



# MARYSVILLE

## WASHINGTON

COMMUNITY DEVELOPMENT DEPARTMENT  
 80 Columbia Avenue • Marysville, WA 98270  
 (360) 363-8100 • (360) 651-5099 FAX

### GRINDER PUMP APPLICATION

SITE INFORMATION	
Inside City Limits	Outside City Limits/Within UGA
Site Address:	Plat Name:
Tax Parcel No:	Lot No:

OWNER/APPLICANT	
Name:	Company:
Address:	
City/State/Zip:	
Phone (home/office):	Phone (cell):
E-mail:	

CONTRACTOR	
Name:	Company:
Address:	
City/State/Zip:	
Phone:	L & I Contractor's License No:
E-mail:	City Business License No:

UTILITIES	
Water System	Sewer System
City water	City gravity main instreet or easement
PUD water	Grinder pump must be approved by Engineering Manager
Well water	Septic system must be approved by Snohomish Health District

FEES	
Building/Plumbing Permit Fees	Sewer Capital Improvement Fees:
Plumbing permit fee -\$75.00 (side sewer repair)	Subject to plan review.
Grinder pump plan review -\$75.00	Side sewer inspection -\$100.00 (new or replacement)
State issuance fee -\$6.50	

PROVISIONS AND AUTHORIZATION	
<p>This permit is issued by the City Building Official under the provisions of the 2018 International Building Code and the 2018 International Residential Code, and shall expire by limitation and become null and void if the building or work authorized by such permit is not commenced within 180 days. By affixing my signature, I hereby certify that I am the owner of the property for which this permit has been issued for, or I am an authorized representative of the owner. All provisions and ordinances governing this type of work will be complied with, whether specified herein or not, including routine calls for inspections.</p>	
Owner or Authorized Agent: _____	Date: _____

Approved	Disapproved	Date:	Engineering Manager:
Approved	Disapproved	Date:	Building Official:
Comments:			

## Engineering Design Standards

### Private Grinder Pumps

Private grinder pumps are only permitted under special circumstances when no other means of gravity sewer service is available. In general, gravity sewer shall be deepened to eliminate the need for grinder pumps. Use of private grinder pumps requires approval by the City Engineer Manager, and will be evaluated on a case-by-case basis. The applicant will need to demonstrate there is no other feasible means of servicing the lot(s). Ejector pumps are permitted for basement applications to pump liquids only (no solids) to an upper level gravity system.

Permit/Application:

- A Grinder pump and Plumbing permit application is required to be submitted electronically for any proposed grinder pump systems

Application Documents:

- Include type and number of fixtures to be serviced by pump on electronically submitted documents.
- Electronically submit a Grinder Pump Sizing and Selection Worksheet.

Pump Type:

- UL listed pump. Interior ejector pump systems require UPC approval.
- 2" minimum discharge from pump.
- Pump curve from manufacturer.

Tank Type:

- 3" sewer waste line from building requires 500 gallon (minimum) concrete tank outside of structure. 4" waste line from building requires 1000 gallon (minimum) concrete tank. All other systems require detailed engineering plans and shall be submitted for the City's review.
- For exterior grinder pump systems, see Standard Plan 5-850.
- Concrete: 28 day compressive strength  $f_c' = 4000$  psi. Rebar #4 ASTM A-815 grade 60. DL-18" earth cover. LL= 25 snow. Soils= 2000 psf, water pressure: 62.4 psf. Flexible pipe adapter: press seal 4" cast-a-seal. Joint material: meet federal specs: SS-S-00210, ASHTO M-1988 and ASTM C990, and risers as required.

Electronically Submitted Site Plan:

- Required when installed outside of structure - grinder pumps.

Electronically Submitted Floor Plan:

- Required when installed inside of structure - ejector pumps.

General Notes:

- Electronically submitted electrical permit must be approved prior to final inspection.
- Force main shall be 2" PVC Schedule 80. Force main shall be tested @ 150% of its design curve pressure.
- All inspections must be completed prior to backfilling.
- When two 45 degree angles are used to achieve a 90 degree bend, no less than one foot of pipe shall be between the two 45 degree bends.



### GRINDER PUMP SIZING AND SELECTION WORKSHEET

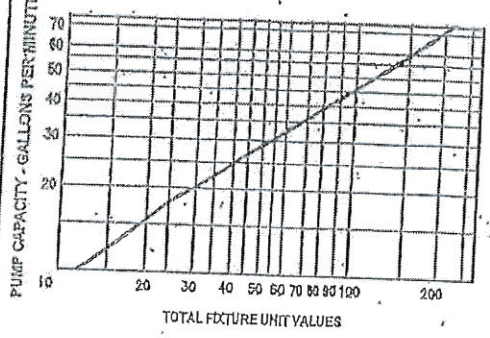
To begin, fill in the shaded areas on the front side. A calculator and additional sheet of paper may be required.

- 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. \_\_\_\_\_ FL (4)
- STEP #5** Total pipe length from front side \_\_\_\_\_ Ft (5)
- STEP #6** Add #4 & #5. [(4) + (5) = (6)] \_\_\_\_\_ FL (6)
- STEP #7** Divide #6 by 100 and multiply it by the associated friction value from Figure "E". This is the total Friction Head. \_\_\_\_\_ FL (7)
- STEP #8** Determine static head in FL, as shown on front side, from minimum water level to the discharge point. \_\_\_\_\_ FL (8)
- STEP #9** Sewer Pressure, if any, expressed in feet (PSI x 2.31). \_\_\_\_\_ FL (9)
- STEP #10** Add #7, #8, & #9. [(7) + (8) + (9) = (10)]. This is the system's Total Dynamic Head. (TDH) \_\_\_\_\_ FL (10)
- STEP #11** Select the Grinder Pump:  
 Base selection on design values, #3 & #10.

**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].

**FIGURE B**  
 PUMP CAPACITY based on total Fixture Units\*



**FIGURE C\***

Pipe Size	Minimum GPM
2"	21

**FIGURE D\***  
 FRICTION FACTORS FOR PIPE FITTINGS IN TERMS OF EQUIVALENT FEET OF STRAIGHT PIPE

Nominal Pipe Size	90 Elbow	45 Elbow	Tee Branch flow	Swing Check Valve	Gate Valve
2"	5.2	2.8	10.3	17.2	1.4

**FIGURE A**  
 PLUMBING FIXTURE UNIT VALUES\*

Fixture Description	Fixture Unit Value	Fixture Description	Fixture Unit Value
Bathub, 1-1/2" trap	2	Sink, service type	3
Bathub, 2" trap	2	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	2
Dishwasher, domestic	2	Washing machine	3
Kitchen sink	2	Water closet	3
Kitchen sink with disposal	2	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		6

\*Graph data is taken from ASPE Handbook, Uniform Plumbing Code, Cameron Hydraulic Data and Plastic Pipe Institute.

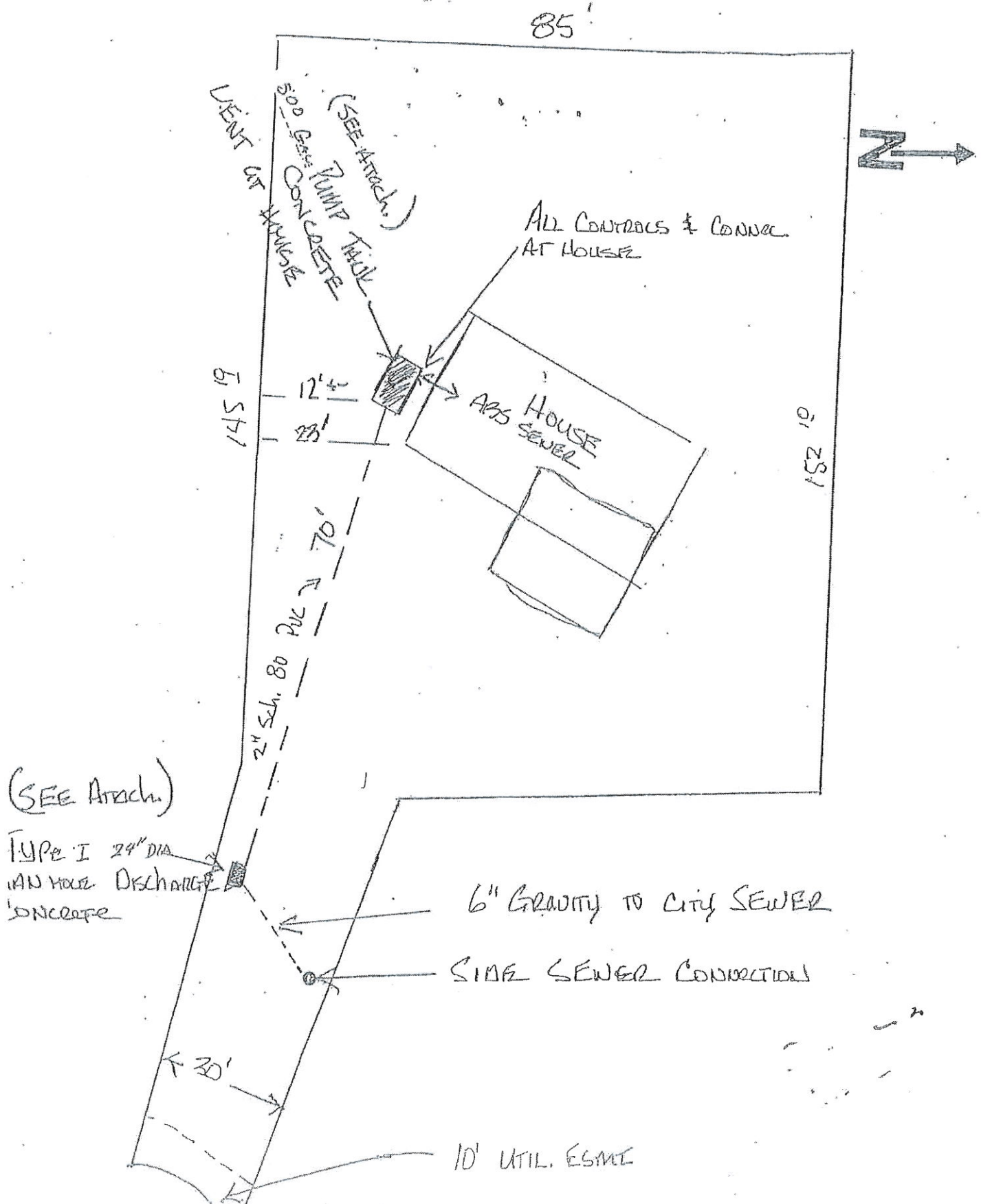
**FIGURE E\***  
 FRICTION HEAD IN FEET PER 100' OF SCHEDULE 40 PLASTIC PIPE

GPM	2" Plastic
10	0.20
12	0.28
15	0.43
18	0.60
21	0.80
25	1.10
30	1.55
35	2.06
40	2.64
45	3.28
50	3.99
60	5.59
70	7.44

EXAMPLE ONLY  
COPY

Jan 5/12/04

T-... E.  
MARYSVILLE, WA.



COMMUNITY DEVELOPMENT DEPARTMENT  
80 Columbia Avenue, Marysville, WA 98270  
(360) 363-8100, (360) 651-5099 FAX  
(360) 363-8204 INSPECTION LINE

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## Side Sewer Diagram

Street Address \_\_\_\_\_ Date \_\_\_\_\_

Plat Name (or Parcel#) \_\_\_\_\_ Div \_\_\_\_\_ Lot \_\_\_\_\_

Owner or Builder \_\_\_\_\_ Phone \_\_\_\_\_

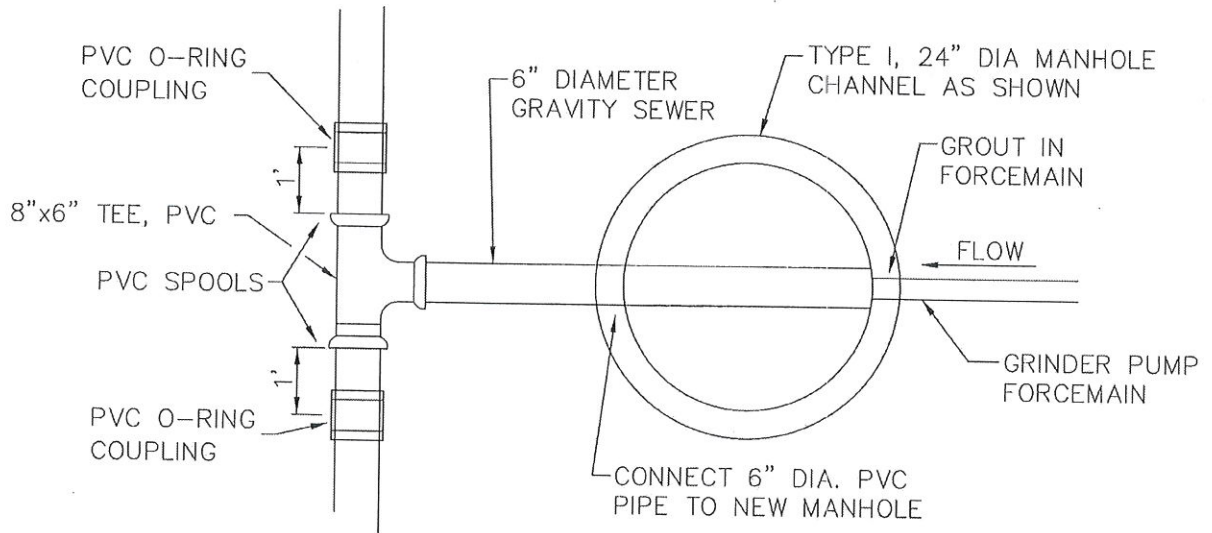
Contractor \_\_\_\_\_ Phone \_\_\_\_\_

Please include a north arrow. Show location of clean-outs, length of pipe runs, bends, depth at connection points, and distance from foundation corners. Use straightedge for drawing.

UT Permit# \_\_\_\_\_ Depth at house \_\_\_\_\_ Depth at stub \_\_\_\_\_

A large grid of small dots for drawing a side sewer diagram. The grid consists of approximately 15 columns and 25 rows of dots, providing a guide for drawing straight lines and shapes.

Inspected by \_\_\_\_\_ Date \_\_\_\_\_



NOTE:

FERNCO COUPLINGS TO BE USED ONLY ON  
 6" PIPE DIA. OR LESS. 8" PIPE DIA. AND  
 LARGER MAIN LINES USE PVC O-RING COUPLINGS.

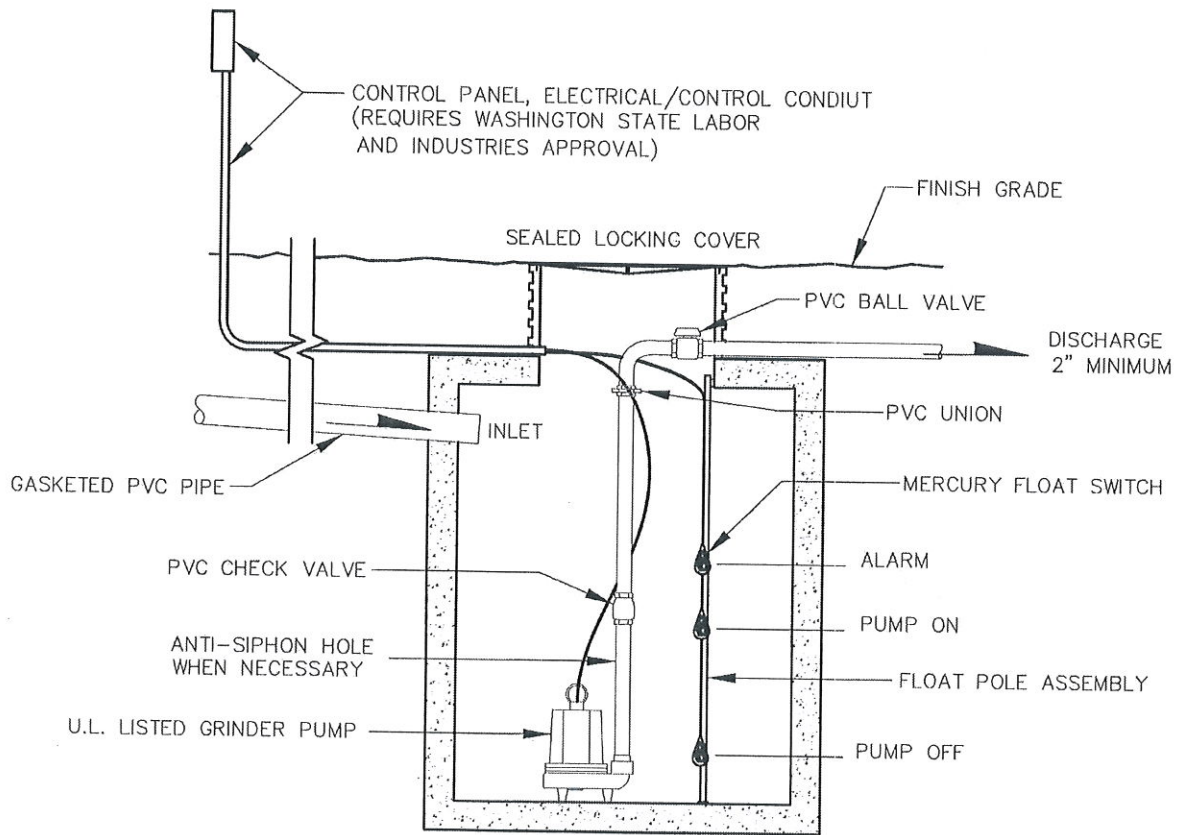
DUCTILE IRON CAN BE USED WITH APPROVED FITTINGS.

APPROVED BY

*Kenneth Neeter* 5/9/07  
 MARYSVILLE CITY ENGINEER DATE

GRINDER PUMP DISCHARGE  
 MANHOLE FOR SINGLE  
 UNIT OR DUPLEX





**NOTES:**

1. MINIMUM TANK REQUIREMENT: 500 GAL., SINGLE CELL, REINFORCED CEMENT CONCRETE
2. PVC DISCHARGE PIPE AND FITTINGS TO BE SCHEDULE 80 OR GREATER
3. SIZING SHEET AND RECORD DRAWING MUST BE ONSITE PRIOR TO APPROVAL
4. WASHINGTON STATE LABOR AND INDUSTRIES ACCEPTANCE OF ELECTRICAL REQUIRED PRIOR TO FINAL APPROVAL
5. THE MINIMUM SIZE OF ANY PUMP OR ANY DISCHARGE PIPE FROM A SUMP HAVING A WATER CLOSET CONNECTED THERETO SHALL NOT BE LESS THAN TWO (2) INCHES. (UNIFORM PLUMBING CODE SECTION 710.3)
6. GROUT ALL PICK HOLES INSIDE AND OUT.

APPROVED BY

*Kenn Riedler*  
 MARYSVILLE CITY ENGINEER

*5/9/07*  
 DATE

**PRIVATE GRINDER  
 PUMP DETAIL**