Building Codes 101 & 102



AIA Detroit

A Chapter of the American Institute of Architects





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ZONING





Zoning v. Code

- ◆ Code = Statewide
- Zoning = Local Ordinances
 - Every municipality is different.
 - Every zoning ordinance is different.
 - Every approval process is different.

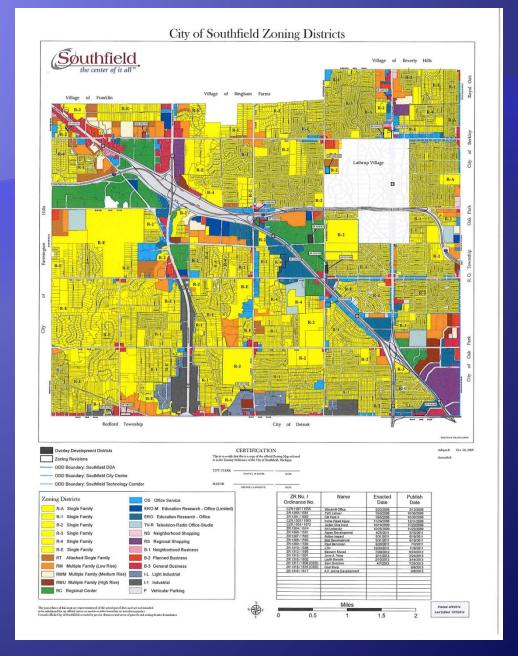


Zoning Approval Process

- Design review board
- Planning commission
- Zoning board
- All public hearings



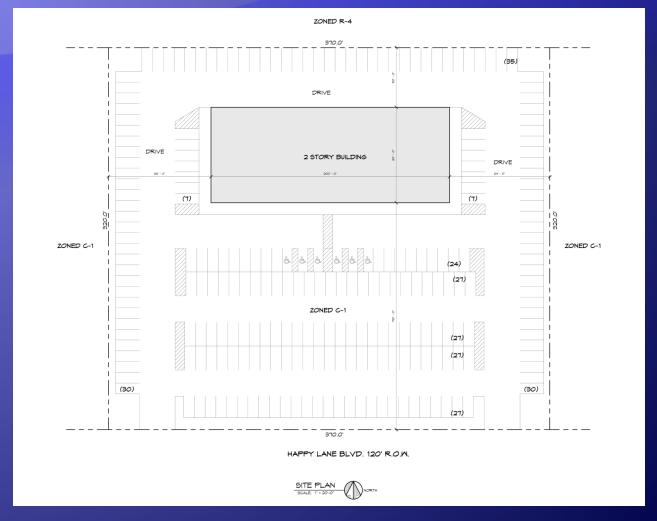








Zoning Information







Site/Building Data

SITE/BUILDING DATA

ZONING: C-1 COMMERCIAL

SITE AREA: 118,400 SQ. FT. (2.72 ± ACRES)

% LOT COVERAGE 13.51% % LANDSCAPING 12.32%

 SETBACKS:
 MIN. FT.
 ACTUAL FT.

 FRONT
 70
 190

 SIDE
 20
 84

 REAR
 35
 50

BLDG. HEIGHT: MAX. FT. ACTUAL FT.

BUILDING AREA: 32,000 GROSS SQ. FT.

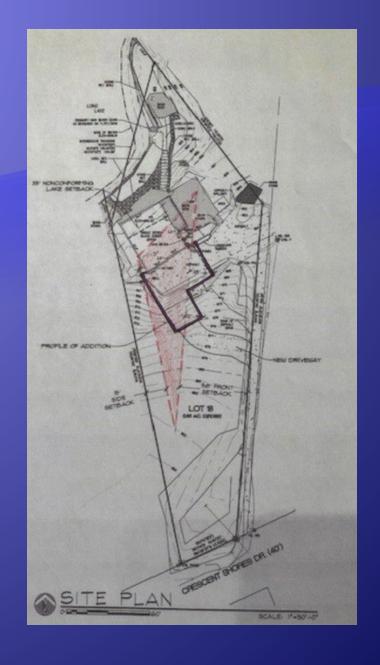
USABLE PARKING PARKING USE SQ. FT. REQUIRED RATIO OFFICE 12,240 1/200 = 61 RESTAURANT 4.226 1/2 SEATING = 109 (217 SEATING) RETAIL 5.176 1/150 = 35 PARKING REQUIRED = 205 PARKING PROVIDED (W/ 6 BFD/ADA) = 214 OVERAGE = +9



Example of Plan Items Requested

- Site Plan
 - Set Back
 - Storm Water
 - Management
 - Parking/ ADA
- Floor Plan
- Elevations
- Color Sample Board







Zoning Board of Appeals Pointers

- Standards for Variances are the <u>SAME</u> in every community in Michigan
- Established by State law and case law
- Must demonstrate <u>PRACTICAL DIFFICULTY</u> for Non-Use Variances and <u>UNDUE HARDSHIP</u> for Use Variances
 - NOT MONETARY HARDSHIP
 - TOPOGRAPHY
 - ◆ LOT SHAPE
 - NOT SELF CREATED
 - NOT CREATED BY PAST OR PRESENT OWNER
 - WILL NOT PERMIT ANY CONDITIONAL, TEMPORARY USE OR NEW USE
 - WITHIN DISTRICT
 - NO ADVERSE IMPACTS ON SURROUNDING PROPERTIES, VALUES OR RESTRICT THE ENJOYMENT OF OTHERS BECAUSE OF THIS REQUEST



Planning Commission Pointers

- It is critical that an architect <u>KNOW THE</u> <u>COMMUNITY!</u>
- Use local Architect
- Attend Pre-Application meeting
- Site visit
- Watch a Planning Commission meeting
- Partner with local designers (Engineer, Landscape Architect, etc.)

EXAMPLE:

The City of Troy has a <u>HYBRID</u> Zoning Ordinance (mix of Traditional and Form Based Code)

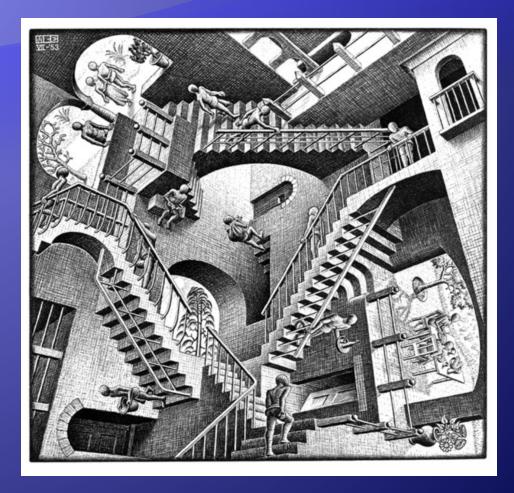


BUILDING CODES





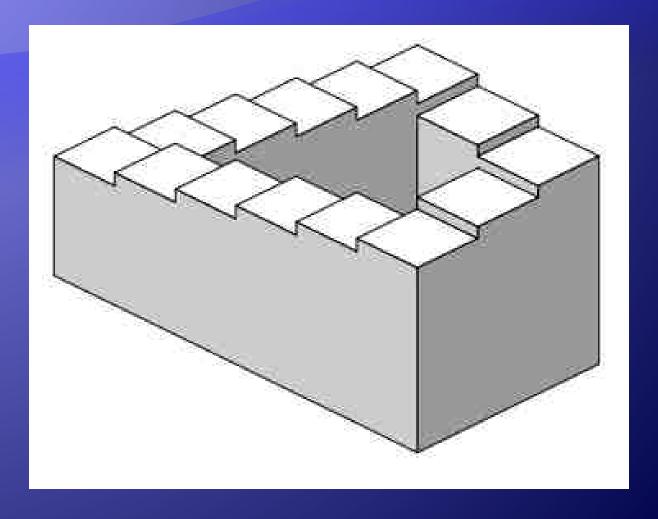
Learning Code – Year 1







Learning Code – Year 30







Why Have a Building Code?

 To protect the health, safety and welfare of building occupants

Do codes work? YES!



WE CAN STILL DO BETTER

Structure Fires in the U.S.

(Data for 2015)

- 501,500 structure fires
- 2,685 civilian deaths
- \$10.3 billion in property damage
- One structure fire every 63 seconds
- One home fire every 86 seconds
- One civilian death every 2 hours & 40 minutes
- 68 fire fighter deaths





Grenfell Tower, London, 2017













...And what about them?







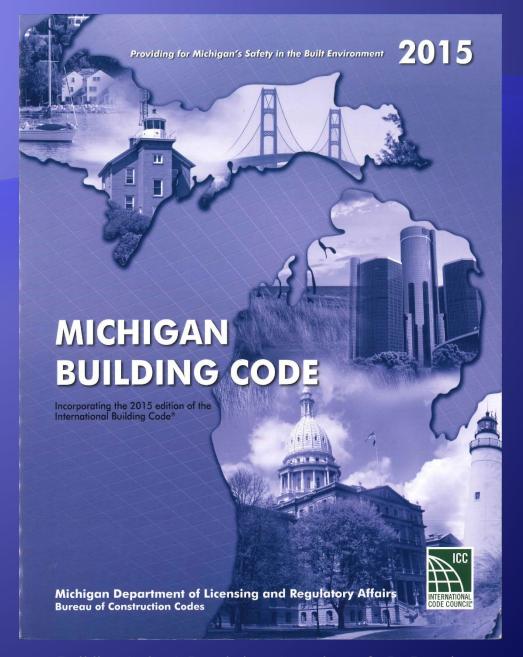
Grenfell Tower Fire

London, June 14, 2017

- Building
 - Constructed in 1970. Renovated in 2015-2016
 - 24 story residential tower. 129 apartments
 - One stairwell (per code)
 - No fire suppression (per code)
 - One exit (per code)
- Fire Data
 - 100 ambulance crews, 20 vehicles
 - 250 firefighters, 70 engines
 - **♦ 71 DEATHS**
 - Financial loss: TBD









One Code, Multiple Books







Applicable Codes & Status

- New Building v Existing Building
- Scope of Project / Disciplines Involved
- Current Codes:
 - 2015 Michigan Building Code
 - 2015 Michigan Plumbing Code
 - 2015 Michigan Mechanical Code
 - 2015 Michigan Rehabilitation Code for Existing Buildings
 - 2017 Michigan Part 8 Electrical Code (MEC)
 - Part 10a Michigan Energy Code
 - Michigan Elevator Rules 2015 or City of Detroit Elevator Rules
 - NFPA 101? Depends on the project type (State Fire Marshal)



Other Codes & Regulations

- Accessibility Code Reqs v Federal Laws...
 - MBC Ch. 11 (scoping) + ICC A117.1 (technical)
 - DOJ's Americans with Disabilities Act (ADA)
 - HUD's Fair Housing Act (FHA)
- Other Local v State Regulations
 - Fire Code
 - State = PA207 = NFPA 1-2006
 - Local = ? (typically IFC)
 - Property Maintenance Code
 - State = n/a
 - Local = ? (typically IPMC)



Useful Information

- Check out "Effective use of the International Building Code" Pages ix to xvii. This is a brief summary of each chapter.
- Revisions to the Code (margin markings)
 - Single Line = ICC Revision
 - Double Line = MI Revision
 - Arrow = Deletion





Useful Information

- Always start with the highest level of the 'scoping' provision before applying subsections
 - Section 713.4.1.1.2 does not apply to your project if the higher level of the section, Section 713.4, doesn't apply.
 - Don't "Cherry Pick" the Code.





Useful Information

 Review the <u>ENTIRE</u> <u>CODE</u>, not just Chapters 3-11. There are "hidden trip hazards" throughout the code!

Example

- Building height requirements are in chapter 5
- However, a penthouse could be considered a floor level. That is covered in chapter 15 (1510).
- Missing this could cause you to have later issues with construction type, high rise requirements and other code requirements.



CHAPTER 1 SCOPE AND ADMINISTRATION

"IT'S THE LAW"





Chapter 1 - At least read it once!

Part 1:

Establishes the limits of applicability of the Code

Part 2:

- Establishes authority and duty of the Code Official
- Establishes the rights and privileges of the Design Professional, Contractor and Property Owner.



Key Sections

- 101 & 102 Scope and Application
- 104 Duties and Power of Building Official
- 105 Permits
- 107 Submittal Documents
- 110 & 111 Inspections and C of O
- 113 Board of Appeals
- 116 Unsafe Structures and Equipment



REGISTERED DESIGN PROFESSIONAL

<u>"</u>The construction documents shall be prepared by...a registered design professional when required by 1980 PA 299, MCL 339.101."

Exceptions

- 1. Small public work projects less than \$15,000.00
- 2. Residential project less than 3,500 SF.



DUTIES AND POWERS OF THE BUILDING OFFICIAL

104.1 General. The *building official* is hereby authorized and directed to enforce the provisions of this code. The *building official* shall have the authority to <u>render interpretations</u> of this code and to adopt policies and procedures in order to <u>clarify</u> the application of its provisions.



Construction Documents

MBC Section 107.2.1 and MRCEB Section 106.2.1:

"...Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations..."



CHAPTER 2 DEFINITIONS

"WHAT DO THE TERMS MEAN DEFINITIVELY?"





IDENTIFYING DEFINED TERMS

Terms defined in the Code are written in:

ITALICS





Useful Information

- Always be mindful of specific 'definitions' and 'punctuation' – per IBC Commentary:
 - "Codes are technical documents and every word, term and punctuation mark can impact the meaning of the code text and the intended results."

"Eats shoots and leaves."
"Eats, shoots, and leaves."



General

201.1 Scope. Unless otherwise expressly stated, the following words and terms shall, for the purposes of this code, have the meanings shown in this chapter.

201.2 Interchangeability. Words used in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

are defined in other codes. Where terms are not defined in this code and are defined in the International Energy Conservation Code, International Fuel Gas Code, International Fire Code, International Mechanical Code or International Plumbing Code, such terms shall have the meanings ascribed to them as in those codes.

201.4 Terms not defined. Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.



CHAPTER 3 USE AND OCCUPANCY CLASSIFICATION

"WHAT CAN I DESIGN?"





General.

- 1. Assembly (see Section 303): Groups A-1, A-2, A-3, A-4 and A-5
- 2. Business (see Section 304): Group B
- 3. Educational (see Section 305): Group E
- 4. Factory and Industrial (see Section 306): Groups F-1 and F-2
- 5. High Hazard (see Section 307): Groups H-1, H-2, H-3, H-4 and H-
- 6. Institutional (see Section 308): Groups I-1, I-2, I-3 and I-4
- 7. Mercantile (see Section 309): Group M
- 8. Residential (see Section 310): Groups R-1, R-2, R-3 and R-4
- 9. Storage (see Section 311): Groups S-1 and S-2
- 10. Utility and Miscellaneous (see Section 312): Group U



SECTION 303.1 ASSEMBLY GROUP A

Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

MBC exception for less than 750 sq. ft. or 50 occupants









SECTION 303.2 Assembly Group A-1.

Assembly uses, usually with fixed seating, intended for the production and viewing of the performing arts or motion pictures including, but not limited to:

- Motion picture theaters
- Symphony and concert halls
- Television and radio studios admitting an audience
- Theaters









Assembly Group A-2.

Assembly uses intended for food and/or drink consumption including, but not limited to:

- Banquet halls
- Casinos (gaming areas)
- Nightclubs
- Restaurants, cafeterias and similar dining facilities
- Taverns and bars









Assembly Group A-3.

Assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

- Arcades, Art galleries, Bowling alleys, Community halls, Courtrooms
- Dance halls (not including food or drink) Exhibition halls, Funeral parlors
- Gymnasiums, Indoor swimming pools, Indoor tennis courts (without seating)
- Lecture halls, Libraries, Museums, Places of religious worship
- Pool and billiard parlors, Waiting areas in transportation terminals











Assembly Group A-4.

Assembly uses intended for viewing of indoor sporting events and activities with spectator seating including, but not limited to:

- Arenas
- Skating rinks
- Swimming pools
- Tennis courts









Assembly Group A-5.

Assembly uses intended for participation in or viewing outdoor activities including, but not limited to:

- Amusement park structures
- Bleachers
- Grandstands
- Stadiums









SECTION 304 BUSINESS GROUP B

Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:









SECTION 304 BUSINESS GROUP B

- Airport traffic control towers
- Ambulatory care facilities
- Animal hospitals, kennels and pounds
- Banks
- Barber and beauty shops
- Car wash
- Civic administration
- Clinic, outpatient
- Dry cleaning and laundries: pick-up and delivery stations and self-service











SECTION 304 BUSINESS GROUP B

- Educational occupancies for students above the 12th grade
- Electronic data processing
- Laboratories: testing and research
- Motor vehicle showrooms
- Post offices
- Print shops
- Professional services (architects, attorneys, dentists, physicians, engineers, etc.)
- Radio and television stations
- Telephone exchanges
- Training and skill development not within a school or academic program









SECTION 305

EDUCATIONAL GROUP E

Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

Religious accessory use with an occupancy below 100 occupants is A-3









SECTION 306 FACTORY GROUP F

Factory Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabricating, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous or Group S storage occupancy.

- F-1 Moderate Hazard
- F-2 Low hazard









SECTION 307 HIGH-HAZARD GROUP H

High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in *control areas* complying with Section 414. Refer to chapter tables for materials and quantities.

- H-1 Detonation Hazard
- H-2 Flammable and Combustible liquids/gases in OPEN containers
- H-3 Flammable and Combustible liquids/gases in CLOSED containers
- H-4 Corrosive or Toxic materials









SECTION 308 INSTITUTIONAL GROUP I

Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which care or supervision is provided to persons who are or are not capable of self-preservation without physical assistance or in which persons are detained for penal or correctional purposes or in which the liberty of the occupants is restricted.

- I-1 Assisted Living & Rehab Centers
- I-2 Hospitals, 24 hr care, Nursing homes
- I-3 Prisons & Jails
- I-4 Day Cares









SECTION 309 MERCANTILE GROUP M

Mercantile Group M occupancy includes, among others, the use of a building or structure or a portion thereof, for the display and sale of merchandise and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public. Mercantile occupancies shall include, but not be limited to, the following:

- Department stores
- Drug stores
- Markets
- Motor fuel-dispensing facilities

- Retail or wholesale stores
- Sales rooms









SECTION 310 RESIDENTIAL GROUP R

Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code*.

Groups R-1, R-2, R-3, or R-4.









Residential Group R-1

Residential occupancies containing *sleeping units* where the occupants are primarily *transient* in nature, including:

- Boarding houses (transient) with more than 10 occupants
- Congregate living facilities (transient) with more than 10 occupants
- Hotels (transient)
- Motels (transient)











Residential Group R-2

Residential occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

- Apartment houses
- Boarding houses (nontransient) with more than 16 occupants
- Congregate living facilities (nontransient) with more than 16 occupants
- Convents
- Dormitories

- Fraternities and sororities
- Hotels (nontransient)
- Live/work units
- Monasteries
- Motels (nontransient)
- Vacation timeshare properties









Residential Group R-3

Residential occupancies where the occupants are primarily permanent in nature and not classified as group R-1, R-2, R-4, or I, including any of the following:

- Adult foster care family homes or adult foster care, for 6 or fewer persons.
- Buildings that do not contain more than 2 dwelling units.
- Boarding houses (nontransient) with 16 or fewer occupants.
- Boarding houses (transient) with 10 or fewer occupants.
- Congregate living facilities (nontransient) with 16 or fewer occupants.
- Congregate living facilities (transient) with 10 or fewer occupants.
- Foster family homes for not more than 4 minor children.
- Foster care family group homes for more than 4 but fewer than 7 minor children.











Residential Group R-4

This occupancy shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive *custodial care*. The persons receiving care are capable of self-preservation. This group shall include, but not be limited to, the following:

- Alcohol and drug centers
- Assisted living facilities
- Congregate care facilities, Convalescent facilities
- Group homes, Halfway houses
- Residential board and custodial care facilities
- Social rehabilitation facilities







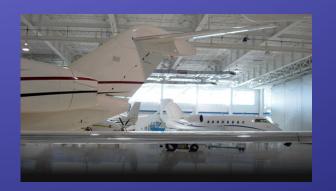




SECTION 311 STORAGE GROUP S

Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as a hazardous occupancy.

- S-1 Moderate Hazard, Combustables
 - Motor vehicle repair, paper, furniture, aircraft hangers
- S-2 Low Hazard, Non-Combustibles
 - Metals, glass, food and meats, Parking Garages











Moderate-hazard storage S-1

- **Group S-1.** Buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:
- Aerosols, Levels 2 and 3, Aircraft hangar (storage and repair), Bags: cloth, burlap and paper, Bamboos and rattan, Baskets, Belting: canvas and leather, Books and paper in rolls or packs, Boots and shoes, Buttons, including cloth covered, pearl or bone, Cardboard and cardboard boxes, Clothing, woolen wearing apparel, Cordage, Dry boat storage (indoor), Furniture, Furs, Glues, mucilage, pastes and size, Grains, Horns and combs, other than celluloid, Leather, Linoleum, Lumber, Motor vehicle repair garages complying with the, maximum allowable quantities of hazardous materials, listed in Table 307.1(1) (see Section 406.8), Photo engravings, Resilient flooring, Silks, Soaps, Sugar, Tires, bulk storage of, Tobacco, cigars, cigarettes and snuff, Upholstery and mattresses, Wax candles









Low-hazard storage, Group S-2

- **Group S-2.** Includes, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic *trim*, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited, to, storage of the following:
- Asbestos, Beverages up to and including 16-percent alcohol in, metal, glass or ceramic containers, Cement in bags, Chalk and crayons, Dairy products in non-waxed coated paper containers, Dry cell batteries, Electrical coils, Electrical motors, Empty cans, Food products, Foods in noncombustible containers, Fresh fruits and vegetables in non-plastic trays or, Containers, Frozen foods, Glass, Glass bottles, empty or filled with noncombustible liquids, Gypsum board, Inert pigments, Ivory, Meats, Metal cabinets, Metal desks with plastic tops and *trim*, Metal parts, Metals, Mirrors, Oil-filled and other types of distribution transformers, Parking garages, open or enclosed, Porcelain and pottery, Stoves, Talc and soap stones, Washers and dryers











SECTION 312 UTILITY AND MISCELLANEOUS GROUP U

Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

- Agricultural buildings Aircraft hangars, accessory to a one- or two-family residence
- Barns Carports Fences more than 6 feet (1829 mm) in height
- Grain silos, accessory to a residential occupancy Greenhouses Livestock shelters
- Private garages Retaining walls Sheds Stables Tanks Towers











CHAPTER 4 SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

"WHAT UNIQUE CIRCUMSTANCE APPLY?"





Chapter 4

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

♦ SECTION 402	COVERED MALL	AND OPEN MALL BUILDINGS

- SECTION 403
 HIGH-RISE BUILDINGS
- SECTION 404 ATRIUMS
- SECTION 405
 UNDERGROUND BUILDINGS
- SECTION 406
 MOTOR-VEHICLE-RELATED OCCUPANCIES
- SECTION 407 GROUP I-2
- SECTION 408 GROUP I-3
- SECTION 409
 MOTION PICTURE PROJECTION ROOMS
- SECTION 410
 STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS
- SECTION 411
 SPECIAL AMUSEMENT BUILDINGS
- SECTION 412
 AIRCRAFT-RELATED OCCUPANCIES
- SECTION 413
 COMBUSTIBLE STORAGE
- SECTION 414 HAZARDOUS MATERIALS
- SECTION 415
 GROUPS H-1, H-2, H-3, H-4 AND H-5
- SECTION 416
 APPLICATION OF FLAMMABLE FINISHES
- SECTION 417 DRYING ROOMS
- SECTION 418 ORGANIC COATINGS
- SECTION 419
 LIVE/WORK UNITS
- SECTION 420
 GROUPS I-1, R-1, R-2, R-3
- SECTION 421 HYDROGEN CUTOFF ROOMS
- SECTION 422
 AMBULATORY CARE FACILITIES
- SECTION 423
 STORM SHELTERS
- SECTION 424 CHILDREN'S PLAY STRUCTURES
- SECTION 425 CONSUMER FIREWORKS FACILITIES
- SECTION 426 COMBUSTIBLE DUST
- SECTION 427 CONSUMER FIREWORKS





CHAPTER 5 GENERAL BUILDING HEIGHTS AND AREAS

"HOW BIG CAN I DESIGN IT?"





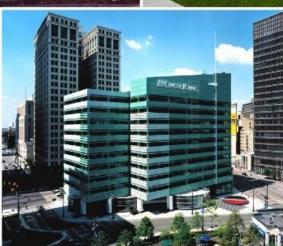




















SECTION 503 General Building Height and Area Limitations.

- Height in Feet Governed by Table 504.3
- Stories Governed by Table 504.4
- Area Governed by Table 506.2
- Based on <u>Use Group</u> and <u>Type of Construction.</u>
- Area: Gross building area per floor.
- Height: Level of fire fighter access to roof line feet and stories.



New Footnotes

Table 504.3, 504.4, 506.2

- UL = Unlimited
- NP = Not permitted
- NS = Buildings not equipped throughout with an automatic sprinkler system
- S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1
- S1 = Buildings a maximum of one story above grade plane equipped throughout with an automatic sprinkler system
- SM = Buildings two or more stories above grade plane equipped throughout with an automatic sprinkler system
- S13R = Buildings equipped throughout with an automatic sprinkler system installed in Group 'R'



Table 504.3:

Allowable Building Height in Feet (Partial Table)

	TYPE OF CONSTRUCTION									
		TYPEI		TYPE II		TYPE III		TYPE IV	TYPE V	
A B			А	В	Α	В	НТ	Α	В	
GROUP	FOOTNOTES									
A, B, E, F, M, S,U	NS S	UL UL	160 180	65 85	55 75	65 85	55 75	65 85	50 70	40 60



Table 504.4:

Allowable Number of Stories Above Grade Plane (Partial Table)

	TYPE OF CONSTRUCTION									
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		А	В	Α	В	Α	В	HT	А	В
GROUP	FOOTNOTES									
A-3	NS	UL	11	3	2	3	2	3	2	1
	S	UL	12	4	3	4	3	4	3	2
В	NS	UL	11	5	3	5	3	5	3	2
	S	UL	12	6	4	6	4	6	4	3
S-2	NS	UL	11	5	3	4	3	4	4	2
	S	UL	12	6	4	5	4	5	5	3



Table 506.2:

Allowable Building Area (Partial Table)

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV TYPE V		PE V
		Α	В	А	В	Α	В	НТ	Α	В
	HEIGHT (FEET)									
GROUP	FOOTNOTES									
A-3	NS S1 SM	UL UL UL	UL UL UL	15,500 62,000 46,500	9,500 38,000 28,500	14,000 56,000 42,000	9,500 38,000 28,500	15,000 60,000 45,000	11,500 46,000 34,500	6,000 24,000 18,000
В	NS S1 SM	UL UL UL	UL UL UL	37,500 150,000 112,500	23,000 92,000 69,000	28,500 114,000 85,500	19,000 76,000 57,000	36,000 144,000 108,000	18,000 72,000 54,000	9,000 36,000 27,000
S-2	NS S1 SM	UL UL UL	79,000 316,000 237,000	39,000 156,000 117,000	26,000 104,000 78,000	39,000 156,000 117,000	26,000 104,000 78,000	38,500 154,000 115,500	21,000 84,000 63,000	13,500 54,000 40,500





"I WANT IT BIGGER!"

- The code loves sprinkler systems!
- Automatic sprinkler system increase:
 - Height Feet
 - Height Stories
 - Area Per Floor



Table 504.3 Building Height Increase

Automatic Sprinkler System Increase

- Increase height by 20'
- Exception: I-2 and High Hazard occupancies (increase not allowed).



Table 504.4 Building Stories Increase

Automatic Sprinkler System Increase

- Increase number of stories by one.
- Exception: I-2 and High Hazard occupancies (increase not allowed).



Table 506.2 Building Area Modifications

Automatic Sprinkler System Increase

- 200% Increase
- 300% Increase (One-story buildings)
- Exceptions for High Hazard occupancies.



SECTION 506 Building Area (Modifications)

Section 506.3.2 Frontage Increase

Section 506.3.3 Area Increase

Section 506.2 Occupancy & Stories



Example Equations

Chapter 5 General Building Heights and Areas

Section 506.2 Allowable Area

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Section 506.2.1 Single-Occupancy - One Story
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Equation 5-1
$$Aa = At + (NS \times If)$$

Equation 5-1 Aa = At + (NS
$$\times$$
 lf)

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

Equation 5-3 Aa = At + (NS
$$\times$$
 lf)

Section 506.3 Frontage Increase

Equation 5-4
$$W = [(L1 \times w1) + (L2 \times w2) + (L3 \times w3) + (L4 \times w4)]/F$$

Equation 5-5 If =
$$[F/P - 0.25]$$
 W/30



Other Increases

Fire Wall: (Chapter 7 and Section 510)

- Creates two or more separate buildings. Each which can contain the maximum allowable area.
- Must be free standing.
- Limited openings allowed must be protected.

Unlimited area buildings (Section 507)

- Typical: One or two stories, fully fire suppressed and 6o' yards or public ways on all sides.
- Many exceptions based on Use and Construction Type
- Must still meet egress limits.

Special Provisions (Section 510)

Parking garages with other uses.

Mezzanines and equipment platforms (Section 505)



SECTION 508 Mixed Use and Occupancy

More than one occupancy group in a building.

Three Options:

- 508.2 Accessory Occupancies
- 508.3 Non-separated Occupancies
- 508.4 Separated Occupancies

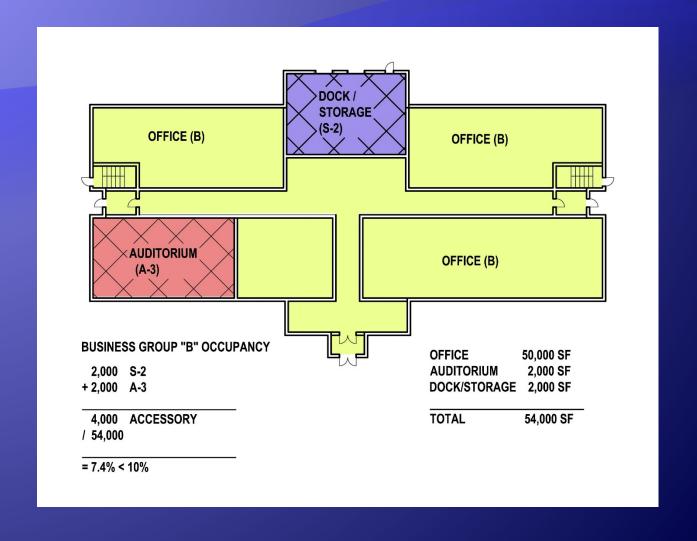


SECTION 508.2 Accessory Occupancies

- Ancillary to main occupancy (i.e. offices in factory or school).
- Less than 10% of main occupancy area.
- No separation required unless H or R occupancies.



Accessory Occupancy Example



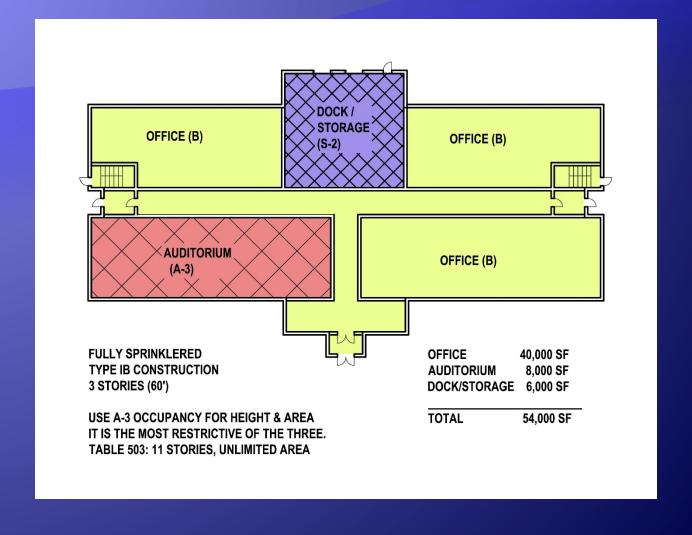


Non-Separated Occupancies

- Allowable height and area based on the <u>most restrictive</u> occupancy group for type of construction.
- The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space.
- Most restrictive egress requirements (Chapter 9) apply to total non-separated occupancy area.
- No separation required.



Non-Separated Occupancy Example





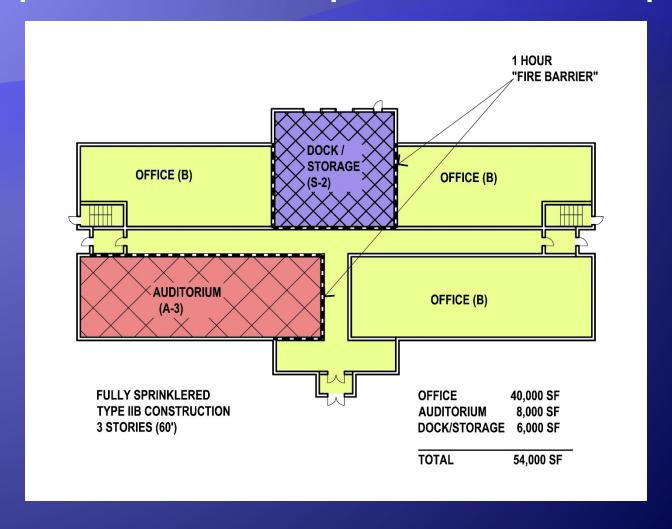
Separated Occupancies

- Each area individually classified based on its occupancy and follows all code requirements for that occupancy.
- Allowable area in each story:
 - sum of ratios of building area for each separated occupancy divided by allowable building area for each separated occupancy shall not exceed 1.
- Allowable height: Limited based on construction type for each separated occupancy.
- Separations ("Fire Barriers" or "Horizontal Assemblies") required per table 508.4





Separated Occupancies Example





Separated Occupancy Calculation

A-3 Occupancy: 8	,000/28,500 =	0.28
------------------	---------------	------

Total (Complies): 0.93



Table 508.4

Required Separation of Occupancies (Partial Table)

	Ac	I, E	-1, -	3, I-4	I-	2	R		F-2, S-2, U		B, F-1, M, S-1	
OCCUPANCY	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	Ν	N	1	2	2	NP	1	2	Ν	1	1	2
l-1, l-3, l-4	<u>-</u>	- , , ,	N	N	2	NP	1	NP	1	2	1	2
l-2	-	-	-	-	N	N	2	NP	2	NP	2	NP
R	-	-	-	-	-	-	N	Ν	1	2	1	2
F-2, S-2, U	-	-	_	-	-	-	-	-	Ν	N	1	2
B, F-1, M, S-1	-	-	-	-	-	-	-	-	-	_	N	N

^{*}High Hazard omitted for clarity*



^{*}Footnotes not shown*

SECTION 509 Incidental Uses

- Ancillary functions associated with a given occupancy that generally pose a greater level of risk to that occupancy."
- Less than 10 percent of the building area per story
- Must be enclosed with fire barrier or a smoke-tight partition with fire suppression per table 509.
- Examples:
 - Furnace rooms over 400,000 BTU
 - Boilers over 15 PSI and 10 HP
 - Laboratories
 - Paint shops, not classified as group H
 - Laundry rooms
 - Plant maintenance shops
 - Most requirements are eliminated with an automatic sprinkler system



CHAPTER 6 TYPES OF CONSTRUCTION

"WHAT IS IT MADE OF?"





Basic Concepts

- Noncombustible Construction
 - Defined by Code
 - Will not ignite or burn
 - Tested (ASTM)
 - Examples: Concrete, steel, masonry, stone, precast concrete
- Combustible Construction
 - ◆ <u>NOT</u> defined by Code
 - Examples: Wood, plastics, foam plastics



Basic Concepts

- "Passive" Fire Protection
 - Use of non-combustible construction
 - Protection by use of fire resistant enclosures such as gypsum board, fire-proofing, masonry, etc.
- "Active" Fire Protection
 - Fire suppression (sprinkler) systems



Construction Classification

 Construction type is based on fire resistance of structural elements (columns, floors, roof and bearing walls).

It's all about compliance with Table 601.



Five Construction Classifications

- Types I & II: Noncombustible materials
- Types III, IV & V: Mix of noncombustible materials and any material permitted by this code.
- Generally, the more stringent the classification, the larger the allowable area and taller the building height.
- More stringent classifications generally require higher fire rated assemblies.



Type I & II Construction

- Noncombustible materials
- Examples:
 - Type IA, IB, IIA: Concrete structure or fireproofed "protected" steel or masonry.
 - Type IIB "Unprotected": Steel



Type III Construction

- Exterior walls are noncombustible materials.
- Interior elements are any material permitted by this code.
- Examples:
 - Exterior masonry bearing walls & steel frame.



Type IV Construction

- "Heavy Timber"
- Exterior walls are noncombustible materials.
- Interior elements are solid or laminated wood.
 - 4x6 min sawed lumber
 - 3x6 7/8 min glue-lam



Type V Construction

- "Light wood framing"
- Exterior and interior elements are any materials permitted by this code.





Table 601

Fire Rating of Structural Elements

- Provides fire-resistance rating requirements for building elements.
- Based on "hours" of protection.
- Building elements:
 - Primary structure
 - Bearing & nonbearing walls and partitions.
 - Floor construction
 - Roof construction



Table 601

Fire-Resistance Rating Requirements for Building Elements

	TYI	PET	TY	PE II	TYF	PE III	TYPE IV	TYF	PE V
BUILDING ELEMENT	Α	В	Α	В	Α	В	HT	Α	В
Primary Structural Frame (See Section 202)	3	2	1	0	1	0	нт	1	0
Bearing Walls Exterior	3	2	1	0	2	2	2	1	0
Interior	3	2	1	0	1	0	1/HT	1	0
Nonbearing Walls and Partitions Exterior	See Table 602								
Nonbearing Walls and Partitions Interior	0	0	0	0	O	0	See Section 602.4.6	0	0
Floor Construction and Secondary Members (See Section 202)	2	2	1	0	1	0	НТ	1	0
Roof Construction and Secondary Members (See Section 202)	11/2	1	1	0	1	0	нт	1	0





Important Note

- You can always use a more fire resistant construction, but classify your building as a lower construction type on your drawings.
- Example: Use a fireproofed steel frame (Type IIA) construction but classify your building as Type IIB.
- It's all about compliance with Table 601 and how you identify it on your drawings.



Table 602

Exterior wall rating based on fire separation distance.

- Exterior walls less than 30' from a property line may be required to be fire-rated.
- Requirements are based on:
 - Distance from property line
 - Type of construction
 - Use group



Table 602

Fire-Resistance Rating Requirements for Exterior Walls Based on Fire Separation Distance

FIRE SEPARATION DISTANCE = X (feet)	TYPES OF CONSTRUCTION	OCCUPANCY GROUP H	OCCUPANCY GROUP F-1, M, S-1	OCCUPANCY GROUP A, B, E, F-2, I, R, S-2, U	
X < 5	All	3	2	1	
5 <u><</u> X < 10	IA Others	3 2	2 1	1 1	
10 <u><</u> X < 30	IA, IB, IIB, VB Others	2 1 1	1 0 1	1 0 1	
X ≥ 30	All	0	0	0	



Building Code; Pointers

- Openings (windows and doors) in fire-rated exterior walls are controlled by section 705.
- Buildings on the same lot also controlled by Section 705.
 - Imaginary property line required between them to determine requirements.



SECTION 603

Combustible Materials in Type I & II Construction

- Some combustible materials are allowed in Type I and II "Noncombustible" construction.
- Examples:
 - Wood Blocking & Trim
 - Stages
 - Insulation
 - Plastics
 - Foam Plastics
 - Electrical Wiring



CHAPTER 7 FIRE & SMOKE PROTECTION FEATURES

"PASSIVE" FIRE PROTECTION





Passive Fire and Smoke Construction Defined

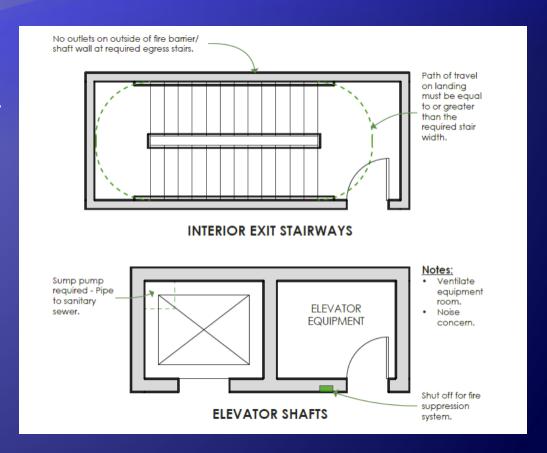
- ◆ Fire walls
- Fire Barrier
- Fire Partition
- Smoke Barrier
- Smoke Partition
- Shaft
- Horizontal Barrier

USE THE CORRECT TERM!



"Sacred Spaces"

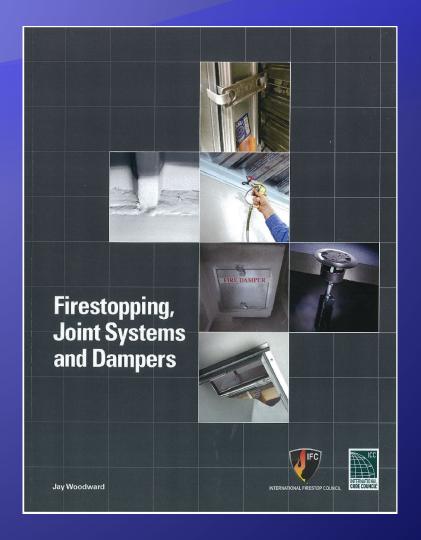
- Nothing allowed in, or through, elevator shafts and equipment rooms, unless it serves that space.
- Not to be used for any other purpose.
- Fire-rated enclosures (1hour for up to 3 floors, 2hour for 4 or more floors).
- Continuity supporting structure must have the same fire rating as the shaft.
- Smoke and fire rated enclosure.







Firestopping, Joint Systems and Dampers







Fire & Smoke Damper Locations

SECTION	WALL TYPE	REFERENCED FROM	TYPE OF DAMPER
717.5.1 (IMC 607.5.1)	Fire Walls	706.11	Fire Damper
717.5.1.1 (IMC 607.5.1.1)	Fire Wall – Horizontal Exits	706.11	Fire Damper, Smoke Damper
717.5.2 (IMC 607.5.2)	Fire Barriers	707.10	Fire Damper
717.5.2.1 (IMC 607.5.2.1)	Fire Barriers – Horizontal Exits	707.10	Fire Damper, Smoke Damper
717.5.3 (IMC 607.5.5)	Shaft Enclosures	713.10	Fire Damper, Smoke Damper
717.5.4 (IMC 607.5.3)	Fire Partitions	708.9	Fire Damper
717.5.4.1 (IMC 607.5.3 and 607.5.4)	Fire Partitions – Corridors	708.9	Fire Damper, Smoke Damper
717.5.5 (IMC 607.5.4)	Smoke Barriers	709.8	Smoke Damper
717.5.6 (IMC 607.5.6)	Exterior Walls	705.10	Fire Damper
717.5.7 (IMC 607.5.7)	Smoke Partitions	710.8	Smoke Damper





CHAPTER 8 INTERIOR FINISHES

"ARE THERE LIMITS ON INTERIOR MATERIALS?"





SMOKE KILLS

- Interior finishes contribute fuel & toxic smoke to fires.
- Most deaths in fire incidents are caused by smoke inhalation.
- Therefore, code restricts interior materials to those tested and approved.





Typical Controlled Materials

- Plastics, Foam Plastics
- Wallcovering: Textile & Vinyl
- Wood Flooring
- Carpet, Carpet Tile
- Resilient Flooring & Base
- Decorative Materials and Trim
- Curtains, Draperies, & Other Window Treatments
- Acoustical Ceiling
- Fire Marshals, especially the State Fire Marshall will often ask to see affidavits showing that finish materials comply with the Code.





CHAPTER 9 FIRE PROTECTION SYSTEMS

"ACTIVE" FIRE PROTECTION





The Codes loves sprinkler Systems!

 The Code provides many exceptions and advantages for buildings –

"equipped throughout with an approved automatic sprinkler system..."



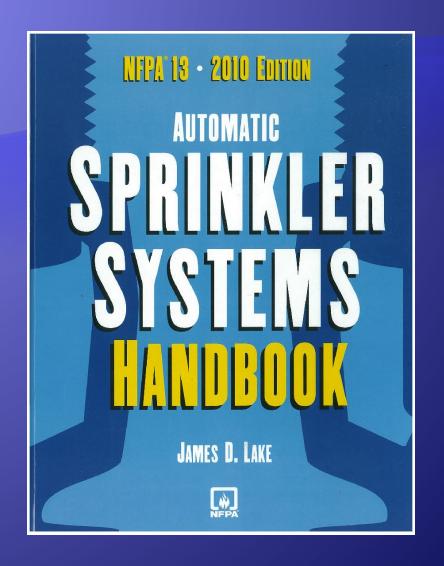


Chapter 9 Highlights

- 903 Specific occupancies & spaces requiring <u>fire</u>
 <u>suppression</u> are indicated. (Not just for area increase)
- 905 Specific occupancies & other conditions where standpipes are required.
- 906 Locations & types of <u>fire extinguishers</u> are indicated.
- 907 Fire Alarm and Detection Systems
- 911 Fire Command Center
- 913 Fire Pump Rooms.



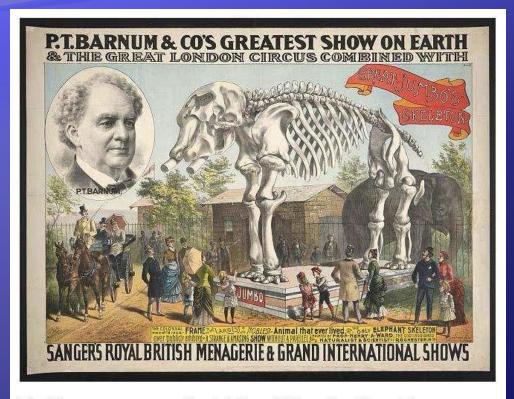








CHAPTER 10 MEANS OF EGRESS



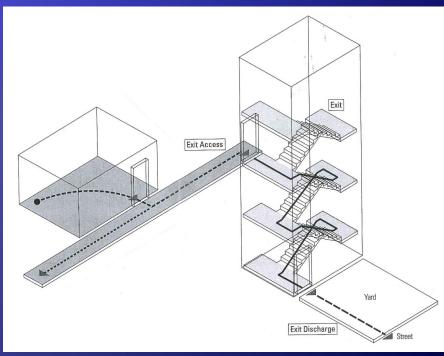
PT Barnum posted This Way to the Egress in his museum's



SECTION 202

Definitions

- Exit Access: "That portion of a means of egress system that leads from any occupied portion of a building to an Exit."
- **Exit:** One of 7 components between Exit Access & Exit Discharge: 1) exterior exit doors at level of exit discharge, 2) interior exit stairways, 3) interior exit ramps, 4) exit passageways, 5) exterior exit



- stairways, 6) exterior exit ramps, and 7) horizontal exits.
- Exit Discharge: "That portion of a means of egress system between the termination of an exit and a public way."



Table 1004.1.2

Design Occupant Load

Occupant load calculated per 'general' function of space (Gross or Net)

- Business: 1/100 Gross Sq Ft
- Classroom: 1/20 Net Sq Ft
- Assembly Unconcentrated (Tables & Chairs): 1/15 Net Sq Ft
- Assembly Concentrated (non-fixed chairs only): 1/7 Net Sq Ft
- Assembly Standing: 1/5 Net Sq Ft
- Storage: 1/300 Gross Sq Ft
- Mercantile: 1/60 Gross Sq Ft









Section 1005.3: Egress Width Sizing

- Stairway (non-sprinklered bldg): 0.3"/occupant (220 occupants x 0.3" = 66")
- Other (non-sprinklered bldg): 0.2"/occupant (220 occupants x 0.2" = 44")

Section 1010.1.1: Doors (various exceptions, but...)

- Minimum Clear Width Opening = 32"
- Maximum Swinging Door Width = 48"
- I-2 (Beds) = 41 ½" Minimum Clear Width Opening
- Minimum Height = 80" (6'-8")

Table 1020.2: Corridor Width: Per Occupancy

- Typical (u.n.o.) = 44" Minimum
- Less than 50 Occupants (all uses u.n.o.) = 36"
- Educational (100 occupants or more) = 72"
- Hospital Bed Movement = 96"









Table 1006.2.1: Spaces One Exit (non-sprinklered)

Occupancy: A, B, E, F, M, U = Max 49 Occupants / R1-4 = Max 10 Occupants / Etc...

Table 1006.3.2(1): Stories with One Exit (R-2 sprinklered)

Basement, First, Second or Third Story = Max 4 dwelling units

Table 1006.3.2(2): Stories with One Exit

- Occupancy: A, B, E, F, M, U = Max 49 Occupants & Max Common Path Travel = 75
 Ft (with Sprinklers Maximum Length of Travel = 100 Ft for some groups)
- Occupancy: B, F, M, S = Max 29 Occupants & Max Common Path Travel = 75 Ft

Table 1006.2.1: Common Path of Travel (2 Exits)

Occupancy With & Without Sprinklers: Typically 75 Ft Without Sprinklers or 100
 Ft With Sprinklers (but dependent on use/group)





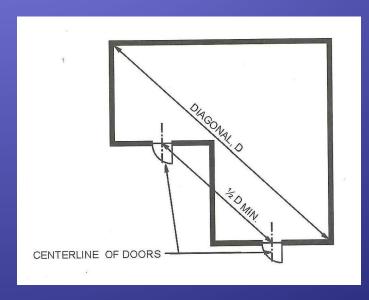


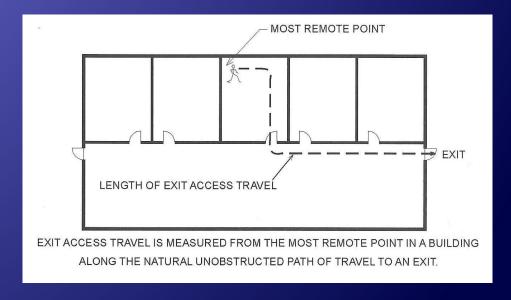
Section 1007.1.1: Doors Configuration (Remoteness)

- Without Sprinklers: Minimum 1/2 the overall diagonal distance
- With Sprinklers: Minimum 1/3 the overall diagonal distance

Table 1017.2: Exit-Access Travel Distance

- Occupancy: A, E, F-1, M, R, S-1 = 200 Ft without Sprinklers or 250 Ft with Sprinklers
- Occupancy: B = 200 Ft without Sprinklers or 300 Ft with Sprinklers
- Occupancy: F-2, S-2, U = 300 Ft without Sprinklers or 400 Ft with Sprinklers







SECTION 1011

Stairs

- Minimum Width = 44" (or 36" with Occupant Load of less than 50)
- Minimum Headroom = 6'-8" (Vertical from edge of nosing)
- Treads & Risers = 11" Minimum Tread & 7" Max or 4" Minimum Riser (R-2/R-3 exceptions)
- Minimum Nosing = 1 1/4" Maximum & Risers solid and vertical or 30° angle (some exceptions to solid req)
- Minimum Landing Size = Not less than required stair width and 48" deep
- Maximum Vertical Rise Between Landings = 12'-0"





SECTIONS 1014 & 1015

Handrails & Guards

Handrails:

- Continuous Handrails on Both Sides (dwelling units/spiral = one handrail)
- Maximum Projection into Minimum Stair = 4½" (both sides), Clear Space 1½" to Wall, Minimum Height = 34" and Maximum Height = 38" (Grip 1¼" to 2"Ø or other graspable configurations dictated)
- Extend 12" horizontal beyond top & continue slope one tread width at bottom & ends return to wall, floor or guard.

Guards:

- Shall be located along open sided walking surfaces located 30" above floor (exceptions for stages, loading docks, etc.)
- Minimum Height = 42" (R-3/R-2/Assembly exceptions), Maximum between construction = 4"Ø sphere up to 36" & 4 3/8" Ø sphere from 36" to 42"



Section 1018: Aisles (Non-Assembly)

Not less than Corridors or 30" Min Mercantile or 28" Min Non-Public (less than 50)

Section 1029: Assembly

- Occupant Load Greater Than 300: 1/2 Occupant Load through Main Exit
- Travel Distance: 200 Ft without Sprinklers or 250 Ft with Sprinklers

Table 1020.1: Corridor Fire-Resistance Rating

Occupancy A, B, E, F, M, S, U: Greater than 30 Occupants without Sprinkler = 1 Hr
or with Sprinkler = 0 Hr

Section 1020.4: Dead End Corridors

20 Ft without Sprinkler or 50 Ft with Sprinklers most other occupancies



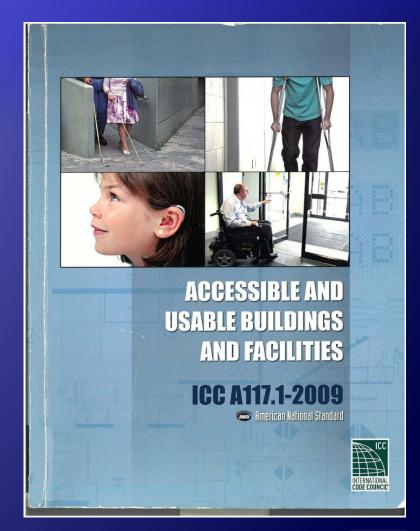






Chapter 11 - Accessibility

- Michigan Barrier Free Design Law (State Building Code Law, 1966 & 1976)
- Americans with Disabilities Act (ADA)
 (Federal Civil Rights Law, 1990, Effective 1992)
- Department of Justice: ADA Standards for Accessible Design latest dated September 15, 2010 & Effective March 15, 2012
- Michigan Building Code (2015 Edition)Chapter 11: Accessibility
- Reference: ICC/ANSI A117.1 Accessible
 & Usable Buildings & Facilities (2009)





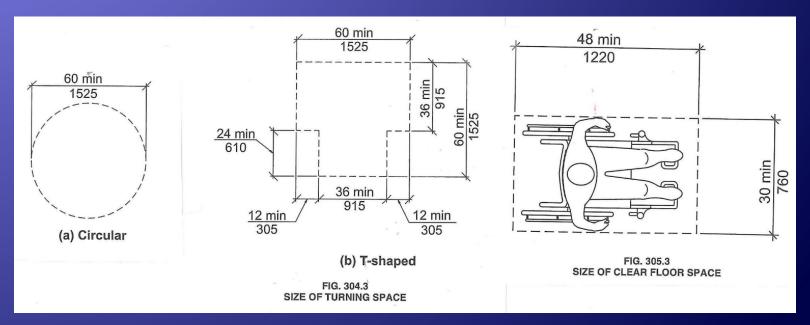
MBC CH 11 - ANSI Chapter 3 Building Blocks

ANSI 304 Turning Space:

60" Diameter or 60" T-Shaped

ANSI 305 Clear Floor Space:

• 30" x 48"





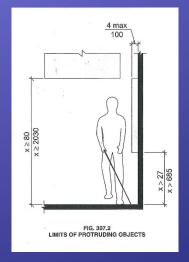
ANSI 306 Knee & Toe Clearance:

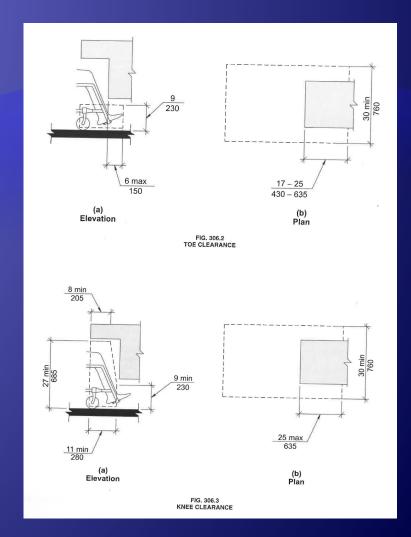
- Knee: 25" under & 27" high
- Toe: 17" to 25" under & 9" high with 6" in

ANSI 307 Projecting Objects:

4" max horizontal projection from 27" to 80"

A.F.F.







MBC CH 11 -ANSI Chapter 4 Accessible Routes

ANSI 402 Accessible Route:

A continuous and unobstructed route from public ROW to building entrance (60% of entrances shall be accessible)





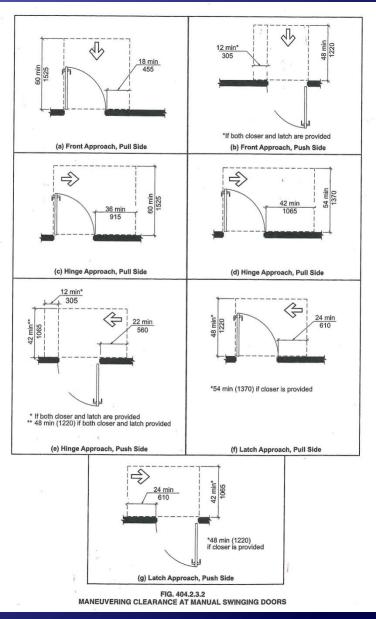
MBC CH 11-ANSI Section 404 Doors and Doorways

ANSI 404.2.2 Clear Width:

32" clear opening

ANSI Table 404.2.3.2 Maneuvering Clearances:

- Push & Pull approach and from hinge side or latch side approach
- 18" pull, 12" push Forward approach





ANSI 404.2.4 Thresholds:

1/2" maximum height with 1:2 bevel edge

ANSI 404.2.5 Two Doors in Series:

48" minimum + width of door & 60" diameter turning space

ANSI 404.2.6 Door Hardware:

 Easy to grasp with one hand and does not require tight grasping, pinching, or twisting of the wrist to operate



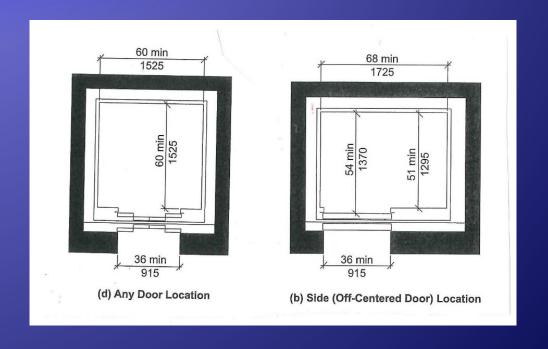




MBC-CH11-ANSI Chapter 4 Accessible Routes

ANSI 407 Elevators:

- Car: 36" Center Door = 60" x 60", 36" Side Door = 68" W x 51" D
- Call Buttons: Centerline top 15" to 48" A.F.F.
- Signals: 72" A.F.F. to centerline (Up/Down Arrows)





ANSI 405 Ramps:

- Running Slope: 1:20 to 1:12 maximum
- Cross Slope: 1:48 maximum
- Clear Width: 36" minimum
- Raise: 30" maximum
- Landings: 6o" minimum length

ANSI 406 Curb Ramps:

- Ramp Slope: 1:12 maximum
- Flared Slope: 1:10 maximum
- Clear Width: 36" minimum
- Top Landing: 36" minimum





MBC-CH 11-ANSI Chapter 5 General Site & Building Elements

ANSI 502 Parking Spaces:

8'-0" wide w/ 60" (5'-0") aisle & or 96" (8'-0") aisle width at van, signage

MBC Table 1106.1 Parking Spaces:

- 1/25 spaces up to 100 spaces provided
- 1/50 spaces up to 200 spaces provided
- 1/100 spaces up to 500 spaces provided
- 2% for 501 to 1000 spaces provided
- 20 + 1/100 over 1000 spaces provided



MBC Table 1108.2.2.1 Assemble Wheelchair Spaces:

- 1/25 seats, 6 up to 500, 6 + 1/150 up to 5,000, 36 + 1/200 over 5,000
 - 2007 Lawsuit U of M Stadium at 110,000 seats: 36 + 110,000/200 at 550 = 586 seats required. March 10, 2008 Settlement at 329 seats & toilet room modifications.
 - Lawsuit Palace of Auburn Hills Settlement August 21, 2013
 - Lawsuit Joe Louis Arena Settlement August 6, 2014





MBC-CH 11-ANSI Chapter 6

Plumbing Fixtures and Facilities

ANSI 602 Drinking Fountains:

Drinking Fountains (high & low-spout 36" max wheelchair, 27" clear under, 38-43" for standing persons)





Projections greater than 4"!



SECTION 1403

Exterior Walls Performance Requirements

Chapter 14 - Applies to exterior walls, wall coverings and related components

Primary function of a wall

Structural

Fire resistance (where applicable)

Weather protection





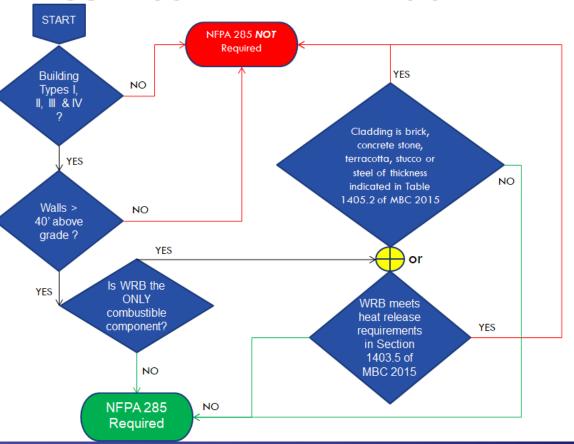
Deconstructing Exterior Wall Assembly

EXTERIOR WALL ASSEMBLY DECISION TREE WRB – Water Resistive Barrier HPL - High-Pressure Decorative Exterior Grade Compact Laminate Start MCM - Metal Composite Material Comply with ls exterior requirements wall YES of rated required assembly to be fire rated? NO Building NFPA 285 NOT NO Types I, Required II, III & IV IF NONE OF THESE APPLY THEN YES Does wall Does wall Does wall assembly Does wall IF ANY OF assembly assembly contain assembly THESE APPLY contain contain foam contain THEN USE WRB? MCM? plastic HPL? OR OR OR **APPROPRIATE** nsulation? **DECISION** TREE(S)



Section 1403 - WRB

COMBUSTIBLE WATER RESISTIVE BARRIER (WRB)



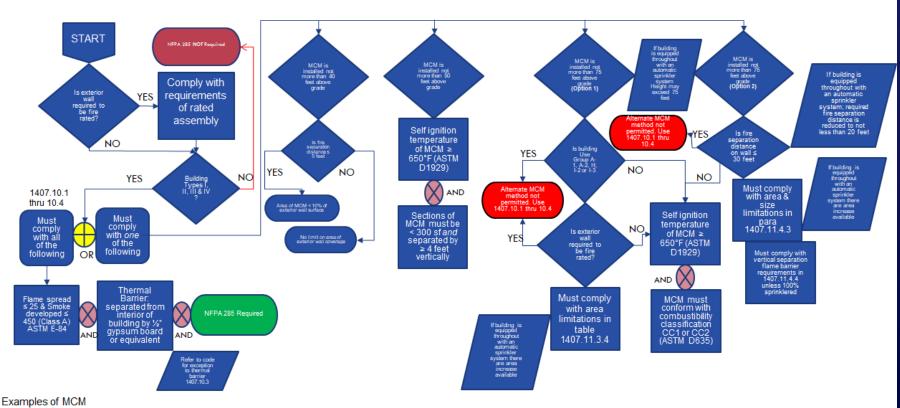
Types of WRB

- Vapor Permeable
- Vapor Barrier
- · Air Barriers
- Fluid Applied
- Sheet Applied



Section 1407 - MCM

METAL COMPOSITE PANEL AS AN EXTERIOR WALL FINISH

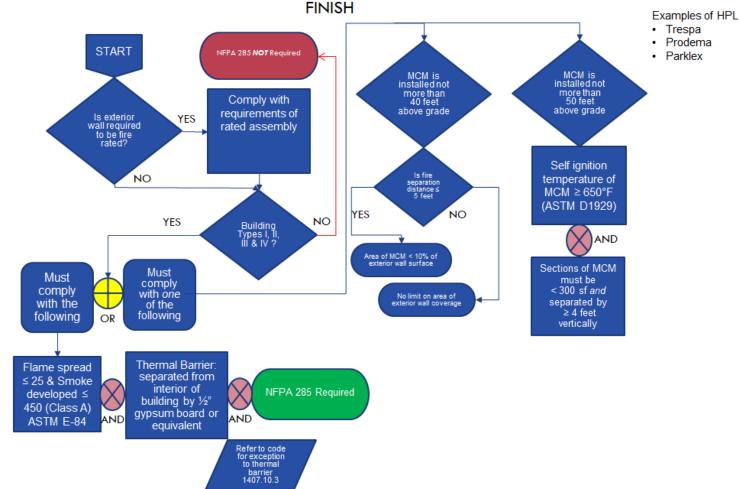


- Reynobond
- Alpolic



Section 1408 - HPL

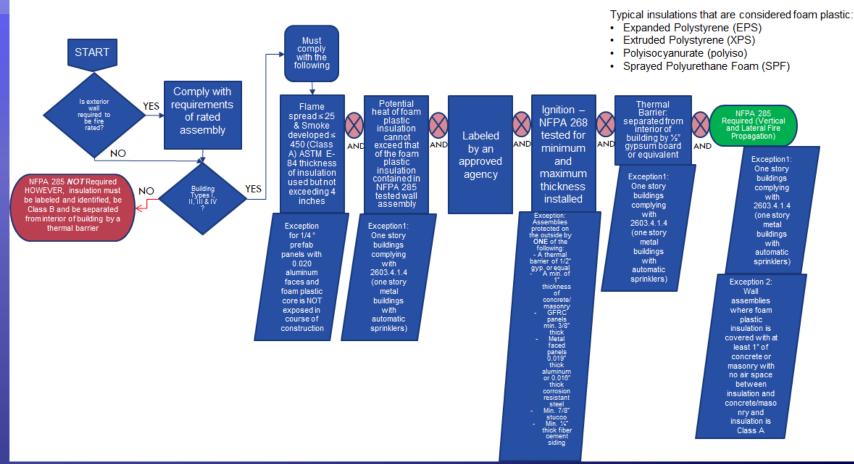
HIGH PRESSURE DECORATIVE EXTERIOR GRADE COMPACT LAMINATES (HPL) AS AN EXTERIOR WALL





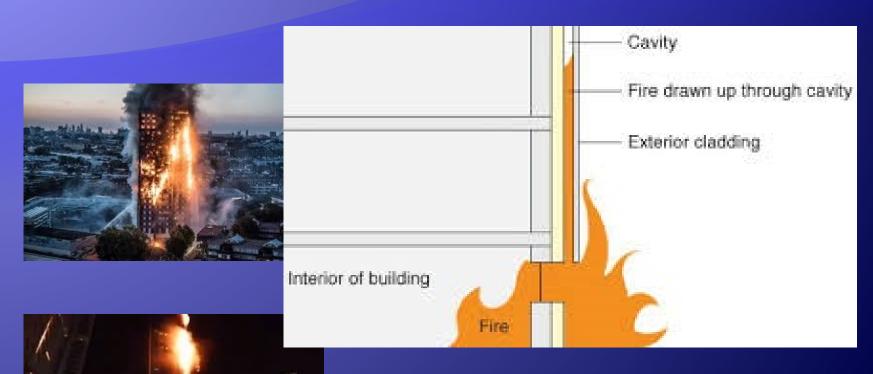
Section 2603 Foam Plastic Insulation

EXTERIOR WALLS CONTAINING FOAM PLASTIC INSULATION





NFPA 285 - Requirements







BUILDING CODE DATA on the DRAWINGS



Building Code Data (Michigan Building Code 2015)

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REFERENCE CODES
                                         BUILDING CODE DATA
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5-William - Princip (Assembly Resemblish)
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Building Code Data (Michigan Building Code 2015)

REFERENCE CODES

BUILDING: 2015 Michigan Building Code

MECHANICAL: 2015 Michigan Mechanical Code

PLUMBING: 2015 Michigan Plumbing Code

ELECTRICAL: 2014 Michigan Electrical Code

ACCESSIBILITY: Michigan Barrier Free Design & The Americans with Disabilities Act

BUILDING CODE DATA (MICHIGAN BUILDING CODE 2015)

CHAPTER 1 Sec. 107.3.4.1 SCOPE AND ADMINISTRATION Deferred Submittals

- 1. Concrete Masonru Unit
- 2. Structural Steel Framing
- 3. Steel Joist Framing
- 4. Metal Decking
- 5. Metal Fabrications
- 6. Architectural Moodwork
- 7. Solid Surface Fabrications
- 8. Elastometric Membrane Roofing
- 9. Metal Doors and Frames
- 10. Wood Doors
- 11. Alumnium Framed Entrances and Storefronts
- 12. Door Hardware
- 13. Linear Metal Ceiling
- 14. HVAC: Ehaust Fan, Ductwork, Grilles/Registers/Diffusers
- 15. Plumbing: Fixtures, Fittings, Water Heater, Floor Drains, Clean Outs
- 16. Electrical: Fixtures, Equipment, Panels, Motor Starters, Switches



Ch. 3 & 4 Use/Occupancy & Special

CHAPTER 3	USE AND OCCUPANCY CLASSIFICATION	
Sec. 303.3	A-2 Group - Assembly	A-2 - Restaurant
Sec. 304.1	B Group - Business	B - Attorney Office
Sec. 309.1	M Group - Mercantile	M - Retail
CHAPTER A	SPECIAL DETAILED REQUIREMENTS BASED ON	No

CHAPTER 4

SPECIAL DETAILED REQUIREM

USE AND OCCUPANCY



Ch. 5 Height & Area

CHAPTER 5 GENERAL BUILDING HEIGHTS AND AREAS

Actual Building Information

Use Group = Restaurant (A-2), Business (B), Mercantile (M)

Height = 40 FtFloors = 2 Story

Area/Floor = 16,000 Sq. Ft

Sprinklered = Yes
Construction Type = 11B
* Most Restrictive = A-2

Table 504.3 Allowable Building Height

Occupancy: A-2 Allowable Height 75 Ft

Type of Construction IIB Actual Height 40 Ft

NS = Building not Sprinklered No S = Building Sprinklered Yes

Table 504.4 Allowable Number of Stories

Occupancy A-2 Allowable Stories 3

Type of Construction IIB Actual Stories 2

NS = Building not Sprinklered No S = Building Sprinklered Yes



Ch. 5 Height & Area

Table 506.2 Allowable Area in Square Feet Allowable Sa Ft 35.625 Occupancy Type of Construction IIB Actual Sq. Ft 16,000 NS = Building not Sprinklered S1 = Building Sprinklered - 1 Story No SM= Building sprinklered -2+ story Yes Sec. 506.2 Allowable Area 16,000 Sq Ft Actual Aa = 35,625 Sq. Ft Allowable (A-2) *Most Restrictive Aa = 86,250 Sa Ft Allowable (B) Aa = 46,875 Sq. Ft Allowable (M) Section 506.2.1 Single - Occupancy - One Story No Equation 5-1 Aa=At + (NS x If) Section 506.2.2 Mixed - Occupancy - One Story NO Equation 5-1 Aa=At + (N5 \times IF) Section 506.2.3 Single - Occupancy - Multi Story NO Aa= [At + (NS x If)] x Sa Equation 5-2 Section 506.2.4 Mixed - Occupancy - Multi Story Yes Equation 5-3 Aa=At + (NS x If) Aa= 28.500 + (9.500 x 75%) Aa= 35,625 Sa Ft Frontage Increase Section 506.3 $M = [(L1 \times M1) + (L2 + M2) + (L3 + M3) + (L4 + M4)/F$ Equation 5-4 $M = [(80 \times 86) + (80 \times 84) + (200 \times 190) + (200 \times 50)]/560$ M = 110%Where 'W' Value Is Greater Than 30 'W' Shall Be 30 Section 506.3.3 Amount of Increase Equation 5-5 If = [F/P - 0.25]W/30If = [560/560 - 0.25] 0/30 = 75%



Ch. 5 Height & Area

Sec. 507	Unlimited Area Buildings	No
Sec. 508	Mixed Use And Occupancy	Yes
Sec. 508.2	Accessory Occupancies (Ancillary to Main)	No
Sec. 508.2.1	Occupancy Classification	NA
Sec. 508.2.2	Allowable Building Height	Yes
Sec. 508.2.3	Area Limitations	No
Sec. 508.2.4	Separation of Occupancies	No
Sec. 508.3	Nonseparated Occupancies	Yes
Sec. 508.4 Table 508.4	Separated Occupancies Required Separation of Occupancies	NO O Hrs
Sec. 509 Table 509	Incidental Uses (Greater Level of Risk) Incidental Uses	NO O Hrs



Ch. 6 Construction Type

CHAPTER 6	TYPES OF CONSTRUCTION		
Table 601	Fire-Resistance Rating Required Building Elements Primary Structural Frame Bearing Walls - Exterior Bearing Walls - Interior Nonbearing Walls and Partitions - Exterior Nonbearing Walls and Partitions - Interior Floor Construction Roof Construction	S	O Hrs O Hrs O Hrs Table 602 O Hrs O Hrs O Hrs
Sec. 602	Construction Classification	Туре	IIB
Table 602	Fire Resistive Rating Exterior Walls < 5 Feet > 5 Feet < 10 Feet > 10 Feet < 30 Feet > 30 Feet		NA NA NA O Hrs



Drawing Information for: Fire

MBC Chapters 7, 8 & 9



Ch. 7 Fire/Smoke Protection

CHAPTER 7	FIRE AND SMOKE PROTECTION FEATURES					
Table 706.4	Fire Wall Fire-Resistance Rating ((Fire Wall)	No	No		
5ec. 707.3 5ec. 707.3.1 5ec. 707.3.2	Fire-Resistance Rating (Fire Barrier) Shaft Interior Exit Stairway			Yes 1 Hrs 1 Hrs (2 Stories)		
Sec. 708.3	Fire-Resistance Rating (Fire Partitions) 1. Groups & R NA 2. Open Mall NA 3. Corridor NA 4. Elevator Lobby NA 5. Egress Balconies NA			O Hrs		
Sec. 709.3	Fire-Resistance Rating (Smoke Barriers) Exception NA			O Hrs		
Sec. 710.3	Fire-Resistance Rating (Smoke Pa	artitions)	No			
Table 716.5	Opening Ratings (Doors)	Yes	1 Hrs			
Table 716.6	Opening Ratings (Windows)	NA	O Hrs	÷		
Sec. 718.2	Fireblocking Required		NA	(Not Combustible Construction)		
Sec. 718.2.6	Exterior Mall Covering Exception 1 Cornices Exception 2 Exterior Malls Exception 3 Exterior Malls	NA NA NA	NA			
Sec. 718.3	Draftstopping in Floors		NA	(Not Combustible Construction)		
Sec. 718.4	Draftstopping in Attics		NA	(Not Combustible Construction)		
Sec. 718.4.3	Draftstopping (Other Groups) Maximum 3,000 Sq. Ft Exception (Sprinkler System)	Yes	NA	(Not Combustible Construction)		





Ch. 8 Interior Finishes

CHAPTER 8	INTERIOR FINISHES	
Table 803.11	Interior Wall and Ceiling Finish Required Sprinklered Yes Interior Stairway B Rating Class Corridors B Rating Class Rooms/Spaces C Rating Class	
Sec. 804.4.1	Interior Floor Finish ("Pill Test")	Yes



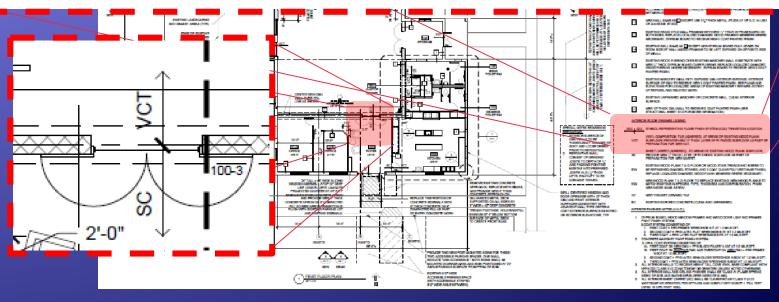
Ch. 8 Interior Finishes

INTERIOR FLOOR FINISHES LEGEND

XXX XXX SYMBOL REPRESENTING FLOOR FINISH SYSTEM (XXX) TRANSITION LOCATION

VCT

VINYL COMPOSITION TILE (ADHERED). AT AREAS OF EXISTING WOOD PLANK SUBFLOOR, PROVIDE NEW 1/4" THICK LAYER OF PLYWOOD SUBFLOOR AS PART OF PREPARATION FOR NEW VCT.





Ch. 8 Interior Finishes

INTERIOR FINISHES NOTES (U.N.O.):

 GYPSUM BOARD, WOOD WINDOW FRAMES AND WOOD DOOR LEAF AND FRAMES PAINT FINISH SYSTEM:

3-COAT SYSTEM CONSISTING OF:

- FIRST COAT = PPG PRIMER 'SPEEDHIDE 6-2' AT 1.0 MILS DFT.
- SECOND COAT = PPG LATEX FLAT 'SPEEDHIDE 6-70' AT 1.3 MILS DFT.
- THIRD COAT = PPG LATEX FLAT 'SPEEDHIDE 6-70' AT 1.3 MILS DFT.
- CONCRETE MASONRY PAINT FINISH SYSTEM:
 - 3- OR 4- COAT SYSTEM CONSISTING OF:
 - 1A. FIRST COAT ON NEW CMU = PPG BLOCK FILLER '4-100' AT 1.0 MILS DFT.
 - 1B. FIRST COAT ON <u>EXISTING</u> CMU AND OVERCOAT ON <u>NEW CMU = PPG PRIMER</u>
 '4-503' AT 1.0 MILS DFT.
 - 2. SECOND COAT = PPG LATEX SEMI-GLOSS 'SPEEDHIDE 6-8524' AT 1.2 MILS DFT.
 - THIRD COAT = PPG LATEX SEMI-GLOSS 'SPEEDHIDE 6-8524' AT 1.2 MILS DFT.
- ALL INTERIOR WALLS TO RECEIVE NEW 4" TALL COVE VINYL BASE COMPLIANT WITH NFPA 253 'CLASS II' (0.22 WATTS/CM² OR GREATER) UNLESS NOTED OTHERWISE.
- ALL INTERIOR WALL AND CEILING FINISHES SHALL BE 'CLASS A' (FLAME SPREAD INDEX OF Ø-25 AND SMOKE-DEVELOPED INDEX OF Ø-450).
- ALL INTERIOR SHEET CARPET (SC) SHALL BE CLASSIFIED AS 'CLASS II' (0.22 WATTS/CM² OR GREATER) PER NFPA 253 AND COMPLY WITH DOCFF-1 'PILL TEST' (CPSC 16 CFR, PART 1630).







Ch. 9 Fire Protection

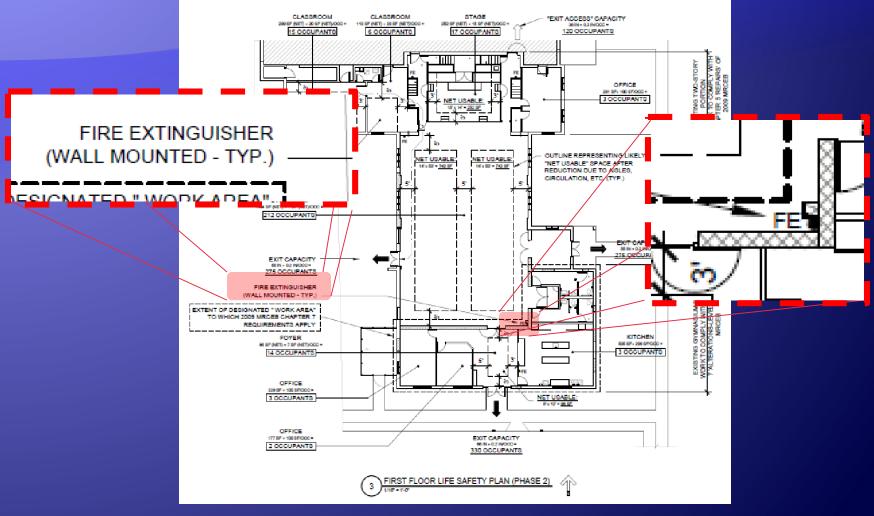
CHAPTER 9 FIRE PROTECTION SYSTEMS

Sec. 903.2 Where Required (Automatic Sprinkler Systems)

903.2.1.2 Group A-2

Yes

Ch. 9 Fire Protection





Drawing Information for: Egress & Capacity

MBC Chapter 10 MPC Chapter 4



C	HAPTER 10	MEANS OF EGRESS		
56	ec. 1004.1	Design Occupant Load		
Tá	able 1004.1.2	Maximum Floor Area Per Occupant	318 Occupants 1st Floor 126 Occupants 2nd Floor	
56	ec. 1004.1.2	Exception: Actual Number		No
Se	ec. 1005.3	Egress Width Per Occupant Served 1005.3.1 Stairways 1005.3.2 Other	0.3 Inches Per Occupants 0.2 Inches Per Occupants	
		Actual Total Egress Capacity (Table 1004.1.2) Allowable Total Egress Capacity		63 Occupants Actual 160 Occupants Allowable
Tá	able 1006.2.1	Spaces With One Means Of Egress		No
Se	ec. 1006.2.1	(2) Exit or Exit Access Doorways Required		Yes
Tá	able 1006.2.1.1	Three or More Exits (Occupant Load) 501 to 1,000 3 Exits Required No 1,001 Plus 4 Exits Required No		No
Ta	able 1006.3.1	Stories With One Exit		No



Sec. 1007.1.1 Exit Doorways (Configuration)

Exception 1 Stairway Yes
Exception 2 Automatic Sprinkler Yes

Table 1017.2 Exit Access Travel Distance

<u>'A-2' Restaurant</u> 81 Ln Ft Actual

39.3 Ln Ft Minimum Required (118/3)

<u>'B' Business</u> 154 Ln Ft Actual 70.3 Ln Ft Minimum Required (211/3)

'M' Mercantile 80 Ln Ft Actual 39.3 Ln Ft Minimum Required (118/3)

<u>'A-2' Restaurant</u> 113 Ln Ft Actual 250 Ln Ft Maximum Allowed

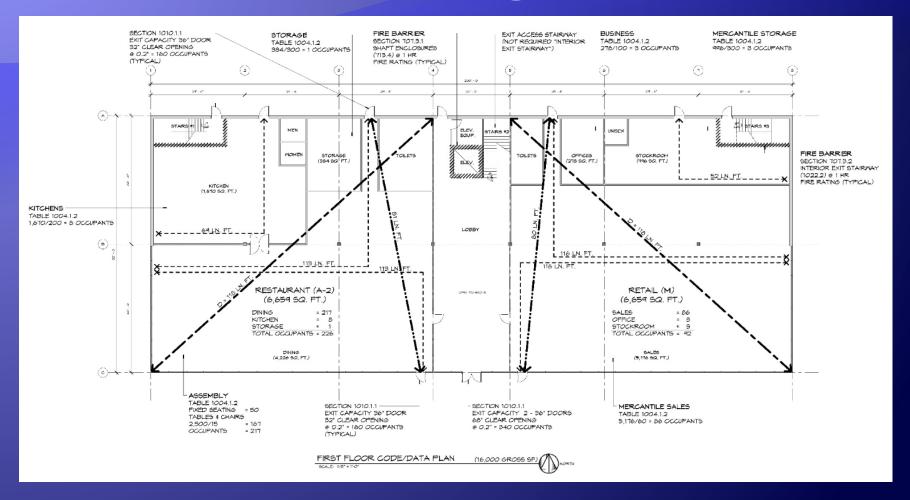
<u>'B' Business</u> 138 Ln Ft Actual 300 Ln Ft Maximum Allowed

<u>'M' Mercantile</u> 116 Ln Ft Actual 250 Ln Ft Maximum Allowed

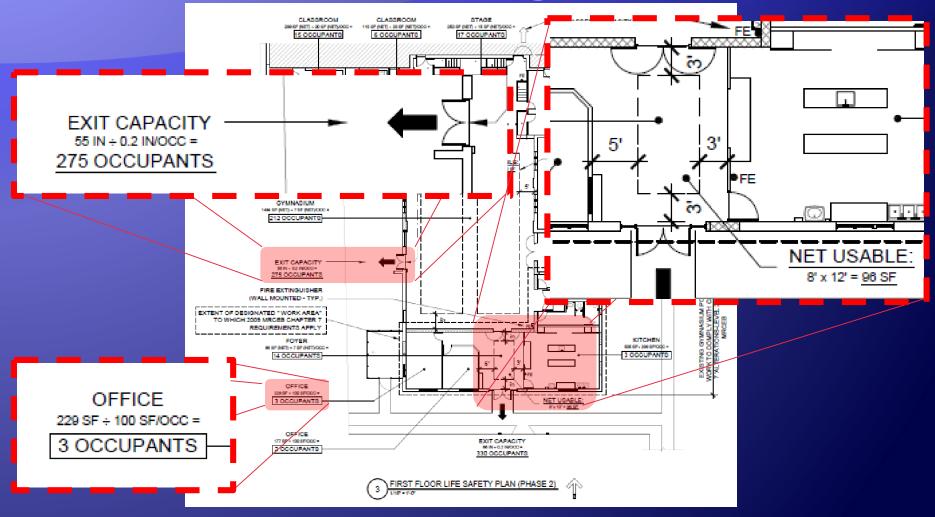


Table 1020.1	Corridor Fire-Resistance Rating Exception 1 Group E NA Exception 2 Group R NA Exception 3 Parking Garages NA Exception 4 Group B Yes Exception 5 Exterior Walls NA	0 Hrs (With Sprinkler System)
Table 1020.2	Corridor Width (Minimum)	60" Actual Yes 44" Minimum NA 36" Minimum (Less Than 50 Occupants)
Sec. 1020.4	Dead Ends 20 Feet Maximum Exception 1 Group I-3 NA Exception 2 Sprinkler System NA Exception 3 2.5 x Width NA	No

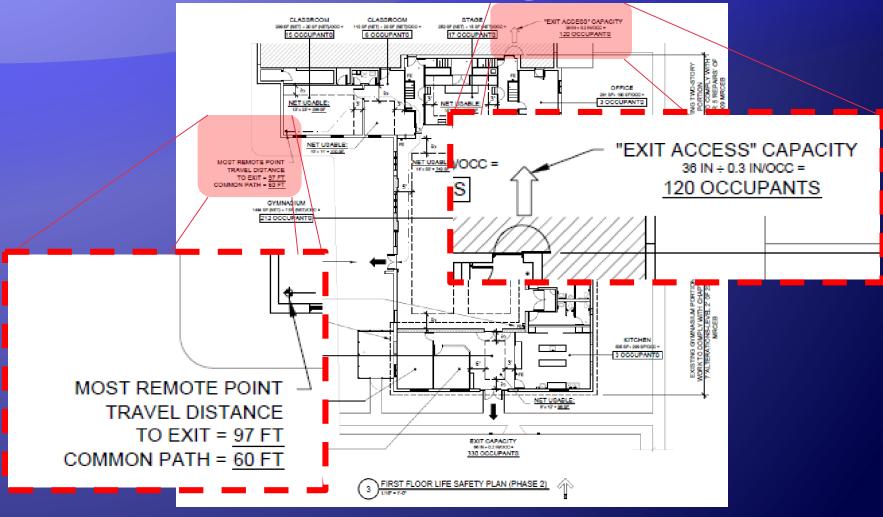














Ch. 4 (MPC) Fixture Quantities

(MICHIGAN PLUMBING CODE 2015)

A-2 Assembly (Restaurant)

CHAPTER 4 FIXTURES, FAUCETS AND FIXTURE FITTINGS

Sec. 403.1 Minimum Number of Fixtures

Table 403.1 Yes

Exception 1 Actual Per Affidavit No

Sec. 403.1.1 Fixture Calculations

50% Men and 50% Women Yes Exception: Not 1/2 Men/Women with Statistical Data No

Minimum Number of Required Plumbing Fixtures

Table 1004.1.2 226 Total Occupants (MBC)

113 Men 50.00% 113 Women 50.00%

Classification/Occupancy Assembly A-2

Mater Closet/Urinal

Men Women 113 113 Ratio 75 75

Required 1.51 1.51 6 Provided

<u>Lavatories</u>

Men Women 113 113 Ratio 200 200

Required 0.57 0.57 6 Provided

<u>Drinking Fountain</u>

Ratio O Sec. 410.3 Substitution Restaurants
Required O Provided

<u>Service Sink</u>

Required 1 1 Provided

Sec. 403.2 Separate Facilities Each Sex Yes

Exception 1 Private Facilities No.

Exception 1 Private Facilities No Exception 2 15 or Less Employees & Customers No Exception 3 50 or Less Mercantile Occupancies No

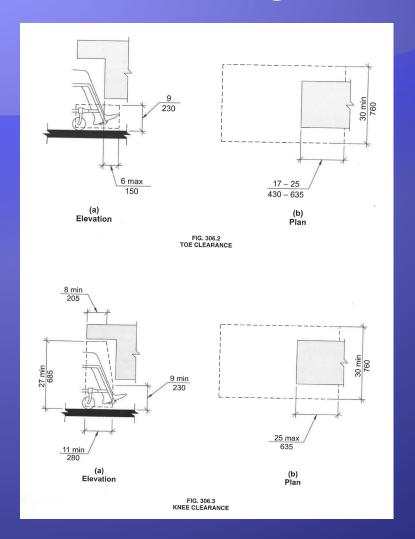


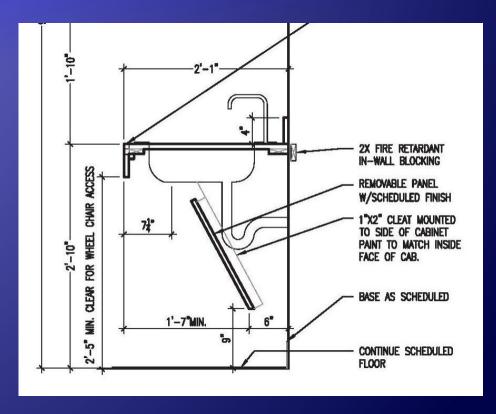
Drawing Information for Accessibility - CH 11





MBC-CH 11 - ANSI 306 Knee & Toe Clearance:

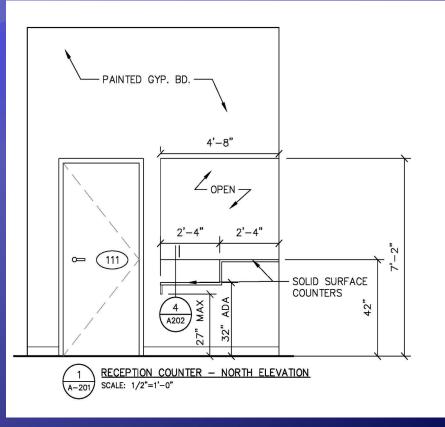






MBC CH 11 -ANSI 307 Projecting Objects:



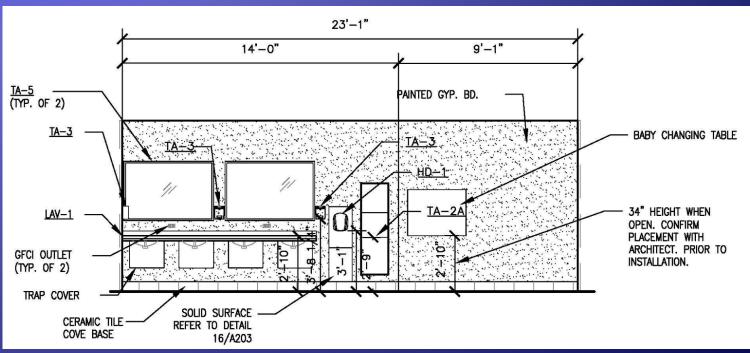




ANSI 308 Reach Ranges:

- Forward: 20" counter at 48" high or 20+" to
 25" counter at 44" high
- Side: 10" from wall x 15" high at 15" to 48"
- Side: 10" from wall x 34" high at 34" to 48"
- Side: 10+" to 25" from wall x 34" high at 34" to 46"

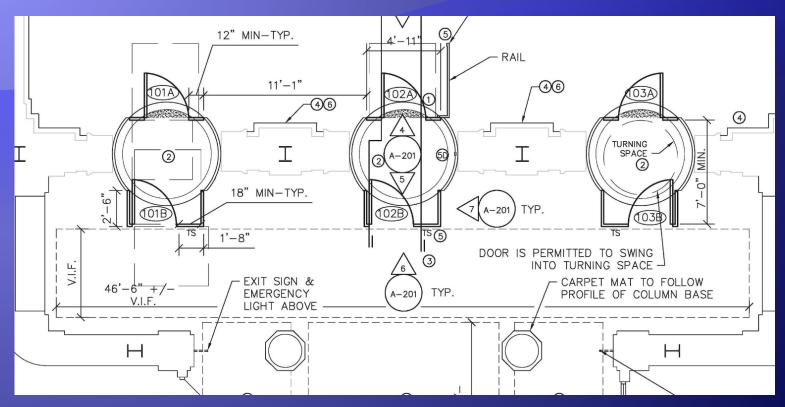








MBC CH 11-ANSI Section 404 Doors and Doorways



ANSI 404.2.6 Door Hardware:

 Specifications - Doors with closers -adjusted for compliant closing speed open 90 degrees - 5 seconds minimum to 12 degrees open.

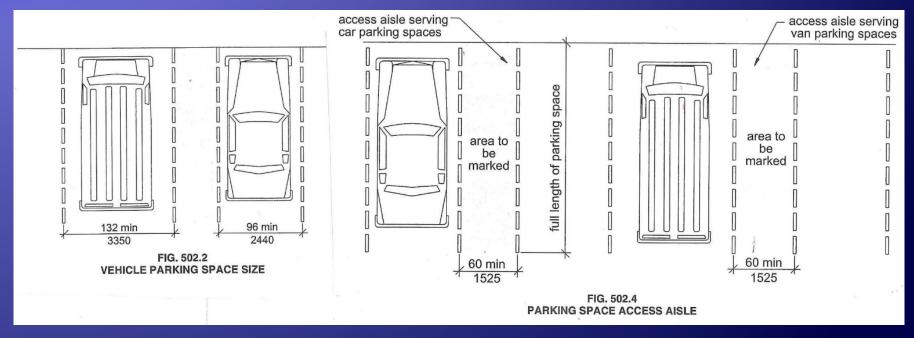


MBC 1106.5 Van Spaces:

1 van / 6 accessible spaces

MBC 1106.6 Location:

On the shortest accessible route of travel from parking to building entrance





MBC-CH11-ANSI Chapter 6 Plumbing Fixtures and Facilities

ANSI 603 Toilet Rooms:

- 6o" Diameter Turning Space
- Door swing not into required clear floor area of fixtures

ANSI 604 Water Closets & Toilet Compartments:

- Water Closets & Water Closet Stalls: 60" x 59" inside clear
- Toe clearance at front and side of compartments
- Compartment Door: 32" door & at open side water closet
- Water Closet Seat: 17" to 19" A.F.F.
- Ambulatory Stall: 36" wide, 42" grab bars both sides, 32" door



ANSI 605 Urinals:

Urinals: 17" to lip & 30" x 48" clear front area

ANSI 606 Lavatories & Sinks:

Lavatories & Sinks: 2'-10" to top, 27" clear under & 30" x 48" clear front area

ANSI 609 Grab Bars:

- Grab Bars:
 - Rear: 36" & 12" from center line water closet, 18" to 27" height
 - Side: 42" & 12" from wall, 18" to 27" height & 18" vertical & 21" to 30" bottom & 34" to 36" from back wall







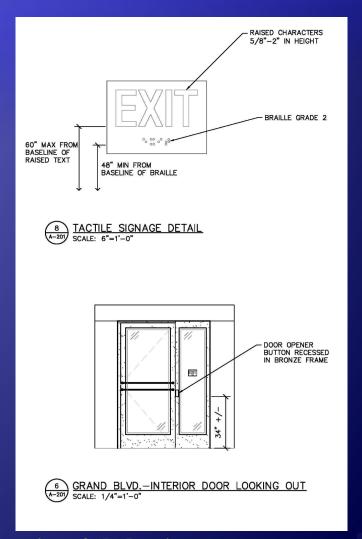
MBC CH 11 - ANSI Chapter 7 Communication Elements and Features

ANSI 703.2 Visual Characters:

- Minimum character Height for Viewing Distance
- Raised Characters
- ◆ Braille

MBC 1013.4 Raised character and braille exit signs

- A sign stating EXIT in visual characters, raised characters and braille and complying with ICC A117.1 shall be provided adjacent to:
 - Area of refuge
 - Exit stairway or ramp
 - Exit passageway
 - Exit discharge

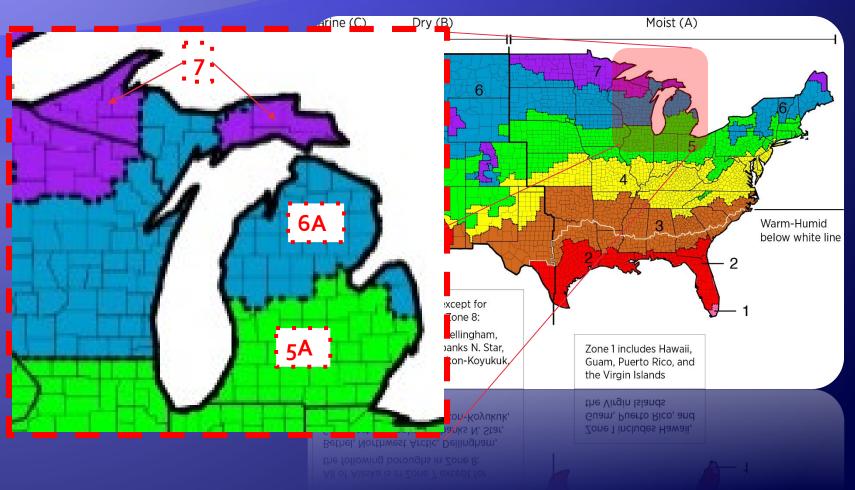




Drawing Information for: Other Technical Criteria MBC Chapters 13, 16 & 17



Ch. 13 Energy Efficiency





Ch. 13 Energy Efficiency

Roofs

Insulation Entirely above Deck

Metal Building^a

Attic and Other

Walls, above Grade

Mass

Metal Building

Steel Framed

Wood Framed and Other

		Nomesidenti	a) le		Residential			Semilarate	4
Opaque Esquents	Assembly	Imul Min. N		Assembly	Insa Min. B	larine L-Value	Assembly	fns Min.	niacies R-Value
itogti									
Insolution Earliety above their	11-0.032	R-30	rc.i.	U-0.092	R-31	lai	U-0.063	R-	15 di
Metal Dollding?	U-0.037	R-19 * R R-25 =		040,037	R-19 + B R-25 +	-11 La or R-8 Ls	U-0.082	- 1	t-19
Attic and Other	U-0.021	R-	19	U-0.023	R-	49	1,-0.034	,	-30
Walls, above Gravis									
Mass	U-0.090	R-i i.	4ci	U-0.090	R-13	3 c.i.	U-0.151 ⁶	R-5	7 cil
Metal Building	U-0.050	R-0 + 8	-19 e.i.	040.050	R-II + F	t-19 c.i.	17-0.094	R-0+	R-9.8 c.i.
Steel Framed	U-0.055	R-13+1	R-IOCA	TI-0.055	R-13 = 0	R-10 c.L.	U-0.084	R-131	R-3.8 c.i.
Wood Framed and Other	U-0.051	R-15 + R- R-19 +		U-0.051	R-13 + R- R-19 +		U-0.089	Б	-13
Well, below Grade						_			
Below Goda Wall	C-0.119	R-7.0	iei.	C-0,092	R-11	lei.	C-1,140		NR
Plane		_	_						_
Minse	U-0.057	R-14.	6 a.l.	U-0.051	R-16	2 s.i.	U-0.107	R-0	ið si.
Step Jaist	U-0.098	R-i	30	80.038	R-	50	U40.053	Б	-19
October .	10.033	R-	541	U-0.033	R-	3 0	D-0.051	В	-19
Blab-en Grade Floors									
Upbontic	F-0.520	R-15 ft	r 24 in	F40,510	k-20 fe	c 24 m	F-0.730	1	NR.
Heated	F-0.688	R-20 to	r 48 in.	F-0.688	R-20 G	e 48 in.	0.900	H-10	fee 24 in.
Opaque Decire									
Swinging	U-0.500			U-0.510			U-0,700		
Nonewinging	L-0,500			160.500			U-1.450		
Tenestration	Assembly Max.	Assembly Max. SHGC	Assembly Min. VESHGC	Assembly Max. · U	Aminbly- Max. SHCC	Assembly Min, VESHCC	Assembly Max. U	Assembly Max. STIGC	Min. VI/SHGC
Vertical Penertreaton, this-40% of Well	7.160	(for all tin	тин (урсы)		(for all fire	me (spes)		(fee sil t	rame types()
Namucis) fluming, all	L-0.32			U-9.82			U-0.45		
Metal framing fixed	U-9.42			8-0.42			U-0.62		
Maid famine, oxentic	6-0.50	SHGC-0.40	1.10	U-0.50	8HGC-0.40	1.10	13-0.78	NR	NR
	U-0.77			U-0.68			040.77		
Metal furning oursuice dust	U-0.77								
Metal flaming entrance	0-0.77								

Nonresidential					
Assembly Insulation Maximum Min. R-Value					
U-0.032	R-30 c.i.				
U-0.037	R-19 + R-11 Ls or R-25 + R-8 Ls				
U-0.021	R-49				
U-0.090	R-11.4 c.i.				
U-0.050	R-0 + R-19 c.i.				
U-0.055	R-13 + R-10 c.i.				
U-0.051	R-13 + R-7.5 c.i. or R-19 + R-5 c.i.				



Ch. 16 Structural Design

CHAPTER 16	STRUCTURAL DESIGN	
Table 1604.3	Deflection Limits Roof Members Floor Members Exterior Walls Interior Partitions	L/240 L/240 L/240 L/200
Table 1604.5	Risk Category I Low Hazard II Except Listed in Categories I, III, IV III Substantial Hazard IV Essential Facilities	II
Table 1607.1	Live Loads	80 PSF
Figure 1608.2	Ground Snow Loads	25 PSF
Sec. 1609	Mind Loads Figure 1609.3(1) - Risk Category II Figure 1609.3(2) - Risk Category III & IV Figure 1609.3(3) - Risk Category I	115 MPH
Sec. 1613	Earthquake Loads Figure 1613.1(1) O.2 Second Acceleration Figure 1613.1(2) 1 Second Acceleration	NA

- Structural Calculations



Ch. 17 Special Inspections

Statement of Special Inspection

- Submit with building permit application
- Identify types of special inspections required for the job
- Indicate who will be performing inspections
- Provide qualifications of each special inspector





STATEMENT OF SPECIAL INSPECTIONS

CITY OF ROCHESTER HILLS BUILDING DEPARTMENT MICHIGAN BUILDING CODE 2015 (MBC 2015)

Revised September 21, 2017



PROJECT INFORMATION:	田皇 裕		
Project Name: Oakridge Dental Center	Project Address: 1959 S. Livernois Road		
Owner Name: Dr. Samer Obeid	Building Permit #: PB-2018-0050		
Architect/Engineer Name: Mr. Al Decker			
FORM PREPARED BY:			
Company Name: Artisan Engineering	Telephone #: 248-243-3940		
Company Address: 2441 S. Christian Hills	Fax #:		
Rochester Hills, MI 48309	Cell Phone #:		
Architect/Engineer Name: Mr. Al Decker	E-Mail Address: artisanengineering@outlook.com		
Architect/Engineer Signature: (MAPE.	Date: March 19, 2018		
INCEDITORS.			

INSTRUCTIONS:

- Complete Form: The Registered Design Professional (Architect/Engineer) shall complete this form and submit it with the Building Permit Application for review and approval by the Building Department prior to the issuance of the Building Permit (Sections 107.1, 1704.2.3, 1704.3 and 1705). This form will be attached to the approved approved plans that shall be on site for all inspections.
- Provide Qualifications: Please refer to the "MINUMUM QUALIFICATIONS FOR SPECIAL INSPECTORS", posted on the Building Department website under "Special Inspection and Program" at www.rochesterbills.org. Each party involved with the Special Inspection and Testing process shall meet these minimum qualification standards (Sections 1701, 1702, 1703, 1704 and 1705). Please provide the appropriate documents that verify the qualifications of each individual or firm listed. This should include all current Education, Experience, Certifications and Accreditations required for each Special Inspector, Special Inspector and Fabricator Shop. Information shall also be provided outlining the qualifications of any Testing Labs (soils, concrete, masonry, steel, and others) being used for the project. This includes information about the Accreditation of the Testing Lab, names and qualifications of each designated Laboratory Technician, and verification of the calibration of each piece of equipment used in the testing.
- Note: This form is intended for buildings or structures that are assigned a Seismic Design Category A, B or C. In Rochester Hills, Michigan, most buildings and structures are in Seismic Design Category B. However, "Essential Facilities" will be in Seismic Design Category C, unless structural calculation shows otherwise.
- Special Inspections Categories: Please select all the categories that apply to your Project by checking the appropriate boxes below and enter the name of each individual responsible for the special inspections you have checked in the space provided to the right of each category.

4.1.0560 Effective 042017



2.	2. STEEL CONSTRUCTION (1705.2 & TABLE 1705.2.3):						
CHECK BOX BELOW IF REQUIRED	CONTINUAL PERIODIC REQUIRED SPECIAL INSPECTIONS & TESTING		REQUIRED SPECIAL INSPECTIONS & TESTING	PLEASE PROVIDE THE NAME AND PHONE NUMBER OF THE SPECIAL INSPECTION AGENCY AND INDIVIDUAL PERFORMING THIS SPECIAL INSPECTION SERVICE IN THE SPACE BELOW.			
√	P	0	1. Structural Steel (1705.2.1): Special inspections and non-destructive testing of structural steel shall be in accordance with the quality assurance inspection requirements of AISC 360-10. (Please refer to Chapter N). P = Perform for each welded joint or members, for each bolted connection, and for each steel element. O = Observe items on a random basis. Operations need not be delayed pending these inspections.	Testing Engineers & Consultants, Inc. (TEC) 1343 Rochester Road PO Box 249 Troy, MI 48099-0249 Tel.: 248-588-6200 Ext. 130 (Office) 248-588-6232 (Fax) 248-755-0455 (Cell)			
	-	X	Cold-Formed Steel Deck (1705.2.2): Special inspections and qualification of welding Special Inspectors for cold-formed steel floor and roof deck shall be in accordance with the quality assurance inspection requirements of SDI QA/QC	Please refer to Attach. # CATG. 2 dated 04-17-2018 (1 page) for list of TEC's designated Special Inspectors.			
			 Open-Web Steel Joists & Joists Girders (1705.2.3 & Table 1705.2.3): Installation of open-web steel joists and girders: 	inspectors.			
	-	Х	 a. End connections - welding or bolting. Referenced Standard*: SJI Specifications listed in Section 2207.1 				
	-	х	 b. Bridging-horizontal or diagonal 1) Standard Bridging: Referenced Standard*: SJI Specifications listed in Section 2207.1 				
	-	X	Bridging that differs from the SJI specifications in Section 2207.1				
		х	4. Cold-Formed Steel Trusses Spanning 60 Feet or Greater (1705.2.4): Verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved truss submittal package.				

^{*} Where applicable, see also Section 1705.12, Special inspections for seismic resistance.



Ch. 17 Special Inspections Type of Special Inspections & Testing

Seismic Resistance:

- Buildings assigned to Seismic Design Category B added in 2015
- Structural Steel, Seismic Force- Resisting systems, Structural Wood, Plumbing, Mechanical, and Electrical Components
- Determine Building Risk Category I, II, III, or IV Table 1604.5



Ch. 17 Special Inspections Type of Special Inspections & Testing Seismic Resistance

How to Determine Seismic Design Category:

- Example Rochester Hills $S_{DS} = 0.092 \text{ g}$ and $S_{DI} = 0.071 \text{ g}$
 - Table 1613.3.5(1)= SDC A for Risk Category I, II, III, IV
 - Table 1613.3.5(2)= SDC B for Risk Category I, II, III
 SDC C for Risk Category IV
 - SDC B or C Apply





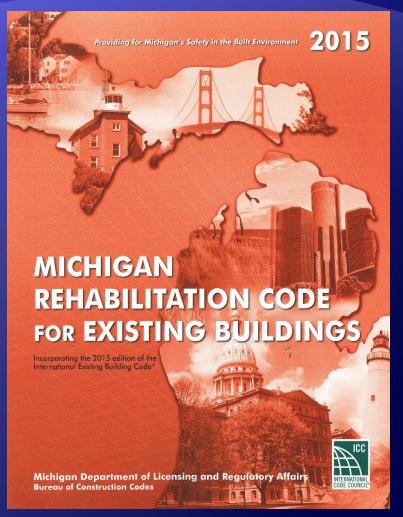
Ch. 17 Special Inspections Type of Special Inspections & Testing Seismic Resistance

How Does This Effect Your Area?

	City Location in Michigan	SDC on Risk Category I or II or III	SDC Based on Risk Category IV (Essential Facilities)
1	Iron Mountain	A	Α
2	Sault St. Marie	A	Α
3	Gaylord	A	Α
4	Traverse City	A	Α
5	Bay City	A	Α
6	Muskegon	В	В
7	Grand Rapids	В	С
8	Lansing	В	С
9	Rochester Hills	В	С
10	Detroit	В	С
11	Benton Harbor	В	С
12	Monroe	В	С



EXISTING BUILDINGS AND STRUCTURES USE THE MICHIGAN REHABILITATION **CODE FOR EXISTING BUILDINGS**





Thank You!

