

### Wet Pit Non-Clog Sewage Pumps

Vertical Solids Handling Pumps are required for sewage and drainage applications where solids and unscreened wastes are carried in the liquid.

Maximum dependability and performance depends on careful calculation of the pumping conditions and selection of the system components. The data outlined below will be useful in selecting the right equipment.

#### Determining Pump Capacity

A simplified procedure is based on the number of toilets to be serviced with allowances for other fixtures and additional water drainage. The table at right includes an allowance for fixtures up to four times the number of toilets. Where the number of fixtures exceeds this allowance, at least 3 gpm for each additional fixture should be added to the pump capacity. This table also includes an allowance for water seepage up to 50% of the sewage capacity. Where the seepage or any other drainage may exceed 50%, the additional amount should be added to the pump capacity.

Maximum Number of Toilets	Pump Capacity GPM
1 or 2	75
3 or 4	100
5 or 6	125
7 to 10	150
11 to 14	200
15 to 20	250
21 to 25	300
26 to 30	350

#### Determining Total Head

The Total Head on the pump will include the difference in elevation between the water level in the sump and the highest point in the discharge line plus any pressure required at the end of the line plus the friction loss in the discharge elbow and discharge pipe, plus the velocity head in the discharge pipe.

#### Typical Example of Total Head Calculation

Vertical distance from lowest water level in sump to highest point in the discharge line .....	46 ft.
Possible back-pressure in sewer line, 3 psig x 2.31 or .....	6.9 ft.
Friction thru discharge pipe and fittings beyond top of sump .....	3 ft.
Friction thru discharge elbow and vertical discharge pipe to top of sump - (300 gpm thru 4" elbow and 10 ft. of 4" pipe - See Table on Page 7560-A2) .....	1.18 ft.
Velocity Head in discharge line (300 gpm in 4" pipe - See Table on 7560-A2) .....	0.89 ft.
Total Head .....	59.97 or 58 ft.

#### Important Notes

- Where the Capacity and Total Head are specified by customer it will be assumed that the Total Head includes all friction losses beyond the pump casing, and the velocity head in pump discharge pipe.  
If this is not so then the rated head should be increased by an amount of 1 to 6 ft. to cover these losses as shown in the example above. See Table on Page 7560-A2.
- Where the bottom of the sump is used as a reference point rather than the liquid level it will usually provide a factor to offset the friction in the discharge elbow and the velocity head.

#### Solid Size

Pumps in commercial, industrial, and public buildings should be capable of handling 2½ inch and preferably 3 inch solids. Private and residential installations should handle at least 1½ inch or 2 inch solids.

#### Sump or Basin Size

The sump or basin should accommodate 3 times the capacity of the pump in gallons per minute, between the high and low pumping levels. Where the sump or basin services more than 6 toilets, it should be large enough in diameter for a Duplex Pump installation.

#### Round Sump Basin Capacities per Foot of Depth

Basin Diameter, Inches	24	30	36	42	48	54	60	72
Capacity Per Foot In Gallons	23	37	53	73	94	119	147	211