

GREENHOUSE COLLINGWOOD (18041) WATER SERVICE SUMMARY

1. FIRE WATER DEMAND

1. Fire water demand requirement is based on NFPA 13 - Standard for the Installation of Sprinkler Systems.
2. According to NFPA 13, section 11.2.2, table 11.2.2.1 water supply requirements for pipe schedule sprinkler systems, for ordinary hazard classification, the fire protection water flow (including sprinkler system and standpipe system) is **850GPM (54L/S)**.

2. COLD WATER DEMAND

1. Cold water demand is spitted to two categories: domestic use and processing use.
2. Domestic water calculation is based on ASPE standard and OBC 7.6.3., also please refer to attached domestic water calculation sheet.
 - 2.1. Based on proposed floor plan, total domestic water fixture unit is **136 FU**.
 - 2.2. For system with flush valve, based on ASPE standard, 136 FU domestic peak flow is **80GPM (5L/S)**.
 - 2.3. Domestic average day volume is based on assumed 8 hours working hour daily usage in following table, converted to 22.95 gallons water per person per day. For 40 employees, average daily domestic water volume is estimated **920 gallons (3480 liters)**.

Fixture	gpm or gpf	min/occ or number/occ	gallons/occ/day
Lavatory	1.0 gpm	2 min/day/occ	2
Water Closet	1.6 gpf	2 use/day/occ	3.2
Wall Urinal	1.25 gpf	1 use/day/occ	1.25
Kitchen Sink	1.5 gpm	0.5 min/day/occ	0.75
Shower	2.0 gpm	7.5 min/day/occ	15
Service Sink	1.5 gpm	0.5 min/day/occ	0.75
Total	-	-	22.95

- 2.4. Maximum day domestic volume is assumed 20 percent more that is **1100 gallons (4160 liters)**.
3. Process water calculation is based on experience average daily volume **800 gallons (3030 liters)**.
 - 3.1. Assume processing volume 800 gallons is distributed during 4 working hours, convert to peak flow rate will be **3.4GPM (0.22L/S)** which is approximate **4 FU**.
 - 3.2. Maximum day processing volume is assumed 20 percent more consumption with 1 hose bib (6gpm) running 3 hours that is **1960 gallons (7420 liters)**.
4. Cold water total demand summary is:
 - 4.1. Peak flow 83.4GPM (5.3L/S), 140 FU.
 - 4.2. Daily average 1720 gallons (6510 liters).
 - 4.3. Maximum day 3060 gallons (11580 liters).

3. SANITARY CALCULATION

1. Sanitary flow is spitted to two categories: domestic sanitary and processing sanitary.
2. Domestic sanitary calculation is based on ASPE standard and OBC 7.4., also please refer to attached domestic water calculation sheet.
 - 2.1. Based on proposed floor plan, total domestic sanitary fixture unit is **90 FU**.
 - 2.2. Based on OBC 7.4.10.5, 90 FU peak flow is **50GPM (3.2L/S)**.
- 4.4. Domestic sanitary average day and maximum day volumes should match cold water volumes in section 2.3 & 2.4, that is average day domestic sanitary volume **920 gallons (3480 liters)**. Maximum day domestic sanitary volume **1100 gallons (4160 liters)**.
3. Process water sanitary calculation is based on experience average daily volume to be **600 gallons (2270 liters)**.
 - 4.5. Maximum possible processing sanitary volume will be including 1 hose bib (6gpm) running for 3 hours discharge to sewer estimated total **2000 gallons (7570 liters)**. Converted to peak flow **11GPM (0.7L/S)** which is approximate **10 FU**.
4. Total sanitary water summary is:
 - 4.1. Peak flow 61GPM (3.9L/S), 100 FU.
 - 4.2. Daily average 1520 gallons (5750 liters).
 - 4.3. Maximum day 3100 gallons (11730 liters).

SANITARY, DOMESTIC HOT & COLD WATER DEMAND

Fixture Type	F.U. PER FIXTURE/ UNIT				No. of Fixtures			TOTAL			
	SAN F.U.	Water F.U.	Hot Water F.U.	Cold Water F.U.	1st Fl.	Mezz Fl.	Total	SAN F.U.	Water F.U.	Hot Water F.U.	Cold Water F.U.
Public											
Lavatory (L)	1.5	2	1.5	1.5	4	2	6	9	12	9	9
Water Closet (WC-2) - Flush valve	6	10		10	5	2	7	42	70	0	70
Wall Urinal (U) - Flush valve	4	5		5	2		2	8	10	0	10
Kitchen Sink (KS)	3	4	3	3	1		1	3	4	3	3
Shower (SH)	3	4	3	3	4		4	12	16	12	12
Hose Bibb (HB)		6		6	4		4	0	24	0	0
Floor Drain	4				4		4	16	0	0	0
Total Fixture Unit								90	136	24	104

Total Domestic Water FU: 136 FU, 80 GPM Peak Flow

Total Domestic San FU: 90 FU, 50GPM Peak Flow