

MBOA ANNUAL SPRING SEMINAR 2021 SPATIAL SEPARATION

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SUMMARY

- 9.10.14.
 - Stacked dwelling units and anything not covered under subsection 9.10.15.
- 9.10.15.
 - Single family dwellings, side-by-side duplex/row housing, secondary suite



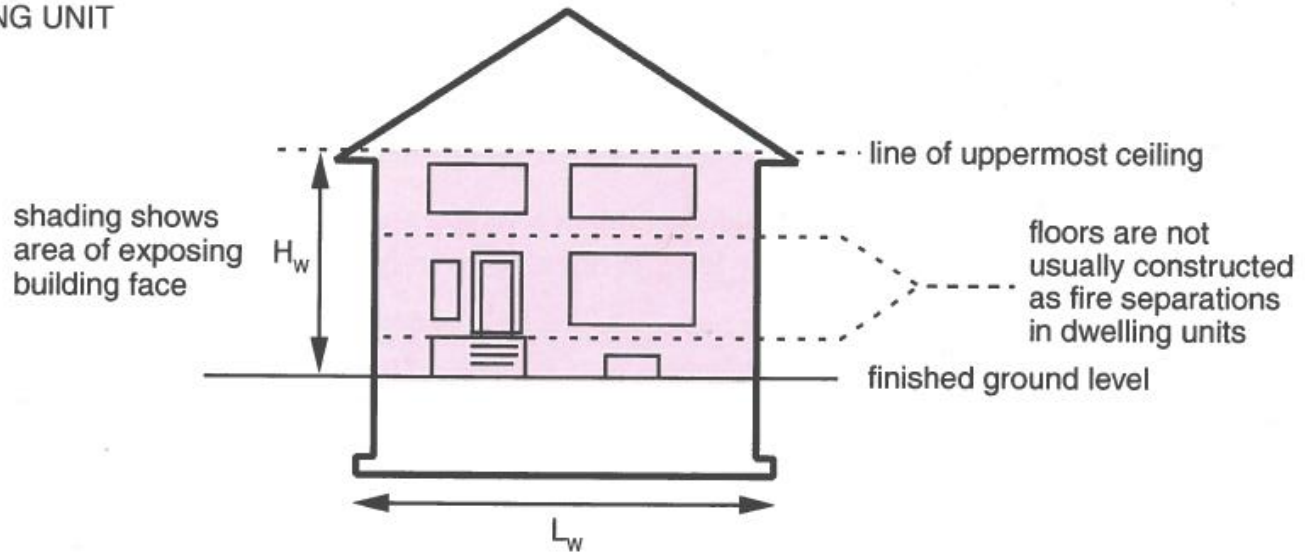
EXPOSING BUILDING FACE

- “*Exposing Building Face (EBF)* means that part of the exterior wall of a *building* that faces one direction and is located between ground level and the ceiling of its top *storey* or, where a *building* is divided into *fire compartments*, the exterior wall of a *fire compartment* that faces one direction.”



EXPOSING BUILDING FACE

DWELLING UNIT



FIRE COMPARTMENT

- “**Fire Compartment** means an enclosed space in a *building* that is separated from all other parts of the *building* by enclosing construction providing a *fire separation* having a required *fire-resistance rating*.”
- “**Fire Separation** means a construction assembly that acts as a barrier against the spread of fire.”
- “**Fire-resistance rating** means the time in minutes or hours that a material or assembly of materials will withstand the passage of flame and the transmission of heat when exposed to fire under specified conditions of test and performance criteria, or as determined by extension or interpretation of information derived therefrom as prescribed in this Code.” (Division B, Appendix D)

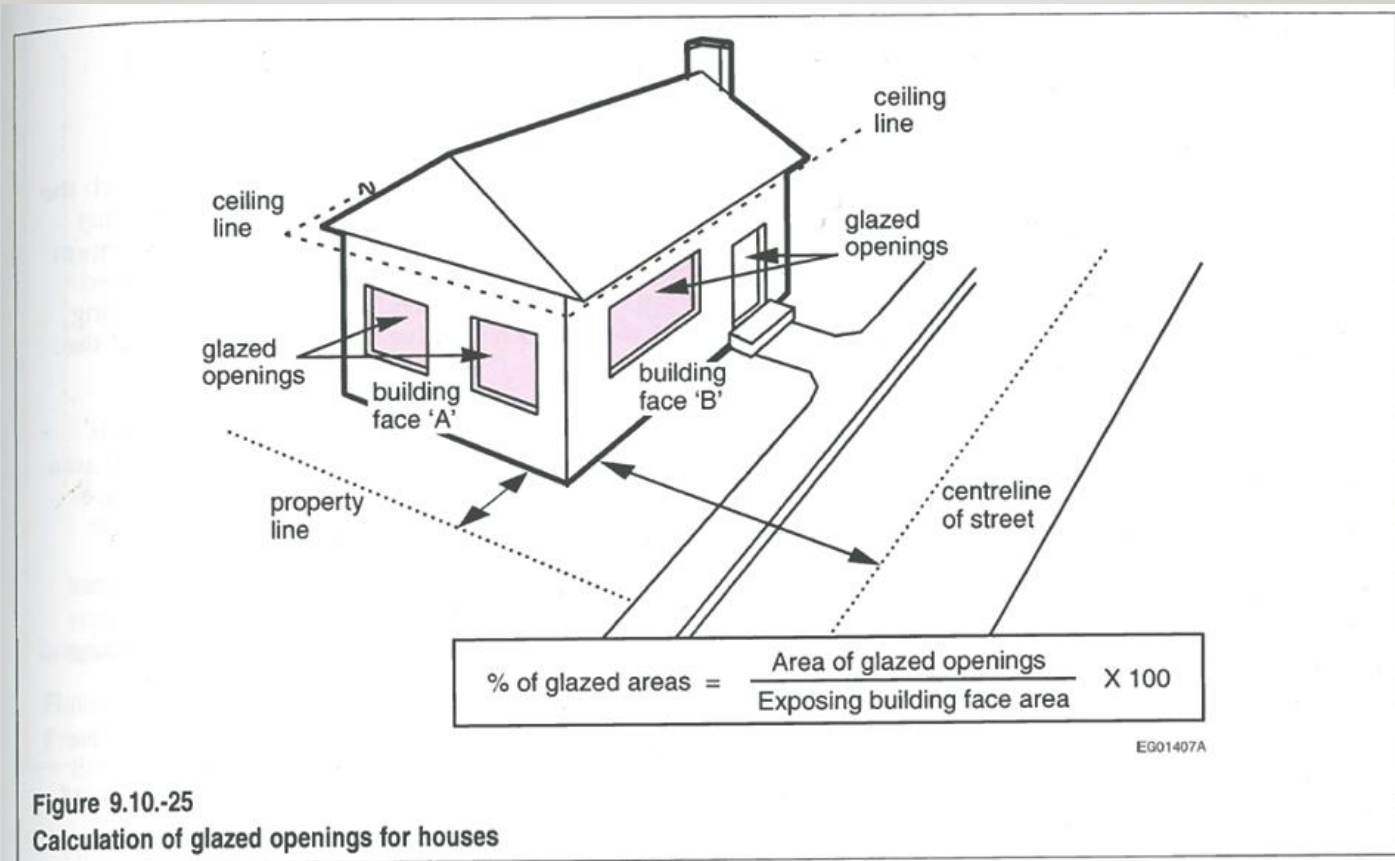


LIMITING DISTANCE

- “Limiting Distance means the distance from an exposing building face to a property line, the center line of a street, lane or public thoroughfare, or to an imaginary line between 2 buildings or fire compartments on the same property, measured at **right angles** to the exposing building face.”



LIMITING DISTANCE



UNPROTECTED OPENINGS VS. GLAZED OPENINGS

- “Unprotected openings means a doorway, window or opening other than one equipped with a closure having the required fire-protection rating, or any part of a wall forming part of the exposing building face that has a fire-resistance rating less than that required for the exposing building face.”
- Glazed openings is not a defined term but is understood to mean all glass (windows & doors).



9.10.15.3. LIMITING DISTANCE & FIRE DEPARTMENT RESPONSE

- LD equal to half the actual LD shall be used as input for Table 9.10.15.5.A. where,
 - Based on fire department response to the building exceeds 10 minutes in 10% or more of all calls to the subject building, AND
 - Any storey in the building is not sprinklered.



9.10.15.4. GLAZED OPENINGS IN EXPOSING BUILDING FACE

- Max aggregate area of glazed openings shall
 - Conform to Table 9.10.15.4.A.
 - Conform to Subsection 3.2.3., or
 - Where $LD > 1.2$ m, be equal to or less than the LD squared
- $LD = 1.2$ m and building is not sprinklered, individual glazed openings or group of glazed openings shall not exceed 60% of the max allowable aggregate area (MBC)
 - Exception is minimum required bedroom egress window



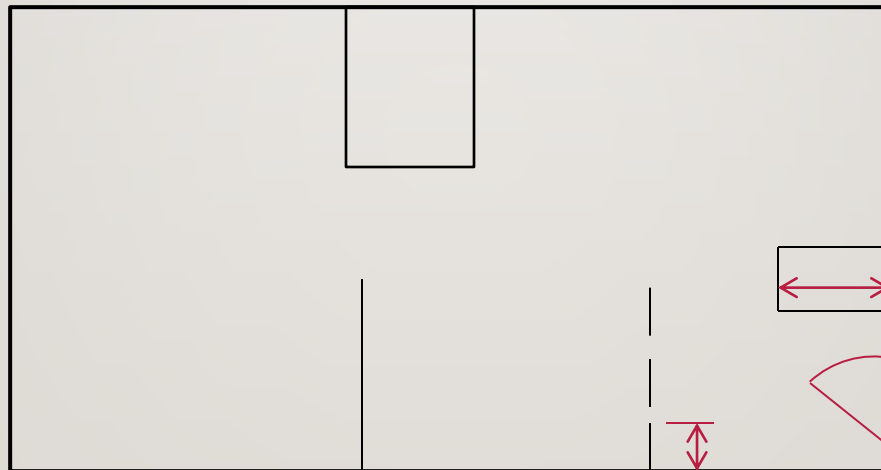
9.10.15.4. GLAZED OPENINGS IN EXPOSING BUILDING FACE

- Grouping or large window requirements
 - Spacing between individual glazed openings serving a single room or space shall not be less than
 - 2.0 m horizontally from another glazed opening on the same exposing building face serving the single room or space
 - 2.0 m vertically from another glazed opening serving the single room or space, or another room or space on the same storey
 - “Single Room or Space” means 2 or more adjacent spaces with full height wall extending < 1.5 m from the exterior wall into the space. Or 2 or more stacked spaces that are on the same storey



9.10.15.4. GLAZED OPENINGS IN EXPOSING BUILDING FACE

- Example of 9.10.15.4.(4) and (5)



9.10.15.4. GLAZED OPENINGS IN EXPOSING BUILDING FACE

- Limits on area of glazed openings shall not apply to the EBF of a dwelling unit facing a detached garage or accessory building, where
 - Accessory building serves only one dwelling unit
 - Accessory building is located on same property as dwelling unit, and
 - The dwelling unit served by the accessory building is only major occupancy on the property.



9.10.15.5. CONSTRUCTION OF EBF OF HOUSES

- Each EBF and any exterior wall above the EBF (enclosing attic or roof) shall conform to Sentences (2) & (3) unless otherwise noted in Sentences (4) & (12).
- Sentence (2): $LD < 0.6$ m EBF requires 45 minute FRR and cladding meeting specified installation and material requirements or meet CAN/ULC –S134 “Fire Test of Exterior Wall Assemblies”



9.10.15.5. CONSTRUCTION OF EBF OF HOUSES

- Sentence (3): $LD \geq 0.6$ m and < 1.2 m EBF shall have FRR not less than 45 minutes and cladding meeting specified installation and material requirements or meet CAN/ULC – S134 “Fire Test of Exterior Wall Assemblies”



9.10.15.5. CONSTRUCTION OF EBF OF HOUSES

- Sentence (4): Requirements for cladding and FRR does not apply to EBF facing detached accessory structures where the accessory structure
 - Serves only one dwelling unit
 - located on the same property
 - Dwelling unit is the only major occupancy on the property



9.10.15.5.(5) & (6)

COMBUSTIBLE PROJECTIONS

- Not permitted when > 1.0 m above grade,
 - 1.2 m from property line or C.L. of public way.
 - 2.4 m from combustible projection on another building on the same property.
- Exceptions to the rule; Sentence (6)
 - Buildings containing 1 or 2 dwelling units only
 - Accessory Buildings serves one unit, same property and only occupancy.
 - For exception to Sentence (6) see Sentences (8) to (10.1).

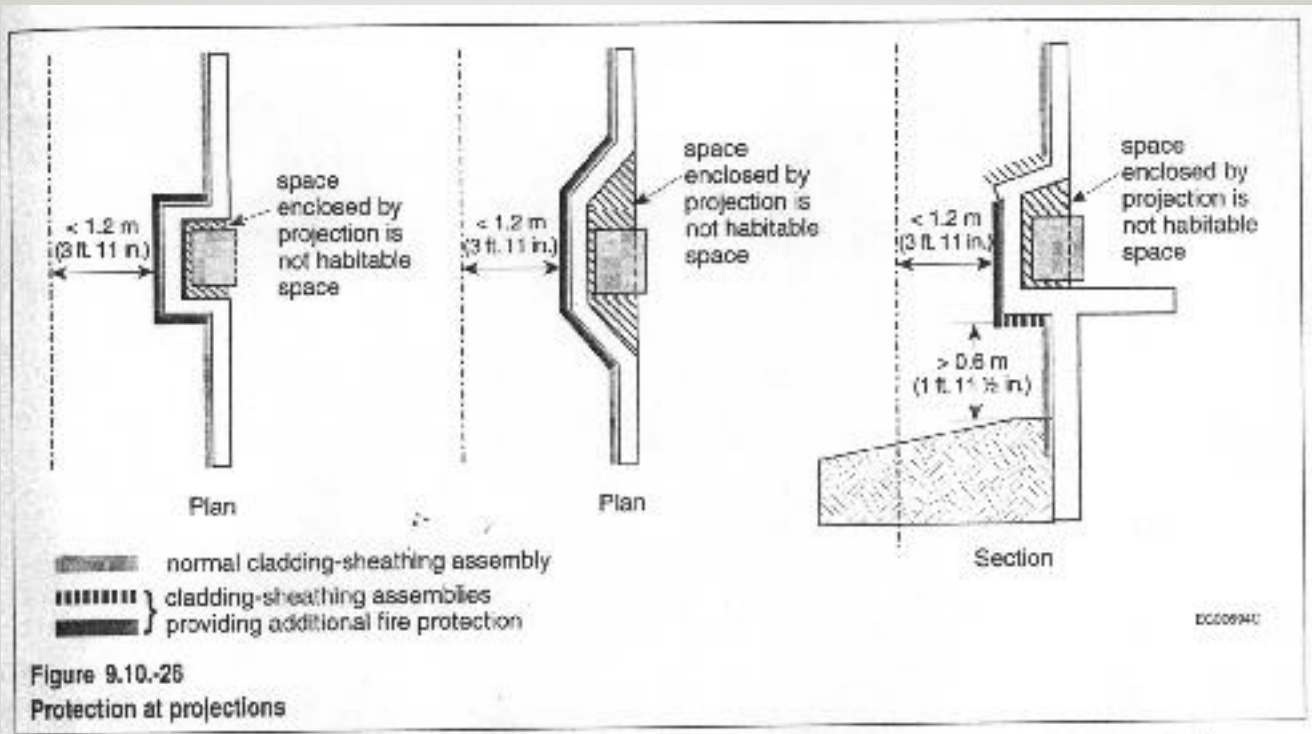


9.10.15.5.(7) COMBUSTIBLE PROJECTIONS CONTINUED

- When permitted by Sentence (6) & projection is totally enclosed, constructed with solid faces & extends \leq 1.2 m of a property line
 - Construction of face & sides to comply with EBF requirements per Sentences (2) & (3).
 - Underside $>$ 0.6 m above finished grade to be protected by listed options



9.10.15.5. COMBUSTIBLE PROJECTIONS EXAMPLE



9.10.15.5.(8), (9) & (10) PROJECTION OF ROOF SOFFIT DISTANCES

- $LD \leq 0.45$ m projecting roof soffits not permitted
- $LD > 0.45$ m face of roof soffits above EBF shall not project less than 0.45 m to property line.
- Soffits within 1.2 m LD, no openings are permitted and be protected by listed options.
 - “Unvented aluminum”



9.10.15.5. PROJECTION OF ROOF SOFFIT DISTANCES PER MBC

- MBC adds Sentence (9.1.): Sentences (8) and (9) do not apply where the EBF; except for the portion of the EBF that is within 1 m of the front of the building; is completely clad with non-combustible cladding.
- MBC adds Sentence (10.1.): Sentence 10 does not apply where the EBF below the roof soffits; except for the portion of the EBF that is within 1 m of the front of the building; is completely clad with non-combustible cladding.



9.10.15.5.(11) PROTECTION OF ROOF SOFFIT

- Buildings of combustible construction; materials installed to provide the required protection for soffits may be covered with a combustible or non-combustible finish material.



9.10.15.5.(12)

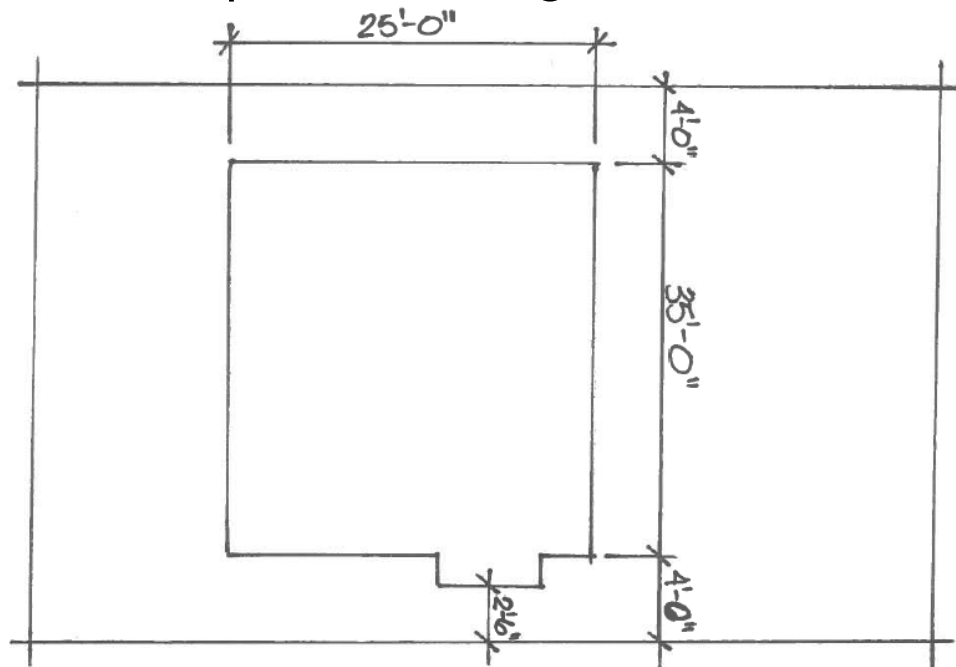
HEAVY TIMBER & STEEL COLUMNS

- Need not conform to Sentence (1) (Table 9.10.14.5.A.)
provided ≥ 3.0 m LD



SPATIAL SEPARATION BETWEEN HOUSES: EXAMPLE I

- Review site plan for limiting distance.



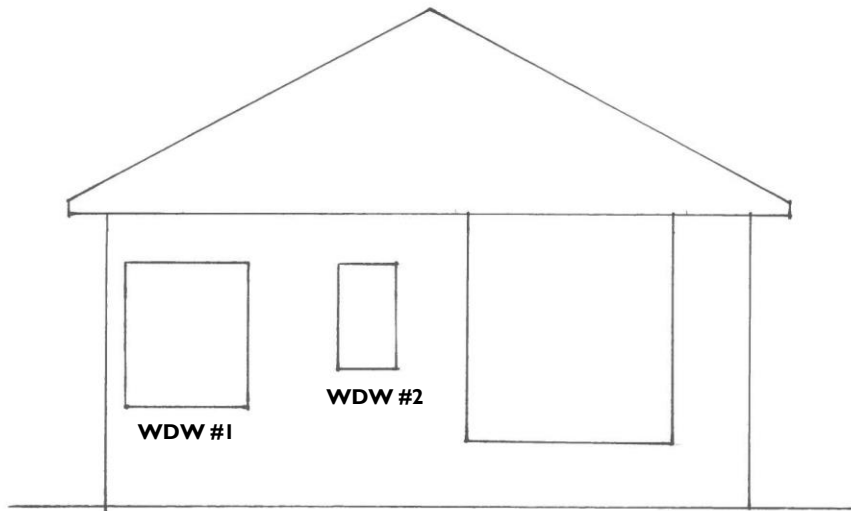
Limiting distance
is 4 ft (1.2 m)

Cantilever
Limiting distance
is 2'-6 ft (0.762 m)



SPATIAL SEPARATION BETWEEN HOUSES: EXAMPLE I

- Calculate *exposing building face* (EBF) area.



EBF Height = 11.5'
EBF Width = 25'
EBF Area = 287.5 sq. ft.
(26.7 m²)



SPATIAL SEPARATION BETWEEN HOUSES: EXAMPLE I

- Determine the maximum aggregate area of glazed openings.

Table 9.10.15.4.
Maximum Area of Glazed Openings in Exterior Walls of Houses
 Forming Part of Sentences 9.10.15.4.(1) and (2)

Maximum Total Area of Exposing Building Face, m ²	Maximum Aggregate Area of Glazed Openings, % of Exposing Building Face Area											
	Limiting Distance, m											
	Less than 1.2	1.2	1.5	2.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
30	0	7	9	12	39	88	100	—	—	—	—	—
40	0	7	8	11	32	69	100	—	—	—	—	—
50	0	7	8	10	28	57	100	—	—	—	—	—
100	0	7	8	9	18	34	56	84	100	—	—	—
Over 100	0	7	7	8	12	19	28	40	55	92	100	—



9.10.15. SPATIAL SEPARATION BETWEEN HOUSES: EXAMPLE I

- Calculate proposed glazing area on EBF.
- Example I:

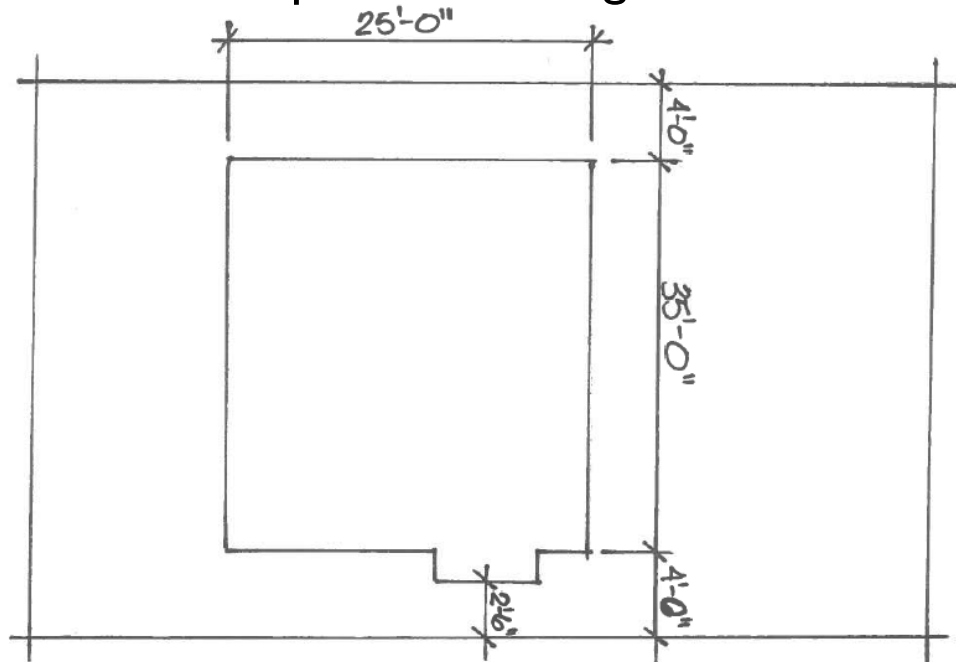
Window	Dimensions	Area (Sq. Ft.)
Window #1	3'x4'	12
Window #2	2'x3'	6
	Total:	18
		$(18/\text{area}) \times 100 =$
		$(18/287.5) \times 100 = 6.2\%$

- Compare: max is 7%, actual is 6.2%.



SPATIAL SEPARATION BETWEEN HOUSES: EXAMPLE 2

- Review site plan for limiting distance.

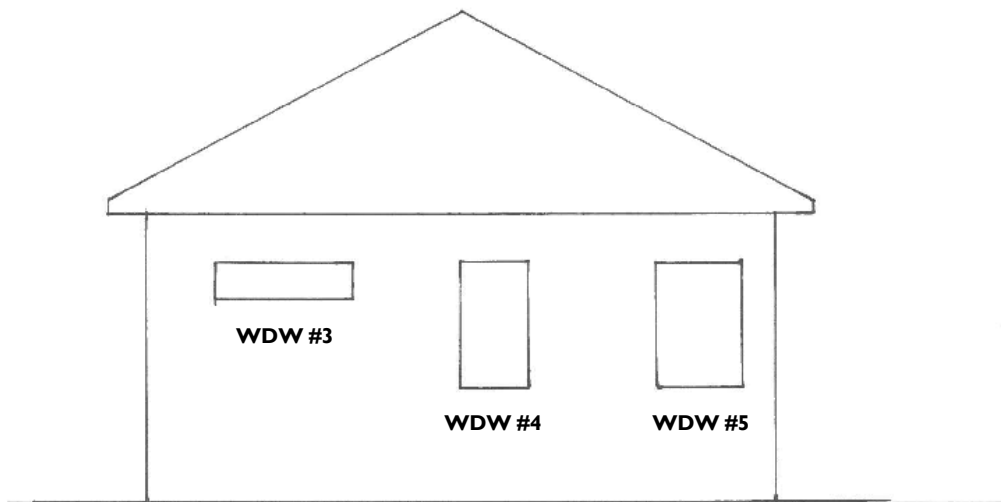


Limiting distance
is 4 ft (1.2 m)



SPATIAL SEPARATION BETWEEN HOUSES: EXAMPLE 2

- Calculate *exposing building face* (EBF) area.



EBF Height = 11.5'
EBF Width = 25'
EBF Area = 287.5 sq. ft.
(26.7 m²)



SPATIAL SEPARATION BETWEEN HOUSES: EXAMPLE 2

- Determine the maximum aggregate area of glazed openings.

Table 9.10.15.4.
Maximum Area of Glazed Openings in Exterior Walls of Houses
 Forming Part of Sentences 9.10.15.4.(1) and (2)

Maximum Total Area of Exposing Building Face, m ²	Maximum Aggregate Area of Glazed Openings, % of <i>Exposing Building Face Area</i>											
	<i>Limiting Distance, m</i>											
	Less than 1.2	1.2	1.5	2.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
30	0	7	9	12	39	88	100	—	—	—	—	—
40	0	7	8	11	32	69	100	—	—	—	—	—
50	0	7	8	10	28	57	100	—	—	—	—	—
100	0	7	8	9	18	34	56	84	100	—	—	—
Over 100	0	7	7	8	12	19	28	40	55	92	100	—



9.10.15. SPATIAL SEPARATION BETWEEN HOUSES: EXAMPLE 2

- Calculate proposed glazing area on EBF.
- Example 2:

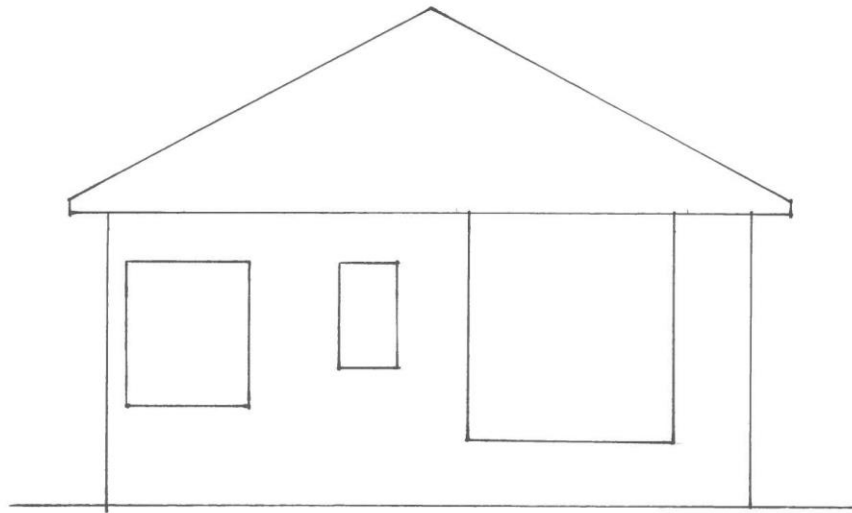
Window	Dimensions	Area (Sq. Ft.)
Window #3	5'x1'	5
Window #4	2'x4'	8
Window #5	3'x4'	12
	Total:	25
		$(25/287.5) \times 100 = 8.7\%$

- Compare: max is 7%, actual is 8.7%.



SPATIAL SEPARATION BETWEEN HOUSES: ROOF SOFFITS

- Roof soffits are subject to Sentence 8 to 10.1 requirements



9.10.15. SPATIAL SEPARATION BETWEEN HOUSES

- Staggered
- Skewed
- Fire compartments
- Building to Building



9.10.15. SPATIAL SEPARATION BETWEEN HOUSES: STAGGERED

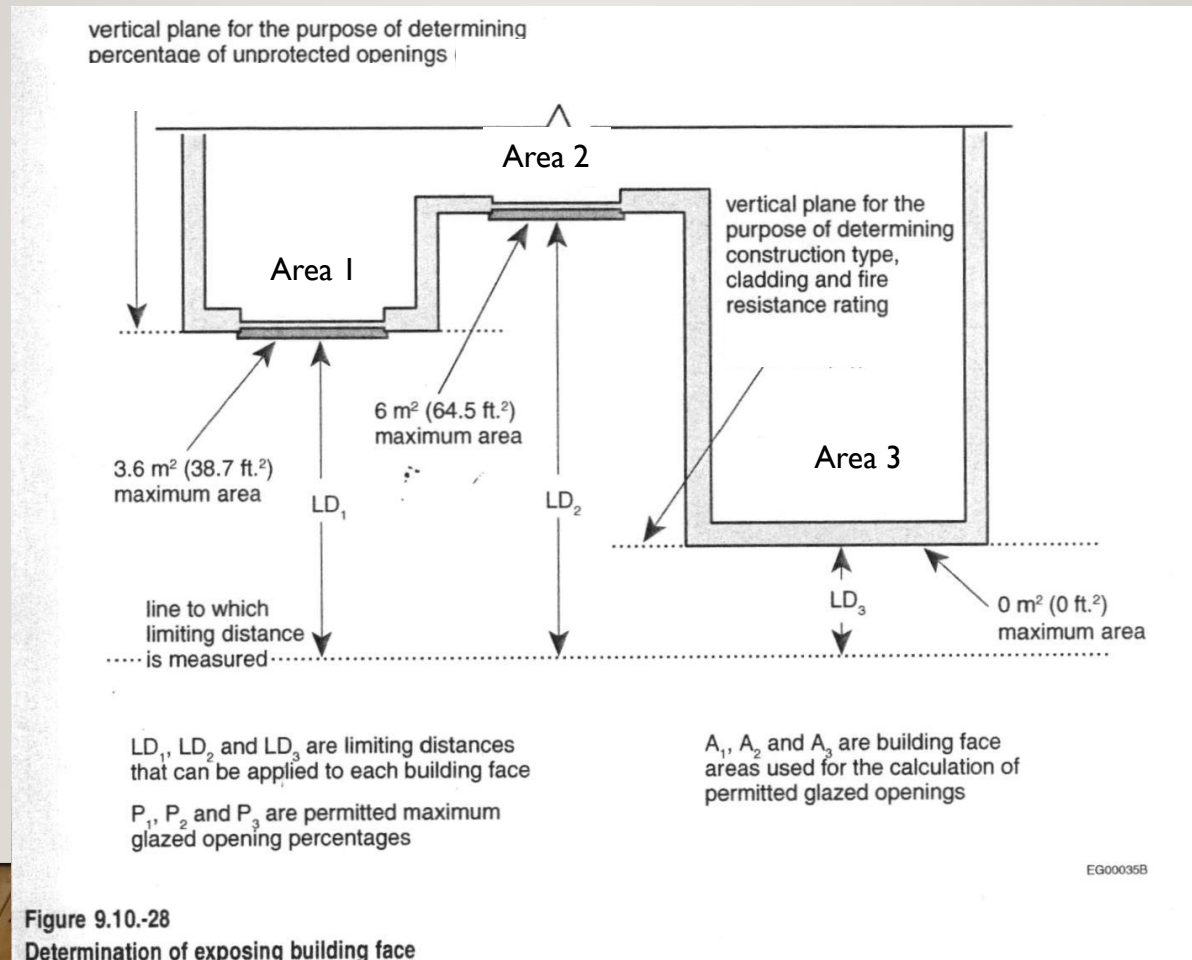


Figure 9.10-28
Determination of exposing building face



9.10.15. SPATIAL SEPARATION BETWEEN HOUSES: STAGGERED

Table 9.10.15.4.
Maximum Area of Glazed Openings in Exterior Walls of Houses
Forming Part of Sentences 9.10.15.4.(1) and (2)

Maximum Total Area of Exposing Building Face, m ²	Maximum Aggregate Area of Glazed Openings, % of Exposing Building Face Area											
	Limiting Distance, m											
	Less than 1.2	1.2	1.5	2.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
30	0	7	9	12	39	88	100	—	—	—	—	—
40	0	7	8	11	32	69	100	—	—	—	—	—
50	0	7	8	10	28	57	100	—	—	—	—	—
100	0	7	8	9	18	34	56	84	100	—	—	—
Over 100	0	7	7	8	12	19	28	40	55	92	100	—



9.10.15. SPATIAL SEPARATION BETWEEN HOUSES: SKEWED

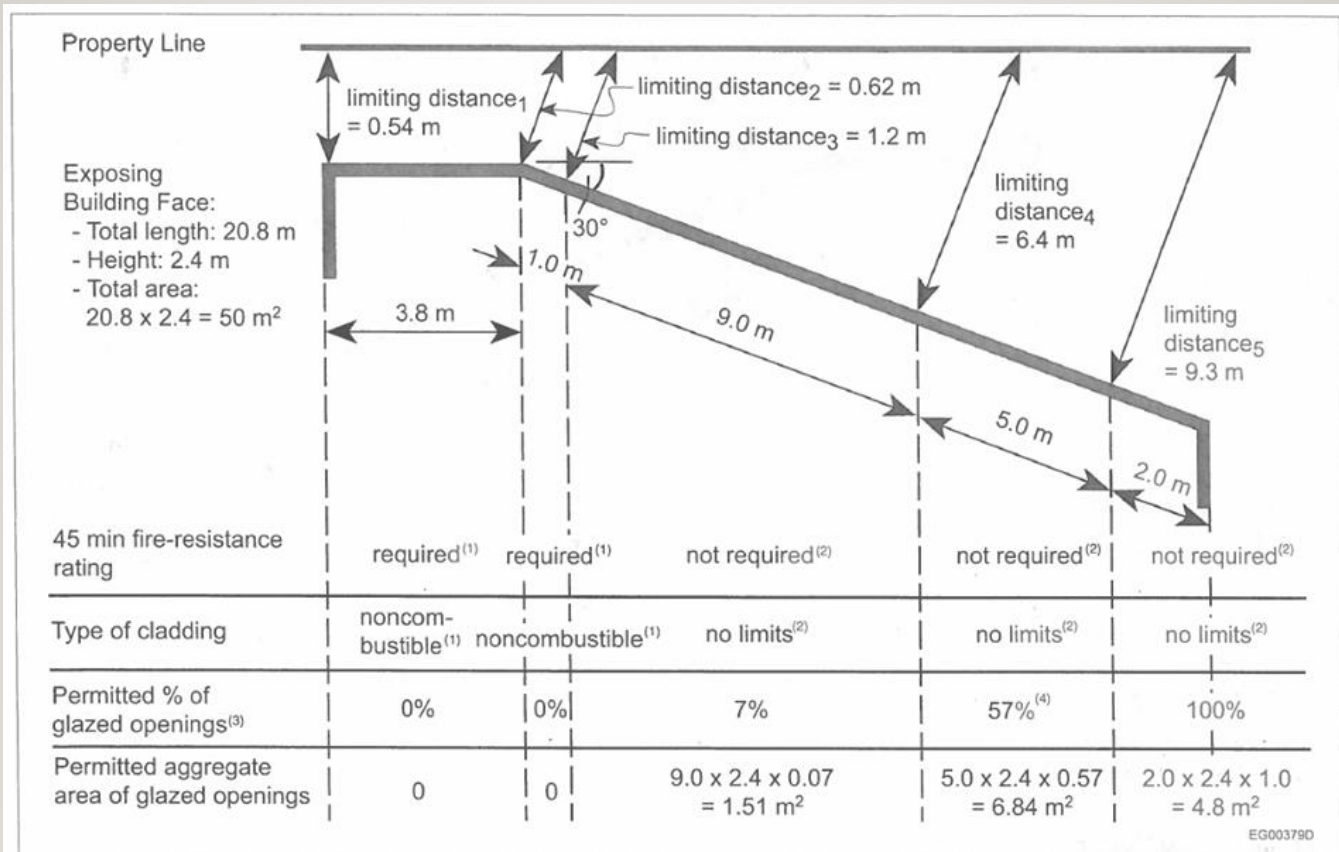


Figure A-9.10.15.4.(2)-C

Example of determination of criteria for the exposing building face of a skewed wall of a house with a different arbitrary division of the wall



9.10.15. SPATIAL SEPARATION BETWEEN HOUSES: SKEWED

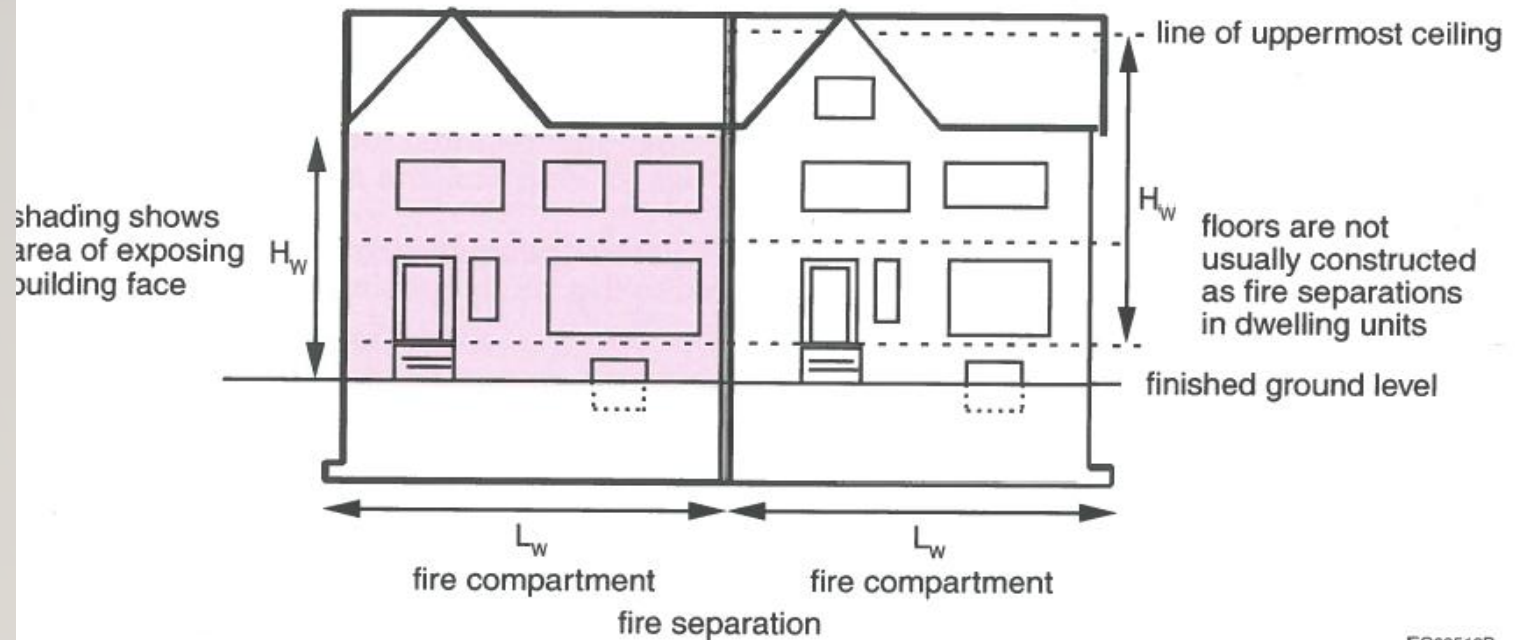
Table 9.10.15.4.
Maximum Area of Glazed Openings in Exterior Walls of Houses
 Forming Part of Sentences 9.10.15.4.(1) and (2)

Maximum Total Area of Exposing Building Face, m ²	Maximum Aggregate Area of Glazed Openings, % of Exposing Building Face Area											
	Limiting Distance, m											
	Less than 1.2	1.2	1.5	2.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
30	0	7	9	12	39	88	100	—	—	—	—	—
40	0	7	8	11	32	69	100	—	—	—	—	—
50	0	7	8	10	28	57	100	—	—	—	—	—
100	0	7	8	9	18	34	56	84	100	—	—	—
Over 100	0	7	7	8	12	19	28	40	55	92	100	—



9.10.15. SPATIAL SEPARATION BETWEEN HOUSES: FIRE COMPARTMENTS

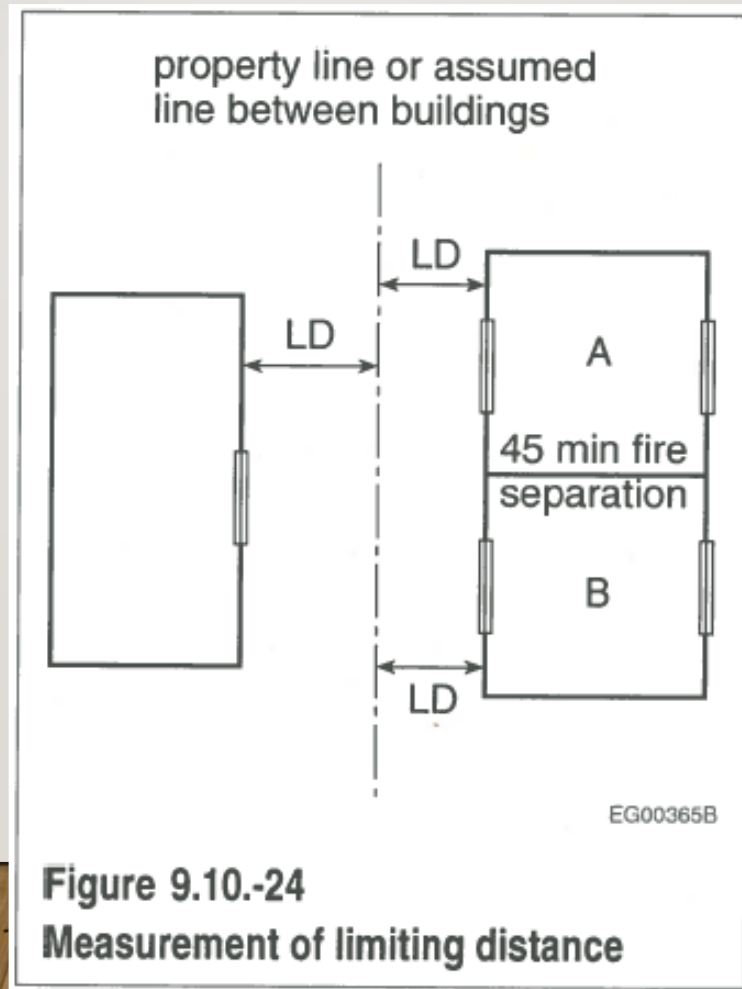
MULTI-COMPARTMENT TYPE BUILDING



EG00518B



9.10.15. SPATIAL SEPARATION BETWEEN HOUSES: BUILDING TO BUILDING



9.10.14. SPATIAL SEPARATION BETWEEN BUILDINGS

- Stacked dwelling units
- Accessory structures
- Dwelling unit above accessory structure (secondary suite above detached garage)



9.10.14.3. LIMITING DISTANCE & FIRE DEPARTMENT RESPONSE

- LD equal to half the actual LD shall be used as input to the requirements of this Subsection, where
 - Based on fire department response to the building exceeds 10 minutes in 10% or more of all calls to the subject building, AND
 - Any storey in the building is not sprinklered.



9.10.14.4. OPENINGS IN EXPOSING BUILDING FACE

- Except as noted in Sentence (6) to (10), the maximum aggregate area of unprotected openings in an exposing building face shall
 - Conform to Table 9.10.14.4.A.
 - Conform to Subsection 3.2.3., or
 - LD not less than 1.2 m, be equal to or less than
 - LD squared, for residential occupancies



9.10.14.4. OPENINGS IN EXPOSING BUILDING FACE

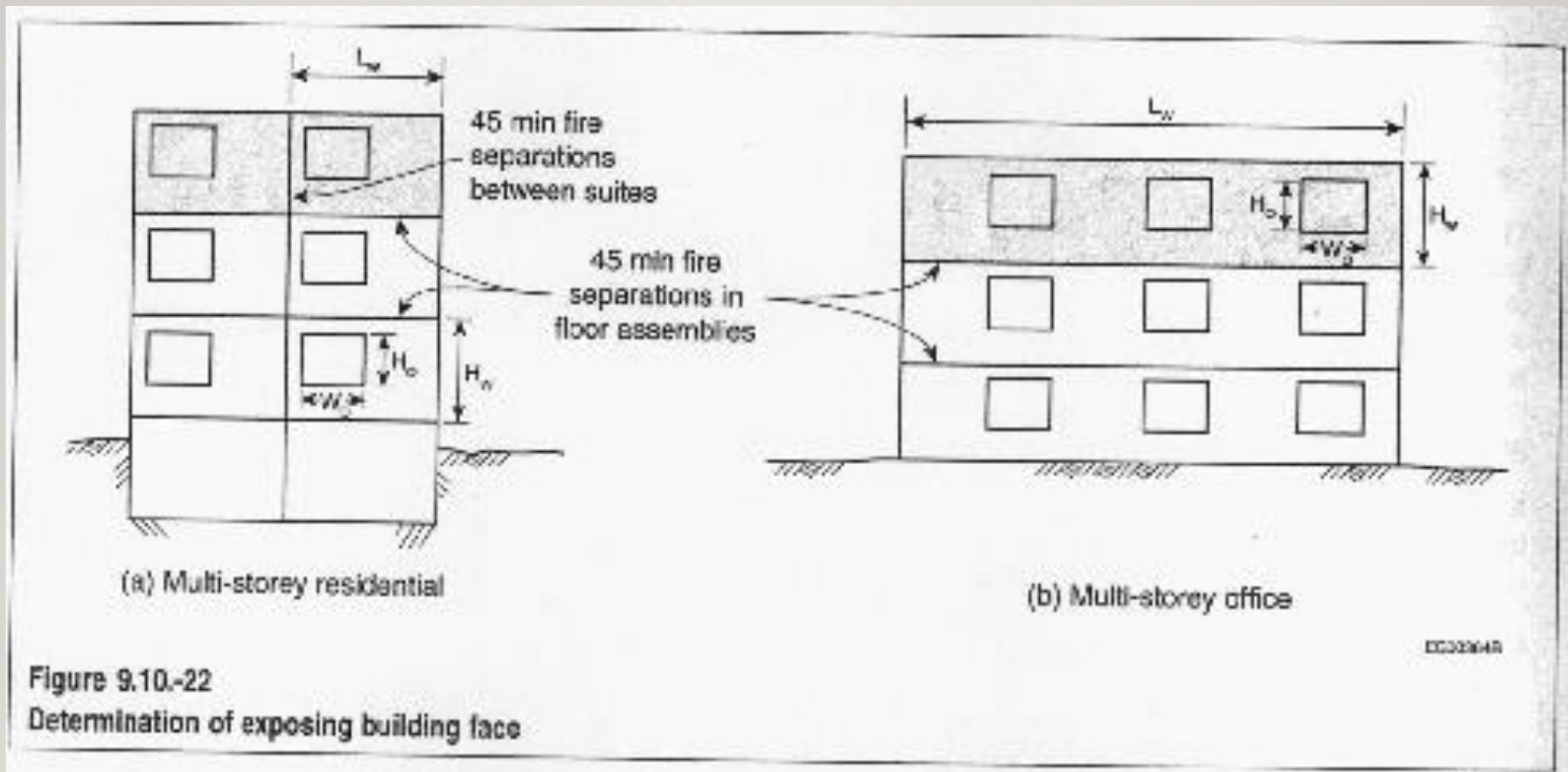
- Unprotected openings (glazed repeated) Table 9.10.14.4.A.

Table 9.10.14.4.A.
Maximum Aggregate Area of Unprotected Openings in Exterior Walls⁽¹⁾
 Forming Part of Sentence 9.10.14.4.(1)

Occupancy Classification of Building	Maximum Total Area of Exposing Building Face, m ²	Maximum Aggregate Area of <i>Unprotected Openings</i> , % of Exposing Building Face Area											
		Limiting Distance, m											
		Less than 1.2	1.2	1.5	2.0	4.0	6.0	8.0	10.0	12.0	16.0	20.0	25.0
<i>Residential, business and personal services, and low-hazard industrial</i>	30	0	7	9	12	39	88	100	—	—	—	—	—
	40	0	7	8	11	32	69	100	—	—	—	—	—
	50	0	7	8	10	28	57	100	—	—	—	—	—
	100	0	7	8	9	18	34	56	84	100	—	—	—
	Over 100	0	7	7	8	12	19	28	40	55	92	100	—
<i>Mercantile and medium-hazard industrial</i>	30	0	4	4	6	20	44	80	100	—	—	—	—
	40	0	4	4	6	16	34	61	97	100	—	—	—
	50	0	4	4	5	14	29	50	79	100	—	—	—
	100	0	4	4	4	9	17	28	42	60	100	—	—
	Over 100	0	4	4	4	6	10	14	20	27	46	70	100



9.10.14. SPATIAL SEPARATION: FIRE COMPARTMENTS



9.10.14.4. OPENINGS IN EXPOSING BUILDING FACE

- Sentence (2): openings in a wall with a LD < 1.2 m
 - Protected by closures of other than wired glass or glass block, whose fire-protection rating complies with the fire-resistance rating See table 9.10.13.1.

Table 9.10.13.1.
Fire-Protection Ratings for Closures
Forming Part of Sentence 9.10.13.1.(1)

Required <i>Fire-Resistance Rating of Fire Separation</i>	Minimum <i>Fire-Protection Rating of Closure</i>
30 or 45 min	20 min ⁽¹⁾
1 h	45 min ⁽¹⁾
1.5 h	1 h
2 h	1.5 h
3 h	2 h
4 h	3 h

Notes to Table 9.10.13.1.:

⁽¹⁾ See Article 9.10.13.2.



9.10.14.4. OPENINGS IN EXPOSING BUILDING FACE

- Sentence (3): except for buildings that are sprinklered and for openable windows having an unobstructed opening equal to 0.35 m² installed per Sentences 9.9.10.1.(1) and (2), where a LD ≤ 2.0 m, individual unprotected openings shall be no greater than
 - The area stated in Table 9.10.14.4.B., or
 - Where the LD is ≥1.2 m, the area calculated by
 - Area = 0.24(2 x LD - 1.2)²

Area = area of unprotected opening

LD = Limiting Distance

Table 9.10.14.4.B.
Maximum Concentrated Area of Unprotected Openings
Forming Part of Sentence 9.10.14.4.(3)

Limiting Distance, m	Maximum Area of Individual Unprotected Openings, m ²
1.2	0.35
1.5	0.78
2.0	1.88



9.10.14.4. OPENINGS IN EXPOSING BUILDING FACE

- Example
 - Where the LD is 1.7 m, the area calculated is
 - Area = $0.24(2 \times LD - 1.2)^2$
 - Area = $0.24(2 \times 1.7 - 1.2)^2$
 - Area = $0.24(2.2)^2$
 - Area = 1.16 m²

Table 9.10.14.4.B.
Maximum Concentrated Area of Unprotected Openings
Forming Part of Sentence 9.10.14.4.(3)

Limiting Distance, m	Maximum Area of Individual <i>Unprotected Openings</i> , m ²
1.2	0.35
1.5	0.78
2.0	1.88



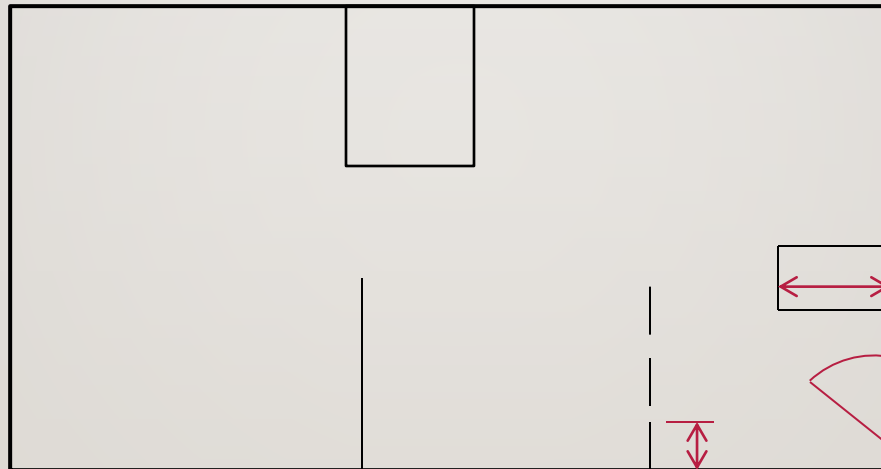
9.10.14.4. OPENINGS IN EXPOSING BUILDING FACE

- Sentence (4): spacing between individual unprotected openings that serve a single room or space described in Sentence (5) shall be not less than
 - 2 m horizontally of another unprotected opening on the same EBF & serves the single room or space, or
 - 2 m vertically of another unprotected opening that serves the single room or space, or another room or space on the same storey.
- Sentence (5): “single room or space” shall mean
 - 2 or more adjacent spaces having a full-height separating wall extending less than 1.5 m from the interior face of the exterior wall, or
 - 2 or more stacked spaces that are on the same storey.



9.10.14.4. OPENINGS IN EXPOSING BUILDING FACE

- Example of 9.10.14.4. (4) & (5)



9.10.14.5. CONSTRUCTION OF EBF & WALLS ABOVE EBF

- Follow Table 9.10.14.5.A unless otherwise noted in Sentences (3) to (13)
 - Using Max Area of Unprotected Openings from Table 9.10.14.4.A. and Occupancy Classification determine
 - Min Fire-Resistance Rating
 - Type of Construction Required
 - Type of Cladding Required



TABLE 9.10.14.5.A. MINIMUM CONSTRUCTION REQUIREMENTS

Table 9.10.14.5.A.
Minimum Construction Requirements for Exposing Building Faces
 Forming Part of Sentence 9.10.14.5.(1)

<i>Occupancy Classification of Building or Fire Compartment</i>	<i>Maximum Area of Unprotected Openings Permitted, % of Exposing Building Face Area</i>	<i>Minimum Required Fire-Resistance Rating</i>	<i>Type of Construction Required</i>	<i>Type of Cladding Required</i>
<i>Residential, business and personal services, and low-hazard industrial</i>	0 to 10	1 h	<i>Noncombustible</i>	<i>Noncombustible</i>
	> 10 to 25	1 h	<i>Combustible or noncombustible</i>	<i>Noncombustible</i>
	> 25 to 50	45 min	<i>Combustible or noncombustible</i>	<i>Noncombustible</i>
	> 50 to < 100	45 min	<i>Combustible or noncombustible</i>	<i>Combustible or noncombustible</i>
<i>Mercantile and medium-hazard industrial</i>	0 to 10	2 h	<i>Noncombustible</i>	<i>Noncombustible</i>
	> 10 to 25	2 h	<i>Combustible or noncombustible</i>	<i>Noncombustible</i>
	> 25 to 50	1 h	<i>Combustible or noncombustible</i>	<i>Noncombustible</i>
	> 50 to < 100	1 h	<i>Combustible or noncombustible</i>	<i>Combustible or noncombustible</i>



9.10.14.5. CONSTRUCTION OF EBF & WALLS ABOVE EBF

- Sentence 9.10.14.5.(2)
 - Exception to non-combustible cladding
 - Unprotected Opening permitted > 10% of EBF
 - wall assembly must comply with 3.1.5.5.(3) & (4)
 - Meet CAN/ULC-S134



9.10.14.5. CONSTRUCTION OF EBF & WALLS ABOVE EBF

- Sentence 9.10.14.5.(3)
 - Exception to non-combustible cladding
 - Unprotected Opening permitted $> 25\%$ of EBF but $< 50\%$
 - LD > 5.0 m
 - LD > 2.5 m with width to height ratio Table 9.10.14.5.B.
 - Sprinklered building
 - Cladding requirements.

Table 9.10.14.5.B.
Maximum Allowable Area and Ratio of Width to Height of Exposing Building Face
Forming Part of Sentence 9.10.14.5.(3)

Maximum Ratio of Width to Height of <i>Exposing Building Face</i>	Maximum Area of <i>Exposing Building Face</i> , m ²
1:1	88
2:1	102
3:1	129
4:1	161
5:1	195



9.10.14.5.(4) & (5) ACCESSORY STRUCTURES

- 9.10.14.5.(4) Accessory Structure
 - EBF fire-resistance rating not required ≥ 0.6 m
 - EBF requires 45 minute FRR < 0.6 m
 - cladding requirements not required, regardless of LD
- 9.10.14.5.(5) Accessory Structure facing Dwelling Unit
 - Construction type & cladding need not comply if,
 - One dwelling unit, same property, only occupancy



9.10.14.5. CONSTRUCTION OF EBF & WALLS ABOVE EBF

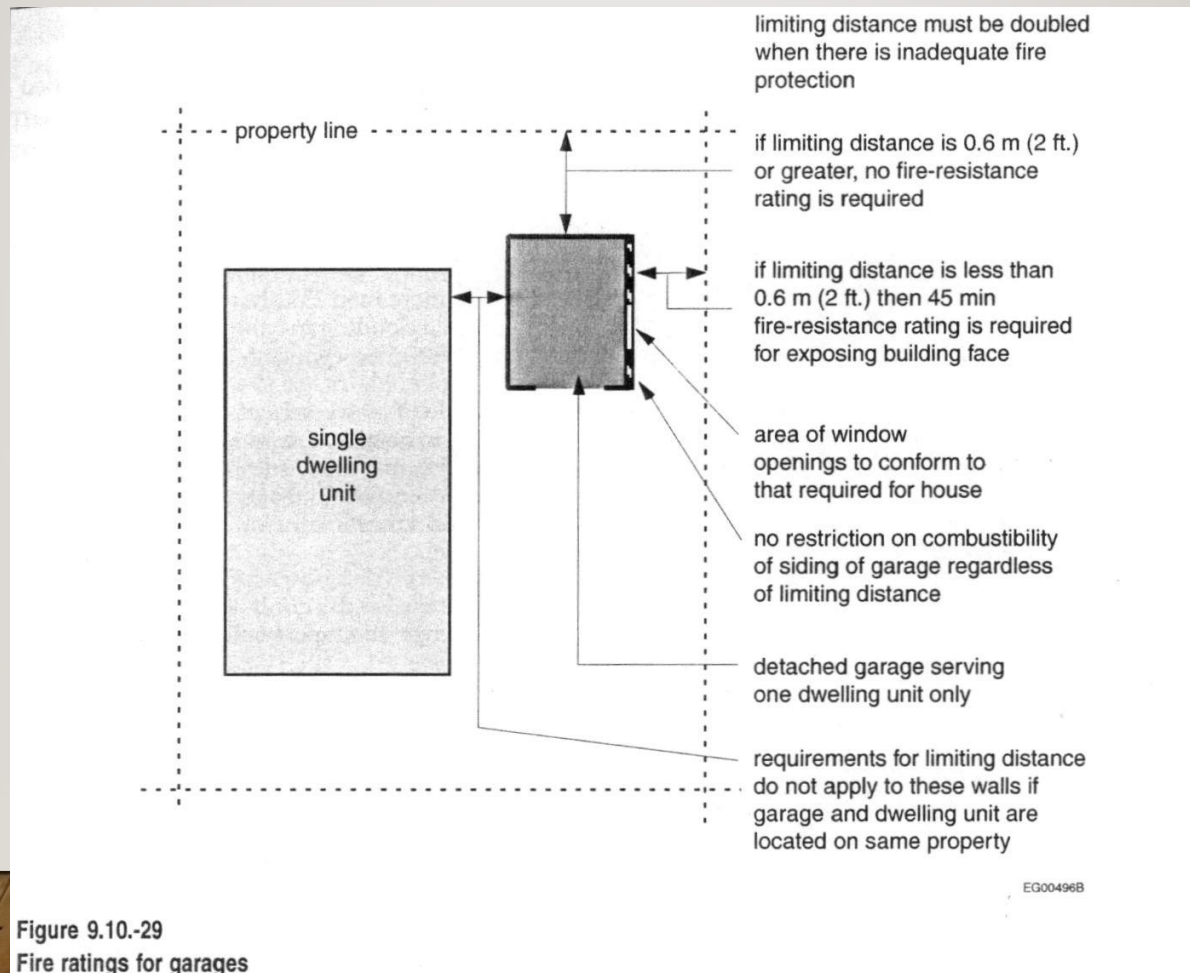


Figure 9.10.-29
Fire ratings for garages



9.10.14.5. CONSTRUCTION OF EBF & WALLS ABOVE EBF

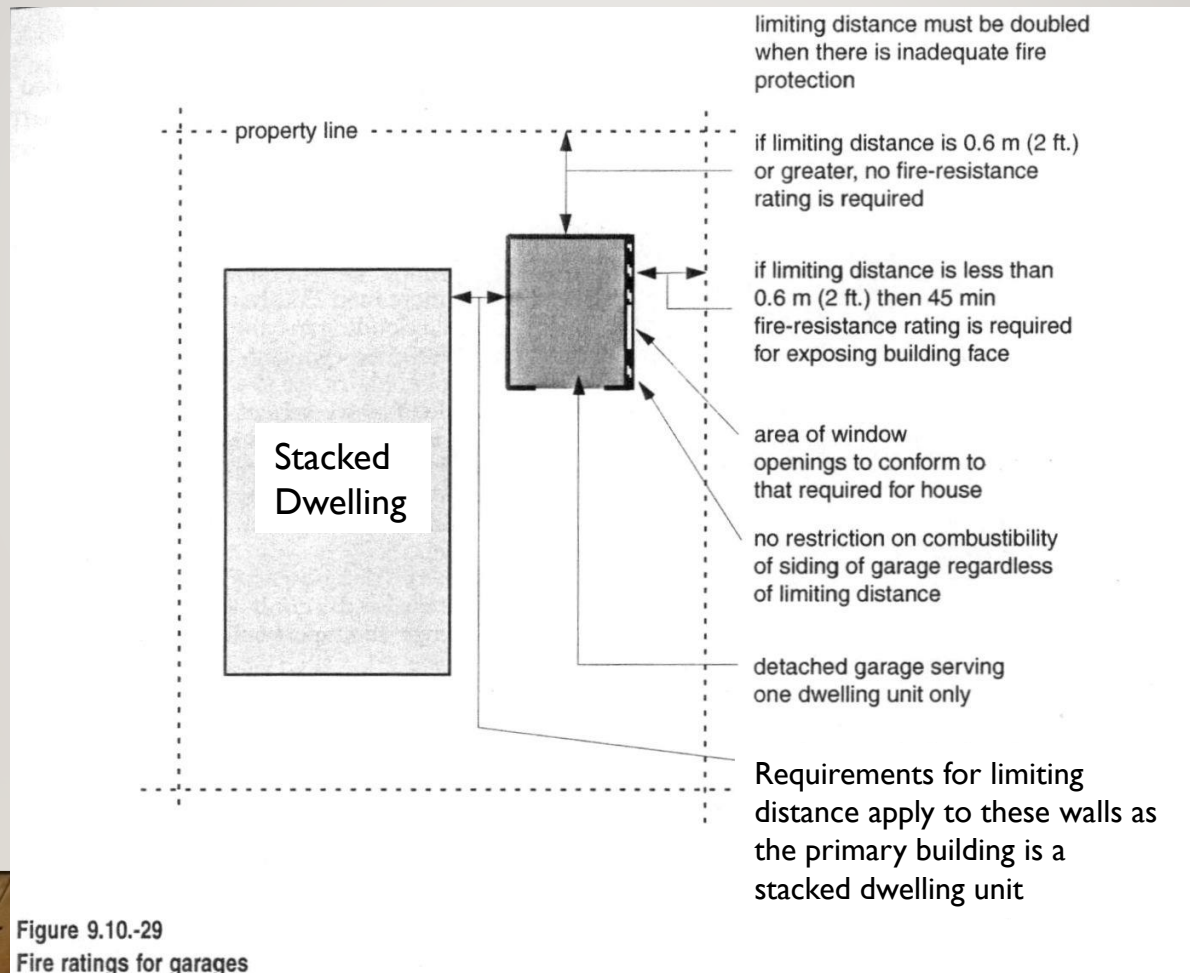


Figure 9.10.-29
Fire ratings for garages



9.10.14.5.(6) & (7)

COMBUSTIBLE PROJECTIONS

- Not permitted when > 1.0 m above grade.
 - 1.2 m from property line or C.L. of public way.
 - 2.4 m from combustible projection on another building on the same property.
- Exception to the rule
 - Buildings containing 1 or 2 dwelling units
 - Accessory Buildings serves one unit, same property and only occupancy.
 - But must meet Sentences (9) – (11)

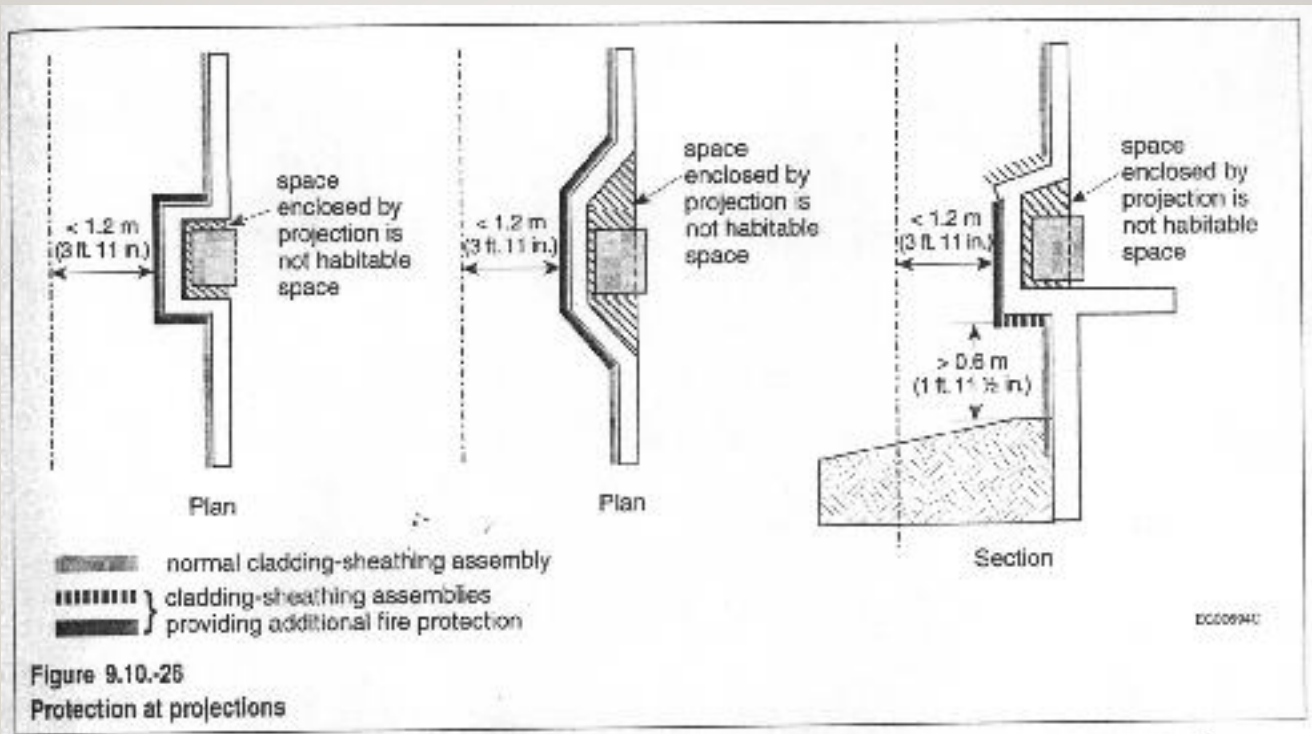


9.10.14.5.(8) COMBUSTIBLE PROJECTIONS CONTINUED

- Totally enclosed/constructed with solid faces, extend within 1.2 m of a property line
 - Construction of face & sides to meet Table 9.10.14.5.A.
 - Underside > 0.6 m above finished grade to be protected by listed options



9.10.14.5.(8) COMBUSTIBLE PROJECTIONS EXAMPLE



9.10.14.5.(9), (10) & (11) PROJECTION OF ROOF SOFFITS

- LD < 0.45 m soffits not permitted
- LD > 0.45 m soffits not permitted less than 0.45 m to property line.
- Soffits within 1.2 m LD no openings are permitted and be protected by listed options.



9.10.14.5.(12)

HEAVY TIMBER & STEEL COLUMNS

- Need not conform to Sentence (1) (Table 9.10.14.5.A.)
provided ≥ 3.0 m LD



9.10.14.5.(13)

NON-LOADBEARING WALL

- Components do not require FRR where
 - Building is 1 storey in height
 - Non-combustible construction
 - Classified as Low Hazard Industrial Occupancy
 - Must be low fire load occupancies
 - $LD \geq 3.0$ m



SPATIAL SEPARATION CONCLUSION

Spatial separation is about saving lives and properties. It is a Code requirement which protects people and their homes from the rapid spread of fire, by isolating fires in the building of origin.

