SUMP PUMP SIZING

PUMP SIZING PROCEDURE

FOUR MAIN FACTORS MUST BE ASCERTAINED.

1. Total gallons per minute required.
2. Total discharge head of pump.
3. Basin sizing.
4. Discharge line size.

1. GALLONS PER MINUTE REQUIRED:

The total GPM capacity of each pump can be determined by using the fixture flow units and conversion tables No. 1 & No. 2 below:

Take into consideration the inflow rates:

Drainage from tile footing (sandy soil) . . . 2 GPM per 100 sq. ft.
Drainage from tile footing (clay soil) . . . 1 GPM per 100 sq. ft.
Run-off from roofs or paved areas . . . Maximum rainfall over 15 minute period from Weather Bureau (60 gal. run-off per 1" of rainfall per 100 sq. ft.)
Building located within 1,000 ft. of river or lake . . . add 20% to inflow rate.
Basement floor more than 3 ft. below sewer level . . . add 10% to inflow rate per foot in excess of 3 ft.

TABLE NO. 1

Demand of various fixtures given in "Fixture Units"

FIXTURE TYPE	PUBLIC	SEMI PUBLIC	PRIVATE
Sink:			
Kitchen	4	3	2
General or Service	3	2	
Bar	3	2	
Lavatory	4	3	2
Dishwasher:			
General	10	4	
Private			2
Washing Machine - Clothes		6	4
Laundry Tub		3	3
Drinking Fountain	2	1	1
Hose Bibb 3/4"	4	4	4
Unlisted fixture 1¼" trap	2	2	2
Unlisted fixture 1½" trap	3	3	3
Unlisted fixture 2" trap	4	4	4
Unlisted fixture 2½" trap	5	5	5
Unlisted fixture 3" trap	6	6	6

TABLE NO. 2

Fixture Unit Conversion - Interpolation May be Used

Total Fixture Units	Pump GPM (each)
100	50
150	75
200	100
250	120
300	140
400	150
500	160
750	180
1000	200
2000	300
3000	350
4000	450
5000	500
6000	600

2. PUMP DISCHARGE HEAD:

a. Static head is the difference of elevation between the lowest water level in the sump basin and the maximum height of the discharge line.

b. Friction loss of head in the discharge pipeline, including valves and fittings.

c. Proper allowance must be made for back pressure in the common discharge line from other sources.

NOTE: Make selection of Pump Model from Table No. 4

3. BASIN SIZING:

a. Basin shall be physically large enough to receive one or two pumps as the case may be.

b. Depth should be a minimum of 36" deeper than incoming influent.

c. Pump operation 30 seconds to 2 minutes. (See Basin Capacities Table No. 3)

TABLE NO. 3 — BASIN CAPACITIES (GALLONS) PER FOOT OF DEPTH

SIZE	18"	24"	30"	36"	42"	48"	60"	72"
ROUND	14	24	38	53	77	95	150	212
SQUARE	17	30	47	68	92	120	188	270

4. DISCHARGE LINE SIZE:

a. Care should be taken to comply with local plumbing code with regard to installation and in sizing discharge pipe size.

b. It is recommended to keep liquid velocity in discharge pipe a minimum of 2½ feet per second for the purpose of scouring the interior of the pipe. If a lower velocity is used, this may permit the solids to settle in the discharge line. 3" discharge pipe minimum 60 gallons per minute. 4" discharge line minimum 100 gallons per minute.