)
 A_t = Tabular area per floor in accordance with Table 503 (square feet)
 I_f = Area increase due to frontage (percent) as calculated in accordance with Section 506.2
 I_s = Area increase due to sprinkler protection (percent) as calculated in accordance with Section 506.3

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Frontage Increase Formula

$$I_f = 100 \left[\frac{F}{P} - 0.25 \right] \frac{W}{30}$$

where:

- I_f = Area increase due to frontage (percent).
- F = Building perimeter which fronts on a public way or accessible open space having 20 feet (6096 mm) open minimum width.
- P = Perimeter of entire building.
- W = Weighted average width of public way or open space (In accordance with Section 506.2.1, this value may not exceed 30).

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For Example

Given: Yards as shown, 40-foot street
Determine: Percentage increase for area purpose (I_f)

$$100 \left[\frac{F}{P} - 0.25 \right] \frac{W}{30}$$

$F = 310$ feet
 $P = 460$ feet
 $W = 30$ feet

$$100 \left[\frac{310}{460} - 0.25 \right] \frac{30}{30}$$

$$100 [0.67 - 0.25] 1.0 *$$

$$100 [0.42] 1.0$$

$I_f = 42\%$

*(cannot exceed 1.0, see allowance for greater increases)

$$100 \left[\frac{F}{P} - 0.25 \right] \frac{W}{30}$$

$F = 320$ feet
 $P = 360$ feet
 $W = (220 \times 30) + (100 \times 25) = 28.44$ feet

$$100 \left[\frac{320}{360} - 0.25 \right] \frac{28.44}{30}$$

$100 [0.89 - 0.25] 0.95$
 $100 [0.64] 0.95$
 $I_f = 61\%$

* Cannot exceed 1.0, see allowance for greater increases

For Example

Given: Yards as shown, 2 40-foot streets
Group A-3 occupancy
Type IIB construction, non-sprinklered
Determine: Maximum allowable area

$$100 \left[\frac{F}{P} - 0.25 \right] \frac{W}{30}$$

$F = 320$ feet
 $P = 360$ feet
 $W = (220 \times 30) + (100 \times 25) = 28.44$ feet

$$100 \left[\frac{320}{360} - 0.25 \right] \frac{28.44}{30}$$

$100 [0.89 - 0.25] 0.95$
 $100 [0.64] 0.95$
 $I_f = 61\%$

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$100 [0.89 - 0.25] 0.95$
 $100 [0.64] 0.95$
 $I_f = 61\%$

* Cannot exceed 1.0, see allowance for greater increases

Basic allowable area = 9,500 sq. ft.
Frontage increase .61 x 9,500 = 5,795 sq. ft.
Maximum allowable area = 15,295 sq. ft.

Automatic Sprinkler System

Where a building is equipped throughout with an approved automatic sprinkler system the area is permitted to increase. (506.3)

- 300 % area increase (single story)
- 200 % area increase (multi-story)

I_s = Area increase due to sprinkler protection (percent) as calculated in accordance with Section 506.3

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Exceptions to Automatic Sprinkler System Increase

1. Buildings with occupancy in Group H-1, H-2 or H-3
2. Fire-resistance rating substitution in accordance with IBC Table 601. Note d.

** Table 601 Note d. Allows for the substitution of an automatic sprinkler system for 1 hour fire resistance-rated construction provided system is not otherwise required or use for an allowable area or height increase.(506.3 and 504.2)

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Working Example

Given: Group B occupancy single-story, Type VB construction, No open yards available

Find: Total allowable area

Basic allowable area = 9,000 sq. ft. (Table 503)
 + Sprinkler increase (I_s) = 9,000 sq. ft. (300 %) /100

Total allowable area = 36,000 sq. ft.

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Working Example

Given: Group B occupancy two stories in height,
Type VB construction, No open yards available

Find: Total allowable area

Basic allowable area = 9,000 sq. ft. (Table 503)
+ Sprinkler increase (I_s) = $9,000 \text{ sq. ft.} (200\%) / 100$

Total allowable area = 27,000 sq. ft.

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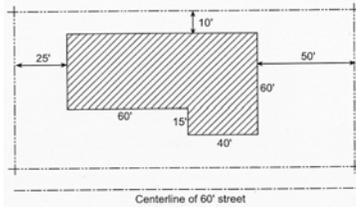
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For Example

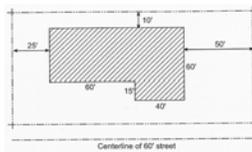
Given: Four-story office building
Type IIB construction
Fully sprinklered
Yards and streets as shown

Determine: Maximum allowable area per floor (A_a)

$$A_a = A_t + \left[\frac{A_t I_f}{100} \right] + \left[\frac{A_t I_s}{100} \right]$$



For Example



$A_t = 23,000 \text{ sq. ft. (Table 503)}$

$$W = \frac{(175 \times 30) + (45 \times 25)}{220} = 28.98$$

$$I_f = 100 \left[\frac{220}{320} - 0.25 \right] \frac{28.98}{30} = 100 \left[0.69 - 0.25 \right] 0.97 = 42.68\%$$

$I_s = 200\%$ (multi-story building)

$$A_a = 23,000 + \left[\frac{23,000 (42.68\%)}{100} \right] + \left[\frac{23,000 (200)}{100} \right]$$

$$= 23,000 + 9,816 + 46,000$$

$$= 78,816 \text{ sq. ft. per floor (236,448 sq. ft. total for building*)}$$

Area Determination (IBC 506.4)

Maximum area per building (more than one story)

For Example -

- Assume a 4 story, Group B building with $A_a=78,816$ sq. ft. per floor
- Allowable area (A_a) per floor x number of stories (3 maximum*)

* 506.4 (3. For three-story or higher buildings multiply by 3)

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Height & Area example cont'd

Check total allowable area

- Allowable area per floor: 78,816
- Max. area per bldg (3 x 78,816) = 236,448

Assuming 4 story building (all floors equal), allow. area per floor:

$236,448/4 \text{ floors} = 59,112$
(vs. 78,816 per Section 506.1)

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Multistory Building Area Options

1	78,816
---	--------

OK

2	78,816
3	78,816
4	78,816

OK

5	59,112
6	59,112
7	59,112
8	59,112

(78,816 x 3) ÷ 4 = 59,112
OK

9	78,816
10	78,816

OK

11	60,000
12	60,000
13	116,448

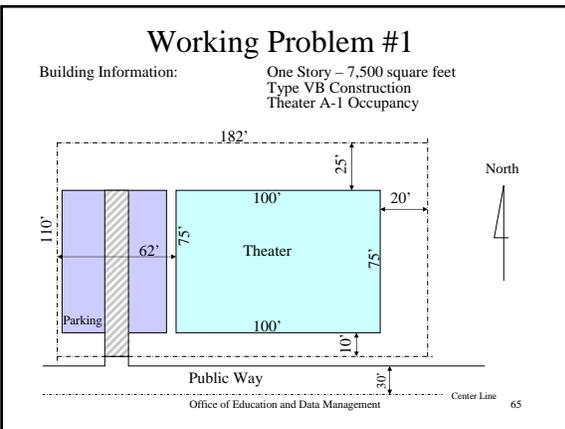
(60,000 x 2) + 116,448 = 236,448
NO, BECAUSE EVEN THOUGH THE TOTAL AREA IS OK THE FIRST FLOOR IS LARGER THAN ALLOWED

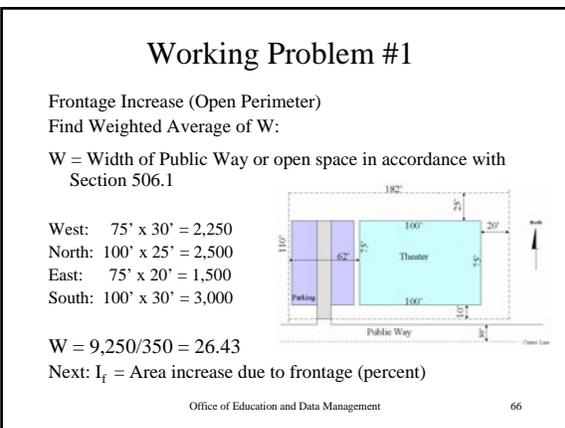
14	52,544
15	52,544
16	52,544
17	78,816

(52,544 x 3) + 78,816 = 236,448
OK

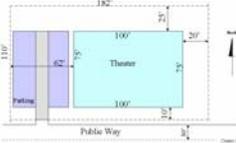
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Working Problem #1



Frontage Increase (Open Perimeter)

$I_f = \text{Area increase due to frontage (percent)}$

$I_f = 100 [F/P - 0.25] W/30$

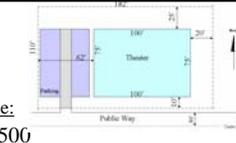
$I_f = 100 [350/350 - 0.25] 26.43/30$

$I_f = 100 [0.75] 0.88 = 66\%$

Next: Allowable Area due to Frontage Increase

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Working Problem #1



Allowable Area due to Frontage Increase:

Tabular Area from Table 503 = 5,500

$I_f = 66\%$

Increase in Area due to Frontage = $(I_f/100) \times \text{Table 503 Value}$

$[(I_f/100) \times \text{Table 503 Value}] = [0.66 \times 5,500] = 3,630$

Allowable Area = Table 503 # + $[(I_f/100) \times \text{Table 503 #}]$

Allowable Area = 5,500 + 3,630 = 9,130 square feet

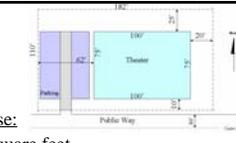
Calculation Option:

Allowable Area = Table 503 Value $\times [(I_f + 100\%)/100]$

Allowable Area = 5,500 $\times [(66\% + 100\%)/100] = 5,500 \times 1.66 = 9,130$

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Working Problem #1



Allowable Area due to Sprinkler Increase:

Tabular Area from Table 503 = 5,500 square feet

$I_s = 300\%$ for single story building

$I_s/100 \times \text{Table 503 Value} = \text{Area Increase due to sprinkler protection}$

Allowable Area = Table 503 Value + $[I_s/100 \times \text{Table 503 Value}]$

Allowable Area = 5,500 + $[3 \times 5,500] = 22,000$

Allowable Area = 5,500 + 16,500 = 22,000

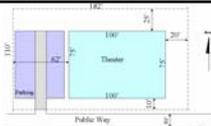
Calculation Option:

Allowable Area = Table 503 Value $\times [(I_s + 100\%)/100]$

Allowable Area = 5,500 $\times [(300\% + 100\%)/100] = 5,500 \times 4.0 = 22,000$

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Working Problem #1



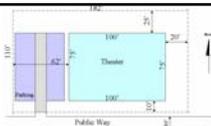
Allowable Area :

Area = Table 503 # + [Frontage Increase]+[Sprinkler Increase]
 Area = 5,500 + 3,630 + 16,500 = 25,630

Calculation Option:
 Allowable Area = Table 503 Value x [(I_s+ I_f +100%)/100]
 Allowable Area = 5,500 x [(300% + 66% + 100%)/100]
 Allowable Area = 5,500 x 4.66 = 25,630

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Working Problem #1



Building Information:

- Type VB Construction
- Theater A-1 Occupancy

Maximum Building Height and Area from Table 503:

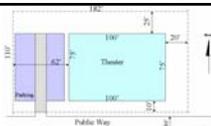
- Area Without Frontage or Sprinkler Increases: 5,500
- Building Height without sprinkler: 1 Story, 40 feet

Maximum Height and Area (with frontage and sprinkler increases):

- 2 stories, 60 ft height
- One Story Building: 25,630 sq ft
- Two Story Building: 40,260 sq ft total (20,130 sq ft/story)

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Working Problem #1

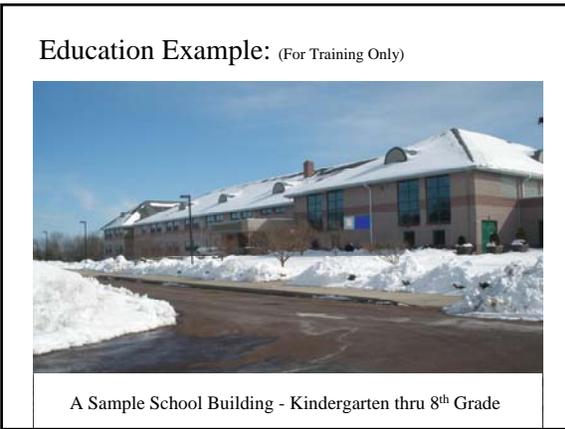


Summary:

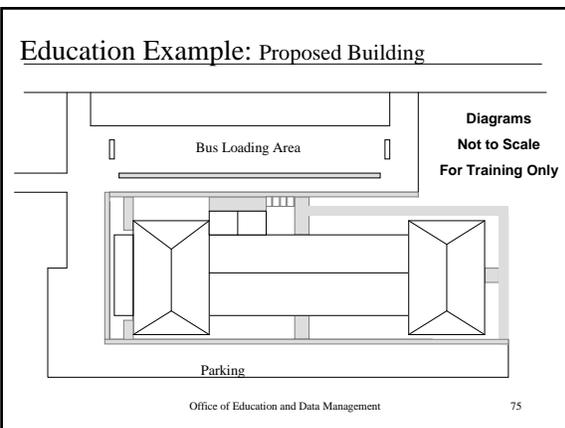
Building Area of 7,500 square feet would not be allowed without a frontage increase or a sprinkler increase for this One Story, Type VB Construction with a Theater A-1 Occupancy.

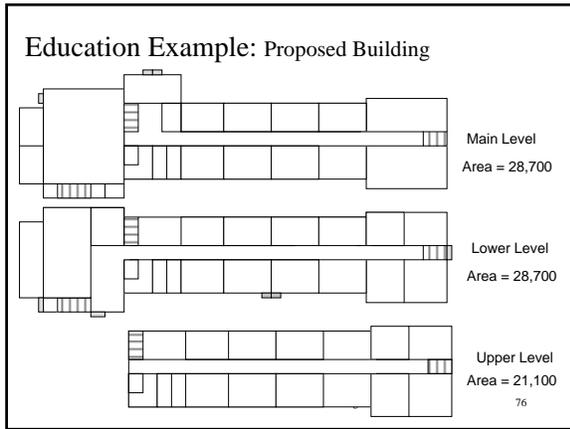
Note: If the fire area of this building has an occupant load of 300 or more an automatic sprinkler system would be required under the SBC IBC 903.2.1.1 and CFSC Part III Section 903.2.1.1.

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Education Example: Proposed Building

Building Information:
 3 Stories, 60 feet in height, 28,700 sq ft main level area
 Frontage Area Increase:
 $I_f = 100 [1.00 - 0.25] 1.0 = 75.0\%$
 Sprinkler Increases ($I_s = 200\%$ for multiple story building) :
 Area: Area From Table 503 + (I_s x Area from Table 503)
 Height: Plus One Story and 20 feet
 Minimum Construction Type:
 Type IIIA or IIIB?

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Education Example: Proposed Building

For Construction Type **IIIB**:
 Table 503 Value Only: **Not Acceptable** due to area and height
 14,500 sq ft, 2 stories, 55 ft maximum height
 With only Frontage Area Increase (75%): **Not Acceptable** due to height
 25,375 sq ft, 2 stories, 55 ft maximum height
 With only Sprinkler Increases ($I_s = 200\%$, plus 1 story plus 20ft) : **Acceptable**
 Area: 29,000 sq ft + 14,500 sq ft = 43,500 sq ft
 Height: 3 stories, 75 ft maximum height
 With Both Frontage and Sprinkler Increases: **Acceptable**
 Area: $(14,500 + (75\% \times 14,500) + (200\% \times 14,500) = 54,375$ sq ft
 Height: 3 stories, 75 ft maximum height

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Education Example: Proposed Building

For Construction Type IIIA:

Table 503 Value Only: Not Acceptable due to area
23,500 sq ft, 3 stories, 65 ft maximum height

With only Frontage Area Increase (75%): Acceptable*
41,125 sq ft, 3 stories, 65 ft maximum height

* IBC 903.2.2 and CSFC 903.2.2 require an automatic sprinkler system for fire areas greater than 20,000 sq ft

With only Sprinkler Increases ($I_s = 200\%$, plus 1 story plus 20ft): Acceptable
Area: 47,000 sq ft + 23,500 sq ft = 70,500 sq ft
Height: 4 stories, 85 ft maximum height

With Both Frontage and Sprinkler Increases: Acceptable
Area: $(23,500 + (75\% \times 23,500) + (200\% \times 23,500)) = 88,125\text{sq ft}$
Height: 4 stories, 85 ft maximum height

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Residential R-1 Discussion:



Front of Building

Residential R-1 Discussion:



Front and Side of Building

Residential R-1 Discussion:



Back and Side of Building
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Residential R-1 Discussion:

5 Story Building
Is a Sprinkler System Required?
Yes, under CGS Section 29-315 for buildings having more than 4 stories along with IBC 903.2.7 and CSFC 903.2.7 that require an automatic sprinkler system throughout buildings with a Group R fire area.

Frontage Increases: $I_f = 100 [F/P - 0.25] W/30$
 $I_f = 100 [1.00 - 0.25] 1.0 = 75.0\%$

Sprinkler Increases ($I_s = 200\%$ for multiple story building) :
Area: Area From Table 503 + (I_s x Area from Table 503)
Height: Plus One Story and 20 feet (reference IBC 504.2)

Total Area = Table 503 Value + (I_s x Table 503 Value)+(I_f x Table 503 Value)

Construction Types:
Type VA or VB: No, Limited to 3 and 4 story with sprinklers
Type IIIA or IIIB: Is it possible based on floor area with sprinklers?
Type IIA or IIB: Is it possible based on floor area with sprinklers?
Type IA or IB: Yes

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International Existing Building Code
Additions

Chapter 9

- **Definition**
 - An extension or increase in floor area, number of stories, or height of a building or structure
 - Exception 902.2
- **Approach**
 - Additions are treated much as they are treated in the model building codes
 - Not creating or extending non-conformance of existing buildings
 - Separation is critical

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International Existing Building Code
Additions

- **Heights & Areas**
 - *Height limitations - 902.1*
 - *No increase of height beyond provisions of Chapter 5 of the IBC*
 - *Area limitations - 902.2*
 - *No increase of area beyond that permitted by Chapter 5 provisions of IBC*
 - *Fire protection systems - 902.3*
 - *Existing fire areas increased by addition*
 - *Shall comply with Chapter 9 of the IBC*

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International Existing Building Code
Additions
Application Example

Existing one-story nonsprinklered Type VB, office, 7000 sq ft

Proposed addition two stories, Type VB, 2000 sq ft per floor, no separation from existing office use

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International Existing Building Code
Additions
Chapter 9

- **Example Analysis**
 - *This is an addition. Therefore, Chapter 9 requirements apply.*
 - *Only the addition and not the existing buildings must comply with requirements of the International Code® for new construction.*

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International Existing Building Code
Additions

Chapter 9

- **Example Analysis (Cont'd)**
 - **Height.**
 - *The building height must not exceed the limitation in Chapter 5 of the IBC.*
 - *The building height must be less than 40 feet.*
 - *IEBC (Sec. 902.1)*
 - **Area.**
 - *The building first floor area (9,000 sq ft) meets the area limitation of*
 - *Table 503 for Group B, Type VB construction.*
 - *IEBC (Sec. 902.2)*



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International Existing Building Code
Additions

Chapter 9

- **Example Analysis (Cont'd)**
 - **Structural.**
 - *Existing structural elements supporting any additional gravity load must comply with the*
 - *IEBC (Sec. 903.2)*
 - **Lateral-force-resisting system.**
 - *Check lateral-force-resisting system*
 - *IEBC (Sec. 903.3)*

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Unlimited Area Buildings

- 1 or 2 stories maximum
- No stories below grade
- Limited use groups
- Most require fully sprinklered with an NFPA13 system
- Minimum fire separation distance
- Construction type limitations

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Summary

- Major Factors for Determining Height and Area
 - Group (Use and Occupancy Classifications)
 - Type of Construction
 - Automatic Sprinkler System Increases
 - Frontage or Open Perimeter Increases
- These Factors will effect:
 - Future additions
 - Changes in use and occupancies
 - Fire safety inspections

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Questions??

CT Public Safety
Division of Fire, Emergency
and Building Services



- Office of the State Building Inspector
 - (860) 685 - 8310
- Office of the State Fire Marshal
 - (860) 685 - 8310
- Office of Education and Data Management
 - (860) 685 - 8330

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