

Question 3

- A Church wishes to add an Auditorium to their existing building. How close to the back lane can they build?
 - The Auditorium is not sprinklered and constructed with concrete block on the interior and brick on the exterior.
 - The face exposed to the back lane is 9m high and 20m wide and contains 42 m² of openings including windows and doors.
 - The back lane is 4 m wide.

Question 3

- The Church and new Auditorium are considered as an A-2 occupancy.
- The exposed wall can be considered to have a 2 hour fire rating with non-combustible cladding.
- The wall is 180 m² with a L/H = 2.2
- Openings represent $42/180 = 23\%$ of the wall area.

Question 3

- Calculate the limiting distance for the exposed face of the building.

Question 3

- Using Table 3.2.3.1.A for non-sprinklered, "A" Occupancies, with L/H less than 3:1 and Unprotected Openings of 23% we get a limiting distance of 6.14 m using an area of 150 m².
- Using Table 3.2.3.1.A for non-sprinklered, "A" Occupancies, with L/H less than 3:1 and unprotected openings of 23% we get a limiting distance of 7.6 m using an area of 250 m².
- In this case our exposed area is 180 m². Therefore the limiting distance is = $((7.6-6.14)/(250-150)) \times (180-150) + 6.14 = 6.58$ m

Question 3

- Check the allowable openings based on wall construction.

Question 3

- Using Sentence 3.2.3.7(2) with an "A" Occupancy and 23% openings we require a 1 hour fire rated wall with non-combustible cladding.
- Our wall for the building exceeds these requirements with a 2 hour fire rating and non-combustible cladding and is therefore acceptable.

Question 3

- How close to the back lane can they build?

Question 3

- Limiting distance of 6.58 m is measured to the centerline of the road. In this case the building has to be set back $6.58 - 2 = 4.58$ m from the edge of the lane.

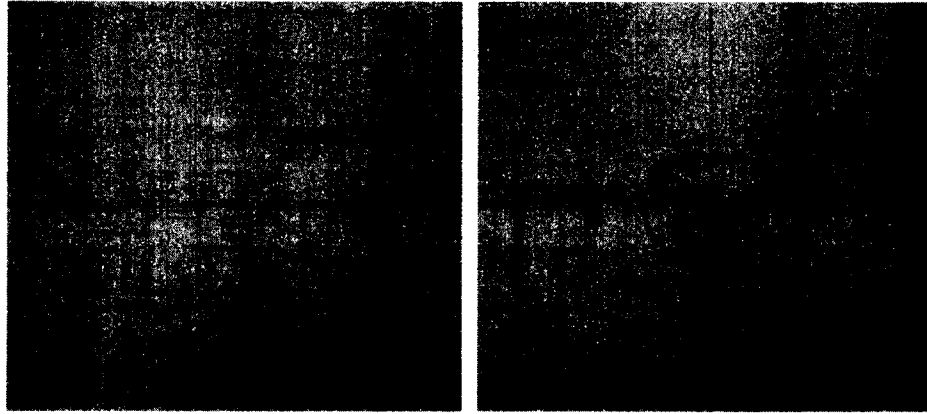
Question 3

- What could they do to build closer to the back lane?

Question 3

- Reduce the area of openings in the exposing building face.
- The wall construction will allow for openings of less than 10% under 3.2.3.7(1)

Question 4



Question 4

- The building is used as a Storage Garage for a Highway Bus with Offices and a Room used as a Waiting Area for bus passengers
- There are two fire compartments separated by a 1 ½ hour rated fire separation.
- The compartments are at 90° to each other.
- The building is not sprinklered.
- There is an exit door in one compartment which is close to 2 windows in the other fire compartment.
- The exit door has a 90 minute fire resistance rating.

Question 4

- What is the limiting distance for the wall containing the exit door?
 - Width = 2m, Height = 5m
 - Door of 0.91 x 2.1 m
 - Wall is combustible construction with a 1 ½ hour fire rating and non-combustible cladding

Question 4

- Wall Area = $2(5) = 10 \text{ m}^2$
- Opening = $.91(2.1) = 1.9 \text{ m}^2$
- Unprotected openings = 0 %
- H/L < 3:1
- Using NBC 2005 Table 3.2.3.1.A we get a limiting distance of 0 m.
- The wall construction however does not permit allowable openings of 10% or less as per NBC 2005 Sentence 3.2.3.7.(2).
- Therefore the Limiting Distance is 1.51 m from NBC 2005 Table 3.2.3.1.A

Question 4

- What is the limiting distance for the wall containing the windows?
 - Width = 8.7 m, Height = 2.65 m
 - 2 windows of 0.61 x 1.32 m
 - Wall is combustible construction with a 1 hour fire resistance rating

Question 4

- Wall Area = $2.65(8.7) = 23 \text{ m}^2$
- Openings = $2(.61)(1.32) = 1.6 \text{ m}^2$
- Unprotected Openings = $100(1.6/23) = 7\%$
- L/H is between 3:1 and 10:1
- Using NBC 2005 Table 3.2.3.1.A we get a limiting distance of 1.2 m
- The wall construction however does not permit allowable openings of 10% or less as per NBC 2005 Sentence 3.2.3.7.(2).
- Therefore the limiting distance is 1.6 m from NBC 2005 Table 3.2.3.1.A

Question 4

- What are the requirements for the windows in the exposed wall?

Question 4

- In this case it is an issue of protecting the exterior exit door. The exit door is within 3 m horizontal distance of the windows and the angle is less than 135° . Therefore, NBC Sentence 3.2.3.13(3) applies and the windows must meet the requirements of Sentence 3.2.3.13(4).
- Windows must be fire rated wired glass or glass block

Question 4

- What are the requirements for the exterior wall construction for the walls which intersect?

Question 4

- Using NBC Sentence 3.2.3.14.(1), exceptions found in Sentence 3.2.3.14.(3), 3.2.3.13.(1) and 3.2.3.19.(4) are not applicable. Note that 3.2.3.13.(1) is not applicable because the exterior exit door is not part of an exit enclosure.
- Using 3.2.3.14.(1), with $D = 1.6 \text{ m}$, $D_0 = 2(1.6) - ((90/90) \times 1.6) = 1.6 \text{ m}$
- Using 3.2.3.14.(2), the exterior walls both require a 1 ½ hour fire rating up to 1.6 m from the intersection.
- A 1.6 m portion of the exterior wall containing the windows will have to be upgraded from a 1 to 1 ½ hour fire rating. This means that there cannot be windows in this portion of the wall.

END