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Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

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SECTION: 5.10.020
FM0551
0306
Supersedes
0503

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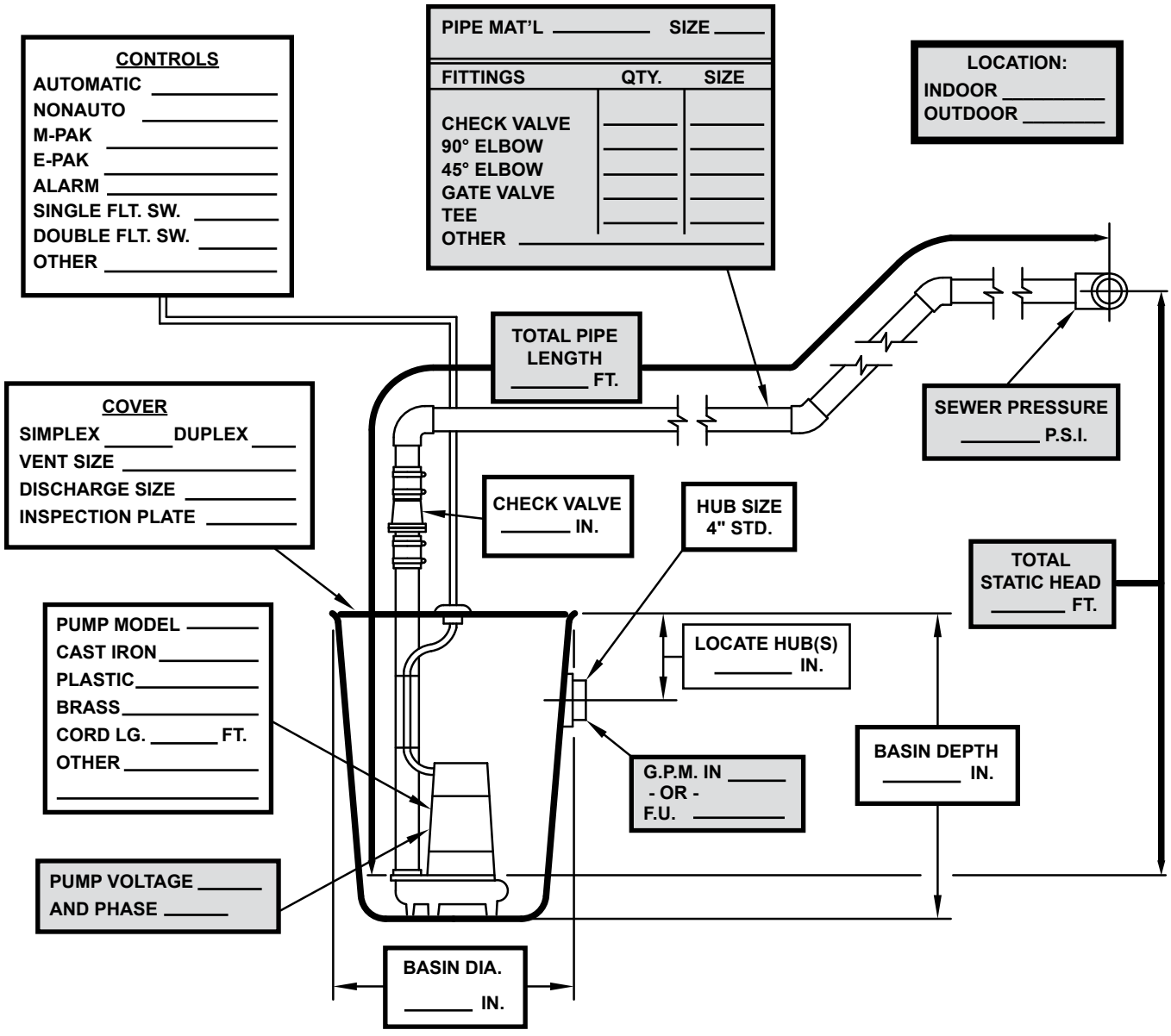
zoellerpumps.com

SEWAGE SYSTEM SIZING AND SELECTION WORK SHEET

See back side for sizing and selection work sheet. Fill out front side and return to representative or Zoeller Pump Company for system sizing and selection assistance. Complete shaded boxes if sizing of pumps is required. Complete unshaded boxes for system selection.



SK391

CUSTOMER _____
ADDRESS _____
JOB _____
JOB# _____ REP. _____
G.P.M. _____ AT T.D.H. OF _____

SEWAGE SYSTEM SIZING AND PUMP SELECTION WORK SHEET

To begin, fill in the shaded areas on the front side. A calculator and additional sheet of paper may be required.

STEP #1 Determine the type and quantity of each plumbing fixture.
Multiply each by its fixture unit values in figure "A".
Sum these values _____
Determine GPM from figure "B". _____GPM (1)

STEP #2 Refer to Figure "C". Based on the System's discharge piping size, Determine the minimum GPM Listed for that size. _____GPM (2)

STEP #3 Select the greater of the two GPM values in #1 & #2. This is your **Design GPM**. If greater than maximum GPM listed in figure, "B", contact factory. _____GPM (3)

STEP #4 Multiply each pipe fitting by its equivalent length value shown in figure "D" and sum. _____Ft. (4)

STEP #5 Total pipe length from front side _____Ft. (5)

STEP #6 Add #4 & #5. [(4) + (5) = (6)] _____Ft. (6)

STEP #7 Divide #6 by 100 and multiply it by the associated friction value from Figure "E". This is the total Friction Head. _____Ft.(7)

STEP #8 Determine static head in Ft., as shown on front side, from minimum water level to the discharge point. _____Ft. (8)

STEP #9 Sewer Pressure, if any, expressed in feet (PSI x 2.31). _____Ft. (9)

STEP #10 Add #7, #8, & #9. [(7) + (8) + (9) = (10)].
This is the system's **Total Dynamic Head. (TDH)** _____Ft. (10)

STEP #11 Select the Zoeller Pump:
Determine solids handling requirement (2" and above).
Select pump from curves shown on FM0269 & FM0995.
Base selection on design values, #3 & #10. _____(Model No.)
Required voltage source _____(Volt/Phase)

STEP #12 Select type of control:
☐ Simplex ☐ Duplex
If simplex:
☐ Mechanical switch ☐ Single float switch
☐ Dual float switch ☐ Alarm
If duplex:
☐ Mechanical Alternator ☐ Electrical Alternator

STEP #13 Select Basin Size: _____in X _____in
Refer to Figure "F" and FM0541 (Diam.) (Depth)

STEP #14 Select Basin Cover:
☐ One Pump ☐ Dual Pump
Vent Pipe Size _____in.
Discharge Pipe Size _____in.

Final Notes:
1) Consult Factory in any application where TDH is less than 5' #10 .
2) Pump must be capable of providing the minimum required GPM for pipe size, Figure "C", at the calculated TDH #10 .
3) Pump's lock valve must be greater than system's highest point.

FIGURE A

PLUMBING FIXTURE UNIT VALUES*

Fixture Description	Fixture Unit Value	Fixture Description	Fixture Unit Value
Bathtub, 1-1/2" trap	2	Sink, service type	3
Bathtub, 2" trap	3	Sink, scullery	4
Bidet, 1-1/2" trap	3	Sink, surgeons	3
Dental unit or cuspidor	1	Swimming pool (per 100 gallons)	1
Drinking fountain	1	Urinal	4**
Dishwasher, domestic	2	Washing machine	2
Kitchen sink	2	Water closet	3**
Kitchen sink with disposal	3	Water softener	4
Lavatory, 1-1/2" trap	1	Unlisted fixture, 1-1/4" trap	2
Lavatory, barber/beautician	2	Unlisted fixture, 1-1/2" trap	3
laundry tray	2	Unlisted fixture, 2" trap	4
Shower	2	Unlisted fixture, 2-1/2" trap	5
Shower, group (per head)	3	Unlisted fixture, 3" trap	6
Bathroom group consisting of lavatory, bathtub or shower, and water closet			6**

*Graph data is taken form ASPE Handbook, Uniform Plumbing Code, Cameron Hydraulic Data and Plastic Pipe Institute.
**Add 4 fixture units for each flush valve fixture

FIGURE B

PUMP CAPACITY BASED ON TOTAL FIXTURE UNITS*

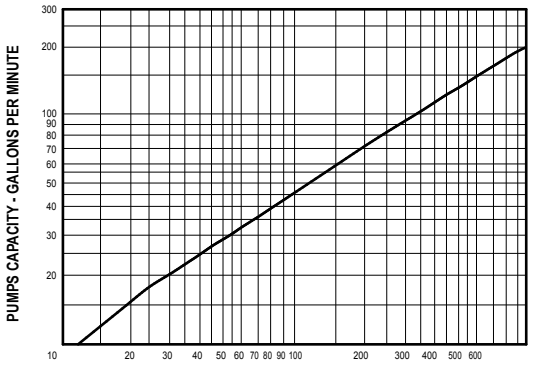


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FIGURE C*

Pipe Size	Minimum GPM
2"	21
2½"	30
3"	46
4"	78

FIGURE D*

Friction factors for pipe fittings in terms of equivalent feet of straight pipe

Nominal Pipe Size	90 Elbow	45 Elbow	Tee (Thru-flow)	Tee Branch flow	Swing Check Valve	Gate Valve
2"	5.2	2.8	3.5	10.3	17.2	1.4
2½"	6.2	3.3	4.1	12.3	20.6	1.7
3"	7.7	4.1	5.1	15.3	25.5	2.0
4"	10.0	5.0	7.0	22.0	33.0	2.3

FIGURE E*

FRICTION HEAD IN FEET PER 100' OF SCHEDULE 40 PIPE

	2"		2½"		3"		4"	
GPM	Plastic	Steel	Plastic	Steel	Plastic	Steel	Plastic	Steel
20	0.73	1.55	0.31	0.65				
25	1.10	2.34	0.47	0.99				
30	1.55	3.28	0.65	1.38				
35	2.06	4.37	0.87	1.84	0.30	0.64		
40	2.64	5.59	1.11	2.35	0.39	0.82		
45	3.28	6.95	1.38	2.93	0.48	1.02		
50	3.99	8.45	1.68	3.56	0.58	1.24		
60	5.59	11.8	2.35	4.99	0.82	1.73		
70	7.44	15.8	3.13	6.64	1.09	2.31	0.29	0.70
80	9.52	20.2	4.01	8.50	1.39	2.95	0.37	0.79
90			4.99	10.6	1.73	3.67	0.46	0.98
100			6.06	12.8	2.11	4.47	0.56	1.19
125			9.18	19.5	3.19	6.75	0.85	1.80
150					4.47	9.46	1.19	2.52
175					5.95	12.3	1.58	3.36
200							2.30	4.30
225							2.56	5.35
250							3.07	6.50
300							4.30	9.11

FIGURE F* (Check Fm0541 for Simplex & Duplex Information)

Recommended BASIN Diameters

GPM	18"	24"	30"	36"	48"
20					
25					
30					
35					
40					
45					
50					
60					
70					
80					
90					
100					
125					
150					
175					
200					
225					
250					