

Occupant Load Determination – Retail/Business

Occupant load purposes

Occupant load factors have been established through studies showing how much space people take for activities and movement. These occupant load factors are based on how the space is being used. The state fire and building codes use occupant load calculations to establish:

- Egress provisions (such as the number of doors needed and the width of doors, stairs, aisles, and corridors).
- When fire protection systems are required (sprinklers, fire alarm systems, etc.).
- The type of occupancy (in some cases).

Common occupant load factors

Here are the common occupant load factors used in retail, business and mercantile settings from Table 1004.5 of the 2020 Minnesota State Fire Code (MSFC):

- Mercantile – 60 sq. ft. per person.
- Storage – 300 sq. ft. per person.
- Offices & businesses (typical use) – 150 sq. ft. per person.
- Offices (high concentration – example: call centers) – 50 sq. ft. person.

Applying occupant load factors to buildings

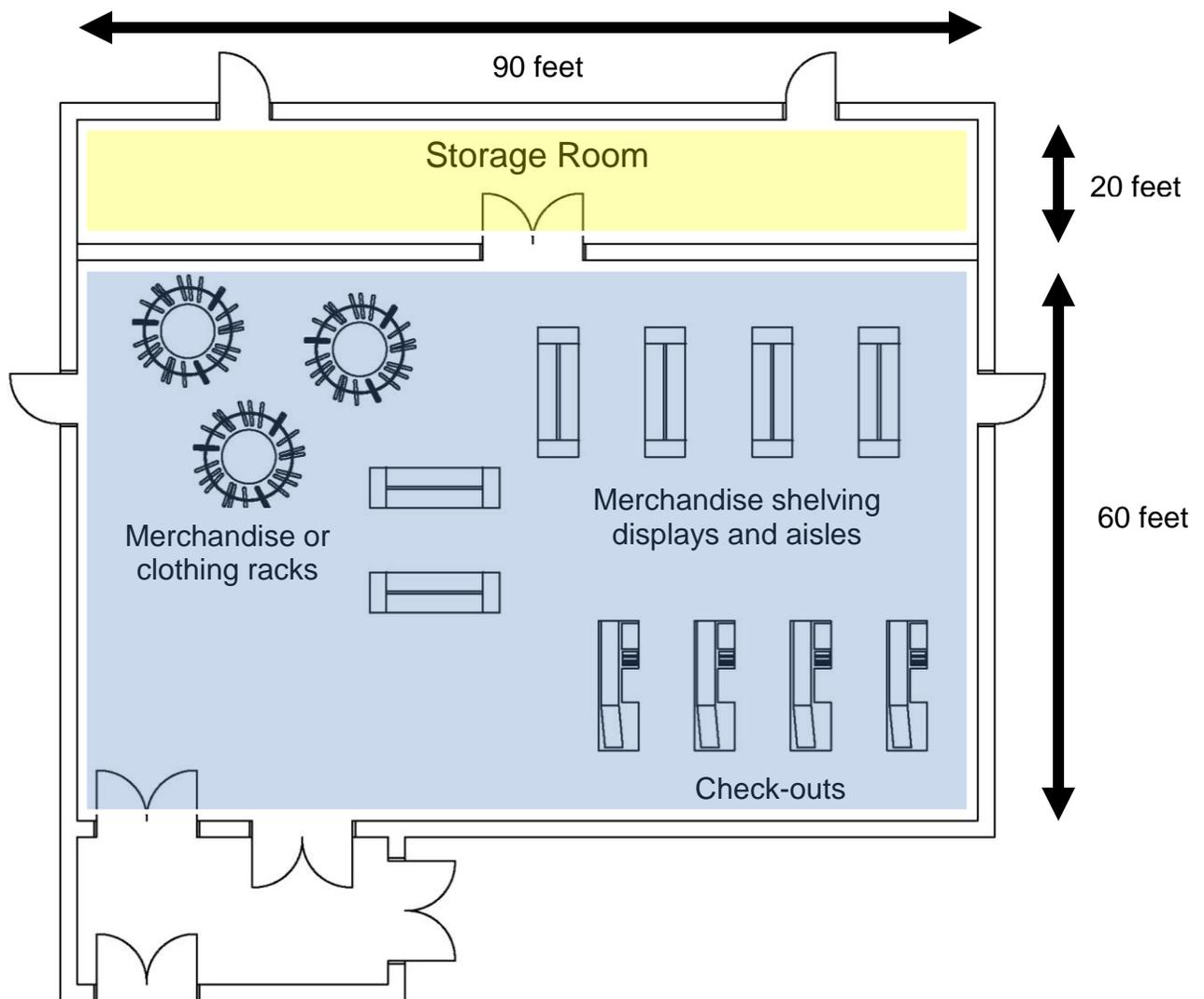
To determine the occupant load of a space, divide the size of the space by the occupant load factor of Table 1004.5 of the 2020 MSFC (see common ones above). In many retail or business settings, there may be more than one use. Please see the following example.

Example of occupant load determination

The following is an example of a retail building with a sales area and storage room. The occupant load is determined by measuring the two areas, dividing by the occupant load factors for each area, and adding the two numbers together.



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Because there are two uses here (retail and storage), there are two different calculations:

- Storage room (shown in yellow):
 - 90 ft. by 20 ft. = 1,800 sq. ft.
 - 1,800 sq. ft. divided by 300 sq. ft. per person = 6 persons.
- Retail / mercantile sales area (shown in blue):
 - 90 ft. by 60 ft. = 5,400 sq. ft.
 - 5,400 sq. ft. divided by 60 sq. ft. per person = 90 persons.
- Total occupant load = 96 persons.

Note: If the occupant load calculations are to ensure compliance with the governor's executive order related to COVID-19 (50 percent reduction), divide the total occupant load determined above by two.

More information: Email the State Fire Marshal Division Fire Code Team at fire.code@state.mn.us. Visit sfm.dps.mn.gov for the latest updates to this information.

