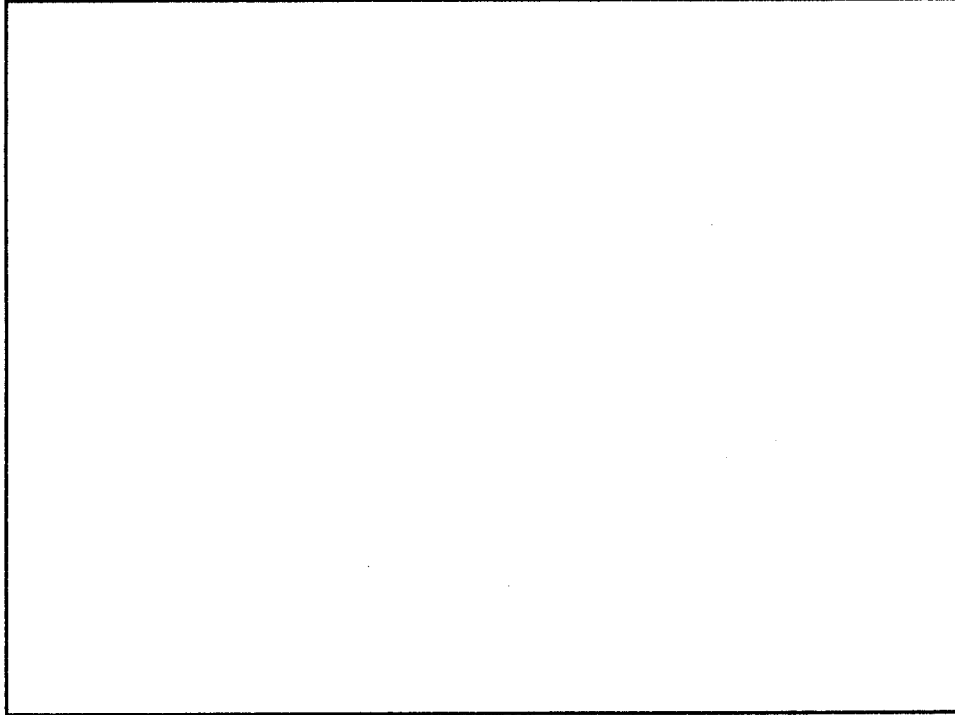


Limiting Distance

Application Questions



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Question 1

- Sprinklered warehouse for storage of combustible goods classified as F-3.
- Exposing Building Face, 6 m high and 20 m wide, 2.5 m from Property Line
- Wall of non-combustible construction and non-combustible cladding
- No openings in exposed building face

Question 1

- What is the maximum amount of unprotected openings allowed in the exposed building face?

Question 1

- Using Table NBC 2005 Table 3.2.3.1.C
- For 100 m² exposed building face, with 2.5 m limiting distance, we are permitted 22% allowable openings.
- For 150 m² exposed building face, with 2.5 m limiting distance, we are permitted, 20% allowable openings.

Question 1

- Using linear interpolation with Table 3.2.3.1.C we have get the following;
- $(22-20)/(150-100) = 0.04\%$ per m²
- $20\% + 0.04(120-100) = 20.8\%$
- Therefore we are permitted a maximum of 20.8% allowable openings

Question 1

- What are the construction requirements for the exposed building face based on the allowable openings?

Question 1

- Using NBC 2005 Sentence 3.2.3.7.(2) allowable openings of 20.8%
- The exposed building face shall have a fire resistance rating of at least 1 hour.
- The exposed building face shall be clad with non-combustible cladding.

Question 1

- The designer wishes to cover the interior side of the exposing building face with a layer of 16 mm type "X" drywall but only for the first 16 m leaving the last 4 m as unprotected non-combustible construction
- Is this acceptable?

Question 1

- Maybe NOT
- The building face is allowed to have 20.8% openings and the proposed unprotected wall area is only 20%. However the entire structure supporting the exposed building face is required to have a 1 hour fire resistance rating. Is the last 4 m of wall structurally independent?
- The NRC Users Guide for Part 3 NBC 1995, on Page 34 states that the tables for unprotected openings were designed with the assumption that the openings would be evenly distributed across the exposed building face.

Question 1

- The designer wishes to change the construction of the building to sprinklered combustible construction with non-combustible cladding, Is this acceptable?

Question 1

- Maybe YES
- NBC 2005 Sentence 3.2.3.7.(2) allows for combustible construction provided it has a 1 hour fire resistance rating.
- The construction requirements of the building found in NBC 2005 3.2.2 based on building size and occupancy must also be satisfied.

Question 2

- A Sprinklered Postal Sorting Building classified as F-2 has an existing South exposed building face 6.5 m high and 90 m wide constructed of concrete block. The limiting distance to the edge of an unused railway spur line owned by CNR is 1m.
- The owner is making an addition of 27 m to the building with the same height, wall construction and limiting distance to the CNR spur line.

Question 2

- The first issue to deal with is the measurement of limiting distance.
 - Some AHJ's may consider the railway spur as a public thoroughfare and measure limiting distance to the centre of the spur line rather than the edge.
 - Other AHJ's may consider the railway spur line as a separate property but not worry about spacial separation issues because the property is unlikely to change use as a railway spur line.
 - Still other AHJ's may consider the railway spur as a separate property and measure the limiting distance to the property line located 1 m from the South face of the Postal Building.

Question 2

- For this example we will assume that the railway spur line is a separate property which can be sold and developed without restriction and as such the limiting distance between the Postal Building and the property line is 1 m.

Question 2

- What is the required fire resistance rating for the South wall of the Postal Building?

Question 2

- Area of the exposed building face is $6.5(90+27) = 760.5 \text{ m}^2$
- Using NBC 2005 Table 3.2.3.1.D for Sprinklered F-2
- Using linear interpolation; $(8-0)/(1.2-0) = 6.67\%$ openings per m limiting distance.
- $6.67(1\text{m}) = 6.67\%$ allowable openings for a 1 m limiting distance.
- Therefore the fire resistance rating of the South wall is 2 hours based on NBC 2005 Sentence 3.2.3.7.(4).

Question 2

- The designer wishes to incorporate four 1 m by 1 m wired glass windows in the addition near the roof line to bring in some natural light into the building. Is this acceptable?

Question 2

- NO
- NBC 2005 Sentence 3.2.3.5.(2) prohibits the use of wired glass in openings for walls where the limiting distance is less than 1.2m.

Question 2

- The designer recognises that the addition will increase travel distances beyond the allowable 45 m and wishes to provide a 2 hour fire rated exterior exit door in the South building face near the interface between the new addition and existing building. Is this acceptable?

Question 2

- Probably NOT
- The exterior exit would have to meet NBC 2005 Article 3.2.3.13 or exceptions found in NBC 2005 Article 3.4.4.3.
- In the definition of exit the exit must lead to an exterior space, protected from fire exposure from the building, leading to an open public thoroughfare. In this case it may not be possible or desirable to protect the exterior exit from fire exposure.

Question 2

