In-Station Training

TM 23-30 Residential Fire

Author

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Purpose

The ventilation profile and flow paths have a major influence on fire development and spread within a building. It is essential to understand the relationship between available oxygen and heat release rate as well as the influence of flow path and convective and radiant heat transfer on fire development and extension.

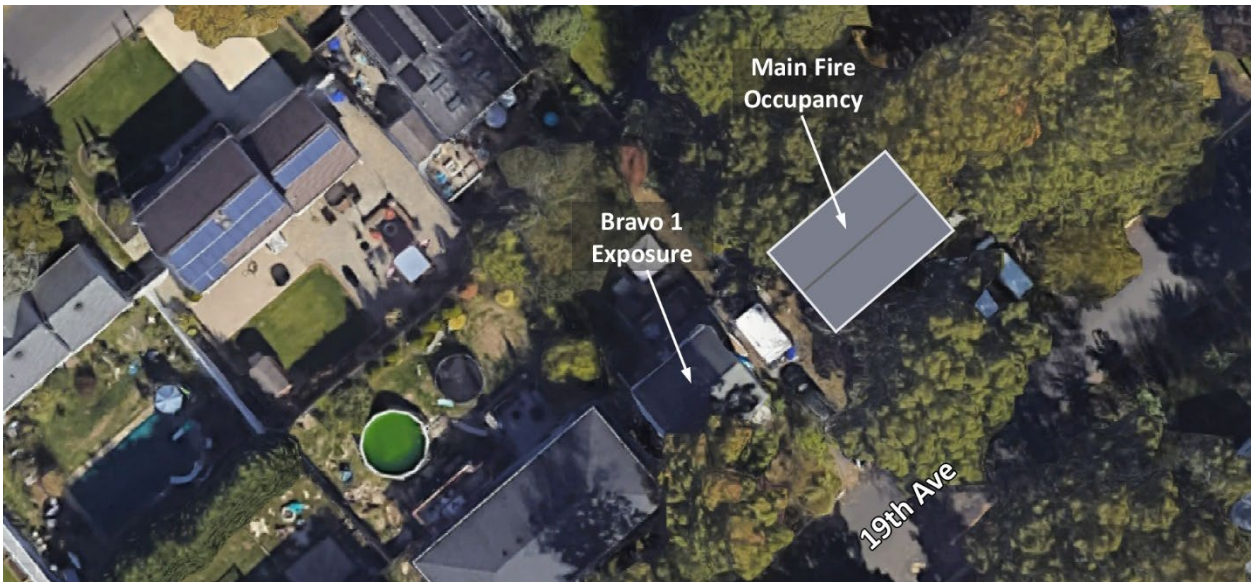
Learning Outcomes

Firefighters and officers perform an effective size-up; select an appropriate strategy, and implement tactics based on the strategic decision-making model.

Conducting the Drill

This incident involved a residential fire at 281 19th Avenue, Brick, New Jersey on June 15, 2023, at 11:13 (Jersey Shore Fire Response, 2023; Costello, 2023; & Rossics, 2023). Review the map and photos (Figures 1-6) to gain an understanding of the area and building involved.

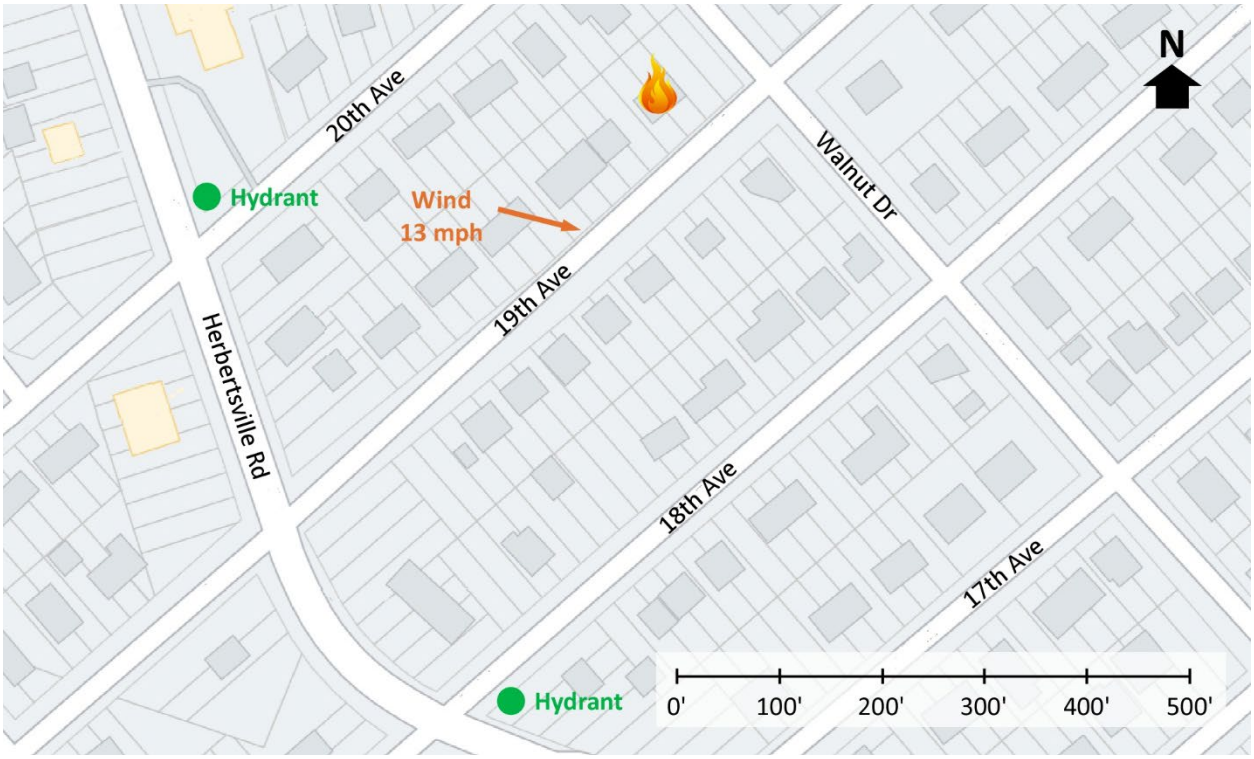
Figure 1. Aerial View



Note: Adapted from Google. (2023a). [Aerial view, 281 19th Avenue, Brick, NJ]. https://bit.ly/3XJiZRN.

The closest hydrants are located on Herbertsville Road at 20th Avenue and 18th Avenue as illustrated in Figure 2.

Figure 2. Map of the Incident Area



Note: Adapted from Google. (2023b). [Map, 281 19th Avenue, Brick, NJ]. https://bit.ly/3O3qTCk.

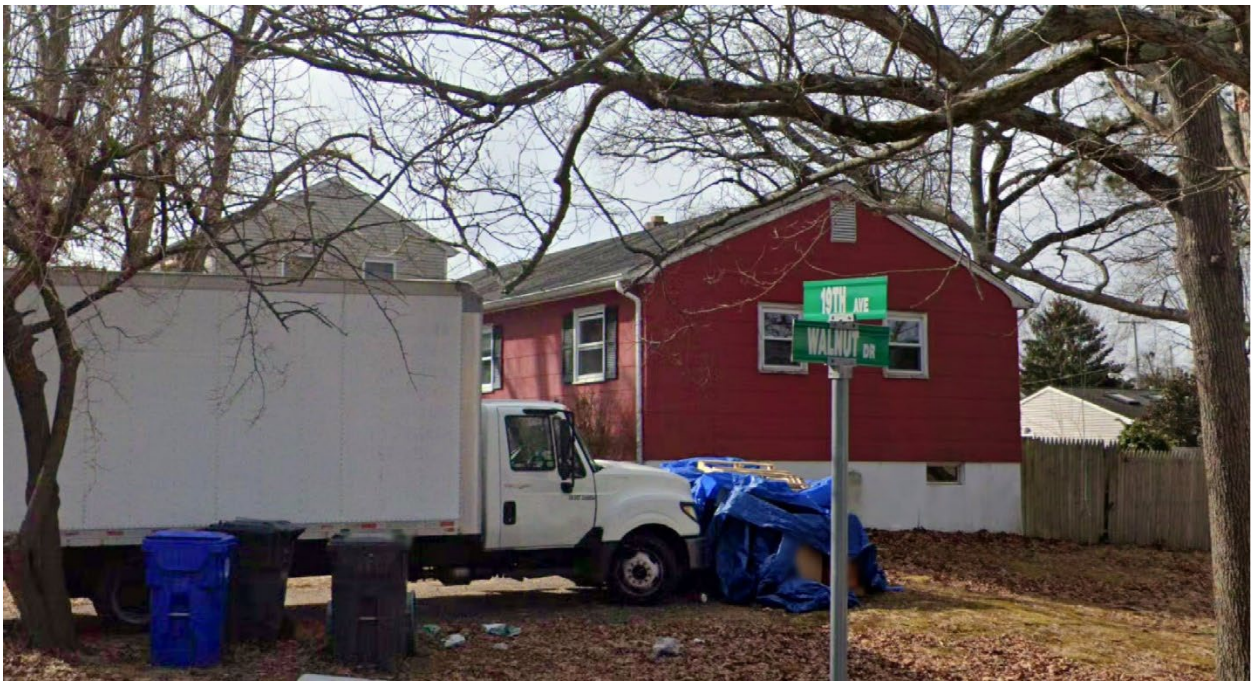
Figure 3. Alpha/Bravo Corner

Note: Adapted from Google. (2022a). [Street view, 281 19th Avenue, Brick, NJ]. https://bit.ly/3PI13Fn.

Figure 4. Side Alpha

Note: Adapted from Google. (2022b). [Street view, 281 19th Avenue, Brick, NJ]. https://bit.ly/43dipNn.

Figure 5. Alpha/Delta Corner



Note: Adapted from Google. (2022c). [Street view, 281 19th Avenue, Brick, NJ]. https://bit.ly/44v2uem.

Figure 6. Charlie/Delta Corner

Note: Adapted from Google. (2022d). [Street view, 281 19th Avenue, Brick, NJ]. https://bit.ly/44v2LxU.

You have been dispatched to 19th Avenue and Walnut Drive for a residential fire at 11:13. You are the company officer or AIC of the first arriving engine and have your company's typical staffing. The temperature is 72° F with wind from the west northwest at 13 mph (Weather Underground, 2023).

1. What critical factors would you consider when dispatched and during response and what conversations would you have with your crew while responding?

While responding you hear a command officer, another engine and advanced life support ambulance with typical staffing for your agency go enroute. Dispatch advises that a neighbor reported flames from the windows of the house on the corner of 19th Avenue and Walnut Drive. A short time later, dispatch provides an update that law enforcement reports a working fire and that all occupants are out of the building. The second engine and ALS ambulance will arrive approximately five minutes after you followed by the command officer. All other units dispatched on the first alarm will arrive after the command officer. You are responding from the north northwest on Herbertsville Road.

Watch the incident video (Jersey Shore Fire Response, 2023) from 04:30 to 05:00 and examine Figure 6 illustrating conditions on arrival.

Figure 7. Conditions on Arrival

Note: Adapted from Jersey Shore Fire Response. (2023). Pre-arrival fully involved two alarm structure fire Brick New Jersey 6/15/23 [video]. https://bit.ly/3O3KSRn.

2. State your initial radio report (IRR) exactly as you would transmit it to dispatch.

3. What specific actions would you take (as the company officer) immediately upon arrival and exiting the apparatus and what task orders would you give your crew?

Smoke is visible from the eaves on Side Charlie with smoke blowing from Bravo/Charlie to Alpha/Delta. Law enforcement officers advise that the occupants are out of the building and their two dogs are secured in the back of a police vehicle.

Watch the incident video (Jersey Shore Fire Response, 2023) from 05:00 to 06:15.

4. Would you change the action you are taking or modify the assignments given to your crew? If so, what task orders would you provide?

5. State your update report exactly as you would transmit it to dispatch.

6. State the tactical assignment you would give the next arriving engine exactly as you would transmit it.

7. Based on the anticipated effectiveness of your tactical operations, state your conditions, actions, and needs (CAN) report that you would provide to the first arriving command officer as part of command transfer to IC #2?

Watch the incident video (Jersey Shore Fire Response, 2023) from 10:15 to 12:15 before answering the next question.

8. The first arriving engine stretched a line and operated from the doorway on Side Alpha. What were the advantages and disadvantages of this attack position? Think about distribution of water within the involved areas in the building.

Additional Learning: Multiple factors influence fire development and extension from compartment to compartment as well as into and through structural voids. The building's ventilation profile and resulting flow paths are a major factor in determining how quickly a fire will become ventilation limited and its path of extension. Watch Fire Behavior, Flow Path/Door Control (LA county Fire Training, 2013).

Watch the incident video (Jersey Shore Fire Response, 2023) from 1:00 to 05:00 and examine Figure 8, which illustrates the initial ventilation profile (over several minutes early in the incident). Discuss how failure of the bedroom windows on the Alpha/Delta corner, the open front door (the screen door is closed), and wind speed and direction may have influenced fire development and spread from the bedroom (room of origin) throughout the first floor.

Figure 8. Ventilation Profile & Flow Path

Note: Adapted from Jersey Shore Fire Response. (2023). Pre-arrival fully involved two alarm structure fire Brick New Jersey 6/15/23 [video]. https://bit.ly/3O3KSRn.

Consider how a law enforcement officer or early arriving command officer closing the door on Side Alpha early in the incident may have influenced fire development and spread in this incident.

How would closing the door have influenced the air track from the windows on Sides Alpha and Delta (as illustrated in Figure 8)? Would the air track have remained unidirectional, or would it likely have become bi-directional (taking air in the lower area of the window and the upper area remaining exhaust)? How would this have impacted the heat release rate from the fire?

It appears that the openings (door and windows) on Side Charlie were closed. But if there was an opening on Side Charlie, how might closing the door on Side Alpha have influenced fire development and spread? How would this have influenced the air track from the windows on Sides Alpha and Delta (as illustrated in Figure 8)?

In addition to closing the door, what other actions could responders arriving in advance of an engine company have taken to reduce the heat release rate and limit fire development and spread? Watch *Exterior Attack with a Dry Chemical Extinguisher* (Axelson, 2019) and *Dry Chemical Extinguisher Suppresses Room and Content Fire* (Axelson, 2021) to give you something to think about.

References

Axelson, L. (2019). An exterior attack, or if you like a transitional attack, with a dry chemical powder extinguisher. In this video we see a small 6 kilo extinguisher (12 kilo is way better). Retrieved July 9, 2023, from https://bit.ly/3roCt2k.

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