PUBLIC HEALTH DIVISION
Office of Environmental Public Health, Drinking Water Program
Tina Kotek, Governor

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September 2, 2023

Devin Sene, EI, LSI
HBH Consulting Engineers, Inc.
501 E First Street
Newberg, OR 97132
dsene@hbh-consulting.com

Sent Via E-mail Only

Re: Corrosion Control and Reservoir Roof - Plan Review # 119-2023
Nestucca High School (PWS ID # 41-90594)
Conditional Approval

Dear Mr. Sene:

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the *Nestucca High School Water System Improvements* consisting of corrosion control treatment (caustic soda) and a new reservoir roof for Nestucca High School's existing 3,500-gallon concrete reservoir. On August 30, 2023, our office received plans and specifications for the improvements. A plan review fee of $825 was also received on September 1, 2023.

The project (described in greater detail beginning on page 7 of this letter) is approved provided the following conditions are met (i.e., Final Approval cannot be granted without meeting conditions below):

Corrosion control system conditions to be met:

1. Product specifications need to be submitted showing the caustic soda meets ANSI/NSF Standard 60 for potable use - OAR 333-061-0050(1)(e).
2. The 50-gallon caustic soda tank must meet ANSI/NSF Standard 61 for potable use and is rated for use with caustic soda - OAR 333-061-0050(1)(e).
3. Plumbing is flushed, disinfected, and tested for coliform bacteria after construction and prior to use – OAR 333-061-0050(10). I have provided these requirements as an attachment to this letter (see pages 11-13).

Note: Please see comments/recommendations on page 3 regarding follow-up water quality parameter & lead and copper tap sampling requirements following construction and Final Approval.

Reservoir roof conditions to be met:

1. When the access manhole is on the roof of the reservoir there shall be a curbing around the opening (e.g., 4" curbing) and a lockable watertight cover that overlaps the curbing - OAR 333-061-0050(6)(a)(J).
2. The outlet ends of the drain and overflow shall be fitted with angle-flap valves or equivalent protection and shall discharge to a watercourse or storm drain capable of accommodating the flow with a vertical separation between the bottom of the pipe and top of the receiving body or structure - OAR 333-061-0050(6)(a)(M).
3. A silt stop shall be provided at the outlet pipe (e.g., an extension of the outlet (effluent) pipe terminating 6" above the floor of the reservoir) - OAR 333-061-0050(6)(a)(N).
4. A fence or other method of vandal deterrence shall be provided around distribution reservoirs - OAR 333-061-0050(6)(a)(P).
5. When interior surfaces of finished water storage tanks are provided with a protective coating, the coating shall meet the requirements of NSF Standard 61: Drinking Water System Components - Health Effects or equivalent - OAR 333-061-0050(6)(a)(Q). Although not included in the submitted plans, it is believed that the reservoir was recently re-coated. Please provide the product specifications showing NSF-61 certification of this coating.
6. The reservoir is disinfected and tested according to OAR 333-061-0050(10)(e) – (h). I have provided these requirements as an attachment to this letter.
7. The 10,000-gallon polyethylene storage tanks shall be physically disconnected from the water system (not just valved off). Alternatively, specifications on the tank and its placement showing how it meets the construction standards under OAR 333-061-0050(6) could be submitted for approval under this same plan review number (#119-2023). If approved, the tank could remain in service or be valved off for future use (e.g., emergency use). However, if left empty for an extended length of time, I recommended disconnecting the tank and providing valves and fittings (e.g., a double block and bleed configuration using 2 or 3 valves and a tee fitting) to be able to re-connect the tank should it be needed in the future.

In addition to the conditions to be met above, I have the following comments/recommendations:

a) An NSF-61 sealant may be needed to seal any gaps between the redwood top plate and the top of the reservoir walls. Although there are likely many other options available, Silkaflex®-1A is one example of an NSF-60 sealant.
b) The existing bolts used to fasten truss members and redwood top plate should be inspected for corrosion and to make sure they are securely in the concrete. Fasteners should be replaced if found to be corroded or loose.
c) A heaver 26-guage galvanized and/or painted steel metal roofing may be a more durable option than the 28-guage roofing planned and will be better able to withstand wind, however I will defer to the design engineer's judgement. If 26-guage roofing is chosen, the design of the roof trusses should be verified to ensure they can support the additional weight.
d) A 24-mesh stainless steel insect screen for the reservoir vents is recommended. A courser ¼" or 1/2" galvanized or stainless hardware cloth can be placed over the finer insect screen to protect the finer screen from damage.
e) Installing a gutter on the downslope side of the roof with a downspout to divert rainwater will help minimize erosion and ponding around the base of the tank foundation.
f) For reference, construction standards for reservoirs are on our website at: https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/PLANREVIEW/Documents/OAR-333-061-0050.pdf
g) Following construction and Final Approval of this project:
    a. increased sampling for water quality parameters (pH and alkalinity) will need to be sampled at both the entry point and in the distribution system (i.e., other locations throughout the school).
    b. Two demonstration rounds of lead and copper tap samples at 10 sites will also be needed in the first 12 months following construction and Final Approval.
    c. Once this increased monitoring is complete, a minimum pH will be established for both the entry point and distribution system.
    d. Sampling for pH will be ongoing and needs to be reported monthly.
    e. Reductions in lead and copper tap sampling is also possible, depending upon the results of the increased demonstration testing rounds.
    f. Increase sampling is summarized in Table 1 (required) and reduced sampling once the increased sampling is done is summarized in Table 2 (anticipated, but subject to change based on the results from sampling in Table 1).

The corrosion control treatment system is not allowed to be placed into service until Final Approval has been granted. The following sampling assumes the water system will be placed into service soon after Final Approval has been granted.

Table 1. Required sampling to demonstrate compliance following Final Approval

What Parameter	**Where**	**When**	**Purpose**	**Enter 90th percentile lead and copper and individual pH and alkalinity sample dates and results**
Lead and Copper **(Round 1)**	**10 tap sample sites**	**Round 1** – within 2 months of Final Approval	Demonstrate corrosion control	Round 1 Date: _____ Lead = _____mg/l Copper = _____mg/l
Lead and Copper **(Round 2)**	**10 tap sample sites**	**Round 2** – 6 months after round 1 sampling	Demonstrate corrosion control	Round 2 Date: _____ Lead = _____mg/l Copper = _____mg/l
pH & Alkalinity (**EP-A**)	**Entry Point A** or "EP-A" (downstream of the concrete reservoir, but prior to first useable tap).	Every 14 days following Final Approval	Results along with lead and copper tap sampling will be used to establish a minimum pH that will have to be maintained at the entry point	**EP-A Results** Date / pH / Alk (6 rows)
pH & Alkalinity (**DIST-A**)	**Distribution** system – select either 1 lead or copper tap sample site or 1 coliform sample site representative of the water quality in distribution system in the school (document the sample site "e.g., Teacher's Lounge"	Take **1st sample** on the day of each round of lead and copper tap sampling. Take a **2nd sample** – within 14 days of the 1st sample.	Results along with lead and copper tap sampling will be used to establish a minimum pH that will have to be maintained in the distribution system. _____ Taken with lead and copper rounds 1 & 2: Taken w/Round 1 => 14 days later => Taken w/Round 2 => 14 days later =>	(10 rows) (26 results needed) **Distribution Results** Date / pH / Alk (4 rows)

Table 2. Sampling anticipated following the demonstration sampling in Table 1				
What Parameter	Where	When	Purpose	Results
Lead and Copper	5 tap sample locations	Every 1 or 3 years (depending upon results of 6-month demonstration rounds)	Reduced Monitoring	**Year 1** Sample Date: _____ Lead = ____ppb Copper = ____mg/l
				Year 2 Sample Date: _____ Lead = ____ppb Copper = ____mg/l
				Year 3 Sample Date: _____ Lead = ____ppb Copper = ____mg/l
pH at EP-A	Same site as EP-A pH sampling in Table 1	Every 14 days (on-going requirement)	Results must be above the required minimum pH	Report the results by the 10th of the following month every month using the "Entry Point" form (provided later)
pH in the Distribution system	Same site as DIST-A pH sampling in Table 1	1st sample during lead and copper tap sampling and 2nd sample within 14 days of 1st sample	Results must be above the required minimum distribution pH	Report results by the 10th of the following month using the "Distribution" form (provided later)
Minimum Water pH requirements and reported pH results will be viewable online here: https://yourwater.oregon.gov/lcr.php?pwsno=90594 Lead and copper 90th percentile results are viewable online here: https://yourwater.oregon.gov/leadcopper.php?pwsno=90594 Individual lead and copper tap sample results are viewable online here: https://yourwater.oregon.gov/lead_copper_detail.php?pwsno=90594				

Templates for required consumer notification of lead and copper tap sample results are online at the links below:

- **Consumer Notification Templates for Non-Transient Non-Community Systems (NTNC)**
  - When samples **exceed** lead AL at NTNC: Fillable MS Word
  - When samples are **below** lead AL at NTNC: Fillable MS Word

- **Certification Form:** Submit to DWS when consumer notification has been completed: Fillable MS Word

Until we receive verification that the conditions have been met and final approval has been issued, the facility is not approved for use. Upon completion of the project, the engineer must complete the Project Final Approval Request Form to verify in writing that construction was completed according to the submitted plans. If substantial changes are made, a set of as-built drawings must be submitted. Documentation demonstrating how the above conditions were met should reference Plan Review #119-2023 and can be emailed to me at me at evan.e.hofeld@oha.oregon.gov or mailed to:

Attn: Evan Hofeld
OHA-Oregon Drinking Water Services
PO Box 14450
Portland, OR 97293-0450

Thank you for your assistance in this plan review process and if you have any questions or would like this information in an alternate format, please feel free to contact me at any time at 971-200-0288 or via e-mail at evan.e.hofeld@dhsoha.state.or.us.

Sincerely,

Evan Hofeld, Regional Engineer
Oregon Health Authority – Drinking Water Services

ec. Misty Wharton, District Superintendent
Nestucca Valley School District #101
MistyW@nestucca.k12.or.us
Chad Holloway, Administrator of Facilities and Alternative Education
Nestucca Valley School District #101
ChadH@nestucca.k12.or.us
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curtis@hilandwater.com
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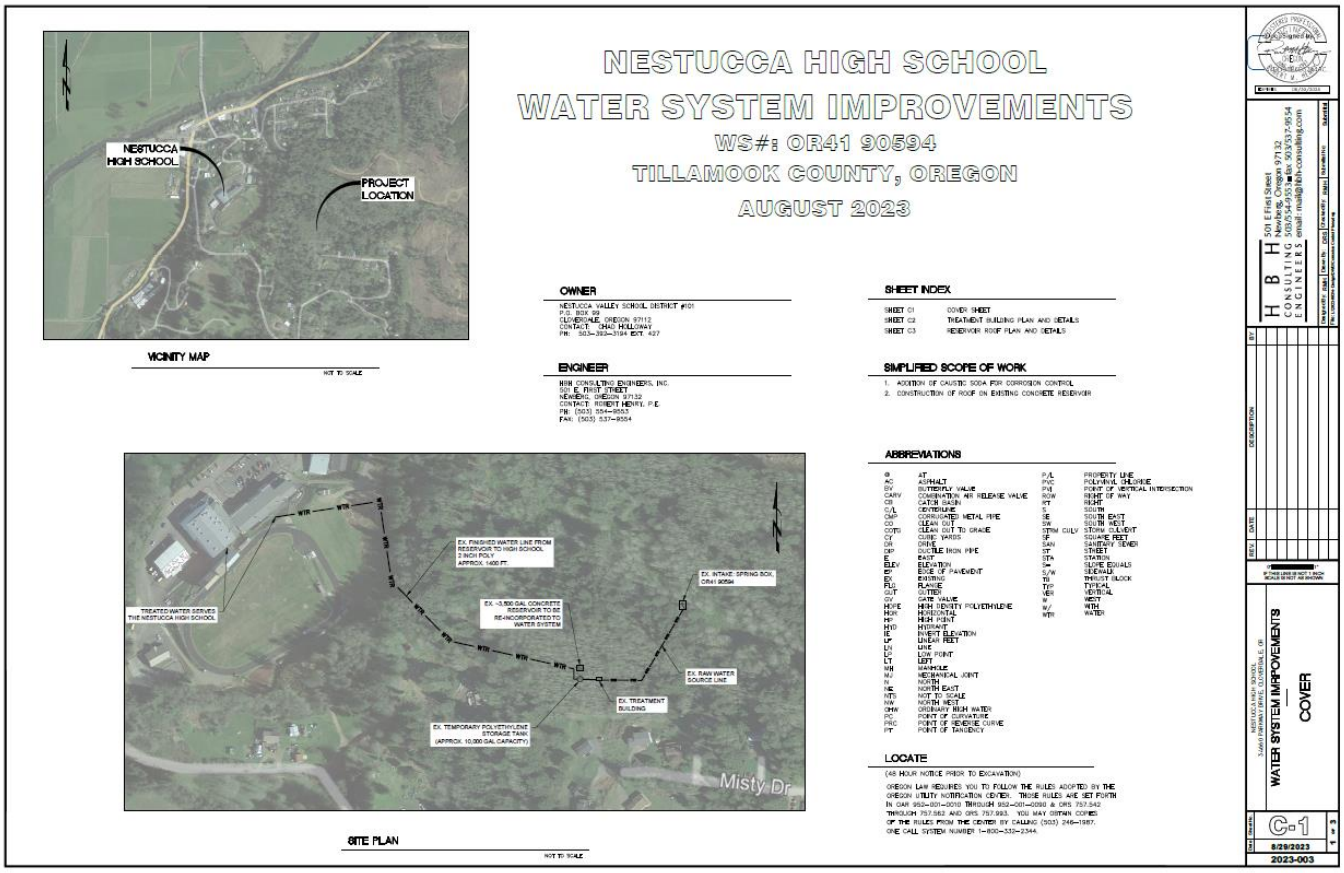
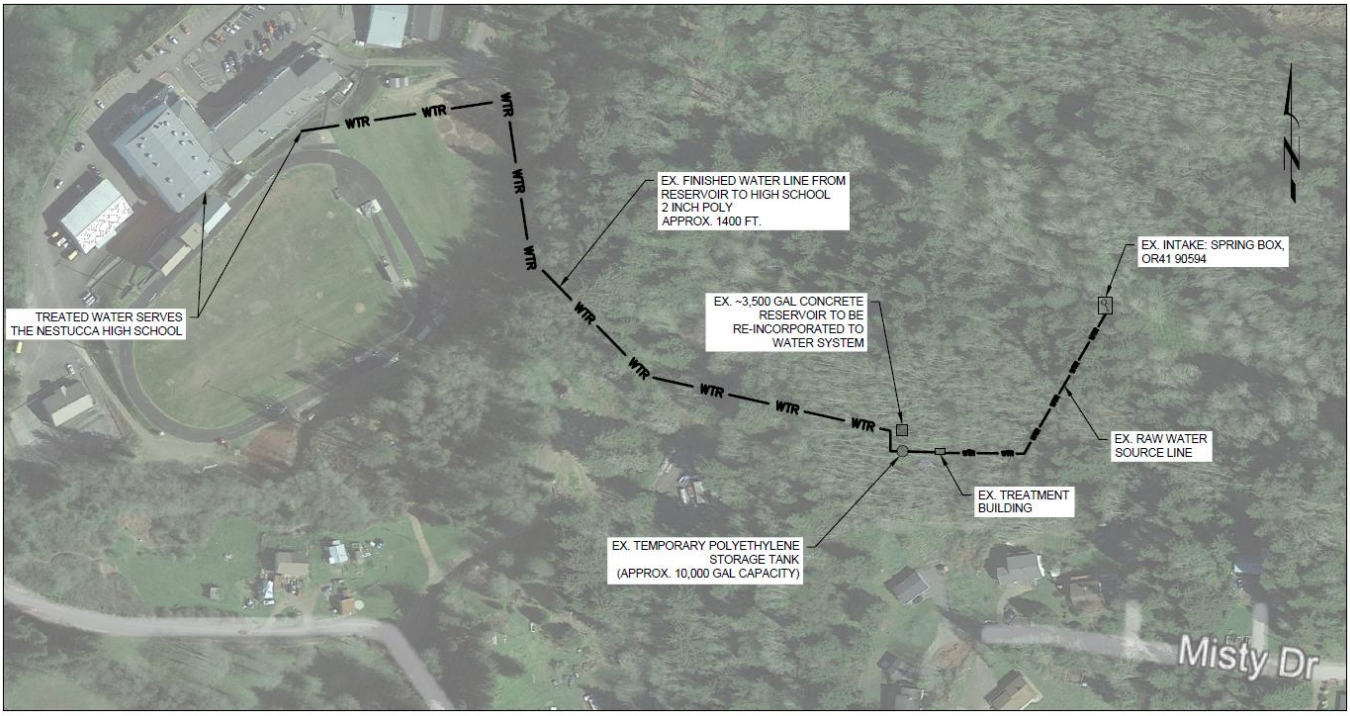
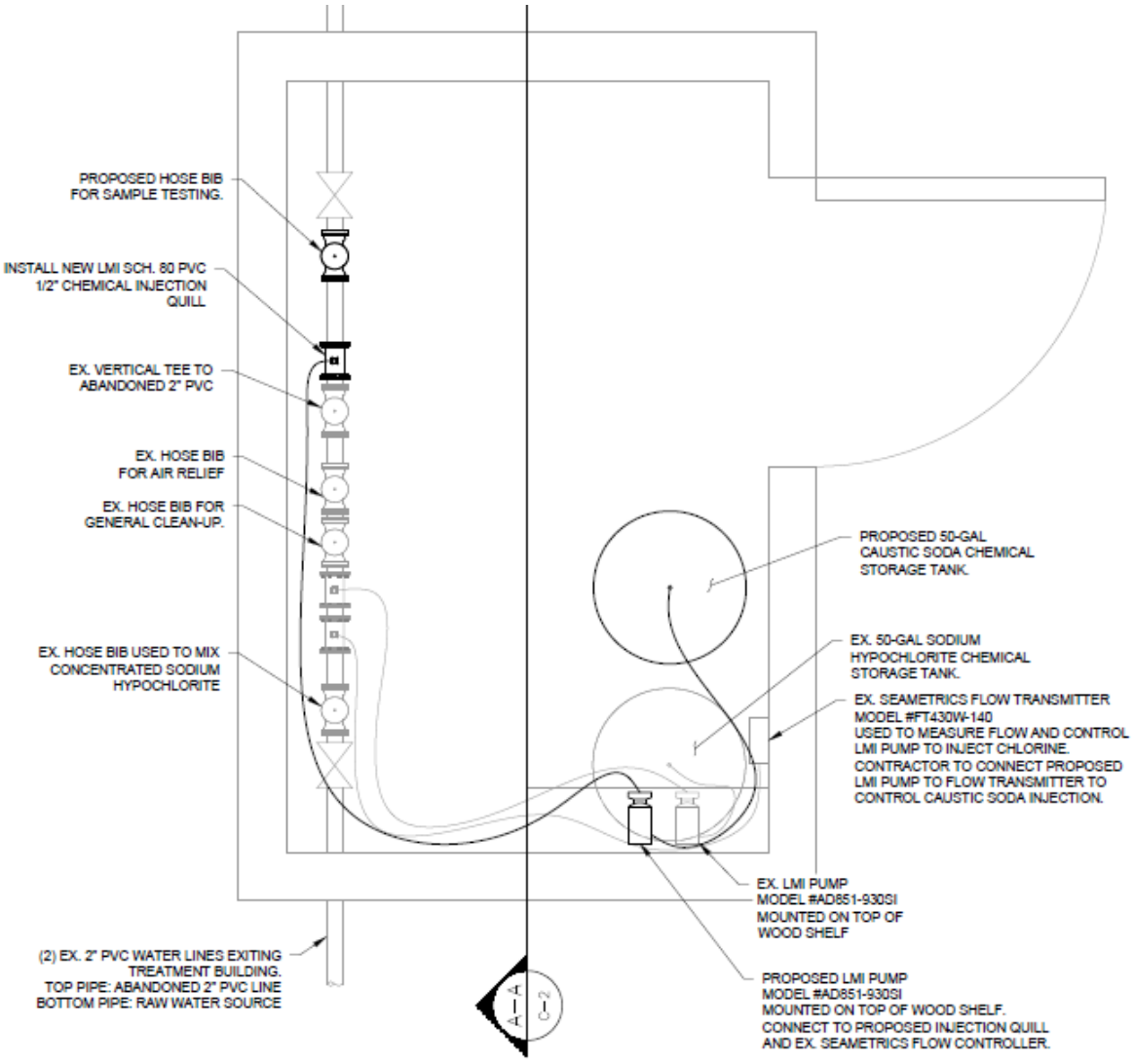
Project Description

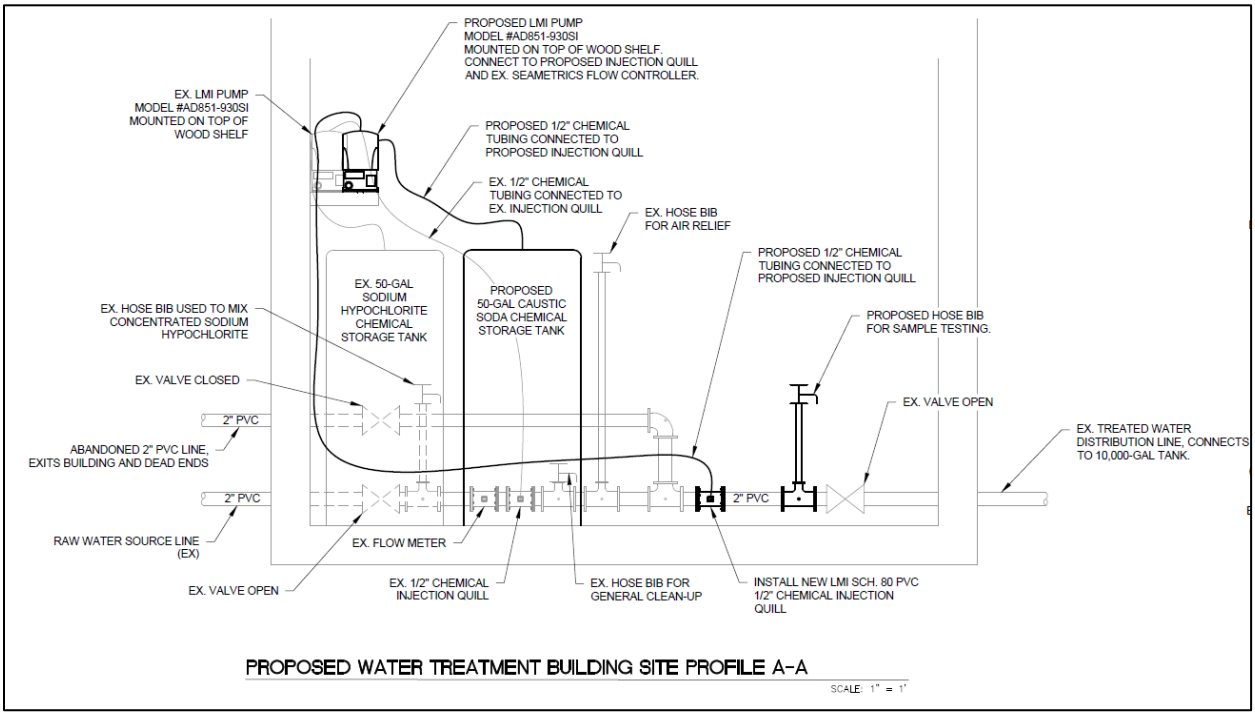


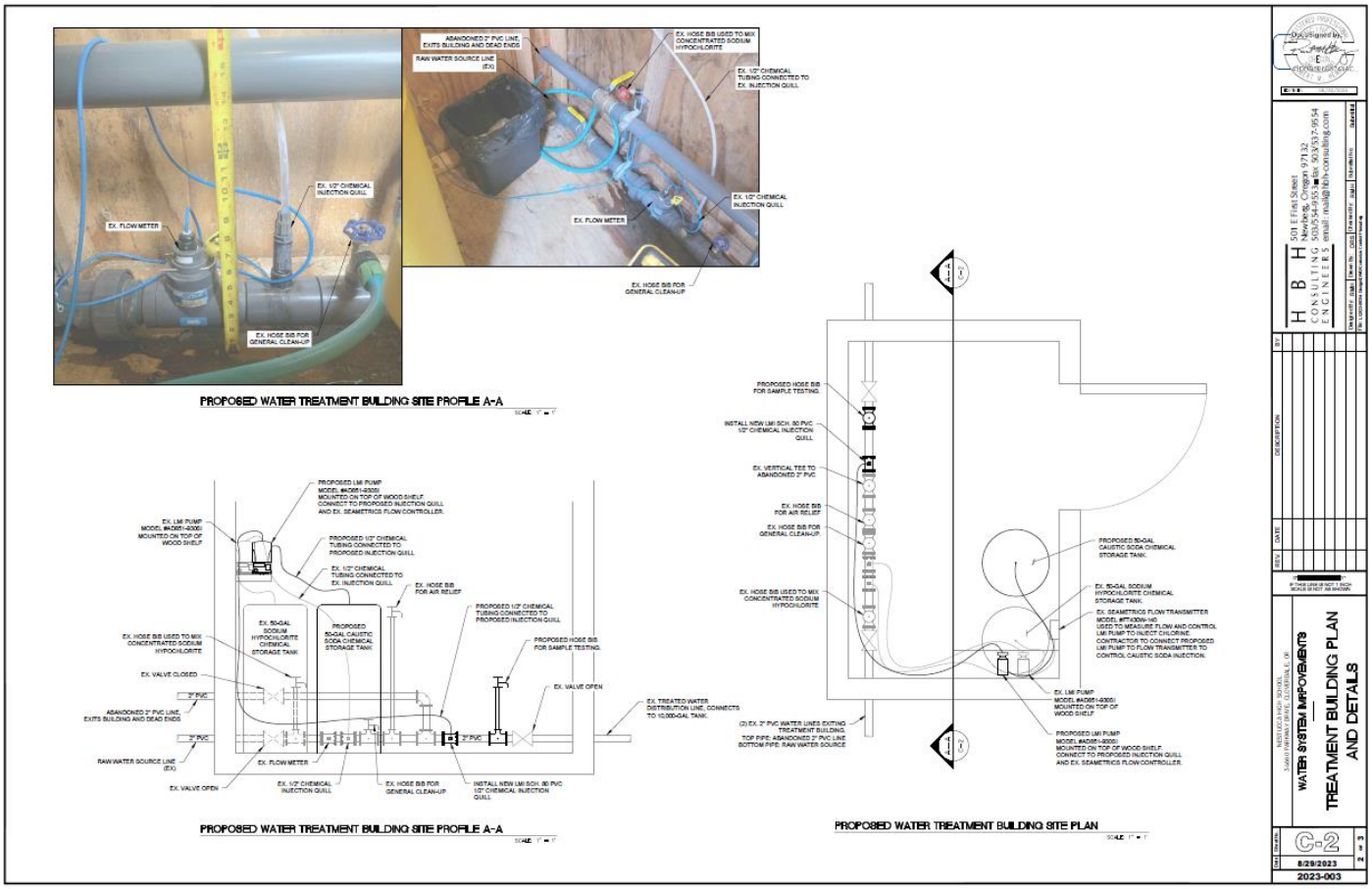


Corrosion control equipment consists of:

1) LMI pump (model #AD851-930SI)
2) 50-gallon caustic tank
3) Caustic
4) Seametrics flow controller
5) New injection quill located post chlorine injection.
6) Pre-existing raw and new treated (post chlorine and soda ash injection) sample taps
7) Pre-existing flow meter

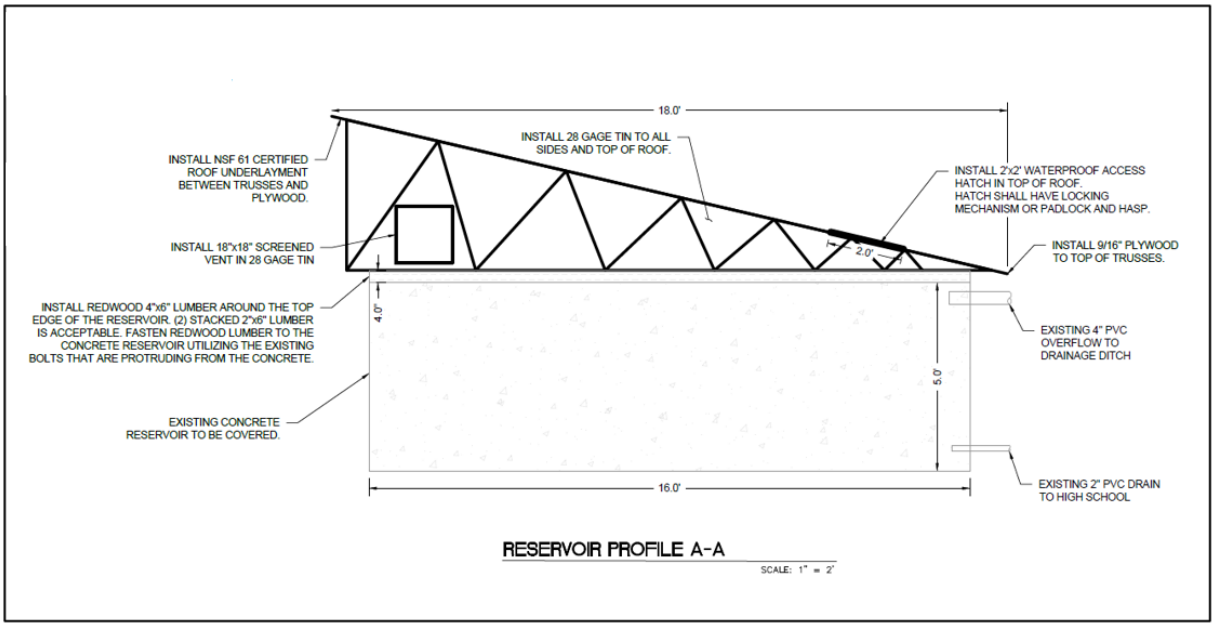


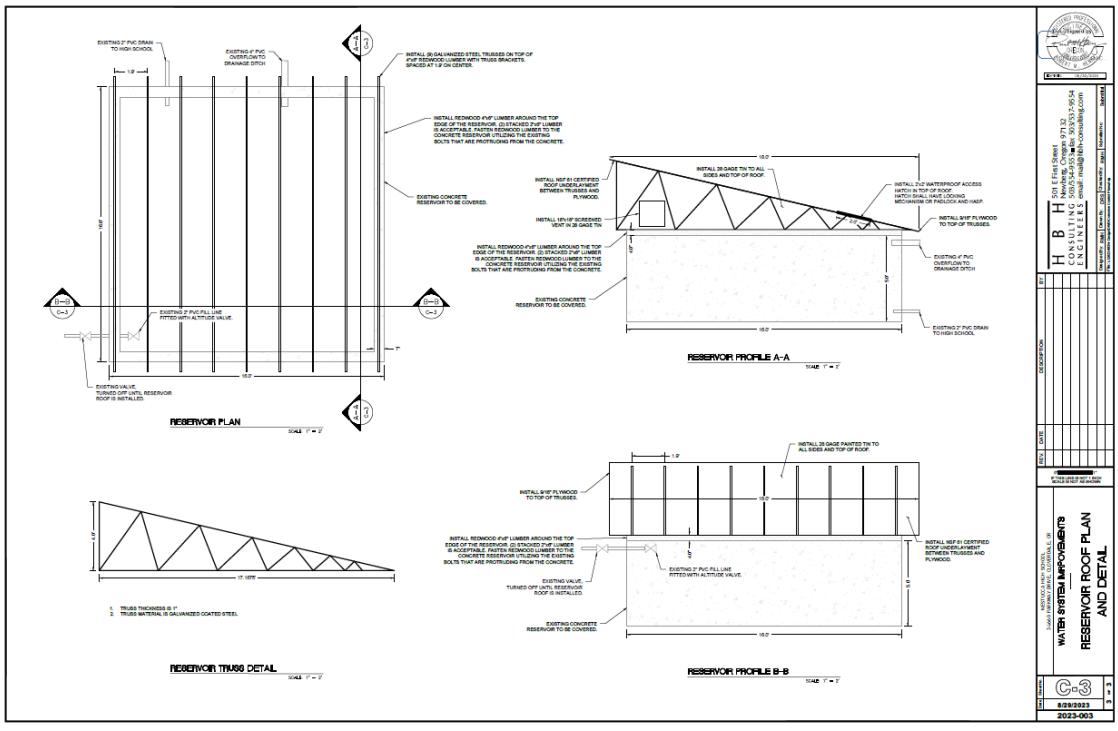

PROPOSED LMI PUMP MODEL #AD851-930SI MOUNTED ON TOP OF WOOD SHELF. CONNECT TO PROPOSED INJECTION QUILL AND EX. SEAMETRICS FLOW CONTROLLER.
EX. LMI PUMP MODEL #AD851-930SI MOUNTED ON TOP OF WOOD SHELF
PROPOSED 1/2" CHEMICAL TUBING CONNECTED TO PROPOSED INJECTION QUILL
EX. 1/2" CHEMICAL TUBING CONNECTED TO EX. INJECTION QUILL
EX. HOSE BIB FOR AIR RELIEF
PROPOSED 1/2" CHEMICAL TUBING CONNECTED TO PROPOSED INJECTION QUILL
EX. 50-GAL SODIUM HYPOCHLORITE CHEMICAL STORAGE TANK
PROPOSED 50-GAL CAUSTIC SODA CHEMICAL STORAGE TANK
EX. HOSE BIB USED TO MIX CONCENTRATED SODIUM HYPOCHLORITE
PROPOSED HOSE BIB FOR SAMPLE TESTING.
EX. VALVE CLOSED
EX. VALVE OPEN
2" PVC
ABANDONED 2" PVC LINE, EXITS BUILDING AND DEAD ENDS
EX. TREATED WATER DISTRIBUTION LINE, CONNECTS TO 10,000-GAL TANK.
2" PVC
2" PVC
RAW WATER SOURCE LINE (EX)
EX. FLOW METER
EX. VALVE OPEN
EX. 1/2" CHEMICAL INJECTION QUILL
EX. HOSE BIB FOR GENERAL CLEAN-UP
INSTALL NEW LMI SCH. 80 PVC 1/2" CHEMICAL INJECTION QUILL
PROPOSED WATER TREATMENT BUILDING SITE PROFILE A-A
SCALE: 1" = 1'


PROPOSED WATER TREATMENT BUILDING SITE PROFILE A-A
PROPOSED WATER TREATMENT BUILDING SITE PROFILE A-A
PROPOSED WATER TREATMENT BUILDING SITE PLAN
H B H CONSULTING ENGINEERS
WATER SYSTEM IMPROVEMENTS
TREATMENT BUILDING PLAN AND DETAILS
C-2
8/29/2023
2023-003

Reservoir Roof:

The roof project seeks to cover an existing 16'W x 16'L x 5'D (~3,500 gallons) concrete reservoir as shown below. The new reservoir roof consists of 9 steel trusses made of 1" galvanized steel members spaced 1.9' apart on center w/truss brackets fastened on top of 4" x 6" or two stacked 2" x 6" redwood lumber attached to top of reservoir walls using existing steel bolts already embedded in the concrete walls. Trusses are covered first with an NSF-61 underlayment, followed by 9/16" plywood sheathing and 28-ga tin roofing.





OAR 333-061-0050(10) – Disinfection of Facilities

(10) Disinfection of facilities:

(a) Following construction or installation of new facilities and repairs to existing facilities, those portions of the facilities which will be in contact with water delivered to users must be cleaned and flushed with potable water and disinfected according to AWWA Standards C651 through C654 before they are placed into service. Disinfection must be by chlorine unless another disinfectant can be demonstrated to be equally effective.

(b) For construction of new distribution pipelines (with any associated service connections and other appurtenances installed at the time of construction), disinfection by chlorination must be conducted as specified in paragraphs (A) through (C) of this subsection unless another method from AWWA Standard C651 is used.

(A) A solution with a free chlorine residual of at least 25 mg/l must be introduced to the pipe such that the solution will contact all surfaces and trapped air will be eliminated. The solution must remain in place for at least 24 hours.

(B) After 24 hours, if the free chlorine residual is 10 mg/l or greater, the chlorine solution must be drained and the pipe flushed with potable water. If the free chlorine residual is less than 10 mg/l after 24-hours, the pipe must be flushed and rechlorinated until a free chlorine residual of 10 mg/l or more is present after a 24 hour period.

(C) After the pipe is disinfected, flushed and filled with potable water, bacteriological samples must be collected to determine the procedures' effectiveness. At least two samples must be collected from the new pipe at least 16 hours apart and analyzed for coliform bacteria. If the pipe has held potable water for at least 16 hours before sample collection, two samples may be collected at least 15 minutes apart while the sample tap is left running. If the results of both analyses indicate the water is free of coliform bacteria, the pipe may be put into service. If either sample indicates the presence of coliform bacteria, the pipe may be re-flushed, filled with potable water and re-sampled. If this second set of samples is free of coliform bacteria, the pipe may be put into service, otherwise the disinfection and flushing process must be repeated until samples are free of coliform.

(c) For repaired pipelines that were depressurized and wholly or partly dewatered during repair or that likely experienced contamination during repair, disinfection according to the procedure specified in paragraphs (10)(b)(A) through (C) of this rule must be followed except that bacteriological samples must be collected downstream of the repair site. If the direction of flow is unknown, samples must be collected on each side of the repair site.

(d) A water line may be returned to service, following repairs or routine maintenance, prior to receiving a report on the bacteriological analysis if the following procedures have been completed:
- (A) Customer meters were shut off prior to placing the water line out of service;
- (B) The area below the water line to be repaired was excavated and dewatered;
- (C) The exposed pipe was treated with a hypochlorite solution;
- (D) The water line was flushed thoroughly, and a concentration of residual chlorine has been re-established that is comparable to the level normally maintained by the water system, if applicable; and
- (E) Bacteriological analysis was conducted to verify repair effectiveness according to this section and samples were collected downstream of the repair site or on each side of the repair site if the direction of flow is unknown.

(e) For reservoirs and tanks, disinfection by chlorination shall be accomplished according to AWWA Standard C652 which includes, but is not limited to, the following methods:
- (A) Filling the reservoir or tank and maintaining a free chlorine residual of not less than 10 mg/l for the appropriate 6 or 24 hour retention period; or

(B) Filling the reservoir or tank with a 50 mg/l chlorine solution and leaving for six hours; or

(C) Directly applying by spraying or brushing a 200 mg/l solution to all surfaces of the storage facility in contact with water if the facility were full to the overflow elevation.

(f) When the procedures described in paragraphs (10)(e)(A) and (B) of this rule are followed, the reservoir or tank shall be drained after the prescribed contact period and refilled with potable water, and a sample taken for microbiological analysis. If the results of the analysis indicate that the water is free of coliform organisms, the facility may be put into service. If not, the procedure shall be repeated until a sample free of coliform organisms is obtained;

(g) When the procedure described in paragraph (10)(e)(C) of this rule is followed, the reservoir or tank shall be filled with potable water and a sample taken for microbiological analysis. It will not be necessary to flush the reservoir or tank after the chlorine solution is applied by spraying or brushing. Microbiological analysis shall indicate that the water is free of coliform organisms before the facility can be put into service;

(h) When a reservoir is chlorinated following routine maintenance, inspection, or repair, it may be put back into service prior to receiving the report on the microbiological analysis provided the water leaving the reservoir has a free chlorine residual of at least 0.4 mg/l or a combined chlorine residual of at least 2.0 mg/l.

(i) Underwater divers used for routine maintenance, inspection, or repair of reservoirs shall use a full body dry suit with hardhat scuba and an external air supply. The diver shall be disinfected by spraying a 200 mg/l solution of chlorine on all surfaces that will come into contact with drinking water.