

CODE REVIEW: BLDG 1 & 2**Remolding of existing building**

Project Description: 2025 11 Building 1 & 2 Date: Monday, December 22, 2025 Project

Location: 14047 Azurite St NW, Ramsey, MN 55303

Construction by: Owner

Architect: El-Nagdy Engineer: Becklin and Whitney

Code Study by: dkw

BASIC BUILDING DESCRIPTION:

Type of Construction = VB

Building does not have an automatic sprinkler system

Allowable area and height based on different uses being separated by fire barriers as needed.

Most restrictive height and area used. (508.3.2)

Use to be Repair and storage of commercial motor vehicles. All fire areas to be less than 5,000 square feet (12-11-2025)

USE 311.2 Moderate-hazard storage, Group S-1.**[F] 903.2.9 Group S-1.**

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

1. A Group S-1 *fire area* exceeds 12,000 square feet (1115 m²).
2. A Group S-1 *fire area* is located more than three stories above *grade plane*.
3. The combined area of all Group S-1 *fire areas* on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).
4. A Group S-1 *fire area* used for the storage of commercial motor vehicles where the *fire area* exceeds 5,000 square feet (464 m²).

[F] 903.2.9.1 Repair garages.

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

1. Buildings having two or more *stories above grade plane*, including basements, with a *fire area* containing a repair garage exceeding 10,000 square feet (929 m²).
2. Buildings not more than one *story above grade plane*, with a *fire area* containing a repair garage exceeding 12,000 square feet (1115 m²).
3. Buildings with repair garages servicing vehicles parked in basements.

A Group S-1 *fire area* used for the repair of commercial motor vehicles where the *fire area* exceeds 5,000 square feet (464 m²).

The buildings are less than 5,000 square feet,

ADDRESS IDENTIFICATION:

Buildings shall be provided with approved address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property. Characters shall be Arabic numbers or alphabetical letters. Numbers shall not be spelled out. Each character shall be not less than 4 inches high and not less than 0.5 inch wide. They shall be installed on a contrasting background. When required by the fire official, address numbers shall be provided in additional approved locations. When access is by a private road and the building address cannot be view from the public way, a monument, pole or other approved sign shall be used to identify the structure. (502.1)

BUILDING SECTION #1

BASIC BUILDING DESCRIPTION:

Type of Construction = VB
Building does not have an automatic sprinkler system
Allowable area and height based on different uses not being separated by fire barriers. Most restrictive height and area used. (508.3.2)

ADDRESS IDENTIFICATION:

Buildings shall be provided with approved address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property. Characters shall be Arabic numbers or alphabetical letters. Numbers shall not be spelled out. Each character shall be not less than 4 inches high and not less than 0.5 inch wide. They shall be installed on a contrasting background. When required by the fire official, address numbers shall be provided in additional approved locations. When access is by a private road and the building address cannot be view from the public way, a monument, pole or other approved sign shall be used to identify the structure. (502.1)

SITE DESCRIPTION: (506.3.2 and 202 FIRE SEPARATION DISTANCE)

The north side has a public way. Distance to public way = 60.0 ,width = 66.0
Length of perimeter facing the public way = 80.0 This side can be accessed from a street or approved fire lane.
The east side has a public way. Distance to public way = 60.0 ,width = 66.0
Length of perimeter facing the public way = 62.0 This side can be accessed from a street or approved fire lane.
The south side has a lot line. Distance to lot line = 44.0
Length of perimeter facing lot line = 80.0 This side can be accessed from a street or approved fire lane.
The west side has a fire wall separating buildings. (706.1)
Length of perimeter = 62.0 This side is not accessible from a street or approved fire lane.
Perimeter of the entire building = 284.0 feet.
Perimeter which fronts a public way or accessible open space = 222.0 feet.
Weighted average of the width of public way or accessible open space = 30.0 feet. (506.3.2)
Allowable area increased 53.17% due to frontage. (506.3)

HEIGHT OF BUILDING:

Actual height of building = 20.00 ft Allowed building height = 40.00 ft The height is within the allowed height. (504.1 and Table 504.3)

BUILDING INTERIOR:

ALLOWABLE AREA AND HEIGHT:

| FL | NAME | OCC | MAX FLR | AREA | ALLOWED | RATIO | STATUS |
|-----------------|------------|-----|---------|------|----------|-------|--------|
| F1 | Building 1 | S1 | 1 | 4960 | 13785.21 | 0.36 | OK |
| TOTAL FOR FLOOR | | | | 4960 | 13785.21 | 0.36 | OK |
| BUILDING TOTAL | | | | 4960 | 13785.21 | 0.36 | OK |

Notes:

Allowable area is based on Table 506.2 and Section 506.
 Allowable number of stories is based on Table 504.4 and Section 504
 Allowed area increased 53.2% for frontage increase. (506.3)
 NOTE: Storage areas were set to the major use occupancy group because these areas are accessory to the major use of the building. (311.1.1)

BUILDING SECTION #1

EXIT REQUIREMENTS:

| FL | NAME OF AREA | NUMB OF OCC | MIN EXIT | MIN EXIT WIDTH | PANIC HDWR | DOOR SWNG | CORRIDOR FIRE RATING | MAX TRVL DIST | NOTES |
|----|-----------------|-------------|----------|----------------|------------|-----------|----------------------|---------------|-------|
| F1 | Building 1 | 25 | 1 | 5 | no | any | N/A | 200 | |
| | TOTAL 1st FLOOR | 25 | 2 | 5 | no | any | N/A | 200 | 5 |

FOOTNOTES:

5. Number of exits from this floor is based on Section 1006.3.2

NOTES FOR EXIT TABLE:

Door swing is based on Section 1010.1.2
 Occupant load is based on Section 1004 and Table 1004.5
 Exit width is in inches and based on Sections 1005.3.1 and 1005.3.2
 For the minimum width of stairways, see Section 1011.2.
 Exits shall be continuous from the point of entry into the exit to the exit discharge. (1003.6)

DOOR SWING EXCEPTIONS:

Exception 5: Revolving doors complying with Section 1010.1.4.1
 Exception 6: Horizontal sliding doors complying with Section 1010.1.4.3
 Exception 7: Power-operated doors complying with Section 1010.1.4.2

EXIT WIDTH NOTES:

Exit width is in inches and based on Section 1005.2

Width shown for all areas is based on other egress components. (1005.3.2)

Width shown for 1st floor is based on other egress components. (1005.3.2)

Width shown for other floors & basements is based on stairways. (1005.3.1)

For the minimum width of doors, see Section 1010.1.1.

EGRESS CONTINUITY:

The path of egress travel along a means of egress shall not be interrupted by any building element other than a means of egress component. (1003.6)

EXIT SEPARATION:

In areas where 2 exits are required, the minimum separation is 1/2 of the maximum diagonal of the area or floor measured in a straight line between exits or exit access doorways. (1007.1.1)

Exception 1: Where interior exit stairways are interconnected by a 1-hour corridor, the separation shall be measured along the shortest direct travel within the corridor.

Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity by more than 50 percent. (1005.5)

MEANS OF EGRESS ILLUMINATION:

1. The means of egress serving a room or space shall be illuminated at all times that the space or room is occupied. (1008.2)

2. The means of egress illumination shall not be less than 1 foot-candle at the walking surface level. (1008.2.1)

3. Illumination shall be provided along the path of travel for the exit discharge for each exit to the public way. (1008.2.3)

See exceptions

See section 1008.3 for emergency power requirements.

ADDITIONAL DOORS:

Where additional doors are provided for egress purposes, they shall conform to the requirements in Section 1010. (1010.1)

LANDINGS AT DOORS:

1. There shall be a floor or landing on each side of a door. (1010.1.5)

2. Such floor or landing shall be at the same elevation on each side of the door. (1010.1.5)

3. The floor or landing shall not be more than 1/2 inch lower than the threshold. (1010.1.7)

4. Landings shall have a width not less than the width of the stairway or width of the doorway, whichever is the greater.

Where a landing serves an occupant load of 50 or more, doors in any position shall not reduce the landing dimension to less than one half of the required width. The minimum length in the direction of exit travel is 44 inches. (1010.1.6)

5. The space between two doors in series shall be 48 inches plus the width of door swinging into the space. (1010.1.8)

BOLT LOCKS:

Manually operated flush bolts and surface bolts are not permitted. (1010.1.9.5)

Exception 3: Where a pair of doors serves an occupant load of less than 50, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.

Exception 2: Where a pair of doors serves a storage or equipment room, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.

The unlatching of any door or leaf shall not require more than one operation. (1010.1.9.6)

Exception 2: Where manually operated bolt locks are permitted.

Exception 3: Doors with automatic flush bolts as permitted.

LOCKS AND LATCHES:

Egress doors shall be readily openable from the egress side without the use of a key or any special knowledge or effort. (1010.1.9)

Locks and latches shall be permitted to prevent operation where any of the following exists: (1010.1.9.4)

2. The main door or doors in Group B, F, M and S areas are permitted to be equipped with key operating locking devices from the egress side provided:

2.1 The locking device is readily distinguishable as locked.

2.2 A readily visible durable sign is posted on the egress side stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED

3. Where egress doors are used in pairs, automatic flush bolts shall be permitted to be used, provided the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.

5. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism.

BUILDING ACCESSIBILITY:

Accessible entrances and accessibility within the building shall comply with Sections 1104 and 1105.

On floors where drinking fountains are provided, accessible drinking fountains shall be provided. No fewer than 2 drinking fountains shall be provided. One shall comply with the requirements for people in a

wheelchair and one for standing persons. (1109.5.1)

MINIMUM NUMBER OF PLUMBING FIXTURES: (2902.1)

| FL | NAME OF AREA | NUMBER OCC | WATER CLOSETS | | LAVATORIES | | DRINKING FOUNTAINS |
|---------------------|--------------|------------|---------------|--------|------------|--------|--------------------|
| | | | MALE | FEMALE | MALE | FEMALE | |
| F1 | Building 1 | 25 | 1 | 1 | 1 | 1 | 1 |
| TOTAL for 1st FLOOR | | 25 | 1 | 1 | 1 | 1 | 1 |

[P] 2902.2 Separate facilities.

Where plumbing fixtures are required, separate facilities shall be provided for each sex.

Exceptions:

2. Separate facilities shall not be required in structures or tenant spaces with a total *occupant load*, including both employees and customers, of 25 or less.

[P] 2902.3.3 Location of toilet facilities in occupancies other than malls.

In occupancies other than covered and open mall buildings, the required public and employee toilet facilities shall exceed a distance of 500 feet.

FIRE-RESISTANCE REQUIREMENTS:**FIRE-RESISTANCE RATING FOR EXTERIOR WALLS:****North Side:**

Group S1 - Bearing walls = 0-hr Nonbearing walls = 0-hr rating on the inside. (705.5, Tables 601 & 602)

Projections extending beyond the exterior wall cannot extend closer to than 20 feet to the fire separation distance line. (Table 705.2)

No limit on unprotected openings. There is no limit on protected openings. (Table 705.8)
Combustible projections extending within 5 feet of the line used to determine the fire separation distance or located where openings are not permitted or where protection of openings are required shall be of at least 1-hour fire-resistive-rated construction, Type IV or fire-retardant-treated wood. (705.2.3)

East Side:

Group S1 - Bearing walls = 0-hr Nonbearing walls = 0-hr rating on the inside. (705.5, Tables 601 & 602)

Projections extending beyond the exterior wall cannot extend closer to than 20 feet to the fire separation distance line. (Table 705.2)

No limit on unprotected openings. There is no limit on protected openings. (Table 705.8)
Combustible projections extending within 5 feet of the line used to determine the fire separation distance or located where openings are not permitted or where protection of openings are required shall be of at least 1-hour fire-resistive-rated construction, Type IV or fire-retardant-treated wood. (705.2.3)

South Side:

Group S1 - Bearing walls = 0-hr Nonbearing walls = 0-hr rating on the inside. (705.5, Tables 601 & 602)

Projections extending beyond the exterior wall cannot extend closer to than 20 feet to the fire separation distance line. (Table 705.2)

No limit on unprotected openings. There is no limit on protected openings. (Table 705.8)
Combustible projections extending within 5 feet of the line used to determine the fire separation distance or located where openings are not permitted or where protection of openings are required shall be of at least 1-hour fire-resistive-rated construction, Type IV or fire-retardant-treated wood. (705.2.3)

West Side:

Group S1 - This wall must meet fire wall requirements. (706) rating on both sides. (705.5, Tables 601 & 602)

Fire protection is not required at the bottom flange of lintels, shelf angles and plates, spanning not more than 6 feet 4 inches if they are part of the structural frame and regardless of the span if they are not part of the structural frame. (704.11)

Projections extending beyond the exterior wall are not permitted. (Table 705.2)

Combustible projections extending within 5 feet of the line used to determine the fire separation distance or located where openings are not permitted or where protection of openings are required shall be of at least 1-hour fire-resistive-rated construction, Type IV or fire-retardant-treated wood. (705.2.3)

FIRE-RESISTANCE RATING REQUIREMENTS:(Table 601 except as noted)

Exterior walls . Minimum fire resistance rating = FIRE-RESISTANCE RATING FOR EXTERIOR WALLS above

Primary structural frame may be of any material. Minimum fire resistance rating = 0 hour

Interior bearing wall may be of any material. Minimum fire resistance rating = 0 hour

Interior nonbearing wall may be of any material. Minimum fire resistance rating = 0 hour

Floor/ceiling assembly may be of any material. Minimum fire resistance rating = 0 hour

Parking surfaces shall be of concrete or similar noncombustible and nonabsorbent materials.

Asphalt parking surfaces are permitted at ground level. (406.2.4)

Roof/ceiling assembly may be of any material. Minimum fire resistance rating = 0 hour

Stairs may be of any material. Minimum fire resistance rating = 0 hour

MARKING AND IDENTIFICATION:

Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified. (703.7)

Identification shall be located in accessible concealed floor, floor-ceiling or attic spaces;

Be located within 15 feet of the end of each wall and at intervals not exceeding 30 feet; and

Suggested wording: 'FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS'

FIRE PARTITIONS:

The following wall assemblies shall comply. (708.1)

Fire partitions shall have a fire-resistance rating of not less than 1-hour. (708.3)

See exceptions.

Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistive-rated floor/ceiling or roof/ceiling assembly above. (708.4)

See exceptions.

The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for tenant and sleeping unit separation wall and corridor walls.

See exceptions.

A 1-hour fire-resistive rating is required for smoke barriers. (709.3)

Smoke barriers shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces. (710.4) See Section 710.5 for opening requirements.

**PENETRATIONS OF FIRE RESISTIVE ASSEMBLIES:
WALLS ASSEMBLIES:**

Penetrations of walls shall comply Section 714.3.1.1 or 714.3.1.2.

FLOOR/CEILING AND ROOF/CEILING ASSEMBLIES:

Penetrations of floor/ceiling and roof/ceiling assemblies shall comply Section 714.4.1.1 or 714.4.1.2.

DUCTS AND AIR TRANSFER OPENINGS:

Where required. (717.5) , Fire walls (717.5.1), Fire barriers (717.5.2), Shaft enclosures (717.5.3), Fire partitions (717.5.4) and Smoke barriers (717.5.5)

REQUIRED SEPARATION OF OCCUPANCIES: (508.4.4 & Table 508.4)

Uses are not separated by fire barriers. The construction of the building is based on the most restrictive use. (508.3.3)

SEPARATION OF INCIDENTAL USE AREAS: (Table 509)

Furnace rooms where any piece of equipment is over 400,000 BTU per hour input = 1 hour

Rooms with any boiler over 15 psi and 10 horsepower = 1 hour

Refrigerant machinery rooms = 1 hour

Hydrogen cut-off rooms not classified as Group H = 1 hour

Incinerator rooms = 2 hours and an automatic sprinkler system is required

Stationary storage battery systems having an energy capacity greater than the threshold quantity specified in Table 1206.2 of the IFC. = 1 hour

FIRE WALL REQUIREMENTS:

Between building 1 and building 2:

The fire wall is required to be a 3 hour fire assembly. (Table 706.4)

In place 2 hour wall

Openings shall be protected by assemblies having a 3 hour fire rating. (706.8 and Table 716.1(2)) 2-1 1/2 hour assemblies may be used.

Fire wall shall extend from the foundation to a termination point at least 30 inches above both adjacent roofs. (706.6) See exceptions for alternate protection at roof.

See Section 706.6.1 for requirements when a fire wall separates buildings of different heights.

See Section 706.6.2 for requirements when a fire wall separates buildings with sloped roofs.

Each opening through a fire wall shall not exceed 156 square feet. The aggregate width of openings at any floor level shall not exceed 25 percent of the length of the wall. (706.8)

If the building has a projection (overhang, canopy, etc) at the fire wall, the fire wall shall extend to the outer edge of the horizontal projection. (706.5.2)

Exception 1: If projection is without concealed spaces, fire wall may stop at the exterior wall if the exterior wall and projection on each side of the fire wall is 1-hour fire-resistive for the depth of the projection on each side of the fire wall.

Exception 2: If projection has concealed space and is noncombustible, fire wall may stop at the exterior wall if the projection has a one hour wall in the concealed space and the exterior wall and projection is 1-hour fire-resistive for the depth of the projection on each side of the fire wall.

Exception 3: If projection has concealed space and is combustible, fire wall may stop at the exterior wall if the fire wall extends through the projection in the concealed space and the exterior wall and projection is 1-hour fire-resistive for the depth of the projection on each side of the fire wall.

If the fire wall intersects an exterior wall at less than 180 degrees, the fire-resistance rating for the exterior walls on both sides of the fire wall shall have a 1-hour fire-resistance rating with 3/4 hour opening protection. The fire-resistance rating of the exterior wall shall extend a minimum of 4 feet on each side of the intersection. (706.5.1)

Fire walls shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. (706.2)

SMOKE AND HEAT REMOVAL:

Areas containing high piled combustible storage require smoke and heat removal when required by Table 3206.2 of the IFC. Design to comply with Section 910.3.

ROOFING REQUIREMENTS:

1. The roofing on this building is required to be Class C or better. (Table 1505.1)

ROOF DRAINAGE:

Where the exterior wall construction extends above the roof in such a manner that water will be entrapped if the primary drains allow build up for any reason, secondary (emergency overflow) roof drains or scuppers shall be provided. (1502.2)

1. Secondary drains or scuppers shall be located and sized to prevent the weight ponding water from exceeding the design load of the roof.
2. See section 1611.1 for design load requirements.
3. Scuppers shall not have an opening dimension of less than 4 inches. (1502.3)
4. See sections 1106 and 1108 of the Plumbing code for design requirements.

DRAFTSTOPPING:

If there is combustible construction in the roof/ceiling assembly, draftstopping shall be installed so that the area of concealed space does not exceed 3,000 square feet. (718.4)

See Section 718.3.1 for approved materials.

See Section 708.4 for construction requirements.

Opening in the partitions shall be protected by self-closing doors with automatic latches constructed as required for the partitions. (718.4.1.1)

AUTOMATIC SPRINKLER SYSTEMS:

If openings are not provided in each 50 feet on at least one exterior wall or there is floor area more than 75 feet from an exterior opening, an automatic sprinkler system is required. Openings shall have a minimum dimension of 30 inches. There must be at least 20 sq.ft. of opening in every 50 lineal feet of wall or fraction thereof. The height of the bottom of the opening shall not exceed 44 inches measured from the floor. (903.2.11.1)

An automatic sprinkler system shall be provided when the area exceeds 2,500 square feet and is used for the storage of upholstered furniture or mattresses. (903.2.9 #5)

Note: The size of the fire area may be reduced using fire barriers. See section 707.3.10 for requirements.

The fire-resistive rating for the fire barrier assembly is 3 hours. (Table 707.3.10)

FIRE PUMPS:

When provided, fire pumps shall be located in rooms that are separated from all other areas by 2-hour fire barrier construction. (913.2.1)

PORTABLE FIRE EXTINGUISHERS:

Portable fire extinguishers are required. (906.1)

See Section 906.1 and Table 906.1 for location requirements.

See Section 906.3 for size and distribution requirements.

STANDPIPE AND HOSE SYSTEMS:

A standpipe system is not required. (905)

SMOKE AND HEAT REMOVAL:

Areas containing high piled combustible storage require smoke and heat removal when required by Table 3206.2 of the IFC. Design to comply with Section 910.3.

END OF REQUIREMENTS FOR BUILDING #1

BUILDING SECTION #2

BASIC BUILDING DESCRIPTION:

Type of Construction = VB

Building does not have an automatic sprinkler system

Allowable area and height based on different uses not being separated by fire barriers. Most restrictive height and area used. (508.3.2)

Use to be Repair and storage of commercial motor vehicles. All fire areas to be less than 5,000 square feet (12-11-2025)

USE 311.2 Moderate-hazard storage, Group S-1.

[F] 903.2.9 Group S-1.

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

- 5. A Group S-1 fire area exceeds 12,000 square feet (1115 m²).
- 6. A Group S-1 fire area is located more than three stories above grade plane.
- 7. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).
- 8. A Group S-1 fire area used for the storage of commercial motor vehicles where the fire area exceeds 5,000 square feet (464 m²).

[F] 903.2.9.1 Repair garages.

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

- 4. Buildings having two or more stories above grade plane, including basements, with a fire area containing a repair garage exceeding 10,000 square feet (929 m²).
- 5. Buildings not more than one story above grade plane, with a fire area containing a repair garage exceeding 12,000 square feet (1115 m²).
- 6. Buildings with repair garages servicing vehicles parked in basements.

A Group S-1 fire area used for the repair of commercial motor vehicles where the fire area exceeds 5,000 square feet (464 m²).

The area to is less than 5,000 square feet.

SITE DESCRIPTION: (506.3.2 and 202 FIRE SEPARATION DISTANCE)

The north side has an imaginary line between two buildings.(705.3) Distance to building = 25.0 ,the imaginary line = 12.5

Length of perimeter facing other building = 80.0 This side is not accessible from a street or approved fire lane.

The east side has a fire wall separating buildings. (706.1)

Length of perimeter = 42.0 This side is not accessible from a street or approved fire lane.

The south side has a lot line. Distance to lot line = 42.0

Length of perimeter facing lot line = 80.0 This side can be accessed from a street or approved fire lane.

The west side has a lot line. Distance to lot line = 60.0

Length of perimeter facing lot line = 42.0 This side can be accessed from a street or approved fire lane.

Perimeter of the entire building = 244.0 feet.

Perimeter which fronts a public way or accessible open space = 122.0 feet.

Weighted average of the width of public way or accessible open space = 30.0 feet. (506.3.2)

Allowable area increased 25.00% due to frontage. (506.3)

HEIGHT OF BUILDING:

Building height not entered. Building height not checked. (504.1)

**BUILDING INTERIOR:
ALLOWABLE AREA AND HEIGHT:**

| FL | NAME | OCC | MAX FLR | AREA | ALLOWED | RATIO | STATUS |
|-----------------|------------|-----|---------|------|---------|-------|--------|
| F1 | Building 2 | S1 | 1 | 3200 | 11250 | 0.28 | OK |
| TOTAL FOR FLOOR | | | | 3200 | 11250 | 0.28 | OK |
| BUILDING TOTAL | | | | 3200 | 11250 | 0.28 | OK |

Notes:

Allowable area is based on Table 506.2 and Section 506.

Allowable number of stories is based on Table 504.4 and Section 504

Allowed area increased 25% for frontage increase. (506.3)

NOTE: Storage areas were set to the major use occupancy group because these areas are accessory to the major use of the building. (311.1.1)

BUILDING SECTION #2

EXIT REQUIREMENTS:

| FL | NAME OF AREA | NUMB OF OCC | MIN NUMB EXIT | MIN EXIT WDR | PANIC HDWR | DOOR SWNG | CORRIDOR FIRE RATING | MAX TRVL DIST | NOTES |
|----|-----------------|-------------|---------------|--------------|------------|-----------|----------------------|---------------|-------|
| F1 | Building 2 | 16 | 1 | 3.2 | no | any | N/A | 200 | |
| | TOTAL 1st FLOOR | 16 | 2 | 3.2 | no | any | N/A | 200 | 5 |

FOOTNOTES:

5. Number of exits from this floor is based on Section 1006.3.2

NOTES FOR EXIT TABLE:

Door swing is based on Section 1010.1.2

Occupant load is based on Section 1004 and Table 1004.5

Exit width is in inches and based on Sections 1005.3.1 and 1005.3.2

For the minimum width of stairways, see Section 1011.2.

Exits shall be continuous from the point of entry into the exit to the exit discharge. (1003.6)

DOOR SWING EXCEPTIONS:

Exception 5: Revolving doors complying with Section 1010.1.4.1

Exception 6: Horizontal sliding doors complying with Section 1010.1.4.3

Exception 7: Power-operated doors complying with Section 1010.1.4.2

EXIT WIDTH NOTES:

Exit width is in inches and based on Section 1005.2

Width shown for all areas is based on other egress components. (1005.3.2)

Width shown for 1st floor is based on other egress components. (1005.3.2)

Width shown for other floors & basements is based on stairways. (1005.3.1)

For the minimum width of doors, see Section 1010.1.1.

EGRESS CONTINUITY:

The path of egress travel along a means of egress shall not be interrupted by any building element other than a means of egress component. (1003.6)

EXIT SEPARATION:

In areas where 2 exits are required, the minimum separation is 1/2 of the maximum diagonal of the area or floor measured in a straight line between exits or exit access doorways. (1007.1.1)

Exception 1: Where interior exit stairways are interconnected by a 1-hour corridor, the separation shall be measured along the shortest direct travel within the corridor.

Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity by more than 50 percent. (1005.5)

MEANS OF EGRESS ILLUMINATION:

1. The means of egress serving a room or space shall be illuminated at all times that the space or room is occupied. (1008.2)

2. The means of egress illumination shall not be less than 1 foot-candle at the walking surface level. (1008.2.1)

3. Illumination shall be provided along the path of travel for the exit discharge for each exit to the public way. (1008.2.3)

See exceptions

See section 1008.3 for emergency power requirements.

ADDITIONAL DOORS:

Where additional doors are provided for egress purposes, they shall conform to the requirements in Section 1010. (1010.1)

LANDINGS AT DOORS:

1. There shall be a floor or landing on each side of a door. (1010.1.5)

2. Such floor or landing shall be at the same elevation on each side of the door. (1010.1.5)

3. The floor or landing shall not be more than 1/2 inch lower than the threshold. (1010.1.7)

4. Landings shall have a width not less than the width of the stairway or width of the doorway, whichever is the greater.

Where a landing serves an occupant load of 50 or more, doors in any position shall not reduce the landing dimension to less than one half of the required width. The minimum length in the direction of exit travel is 44 inches. (1010.1.6)

5. The space between two doors in series shall be 48 inches plus the width of door swinging into the space. (1010.1.8)

BOLT LOCKS:

Manually operated flush bolts and surface bolts are not permitted. (1010.1.9.5)

Exception 3: Where a pair of doors serves an occupant load of less than 50, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.

Exception 2: Where a pair of doors serves a storage or equipment room, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.

The unlatching of any door or leaf shall not require more than one operation. (1010.1.9.6)

Exception 2: Where manually operated bolt locks are permitted.

Exception 3: Doors with automatic flush bolts as permitted.

LOCKS AND LATCHES:

Egress doors shall be readily openable from the egress side without the use of a key or any special knowledge or effort. (1010.1.9)

Locks and latches shall be permitted to prevent operation where any of the following exists: (1010.1.9.4)

2. The main door or doors in Group B, F, M and S areas are permitted to be equipped with key operating locking devices from the egress side provided:

2.1 The locking device is readily distinguishable as locked.

2.2 A readily visible durable sign is posted on the egress side stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED

3. Where egress doors are used in pairs, automatic flush bolts shall be permitted to be used, provided the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.

5. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism.

MINIMUM NUMBER OF PLUMBING FIXTURES: (2902.1)

| FL | NAME OF AREA | NUMBER OCC | WATER CLOSETS | | LAVATORIES | | DRINKING FOUNTAINS |
|---------------------|--------------|------------|---------------|--------|------------|--------|--------------------|
| | | | MALE | FEMALE | MALE | FEMALE | |
| F1 | Building 2 | 16 | 1 | 1 | 1 | 1 | 1 |
| TOTAL for 1st FLOOR | | 16 | 1 | 1 | 1 | 1 | 1 |

NOTES ON THE TOTAL NUMBER OF PLUMBING FIXTURES:

The number of fixtures for a floor may not match total number of fixtures per area.

1. Fixtures for accessory areas are not included in the floor total.

2. The number of fixtures for each area are rounded up to the next whole number. Floor totals are not rounded up until the floor total is obtained.

If the fixtures only serve an area, use number shown for each area.

If the fixtures serve an entire floor, use number shown for totals.

ACCESSIBLE FACILITIES:

Accessible water fountains shall comply with ICC/ANSI A117.1, see Section 602.

Toilet facilities shall comply with ICC/ANSI A117.1, see Sections 603 through 609.

ADDITIONAL TOILET REQUIREMENTS:

Customers, patrons and visitors shall be provided with public toilet facilities in spaces intended for public utilization. (2902.3)

The route to the public facilities shall not pass through kitchens, storage rooms or closets. (2902.3.1)

The path of travel to facilities shall not exceed a distance of 500 feet. (2902.3.2)

Directional signage indicating route to public facilities shall be posted. Such signage shall be located in a corridor or aisle at the entrance to the facilities. (2902.4.1)

Where a toilet is provided for use of multiple occupants, the egress door for the room shall not be lockable from the inside. (2902.3.5)

Where a building or tenant space requires a separate toilet facility for each sex and each toilet facility is required to have only one water closet, two family/assisted-use toilet facilities shall be permitted to serve as required separate facilities. Toilet facilities shall not be required to be identified for exclusive use by either sex. (2902.2.1)

LIGHT AND VENTILATION:

1. Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings or shall be provided with artificial light. (1204.1)

2. Buildings shall be provided with natural ventilation or mechanical ventilation per the International Mechanical Code. (1202.1)

3. Rooms containing bathtubs, showers, spas and similar bathing fixtures shall be mechanically ventilated. (1202.5.2.1)

Minnesota Mechanical Code

1. Ignition sources: Any equipment with an ignition source must be located a minimum of 18 inches above the floor.
2. CO and NO₂ detection: Enclosed garages require both carbon monoxide and nitrogen dioxide detection devices to activate the ventilation system.

FIRE-RESISTANCE REQUIREMENTS:**FIRE-RESISTANCE RATING FOR EXTERIOR WALLS:****North Side:**

Group S1 - Bearing walls = 0-hr Nonbearing walls = 0-hr rating on the inside. (705.5, Tables 601 & 602)

Projections extending beyond the exterior wall can extend 24 inches plus 8 inches for every foot of FSD beyond 3 feet or fraction thereof. (Table 705.2)

No limit on unprotected openings. There is no limit on protected openings. (Table 705.8)

Combustible projections extending within 5 feet of the line used to determine the fire separation distance or located where openings are not permitted or where protection of openings are required shall be of at least 1-hour fire-resistive-rated construction, Type IV or fire-retardant-treated wood. (705.2.3)

East Side:

Group S1 - This wall must meet fire wall requirements. (706) rating on both sides. (705.5, Tables 601 & 602)

Fire protection is not required at the bottom flange of lintels, shelf angles and plates, spanning not more than 6 feet 4 inches if they are part of the structural frame and regardless of the span if they are not part of the structural frame. (704.11)

Projections extending beyond the exterior wall are not permitted. (Table 705.2)

Combustible projections extending within 5 feet of the line used to determine the fire separation distance or located where openings are not permitted or where protection of openings are required shall be of at least 1-hour fire-resistive-rated construction, Type IV or fire-retardant-treated wood. (705.2.3)

South Side:

Group S1 - Bearing walls = 0-hr Nonbearing walls = 0-hr rating on the inside. (705.5, Tables 601 & 602)

Projections extending beyond the exterior wall cannot extend closer to than 20 feet to the fire separation distance line. (Table 705.2)

No limit on unprotected openings. There is no limit on protected openings. (Table 705.8)

Combustible projections extending within 5 feet of the line used to determine the fire separation distance or located where openings are not permitted or where protection of openings are required shall be of at least 1-hour fire-resistive-rated construction, Type IV or fire-retardant-treated wood. (705.2.3)

West Side:

Group S1 - Bearing walls = 0-hr Nonbearing walls = 0-hr rating on the inside. (705.5, Tables 601 & 602)

Projections extending beyond the exterior wall cannot extend closer to than 20 feet to the fire separation distance line. (Table 705.2)

No limit on unprotected openings. There is no limit on protected openings. (Table 705.8)

Combustible projections extending within 5 feet of the line used to determine the fire separation distance or located where openings are not permitted or where protection of openings are required shall be of at least 1-hour fire-resistive-rated construction, Type IV or fire-retardant-treated wood. (705.2.3)

FIRE-RESISTANCE RATING REQUIREMENTS:(Table 601 except as noted)

Exterior walls . Minimum fire resistance rating = FIRE-RESISTANCE RATING FOR EXTERIOR WALLS above

Primary structural frame may be of any material. Minimum fire resistance rating = 0 hour

Interior bearing wall may be of any material. Minimum fire resistance rating = 0 hour

Interior nonbearing wall may be of any material. Minimum fire resistance rating = 0 hour

Floor/ceiling assembly may be of any material. Minimum fire resistance rating = 0 hour

Parking surfaces shall be of concrete or similar noncombustible and nonabsorbent materials. Asphalt parking surfaces are permitted at ground level. (406.2.4)
Roof/ceiling assembly may be of any material. Minimum fire resistance rating = 0 hour
Stairs may be of any material. Minimum fire resistance rating = 0 hour

MARKING AND IDENTIFICATION:

Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified. (703.7)

Identification shall be located in accessible concealed floor, floor-ceiling or attic spaces; Be located within 15 feet of the end of each wall and at intervals not exceeding 30 feet; and Suggested wording: 'FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS'

FIRE PARTITIONS:

The following wall assemblies shall comply. (708.1)

Fire partitions shall have a fire-resistance rating of not less than 1-hour. (708.3)

See exceptions.

Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistive-rated floor/ceiling or roof/ceiling assembly above. (708.4)

See exceptions.

The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for tenant and sleeping unit separation wall and corridor walls.

See exceptions.

A 1-hour fire-resistive rating is required for smoke barriers. (709.3)

Smoke barriers shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces. (710.4)

See Section 710.5 for opening requirements.

PENETRATIONS OF FIRE RESISTIVE ASSEMBLIES:**WALLS ASSEMBLIES:**

Penetrations of walls shall comply Section 714.3.1.1 or 714.3.1.2.

FLOOR/CEILING AND ROOF/CEILING ASSEMBLIES:

Penetrations of floor/ceiling and roof/ceiling assemblies shall comply Section 714.4.1.1 or 714.4.1.2.

DUCTS AND AIR TRANSFER OPENINGS:

Where required. (717.5) , Fire walls (717.5.1), Fire barriers (717.5.2), Shaft enclosures (717.5.3), Fire partitions (717.5.4) and Smoke barriers (717.5.5)

REQUIRED SEPARATION OF OCCUPANCIES: (508.4.4 & Table 508.4)

Uses are not separated by fire barriers. The construction of the building is based on the most restrictive use. (508.3.3)

SEPARATION OF INCIDENTAL USE AREAS: (Table 509)

Furnace rooms where any piece of equipment is over 400,000 BTU per hour input = 1 hour

Rooms with any boiler over 15 psi and 10 horsepower = 1 hour

Refrigerant machinery rooms = 1 hour

Hydrogen cut-off rooms not classified as Group H = 1 hour

Incinerator rooms = 2 hours and an automatic sprinkler system is required

Stationary storage battery systems having an energy capacity greater than the threshold quantity specified in Table 1206.2 of the IFC. = 1 hour

FIRE WALL REQUIREMENTS:

Between building 1 and building 2:

The fire wall is required to be a 3 hour fire assembly. (Table 706.4)

Openings shall be protected by assemblies having a 3 hour fire rating. (706.8 and Table 716.1(2))
2-1 1/2 hour assemblies may be used.

Fire wall shall extend from the foundation to a termination point at least 30 inches above both adjacent roofs. (706.6) See exceptions for alternate protection at roof.

See Section 706.6.1 for requirements when a fire wall separates buildings of different heights.

See Section 706.6.2 for requirements when a fire wall separates buildings with sloped roofs.
Each opening through a fire wall shall not exceed 156 square feet. The aggregate width of openings at any floor level shall not exceed 25 percent of the length of the wall. (706.8)

If the building has a projection (overhang, canopy, etc) at the fire wall, the fire wall shall extend to the outer edge of the horizontal projection. (706.5.2)

Exception 1: If projection is without concealed spaces, fire wall may stop at the exterior wall if the exterior wall and projection on each side of the fire wall is 1-hour fire-resistive for the depth of the projection on each side of the fire wall.

Exception 2: If projection has concealed space and is noncombustible, fire wall may stop at the exterior wall if the projection has a one hour wall in the concealed space and the exterior wall and projection is 1-hour fire-resistive for the depth of the projection on each side of the fire wall.

Exception 3: If projection has concealed space and is combustible, fire wall may stop at the exterior wall if the fire wall extends through the projection in the concealed space and the exterior wall and projection is 1-hour fire-resistive for the depth of the projection on each side of the fire wall.

If the fire wall intersects an exterior wall at less than 180 degrees, the fire-resistance rating for the exterior walls on both sides of the fire wall shall have a 1-hour fire-resistance rating with 3/4 hour opening protection. The fire-resistance rating of the exterior wall shall extend a minimum of 4 feet on each side of the intersection. (706.5.1)

Fire walls shall be designed and constructed to allow collapse of the structure on either side without collapse of the wall under fire conditions. (706.2)

GLAZING REQUIREMENTS:

All glazing in hazardous locations is required to be of safety glazing material. (2406.1)
See Section 2406.4 for locations.

WALL AND CEILING FINISHES:

1. Wall and ceiling finish materials are required to comply with Sec. 803.13 and Table 803.13.
2. Textile wall and ceiling coverings shall have Class A flame spread index and shall be protected by automatic sprinklers or meet the criteria in Section 803.5, 803.6.
3. Expanded vinyl wall coverings shall comply with the requirements for textile wall and ceiling materials. (803.7)
4. Toilet room floors shall have a smooth, hard nonabsorbent surface that extends upward onto the walls at least 4 inches. (1209.2.1)
5. Walls within 2 feet of urinals and water closets shall have a smooth, hard nonabsorbent surface, to a height of 4 feet above the floor. (1209.2.2)

CEILING HEIGHTS:

Occupiable spaces, habitable spaces and corridors shall have a ceiling height of not less than 7 feet 6 inches. Bathrooms, toilet rooms, kitchens, storage rooms and laundry rooms shall be permitted to have a ceiling height of not less than 7 feet. (1207.2)

INSULATION NOTES:

1. Insulating materials shall have a flame-spread rating of no more than 25 and a smoke developed index of not more than 450. (720.2) 'concealed installation' and Sec. 720.3 'exposed installation'

Foam plastic insulations are required to be protected. (2603)

CODE REVIEW: BLDG 3

Remolding of existing building

Project Description: 2025 11 Building 3 Date: Monday, December 22, 2025
Project Location: 14047 Azurite St NW, Ramsey, MN 55303
Construction by: Owner
Architect: El-Nagdy Engineer: Becklin and Whitney
Code Study by: dkw

BASIC BUILDING DESCRIPTION:

Type of Construction = VB
Building does not have an automatic sprinkler system
Allowable area and height based on different uses being separated by fire barriers as needed.
Most restrictive height and area used. (508.3.2)

Use to be Repair and storage of commercial motor vehicles. All fire areas to be less than 5,000 square feet (12-11-2025)

USE 311.2 Moderate-hazard storage, Group S-1.

[F] 903.2.9 Group S-1.

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

1. A Group S-1 *fire area* exceeds 12,000 square feet (1115 m²).
2. A Group S-1 *fire area* is located more than three stories above *grade plane*.
3. The combined area of all Group S-1 *fire areas* on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).
4. A Group S-1 *fire area* used for the storage of commercial motor vehicles where the *fire area* exceeds 5,000 square feet (464 m²).

[F] 903.2.9.1 Repair garages.

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

1. Buildings having two or more *stories above grade plane*, including basements, with a *fire area* containing a repair garage exceeding 10,000 square feet (929 m²).
2. Buildings not more than one *story above grade plane*, with a *fire area* containing a repair garage exceeding 12,000 square feet (1115 m²).
3. Buildings with repair garages servicing vehicles parked in basements.
4. A Group S-1 *fire area* used for the repair of commercial motor vehicles where the *fire area* exceeds 5,000 square feet (464 m²).

**TABLE 706.4
FIRE WALL FIRE-RESISTANCE RATINGS**

| GROUP | FIRE-RESISTANCE RATING (hours) |
|--|---|
| A, B, E, H-4, I, R-1, R-2, U | 3 ^a |
| F-1, H-3 ^b , H-5, M, S-1 | 3 |
| H-1, H-2 | 4 ^b |
| F-2, S-2, R-3, R-4 | 2 |

- a. In Type II or V construction, walls shall be permitted to have a 2-hour fire-resistance rating.
- b. For Group H-1, H-2 or H-3 buildings, also see Sections 415.7 and 415.8.

The building is less than 8,000 square feet

ADDRESS IDENTIFICATION:

Buildings shall be provided with approved address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property. Characters shall be Arabic numbers or alphabetical letters. Numbers shall not be spelled out. Each character shall be not less than 4 inches high and not less than 0.5 inch wide. They shall be installed on a contrasting background. When required by the fire official, address numbers shall be provided in additional approved locations. When access is by a private road and the building address cannot be view from the public way, a monument, pole or other approved sign shall be used to identify the structure. (502.1)

SITE DESCRIPTION: (506.3.2 and 202 FIRE SEPARATION DISTANCE)

The north side has a public way. Distance to public way = 60.0 ,width = 66.0

Length of perimeter facing the public way = 160.0 This side can be accessed from a street or approved fire lane.

The east side has a public way. Distance to public way = 60.0 ,width = 66.0

Length of perimeter facing the public way = 60.0 This side can be accessed from a street or approved fire lane.

The south side has an imaginary line between two buildings.(705.3) Distance to building = 25.0 ,the imaginary line = 12.5

Length of perimeter facing other building = 160.0 This side is not accessible from a street or approved fire lane.

The west side has a lot line. Distance to lot line = 65.0

Length of perimeter facing lot line = 60.0 This side can be accessed from a street or approved fire lane.

Perimeter of the entire building = 440.0 feet.

Perimeter which fronts a public way or accessible open space = 280.0 feet.

Weighted average of the width of public way or accessible open space = 30.0 feet. (506.3.2)

Allowable area increased 38.64% due to frontage. (506.3)

HEIGHT OF BUILDING:

Actual height of building = 24.00 ft Allowed building height = 40.00 ft The height is within the allowed height. (504.1 and Table 504.3)

BUILDING INTERIOR:

ALLOWABLE AREA AND HEIGHT:

| FL | NAME | OCC | MAX FLR | AREA | ALLOWED | RATIO | STATUS |
|-----------------|-----------|-----|---------|------|----------|-------|--------|
| F1 | Section 1 | S1 | 1 | 1727 | 12477.27 | 0.14 | OK |
| F1 | Section 2 | S1 | 1 | 1727 | 12477.27 | 0.14 | OK |
| F1 | Section 3 | S1 | 1 | 4075 | 12477.27 | 0.33 | OK |
| TOTAL FOR FLOOR | | | | 7529 | 12477.27 | 0.60 | OK |
| BUILDING TOTAL | | | | 7529 | 12477.27 | 0.60 | OK |

Notes:

Allowable area is based on Table 506.2 and Section 506.

Allowable number of stories is based on Table 504.4 and Section 504

Allowed area increased 38.6% for frontage increase. (506.3)

NOTE: Storage areas were set to the major use occupancy group because these areas are accessory to the major use of the building. (311.1.1)

EXIT REQUIREMENTS:

| FL | NAME OF AREA | NUMB OF OCC | MIN EXIT | MIN EXIT WIDTH | PANIC HDWR | DOOR SWNG | CORRIDOR FIRE RATING | MAX TRVL DIST | NOTES |
|-----------------|--------------|-------------|----------|----------------|------------|-----------|----------------------|---------------|-------|
| F1 | Section 1 | 9 | 1 | 1.7 | no | any | N/A | 200 | |
| F1 | Section 2 | 9 | 1 | 1.7 | no | any | N/A | 200 | |
| F1 | Section 3 | 20 | 1 | 4.1 | no | any | N/A | 200 | |
| TOTAL 1st FLOOR | | 38 | 2 | 7.5 | no | any | N/A | 200 | 5 |

FOOTNOTES:

5. Number of exits from this floor is based on Section 1006.3.2

NOTES FOR EXIT TABLE:

Door swing is based on Section 1010.1.2

Occupant load is based on Section 1004 and Table 1004.5

Exit width is in inches and based on Sections 1005.3.1 and 1005.3.2

For the minimum width of stairways, see Section 1011.2.

Exits shall be continuous from the point of entry into the exit to the exit discharge. (1003.6)

DOOR SWING EXCEPTIONS:

Exception 5: Revolving doors complying with Section 1010.1.4.1

Exception 6: Horizontal sliding doors complying with Section 1010.1.4.3

Exception 7: Power-operated doors complying with Section 1010.1.4.2

EXIT WIDTH NOTES:

Exit width is in inches and based on Section 1005.2

Width shown for all areas is based on other egress components. (1005.3.2)

Width shown for 1st floor is based on other egress components. (1005.3.2)

Width shown for other floors & basements is based on stairways. (1005.3.1)

For the minimum width of doors, see Section 1010.1.1.

EGRESS CONTINUITY:

The path of egress travel along a means of egress shall not be interrupted by any building element other than a means of egress component. (1003.6)

EXIT SEPARATION:

In areas where 2 exits are required, the minimum separation is 1/2 of the maximum diagonal of the area or floor measured in a straight line between exits or exit access doorways. (1007.1.1)

Exception 1: Where interior exit stairways are interconnected by a 1-hour corridor, the separation shall be measured along the shortest direct travel within the corridor.

Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity by more than 50 percent. (1005.5)

MEANS OF EGRESS ILLUMINATION:

1. The means of egress serving a room or space shall be illuminated at all times that the space or room is occupied. (1008.2)

2. The means of egress illumination shall not be less than 1 foot-candle at the walking surface level. (1008.2.1)

3. Illumination shall be provided along the path of travel for the exit discharge for each exit to the public way. (1008.2.3)

See exceptions

See section 1008.3 for emergency power requirements.

ADDITIONAL DOORS:

Where additional doors are provided for egress purposes, they shall conform to the requirements in Section 1010. (1010.1)

LANDINGS AT DOORS:

1. There shall be a floor or landing on each side of a door. (1010.1.5)

2. Such floor or landing shall be at the same elevation on each side of the door. (1010.1.5)

3. The floor or landing shall not be more than 1/2 inch lower than the threshold. (1010.1.7)

4. Landings shall have a width not less than the width of the stairway or width of the doorway, whichever is the greater.

Where a landing serves an occupant load of 50 or more, doors in any position shall not reduce the landing dimension to less than one half of the required width. The minimum length in the direction of exit travel is 44 inches. (1010.1.6)

5. The space between two doors in series shall be 48 inches plus the width of door swinging into the space. (1010.1.8)

BOLT LOCKS:

Manually operated flush bolts and surface bolts are not permitted. (1010.1.9.5)

Exception 3: Where a pair of doors serves an occupant load of less than 50, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.

Exception 2: Where a pair of doors serves a storage or equipment room, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.

The unlatching of any door or leaf shall not require more than one operation. (1010.1.9.6)

Exception 2: Where manually operated bolt locks are permitted.

Exception 3: Doors with automatic flush bolts as permitted.

LOCKS AND LATCHES:

Egress doors shall be readily openable from the egress side without the use of a key or any special knowledge or effort. (1010.1.9)

Locks and latches shall be permitted to prevent operation where any of the following exists: (1010.1.9.4)

2. The main door or doors in Group B, F, M and S areas are permitted to be equipped with key operating locking devices from the egress side provided:

2.1 The locking device is readily distinguishable as locked.

2.2 A readily visible durable sign is posted on the egress side stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED

3. Where egress doors are used in pairs, automatic flush bolts shall be permitted to be used, provided the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.

5. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism.

BUILDING ACCESSIBILITY:

Accessible entrances and accessibility within the building shall comply with Sections 1104 and 1105.

On floors where drinking fountains are provided, accessible drinking fountains shall be provided. No fewer than 2 drinking fountains shall be provided. One shall comply with the requirements for people in a wheelchair and one for standing persons. (1109.5.1)

MINIMUM NUMBER OF PLUMBING FIXTURES: (2902.1)

| FL | NAME OF AREA | NUMBER OCC | WATER CLOSETS MALE | WATER CLOSETS FEMALE | LAVATORIES MALE | LAVATORIES FEMALE | DRINKING FOUNTAINS |
|---------------------|--------------|------------|--------------------|----------------------|-----------------|-------------------|--------------------|
| F1 | Section 1 | 9 | 1 | 1 | 1 | 1 | 1 |
| F1 | Section 2 | 9 | 0 | 0 | 0 | 0 | 1 |
| F1 | Section 3 | 20 | 0 | 0 | 0 | 0 | 1 |
| TOTAL for 1st FLOOR | | 38 | 1 | 1 | 1 | 1 | 1 |

Actual occupancy for plumbing fixtures is less than 25.

NOTES ON THE TOTAL NUMBER OF PLUMBING FIXTURES:

The number of fixtures for a floor may not match total number of fixtures per area.

1. Fixtures for accessory areas are not included in the floor total.
2. The number of fixtures for each area are rounded up to the next whole number. Floor totals are not rounded up until the floor total is obtained.

If the fixtures only serve an area, use number shown for each area.

If the fixtures serve an entire floor, use number shown for totals.

[P] 2902.2 Separate facilities.

Where plumbing fixtures are required, separate facilities shall be provided for each sex.

Exceptions:

2. Separate facilities shall not be required in structures or tenant spaces with a total *occupant load*, including both employees and customers, of 25 or less.

[P] 2902.3.3 Location of toilet facilities in occupancies other than malls.

In occupancies other than covered and open mall buildings, the required public and employee toilet facilities shall exceed a distance of 500 feet.

FIRE-RESISTANCE REQUIREMENTS:

FIRE-RESISTANCE RATING FOR EXTERIOR WALLS:

North Side:

Group S1 - Bearing walls = 0-hr Nonbearing walls = 0-hr rating on the inside. (705.5, Tables 601 & 602)

Projections extending beyond the exterior wall cannot extend closer to than 20 feet to the fire separation distance line. (Table 705.2)

No limit on unprotected openings. There is no limit on protected openings. (Table 705.8)

Combustible projections extending within 5 feet of the line used to determine the fire separation distance or located where openings are not permitted or where protection of openings are required shall be of at least 1-hour fire-resistive-rated construction, Type IV or fire-retardant-treated wood. (705.2.3)

East Side:

Group S1 - Bearing walls = 0-hr Nonbearing walls = 0-hr rating on the inside. (705.5, Tables 601 & 602)

Projections extending beyond the exterior wall cannot extend closer to than 20 feet to the fire separation distance line. (Table 705.2)

No limit on unprotected openings. There is no limit on protected openings. (Table 705.8)

Combustible projections extending within 5 feet of the line used to determine the fire separation distance or located where openings are not permitted or where protection of openings are required shall be of at least 1-hour fire-resistive-rated construction, Type IV or fire-retardant-treated wood. (705.2.3)

South Side:

Group S1 - Bearing walls = 0-hr Nonbearing walls = 0-hr rating on the inside. (705.5, Tables 601 & 602)

Projections extending beyond the exterior wall can extend 24 inches plus 8 inches for every foot of FSD beyond 3 feet or fraction thereof. (Table 705.2)

No limit on unprotected openings. There is no limit on protected openings. (Table 705.8)

Combustible projections extending within 5 feet of the line used to determine the fire separation distance or located where openings are not permitted or where protection of openings are required shall be of at least 1-hour fire-resistive-rated construction, Type IV or fire-retardant-treated wood. (705.2.3)

West Side:

Group S1 - Bearing walls = 0-hr Nonbearing walls = 0-hr rating on the inside. (705.5, Tables 601 & 602)

Projections extending beyond the exterior wall cannot extend closer to than 20 feet to the fire separation distance line. (Table 705.2)

No limit on unprotected openings. There is no limit on protected openings. (Table 705.8)

Combustible projections extending within 5 feet of the line used to determine the fire separation distance or located where openings are not permitted or where protection of openings are required shall be of at least 1-hour fire-resistive-rated construction, Type IV or fire-retardant-treated wood. (705.2.3)

FIRE-RESISTANCE RATING REQUIREMENTS:(Table 601 except as noted)

Exterior walls . Minimum fire resistance rating = FIRE-RESISTANCE RATING FOR EXTERIOR WALLS above

Primary structural frame may be of any material. Minimum fire resistance rating = 0 hour

Interior bearing wall may be of any material. Minimum fire resistance rating = 0 hour

Interior nonbearing wall may be of any material. Minimum fire resistance rating = 0 hour

Floor/ceiling assembly may be of any material. Minimum fire resistance rating = 0 hour

Parking surfaces shall be of concrete or similar noncombustible and nonabsorbent materials.

Asphalt parking surfaces are permitted at ground level. (406.2.4)

Roof/ceiling assembly may be of any material. Minimum fire resistance rating = 0 hour

Stairs may be of any material. Minimum fire resistance rating = 0 hour

MARKING AND IDENTIFICATION:

Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified. (703.7)

Identification shall be located in accessible concealed floor, floor-ceiling or attic spaces;

Be located within 15 feet of the end of each wall and at intervals not exceeding 30 feet; and

Suggested wording: 'FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS'

MARKING AND IDENTIFICATION:

Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified. (703.7)

Identification shall be located in accessible concealed floor, floor-ceiling or attic spaces; Be located within 15 feet of the end of each wall and at intervals not exceeding 30 feet; and Suggested wording: 'FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS'

FIRE PARTITIONS:

The following wall assemblies shall comply. (708.1)

Fire partitions shall have a fire-resistance rating of not less than 1-hour. (708.3)

See exceptions.

Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistive-rated floor/ceiling or roof/ceiling assembly above. (708.4)

See exceptions.

The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for tenant and sleeping unit separation wall and corridor walls.

See exceptions.

A 1-hour fire-resistive rating is required for smoke barriers. (709.3)

Smoke barriers shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces. (710.4)

See Section 710.5 for opening requirements.

PENETRATIONS OF FIRE RESISTIVE ASSEMBLIES:

WALLS ASSEMBLIES:

Penetrations of walls shall comply Section 714.3.1.1 or 714.3.1.2.

FLOOR/CEILING AND ROOF/CEILING ASSEMBLIES:

Penetrations of floor/ceiling and roof/ceiling assemblies shall comply Section 714.4.1.1 or 714.4.1.2.

DUCTS AND AIR TRANSFER OPENINGS:

Where required. (717.5) , Fire walls (717.5.1), Fire barriers (717.5.2), Shaft enclosures (717.5.3), Fire partitions (717.5.4) and Smoke barriers (717.5.5)

REQUIRED SEPARATION OF OCCUPANCIES: (508.4.4 & Table 508.4)

Uses are not separated by fire barriers. The construction of the building is based on the most restrictive use. (508.3.3)

SEPARATION OF INCIDENTAL USE AREAS: (Table 509)

Furnace rooms where any piece of equipment is over 400,000 BTU per hour input = 1 hour

Rooms with any boiler over 15 psi and 10 horsepower = 1 hour

Refrigerant machinery rooms = 1 hour

Hydrogen cut-off rooms not classified as Group H = 1 hour

Incinerator rooms = 2 hours and an automatic sprinkler system is required

Stationary storage battery systems having an energy capacity greater than the threshold quantity specified in Table 1206.2 of the IFC. = 1 hour

SMOKE AND HEAT REMOVAL:

Areas containing high piled combustible storage require smoke and heat removal when required by Table 3206.2 of the IFC. Design to comply with Section 910.3.

ROOFING REQUIREMENTS:

1. The roofing on this building is required to be Class C or better. (Table 1505.1)

ROOF DRAINAGE:

Where the exterior wall construction extends above the roof in such a manner that water will be entrapped if the primary drains allow build up for any reason, secondary (emergency overflow) roof drains or scuppers shall be provided. (1502.2)

1. Secondary drains or scuppers shall be located and sized to prevent the weight ponding water from exceeding the design load of the roof.
2. See section 1611.1 for design load requirements.
3. Scuppers shall not have an opening dimension of less than 4 inches. (1502.3)
4. See sections 1106 and 1108 of the Plumbing code for design requirements.

AUTOMATIC SPRINKLER SYSTEMS:

If openings are not provided in each 50 feet on at least one exterior wall or there is floor area more than 75 feet from an exterior opening, an automatic sprinkler system is required. Openings shall have a minimum dimension of 30 inches. There must be at least 20 sq.ft. of opening in every 50 lineal feet of wall or fraction thereof. The height of the bottom of the opening shall not exceed 44 inches measured from the floor. (903.2.11.1)

Buildings without automatic sprinklers is limited as follows:

1. Storage spaces.
 - a. *The fire area* shall not exceed 12,000 square feet
2. Motor vehicle repair garages
 - a. *The fire area* used for the repair of commercial motor vehicles shall not exceed 5,000 square feet
 - b. *The fire area* used for the repair of non-commercial motor vehicles shall not exceed 12,000 square feet

TABLE 508.4 REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Rating 2 Hours

PORTABLE FIRE EXTINGUISHERS:

Portable fire extinguishers are required. (906.1)

See Section 906.1 and Table 906.1 for location requirements.

See Section 906.3 for size and distribution requirements.

STANDPIPE AND HOSE SYSTEMS:

A standpipe system is not required. (905)

SMOKE AND HEAT REMOVAL:

Areas containing high piled combustible storage require smoke and heat removal when required by Table 3206.2 of the IFC. Design to comply with Section 910.3.

ACCESSIBLE FACILITIES:

Accessible water fountains shall comply with ICC/ANSI A117.1, see Section 602.

Toilet facilities shall comply with ICC/ANSI A117.1, see Sections 603 through 609.

ADDITIONAL TOILET REQUIREMENTS:

Customers, patrons and visitors shall be provided with public toilet facilities in spaces intended for public utilization. (2902.3)

The route to the public facilities shall not pass through kitchens, storage rooms or closets. (2902.3.1)

The path of travel to facilities shall not exceed a distance of 500 feet. (2902.3.2)

Directional signage indicating route to public facilities shall be posted. Such signage shall be located in a corridor or aisle at the entrance to the facilities. (2902.4.1)

Where a toilet is provided for use of multiple occupants, the egress door for the room shall not be lockable from the inside. (2902.3.5)

Where a building or tenant space requires a separate toilet facility for each sex and each toilet facility is required to have only one water closet, two family/assisted-use toilet facilities shall be permitted to serve as required separate facilities.

Toilet facilities shall not be required to be identified for exclusive use by either sex. (2902.2.1)

LIGHT AND VENTILATION:

1. Every space intended for human occupancy shall be provided with natural light by means of exterior glazed openings or shall be provided with artificial light. (1204.1)

2. Buildings shall be provided with natural ventilation or mechanical ventilation per the International Mechanical Code. (1202.1)

3. Rooms containing bathtubs, showers, spas and similar bathing fixtures shall be mechanically ventilated. (1202.5.2.1)

Minnesota Mechanical Code

1. Ignition sources: Any equipment with an ignition source must be located a minimum of 18 inches above the floor.
2. CO and NO₂ detection: Enclosed garages require both carbon monoxide and nitrogen dioxide detection devices to activate the ventilation system.

GLAZING REQUIREMENTS:

All glazing in hazardous locations is required to be of safety glazing material. (2406.1)

See Section 2406.4 for locations.

WALL AND CEILING FINISHES:

1. Wall and ceiling finish materials are required to comply with Sec. 803.13 and Table 803.13.
2. Textile wall and ceiling coverings shall have Class A flame spread index and shall be protected by automatic sprinklers or meet the criteria in Section 803.5, 803.6.
3. Expanded vinyl wall coverings shall comply with the requirements for textile wall and ceiling materials. (803.7)
4. Toilet room floors shall have a smooth, hard nonabsorbent surface that extends upward onto the walls at least 4 inches. (1209.2.1)
5. Walls within 2 feet of urinals and water closets shall have a smooth, hard nonabsorbent surface, to a height of 4 feet above the floor. (1209.2.2)

CEILING HEIGHTS:

Occupiable spaces, habitable spaces and corridors shall have a ceiling height of not less than 7 feet 6 inches. Bathrooms, toilet rooms, kitchens, storage rooms and laundry rooms shall be permitted to have a ceiling height of not less than 7 feet. (1207.2)

INSULATION NOTES:

1. Insulating materials shall have a flame-spread rating of no more than 25 and a smoke developed index of not more than 450. (720.2) 'concealed installation' and Sec. 720.3 'exposed installation'

Foam plastic insulations are required to be protected. (2603)