DOMESTIC CW STORAGE TANK AND PRESSURE BOOSTER PUMP CONTROL

GENERAL

Booster pump package manufacturer shall provide a DDC (microprocessor) based controller to control operation of domestic cold water storage tank water levels, booster pump package and system alarms. Controller shall be mounted in booster pump package control panel mounted to skid frame.

Provide a programmable time clock with adjustable occupied/unoccupied settings.

Controls contractor shall provide domestic cold water fill valve and actuator and shall be responsible for all field wiring between controlled devices, alarms and liquid level probe and booster pump manufacturer provided controller. Coordinate requirements with plumbing contractor and booster pump package vendor.

WATER TANK FILL CONTROL

Primary tank fill shall occur overnight at programmed time (Owner Directed) or whenever maximum daily draw down level is reached. Fill valve shall be commanded open by programmable time clock or level control until PRIMARY FILL – OFF level as sensed by liquid level probe has been reached at which time fill valve shall be closed.

At any time between 9AM and 7PM during day if BACKUP FILL – ON level position as sensed by liquid level probe, fill valve shall open and add water to tank until BACKUP FILL – OFF level position is reached and fill valve shall close.

At 4 AM (adj) programmable time clock shall command open tank fill valve to top off fill level of tank to PRIMARY FILL – OFF level. Tank fill valve shall close when PRIMARY FILL – OFF level has been reached.

WATER TANK ALARMS

When High Water level as sensed by liquid level probe is reached, an audible alarm shall sound at control panel at booster pump station and a red indicating light shall illuminate. Alarm shall be manually reset and panel shall be provided with an audible alarm silence switch.

When Low Water level as sensed by liquid level probe is reached, an audible alarm shall sound at control panel at booster pump station and a yellow indicating light shall illuminate. Low water level shall automatically reset when condition is corrected. (i.e. BACK-UP FILL resolves condition) Alarm shall be manually reset and panel shall be provided with an audible alarm silence switch in the event condition remains.

When Pump Shutdown level is reached as sensed by liquid level probe, booster pump operation shall be terminated and an audible alarm shall sound at control panel at booster pump station and a red light shall illuminate. Alarm shall be manually reset and panel shall be provided with an audible alarm silence switch.

BOOSTER PUMP OPERATION AND ALARMS

The booster pump system shall be designed to operate intermittently and incorporate 3– stage sequencing. Pump No. 1 shall handle low demand requirements (Stage 1) when demand exceeds Pump No. 1 capacity, Pump No. 1 is de–activated and Pump No. 2 activates (Stage 2) until its capacity is exceeded at which point both pumps are allowed to operate (Stage 3) to meet demand. With decreasing demand pumps are sequenced off in reverse order.

With the pump selector switches on "auto", pump No. 1 shall operate when system pressure as sensed by pressure switch in discharge header drops to pre–selected set point. Pump No. 1 shall continue to run until the pressure switch deactivates (opens), the pump minimum run timer elapses and the lag pump(s) if required to meet demand have sequenced off. Sequential control of booster pumps will be by means of current sensing devices which is directly related to pump capacity. The current sensing devices (relays) are pre–set to start and stop the pumping units in the required sequence and flow value.

Both pumps shall be capable of being operated manually by means of HOA selector switches.

Control panel shall be furnished with green pump running lights indicating which pumps are operating at any time.

Control panel shall be furnished with No–Flow Shutdown feature. An aquastat mounted on suction header monitors water temperature and stops pumps when pump seal water temperature exceeds 80 deg. F. A pressure switch mounted in the control panel and piped to the discharge header will re–start pumps when system pressure drops to the minimum allowed pressure (cut–in)

Control panel shall be provided with elapsed time meters to monitor hours of operation of each pump and motor.

Provide High System Pressure, Pump Shutdown with manual reset and pilot light. A high system pressure switch monitors booster system outlet pressure and stops the pumps if discharge pressure exceeds pre–set value. Alarm shall override pump operation in manual mode.

Provide low suction pressure switch and pilot light with automatic reset. In the event suction pressure drops to a pre–set level, the low suction pressure switch shall prohibit pump operation. A red light shall illuminate on the control panel and alarm shall sound. An audible alarm silence switch shall be provided.

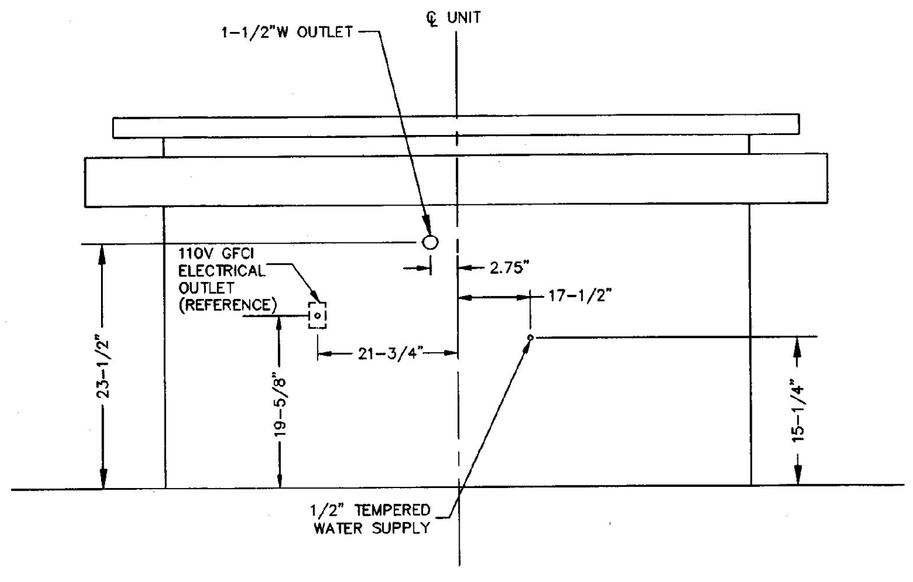
Control panel shall be provided with a lamp test feature to allow maintenance staff to monitor condition of panel illuminating lights.

PLUMBING FIXTURE AND EQUIPMENT SCHEDULE

No	MAKE & MODEL	MOUNTING	CONNECTIONS HW	CW	TW	W	V	ACCESSORIES	REMARKS
WC–1	AM. STD. AFWALL #2258.125 (BACK SPUD)	WALL	–	1	–	3	2	FLUSH VALVE: SLOAN ROYAL OPTIMA 152–1.5 ES–S W/EL–1500–L, CARRIER: ZURN 1203 OR EQUAL, SEAT CHURCH #9500C	COORDINATE INSTALLATION OF ELECTRONIC SENSORS & REQUIRED TRANSFORMERS W/ELEC. CONTRACTOR
WC–1A	AM. STD. AFWALL #2258.125 (BACK SPUD)	WALL	–	1	–	3	2	FLUSH VALVE: SLOAN ROYAL OPTIMA 152–1.5 ES–S W/EL–1500–L, CARRIER: ZURN 1203 OR EQUAL, SEAT CHURCH #9500C	MOUNT 17" TO 19" AFF COORDINATE INSTALLATION OF ELECTRONIC SENSORS & REQUIRED TRANSFORMERS W/ELEC. CONTRACTOR
UR–1	AM. STD WASHBROOK #6506.011 (BACK SPUD)	WALL		3/4	–	2	1 1/2	FLUSH VALVE: SLOAN ROYAL OPTIMA 195–1 ES–S W/EL–1500–L CARRIER: ZURN 1222 OR EQUAL	MOUNT RIM 24" AFF COORDINATE INSTALLATION OF ELECTRONIC SENSORS & REQUIRED TRANSFORMERS W/ELEC. CONTRACTOR
UR–1A	AM. STANDARD WASHBROOK #6506.011 (BACK SPUD)	WALL		3/4	–	2	1 1/2	FLUSH VALVE: SLOAN ROYAL OPTIMA 195–1 ES–S W/EL–1500–L CARRIER: ZURN 1222 OR EQUAL	MOUNT RIM 17" AFF COORDINATE INSTALLATION OF ELECTRONIC SENSORS & REQUIRED TRANSFORMERS W/ELEC. CONTRACTOR
S–1	BRADLEY EXPRESS SS–3AZ	WALL	–	–	1/2"	1 1/2	1 1/2	FAUCETS: INTERGRAL WITH FIXTURE. PROVIDE TRANSFORMER & SOLENOID VALVES, & STANDARD EQUIPMENT *	* DO NOT PROVIDE MIXING VALVE, COLOR BY ARCHITECT
S–2	BRADLEY EXPRESS SS–1	WALL/W PEDESTAL APRON	–	–	1/2"	1 1/2	1 1/2	FAUCETS: INTERGRAL WITH FIXTURE, W/TRAP COVER, TRANSFORMER, SOLENOID VALVE & STANDARD EQUIPMENT * PROVIDE CARRIER: ZURN 1231	* DO NOT PROVIDE MIXING VALVE, COLOR BY ARCHITECT
JS–1	ELKAY DLR–3122–12	COUNTER	1/2	1/2	–	1 1/2	1 1/2	DRAIN: ELKAY LK–99, FAUCET LK–2423	
KS–1	ELKAY CELEBRITY #DCR–2522–10 S.S. SINK	COUNTER	1/2	1/2	–	1 1/2	1 1/2	FAUCET: ELKAY LK–2443, DRAIN: ELKAY LK–99	
DF–1	ELKAY EDFP–214–C	WALL	–	1/2	–	1 1/2	1 1/2	SEE ARCH. ELEVATIONS FOR MOUNTING HEIGHT	
DF–2	ELKAY EDFP–214–C	WALL	–	1/2	–	1 1/2	1 1/2	SEE ARCH. ELEVATIONS FOR MOUNTING HEIGHT	
FD–1	ZURN ZN–415–VP–Y	FLOOR	–	–	–	3"	1 1/2	PROVIDE VANDAL PROOF SQUARE (TYPE S) TOP AND SEDIMENT BUCKET	
FD–2	ZURN ZN–415–Y	FLOOR	–	–	–	2"	–	PROVIDE SQUARE TOP (TYP 5) AND SEDIMENT BUCKET	
HB–1	WOODFORD MODEL B65 WALL HYDRANT	WALL (EXTERIOR)	–	3/4	–	–	–	90° INLET ELBOW W/UNION NUT, POLISHED CHROME BOX AUTOMATIC DRAINING, FREEZELESS, VACUUM BREAKER – BFP.	
HB–2	WOODFORD MODEL B75 WALL HYDRANT	WALL (INTERIOR)	–	3/4	–	–	–	POLISHED CHROME BOX & 90° INLET ELBOW W/UNION NUT VACUUM BREAKER – BFP.	
MS–1	FIAT #830–AA SERVICE SINK FAUCET	WALL	1/2	1/2	–	–	–	PROVIDE FIAT #889–CC MOP HANGER, MODEL 832–AA 30" FLEX HOSE & BRACKET, COORDINATE WITH ARCH FOR MOUNTING LOCATION	BASE IS FORMED W/FLR.
TMX–1	POWERS B–D–U–S–1 MASTER SUPPLY FIXTURE, W/420 VALVE	WALL	1/2	1/2	–	–	–	THERMOSTATIC WATER MIXING VALVE, 1/2" INLETS, 1/2" OUTLET, ROUGH CHROME FINISH, EXPOSED CABINET. PROVIDE DIAL THERMOMETER IN OUTLET	MOUNT BOT. 60" AFF
HB–3	WOODFORD MODEL 24 P–3/4	EXPOSED WALL	–	3/4	–	–	–	VACUUM BREAKER–BACKFLOW PREVENTER, BRASS FINISH	–
HWRP–1	ARMSTRONG ASTRO SERIES MODEL 50B	IN–LINE	3/4	–	–	–	–	2.5 GPM @ 18 FT. HD., 1800 RPM	ELECTRIC: 120V – 1PH, 110W
RCH–1	ELKAY ER–10 (2 STATIONS)	FLOOR	1/2	1/2	–	–	–	9.6 G.P.H, 1/4 HP, 120V–1PH	MOUNT ON CRAWL SPACE FLOOR BELOW FOUNTAINS
FD–3	ZURN Z–610	FLOOR	–	–	–	3"	1–1/2"	SUSPENDED SEDIMENT BUCKET, SQUARE CAST IRON GATE	TYPE B – SEE SPECS
SP–1	LITTLE GIANT MODEL 8E–CIA–RFS	SUBMERSIBLE	–	–	–	4"INLET 2"OUTLET	3"	15' POWER CORD, 3.5 GPM @12 FT HD, 120V–1PH, BASIN:	–
HP–1,2	JOHN WOOD COMPANY TYPE I SERIES NO. JBPR–22–014	FLOOR	–	–	–	–	–	317 GALLON CAPACITY, W/ SEISMIC MOUNTING CLIPS, FDA APPROVED POTABLE MATERIAL.	MOUNTED IN VERTICAL.
TMX–2	POWERS HYDROGUARD SERIES 430, MODEL 431	PIPING	3/4	3/4	–	–	–	ROUGH FINISH	MOUNT @ INDIRECT WATER HEATER
SI–1	ZURN Z–1181 SOLIDS INTERCEPTOR	FLOOR SUPPORT	–	–	–	2"	1–1/2"	30 GPM FLOW RATE	PROVIDE UNISTRUT FLOOR SUPPORT

WATER HEATER SCHEDULE

No	MAKE & MODEL	1ST HR GALS	BOILER	ACCESSORIES
IFWC–1	WEIL–McLAIN INDIRECT FIRED WATER HEATER MODEL PLUS 60	171	WEIL–McLAIN #B–WGO–2, SEE MECH. DRAWINGS	

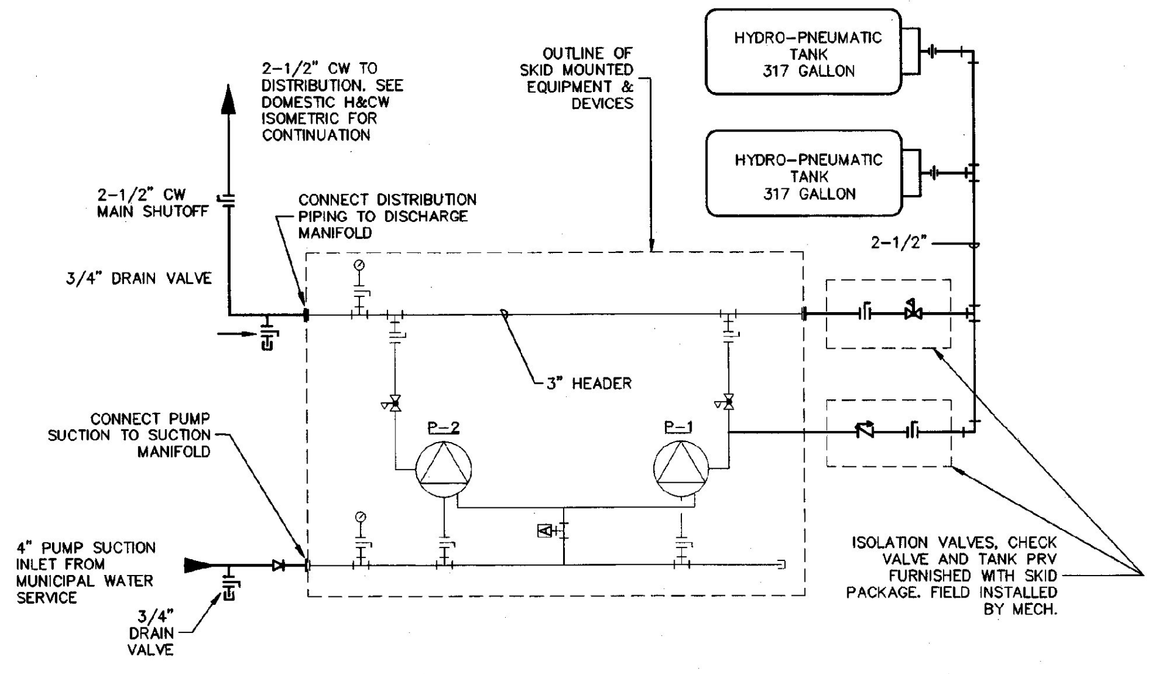


TYPICAL 3 BAY LAVATORY PLUMBING CONNECTION DETAIL

SCALE: NONE

NOTES:

1. COORDINATE ROUGH–IN WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. DESIGN INTENT IS TO ROUGH–IN TEMPERED WATER THROUGH FLOOR TIGHT TO INSIDE FACE OF EXTERIOR WALL. TEMPERED WATER RISER TO BE CONCEALED BY SINK APRON ASSEMBLY.



DOMESTIC CW BOOSTER PUMP PIPING SCHEMATIC

SCALE: NONE

DESIGN BASIS:

DOMESTIC WATER BOOSTER PACKAGE (DWBP–1): ARMSTRONG HYDROPAK MODEL #6524 (DUPLEX UNEQUAL FLOW) TOTAL PUMPING CAPACITY 80 GPM; SYSTEM PRESSURE 55 PSI; SUCTION PRESS: 20 PSI (EST); PUMP 1: 30 GPM; PUMP 2: 50 GPM; ELECTRIC: PUMP 1: 2HP, 240V–1PH; PUMP 2: 3HP,240V–1PH. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

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STATE OF VERMONT
RICHARD A. CAMARA
NO. 7179
PROFESSIONAL ENGINEER
1/15/01

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SCHEDULES AND DETAILS

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CHECKED:	DATE:
M.COOK	JAN 15, 2001

P–1sb