

CONTROL SEQUENCE

WATER SYSTEM IS SERVED BY A SINGLE CENTRIFUGAL BOOSTER PUMP OPERATING ON A RANGE BETWEEN 30 AND 50 PSI (ADJUSTABLE) WHEN PRESSURE REACHES 30 PSI, BOOSTER PUMP IS ENGAGED VIA PRESSURE SWITCH.

AS PRESSURE IN THE PIPING SYSTEM IS RAISED FROM 30 TO 50 PSI, WATER IS DRAWN FROM THE FINISHED WATER STORAGE TANK, VIA A SUCTION LINE. FLOW THROUGH THE SYSTEM IS MEASURED BY METER M-2.

ONCE 50 PSI IS REACHED, THE BOOSTER PUMP RAMPERS DOWN AND STOPS.

THE CYCLE IS REPEATED UNTIL THE LOW LEVEL ALARM CONTACT IN FINISHED WATER STORAGE TANK IS ENGAGED.

WELL PUMP IS SIGNALLED AND WELL PUMP IS ENGAGED.

WELL PUMP RAMPERS UP TO PROVIDE A GIVEN FLOW RATE AT A GIVEN TIME, THROUGH A VFD.

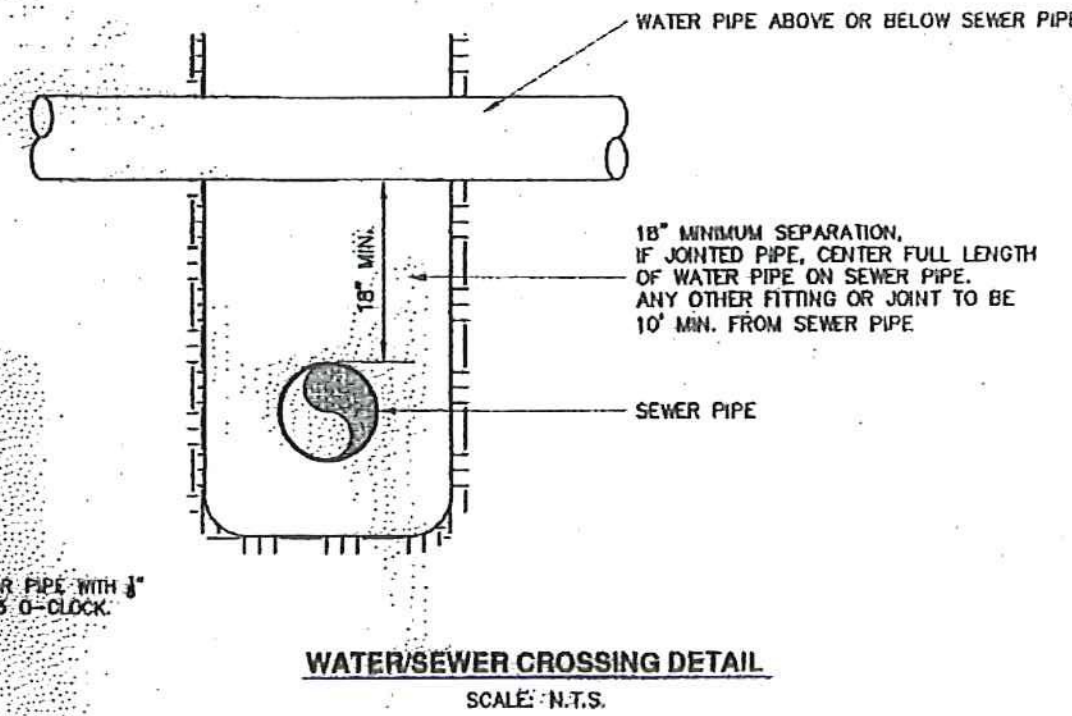
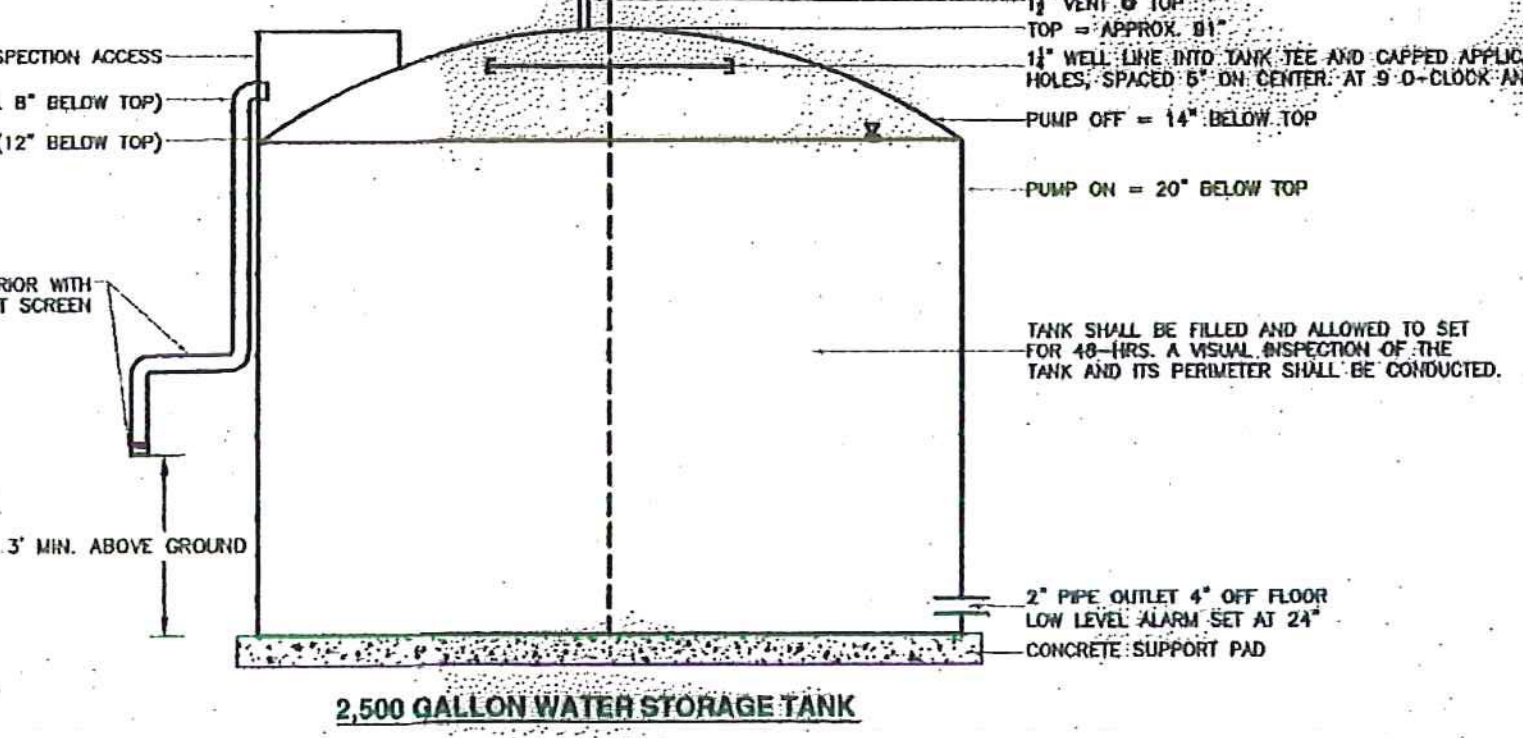
FLOW FROM THE WELL IS MEASURED THROUGH A FLOW METER AT THE PIPE ENTRANCE (METER M-1).

CHLORINE IS METERED TO THE RAW WATER THRU A 1" BALL VALVE, WITH CHEMICAL FEED RATE, AND PAGED ON FLOW FROM THE WELL PUMP.

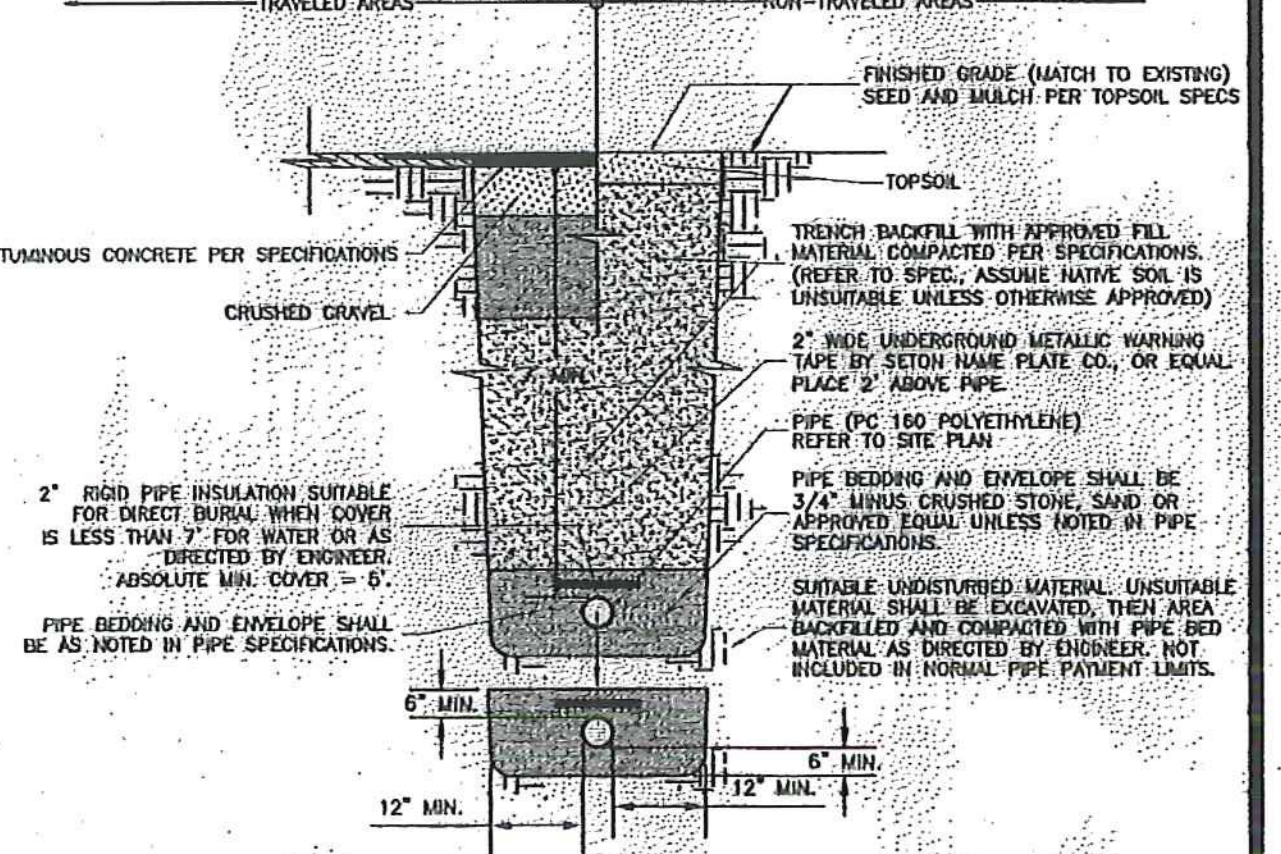
CHLORINE PUMP WILL BE WIRDED TO A DEDICATED OUTLET, AND FLOW METER, SO THE CHEMICAL FEED PUMP WILL ONLY OPERATE WHEN THE WELL PUMP IS ENGAGED, BUT PAGE FEED BASED ON FLOW.

WATER IS PUMPED DIRECTLY INTO THE FINISHED WATER STORAGE TANK UNTIL PUMP OFF CONTACT IS ENGAGED.

WELL PUMP SHUTS DOWN.



- WATER/SEWER CROSSING NOTES:**
- SEWERS CROSSING WATER MAINS SHALL BE LAD BENEATH THE WATER MAIN WITH AT LEAST 18" OF VERTICAL CLEARANCE BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER.
 - WHEN IT IS IMPOSSIBLE TO MAINTAIN THE 18" OF VERTICAL SEPARATION OR WHERE THE SEWER MUST BE LAD ABOVE THE WATER MAIN, THE CROSSING SHALL BE ARRANGED SO THAT ONE FULL LENGTH OF SEWER IS CENTERED ABOVE OR BELOW THE WATER LINE WITH SEWER JOINTS AS FAR AS POSSIBLE FROM WATER JOINTS. INSULATION BETWEEN THE WATER AND SEWER WILL BE REQUIRED.
 - THE SEWER PIPE MUST BE CONSTRUCTED TO WATER MAIN STANDARDS FOR A MINIMUM DISTANCE OF 20' EITHER SIDE OF CROSSING OR A TOTAL OF 3 PIPE LENGTHS, WHICHEVER IS GREATER.
 - THE SECTION CONSTRUCTED TO WATER MAIN STANDARDS MUST BE PRESSURE TESTED TO MAINTAIN 50 P.S.I. FOR 15 MIN. WITHOUT LEAKAGE PRIOR TO BACKFILLING 1' ABOVE THE PIPE TO ASSURE TIGHTNESS.
 - WHERE A WATER MAIN CROSSES UNDER A SEWER, ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO PREVENT DAMAGE TO THE WATER MAIN.



- GENERAL NOTES**
- INFORMATION PRESENTED ON THIS PLAN IS SCHEMATIC IN NATURE. ACTUAL LAYOUT TO BE COORDINATED BY CONTRACTOR.
 - IT IS NOT INTENT OF THE DRAWING TO SHOW EVERY PART. CONTRACTOR TO BUILD SYSTEM WHICH MEETS PERFORMANCE STANDARDS SHOWN.
 - CONTROLS, MECHANICAL, ELECTRICAL, DETAILS & NOTES BY OTHERS.
 - ALL WORK SHALL BE IN CONFORMANCE WITH STATE & LOCAL PLUMBING AND ELECTRICAL CODES.
- SYSTEM TESTING REQUIREMENTS**
- WATER SERVICE TESTING REQUIREMENTS:**
- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL TEMPORARY PIPE, FITTINGS, MATERIALS, LABOR, AND EQUIPMENT REQUIRED FOR RE-TESTING. THE WELL LINE SHALL BE PRESSURE TESTED FOR A PERIOD OF NOT LESS THAN 2 HRS AT A PRESSURE EQUAL TO 1.5 TIMES THE WORKING PRESSURE IN THE SYSTEM (110 PSI).
 - PRIOR TO DISINFECTION OF THE SERVICE, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER AND SYSTEM OPERATOR TO COMPLETE THE PRESSURE TEST OF THE WELL LINE.
 - ONCE A SUCCESSFUL PRESSURE TEST HAS OCCURRED, THE DISINFECTION OF WATER SERVICES SHALL BE ACCOMPLISHED IN ACCORDANCE WITH ANWA STANDARD FOR DISINFECTING WATER MAINS, LATEST EDITION. THE FOLLOWING DESCRIPTIONS MAY BE USED AS A GUIDE.
 - AT A POINT NOT MORE THAN 10 FEET (3 METERS) DOWNSTREAM FROM THE BEGINNING OF THE NEW SERVICE, WATER ENTERING THE NEW SERVICE SHALL RECEIVE A DOSE OF CHLORINE, FED AT A CONSTANT RATE (TABLET METHOD IS NOT ALLOWED) SUCH THAT THE WATER WILL HAVE NOT LESS THAN 25 MG/L FREE CHLORINE TO ENSURE THAT THIS CONCENTRATION IS PROVIDED. THE CONTRACTOR SHALL MEASURE THE CHLORINE CONCENTRATION AT REGULAR INTERVALS USING APPROPRIATE TEST KITS.
 - CHLORINE APPLICATION SHALL NOT CEASE UNTIL THE ENTIRE SERVICE IS FILLED WITH HEAVILY CHLORINATED WATER.
 - THE CHLORINATED WATER SHALL BE RETAINED IN THE SERVICE PIPE FOR AT LEAST 24 HOURS, DURING WHICH TIME ALL VALVES IN THE TREATED SECTION SHALL NOT BE OPERATED TO ENSURE DISINFECTION OF THE APPURTENANCES. AT THE END OF THIS 24 HOUR PERIOD, THE TREATED WATER IN ALL PORTIONS OF THE PIPE SHALL HAVE A RESIDUAL OF NOT LESS THAN 10 MG/L FREE CHLORINE.
 - FEED LINES SHALL BE OF SUCH MATERIAL AND STRENGTH AS TO SAFELY WITHSTAND THE CORROSION CAUSED BY THE CONCENTRATED CHLORINE SOLUTIONS AND THE MAXIMUM PRESSURES THAT MAY BE CREATED BY THE PUMPS. ALL CONNECTIONS SHALL BE CHECKED FOR TIGHTNESS BEFORE THE SOLUTION IS APPLIED TO THE PIPE.
 - UPON COMPLETION OF DISINFECTION AND DE-CHLORINATION OF THE WELL LINE, THE CONTRACTOR SHALL COLLECT AND SUBMIT A WATER QUALITY SAMPLE FOR ANALYSIS TO A VERMONT DEPARTMENT OF HEALTH APPROVED LABORATORY. THE CONTRACTOR IS RESPONSIBLE FOR COLLECTING AND DELIVERING THE SAMPLE TO THE LAB, INCLUDING ANY AND ALL FEES.
 - A MINIMUM OF 24 HOURS AFTER THE FIRST SAMPLE IS COLLECTED, THE CONTRACTOR SHALL COLLECT AND SUBMIT A WATER QUALITY SAMPLE FOR ANALYSIS TO THE SAME LABORATORY PREVIOUSLY SUBMITTED.
 - THE CONTRACTOR SHALL SUBMIT ALL WATER QUALITY TEST RESULTS TO THE ENGINEER AND SYSTEM OPERATOR. PENNING (2) CONSECUTIVE PASSING BACTERIOLOGICAL SAMPLES, THE LINE WILL BE CONSIDERED SUITABLE FOR CONSUMPTION, AND APPLICABLE CONNECTIONS CAN BE MADE.
 - WELL FEED LINE MUST ACHIEVE SUCCESSFUL TESTING PRIOR TO CONNECTION WITH ABOVE GROUND 2,500 GALLON STORAGE TANK.
- WATER TANK DISINFECTION TESTING REQUIREMENTS:**
- BEFORE FILLING THE STORAGE TANK, CONTRACTOR SHALL ACHIEVE PASSING RESULTS FOR ALL TESTING REQUIRED ON THE WELL SERVICE LINE.
 - CONTRACTOR SHALL THOROUGHLY CLEAN & FLUSH THE TANK PRIOR TO USE FOR TESTING.
 - THE CONTRACTOR SHALL NOTIFY THE ENGINEER & SYSTEM OPERATOR PRIOR TO CHLORINATING THE TANK.
 - DISINFECTION SHALL MEET THE ANWA C 652 STANDARD LATEST EDITION METHOD-2, OR AS REQUIRED BY THE APPLICABLE STATE AGENCY.
 - PRIOR TO FILLING ALL INTERIOR SURFACES OF THE TANK SHALL BE COATED WITH A 200 PPM CHLORINE SOLUTION.
 - TANK SHALL BE FILLED AND ALLOWED TO SET FOR 48 HOURS.
 - PRIOR TO PLACING THE TANK IN SERVICE (2) CONSECUTIVE BACTERIOLOGICAL SAMPLES MUST BE COLLECTED AT LEAST 24 HOURS APART AND ANALYZED BY AN INDEPENDENT LABORATORY APPROVED BY VT DEPARTMENT OF HEALTH. WITH BOTH TEST RESULTS ABSENT OF TOTAL COLIFORM.
- WATER TANK INSPECTION:**
- UPON FILLING THE STORAGE TANK, THE CONTRACTOR SHALL VISUALLY INSPECT THE TANK AND ASSOCIATED FITTINGS FOR LEAKS. ANY DEFICIENCIES SHALL BE CORRECTED.

Equipment Schedule

Tag	Make	Model	Notes
P-1	Schaefer	4-Inch Tri-Seal	1.5 hp well pump - 3 Phase - VFD Control
P-2	Schaefer	MH	1.5 hp booster pump

Chemical Feed

Tag	Make	Model	Notes
CF-1	Stenner	45MHP2	Classic Series, Single Head, Fixed Output Chemical Feed Pump
CF-2	Stenner	STS15NC	15 gallon day tank (part of chemical feed package)
PCM	Stenner	PCM1	Pump Control Module for proportional injection system

Water Meters

Tag	Make	Model	Notes
M-1	Stenner	JLP0750-1PPG	Raw water meter to measure flow from well, and pace chemical feed
M-2	Sensus	Omni C2	Finished Water Meter, range (0.5 to 200 gpm)

Level Sensor

Tag	Make	Model	Notes
LS-1	Omega	PX-437-010G1	0-23.1 ft range, with 40 feet of cable
LS-2	Omega	DP25B-E-A	Input Meter (Voltage and Current) with excitation, and Analog Output

Interior Piping
All interior piping shall be Schedule 80 Solvent Weld PVC (NSF approved), Type "L" Copper or approved equal.

Ball Valves
All ball valves shall be Nibco Schedule 80 PVC or Apollo Lead Free Brass

Well Pipe (Site)
All piping from the well to SRE building shall be PC 160 polyethylene, IPS. Size shall be per the site plan.

Anti-Vibration Pads
Anti-vibration pads shall be VibraSystems Neoprene Pads; VP series, Waffle design, and field cut to meet the dimensions of the pump.

Storage Tank

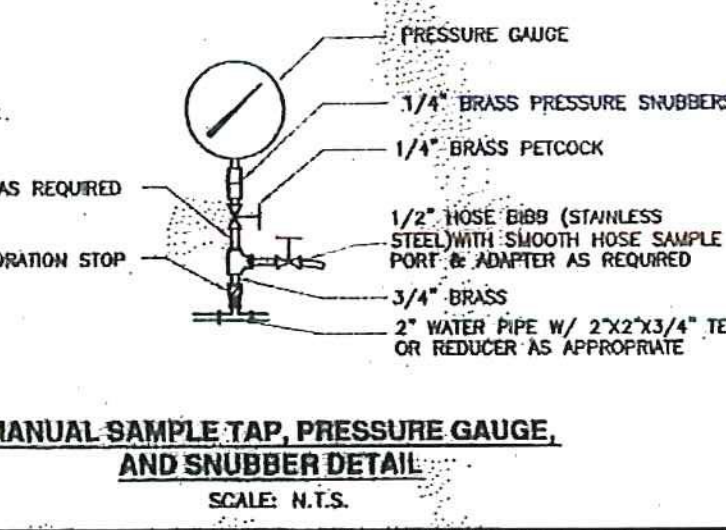
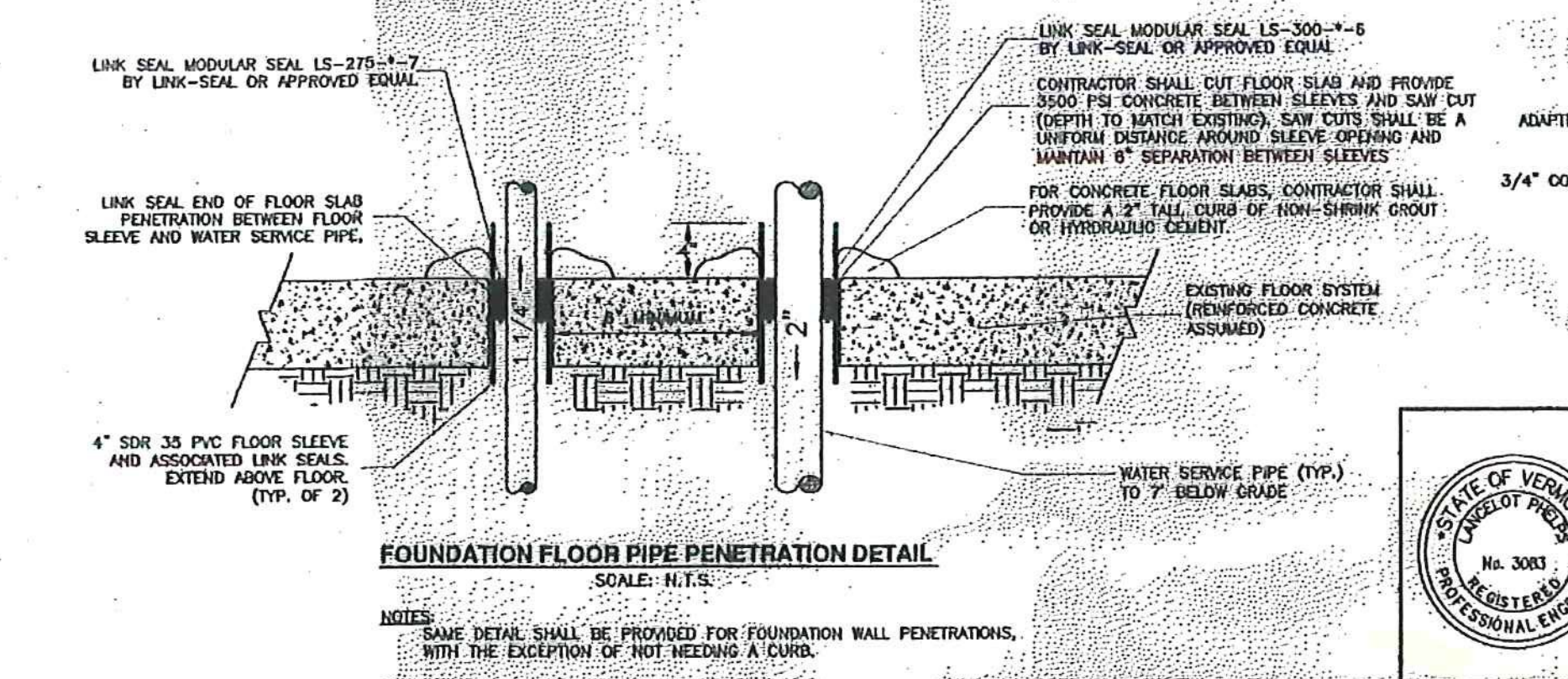
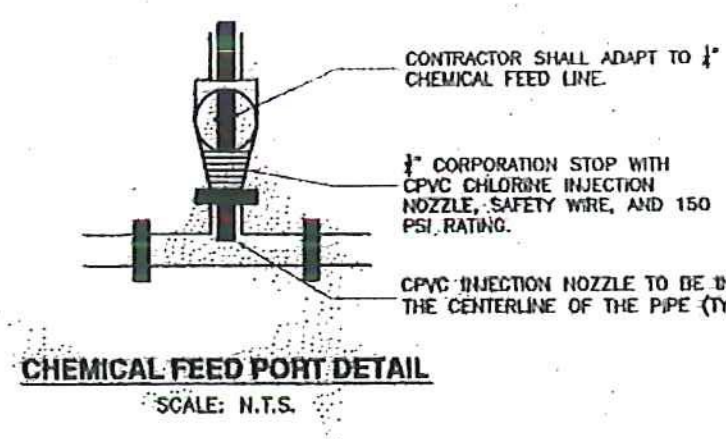
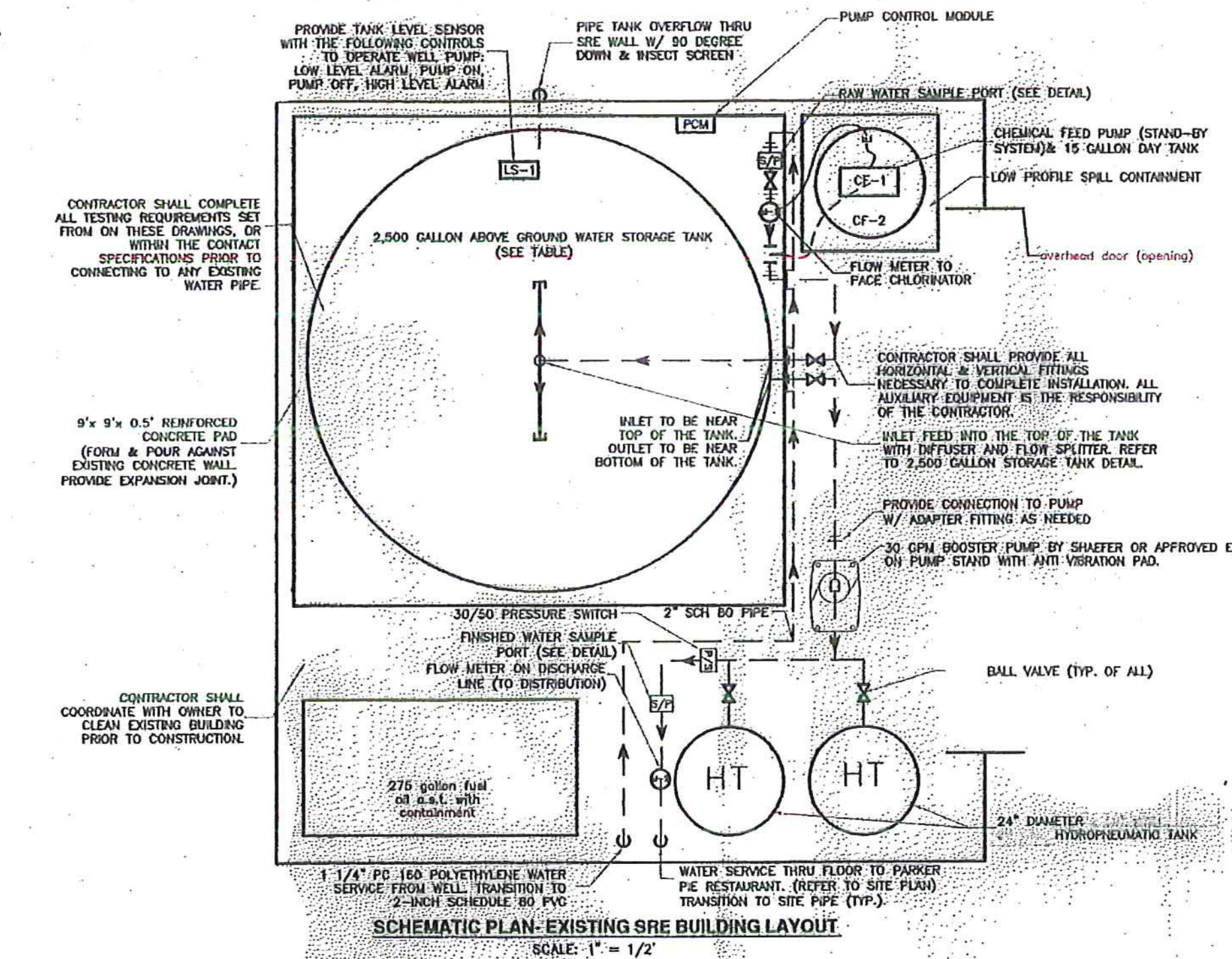
Tag	Make	Model	Notes
TANK	Norwesco	#40051	2,500 Gallons; 95" diameter X 91" high, White Polyethylene

Hydropneumatic Tanks

Tag	Make	Model	Notes
HT	Wellmate	WM-35WB	119 gallon capacity; 24" diameter

Pressure Switch
The pressure switch shall be a Dwyer, Mercoild, Model CXA-R2 adjustable pressure switch. Settings shall be 30 psi low, and 50 psi high at the start of system operation.

- Notes**
- Intent of these documents is to provide a level of service required. Contractor shall provide a complete working system which meets the performance standard set forth in these drawings.
 - Instrumentation and Controls shall be capable of meeting the required setpoints at a minimum. Contractor shall work with Owner for solicited controls.
 - All pressure gauges shall be Watts, with acceptable pressure range from 0 to 150 psig
 - All sample ports shall be smooth bore, stainless steel, or lead free brass conforming to Vermont Lead Free Law
 - All tanks, piping, and equipment shall be on pads or supported a minimum of 6 inches above the building floor.



SCHEDULE A - WATER SYSTEM - BID SET
VTRANS PROJECT #AV11570042-301
JUNE 2016

	REVISIONS: NEW DESIGN SUBMITTAL & CHANGE COMMENTS: 8/27/15 FINAL PLAN REVISIONS: 8/27/15 REVISED WATER SERVICE LOCATIONS: 10/15/15 ADD REVISING & CHECKED: 10/15/15 DESIGN ENGINEER: 8/27/15	THE DRAWINGS FOR THIS PROJECT SHALL NOT BE REUSED OR ALTERED IN ANY WAY WITHOUT THE WRITTEN APPROVAL AND AUTHORITY OF THE ENGINEER. ANY REVISIONS SHALL BE MADE BY THE ENGINEER AND NOTED IN THE REVISION BLOCK.	PHELPS ENGINEERING, INC. 79 Court St., P.O. Box 367 Middlebury, VT 05753 Telephone (802) 388-7829	NEWPORT AIRPORT WATER SYSTEM DESIGN PHASE I BUILDOUT COVENTRY, VERMONT
	PHELPS ENGINEERING, INC. SCALE: AS SHOWN DR. BY: RC/CJ SHEET NO. 3 OF 5 DWS. NO. 201503 DATE: 8/6/2015 CK'D BY: JR/RC	PROCESS/FLOW CONCEPT		