# MINNESOTA CONSERVATION CODE for EXISTING BUILDINGS

## Key Topics and Challenging Sections

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## Agenda

Time	Торіс
5 min	Introduction
5 min	Code tracking basics to make sure you're on the right path
10 min	What is required for ALL projects
25 min	When to use the Prescriptive Method (Chapter 5)
50 min	Work Area Method Alterations (Chapters 6, 7, 8, and 9)
10 min	Work Area Method Changes of Occupancy (Chapter 10)
5 min	Work Area Method Additions (Chapter 11)
5 min	Questions

## Learning Objectives

#### Learners will be able to:

- Quickly select the most cost-effective compliance path
- Clearly communicate the compliance path
- Differentiate between Levels of Alteration and where criteria apply under the Work Area Method
- Affirmatively determine if a fire-suppression sprinkler system or alarm is required or required to be modified



## Code Tracking Basics

#### Code Tracking 101: Start with MR 1300

#### Page 1 of any PRINTED Minnesota Code:

- 1300.0040 SCOPE, subpart 2: Compliance
  - If the building is classified as IRC-1, IRC-2, IRC-3, or IRC-4, then it shall comply with Minnesota Rule 1309 Residential Code.
  - If the building is NOT classified as IRC-1, IRC-2, IRC-3, or IRC-4, then it shall comply with Minnesota Rule 1305 Commercial Code.

Exception: Existing Buildings scoped to MR 1305 undergoing repair, alteration, change of occupancy, addition, or relocation may comply with MR 1311 The Minnesota Conservation Code for Existing Buildings [MCCEB]

## Step 1:

Start at the beginning!

#### Code Tracking 101: Start with MR 1300

#### Page 1 of any PRINTED Minnesota Code:

- 1300.0040 SCOPE, subpart 2: Complian Why is this important?
  - If the building is classified as IRC-1, IRC then it shall comply with Minnesota R Residential Code.
  - If the building is NOT classified as IRC-IRC-4, then it shall comply with Minne Commercial Code.

Exception: Existing Buildings scopec undergoing repair, alteration, chang addition, or relocation may comply Rule 1311 The Minnesota Conservat Existing Buildings [MCCEB] If complying with MR 1305, then the <u>ENTIRE</u> existing building <u>must</u> comply with MR 1305 current requirements without exception.

Most buildings CAN'T comply.

- 2. If complying with MR 1311, then:
  - All new work must meet MR 1305 requirements
    <u>BECAUSE MR 1311 SAYS SO</u>
  - Existing construction MAY be allowed to remain
  - <u>ONLY</u> refer to MR 1305 when MR 1311 directs you there.





#### Provisions for All Compliance Methods- Chapter 3

#### **Compliance Path Watershed**

## **General Provisions**

#### **Repairs:**

Repairs are stand-alone, are NOT part of any work area, apply to all compliance paths.

#### Alterations, Additions, and Changes of Occupancy:

Three *Separate and Distinct* Compliance Paths:

**301.3.1** Prescriptive Method (Chapter 5 all inclusive)

301.3.2 Work Area Method (Chapters 6, 7, 8, 9, 10, 11, and 12)

301.3.3 Performance Method (Really doesn't work and no one uses it)



## **General Provisions**

#### Accessibility:

Section 301.5 provides direct reference to MR 1341. The accessibility provisions of <u>this</u> Chapter 3 are found there.

#### **Dangerous Conditions:**

Section 302.2 gives the building official the authority require dangerous conditions to be mitigated. Dangerous is defined.

#### Existing Materials: [MCCEB 302.4]

Existing materials in use may remain unless unsafe.

#### **New & Replacement Materials:** [MCCEB 302.5]

<u>Repairs:</u> Can be one-for-one replacement with like-inkind or better or must meet criteria for new construction. <u>Alterations:</u> Materials must meet all the requirements for new construction.

<u>New Work:</u> Materials must meet all the requirements for new construction.

Occupancy & Use: Per MR 1305 Chapter 3 [MCCEB 302.6]



## **General Provisions**

## **Structural Live Loads:**

If No increase in live load: Can use the live load required for the original building construction.

If the live load is increased: Must use the current requirements for structural capacity to size and make corrections to existing structure carrying additional loads.

#### **Snow Loads on Adjacent Buildings:**

Where additions or alterations potentially affect snow drift loading on adjacent buildings, the code official may require those affected buildings to be structurally improved to meet current snow drift load requirements.







## Repairs- Chapter 4



 <u>Repair</u> is a restoration of existing components to best/original condition.

#### Repair vs. Level 1 Alteration

 Level 1 Alteration is replacement of existing whole components with like-in-kind.



#### Acceptable Materials- Repairs

- Repair materials may match existing
- Repair materials <u>may</u> comply with new requirements
- Repair materials may be more conforming to the current code than the original materials, and still not comply with the current code.

#### LOTS OF LATTITUDE FOR REPAIRS



#### Structural Damage Due to Snow Load

- Repairs for <u>Substantial Damage</u> due to snow loading shall be repaired to meet the current structural requirements for snow load. Rehab must include the entire load path to the ground.
- Repairs for damage due to snow that is <u>NOT Substantial Damage</u> may be repaired to match the original construction requirements

Substantial Damage >50% Value of Building



#### **Gravity Load System- Repairs**







### Prescriptive Compliance Path- Chapter 5

### Strategy for Prescriptive Method

#### ALWAYS, ALWAYS, ALWAYS Start with the Prescriptive Method until you can't.

**Start** with Section 506 Change of Occupancy.



Relative Hazard	Occupancy Classification
1 (highest hazard)	H, I-2, I-3
2	A-1, A-2, A-3, A-4
3	A-5, E, I-1, R-1, R-2, I-4
4	R-3, R-4, M
5	B, F-1, S-1, IRC-1, IRC-3
6	F-2, S-2, IRC-2
7 (lowest hazard)	U, IRC-4

#### Additions

### **Prescriptive Method**

#### 502.1 General Criteria

- All new construction shall comply with MR 1305
- Alterations to the existing to accommodate the addition shall not result in an overall building less compliant to the current code than prior to the addition. (do no harm)



#### Additions in Flood Hazard Areas

#### **Prescriptive Method**



502.3 Additions in Flood Hazard Areas

- New construction must comply with MR 1335 MN Flood Code
- If not Substantial Improvement, then existing building shall be no-lessconforming to MR 1335.
- If Substantial Improvement, then entire building must comply with MR 1335



#### Existing Structure with New Loads Prescriptive Method

502.4 Existing Structural Elements carrying new gravity loads.

- <u>Any</u> new gravity loads imposed on the existing structure may increase the load up to 105% of original design capacity.
- <u>MORE</u> requires reinforcement to current code requirements.



#### Alterations

#### **Prescriptive Method**

503.1 General.

- Alterations must comply with current code
- Existing conditions may remain as long as the alterations don't make them less conforming to the current code. (do no harm)

## Alterations- Using Existing Stairs Prescriptive Method

#### 503.1 Exceptions

- Existing stairs with max rise of 8.25" and minimum tread of 9" with minimum tread width of 36"
- 2. If non-compliant with #1, may remain if technically infeasible to replace
- 3. Handrails per MBC Chapter 10 except extensions not required if the extensions hinder the means of egress.



#### Existing Structure w/ New Loads Prescriptive Method

#### 503.3 New Gravity Loads.

- Any new gravity loads on existing structure may not exceed the original design capacity by more than 105%.
- If original design capacity is exceeded by more than 105%, the structure must be replaced or altered to comply with current code.

#### Existing Structure w/ New Loads Prescriptive Method

#### 503.4 New Lateral Loads.

- Any new <u>lateral loads</u> on existing structure may not exceed the original design capacity by more than <u>110%</u>.
- If original design capacity is exceeded by more than 110%, the structure must be replaced or altered to comply with current code.

#### Fire Escapes

#### Prescriptive Method

#### 504.1 Fire Escapes

- Can't use for new construction/additions
- Can continue to be used for existing buildings, even replaced.
- Can be used for MOE for existing buildings where a new stair can't.



## Windows & EERO

#### **Prescriptive Method**

505.1 Glass: Replacement glass must meet current code

505.2 Fall Protection If:

- Fall hazard is > 72", and
- Group R-2 or R-3, and
- Replacement includes sash and frame, and
- Sill < 36", Then

Limit window to resist 4" sphere or provide Fall Protection Device per ASTM F2090.



#### Windows & Fall Protection

#### **Prescriptive Method**

505.3 Emergency Escape and Rescue Openings

- Required for whole replacements in R-2 & R-3
- Replacements must meet minimums of MBC 1030 or be the largest available standard size from the manufacturer within the same style or better.



#### **Prescriptive Method**

507.1 Provisions requiring improvements don't apply to historic buildings unless by this section!



## **Prescriptive Method**

507.2 Distinct Life Safety Hazards must be addressed. This means:

- Risky structural problems
- Hazardous materials
- Components at risk of falling or failure
- Insufficient means of egress
- <u>NOT</u> lack of sprinklers



#### **Prescriptive Method**

507.3 Flood Hazard Historic buildings exempt, including for substantial improvements.

Note: New additions must comply with current requirements because they are not historic.



### **Prescriptive Method**

#### 507.4 Structural

- Bldg Official can accept the live load capacity of the existing floor with operational controls to limit actual loading.
- Repairs for substantial damage may restore without current code reqs



## What <u>Don't</u> We Find?

## **Prescriptive Method**

- Requirements for fire sprinkler systems
- Requirements for fire alarm systems
- Ventilation Requirements
- Sound Transmission Performance Criteria
- Application of Toileting and Bathing criteria for Change of Occupancy
- 20% Increase in allowable area for historic buildings undergoing a change of occupancy.







#### Work Area Method- Chapter 6- Classification of Work

## Work Area Method



OR AND INDUSTRY

# Work Area Method



#### Wholescale 1 for 1 replacements:

- Windows
- Doors
- Siding
- Roof Coverings
- Surfaces/Finishes

Removal and replacement or covering of existing materials, elements, equipment, or fixtures using new materials elements equipment or fixtures that serve More than repairs to existing systems



# Work Area Method



Beyond one-for-one Replacement:

- Interior Remodeling
- Adding/Extending HVAC
- Adding Sprinklers/ Fire Alarms
- Reroofing when including additional insulation.

Reconfiguration of space, adding or removing doors/windows, reconfiguration or extension of systems. Installation of new systems.

Catch-all for everything <u>within</u> the building that is beyond Level 1.


Adds additional protections when most of the building is undergoing renovation.

- Fire Protection Systems
- Means of Egress Lighting
- Structural Improvements

Essentially Level 2 where the Work Area Exceeds 50% of <u>Building</u>







#### Change of Occupancy is:

- Change Classification, or
- Group Change within a Classification, or
- Change of use where code requirements change.

#### Change in <u>USE</u> of the building





Additions must:

- Completely comply with the current codes.
- Not make the existing building less conforming.

An increase in floor area, number of stories, or building height. Additions nearly ALWAYS include at

least Level 2 Alterations for

connection.



#### Many Additional Allowances:

- Allowable Area
- Means of Egress
- Fire Ratings
- Changes of Occupancy
- Structural

#### Must be:

- Listed in NRHP, or
- Listed by local group/SHPO, or
- Determined eligible by SHPO
- Listed by a historic group legally recognized by the municipality
  Not every old building is Historic.











### Work Area Method- Level 1 Alterations- Chapter 7

 Building can't be altered to be <u>Less</u>
<u>Safe</u> than before the alteration unless the current code allows a reduced condition. [701.2]

#### • Structural [706]

 If increasing loading on existing members, can increase up to 105% of original design capacity.

 If loading is > 105% of original design capacity, then must reinforce to match existing structural support criteria.



#### Energy Conservation [707 nutshell]

- If you replace it you match current code
- If you open it up, you do the best you can
- If you don't touch it, you don't need to touch it.











### Work Area Method- Level 2 Alterations- Chapter 8

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### Level 2 is:

- Reconfiguration of space
- Adding/removing doors or windows
- Reconfiguration or extension of any systems (like HVAC)
- Installation of any new equipment (more than one-for-one replacement)

All new work must comply with 1305 [801.3]

**Exceptions:** 

1. New windows- light & ventilation



All new work must comply with 1305 [801.3]

Exceptions:

- 1. New windows- light & ventilation
- 2. New Electrical Equip- Section 807

## All new work must comply with 1305 [801.3]

#### **Exceptions:**

- 1. New windows- light & ventilation
- 2. New Electrical Equip- Section 807
- 3. Dead End Corridors- Typical 35 feet

#### Exceptions:

Allowed longer if okay in 1305

DEAD END

- 2. 50 feet if existing, fire alarm and NOT A or H
- 3. 70 feet if existing, sprinkled and NOT A or H
- 50 feet if new or extended, sprinkled, NOT A or H

## All new work must comply with 1305 [801.3]

#### **Exceptions:**

- **1**. New windows- light & ventilation
- 2. New Electrical Equip- Section 807
- 3. Dead End Corridors- Table 805.6
- 4. Minimum ceilings 7 feet

## All new work must comply with 1305 [801.3]

#### **Exceptions:**

- 1. New windows- light & ventilation
- 2. New Electrical Equip- Section 807
- 3. Dead End Corridors- Table 805.6
- 4. Minimum ceilings 7 feet
- 5. Escalators to subway- 32" width
- 6. New structure- Alt Design okay per 302

### Limitations of Requirements

### **Alterations Level 2**

#### 802.1 Scope.

Application of code criteria is limited to within the work area containing Level 2 Alterations but extends to other areas identified in Section 802.



### **Interior Finishes**

### Alterations Level 2

#### 802.4 Interior Finishes

 Interior finishes of walls and ceilings within the work area shall comply with the current code.

Exception allows an approved flameretardant coating.

### Alterations Level 2

### Guards

#### 802.5 Guards

Guards within all work areas must comply with the following:

- If there is a fall hazard of >30" and there is no current guard or the guard is in danger of collapse, the existing guard must be repaired, or a new guard must be installed.
- New guards must comply with the current code requirements.



### Fire Resistance Ratings

### Alterations Level 2

#### 802.6 Fire Resistance Ratings

If NFPA 13 and NFPA 13R sprinkler systems are added to a building throughout:

- Building Officials may accept existing finishes as meeting the current code requirements.
- Requires a report to the building official identifying noncompliant/ questionable materials requiring consideration.





### Fire Protection (Sprinkler Systems) Level 2 Alterations



### Fire Protection- Alterations- Level 2: Work Area Method

#### 803.1 Scope.

- Limited to Level 2 Work Areas
- Expanded beyond <u>ONLY</u> where indicated by Section 803



#### Corridors:

Where a story is provided with sprinkling, the corridors may be reduced in rating as per a sprinkled building. [803.1.1]





### Sprinklers Alterations- Level 2: Work Area Method

### Highrise Buildings

IF:

- Work areas serve 30 or more, OR
- Means of egress serves multiple tenants

Then Sprinkle the work area if sufficient supply.



### Sprinklers Alterations- Level 2: Work Area Method

#### Highrise Buildings

IF:

Work area <a>> 50% of</a>
Floor Area

Then the entire story containing the work area shall be sprinkled, <u>except</u> tenant spaces entirely outside the work area.



### Sprinklers Alterations- Level 2: Work Area Method

#### Highrise Buildings

IF:

Work area <a>> 50% of</a>
Floor Area

Then the entire story containing the work area shall be sprinkled, <u>except</u> tenant spaces entirely outside the work area.



### Sprinklers

### Alterations- Level 2: Work Area Method

Groups A, B, E, F-1, H, I, M, R-1, R-2, R-4, S-1, and S-2 (everything except F-2 and R-3) [803.2.2]

#### IF:

- Work areas serve 30 or more, OR
- Means of egress serves multiple tenants
- Then Sprinkle the work area and MOE\* ONLY IF:
- MR 1305 requires sprinkling of the work area, AND
- Work area > 50% of Floor Area\*\*

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### Fire Alarms Alterations Level 2: Work Area Method

### Fire Alarms [803.4] Groups E, I-1, I-2, I-3, and R-2:

 Provide a fire alarm in the work area as required by the Fire Code.

**Group R-1:** Fire alarm shall be installed <u>throughout</u> as required for existing buildings



### Fire Alarms Alterations Level 2: Work Area Method

### Fire Alarms [803.4.2]

If the work are > 50% of floor area, Fire Alarms shall be provided throughout the floor.

# Exception: Tenant spaces outside of the work area.



### Smoke Alarms Alterations Level 2: Work Area Method

### Smoke Alarms [803.4.3]

All sleeping units and dwelling units in any work area within Group R or Group I-1 shall be provided with smoke alarms per the Fire Code.

Exception: Interconnection of the smoke alarms is not required beyond the work area.



### CO Detection Alterations Level 2: Work Area Method

Carbon Monoxide Detection REQUIRED in I-1, I-2, I-4 and R Exceptions:

- Work only involving building exterior surfaces (windows, reroof, siding)
- Plumbing or non-fuelburning mechanical systems alterations

[804]





### Means of Egress

### Level 2 Alterations



#### 805.1 Scope includes:

- Work Area, and
- Common means of egress when:
  - $\odot$  The occupant load served is > 30, or
  - The means of egress serves multiple tenants.



#### 805.3 Number of Exits

- Every story with a work area that includes exits or corridors shared by multiple tenants shall be provided with the minimum number of exits as required by MR 1305.
- The exits may also comply with 805.3.1.1 for single exit buildings, and
- May include fire escapes (but not for additions).



805.3.1.1 Single Exits

Follow the tables, or

Follow MR 1305

Story	Occupancy		Max. # <u>Dwelling</u> <u>Units ONLY</u>		Max travel distance	
B, 1, 2	R-2 (non-sprinkled)		4 per story		50 feet	
Story	Occupancy	Max. Occupant M load/ story di		Max dista	Max travel listance	
B, 1	B, F-2, S-2ª	35		75 feet		
2	B, F-2, S-2 <sup>a</sup>	35 75		75 fe	feet	

a. Travel Distance in S-2 open parking garage may be 100 feet No application higher than second story above grade plane



#### 805.3.1.2.1 Fire Escapes

- Allowed in All Occupancies except I-2, Fire escapes may be used for <u>one</u> means of egress when more than one is required.
- Access can't be locked or barred in any way.
- Must be accessed by a door. R-1, R-2 and I-1 may use an Emergency Escape and Rescue Opening.
- New fire escapes only permitted where exterior stairways can't be used.
- Openings within 10 feet must be protected.
- Ladders prohibited in Group E or Group I.



#### 805.3.1.2.1 Fire Escapes- Construction

- Non-combustible construction
- 100 PSF live load
- Stairways must be <u>></u> 22" wide (size per egress width)
- Risers < 8"; Treads > 8"
- Landings <u>></u> 40" x 36"
- Landings < 8" below an access door or EERO.


# Means of Egress Alterations Level 2: Work Area Method

#### 805.5 Openings in Corridor Walls

Protect openings per below unless corridor is not rated per MR 1305.

- Work area doors must be solid core with no louvers.
- Dwelling/Sleeping units shall have not less than a 1-3/8" thick solid core door.
- Transoms must have ¼" wired glass in metal frames and be sealed closed, or infilled with solid material consistent with corridor rating.
- IF work area 50% of floor area, door protection required throughout the floor.



# Means of Egress Alterations Level 2: Work Area Method

### **805.6 Dead End Limits**

- 35 Feet Basic allowance
- 50 feet in buildings with fire alarm (not Group A or H)
- 70 feet in fully sprinkled buildings (not Group A or H) for <u>existing corridors</u>.
- 50 feet in fully sprinkled buildings (not Group A or H) for <u>newly constructed</u> <u>or extended corridors</u>.



# MOE Lighting, Exit Signage, Handrails and Guards

**805.9 Handrails:** (applies to the work area and along the MOE to the level of exit discharge)

- **ONE** at each stairway with 3 or more risers.
- Existing handrails are acceptable unless in danger of collapse.
- If none exists or the existing handrail is in danger of collapse, provide (1) for stairs up to 66" wide and both sides for stairs > 66" wide.

**805.11 Guards:** (applies to the work area and along the MOE to the level of exit discharge)

- Required in work area where fall hazards > 30"
- Existing guards are acceptable if not dangerous
- If none exists or the existing guard is in danger of collapse, provide new per MR 1305





### Existing Structure with New Loads Work Area Method

806.2 Existing Structural Elements carrying new gravity loads.

- <u>Any</u> new gravity loads imposed on the existing structure may increase the load up to 105% of original design capacity.
- <u>MORE</u> requires reinforcement to current code requirements.



### Mechanical

### Work Area Method

### 808 Mechanical

- Reconfigured occupiable/ habitable space must be provided with ventilation (outdoor air)
- Altered existing HVAC systems shall provide not less than 5 cfm of outdoor air and not less than 15 cfm of ventilation air per person.
- Newly introduced uses that introduce contaminants or odors shall be provided with local exhaust.



# Plumbing & Energy Conservation Work Area Method

### 809 Plumbing

 IF the occupant load of a STORY increases by 20% or more, fixtures shall be provided per MR 1305

### 810 Energy Conservation

- If its new, build it per the current code.
- If you open it up or change it, do the best you can.
- If you don't touch it, you don't have to.









### Work Area Method: Level 3 Alterations- Chapter 9

Level 2 Work Area exceeds 50% of the building area

### Alterations Level 3: Work Area Method

### **Existing Shafts & Vertical Openings:**

- Enclose stairways from the highest work area to the level of exit discharge as per required by MCCEB Section 802.2.1
- Interior finishes in exits must comply with the current code or be topically fire-retardant treated as approved by the building official.



### Alterations Level 3: Work Area Method

#### Fire Protection:

6.1

- Comply with Level 2 requirements
- Sprinkle work areas in high-rise buildings with enough municipal water pressure.
- Sprinkle rubbish and linen chutes in the work area
- Sprinkle locations where furniture or mattresses are made, sold, or stored
- Sprinkle specialty areas per MR 1305, Table 903.2.11.6.

#### Table 903.2.116

Additional Required Suppression Systems

<u></u>	4	
14	Section	Subject
1	402.5, 402.6.2	Covered and open mall buildings
Bur .	403.3	High-rise buildings
1	404.3	Atriums
	405.3	Underground Structures
-	407.7	Group I-2
100	410.6	Stages
-12.2	411.3	Special Amusement Buildings
7	412.2.4	Airport Traffic Control Towers
. 15	412.3.6, 412.3.6.1, 412.5.6	Aircraft Hangars
-	415.11.11	Group H5 HPM exhaust ducts
	416.5	Flammable finishes
	417.4	Drying Rooms
	424.3	Children's play structures
	428	Buildings containing laboratory suites
	507	Unlimited area buildings
	509.4	Incidental uses
	1029.6.2.3	Smoke-protected assembly seating
	IFC	Sprinkler system requirements as set
1 and		forth in Section 903.2.11.6 of the Fire
and and		Code

### Alterations Level 3: Work Area Method

#### Fire Alarms:

- Provide manual fire alarms in the work area where required by the MBC.
- Visual alarms are not required except when installing a new system, or the existing system is being replaced.

#### **Fire Detection:**

 Provide automatic fire detection in the work area where required by the MBC.







### Work Area Method: Change of Occupancy- Chapter 10

# Change of Occupancy: WAM

### **Change of Occupancy**

A change in the use of a building or portion of a building that results in any of the following:

- 1. A change of occupancy classification.
- 2. A change from one group to another group within an occupancy classification.
- 3. Any change in use within a group for which there is a change in application of the requirements of the code.



### Special Uses

# Change of Occupancy: WAM

# **Special Use & Occupancy**

The following must comply with the requirements of 1305:

- 1. Covered & Open Malls
- 2. Atriums
- 3. Motor vehicle related
- 4. Aircraft-related
- 5. Motion picture projection rooms
- 6. Stages & Platforms



 Special Amusement Buildings
Incidental Use Areas
Hazardous materials
Ambulatory Care Facilities
Group I-2 Occupancies

### Fire Protection

# Change of Occupancy: WAM

# **Fire Sprinkling**

Section 1004 refers to Chapter 9 of MR 1305 for scoping when there is a Change of Occupancy and then to MCCEB 1011 if scoped.

# Must comply w/ MCCEB Ch. 9

- If required to be sprinkled and <u>NO</u> <u>Occupancy Separation</u>, then sprinkle the entire fire area.
  [MCCEB 1011.1.1.1]
- If required to be sprinkled and <u>YES</u> <u>Occupancy Separation</u>, then ONLY sprinkle the area bounded by the Occupancy Separation. [MCCEB 1011.1.1.2]

### **Fire Protection**

# Change of Occupancy: WAM

# **Fire Alarms & Detection**

If MR 1305, Chapter 9 requires fire alarms and detection in the new occupancy, it shall be provided throughout the area where the change of occupancy occurs.  If there is an existing fire alarm system in the building, the new portion required by the change of occupancy shall be integrated with the existing to provide notification through the extents of the existing system and the new change of occupancy. [MCCEB 10111.2.2]

# Means of Egress

# Change of Occupancy: WAM

### General Requirements:

- Egress capacity shall comply with 1305 [1011.4.3]
- Existing stairways shall have handrails per MCCEB 805.9\* [1011.4.4]
- Existing guards shall comply with MCCEB 805.11\* [1011.4.5]

### \* If existing its fine if it isn't collapsing



### Means of Egress

# Change of Occupancy: WAM

1005.1 Requires MOE compliance with 1011 for the change of occupancy. 1011.4 requires a hazard analysis through Table 1011.4

When the hazard increases, <u>All</u> MOE must comply with MR 1305

### But there are EXCEPTIONS!

Relative Hazard	Occupancy Classification
1 (Highest Hazard)	Н
2	I-2; I-3, I-4
3	A; E; I-1; M; R-1; R-2; R-4 Condition 2
4	B; F-1; R-3; R-4 Condition 1; S-1
5 (Lowest Hazard)	F-2; S-2; U

When the hazard does not increase, <u>New</u> <u>or reconfigured</u> MOE must comply with MR 1305; Existing with MCCEB 905.

# Means of Egress

# Change of Occupancy: WAM

### The Exceptions to all MOE compliance with 1305 when Hazards Increase:

- Stairways can be enclosed per MCCEB 903.1 (typically 1-hour)
- Stairways, handrails & Guards comply with MCCEB Chapter 9.
- **3.** Replacement stairways may match the original pitch
- 4. Intact lath & plaster walls are acceptable for fire partitions in corridors

- Existing doors, transoms and other corridor openings shall comply with Sections 805.5.1 through 805.5.3
- 6. Dead end corridors shall comply with 805.6
- Existing operable windows with ≥ 4 ft<sup>2</sup> of clear opening NLT 22" high or 20" wide is acceptable as EERO.

### Mechanical

# Change of Occupancy: WAM

- Must comply with the current Minnesota Mechanical Code under the following two conditions:
- If the new occupancy increases kitchen exhaust requirements, and/ or
- 2. If the new occupancy increases ventilation requirements.



# Plumbing

# Change of Occupancy: WAM

- Provide for any increase in plumbing fixture requirements due to the change of occupancy.
- New food handling establishments must protect food handling areas from pipe leak contamination.
- New occupancies with grease or oilladen wastes must be provided with interceptors.
- Chemical wastes shall discharge into compatible piping or be neutralized.
- Change of Occupancy to Group I-2 plumbing must completely comply with current code.







### Work Area Method: Additions- Chapter 11

### Additions: Work Area Method

CENTRE

### Allowable Height & Area

- Additions always reduce existing building frontage.
- Additions always force re-evaluation of overall building allowable area. Entire building must show compliance with the current code for allowable area.
- DLI/CCLD Plan Review Policy PR-04 exempts new fire walls constructed completely within existing buildings from structural independence requirements.

https://www.dli.mn.gov/sites/default/files/pdf/pr04.pdf

### Additions: Work Area Method

### Fire Walls at Existing Exterior Walls

- Existing exterior wall may contribute up to ½ of the required fire resistance rating [IBC 706.2/ NFPA 221]
- New construction side must comprise at least ½ of the required fire resistance rating and must meet all of the current requirements for fire walls. [IBC 706.2/ NFPA 221]
- Opening protection must at least occur all in one primary wall plane, preferably the new wall.



### Additions: Work Area Method

### **Structural Loading onto Existing**

- Existing gravity load carrying systems may be loaded to not more than 105% of the demand capacity ratio.
- Existing lateral load carrying system may be loaded to not more than 110% of the demand capacity ratio.

### Storm Shelters: Additions to E Occupancies



**Scoping** (When do we need them) When:

- E occupancy addition(s), and
- 50 or more occupants added, and
- Designated county (MN Amendment)
- Not daycare or places of worship

Not Changes of Occupancy





### **Exceptions:**

 The addition does not need to be made larger merely to accommodate the entire school.

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- 2. Existing qualifying storm shelters can offset the required capacity for new construction.
  - Exception 1 does NOT say that the occupant load can be reduced to that of the addition only!

# Storm Shelters: Additions to E Occupancies

### **Required Capacity:**

- Occupant Load of the School <u>SITE</u> (as an E occupancy)
- Occupant Load is (the greater of):
  - Classrooms +Lab/Vocational space + offices, OR
  - Indoor assembly space <u>associated with E</u> (that means daytime school use)

[1106.1.1]

### Not per MOE!







# Thank You!

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### Storm Shelters: Additions to E Occupancies



### Storm Shelters: ICC 500 Highlights Chapter 1- Application & Administration

- Special Needs- Provisions for special needs is NOT REQUIRED [101.4] Accessible route is required to the storm shelter but accessible features within are not required but highly recommended.
- Peer Review- requires an independent licensed design professional...can be in the same firm but not on the same design team. [106.1.1]
- Special Inspections: Required for postinstalled anchors.

### Storm Shelters: ICC 500 Highlights Chapter 3- Structural Design

#### Structural Design- Chapter 3

- Rainfall in MN: 9.5"/hr [303.1.1]
- Roof Live Load: 100 PSF [303.2]
- Wind Speed: 250 MPH [304.2]
- Shelters shall be designed to survive the destruction of the host building. [304.9]
- Impact Resistance:
  - Vertical surfaces: 15# 2x4 end impact at 100 mph
  - Horizontal surfaces: 15# 2x4 end impact at 67 mph
- Soil/Ground Protection
  - 12" of soil protects horizontal surfaces from impact.
  - 36" of soil protects vertical surfaces from impact.
- Penetrations larger than 3 ½ square inches or 21/16" diameter must be protected per 306.3.

# Storm Shelters: ICC 500 Highlights Chapter 5- Occupancy, MOE and Accessibility

#### **Occupant Density:**

- Standing/seated: 5 sf/person
- Wheelchair: 10 sf/person

### **Usable Floor Area Reduction:**

- 50% reduction for fixed seating or concentrated furnishings (or count the seats)
- 35% reduction for unconcentrated furnishings (classrooms)
- 15% reduction for "open plan furnishings" like a lobby

### Wheelchair Spaces:

• 1 space / 200 occupants

### Storm Shelters: ICC 500 Highlights Chapter 5- Occupancy, MOE and Accessibility

### Number of Doors & Swing: [501.2]

 Based upon occupant load for normal occupancy (not storm occupancy)

### Emergency Escape Openings: [501.4]

- At least one additional door, or
- Opening w/ Minimum Dimensions:
  - Opening <u>></u> 5.7 sqft in area,
  - 20" minimum width
  - 24" minimum height
- Ladder required when the access is more than 30 inches above the floor.

### Storm Shelters: ICC 500 Highlights Chapter 6- Fire Safety

#### Fire Separation: [601.1]

 Two-Hour fire barrier separation between the storm shelter and other areas of the building.

Note: This creates a surviving bunker, not required to have automatic fire suppression sprinkler service if the host building is destroyed. If the host building is required to be sprinkled, the storm shelter is required to be sprinkled.

## Storm Shelters: ICC 500 Highlights Chapter 7- Essential Features & Accessories

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### Protection of Critical Systems: [701.1]

 Two-Hour service for ventilation, sanitation facilities & lighting. (Not fire sprinkler system).

### Ventilation: [702]

- Natural (6 square inches per person)
- Mechanical (Ventilation as required for <u>NORMAL USE</u>) [702.1.2]

#### Sanitation: [703]

- 2 WC for first 500, then 1 WC for each additional 500 occupants
- 1 lavatory/hand washing station per 1000 occupants
- Lavatory not required for an occupant load less than 50.
  - Drinking fountains NOT required

### Storm Shelters- ICC 500 Highlights Chapter 7- Water & Waste Interpretations



### **Water Supply:** [702.2.3]

**702.2.3** Support systems for the sanitation facilities (e.g., bladders, storage tanks or vessels, etc.) shall be capable of supplying water and containing waste for the design capacity of the tornado shelter.

 Since climate conditions in Minnesota require municipal water supply and waste lines to be located below the frost depth, the piping below grade or below an interior ground floor slab are considered firm utilities.



- Water supply lines must be located below grade or below a slab-on-grade to be protected. DLI/CCLD does allow the water service to surface for metering in a hardened space and then directly returning underground since the exposure is minimal. Separate sprinkler main and solenoid valve on domestic water required to ensure water pressure to shelter if host building is destroyed.
- Water supply to the storm shelter from the meter shall be a dedicated line.