How To Choose A Floor Drain

Adequate and proper drainage of surface areas within and immediately adjacent to building structures is of prime importance. Careful consideration must be given to these areas, particularly their size and shape, and the anticipated volume of drainage to be handled.

Drainage volume is governed by a number of factors, depending on the building type and its use. Some of the factors to be considered include water discharge from equipment, run-off from vehicles, condensate waste and emergency drainage. The drainage volume of surfaces outside the building is normally based on rainfall factors for the geographical region in which the project is located. Exterior drains may be sized and placed using rainfall data provided in this guide. After these considerations have been studied and the piping layout has been developed, the proper types and sizes of drains to service the requirements must be determined.

Floor and area drain selection involves several fundamental steps including determination of tops and outlet sizes to provide fast, efficient drainage. Next, the type of drain best suited for the application must be selected. Considerations here include location, drain material, floor construction, weight of traffic, presence of sediment and debris, backflow prevention and architectural aesthetics, which is particularly significant in finished areas. Finally, the outlet connections must be selected, based on the piping system used, hub and spigot, no-hub, threaded and so forth. The following technical data will help you in making your selection.

LOCATION

The location, for which a drain is required, plays an important role in the selection of the drain. Basements, boiler and equipment rooms, parking and service areas, utility rooms, machine and processing areas, elevator pits, toilet and shower rooms, laundries, kitchens, cold storage areas and many other locations must be equipped with floor drains.

COMPLIANCE WITH ADA

In order to comply with the American Disabilities Act (ADA), drains located in walking surfaces or along accessible routes must have grate openings no greater than 1/2 in. (13 mm) in one direction. If the grate openings are elongated, then the openings must be oriented so that the long dimension is perpendicular to the dominant direction of travel.

SIZES OF TOPS & OUTLETS

Top size of floor or area drain normally relates directly to the grate free area which is the total area of drainage openings in the grate for efficient drainage. Interior floor drains should have a grate free area equal to 1-1/2 times the free area of the connecting pipe. Exterior area drains subject to rainfall should have a minimum free area equal to 2 times the free area of the connecting pipe. This recommended ratio of free area to outlet size (connecting pipe size) is per Floor Drain Standard ANSI A112.21.1M-1980.

FLOW RATE CALCULATION

If the water pressure head above the floor and the required flow rate are known, the required grate free area of the drain can be calculated using the following equation:

$Q = 448.2 \bullet C_d \bullet A \bullet \sqrt{2 \bullet g \bullet h}$ where

Q = Flow Rate (Gallons per Minute)
C_d = Discharge Coefficient = 0.6
A = Free area [open area] of grate (ft/s^2)
g = Acceleration (32.2 ft/s^2)
h= Head above the floor (ft)

This equation can be solved for A:

$$A = \frac{Q}{448.2 \bullet C_d \bullet \sqrt{2 \bullet g \bullet h}}$$

An Example: A head of 0.5 in. (÷ 12 = h in ft. .006 ft.) above the floor with a required flow rate of 15 gallons per minute and an average discharge coefficient of 0.6 gives a required grate free area of 0.034 sq. ft. [4.92 sq. in.].

AESTHETICS

The floor drain is aesthetically pleasing when the proper top material and shape are specified to harmonize with the surrounding environment. JOSAM features products that can be specified and installed with confidence and pride.