NFSA
NATIONAL FIRE SPRINKLER ASSOCIATION
The Voice of the Fire Sprinkler Industry

NFSA Fire Sprinkler Guide:

2018 International Building Code Edition

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Introduction:

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Sprinkler Design Advantages:

The following sprinkler advantages are applicable to all occupancy classifications wherever approved fire sprinkler systems are installed in buildings. They are applicable only to the fire areas or where the NFPA 13 fire sprinklers are installed throughout. They are also applicable even though NFPA 13 fire sprinklers are required by other sections of the building code. Additional occupancy group specific sprinkler design advantages are listed in Part C for each individual group.

Accessibility Stairs	
IBC 1009.3.2	NFPA 13 or 13R sprinkler systems delete the accessibility requirement for 48” egress stairs.
IBC 1009.3.3	NFPA 13 or 13R sprinkler systems eliminate areas of refuge in stairs.
Aircraft-Related Occupancies	
IBC 412.2.2.3.2	NFPA 13 sprinkler systems permit the separation of exits to be reduced to one-fourth of the length of the maximum overall dimension of the area served.
Area Increase	
IBC Table 506.2	NFPA 13 sprinkler systems add 300% for one story and 200% for multiple stories in building area.
Areas for Assisted Rescue	
IBC 1009.7.2	NFPA 13 or 13R sprinkler systems eliminate fire-resistance rating and opening protectives in exterior walls of exterior areas for assisted rescue.
IBC 1009.7.4	NFPA 13 or 13R sprinkler systems eliminate the requirement for 48” egress stairs for exterior areas for assisted rescue.
Atriums	
IBC 404.2	NFPA 13 sprinkler systems permit the atrium floor area to be used for any approved use where the individual space is provided with an automatic sprinkler system.

IBC 404.6	NFPA 13, 13R, or 13D sprinkler systems permit a glass wall forming a smoke partition where automatic closely spaced NFPA 13 sprinkler systems are provided along both sides of the separation wall.
Attics and Crawl Spaces	
IBC 413.2	NFPA 13, 13R, or 13D sprinkler systems delete the 1-hour fire resistance rating for attics and under-floor concealed spaces used for storage of combustible materials.
Balcony Fire Rating	
IBC 705.3.2.1 (3)	NFPA 13, 13R, or 13D sprinkler systems permit balconies and similar appendages on buildings of Types III, IV and V to be of Type V construction without a fire resistance rating.
IBC 705.3.2.1 (4)	NFPA 13, 13R, or 13D sprinkler systems eliminate the aggregate width requirement of balconies.
Boiler Rooms	
IBC Table 509	NFPA 13, 13R, or 13D sprinkler systems eliminate the 1-hour wall requirement around boiler rooms having boilers over 15 psi and 10 horsepower.
Corridor Rating	
IBC Table 1020.1	NFPA 13 or 13R sprinkler systems delete the corridor fire resistance rating.
Dead End Corridors	
IBC 1020.4	NFPA 13 sprinkler systems allow dead end corridors up to 50 ft. in the following occupancies: B, E, F, I-1, M, R-1, R-2, R-4, S and U.
IBC 1020.5.1	NFPA 13, 13R or 13D sprinkler systems allow the space between the corridor ceiling and the floor or roof structure above corridors to serve as return air.
IBC 1028.1	NFPA 13, 13R or 13D sprinkler systems permit of maximum of 50 percent of the occupants to exit through exit enclosures.

Delayed Egress Locks

IBC 1010.1.9.8

NFPA 13 sprinkler systems allow for delayed egress locking systems on exit or exit access doors serving other than the main exit door courtrooms.

IBC 1010.1.9.8.1 (5)

NFPA 13 sprinkler systems allow for the egress path in Group I-1 and I-4 to go through two delayed egress locking systems, no more than 30 second combined delay.

Draftstopping and Fireblocking

IBC 708.4.2

NFPA 13 or 13R sprinkler systems eliminate fireblocking and draftstopping at the partition line where fire sprinklers are installed in concealed combustible spaces.

Draftstopping

IBC 718.3

NFPA 13 sprinkler systems eliminate the requirement for draftstopping at 1,000 sq ft in floor ceiling assembly.

IBC 718.4

NFPA 13 sprinkler systems eliminate the requirement for draftstopping in attics and concealed spaces at 3,000 sq ft.

Elevators

IBC 1009.2.1

NFPA 13 or 13R sprinkler systems eliminate the requirement for elevators to serve as the means of egress as required by ADA.

Emergency Escape and Rescue

IBC 1030.1

NFPA 13, 13R or 13D sprinkler systems eliminate emergency escape and rescue openings in dwelling and sleeping units in Groups R-2 and R-3. Does not include basements.

Exit Enclosures

IBC 1019.3

NFPA 13 sprinkler systems provide open stairs, where the vertical opening is limited and is protected by a draft curtain and closely spaced fire sprinklers. In Group B and M, this is limited to four stories.

Exit Enclosure Doors

IBC 716.2.2.3 — NFPA 13 or 13R sprinkler systems delete the maximum transmitted temperature end point for door assemblies in interior exit enclosures, ramps and exit passageways.

Exit Spacing

IBC 1007.1.1 — NFPA 13 or 13R sprinkler systems allow for exit spacing to be reduced to one-third of the length of the maximum of the overall diagonal dimension of the area served.

Exterior Wall Openings

IBC Table 705.8 — NFPA 13 sprinkler systems permit maximum allowable area of unprotected opening to be the same as for protected opening.

IBC 705.8.5 — NFPA 13 or 13R sprinkler systems eliminate the requirements for flame barriers protecting window separations, separated by five feet or less.

IBC 705.8.2 — NFPA 13 sprinkler systems delete the protection requirements of openings in an exterior wall where buildings are equipped with NFPA 13 sprinkler systems and water curtains are installed on the exterior.

Fire Alarm

IBC 907.2 — NFPA 13 or 13R sprinkler systems eliminate the requirement for multiple manual pull stations in A, B, E, F, M, R-1, R-2 occupancies.

IBC 907.4.2.1 — NFPA 13 or 13R sprinkler systems permit 200 feet of travel distance between manual pull stations.

IBC 907.4.3.1 — NFPA 13 or 13R sprinkler systems eliminate the requirement for heat detectors.

IBC 907.6.4 — NFPA 13 fire sprinkler zones are not limited to fire alarm zones.

Fire Barriers

IBC 707.6

NFPA 13 sprinkler systems permit openings in fire barriers to exceed the 156 sq ft. where both fire areas are sprinklered.

Fire Barrier Continuity

IBC 708.4 (Exception 2.2)

NFPA 13 sprinkler systems eliminate corridor walls extending above the lower membrane of a corridor ceiling.

Fire Dampers

IBC 717.5.2

NFPA 13 or 13R sprinkler systems eliminate the required fire dampers in ducts for HVAC systems, fire barrier walls that have a required fire resistance rating of 1-hour or less.

Fire Pump Rooms

IBC 913.2.1

NFPA 13 or 13R sprinkler systems permit 1-hour fire barrier and horizontal assemblies for fire pump rooms.

Fire Walls

IBC 706.5 (3)

NFPA 13 or 13R sprinkler systems allow the firewall to terminate to the inside surface of the non-combustible exterior wall.

IBC 706.8

NFPA 13 sprinkler systems permit openings in firewalls to exceed the 156 sq ft limit where both buildings are sprinklered.

Foam Plastic Insulation

IBC 2603.3

NFPA 13 sprinkler systems allow foam plastic insulation to increase from 4” to 10” in thickness.

Freezers

IBC 603.1 (26)

NFPA 13 sprinkler systems permit combustible freezer and cooler walls in Type I and II construction up to 1,000 sq.ft.

Furnace Rooms

IBC Table 509	NFPA 13, 13R, or 13D sprinkler systems eliminate the 1-hour wall requirement around furnace rooms having equipment with over 400,000 BTU per hour input.

Hazardous Materials

IBC 414.2.4	NFPA 13 sprinkler systems permit the fire resistance ratings of fire barrier for control area floor assemblies and the construction supporting the floor of the control area to be reduced to 1-hour in buildings of three or few stories of Types IIA, IIIA, IV, and VA.

Heavy Timber

IBC T2304.11	NFPA 13, 13R or 13D sprinkler systems permit a reduction of lumber width to 3 inches for Type IV construction

Height Increases

IBC Table 504.3	NFPA 13 or 13R sprinkler systems permit a height increase of 20 feet.
IBC Table 504.4	NFPA 13 or 13R sprinkler systems increase number of stories by one story

High-Rise Buildings (under 420 feet in height)

IBC 403.4.8.2	NFPA 13 sprinkler systems reduce generator fuel line protection to 1-hour.

High-Rise Buildings (up to 420 feet in height)

IBC 403.2.1.1	NFPA 13 sprinkler systems permit the reduction of the type of construction from Type IA to Type IB. In other than Group F-1, H-2, H-3, H-5, M and S-1 the type of construction is further reduced to Type IIB.
IBC 403.2.1.2	NFPA 13 sprinkler systems permit the fire resistance rating of vertical shafts reduced to 1-hour fire barriers in high-rise buildings where NFPA 13 sprinkler systems are installed at the top of the shaft and alternate floor levels.

Hoistway Opening Protection

IBC 3006.2

NFPA 13 sprinkler systems eliminate elevator hoistway opening protection.

I-2 Occupancies

IBC 407.2.5 (4)

NFPA 13 sprinkler systems permit shared living spaces, group meeting, or multipurpose therapeutic space are permitted to open to the corridor.

Interior Floor Finish

IBC 804.4.2

NFPA 13 or 13R sprinkler systems reduce the requirements for floor finish materials in vertical exits and exit passageways and exit access corridors.

Interior Wall and Ceiling Finishes

IBC Table 803.11

NFPA 13 or 13R sprinkler systems reduce the wall and ceiling finishes to a lower category.

Labs and Shops in Group E

IBC Table 509

NFPA 13 sprinkler systems eliminate the 1-hour wall requirement for laboratories and vocational shops in Group E.

Laundry Rooms

IBC Table 509

NFPA 13, 13R, or 13D sprinkler systems eliminate the 1-hour wall requirement for laundry, waste and linen collection rooms.

Light Diffusing Systems

IBC 2607.5

NFPA 13 sprinkler systems permit a 100 percent increase in the maximum percentage area for light transmitting plastic wall panels.

IBC 2606.7

NFPA 13 sprinkler systems permit the use of light diffusing systems with an occupant load of 1,000 or more, theaters with the stage and proscenium opening and an occupant load of 700 or more, group I-2, group I-3 exit stairways and exit passageways.

IBC 2606.7.4	NFPA 13 sprinkler systems remove limitations of the areas of light diffusing systems.
Light Transmitting Roof Panels	
IBC 2608.2 (2)	NFPA 13 sprinkler systems eliminate flame barriers for adjacent stories.
IBC 2608.2 (3)	NFPA 13 sprinkler systems permit unlimited height for light transmitting plastics.
IBC 2609.1	NFPA 13 sprinkler systems permit light transmitting plastic roof panels in buildings required to be of fire rated construction without complying with the roof covering requirements.
IBC 2609.2 (1)	NFPA 13 sprinkler systems eliminate the 4-ft. minimum separation requirement between individual plastic roof panels.
IBC 2609.4 (1)	NFPA 13 sprinkler systems permit a 100 percent increase in an aggregate area of plastic roof panels.
Light-Transmitting Plastic Interior Signs	
IBC 2611.2	NFPA 13 sprinkler systems increase aggregate area of all light transmitting plastics to 100 sq. ft.
Means of Egress Sizing	
IBC 1005.3.1	Sprinklers lower egress capacity factor to 0.2 inches per occupant.
IBC 1005.3.2	NFPA 13 or 13R sprinkler systems lower egress capacity factor to 0.15 inches per occupant in egress components other than stairways.
Metal Composite Material (MCM) Installation	
IBC 1406.11.3 and 1406.11.4	NFPA 13 sprinkler systems eliminate height limitations of the installation of MCM panels
IBC 1406.11.3.5 and 1406.11.4.3	NFPA 13 sprinkler systems allows for an increase the area of MCM panels.

Mezzanines

IBC 505.2.1 (2) — NFPA 13 sprinkler systems increase mezzanine area up to one half of the floor area in construction Types I and II.

IBC 505.2.3 (5) — Mezzanines in 2 story buildings equipped with NFPA 13 systems, other than H and I use, having two or more means of egress are not required to exit into the area of the mezzanine

Occupancy Separations

IBC Table 508.4 — NFPA 13 sprinkler systems permit up to a 1-hour reduction in the fire resistance rating of fire separation walls.

Occupied Roofs

IBC 503.1.4 — NFPA 13 or 13R sprinkler systems permit for occupied roofs to not be limited to the occupancies allowed on the story immediately below the roof.

Open Corridors and Exit Enclosures

IBC 1027.6 — NFPA 13 or 13R sprinkler systems permit an open corridor connected to an open exit enclosure (stair).

Paint Shops

IBC Table 509 — NFPA 13, 13R, or 13D sprinkler systems eliminate the 1-hour wall requirement for paint shops.

Pedestrian Walkways

IBC 3104.5.2 and 3104.5.4 — NFPA 13 sprinkler systems eliminate the requirement for fire barriers between pedestrian walkways and buildings.

IBC 3104.5 — NFPA 13 sprinkler systems permit increased height and stories for pedestrian walkways and buildings.

IBC 3104.9 — NFPA 13 sprinkler systems permit an increase from 200 ft to 250 ft for exit access travel distance in pedestrian walkways.

IBC 3104.9	NFPA 13 sprinkler systems allow any increase from 200 ft to 400 ft of exit access travel systems in a pedestrian walkway constructed with both sides at least 50 percent open.
Plastic Glazing	
IBC 2608.2 (1)	NFPA 13 sprinkler systems permit the allowable area of glazing to 50 percent of the wall face.
Plastic Skylights	
IBC 2610.4	NFPA 13 sprinkler systems eliminate the 100-sq. ft. maximum area for skylights.
IBC 2610.5	NFPA 13 sprinkler systems permit an increase to 2/3 of the floor area of the room or space.
Refrigerant Machinery	
IBC Table 509	NFPA 13, 13R, or 13D sprinkler systems eliminate the 1-hour wall requirement around refrigerant machinery rooms.
Revolving Doors	
IBC 1010.1.4.1.2	NFPA 13, 13R, or 13D sprinkler systems permit a higher breakout force for revolving doors not used in means of egress.
Set Out Construction	
IBC 803.15.2	NFPA 13 or 13R sprinkler systems permit a reduction in the class finish requirements for walls or ceilings that are set out or dropped.
Shaft Enclosure	
IBC 713.11	The bottom of a shaft is not required to be closed off provided it terminates in room protected by NFPA 13, 13R, or 13D fire sprinklers.
Skylight Separation	
IBC 2610.6	NFPA 13 sprinkler systems eliminate the minimum separation distance of 4-ft. between skylights.
Smoke and Heat Removal	
IBC 910.2	NFPA 13 sprinkler systems eliminate smoke and heat removal in frozen food warehouses used solely for Class 1 and Class 2 commodities.

Spaces with Single Exits

IBC T1006.2.1	NFPA 13 or 13R sprinkler systems allows certain occupancies to have single exits or exit access doorways.

Spaces Under Grandstands

IBC 1029.1.1.1	NFPA 13 sprinkler systems permit accessory use spaces that are under 1,000 sq. ft. under grandstands.

Sprinkler Penetration

IBC 714.3.2	The annular space created by the penetration of a NFPA 13, 13R, or 13D fire sprinkler covered by a metal escutcheon plate requires no additional firestopping.
IBC 714.4.2	The annular space created by the penetration of a NFPA 13, 13R, or 13D fire sprinkler covered by a metal escutcheon plate requires no additional firestopping.

Stages

IBC 410.2.1 (2)	NFPA 13, 13R, or 13D sprinkler systems installed in the space below the stage eliminate the requirement for a fire resistance rated floor.
IBC 410.2.5	NFPA 13 proscenium wall water curtains may be used in lieu of fire curtains for proscenium openings.
IBC 410.5.3.2	NFPA 13 sprinkler systems increase travel distance for technical production areas to 400 feet.
IBC 905.3.4	NFPA 13 sprinkler systems allow 1 ½" hose connections instead of 2 ½" hose connections installed near stages.

Standpipes

IBC 905.3.1	NFPA 13 or 13R sprinkler systems allow Class I standpipes where Class III standpipes are required.
IBC 905.3.1	NFPA 13, 13R, or 13D sprinkler systems allow Class I standpipes in basements.

IBC 905.4	NFPA 13, 13R, or 13D sprinkler systems allow Class I standpipes to have 50’ more travel.
IBC 905.4.1	NFPA 13, 13R, or 13D sprinkler systems allow the risers and laterals of standpipes not to be covered by fire resistive material.

Textile Wall Covering

IBC 803.5.2	NFPA 13 or 13R sprinkler systems eliminate the requirement of materials to pass ASTM E-84 requirements for Class A materials.

Travel Distance

IBC Tables 1006.2.1 and 1017.2	NFPA 13 or 13R sprinkler systems increase the travel distances for all occupancies.

Unlimited Area Buildings

IBC 507.4	NFPA 13 sprinkler systems permit unlimited area in Group A-4 buildings not more than one story in height in other than Type V construction.
IBC 507.4	NFPA 13 sprinkler systems permit unlimited area in Group B, F, M or S buildings not more than one story in height of any construction type and connected to public ways not less than 60 feet in width.
IBC 507.5	NFPA 13 sprinkler systems permit unlimited area in Group B, F, M or S buildings not more than two stories and connected to public ways not less than 60 feet in width.
IBC 507.9	NFPA 13 sprinkler systems permit unlimited area in Group B, F, H-5, M or S buildings not more than two stories and connected to public ways not less than 60 feet in width.
IBC 507.12	NFPA 13 sprinkler systems permit unlimited area in motion picture theatres of Type II construction located on the first story and connected to public ways not less than 60 feet in width.

Vertical Openings for Escalator

IBC 712.1.3

NFPA 13 sprinkler systems modify enclosure requirements for escalators.

Special Occupancy Sprinkler Requirements:

The following special uses and occupancies require fire sprinkler systems installed throughout the building or spaces where otherwise not indicated in the specific occupancy chapters. The code may provide height, area, and material exceptions to exempt NFPA 13 sprinkler systems in some locations or occupancies.

IBC 402.5	Covered and open mall buildings.
IBC 403.3	High-rise buildings.
IBC 404.3	Buildings with unseparated atriums, and all atrium areas in buildings.
IBC 405.3	Underground buildings.
IBC 406.6.3	Enclosed parking garages.
IBC 410.6	Stages.
IBC 411.3	Special amusement buildings.
IBC 412.3.6	Airport traffic control towers.
IBC 412.5.6	Aircraft paint hangers.
IBC 413.1	High-piled and rack storage.
IBC 419.5	Live/work unit.
IBC 903.2.9.1	Repair garages.
IBC 910.4	In buildings where mechanical smoke removal systems are installed.

Partial Sprinkler Requirements:

The International Building Code requires certain areas of the building to be sprinklered regardless of use, construction type, or whether the rest of the building is sprinklered. These requirements can be satisfied with partial or limited area sprinkler systems if they comply with the installation standard. The list of partial sprinkler requirements is as follows:

Stories without openings and basements

IBC 903.2.11.1

An automatic sprinkler system shall be installed throughout all stories, of all buildings where the floor area exceeds 1,500 square feet and where there is not provided at least one of the following types of exterior wall openings.

Rubbish and linen chutes

IBC 903.2.11.2

An automatic sprinkler system shall be installed at the top of rubbish and linen chutes and in their terminal rooms. Fire NFPA 13 sprinkler systems shall be installed within such chutes at alternate floors. Chute NFPA 13 sprinkler systems shall be accessible for servicing.

Buildings 55 feet or more in height

IBC 903.2.11.3

An automatic sprinkler system shall be installed throughout buildings with a floor level having an occupant load of 30 or more that is located 55 feet or more above the lowest level of fire department vehicle access.

Ducts conveying hazardous exhausts

IBC 415.11.11 and 903.2.11.4

An automatic sprinkler system shall be installed throughout buildings with a floor level having an occupant load of 30 or more that is located 55 feet or more above the lowest level of fire department vehicle access.

Commercial cooking operations

IBC 903.2.11.5

An automatic sprinkler system shall be installed in commercial kitchen exhaust hood and duct system where an automatic sprinkler system is used to comply with Section IBC 904.

Flammable finishes

IBC 416.5

Spray, dip, immersing spaces and storage rooms are required to have a fire sprinkler system or other suppression system.

Other required suppression systems

IBC 903.2.11.6

In addition to the requirements above, IBC Table 903.2.11.6 of the IBC and IFC also requires the installation of a fire sprinkler system for certain buildings and uses.

Assembly Occupancies:

A. Complete Sprinkler Requirements:

The following paragraphs outline where complete sprinkler systems are required:

An automatic sprinkler system shall be provided throughout buildings and portions thereof used as Group A occupancies as provided in this section. For Group A-1, A-2, A-3 and A-4 occupancies, the automatic sprinkler system shall be provided throughout the story where the Group A-1, A-2, A-3 or A-4 occupancy is located and in all floors from the Group A occupancy to, and including, all levels of exit discharge serving the Group A occupancy. For Group A-5 occupancies, the automatic sprinkler system shall be provided in the spaces indicated in Section 903.2.1.5.1

Group A-1, IBC 903.2.1.1: An automatic sprinkler system shall be provided for all fire areas containing and intervening floors of Group A-1 occupancies where one of the following conditions exists:

- The fire area exceeds 12,000 square feet;
- The fire area has an occupant load of 300 or more;
- The fire area is located on a floor other than a level of exit discharge serving such occupancies; or
- The fire area contains a multi-theater complex.

Group A-2, IBC 903.2.1.2: An automatic sprinkler system shall be provided for all fire areas containing and intervening floors of Group A-2 occupancies where one of the following conditions exists:

- The fire area exceeds 5,000 square feet;
- The fire area has an occupant load of 100 or more; or
- The fire area is located on a floor other than a level of exit discharge serving such occupancies.

Group A-3, IBC 903.2.1.3: An automatic sprinkler system shall be provided for all fire areas containing and intervening floors of Group A-3 occupancies where one of the following conditions exists:

- The fire area exceeds 12,000 square feet;
- The fire area has an occupant load of 300 or more; or
- The fire area is located on a floor other than a level of exit discharge serving such occupancies.

Group A-4, IBC 903.2.1.4: An automatic sprinkler system shall be provided for all fire areas containing and intervening floors of Group A-4 occupancies where one of the following conditions exists:

- The fire area exceeds 12,000 square feet;
- The fire area has an occupant load of 300 or more; or
- The fire area is located on a floor other than a level of exit discharge serving such occupancies.

Group A-5, IBC 903.2.1.5: An automatic sprinkler system shall be provided for Group A-5 occupancies in the following areas: concession stands, retail areas, press boxes and other accessory use areas more than 1,000 square feet.

Multiple Assembly Occupancies, IBC 903.2.1.7: An automatic sprinkler system shall be provided where multiple fire areas of Group A-1, A-2, A-3 or A-4 occupancies share exit or exit access components and the combined occupant load of theses fire areas is 300 or more.

Assembly on Roof Tops, IBC 903.2.1.6: Where an occupied roof has an assembly occupancy with an occupant load exceeding 100 for Group A-2 and 300 for other Group A occupancies, all floors between the occupied roof and the level of exit discharge shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Exception: Open parking garages of Type I or Type II construction.

B. Allowable Heights and Areas:

The allowable heights, areas and stories illustrated in the following tables represent the information found in Chapter 5 of the IBC.

The maximum area of multi-story buildings depends on single occupancy, nonseparated occupancies or mixed occupancies. For multi-story, single or nonseparated occupancies, the allowable area, sprinklered or unsprinklered, is multiplied by three. For more information, see IBC Section 506.2.3 for single or nonseparated occupancies and Section IBC 506.2.4 for mixed occupancies.

The areas shown in the following tables may be further increased by using the frontage increases per Section 506.3 of the IBC.

Group A-1 Allowable Areas

A-1		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	5	3	2	3	2	3	2	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	15,500	8,500	14,000	8,500	15,000	11,500	5,500
S	STORIES	UL	6	4	3	4	3	4	3	2
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	62,000	34,000	56,000	34,000	60,000	46,000	22,000
	MULTI-STORY AREA	UL	UL	46,500	25,500	42,000	25,500	45,000	34,500	16,500

Group A-2 Allowable Areas

A-2		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	3	2	3	2	3	2	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
S	STORIES	UL	12	4	3	4	3	4	3	2
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	MULTI-STORY AREA	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000

Group A-3 Allowable Areas

A-3		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	3	2	3	2	3	2	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
S	STORIES	UL	12	4	3	4	3	4	3	2
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	MULTI-STORY AREA	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000

Group A-4 Allowable Areas

A-4		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	3	2	3	2	3	2	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	15,500	9,500	14,000	9,500	15,000	11,500	6,000
S	STORIES	UL	12	4	3	4	3	4	3	2
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	62,000	38,000	56,000	38,000	60,000	46,000	24,000
	MULTI-STORY AREA	UL	UL	46,500	28,500	42,000	28,500	45,000	34,500	18,000

Group A-5 Allowable Areas

A-5		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	UL	UL	UL	UL	UL	UL	UL	UL
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	UL	UL	UL	UL	UL	UL	UL
S	STORIES	UL	UL	UL	UL	UL	UL	UL	UL	UL
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	UL	UL	UL	UL	UL	UL	UL
	MULTI-STORY AREA	UL	UL	UL	UL	UL	UL	UL	UL	UL

C. Sprinkler Advantages

The following occupancy specific sprinkler design advantages permitted when a complete automatic sprinkler system is installed (for additional sprinkler advantages applicable to all use groups, see section I):

Assembly Specific Sprinkler Advantages:

Combustible Decorative Materials

IBC 806.2	NFPA 13 sprinkler systems increase the amount of combustible decorations in auditoriums in Group A up to 75% (versus 10%) in assembly occupancies.

Fire Alarms

IBC 907.2.1	Multiple manual pull stations not required when NFPA 13 sprinkler systems are present in A occupancies.

Sensor Door Lock Release

IBC 1010.1.9.8 doors.	NFPA 13 sprinkler systems permit sensor released

Travel Distance

IBC Table 1017.2	NFPA 13 sprinkler systems permit an increase from 200 ft to 250 ft in assembly buildings.

Unlimited Areas

IBC 507.4	NFPA 13 sprinkler systems permit unlimited areas for one-story Group A-4, B, F, M, or S buildings.
IBC 507.6 and IBC 507.7	NFPA 13 sprinkler systems permit unlimited areas for Group A-3 of Type II, III, and IV construction.
IBC 507.12	NFPA 13 sprinkler systems permit unlimited areas for motion picture theaters of one story and Type II construction.

Business Occupancies:

A. Complete Sprinkler Requirements:

The following paragraphs outline where complete sprinkler systems are required:

NFPA 13 sprinkler systems are required whenever the floor areas exceed the permitted allowable areas for a non-sprinklered building based on the occupancy classification and the type of construction.

Group B ambulatory health care facilities, IBC 903.2.2: An automatic sprinkler system shall be installed throughout the entire floor containing an ambulatory health care facility occupancy when either of the following conditions exists at any time:

- Four or more care recipients are incapable of self-preservation, whether rendered incapable by staff or staff has accepted responsibility for care recipients already incapable.
- One or more care recipients who are incapable of self-preservation are located at other than the level of exit discharge serving such an occupancy.

In buildings where ambulatory care is provided on levels other than the level of exit discharge, an automatic sprinkler system shall be installed throughout the entire floor where such care is provided as well as all floors below, and all floors between the level of ambulatory care and the nearest level of exit discharge, including the level of exit discharge.

B. Allowable Heights and Areas

The allowable heights, areas and stories illustrated in the following tables represent the information found in Chapter 5 of the IBC.

The maximum area of multi-story buildings depends on single occupancy, nonseparated occupancies or mixed occupancies. For multi-story, single or nonseparated occupancies, the allowable area, sprinklered or unsprinklered, is multiplied by three. For more information, see IBC Section 506.2.3 for single or nonseparated occupancies and IBC Section 506.2.4 for mixed occupancies.

The areas shown in the following tables may be further increased by using the frontage increases per IBC Section 506.3 of the IBC.

Group B Allowable Areas

B		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	5	3	5	3	5	3	2
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000
S	STORIES	UL	12	6	4	6	4	6	4	3
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000
	MULTI-STORY AREA	UL	UL	112,500	69,000	85,500	57,000	108,000	54,000	27,000

C. Sprinkler Advantages

The following occupancy specific sprinkler design advantages permitted when a complete automatic sprinkler system is installed (for additional sprinkler advantages applicable to all use groups, see section I):

Business Specific Sprinkler Advantages:

Bolt Locks

IBC 1010.1.9.4 — NFPA 13 sprinkler systems permit bolt locks on inactive door leafs in Groups B, F, S.

Dead End Corridors

IBC 1020.4 — NFPA 13 sprinkler systems allow dead end corridors up to 50 ft. in the following occupancies: B, E, F, I-1, M, R-1, R-2, R-4, S and U.

Delayed Egress

IBC 1010.1.9.7 — NFPA 13 sprinkler systems permit delayed egress locking systems.

Exit Enclosures

IBC 1019.3 — NFPA 13 sprinkler systems provide open stairs, where the vertical opening is limited and is protected by a draft curtain and closely spaced NFPA 13 systems. In Group B and M, this is limited to four stories.

Fire Alarms

IBC 907.2.2	Multiple manual pull stations not required when NFPA 13 sprinkler systems are present in B occupancies.
IBC 907.2.2.1	NFPA 13 sprinkler systems eliminate supervised smoke detection system in ambulatory care facilities.

Sensor Door Lock Release

IBC 1010.1.9.8	NFPA 13 sprinkler systems permit sensor released doors.

Smoke Dampers

IBC 717.5.3	NFPA 13 or 13R sprinkler systems eliminate smoke dampers at shafts in groups B and R buildings.
IBC 717.5.4	NFPA 13 sprinkler systems eliminate fire dampers in corridor walls constructed as fire partitions.

Unlimited Areas

IBC 507.4	NFPA 13 sprinkler systems permit unlimited areas for one-story Group A-4, B, F, M, or S buildings.
IBC 507.5	NFPA 13 sprinkler systems permit unlimited areas for two-story Group B, F, M, or S buildings.
IBC 507.9	NFPA 13 sprinkler systems permit unlimited areas for two-story mixed Group B, F, H-5, M and S buildings.

Educational Occupancies:

A. Complete Sprinkler Requirements:

The following paragraphs outline where complete sprinkler systems are required.

Group E, IBC 903.2.3: An automatic sprinkler system shall be provided for Group E occupancies as follows:

- Throughout all Group E fire areas greater than 12,000 square feet in area.

  Throughout every portion of educational buildings other than the level of exit discharge.

- Occupant load of 300 or more.
  Exception: An automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area where every classroom throughout the building has at least one exterior exit door at ground level.

B. Allowable Heights and Areas

The allowable heights, areas and stories illustrated in the following tables represent the information found in Chapter 5 of the IBC.

The maximum area of multi-story buildings depends on single occupancy, nonseparated occupancies or mixed occupancies. For multi-story, single or nonseparated occupancies, the allowable area, sprinklered or unsprinklered, is multiplied by three. For more information, see IBC Section 506.2.3 for single or nonseparated occupancies and IBC Section 506.2.4 for mixed occupancies.

The areas shown in the following tables may be further increased by using the frontage increases per Section 506.3 of the IBC.

Group-E Allowable Areas

E		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	5	3	2	3	2	3	1	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	26,500	14,500	23,500	14,500	25,500	18,500	9,500
S	STORIES	UL	6	4	3	4	3	4	2	2
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	106,000	58,000	94,000	58,000	102,000	74,000	38,000
	MULTI-STORY AREA	UL	UL	79,500	43,500	76,500	43,500	76,500	55,500	28,500

C. Sprinkler Advantages

The following occupancy specific sprinkler design advantages permitted when a complete automatic sprinkler system is installed (for additional sprinkler advantages applicable to all use groups, see section I):

Educational Specific Sprinkler Advantages:

Dead End Corridors

IBC 1020.4 — NFPA 13 sprinkler systems allow dead end corridors up to 50 ft. in the following occupancies: B, E, F, I-1, M, R-1, R-2, R-4, S and U.

Fire Alarms

IBC 907.2.3 — Multiple manual pull stations not required when NFPA 13 sprinkler systems are present in E occupancies.

Sensor Door Lock Release

IBC 1010.1.9.8 — NFPA 13 sprinkler systems permit sensor released doors.

Unlimited Areas

IBC 507.11 — NFPA 13 sprinkler systems permit unlimited areas for one-story Group E of Type II. IIIA or IV construction.

Factory and Industrial Occupancies:

A. Complete Sprinkler Requirements:

The following paragraphs outline where complete sprinkler systems are required.

Group F-1, IBC 903.2.4: An automatic sprinkler system shall be provided throughout all buildings containing Group F-1 occupancy where one of the following conditions exists:

- A Group F-1 fire area exceeds 12,000 square feet
- A Group F-1 fire area is located more than three stories above grade plane.
- The combined area of all Group F-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet.
- A Group F-1 occupancy used for the manufacture of upholstered furniture or mattresses exceeds 2,500 square feet.

Woodworking Operations, IBC 903.2.4.1; An automatic sprinkler system shall be provided throughout all Group F-1 occupancy fire areas that contain woodworking operations more than 2,500 square feet in area which generate finely divided combustible waste or use finely divided combustible materials.

B. Allowable Heights and Areas:

The allowable heights, areas and stories illustrated in the following tables represent the information found in Chapter 5 of the IBC.

The maximum area of multi-story buildings depends on single occupancy, nonseparated occupancies or mixed occupancies. For multi-story, single or nonseparated occupancies, the allowable area, sprinklered or unsprinklered, is multiplied by three. For more information, see IBC Section 506.2.3 for single or nonseparated occupancies and IBC Section 506.2.4 for mixed occupancies.

The areas shown in the following tables may be further increased by using the frontage increases per Section 506.3 of the IBC.

Group-F-1 Allowable Areas

F-1		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	4	2	3	2	4	2	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	25,000	15,500	19,000	12,000	33,500	14,000	8,500
S	STORIES	UL	12	5	3	4	3	5	3	2
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	100,000	62,000	76,000	48,000	134,000	56,000	34,000
	MULTI-STORY AREA	UL	UL	75,000	46,500	57,000	36,000	100,500	42,000	25,500

Group-F-2 Allowable Areas

F-2		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	5	3	4	3	5	3	2
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	37,500	23,000	28,500	18,000	50,500	21,000	13,000
S	STORIES	UL	12	6	4	5	4	6	4	2
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	150,000	92,000	114,000	72,000	202,000	84,000	52,000
	MULTI-STORY AREA	UL	UL	112,500	69,000	85,500	54,000	151,000	63,000	39,000

C. Sprinkler Advantages:

The following occupancy specific sprinkler design advantages permitted when a complete automatic sprinkler system is installed (for additional sprinkler advantages applicable to all use groups, see section I):

Factory Specific Sprinkler Advantages:

<u>Bolt Locks</u>

IBC 1010.1.9.4

NFPA 13 sprinkler systems permit bolt locks on inactive door leafs in Groups B, F, S.

Dead End Corridors

IBC 1020.4	NFPA 13 sprinkler systems allow dead end corridors up to 50 ft. in the following occupancies: B, E, F, I-1, M, R-1, R-2, R-4, S and U.

Delayed Egress

IBC 1010.1.9.7	NFPA 13 sprinkler systems permit delayed egress locking systems.

Fire Alarms

IBC 907.2.4	Multiple manual pull stations not required when NFPA 13 sprinkler systems are present in F occupancies.

Travel Distance

IBC 1017.2.2	NFPA 13 sprinkler systems allow up to 400 ft of travel distance in single story groups F-1 and S-1.
IBC Table 1017.2	NFPA fire sprinkler allow up to 400 ft of travel distance in groups F-2 and S-2.

Unlimited Areas

IBC 507.4	NFPA 13 sprinkler systems permit unlimited areas for one-story Group A-4, B, F, M, or S buildings.
IBC 507.5	NFPA 13 sprinkler systems permit unlimited areas for two-story Group B, F, M, or S buildings.
IBC 507.9	NFPA 13 sprinkler systems permit unlimited areas for two-story mixed Group B, F, H-5, M and S buildings.

High Hazard Occupancies:

A. Complete Sprinkler Requirements:

The following paragraphs outline where complete sprinkler systems are required:

Group H, IBC 903.2.5: Automatic sprinkler systems shall be provided in high-hazard occupancies.

Group H-5, IBC 903.2.5.2: An automatic sprinkler system shall be installed throughout buildings containing Group H-5 occupancies. The design of the sprinkler system shall not be less than that required by this code for the fire sprinkler occupancy hazard classifications in accordance with the following:

- Fabrication areas, service corridors, storage room without dispensing, and other corridors a minimum hazard category of Ordinary Hazard Group II
- Storage rooms with dispensing a minimum hazard category of Extra Hazard Group II.

If the design area of the sprinkler system consists of a corridor protected by one row of NFPA 13 systems, the maximum number of NFPA 13 sprinkler systems required to be calculated is 13.

Pyroxylin plastics, IBC 903.2.5.3: An automatic sprinkler system shall be provided in buildings, or portions thereof, where cellulose nitrate film or pyroxylin plastics are manufactured, stored or handled in quantities exceeding 100 pounds.

B. Allowable Heights and Areas:

The allowable heights, areas and stories illustrated in the following tables represent the information found in Chapter 5 of the IBC.

The maximum area of multi-story buildings depends on single occupancy, nonseparated occupancies or mixed occupancies. For multi-story, single or nonseparated occupancies, the allowable area, sprinklered or unsprinklered, is multiplied by three. For more information, see IBC Section 506.2.3 for single or nonseparated occupancies and IBC Section 506.2.4 for mixed occupancies.

The areas shown in the following tables may be further increased by using the frontage increases per Section 506.3 of the IBC.

Group H-1 Allowable Areas

H-1		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	1	1	1	1	1	1	1	1	NP
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	21,000	16,500	11,000	7,000	9,500	7,000	10,500	7,500	NP
S	STORIES	1	1	1	1	1	1	1	1	NP
	HEIGHT	UL	160	65	55	65	55	65	50	40
	1-STORY,AREA	21,000	16,500	11,000	7,000	9,500	7,000	10,500	7,500	NP
	MULTI-STORY AREA	NP	NP	NP	NP	NP	NP	NP	NP	NP

Group H-2 Allowable Areas

H-2		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	3	2	1	2	1	2	1	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	21,000	16,500	11,000	7,000	9,500	7,000	10,500	7,500	3,000
S	STORIES	UL	3	2	1	2	1	2	1	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	1-STORY,AREA	21,000	16,500	11,000	7,000	9,500	7,000	10,500	7,500	3,000
	MULTI-STORY AREA	21,000	16,500	11,000	7,000	9,500	7,000	10,500	7,500	3,000

Group H-3 Allowable Areas

H-3		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	6	4	2	4	2	4	2	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	60,000	26,500	14,000	17,500	13,000	25,500	10,000	5,000
S	STORIES	UL	6	4	2	4	2	4	2	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	1-STORY,AREA	UL	60,000	26,500	14,000	17,500	13,000	25,500	10,000	5,000
	MULTI-STORY AREA	UL	60,000	26,500	14,000	17,500	13,000	25,500	10,000	5,000

Group H-4 Allowable Areas

H-4		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	7	5	3	5	3	5	3	2
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	37,500	17,500	28,500	17,500	36,000	18,000	6,500
S	STORIES	UL	8	6	4	6	4	6	4	3
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	150,000	70,000	114,000	70,000	25,500	72,000	26,000
	MULTI-STORY AREA	UL	UL	112,500	52,500	85,500	52,500	108,000	54,000	19,500

Group H-5 Allowable Areas

H-5		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	4	4	3	3	3	3	3	3	2
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000
S	STORIES	4	4	3	3	3	3	3	3	2
	HEIGHT	UL	160	65	55	65	55	65	50	40
	1-STORY,AREA	UL	UL	150,000	92,000	114,000	76,000	144,000	72,000	36,000
	MULTI-STORY AREA	UL	UL	112,500	69,000	85,500	57,000	108,000	54,000	27,000

High Hazard Specific Sprinkler Advantages:

See Section I for general advantages and verify by stated code section. Most may not apply to Group H buildings.

<u>Unlimited Areas</u>

IBC 507.9

NFPA 13 sprinkler systems permit unlimited areas for two-story mixed Group B, F, H-5, M and S buildings.

Institutional Occupancies:

A. Complete Sprinkler Requirements:

The following paragraphs outline where complete sprinkler systems are required.

Group I, IBC 903.2.6: An automatic sprinkler system shall be provided throughout buildings with a Group I fire area.

Exceptions:

1. An automatic sprinkler system installed in accordance with IBC Section 903.3.1.2 shall be permitted in Group I-1 Condition 1 facilities.

2. An automatic sprinkler system is not required where Group I-4 day care facilities are at the level of exit discharge and where every room where care is provided has not fewer than one exterior exit door.

3. In buildings where Group I-4 day care is provided on levels other than the level of exit discharge, an automatic sprinkler system in accordance with IBC Section 903.3.1.1 shall be installed on the entire floor where care is provided, all floors between the level of care and the level of exit discharge, and all floors below the level of exit discharge other than areas classified as an open parking garage.

Group I-1 and I-2, IBC 308.3.1 and IBC 308.4.1: Providing care to five or fewer persons shall be classified as Group R-3 or comply with the IRC, provided automatic NFPA 13 sprinkler systems are installed per IBC Section 903.3.1.3 or P2904 of the IRC.

B. Allowable Heights and Areas:

The allowable heights, areas and stories illustrated in the following tables represent the information found in Chapter 5 of the IBC.

The maximum area of multi-story buildings depends on single occupancy, nonseparated occupancies or mixed occupancies. For multi-story, single or nonseparated occupancies, the allowable area, sprinklered or unsprinklered, is multiplied by three. For more information, see IBC Section 506.2.3 for single or nonseparated occupancies and Section 506.2.4 for mixed occupancies.

The areas shown in the following tables may be further increased by using the frontage increases per Section 506.3 of the IBC.

Group I-1 Allowable Areas

I-1 CONDITION 1		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	9	4	3	4	3	4	3	2
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	15,500	8,500	14,000	8,500	15,000	11,500	5,500
S	STORIES	UL	10	5	4	5	4	5	4	3
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	62,000	34,000	56,000	34,000	60,000	46,000	22,000
	MULTI-STORY AREA	UL	UL	46,500	25,500	42,000	25,500	45,000	34,500	16,500

I-1 CONDITION 2		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	9	4	3	4	3	4	3	2
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	15,500	8,500	14,000	8,500	15,000	11,500	5,500
S	STORIES	UL	9	4	3	4	3	4	3	2
	HEIGHT	UL	160	65	55	65	55	65	50	40
	1-STORY,AREA	UL	UL	62,000	34,000	56,000	34,000	60,000	46,000	22,000
	MULTI-STORY AREA	UL	UL	46,500	25,500	42,000	25,500	45,000	34,500	16,500

*NFPA 13 and NFPA 13R give height increases. NFPA 13R, NFPA 13D, and IRC P2904 do not increase area, use non-sprinklered.

Group I-2 Allowable Areas

I-2		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	4	2	1	1	NP	1	1	NP
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	15,000	11,000	12,000	NP	12,000	9,500	NP
S	STORIES	UL	5	3	1	1	NP	1	1	NP
	HEIGHT	UL	180	85	55	65	55	65	50	40
	1-STORY,AREA	UL	UL	60,000	44,000	48,000	NP	48,000	38,000	NP
	MULTI-STORY AREA	UL	UL	45,000	33,000	36,000	NP	36,000	28,500	NP

Group I-3 Allowable Areas

I-3		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	4	2	1	2	1	2	2	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	15,000	10,000	10,500	7,500	12,000	7,500	5,000
S	STORIES	UL	5	3	2	3	2	3	3	2
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	45,000	40,000	42,000	30,000	48,000	30,000	20,000
	MULTI-STORY AREA	UL	UL	45,000	30,000	31,500	22,500	36,000	22,500	15,000

Group I-4 Allowable Areas

I-4		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	5	3	2	3	2	3	1	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	60,500	26,500	13,000	23,500	13,000	25,500	18,500	9,000
S	STORIES	UL	6	4	3	4	3	4	2	2
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	121,000	106,000	52,000	94,000	52,000	102,000	74,000	36,000
	MULTI-STORY AREA	UL	181,500	79,500	39,000	70,500	39,000	76,500	55,500	27,000

C. Sprinkler Advantages:

The following occupancy specific sprinkler design advantages permitted when a complete automatic sprinkler system is installed (for additional sprinkler advantages applicable to all use groups, see Section I):

Institutional Specific Sprinkler Advantages:

<u>Dead End Corridors</u>

IBC 1020.4

NFPA 13 sprinkler systems allow dead end corridors up to 50 ft. in the following occupancies: B, E, F, I-1, M, R-1, R-2, R-4, S and U.

<u>Delayed Egress</u>

IBC 1010.1.9.7

NFPA 13 sprinkler systems permit delayed egress locking systems.

Electric Door Locking

IBC 1010.1.9.6	NFPA 13 sprinkler systems permit controlled locking egress doors in I-1 and I-3.

Elevator Lobbies

IBC 3006.3	NFPA 13 sprinkler systems permit enclosed elevator lobbies in I-1 Condition 2, I-2, I-3, to be protected as smoke partitions.

Alarms

IBC 907.2.6.1 and 907.2.6.3.3	NFPA 13 sprinkler systems eliminate the need for smoke detectors in habitable areas in group's I-1 and I-3.

Glazing for Interior Stairs and Ramps

IBC 408.3.8	NFPA 13 sprinkler systems permit glazing in interior stair and ramp doors and walls in I-3 occupancies where glazing has sprinkler protection.

Open Waiting Areas

IBC 407.2.1	Sprinkler systems in I-2 occupancies, using quick-response NFPA 13 systems, permit waiting areas similar spaces to be open to the corridor.
IBC 407.2.5	Sprinkler systems in I-2 Condition 1 occupancies, using quick-response NFPA 13 systems, permit shared living spaces, group and therapeutic spaces open to the corridor.

Security Glazing

IBC 408.7	NFPA 13 sprinkler systems permit I-3 occupancies security glazing in 1-hour fire barriers, fire partitions and smoke barriers when protected by NFPA 13 systems.

Sensor Door Lock Release

IBC 1010.1.9.8	NFPA 13 sprinkler systems permit sensor released doors in I-1, I-2, I-4 occupancies.

Smoke Dampers

IBC 717.5.5	NFPA 13 sprinkler systems eliminate smoke dampers in smoke barriers where fully ducted in Group I-2 Condition 2.

Mercantile Occupancies:

A. Complete Sprinkler Requirements:

The following paragraphs outline where complete sprinkler systems are required.

Group M, IBC 903.2.7: An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

- A Group M fire area exceeds 12,000 square feet.
- A Group M fire area is located more than three stories above grade plane.
- The combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet.
- A Group M occupancy is used for the display and sale of upholstered furniture exceeds 5,000 square feet.

High-piled storage, IBC 903.2.7.1: An automatic sprinkler system shall be provided in accordance with the International Fire Code in all buildings of Group M where storage of merchandise is in high-piled or rack storage arrays.

B. Allowable Heights and Areas:

The allowable heights, areas and stories illustrated in the following tables represent the information found in Chapter 5 of the IBC.

The maximum area of multi-story buildings depends on single occupancy, nonseparated occupancies or mixed occupancies. For multi-story, single or nonseparated occupancies, the allowable area, sprinklered or unsprinklered, is multiplied by three. For more information, see IBC Section 506.2.3 for single or nonseparated occupancies and Section 506.2.4 for mixed occupancies.

The areas shown in the following tables may be further increased by using the frontage increases per Section 506.3 of the IBC.

Group M Allowable Areas

M		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	4	2	4	2	4	3	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	UL	21,500	12,500	18,500	12,500	20,500	14,000	9,000
S	STORIES	UL	12	5	3	5	3	5	4	2
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	UL	86,000	50,000	74,000	50,000	82,000	56,000	36,000
	MULTI-STORY AREA	UL	UL	64,500	37,500	55,500	37,500	61,500	42,000	27,000

C. Sprinkler Advantages:

The following occupancy specific sprinkler design advantages permitted when a complete automatic sprinkler system is installed (for additional sprinkler advantages applicable to all use groups, see section I):

Mercantile Specific Sprinkler Advantages:

Delayed Egress

IBC 1010.1.9.7 — NFPA 13 sprinkler systems permit delayed egress locking systems.

Exit Enclosures

IBC 1019.3 — NFPA 13 sprinkler systems provide open stairs, where the vertical opening is limited and is protected by a draft curtain and closely spaced NFPA 13 systems. In Group B and M, this is limited to four stories.

Fire Alarms

IBC 907.2.7 — Multiple manual pull stations not required when NFPA 13 sprinkler systems are present in M occupancies.

Flammable and Combustible Liquids

IBC Table 414.2.5(2) — NFPA 13 sprinkler systems permit increase in control areas of group M

Indoor and Outdoor Control Areas (Non-flammable liquids, Non-combustible Solids)

IBC Table 414.2.5(1) sub (b) and (i)	NFPA 13 sprinkler systems permit unlimited or increase of 100% in groups M and S control areas.

Sensor Door Lock Release

IBC 1010.1.9.8	NFPA 13 sprinkler systems permit sensor released doors.

Unlimited Areas

IBC 507.4	NFPA 13 sprinkler systems permit unlimited areas for one-story Group A-4, B, F, M, or S buildings.
IBC 507.5	NFPA 13 sprinkler systems permit unlimited areas for two-story Group B, F, M, or S buildings.
IBC 507.9	NFPA 13 sprinkler systems permit unlimited areas for two-story mixed Group B, F, H-5, M and S buildings.
IBC 507.13	Covered and open malls, and anchor buildings up to three-stories are unlimited in area.

Residential Occupancies:

A. Complete Sprinkler Requirements:

The following paragraphs outline where complete sprinkler systems are required.

Group R-3, IBC 903.2.8.1: An automatic sprinkler system installed in accordance with Section 903.3.1.3 shall be permitted in Group R-3 occupancies.

Group R-4 Condition 1, IBC 903.2.8.2: An automatic sprinkler system installed in accordance with IBC Section 903.3.1.3 shall be permitted in Group R-4 Condition 1 occupancies.

Group R-4 Condition 2, IBC 903.2.8.3: An automatic sprinkler system installed in accordance with IBC Section 903.3.1.2 shall be permitted in Group R-4 Condition 2 occupancies. Attics shall be protected in accordance with IBC Section 903.3.1.2.3 903.3.1.2.3 (1-4) Attics used for living purposes, storage

Care facilities, IBC 903.2.8.4: An automatic sprinkler system installed in accordance with IBC Section 903.3.1.3 shall be permitted in care facilities with five or fewer individuals in a single-family dwelling.

B. Allowable Heights and Areas:

The allowable heights, areas and stories illustrated in the following tables represent the information found in Chapter 5 of the IBC.

The maximum area of multi-story buildings depends on single occupancy, nonseparated occupancies or mixed occupancies. For multi-story, single or nonseparated occupancies, the allowable area, sprinklered or unsprinklered, is multiplied by three. For more information, see IBC Section 506.2.3 for single or nonseparated occupancies and IBC Section 506.2.4 for mixed occupancies.

The areas shown in the following tables may be further increased by using the frontage increases per Section 506.3 of the IBC.

Group R-1 Allowable Areas

R-1		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	4	4	4	4	4	3	2
	HEIGHT	UL	160	65	55	65	55	65	50	40
	13R AREA	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
	AREA	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
S	STORIES	UL	12	5	5	5	5	5	4	3
	13R STORIES	4	4	4	4	4	4	4	4	3
	13 HEIGHT	UL	180	85	75	85	75	85	70	60
	13R HEIGHT	60	60	60	60	60	60	60	60	60
	13 1-ST. AREA	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000
	13 MULTI-ST AREA	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	16,500

Group R-2 Allowable Areas

R-2		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	4	4	4	4	4	3	2
	HEIGHT	UL	160	65	55	65	55	65	50	40
	13R AREA	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
	AREA	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
S	STORIES	UL	12	5	5	5	5	5	4	3
	13R STORIES	4	4	4	4	4	4	4	4	3
	13 HEIGHT	UL	180	85	75	85	75	85	70	60
	13R HEIGHT	60	60	60	60	60	60	60	60	60
	13 1-ST. AREA	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000
	13 MULTI-ST AREA	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	21,000

Group R-3 Allowable Areas

R-3		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	4	4	4	4	4	3	3
	HEIGHT	UL	160	65	55	65	55	65	50	40
	13R 13D AREA	UL	UL	UL	UL	UL	UL	UL	UL	UL
	AREA	UL	UL	UL	UL	UL	UL	UL	UL	UL
S	STORIES	UL	12	5	5	5	5	5	4	4
	13R STORIES	4	4	4	4	4	4	4	4	4
	13D STORIES	4	4	4	4	4	4	4	3	3
	13 HEIGHT	UL	180	85	75	85	75	85	70	60
	13R HEIGHT	60	60	60	60	60	60	60	60	60
	13D HEIGHT	60	60	60	60	60	60	60	50	40
	13 1-ST. AREA	UL	UL	UL	UL	UL	UL	UL	UL	UL
	13 MULTI-ST AREA	UL	UL	UL	UL	UL	UL	UL	UL	UL

Group R-4 Allowable Areas

R-4		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	4	4	4	4	4	3	2
	HEIGHT	UL	160	65	55	65	55	65	50	40
	13R 13D AREA	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
	AREA	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
S	STORIES	UL	12	5	5	5	5	5	4	3
	13R STORIES	4	4	4	4	4	4	4	4	3
	13D STORIES	4	4	4	4	4	4	4	3	2
	13 HEIGHT	UL	180	85	75	85	75	85	70	60
	13R HEIGHT	60	60	60	60	60	60	60	60	60
	13D HEIGHT	60	60	60	60	60	60	60	50	40
	13 1-ST. AREA	UL	UL	96,000	64,000	96,000	64,000	82,000	48,000	28,000
	13 MULTI-ST AREA	UL	UL	72,000	48,000	72,000	48,000	61,500	36,000	21,000

C. Sprinkler Advantages:

The following occupancy specific sprinkler design advantages permitted when a complete automatic sprinkler system is installed (for additional sprinkler advantages applicable to all use groups, see section I):

Residential Specific Sprinkler Advantages:

Combustible Decorative Materials

IBC 806.2	NFPA 13 sprinkler systems increase the amount of combustible decorations in Group R-2 up to 50% (versus 10%).

Dead End Corridors

IBC 1020.4	NFPA 13 sprinkler systems allow dead end corridors up to 50 ft. in the following occupancies: B, E, F, I-1, M, R-1, R-2, R-4, S and U.

Delayed Egress

IBC 1010.1.9.7	NFPA 13 sprinkler systems permit delayed egress locking systems.

Draftstopping

IBC 718.3	NFPA 13 sprinkler systems eliminate draftstopping in floors of all R groups.
IBC 718.4	NFPA 13 sprinkler systems eliminate draftstopping in attics of groups R-1 and R-2.

Egress from Spaces

IBC 1006.2.1 and IBC Table 1006.3.2(1)	NFPA 13 or 13R sprinkler systems permit one means of egress from R-2 and R-3 dwelling units.

Fire Alarms

IBC 907.2.8.1, 907.2.9 and 907.2.10.1	Multiple manual pull stations not required when NFPA 13 or 13R sprinkler systems are present in R-1, R-2 and R-4 occupancies.
IBC 907.2.10.2	NFPA 13 sprinkler systems eliminate smoke detection in habitable spaces in Group R-4.

Fire Partition

IBC 708.3	NFPA 13 sprinkler systems reduce the fire resistance rating of fire partitions between dwelling/sleeping units to ½ hour.

Horizontal Assemblies

IBC 711.2.4.3	NFPA 13 sprinkler systems reduce the fire resistance rating of horizontal assemblies between dwelling/sleeping units to ½ hour.

Sensor Door Lock Release

IBC 1010.1.9.8	NFPA 13, 13R, or 13D sprinkler systems permit sensor released doors in R-1 and R-2 occupancies.

Smoke Dampers

IBC 717.5.3	NFPA 13 sprinkler systems eliminate smoke dampers at shafts in groups B and R buildings.

Storage Occupancies:

A. Complete Sprinkler Requirements:

The following paragraphs outline where complete sprinkler systems are required.

Group S-1, IBC 903.2.9: An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:

- A Group S-1 fire area exceeds 12,000 square feet
- A Group S-1 fire area is located more than three stories above grade plane.
- The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet.
- A Group S-1 fire area used for the storage of commercial trucks or buses where the fire area exceeds 5,000 square feet.
- A Group S-1 occupancy used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet.

Repair garages, IBC 903.2.9.1: An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with IBC Section 406, as shown:

- Buildings having two or more stories above grade plane, including basements, with a fire area containing a repair garage exceeding 10,000 square feet.
- Buildings no more than one story above grade plane, with a fire area containing a repair garage exceeding 12,000 square feet.
- Buildings with repair garages servicing vehicles parked in basements.
- A Group S-1 fire area used for the repair of commercial trucks or buses where the fire area exceeds 5,000 square feet

Bulk storage of tires, IBC 903.2.9.2: Buildings and structures where the area for the storage of tires exceeds 20,000 cubic feet shall be equipped throughout with an automatic sprinkler system in accordance with IBC Section 903.3.1.1.

Group S-2, enclosed parking garages, IBC 903.2.10: An automatic sprinkler system shall be provided throughout buildings classified as enclosed parking garages in accordance with IBC Section 406.4 as follows:

- Where the fire area of the enclosed parking garage exceeds 12,000 square feet; or
- Where the enclosed parking garage is located beneath other groups.
  Exception: Enclosed parking garages located beneath Group R-3 occupancies.

Commercial parking garages, IBC 903.2.10.1: An automatic sprinkler system shall be provided throughout buildings used for storage of commercial trucks or buses where the fire area exceeds 5,000 square feet.

B. Allowable Heights and Areas:

The allowable heights, areas and stories illustrated in the following tables represent the information found in Chapter 5 of the IBC.

The maximum area of multi-story buildings depends on single occupancy, nonseparated occupancies or mixed occupancies. For multi-story, single or nonseparated occupancies, the allowable area, sprinklered or unsprinklered, is multiplied by three. For more information, see IBC Section 506.2.3 for single or nonseparated occupancies and IBC Section 506.2.4 for mixed occupancies.

The areas shown in the following tables may be further increased by using the frontage increases per Section 506.3 of the IBC.

Group S-1 Allowable Areas

S-1		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	4	2	3	2	4	3	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	48,000	26,000	17,500	26,000	17,500	25,500	14,000	9,000
S	STORIES	UL	12	5	3	4	3	5	4	2
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	192,000	104,000	70,000	104,000	70,000	102,000	56,000	36,000
	MULTI-STORY AREA	UL	144,000	78,000	52,500	78,000	52,500	76,500	42,000	27,000

Group S-2 Allowable Areas

S-2		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	11	5	3	44	3	4	4	2
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	79,000	39,000	26,000	39,000	26,000	38,500	21,000	13,500
S	STORIES	UL	12	6	4	5	4	5	5	3
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	316,000	156,000	104,000	156,000	104,000	154,000	84,000	54,000
	MULTI-STORY AREA	UL	237,000	117,000	78,000	117,000	78,000	115,000	63,000	40,500

C. Sprinkler Advantages:

The following occupancy specific sprinkler design advantages permitted when a complete automatic sprinkler system is installed (for additional sprinkler advantages applicable to all use groups, see section I):

Storage Specific Sprinkler Advantages

Bolt Locks

IBC 1010.1.9.4 — NFPA 13 sprinkler systems permit bolt locks on inactive door leafs in Groups B, F, S.

Dead End Corridors

IBC 1020.4 — NFPA 13 sprinkler systems allow dead end corridors up to 50 ft. in the following occupancies: B, E, F, I-1, M, R-1, R-2, R-4, S and U.

Delayed Egress

IBC 1010.1.9.7 — NFPA 13 sprinkler systems permit delayed egress locking systems.

Indoor and Outdoor Control Areas (Non-flammable liquids, Non-combustible Solids)

IBC Table 414.2.5(1) sub (b) and (i) — NFPA 13 sprinkler systems permit unlimited or increase of 100% in groups M and S control areas.

Maximum Quantity Control Area (Health Hazard)

IBC Table 307.1 (2)	NFPA 13 sprinkler systems allow for 100% increase in quantities in a control area.
IBC 414.2.4	NFPA 13 sprinkler systems eliminate control area floor fire rating in Type II-A, III-A, and V-A.
IBC 412.4.6.1	NFPA 13 sprinkler systems increase Group III aircraft hangars total fuel capacity in a single fire area to 7,500 gallons.

Maximum Quantity Control Area (Physical Hazard)

IBC Table 307.1 (1)	NFPA 13 sprinkler systems allow for 100% increase in quantities in a control area.

Open Parking with Mechanical Access

IBC Table 406.5.4	NFPA 13 sprinkler systems allow additional building height of open parking garages with mechanical access.

Smoke and Heat Vents

IBC 910.1	Where ESFR and CMSA NFPA 13 sprinkler systems are provided, smoke and heat vents are not required.
IBC 910.1	Frozen food warehouses of Class I and II commodities are exempt from smoke and heat vents.
IBC 910.3.3	NFPA 13 sprinkler systems provide an 89% reduction over unsprinklered buildings for aggregate area of smoke and heat vents.

Travel Distance

IBC 1017.2.2	NFPA 13 sprinkler systems allow up to 400 ft of travel distance in single story groups F-1 and S-1.
IBC Table 1017.2	NFPA 13 sprinkler systems allow up to 400 ft of travel distance in groups F-2 and S-2.

Unlimited Areas

IBC 507.4	NFPA 13 sprinkler systems permit unlimited areas for one-story Group A-4, B, F, M, or S buildings.
IBC 507.5	NFPA 13 sprinkler systems permit unlimited areas for two-story Group B, F, M, or S buildings.
IBC 507.9	NFPA 13 sprinkler systems permit unlimited areas for two-story mixed Group B, F, H-5, M and S buildings.

Utility Occupancies:

A. Complete Sprinkler Requirements:

The following outlines where complete sprinkler systems are required.

B. Allowable Heights and Areas:

The allowable heights, areas and stories illustrated in the following tables represent the information found in Chapter 5 of the IBC.

The maximum area of multi-story buildings depends on single occupancy, nonseparated occupancies or mixed occupancies. For multi-story, single or nonseparated occupancies, the allowable area, sprinklered or unsprinklered, is multiplied by three. For more information, see IBC Section 506.2.3 for single or nonseparated occupancies and Section 506.2.4 for mixed occupancies.

The areas shown in the following tables may be further increased by using the frontage increases per Section 506.3 of the IBC.

Group U Allowable Areas

U		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B		A	B
NS	STORIES	UL	5	4	2	3	2	4	2	1
	HEIGHT	UL	160	65	55	65	55	65	50	40
	AREA	UL	35,500	19,000	8,500	14,000	8,500	18,000	9,000	5,500
S	STORIES	UL	6	5	3	4	3	5	3	2
	HEIGHT	UL	180	85	75	85	75	85	70	60
	1-STORY,AREA	UL	142,000	76,000	34,000	56,000	34,000	72,000	36,000	22,000
	MULTI-STORY AREA	UL	106,500	57,000	25,500	42,000	25,500	54,000	27,000	16,500

C. Sprinkler Advantages:

The following occupancy specific sprinkler design advantages permitted when a complete automatic sprinkler system is installed (for additional sprinkler advantages applicable to all use groups, see section I):

Dead End Corridors

IBC 1020.4

NFPA 13 sprinkler systems allow dead end corridors up to 50 ft. in the following occupancies: B, E, F, I-1, M, R-1, R-2, R-4, S and U.

Delayed Egress

IBC 1010.1.9.7	NFPA 13 sprinkler systems permit delayed egress locking systems.

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