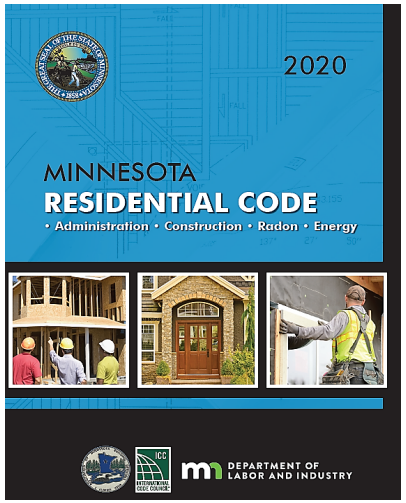
DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING



Two-family Dwellings and Townhouses

Based on the 2020 Minnesota Residential Code

Terence Olson
DLI/CCLD Education Unit
Municipal Grants Administrator

October 2024

Objective and Outcome

Objective:

Provide an overview of the special requirements for two-family dwellings and townhouses.

Outcome:

Participants will be able to identify the special requirements unique to two-family dwellings and townhomes.

Be able to answer these 2 questions:

1. Why are townhouses and two-family dwellings different from other residential buildings?
2. How are they constructed different?

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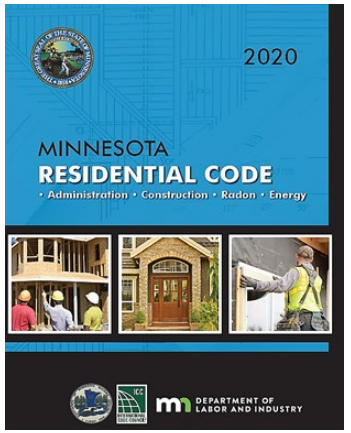
- Some text may be summarized, highlighted or generalize the code section. Additional provisions or exceptions may be included in the actual code section.



Program Materials and Disclaimers

Resources to verify fire-resistance and sound ratings

GA-600-2021

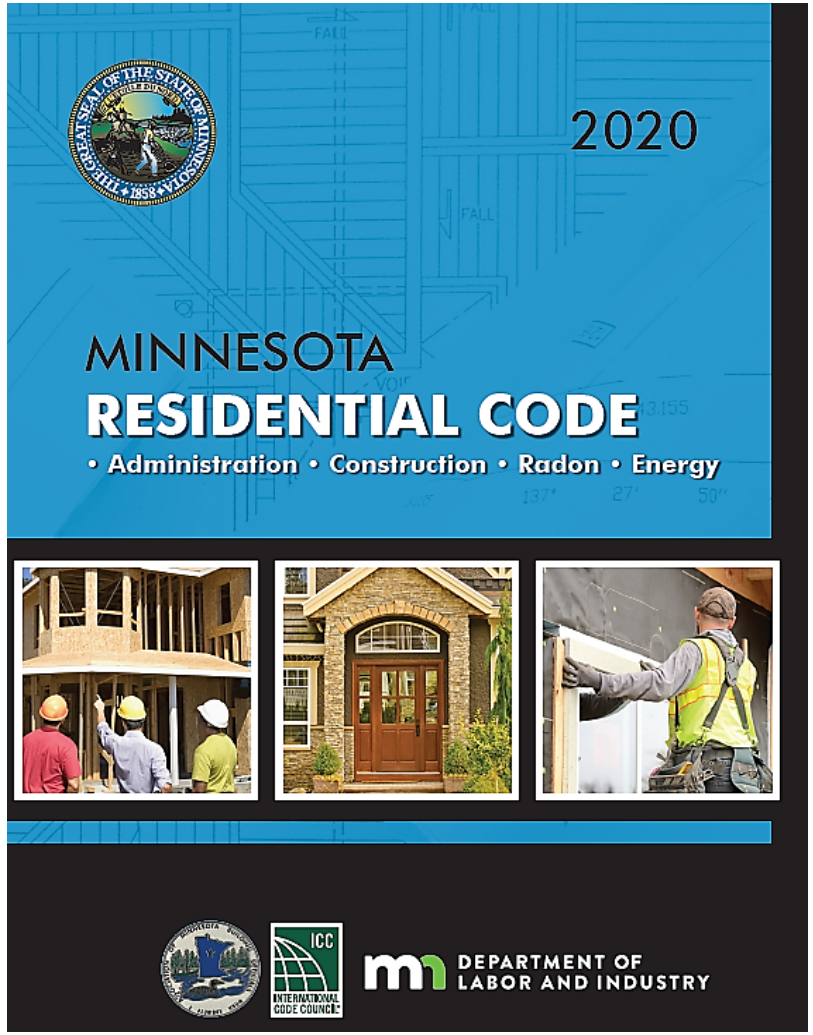
For complete information on the systems or components tested, the listing or test report should be reviewed.

Details regarding generic systems may be requested from the Gypsum Association; details on proprietary systems are available from the companies listed for those systems.

GA-600- 2021 Fire Resistive Design Manual

Please open and follow along in the 2020 Minnesota Residential Code (MRC) Ch. 1309

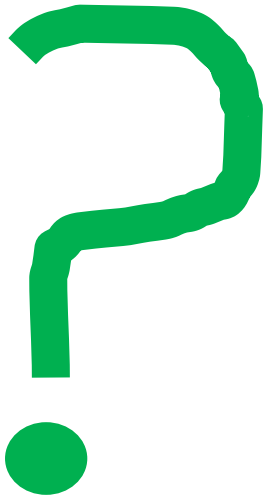
Code reference sections and page numbers are provided in the bottom left corner of slides for convenience.



Section– page number

DLI/CCLD image

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING



Where do we start?

SCOPING

1300.0040 – SCOPE

Subp. 2. Compliance

Structures classified under part 1300.0070, subpart 12b, as IRC-1, IRC-2, IRC-3, and IRC-4 occupancies not more than three stories above grade plane in height with a separate means of egress shall comply with chapter **1309 (MRC)** and other applicable rules.

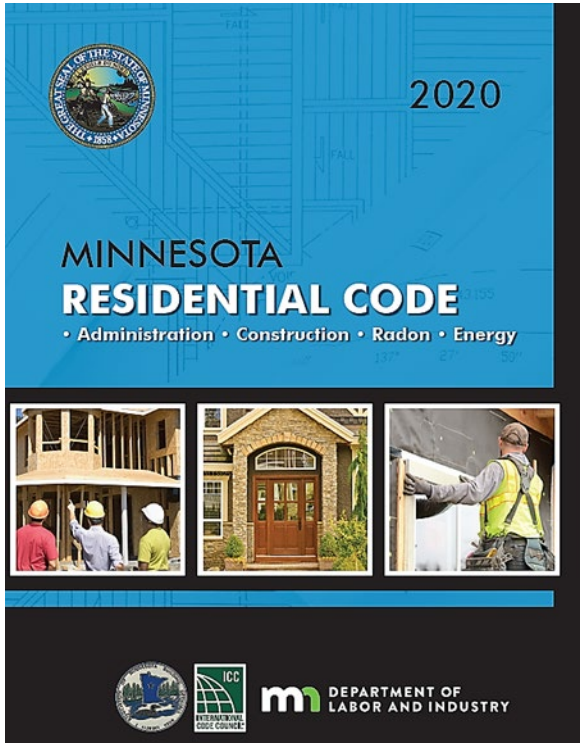
Other buildings and structures and appurtenances connected or attached to them shall comply with chapter **1305 (MBC)** and other applicable rules.

Scope

1300.0040

Subp. 2. Compliance

- Structures classified as IRC-1, IRC-2, IRC-3, and IRC-4 occupancies (1300.0070)
- not more than three stories above grade plane in height
- with a separate means of egress shall comply with chapter **1309 (MRC)** and other applicable rules.



1309 (MRC)

DLI/CCLD image

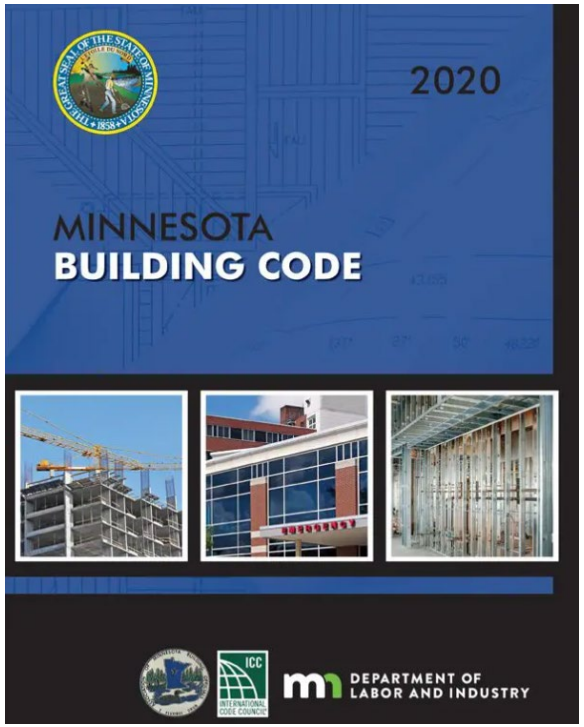
MR 1300.0040 subpart 2 – 2020 MRC – Page 3

Scope

1300.0040

Subp. 2. Compliance.

Other buildings and structures and appurtenances connected or attached to them shall comply with chapter **1305 (MBC)** and other applicable rules.



1305 (MBC)

DLI/CCLD image

Scope

1300.0040 – SCOPE - Subp. 2. Compliance.

Structures classified under part 1300.0070, subpart 12b, as IRC-1, IRC-2, IRC-3, and IRC-4 occupancies not more than three stories above grade plane in height with a separate means of egress shall comply with chapter 1309 **(MRC)** and other applicable rules.

Other buildings and structures … shall comply with chapter 1305 **(MBC)** and other applicable rules.

Scope

1300.0070 subp. 12b

International Residential Code (IRC) occupancy classifications are as follows:

IRC-1 single-family dwellings;

IRC-2 two-family dwellings;

IRC-3 townhouses; and

IRC-4 accessory structures:

A. garages;

B. storage sheds; and

C. similar structures.

MR 1300.0070 subpart 12b – 2020 MRC – Page 5
Section R300.1 – 2020 MRC – Page 73

SECTION R300.1 CLASSIFICATION

R300.1. Occupancy classification. Structures or portions of structures shall be classified with respect to occupancy in one or more of the groups in accordance with Table R300.1

TABLE R300.1
OCCUPANCY CLASSIFICATIONS

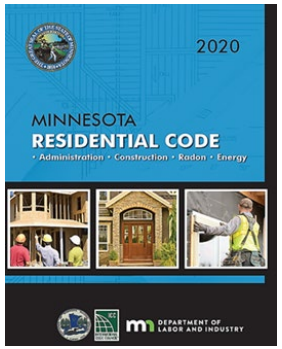
IRC-1	Dwelling, single-family
IRC-2	**Dwelling, two-family**
IRC-3	**Townhouse**
IRC-4	Accessory structures

Where do we start?

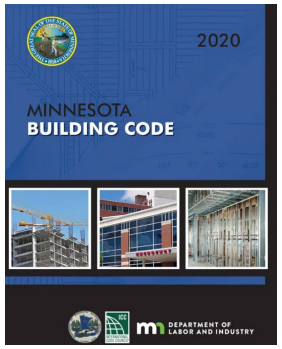
1300.0040 – SCOPE

Subp. 2. Compliance

Structures classified under part 1300.0070, subpart 12b, as IRC-1, **IRC-2, IRC-3,** and IRC-4 occupancies not more than three stories above grade plane in height with a separate means of egress shall comply with chapter **1309 (MRC)** and other applicable rules.



Other buildings and structures and appurtenances connected or attached to them shall comply with chapter **1305 (MBC)** and other applicable rules.



MR 1300.0040 subpart 2 – 2020 MRC – Page 3

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

1. Why are townhouses and two-family dwellings different from other residential buildings?

DEFINITIONS

Definitions

MRC Ch. 202 – Definitions

Building Line:

The line established by **LAW,** beyond which a building may not extend……

Lot:

A portion or parcel of land considered as a unit.

Lot Line

A line dividing one lot from another or a street or public place.

Section R202 - 2020 MRC – Page 64, 67

MRC Ch. 202 – Definitions

Building:

Any one- or two-family dwelling or portion thereof, including townhouses, used or intended to be used for human habitation, for living, sleeping, cooking or eating purposes, or any combination thereof, or any accessory structure.

Grade:

The finished ground level adjoining the building at all exterior walls.

Section R202 - 2020 MRC – Page 64, 66

MRC Ch. 202 – Definitions

Grade plane

A reference plane representing the average of the finished ground level adjoining the building at all *exterior walls*. Where the finished ground level slopes away from the *exterior walls*, the reference plane shall be established by the lowest points within the area between the building and the *lot line* or, where the *lot line* is more than 6 feet from the building between the structure and a point 6 feet from the building.

Section R202 - 2020 MRC – Page 66

MRC Ch. 202 – Definitions

Story:

That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above.

Story above grade plane:

Any *story* having its finished floor surface entirely above *grade plane*, or in which the finished surface of the floor next above is either of the following:

1. More than 6 feet *above grade plane.*
2. More than 12 feet above the finished ground level at any point.

Section R202 - 2020 MRC – Page 70

MRC Ch. 202 – Definitions

Fire Separation Distance:

The distance measured from the building face to one of the following:

1. To the closest interior lot line; or
2. to the centerline of a street, an alley or public way; or
3. to an imaginary line between two buildings on the lot.

(often referred to as the ***'Line of Fire Separation'***.)

The distance shall be measured at a right angle from the face of the wall.

Section R202 - 2020 MRC – Page 66

MRC Ch. 202 – Definitions

Dwelling Unit

- A **single unit** providing **complete** independent living facilities…including **permanent** provisions for
    - living,
    - sleeping,
    - eating,
    - cooking and
    - sanitation.

Section R202 - 2020 MRC – Page 65

MRC Ch. 202 – Definitions

Dwelling

Single-Family (IRC-1)

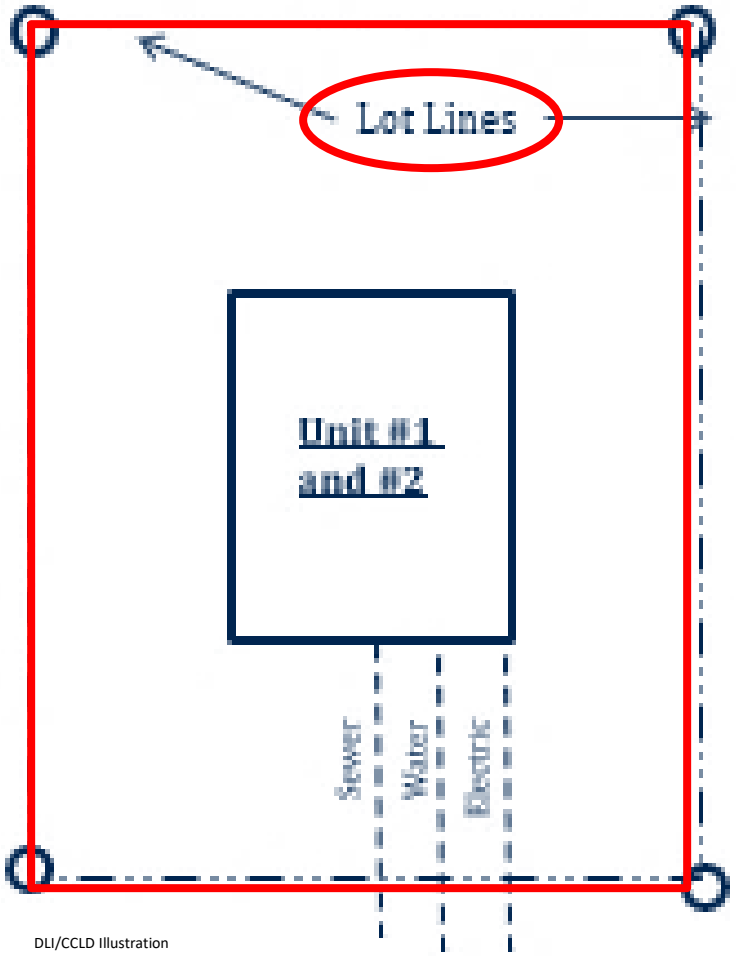
- Any **building** that contains 1 dwelling unit
- used, intended or designed……for living purposes

Two-Family (IRC-2)

- Any **building** that contains 2 separate dwelling units
- with separation either **horizontal** or **vertical**
- on **one lot** that is used …for living purposes

Section R202 - 2020 MRC – Page 65

Two-Family

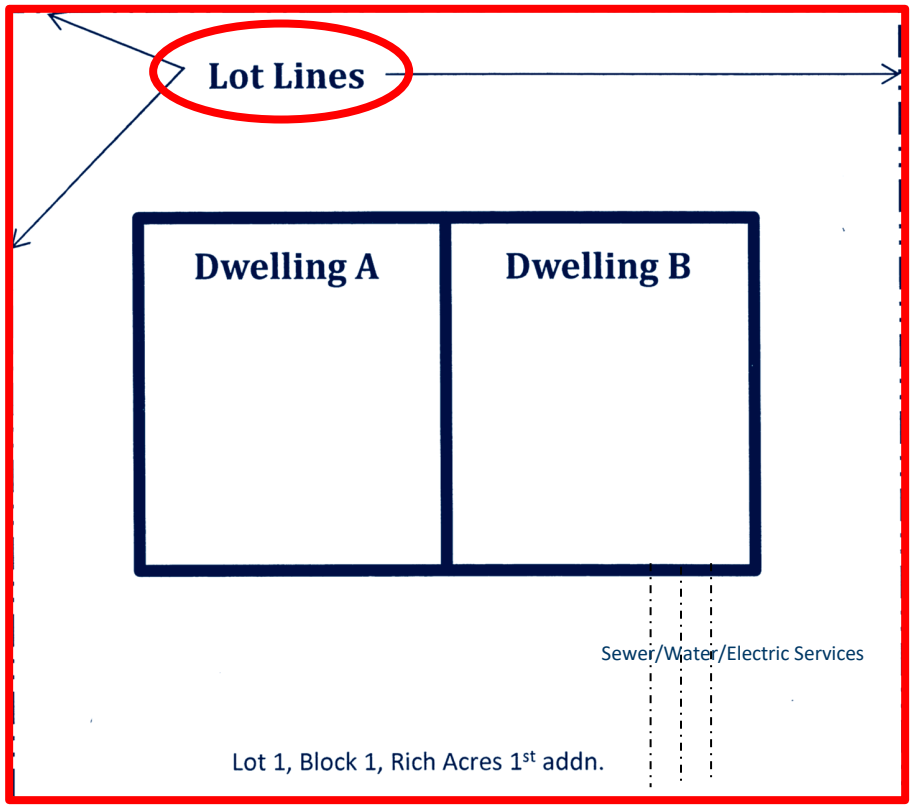


DLI/CCLD Illustration

Two-Family Dwelling (IRC-2)

- Any building that contains **2** separate dwelling units.
- Either horizontal or vertical separation.
- **On one lot.**

Definitions



DLI/CCLD Illustration

- **Two-Family Dwelling (IRC-2)**
  - Any building that contains **2** separate dwelling units.
  - Either horizontal or vertical separation.
  - **On one lot.**

Two-family dwellings

DLI/CCLD Photo

DLI/CCLD Photo

Each of the photos represents a two-family dwelling on one lot. One dwelling with a horizontal separation and the other with a vertical separation. **(IRC-2)**

Section R202 - 2020 MRC – Page 65

MRC Ch. 202 – Definitions

Dwelling

Townhouse (IRC-3)

- **Single Family-Dwelling Unit**…Constructed in a group of **2 or more** attached units
- In which each unit extends from the **foundation to the roof** and
- Having **open** space on at least **2 sides** of each Dwelling unit
- Each Single-Family Dwelling Unit **SHALL be considered a SEPARATE** building.
- **SEPARATE** building service utilities shall be provided to each Single-Family Dwelling unit when required by **other chapters** of the State Building Code.

Section R202 - 2020 MRC – Page 65

Definitions

START HERE

1300.0040 – SCOPE - Subp. 2. Compliance.

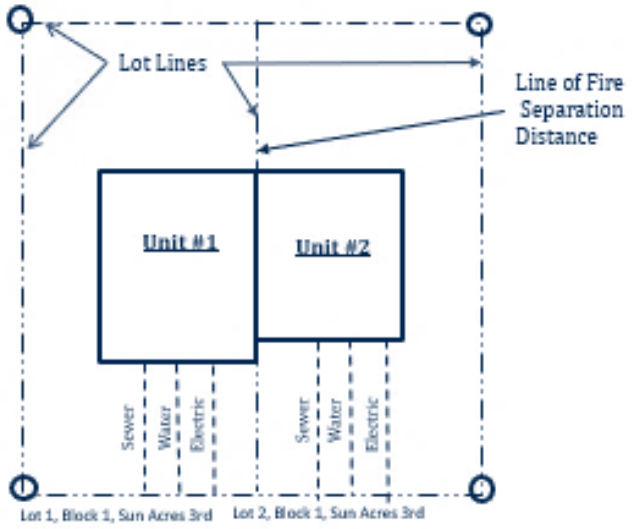
We can use - MRC 1309

- 3 stories or less
- with a separate means of egress

Townhouse

Townhouse (IRC-3)

- A single-family dwelling unit constructed in a group of two or more attached units
- Each unit extends from the foundation to the roof.
- Open space on at least two sides of each unit.



DLI/CCLD Illustrations

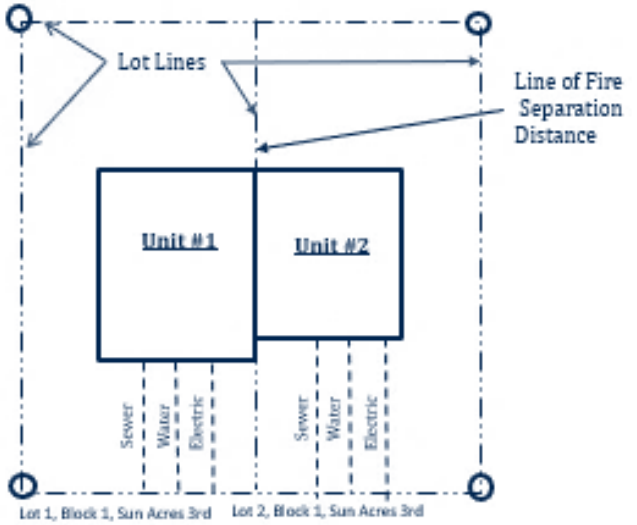
Townhouse

Townhouse (IRC-3)-cont.

- Each Single-Family Dwelling Unit SHALL be considered a SEPARATE building.

- **SEPARATE** building service utilities shall be provided to each Single-Family Dwelling unit when required by **other chapters** of the State Building Code.

DLI/CCLD Illustrations

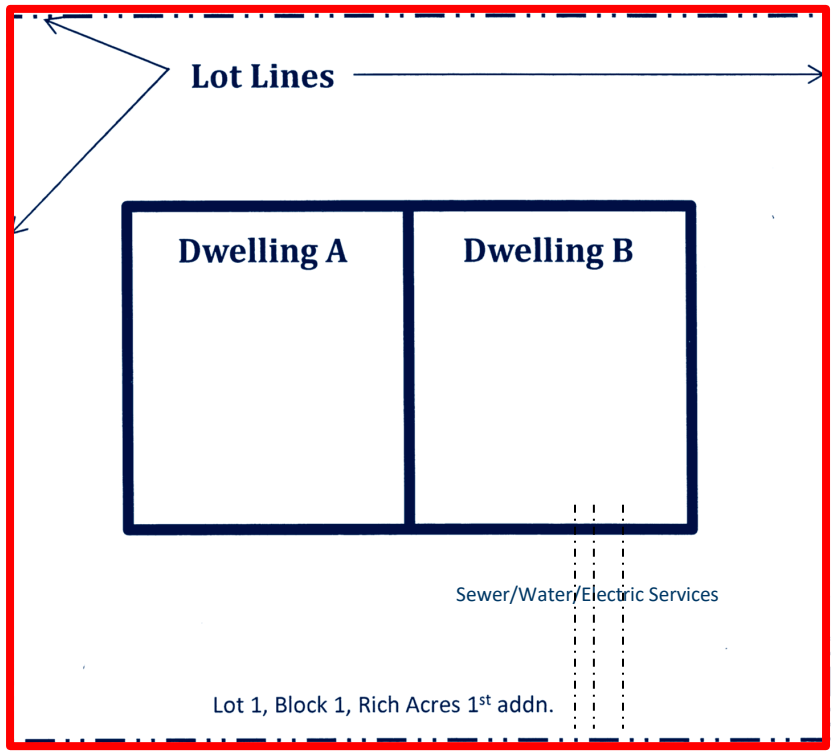


Examples

Two-Family Dwelling or Townhouse?

Why?

DLI/CCLD Illustrations



DLI/CCLD Illustration

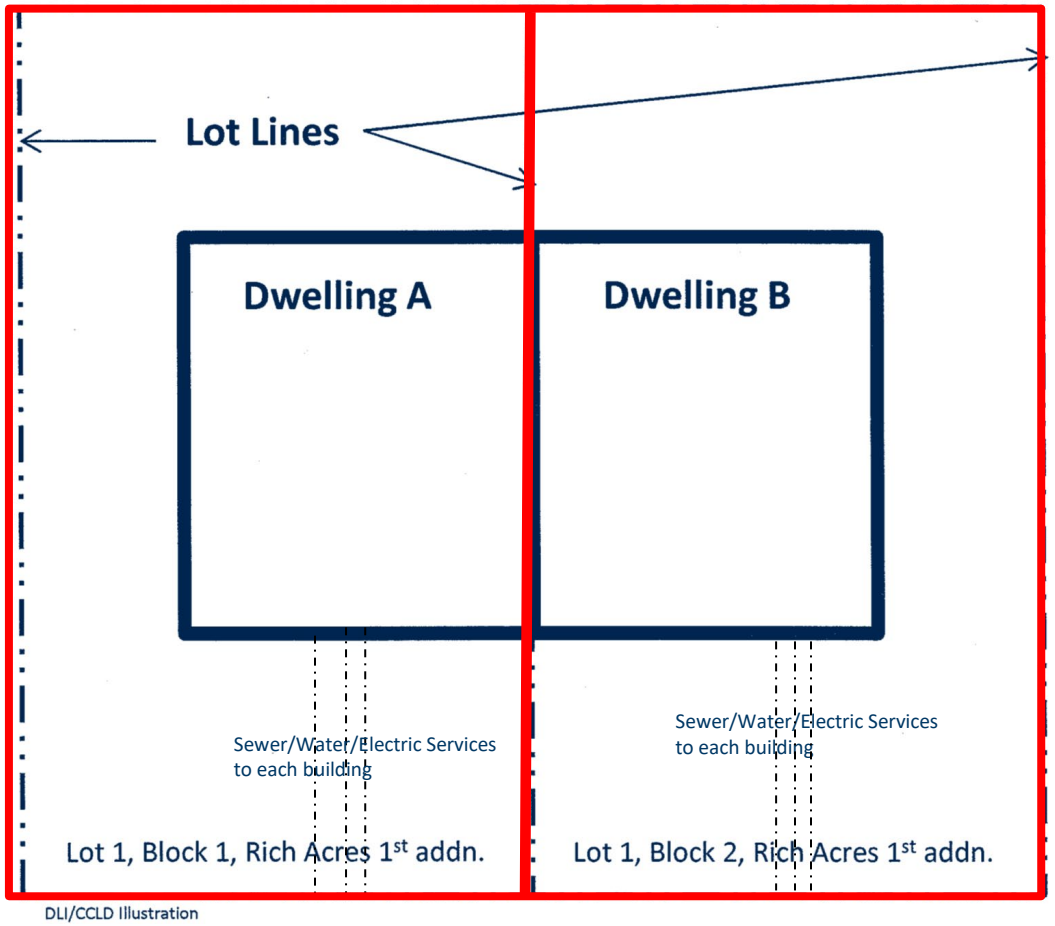
- Two dwellings on one lot
- Single sewer/water/electric service to building

Answer:

Two-family dwelling:

- Two-family dwellings IRC-2

Examples



DLI/CCLD Illustration

- Two or more units
- Vertical separation
- Two sides open
- Separate sewer/water/electric service to buildings

Answer

Two-unit townhouse:

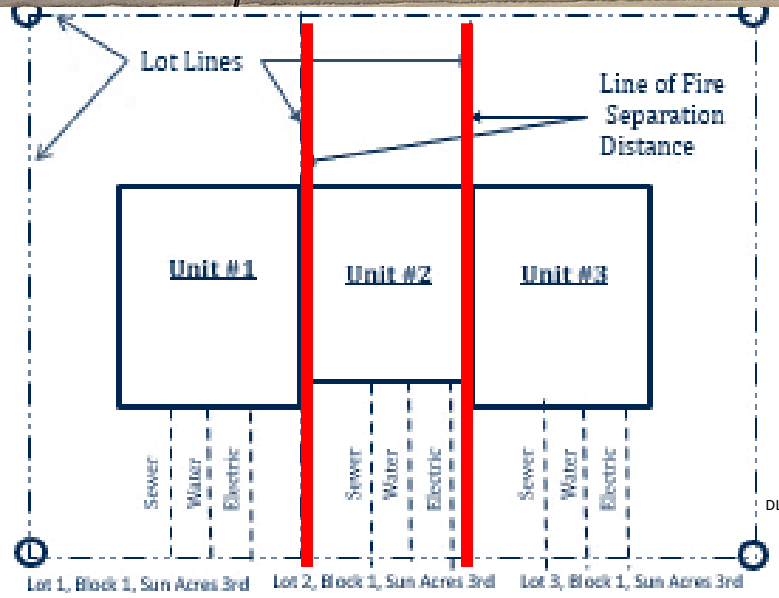
- Townhouses IRC-3

Examples

Townhouse (IRC-3) 1309?

- 3 stories or less
- Separate Means of Egress
- 2 or more ATTACHED units
- Vertical separation
- Each unit OPEN on 2 Sides
- Separate Utilities

DLI/CCLD Photo



DLI/CCLD Illustrations

Examples

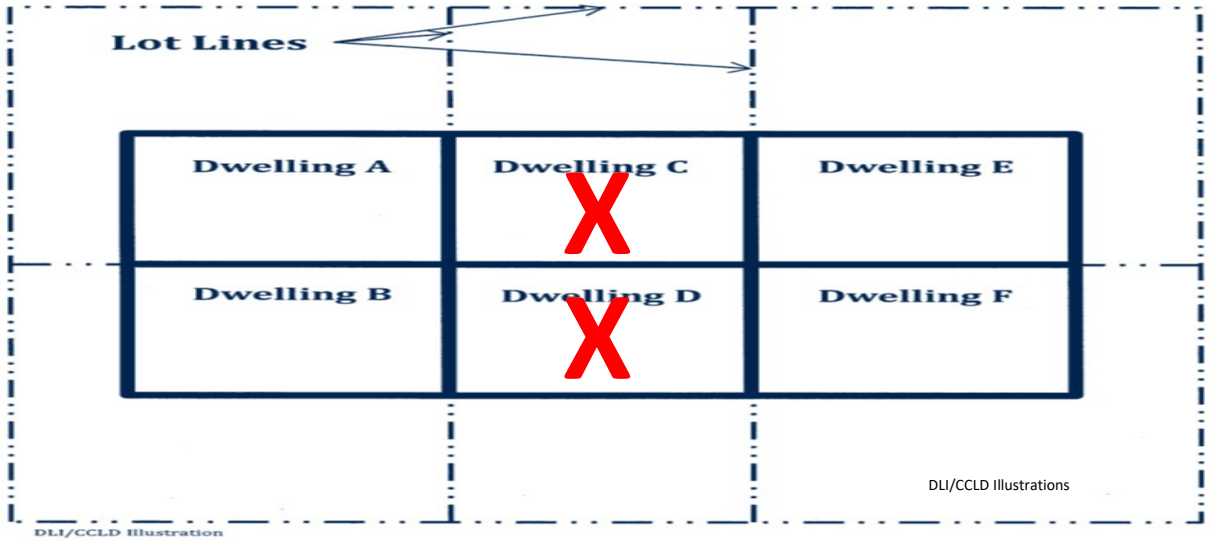
~~Townhouse (IRC-3)~~

- 2 or more ATTACHED units
- ~~OPEN on 2 SIDES~~
- Separate Means of Egress

~~**MRC 1309 ?**~~

MBC 1305!

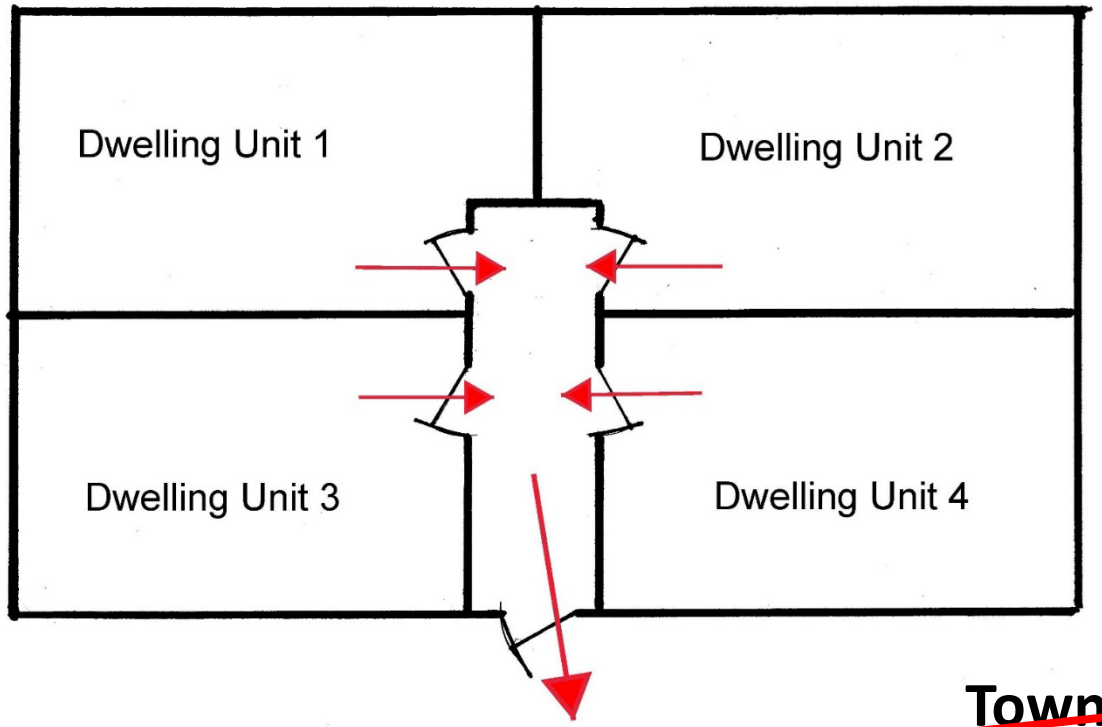
DLI/CCLD Photo



DLI/CCLD Illustrations

DLI/CCLD Illustration

Townhouse ?



~~Townhouse (IRC-3)~~

- 2 or more ATTACHED units
- OPEN on 2 SIDES
- ~~Separate Means of Egress~~
- Vertical separation

MBC 1305

QUESTIONS?

1. **Is there a limit to how many townhomes can be joined together?**
2. **Can townhomes have horizontal separations (stacked)?**
3. **Does MRC say that a townhouse dwelling unit has to have a front door?**
4. **Does the MRC say that townhomes have to be separated by property lines?**

Section R202 – 2020 MRC – Page 65

MRC Ch. 202 – Definitions

Dwelling

Townhouse (IRC-3)

- **Single Family-Dwelling Unit**…Constructed in a group of **2 or more** attached units
- In which each unit extends from the **foundation to the roof** and
- Having **open** space on at least **2 sides** of each Dwelling unit
- Each Single-Family Dwelling Unit **SHALL be considered a SEPARATE** building.
- **SEPARATE** building service utilities shall be provided to each Single-Family Dwelling unit when required by **other chapters** of the State Building Code.

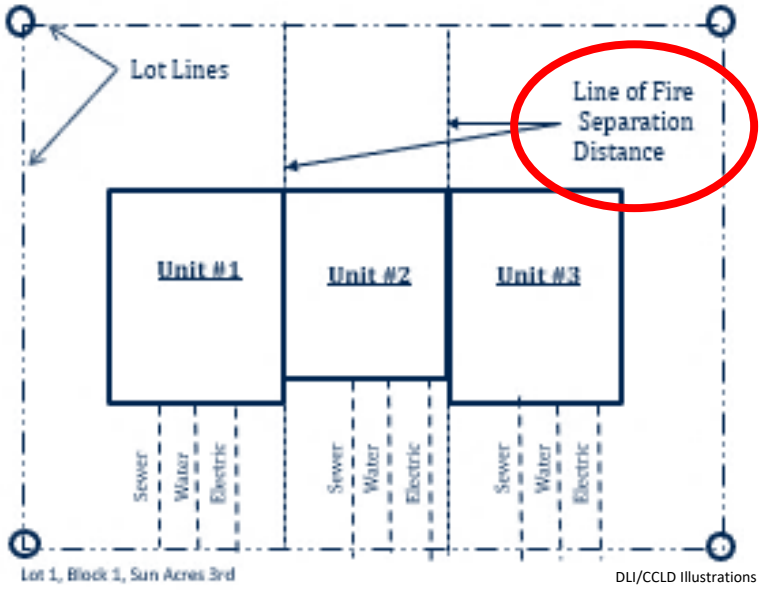
Section R202 - 2020 MRC – Page 65

Examples

Townhouse (IRC-3) 1309?

- 3 stories or less
- Separate Means of Egress
- 2 or more ATTACHED units
- Each unit OPEN on 2 Sides
- Vertical Separation
- Separate Utilities
- **On the SAME LOT ?**

DLI/CCLD Photo



DLI/CCLD Illustrations

Scope and definitions

Who else helps us define what is a Townhouse or 2-Family dwelling?

- ✓ Building Codes - MRC
- ✓ Planning & Zoning
- ✓ City Ordinances
- ✓ Laws
- ✓ Property Records
- ✓ Public Works/Utilities

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

2. How are they constructed different?

SEPARATIONS

FIRE **SOUND**

TWO-FAMILY DWELLINGS OR TOWNHOUSES

Townhouses

BEFORE

DLI/CCLD Photo

Section R302.2.6 - 2020 MRC – Page 101

AFTER

Photo provided by D. Schoeppner

Photo provided by D. Schoeppner

Code compliance performs when everyone does their job.

Section R302.2.6 - 2020 MRC – Page 101

MRC Ch. 202 – Definitions

Fire Separation Distance:

The distance measured from the building face to one of the following:

1. To the closest interior lot line; or
2. to the centerline of a street, an alley or public way; or
3. to an imaginary line between two buildings on the lot.

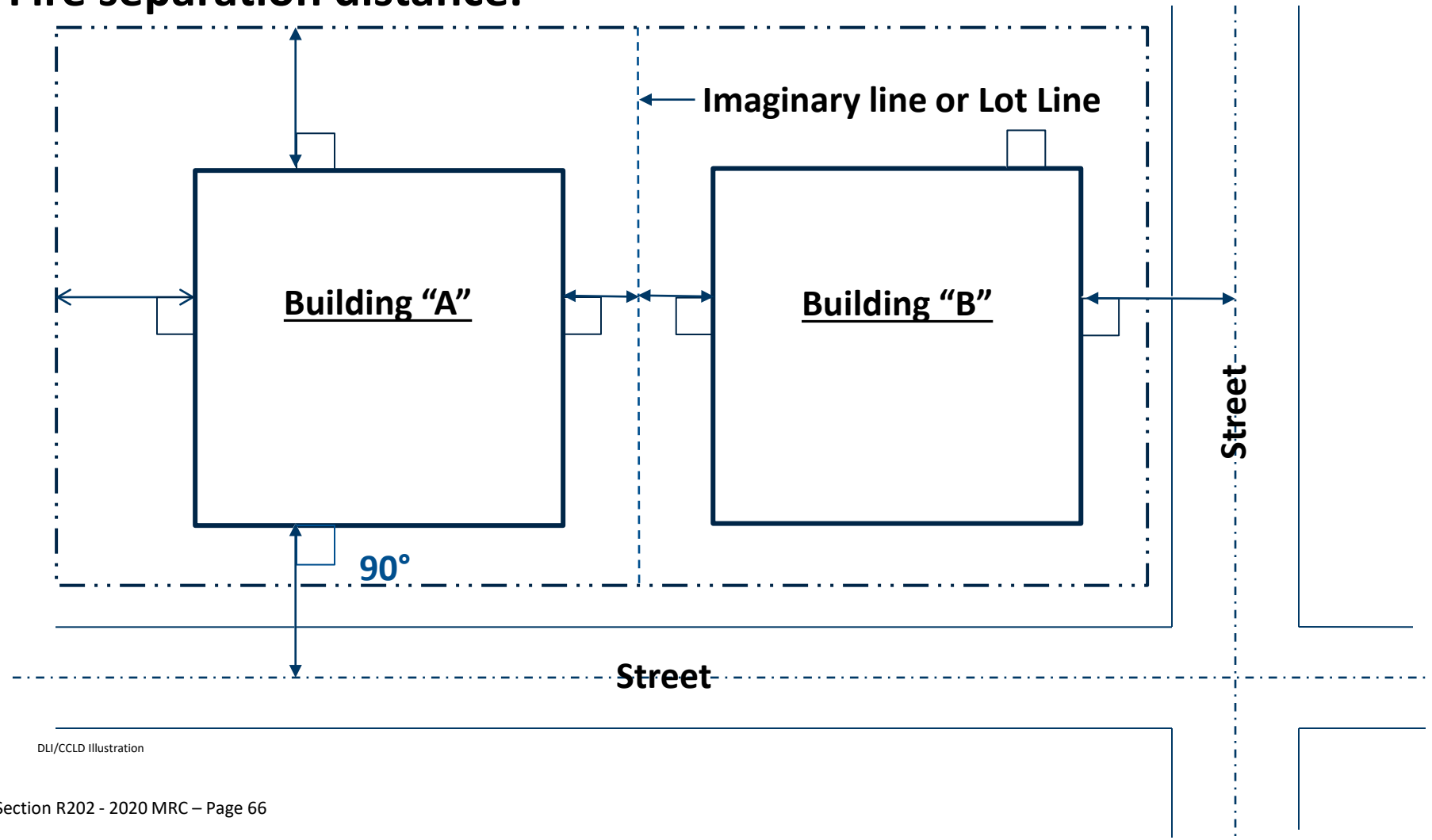
(often referred to as the ***'Line of Fire Separation'***.)

The distance shall be measured at a right angle from the face of the wall.

Section R202 - 2020 MRC – Page 66

Line of Fire Separation Distance

Fire separation distance.



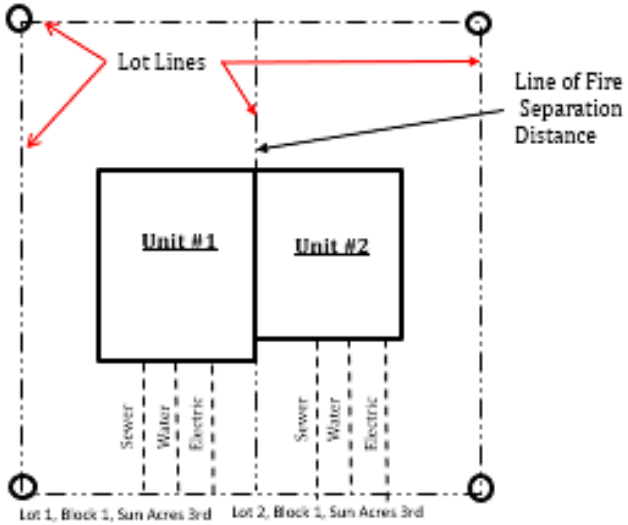
DLI/CCLD Illustration

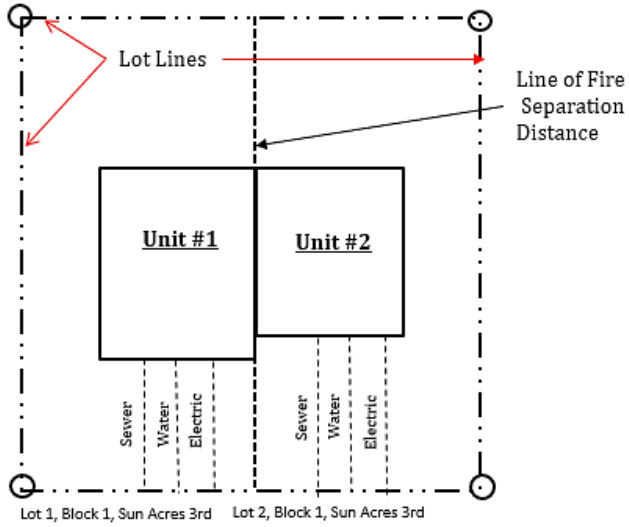
Section R202 - 2020 MRC – Page 66

FIRE SEPARATIONS

DLI/CCLD Photo

Townhouse





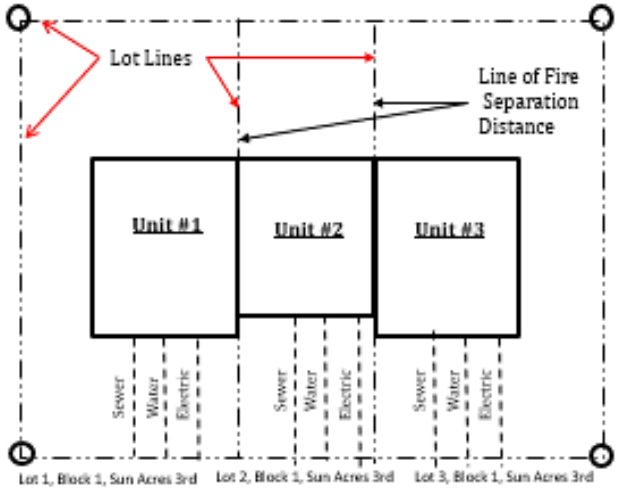
DLI/CCLD Illustrations

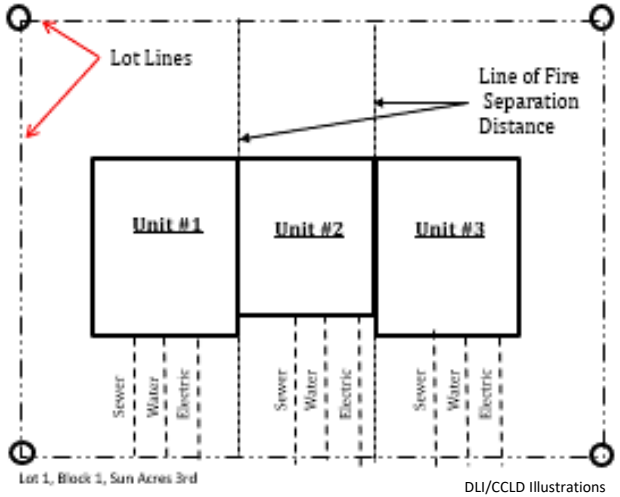
2-Family Dwelling

FIRE SEPARATIONS

Townhouse

DLI/CCLD Photo





DLI/CCLD Illustrations

Section R202 - 2020 MRC – Page 65

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

Code Sections

MRC Ch. 302 - Fire-Resistant Construction

R302.1 Exterior Walls

- R302.1(1) Table (NOT Sprinkled)
- R302.1(2) Table (with Sprinklers)
- Exception1

Section R202 - 2020 MRC – Page 99, 100

MRC Ch. 302 - Fire-Resistant Construction

R302.2 – Townhouses

- R302.2.1 Double Walls
- R302.2.2 Common Walls
- R302.2.3 Continuity
- R302.2.4 Parapets
- R302.2.5 Parapet Construction
- R302.2.6 Structural Independence
- R302.2.7 Sound Transmission

Section R202 - 2020 MRC – Page 100, 101

MRC Ch. 302 - Fire-Resistant Construction

R302.3 Two-Family Dwellings

- R302.3.1 Supporting Construction
- R302.3.2 Sound Transmission

R302.4 – Dwelling Unit Rated Penetrations (for Townhouses & 2-Family dwellings)

- R302.4.1 Through Penetrations
- R302.4.2 Membrane Penetrations

MRC Appendix K – Sound Transmission

Section R202 - 2020 MRC – Page 101, 102,
Section R313 – 2020 MRC - Page 116
MRC Appendix K – Page 563

CODE Sections

MRC Ch. 313 – Automatic Fire Sprinkler Systems

R313.1 – Townhouse Sprinklers

R313.2 – One and Two-Family Dwellings

R313.3 – Installation Requirements

R313.4 – State Licensed Facilities

Section R202 - 2020 MRC – Page 116,
Appendix K - Page 563

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

MRC Ch. 302.1 Exterior Walls

MRC Ch. 302 - Fire-Resistant Construction

R302.1 Exterior Walls

- R302.1(1) Table (NOT Sprinkled R313)
- R302.1(2) Table (with Sprinklers R313) (3-unit townhouse or more)
- Exception 1

Section R202 - 2020 MRC – Page 99, 100, 116

MRC Ch. 302 - Fire-Resistant Construction

R302.1 Exterior Walls

Construction, projections, openings and penetrations of exterior walls of dwellings and accessory buildings shall comply with Table R302.1(1); or dwellings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904 shall comply with Table R302.1(2).

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the fire separation distance.

Section R202 - 2020 MRC – Page 99, 100, 116

Townhouses

Fire separation distance.

TABLE R302.1(1)
EXTERIOR WALLS

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCE
Walls	Fire-resistance rated	1 hour—tested in accordance with ASTM E119, UL 263, or Section 703.3 of the *International Building Code* with exposure from both sides	0 feet
	Not fire-resistance rated	0 hours	≥ 5 feet
Projections	Not allowed	NA	< 2 feet
	Fire-resistance rated	1 hour on the underside, or heavy timber, or fire-retardant-treated wood[a, b, c]	≥ 2 feet to < 5 feet
	Not fire-resistance rated	0 hours	≥ 5 feet
Openings in walls	Not allowed	NA	< 3 feet
	25% maximum of wall area	0 hours	3 feet
	Unlimited	0 hours	5 feet
Penetrations	All	Comply with Section R302.4	< 3 feet
		None required	3 feet

For SI: 1 foot = 304.8 mm.
NA = Not Applicable.
a. The fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave overhang if fireblocking is provided from the wall top plate to the underside of the roof sheathing.
b. The fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the rake overhang where gable vent openings are not installed.
c. One hour on the underside equates to one layer of $^{5}/_{8}$-inch type X gypsum sheathing. Openings are not allowed.

Section R302.1(1) - 2020 MRC – Page 100

Townhouses

Fire separation distance.

TABLE R302.1(2)
EXTERIOR WALLS—DWELLINGS WITH FIRE SPRINKLERS

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCE
Walls	Fire-resistance rated	1 hour—tested in accordance with ASTM E119, UL 263, or Section 703.3 of the *International Building Code* with exposure from the outside	0 feet
	Not fire-resistance rated	0 hours	3 feet[a]
Projections	Not allowed	NA	< 2 feet
	Fire-resistance rated	1 hour on the underside, or heavy timber, or fire-retardant-treated wood[b, c, d]	2 feet[a]
	Not fire-resistance rated	0 hours	3 feet
Openings in walls	Not allowed	NA	< 3 feet
	Unlimited	0 hours	3 feet[a]
Penetrations	All	Comply with Section R302.4	< 3 feet
		None required	3 feet[a]

For SI: 1 foot = 304.8 mm.
NA = Not Applicable.

a. For residential subdivisions where all dwellings are equipped throughout with an automatic sprinkler system installed in accordance with Section P2904, the fire separation distance for exterior walls not fire-resistance rated and for fire-resistance-rated projections shall be permitted to be reduced to 0 feet, and unlimited unprotected openings and penetrations shall be permitted, where the adjoining lot provides an open setback yard that is 6 feet or more in width on the opposite side of the property line.

b. The fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave overhang if fireblocking is provided from the wall top plate to the underside of the roof sheathing.

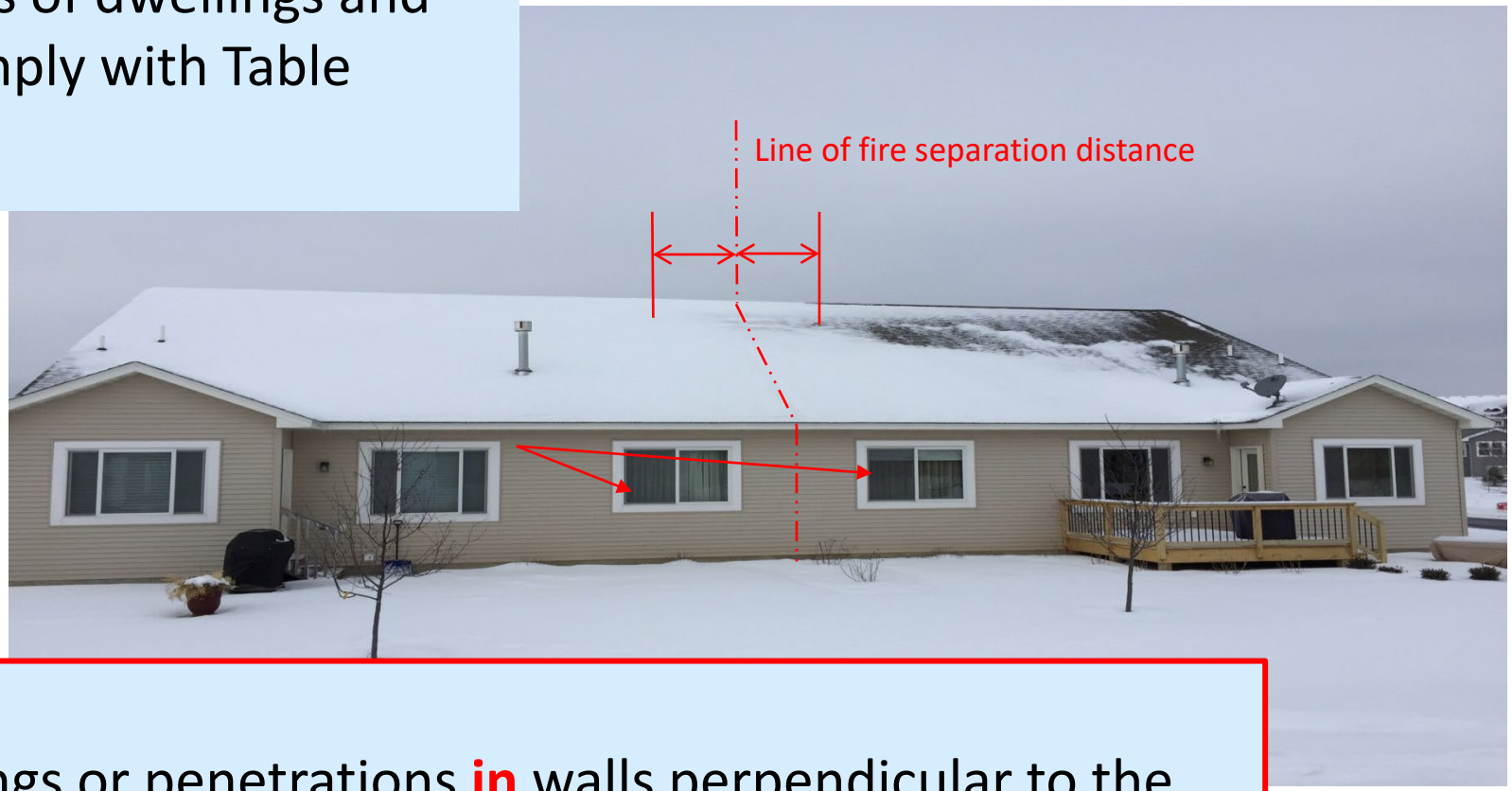
c. The fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the rake overhang where gable vent openings are not installed.

d. One hour on the underside equates to one layer of $^{5}/_{8}$-inch type X gypsum sheathing. Openings are not allowed.

Section R302.1(2) - 2020 MRC – Page 100

Townhouses

R302.1 Exterior walls.
Construction, projections, openings and penetrations of exterior walls of dwellings and accessory buildings shall comply with Table R302.1(1);



Exceptions:
1. Walls, projections, openings or penetrations **in** walls perpendicular to the line used to determine the fire separation distance.

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

MRC Ch. 302.3 Two-Family Dwellings

Section R202 - 2020 MRC – Page 101, 102,
Section R313 – 2020 MRC - Page 116

Two-family dwellings

DLI/CCLD Photo

DLI/CCLD Photo

Each of the photos represents a two-family dwelling on one lot. One dwelling with a horizontal separation and the other with a vertical separation.

Two-family dwellings

R302.3 - Two-family dwellings.

Dwelling units in two-family dwellings shall be separated from each other by wall and floor assemblies having not less than a 1-hour fire-resistance rating when tested in accordance with ASTM E 119, UL 263 or Section 703.3 of the International Building Code.

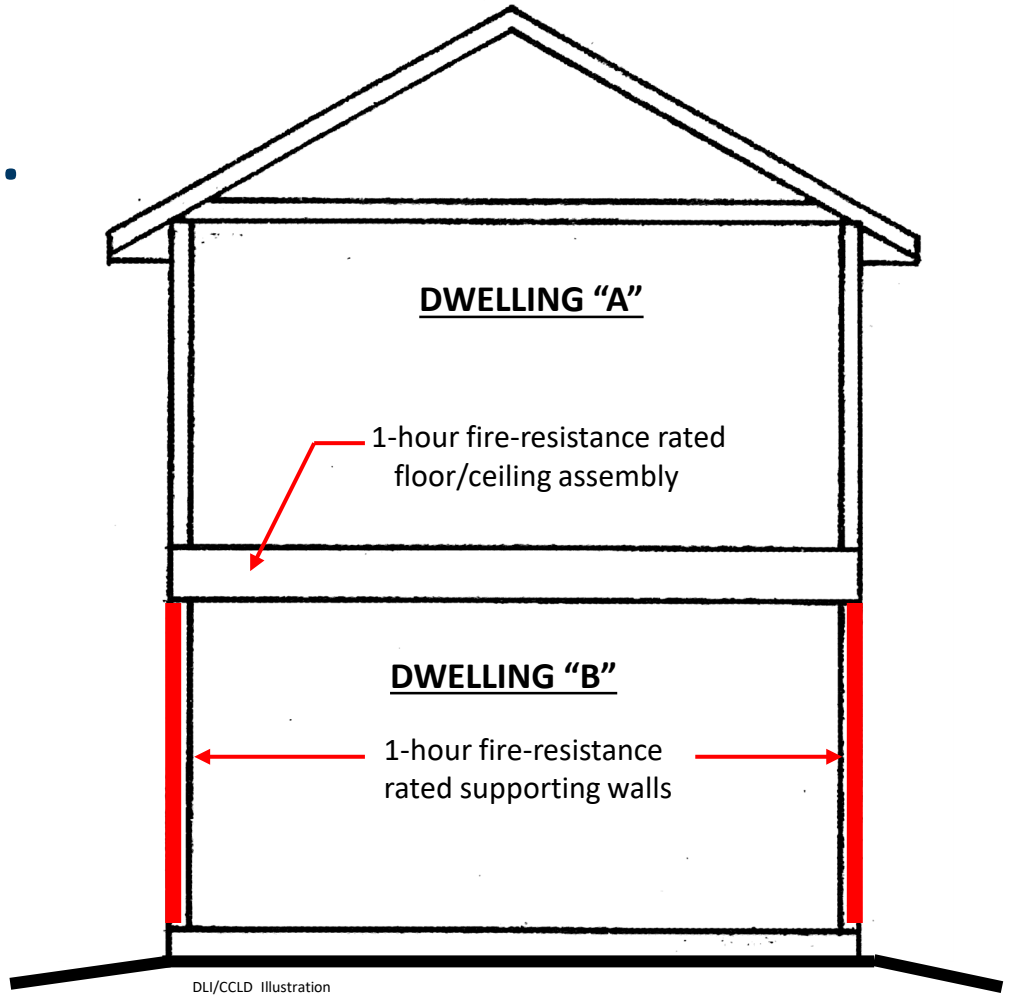
Fire-resistance-rated floor/ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.

(see exceptions – Sprinks, Attics)

Two-family dwellings

R302.3.1 - Supporting construction.

When floor assemblies are required to be fire-resistance rated by Section R302.3, the supporting construction of such assemblies shall have an equal or greater fire-resistance rating.



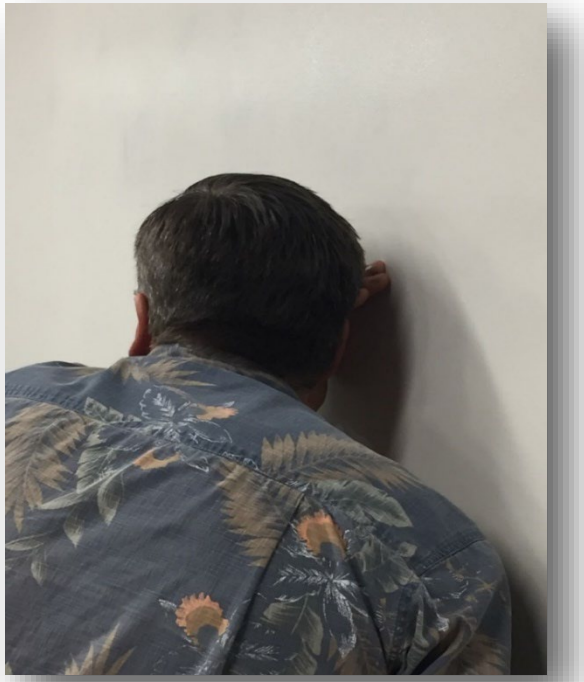
DLI/CCLD Illustration

Section R302.3.1 - 2020 MRC – Page 102

Two-Family Dwellings

R302.3.2 - Sound transmission.

Two-Family Dwellings constructed in accordance with Section R302.3 shall comply with the sound transmission requirements of **MRC Appendix K**.



Section R302.2.7 - 2020 MRC – Page 102

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

MRC Ch. 302.2 Townhouses

MRC Ch. 302 - Fire-Resistant Construction

R302.2 – Townhouses

- R302.2.1 Double Walls
- R302.2.2 Common Walls
- R302.2.3 Continuity
- R302.2.4 Parapets
- R302.2.5 Parapet Construction
- R302.2.6 Structural Independence
- R302.2.7 Sound Transmission

Section R202 - 2020 MRC – Page 100, 101

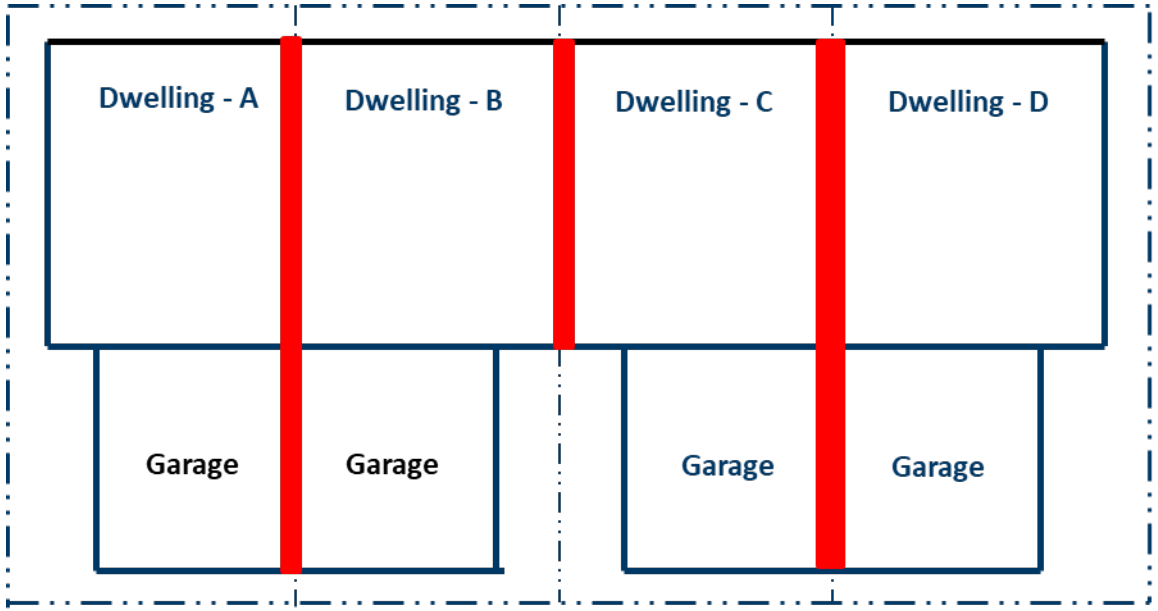
Townhouses

R302.2 Townhouses:

Walls separating townhouses shall be constructed in accordance with Section R302.2.1 or R302.2.2.

R302.2.1 – Double walls

R302.2.2 – Common walls

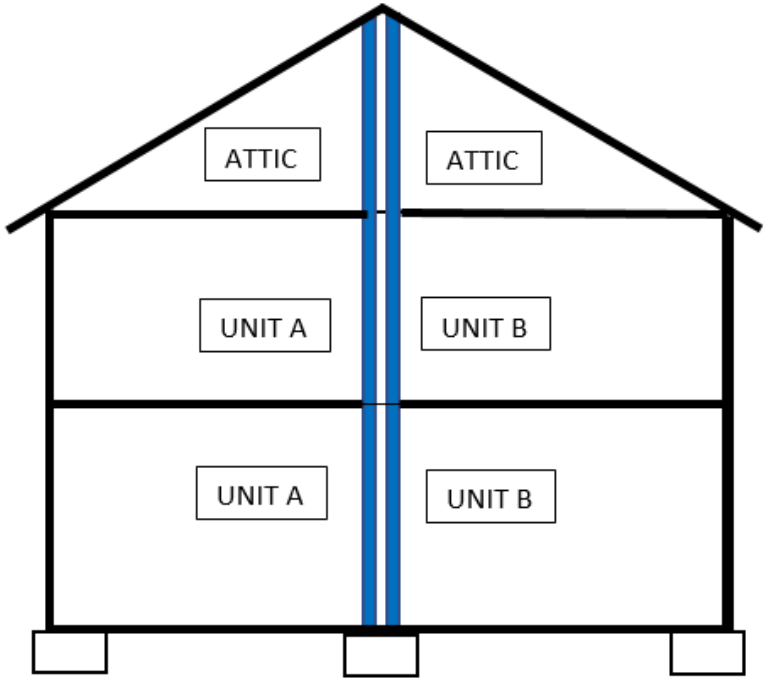


DLI/CCLD Illustration

Townhouses

R302.2.1 Double walls:

- Each townhouse shall be separated by two (2) 1-hour fire-resistance-rated wall assemblies
- Tested in accordance with ASTM E119, UL 263 or Section 703.3 of the International Building Code.

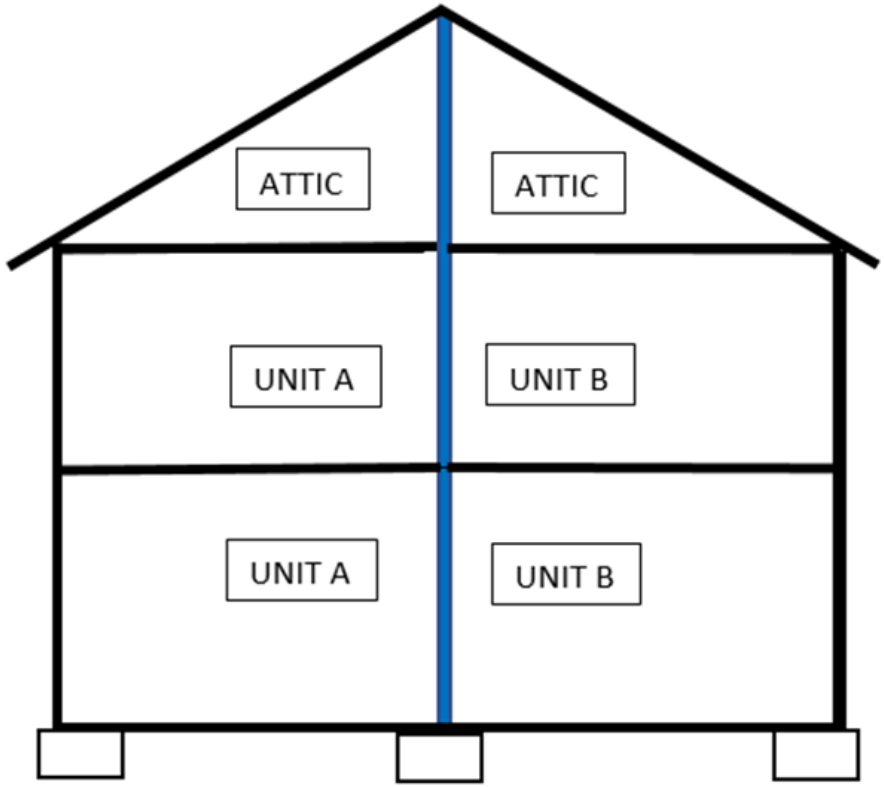


2 - One Hour Walls
IRC R302.2.1

Townhouses

R302.2.2 Common walls:

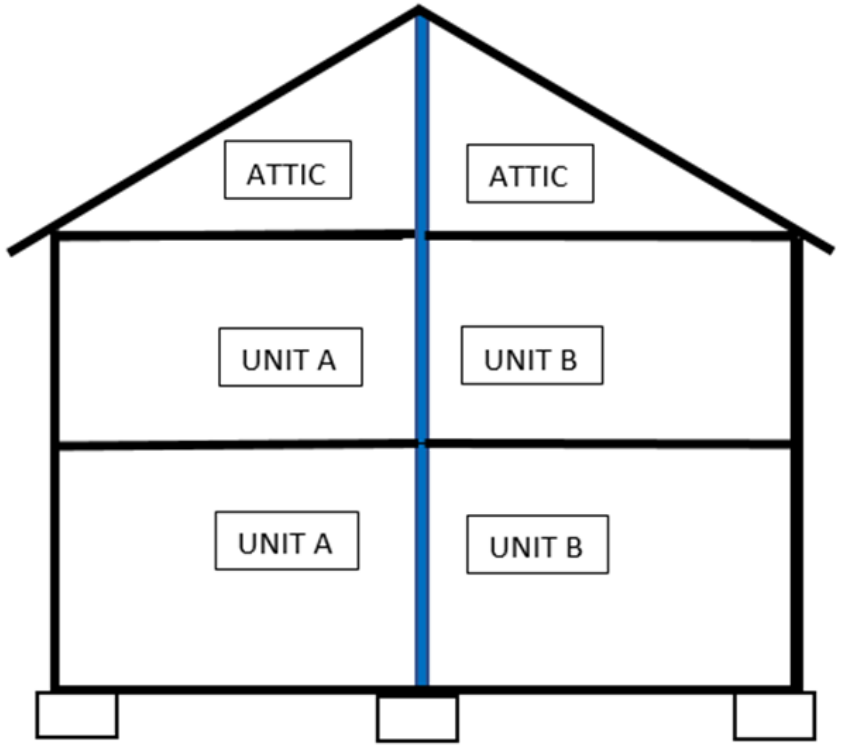
- Common walls separating townhouses shall be assigned a fire-resistance rating in accordance with Item 1 or 2.
- The common wall shared by two townhouses shall be constructed **without** plumbing or mechanical equipment, ducts or vents in the cavity of the common wall.
- The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing.



Section R302.2 - 2020 MRC – Page 100, 101

R302.2.2 Common walls – cont.

- Electrical installations shall be in accordance with Chapters 34 through 43. (See Minnesota Electrical Code)
- Penetrations of the membrane of common walls for electrical outlet boxes shall be in accordance with Section R302.4.



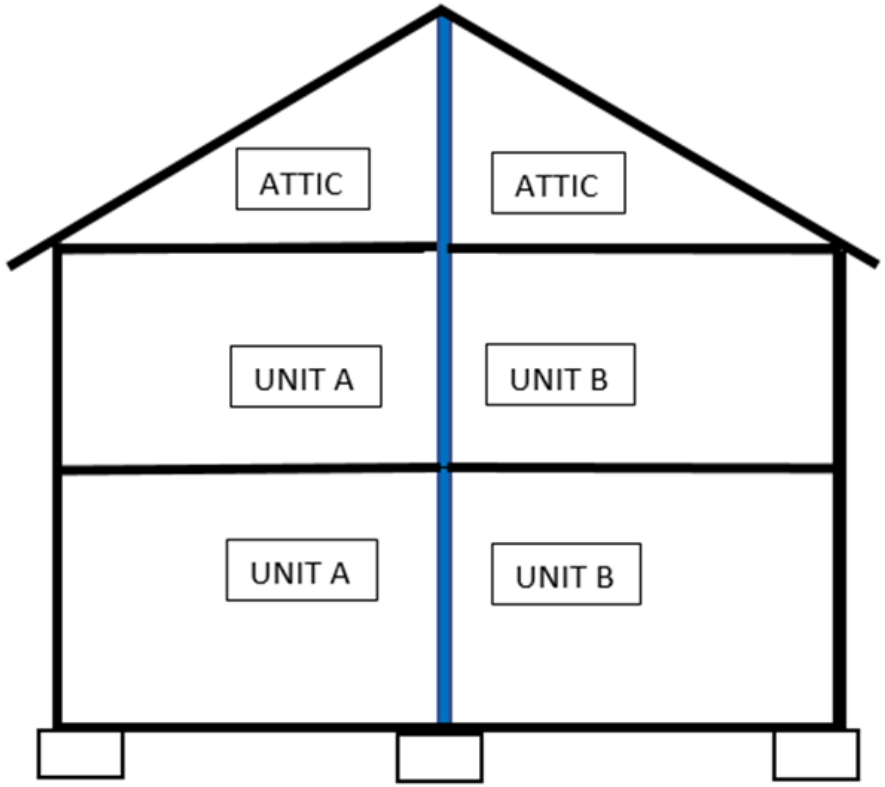
Section R302.2 - 2020 MRC – Page 100, 101

Townhouses

RECAP:

R302.2.2 Common walls:

Common walls separating townhouses shall be assigned a fire-resistance rating in accordance with Item 1 or 2.



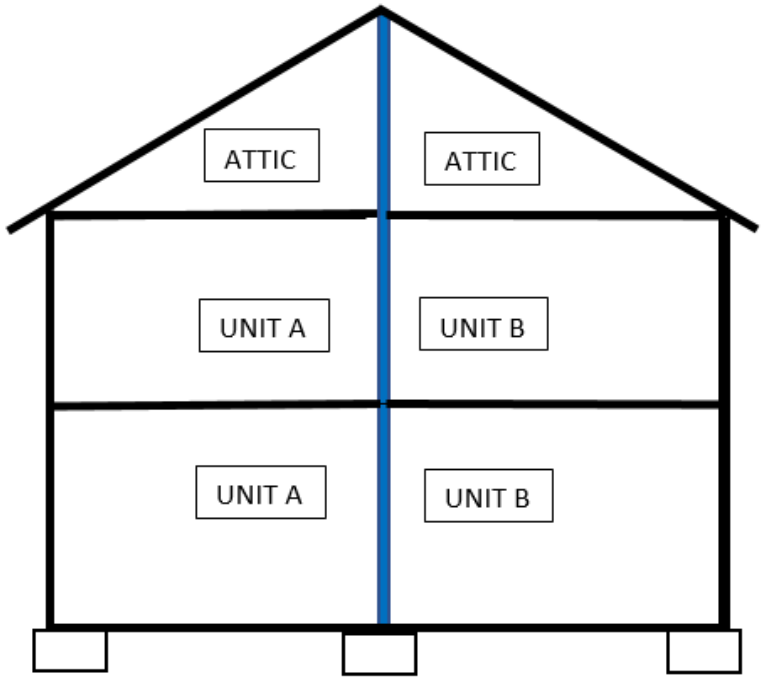
Section R302.2 - 2020 MRC – Page 100, 101

Townhouses

R302.2.2 Common walls - cont.

Item 1:

Where a fire sprinkler system in accordance with Section P2904 is provided, the common wall shall be not less than a 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119, UL 263 or Section 703.3 of the International Building Code.



DLI/CCLD Illustration

1 - One Hour Wall
w/ fire sprinkler system
(NO plumbing or mechanical equipment)
IRC R302.2.2 item #1

All Townhouses Sprinkled (three or more) - MN

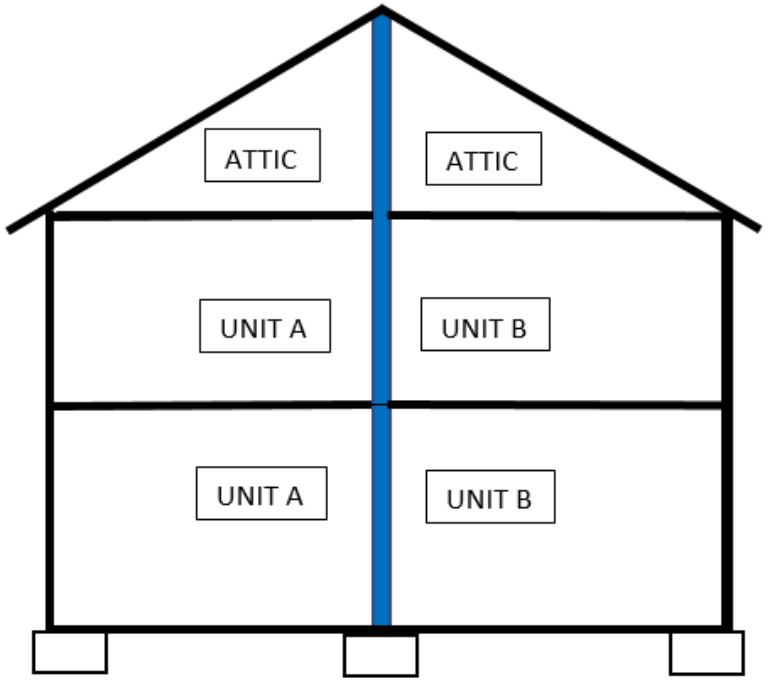
Section R302.2 - 2020 MRC – Page 100, 101

Townhouses

R302.2.2 Common walls - cont.

Item 2:

Where a fire sprinkler system in accordance with Section P2904 is **NOT** provided, the common wall shall be not less than a 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119, UL 263 or Section 703.3 of the International Building Code.



DLI/CCLD Illustration

1 - Two Hour Wall
w/o fire sprinkler system
(NO plumbing or mechanical equipment)
IRC R302.2.2 item #2

Two Unit Townhouse Only

Section R302.2 - 2020 MRC – Page 100, 101

MRC Ch. 302 - Fire-Resistant Construction

R302.2 – Townhouses

- R302.2.1 Double Walls
- R302.2.2 Common Walls
- R302.2.3 Continuity
- R302.2.4 Parapets
- R302.2.5 Parapet Construction
- R302.2.6 Structural Independence
- R302.2.7 Sound Transmission

Section R202 - 2020 MRC – Page 100, 101

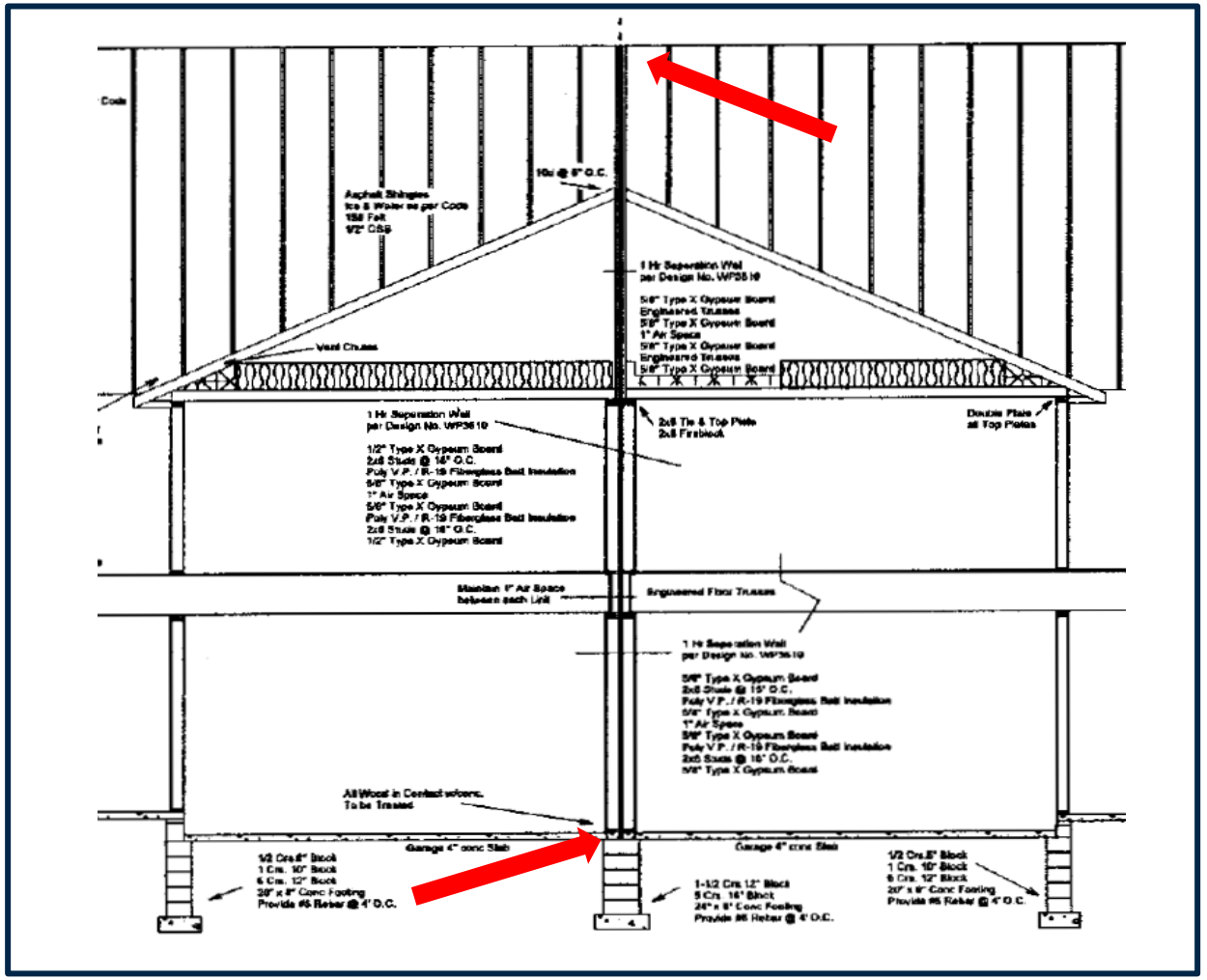
DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

R302.2.3 – Continuity

Townhouses

R302.2.3 Continuity:

The fire-resistance-rated wall or assembly separating townhouses shall be continuous from the foundation to the underside of the roof sheathing, roof deck, or roof slab.



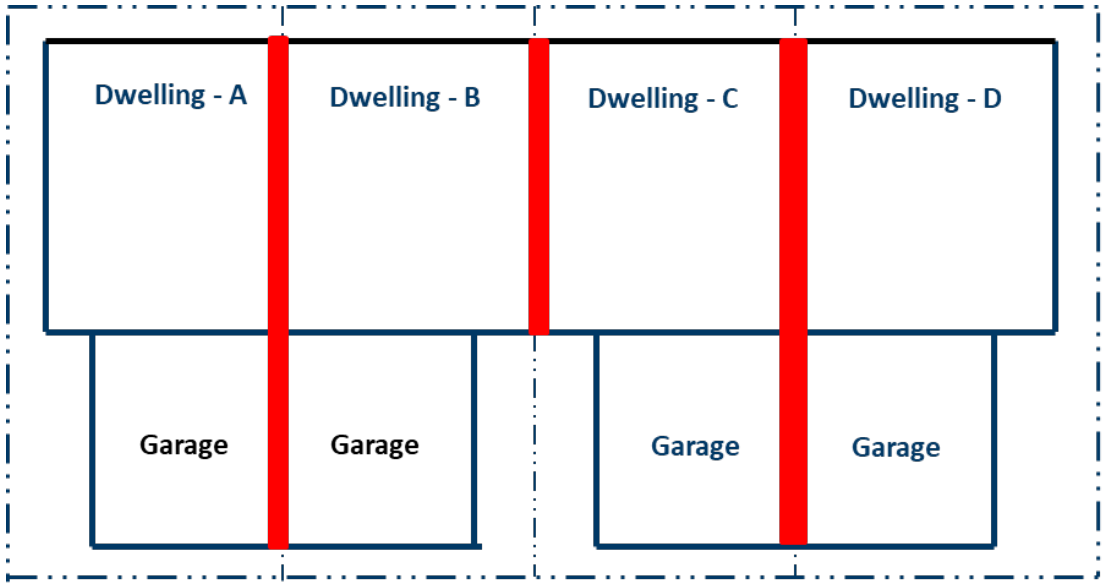
Section R302.2.3 - 2020 MRC – Page 101

Townhouses

R302.2.3 Continuity – cont.

The fire-resistance rating shall extend the full length of the wall or assembly,

including wall extensions through and separating attached enclosed accessory structures.



Section R302.2.3 - 2020 MRC – Page 101

R302.2.3 Continuity – cont.

The separation shall extend through enclosed soffits, overhangs, and similar projections.

Section R302.2.3 - 2020 MRC – Page 101

MRC Ch. 302 - Fire-Resistant Construction

R302.2 – Townhouses

- R302.2.1 Double Walls
- R302.2.2 Common Walls
- R302.2.3 Continuity
- R302.2.4 Parapets
- R302.2.5 Parapet Construction
- R302.2.6 Structural Independence
- R302.2.7 Sound Transmission

Section R202 - 2020 MRC – Page 100, 101

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

R302.2.4 - Parapets
R302.2.5 – Parapet Construction

Townhouses

R302.2.4 Parapets for townhouses.

Parapets constructed in accordance with Section R302.2.5 shall be constructed for townhouses as an extension of exterior walls or common walls in accordance with the following:

1. Where roof surfaces adjacent to the wall or walls are at the same elevation, the parapet shall extend not less than 30 inches above the roof surfaces.

2. Where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof is not more than 30 inches above the lower roof, the parapet shall extend not less than 30 inches above the lower roof surface.

R302.2.4 Parapets for townhouses – cont.

Exception:

A parapet is **NOT** required when the roof is covered with a minimum class C roof covering, and

The roof decking or sheathing is of noncombustible materials or approved fire-retardant-treated wood for a distance of **4 feet on each side** of the wall or walls, or one layer of $^{5}/_{8}$-inch type X gypsum board is installed directly beneath the roof decking or sheathing,… and

There are no openings or penetrations in the roof **within 4 feet** of the common walls.

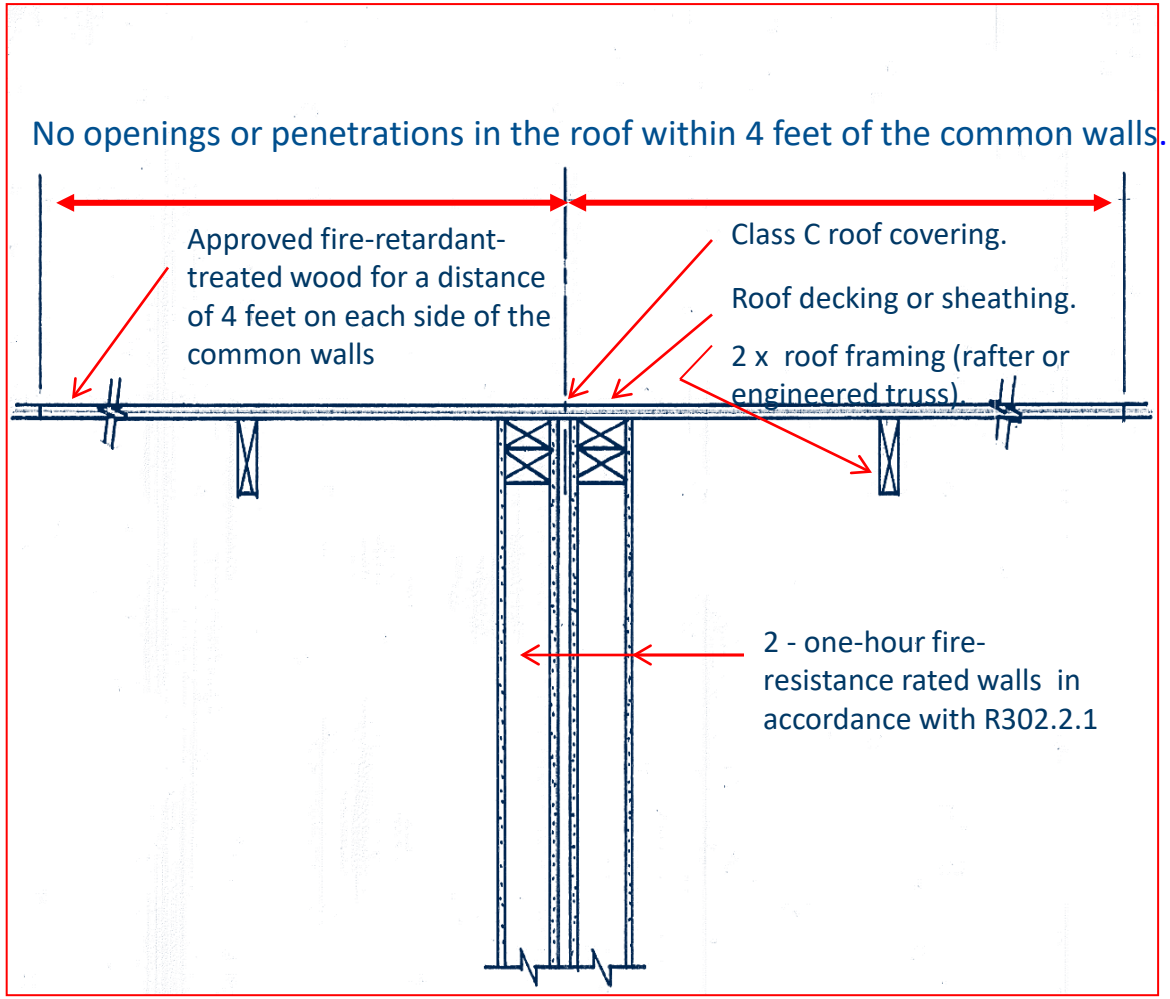
Section R302.2.1 - 2020 MRC – Page 101

Townhouses

Parapets.

DLI/CCLD Photo

DLI/CCLD Photo



DLI/CCLD Illustration

Section R302.2.4 - 2020 MRC – Page 101

R302.2.4 Parapets for townhouses – cont.

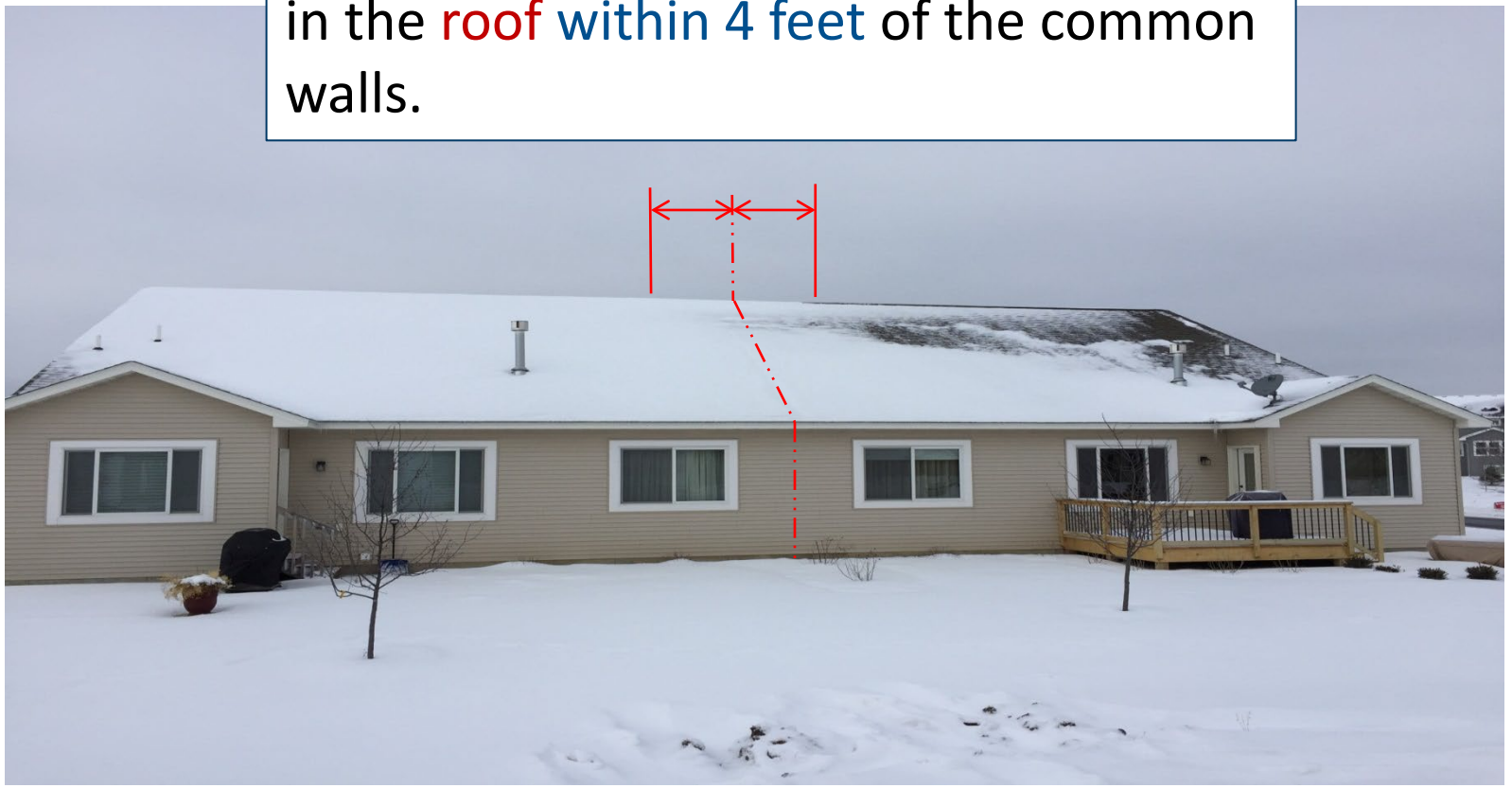
Exception:

The roof decking or sheathing is of noncombustible materials or approved fire-retardant-treated wood for a distance of **4 feet on each side** of the wall or walls

DLI/CCLD Photo

Parapets

Exception:
There are no openings or penetrations in the roof within 4 feet of the common walls.



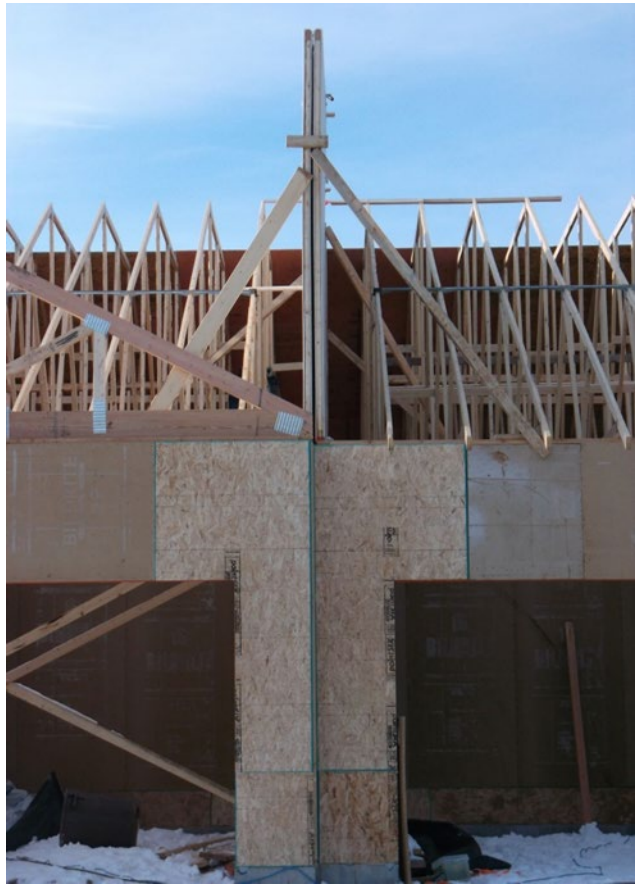
Section R302.2.2 - 2015 MRC – Page 101

Townhouse Separations

R302.2.5 Parapet Const.

Parapets shall have the same fire-resistance rating as that required for the supporting wall or walls……

(See this section for all language concerning parapet construction on roofs.)



DLI/CCLD image

Section R302.2.4 - 2015 MRC – Page 101

MRC Ch. 302 - Fire-Resistant Construction

R302.2 – Townhouses

- R302.2.1 Double Walls
- R302.2.2 Common Walls
- R302.2.3 Continuity
- R302.2.4 Parapets
- R302.2.5 Parapet Construction
- R302.2.6 Structural Independence
- R302.2.7 Sound Transmission

Section R202 - 2020 MRC – Page 100, 101

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

R302.2.6 – Structural Independence

Townhouses

R302.2.6 Structural independence.

Each individual townhouse shall be structurally independent.

Exceptions: (see all exceptions)

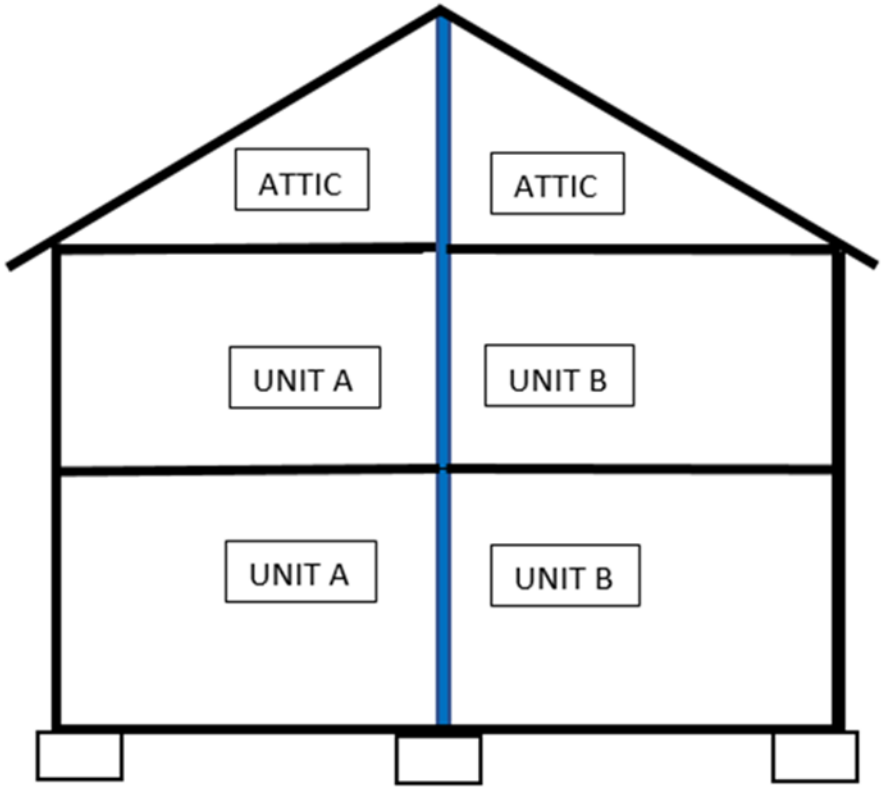
1. Foundations supporting exterior wall or common walls.
2. Structural roof and wall sheathing from each unit fastened to the common wall framing
3. Nonstructural wall and roof coverings.

R302.2.6 Structural independence - cont.

Each individual townhouse shall be structurally independent.

Exceptions: (- continued)

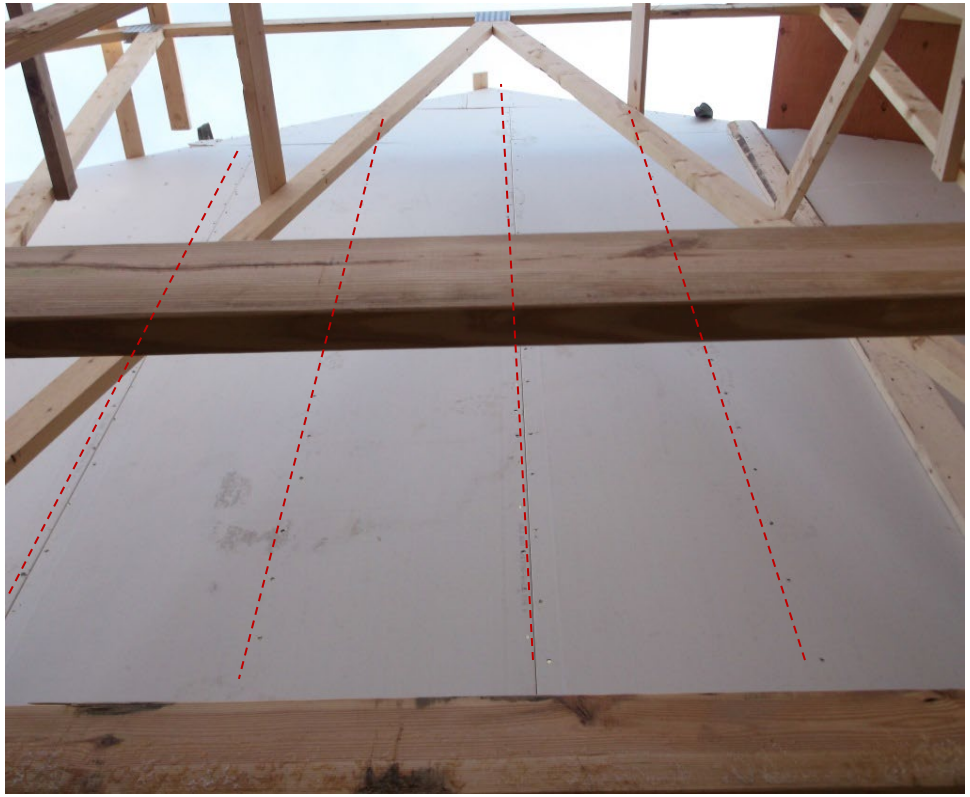
4. Flashing at termination of roof covering over the common wall.
5. Townhouses separated by a common wall as provided in Section R302.2.



Townhouses

Structural independence.

DLI/CCLD Photo

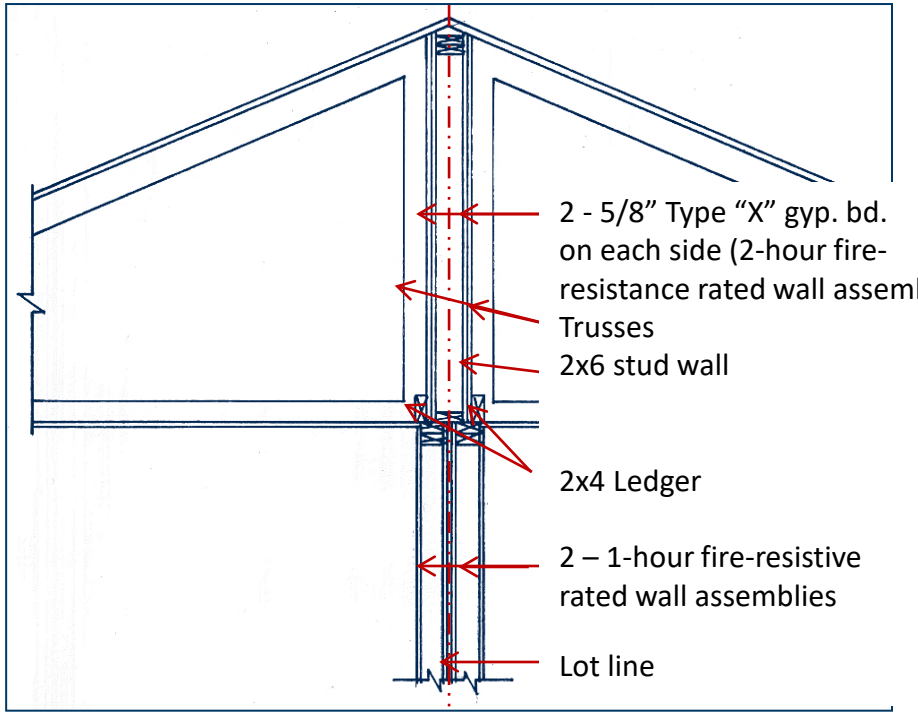


DLI/CCLD Photo

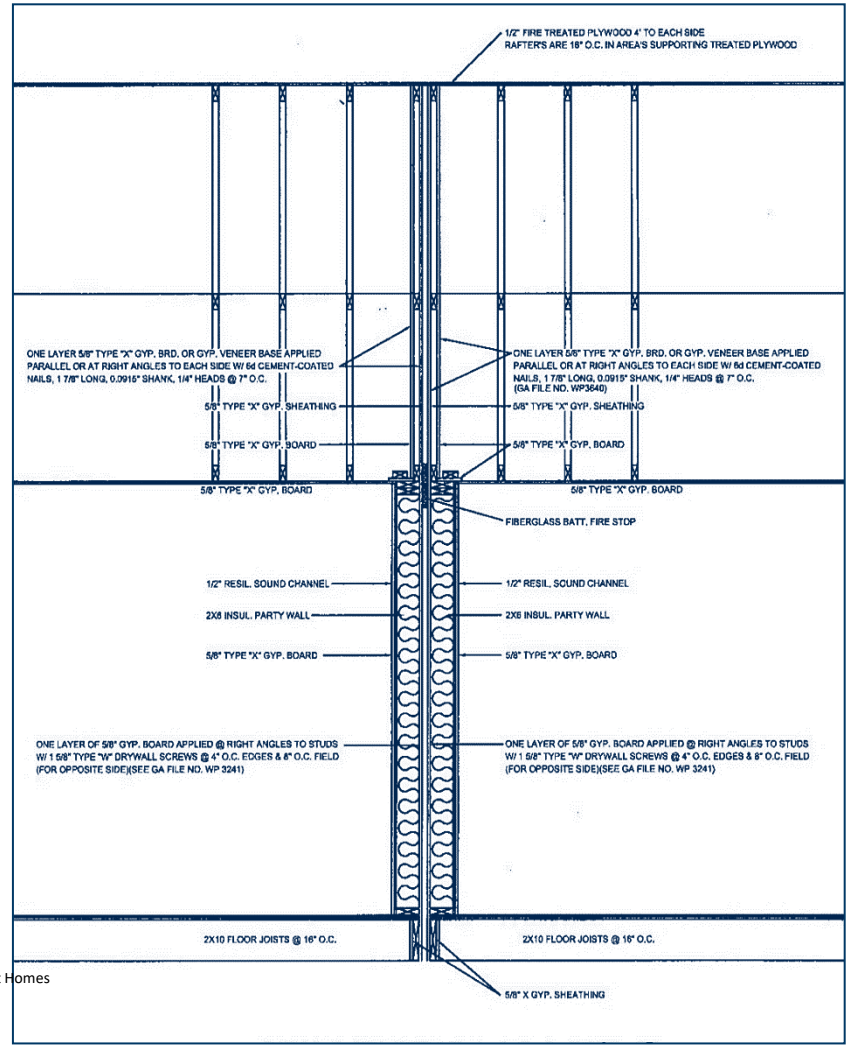
Section R302.2.6 - 2015 MRC – Page 101

Townhouses

Structural independence.



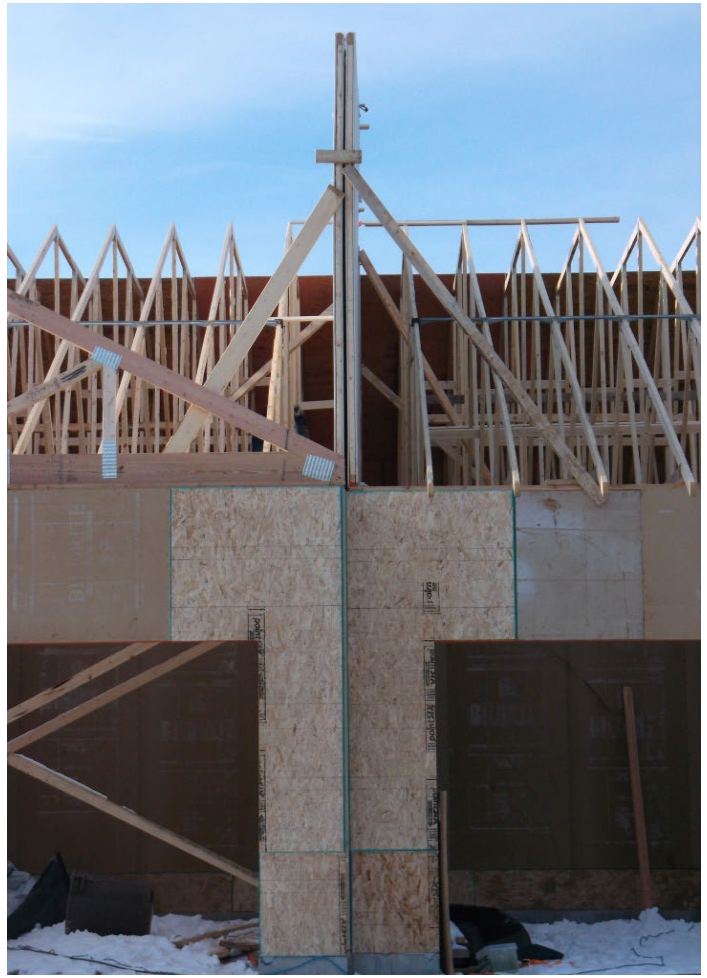
DLI/CCLD Illustration



Plan courtesy of Norcutt Homes

Section R302.2.6 - 2020 MRC – Page 101

Structural independence?



Section R302.2.6 - 2020 MRC – Page 101

Structural independence.

BEFORE

DLI/CCLD Photo

Structural independence.

AFTER

Photo provided by D. Schoeppner

Photo provided by D. Schoeppner

Code compliance performs when everyone does their job.

Section R302.2.6 - 2020 MRC – Page 101

MRC Ch. 302 - Fire-Resistant Construction

R302.2 – Townhouses

- R302.2.1 Double Walls
- R302.2.2 Common Walls
- R302.2.3 Continuity
- R302.2.4 Parapets
- R302.2.5 Parapet Construction
- R302.2.6 Structural Independence
- R302.2.7 Sound Transmission

Section R202 - 2020 MRC – Page 100, 101

Townhouses

R302.2.7 - Sound transmission.

Townhouses constructed in accordance with Section R302.2 shall comply with the sound transmission requirements of **MRC Appendix K**.

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

R302.3.2 Two-Family Dwellings
&
R302.2.7 Townhouses

Sound Transmission (STC ratings)

Sound transmission

MRC Appendix K – Sound Transmission

Section AK101.1 - General.

Wall and floor-ceiling assemblies separating dwelling units, including those separating adjacent townhouse units,

shall provide air-borne sound insulation for walls, and

both air-borne and impact sound insulation for floor-ceiling assemblies.

Section AK101 - 2015 MRC – Page 563

Sound transmission

General information.

- Air-Borne Sound **(STC):**
  - Sound traveling through air in a structure.
- Impact Sound **(IIC):**
  - Structural-borne Sound (Impact Sound):
  - The sound created when a building surface is struck by an object.
  - Sound that has traveled through a structure as vibration in solid material.

MRC Appendix K – Sound Transmission

Section AK102 – Airborne sound.

AK102.1 General

- Airborne sound insulation for wall and floor-ceiling assemblies shall meet a sound transmission class **(STC)** rating of **45** when tested in accordance with ASTM E90.
- Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings.
- Dwelling unit entrance doors, which share a common space, shall be tight fitting to the frame and sill.

Section AK101 - 2015 MRC – Page 563

MRC Appendix K – Sound Transmission

Section AK102 Airborne sound.

AK102.1.1 Masonry.

The sound transmission class of concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 0302 or determined through testing in accordance with ASTM E90.

MRC Appendix K – Sound Transmission

Section AK103 – Structural-borne sound.

- **AK103.1 General.**

Floor/ceiling assemblies between *dwelling units*, or between a *dwelling unit* and a public or service area within a structure, shall have an impact insulation class **(IIC)** rating of not less than **45** when tested in accordance with ASTM E492.

Sound transmission

General information.

STC = Sound Transmission Class rating
IIC = Impact Insulation Class rating
Minimum Air-borne sound and Structural-borne sound = **45**

STC	**People Reaction Measurement**
If the STC = 35	Clearly hear conversation
If the STC = 45	Conversation is muddled
If the STC = 55	Won't hear conversation; but will still hear loud sounds such as raised voices, bass music, or television.

DLI Illustration

Sound transmission

General information.

Air is the basic medium for sound transmission

Close off air leak paths allowing noise to go through or around the system using an acoustic sealant

A 1/4” perimeter crack surrounding a 96 sq. ft. wall represents an approximate 1 sq. ft. hole.

Sound transmission

General information.

Resource to verify STC ratings

GA-600 Fire Resistive Design Manual

Sound transmission

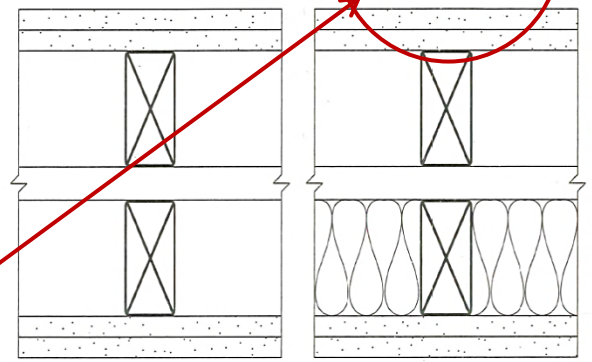
GA FILE NO. WP 3820 | **GENERIC** | **2 HOUR FIRE** | **55 to 59 STC SOUND**

GYPSUM WALLBOARD, WOOD STUDS

Base layer 5/8" type X gypsum wallboard or gypsum veneer base applied at right angles to each side of double row of 2 x 4 wood studs 16" o.c. on separate plates 1" apart with 6d coated nails, 1 7/8" long, 0.085" shank, 1/4" heads, 24" o.c. **Face** layer 5/8" type X gypsum wallboard or gypsum veneer base applied at right angles to each side with 8d coated nails, 2 3/8" long, 0.100" shank, 1/4" heads, 8" o.c.

Joints staggered 16" each layer and side. Sound tested with 3 1/2" glass fiber insulation stapled to studs in stud spaces on one side and with nails for base layer spaced 6" o.c. Horizontal bracing required at mid-height. **(LOAD-BEARING)**

STC > 45 - OK



Thickness:	10 3/4"
Approx. Weight:	13 psf
Fire Test:	See WP 4135 (FM WP 360, 9-27-74)
Sound Test:	NGC 3056, 4-7-70

GA-600-2003 Fire Resistive Design Manual

Sound transmission

General information.

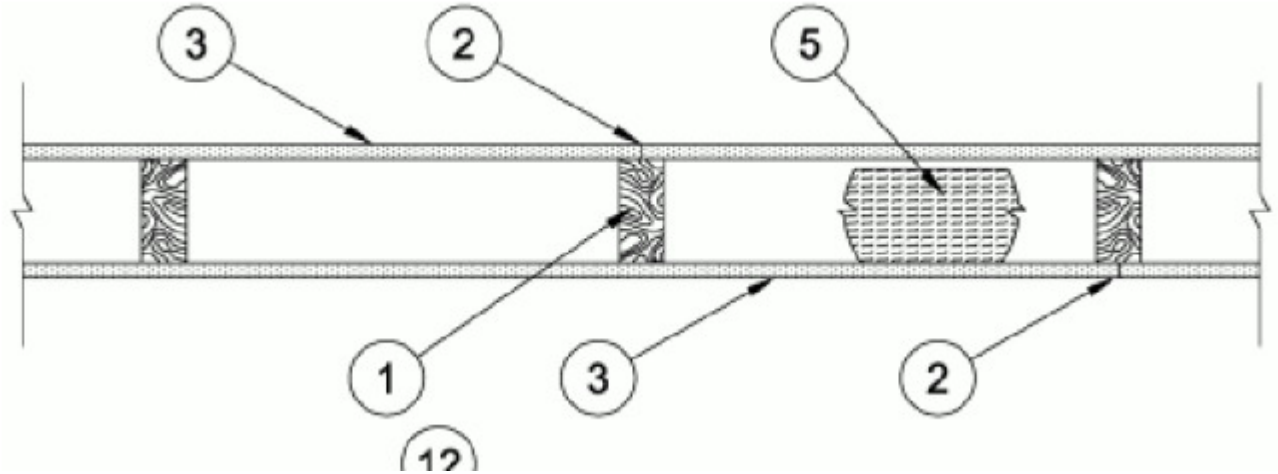
UL assembly U305

Design No. **U305**
February 3, 2023

See item 9

Bearing Wall Rating — 1 Hr
Finish Rating — See Items 3, 3A, 3D, 3E, 3F, 3G, 3H, 3J and 3L.
STC Rating - 56 (See Item 9)
method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit S
restriction factor shall be used — See Guide BXUV or BXUV7

ıch products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), r



Sound transmission

General information.

UL Design No. U305 - cont.

9. STC Rating — The STC Rating of the wall assembly is 56 when it is constructed as described by Items 1 through 6, **except:**

A. Item 2, above — Nail heads Shall be covered with joint compound.

B. Item 2, above — Joints As described, shall be covered with fiber tape and joint compound.

C. Item 5, above — Batts and Blankets* The cavities formed by the studs shall be friction fit with R-19 unfaced fiberglass insulation batts measuring 6-1/4 in. thick and 15-1/4 in. wide.

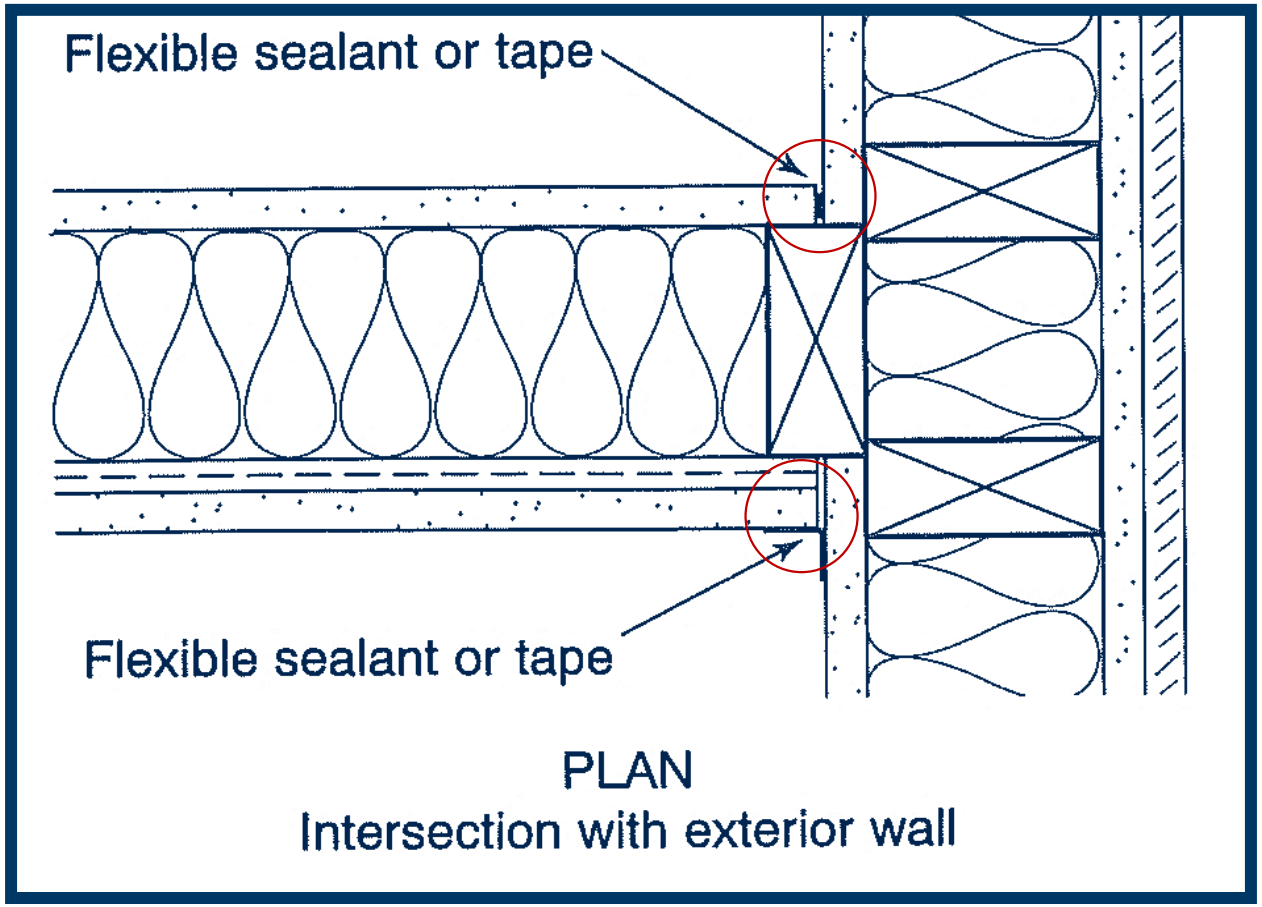
D. Item 6, above — Steel Framing Members* Type RSIC-1 clips shall be used to attach gypsum board to studs on either side of the wall assembly.

E. Item 8, above — Caulking and Sealants (Not Shown) A bead of acoustical sealant shall be applied around the partition perimeter for sound control.

F. Steel Corner Fasteners (Item 4), Fiber, Sprayed (Items 5A and 5B) and Steel Framing Members (Item 6A), not evaluated as alternatives for obtaining STC rating.

Sound transmission

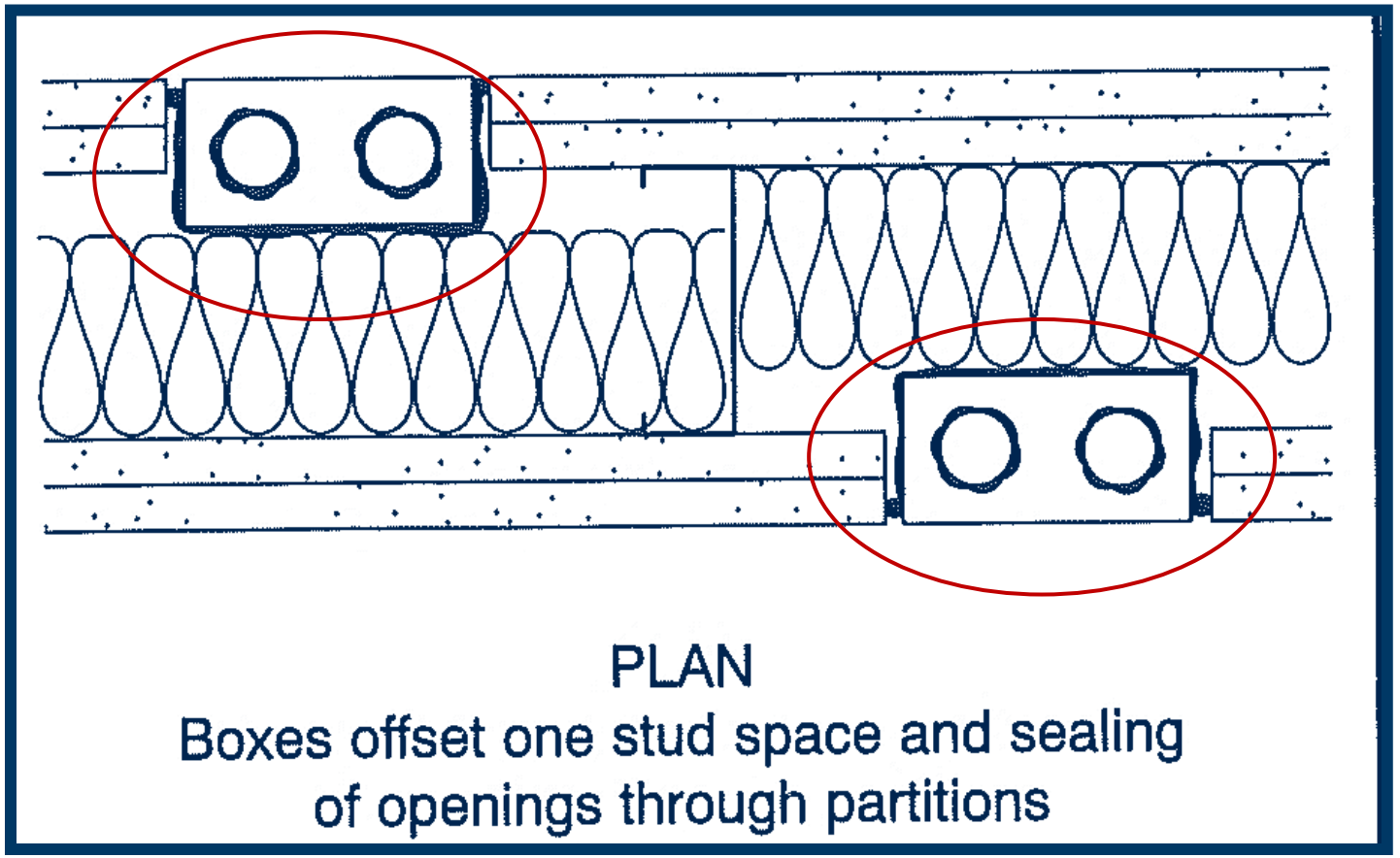
General information.



GA-600-2012Fire Resistive Design Manual Illustrations

Sound transmission

General information.



GA-600-2012 Fire Resistive Design Manual Illustrations

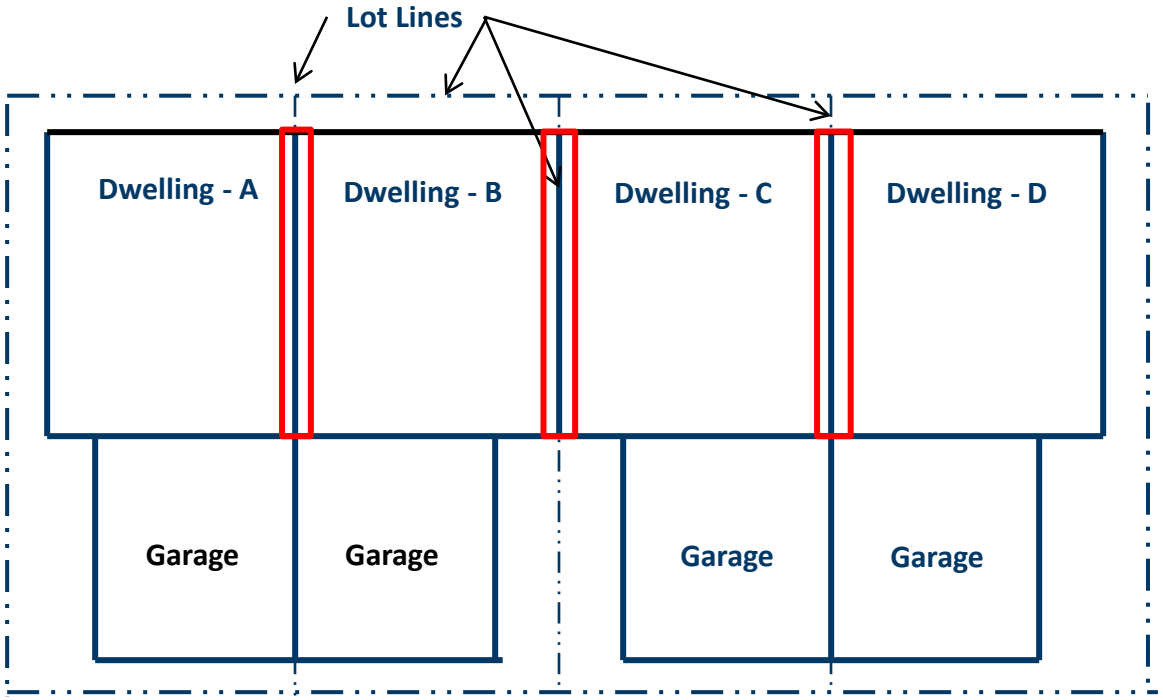
Exercise/Discussion

Sound transmission.

Exercise/Discussion

Which walls will require a sound transmission rating?

Why?



DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

½-hour?

1-hour?

2-hour?

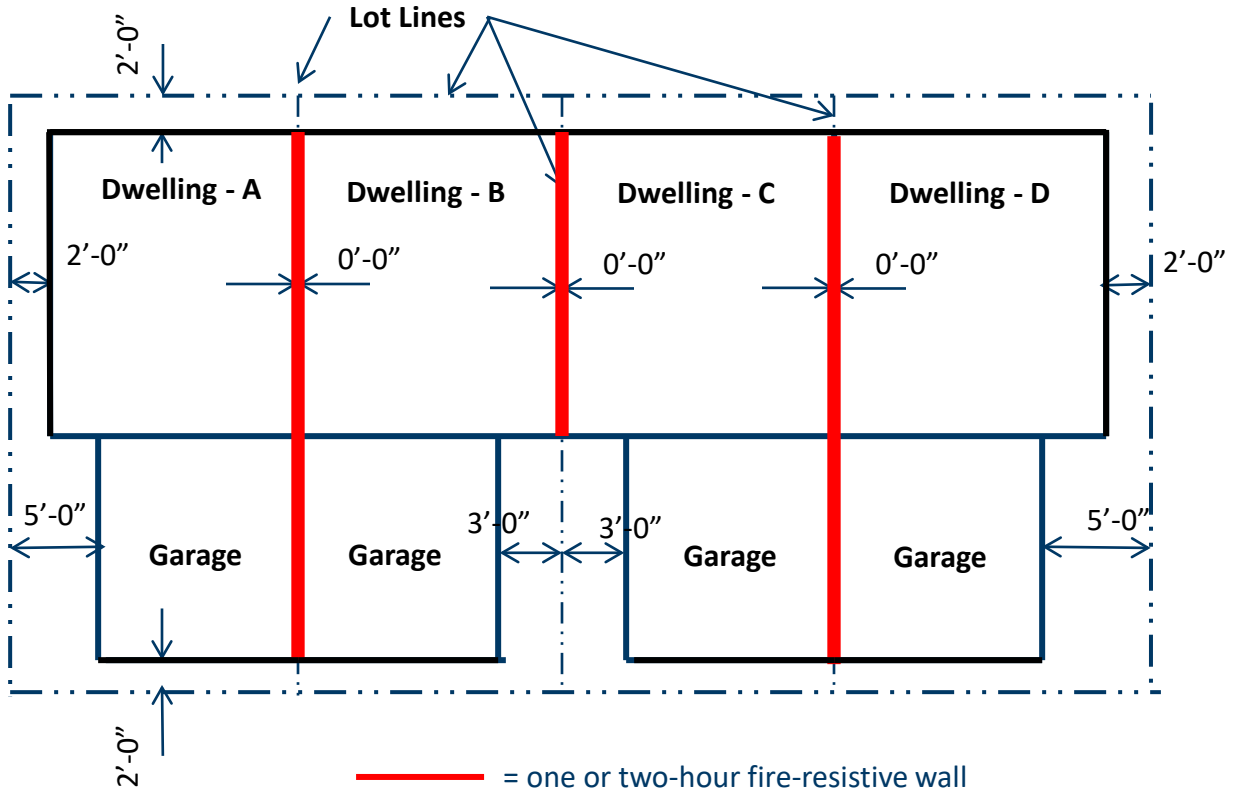
Fire Resistance Ratings

Exercise/Discussion

Fire Resistive Ratings.

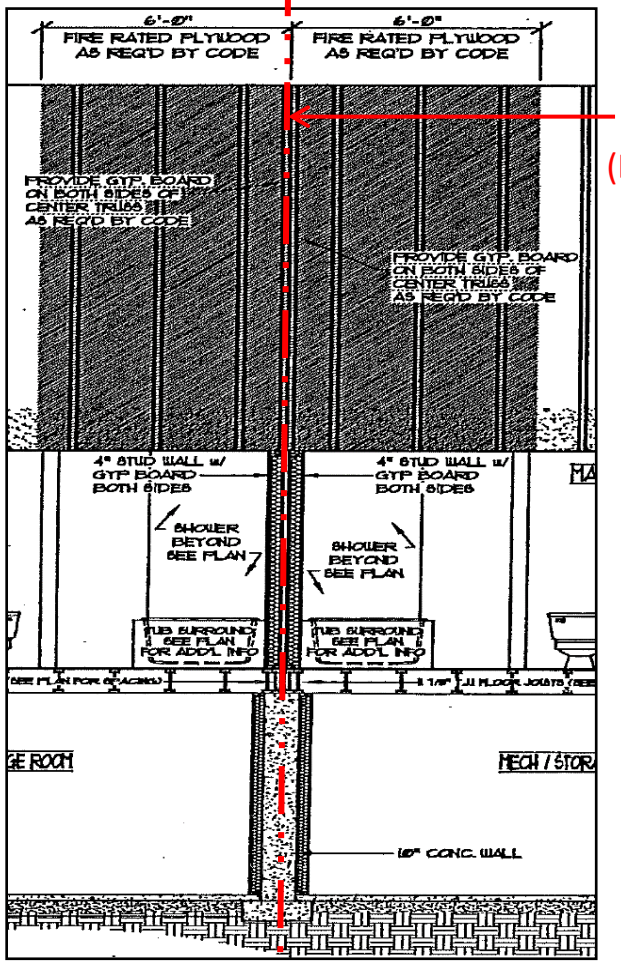
Which walls will require a fire-resistive rating?

Why?

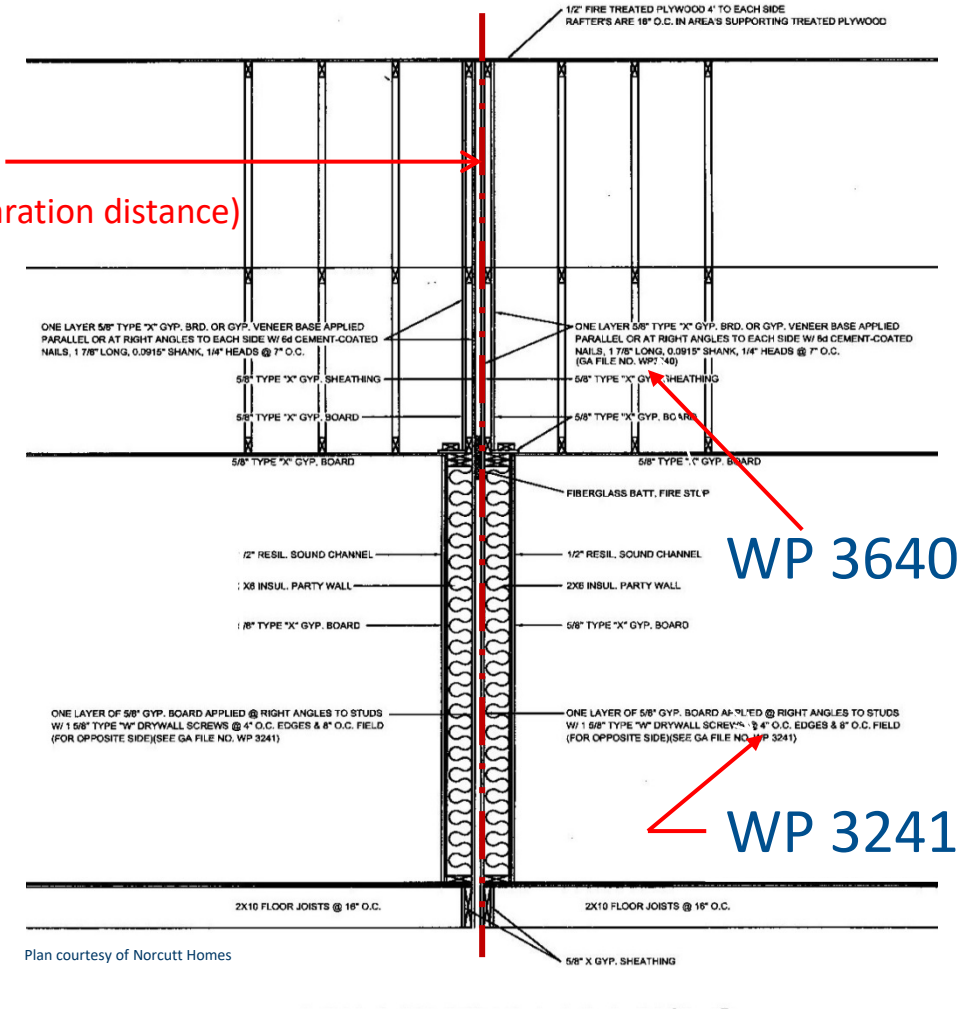


Townhouses

Fire separation distance.



Lot Line
(Line of fire separation distance)



WP 3640

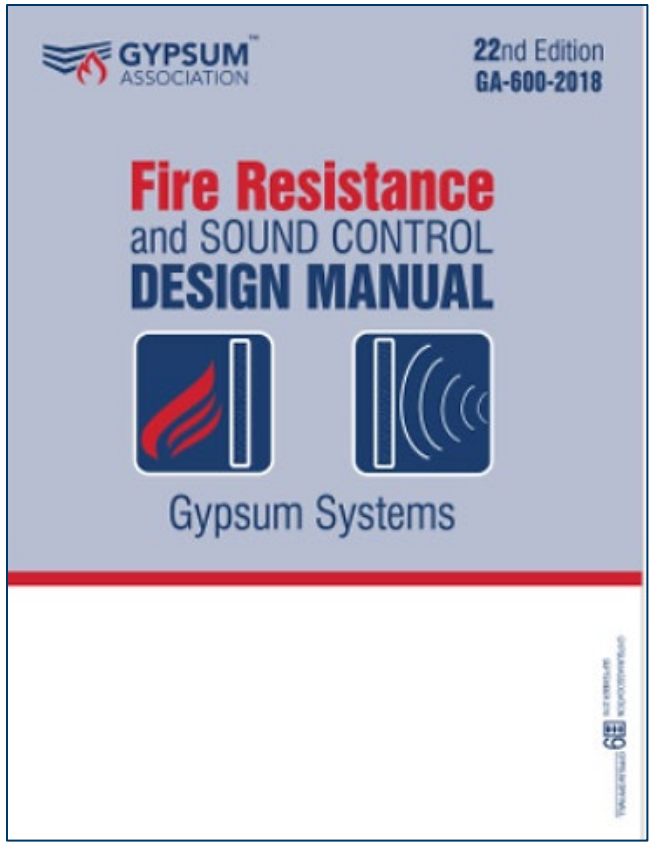
WP 3241

Plan courtesy of Norcutt Homes

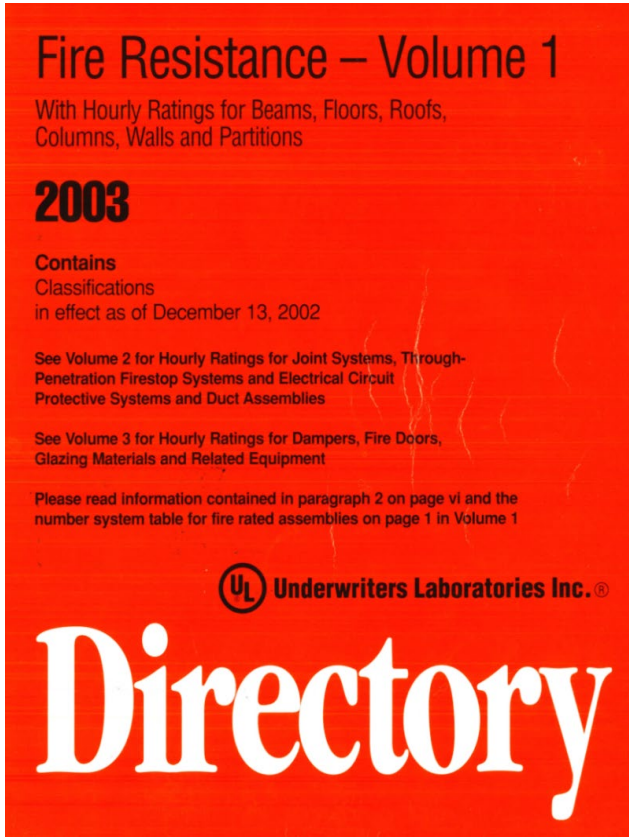
Plan courtesy of Norcutt Homes

Program Materials

Resources to verify fire-resistance ratings



GA-600-2018 Fire Resistive Design Manual



Underwriters Laboratories Fire Resistance standard

www.ul.com/productspec

Resources to verify fire-resistance ratings

Testing agencies:

- Gypsum Association (GA)
- UL

Product manufacturers:

- APA Engineered wood
- Georgia Pacific
- National Gypsum Association
- USG
- Gold Bond

Program Materials – GA-600 Notes

GENERAL EXPLANATORY NOTES

6. Unless otherwise specified, the face layers of all systems, except those with predecorated or metal covered surfaces, shall have joints taped (minimum Level 1 as specified in GA-214, *Recommended Levels of Gypsum Board Finish*) and fastener heads treated. Base layers in multi-layer systems shall not be required to have joints or fasteners taped or covered with joint compound.

Program Materials – GA-600 Notes

GENERAL EXPLANATORY NOTES

7. When a fire-resistance rated partition extends above the ceiling, the gypsum board joints occurring above the ceiling need not be taped and fasteners need not be covered when all of the following conditions are met.

   a. The ceiling is part of a fire-resistance rated floor-ceiling or roof-ceiling system;

   b. All vertical joints occur over framing members;

Program Materials – GA-600 Notes

GENERAL EXPLANATORY NOTES

7-cont.

c. Horizontal joints are either staggered 24” o.c. on opposite sides of the partition, or are covered with strips of gypsum board not less than 6” wide; or the partition is a two-layer system with joints staggered 16” or 24” o.c.; and…

(See full explanatory text)

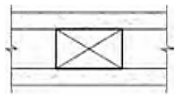
Fire Resistive Assemblies

GA FILE NO. WP 3640 | **GENERIC** | **1 HOUR FIRE**

GYPSUM WALLBOARD, WOOD STUDS

One layer 5/8" type X gypsum wallboard or gypsum veneer base applied parallel or at right angles to each side of either 2 x 3 or 2 x 4 wood studs, turned flatwise, 24" o.c. with 6d cement-coated nails, 17/8" long, 0.0915" shank, 1/4" heads, 7" o.c.

Horizontal joints staggered not less than 12" on opposite sides. **(NLB)**



Thickness: 2 7/8"
Approx. Weight: 7 psf
Fire Test: UL, 9-12-96, UL Design U338

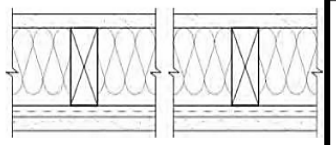
GA FILE NO. WP 3241 | **PROPRIETARY*** | **1 HOUR FIRE** | **50 to 54 STC SOUND**

GYPSUM WALLBOARD, RESILIENT CHANNELS, MINERAL FIBER INSULATION, WOOD STUDS

Resilient channels 24" o.c. attached at right angles to ONE SIDE of 2 x 4 wood studs 16" or 24" o.c. with 1 1/4" Type S drywall screws. One layer 5/8" proprietary type X gypsum wallboard or gypsum veneer base applied parallel to channels with 1" Type S drywall screws 12" o.c. End joints backblocked with resilient channels. 3" mineral fiber insulation, 2.0 or 2.3 pcf, in stud space.

OPPOSITE SIDE: One layer 5/8" proprietary type X gypsum wallboard or gypsum veneer base applied at right angles to studs with 1 1/4" Type W drywall screws 12" o.c.

Vertical joints staggered 48" on opposite sides. Sound tested with studs 16" o.c. and open face of mineral fiber insulation blankets toward resilient channel-side of stud space. **(LOAD-BEARING)**

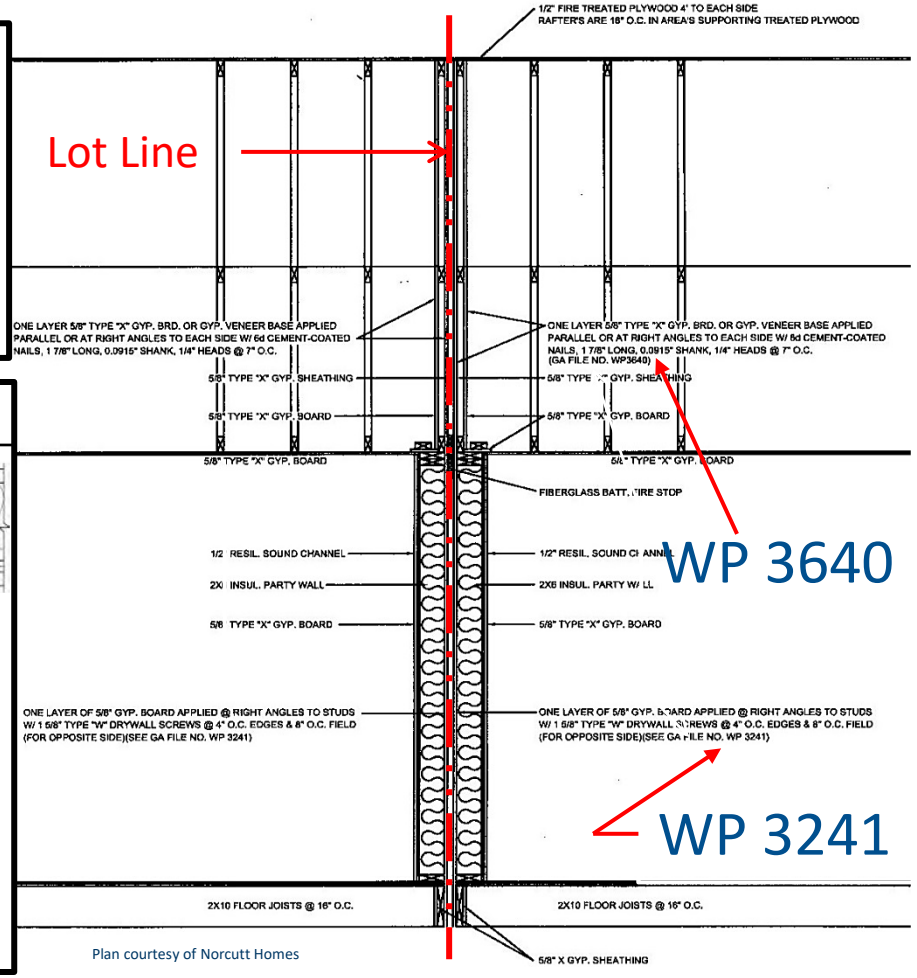


Thickness: 5 1/4"
Approx. Weight: 7 psf
Fire Test: Based on UL R3660-7, 11-12-87; UL R2717-61, 8-18-87; UL Design U311
Sound Test: Estimated

PROPRIETARY GYPSUM BOARD

CertainTeed Gypsum Inc.	-	5/8" CertainTeed® Type C Gypsum Board
CertainTeed Gypsum Canada Inc.	-	5/8" CertainTeed® Type C Gypsum Board
Georgia Pacific Gypsum LLC	-	5/8" ToughRock® Fireguard C® Gypsum Board
Lafarge North America Inc.	-	5/8" Firecheck® Type C
National Gypsum Company	-	5/8" Gold Bond® Brand FIRE-SHIELD C™ Gypsum Board
PABCO Gypsum	-	5/8" FLAME CURB® Super 'C'™
Temple-Inland	-	5/8" TG-C

GA-600-2012 Fire Resistive Design Manual



Plan courtesy of Norcutt Homes

Section R302.2.2 - 2020 MRC – Page 100, 101

Fire Resistive Assemblies

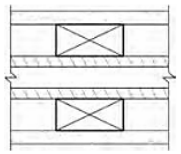
GA FILE NO. WP 3642	GENERIC	1 HOUR FIRE

GYPSUM WALLBOARD, WOOD STUDS

One layer 5/8" type X gypsum wallboard or gypsum veneer base applied parallel or at right angles to ONE SIDE of either 2 x 3 or 2 x 4 wood studs, turned flatwise, 24" o.c. with 6d cement-coated nails, 1 7/8" long, 0.0915" shank, 1/4" heads, 7" o.c.

Inner layer plywood applied with nails.

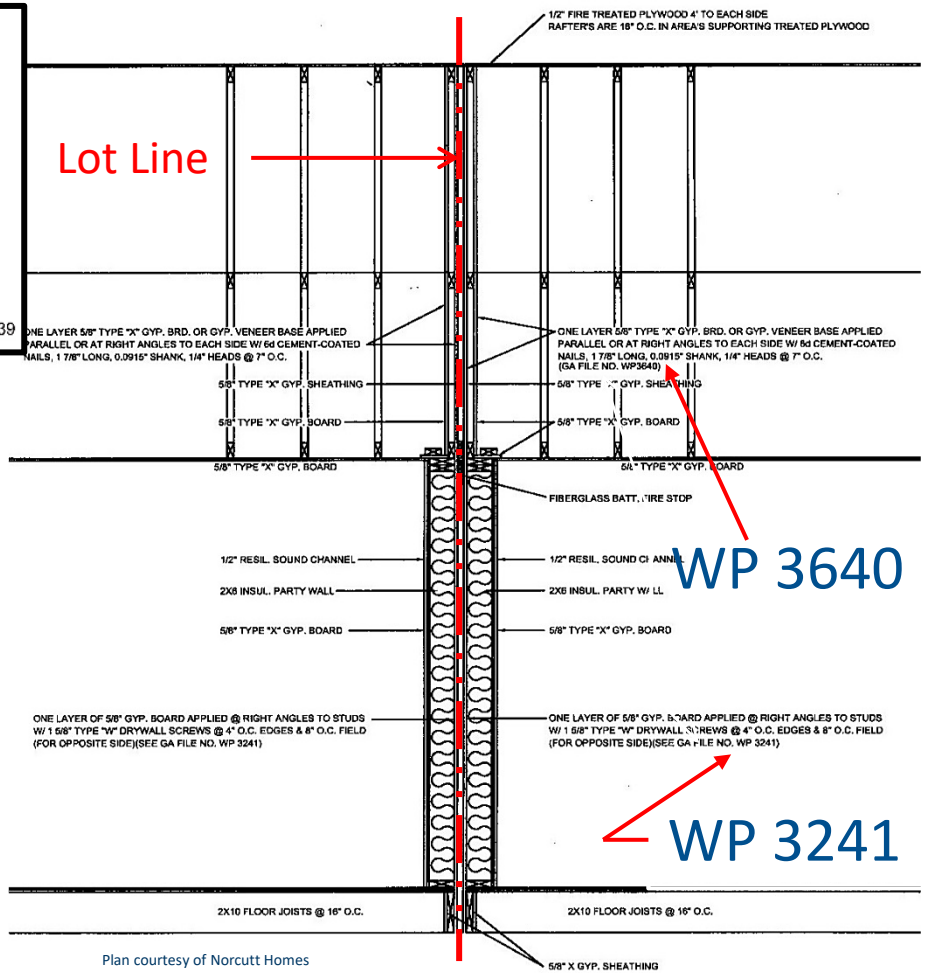
Second wall duplicate of first wall and separated by 1" air space. **(NLB)**



Thickness: 5 1/2"
Approx. Weight: 10 psf
Fire Test: UL, 9-12-96, UL Design U339

GA-600-2012 Fire Resistive Design Manual

DLI/CCLD Photo



Plan courtesy of Norcutt Homes

Section R302.2.2 - 2020 MRC – Page 100, 101

Fire Resistive Assemblies

R302.2 Townhouses. (Cont.)

R302.2.2 (1.) (sprinkler) A common 1-hour fire-resistance-rated wall…

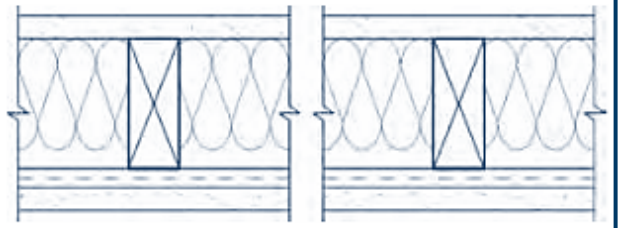
GA FILE NO. WP 3242	GENERIC	1 HOUR FIRE	50 to 54 STC SOUND

GYPSUM WALLBOARD, RESILIENT CHANNELS, MINERAL OR GLASS FIBER INSULATION, WOOD STUDS

Resilient channels 16" o.c. attached at right angles to ONE SIDE of 2 x 4 wood studs 24" o.c. with 1¼" Type S drywall screws. One layer ⅝" type X gypsum wallboard or gypsum veneer base applied at right angles to channels with 1" Type S drywall screws 8" o.c. with vertical joints located midway between studs. 3" mineral or glass fiber insulation in stud space.

OPPOSITE SIDE: One layer ⅝" type X gypsum wallboard or gypsum veneer base applied parallel or at right angles to studs with 6d cement coated nails, 1⅞" long, 0.0915" shank, ¹⁵⁄₆₄" heads, 7" o.c.

Vertical joints staggered 24" on opposite sides. **(LOAD-BEARING)**



Thickness:	5⅜"
Approx. Weight:	7 psf
Fire Test:	Based on UL R14196, 05NK05371, 2-15-05, UL Design U309
Sound Test:	NRCC TL-93-098, IRC-IR-761, 3/98

Section R302.2.2 - 2020 MRC – Page 100,101

Fire Resistive Assemblies

R302.2 Townhouses. (Cont.)

R302.2.2 (2) (**NON** Sprinkler) A common 2-hour fire-resistance-rated wall…

GA FILE NO. WP 3825	PROPRIETARY*	2 HOUR FIRE	55 to 59 STC SOUND

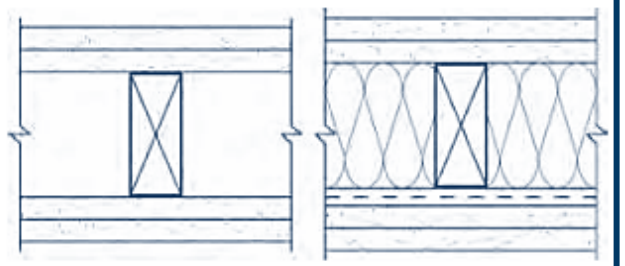
GYPSUM WALLBOARD, WOOD STUDS

Base layer 5/8" type X gypsum wallboard applied at parallel to each side of 2 x 4 wood studs 24" o.c. with 1 1/4" Type S drywall screws 8" o.c. **Face** layer 5/8" type X gypsum wallboard applied parallel to each side with 2" Type S drywall screws 8" o.c.

Joints staggered 24" each layer and side. Sound tested with resilient channels 24" o.c. on one side and and 3 1/2" glass fiber insulation in the stud cavity. **(LOAD-BEARING)**

PROPRIETARY GYPSUM BOARD

American Gypsum Company LLC - 5/8" FireBloc® Type X



NOTE: Where the word "proprietary" appears in system descriptions either the system or one or more of its components is considered proprietary. Each proprietary system shall be built utilizing the components specified by the company or companies listed under the detailed description for that system.

Section R302.2.2 - 2020 MRC – Page 100,101

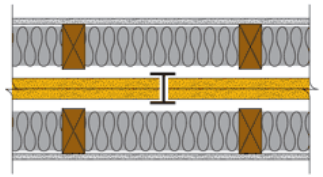
Fire Resistive Assemblies

R302.2 Townhouses. (Cont.)

R302.2.2 (2) (**NON** Sprinkler) A common 2-hour fire-resistance-rated wall…

AREA SEPARATION WALL

Two layers 1" (25.4 mm) ToughRock Shaftliner or DensGlass® Shaftliner inserted in H-Studs 24" (610 mm) o.c. Min. 3/4" (19 mm) air space on both sides must be maintained between liner panels and adjacent framing. Sound Tested with 2"x 4" stud wall with 1/2" (12.7 mm) ToughRock® Fireguard C gypsum wallboard or DensArmor Plus® Fireguard C panels each side of assembly and 3-1/2" (89 mm) fiberglass insulation in stud space both sides. Breakaway clip facings and height of wall differ between UL Design U373 and WHI GP/WA 120-04. Please consult each listing for specific information.



Hourly Rating: **2-hour**

STC Rating: **65-69 STC**

Fire Test Reference: **UL U373, ULC W312, WHI GP/WA 120-04, cUL U373, GA ASW 0810**

Sound Test Reference: **RAL TL10-291**

Approved for Assembly:

DensGlass® Shaftliner Panel

ToughRock Shaftliner

DensArmor Plus Fireguard C

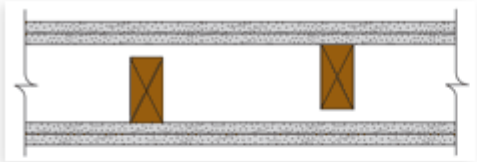
ToughRock Fireguard C

GP Georgia-Pacific Building Products

Fire Resistive Assemblies

R302.2 Townhouses. (Cont.)

R302.2.2 (2) (**NON** Sprinkler) A common 2-hour fire-resistance-rated wall



Hourly Rating: 2-hour

STC Rating: 45-49 STC

Fire Test Reference: GA WP 3910

Sound Test Reference: NOAL 17-0853, 8-30-17, NOAL 17-0854, 8-30-17

Wood-Framed Wall

Base Layer: 5/8" (15.9 mm) ToughRock® Fireguard X® or 5/8" (15.9 mm) DensArmor Plus® Fireguard® gypsum panels applied horizontally to each side of 2" x 4" wood studs 16" (406 mm) o.c. staggered 8" (203 mm) o.c. on 2"x 6" wood plates with 2" Type W screws 24" (610 mm) o.c. Face Layer: 5/8" (15.9 mm) ToughRock® Fireguard X® or 5/8" (15.9 mm) DensArmor Plus Fireguard gypsum panels applied horizontally to studs with 2-1/2" Type W Screws 8" (203 mm) o.c. Stagger vertical joints 16" (406 mm) o.c. each layer and side. Horizontal bracing required at mid height. Load Bearing

Approved for Assembly:

DensArmor Plus® Fireguard C® Products,DensArmor Plus® Fireguard® Products,DensElement® Barrier Sheathing,DensGlass® Fireguard® Sheathing,DensShield® Fireguard® Tile Backer,ToughRock® Fireguard C® Products,ToughRock® Fireguard X® Mold-Guard™ Products,ToughRock® Fireguard X® Products,ToughRock® Lite-Weight Fire-Rated Products (Meets Fire Rating but not included in Sound Testing)

Georgia-Pacific Building Products

Back to the CODE Sections

MRC Ch. 302 - Fire-Resistant Construction

R302.1 – Exterior walls

R302.2 – Townhouses

R302.3 Two-Family Dwellings

MRC Appendix K – Sound Transmission

R302.4 – Dwelling Unit Rated Penetrations (for Townhouses & 2-Family dwellings)

- R302.4.1 Through Penetrations
- R302.4.2 Membrane Penetrations

Section R202 - 2020 MRC – Page 101, 102,
Section R313 – 2020 MRC - Page 116
MRC Appendix K – Page 563

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

R302.4 – Dwelling Unit Rated Penetrations

Dwelling unit rated penetrations

MRC Ch. 302 - Fire-Resistant Construction

R302.4 - Dwelling unit rated penetrations.

Penetrations of wall or floor/ceiling assemblies required to be fire-resistance rated in accordance with Section R302.2 or R302.3 shall be protected in accordance with this section.

(R302.2 Townhouses)

(R302.3 Two-Family Dwellings)

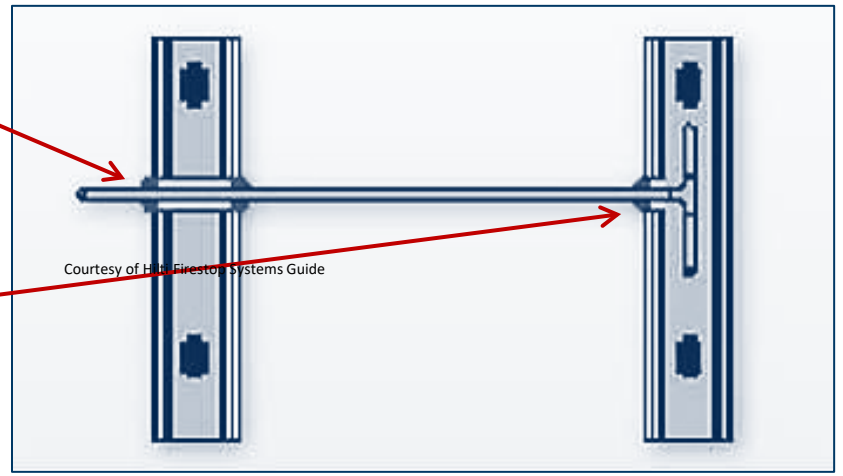
Dwelling unit rated penetrations

R302.4 - Dwelling unit rated penetrations – cont.

There are two types of penetrations to be considered:

R302.4.1 - A **through penetration** passes entirely through a fire-resistance rated assembly.

R302.4.2 - A **membrane penetration** passes through one side of fire-resistance rated assembly.



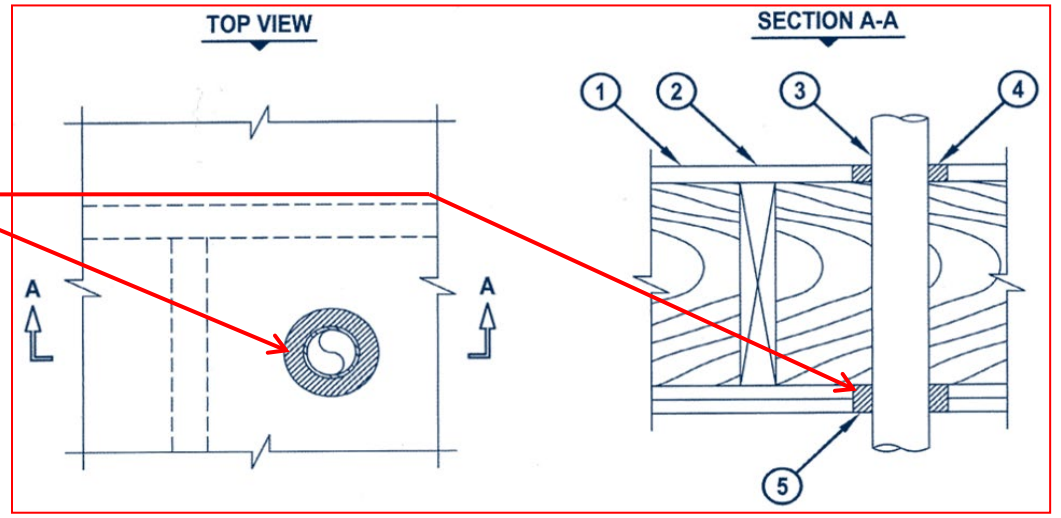
Dwelling unit rated penetrations

R302.4.1- Through penetrations.

Through penetrations of fire-resistance-rated wall or floor assemblies shall comply with Section R302.4.1.1 or R302.4.1.2.

Exception: 2. Where the penetrating items are steel, ferrous or copper pipes, tubes or conduits, the annular space shall be protected as follows:

Annular Space



See full text and exception

Dwelling unit rated penetrations

R302.4.1- Through penetrations.

Through penetrations of fire-resistance-rated wall or floor assemblies shall comply with Section R302.4.1.1 or R302.4.1.2.
See the exceptions.

R302.4.1.1 – Fire-resistive rated assembly

Penetrations shall be installed as tested in the *approved* fire-rated assembly.

R302.4.1.2 – Penetration firestop system

Penetrations shall be protected by an *approved* penetration firestop system installed as tested in accordance with ASTM E814 or UL 1479, with a positive pressure differential of not less than 0.01 inch of water (3 Pa) and shall have an F rating of not less than the required fire-resistance rating of the wall or floor-ceiling assembly penetrated.

Dwelling unit rated penetrations

R302.4.2 – Membrane penetrations.

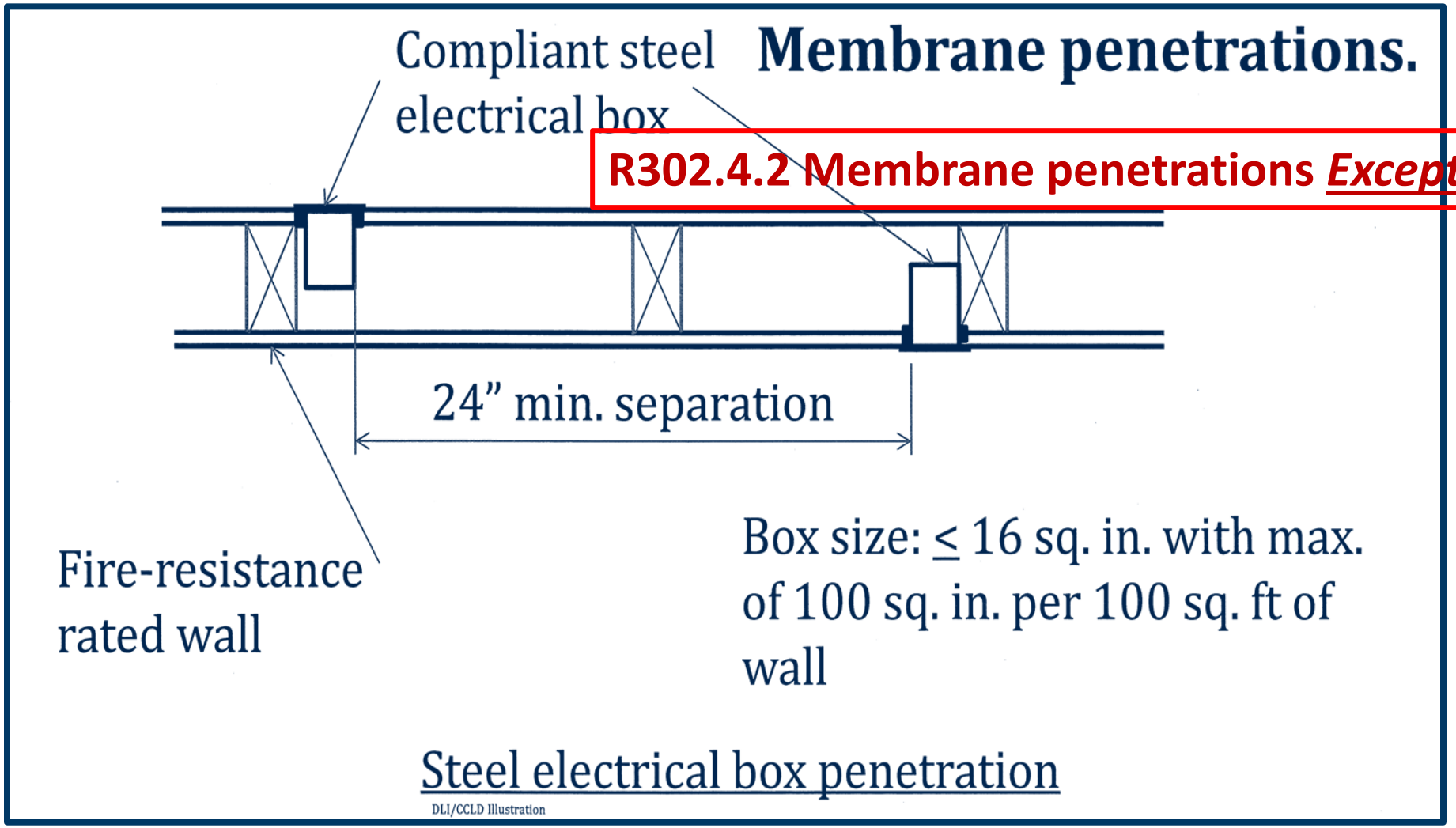
Membrane Penetrations shall comply with Section R302.4.1.

Where walls are required to have a fire-resistance rating, recessed fixtures shall be installed so that the required fire-resistance rating will not be reduced.

(See this section for Exceptions:

Exp. 1 – Steel Electrical boxes
Exp. 2 – Listed electrical boxes
Exp. 3 – Fire sprinkler annular space
Exp. 4 – Ceiling membrane penetrations

Dwelling unit rated penetrations



Section R302.4.2- 2020 MRC – Page 102 & 103

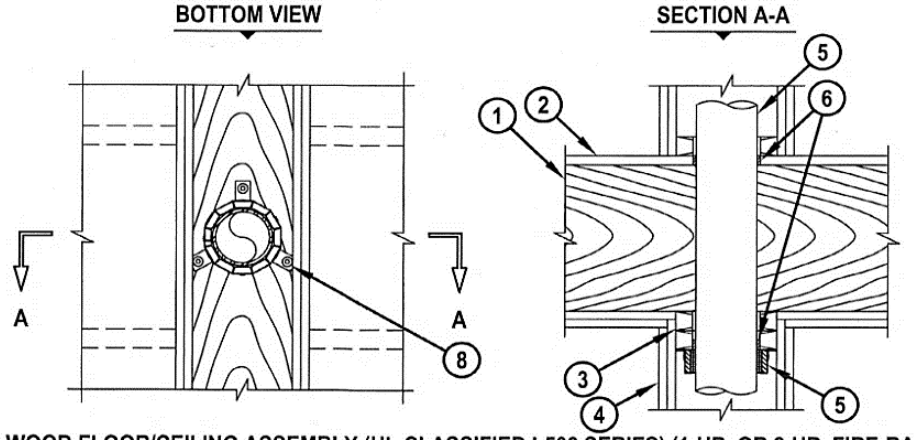
Dwelling unit rated penetrations

UL SYSTEM NO. F-C-2030

PLASTIC PIPE THROUGH WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR. OR 2-HR.
T-RATING = 0-HR., 3/4-HR., 1-HR., 1-1/2-HR. OR 2-HR.

FC2030[.022604



1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. WOOD TOP PLATE.
4. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
5. PENETRATING ITEM TO BE ONE OF THE FOLLOWING (ALSO SEE NOTE NO. 2 BELOW) :
   A. MAXIMUM 4" NOMINAL DIAMETER PVC PLASTIC PIPE (CELLULAR AND SOLID CORE).
   B. MAXIMUM 4" NOMINAL DIAMETER ABS PLASTIC PIPE (CELLULAR AND SOLID CORE).
   C. MAXIMUM 4" NOMINAL DIAMETER FRPP PLASTIC PIPE.
   D. MAXIMUM 4" NOMINAL DIAMETER CPVC PLASTIC PIPE.
6. HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT INSTALLED TO THE MAXIMUM EXTENT POSSIBLE.
7. HILTI CP 643N FIRESTOP COLLAR WITH FASTENING HOOKS (SEE TABLE BELOW).
8. 3/4" WOOD SCREWS AND WASHERS TO ATTACH EACH FASTENING HOOK.

NOMINAL PIPE DIAMETER	PRODUCT DESCRIPTION	NO. OF FASTENING HOOKS	MAXIMUM HOLE SIZE
1-1/2"	CP 643 50/1.5" N	2	2-1/2"
2"	CP 643 63/2" N	2	2-5/8"
3"	CP 643 90/3" N	3	4"
4"	CP 643 110/4" N	3	5"

NOTES : 1. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1/2".
2. CLOSED OR VENTED PIPING SYSTEM. (PVC, ABS, FRPP=SCHEDULE 40, CPVC=SDR 17).

DLI/CCLD Photo

Hilti Firestop Systems Guide

Section R302.4 - 2020 MRC – Page 102

Dwelling unit rated penetrations

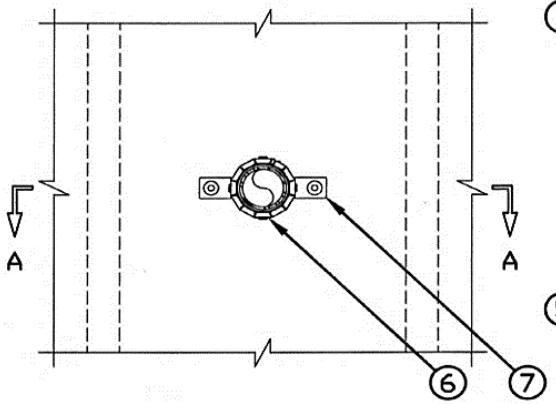
UL SYSTEM NO. F-C-2128

PLASTIC PIPE THROUGH 1-HR. OR 2-HR. WOOD FLOOR/CEILING ASSEMBLY

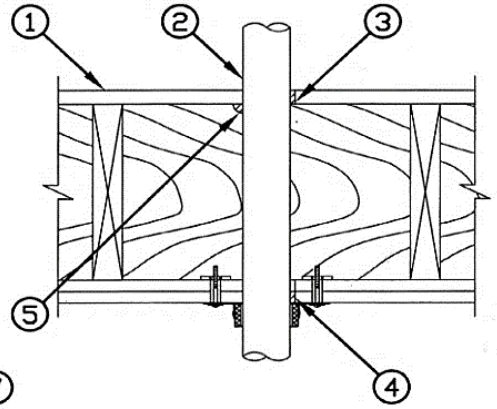
F-RATING = 1-HR. OR 2-HR.
T-RATING = 1-HR. OR 2-HR.

FC2128d022704

BOTTOM VIEW



SECTION A-A



1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING (SEE NOTE NO. 3 BELOW) :
   A. MAXIMUM 2" NOMINAL DIAMETER PVC PLASTIC PIPE (CELLULAR AND SOLID CORE).
   B. MAXIMUM 2" NOMINAL DIAMETER ABS PLASTIC PIPE (CELLULAR AND SOLID CORE).
   C. MAXIMUM 2" NOMINAL DIAMETER CPVC PLASTIC PIPE.
3. MINIMUM 3/4" DEPTH OF HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.
4. MINIMUM 5/8" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.
5. MINIMUM 1/2" BEAD OF HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT AT POINT OF CONTACT.
6. HILTI CP 643N FIRESTOP COLLAR WITH FASTENING HOOKS.
7. HILTI 3/16" TOGGLER BOLTS TO ATTACH EACH FASTENING HOOK TO FLOOR/CEILING ASSEMBLY.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 3".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 5/8".
3. CLOSED OR VENTED PIPING SYSTEM. (PVC & ABS = SCHEDULE 40, CPVC = SDR 17).
4. CHASE WALL (NOT SHOWN, OPTIONAL) - THE THROUGH PENETRANT MAY BE ROUTED THROUGH A 1-HR. OR 2-HR. FIRE-RATED GYPSUM CHASE WALL.

Hilti Firestop Systems Guide

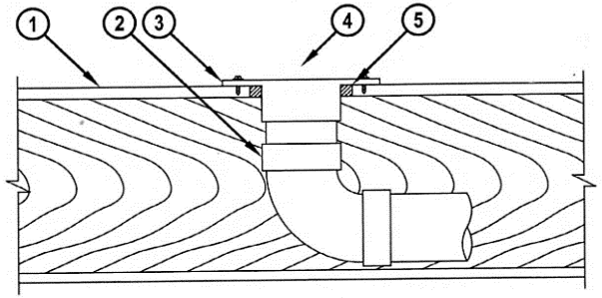
UL SYSTEM NO. F-C-2203

CLOSET FLANGE IN 1-HR. WOOD FLOOR/CEILING ASSEMBLY

F-RATING = 1-HR.
T-RATING = 1/2-HR.

FC2203a.032902

CROSS-SECTIONAL VIEW



1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. DRAIN PIPING AND 90° ELBOW TO BE ONE OF THE FOLLOWING:
   A. NOMINAL 4" DIAMETER PVC PLASTIC PIPE (SCHEDULE 40).
   B. NOMINAL 4" DIAMETER ABS PLASTIC PIPE (SCHEDULE 40).
3. PVC OR ABS CLOSET FLANGE SIZED TO ACCOMMODATE DRAIN PIPE. CLOSET FLANGE SECURED TO PLYWOOD SUBFLOOR WITH STEEL SCREWS.
4. (NOT SHOWN). FLOOR MOUNTED VITREOUS CHINA WATER CLOSET.
5. MINIMUM 3/4" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.

NOTE : DIAMETER OF OPENING TO BE MAXIMUM 1/2" LARGER THAN OUTSIDE DIAMETER OF CLOSET FLANGE.

Hilti Firestop Systems Guide

CODE Sections

MRC Ch. 313 – Automatic Fire Sprinkler Systems

R313.1 – Townhouse Sprinklers

R313.2 – One and Two-Family Dwellings

R313.3 – Installation Requirements

R313.4 – State Licensed Facilities

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Appendix K - Page 563

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

Two-Family Dwellings
&
Townhouses

SPRINKLERS ?

MRC Ch. 313 – Automatic Fire Sprinkler Systems

R313.1 - Townhouse automatic fire sprinkler systems

An automatic fire sprinkler system shall be installed in ***townhouses***.

Exceptions:

1. An automatic residential fire sprinkler system shall **NOT** be required to be installed in a **two-unit** townhouse, unless required by Section R313.4. (State-licensed facilities)
2. An automatic residential fire sprinkler system shall not be required when additions or alterations are made to existing townhouses that do not have an automatic residential fire sprinkler system installed.

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Townhouses

Effective Monday, June 5, 2017, MR 1309.0313 was amended and published in the State Register establishing that one- and two-family dwellings, or two-unit townhouses, shall NOT be required to have automatic fire sprinkler systems under the 2015 MN Residential Code (remains in effect for 2020 MRC)

MRC Ch. 313 – Automatic Fire Sprinkler Systems

R313.1 Townhouse automatic fire sprinkler systems

R313.1.1 Design and installation.

Automatic residential fire sprinkler systems for *townhouses* shall be designed and installed in accordance with IRC Section P2904 or NFPA 13D.

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Two-Family dwelling – Fire Sprinklers

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MRC Ch. 313 – Automatic Fire Sprinkler Systems

R313.2 One- and two-family dwellings automatic fire systems.

An automatic residential fire sprinkler system shall **not** be required to be installed in one- and two-family *dwellings*, unless required by Section R313.4. (State Licensed)

R313.2.1 Design and installation.

Automatic residential fire sprinkler systems shall be designed and installed in accordance with IRC Section P2904 or NFPA 13D.

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MRC Ch. 313 – Automatic Fire Sprinkler Systems

R313.3 Installation requirements

When an automatic sprinkler system is required in two-family dwellings, it shall be installed in accordance with IRC Section P2904 or NFPA 13D.

Automatic sprinkler systems required in two-family dwellings and townhouse buildings shall be installed in accordance with the following:

1. Attached garages are required to have one dry head sprinkler located within 5 lineal feet of each door installed in the common wall separating the dwelling unit and the attached garage;

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MRC Ch. 313 – Automatic Fire Sprinkler Systems

R313.3 Installation requirements – cont.

2. Attached covered patios, covered decks, covered porches, and similar structures are required to have automatic sprinklers with a minimum of one dry head for every 20 lineal feet of common wall between the dwelling unit and the covered patio, covered deck, covered porch, or similar structure.

Exception:

Attached roofs of covered patios, covered decks, covered porches, or similar structures that do not exceed 40 square feet of floor area.

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MRC Ch. 313 – Automatic Fire Sprinkler Systems

R313.4 State Licensed Facilities

One- and two-family dwellings and townhouse buildings containing facilities required to be licensed or registered by the state of Minnesota

Shall be provided with an automatic sprinkler system required by the applicable licensing provisions of that agency or according to this part, whichever is more restrictive.

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Automatic fire sprinklers

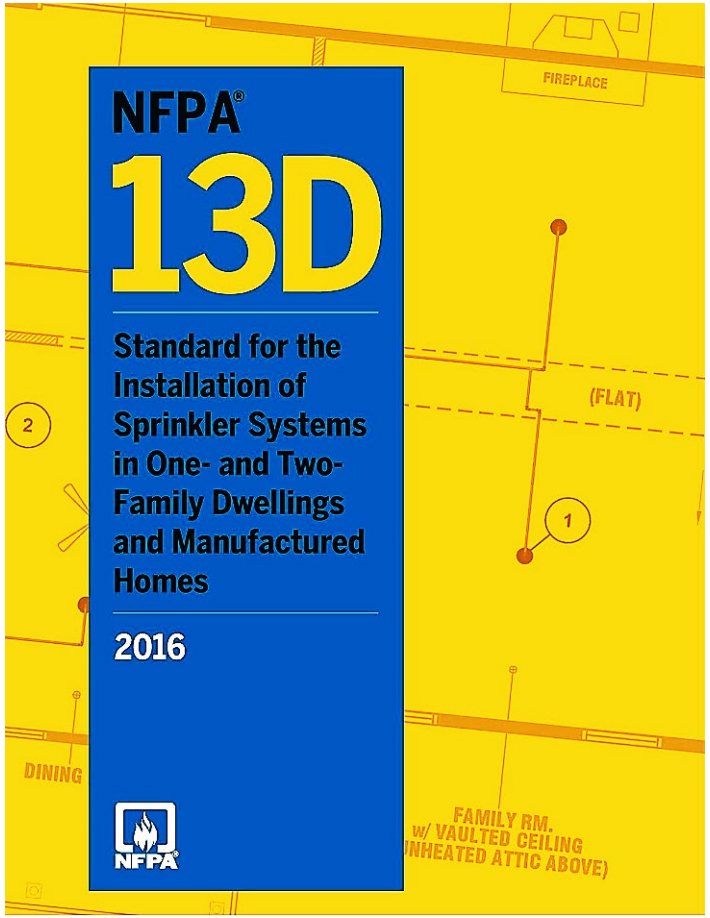
General information.

NFPA 13D or Section P2904

Standard for the installation of sprinkler systems in One- and two-family dwellings, and townhouses.

Designed for life safety only.

Typically, the same water supply as domestic.



NFPA 13D Standard

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Automatic fire sprinklers

IRC-1 Single-family dwellings

Fire sprinklers not required unless by R313.4

IRC-2 Two-family dwellings

Fire sprinklers not required unless by R313.4

IRC-3 Townhouses (two unit)

Fire sprinklers not required unless by R313.4

IRC-3 Townhouses (three or more)

Fire sprinklers required

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DLI/CCLD Photos

DEPARTMENT OF LABOR AND INDUSTRY
CONSTRUCTION CODES AND LICENSING

Q & A

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