

TYPE

**SEWAGE EJECTOR SYSTEM****VSAF**

**photo  
coming  
soon**

Flows to 600 gpm, Heads to 120', 1 thru 40  
HP. Discharge size 4", 1750 and 1150 RPM,  
strainer in discharge pipe.

**HIGHLIGHTS**

- 🌀 Installations where rags can clog standard sewage pumps
- 🌀 1750 RPM 1150 RPM Operation
- 🌀 Fiberglass or Steel Basins
- 🌀 Basket Strainer Traps Large Objects
- 🌀 Ideal for Hospitals, Schools, and Correctional Facilities
- 🌀 Control Systems Available

## FEATURES

**FLEXIBLE COUPLING:** Machined and balanced.

**THRUST BEARING:** Ball bearing mounted above suspension plate in dust-proof and moisture-proof housing.

**ADJUSTING NUTS:** Two bronze lock nuts for accurate vertical adjustment of impeller clearance.

**SUSPENSION PLATE:** Cast iron suspension plate has integral strengthening ribs.

**DISCHARGE PIPE:** Wrought steel, locked to suspension plate, held in bottom elbow by slip-bolt mating flange.

**TOP DISCHARGE ELBOW:** Cast iron 45 degree elbow with integral 125# companion flange. Bottom of housing encloses top expansion joint.

**STRAINER:** Cast iron housing; stainless steel basket easily removable from top. Entire assembly slips out of discharge line without disturbing piping.

**INLET TEE:** Cast iron tee with three mating flanges for simple assembly.

**CONTROL VALVE:** Cast iron housing with removable top for easy access; brass flapper. Prevents backing up into house line during discharge cycle. Shut-off handle cuts off either pump.

**OVERFLOW FITTING:** Permits water to overflow directly into basin if both pumps are operating.

**IMPELLER:** One-piece cast iron non-clog, dynamically and hydraulically balanced, keyed and locked to shaft. Bronze impellers optional.

**SHAFT:** Carbon steel, turned, ground, and polished; sized for maximum load.

**SUSPENSION LEGS:** Cast iron sections with integral end flanges.

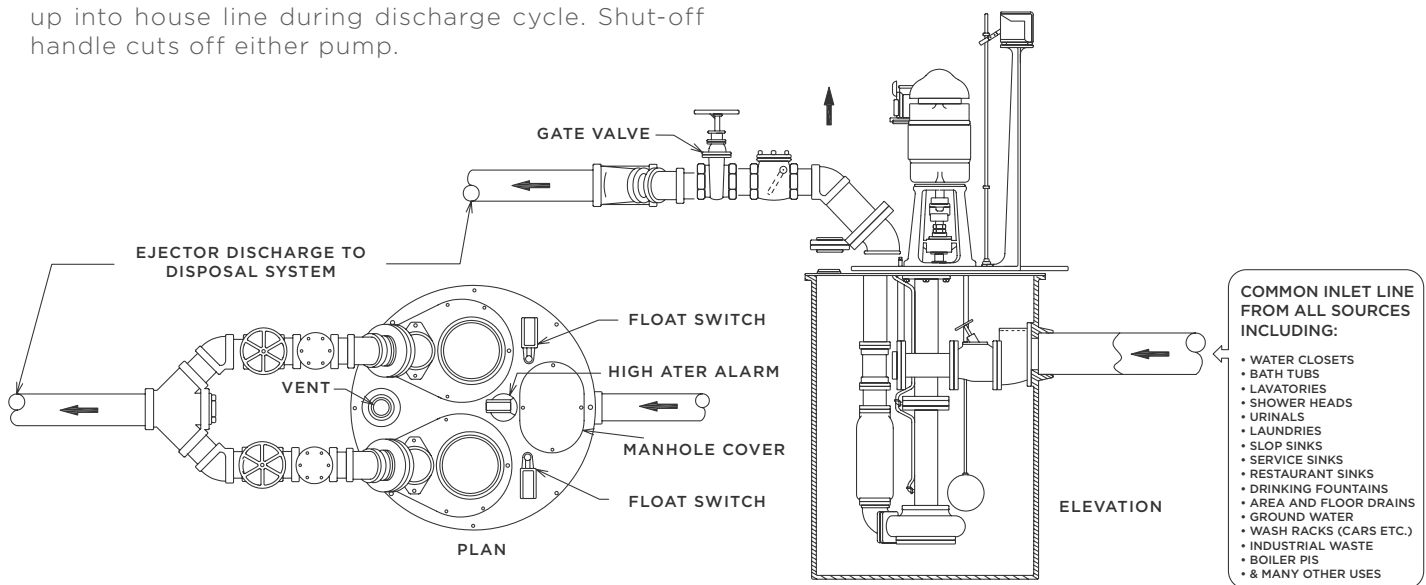
**INTERMEDIATE GUIDE BEARINGS:** For each four feet of shaft length; renewable bronze sleeve type.

**CASING:** Cast iron with smooth water passages.

**LOWER DISCHARGE ELBOW:** Removable; acts as elbow and housing for bottom expansion joint.

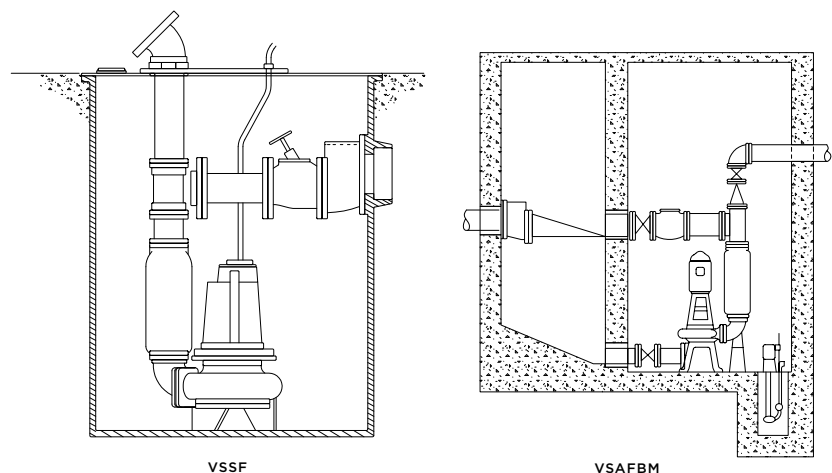
**BOTTOM GUIDE BEARING:** Renewable bronze sleeve bearing pressed into casing.

**LUBRICATION SYSTEM:** Guide bearings lubricated through flexible grease line. Alemite fitting furnished on the suspension plate for each line. Sight-feed and automatic oilers available.



## Other Fed-Flush Arrangements

VSAF unit numbers cover vertical submerged sewage ejectors (VSA) with Fed-Flush fittings. Fed-Flush fittings can also be furnished with VSS submersible sewage ejectors (VSSF units). See supplemental pamphlet for pump data. Fed-Flush fittings can also be furnished with VSABM dry pit sewage pumps (VSAFBM units).



## SUGGESTED SPECIFICATIONS

Furnish a pedestal mounted alternating float switch, with brass rod and copper float, to provide alternate cycles of operation, plus simultaneous operation when required. Furnish a pedestal mounted auxiliary float switch with brass rod and copper float, for emergency 2-pump operation. Float control equal to Federal Type FS-4.

Furnish a compression tube type high water alarm actuating switch with adjustable sensing tube and integral alarm horn, equal to Federal Type FS-5.

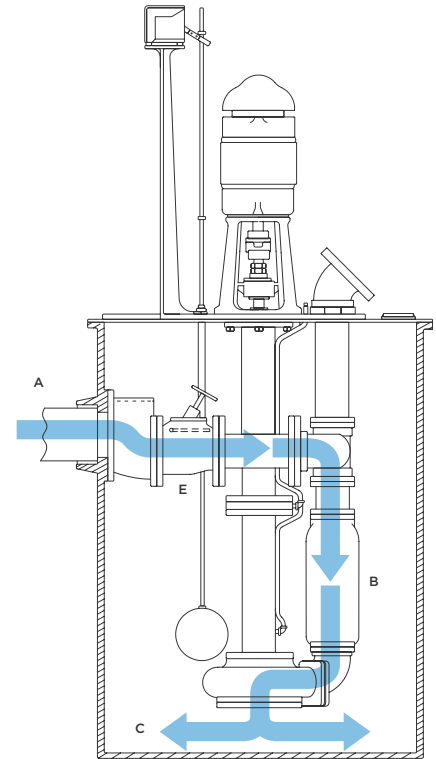
Furnish each motor with a magnetic line voltage starter providing overload and low voltage protection, in NEMA-1 wall mounting enclosure, having "Hand-Off-Automatic" selector switch and reset button.

Furnish a cast iron (or steel) sewage basin, \_\_\_\_\_ diameter by \_\_\_\_\_ deep, having internal rust resistant coating. Inlet connection shall be as required by job conditions. Cover shall be steel with all required openings, including those for pumps, controls, alarm actuator, vent connection, and manhole. Manhole opening provided with cast iron cover.

ALTERNATE FOR CONCRETE PIT: (substitute the following paragraph for the above cast iron basin paragraph)

Furnish a Federal PF-1 type angle iron pit frame for a concrete pit \_\_\_\_\_ x \_\_\_\_\_ x \_\_\_\_\_ deep. Pit to be constructed by general contractor. Plumbing contractor shall furnish the pit frame together with a heavy steel pit cover having all required openings, including those for pumps, controls, alarm actuator, vent connection and manhole. Manhole opening provided with cast iron cover. Cover and frame to be treated with a corrosion resistant coating and to be of casttight bolted construction.

Note: Inlet adaptor for mounting FED-FLUSH fittings must be installed when concrete pit is poured. (Advise inlet size and pit wall thickness when ordering adaptor.)



**IN-FLOW CYCLE**

Sewage water with solids enter from house line (A). Solids are held in strainer (B) and water continues into basin (C).

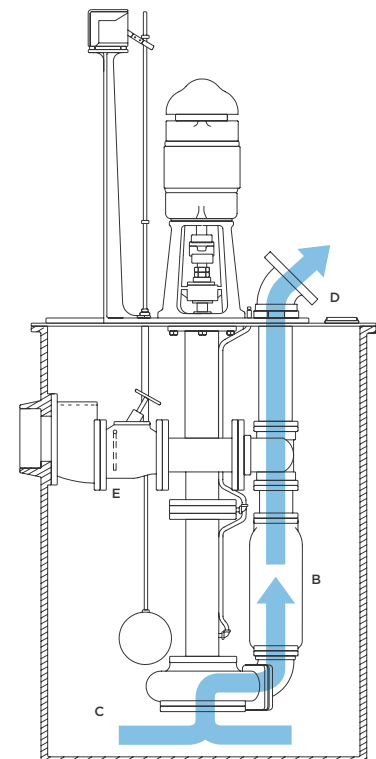
## SUGGESTED SPECIFICATIONS

Furnish and install where shown on plans, Fed-Flush Type VSAF-\_\_\_\_\_, duplex, vertical, submerged strainer basket type sewage ejector unit as manufactured by Federal Pump Corporation. Each pump to be rated at \_\_\_\_\_ G.P.M. against a total dynamic head of \_\_\_\_\_ feet. Pumps to have \_\_\_\_\_ inch discharge and be constructed for basin \_\_\_\_\_ feet deep.

The unit shall be so designed that sewage entering the pit shall be carried to the strainer baskets installed in pump discharge lines. Solids will be retained in the baskets and liquids will continue thru the casing into the basin. The strainer shall have a cast iron housing and a stainless steel basket, removable from the top of the housing. Solids shall be flushed into the discharge line during the discharge cycle. A control valve shall prevent back-up into the house line during discharge cycles and permit cut-off of either pump. Overflow fitting shall allow liquid to flow directly into basin during discharge cycles.

Pump shaft shall be large diameter carbon steel; impeller to be cast iron, non-clog type; thrust bearing enclosed in moisture-proof housing, mounted above the suspension plate. Suspension plate shall be cast iron; suspension column shall be constructed of cast iron sections, with integral rabbetted end flanges. Bronze intermediate guide bearings shall be furnished for every four feet of shaft length. Cast iron pump casing shall have pressed-fit bronze bearing. Lubrication of guide bearings shall be by means of alemite grease fittings on suspension plate and flexible grease lines. Casing shall have bolt-on discharge elbow forming lower expansion joint housing. Discharge pipe to terminate above the suspension plate in a cast iron 45 degree elbow and top expansion joint housing, with 125# ASA integral flange.

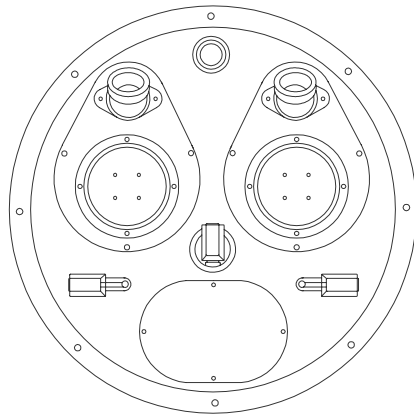
Motors to be \_\_\_\_\_ H.P., \_\_\_\_\_ R.P.M., \_\_\_\_\_ ph., \_\_\_\_\_ cy., \_\_\_\_\_ volts, vertical, open, drip proof, ball bearing.



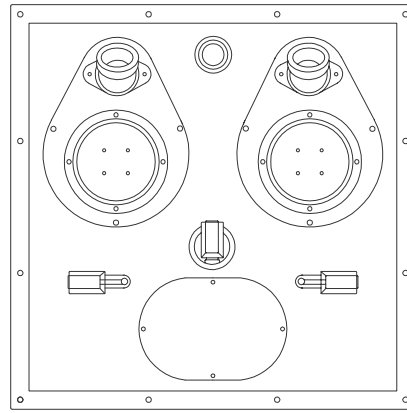
**DISCHARGE CYCLE**

Water is pumped from basin (C), flushes solids in strainer (B) out into discharge line (D). Control valve (E) prevents backup into house line.

## PIT & BASIN COVERS



Duplex Unit  
Round Pit or Basin



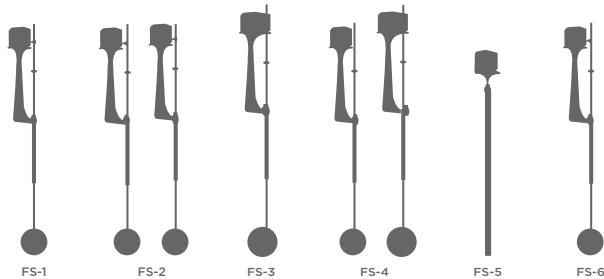
Duplex Unit  
Square Pit

SQUARE PIT SIZE	G	CTC	OS	PF
42X42	13-34	41	42	48-18
48X48	13-34	47	48	54-18
54X54	13-34	53	54	60-18
60X60	13-34	59	60	66-18
66X66	13-34	65	66	72-18
72X72	13-34	71	72	78-18
78X78	13-34	77	78	84-18
84X84	13-34	83	84	90-18

ROUND PIT OR BASIN	G	BOLT CIRCLE BC	COVER DIA. OD
42	13-34	44-12	46
48	13-34	51	53
60	13-34	63	66
72	13-34	75	78

PUMP FRAME	F
VSAF-4F	12
VSAF-4A	13-34
VSAF-4C	16-12
VSAF-4E	16-12

## CONTROL EQUIPMENT



### PUMP CONTROLS

The following control arrangements are available:

**FS-1** (for single unit) one float switch for start-stop control.

**FS-2** (for duplex unit) two float switches for start-stop control. The switches can be manually set to change the lead pump. Both pumps will operate if the in-flow rate requires.

**FS-3** (for duplex unit) - one alternating float switch which operates the two pumps on an alternating basis and turns on both pumps simultaneously if the in-flow rate requires.

**FS-4** (for duplex unit) - one alternating float switch (as described immediately above) plus two-pole emergency auxiliary float switch which will turn on both pumps at a predetermined high water level if the alternating float switch fails to operate for some reason.

**FS-5** (for single or duplex unit) - a compression tube type high water alarm actuating switch with integral alarm horn. Can also provide signal for remote alarm indication. Alarm panel with bell, indicating light and silencing button is also available.

**FS-6** (for single or duplex unit) - one float switch to act as a high water alarm actuator instead of the compression tube type described immediately above.



### MOTOR CONTROLS

The following control arrangements are available:

**For single or duplex units:** (1) magnetic starter for each motor to be mounted on an adjacent wall or on the float switch pedestal(s).

**For duplex units:** A Type D Duplex Control Panel in a single enclosure for mounting on an adjacent wall. These panels are available as follows:

**D1000:** (2) magnetic starters in one enclosure.

**D1100:** (2) magnetic starters and (2) unfused disconnect switches in one enclosure.

**D1200:** (2) magnetic starters and (2) fusible disconnect switches in one enclosure.

**D1300:** (2) magnetic starters and (2) circuit breakers in one enclosure.

Modifications are available for magnetic starters and Type D Duplex Panels as follows: special enclosures, 'Hand-of f-Automatic' selector switches, pilot lights, control circuit transformers, manual transfer switch and automatic pump alternator.

Selection Table – 1150 R.P.M.					Selection Table – 1150 R.P.M.				
Unit No.	G.P.M.	Disch. Head (ft.)	Motor H.P.	Disch. Size (ins.)	Unit No.	G.P.M.	Disch. Head (ft.)	Motor H.P.	Disch. Size (ins.)
VSAF-4F-1-4	50	28	1	4	VSAF-4F-1-6	50	19	1	4
VSAF-4F-1.5-4	50	33	1.5	4	VSAF-4A-1-6	50	28	1	4
VSAF-4F-2-4	50	40	2	4	VSAF-4A-1.5-6	50	29	1.5	4
VSAF-4F-3-4	50	45	3	4	VSAF-4A-2-6	50	31	2	4
VSAF-4A-5-4	50	62	5	4	VSAF-4C-3-6	50	36	3	4
VSAF-4F-1-4	75	25	1	4	VSAF-4E-5-6	50	48	5	4
VSAF-4F-1.5-4	75	32	1.5	4	VSAF-4E-7.5-6	50	61	7.5	4
VSAF-4F-2-4	75	38	2	4	VSAF-4F-1-6	75	18	1	4
VSAF-4F-3-4	75	43	3	4	VSAF-4A-1-6	75	23	1	4
VSAF-4A-5-4	75	61	5	4	VSAF-4A-1.5-6	75	26	1.5	4
VSAF-4F-1-4	100	23	1	4	VSAF-4A-2-6	75	29	2	4
VSAF-4F-1.5-4	100	30	1.5	4	VSAF-4C-3-6	75	35	3	4
VSAF-4F-2-4	100	35	2	4	VSAF-4E-5-6	75	46	5	4
VSAF-4F-3-4	100	40	3	4	VSAF-4E-7.5-6	75	59	7.5	4
VSAF-4A-5-4	100	60	5	4	VSAF-4F-1-6	100	16	1	4
VSAF-4F-1-4	125	19	1	4	VSAF-4A-1-6	100	20	1	4
VSAF-4F-1.5-4	125	26	1.5	4	VSAF-4A-1.5-6	100	24	1.5	4
VSAF-4F-2-4	125	33	2	4	VSAF-4A-2-6	100	27	2	4
VSAF-4F-3-4	125	38	3	4	VSAF-4C-3-6	100	33	3	4
VSAF-4A-5-4	125	57	5	4	VSAF-4E-5-6	100	44	5	4
VSAF-4F-1-4	150	16	1	4	VSAF-4E-7.5-6	100	58	7.5	4
VSAF-4F-1.5-4	150	23	1.5	4	VSAF-4F-1-6	125	14	1	4
VSAF-4F-2-4	150	31	2	4	VSAF-4A-1-6	125	18	1	4
VSAF-4F-3-4	150	36	3	4	VSAF-4A-1.5-6	125	23	1.5	4
VSAF-4A-5-4	150	55	5	4	VSAF-4A-2-6	125	25	2	4
VSAF-4C-7.5-4	150	65	7.5	4	VSAF-4C-3-6	125	31	3	4
VSAF-4F-1-4	200	7	1	4	VSAF-4E-5-6	125	42	5	4
VSAF-4F-1.5-4	200	13	1.5	4	VSAF-4E-7.5-6	125	57	7.5	4
VSAF-4F-2-4	200	25	2	4	VSAF-4F-1-6	150	12	1	4
VSAF-4F-3-4	200	30	3	4	VSAF-4A-1.5-6	150	21	1.5	4
VSAF-4A-5-4	200	47	5	4	VSAF-4A-2-6	150	24	2	4
VSAF-4C-7.5-4	200	61	7.5	4	VSAF-4C-3-6	150	30	3	4
VSAF-4A-1.5-4	250	8	1.5	4	VSAF-4E-5-6	150	40	5	4
VSAF-4A-2-4	250	16	2	4	VSAF-4E-7.5-6	150	56	7.5	4
VSAF-4A-3-4	250	25	3	4	VSAF-4A-1.5-6	200	16	1.5	4
VSAF-4A-5-4	250	44	5	4	VSAF-4A-2-6	200	22	2	4
VSAF-4A-7.5-4	250	57	7.5	4	VSAF-4C-3-6	200	28	3	4
VSAF-4C-10-4	250	71	10	4	VSAF-4C-5-6	200	38	5	4
VSAF-4C-15-4	250	88	15	4	VSAF-4E-7.5-6	200	54	7.5	4
VSAF-4A-2-4	300	9	2	4	VSAF-4A-1.5-6	250	14	1.5	4
VSAF-4A-3-4	300	20	3	4	VSAF-4C-2-6	250	19	2	4
VSAF-4A-5-4	300	38	5	4	VSAF-4C-3-6	250	26	3	4
VSAF-4A-7.5-4	300	48	7.5	4	VSAF-4C-5-6	250	35	5	4
VSAF-4C-10-4	300	68	10	4	VSAF-4E-7.5-6	250	50	7.5	4
VSAF-4C-15-4	300	85	15	4	VSAF-4E-10-6	250	58	10	4
VSAF-4A-3-4	350	19	3	4	VSAF-4C-2-6	300	15	2	4
VSAF-4A-5-4	350	32	5	4	VSAF-4C-3-6	300	23	3	4
VSAF-4C-7.5-4	350	50	7.5	4	VSAF-4C-5-6	300	31	5	4
VSAF-4C-10-4	350	65	10	4	VSAF-4E-7.5-6	300	47	7.5	4
VSAF-4C-15-4	350	80	15	4	VSAF-4E-10-6	300	54	10	4
VSAF-4C-3-4	400	16	3	4	VSAF-4E-15-6	300	59	15	4
VSAF-4C-5-4	400	30	5	4	VSAF-4C-2-6	350	13	2	4
VSAF-4C-7.5-4	400	42	7.5	4	VSAF-4C-3-6	350	21	3	4
VSAF-4C-10-4	400	61	10	4	VSAF-4C-5-6	350	28	5	4
VSAF-4C-15-4	400	75	15	4	VSAF-4E-7.5-6	350	42	7.5	4
VSAF-4C-5-4	500	23	5	4	VSAF-4E-10-6	350	50	10	4
VSAF-4C-7.5-4	500	36	7.5	4	VSAF-4E-15-6	350	58	15	4
VSAF-4C-10-4	500	55	10	4	VSAF-4C-2-6	400	12	2	4
VSAF-4C-15-4	500	71	15	4	VSAF-4C-3-6	400	20	3	4
VSAF-4C-20-4	500	78	20	4	VSAF-4C-5-6	400	24	5	4
VSAF-4E-25-4	500	88	25	4	VSAF-4E-7.5-6	400	38	7.5	4
VSAF-4E-30-4	500	102	30	4	VSAF-4E-10-6	400	44	10	4
VSAF-4E-40-4	500	120	40	4	VSAF-4E-15-6	400	57	15	4
VSAF-4C-5-4	600	17	5	4	VSAF-4C-3-6	500	15	3	4
VSAF-4C-7.5-4	600	30	7.5	4	VSAF-4C-5-6	500	23	5	4
VSAF-4C-10-4	600	53	10	4	VSAF-4E-7.5-6	500	31	7.5	4
VSAF-4C-15-4	600	65	15	4	VSAF-4E-10-6	500	42	10	4
VSAF-4C-20-4	600	73	20	4	VSAF-4E-15-6	500	54	15	4
VSAF-4E-25-4	600	82	25	4	VSAF-4E-5-6	600	16	5	4
VSAF-4E-30-4	600	100	30	4	VSAF-4E-7.5-6	600	29	7.5	4
VSAF-4E-40-4	600	115	40	4	VSAF-4E-10-6	600	40	10	4
					VSAF-4E-15-6	600	50	15	4

## PUMP SIZING DATA

### PUMP CAPACITY

Pump capacity can be determined by the number of water closets to be handled. Other fixtures need not be considered. The capacity shown applies to single pumps and to each pump of a duplex set.

NO. OF WATER CLOSETS HANDLED	PUMP CAPACITY (G.P.M.)
1	50
2 OR 3	75
4 OR 5	100
6 OR 7	125
8 TO 10	150
11 TO 15	200
16 TO 20	250
21 TO 25	300
26 TO 30	350

If outside drainage is greater than 1/2 the pump capacity as determined above, add the excess amount to the pump capacity.

### PUMP DISCHARGE HEAD

The discharge head for a sewage ejector installation consists of the following elements:

**STATIC HEAD:** The difference in elevation between the lowest water level in the sewage basin or pit, and the maximum height of the discharge line.

**FRICTION:** Loss of head in the discharge line, including valves and other fittings.

**BACK PRESSURE:** Proper allowance must be made for back pressure in sewer line, if existing.

### EXAMPLE

**PROPOSED INSTALLATION:** Sewage basin 5&#39;-0" in depth to be set in ground, with top flush with furnished floor. Basement floor 10&#39;-0" below highest point of discharge line. Ejector capacity 100 G.P.M. size of discharge line 4"

Static Head	14 f t*.
Friction Head	2 ft.
Valves & other Fittings	3 ft.
Back Pressure	6 ft.
Total Dynamic Head	25 ft.

\*Lowest water level estimated to be approximately 1 f t. above bottom of sewage basin.

### DRAINAGE FROM FIXTURES & OTHER SOURCES

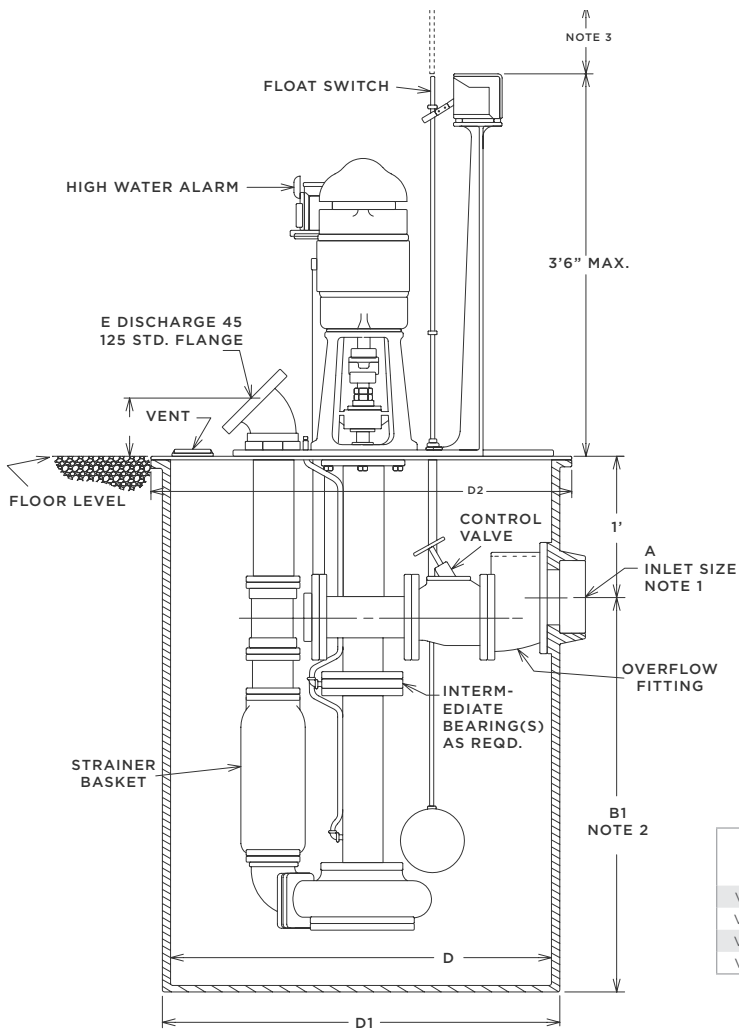
Water Closet	7 G.P.M.
Urinal	3 G.P.M.
Lavatory	5 G.P.M.
Bath Tub	6 G.P.M.
Shower Bath	8 G.P.M.
Laundry Tray	3 G.P.M.
D K G Fountain	1 G.P.M.
Washing Machine Residential	10 G.P.M.
Washing Machine Commercial Average	20 G.P.M.
Wash Sink or Fountain Industrial Average	9 G.P.M.
Automatic Dishwasher Residential	3 G.P.M.
Service Sink	4 G.P.M.
Restaurant Sink	4 G.P.M.
Shop Sink	15 G.P.M.
1/2" Horse Connection	5 G.P.M.
Floor Drain	5 G.P.M.
Auto Wash Rack	18 G.P.M.

### DRAINAGE

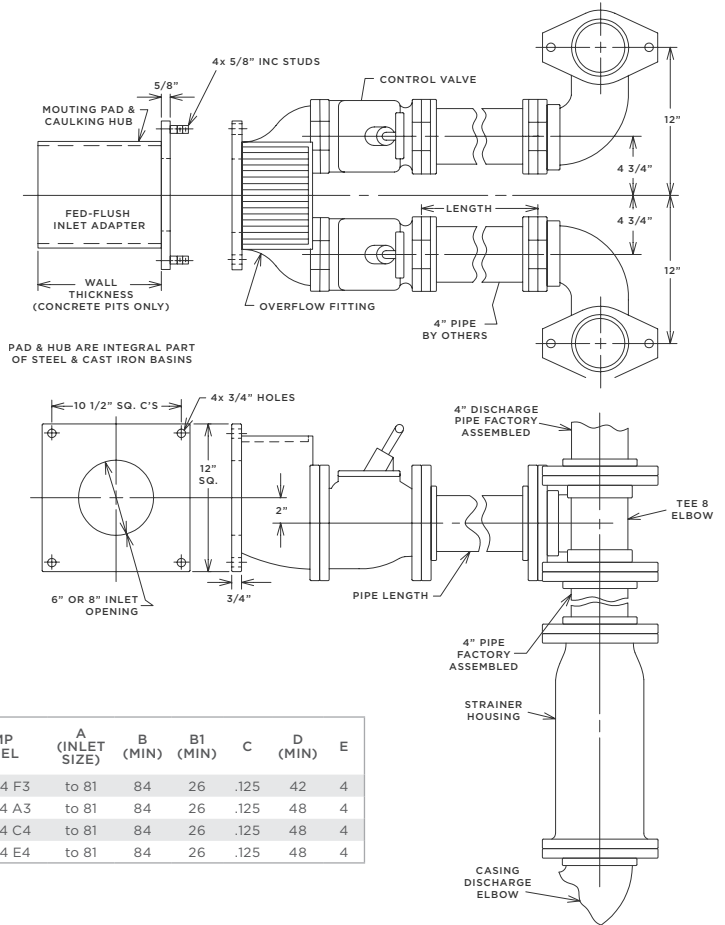
**PAVED AREA** Normal rainfall 1" per hour on 100 sq. ft. - 1 g.p.m.

**SANDY SOIL** Normal for 100 sq. ft. - 2.0 g.p.m. (20,000 sq. ft. or less). Normal for 100 sq. ft. - 1.5 g.p.m. (over 20,000 sq. ft.)

**CLAY SOIL** Normal for 100 sq. ft. - 1.0 g.p.m. (20,000 sq. ft. or less). Normal for 100 sq. ft. - .75 g.p.m. (over 20,000 sq. ft.)



## Fed-Flush Fittings



PUMP MODEL	A (INLET SIZE)	B (MIN)	B1 (MIN)	C	D (MIN)	E
VSAF-4 F3	to 81	84	26	.125	42	4
VSAF-4 A3	to 81	84	26	.125	48	4
VSAF-4 C4	to 81	84	26	.125	48	4
VSAF-4 E4	to 81	84	26	.125	48	4

Note 1: Basins for Fed-Flush units can have only one inlet connection. This connection is an outside caulking hub sized to accept the specified inlet pipe size (3 thru 8 inches).

The minimum distance from the top of the basin down to the centerline of the inlet connection is 18 inches.

Note 2: The minimum distance from the bottom of the basin up to the centerline of the inlet connection is 42 inches.

Note 3: Float rod travel varies with the depth of the basin and the type of float used.

Note 4: The standard basin cover vent is a 3 inch screwed connection. If local code requires a 4 inch vent connection, it must be so specified when the unit is ordered.

Note 5: Fed-Flush units can be furnished with steel basins or fiberglass basins. All basin covers are steel.

Note 6: Fed-Flush units can be furnished for installation in round, square or rectangular concrete pits. Steel covers and grouting frames are furnished for these pits.

For square or rectangular pits, the inlet connection must be on the vertical centerline of the pit wall. A Fed-Flush inlet adaptor is furnished and must be installed when the pit is poured. Advise the inlet pipe size and pit wall thickness when ordering this adaptor.

Note 7: The D1 dimension (basin outside diameter) is approximately 1.5 inches larger than the D dimension (basin inside diameter).

Note 8: The D2 dimension (diameter of basin flange) is as follows:

42" Diameter basin, D2 = 46 inches  
 48" Diameter basin, D2 = 53 inches  
 60" Diameter basin, D2 = 66 inches  
 72" Diameter basin, D2 = 78 inches

Note 9: The D (minimum) dimension shown in the table is both the diameter of a round pit or basin, and the side length of a square pit.

Note 10: Dimensions are subject to change and should not be used for construction purposes unless certified. All dimensions are in inches unless otherwise noted.



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