## DOMESTIC WATER CALCULATION SCHEDULE

| IDENTITY DATA | | QTY | SPACE TYPE | COLD WATER DEMAND | HOT WATER DEMAND |
|---|---|---|---|---|---|
| UNIT TAG | DESCRIPTION | | | *[WSFU]* | *[WSFU]* |
| HB-1 | HOSE BIB | 1 | PUBLIC | 2.5 | N/A |
| HB-1 | HOSE BIB, EACH ADDITIONAL | 2 | PUBLIC | 2.0 | N/A |
| HB-2 | HOSE BIB (Hot & Cold) | 1 | PUBLIC | 2.5 | 1.9 |
| RH-1 | HOSE BIB | 1 | PUBLIC | 2.5 | N/A |
| MS-1 & MS-2 | SINKS - SERVICE OR MOP BASIN | 2 | PUBLIC | 6.0 | 4.5 |
| WC-2 | WATER CLOSET, 1.6 GPF FLUSHOMETER VALVE | 3 | PUBLIC | 90.0 | N/A |
| LV-2 | LAVATORY | 3 | PUBLIC | 3.0 | 2.3 |
| WF-1 | DRINKING FOUNTAIN OR WATER COOLER | 1 | PUBLIC | 0.5 | N/A |
| S-1 & S-2 | SINKS - KITCHEN, DOMESTIC (W/ OR W/OUT DISHWASHER) | 5 | PUBLIC | 7.5 | 5.6 |
| WC-1 | WATER CLOSET, 1.6 GPF GRAVITY TANK | 193 | PRIVATE | 482.5 | N/A |
| LV-1 | LAVATORY | 203 | PRIVATE | 203.0 | 152.3 |
| BT-1 & BT-2 | BATHTUB OR COMBINATION BATH/SHOWER (FILL) | 87 | PRIVATE | 348.0 | 261.0 |
| SH-1 & SH-2 | SHOWER, PER HEAD | 106 | PRIVATE | 212.0 | 159.0 |
| KS-1 & KS-2 | SINKS - KITCHEN, DOMESTIC (W/ OR W/OUT DISHWASHER) | 182 | PRIVATE | 273.0 | 204.8 |
| AWB-1 | CLOTHES WASHER | 182 | PRIVATE | 728.0 | 546.0 |
| DOMESTIC COLD WATER (FUTURE) | FUTURE T.I. | N/A | N/A | 400 | N/A |
| | | **TOTAL [WSFU]** | | **2762** | **1337.3** |
| | | **TOTAL [GPM]** | | **410** | **250** |
| | | **DOMESTIC WATER MAIN PIPE [in]** | | **6"** | **---** |

NOTES:

1. MAIN WATER IS SIZED SUCH THAT AT 400GPM, THE FLOW VELOCITY IN COPPER TYPE L, REMAIN BELOW 8FPS THRESHOLD.

## DWV CALCULATION SCHEDULE

| FIXTURE | | QUANTITY | SPACE TYPE | TOTAL DRAINAGE FIXTURE UNIT |
|---|---|---|---|---|
| TAG | DESCRIPTION | # | | *[DFU]* |
| MS-1 | SINKS, SERVICE OR MOP BASIN(1) | 2 | PUBLIC | 6.0 |
| FD-1 | FLOOR DRAIN | 7 | PUBLIC | 14.0 |
| WC-2 | WATER CLOSET, 1.6 GPF FLUSHOMETER VALVE | 3 | PUBLIC | 12.0 |
| LV-2 | LAVATORY | 3 | PUBLIC | 3.0 |
| WF-1 | DRINKING FOUNTAIN OR WATER COOLER | 1 | PUBLIC | 0.5 |
| S-1 & S-2 | SINKS, KITCHEN, DOMESTIC (W/ OR W/OUT FOOD WASTE DISPOSER, DISHWASHER, OR BOTH) | 5 | PUBLIC | 10.0 |
| WC-1 | WATER CLOSET, 1.6 GPF GRAVITY TANK | 193 | PRIVATE | 579.0 |
| LV-1 | LAVATORY | 203 | PRIVATE | 203.0 |
| BT-1 & BT-2 | BATHTUB OR COMBINATION BATH/SHOWER | 87 | PRIVATE | 174.0 |
| SH-1 & SH-2 | SHOWER, SINGLE-HEAD TRAP | 106 | PRIVATE | 212.0 |
| KS1 & KS-2 | SINKS, KITCHEN, DOMESTIC (W/ OR W/OUT FOOD WASTE DISPOSER, DISHWASHER, OR BOTH) | 182 | PRIVATE | 364.0 |
| AWB | CLOTHES WASHER, DOMESTIC, STANDPIPE | 182 | PRIVATE | 546.0 |
| GI-1 (FUTURE) | GREASE INTERCEPTOR | | | 108 |
| WASTE (FUTURE) | FUTURE T.I. | | | 108 |
| | | | **TOTAL [DFU]** | **2340** |
| | | | **MAIN WASTE PIPE [in]** | **8.0** |
| | | | **MAIN PIPE SLOPE [in/ft]** | **1/4** |

NOTES:

1. PIPE IS SIZED PER OSPC 2018 TABLE 703.2

## DOMESTIC WATER PRESSURE CALCULATION-BASIS OF DESIGN

| DESCRIPTION | VALUE/TAG | COMMENTS |
|---|---|---|
| CITY WATER PRESSURE [PSI] | 52.0 | DESIGN PRESSURE |
| | | |
| ΔP DUE TO WATER METER [PSI] | -3.5 | |
| ΔP DUE TO VALVES [PSI] | -5.5 | RPBA AND PRV VALVES |
| ΔP DUE TO ELEVATION [PSI] | -42.0 | |
| ΔP DUE TO PIPE AND FITTINGS [PSI] | -31 | PIPE LOSSES BASED ON 8FPS FLOW VELOCITY IN PIPES. 50% WAS ADDED TO THE LENGTH OF PIPING TO ACCOUNT FOR LOSSES DUE TO FITTING. |
| REQUIRED RESIDUAL PRESSURE AT FIXTURE [PSI] | -25 | AS PER ASPE TABLE 5-19 |
| TOTAL ΔP [PSI] | -107 | |
| | | |
| IS A BOOSTER PUMP REQUIRED? | YES | |
| REQUIRED BOOST PRESSURE TO MEET DEMAND [PSI] | 55 | |

**NOTES:**

1. INSTALL LOW PRESSURE CUTOFF SWITCH NO MORE THAN 5FT UPSTREAM OF PUMP INTAKE. INSTALL A PRESSURE GAUGE BETWEEN SHUTOFF VALVE AND THE PUMP.

## HW DELIVERY TIME TO SELECT FIXTURES - BASIS OF DESIGN

| IDENTITY DATA | DELIVERY TIME TO FIXTURE | | | |
|---|---|---|---|---|
| UNIT STACK NO. BASED ON LEVEL 4 | BRANCH LENGTH TO LAV | LAV | BRANCH LENGTH TO KITCHEN SINK | KITCHEN SINK |
| | [FT] | [S] | [FT] | [S] |
| 402 | 21 | 23 | 21 | 12 |
| 403 | 22 | 24 | 35 | 19 |
| 404 | 22 | 24 | 23 | 13 |
| 405 | 27 | 30 | 26 | 14 |
| 406 | 26 | 29 | 20 | 11 |
| 407 | 26 | 29 | 21 | 12 |
| 408 | 18 | 20 | 18 | 10 |
| 409 | 20 | 22 | 17 | 9 |
| 410 | 21 | 23 | 17 | 9 |
| 411 | 29 | 32 | 24 | 13 |
| 412 | 31 | 34 | 22 | 12 |
| 413 | 26 | 29 | 22 | 12 |
| 414 | 26 | 29 | 20 | 11 |
| 415 | 22 | 24 | 26 | 14 |
| 416 | 15 | 17 | 23 | 13 |
| 418 | 27 | 30 | 24 | 13 |
| 420 | 18 | 20 | 26 | 14 |
| 421 | 37 | 41 | 44 | 24 |
| 422 | 17 | 19 | 20 | 11 |
| 423 | 18 | 20 | 18 | 10 |
| 424 | 20 | 22 | 31 | 17 |
| 425 | 23 | 25 | 31 | 17 |
| 426 | 22 | 24 | 32 | 18 |
| 427 | 19 | 21 | 15 | 8 |
| 428 | 16 | 18 | 35 | 19 |
| 429 | 22 | 24 | 31 | 17 |
| 430 | 31 | 34 | 26 | 14 |
| 431 | 17 | 19 | 19 | 10 |
| 432 | 32 | 35 | 29 | 16 |
| 433 | 16 | 18 | 32 | 18 |

**HW DELIVERY TIME WAS CALCULATED BASED ON THE FOLLOWING ASSUMPTIONS:**

1. BRANCH LENGTH IS THE HORIZONTAL DISTANCE FROM CLOSEST HW/HWR JUNCTION TO THE FIXTURE; INCLUDING 6' DROP FROM CEILING SPACE.
2. PIPE IS 1/2" UPONOR PEX (WHITE), ID = 0.475".
3. LAV FAUCET FLOWRATE 0.5 GPM.
4. KITCHEN SINK FAUCET FLOWRATE 1.0 GPM.

## BUILDING STORM CALCULATION - BASIS OF DESIGN

| DRAIN TAG | ROOF | WALL [50%] | WALL [35%] | TOTAL AREA | FLOW @ 1.3 INCHES PER HOUR | HORIZONTAL SLOPE | HORIZONTAL PIPE SIZE |
|---|---|---|---|---|---|---|---|
| | SF | SF | SF | SF | GPM | --- | IN |
| RD-1 OR OD-1 (EACH/ROOF, AREA 1) | 4275 | | | 4275 | 58 | 1/8 inch per foot slope | 4 |
| RD-1 OR OD-1 (EACH/ROOF, AREA 2) | 790 | | | 790 | 11 | 1/8 inch per foot slope | 3 |
| RD-1 OR OD-1 (EACH/ROOF, AREA 3) | 2700 | | | 2700 | 37 | 1/8 inch per foot slope | 3 |
| RD/OD 2&3 (COMBINED) | 3490 | | | 3490 | 94 | 1/8 inch per foot slope | 5 |
| RD/OD AREAS 1,2&3 (COMBINED) | 7765 | | | 7765 | 210 | 1/4 inch per foot slope (TYPICAL) | 6 |
| RD-1 OR OD-1 (EACH/ROOF, AREA 4) | 2002 | | | 2002 | 27 | 1/8 inch per foot slope | 3 |
| RD-1 OR OD-1 (EACH/ROOF, AREA 5) | 4940 | | | 4940 | 67 | 1/8 inch per foot slope | 4 |
| RD/OD 4&5 (COMBINED) | 6942 | | | 6942 | 188 | 1/8 inch per foot slope | 6 |
| RD-6 OR OD-6 | 4518 | | | 4518 | 61 | 1/8 inch per foot slope | 4 |
| RD-1 OR OD-1 (EACH/ROOF, AREA 6) | 4518 | | | 4518 | 122 | 1/8 inch per foot slope | 5 |
| RD/OD AREAS 4,5 & 6 (COMBINED) | 11460 | | | 11460 | 310 | 1/4 inch per foot slope (TYPICAL) | 6 |
| L3 COURTYARD AREA | 1308 | | | 1308 | 18 | | |
| RD-3 (ROOF & L3 COURTYARD, AREA 7) | 20533 | | | 20533 | 278 | 1/8 inch per foot slope | 8 |
| OD-3 (ROOF & L3 COURTYARD, AREA 7) | 20533 | | | 20533 | 278 | 1/8 inch per foot slope | 8 |
| RD-4 (EACH DECK, AREA 8) | 135.5 | 500 | | 386 | 5 | 1/8 inch per foot slope | 3 |
| OD-4 (EACH DECK, AREA 8) | 135.5 | 500 | | 386 | 5 | 1/8 inch per foot slope | 3 |
| RD-4 (EACH DECK, AREA 9) | 46 | 306 | | 199 | 3 | 1/8 inch per foot slope | 3 |
| OD-4 (EACH DECK, AREA 9) | 46 | 306 | | 199 | 3 | 1/8 inch per foot slope | 3 |
| RD-2 (EACH/8TH FLOOR DECK) | | 310 | | 155 | 2 | 1/8 inch per foot slope | 3 |
| OD-2 (EACH/8TH FLOOR DECK) | | 310 | | 155 | 2 | 1/8 inch per foot slope | 3 |
| RD-2 AND OD-2 (COMBINED) | | 931 | | 466 | 13 | 1/8 inch per foot slope | 3 |
| | | | | | | | |
| **TOTAL COMBINED LEAVING THE BUILDING** | **21438** | **4544** | **0.0** | **23709.8** | **640.6** | **1/4 inch per foot slope (TYPICAL)** | **8** |

**NOTES:**

1. MAIN STORM IS SIZED PER UPC 2018, CHAPTER 11 FOR A COMBINED PRIMARY & SECONDARY RAIN DRAINAGE SYSTEM.

City Of Portland

REVIEWED FOR CODE COMPLIANCE

Date: 02/11/20

Project: 19-106743-REV-01-CO


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REGISTERED PROFESSIONAL ENGINEER 80947PE DIGITALLY SIGNED OREGON JAN 31, 2020 SCOTT A. PRATT

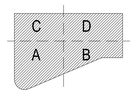
RENEWS: 12-31-2019

**18S**

GREYSTAR
1715 SW Salmon St
Portland, OR 97205

REVISIONS

| | | |
|---|---|---|
| A | PERMIT RESPONSE 1 | 06/03/2019 |
| 3 | AB-01 | 09/27/2019 |




KEYPLAN

CHECKED BY: Checker
ISSUE DATE: 27 SEP 2019
PROJECT NO: 1803002

**PLUMBING SCHEDULES**

**P00.01**

**CONSTRUCTION SET**

10/31/2019 1:05:12 PM