

“Means of Egress”

For www.fireengineering.com

by Gregory Havel

Photo by Author

The photo shows one of the required exits from the newly-renovated dining hall building at a university in southeastern Wisconsin. Many of the fire code and life safety requirements are visible. Most are included in NFPA 1—*Uniform Fire Code*; NFPA 101—*Life Safety Code*; and other NFPA codes and standards as noted. The life safety features include:



1 Unobstructed corridor: The corridor leading to the exit is unobstructed by storage, trash containers, housekeeping equipment, or potted plants.

2 Discharge at grade: The sidewalk outside the door is at the same level as the floor, and pitches away from the building to prevent accumulation of rainwater and ice build-up in winter. It leads from the building to a paved driveway on one end and a parking lot at the other.

3 Door opening out: The door opens outwards, due to the large number of people who can occupy the building.



4 Panic hardware: The door is held closed by a panic bar and latch. While a key may be needed at times to get into the building through these doors, occupants can exit at any time by pushing on the panic bar and opening the door.

5 Handicapped accessible doors: The door at the far right of each set of these exit doors is provided with a push-button and electric operator, for accessibility by visitors with impaired mobility, as required by NFPA 101 and the Americans with Disabilities Act.

6 Illumination: The corridor leading to the exit door has some light fixtures working even when the building is not open for business. The electrical system was installed as required by NFPA 70 *National Electrical Code*, as required by the State of Wisconsin.

7 Illuminated exit sign: The exit sign is lit by light-emitting diodes (LEDs) both day and night; has **emergency lighting capability**, and has a back-up battery inside the fixture in the event of a power failure. (NFPA 1, 101, and 70). Note the test button (in the rectangular plate on the ceiling at the upper right) for the battery back-up for the exit sign and emergency lighting feature of the fixtures that are lit in the photo.

8 Fire alarm pull station: Located near the exit in the vestibule on the wall at the right, as required by NFPA 1, 101, and the National Fire Alarm Code.

9 Fire alarm horn/strobe: While the alarm horns in the adjacent rooms and corridors are audible in this area, ADA and Life Safety Code require a flashing strobe to warn the hearing-impaired. It is located on the wall to the right of the doors, near the ceiling.

10 Fire alarm smoke detectors: Visible on the ceiling near the inner set of doors, and in the glass vestibule.

11 Wall heater: To dry the floor in the vestibule if it becomes wet, and to prevent the formation of ice in the winter.

12 Fire extinguisher: A fire extinguisher is provided near each exit from this building, and where needed to be not more than 75 feet of travel distance from anywhere in the building. (NFPA 10) The fire extinguisher cabinet is on the wall to the far left, and not visible in this photo.

13 Automatic fire sprinkler system: The sprinkler heads in this building are recessed and concealed. The cap covering the sprinkler head is visible near the smoke detector near the top left of the photo. There is a similar head in the glass vestibule, hidden behind the aluminum framing of the vestibule. (NFPA 1, NFPA 13 Fire Sprinkler Code, NFPA 101)

14 Safety glazing: The glass in both sets of the exit doors, as well as in the glass between the pairs, is tempered insulating glass. There are two panes of glass with a dry inert gas at low pressure sealed between the panes in each door and window. The glass is tempered, so that it is difficult to break. If it does break, it will shatter into small pieces like gravel, instead of breaking into razor-sharp shards and spears. The decorative windows into the dining room at the right are also tempered glass.



Most of these code and life safety requirements are the result of tragedies that caused the deaths or serious injuries of many people. The origin and history of any one of these code or life safety requirements would make a good topic for a research paper for a student in a fire science or fire protection engineering program.

Only one example is the Triangle Shirtwaist fire of 1911, which claimed the lives of 146 of the 500 employees who were locked in their factory floor during working hours. The public outcry resulted in the first requirements for exit doors opening outward, and operating without keys. Within a year of the fire, several manufacturers marketed lock-sets with a “night-latch” feature, which allowed a door to be locked from outside, but still be opened by turning the handle on the inside; and several types of “panic hardware”, which does not even require locating and turning a handle for the door to open.

Any manufacturers or brand names noted above are used only as examples, and the websites only as sources of additional information. Reference to them is not an endorsement of either product or manufacturer.

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