Instructions for completing Water Calculation Worksheet, SBD 6479 (R11/11)

1. Demand of building in water supply fixture units (WSFU). Add up WSFU's (SPS Tables 382.40 - 1 & 2).
   1.a. Demand of building in WSFU converted to Gallons Per Minute. Convert WSFU's to GPM (SPS Table 382.40 - 3).

2. Determine difference in elevation from main or external pressure tank to building control valve. Ask purveyor depth of main in street, or ask pump installer depth of pipe at connection to external pressure tank.

3. Size of meter (if applicable). Ask purveyor for meter size for GPM demand.

4. Developed length in feet from main or external pressure tank to building control valve. Measure actual distance.

5. Determine low pressure at main in street, or at external pressure tank. Ask purveyor for the low residual pressure of water at address, or ask pump installer low pressure setting on switch.

6. Low pressure at main in street, or external pressure tank (as determined at # 5 above).

7. Determine pressure loss due to friction in the water service. Refer to SPS 382 Appendix Graphs A382.40 (7) - 2 thru 11.

8. Determine the pressure loss or gain due to the difference in elevation between the main or external pressure tank and the building control valve. Measure difference in height (ft.) from the main or external pressure tank to the building control valve. Multiply height (ft.) by .434.

9. Available pressure after the building control valve (enter in line "B").
   B. Available pressure after the building control valve (from line "9").
   C. Determine pressure loss of water meter, SPS 382 Appendix Graph A382.40 (7)-1 or provide manufacturer's loss curve.
   D. Pressure at controlling fixture. This is the most demanding pressure required for a fixture to properly operate. Compare; 1. Required fixture pressure, 2. Elevation of fixture, 3. Developed length to fixture.
   E. Determine difference in elevation between the building control valve and the controlling fixture. Measure difference in height (ft.) from the building control valve to the controlling fixture. Multiply height (ft.) by .434.
   F. Pressure loss due to water treatment devices (water softeners, filters, etc.), and backflow preventers which serve the controlling fixture. Add up the WSFU's downstream of the water treatment device and convert to GPM using SPS Table 382.40-3, or, Table 382.40-3e when serving an individual dwelling. Refer to manufacturer's graph to convert gpm to pressure loss through the WTD, and or a backflow preventer.
   G. Pressure loss through tankless water heaters, combination boiler / hot water heaters, heat exchangers which serve the controlling fixture. Add up WSFU's downstream of the heating appliance and convert to GPM using SPS Table 382.40-3. Refer to manufacturer's pressure loss graph to determine loss at the required GPM.
   H. Developed length from building control valve to controlling fixture in feet X 1.5. This is the measured length (ft) of pipe between the building control valve and the controlling fixture. Multiply the length (ft) by 1.5.

A. = Pressure available for uniform loss. This number is only an indicator for using the pipe sizing SPS Tables 382.40-4 thru 11.

Table 82.40−1

WATER SUPPLY FIXTURE UNITS FOR NONPUBLIC USE FIXTURES

Type of Fixture[a]	Water Supply Fixture Units (wsfu)		
	Hot	Cold	Total
Automatic Clothes Washer	1.0	1.0	1.5
Bar Sink	0.5	0.5	1.0
Bathtub, with or without Shower Head	1.5	1.5	2.0
Bidet	1.0	1.0	1.5
Dishwashing Machine	1.0		1.0
Glass Filler		0.5	0.5
Hose Bibb:			
1/2″ diameter		3.0	3.0
3/4″ diameter		4.0	4.0
Kitchen Sink	1.0	1.0	1.5
Laundry Tray, 1 or 2 Compartment	1.0	1.0	1.5
Lavatory	0.5	0.5	1.0
Manufactured Home	—	15	15
Shower, Per Head	1.0	1.0	1.5
Water Closet, Flushometer Type		6.0	6.0
Water Closet, Gravity Type Flush Tank		2.0	2.0
Bathroom Groups:			
Bathtub, Lavatory and Water Closet−FM[b]	2.0	7.5	8.0
Bathtub, Lavatory and Water Closet−FT[c]	2.0	3.5	4.0
Shower Stall, Lavatory and Water Closet−FM	1.5	7.0	7.5
Shower Stall, Lavatory and Water Closet−FT	1.5	3.0	3.5

Table 82.40–3e

CONVERSION OF WATER SUPPLY FIXTURE UNITS TO GALLONS PER MINUTE FOR WATER TREATMENT DEVICES[a] SERVING AN INDIVIDUAL DWELLING[b]

Water Supply Fixture Units (WSFUs)	Gallons Per Minute (GPM)
1	1
2	2
3	3
4	4
5	4.5
6	5
7	6
8	6.5
25	7
35	8
40	9

[a] Treatment devices providing treatment for compliance with Table 82.70–1 shall use Table 82.40–2 for conversion.

[b] Table shall not be used for converting hose bibb, high flow fixture or hydrant wsfu.

Table 82.40–2

WATER SUPPLY FIXTURE UNITS FOR PUBLIC USE FIXTURES

Type of Fixture[a]	Water Supply Fixture Units (wsfu)		
	Hot	Cold	Total
Automatic Clothes Washer, Individual	2.0	2.0	3.0
Automatic Clothes Washer, Large Capacity	b	b	b
Autopsy Table	2.0	2.0	3.0
Bathtub, With or Without Shower Head	2.0	2.0	3.0
Coffeemaker		0.5	0.5
Dishwasher, Commercial	b	b	b
Drink Dispenser		0.5	0.5
Drinking Fountain		0.25	0.25
Glass Filler		0.5	0.5
Health Care Fixtures:			
Clinic sink	2.0	7.0	7.0
Exam/treatment sink	0.5	0.5	1.0
Surgeon washup	1.5	1.5	2.0
Hose Bibb:			
$^1/_2$″ diameter		3.0	3.0
$^3/_4$″ diameter		4.0	4.0
Icemaker		0.5	0.5
Lavatory	0.5	0.5	1.0
Shower, Per Head	2.0	2.0	3.0
Sinks:			
Bar and Fountain	1.5	1.5	2.0
Barber and Shampoo	1.5	1.5	2.0
Cup		0.5	0.5
Flushing Rim		7.0	7.0
Kitchen and Food Preparation per faucet	2.0	2.0	3.0
Urinal:			
Syphon Jet		4.0	4.0
Washdown		2.0	2.0
Wall Hydrant, Hot and Cold Mix:			
$^1/_2$″ diameter	2.0	2.0	3.0
$^3/_4$″ diameter	3.0	3.0	4.0
Wash Fountain:			
Semicircular	1.5	1.5	2.0
Circular	2.0	2.0	3.0
Water Closet:			
Flushometer		6.5	6.5
Gravity Type Flush Tank		3.0	3.0

[a] For fixtures not listed, factors may be assumed by comparing the fixture to a listed fixture which uses water in similar quantities and at similar rates.
[b] Load factors in gallons per minute, gpm, based on manufacturer's requirements.

Table 82.40–3

CONVERSION OF WATER SUPPLY FIXTURE UNITS TO GALLONS PER MINUTE

Water Supply Fixture Units	Gallons per Minute	
	Predominately Flushometer Type Water Closets or Syphon Jet Urinals	Predominately Flush Tank Type Water Closets or Washdown Urinals
1	—	1
2	—	2
3	—	3
4	10	4
5	15	4.5
6	18	5
7	21	6
8	24	6.5
9	26	7
10	27	8
20	35	14
30	40	20
50	51	28
60	54	32
70	58	35
80	62	38
90	65	41
100	68	42
120	73	48
140	78	53
160	83	57
180	87	61
200	92	65
250	101	75
300	110	85
400	126	105
700	170	161
800	183	178
900	197	195
1000	208	208
1250	240	240
1500	267	267
1750	294	294
2000	321	321
2250	348	348
2500	375	375
2750	402	402
3000	432	432
4000	525	525
5000	593	593

Note: Values not specified in the table may be calculated by interpolation.