

NRC-CNRC

From *Discovery*
to *Innovation...*

2010 NATIONAL MODEL CONSTRUCTION CODES

Spatial Separations

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February 2011



National Research
Council Canada

Conseil national
de recherches Canada

Canada



Introduction

- Presentation is part of a series on the 2010 National Model Construction Codes
- Model codes developed by Canadian Commission on Building and Fire Codes
- These codes must be adopted by provincial/territorial authorities to become law



Nature of Technical Changes

- Fire department response times
- *Limiting distance*
- Glazed openings and *unprotected openings*
- Protection of *exposing building face*
- Projections





Edmonton Fire – Residential Buildings





Edmonton Fire continued...





Nature of Technical Changes

- Fire department response times
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Limiting Distance (LD)

- Clarification of relationship between fire department response time and LD (between *buildings* and property lines):
 - **10-min response time**
 - Harmonization between Part 3 and Part 9 language on LD **when the 10-min is exceeded**
- Authority having jurisdiction should be consulted at onset of project



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Exposing Building Face





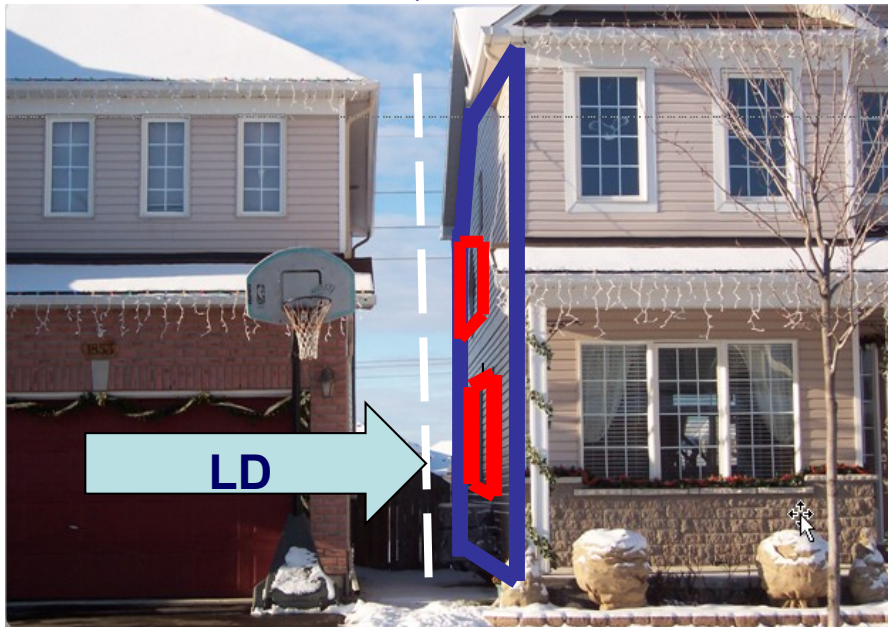
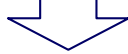
Unprotected Openings (Glazed Openings)



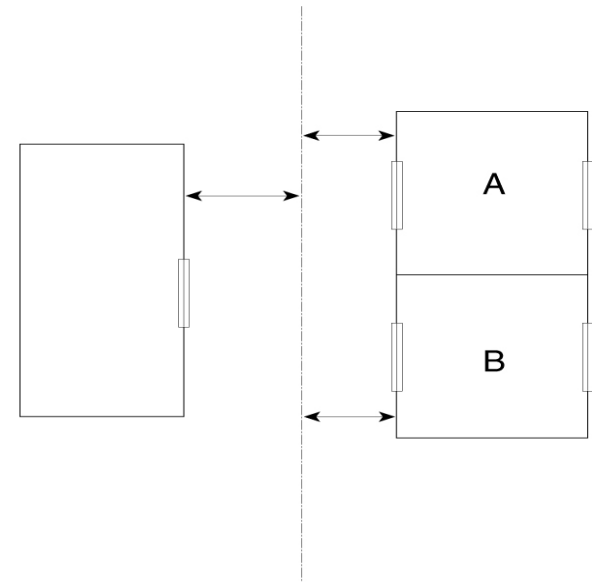


Limiting Distance (LD)

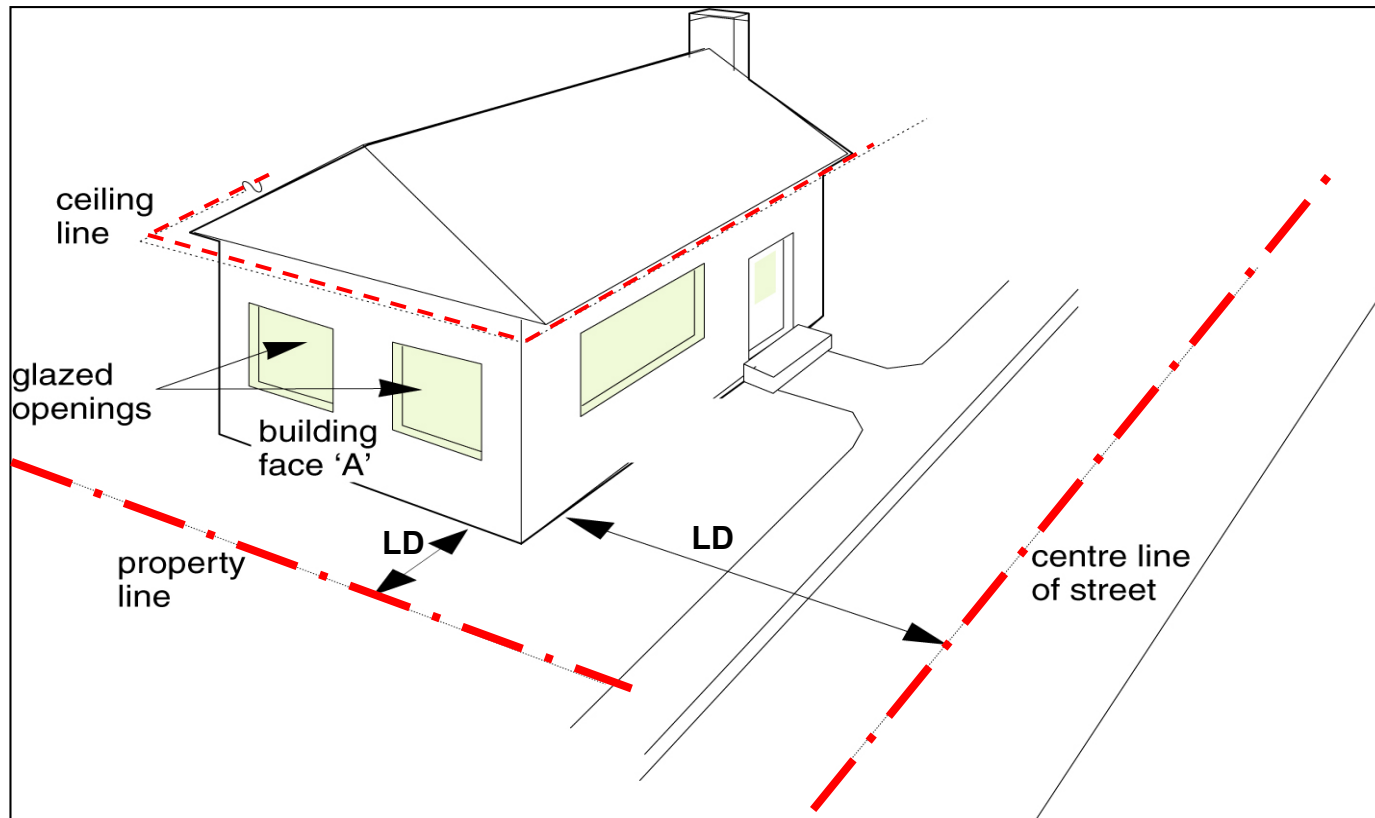
Property Line



property line or assumed line between buildings



Glazed Openings & LD (Unprotected Openings)





Limiting Distance (LD)

- Value equal to half the actual *limiting distance* must be used where:
 - 10-min fire department response cannot be met in 90% of calls to the *building*
- AND
- any *storey* in the *building* is not *sprinklered*





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Area of Unprotected Openings

- **Area limits** where $LD \leq 2$ m
 - Buildings
 - Area = $0.24 [(2 * LD) - 1.2]^2$

LD (m)	Maximum Area of Individual Unprotected Openings, m ²
1.2	0.35
1.5	0.78
2.0	1.88



Area of Unprotected Openings

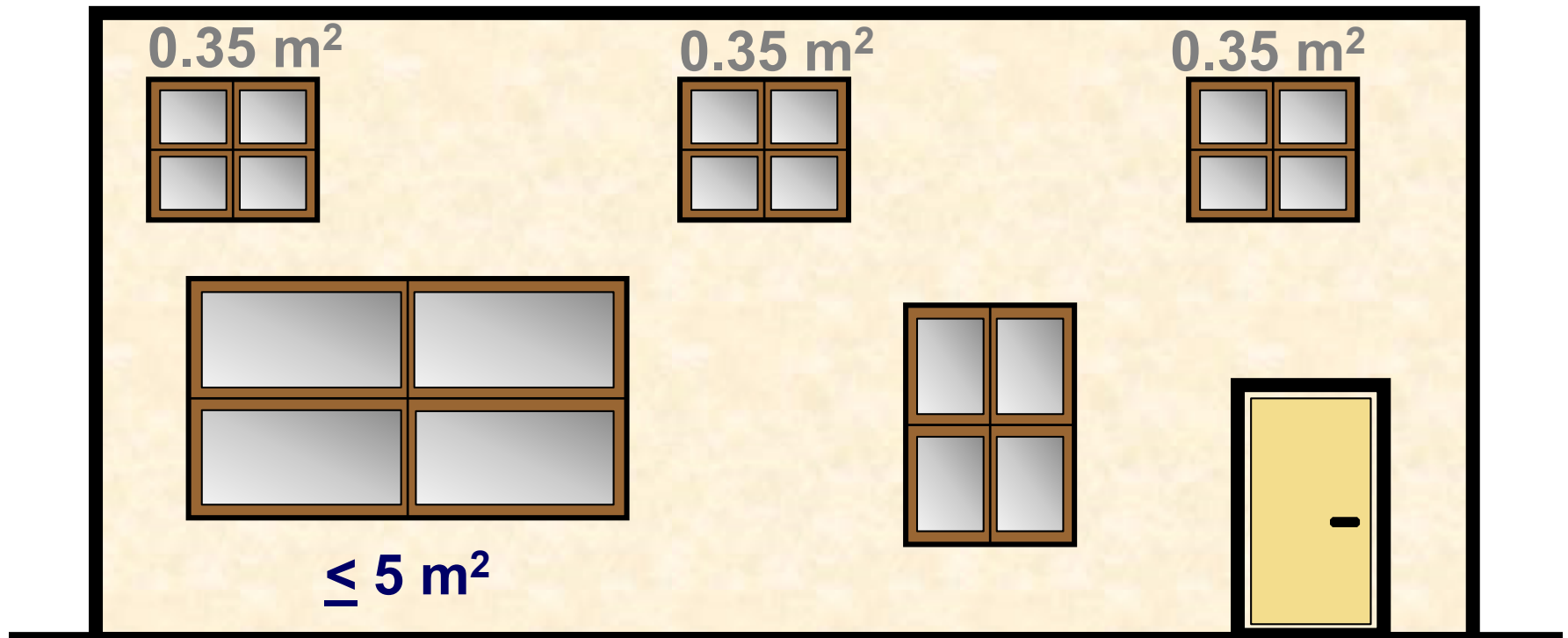
- **Area limits** where **$LD \leq 2$ m**
 - Part 9 homes:
 - ... individual glazed openings or group of glazed openings in *exposing building face* to not exceed 50% maximum allowable
 - Exceptions
 - *Buildings* and houses:
 - Exception for openable windows (bedroom egress)
 - Sprinklered buildings and houses



Area of Glazed Openings

- **Area limits where $LD \leq 2$ m: Houses**

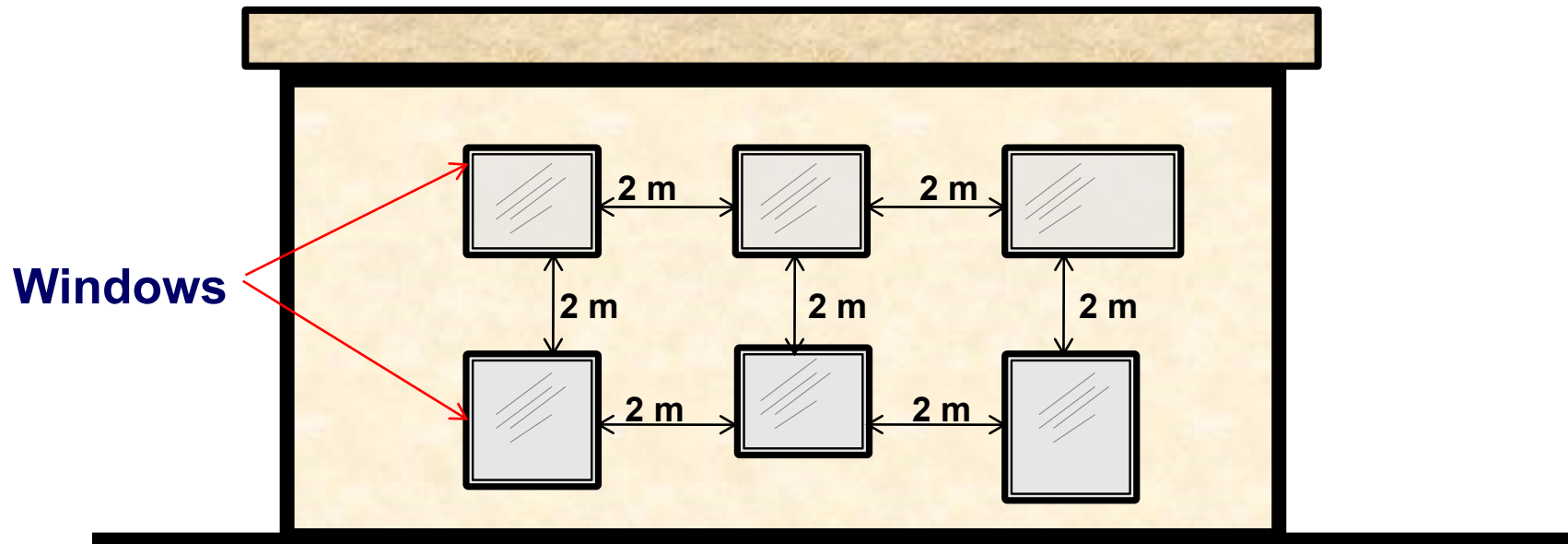
MAGO = 10 m²





Area of Unprotected Openings

- **Spacing where $LD \leq 2\text{ m}$**
 - 2 m horizontally of another *unprotected opening*
 - 2 m vertically of another *unprotected opening*



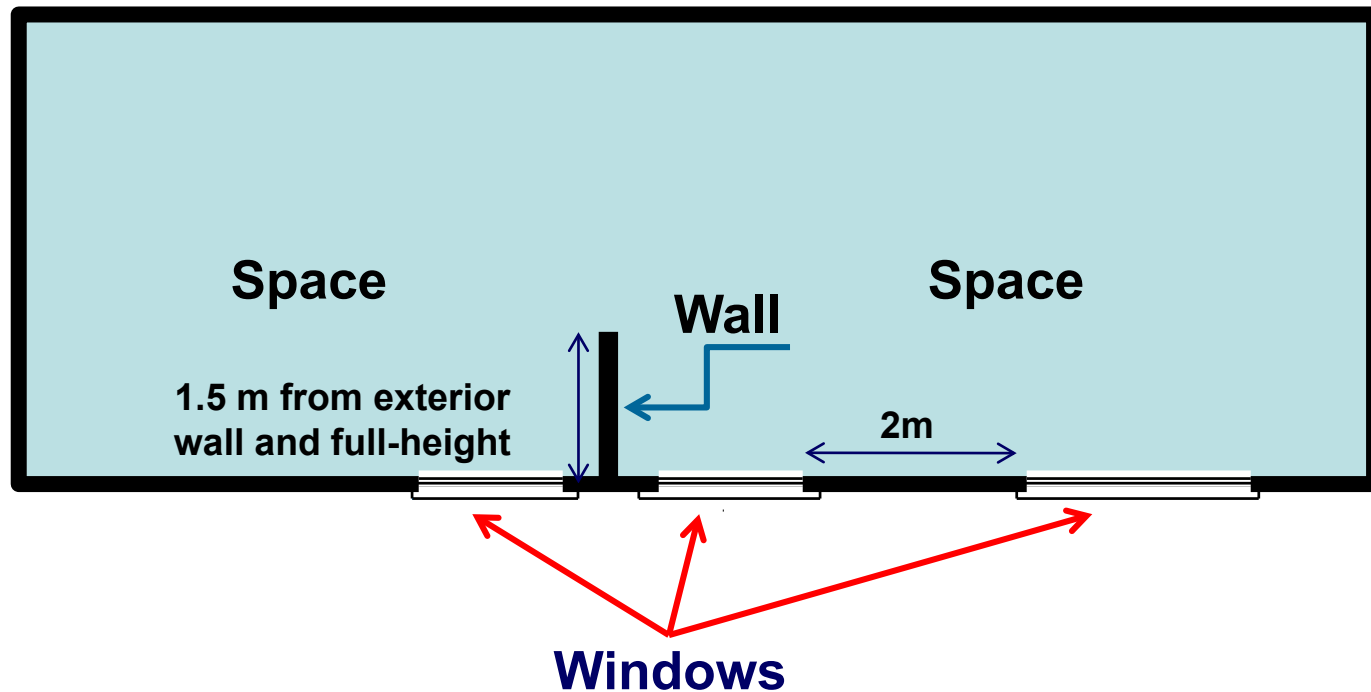
Single Room or Space (Elevation View)



Unprotected Openings

- Spacing where $LD \leq 2 \text{ m}$

Single Room or Space (Plan View)

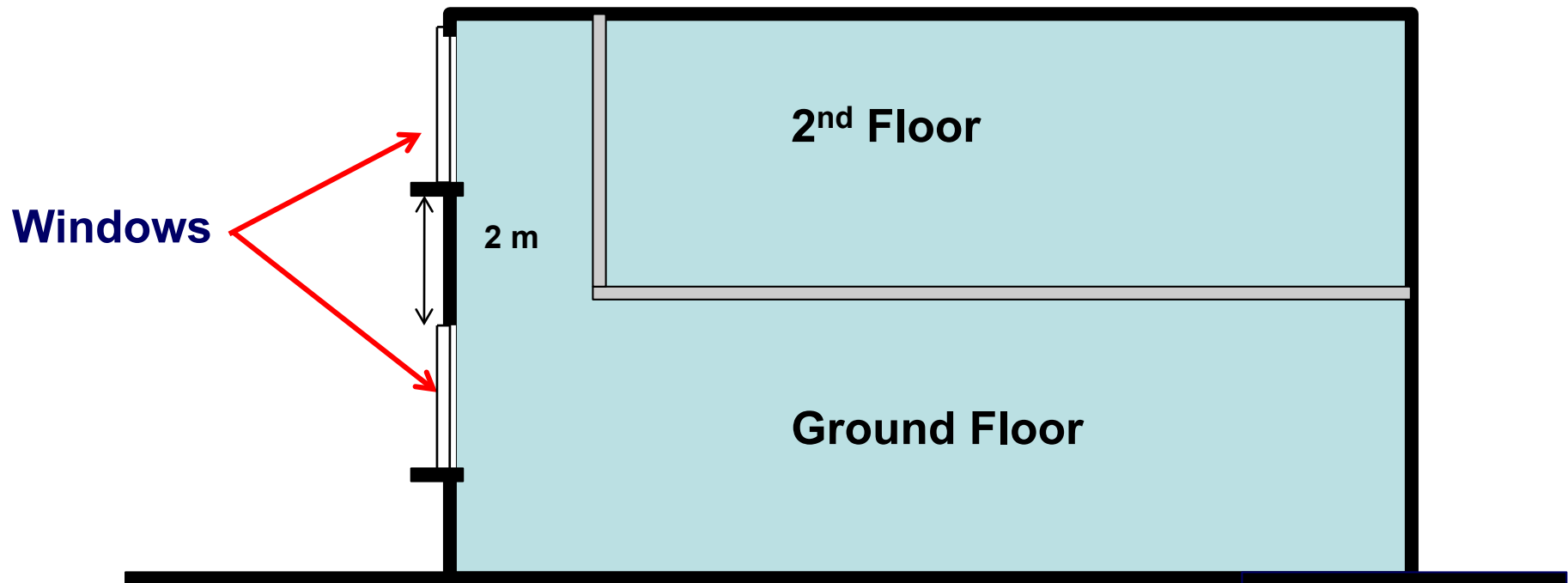




Unprotected Openings

- Spacing where $LD \leq 2 \text{ m}$

(Sectional View)



... two or more stacked spaces that are on the same *storey*



Nature of Technical Changes

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- **Protection of *exposing building face***
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Construction of Exposing Building Face



- New change to existing table on cladding
 - Maximum Area of Unprotected Openings (MAUO) > 25 to 50%
 - Cladding required to be noncombustible
 - (2005 NBC MAUO between 25 and 100% was permitted to be combustible)



Construction of Exposing Building Face (Part 3)



- MAUO > 25-50% exception for *noncombustible* cladding where:
 - LD > 5 m
 - **Sprinkler** (including attic)
- OR
- Conforms to special rules controlling cladding in Part 9
 - e.g. - wood siding
 - plywood
 - hardboard
 - vinyl siding

Construction of Exposing Building Face (Part 9)



- Part 9 Buildings
 - MAUO 25-50% exception for *noncombustible* cladding where:
 - **LD > 5 m**
 - LD > 2.5 m (aspect ratio)
 - **Sprinkler**
 - OR
 - Conforms to special rules controlling cladding in Part 9
 - e.g. - wood siding
 - plywood
 - hardboard
 - vinyl siding



Construction Aspect Ratio (Part 9)

- Part 9 Buildings

Area and Ratio of W-H where $LD \geq 2.5$ m

Maximum Ratio of Width to Height of Exposing Building Face	Maximum Area of Exposing Building Face (m²)
1:1	88
2:1	102
3:1	129
4:1	161
5:1	195

Construction of Exposing Building Face



- Part 9 Houses
 - Where $LD \geq 0.6$ and < 1.2 m:
 - Exposing building face (EBF) with 45-min *fire-resistance rating*
 - Conditions on cladding
 - Metal or noncombustible
 - CAN/ULC S134
 - OR
 - Conforms to special rules controlling cladding in Part 9
 - e.g.
 - wood siding
 - plywood
 - hardboard
 - vinyl siding



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Combustible Projections

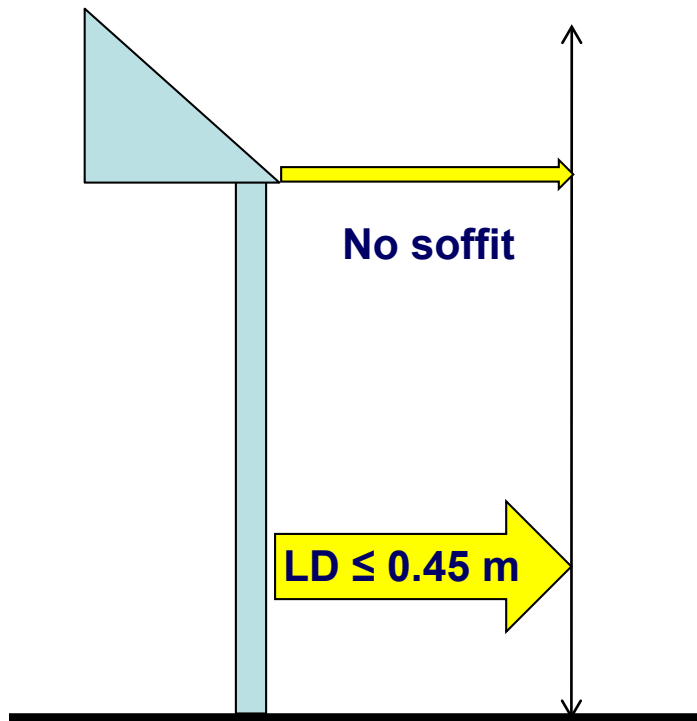
- Roof soffits cannot be built above EBF, where $LD < 0.45$ m
- Roof soffits not to project to < 0.45 m from property line where $LD > 0.45$ m



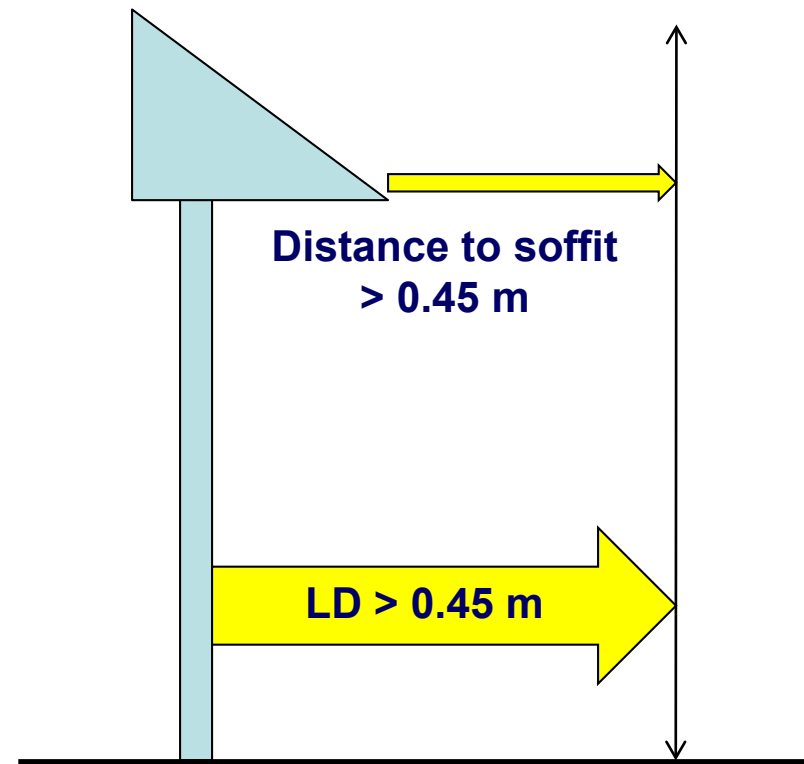
Combustible Projections – Roof Soffits



- $LD \leq 0.45$ m
 - Roof soffits cannot be constructed $LD \leq 0.45$ m



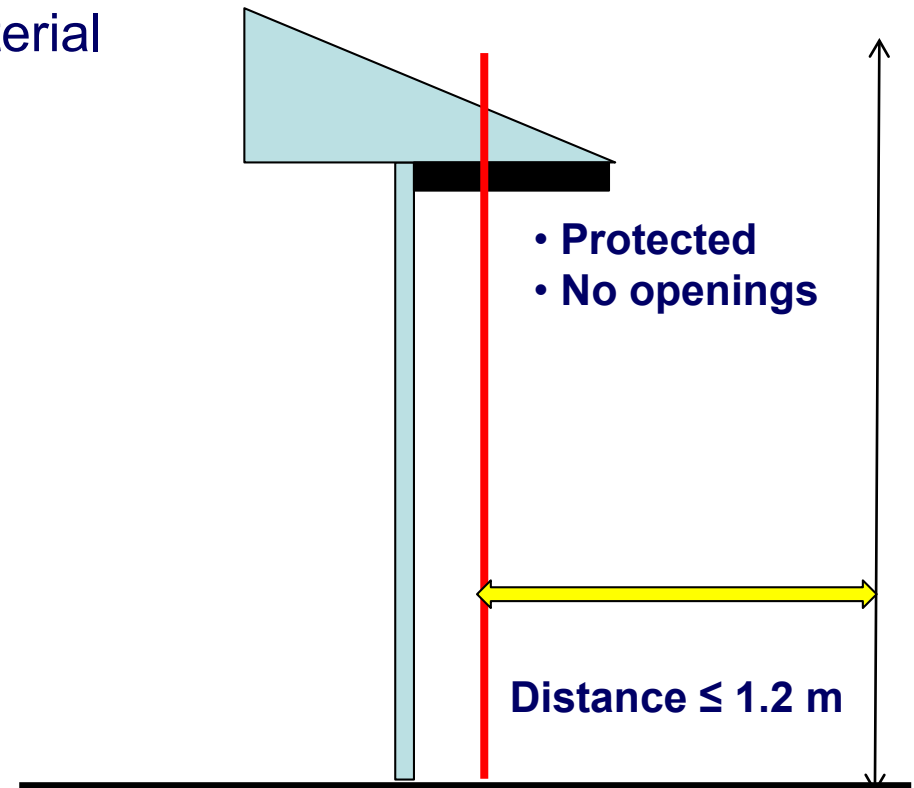
- $LD > 0.45$ m
 - Roof soffits cannot project to ≤ 0.45 m from property line





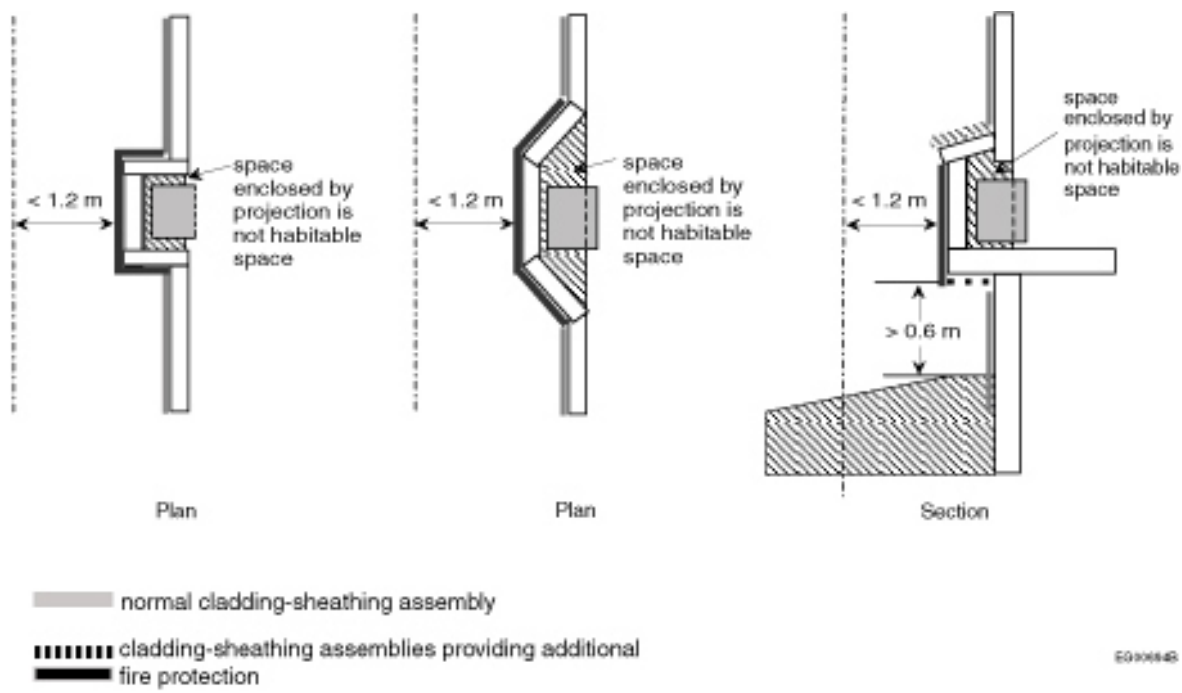
Combustible Projections – Roof Soffits

- Where soffits project within < 1.2 m
 - No openings, and
 - Protected by acceptable material





Projections





Summary

- New requirements introduced to Parts 3 and 9 addressing concerns related to spatial separations
 - Clarified Fire Department Response Time
 - Limitations on % of unprotected openings (EBF)
 - Requirements for noncombustible cladding (EBF)
 - Limits on projections (EBF)
 - Protection of projections (EBF)



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Questions?

Send them to us at codes@nrc-cnrc.gc.ca

Thank you!