# HAWKS PRAIRIE RESERVOIR REHABILITATION

LACEY CONTRACT NUMBER PW 2021-19
FEMA HAZARD MITIGATION GRANT NO. 4584-04

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**SPECIFICATIONS AND BID DOCUMENTS**
**DEPARTMENT OF PUBLIC WORKS**

**LACEY PROJECT NUMBER PW 2021-19**

***CITY OF LACEY***
**WASHINGTON**

***CITY OFFICIALS***

| | |
|---|---|
| **MAYOR** | **ANDY RYDER** |
| **DEPUTY MAYOR** | **MALCOLM MILLER** |
| **COUNCIL MEMBERS** | **LENNY GREENSTEIN** |
| | **CAROLYN COX** |
| | **NICOLAS DUNNING** |
| | **MAREN TURNER** |
| | **RYAN SIU** |
| **CITY MANAGER** | **RICK WALK** |
| **CITY ATTORNEY** | **DAVID S. SCHNEIDER** |
| **DIRECTOR OF PUBLIC WORKS** | **SCOTT EGGER, P.E.** |
| **CITY ENGINEER** | **AUBREY COLLIER, P.E., S.E.** |

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# LACEY CONTRACT NUMBER PW 2021-19

# CITY OF LACEY

---

I hereby certify that the Project Specifications were prepared by me or under my direct supervision and I am duly registered Engineer under the laws of the state of Washington.




3/5/26

Ryan Jewell, P.E.
City of Lacey
Section A-D, F-L, O-R

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# TABLE OF CONTENTS


Advertisement for Bids ..... i

**INSTRUCTIONS**

Instructions to Bidders ..... A-1
Bidder's Checklist ..... A-2

**BID DOCUMENTS**

Proposal & Bid Sheet ..... B-1
Bid Deposit Selection ..... B-5
Bid Bond Form ..... B-6
Non-Collusion Certificate ..... B-7
Certification of Compliance with Wage Payment Statutes ..... B-8
Certification of Employment Security Department (ESD) Good Standing ..... B-9
Subcontractor List ..... B-10
Debarment Certification Form ..... B-11

**CONTRACT DOCUMENTS**

Construction Contract ..... C-1
Performance Bond Form ..... C-4
Declaration of Option for Management of Statutory Retained Percentage ..... C-5

**SPECIAL PROVISIONS**

Table of Contents ..... ii
Special Provisions ..... D-1

**TECHNICAL SPECIFICATIONS**

Table of Contents ..... E-i

**PREVAILING MINIMUM HOURLY RATES**

State Wage Rates ..... F-1


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## APPENDICES


COL RAM Forms and Instructions ..... G-1

Pre-Startup & Startup Checklists ..... H-1

Apprentice Utilization Plan ..... I-1

City-procured Permit(s) ..... J-1

SWPPP ..... K-1

SEPA Exemption ..... L-1

Arborist Report ..... M-1

Structural Conditional Assessment ..... N-1

FEMA Funding Agreement ..... O-1

Acknowledgement of Responsibilities For Professionals Doing Tree Removal ..... P-1

Record Drawings ..... Q-1

Disclosure of Lobbying Activities ..... R-1


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# ADVERTISEMENT FOR BIDS

## Hawks Prairie Reservoir Rehabilitation

NOTICE IS HEREBY GIVEN that sealed bids will be received by the City of Lacey at City Hall, Lacey, Washington until 2:30 p.m., April 21, 2026, at which time bids will be publicly opened in person and via a live video stream. Links to the YouTube live video stream can be found at https://CityofLacey.org/rfp-rfq/ under the specific project section and on the specific project page on the Builders Exchange website for the following work:

**This contract provides for construction of structural, electrical, mechanical and civil improvements to the 4.0 MG Hawks Prairie Reservoir including rafter and roof repairs, replacing reservoir appurtenances, updating cathodic protection system, electrical upgrades, full interior and exterior coatings and containment, new foundation and anchor chairs, new vaults and connections, water line installation, fire hydrant, new asphalt pavement, retaining wall, concrete pad and additional site improvements as identified in the construction plans and these specifications.**

Each bid must be accompanied by a certified check for five percent of the amount of the proposal made payable to the City Treasurer, or an approved bid bond for five percent of the amount of the proposal executed on the approved form attached to these specifications. If bid bond is used, the five percent may be shown in dollars and cents or the form may be filled in by inserting therein, in lieu thereof, "five percent of the amount of the accompanying proposal". Check of unsuccessful bidders will be returned immediately upon award of contract.

The City Council reserves the right to reject any and all bids and to waive all informalities.

Plans, Specifications, and Addenda for this project are available through the "City of Lacey" on-line plan room. Free of charge access is provided by going to http://bxwa.com and clicking on: "Posted Projects", "Public Works", "City of Lacey", and "Projects Bidding". Bidders are asked to "Register" in order to receive automatic email notification of future addenda and to be placed on the "Bidders List". Any questions regarding this contract can be directed to:

Ryan Jewell, P.E.
Ryan.Jewell@CityofLacey.org

The range for this project is $6,800,000 to $7,300,000.

A NON-MANDATORY PREBID CONFERENCE IS SCHEDULED FOR APRIL 9, 2026 AT 10:00AM. We will meet at the Hawks Prairie Reservoir located at 4040 Marvin Road Northeast.

Publish: **04/01/2026**
**04/08/2026**

City Clerk
City of Lacey, Washington

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# A

# INSTRUCTIONS

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## INSTRUCTIONS TO BIDDERS

Bidders shall examine contract and bid documents and the site and shall satisfy themselves as to conditions that exist.

Each Bidder shall submit to the City Clerk, Lacey, Washington a sealed bid endorsed upon the outside wrapper with **Hawks Prairie Reservoir Rehabilitation** at the time and place designated in the advertisement.

Bids may be delivered in person to Lacey City Hall, 420 College Street SE, or by mail to City of Lacey 420 College St SE Lacey, WA 98503.

Bids will be publicly opened via a live video stream. Links to the YouTube live video stream can be found at https://cityoflacey.org/rfp-rfq/ or under the specific project section and on the specific project page on the Builders Exchange website.

The City of Lacey is committed to offering reasonable accommodations to persons with disabilities. We invite any person with special needs to contact the City Clerk at (360) 491-3212 at least seventy-two (72) hours before the meeting to discuss any special accommodations that may be necessary. Citizens with hearing impairment may call the TDD line at (800) 833-6388.

Each Bidder shall complete the proposal with prices in figures with the extension properly computed. The proposal must be properly signed by a duly authorized agent. Proposal must acknowledge addenda, if any, received.

If alternates are included in the proposal the Bidder shall complete the alternates. The City will award the contract to the lowest responsible Bidder as determined by the Special Provisions. The City reserves the right to delete alternates after award.

A Bidder will be deemed not responsible if the Bidder does not meet the mandatory bidder responsibility criteria in RCW 39.04.350(1).

The City does not pre-qualify Bidders. However, if the apparent low Bidder has not already been determined qualified, the City shall afford seven (7) days after notification for the low Bidder to provide evidence for evaluation, as to capability to perform the work. The evaluation will include consideration of experience, personnel, equipment, financial resources as well as performance record. The information must be sufficient to enable the Bidder to obtain the required qualification rating prior to the award of the contract.

No bidder may withdraw his bid after the hour set for the opening of bids or before award of the contract unless said award is delayed for a period of forty-five (45) days.

### CONTRACT PARTS

The contract to be executed as a result of this bid consists of multiple parts, all of which pertain as if fully attached hereto and Bidder shall consider all parts as a complete document. In the event of discrepancies between the various parts, precedent shall be in the following order:

1. Contract Form,
2. Addenda (if any),
3. Proposal Form,
4. Special Provisions,
5. Technical Specifications,
6. Contract Plans,
7. WSDOT Standard Specifications for Road, Bridge, and Municipal Construction,
8. City of Lacey Development Guidelines and Public Works Standards, and
9. WSDOT Standard Plans for Road, Bridge and Municipal Construction

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**BIDDER'S CHECKLIST**

**The bidder's attention is especially called to the following forms which must be executed in full as required, and submitted with the bid proposal:**

Proposal: The unit prices bid must be shown in the space provided.

Proposal Signature Sheet: To be filled in and signed by the bidder. All addenda must be acknowledged.

Bid Deposit: Any bid shall be accompanied by a deposit of cash, certified check, cashier's check, or surety bond, in an amount equal to at least five percent (5%) of the total amount bid. Checks shall be payable to the City Clerk, City of Lacey, Washington.

If a surety bond is used, it shall be submitted on the provided form and signed by the bidder and their surety company. The surety's "attorney-in-fact" must be registered with the Washington State Insurance Commissioner. The power of attorney must also be submitted with the bond. Photocopies will not be accepted. See Specification section 1-02.7 for more information.

Non-Collusion and Debarment Affidavit

Debarment, Suspension, Ineligibility or Voluntary Exclusion Certification Form

☐ Subcontractors List for HVAC, plumbing, and electrical

**The following form must be submitted within 24 hours (excluding weekends and holidays) following the bid submittal deadline via email to ProjectAdmin@cityoflacey.org**

☐ Certification of Compliance with Wage Payment Statutes

**The following must be submitted within 48 hours (excluding weekends and holidays) following the bid submittal deadline via email to ProjectAdmin@cityoflacey.org**

☐ Subcontractors List for structural steel and rebar installation
☐ Supplemental Criteria per Specification section 1-02.14

**The following must be completed before the contract can be awarded:**

☐ L&I training on the requirements related to public works and prevailing wages per RCW 39.04.350

☐ Certification of Employment Security Department (ESD) good standing

**The following forms are to be executed after the contract is awarded:**

- Contract: This agreement to be executed by the successful bidder
- Performance and Payment Bond
- Insurance Certificate
- Apprentice Utilization Plan
- Disclosure of Lobbying Activities

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# B
# BID DOCUMENTS

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# CITY OF LACEY

Hawks Prairie Reservoir Rehabilitation

Lacey Contract Number: PW 2021-19

Federal Aid Project Number: D25-005

WSDOT Contract Number:

TIB Contract Number:

# Contract Proposal

DATE: _____

The undersigned, as bidder, has examined the bid documents as prepared by the Public Works Department, City of Lacey.

The undersigned, as bidder, proposes to furnish all material and perform all labor in accordance with the bid documents at the following prices.

Bidder must fill in unit prices in figures for each item and total.

Bidder shall sign this proposal form and submit all required paperwork with the bid.

## A Base Bid - Non-FEMA

| No. | Quantity | Unit | Item ID | Item Description | Unit Price | Extended Price |
|---|---|---|---|---|---|---|
| A1 | 200000 | MC | 104-010 | Minor Change | $1.00 | $200,000.00 |
| A2 | 1 | LS | 105-010 | Record Drawing | $5,000.00 | $5,000.00 |
| A3 | 1 | LS | 107-010 | SPCC Plan | LUMP SUM | |
| A4 | 1 | LS | 201-010 | Clearing and Grubbing | LUMP SUM | |
| A5 | 100 | CY | 203-130 | Embankment Compaction | | |
| A6 | 5000 | TN | 203-500 | Gravel Borrow | | |
| A7 | 1 | LS | 205-510 | Trench Safety System | LUMP SUM | |
| A8 | 1 | MGAL | 208-510 | Dust Control | | |
| A9 | 10 | CY | 209-080 | Controlled Density Fill | | |
| A10 | 30000 | FA | 214-506 | Dewatering | $1.00 | $30,000.00 |
| A11 | 580 | TN | 404-010 | Crushed Surfacing Base Course | | |
| A12 | 340 | TN | 404-020 | Crushed Surfacing Top Course | | |
| A13 | 310 | TN | 504-011 | HMA Cl. 1/2" PG 58H-22 | | |
| A14 | 1 | LS | 504-610 | Preparation of Existing Surfaces | LUMP SUM | |
| A15 | 23 | LF | 704-503 | 4 Inch Diameter Storm Sewer Pipe | | |
| A16 | 109 | LF | 704-505 | 6 Inch Diameter Storm Sewer Pipe | | |
| A17 | 478 | LF | 704-506 | 6 Inch Diameter Perforated Storm Sewer Pipe | | |
| A18 | 25 | LF | 704-512 | 12 Inch Diameter Storm Sewer Pipe | | |
| A19 | 75 | LF | 704-518 | 18 Inch Diameter Storm Sewer Pipe | | |
| A20 | 4 | EA | 704-951 | Connect to Existing Manhole | | |
| A21 | 1 | EA | 705-215 | Catch Basin Type 1L | | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | | | | |
|---|---|---|---|---|---|---|
| A22 | 2 | EA | 705-248 | Catch Basin Type 2 - 48 In. Diam. | | |
| A23 | 4 | EA | 705-920 | Raise Manhole to Grade | | |
| A24 | 210 | TN | 708-610 | Bank Run Gravel for Trench Backfill | | |
| A25 | 200 | TN | 708-620 | Imported Pipe Bedding | | |
| A26 | 12 | HR | 708-810 | Utility Potholing | | |
| A27 | 19 | LF | 709-507 | 6 Inch D.I. Water Main | | |
| A28 | 23 | LF | 709-512 | 12 Inch D.I. Water Main | | |
| A29 | 123 | LF | 709-516 | 16 Inch D.I. Water Main | | |
| A30 | 5 | EA | 709-950 | Connect to Existing Water Main | | |
| A31 | 1 | EA | 712-506 | 6 Inch Gate Valve | | |
| A32 | 2 | EA | 712-512 | 12 Inch Gate Valve | | |
| A33 | 4 | EA | 712-517 | 16 Inch Gate Valve | | |
| A34 | 3 | EA | 712-915 | Raise Valve Box to Grade | | |
| A35 | 1 | EA | 714-510 | Hydrant Assembly | | |
| A36 | 1 | LS | 801-010 | ESC Lead | LUMP SUM | |
| A37 | 1 | AC | 801-550 | Seeding, Fertilizing, and Mulching | | |
| A38 | 1 | LS | 801-680 | Erosion/Water Pollution Control | LUMP SUM | |
| A39 | 1 | LS | 802-980 | Landscaping | LUMP SUM | |
| A40 | 35 | LF | 804-010 | Cement Conc. Traffic Curb and Gutter | | |
| A41 | 50 | LF | 812-515 | Chain Link Fence Type 3 with Barbed Wire | | |
| A42 | 64 | SY | 814-511 | Cement Concrete | | |
| A43 | 220 | SF | 832-510 | Gravity Block Wall | | |
| A44 | 50 | LF | 834-510 | Temporary Chain Link Fence | | |
| A45 | 2 | EA | 850-530 | Bollard Type I | | |
| A46 | 1 | LS | 850-792 | Project Closeout | $20,000.00 | $20,000.00 |
| A47 | 1 | LS | 850-862 | Cathodic Protection | LUMP SUM | |

Schedule A Subtotal:

Tax Rate (%) : 9.70 Tax:

Schedule A Total:

## B Base Bid - FEMA

| No. | Quantity | Unit | Item ID | Item Description | Unit Price | Extended Price |
|---|---|---|---|---|---|---|
| B1 | 1 | CALC | 107-020 | Apprenticeship Incentive | $5,000.00 | $5,000.00 |
| B2 | 1 | CALC | 107-025 | Apprenticeship Penalty | ($5,000.00) | ($5,000.00) |
| B3 | 1 | LS | 109-010 | Mobilization | LUMP SUM | |
| B4 | 1 | LS | 202-510 | Removal of Structures and Obstructions | LUMP SUM | |
| B5 | 200 | CY | 203-120 | Unsuitable Foundation Excavation Incl. Haul | | |
| B6 | 2500 | CY | 203-610 | Excavation Incl. Haul | | |
| B7 | 1 | LS | 850-725 | Electrical | LUMP SUM | |
| B8 | 1 | LS | 850-735 | Startup | $20,000.00 | $20,000.00 |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | | | | |
|---|---|---|---|---|---|---|
| B9 | 1 | LS | 850-850 | Reservoir Foundation | LUMP SUM | |
| B10 | 1 | FA | 850-852 | Reservoir Column Repair | $150,000.00 | $150,000.00 |
| B11 | 1 | LS | 850-860 | Reservoir Mechanical | LUMP SUM | |
| B12 | 1 | LS | 850-875 | Reservoir Disinfection | LUMP SUM | |
| B13 | 1 | LS | 850-885 | Reservoir Structure | LUMP SUM | |
| B14 | 1 | LS | 850-890 | Reservoir Appurtenances | LUMP SUM | |

Schedule B Subtotal:

Tax Rate (%) : 9.70 Tax:

Schedule B Total:

## C Alternate #1 - Non-FEMA

| No. | Quantity | Unit | Item ID | Item Description | Unit Price | Extended Price |
|---|---|---|---|---|---|---|
| C1 | 1 | LS | 850-867 | Reservoir Finishes Replacement (Exterior) | LUMP SUM | |
| C2 | 1 | LS | 850-872 | Reservoir Finishes Replacement (Interior) | LUMP SUM | |

Schedule C Subtotal:

Tax Rate (%) : 9.70 Tax:

Schedule C Total:

## D Alternate #2 - FEMA

| No. | Quantity | Unit | Item ID | Item Description | Unit Price | Extended Price |
|---|---|---|---|---|---|---|
| D1 | 1 | LS | 850-868 | Reservoir Finishes Repair (Exterior) | LUMP SUM | |
| D2 | 1 | LS | 850-873 | Reservoir Finishes Repair (Interior) | LUMP SUM | |

Schedule D Subtotal:

Tax Rate (%) : 9.70 Tax:

Schedule D Total:

Contract Total:
(All Schedules)



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The undersigned also agrees as follows:

- Within 10 calendar days after the contract is awarded to sign and return the contract and provide insurance documents.
- That this proposal cannot be withdrawn within 45 days after receipt of bids.
- That it is the understanding that the City of Lacey may accept or reject any or all bids.
- The undersigned hereby agrees to pay for labor not less than the prevailing rates of wages per the bid documents.
- Enclosed with this proposal is a bid deposit in the sum of 5% of the bid total amount which it is agreed shall be collected and retained by the City of Lacey as liquidated damages in the event this proposal is accepted by the City of Lacey with 45 calendar days after the receipt of bids and the undersigned fails to execute the contract and the required bond with the City of Lacey, under the conditions thereof, within 10 calendar days after the undersigned is notified that said proposal has been accepted, otherwise said bid deposit shall be returned to the undersigned upon demand.
- A Performance/Payment Bond will be furnished to the City with the contract.
- Retention will be held on this contract per RCW 60.28.011.

Addenda Receipt Acknowledged

_____,_____,_____

_____ _____

Signature of Bidder Date

(If an Individual, Partnership, or Non-Incorporated organization)

_____ _____

Firm Name Please Print Phone

Address of Bidder: _____

_____

Name and Address of Firm Members:

_____

_____

_____

_____

Signature of Bidder (if a Corporation)

Title: _____

Firm Name: _____ Phone: _____

Business Address: _____

Incorporated under the Laws of the State of _____

Officers Address

President: _____ _____

Secretary: _____ _____

Treasurer: _____ _____



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## BID DEPOSIT SELECTION

A bid deposit in an amount of five percent (5%) of the total bid amount is attached hereto:

| | | |
|---|---|---|
| CASH | ☐ | In the amount of _____ |
| CASHIER'S CHECK | ☐ | In the amount of _____ |
| CERTIFIED CHECK | ☐ | In the amount of _____ |
| BID BOND | ☐ | In the amount of 5% of the total bid amount |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**CONTRACTOR'S BID DEPOSIT SURETY BOND**
**to City of Lacey, Washington**

We,_____ , as Principal, existing under and by virtue of the laws of the State of Washington and authorized to do business in the State of Washington, and _____, as Surety, organized and existing under the laws of the State of _____ , are held and firmly bound unto the City of Lacey, a Washington municipality, as Obligee, in the penal sum of 5% of the total amount bid, not to exceed $_____ , for the payment of which we jointly and severally bind ourselves, and our legal representatives and successors.

WHEREAS, the Principal has submitted a bid for Hawks Prairie Reservoir Rehabilitation.

NOW THEREFORE, the condition of the obligation is such that if the Obligee shall accept the bid of Principal and make timely award to the Principal according to the terms of the bid documents; and the Principal shall, within ten days after notice of the award, exclusive of the day of notice, enter into the contract with the Obligee and furnish the contractor's bonds (performance and payment bonds) with Surety satisfactory to the Obligee in an amount equal to 100% of the amount of the bid proposed including additives, alternatives and Washington State sales tax, then this obligation shall be null and void; otherwise if the Principal fails to enter into the contract and fails to furnish the contractor's bonds within ten days of notice of award, exclusive of the day of notice, the amount of the bid deposit shall be forfeited to the Obligee, payable by the Surety; but in no event will the Surety's liability exceed the face amount of this bid bond.

This bond may be executed in two original counterparts, and shall be signed by the parties' duly authorized officers. This bond will only be accepted if it is accompanied by a fully executed and original power of attorney for the officer executing on behalf of the surety.

| PRINCIPAL (CONTRACTOR) | | SURETY | |
|---|---|---|---|
| _____ | | _____ | |
| Principal Signature | Date | Surety Signature | Date |
| _____ | | _____ | |
| Printed Name | | Printed Name | |
| _____ | | _____ | |
| Title | | Title | |

Name, address, and telephone of local office/agent of Surety Company is:

_____

_____



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## NON-COLLUSION AND DEBARMENT AFFIDAVIT

I, the undersigned, being duly sworn, deposes and says that the person, firm, association, copartnership or corporation herein named, has not either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in the preparation and submission of a proposal of the City of Lacey for consideration in the award of a contract on the improvement described as follows.

I further certify that, except as noted below, the firm, association or corporation or any person in a controlling capacity associated therewith or any position involving the administration of State or federal funds; is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal or State agency; has not been suspended, debarred, voluntarily excluded or determined ineligible by any federal or State agency within the past three years; does not have a proposed debarment pending; and has not been indicted, convicted, or had a civil judgment rendered against said person, firm, association or corporation by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three years.

I further acknowledge that by signing my signature, I am deemed to have signed and have agreed to the provisions of this affidavit.

_____

Name of Project

_____

Name of Firm

_____

Signature of Authorized Member



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## CERTIFICATION OF COMPLIANCE WITH WAGE PAYMENT STATUTES

The bidder hereby certifies that, within the three-year period immediately preceding the bid solicitation date, the bidder is not a "willful" violator, as defined in RCW 49.48.082, of any provision of chapters 49.46, 49.48, or 49.52 RCW, as determined by a final and binding citation and notice of assessment issued by the Department of Labor and Industries or through a civil judgment entered by a court of limited or general jurisdiction.

I certify under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct.

_____
Bidder's Business Name

_____
Signature of Authorized Official*

_____
Printed Name

_____
Title

_____ _____ _____
Date City State

*Check One:*

Sole Proprietorship ☐ Partnership ☐ Joint Venture ☐ Corporation ☐

State of Incorporation, or if not a corporation, State where business entity was formed:

_____

If a co-partnership, give firm name under which business is transacted:

_____

** If a corporation, proposal must be executed in the corporate name by the president or vice-president (or any other corporate officer accompanied by evidence of authority to sign). If a co-partnership, proposal must be executed by a partner.*

This form must be submitted with the Bid Proposal or as a Supplement to the Bid no later than 24 hours after the time for delivery of the Bid Proposal, as provided for in Section 1-02.9 of the Contract Provisions.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## CERTIFICATION OF EMPLOYMENT SECURITY DEPARTMENT (ESD) GOOD STANDING AND NUMBER

The bidder hereby provides an ESD number and certifies that per RCW 39.04.350 and Title 50 RCW, in which the City will verify prior to entering into contract with the Contractor, that the Bidder has a valid ESD number and is deemed to be in good standing with Washington State's Employment Security Department.

I certify under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct.

_____
Bidder's Business Name

_____
Employment Security Department (ESD) Number

_____
WA State Unified Business Identifier (UBI #)

_____
Signature of Authorized Official*

_____
Printed Name

_____
Title

| _____ | _____ | _____ |
|---|---|---|
| Date | City | State |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# SUBCONTRACTOR LIST

Project Name: Hawks Prairie Reservoir Rehabilitation

Subcontractor(s) with whom the bidder will directly subcontract that are proposed to perform the work of structural steel installation, rebar installation, heating, ventilation and air conditioning, and plumbing, as described in Chapter 18.106 RCW, and electrical as described in Chapter 19.28 RCW **must** be listed below. Failure to list subcontractors who will contract directly with the prime contract bidder, naming more than one subcontractor to perform the same work, include proof of licensure when required, or submit by the deadline will result in your bid being non-responsive, and therefore, void.

**HVAC, plumbing, and electrical names and license number must be submitted at the published bid time. Structural steel and rebar names must be submitted within forty-eight (48) hours of the published bid time in accordance with Chapter 39.30 RCW.**

| | |
|---|---|
| Work to be Performed: PLUMBING | |
| ☐ Subcontractor Name: | ☐ License Number: |
| OR ☐ Work performed by bidder | |
| OR ☐ N/A | |
| Work to be Performed: HEATING VENTILATION AND AIR CONDITIONING (HVAC) | |
| ☐ Subcontractor Name: | ☐ License Number: |
| OR ☐ Work performed by bidder | |
| OR ☐ N/A | |
| Work to be Performed: *ELECTRICAL | |
| ☐ Subcontractor Name: | ☐ License Number: |
| OR ☐ Work performed by bidder | |
| OR ☐ N/A | |
| Work to be Performed: STRUCTURAL STEEL INSTALLATION | |
| ☐ Subcontractor Name: | |
| OR ☐ N/A or Work performed by bidder | |
| Work to be Performed: REBAR INSTALLATION | |
| ☐ Subcontractor Name: | |
| OR ☐ N/A or Work performed by bidder | |

* Bidders are notified that is the opinion of the enforcement agency that PVC or metal conduit, junction boxes, etc., are considered electrical equipment and therefore considered part of electrical work, even if the installation is for future use and no wiring or electrical current is connected during the project.

Supplemental information, including corrections to licensing information, shall be submitted to projectadmin@cityoflacey.org within 48 hours of the published bid time.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Debarment, Suspension, Ineligibility or Voluntary Exclusion Certification Form

| NAME | | Doing business as (DBA) | |
|---|---|---|---|
| ADDRESS | **Applicable Procurement or Solicitation #, if any:** | WA Uniform Business Identifier (UBI) | Federal Employer Tax Identification #: |
| **This certification is submitted as part of a request to contract.** | | | |

## Instructions For Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions

**READ CAREFULLY BEFORE SIGNING THE CERTIFICATION. Federal regulations require contractors and bidders to sign and abide by the terms of this certification, without modification, in order to participate in certain transactions directly or indirectly involving federal funds.**

1. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the department, institution or office to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or had become erroneous by reason of changed circumstances.
4. The terms covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded, as used in this clause, have the meaning set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is proposed for debarment under the applicable CFR, debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
6. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled ``Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction,'' without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not proposed for debarment under applicable CFR, debarred, suspended, ineligible, or voluntarily excluded from covered transactions, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the List of Parties Excluded from Federal Procurement and Non-procurement Programs.
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business activity.
9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is proposed for debarment under applicable CFR, suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

## Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions

**The prospective lower tier participant certifies, by submission of this proposal or contract, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this form.**

Bidder or Contractor Signature: _____ Date: _____

Print Name and Title: _____



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# FEDERAL DEBARMENT, SUSPENSION INELIGIBILITY and VOLUNTARY EXCLUSION

## (FREQUENTLY ASKED QUESTIONS)

**What is "Debarment, Suspension, Ineligibility, and Voluntary Exclusion"?**
These terms refer to the status of a person or company that cannot contract with or receive grants from a federal agency.

In order to be debarred, suspended, ineligible, or voluntarily excluded, you must have:

- had a contract or grant with a federal agency, and
- gone through some process where the federal agency notified or attempted to notify you that you could not contract with the federal agency.
- Generally, this process occurs where you, the contractor, are not qualified or are not adequately performing under a contract, or have violated a regulation or law pertaining to the contract.

**Why am I required to sign this certification?**
You are requesting a contract or grant with the Washington Military Department. Federal law (Executive Order 12549) requires Washington Military Department ensure that persons or companies that contract with Washington Military Department are not prohibited from having federal contracts.

**What is Executive Order 12549?**
Executive Order 12549 refers to Federal Executive Order Number 12549. The executive order was signed by the President and directed federal agencies to ensure that federal agencies, and any state or other agency receiving federal funds were not contracting or awarding grants to persons, organizations, or companies who have been excluded from participating in federal contracts or grants. Federal agencies have codified this requirement in their individual agency Code of Federal Regulations (CFRs).

**What is the purpose of this certification?**
The purpose of the certification is for you to tell Washington Military Department in writing that you have not been prohibited by federal agencies from entering into a federal contract.

**What does the word "proposal" mean when referred to in this certification?**
Proposal means a solicited or unsolicited bid, application, request, invitation to consider or similar communication from you to Washington Military Department.

**What or who is a "lower tier participant"?**
Lower tier participants means a person or organization that submits a proposal, enters into contracts with, or receives a grant from Washington Military Department, OR any subcontractor of a contract with Washington Military Department. If you hire subcontractors, you should require them to sign a certification and keep it with your subcontract.

**What is a covered transaction when referred to in this certification?**
Covered Transaction means a contract, oral or written agreement, grant, or any other arrangement where you contract with or receive money from Washington Military Department. Covered Transaction does not include mandatory entitlements and individual benefits.

## Sample Debarment, Suspension, Ineligibility, Voluntary Exclusion Contract Provision

**Debarment Certification.** The Contractor certifies that the Contractor is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in this Contract by any Federal department or agency. If requested by Washington Military Department, the Contractor shall complete a Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion form. Any such form completed by the Contractor for this Contract shall be incorporated into this Contract by reference.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# C

# CONTRACT DOCUMENTS

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Project Number PW 2021-19

# CONSTRUCTION CONTRACT

THIS AGREEMENT, made and effective as of the date of the last signature below, between the City of Lacey, hereinafter called Owner, under and by virtue of the charter, laws and ordinances of the said Owner and the laws of the State of Washington, and

_____ hereinafter called Contractor,

WITNESSETH:

That in consideration of the payment, covenants and agreement hereinafter mentioned, attached and made a part of this Agreement, to be made and performed by the parties hereto, the parties covenant and agree as follows regarding:

City of Lacey Contract No. PW 2021-19 for the "Hawks Prairie Reservoir Rehabilitation" project in the sum of _____ Dollars ($_____) including applicable sales tax.

1. The Contractor shall do all work and furnish all tools, materials and equipment in accordance with and as described in the attached Plans and Specifications, and in full compliance with the terms, conditions and stipulations herein set forth and attached, now referred to and by such reference incorporated herein and made a part hereof as fully for all purposes as if here set forth at length, and shall perform any alterations in or in addition to the work covered by this Contract and every part thereof and any force account work which may be ordered as provided in this Contract and every part thereof.

   The Contractor shall provide and bear the expense of all materials, labor, equipment, tools, implements and conveniences and things of every description that may be requisite for the transfer of materials and for constructing and completing the work provided for in this Contract and every part thereof, except such as are mentioned in the Specifications to be furnished by the Owner.

2. The Owner hereby promises and agrees with the Contractor to employ, and does employ the Contractor to provide the materials and to do and cause to be done the above described work and to complete and finish the same according to the attached Plans and Specifications and the schedule of unit or itemized prices hereto attached, at the time and in the manner and upon the conditions provided for in this Contract and every part thereof.

3. Contractor, for himself and for his heirs, executors, administrators, successors, assigns, does hereby agree to the full performance of all the covenants herein contained upon the part of Contractor.

4. It is further provided that no liability shall attach to Owner or Agent thereof by reason of entering into this Contract, except as expressly provided herein.

5. Payments will be made under the Contract according to the schedule of rates and prices and the specification attached and made a part thereof. Partial payments under the Contract will be made at the request of the Contractor not more than once each month upon approval of the Owner, as hereinafter specified, provided they are in accordance with the provisions of RCW 60.28.010. There will be reserved and retained from monies



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

earned by the Contractor, as determined by such monthly estimates, a sum equal to 5 percent of the Contract price.

Payment of the retained percentage shall be withheld for a period of forty-five (45) days following the final acceptance of the work and materials by the Owner, and shall be paid the Contractor at the expiration of said forty-five (45) days in event no claims, as provided by law, have been filed against such funds; and provided further, that releases have been obtained from all departments and agencies having jurisdiction over the activities of the Contractor. In the event such claims are filed, Contractor shall be paid such retained percentages less an amount sufficient to pay any such claims together with a sum sufficient to pay the cost of such action, and to cover attorney fees as determined by the Owner.

6. Requests for review of substitute items of material or equipment will not be accepted by the Owner or Agent from anyone other than the Contractor. If the Contractor wishes to furnish a substitute item, the Contractor shall make written application to the Owner's Agent for acceptance thereof, certifying that the proposed substitute will perform adequately the functions called for by the general design, be similar and of equal substance to that specified and be suited to the same use and capable of performing the same function as that specified. All variations of the proposed substitute from that specified shall be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, which shall be considered by the Owner in evaluating the proposed substitute. The Owner may require the Contractor to furnish at the Contractor's expense, additional data about the proposed substitute. The Owner will be the sole judge of acceptability, and no substitute will be ordered without the Owner's prior written acceptance. The Owner may require the Contractor to furnish at the Contractor's expense, a special performance guarantee or other surety with respect to any other substitute.

   The Owner or Agent will record the time and expenses in evaluating substitutions proposed by the Contractor. Whether or not the Owner accepts a proposed substitute, the Contractor shall reimburse the Owner for the costs of evaluating any proposed substitute.

7. The Owner reserves the right, after the final payment has been made, to claim and recover by process of law such sums as may be sufficient to make good any defects in the equipment or to recover any over-payment resulting from dishonest acts of the Contractor.

8. The contract time will commence to run, and the Contractor shall start to perform his obligation under the contract documents, on the day indicated in the Notice to Proceed given by Owner to Contractor; but in no event shall contract time commence to run later than the 30th calendar day after the date when both Owner and Contractor execute the Contract. A Notice to Proceed may be given at any time within thirty (30) calendar days after the date when both Owner and Contractor execute the Contract.

9. The Contractor shall guarantee the materials and workmanship for a period of one (1) year from and after the date of final acceptance by the Owner.

   If, within said guarantee period, repairs are required which, in the opinion of the Owner, are rendered necessary as a result of work or materials which are inferior, defective or not in accordance with the terms of the Contract, the Contractor shall, promptly upon receipt of notice from the Owner, and without expense to the Owner, (a) correct all defects and place in satisfactory condition in every particular all of such guaranteed work and


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

materials; (b) make good all damage which in the opinion of the Owner is caused by such defects; and (c) make good any other work or material or the equipment and contents of a building, structure or site disturbed in fulfilling any such guarantee.

If the Contractor, after notice, fails within ten (10) days to proceed to comply to the terms of this guarantee, the Owner may have the defects corrected, and the Contractor and his Surety shall be liable for all expense incurred, provided, however, that in case of an emergency where, in the opinion of the Owner, delay would cause serious loss or damage, repairs may be made without notice being given to the Contractor and the Contractor shall pay the cost thereof.

IN WITNESS WHEREOF, the said Contractor has executed this instrument and the City Manager, pursuant to resolution duly adopted, has caused this instrument to be executed in the name of the City of Lacey the day and year first above-written.

_____

_____

_____

Contractor Date

_____

Contractor's Registration Number (UBI No.)

_____

City of Lacey Business License Number

_____

City Manager Date

ATTEST:
By:

_____

City Clerk

APPROVED AS TO FORM:
By :

_____

City Attorney



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## CONTRACTOR'S PERFORMANCE/PAYMENT BOND
## to City of Lacey, Washington

The City of Lacey, Washington, in Thurston County, has awarded to _____ (Contractor), as Principal, a contract for the construction of the project designated as the **Hawks Prairie Reservoir Rehabilitation Project #2021-19** in Lacey, Washington, and said Principal is required under the terms of the Contract to furnish a performance/payment bond in accordance with chapter 39.08 Revised Code of Washington (RCW).

The Principal, and _____(Surety), a corporation, organized under the laws of _____ and licensed to do business in the State of Washington as surety and named in the current list of "Surety Companies Acceptable in Federal Bonds" as published in the Federal Register by the Audit Staff Bureau of Accounts, U.S. Treasury Dept., are jointly and severally held and firmly bound to the City of Lacey, as Obligee, in the sum of $_____ total Contract amount (including Washington State sales tax), subject to the provisions herein.

The obligations of this bond shall become null and void, if and when the Principal, its heirs, executors, administrators, successors, or assigns shall well and faithfully perform all of the Principal's obligations under the Contract and fulfill all the terms and conditions of all duly authorized modifications, additions, and changes to said Contract that may hereafter be made, at the time and in the manner therein specified; shall pay all persons in accordance with chapters 39.08, 39.12, and 60.28 RCW, including all workers, laborers, mechanics, subcontractors, and material suppliers, and all persons who shall supply such contractor or subcontractor with provisions and supplies for the carrying on of such work; shall warranty the work as provided in the Contract and shall indemnify and hold harmless the Obligee from any defects in the workmanship and materials incorporated into the work for the period identified in the Contract; and if such obligations have not been fulfilled, this bond shall remain in full force and effect.

The Surety for value received agrees that no change, extension of time, alteration or addition to the terms of the Contract, the specifications accompanying the Contract, or to the work to be performed under the Contract shall in any way affect its obligation on this bond, and waives notice of any change, extension of time, alteration or addition to the terms of the Contract or the work performed. The Surety agrees that modifications and changes to the terms and conditions of the Contract that increase the total amount to be paid the Principal shall automatically increase the obligation of the Surety on this bond and notice to Surety is not required for such increased obligation.

This bond may be executed in two original counterparts and shall be signed by the parties' duly authorized officers. This bond will only be accepted if it is accompanied by a fully executed and original power of attorney for the officer executing on behalf of the surety.

| PRINCIPAL (CONTRACTOR) | | SURETY | |
|---|---|---|---|
| _____ | | _____ | |
| Principal Signature | Date | Surety Signature | Date |
| _____ | | _____ | |
| Printed Name | | Printed Name | |
| _____ | | _____ | |
| Title | | Title | |

Name, address, and telephone of local office/agent of Surety Company is:

_____

_____



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## DECLARATION OF OPTION FOR MANAGEMENT OF STATUTORY RETAINED PERCENTAGE

A. I hereby elect to have the retained percentage of this contract held in a fund by the City of Lacey until forty-five (45) days following final acceptance of the work.

_____
Contractor (please print)

_____ _____
Date Signature

B. I hereby elect to have the City of Lacey invest the retained percentage of this contract from time to time as such retained percentage accrues and in accordance with RCW Ch. 60.28.

I hereby designate _____ as the repository for the escrow of said funds.

I hereby further agree to be fully responsible for payment of all costs or fees incurred as a result of placing said percentage in escrow and investing it as authorized by statue.

The City of Lacey shall not be liable in any way for any costs or fees in connection therewith.

_____
Contractor (please print)

_____ _____
Date Signature

**C.** I hereby elect to hold a retainage bond.

_____
Contractor (please print)

_____ _____
Date Signature


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# D

# SPECIAL PROVISIONS

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**TABLE OF CONTENTS**

**SPECIAL PROVISIONS** ..... **1**

DESCRIPTION OF WORK ..... 2
1-01 DEFINITIONS AND TERMS ..... 2
1-02 BID PROCEDURES AND CONDITIONS ..... 4
1-03 AWARD AND EXECUTION OF CONTRACT ..... 11
1-04 SCOPE OF THE WORK ..... 12
1-05 CONTROL OF WORK ..... 14
1-06 CONTROL OF MATERIAL ..... 21
1-07 LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC ..... 23
1-08 PROSECUTION AND PROGRESS ..... 38
1-09 MEASUREMENT AND PAYMENT ..... 44
1-10 TEMPORARY TRAFFIC CONTROL ..... 47
2-01 CLEARING, GRUBBING, AND ROADSIDE CLEANUP ..... 47
2-02 REMOVAL OF STRUCTURES AND OBSTRUCTIONS ..... 48
2-03 ROADWAY EXCAVATION AND EMBANKMENT ..... 50
2-05 TRENCH SAFETY SYSTEM ..... 51
2-07 WATERING ..... 52
2-08 DUST CONTROL ..... 53
2-09 STRUCTURE EXCAVATION ..... 53
2-14 DEWATERING ..... 54
5-04 HOT MIX ASPHALT ..... 55
7-04 STORM SEWERS ..... 72
7-05 MANHOLES, INLETS, CATCH BASINS, AND DRYWELLS ..... 73
7-08 GENERAL PIPE INSTALLATION REQUIREMENTS ..... 75
7-09 WATER MAINS ..... 81
7-12 VALVES FOR WATER MAINS ..... 84
7-14 HYDRANTS ..... 86
7-15 SERVICE CONNECTIONS ..... 86
8-01 EROSION CONTROL AND WATER POLLUTION CONTROL ..... 89
8-02 ROADSIDE RESTORATION ..... 91
8-05 LAWN AND LANDSCAPE RESTORATION ..... 95
8-06 CEMENT CONCRETE DRIVEWAY ENTRANCES ..... 96
8-12 CHAIN LINK FENCE AND WIRE FENCE ..... 96
8-24 GRAVITY BLOCK WALL ..... 97
8-34 TEMPORARY CHAIN LINK FENCE ..... 99
8-40 ARC FLASH STUDY ..... 100
8-50 MISCELLANEOUS ..... 107
9-03 AGGREGATES ..... 108
9-14 EROSION CONTROL AND ROADSIDE PLANTING ..... 109

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# SPECIAL PROVISIONS

## INTRODUCTION TO THE SPECIAL PROVISIONS

**(January 4, 2024 APWA GSP, Option A)**

The work on this project shall be accomplished in accordance with the *Standard Specifications for Road, Bridge and Municipal Construction*, 2025 edition, as issued by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA), Washington State Chapter (hereafter "Standard Specifications"). The Standard Specifications, as modified or supplemented by these Special Provisions, all of which are made a part of the Contract Documents, shall govern all of the Work.

These Special Provisions are made up of both General Special Provisions (GSPs) from various sources, which may have project-specific fill-ins; and project-specific Special Provisions. Each Provision either supplements, modifies, or replaces the comparable Standard Specification, or is a new Provision. The deletion, amendment, alteration, or addition to any subsection or portion of the Standard Specifications is meant to pertain only to that particular portion of the section, and in no way should it be interpreted that the balance of the section does not apply.

The GSPs are labeled under the headers of each GSP, with the effective date of the GSP and its source. For example:

(March 8, 2013 APWA GSP)
(April 1, 2013)
(May 1, 2013 Lacey GSP)

Project specific special provisions are labeled without a date as such:
(*****)

Also incorporated into the Contract Documents by reference are:

- *Manual on Uniform Traffic Control Devices for Streets and Highways*, currently adopted edition, with Washington State modifications, if any
- *Standard Plans for Road, Bridge and Municipal Construction*, WSDOT Manual M21-01, current edition
- *City of Lacey Development Guidelines and Public Works Standards*, current edition

Contractor shall obtain copies of these publications, at Contractor's own expense.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# DESCRIPTION OF WORK

This contract provides for construction of structural, electrical, mechanical and civil improvements to the 4.0 MG Hawks Prairie Reservoir including rafter and roof repairs, replacing reservoir appurtenances, updating cathodic protection system, electrical upgrades, full interior and exterior coatings and containment, new foundation and anchor chairs, new vaults and connections, water line installation, fire hydrant, new asphalt pavement, retaining wall, concrete pad and additional site improvements as identified in the construction plans and specifications.

# 1-01 DEFINITIONS AND TERMS

## 1-01.3 Definitions

**(January 19, 2022 APWA GSP)**

Delete the heading Completion Dates and the three paragraphs that follow it, and replace them with the following:

Dates

Bid Opening Date
The date on which the Contracting Agency publicly opens and reads the Bids.

Award Date
The date of the formal decision of the Contracting Agency to accept the lowest responsible and responsive Bidder for the Work.

Contract Execution Date
The date the Contracting Agency officially binds the Agency to the Contract.

Notice to Proceed Date
The date stated in the Notice to Proceed on which the Contract time begins.

Substantial Completion Date
The day the Engineer determines the Contracting Agency has full and unrestricted use and benefit of the facilities, both from the operational and safety standpoint, any remaining traffic disruptions will be rare and brief, and only minor incidental work, replacement of temporary substitute facilities, plant establishment periods, or correction or repair remains for the Physical Completion of the total Contract.

Physical Completion Date
The day all of the Work is physically completed on the project. All documentation required by the Contract and required by law does not necessarily need to be furnished by the Contractor by this date.

Completion Date
The day all the Work specified in the Contract is completed and all the obligations of the Contractor under the contract are fulfilled by the Contractor. All documentation required by the Contract and required by law must be furnished by the Contractor before establishment of this date.

Final Acceptance Date
The date on which the Contracting Agency accepts the Work as complete.

Supplement this Section with the following:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

All references in the Standard Specifications or WSDOT General Special Provisions, to the terms "Department of Transportation", "Washington State Transportation Commission", "Commission", "Secretary of Transportation", "Secretary", "Headquarters", and "State Treasurer" shall be revised to read "Contracting Agency".

All references to the terms "State" or "state" shall be revised to read "Contracting Agency" unless the reference is to an administrative agency of the State of Washington, a State statute or regulation, or the context reasonably indicates otherwise.

All references to "State Materials Laboratory" shall be revised to read "Contracting Agency designated location".

All references to "final contract voucher certification" shall be interpreted to mean the Contracting Agency form(s) by which final payment is authorized, and final completion and acceptance granted.

Additive
A supplemental unit of work or group of bid items, identified separately in the Bid Proposal, which may, at the discretion of the Contracting Agency, be awarded in addition to the base bid.

Alternate
One of two or more units of work or groups of bid items, identified separately in the Bid Proposal, from which the Contracting Agency may make a choice between different methods or material of construction for performing the same work.

Business Day
A business day is any day from Monday through Friday except holidays as listed in Section 1-08.5.

Contract Bond
The definition in the Standard Specifications for "Contract Bond" applies to whatever bond form(s) are required by the Contract Documents, which may be a combination of a Payment Bond and a Performance Bond.

Contract Documents
See definition for "Contract".

Contract Time
The period of time established by the terms and conditions of the Contract within which the Work must be physically completed.

Notice of Award
The written notice from the Contracting Agency to the successful Bidder signifying the Contracting Agency's acceptance of the Bid Proposal.

Notice to Proceed
The written notice from the Contracting Agency or Engineer to the Contractor authorizing and directing the Contractor to proceed with the Work and establishing the date on which the Contract time begins.

Traffic
Both vehicular and non-vehicular traffic, such as pedestrians, bicyclists, wheelchairs, and equestrian traffic.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 1-02 BID PROCEDURES AND CONDITIONS

## 1-02.1 Prequalification of Bidders

Delete this Section and replace it with the following:

## 1-02.1 Qualifications of Bidder

**(January 24, 2011 APWA GSP)**

Before award of a public works contract, a bidder must meet at least the minimum qualifications of RCW 39.04.350(1) to be considered a responsible bidder and qualified to be awarded a public works project.

## 1-02.1(1) Supplemental Qualifications Criteria

**(July 31, 2017 APWA GSP)**

In addition, the Contracting Agency has established Contracting Agency-specific and/or project-specific supplemental criteria, in accordance with RCW 39.04.350(3), for determining Bidder responsibility, including the basis for evaluation and the deadline for appealing a determination that a Bidder is not responsible. These criteria are contained in Section 1-02.14 Option C of these Special Provisions.

## 1-02.2 Plans and Specifications

**(April 1, 2024 Lacey GSP)**

Delete this section and replace it with the following:

Information as to where Bid Documents can be obtained or reviewed will be found in the Call for Bids (Advertisement for Bids) for the work.

After award of the contract, conformed plans and specifications will be issued to the Contractor at no cost in digital format and as detailed below:

| To Prime Contractor | No. of Sets | Basis of Distribution |
|---|---|---|
| Reduced plans (11" x 17") | 3 | Furnished only upon request |
| Contract Provisions | 1 | Furnished only upon request |
| Large plans (22" x 34") | 1 | Furnished only upon request |

Additional plans and Contract Provisions may be obtained by the Contractor from the source stated in the Call for Bids, at the Contractor's own expense.

## 1-02.4 Examination of Plans, Specifications and Site of Work

## 1-02.4(1) General

**(December 30, 2022 APWA GSP Option B)**

The first sentence of the ninth paragraph, beginning with "Prospective Bidder desiring…", is revised to read:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Prospective Bidder desiring an explanation or interpretation of the Bid Documents, shall request the explanation or interpretation in writing by close of business 5 business days preceding the bid opening to allow a written reply to reach all prospective Bidders before the submission of their Bids.

## 1-02.5 Proposal Forms
**(November 25, 2024 APWA GSP)**

Delete this section and replace it with the following:

The Proposal Form will identify the project and its location and describe the work. It will also list estimated quantities, units of measurement, the items of work, and the materials to be furnished at the unit bid prices. The bidder shall complete spaces on the proposal form that call for, but are not limited to, unit prices; extensions; summations; the total bid amount; signatures; date; and, where applicable, retail sales taxes and acknowledgment of addenda; the bidder's name, address, telephone number, and signature; the bidder's DBE commitment, if applicable; a State of Washington Contractor's Registration Number; and a Business License Number, if applicable. Bids shall be in legible figures (not words) written in ink or typed and expressed in U.S. dollars. The required certifications are included as part of the Proposal Form.

The Contracting Agency reserves the right to arrange the proposal forms with alternates and additives, if such be to the advantage of the Contracting Agency. The bidder shall bid on all alternates and additives set forth in the Proposal Form unless otherwise specified.

## 1-02.6 Preparation of Proposal
**(******)**

### Alternative Bids

The Bid Proposal for this contract requires the Bidder to submit a bid on all alternatives.

**Bid Proposal**

The Bid Proposal is composed of the following parts: Base Bid and Alternatives 1 and 2.

The Base Bid includes all items that do not change as to quantity, dimension, or type of construction, regardless of which alternative is selected.

The Alternative portion of the bid proposal contains all items which change as to quantity, dimension, or construction method, depending on which alternative is selected.

See the Technical Specifications for additional information and descriptions of bid items.

**Alternative 1**
Alternative 1 is based on the full recoating of the reservoir exterior and interior in accordance with the Technical Specifications and these Special provisions.

The bid items for Alternative 1 are as listed in the bid proposal.

**Alternative 2**
Alternative 2 is based on the coating repair of exterior and interior reservoir surfaces in accordance with the Technical Specifications and these Special provisions.

The bid items for Alternative 2 are as listed in the bid proposal.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Bidding Procedures**
The Bidder shall submit a price on each and every item of Work included on the proposal form. The Bidder shall submit their sealed Bid in accordance with 1-02.9.

The successful Bidder will be determined by the lowest total of Alternative 1 plus the Base Bid. Award will be based on the lowest total subject to the requirements of Section 1-03. The sum of Alternative 1 plus the Base Bid will fix the awarded contract price and the amount of the contract bond.

## 1-02.7 Bid Deposit
**(March 8, 2013 APWA GSP)**

Supplement this section with the following:

Bid bonds shall contain the following:

1. Contracting Agency-assigned number for the project;
2. Name of the project;
3. The Contracting Agency named as obligee;
4. The amount of the bid bond stated either as a dollar figure or as a percentage which represents five percent of the maximum bid amount that could be awarded;
5. Signature of the bidder's officer empowered to sign official statements. The signature of the person authorized to submit the bid should agree with the signature on the bond, and the title of the person must accompany the said signature;
6. The signature of the surety's officer empowered to sign the bond and the power of attorney.

If so stated in the Contract Provisions, bidder must use the bond form included in the Contract Provisions.

If so stated in the Contract Provisions, cash will not be accepted for a bid deposit.

## 1-02.9 Delivery of Proposal
**(April 1, 2024 Lacey GSP)**

Delete this section and replace it with the following:

Each Proposal shall be submitted in a sealed envelope, with the Project Name and Project Number as stated in the Call for Bids clearly marked on the outside of the envelope, or as otherwise required in the Bid Documents, to ensure proper handling and delivery. The proposal shall be submitted to the City of Lacey at 420 College Street SE, Lacey WA 98503 at the date and time shown in the advertisement.

If supplemental information is due after the Bid Proposal is due, the document(s) shall be submitted as follows:

1. In a sealed envelope labeled the same as for the Proposal, with "Supplemental Information" added, or
2. By e-mail to the following e-mail address: ProjectAdmin@cityoflacey.org

All other information required to be submitted with the Bid Proposal must be submitted with the Bid Proposal itself, at the time stated in the Call for Bids.

Proposals that are received as required will be publicly opened and read as specified in Section 1-02.12. The Contracting Agency will not open or consider any Bid Proposal that is received after the time specified in the Call for Bids for receipt of Bid Proposals, or received in a location other than that



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

specified in the Call for Bids. The Contracting Agency will not open or consider any "Supplemental Information" that is received after the time specified, or received in a location other than that specified in the Call for Bids.

If an emergency or unanticipated event interrupts normal work processes of the Contracting Agency so that Proposals cannot be received at the office designated for receipt of bids as specified in Section 1-02.12 the time specified for receipt of the Proposal will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which the normal work processes of the Contracting Agency resume.

## 1-02.10 Withdrawing, Revising, or Supplementing Proposal
**(July 23, 2015 APWA GSP)**

Delete this section in its entirety, and replace it with the following:

After submitting a physical Bid Proposal to the Contracting Agency, the Bidder may withdraw, revise, or supplement it if:

1. The Bidder submits a written request signed by an authorized person and physically delivers it to the place designated for receipt of Bid Proposals, and
2. The Contracting Agency receives the request before the time set for receipt of Bid Proposals, and
3. The revised or supplemented Bid Proposal (if any) is received by the Contracting Agency before the time set for receipt of Bid Proposals.

If the Bidder's request to withdraw, revise, or supplement its Bid Proposal is received before the time set for receipt of Bid Proposals, the Contracting Agency will return the unopened Proposal package to the Bidder. The Bidder must then submit the revised or supplemented package in its entirety. If the Bidder does not submit a revised or supplemented package, then its bid shall be considered withdrawn.

Late revised or supplemented Bid Proposals or late withdrawal requests will be date recorded by the Contracting Agency and returned unopened. Mailed, Emailed, or faxed requests to withdraw, revise, or supplement a Bid Proposal are not acceptable.

## 1-02.13 Irregular Proposals
**(September 3, 2024 APWA GSP)**

Delete this section and replace it with the following:

1. A Proposal will be considered irregular and will be rejected if:
   a. The Bidder is not prequalified when so required;
   b. The Bidder adds provisions reserving the right to reject or accept the Award, or enter into the Contract;
   c. A price per unit cannot be determined from the Bid Proposal;
   d. The Proposal form is not properly executed;
   e. The Bidder fails to submit or properly complete a subcontractor list (WSDOT Form 271-015), if applicable, as required in Section 1-02.6;
   f. The Bidder fails to submit or properly complete a Disadvantaged Business Enterprise Certification (WSDOT Form 272-056), if applicable, as required in Section 1-02.6;
   g. The Bidder fails to submit Written Confirmations (WSDOT Form 422-031) from each DBE firm listed on the Bidder's completed DBE Utilization Certification that they are in agreement with the bidder's DBE participation commitment, if applicable, as required in Section 1-02.6, or if the written confirmation that is submitted fails to meet the requirements of the Special Provisions;



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

h. The Bidder fails to submit DBE Good Faith Effort documentation, if applicable, as required in Section 1-02.6, or if the documentation that is submitted fails to demonstrate that a Good Faith Effort to meet the Condition of Award in accordance with Section 1-07.11;
i. The Bidder fails to submit a DBE Bid Item Breakdown (WSDOT Form 272-054), if applicable, as required in Section 1-02.6, or if the documentation that is submitted fails to meet the requirements of the Special Provisions;
j. The Bidder fails to submit the Bidder Questionnaire (DOT Form 272-022), if applicable as required by Section 1-02.6, or if the documentation that is submitted fails to meet the requirements of the Special Provisions; or
k. The Bid Proposal does not constitute a definite and unqualified offer to meet the material terms of the Bid invitation.

2. A Proposal may be considered irregular and may be rejected if:
   a. The Proposal does not include a unit price for every Bid item;
   b. Any of the unit prices are excessively unbalanced (either above or below the amount of a reasonable Bid) to the potential detriment of the Contracting Agency;
   c. The authorized Proposal Form furnished by the Contracting Agency is not used or is altered;
   d. The completed Proposal form contains unauthorized additions, deletions, alternate Bids, or conditions;
   e. Receipt of Addenda is not acknowledged;
   f. A member of a joint venture or partnership and the joint venture or partnership submit Proposals for the same project (in such an instance, both Bids may be rejected); or
   g. If Proposal form entries are not made in ink.

## 1-02.14 Disqualification of Bidders
(******)

Delete this section and replace it with the following:

A Bidder will be deemed not responsible if the Bidder does not meet the mandatory bidder responsibility criteria in RCW 39.04.350(1), as amended; or does not meet Supplemental Criteria in this Section:

The Contracting Agency will verify that the Bidder meets the mandatory bidder responsibility criteria in RCW 39.04.350(1). Evidence that the Bidder meets Supplemental Criteria shall be provided by the Bidder as stated later in this Section.

Supplemental Criteria:

A. **Criterion**:
   a. **The Bidder shall have successfully completed (2) projects of a "similar size", and one of those projects must be a "public work" project.** "Public work" is as defined in RCW 39.04.010. For the purposes of meeting this criterion, the Owner has determined that "similar size" means projects with a contract amount of $2,000,000 or greater.
   b. **The Bidder or Subcontractor shall have successfully completed (1) project of a "similar scope" within the last (5) five years.** For this requirement, the term Bidder includes: (i) the legal entity that signed this bid; or (ii) any employee of the legal entity that signed this bid provided this employee was responsible for managing day to day on site activities for the referenced project and will be responsible for management of day to day onsite activities of this contract. For the purposes of meeting this criterion, the Owner has determined that "similar scope" means projects that have the following



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

characteristics: Construction or rehabilitation of water reservoirs (1 million-gallon or larger).

B. **Evaluation and Reference Checks**: In evaluating whether the projects were "successfully completed," the Owner may check owner references for the previous projects and may evaluate the owner's assessment of the Bidder performance. In conducting reference checks, the Owner may include itself as a reference if the bidder has performed work for the Owner, even if the bidder did not identify the Owner as a reference. The assessment may include but is not limited to the following areas:

a. Administration / Management / Supervision
   i. Supervision and decision making
   ii. Coordination and communication with subcontractors and suppliers
   iii. Submission of documents, reports, material submittals
   iv. Timeliness of progress schedules
   v. Public safety and traffic control
   vi. Compliance with laws, ordinances and regulations
   vii. Maintenance of employee safety standards
   viii. Coordination and cooperation with department personnel on project matters
   ix. Relations with the general public, other agencies and/or adjacent contractors
b. Quality of Work
   i. Adherence to plans and specifications
   ii. Standards of Workmanship
   iii. Completion of final (punch list) work
c. Progress of Work
   i. Completion of project within allotted time
   ii. Scheduling and execution of schedule
   iii. Delivery of materials and supplies
   iv. Operation and use of equipment
   v. Use of personnel
d. Equipment
   i. Condition
   ii. Maintenance
   iii. Proper/Suitable equipment used

C. **Documentation**: The Bidder shall submit a list of projects to the Owner. If "similar scope" documentation is based on employee experience working for another business, the Bidder shall also submit project information for that employee that can be verified. The information about each project shall include the following:

- Contractor's name (identify as bidder or subcontractor)
- Employee's name(s) who worked on the project, if applicable
- Owner's name and contact information for the owner's representative;
- Contract amount;
- Date of Completion;
- A brief description of the scope of the project and how the project is similar to this project

As evidence that the Bidder meets the mandatory and supplemental responsibility criteria stated above, the apparent low Bidder must submit to the Contracting Agency by 2:30 P.M. of the second business day following the bid submittal deadline, documentation verifying that the Bidder meets all of the supplemental criteria together with supporting documentation including but not limited to that detailed above (sufficient in the sole judgment of the Contracting Agency) demonstrating compliance with all supplemental responsibility criteria. The Contracting Agency reserves the right to request such documentation from other Bidders as well, and to request further documentation as needed to assess



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Bidder responsibility. The Contracting Agency also reserves the right to obtain information from third-parties and independent sources of information concerning a Bidder's compliance with the mandatory and supplemental criteria, and to use that information in their evaluation. The Contracting Agency may (but is not required to) consider mitigating factors in determining whether the Bidder complies with the requirements of the supplemental criteria.

The basis for evaluation of Bidder compliance with these mandatory and Supplemental Criteria shall include any documents or facts obtained by Contracting Agency (whether from the Bidder or third parties) including but not limited to: (i) financial, historical, or operational data from the Bidder; (ii) information obtained directly by the Contracting Agency from others for whom the Bidder has worked, or other public agencies or private enterprises; and (iii) any additional information obtained by the Contracting Agency which is believed to be relevant to the matter.

If the Contracting Agency determines the Bidder does not meet the bidder responsibility criteria above and is therefore not a responsible Bidder, the Contracting Agency shall notify the Bidder in writing, with the reasons for its determination. If the Bidder disagrees with this determination, it may appeal the determination within two (2) business days of the Contracting Agency's determination by presenting its appeal and any additional information to the Contracting Agency. The Contracting Agency will consider the appeal and any additional information before issuing its final determination. If the final determination affirms that the Bidder is not responsible, the Contracting Agency will not execute a contract with any other Bidder until at least two business days after the Bidder determined to be not responsible has received the Contracting Agency's final determination.

Request to Change Supplemental Bidder Responsibility Criteria Prior To Bid: Bidders with concerns about the relevancy or restrictiveness of the Supplemental Bidder Responsibility Criteria may make or submit requests to the Contracting Agency to modify the criteria. Such requests shall be in writing, describe the nature of the concerns, and propose specific modifications to the criteria. Bidders shall submit such requests to the Contracting Agency no later than five (5) business days prior to the bid submittal deadline and address the request to the Project Engineer or such other person designated by the Contracting Agency in the Bid Documents.

## 1-02.15 Pre-Award Information

**(December 30, 2022 APWA GSP)**

Revise this section to read:

Before awarding any contract, the Contracting Agency may require one or more of these items or actions of the apparent lowest responsible bidder:

1. A complete statement of the origin, composition, and manufacture of any or all materials to be used,
2. Samples of these materials for quality and fitness tests,
3. A progress schedule (in a form the Contracting Agency requires) showing the order of and time required for the various phases of the work,
4. A breakdown of costs assigned to any bid item,
5. Attendance at a conference with the Engineer or representatives of the Engineer,
6. Obtain, and furnish a copy of, a business license to do business in the city or county where the work is located.
7. Any other information or action taken that is deemed necessary to ensure that the bidder is the lowest responsible bidder.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 1-03 AWARD AND EXECUTION OF CONTRACT

## 1-03.1 Consideration of Bids
**(December 30, 2022 APWA GSP)**

Revise the first paragraph to read:

After opening and reading proposals, the Contracting Agency will check them for correctness of extensions of the prices per unit and the total price. If a discrepancy exists between the price per unit and the extended amount of any bid item, the price per unit will control. If a minimum bid amount has been established for any item and the bidder's unit or lump sum price is less than the minimum specified amount, the Contracting Agency will unilaterally revise the unit or lump sum price, to the minimum specified amount and recalculate the extension. The total of extensions, corrected where necessary, including sales taxes where applicable and such additives and/or alternates as selected by the Contracting Agency, will be used by the Contracting Agency for award purposes and to fix the Awarded Contract Price amount and the amount of the contract bond.

## 1-03.3 Execution of Contract
**(July 8, 2024 APWA GSP Option A)**

Revise this section to read:

Within 3 calendar days of Award date (not including Saturdays, Sundays and Holidays), the successful Bidder shall provide the information necessary to execute the Contract to the Contracting Agency. The Bidder shall send the contact information, including the full name, email address, and phone number, for the authorized signer and bonding agent to the Contracting Agency.

Copies of the Contract Provisions, including the unsigned Form of Contract, will be available for signature by the successful bidder on the first business day following award. The number of copies to be executed by the Contractor will be determined by the Contracting Agency.

Within 10 calendar days after the award date, the successful bidder shall return the signed Contracting Agency-prepared contract, an insurance certification as required by Section 1-07.18, a satisfactory bond as required by law and Section 1-03.4, the Transfer of Coverage form for the Construction Stormwater General Permit with sections I, III, and VIII completed when provided. Before execution of the contract by the Contracting Agency, the successful bidder shall provide any pre-award information the Contracting Agency may require under Section 1-02.15.

Until the Contracting Agency executes a contract, no proposal shall bind the Contracting Agency nor shall any work begin within the project limits or within Contracting Agency-furnished sites. The Contractor shall bear all risks for any work begun outside such areas and for any materials ordered before the contract is executed by the Contracting Agency.

If the bidder experiences circumstances beyond their control that prevents return of the contract documents within the calendar days after the award date stated above, the Contracting Agency may grant up to a maximum of 10 additional calendar days for return of the documents, provided the Contracting Agency deems the circumstances warrant it.

## 1-03.4 Contract Bond
**(July 23, 2015 APWA GSP)**

Delete the first paragraph and replace it with the following:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The successful bidder shall provide executed payment and performance bond(s) for the full contract amount. The bond may be a combined payment and performance bond; or be separate payment and performance bonds. In the case of separate payment and performance bonds, each shall be for the full contract amount. The bond(s) shall:

1. Be on Contracting Agency-furnished form(s);
2. Be signed by an approved surety (or sureties) that:
   a) Is registered with the Washington State Insurance Commissioner, and
   b) Appears on the current Authorized Insurance List in the State of Washington published by the Office of the Insurance Commissioner,
3. Guarantee that the Contractor will perform and comply with all obligations, duties, and conditions under the Contract, including but not limited to the duty and obligation to indemnify, defend, and protect the Contracting Agency against all losses and claims related directly or indirectly from any failure:
   a) Of the Contractor (or any of the employees, subcontractors, or lower tier subcontractors of the Contractor) to faithfully perform and comply with all contract obligations, conditions, and duties, or
   b) Of the Contractor (or the subcontractors or lower tier subcontractors of the Contractor) to pay all laborers, mechanics, subcontractors, lower tier subcontractors, material person, or any other person who provides supplies or provisions for carrying out the work;
4. Be conditioned upon the payment of taxes, increases, and penalties incurred on the project under titles 50, 51, and 82 RCW; and
5. Be accompanied by a power of attorney for the Surety's officer empowered to sign the bond; and
6. Be signed by an officer of the Contractor empowered to sign official statements (sole proprietor or partner). If the Contractor is a corporation, the bond(s) must be signed by the president or vice president, unless accompanied by written proof of the authority of the individual signing the bond(s) to bind the corporation (i.e., corporate resolution, power of attorney, or a letter to such effect signed by the president or vice president).

### 1-03.7 Judicial Review

**(December 30, 2022 APWA GSP)**

Revise this section to read:

All decisions made by the Contracting Agency regarding the Award and execution of the Contract or Bid rejection shall be conclusive subject to the scope of judicial review permitted under Washington Law. Such review, if any, shall be timely filed in the Superior Court of the county where the Contracting Agency headquarters is located, provided that where an action is asserted against a county, RCW 36.01.050 shall control venue and jurisdiction.

## 1-04 SCOPE OF THE WORK

### 1-04.2 Coordination of Contract Documents, Plans, Special Provisions, Specifications, and Addenda

**(November 20, 2020 Lacey GSP)**

Revise the second paragraph to read:

Any inconsistency in the parts of the contract shall be resolved by following this order of precedence (e.g., 1 presiding over 2, 2 presiding over 3, 3 over 4, and so forth):

1. Contract Form,



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

2. Addenda (if any),
3. Proposal Form,
4. Special Provisions,
5. Technical Specifications, if included,
6. Contract Plans,
7. WSDOT Standard Specifications for Road, Bridge, and Municipal Construction,
8. City of Lacey Development Guidelines and Public Works Standards, and
9. WSDOT Standard Plans for Road, Bridge and Municipal Construction

## 1-04.4(1) Minor Changes
**(May 30, 2019 APWA GSP)**

Delete the first paragraph and replace it with the following:

Payments or credits for changes amounting to $25,000 or less may be made under the Bid item "Minor Change". At the discretion of the Contracting Agency, this procedure for Minor Changes may be used in lieu of the more formal procedure as outlined in Section 1-04.4, Changes. All "Minor Change" work will be within the scope of the Contract Work and will not change Contract Time.

## 1-04.5 Procedure, Protest, and Dispute by the Contractor
**(January 19, 2022 APWA GSP)**

Revise item 1 of the first paragraph to read:

1. Give a signed written notice of protest to the Engineer or the Engineer's field Inspectors within 5 calendar days of receiving a change order or an Engineer's Written Determination.

## 1-04.6 Variation in Estimated Quantities
**(May 25, 2006 APWA GSP)**

Supplement this Section with the following:

The quantities for "Utility Potholing", "Unsuitable Foundation Excavation Incl Haul", "Embankment Compaction", "Sampling Station", "Gravel Borrow", "Dust Control", "Excavation Incl Haul", "Controlled Density Fill", "Crushed Surfacing Base Course", "Crushed Surfacing Top Course", "HMA Cl ½" PG 58H-22", "Imported Pipe Bedding" and "Bank Run Gravel for Trench Backfill", "Cement Concrete", "Gravity Block Wall", "Temporary Chain Link Fence" and "Chain Link Fence Type 3 with Barbed Wire" have been entered into the Proposal only to provide a common proposal for bidders. Actual quantities will be determined in the field as the work progresses, and will be paid at the original bid price, regardless of final quantity. These bid items shall not be subject to the provisions of 1-04.6 of the Standard Specifications.

## 1-04.6 Variations in Estimated Quantities
**(December 30, 2022 APWA GSP Option B)**

Revise the first paragraph to read:

Payment to the Contractor will be made only for the actual quantities of Work performed and accepted in conformance with the Contract. When the accepted quantity of Work performed under a unit item varies from the original Proposal quantity, payment will be at the unit Contract price for all Work unless the total accepted quantity of the Contract item, adjusted to exclude added or deleted amounts included in change orders accepted by both parties, increases or decreases by more than 25 percent from the original Proposal quantity, and if the total extended bid price for that item at time of award is equal to or greater



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

than 10 percent of the total contract price at time of award. In that case, payment for contract work may be adjusted as described herein.

# 1-05 CONTROL OF WORK

## 1-05.4 Conformity With and Deviations from Plans and Stakes

Supplement this section with the following:

**Roadway and Utility Surveys**
**(November 25, 2024 APWA GSP, Option A)**

The Engineer shall furnish to the Contractor one time only all principal lines, grades, and measurements the Engineer deems necessary for completion of the work. These shall generally consist of one initial set of:

1. Slope stakes for establishing grading;
2. Curb grade stakes;
3. Centerline finish grade stakes for pavement sections wider than 25 feet; and
4. Offset points to establish line and grade for underground utilities such as water, sewers, and storm drains.

On alley construction projects with minor grade changes, the Engineer shall provide only offset hubs on one side of the alley to establish the alignment and grade.

### 1-05.4(2) Survey Control and Electronic Files
**(August 10, 2010 Lacey GSP)**

Add the following new section:

The Contractor shall re-establish the survey control used in design by using existing survey monuments and other control points as provided by the City.

When requested by the Contractor, the City will provide an electronic version of the construction plans (drawings), for use by the Contractor at the Contractor's own risk. In all cases, the approved paper construction plans are the official contract documents. If the Contractor wishes to use the electronic version of the construction plans for the purposes of providing surveying of the proposed improvements, it shall be the Contractor's responsibility to verify that any coordinates used from the electronic file match the station and offset location given in the contract construction plans. Construction plans are diagrammatic in nature. The coordinate locations of the various graphic elements within the electronic files may not necessarily be precisely shown with respect to their coordinate position. In all cases, the location callouts in the contract construction plans shall govern.

## 1-05.7 Removal of Defective and Unauthorized Work
**(November 4, 2024 WSDOT GSP 1-05.7.OPT1.2026)**

Section 1-05.7, including title and subsections, is deleted and replaced with the following:

**Nonconforming Work**
The Contracting Agency will not pay for Nonconforming Work.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Nonconforming Work is Work that in any way fails to meet the requirements of the Contract. This includes, but is not limited to:

- Work that does not conform to Contract requirements
- Work that does not meet Contract requirements
- Work done beyond the lines and grades set by the Plans or the Engineer
- Extra Work and materials furnished without the Engineer's written approval
- Defective Work
- Noncompliant Work
- Nonconforming Work
- Out of specification Work
- Rejected Work
- Unacceptable Work
- Unauthorized Work
- Unsuitable Work
- Unsatisfactory Work

**Identification of Nonconforming Work**
The Contractor is responsible for quality control and shall identify all Nonconforming Work. The Contracting Agency may also identify Nonconforming Work during inspection of Work that has been completed, is at an identified hold point, or has been identified by the Contractor as ready for inspection. However, failure by the Contracting Agency to identify Nonconforming Work shall not relieve the Contractor from their responsibility for the quality of the Work, nor shall it constitute acceptance or approval of the Nonconforming Work.

**Reporting of Nonconforming Work**
Unless otherwise specified, the Contractor shall immediately report all Nonconforming Work to the Engineer along with any relevant information about how the Nonconforming Work shall be remediated. The Contractor shall be responsible and bear all costs for remediating Nonconforming Work.

If the Contract requires the use of the WSDOT Unifier system for Document Control in accordance with Section 1-04.2, reporting and remediation submittals shall follow the "Nonconformance Report" business process in Unifier.

**Remediation of Nonconforming Work**
Remediation to correct Nonconforming Work shall be completed as soon as possible. However, unless otherwise specified, the Contractor shall not proceed with implementing the remedy until the Engineer has accepted the Contractor's proposed remedy. Any remedial work done prior to the Engineer's acceptance shall be at the Contractor's sole risk and will be subject to further rejection or remediation. The Engineer has the right to reject all or part of the Nonconforming Work, and the Engineer's decision is final and not subject to protest.

Remediation shall be classified in one of the following categories:

1. Rework to Contract requirements
2. Remove and replace
3. Repair to acceptable standards

When disputes occur over which category a remedy belongs, the Engineer's decision will be final and binding.

**Rework to Contract Requirements**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

To be considered rework, the design and construction standards of the proposed completed Work, in the sole judgment of the Engineer, shall meet the design and construction standards applicable to the project.

Reporting of Nonconforming Work that is reworked is not required if all of the following conditions are met:

1. The remediation shall be completed in the same shift as the Nonconforming Work was identified.
2. It shall be remedied without damaging other Work.
3. It shall be remedied without putting the public at risk.
4. The Contractor's proposed remedy is in accordance with the Contract requirements.
5. The Engineer does not request the Nonconforming Work be reported.

Examples of Nonconforming Work that may not need reported if reworked include:

- Missing dobies prior to concrete pouring
- Rebar spacing and missing rebar
- Out of plumb luminaire or sign pole/post

For all other rework the Contractor shall submit all relevant information to the Engineer. The Contractor shall include Type 2 Working Drawings. The Type 2 Working Drawings shall explain how the nonconforming work will be reworked including repairs that will achieve the Contract requirements. For preapproved repair procedures, Type 1 Working drawings shall be included in lieu of the Type 2 Working Drawings.

**Remove and Replace**

To be considered as remove and replace, the Nonconforming Work shall be removed and replaced and the design and construction standards of the proposed completed Work, in the sole judgment of the Engineer, shall meet the design and construction standards applicable to the project.

Reporting of Nonconforming Work that is removed and replaced is not required if all of the following conditions are met:

1. The remedy shall be completed in the same shift the Nonconforming Work was identified.
2. It shall be removed and replaced without damaging other Work.
3. Both the removal and the replacement meet all Contract requirements.
4. The Engineer does not request the Nonconforming Work be reported.

Examples of Nonconforming Work that may not need reported if removed and replaced include:

- Decompacting and recompacting a lift of embankment to meet compaction requirements
- Removing and replacing an installed and dented luminaire pole with a new one.

For all other remove and replace Work, the Contractor shall submit all relevant information, including Working Drawings of the Type requested by the Engineer.

The Working Drawings shall include how the nonconforming Work will be removed and replaced including protection of other Work if needed. Type 2 Working Drawings shall be required, unless the remediation requires engineering, in which case, Type 2E Working Drawings shall be provided.

**Repair to an Acceptable Standard**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

At the Contractor's written request, the Engineer may approve remediation that includes repairing to an acceptable standard that does not meet the Contract requirements with an appropriate price reduction that may range from no reduction to no payment.

To request to repair Nonconforming work to an acceptable standard, the Contractor shall submit all relevant information. Remedies proposed for this category shall include Type 2E Working Drawings. The Type 2E working drawings shall indicate whether the Work, as repaired, will achieve the same load carrying capacity, and shall assess the effects of the repair on the durability of the Work. Calculations shall be provided to demonstrate that the Work, as repaired, will perform the intended functions for its intended design life.

## 1-05.11 Final Inspections and Operational Testing

**(October 1, 2005 APWA GSP)**

Delete this section and replace it with the following:

### 1-05.11(1) Substantial Completion Date

When the Contractor considers the work to be substantially complete, the Contractor shall so notify the Engineer and request the Engineer establish the Substantial Completion Date. The Contractor's request shall list the specific items of work that remain to be completed in order to reach physical completion. The Engineer will schedule an inspection of the work with the Contractor to determine the status of completion. The Engineer may also establish the Substantial Completion Date unilaterally.

If, after this inspection, the Engineer concurs with the Contractor that the work is substantially complete and ready for its intended use, the Engineer, by written notice to the Contractor, will set the Substantial Completion Date. If, after this inspection the Engineer does not consider the work substantially complete and ready for its intended use, the Engineer will, by written notice, so notify the Contractor giving the reasons therefore.

Upon receipt of written notice concurring in or denying substantial completion, whichever is applicable, the Contractor shall pursue vigorously, diligently and without unauthorized interruption, the work necessary to reach Substantial and Physical Completion. The Contractor shall provide the Engineer with a revised schedule indicating when the Contractor expects to reach substantial and physical completion of the work.

The above process shall be repeated until the Engineer establishes the Substantial Completion Date and the Contractor considers the work physically complete and ready for final inspection.

### 1-05.11(2) Final Inspection and Physical Completion Date

When the Contractor considers the work physically complete and ready for final inspection, the Contractor by written notice, shall request the Engineer to schedule a final inspection. The Engineer will set a date for final inspection. The Engineer and the Contractor will then make a final inspection and the Engineer will notify the Contractor in writing of all particulars in which the final inspection reveals the work incomplete or unacceptable. The Contractor shall immediately take such corrective measures as are necessary to remedy the listed deficiencies. Corrective work shall be pursued vigorously, diligently, and without interruption until physical completion of the listed deficiencies. This process will continue until the Engineer is satisfied the listed deficiencies have been corrected.

If action to correct the listed deficiencies is not initiated within 7 days after receipt of the written notice listing the deficiencies, the Engineer may, upon written notice to the Contractor, take whatever steps are necessary to correct those deficiencies pursuant to Section 1-05.7.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The Contractor will not be allowed an extension of contract time because of a delay in the performance of the work attributable to the exercise of the Engineer's right hereunder.

Upon correction of all deficiencies, the Engineer will notify the Contractor and the Contracting Agency, in writing, of the date upon which the work was considered physically complete. That date shall constitute the Physical Completion Date of the contract, but shall not imply acceptance of the work or that all the obligations of the Contractor under the contract have been fulfilled.

### 1-05.11(3) Operational Testing

It is the intent of the Contracting Agency to have at the Physical Completion Date a complete and operable system. Therefore when the work involves the installation of machinery or other mechanical equipment; street lighting, electrical distribution or signal systems; irrigation systems; buildings; or other similar work it may be desirable for the Engineer to have the Contractor operate and test the work for a period of time after final inspection but prior to the physical completion date. Whenever items of work are listed in the Contract Provisions for operational testing they shall be fully tested under operating conditions for the time period specified to ensure their acceptability prior to the Physical Completion Date. During and following the test period, the Contractor shall correct any items of workmanship, materials, or equipment which prove faulty, or that are not in first class operating condition. Equipment, electrical controls, meters, or other devices and equipment to be tested during this period shall be tested under the observation of the Engineer, so that the Engineer may determine their suitability for the purpose for which they were installed. The Physical Completion Date cannot be established until testing and corrections have been completed to the satisfaction of the Engineer.

The costs for power, gas, labor, material, supplies, and everything else needed to successfully complete operational testing, shall be included in the unit contract prices related to the system being tested, unless specifically set forth otherwise in the proposal.

Operational and test periods, when required by the Engineer, shall not affect a manufacturer's guaranties or warranties furnished under the terms of the contract.

### 1-05.12(1) Guarantee Periods
(******)

Add the following new section:

### One-Year Guarantee Period

The Contractor shall return to the project and repair or replace all defects in workmanship and material discovered within one year after Final Acceptance of the Work, within two years for reservoir coatings (internal and external), and within three years for the cathodic protection system. The Contractor shall start work to remedy any such defects within 7 calendar days of receiving Contracting Agency's written notice of a defect, and shall complete such work within the time stated in the Contracting Agency's notice. In case of an emergency, where damage may result from delay or where loss of services may result, such corrections may be made by the Contracting Agency's own forces or another contractor, in which case the cost of corrections shall be paid by the Contractor. In the event the Contractor does not accomplish corrections within the time specified, the work will be otherwise accomplished and the cost of same shall be paid by the Contractor.

When corrections of defects are made, the Contractor shall then be responsible for correcting all defects in workmanship and materials in the corrected work for one year after acceptance of the corrections by the Contracting Agency.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Two-Year Guarantee Period

The Contractor shall return to the project and repair or replace all defects in internal and external coating workmanship and materials discovered within two years of the Final Acceptance of the Work. The Contractor shall obtain and provide the Contracting Agency with an inspection report detailing the state of the interior and exterior coating and any apparent defects a minimum of thirty (30) and a maximum of sixty (60) calendar days prior to the expiration of the warranty period. The inspection report shall include a detailed analysis of the state of coatings and be supported by video footage and photographs. The inspection shall be performed by a Contracting Agency approved NACE certified diving inspector. The reservoir shall remain online during inspection. If the Contractor fails to provide the inspection report thirty (30) calendar days prior to the expiration of the warranty period, the warranty period shall be extended sixty (60) calendar days from its original expiration date. Should the Contractor fail to provide an inspection thirty (30) calendar days prior to the expiration of the amended warranty period, the warranty period shall be extended another sixty (60) calendar days beyond the amended warranty period. Sixty (60) calendar day extensions shall continue to accrue until an inspection report, performed by an approved inspector, is submitted to the Contracting Agency a minimum of thirty (30) calendar days prior to the expiration of the latest warranty period.

The Contractor shall start work to remedy any such defects within 7 calendar days of receiving Contracting Agency's written notice of a defect, and shall complete such work within the time stated in the Contracting Agency's notice. In case of an emergency, where damage may result from delay or where loss of services may result, such corrections may be made by the Contracting Agency's own forces or another contractor, in which case the cost of corrections shall be paid by the Contractor. In the event the Contractor does not accomplish corrections within the time specified, the work will be otherwise accomplished and the cost of same shall be paid by the Contractor.

When corrections of coating defects are made, the Contractor shall then be responsible for correcting all defects in workmanship and materials in the corrected work for two years after acceptance of the corrections by the Contracting Agency.

These guarantees are supplemental to and do not limit or affect the requirements that the Contractor's work comply with the requirements of the Contract or any other legal rights or remedies of the Contracting Agency.

## Three-Year Guarantee Period

The Contractor shall return to the project and repair or replace all defects in the cathodic protection system's workmanship and material discovered within three years after Final Acceptance of the Work and within one year of the completion of the coatings two-year guarantee period, whichever is longer. The Contractor shall start work to remedy any such defects within 7 calendar days of receiving Contracting Agency's written notice of a defect, and shall complete such work within the time stated in the Contracting Agency's notice. In case of an emergency, where damage may result from delay or where loss of services may result, such corrections may be made by the Contracting Agency's own forces or another contractor, in which case the cost of corrections shall be paid by the Contractor. In the event the Contractor does not accomplish corrections within the time specified, the work will be otherwise accomplished and the cost of same shall be paid by the Contractor.

When corrections of defects are made, the Contractor shall then be responsible for correcting all defects in workmanship and materials in the corrected work for one year beyond the two-year guarantee of the coating systems or an additional year, whichever is longer. The extended guarantee period shall begin upon acceptance of the corrections by the Contracting Agency.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## 1-05.15 Method of Serving Notices
**(January 4, 2024 APWA GSP)**

Revise the second paragraph to read:

All correspondence from the Contractor shall be served and directed to the Engineer. All correspondence from the Contractor constituting any notification, notice of protest, notice of dispute, or other correspondence constituting notification required to be furnished under the Contract, must be written in paper format, hand delivered or sent via certified mail delivery service with return receipt requested to the Engineer's office. Electronic copies such as e-mails or electronically delivered copies of correspondence will not constitute such notice and will not comply with the requirements of the Contract.

## 1-05.16 Water and Power
**(October 1, 2005 APWA GSP)**

Add the following new section:

The Contractor shall make necessary arrangements, and shall bear the costs for power and water necessary for the performance of the work, unless the contract includes power and water as a pay item.

## 1-05.18 Record Drawings
**(April 2, 2018 Lacey GSP Option B)**

Add the following new section:

The Contractor shall maintain one set of full size plans for Record Drawings, updated with clear and accurate red-lined field revisions on a daily basis, and within 2 business days after receipt of information that a change in Work has occurred. The Contractor shall not conceal any work until the required information is recorded.

This Record Drawing set shall be used for this purpose alone, shall be kept separate from other Plan sheets, and shall be clearly marked as Record Drawings. These Record Drawings shall be kept on site at the Contractor's field office, and shall be available for review by the Contracting Agency at all times. The Contractor shall bring the Record Drawings to each progress meeting for review.

The preparation and upkeep of the Record Drawings is to be the assigned responsibility of a single, experienced, and qualified individual. The quality of the Record Drawings, in terms of accuracy, clarity, and completeness, is to be adequate to allow the Contracting Agency to modify the computer-aided drafting (CAD) Contract Drawings to produce a complete set of Record Drawings for the Contracting Agency without further investigative effort by the Contracting Agency.

The Record Drawing markups shall document all changes in the Work, both concealed and visible. Items that must be shown on the markups include but are not limited to:

- Actual dimensions, arrangement, and materials used when different than shown in the Plans.
- Changes made by Change Order or Field Order.
- Changes made by the Contractor.
- Accurate locations of storm sewer, sanitary sewer, water mains and other water appurtenances, structures, conduits, light standards, vaults, width of roadways, sidewalks, landscaping areas, building footprints, channelization and pavement markings, etc. Include pipe invert elevations, top of castings (manholes, inlets, etc.).



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

If the Contract calls for the Contracting Agency to do all surveying and staking, the Contracting Agency will provide the elevations at the tolerances the Contracting Agency requires for the Record Drawings.

When the Contract calls for the Contractor to do the surveying/staking, the applicable tolerance limits include, but are not limited to the following:

| | Vertical | Horizontal |
|---|---|---|
| As-built sanitary & storm invert and grate elevations | ± 0.01 foot | ± 0.01 foot |
| As-built monumentation | ± 0.01 foot | ± 0.01 foot |
| As-built waterlines, inverts, valves, hydrants | ± 0.01 foot | ± 0.01 foot |
| As-built ponds/swales/water features | ± 0.01 foot | ± 0.01 foot |
| As-built buildings (fin. Floor elev.) | ± 0.01 foot | ± 0.01 foot |
| As-built gas lines, power, TV, Tel, Com | ± 0.01 foot | ± 0.01 foot |
| As-built signs, signals, etc. | N/A | ± 0.01 foot |

Making Entries on the Record Drawings:

Use erasable colored pencil (not ink) for all markings on the Record Drawings, conforming to the following color code:

Additions - Red
Deletions - Green
Comments - Blue
Dimensions - Graphite

Provide the applicable reference for all entries, such as the change order number, the request for information (RFI) number, or the approved shop drawing number.

Date all entries.

Clearly identify all items in the entry with notes similar to those in the Contract Drawings (such as pipe symbols, centerline elevations, materials, pipe joint abbreviations, etc.).

The Contractor shall certify on the Record Drawings that said drawings are an accurate depiction of built conditions, and in conformance with the requirements detailed above. The Contractor shall submit final Record Drawings to the Contracting Agency. Contracting Agency acceptance of the Record Drawings is one of the requirements for achieving Physical Completion.

A lump sum price of $5,000 has been included in the Proposal for this work. Any additional costs anticipated or incurred by the Contractor for the work shall be included in the various lump sum unit price bid items as found in the Proposal. Payment for this item will be made once Record Drawings have been submitted and approved.

# 1-06 CONTROL OF MATERIAL

## 1-06.1 Approval of Materials Prior to Use

**(January 4, 2016 Lacey GSP)**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The second sentence of first paragraph is revised to read:

The Contractor shall use the Qualified Product List (QPL), the Aggregate Source Approval (ASA) Database, or the City of Lacey Request for Approval of Material (COL RAM) form.

## 1-06.1(2) Request for Approval of Material (RAM)

The first paragraph is revised to read:

The COL RAM shall be used with all submittals. The COL RAM shall be prepared by the Contractor in accordance with the instructions and submitted to the engineer for approval before the material is incorporated into the Work..

Supplement this section with the following:

The Contractor shall submit sufficient information that describes the materials proposed as defined and described in these specifications and plans within 20 working days following the Notice to Proceed.

The City of Lacey has identified the following items as long lead items.
1. Electrical Equipment
2. Cathodic Protection Equipment

Long lead items shall be submitted within 20 working days of Notice to Proceed. The list above may not include all long lead items. The contractor is responsible for identifying all items and shall notify the Engineer of any additional items.

The Contractor shall submit one electronic of catalog cuts, shop drawings, and a material testing sample, as required for all items to be used in this contract for approval. The Contractor shall circle or highlight products and materials that are specific to this project, and cross out items that are not for this project.

All items not in exact compliance with the specifications must be noted as a change. The Contractor shall include an explanation, product specifications, sample articles, and any other items that will aid the Engineer in approving an item not in exact accordance with the specifications.

All submittals shall be submitted in Adobe Acrobat format and submittals that exceed 10 pages shall include a table of contents. Submittals that are not submitted in the format outlined may be rejected outright and the Contractor is required to resubmit in the correct format. The form and the submittal shall be sent in the same e-mail. Submittals that exceed 10 MB shall either be provided on a CD, a flash drive or via an internet link.

The Engineer will review submittals within 10 working days. The Contractor may request additional working days if approval or disapproval is not received in 10 working days. The Contractor may not request additional working days for failure to submit sufficient information to approve an item, or for rejection of an item not in accordance with the specifications.

Resubmittals shall be submitted within 5 working days from City's transmittal, to the contractor, of the Engineer reviewed submittal. If the submittal is "Rejected", the contractor shall resubmit the entire submittal. If the submittal is marked "Revise and Resubmit", the contractor shall submit items that are identified in the Engineer's comments.

Any material purchased or labor performed prior to such approval shall be at the Contractor's risk. The Contractor must receive all material approvals before the materials will be allowed on the project.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### 1-06.6 Recycled Materials
(January 4, 2016 APWA GSP)

Delete this section, including its subsections, and replace it with the following:

The Contractor shall make their best effort to utilize recycled materials in the construction of the project. Approval of such material use shall be as detailed elsewhere in the Standard Specifications.

Prior to Physical Completion the Contractor shall report the quantity of recycled materials that were utilized in the construction of the project for each of the items listed in Section 9-03.21. The report shall include hot mix asphalt, recycled concrete aggregate, recycled glass, steel furnace slag and other recycled materials (e.g. utilization of on-site material and aggregates from concrete returned to the supplier). The Contractor's report shall be provided on DOT form 350-075 Recycled Materials Reporting.

## 1-07 LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC

### 1-07.1 Laws to be Observed
(October 1, 2005 APWA GSP)

Supplement this section with the following:

In cases of conflict between different safety regulations, the more stringent regulation shall apply.

The Washington State Department of Labor and Industries shall be the sole and paramount administrative agency responsible for the administration of the provisions of the Washington Industrial Safety and Health Act of 1973 (WISHA).

The Contractor shall maintain at the project site office, or other well-known place at the project site, all articles necessary for providing first aid to the injured. The Contractor shall establish, publish, and make known to all employees, procedures for ensuring immediate removal to a hospital, or doctor's care, persons, including employees, who may have been injured on the project site. Employees should not be permitted to work on the project site before the Contractor has established and made known procedures for removal of injured persons to a hospital or a doctor's care.

The Contractor shall have sole responsibility for the safety, efficiency, and adequacy of the Contractor's plant, appliances, and methods, and for any damage or injury resulting from their failure, or improper maintenance, use, or operation. The Contractor shall be solely and completely responsible for the conditions of the project site, including safety for all persons and property in the performance of the work. This requirement shall apply continuously, and not be limited to normal working hours. The required or implied duty of the Engineer to conduct construction review of the Contractor's performance does not, and shall not, be intended to include review and adequacy of the Contractor's safety measures in, on, or near the project site.

### 1-07.1 Laws to be Observed
(April 3, 2006 WSDOT GSP)

Supplement this section with the following:

Confined spaces are known to exist at the following locations:

- Vaults
- Reservoir
- Catch basins



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Manholes

The Contractor shall be fully responsible for the safety and health of all on-site workers and compliant with Washington Administrative Code (WAC 296-809).

The Contractor shall prepare and implement a confined space program for each of the confined spaces identified above. The Contractors Confined Space program shall be sent to the contracting agency at least 30 days prior to the Contractor beginning work in or adjacent to the confined space. No work shall be performed in or adjacent to the confined space until the plan is submitted to the Engineer as required. The Contractor shall communicate with the Engineer to ensure a coordinated effort for providing and maintaining a safe worksite for both the Contracting Agency's and Contractor's workers when working in or near a confined space.

All costs to prepare and implement the confined space program shall be included in the bid prices for the various items associated with the confined space work.

## 1-07.2 State Sales Tax
**(June 27, 2011 APWA GSP)**

Delete this section, including its sub-sections, in its entirety and replace it with the following:

The Washington State Department of Revenue has issued special rules on the State sales tax. Sections 1-07.2(1) through 1-07.2(3) are meant to clarify those rules. The Contractor should contact the Washington State Department of Revenue for answers to questions in this area. The Contracting Agency will not adjust its payment if the Contractor bases a bid on a misunderstood tax liability.

The Contractor shall include all Contractor-paid taxes in the unit bid prices or other contract amounts. In some cases, however, state retail sales tax will not be included. Section 1-07.2(2) describes this exception.

The Contracting Agency will pay the retained percentage (or release the Contract Bond if a FHWA-funded Project) only if the Contractor has obtained from the Washington State Department of Revenue a certificate showing that all contract-related taxes have been paid (RCW 60.28.051). The Contracting Agency may deduct from its payments to the Contractor any amount the Contractor may owe the Washington State Department of Revenue, whether the amount owed relates to this contract or not. Any amount so deducted will be paid into the proper State fund.

### 1-07.2(1) State Sales Tax — Rule 171

WAC 458-20-171, and its related rules, apply to building, repairing, or improving streets, roads, etc., which are owned by a municipal corporation, or political subdivision of the state, or by the United States, and which are used primarily for foot or vehicular traffic. This includes storm or combined sewer systems within and included as a part of the street or road drainage system and power lines when such are part of the roadway lighting system. For work performed in such cases, the Contractor shall include Washington State Retail Sales Taxes in the various unit bid item prices, or other contract amounts, including those that the Contractor pays on the purchase of the materials, equipment, or supplies used or consumed in doing the work.

### 1-07.2(2) State Sales Tax — Rule 170

WAC 458-20-170, and its related rules, apply to the constructing and repairing of new or existing buildings, or other structures, upon real property. This includes, but is not limited to, the construction of streets, roads, highways, etc., owned by the state of Washington; water mains and their appurtenances;



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

sanitary sewers and sewage disposal systems unless such sewers and disposal systems are within, and a part of, a street or road drainage system; telephone, telegraph, electrical power distribution lines, or other conduits or lines in or above streets or roads, unless such power lines become a part of a street or road lighting system; and installing or attaching of any article of tangible personal property in or to real property, whether or not such personal property becomes a part of the realty by virtue of installation.

For work performed in such cases, the Contractor shall collect from the Contracting Agency, retail sales tax on the full contract price. The Contracting Agency will automatically add this sales tax to each payment to the Contractor. For this reason, the Contractor shall not include the retail sales tax in the unit bid item prices, or in any other contract amount subject to Rule 170, with the following exception.

Exception: The Contracting Agency will not add in sales tax for a payment the Contractor or a subcontractor makes on the purchase or rental of tools, machinery, equipment, or consumable supplies not integrated into the project. Such sales taxes shall be included in the unit bid item prices or in any other contract amount.

### 1-07.2(3) Services

The Contractor shall not collect retail sales tax from the Contracting Agency on any contract wholly for professional or other services (as defined in Washington State Department of Revenue Rules 138 and 244).

### 1-07.6 Permits and Licenses
(******)

Section 1-07.6 is supplemented with the following:

The Contracting Agency has obtained or begun the application for the below-listed permit(s) for this project. A copy of the permit(s) or permit application(s) are attached as an appendix for informational purposes. Copies of these permits, including a copy of the Transfer of Coverage form, when applicable, are required to be onsite at all times.

Unless noted otherwise, contact with the permitting agencies, concerning the below-listed permit(s), shall be made through the Engineer with the exception of when the Construction Stormwater General Permit coverage is transferred to the Contractor, direct communication with the Department of Ecology is allowed. The Contractor shall be responsible for obtaining Ecology's approval for any Work requiring additional approvals (e.g. Request for Chemical Treatment Form). The Contractor shall obtain additional permits as necessary. All costs to obtain and comply with additional permits shall be included in the applicable Bid items for the Work involved.

| NAME OF DOCUMENT | PERMITTING AGENCY | PERMIT REFERENCE NO. |
|---|---|---|
| NPDES Construction Stormwater General Permit | Department of Ecology | WAR314848 |
| Grading | City of Lacey | GRAD25-3282* |
| Electrical | City of Lacey | ELEC25-3281* |
| Building | City of Lacey | AA25-3279* |

*The Contracting Agency has begun the permit application. The Contractor shall complete and submit the applications in the Appendices to the City of Lacey at Build@cityoflacey.org.

### 1-07.6 Permits and Licenses
(******)

Section 1-07.6 is supplemented with the following:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The Contractor shall obtain any additional permits as necessary. All costs to obtain and comply with permits shall be included in the applicable Bid items for the Work involved.

## 1-07.9(3) Apprentices
**(July 8, 2024 APWA GSP)**

Supplement this section with the following:

**Apprentice Utilization**

This Contract includes an Apprentice Utilization Requirement. Fifteen percent or more of project Labor Hours shall be performed by Apprentices unless Good Faith Efforts are accepted. Apprentice Utilization will be determined using the Department of Labor and Industries (L&I) online Prevailing Wage Intent & Affidavit (PWIA) system.

**Definitions**

For the purposes of this specification the following definitions apply:

1. Apprentice is a person enrolled in a State-approved Apprenticeship Training Program.

2. Apprentice Utilization is the apprentice labor hours, on the project, expressed as a percentage of project Labor Hours based on certified payrolls or the affidavits of wages paid, whichever is least. The percentage is not rounded up.

3. Apprentice Utilization Requirement is the minimum percentage of apprentice labor hours required by the Contract.

4. Good Faith Effort(s) (GFE) describes the Contractor's efforts to meet the Apprentice Utilization Requirement including but not limited to the specific steps as described elsewhere in this specification.

5. Labor Hours are the total hours performed by all workers receiving an hourly wage who are subject to prevailing wage requirements for work performed on the Contract as defined by RCW 39.04.310. Labor Hours are determined based on the scope of work performed by the individuals, rather than the title of their occupations in accordance with WAC 296-127.

6. State-approved Apprenticeship Training Program is an apprenticeship training program approved by the Washington State Apprenticeship Council.

7. Apprentice Wage Rates are the applicable wage rates that are to be paid for an apprentice registered in a training program, separate from Journey Level rates, as set by the Washington State Apprenticeship Training Council and Washington State Department of Labor and Industries (L&I).

**Electronic Reporting**
The Contractor shall use the PWIA System to submit the "Apprentice Utilization Plan". Reporting instructions are available in the application.

**Apprentice Utilization Plan**
The Contractor shall submit an "Apprentice Utilization Plan" by filling out the Apprentice Utilization Plan Form (WSDOT Form 424-004) within 30 calendar days of execution, however no later than the



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

preconstruction meeting, demonstrating how and when they intend to achieve the Apprentice Utilization Requirement. The Plan shall be in sufficient detail for the Engineer to track the Contractor's progress in meeting the utilization requirements. An Apprentice Utilization Plan shall be updated and resubmitted as the Work progresses or when requested by the Engineer.

If the Contractor is unable to demonstrate the ability to meet the Apprentice Utilization Requirement with their initial Apprentice Utilization Plan submission, an effort must be made to find additional registered apprentices to perform on the contract. If after attempts have been made at every tier and every scope, the Contractor must submit GFE documentation to the Contracting Agency. The Contractor shall actively seek out opportunities to meet the Apprentice Utilization Requirement during the construction Work.

**Contacts**
The Contractor may obtain information on State-approved Apprenticeship Training Programs by using the Apprentice Registration and Tracking System (ARTS) https://secure.lni.wa.gov/arts-public/#/program-search or contacting the Department of Labor and Industries directly at:

Specialty Compliance and Services Division, Apprenticeship Section, P.O. Box 44530, Olympia, WA 98504-4530 or by phone at (360) 902-5320.

**Compliance**
The Contractor is expected to make attempts to employ Apprentices and shall include the requirement in any subcontracts at any tier. In the event that the Contractor is unable to achieve the Apprentice Utilization Requirement, the Contractor shall submit GFE documentation demonstrating the efforts and attempts they made. Final GFE documentation shall be submitted to the Contracting Agency after Substantial Completion but no later than 30 days after Physical Completion.

If the Contractor fails to actively attempt to employ Apprentices, submit GFE documentation, or if the Engineer does not approve the GFE, the Contractor will be assessed a penalty. The Engineer will provide the Contractor with a written notice at Final Acceptance of the project informing the Contractor of the failure to comply with this specification which will include a calculation of the penalty to be assessed as provided for in the Payment section in this special provision.

If the Contractor achieves the required Apprentice Utilization an incentive will be assessed with Final Payment.

**Good Faith Efforts**
The GFE shall document the attempts (efforts) the Contractor (and any subcontractor at any tier) made to meet the Apprentice Utilization Requirement. Emails, letters, or other written communications with letterhead, titles, and contact information are required.

Documentation must include one or more of the following accepted GFEs:

1. Demonstrated Lack of Availability of Apprentices. Correspondence from State-approved Apprenticeship Training Program(s), with project specific responses confirming there is a lack of availability of Apprentices for this project.

2. Demonstrated Disproportionate Ratio of Material/Equipment/Products to Labor Hours. Documentation explaining the bid includes a disproportionate high cost of material/equipment/products to Labor Hours. (E.g., a $2 M estimated contract includes $1 M or more in procurement costs of equipment to be installed.)

3. Demonstrated Lack of Necessary Labor Hours. Correspondence from a State-approved Apprentice Training Programs confirming there is not enough time in the project to meet required journey level to apprentice training ratios.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

4. Demonstrated Lack of Available Approved Programs. Correspondence from State-approved Apprentice Training Programs, confirming there are no programs that train for the scopes included/anticipated on the project. Contractor and state programs to submit training program detail needs and details that could be used for future program creation.

5. Funding Precedent. Documentation that shows conflicting, more restrictive, or precedent requirements for other training on the Project. Examples include, but are not limited to, Tribal Employment Rights (TERO), Federal Training Hours, or Special Training that affect the ability to use state-registered apprentices.

6. Warranty Work. Documentation from Original Equipment Manufacturers, or similar, confirming that work performed must only be completed by certified journey-level installers or risk voiding warranty, or similar.

7. Other Effort. The Contractor may submit other evidence, documentation, or rationale for not being able to achieve the required Apprentice Utilization that are not covered in the other efforts named. Other efforts will still need to be corroborated by an independent, knowledgeable third-party.

Contractors may receive a GFE credit for graduated Apprentice hours through the end of the calendar year for all projects worked on as long as the Apprentice remains continuously employed with the same Contractor/subcontractor they were working for when they graduated. If an Apprentice graduates during employment on a project of significant duration, they may be counted towards a GFE credit for up to one year after their graduation or until the end of the project (whichever comes first). Determination of whether Contract requirements were met in good faith will be made by subtracting the hours from the journeyman total reported hours for the project and adding them to the apprentice hour total. If the new utilization percentage meets the Contract requirement, the Contractor will be reported as meeting the requirement in good faith.

**Approving Good Faith Efforts**
The Contracting Agency will review submitted Good Faith Efforts and issue a determination. The Engineer may request additional information, documentation, evidence or similar in order to approve such efforts. A determination by the Engineer is final. The approved Good Faith Efforts will be loaded into the PWIA system by the Contracting Agency.

**Payment**
Payment will be made for the following Bid Items:

"Apprenticeship Incentive", by calculation
An incentive of $5,000 will be assessed with the Final Payment for Contractors who meet the Apprentice Utilization Requirement without a reduction by Good Faith Effort. For the purpose of providing a common proposal for all bidders, the Contracting Agency has entered an amount in the proposal to become a part of the total bid by the Contractor.

"Apprenticeship Penalty", by calculation.
Apprenticeship Hours will be measured for each hour of work performed by an apprentice as shown on the Monthly Apprentice Utilization Report, based on certified payrolls or the affidavits of wages paid, whichever is least. The percentage is not rounded up. For the purpose of providing a common proposal for all bidders, the Contracting Agency has entered an amount in the proposal to become a part of the total bid by the Contractor.

When the Contractor fails to meet the Apprenticeship goal of 15%, a penalty will be assessed for each hour that is not achieved, unless a Good Faith Effort is approved by the Contracting Agency.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Apprenticeship Utilization Penalty will be calculated as described below:

| Percent of goal met | Penalty per hour of unmet goal |
|---|---|
| 100% | $0.00 |
| 90% to 99% | $2.00 |
| 75% to 89% | $3.50 |
| 50% to 74% | $5.00 |
| 1% to 49% | $7.50 |
| 0% | $10.00 |

The Contractor shall include all related costs in the unit Bid prices of the Contract, included but not limited to implementing, developing, documenting, and administering an apprenticeship utilization program, recording and reporting hours and all other costs to comply with this provision.

## 1-07.9(5)A Required Documents

(July 8, 2024 APWA GSP)

This section is revised to read as follows:

All Statements of Intent to Pay Prevailing Wages, Affidavits of Wages Paid and Certified Payrolls, including a signed Statement of Compliance for Federal-aid projects, shall be submitted to the Engineer and to the State L&I online Prevailing Wage Intent & Affidavit (PWIA) system. When apprenticeship is a requirement of the contract, include in PWIA all apprentices.

## 1-07.9(6) Audits

(******)

Supplement this section with the following:

The Contractor shall maintain auditable records and accounts so as to facilitate the audit requirements described in Attachment II, Section A.33 of the Federal Funding Agreement in Appendix O.

## 1-07.11(2)A Equal Employment Opportunity (EEO) Responsibilities

(******)

Supplement this section with the following:

During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

(4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*Provided,* however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: *Provided,* That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

## 1-07.15(1) Spill Prevention, Control, and Countermeasures Plan
(******)

The Contractor shall immediately notify the City of any hazardous material spill. The project site is located within the Contracting Agency's Sanitary Control Area for potable water supply. The Contractor is responsible for aquifer water quality during the entire construction phase and should take all means necessary to protect the water quality, including but not limited to the requirements of these Special Provisions and Division 2 of the Technical Specifications.

The Contractor shall prepare a project-specific spill prevention, control, and countermeasures plan (SPCC Plan), and shall implement the plan for the duration of the project. No on-site construction activities may commence until the Contracting Agency accepts a SPCC Plan for the project. An SPCC Plan template and guidance information is available at https://wsdot.wa.gov/engineering-standards/environmental-guidance/stormwater-water-quality.

The SPCC Plan shall address all fuels, petroleum products, hazardous materials, and other materials defined in Chapter 447 of the WSDOT Environmental Manual M 31-11. Occupational safety and health requirements that may pertain to SPCC Plan implementation are contained in, but not limited to, WAC



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

296-824 and WAC 296-843. The SPCC Plan shall address conditions that may be required by Section 3406 of the current International Fire Code, or as approved by the local Fire Marshal.

**Implementation Requirements**

The Contractor shall update the SPCC Plan throughout project construction so that the written plan reflects actual site conditions and practices. The Contractor shall update the SPCC Plan at least annually and maintain a copy of the updated SPCC Plan on the project site. The Contractor shall fully implement the SPCC Plan, as accepted and updated, at all times.

**SPCC Plan Element Requirements**

The SPCC Plan shall set forth the following information in the following order:

1. Responsible Personnel – Identify the names, titles, and contact information for the personnel responsible for implementing and updating the plan and for responding to spills.
2. Spill Reporting – List the names and telephone numbers of the Federal, State, and local agencies the Contractor shall notify in the event of a spill as referenced in the abovementioned template.
3. Spill Prevention – Describe the following items:
   a. The contents and locations of spill response kits that the Contractor shall supply and maintain that are appropriately stocked, located in close proximity to hazardous materials and equipment, and immediately accessible.
   b. Security measures for potential spill sources to prevent accidental spills and vandalism.
   c. Site inspection procedures and frequency.
4. Spill Response – Outline the response procedures the Contractor shall follow for each scenario listed below, indicating that if hazardous materials are encountered or spilled during construction, the Contractor shall do everything possible to control and contain the material until appropriate measures can be taken. Include a description of the actions the Contractor shall take and the specific on-site spill response equipment that shall be used to assess the spill, secure the area, contain and eliminate the spill source, clean up spilled material, decontaminate equipment, and dispose of spilled and contaminated material:
   a. A spill of each type of hazardous material present.
   b. Stormwater that has come into contact with hazardous materials.
   c. A release or spill of any unknown preexisting contamination and contaminant sources (such as buried pipes or tanks) encountered during project Work.

**Payment**

If no bid item for "SPCC Plan" is included in the proposal, any work described in this section shall be incidental to the project.

## 1-07.18 Public Liability and Property Damage Insurance

Delete this section in its entirety, and replace it with the following:

## 1-07.18 Insurance

**(January 4, 2024 APWA GSP)**

### 1-07.18(1) General Requirements

A. The Contractor shall procure and maintain the insurance described in all subsections of section 1-07.18 of these Special Provisions, from insurers with a current A. M. Best rating of not less than A-:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

VII and licensed to do business in the State of Washington. The Contracting Agency reserves the right to approve or reject the insurance provided, based on the insurer's financial condition.

B. The Contractor shall keep this insurance in force without interruption from the commencement of the Contractor's Work through the term of the Contract and for thirty (30) days after the Physical Completion date, unless otherwise indicated below.

C. If any insurance policy is written on a claims-made form, its retroactive date, and that of all subsequent renewals, shall be no later than the effective date of this Contract. The policy shall state that coverage is claims made and state the retroactive date. Claims-made form coverage shall be maintained by the Contractor for a minimum of 36 months following the Completion Date or earlier termination of this Contract, and the Contractor shall annually provide the Contracting Agency with proof of renewal. If renewal of the claims made form of coverage becomes unavailable, or economically prohibitive, the Contractor shall purchase an extended reporting period ("tail") or execute another form of guarantee acceptable to the Contracting Agency to assure financial responsibility for liability for services performed.

D. The Contractor's Automobile Liability, Commercial General Liability and Excess or Umbrella Liability insurance policies shall be primary and non-contributory insurance as respects the Contracting Agency's insurance, self-insurance, or self-insured pool coverage. Any insurance, self-insurance, or self-insured pool coverage maintained by the Contracting Agency shall be excess of the Contractor's insurance and shall not contribute with it.

E. The Contractor shall provide the Contracting Agency and all additional insureds with written notice of any policy cancellation, within two business days of their receipt of such notice.

F. The Contractor shall not begin work under the Contract until the required insurance has been obtained and approved by the Contracting Agency

G. Failure on the part of the Contractor to maintain the insurance as required shall constitute a material breach of contract, upon which the Contracting Agency may, after giving five business days' notice to the Contractor to correct the breach, immediately terminate the Contract or, at its discretion, procure or renew such insurance and pay any and all premiums in connection therewith, with any sums so expended to be repaid to the Contracting Agency on demand, or at the sole discretion of the Contracting Agency, offset against funds due the Contractor from the Contracting Agency.

H. All costs for insurance shall be incidental to and included in the unit or lump sum prices of the Contract and no additional payment will be made.

I. Under no circumstances shall a wrap up policy be obtained, for either initiating or maintaining coverage, to satisfy insurance requirements for any policy required under this Section. A "wrap up policy" is defined as an insurance agreement or arrangement under which all the parties working on a specified or designated project are insured under one policy for liability arising out of that specified or designated project.

### 1-07.18(2) Additional Insured

All insurance policies, with the exception of Workers Compensation, and of Professional Liability and Builder's Risk (if required by this Contract) shall name the following listed entities as additional insured(s) using the forms or endorsements required herein:

- the Contracting Agency and its officers, elected officials, employees, agents, and volunteers,
- RH2 Engineering, Inc. and its employees and agents,
- Partnering Agencies included in the work.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The above-listed entities shall be additional insured(s) for the full available limits of liability maintained by the Contractor, irrespective of whether such limits maintained by the Contractor are greater than those required by this Contract, and irrespective of whether the Certificate of Insurance provided by the Contractor pursuant to 1-07.18(4) describes limits lower than those maintained by the Contractor.

For Commercial General Liability insurance coverage, the required additional insured endorsements shall be at least as broad as ISO forms CG 20 10 10 01 for ongoing operations and CG 20 37 10 01 for completed operations.

### 1-07.18(3) Subcontractors

The Contractor shall cause each subcontractor of every tier to provide insurance coverage that complies with all applicable requirements of the Contractor-provided insurance as set forth herein, except the Contractor shall have sole responsibility for determining the limits of coverage required to be obtained by subcontractors.

The Contractor shall ensure that all subcontractors of every tier add all entities listed in 1-07.18(2) as additional insureds, and provide proof of such on the policies as required by that section as detailed in 1-07.18(2) using an endorsement as least as broad as ISO CG 20 10 10 01 for ongoing operations and CG 20 37 10 01 for completed operations.

Upon request by the Contracting Agency, the Contractor shall forward to the Contracting Agency evidence of insurance and copies of the additional insured endorsements of each subcontractor of every tier as required in 1-07.18(4) Verification of Coverage.

### 1-07.18(4) Verification of Coverage

The Contractor shall deliver to the Contracting Agency a Certificate(s) of Insurance and endorsements for each policy of insurance meeting the requirements set forth herein when the Contractor delivers the signed Contract for the work. Failure of Contracting Agency to demand such verification of coverage with these insurance requirements or failure of Contracting Agency to identify a deficiency from the insurance documentation provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

Verification of coverage shall include:

1. An ACORD certificate or a form determined by the Contracting Agency to be equivalent.
2. Copies of all endorsements naming Contracting Agency and all other entities listed in 1-07.18(2) as additional insured(s), showing the policy number. The Contractor may submit a copy of any blanket additional insured clause from its policies instead of a separate endorsement.
3. Any other amendatory endorsements to show the coverage required herein.
4. A notation of coverage enhancements on the Certificate of Insurance shall not satisfy these requirements – actual endorsements must be submitted.

Upon request by the Contracting Agency, the Contractor shall forward to the Contracting Agency a full and certified copy of the insurance policy(s). If Builders Risk insurance is required on this Project, a full and certified copy of that policy is required when the Contractor delivers the signed Contract for the work.

### 1-07.18(5) Coverages and Limits

The insurance shall provide the minimum coverages and limits set forth below. Contractor's maintenance of insurance, its scope of coverage, and limits as required herein shall not be construed to limit the liability of the Contractor to the coverage provided by such insurance, or otherwise limit the Contracting Agency's recourse to any remedy available at law or in equity.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

All deductibles and self-insured retentions must be disclosed and are subject to approval by the Contracting Agency. The cost of any claim payments falling within the deductible or self-insured retention shall be the responsibility of the Contractor. In the event an additional insured incurs a liability subject to any policy's deductibles or self-insured retention, said deductibles or self-insured retention shall be the responsibility of the Contractor.

### 1-07.18(5)A Commercial General Liability

Commercial General Liability insurance shall be written on coverage forms at least as broad as ISO occurrence form CG 00 01, including but not limited to liability arising from premises, operations, stop gap liability, independent contractors, products-completed operations, personal and advertising injury, and liability assumed under an insured contract. There shall be no exclusion for liability arising from explosion, collapse or underground property damage.

The Commercial General Liability insurance shall be endorsed to provide a per project general aggregate limit, using ISO form CG 25 03 05 09 or an equivalent endorsement.

Contractor shall maintain Commercial General Liability Insurance arising out of the Contractor's completed operations for at least three years following Substantial Completion of the Work.

Such policy must provide the following minimum limits:

| | |
|---|---|
| $2,000,000 | Each Occurrence |
| $3,000,000 | General Aggregate |
| $3,000,000 | Products & Completed Operations Aggregate |
| $2,000,000 | Personal & Advertising Injury each offence |
| $2,000,000 | Stop Gap / Employers' Liability each accident |

### 1-07.18(5)B Automobile Liability

Automobile Liability shall cover owned, non-owned, hired, and leased vehicles; and shall be written on a coverage form at least as broad as ISO form CA 00 01. If the work involves the transport of pollutants, the automobile liability policy shall include MCS 90 and CA 99 48 endorsements.

Such policy must provide the following minimum limit:

| | |
|---|---|
| $1,000,000 | Combined single limit each accident |

### 1-07.18(5)C Workers' Compensation

The Contractor shall comply with Workers' Compensation coverage as required by the Industrial Insurance laws of the State of Washington.

## 1-07.23 Public Convenience and Safety

### 1-07.23(1) Construction Under Traffic

**(January 31, 2025 Lacey GSP)**

Section 1-07.23(1) is supplemented with the following:

The Contractor shall be responsible for removing permanent traffic signs as deemed necessary by the Engineer and shall install and maintain any temporary signs necessary for the safety of the public. The Contractor shall maintain pedestrian access at all times, without having pedestrians enter the travel lane.

Lane, shoulder, and roadway closures are only permitted as follows:

One lane of traffic shall remain open at all times.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Access to the Hawks Prairie Water Treatment Facility shall remain open at all times.

If the Engineer determines the permitted closure hours adversely affect traffic, the Engineer may adjust the hours accordingly. The Engineer will notify the Contractor in writing of any change in the closure hours. Exceptions to these restrictions are listed below and when applicable take precedence over closures listed above. The Engineer may also consider on a case-by-case basis additional exceptions following a written request by the Contractor.

Lane, ramp, shoulder, and roadway closures are not allowed on any of the following:

1. A holiday,

2. A holiday weekend; holidays that occur on Friday, Saturday, Sunday or Monday are considered a holiday weekend. A holiday weekend includes Saturday, Sunday, and the holiday.

3. After noon on the day prior to a holiday or holiday weekend, and

4. Before noon on the day after the holiday or holiday weekend.

All lane restrictions shall be held to a minimum time and length. Road closures will not be allowed except as shown in provided traffic control plans without additional approval. Lane closures shall comply with provided traffic control plans and these specifications. If the Contractor wishes to deviate from the approved plan, they shall submit a new traffic control plan to the Engineer at no additional cost to the agency a minimum of five working days prior to the proposed lane closure.

During non-working hours, Saturdays, Sundays, and Holidays, the Contractor shall keep all lanes open to traffic throughout the limits of the project with the lane and sidewalk area completely clear of all material, tools, personnel, and equipment as directed by the Engineer.

**Traffic Delays**
Delays to traffic shall be held to a minimum. When Automated Flagger Assistance Devices (AFADs) or flaggers are used to control traffic, traffic shall not be stopped for more than 10 minutes at any time. All traffic congestion shall be allowed to clear before traffic is delayed again.

If the delay becomes greater than 10 minutes, the Contractor shall immediately begin to take action to cease the operations that are causing the delays. If the 10 minute delay limit has been exceeded, as determined by the Engineer, the Contractor shall provide to the Engineer, a written proposal to revise their work operations to meet the 10 minute limit. This proposal shall be accepted by the Engineer prior to resuming any work requiring traffic control.

There shall be no delay to medical, fire, or other emergency vehicles. Preference shall also be given to school buses when school is in session. The Contractor shall alert all flaggers and personnel of this requirement.

**Advance Notification**
The Contractor shall notify the Engineer in writing of any traffic impacts related to lane closure, shoulder closure, sidewalk closure, or any combination for the week by 12:00 p.m. (noon) Wednesday the week prior to the stated impacts.

The Contractor shall notify the Engineer in writing ten working days in advance of any traffic impacts related to full roadway closure.

The Contractor shall notify the Engineer in writing of any changes to the stated traffic impacts a minimum of 48 hours prior to the traffic impacts.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Public Notification**

The Contractor shall furnish and install information signs that provide advance notification of a roadway closure a minimum of 5 working days prior to the closure. Sign locations, messages, letter sizes, and sign sizes are shown in the Plans.

The Contractor shall notify North Thurston School District and Intercity Transit, in writing, a minimum of 5 working days prior to each closure. The Contractor shall furnish copies of these notifications to the Engineer.

## 1-07.24 Rights of Way

**(July 23, 2015 APWA GSP)**

Delete this section and replace it with the following:

Street Right of Way lines, limits of easements, and limits of construction permits are indicated in the Plans. The Contractor's construction activities shall be confined within these limits, unless arrangements for use of private property are made.

Generally, the Contracting Agency will have obtained, prior to bid opening, all rights of way and easements, both permanent and temporary, necessary for carrying out the work. Exceptions to this are noted in the Bid Documents or will be brought to the Contractor's attention by a duly issued Addendum.

Whenever any of the work is accomplished on or through property other than public Right of Way, the Contractor shall meet and fulfill all covenants and stipulations of any easement agreement obtained by the Contracting Agency from the owner of the private property. Copies of the easement agreements may be included in the Contract Provisions or made available to the Contractor as soon as practical after they have been obtained by the Engineer.

Whenever easements or rights of entry have not been acquired prior to advertising, these areas are so noted in the Plans. The Contractor shall not proceed with any portion of the work in areas where right of way, easements or rights of entry have not been acquired until the Engineer certifies to the Contractor that the right of way or easement is available or that the right of entry has been received. If the Contractor is delayed due to acts of omission on the part of the Contracting Agency in obtaining easements, rights of entry or right of way, the Contractor will be entitled to an extension of time. The Contractor agrees that such delay shall not be a breach of contract.

Each property owner shall be given 48 hours notice prior to entry by the Contractor. This includes entry onto easements and private property where private improvements must be adjusted.

The Contractor shall be responsible for providing, without expense or liability to the Contracting Agency, any additional land and access thereto that the Contractor may desire for temporary construction facilities, storage of materials, or other Contractor needs. However, before using any private property, whether adjoining the work or not, the Contractor shall file with the Engineer a written permission of the private property owner, and, upon vacating the premises, a written release from the property owner of each property disturbed or otherwise interfered with by reasons of construction pursued under this contract. The statement shall be signed by the private property owner, or proper authority acting for the owner of the private property affected, stating that permission has been granted to use the property and all necessary permits have been obtained or, in the case of a release, that the restoration of the property has been satisfactorily accomplished. The statement shall include the parcel number, address, and date of



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

signature. Written releases must be filed with the Engineer before the Completion Date will be established.

# 1-08 PROSECUTION AND PROGRESS

Add the following new section:

## 1-08.0 Preliminary Matters

**(May 25, 2006 APWA GSP)**

Add the following new section:

## 1-08.0(1) Preconstruction Conference

**(July 8, 2024 APWA GSP)**

Prior to the Contractor beginning the work, a preconstruction conference will be held between the Contractor, the Engineer and such other interested parties as may be invited. The purpose of the preconstruction conference will be:

1. To review the initial progress schedule;
2. To establish a working understanding among the various parties associated or affected by the work;
3. To establish and review procedures for progress payment, notifications, approvals, submittals, etc.;
4. To review DBE Requirements, Training Plans, and Apprenticeship Plans, when applicable.
5. To establish normal working hours for the work;
6. To review safety standards and traffic control; and
7. To discuss such other related items as may be pertinent to the work.

The Contractor shall prepare and submit at the preconstruction conference the following:

1. A breakdown of all lump sum items;
2. A preliminary schedule of working drawing submittals; and
3. A list of material sources for approval if applicable.

### 1-08.0(1)A Preconstruction Video

**(January 31, 2025 Lacey GSP)**

Add the following new section:

The Contractor shall provide pre-construction video of the existing conditions for the construction area including all easements, streets, alleys, and driveways within the project area. Further, video shall include existing visible drainage structures, driveways, sidewalks, and other frontage improvements. The Contractor shall also provide pre-construction video of the existing conditions of each face of an existing structure (houses, garages, sheds, fences, etc.), within 30 feet of the construction area.

The Contractor shall provide a copy of the video, in electronic format, to the City prior to any construction.

All costs for providing and furnishing the pre-construction video shall be considered incidental to the Project and no other payment will be allowed.

## 1-08.0(2) Hours of Work

**(December 8, 2014 APWA GSP)**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Except in the case of emergency or unless otherwise approved by the Engineer, the normal working hours for the Contract shall be any consecutive 8-hour period between 7:00 a.m. and 6:00 p.m. Monday through Friday, exclusive of a lunch break. If the Contractor desires different than the normal working hours stated above, the request must be submitted in writing prior to the preconstruction conference, subject to the provisions below. The working hours for the Contract shall be established at or prior to the preconstruction conference.

All working hours and days are also subject to local permit and ordinance conditions (such as noise ordinances).

If the Contractor wishes to deviate from the established working hours, the Contractor shall submit a written request to the Engineer for consideration. This request shall state what hours are being requested, and why. Requests shall be submitted for review no later than 5 prior to the day(s) the Contractor is requesting to change the hours.

If the Contracting Agency approves such a deviation, such approval may be subject to certain other conditions, which will be detailed in writing. For example:

1. On non-Federal aid projects, requiring the Contractor to reimburse the Contracting Agency for the costs in excess of straight-time costs for Contracting Agency representatives who worked during such times. (The Engineer may require designated representatives to be present during the work. Representatives who may be deemed necessary by the Engineer include, but are not limited to: survey crews; personnel from the Contracting Agency's material testing lab; inspectors; and other Contracting Agency employees or third-party consultants when, in the opinion of the Engineer, such work necessitates their presence.)
2. Considering the work performed on Saturdays, Sundays, and holidays as working days with regard to the contract time.
3. Considering multiple work shifts as multiple working days with respect to contract time even though the multiple shifts occur in a single 24-hour period.
4. If a 4-10 work schedule is requested and approved the non-working day for the week will be charged as a working day.
5. If Davis Bacon wage rates apply to this Contract, all requirements must be met and recorded properly on certified payroll

## 1-08.0(2)A Lacey Hours of Work
**(September 25, 2024 Lacey GSP)**

Add the following new section:

Lacey Municipal Code (LMC) Chapter 14.38.010, prohibits outside construction activities between the hours of 9:00 p.m. and 7:00 a.m. in or adjacent to residential zones of the City unless otherwise specified. A waiver to this ordinance will not be allowed, except in case of emergency, or where operations are necessary during such hours in order to promote the safety of the traveling public as shown in theses specifications or as determined by the Engineer.

## 1-08.1(7)A Payment Reporting
**(November 25, 2024 APWA GSP)**

Delete this section and replace it with the following:

**1-08.1(7)A VACANT**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## 1-08.3(2)A Type A Progress Schedule
**(December 30, 2022 APWA GSP)**

Revise this section to read:

The Contractor shall submit five (5) copies of a Type A Progress Schedule no later than at the preconstruction conference, or some other mutually agreed upon submittal time. The schedule may be a critical path method (CPM) schedule, bar chart, or other standard schedule format. Regardless of which format used, the schedule shall identify the critical path. The Engineer will evaluate the Type A Progress Schedule and approve or return the schedule for corrections within 15 calendar days of receiving the submittal.

## 1-08.3(2)B Type B Progress Schedule
**(January 4, 2024 APWA GSP)**

Revise the first paragraph to read:

The Contractor shall submit a preliminary Type B Progress Schedule at or prior to the preconstruction conference. The preliminary Type B Progress Schedule shall comply with all of these requirements and the requirements of Section 1-08.3(2), except that it may be limited to only those activities occurring within the first 60-working days of the project.

Revise the first sentence of the second paragraph to read:

The Contractor shall submit five (5) copies of a Type B Progress Schedule depicting the entire project no later than 21-calendar days after the preconstruction conference.

## 1-08.3(2)D Preliminary Progress Schedule
**(January 4, 2024 APWA GSP)**

Revise the second paragraph to read:

1. The preliminary progress schedule shall be submitted no later than the preconstruction conference for all Type B and Type C progress schedules.

## 1-08.4 Prosecution of Work
**(July 23, 2015 APWA GSP)**

Delete this section in its entirety, and replace it with the following:

### 1-08.4 Notice to Proceed and Prosecution of Work

Notice to Proceed will be given after the contract has been executed and the contract bond and evidence of insurance have been approved and filed by the Contracting Agency. The Contractor shall not commence with the work until the Notice to Proceed has been given by the Engineer. The Contractor shall commence construction activities on the project site within ten days of the Notice to Proceed Date, unless otherwise approved in writing. The Contractor shall diligently pursue the work to the physical completion date within the time specified in the contract. Voluntary shutdown or slowing of operations



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

by the Contractor shall not relieve the Contractor of the responsibility to complete the work within the time(s) specified in the contract.

When shown in the Plans, the first order of work shall be the installation of high visibility fencing to delineate all areas for protection or restoration, as described in the Contract. Installation of high visibility fencing adjacent to the roadway shall occur after the placement of all necessary signs and traffic control devices in accordance with 1-10.1(2). Upon construction of the fencing, the Contractor shall request the Engineer to inspect the fence. No other work shall be performed on the site until the Contracting Agency has accepted the installation of high visibility fencing, as described in the Contract.

## 1-08.4(1) Order of Work
(******)

Add the following new section:

Prior to starting construction and issuance of notice to proceed by the City, the Contractor shall furnish the Contracting Agency with a schedule, sequence, and method of proceeding with the work. This schedule shall address all items herein and must be approved by the Contracting Agency prior to commencing any construction operations.

The Contractor shall provide access to the top of the center column during the first two weeks of the project to allow for structural inspection in accordance with section 13.50 of the Technical Specifications. The Contractor shall clean the top of the center column prior to the engineer's inspection. The Contractor shall coordinate with the owner to schedule the inspection.

The Contractor shall coordinate with the owner of the HAM radio equipment (Larry Watkinson, 360-561-3455, lwatkinson@comcast.net) prior to and throughout construction to schedule the removal, salvaging, and reinstallation of equipment. Equipment shall be salvaged as described in special provision 2-02.3.

The reservoir shall be online from June 1 through October 1. The Contractor may take the tank offline during this period with prior City approval. Approval shall be contingent upon the approval of a Progress Schedule. The Progress Schedule shall include a minimum 10-day period for disinfection, sampling, and testing of the reservoir prior to returning it to service as required to meet the requirements of this section.

The waterline between points 1501 & 1502, shown on sheet C08, may not be offline between May and September. Cut-in valves shall be installed at the locations shown on the Plans prior to any shutdown.

The Contractor shall coordinate booster pump shutdown with the Contracting agency a minimum of 10 working days prior to shutdown. The booster pump station shall not be offline for more than 4 consecutive hours.

The Contractor shall submit a disinfection and testing plan in accordance with Section 1.75.16.50 of the Technical Specifications and these specifications. The submitted disinfection plan shall only include valve operation and water quality testing procedures during Owner work hours (7 AM to 4:30 PM, Monday through Friday). The filling rate will vary based on available system water, but shall not exceed 4,000 gpm. The Plan shall include completion of the required coating inspections prior to disinfection and filling.

If the bacteria test detects e-coli, then the Contractor shall discharge all water from the tank and start the disinfection process over, including the submission of a new disinfection plan and schedule. The revised plan and schedule shall include provisions for emptying the tank. The existing on-site detention pond can only hold approximately 100,000 gallons and LOTT only allows an average of 25,000 gallons of water a day to be flushed into the sewer system to the treatment plants. It shall be the Contractors responsibility to



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

make arrangements to dispose of the water in stormwater systems, sanitary sewer, or other methods in accordance with and as required by applicable regulations and the Contracting Agency. Water containing a chlorine residual shall not be disposed of into the water system, stormwater system, or any surface watercourse.

The pre-startup checklist shall be completed before disinfection and testing (Section 1.75.16.50 of the Technical Specifications). Startup of the reservoir shall occur immediately after tank disinfection and testing. See Appendix H for the Pre-Startup and Startup checklists. Completion of each checklist item must be verified by City staff prior to proceeding to the next phase.

## 1-08.5 Time for Completion

(******)

This project shall be completed in accordance with the provisions of Section 1-08 of the Standard Specifications within 180 working days.

## 1-08.5 Time for Completion

(November 25, 2024 APWA GSP Option A)

Revise the third and fourth paragraphs to read:

Contract time shall begin on the first working day following the Notice to Proceed Date.

Each working day shall be charged to the contract as it occurs, until the contract work is physically complete. If Substantial Completion has been granted and all the authorized working days have been used, charging of working days will cease. Each week the Engineer will provide the Contractor a statement that shows the number of working days: (1) charged to the contract the week before; (2) specified for the Physical Completion of the contract; and (3) remaining for the Physical Completion of the contract. The statement will also show the nonworking days and any partial or whole day the Engineer declares as unworkable. The statement will be identified as a Written Determination by the Engineer. If the Contractor does not agree with the Written Determination of working days, the Contractor shall pursue the protest procedures in accordance with Section 1-04.5. By failing to follow the procedures of Section 1-04.5, the Contractor shall be deemed as having accepted the statement as correct. If the Contractor is approved to work 10 hours a day and 4 days a week (a 4-10 schedule) and the fifth day of the week in which a 4-10 shift is worked would ordinarily be charged as a working day then the fifth day of that week will be charged as a working day whether or not the Contractor works on that day.

Revise the sixth paragraph to read:

The Engineer will give the Contractor written notice of the Completion Date of the Contract after all the Contractor's obligations under the Contract have been performed by the Contractor. The following events must occur before the Completion Date can be established:

1. The physical Work on the project must be complete; and
2. The Contractor must furnish all documentation required by the Contract and required by law, to allow the Contracting Agency to process final acceptance of the contract. The following documents must be received by the Project Engineer prior to establishing a Completion Date:
   a. Certified Payrolls (per Section 1-07.9(5)).
   b. Material Acceptance Certification Documents
   c. Monthly Reports in DMCS of the amounts paid including the final payment confirmation to all firms required by Section 1-08.1(7)A if applicable Final Contract Voucher Certification



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

d. Copies of the approved "Affidavit of Prevailing Wages Paid" for the Contractor and all Subcontractors
e. A copy of the Notice of Termination sent to the Washington State Department of Ecology (Ecology); the elapse of 30 calendar days from the date of receipt of the Notice of Termination by Ecology; and no rejection of the Notice of Termination by Ecology. This requirement will not apply if the Construction Stormwater General Permit is transferred back to the Contracting Agency in accordance with Section 8-01.3(16).
f. Property owner releases per Section 1-07.24

## 1-08.6 Suspension of Work

(******)

Contract time may be suspended for procurement of critical materials (Procurement Suspension). In order to receive a Procurement Suspension, the Contractor shall within 21 calendar days after execution by the Contracting Agency, place purchase orders for all materials deemed critical by the Contracting Agency for physical completion of the contract. The Contractor shall provide copies of purchase orders for the critical materials. Such purchase orders shall disclose the purchase order date and estimated delivery dates for such critical material.

The Contractor shall show procurement of the materials anticipated to be critical materials as activities in the Progress Schedule. If approved Progress Schedule indicates that the materials procurement are critical activities, and if the Contractor has provided documentation that purchase orders are placed for the critical materials within the prescribed 21 calendar days, then contract time will be suspended upon physical completion of all critical work except that work dependent upon the critical materials. Items anticipated to be critical materials include but are not limited to:

Long lead items as identified in **Section 1-06.1(2).**

Charging of contract time will resume upon delivery of the critical materials to the Contractor or 90 calendar days, whichever occurs first.

Contract time may be suspended as required to keep the reservoir online during the peak demand season (from June 1 to October 1). In order to receive a suspension, the Contractor shall show taking the reservoir offline in the Progress Schedule. If the approved Progress Schedule indicates that taking the tank offline is a critical activity, then contract time will be suspended upon physical completion of all critical work except that work dependent upon taking the reservoir offline.

## 1-08.9 Liquidated Damages

**(March 3, 2021 APWA GSP, Option B)**

Revise the second and third paragraphs to read:

Accordingly, the Contractor agrees:

1. To pay (according to the following formula) liquidated damages for each working day beyond the number of working days established for Physical Completion, and

2. To authorize the Engineer to deduct these liquidated damages from any money due or coming due to the Contractor.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Liquidated Damages Formula**

LD=0.15C/T

Where:

LD = liquidated damages per working day (rounded to the nearest dollar)
C = original Contract amount
T = original time for Physical Completion

When the Contract Work has progressed to Substantial Completion as defined in the Contract, the Engineer may determine the Contract Work is Substantially Complete. The Engineer will notify the Contractor in writing of the Substantial Completion Date. For overruns in Contract time occurring after the date so established, the formula for liquidated damages shown above will not apply. For overruns in Contract time occurring after the Substantial Completion Date, liquidated damages shall be assessed on the basis of direct engineering and related costs assignable to the project until the actual Physical Completion Date of all the Contract Work. The Contractor shall complete the remaining Work as promptly as possible. Upon request by the Project Engineer, the Contractor shall furnish a written schedule for completing the physical Work on the Contract.

# 1-09 MEASUREMENT AND PAYMENT

## 1-09.2(1) General Requirements for Weighing Equipment
**(November 25, 2024 APWA GSP, Option B)**

Revise item 4 of the fifth paragraph to read:

4. Test results and scale weight records for each day's hauling operations are provided to the Engineer daily. Reporting shall utilize WSDOT form 422-027LP, Scaleman's Daily Report, unless the printed ticket contains the same information that is on the Scaleman's Daily Report Form. The scale operator must provide AM and/or PM tare weights for each truck on the printed ticket

## 1-09.2(1) General Requirements for Weighing Equipment
**(July 8, 2024 APWA GSP, Option C)**

Revise the sixth and seventh paragraph to read:

Trucks and Tickets – Each truck to be weighed shall bear a unique identification number. This number shall be legible and in plain view of the scale operator. The Contractor shall provide Electronic tickets or Physical tickets for all weighed materials. All Tickets shall, regardless of medium, at a minimum, contain the following information:

1. Date of haul;
2. Contract number;
3. Contract unit Bid item;
4. Unit of measure;
5. Identification number of hauling vehicle; and
6. Weight delivered:
   a. Net weight in the case of batch and hopper scales.
   b. Gross weight, tare (a.m. and p.m. minimum) and net weight in the case of platform scales (tare may be omitted if a tare beam is used).



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

c. Approximate load out weight in the case of belt conveyor scales.

Electronic-tickets shall be uploaded to the designated site so that they can be accessed by the material receiver at the material delivery point. Physical tickets shall be handed to the inspector at the delivery point at the time materials are delivered. The material delivery point is defined as the location where the material is incorporated into the permanent Work. The Contractor's representative shall make report summaries available to the Engineer's designated receiver, not later than the end of shift, for reconciliation. Tickets for loads not verified as delivered will receive no pay.

## 1-09.2(5) Measurement
**(December 30, 2022 APWA GSP)**

Revise the first paragraph to read:

Scale Verification Checks – At the Engineer's discretion, the Engineer may perform verification checks on the accuracy of each batch, hopper, or platform scale used in weighing contract items of Work.

## 1-09.6 Force Account
**(October 10, 2008 APWA GSP)**

Supplement this section with the following:

The Contracting Agency has estimated and included in the Proposal, dollar amounts for all items to be paid per force account, only to provide a common proposal for Bidders. All such dollar amounts are to become a part of Contractor's total bid. However, the Contracting Agency does not warrant expressly or by implication, that the actual amount of work will correspond with those estimates. Payment will be made on the basis of the amount of work actually authorized by Engineer.

## 1-09.9 Payments
**(July 8, 2024, APWA GSP, Option B)**

Delete the fourth paragraph and replace it with the following:

Progress payments for completed work and material on hand will be based upon progress estimates prepared by the Engineer. A progress estimate cutoff date will be established at the preconstruction conference.

The initial progress estimate will be made not later than 30 days after the Contractor commences the work, and successive progress estimates will be made every month thereafter until the Completion Date. Progress estimates made during progress of the work are tentative, and made only for the purpose of determining progress payment. The progress estimates are subject to change at any time prior to the calculation of the Final Payment.

The value of the progress estimate will be the sum of the following:

1. Unit Price Items in the Bid Form — the approximate quantity of acceptable units of work completed multiplied by the unit price.
2. Lump Sum Items in the Bid Form — based on the approved Contractor's lump sum breakdown for that item, or absent such a breakdown, based on the Engineer's determination.
3. Materials on Hand — 100 percent of invoiced cost of material delivered to Job site or other storage area approved by the Engineer.
4. Change Orders — entitlement for approved extra cost or completed extra work as determined by the Engineer.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Progress payments will be made in accordance with the progress estimate less:

1. Retainage per Section 1-09.9(1), on non FHWA-funded projects;
2. The amount of Progress Payments previously made; and
3. Funds withheld by the Contracting Agency for disbursement in accordance with the Contract Documents.

Progress payments for work performed shall not be evidence of acceptable performance or an admission by the Contracting Agency that any work has been satisfactorily completed. The determination of payments under the contract will be final in accordance with Section 1-05.1.

### 1-09.9 Payments

**(November 20, 2020 Lacey GSP)**

Section 1-09.9 is supplemented with the following:

Progress payments and the Final Contract Voucher Certification (FCVC) will be transmitted electronically to the Contractor for signature. The Contractor shall apply all signatures electronically using the software provided by the Contracting Agency. Within 21 days of execution of the Contract, the Contractor shall submit the names, email addresses, and text-message capable phone numbers for the authorized signers and shall bear the name, phone number and email of the officer providing this authorization. Delegation of authority to sign progress payments and the FCVC shall be by the officer authorized to sign the Contract.

### 1-09.11(3) Time Limitation and Jurisdiction

**(December 30, 2022 APWA GSP)**

Revise this section to read:

For the convenience of the parties to the Contract it is mutually agreed by the parties that all claims or causes of action which the Contractor has against the Contracting Agency arising from the Contract shall be brought within 180 calendar days from the date of final acceptance (Section 1-05.12) of the Contract by the Contracting Agency; and it is further agreed that all such claims or causes of action shall be brought only in the Superior Court of the county where the Contracting Agency headquarters is located, provided that where an action is asserted against a county, RCW 36.01.050 shall control venue and jurisdiction. The parties understand and agree that the Contractor's failure to bring suit within the time period provided, shall be a complete bar to all such claims or causes of action. It is further mutually agreed by the parties that when claims or causes of action which the Contractor asserts against the Contracting Agency arising from the Contract are filed with the Contracting Agency or initiated in court, the Contractor shall permit the Contracting Agency to have timely access to all records deemed necessary by the Contracting Agency to assist in evaluating the claims or action.

### 1-09.13(1) General

**(January 19, 2022 APWA GSP)**

Revise this section to read:

Prior to seeking claims resolution through arbitration or litigation, the Contractor shall proceed in accordance with Sections 1-04.5 and 1-09.11. The provisions of Sections 1-04.5 and 1-09.11 must be complied with in full as a condition precedent to the Contractor's right to seek claim resolution through binding arbitration or litigation.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Any claims or causes of action which the Contractor has against the Contracting Agency arising from the Contract shall be resolved, as prescribed herein, through binding arbitration or litigation.

The Contractor and the Contracting Agency mutually agree that those claims or causes of action which total $1,000,000 or less, which are not resolved by mediation, shall be resolved through litigation unless the parties mutually agree in writing to resolve the claim through binding arbitration.

The Contractor and the Contracting Agency mutually agree that those claims or causes of action in excess of $1,000,000, which are not resolved by mediation, shall be resolved through litigation unless the parties mutually agree in writing to resolve the claim through binding arbitration.

### 1-09.13(3)A Arbitration General
**(January 19, 2022 APWA GSP)**

Revise the third paragraph to read:

The Contracting Agency and the Contractor mutually agree to be bound by the decision of the arbitrator, and judgment upon the award rendered by the arbitrator may be entered in the Superior Court of the county in which the Contracting Agency's headquarters is located, provided that where claims subject to arbitration are asserted against a county, RCW 36.01.050 shall control venue and jurisdiction of the Superior Court. The decision of the arbitrator and the specific basis for the decision shall be in writing. The arbitrator shall use the Contract as a basis for decisions.

### 1-09.13(4) Venue for Litigation
**(December 30, 2022 APWA GSP)**

Revise this section to read:

Litigation shall be brought in the Superior Court of the county in which the Contracting Agency's headquarters is located, provided that where claims are asserted against a county, RCW 36.01.050 shall control venue and jurisdiction of the Superior Court. It is mutually agreed by the parties that when litigation occurs, the Contractor shall permit the Contracting Agency to have timely access to all records deemed necessary by the Contracting Agency to assist in evaluating the claims or action.

## 1-10 TEMPORARY TRAFFIC CONTROL

### 1-10.5(1) Lump Sum Bid for Project (No Unit Items)
**(November 4, 2024 WSDOT GSP)**

In Section 1-10.5(1), the paragraph following the bid item "Project Temporary Traffic Control", lump sum is revised to read:

The lump sum Contract payment shall be full compensation for all costs incurred by the Contractor in performing the Contract Work defined in Section 1-10 except for costs compensated by Bid Proposal items reinstated as described in Section 1-10.5(3).

## 2-01 CLEARING, GRUBBING, AND ROADSIDE CLEANUP

### 2-01.1 Description
**(October 16, 2009 Lacey GSP)**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Supplement this section with the following:

The City of Lacey is a Tree City USA, and has deemed it necessary to protect all trees to the best of their ability. Only the trees that are evaluated by a certified Arborist as being diseased or detrimental to the project shall be removed as shown in the plans. The Contractor shall conduct a site review noting all trees within the construction zone prior to submitting a bid. Ease of construction, spoils, or stockpiling needs shall not justify tree removal.

A high visibility fence shall be installed around all trees and vegetation as required by the Engineer prior to beginning work. The Contractor shall be responsible for installing, maintaining and removing the high visibility fence as required.

Disposal of all organic waste shall be by Disposal Method No. 2. Disposal Method No. 1 and No. 3 will not be permitted in this contract. The City of Lacey encourages recycling of organic material at a certified organic recycling center.

The Contractor shall take all precautions necessary to protect the public, property, trees, and natural vegetation from harm. Any damage to utilities or other structures on public right-of-way or private property shall be restored by the Contractor or authorized agent at the Contractor's expense.

### 2-01.5 Payment
(October 16, 2009 Lacey GSP)

Modify this section with the following:

The unit contract price per acre or lump sum for "Clearing and Grubbing" shall be full pay for all work described in this section including "Roadside Cleanup". If no bid item for "Clearing and Grubbing" or "High Visibility Fence" is included in the proposal, any work described in this section shall be incidental to the project.

## 2-02 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

### 2-02.1 Description
(******)

Supplement this section with the following:

The following items plus all materials resulting from incidental work including clearing; grubbing and roadside cleanup shall be removed from the job site, disposed of in a waste site or when noted on the plans or specifications, delivered to the City.

This work consists of but shall not be limited to the following items:

| | |
|---|---|
| Pavement | Bollards |
| Sidewalk | Propane Tank(s) |
| Concrete | Foundations |
| Curb and Gutter | Fencing |
| Catch Basins | Manholes |
| Storm Sewer Pipe | Culverts |
| Storm Sewer Outfalls | Refuse |
| Water Pipe | Fire Hydrants |
| Water Valves and Fittings | Valve Boxes |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Meter Boxes
Trees
Rocks and Stumps
CMU Wall
Vaults
Radio Control Panel
Radio Antennas
Silt Fence
Roadside Cleanup
Air release valves
Trash Rack
Roadside Cleanup
Radio Cable and Conduit

The Contractor shall provide the temporary fencing immediately upon removal of the existing fence and will maintain the temporary fence until the permanent fence is installed.

## 2-02.3 Construction Requirements
(******)

Supplement this section with the following:

Where shown on the plans, catch basins, manholes, and inlets may be removed to a point 5 feet below the subgrade and the cavity filled with gravel borrow compacted to 95% of maximum density. Where existing pipe is to be abandoned, the Contractor shall seal the pipe with commercial concrete.

Where shown on the plans, vaults shall be removed entirely.

The removal of an existing hydrant assembly shall consist of turning off the gate valve, removing the existing hydrant assembly, valve box and anything else that is within 2' of the finished grade. Cap or plug the existing valve with a watertight concrete grout or blind flange after the existing hydrant assembly and spool has been removed. The Contractor shall return the existing fire hydrant assembly to the City. If the existing hydrant is damaged due to the Contractor's negligence, the Contractor shall replace the hydrant with a new hydrant.

The Contractor shall salvage the existing Radio Control Cabinet/Panel, coaxial cables, and antennas in coordination with the owner (Larry Watkinson, 360-561-3455, lwatkinson@comcast.net) of the equipment as outlined in special provision 1-08.4(1). Salvaged radio equipment shall be delivered to the Contracting Agency to be stored on site. The Contractor shall provide access for the owner the disconnect the coaxial cables at the base of the reservoir and the cables/conduit feeding the control panel. If the existing radio equipment is damaged due to the Contractor's negligence, the Contractor shall replace the equipment.

Upon completion of the reservoir foundation work, the Contractor shall reinstall the radio equipment in coordination with the owner.

The Contractor shall use due care and caution during removal and transportation of the salvaged material so that no damage occurs to the salvaged material. Any damage caused by the Contractor shall be deducted from the amount due.

## 2-02.3(3) Removal of Pavement, Sidewalks, Curbs, and Gutters
(September 25, 2024 Lacey GSP)

Supplement this section with the following:

In removing pavement, sidewalks, and curbs, the Contractor shall:

1. Mark all cut lines in the field and have the Engineer approve them prior to commencing cutting operations. The Engineer reserves the right to adjust removal to the nearest construction joint.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

2. Make a vertical saw cut between any existing pavement, sidewalk, or curb that is to remain and the portion to be removed.

3. All sawcuts shall be continuous and made with saws designed specifically for this purpose; no skip cutting, wheel cutting, or jack hammering will be allowed unless given prior approval by the Engineer.

4. Replace at no expense to the Contracting Agency any pavement designated to remain that is damaged during the removal of other pavement. All damaged sidewalks and curbs shall be replaced to the nearest existing joint.

5. Haul all broken–up pieces of pavement, sidewalks, and curbs to an off-project disposal site.

All transitions to existing asphalt or cement concrete driveways, parking lots, curb and gutter and walkways shall be vertically sawcut full-depth with straight, uniform edges. Existing asphalt pavement roadway edge may be cut with a wheel, provided the wheel cut is full depth and no damage occurs to the pavement which is to remain. Neither impact tools nor pavement breakers may be used for trench crossing of existing pavement. Trench crossing of existing pavement shall be vertically sawcut.

When sawcutting the existing roadway is needed to widen the road to perform excavation, the Contractor shall take extra precaution to make a neat, uniform cut, and shall sawcut pavement to full depth, regardless of number of passes necessary. Compaction of asphalt near the sawcut is critical and a vertical, neat line sawcut is required. If in the opinion of the Engineer, the cut is not satisfactory due to Contractor's workmanship or equipment, or if the sawcut becomes damaged and irregular, the Contractor shall fix the problem to the satisfaction of the Engineer, at Contractor's own expense.

Existing asphalt pavement shall be expected to have an 8-inch thickness. No additional compensation for saw cutting shall be considered unless the depth of the total pavement is greater than 12-inches.

The Contractor may grind the existing pavement in lieu of excavation and haul. Spoils from grinding can be stockpiled and used and paid for per sections 4-04.3(12), 4-04.4 and 4-04.5. If the Contractor elects to grind and stockpile the existing pavement, all costs and expenses necessary to furnish all labor, equipment, tools and materials shall be incidental to other bid items and no additional compensation will be allowed.

### 2-02.5 Payment
**(April 1, 2024 Lacey GSP)**

Delete this section and replace with the following:

"Removal of Structures and Obstructions", lump sum.
The lump sum contract price for these bid items shall be full compensation for all labor, equipment and materials necessary to complete the requirements of this section.

## 2-03 ROADWAY EXCAVATION AND EMBANKMENT

### 2-03.3(7)C Contractor-Provided Disposal Site
**(October 16, 2009 Lacey GSP)**

Supplement this section with the following:

The Contracting Agency has not provided a waste site for disposal of excess materials and debris.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### 2-03.3(14)C Compacting Earth Embankments
(October 29, 2010 Lacey GSP)

Supplement this section with the following:

The Contractor shall be required to compact all embankments in accordance with Method C as described in Section 2-03.3(14) C of the Standard Specifications.

### 2-03.3(14)E Unsuitable Foundation Excavation
(October 29, 2010 Lacey GSP)

Supplement this section with the following:

The Contractor shall excavate to stable material and backfill in lifts with Crushed Surfacing Base Course or Gravel Borrow as identified by the Engineer.

If the Engineer identifies additional excavation to a depth greater than what is shown in the Plans, it shall be paid for by the bid item "Unsuitable Foundation Excavation Incl. Haul". If the Contractor excavates to a depth beyond that shown in the Plans without the Engineer's approval, all costs shall be at the Contractor's expense.

### 2-03.4 Measurement
(October 29, 2010 Lacey GSP)

Supplement this section with the following:

The quantity of the following items to be paid for on this project shall be quantities shown on the bid proposal:

"Embankment Compaction", per cubic yard.

The quantities in the bid proposal are based on a computer-generated earthwork calculated on the existing ground survey. The quantities do not incorporate expansion, clearing and grubbing, or construction methodology. These values are listed for the convenience of the Contractor in determining the volume of work involved as calculated by the Engineer and are not guaranteed to be accurate. The prospective bidders shall verify these quantities prior to submitting the bid. A digital copy of the survey is available to prospective bidders from the Contracting Agency at the Contractor's request. No adjustments will be made in these quantities although the actual quantities may deviate from those listed.

### 2-03.5 Payment
(September 25, 2024 Lacey GSP)

Supplement this section with the following:

"Embankment Compaction", per cubic yard.
The unit contract price per cubic yard for "Embankment Compaction" shall be full pay for all labor, material, and equipment required to excavate, load, place, haul, or otherwise dispose of the material.

## 2-05 TRENCH SAFETY SYSTEM
(October 16, 2009 Lacey GSP)



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Add the following new section:

### 2-05.1 Description

This work consists of furnishing, utilizing, moving, and maintaining a trench safety system.

### 2-05.3 Construction Requirements

The Contractor shall comply with all applicable state laws, OSHA, WISHA requirements, and Department of Labor and Industries regulations governing trench excavation and pipe laying.

If extra excavation is used in lieu of, or in addition to shoring, cribbing, trench shields, or trench boxes, and select backfill material is required in the trench zone, then select backfill shall be used in the extra excavation zone.

### 2-05.4 Measurement

Trench safety system shall be paid for per lump sum regardless of the type, size and quantity used.

### 2-05.5 Payment

The lump sum contract price for "Trench Safety System" shall be full compensation for all labor, tools, equipment, and materials necessary to comply with the requirements stated above.

## 2-07 WATERING

### 2-07.3 Construction Requirements
(October 16, 2009 Lacey GSP)

Supplement this section with the following:

If the Contractor anticipates the use of City water, the Contractor shall apply for a water meter through the City of Lacey. Any damage rendered to the meter shall be repaired or replaced by the Contracting Agency and those costs deducted from monies due to the Contractor. All water used shall be metered and used sparingly for the entire length of the project. The Contractor will not be charged for water used on the project. The meter shall be returned promptly at the end of the project.

The Contractor is responsible for complying with backflow prevention requirements, which may include but are not limited to providing a certified air gap or reduced pressure backflow assembly (RPBA).

The Contractor shall use the water to keep the project site clean and to control dust during and after construction hours as determined by the Engineer.

### 2-07.4 Measurement
(October 16, 2009 Lacey GSP)

Delete and replace this section with the following:

The Contractor shall apply for a construction meter through the Contracting Agency. All water used shall be measured with the Contracting Agency supplied meter.

### 2-07.5 Payment
(February 14, 2023 Lacey GSP)



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Delete and replace this section with the following:

The Contractor will not be charged for water used on this project. A construction meter will also be provided for a deposit and can be obtained at the City of Lacey Maintenance Service Center. Any costs to repair meters damaged by the Contractor shall be recovered from monies due the Contractor.

All costs to use or apply water as directed by the Engineer, including but not limited to supplying tank trucks, reduced pressure backflow assemblies (RPBA), and certification of approved backflow prevention methods, shall be considered incidental to the project and no other payment will be allowed.

## 2-08 DUST CONTROL

**(October 16, 2009 Lacey GSP)**

Add the following new sections:

### 2-08.1 Description

This work consists of furnishing and applying Magnesium Chloride solution for dust control as the Engineer requires.

### 2-08.2 Materials

Magnesium Chloride compound shall be combined with water per the manufacturer's specifications for dust control applications.

### 2-08.3 Construction Requirements

The Contractor shall apply magnesium chloride solution by means of tank trucks equipped with spray bars. Spray controls shall ensure that the solution flows evenly and in the amounts required by the manufacturer's recommendation and directed by the Engineer.

### 2-08.4 Measurement

"Dust Control" per MGAL, shall be measured by tanks or tank trucks of known capacity or by meters approved by the Engineer. The Contractor shall supply and install any meters at no expense to the Contracting Agency.

### 2-08.5 Payment

"Dust Control", per MGAL.

The unit contract price per MGAL for "Dust Control" shall be full pay for all labor, materials, tools, and equipment necessary to furnish, haul, and apply the magnesium chloride solution.

## 2-09 STRUCTURE EXCAVATION

### 2-09.3(1)E Backfilling

**(January 31, 2025 Lacey GSP)**

Supplement this section with the following:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The Controlled Density Fill will require 24 hours of cure time, or as directed by the Engineer. Prior to backfill, all appurtenances shall be covered with 11 mill plastic as directed by the Engineer. The Contractor shall have a steel plate cover placed and anchored over the trench until the Engineer determines the mixture is sufficiently cured, so that a temporary or permanent patch can be placed. This process shall be coordinated so that there will be minimum inconvenience to the public.

### 2-09.5 Payment
**(October 16, 2009 Lacey GSP)**

Modify this section with the following:

Structure Excavation Including Haul, and Shoring or Extra Excavation shall be incidental to the structure to be constructed unless a bid item is provided.

## 2-14 DEWATERING
**(November 20, 2020 Lacey GSP Option B)**

Add the following new sections:

### 2-14.1 Description

This work consists of furnishing all labor, tools, equipment, and materials required for dewatering as the work and Engineer requires to maintain a dry excavation by diverting or removing both groundwater and surface water.

### 2-14.3 Construction Requirements

Excavations must be kept free of water. The Contractor must control surface run-off and groundwater so as to prevent entry or collection of water in excavations and to maintain the undisturbed state of the native subgrade.

The Contractor must submit the method and installation of the dewatering system to the Engineer at least 20 working days prior to installation of dewatering systems.

Disposal of the water must not cause injury to public or private property, or nuisance to the public. Sufficient pumping and power equipment in good working condition must be available at all times for all emergencies, including power outage. Competent personnel must be available at all times for the operation of the dewatering system. Water discharge must comply with required permits from the City of Lacey and/or Thurston County, state and federal agencies as appropriate, and be conducted per Section 8-01.

### 2-14.5 Payment

"Dewatering", by force account as provided in Section 1-09.6. "Dewatering" shall be full pay for submitting a Dewatering Plan, furnishing all labor, tools, equipment, and materials required for dewatering, all Work required during construction and to keep the work area dry during construction, and backfilling as specified. This shall also include removal of all dewatering equipment and materials, backfill and restoration, and any additional worked deemed necessary by the Engineer. To provide a common proposal for all bidders, the Contracting Agency has entered an amount in the Proposal to become a part of the Contractor's total Bid.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 5-04 HOT MIX ASPHALT

## 5-04.1 Description

**(January 31, 2023 APWA GSP)**

Delete this entire section and replace it with the following:

This Work shall consist of providing and placing one or more layers of plant-mixed hot mix asphalt (HMA) on a prepared foundation or base in accordance with these Specifications and the lines, grades, thicknesses, and typical cross-sections shown in the Plans. The manufacture of HMA may include warm mix asphalt (WMA) processes in accordance with these Specifications. WMA processes include organic additives, chemical additives, and foaming.

HMA shall be composed of asphalt binder and mineral materials as may be required, mixed in the proportions specified to provide a homogeneous, stable, and workable mixture.

## 5-04.2 Materials

**(October 30, 2018 Lacey GSP)**

Delete this entire section and replace it with the following:

Materials shall meet the requirements of the following sections:

| | |
|---|---|
| Asphalt Binder | 9-02.1(4) |
| Cationic Emulsified Asphalt | 9-02.1(6) |
| Anti-Stripping Additive | 9-02.4 |
| HMA Additive | 9-02.5 |
| Aggregates | 9-03.8 |
| Recycled Asphalt Pavement | 9-03.8(3)B |
| Mineral Filler | 9-03.8(5) |
| Recycled Material | 9-03.21 |
| Portland Cement | 9-01 |
| Sand | 9-03.1(2)<br>(As noted in 5-04.3(5)C for crack sealing) |
| Joint Sealant | 9-04.2 |
| Foam Backer Rod | 9-04.2(3)A |

The Contract documents may establish that the various mineral materials required for the manufacture of HMA will be furnished in whole or in part by the Contracting Agency. If the documents do not establish the furnishing of any of these mineral materials by the Contracting Agency, the Contractor shall be required to furnish such materials in the amounts required for the designated mix. Mineral materials include coarse and fine aggregates, and mineral filler.

Reclaimed/recycled asphalt pavement and/or shingles (RAP and/or RAS) will not be allowed on this project.

The grade of asphalt binder shall be as required by the Contract. Blending of asphalt binder from different sources is not permitted.

Production of aggregates shall comply with the requirements of Section 3-01.
Preparation of stockpile site, the stockpiling of aggregates, and the removal of aggregates from stockpiles shall comply with the requirements of Section 3-02.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## 5-04.2(1) How to Get an HMA Mix Design on the QPL
**(January 31, 2023 APWA GSP)**

Delete this entire section and replace it with the following:

If the Contractor wishes to submit a mix design for inclusion in the Qualified Products List (QPL), please follow the WSDOT process outlined in Standard Specification 5-04.2(1).

## 5-04.2(1)A
Delete this entire section

## 5-04.2(2) Mix Design – Obtaining Project Approval
**(January 31, 2023 APWA GSP)**

Delete this entire section and replace it with the following:

No paving shall begin prior to the approval of the mix design by the Engineer.

Nonstatistical evaluation will be used for all HMA not designated as Commercial HMA in the Contract documents.

Commercial evaluation will be used for Commercial HMA and for other classes of HMA in the following applications: sidewalks, road approaches, ditches, slopes, paths, trails, gores, prelevel, temporary pavement, and pavement repair. Other nonstructural applications of HMA accepted by commercial evaluation shall be as approved by the Project Engineer. Sampling and testing of HMA accepted by commercial evaluation will be at the option of the Project Engineer. The Proposal quantity of HMA that is accepted by commercial evaluation will be excluded from the quantities used in the determination of nonstatistical evaluation.

Nonstatistical Mix Design. Fifteen days prior to the first day of paving the Contractor shall provide one of the following mix design verification certifications for Contracting Agency review;

- The WSDOT Mix Design Evaluation Report from the current WSDOT QPL, or one of the mix design verification certifications listed below.
- The proposed HMA mix design on WSDOT Form 350-042 with the seal and certification (stamp & signature) of a valid licensed Washington State Professional Engineer.
- The Mix Design Report for the proposed HMA mix design developed by a qualified City or County laboratory that is within one year of the approval date.

The mix design shall be performed by a lab accredited by a national authority such as Laboratory Accreditation Bureau, L-A-B for Construction Materials Testing, The Construction Materials Engineering Council (CMEC's) ISO 17025 or AASHTO Accreditation Program (AAP) and shall supply evidence of participation in the AASHTO: resource proficiency sample program.

Mix designs for HMA accepted by Nonstatistical evaluation shall:

- Be designed for 4.45 million equivalent single axle loads (ESALs).
- Have the aggregate structure and asphalt binder content determined in accordance with WSDOT Standard Operating Procedure 732 and meet the requirements of Sections 9-03.8(2), except that Hamburg testing for ruts and stripping are at the discretion of the Engineer, and 9-03.8(6).
- Have anti-strip requirements, if any, for the proposed mix design determined in accordance with AASHTO T 283 or T 324 or based on historic anti-strip and aggregate source compatibility from previous WSDOT lab testing.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

At the discretion of the Engineer, agencies may accept verified mix designs older than 12 months from the original verification date with a certification from the Contractor that the materials and sources are the same as those shown on the original mix design.

Commercial Evaluation Mix Design. Approval of a mix design for "Commercial Evaluation" will be based on a review of the Contractor's submittal of WSDOT Form 350-042 (for commercial mixes, AASHTO T 324 evaluation is not required) or a Mix Design from the current WSDOT QPL or from one of the processes allowed by this section. Testing of the HMA by the Contracting Agency for mix design approval is not required.

For the Bid Item Commercial HMA, the Contractor shall select a class of HMA and design level of ESALs appropriate for the required use.

### 5-04.2(2)A Changes to the Job Mix Formula

Delete this section

### 5-04.2(2)B Using Warm Mix Asphalt Processes

**(January 31, 2023 APWA GSP)**

Delete this entire section and replace it with the following:

The Contractor may elect to use additives that reduce the optimum mixing temperature or serve as a compaction aid for producing HMA. Additives include organic additives, chemical additives and foaming processes. The use of Additives is subject to the following:

- Do not use additives that reduce the mixing temperature more than allowed in Section 5-04.3(6) in the production of mixtures.
- Before using additives, obtain the Engineer's approval using WSDOT Form 350-076 to describe the proposed additive and process.

## 5-04.3 Construction Requirements

### 5-04.3(1) Weather Limitations

**(January 31, 2023 APWA GSP)**

Delete this entire section and replace it with the following:

Do not place HMA for wearing course on any Traveled Way beginning October 1st through March 31st of the following year without written concurrence from the Engineer.

Do not place HMA on any wet surface, or when the average surface temperatures are less than those specified below, or when weather conditions otherwise prevent the proper handling or finishing of the HMA.

Minimum Surface Temperature for Paving

| Compacted Thickness (Feet) | Wearing Course | Other Courses |
|---|---|---|
| Less than 0.10 | 55°F | 45°F |
| 0.10 to .20 | 45°F | 35°F |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | |
|---|---|---|
| More than 0.20 | 35°F | 35°F |

## 5-04.3(3) Equipment

### 5-04.3(3)A Mixing Plant
**(January 31, 2023 APWA GSP)**

Delete this entire section and replace it with the following:

Plants used for the preparation of HMA shall conform to the following requirements:

1. Equipment for Preparation of Asphalt Binder – Tanks for the storage of asphalt binder shall be equipped to heat and hold the material at the required temperatures. The heating shall be accomplished by steam coils, electricity, or other approved means so that no flame shall be in contact with the storage tank. The circulating system for the asphalt binder shall be designed to ensure proper and continuous circulation during the operating period. A valve for the purpose of sampling the asphalt binder shall be placed in either the storage tank or in the supply line to the mixer.

2. Thermometric Equipment – An armored thermometer, capable of detecting temperature ranges expected in the HMA mix, shall be fixed in the asphalt binder feed line at a location near the charging valve at the mixer unit. The thermometer location shall be convenient and safe for access by Inspectors. The plant shall also be equipped with an approved dial-scale thermometer, a mercury actuated thermometer, an electric pyrometer, or another approved thermometric instrument placed at the discharge chute of the drier to automatically register or indicate the temperature of the heated aggregates. This device shall be in full view of the plant operator.

3. Heating of Asphalt Binder – The temperature of the asphalt binder shall not exceed the maximum recommended by the asphalt binder manufacturer nor shall it be below the minimum temperature required to maintain the asphalt binder in a homogeneous state. The asphalt binder shall be heated in a manner that will avoid local variations in heating. The heating method shall provide a continuous supply of asphalt binder to the mixer at a uniform average temperature with no individual variations exceeding 25°F. Also, when a WMA additive is included in the asphalt binder, the temperature of the asphalt binder shall not exceed the maximum recommended by the manufacturer of the WMA additive.

4. Sampling and Testing of Mineral Materials – The HMA plant shall be equipped with a mechanical sampler for the sampling of the mineral materials. The mechanical sampler shall meet the requirements of Section 1-05.6 for the crushing and screening operation. The Contractor shall provide for the setup and operation of the field-testing facilities of the Contracting Agency as provided for in Section 3-01.2(2).

5. Sampling HMA – The HMA plant shall provide for sampling HMA by one of the following methods:

    (a) A mechanical sampling device attached to the HMA plant.

    (b) Platforms or devices to enable sampling from the hauling vehicle without entering the hauling vehicle.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## 5-04.3(3)B Hauling Equipment
**(January 31, 2023 APWA GSP)**

Delete this entire section and replace it with the following:

Trucks used for hauling HMA shall have tight, clean, smooth metal beds and shall have a cover of canvas or other suitable material of sufficient size to protect the mixture from adverse weather. Whenever the weather conditions during the work shift include, or are forecast to include precipitation or an air temperature less than 45°F or when time from loading to unloading exceeds 30 minutes, the cover shall be securely attached to protect the HMA.

The Contractor shall provide an environmentally benign means to prevent the HMA mixture from adhering to the hauling equipment. Excess release agent shall be drained prior to filling hauling equipment with HMA. Petroleum derivatives or other coating material that contaminate or alter the characteristics of the HMA shall not be used. For live bed trucks, the conveyer shall be in operation during the process of applying the release agent.

## 5-04.3(3)D Material Transfer Device or Material Transfer Vehicle
**(April 2, 2018 Lacey GSP, Option 1)**

Delete this section and replace it with the following:

A Material Transfer Device/Vehicle (MTD/V) is not required for this project.

## 5-04.3(3)E Rollers
**(January 31, 2023 APWA GSP)**

Delete this entire section and replace it with the following:

Rollers shall be of the steel wheel, vibratory, oscillatory, or pneumatic tire type, in good condition and capable of reversing without backlash. Operation of the roller shall be in accordance with the manufacturer's recommendations. When ordered by the Engineer for any roller planned for use on the project, the Contractor shall provide a copy of the manufacturer's recommendation for the use of that roller for compaction of HMA. The number and weight of rollers shall be sufficient to compact the mixture in compliance with the requirements of Section 5-04.3(10). The use of equipment that results in crushing of the aggregate will not be permitted. Rollers producing pickup, washboard, uneven compaction of the surface, displacement of the mixture or other undesirable results shall not be used.

## 5-04.3(4) Preparation of Existing Surfaces
**(December 19, 2019 Lacey GPS)**

Delete this section and replace it with the following:

When the surface of the existing pavement or old base is irregular, the Contractor shall bring it to a uniform grade and cross-section as shown on the Plans or approved by the Engineer.

Preleveling of uneven or broken surfaces over which HMA is to be placed may be accomplished by using an asphalt paver, a motor patrol grader, or by hand raking, as approved by the Engineer.

Compaction of preleveling HMA shall be to the satisfaction of the Engineer and may require the use of small steel wheel rollers, plate compactors, or pneumatic rollers to avoid bridging across preleveled areas



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

by the compaction equipment. Equipment used for the compaction of preleveling HMA shall be approved by the Engineer.

Before construction of HMA on an existing paved surface, the entire surface of the pavement shall be clean. All fatty asphalt patches, grease drippings, and other objectionable matter shall be entirely removed from the existing pavement. All pavements or bituminous surfaces shall be thoroughly cleaned of dust, soil, pavement grindings, and other foreign matter. All holes and small depressions shall be filled with an appropriate class of HMA. The surface of the patched area shall be leveled and compacted thoroughly. Prior to the application of tack coat, or paving, the condition of the surface shall be approved by the Engineer.

A tack coat of asphalt shall be applied to all paved surfaces on which any course of HMA is to be placed or abutted. Tack coat shall be uniformly applied to cover the existing pavement with a thin film of residual asphalt free of streaks and bare spots at a rate between 0.02 and 0.10 gallons per square yard of retained asphalt. The rate of application shall be approved by the Engineer. A heavy application of tack coat shall be applied to all joints. For Roadways open to traffic, the application of tack coat shall be limited to surfaces that will be paved during the same working shift. The spreading equipment shall be equipped with a thermometer to indicate the temperature of the tack coat material.

Equipment shall not operate on tacked surfaces until the tack has broken and cured. If the Contractor's operation damages the tack coat it shall be repaired prior to placement of the HMA.

The tack coat shall be CSS-1, or CSS-1h emulsified asphalt. The CSS-1 and CSS-1h emulsified asphalt may be diluted once with water at a rate not to exceed one part water to one part emulsified asphalt. The tack coat shall have sufficient temperature such that it may be applied uniformly at the specified rate of application and shall not exceed the maximum temperature recommended by the emulsified asphalt manufacturer

All vegetation including root structures and moss shall be removed in their entirety within the paved areas including adjoining curbs, gutters, and sidewalks. Further, all vegetation overgrowth shall be trimmed and removed 6 inches from back of proposed HMA edge limits as directed by the Engineer.

Driveway preparation shall include saw cutting, cutting, filling, and grading the transitional area required to provide a HMA approach between the edge of pavement and driveway regardless of the existing surface treatment or width. The Engineer shall mark in the field where the asphalt or concrete shall be sawcut. Typical driveway aprons for paved/concrete driveways are 18" unless shown longer on the plans. Typical driveway aprons for gravel driveways are 48" unless shown longer in the plans. All material that must be removed from the driveway shall be hauled and disposed off the project site. All imported material required to grade and compact driveway bases shall be paid for by the unit bid item "Crushed Surfacing Top Course." All driveways shall require preparation. Temporary access shall be provided for all driveways prior to paving. There shall be no additional compensation for those driveways requiring more preparation than others.

Shoulder preparation shall include cutting, filling, and grading the shoulder to ensure a uniform, longitudinal pavement edge. Maximum distance shall be 12 inches from proposed edge of pavement surface to a maximum depth of 6 inches from edge of roadway finish grade. Backfill requirements beyond these limits shall be repaired at the Contractor's expense. All grading within drainage ditches or swales to establish or maintain existing flowlines shall also be included in shoulder preparation.

All excess asphalt joint filler shall be completely removed and all premolded and rubberized joint filler shall be removed to a minimum 1/2 inch below the surface of the existing pavement.

### 5-04.3(5) Producing/Stockpiling Aggregates and RAP



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

(October 30, 2018 Lacey GSP)

If Recycled asphalt pavement (RAP) is allowed per section 5-04.2, aggregates and RAP shall be stockpiled according to the requirements of Section 3-02. Sufficient storage space shall be provided for each size of aggregate and RAP. Materials shall be removed from stockpile(s) in a manner to ensure minimal segregation when being moved to the HMA plant for processing into the final mixture. Different aggregate sizes shall be kept separated until they have been delivered to the HMA plant.

### 5-04.3(5)A Stockpiling RAP or RAS for High RAP/Any RAS Mixes

Delete this section

### 5-04.3(6) Mixing

(October 30, 2018 Lacey GSP)

Delete this section and replace it with the following:

After the required amount of mineral materials, asphalt binder, recycling agent and anti-stripping additives have been introduced into the mixer the HMA shall be mixed until complete and uniform coating of the particles and thorough distribution of the asphalt binder throughout the mineral materials is ensured.

When discharged, the temperature of the HMA shall not exceed the optimum mixing temperature by more than 25°F as shown on the reference mix design report or as approved by the Engineer. Also, when a WMA additive is included in the manufacture of HMA, the discharge temperature of the HMA shall not exceed the maximum recommended by the manufacturer of the WMA additive. A maximum water content of 2 percent in the mix, at discharge, will be allowed providing the water causes no problems with handling, stripping, or flushing. If the water in the HMA causes any of these problems, the moisture content shall be reduced as directed by the Engineer.

Storing or holding of the HMA in approved storage facilities will be permitted with approval of the Engineer, but in no event shall the HMA be held for more than 24 hours. HMA held for more than 24 hours after mixing shall be rejected. Rejected HMA shall be disposed of by the Contractor at no expense to the Contracting Agency. The storage facility shall have an accessible device located at the top of the cone or about the third point. The device shall indicate the amount of material in storage. No HMA shall be accepted from the storage facility when the HMA in storage is below the top of the cone of the storage facility, except as the storage facility is being emptied at the end of the working shift.

If Recycled asphalt pavement (RAP) is allowed per section 5-04.2, RAP utilized in the production of HMA shall be sized prior to entering the mixer so that a uniform and thoroughly mixed HMA is produced. If there is evidence of the recycled asphalt pavement not breaking down during the heating and mixing of the HMA, the Contractor shall immediately suspend the use of the RAP until changes have been approved by the Engineer. After the required amount of mineral materials, RAP, new asphalt binder and asphalt rejuvenator have been introduced into the mixer the HMA shall be mixed until complete and uniform coating of the particles and thorough distribution of the asphalt binder throughout the mineral materials, and RAP is ensured.

### 5-04.3(7) Spreading and Finishing

(January 24, 2024 Lacey GSP)

Delete this section and replace it with the following:

The mixture shall be laid upon an approved surface, spread, and struck off to the grade and elevation established. HMA pavers complying with Section 5-04.3(3) shall be used to distribute the mixture. Unless



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

otherwise directed by the Engineer, the nominal compacted depth of any layer of any course shall not exceed the following:

| | | |
|---|---|---|
| HMA Class 1" | | 0.35 feet |
| HMA Class ¾" and HMA Class ½" | | |
| | wearing course | 0.30 feet |
| | other courses | 0.35 feet |
| HMA Class ⅜" | | 0.17 feet |

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the paving may be done with other equipment or by hand.

When more than one JMF is being utilized to produce HMA, the material produced for each JMF shall be placed by separate spreading and compacting equipment. The intermingling of HMA produced from more than one JMF is prohibited. Each strip of HMA placed during a work shift shall conform to a single JMF established for the class of HMA specified unless there is a need to make an adjustment in the JMF.

The Contractor shall complete the first lift over the entire length of the project, before the final lift will be allowed to be installed.

If traffic signal loops are required, these loops shall be installed prior to the final lift.

## 5-04.3(8) Aggregate Acceptance Prior to Incorporation in HMA
**(January 31, 2023 APWA GSP)**

Delete this section and replace it with the following:

For HMA accepted by nonstatistical evaluation, the aggregate properties of sand equivalent, uncompacted void content, and fracture will be evaluated in accordance with Section 3-04. Sampling and testing of aggregates for HMA accepted by commercial evaluation will be at the option of the Engineer.

## 5-04.3(9) HMA Mixture Acceptance
**(January 31, 2023 APWA GSP)**

Delete this entire section and replace it with the following:

Acceptance of HMA shall be as provided under nonstatistical, or commercial evaluation.

Nonstatistical evaluation will be used for the acceptance of HMA unless Commercial Evaluation is specified.

Commercial evaluation will be used for Commercial HMA and for other classes of HMA in the following applications: sidewalks, road approaches, ditches, slopes, paths, trails, gores, prelevel, temporary pavement, and pavement repair. Other nonstructural applications of HMA accepted by commercial evaluation shall be as approved by the Engineer. Sampling and testing of HMA accepted by commercial evaluation will be at the option of the Engineer.

The mix design will be the initial JMF for the class of HMA. The Contractor may request a change in the JMF. Any adjustments to the JMF will require the approval of the Engineer and may be made in accordance with this section.

HMA Tolerances and Adjustments



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

1. Job Mix Formula Tolerances – The constituents of the mixture at the time of acceptance shall be within tolerance. The tolerance limits will be established as follows:

For Asphalt Binder and Air Voids (Va), the acceptance limits are determined by adding the tolerances below to the approved JMF values. These values will also be the Upper Specification Limit (USL) and Lower Specification Limit (LSL) required in Section 1-06.2(2)D2

| Property | Non-Statistical Evaluation | Commercial Evaluation |
|---|---|---|
| Asphalt Binder | +/- 0.5% | +/- 0.7% |
| Air Voids, Va | 2.5% min. and 5.5% max | N/A |

For Aggregates in the mixture:

(a) First, determine preliminary upper and lower acceptance limits by applying the following tolerances to the approved JMF.

| Aggregate Percent Passing | Non-Statistical Evaluation | Commercial Evaluation |
|---|---|---|
| 1", ¾", ½", and 3/8" sieves | +/- 6% | +/- 8% |
| No. 4 sieve | +/-6% | +/- 8% |
| No. 8 Sieve | +/- 6% | +/-8% |
| No. 200 sieve | +/- 2.0% | +/- 3.0% |

(b) Second, adjust the preliminary upper and lower acceptance limits determined from step (a) the minimum amount necessary so that none of the aggregate properties are outside the control points in Section 9-03.8(6). The resulting values will be the upper and lower acceptance limits for aggregates, as well as the USL and LSL required in Section 1-06.2(2)D2.

2. Job Mix Formula Adjustments – An adjustment to the aggregate gradation or asphalt binder content of the JMF requires approval of the Engineer. Adjustments to the JMF will only be considered if the change produces material of equal or better quality and may require the development of a new mix design if the adjustment exceeds the amounts listed below.

(a) Aggregates –2 percent for the aggregate passing the 1½", 1", ¾", ½", ⅜", and the No. 4 sieves, 1 percent for aggregate passing the No. 8 sieve, and 0.5 percent for the aggregate passing the No. 200 sieve. The adjusted JMF shall be within the range of the control points in Section 9-03.8(6).

(b) Asphalt Binder Content – The Engineer may order or approve changes to asphalt binder content. The maximum adjustment from the approved mix design for the asphalt binder content shall be 0.3 percent.

## 5-04.3(9)C Mixture Acceptance – Nonstatistical Evaluation
**(January 31, 2023 APWA GSP)**

HMA mixture which is accepted by Nonstatistical Evaluation will be evaluated by the Contracting Agency by dividing the HMA tonnage into lots.

## 5-04.3(9)C1 Mixture Nonstatistical Evaluation – Lots and Sublots
**(January 31, 2023 APWA GSP)**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

A lot is represented by randomly selected samples of the same mix design that will be tested for acceptance. A lot is defined as the total quantity of material or work produced for each Job Mix Formula placed. Only one lot per JMF is expected. A sublot shall be equal to one day's production or 800 tons, whichever is less except that the final sublot will be a minimum of 400 tons and may be increased to 1200 tons.

All of the test results obtained from the acceptance samples from a given lot shall be evaluated collectively. If the Contractor requests a change to the JMF that is approved, the material produced after the change will be evaluated on the basis of the new JMF for the remaining sublots in the current lot and for acceptance of subsequent lots. For a lot in progress with a CPF less than 0.75, a new lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced.

Sampling and testing for evaluation shall be performed on the frequency of one sample per sublot.

## 5-04.3(9)C2 Mixture Nonstatistical Evaluation Sampling
**(January 31, 2023 APWA GSP)**

Samples for acceptance testing shall be obtained by the Contractor when ordered by the Engineer. The Contractor shall sample the HMA mixture in the presence of the Engineer and in accordance with AASHTO T 168. A minimum of three samples should be taken for each class of HMA placed on a project. If used in a structural application, at least one of the three samples shall be tested.

Sampling and testing HMA in a structural application where quantities are less than 400 tons is at the discretion of the Engineer.

For HMA used in a structural application and with a total project quantity less than 800 tons but more than 400 tons, a minimum of one acceptance test shall be performed. In all cases, a minimum of 3 samples will be obtained at the point of acceptance, a minimum of one of the three samples will be tested for conformance to the JMF:

- If the test results are found to be within specification requirements, additional testing will be at the Engineer's discretion.
- If test results are found not to be within specification requirements, additional testing of the remaining samples to determine a CPF shall be performed.

## 5-04.3(9)C3 Mixture Nonstatistical Evaluation – Acceptance Testing
**(January 31, 2023 APWA GSP)**

Testing of HMA for compliance of Va will at the option of the Contracting Agency. If tested, compliance of Va will use WSDOT SOP 731.

Testing for compliance of asphalt binder content will be by WSDOT FOP for AASHTO T 308.

Testing for compliance of gradation will be by FOP for WAQTC T 27/T 11.

## 5-04.3(9)C4 Mixture Nonstatistical Evaluation – Pay Factors
**(January 31, 2023 APWA GSP)**

Add the following new section:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

For each lot of material falling outside the tolerance limits in 5-04.3(9), the Contracting Agency will determine a Composite Pay Factor (CPF) using the following price adjustment factors:

| Table of Price Adjustment Factors | |
|---|---|
| Constituent | Factor "f" |
| All aggregate passing: 1½", 1", ¾", ½", ⅜" and No.4 sieves | 2 |
| All aggregate passing No. 8 sieve | 15 |
| All aggregate passing No. 200 sieve | 20 |
| Asphalt binder | 40 |
| Air Voids (Va) (where applicable) | 20 |

Each lot of HMA produced under Nonstatistical Evaluation and having all constituents falling within the tolerance limits of the job mix formula shall be accepted at the unit Contract price with no further evaluation. When one or more constituents fall outside the nonstatistical tolerance limits in the Job Mix Formula shown in Table of Price Adjustment Factors, the lot shall be evaluated in accordance with Section 1-06.2 to determine the appropriate CPF. The nonstatistical tolerance limits will be used in the calculation of the CPF and the maximum CPF shall be 1.00. When less than three sublots exist, backup samples of the existing sublots or samples from the Roadway shall be tested to provide a minimum of three sets of results for evaluation.

## 5-04.3(9)C6 Mixture Nonstatistical Evaluation – Price Adjustments
**(January 31, 2023 APWA GSP)**

For each lot of HMA mix produced under Nonstatistical Evaluation when the calculated CPF is less than 1.00, a Nonconforming Mix Factor (NCMF) will be determined. The NCMF equals the algebraic difference of CPF minus 1.00 multiplied by 60 percent. The total job mix compliance price adjustment will be calculated as the product of the NCMF, the quantity of HMA in the lot in tons, and the unit Contract price per ton of mix.

If a constituent is not measured in accordance with these Specifications, its individual pay factor will be considered 1.00 in calculating the CPF.

## 5-04.3(9)C7 Mixture Nonstatistical Evaluation – Retests
**(January 31, 2023 APWA GSP)**

The Contractor may request a sublot be retested. To request a retest, the Contractor shall submit a written request within 7 calendar days after the specific test results have been received. A split of the original acceptance sample will be retested. The split of the sample will not be tested with the same tester that ran the original acceptance test. The sample will be tested for a complete gradation analysis, asphalt binder content, and, at the option of the agency, Va. The results of the retest will be used for the acceptance of the HMA in place of the original sublot sample test results. The cost of testing will be deducted from any monies due or that may come due the Contractor under the Contract at the rate of $500 per sample.

## 5-04.3(10) HMA Compaction Acceptance
**(January 31, 2023 APWA GSP)**

Delete this entire section and replace it with the following:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

HMA mixture accepted by nonstatistical evaluation that is used in traffic lanes, including lanes for intersections, ramps, truck climbing, weaving, and speed change, and having a specified compacted course thickness greater than 0.10-foot, shall be compacted to a specified level of relative density. The specified level of relative density shall be a CPF of not less than 0.75 when evaluated in accordance with Section 1-06.2, using a LSL of 92.0 (minimum of 92 percent of the maximum density). The maximum density shall be determined by WSDOT FOP for AASHTO T 729. The specified level of density attained will be determined by the evaluation of the density of the pavement. The density of the pavement shall be determined in accordance with WSDOT FOP for WAQTC TM 8, except that gauge correlation will be at the discretion of the Engineer, when using the nuclear density gauge and WSDOT SOP 736 when using cores to determine density.

Tests for the determination of the pavement density will be taken in accordance with the required procedures for measurement by a nuclear density gauge or Roadway cores after completion of the finish rolling.

If the Contracting Agency uses a nuclear density gauge to determine density the test procedures FOP for WAQTC TM 8 and WSDOT SOP T 729 will be used on the day the mix is placed and prior to opening to traffic.

Roadway cores for density may be obtained by either the Contracting Agency or the Contractor in accordance with WSDOT SOP 734. The core diameter shall be 4-inches minimum, unless otherwise approved by the Engineer. Roadway cores will be tested by the Contracting Agency in accordance with WSDOT FOP for AASHTO T 166.

If the Contract includes the Bid item "Roadway Core", the cores shall be obtained by the Contractor in the presence of the Engineer on the same day the mix is placed and at locations designated by the Engineer. If the Contract does not include the Bid item "Roadway Core", the Contracting Agency will obtain the cores.

For a lot in progress with a CPF less than 0.75, a new lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced.

HMA mixture accepted by commercial evaluation and HMA constructed under conditions other than those listed above shall be compacted on the basis of a test point evaluation of the compaction train. The test point evaluation shall be performed in accordance with instructions from the Engineer. The number of passes with an approved compaction train, required to attain the maximum test point density, shall be used on all subsequent paving.

HMA for preleveling shall be thoroughly compacted. HMA that is used for preleveling wheel rutting shall be compacted with a pneumatic tire roller unless otherwise approved by the Engineer.

Test Results

For a sublot that has been tested with a nuclear density gauge that did not meet the minimum of 92 percent of the reference maximum density in a compaction lot with a CPF below 1.00 and thus subject to a price reduction or rejection, the Contractor may request that a core be used for determination of the relative density of the sublot. The relative density of the core will replace the relative density determined by the nuclear density gauge for the sublot and will be used for calculation of the CPF and acceptance of HMA compaction lot.

When cores are taken by the Contracting Agency at the request of the Contractor, they shall be requested by noon of the next workday after the test results for the sublot have been provided or made available to the Contractor. Core locations shall be outside of wheel paths and as determined by the Engineer. Traffic control shall be provided by the Contractor as requested by the Engineer. Failure by the Contractor to provide the requested traffic control will result in forfeiture of the request for cores. When the CPF for the



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

lot based on the results of the HMA cores is less than 1.00, the cost for the coring will be deducted from any monies due or that may become due the Contractor under the Contract at the rate of $200 per core and the Contractor shall pay for the cost of the traffic control.

### 5-04.3(10)A HMA Compaction – General Compaction Requirements
**(January 31, 2023 APWA GSP)**

Compaction shall take place when the mixture is in the proper condition so that no undue displacement, cracking, or shoving occurs. Areas inaccessible to large compaction equipment shall be compacted by other mechanical means. Any HMA that becomes loose, broken, contaminated, shows an excess or deficiency of asphalt, or is in any way defective, shall be removed and replaced with new hot mix that shall be immediately compacted to conform to the surrounding area.

The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option, provided the specified densities are attained. Unless the Engineer has approved otherwise, rollers shall only be operated in the static mode when the internal temperature of the mix is less than 175°F. Regardless of mix temperature, a roller shall not be operated in a mode that results in checking or cracking of the mat. Rollers shall only be operated in static mode on bridge decks.

### 5-04.3(10)B HMA Compaction - Cyclic Density
**(January 31, 2023 APWA GSP)**

Low cyclic density areas are defined as spots or streaks in the pavement that are less than 90 percent of the theoretical maximum density. At the Engineer's discretion, the Engineer may evaluate the HMA pavement for low cyclic density, and when doing so will follow WSDOT SOP 733. A $500 Cyclic Density Price Adjustment will be assessed for any 500-foot section with two or more density readings below 90 percent of the theoretical maximum density.

### 5-04.3(10)D HMA Compaction-Visual Evaluation
Delete this section and replace it with the following:

### 5-04.3(10)D HMA Nonstatistical Compaction

### 5-04.3(10)D1 HMA Nonstatistical Compaction – Lots and Sublots
**(January 31, 2023 APWA GSP)**

HMA compaction which is accepted by nonstatistical evaluation will be based on acceptance testing performed by the Contracting Agency dividing the project into compaction lots.

A lot is represented by randomly selected samples of the same mix design that will be tested for acceptance. A lot is defined as the total quantity of material or work produced for each Job Mix Formula placed. Only one lot per JMF is expected. A sublot shall be equal to one day's production or 400 tons, whichever is less except that the final sublot will be a minimum of 200 tons and may be increased to 800 tons. Testing for compaction will be at the rate of 5 tests per sublot per WSDOT T 738.

The sublot locations within each density lot will be determined by the Engineer. For a lot in progress with a CPF less than 0.75, a new lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced.

HMA mixture accepted by commercial evaluation and HMA constructed under conditions other than those listed above shall be compacted on the basis of a test point evaluation of the compaction train. The test point evaluation shall be performed in accordance with instructions from the Engineer. The number of



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

passes with an approved compaction train, required to attain the maximum test point density, shall be used on all subsequent paving.

HMA for preleveling shall be thoroughly compacted. HMA that is used to prelevel wheel ruts shall be compacted with a pneumatic tire roller unless otherwise approved by the Engineer.

### 5-04.3(10)D2 HMA Compaction Nonstatistical Evaluation – Acceptance Testing
**(January 31, 2023 APWA GSP)**

The location of the HMA compaction acceptance tests will be randomly selected by the Engineer from within each sublot, with one test per sublot.

### 5-04.3(10)D3 HMA Nonstatistical Compaction – Price Adjustments
**(January 31, 2023 APWA GSP)**

For each compaction lot with one or two sublots, having all sublots attain a relative density that is 92 percent of the reference maximum density the HMA shall be accepted at the unit Contract price with no further evaluation. When a sublot does not attain a relative density that is 92 percent of the reference maximum density, the lot shall be evaluated in accordance with Section 1-06.2 to determine the appropriate CPF. The maximum CPF shall be 1.00, however, lots with a calculated CPF in excess of 1.00 will be used to offset lots with CPF values below 1.00 but greater than 0.90. Lots with CPF lower than 0.90 will be evaluated for compliance per 5-04.3(11). Additional testing by either a nuclear moisture-density gauge or cores will be completed as required to provide a minimum of three tests for evaluation.

For compaction below the required 92%, a Non-Conforming Compaction Factor (NCCF) will be determined. The NCCF equals the algebraic difference of CPF minus 1.00 multiplied by 40 percent. The Compaction Price Adjustment will be calculated as the product of CPF, the quantity of HMA in the compaction control lot in tons, and the unit Contract price per ton of mix.

## 5-04.3(11) Reject Work

### 5-04.3(11)A Reject Work General
**(January 31, 2023 APWA GSP)**

Delete this section and replace it with the following:

Work that is defective or does not conform to Contract requirements shall be rejected. The Contractor may propose, in writing, alternatives to removal and replacement of rejected material. Acceptability of such alternative proposals will be determined at the sole discretion of the Engineer. HMA that has been rejected is subject to the requirements in Section 1-06.2(2) and this specification, and the Contractor shall submit a corrective action proposal to the Engineer for approval.

### 5-04.3(11)B Rejection by Contractor
**(January 31, 2023 APWA GSP)**

Delete this section and replace it with the following:

The Contractor may, prior to sampling, elect to remove any defective material and replace it with new material. Any such new material will be sampled, tested, and evaluated for acceptance.

### 5-04.3(11)C Rejection Without Testing (Mixture or Compaction)
**(January 31, 2023 APWA GSP)**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Delete this section and replace it with the following:

The Engineer may, without sampling, reject any batch, load, or section of Roadway that appears defective. Material rejected before placement shall not be incorporated into the pavement. Any rejected section of Roadway shall be removed.

No payment will be made for the rejected materials or the removal of the materials unless the Contractor requests that the rejected material be tested. If the Contractor elects to have the rejected material tested, a minimum of three representative samples will be obtained and tested. Acceptance of rejected material will be based on conformance with the nonstatistical acceptance Specification. If the CPF for the rejected material is less than 0.75, no payment will be made for the rejected material; in addition, the cost of sampling and testing shall be borne by the Contractor. If the CPF is greater than or equal to 0.75, the cost of sampling and testing will be borne by the Contracting Agency. If the material is rejected before placement and the CPF is greater than or equal to 0.75, compensation for the rejected material will be at a CPF of 0.75. If rejection occurs after placement and the CPF is greater than or equal to 0.75, compensation for the rejected material will be at the calculated CPF with an addition of 25 percent of the unit Contract price added for the cost of removal and disposal.

## 5-04.3(11)D Rejection - A Partial Sublot
**(January 31, 2023 APWA GSP)**

Delete this section and replace it with the following:

In addition to the random acceptance sampling and testing, the Engineer may also isolate from a normal sublot any material that is suspected of being defective in relative density, gradation or asphalt binder content. Such isolated material will not include an original sample location. A minimum of three random samples of the suspect material will be obtained and tested. The material will then be statistically evaluated as an independent lot in accordance with Section 1-06.2(2).

## 5-04.3(11)E Rejection - An Entire Sublot
**(January 31, 2023 APWA GSP)**

Delete this section and replace it with the following:

An entire sublot that is suspected of being defective may be rejected. When a sublot is rejected a minimum of two additional random samples from this sublot will be obtained. These additional samples and the original sublot will be evaluated as an independent lot in accordance with Section 1-06.2(2).

## 5-04.3(11)F Rejection - A Lot in Progress
**(January 31, 2023 APWA GSP)**

Delete this section and replace it with the following:

The Contractor shall shut down operations and shall not resume HMA placement until such time as the Engineer is satisfied that material conforming to the Specifications can be produced:

1. When the CPF of a lot in progress drops below 1.00 and the Contractor is taking no corrective action, or
2. When the Pay Factor (PF) for any constituent of a lot in progress drops below 0.95 and the Contractor is taking no corrective action, or
3. When either the PF for any constituent or the CPF of a lot in progress is less than 0.75.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## 5-04.3(11)G Rejection - An Entire Lot (Mixture or Compaction)

(January 31, 2023 APWA GSP)

Delete this section and replace it with the following:

An entire lot with a CPF of less than 0.75 will be rejected.

## 5-04.3(13) Surface Smoothness

(April 1, 2024 Lacey GSP)

Delete this section and replace it with the following:

The completed surface of all courses shall be of uniform texture, smooth, uniform as to crown and grade, and free from defects of all kinds. The completed surface of the wearing course shall not vary more than ⅛ inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline. The transverse slope of the completed surface of the wearing course shall vary not more than ¼ inch in 10 feet from the rate of transverse slope shown in the Plans.

When deviations in excess of the above tolerances are found that result from a high place in the HMA, the pavement surface shall be corrected by one of the following methods:

1. Removal of material from high places by grinding with an approved grinding machine, or

2. Removal and replacement of the wearing course of HMA, or

3. By other method approved by the Engineer.

Correction of defects shall be carried out until there are no deviations anywhere greater than the allowable tolerances.

Deviations in excess of the above tolerances that result from a low place in the HMA and deviations resulting from a high place where corrective action, in the opinion of the Engineer, will not produce satisfactory results will be accepted with a price adjustment. The Engineer shall deduct from monies due or that may become due to the Contractor the sum of $500.00 for each and every section of single traffic lane 100 feet in length in which any excessive deviations described above are found.

## 5-04.3(22) Temporary Patching

(April 2, 2018 Lacey GSP)

Add the following new section:

All excavations within or across streets, driveways, or failure of existing pavement that will be exposed to traffic shall be temporarily patched by the end of the working day or as directed by the Engineer. The patch shall be constructed of a minimum of 0.17 feet of either Commercial HMA or as directed by the Engineer. The Contractor shall maintain all temporary patches until such time as the permanent pavement is in place.

## 5-04.3(25) HMA Wedge Curb

(April 2, 2018 Lacey GSP)

Add the following new section:

The Contractor shall construct a HMA wedge curb where shown on the plans and shall be integral to the mainline paving operation respective to being placed and compacted. HMA used for wedge curb shall be compensated with the HMA bid item per ton and no other compensation shall be allowed.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## 5-04.3(26) Utility Access

(April 1, 2024 Lacey GSP)

Add the following new section:

When lowering and raising valves the valve riser pipes must remain free of debris. Cap the valve riser pipe to prevent debris from entering the riser and to provide access to the operating nut.

The contractor is responsible for tracking exact locations of all valves and manholes to be lowered or raised. Before asphalt is placed over a valve, metal must be placed directly above the valve location for the purpose of locating the valve with a metal detector. Once asphalt has been placed over a valve or manhole, the location of that valve or manhole must be marked on the asphalt within 3 working days. The location marks must be maintained until the valves are raised. All valves and manholes must be raised within 20 working days after each time they are paved over. The cost of raising new valves and manholes is incidental to the cost for that bid item. The cost for raising existing valves and manholes will only be paid once for each location, no additional compensation will be allowed if the contractor has to raise the same valve/manhole twice. See sections 7-05 and 7-12 for additional information on raising valves and manholes.

## 5-04.4 Measurement

(February 14, 2023 Lacey GSP)

Supplement this section with the following:

No unit of measure shall apply to the lump sum price for Preparation of Existing Surfaces.

The quantities in the bid proposal for Planing Bituminous Pavement are based on a computer generated earthwork calculation from the existing ground survey. The quantities do not incorporate expansion, clearing and grubbing, or construction methodology. These values are listed for the convenience of the Contractor in determining the volume of work involved as calculated by the Engineer and are for estimating purposes only. The prospective bidders shall verify these quantities prior to submitting the bid. A digital copy of the survey is available to prospective bidders from the Contracting Agency at the Contractor's request. No adjustments will be made in these quantities although the actual quantities may deviate from those listed.

## 5-04.5 Payment

(April 1, 2024 Lacey GSP)

Supplement this section with the following:

The unit Contract price per ton for all HMA bid items shall also include Paving Operations Supervisor (POS) and the removal of excess tack coat of asphalt from existing surfaces, including, but not limited to existing pavement markings. Pavement markings shall be restored to a pre-construction condition or better. No additional compensation shall be given to the Contractor for installing new pavement markings if existing pavement markings cannot be restored to a pre-construction condition or better as directed by the Engineer.

"Preparation of Existing Surfaces," lump sum.

The lump sum contract price for "Preparation of Existing Surfaces" shall be full pay for all labor, materials, and equipment to comply with the plans and specifications, including but not limited to cleaning and removal of all vegetation from proposed paved surfaces or that vegetation that will interfere with paving operations prior to paving.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 7-04 STORM SEWERS

## 7-04.1 Description
(January 3, 2017 Lacey GSP)

Supplement this section with the following:

This work shall consist of constructing debris barriers, trash racks, special fittings, joint materials, dewatering, bypass pumping, and testing.

## 7-04.2 Materials
(January 31, 2025 Lacey GSP)

Delete the first paragraph of this section and replace with the following:

Pipe used in this project shall meet the requirements of the following sections:

| | |
|---|---|
| Perforated PVC Underdrain Pipe | 9-05.2(6) |
| Solid Wall PVC Storm Sewer Pipe | 9-05.12(1) |
| Ductile Iron Sewer Pipe | 9-05.13 |
| Safety Bars | 9-05.18 |

## 7-04.3 Construction Requirements
(October 29, 2010 Lacey GSP)

Supplement this section with the following:

The Contractor shall furnish, construct, and install the debris barriers as shown in the Plans or as designated by the Engineer.

## 7-04.4 Measurement
(October 30, 2018 Lacey GSP)

Supplement this section with the following:

Debris barriers will be measured per each.
Trash racks will be measured per each.
"Connect to Existing Storm Main" will be measured per each location called out in the plans

## 7-04.5 Payment
(******)

Delete this section and replace with the following:

"Connect to Existing Storm Main", per each.
The unit contract price for "Connect to Existing Storm Main" shall be full pay for providing all labor, tools, equipment, and materials necessary to connect to the existing main. For purposes of payment, there will be no distinction made for the difficulty of connecting to the existing main or the quantity of connecting pipes or other materials needed. If no such item exists all costs shall be incidental to the project and no additional compensation shall be allowed.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

"___ Inch Diameter Perforated Storm Sewer Pipe", per linear foot.

The unit contract price per linear foot for "___ Inch Diameter Perforated Storm Sewer Pipe", shall be full compensation for all labor, material, and equipment to furnish, place, assemble, and install storm sewer line, complete in place, including all wyes, tees, caps, plugs, trash racks, debris barriers, special fittings, joint materials, commercial concrete, adjustment of inverts to manholes, dewatering, bypass pumping, and testing. Further, all excavation, hauling, disposal, compaction, dewatering, temporary patching and other required earthwork shall be included.

"___ Inch Diameter Storm Sewer Pipe", per linear foot.

The unit contract price per linear foot for "___ Inch Diameter Storm Sewer Pipe", shall be full compensation for all labor, material, and equipment to furnish, place, assemble, and install storm sewer line, complete in place, including all wyes, tees, caps, plugs, trash racks, debris barriers, special fittings, joint materials, commercial concrete, adjustment of inverts to manholes, dewatering, bypass pumping, and testing. Further, all excavation, hauling, disposal, compaction, temporary patching, dewatering, and other required earthwork shall be included.

# 7-05 MANHOLES, INLETS, CATCH BASINS, AND DRYWELLS

## 7-05.2 Materials
**(April 1, 2024 Lacey GSP)**

Section 7-05.2 is supplemented with the following:

Patching Material for Concrete Structure Repair 9-20.2

## 7-05.3 Construction Requirements
**(April 1, 2024 Lacey GSP)**

Modify this section by deleting the eighth paragraph and replacing it with the following:

Rubber gaskets or flexible plastic gaskets may be used in tongue and groove joints of precast units. Joints between precast manhole units used for sanitary sewers shall be rubber gasketed. All other joints and all openings cut through the walls shall be grouted and watertight. Mortar shall conform to the requirements of Section 9-20.2 or 9-20.4(3)

## 7-05.3(1)B Raise Manhole To Grade
**(April 1, 2024 Lacey GSP)**

Add the following new section:

Where shown on the plans or where directed by the Engineer, existing manholes and Type 2 catch basins shall be raised to the grade as staked or as directed by the Engineer. The Contractor shall supply and install new manhole rings, frames, and covers as part of raising the manhole to grade. The finished installation shall conform to the detail shown in plans. No wood adjustment nor bricks of any kind will be allowed.

Refer to Section 5-04.3(26) Utility Access for additional requirements.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Maximum distance allowed from edge of iron ring or frame of appurtenance to outside edge of pavement restoration is 18 inches. Patches larger than this or clean misses (e.g. where the Contractor excavates in the new pavement mat and does not find the iron appurtenance to raise) shall result in a credit from the Contractor to the City of $1000 for each occurrence. Further, the Contractor shall repair the pavement patch as directed by the Engineer.

### 7-05.3(1)D Raise Catch Basin to Grade
**(April 1, 2024 Lacey GSP)**

Section 7-05.3(1)D is added with the following:

Where shown on the plans or as directed by the Engineer, existing catch basins shall be raised to the grade as staked or as directed by the Engineer. The Contractor shall remove and replace adjacent curb and gutter as required. Further, the Contractor shall supply and install concrete riser sections, and new frame and grate. The finished installation shall conform to the detail shown in plans. No wood adjustment nor bricks of any kind will be allowed.

Refer to Section 5-04.3(26) Utility Access for additional requirements.

Maximum distance allowed from edge of iron ring or frame of appurtenance to outside edge of pavement restoration is 18 inches. Patches larger than this or clean misses (e.g. where the Contractor excavates in the new pavement mat and does not find the iron appurtenance to raise) shall result in a credit from the Contractor to the City of $1000 for each occurrence. Further, the Contractor shall repair the pavement patch as directed by the Engineer.

### 7-05.3(5) Catch Basin Assembly
**(January 3, 2017 Lacey GSP)**

Section 7-05.3(5) is added with the following:

Contractor shall furnish and install East Jordan Iron Works Catch Basin Assembly, or approved equal, on all catch basins and storm sewer manholes unless otherwise indicated on the construction plans. Assemblies must be ductile iron and manufactured in the USA. Where a cover, grate or curb inlet is indicated in the plans, the Contractor shall furnish and install the indicated item.

### 7-05.4 Measurement
**(October 30, 2018 Lacey GSP)**

Supplement this section with the following:

"Connect to Existing Manhole" will be measured per each location called out in the plans.
"Connect to Existing Catch Basin" will be measured per each location called out in the plans.

### 7-05.5 Payment
**(******)**

Supplement this section with the following:

The unit contract price per each for manholes and catch basins shall be full pay for furnishing all labor, tools, equipment, and materials required to place the structure including excavation, haul, backfill, testing, and all accessories, such as rings, covers, grates, steps, grate inlets, trash racks, beehive grates and debris cages, removable silt trap tees, GU liners, inside drops, outside drops, lowering and raising after the



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

paving or concrete restoration and all other items needed to install the manhole complete in place in accordance with the plans and these specifications in conformity with the lines and grades staked.

"Raise Manhole to Grade", per each.
The unit Contract price per each for "Adjust Manhole", "Raise Manhole to Grade", and "Elevate Manhole" shall be full pay for all costs necessary to adjust, raise, or elevate existing manholes to include furnishing and installing new materials such as rings, covers, grates, grate inlets as shown in the details complete in place, including restoration of adjacent areas. New manholes will not be paid to be adjusted, raised nor elevated. The adjusting, raising or elevating of new manholes shall be included in the price of the new manhole.

"Catch Basin Type __ – __ In. Diam." per each
In addition to the unit price description for catch basins above, the unit Contract price per each for "Catch Basin Type __ – __ In. Diam." shall be full payment for all costs necessary to install the catch basin as shown on plan, including the funnel top.

"Connect to Existing Manhole", per each.
The unit contract price per each for "Connect to Existing Manhole" shall be full pay for furnishing all labor, tools, equipment, and materials required to connect to existing manholes and Type II Catch Basins in place, including concrete, concrete collars and sealants. Further, all excavation, haul, backfill, testing, and accessories shall be included in the unit contract price. For purposes of payment, there will be no distinction made for the difficulty of connecting to the existing manhole/type II catch basin or the quantity of pipes connecting to the manhole/type II catch basin. Items not specifically identified on the plans but necessary to properly connect to manhole shall be considered incidental and no other compensation shall be allowed.

"Connect to Existing Catch Basin", per each.
The unit contract price per each for "Connect to Existing Catch Basin" shall be full pay for furnishing all labor, tools, equipment, and materials required to connect to existing Catch Basin in place, including concrete, concrete collars and sealants. Further, all excavation, haul, backfill, testing, and accessories shall be included in the unit contract price. For purposes of payment, there will be no distinction made for the difficulty of connecting to the existing Catch Basin or the quantity of pipes connecting to the Catch Basin. Items not specifically identified on the plans but necessary to properly connect to manhole shall be considered incidental and no other compensation shall be allowed.

# 7-08 GENERAL PIPE INSTALLATION REQUIREMENTS

## 7-08.1 Description
**(December 31, 2014 Lacey GSP)**

This section is revised to read:

This work includes installing culverts, storm sewers, sanitary sewers, and water mains. The contractor shall also follow Section 7-02, 7-04, 7-09 or 7-17 as it applies to the specific kind of Work.

## 7-08.2 Materials
**(October 16, 2009 Lacey GSP)**

Supplement this section with the following:

Bank Run Gravel for Trench Backfill shall be in accordance with Section 9-03.19.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Controlled Density Fill shall be in accordance with Section 2-09.3(1)E.
Imported Pipe Bedding shall be in accordance with Section 9-03.16.

## 7-08.3 Construction Requirements

### 7-08.3(1) Excavation and Preparation of Trench
**(October 30, 2018 Lacey GSP)**

Supplement this section with the following:

The contractor shall locate and preserve all existing utilities per RCW 19.122. Utility locations shown on the plans depict the physical features that were visible at the time of the survey. The City of Lacey is not responsible for the location of underground utilities that are marked or not marked in the field by other utility providers. Utility service laterals are not typically shown on plans or locatable and the contractor shall anticipate such services. The City will locate the meters and the mains. For service laterals, pursuant to RCW 19.122.030, the City will indicate a presence of an un-locatable service lateral and if requested can meet with the contractor or provide copies of available records. The Contractor shall have a crimping tool available during excavation to crimp any broken water services. Before commencing work, the contractor shall coordinate with One-Call services to determine the location of all utilities.

The Contractor shall pothole all apparent conflicts between existing utilities and proposed construction as approved by the Engineer. The Contractor shall notify Engineer of location and approximate time to complete prior to potholing. The Contractor shall notify the Engineer of any conflicts with the existing utilities and proposed work at least 3 days prior to proceeding with work. Potholing of the utilities shall be completed a minimum distance of 300 feet in front of pipe laying operations. No adjustment to the contract price or time will be made if the contractor fails to follow this specification. Potholing for Utility Crossings and Connections shall be performed by the Contractor using vacuum excavation truck or other device approved by the Engineer. If the Contractor potholes prior to approval no compensation shall be made for the potholing.

The Contractor shall deflect pressurized pipe at the joints no greater than the maximum allowable deflection as determined by the pipe or fitting manufacturer to avoid conflicts with crossing utilities. Vertical bends and vertical thrust blocking shall be avoided by deflecting pipe either upwards or downwards prior to the utility crossing.

### 7-08.3(1)A Trenches
**(December 31, 2014 Lacey GSP)**

Section 7-08.3(1)A is supplemented with the following to the fourth paragraph:

All material excavated from trenches shall not be piled on the roadway.

### 7-08.3(3) Backfilling
**(January 31, 2025 Lacey GSP)**

Supplement this section with the following:

For backfilling trenches for longitudinal runs of pipe, the Contractor shall use all suitable native material prior to using bank run gravel and/or controlled density fill. All native backfill material shall be approved by the Engineer prior to placement. If the Contractor places imported material prior to approval, no compensation shall be made for the imported material. All backfill material shall be compacted and tested according to Section 2-03.3(14)D.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

For transverse runs of pipe including the service lines within the roadway prism, the Contractor shall use controlled density fill unless approved otherwise by the Engineer. All native material shall be excavated, hauled and disposed of offsite. All exceptions shall be approved by the Engineer.

At the end of each workday, the Contractor shall install a lift of temporary asphalt on top of the trench backfill, flush with the existing pavement. No trench excavation shall be exposed to traffic without a temporary asphalt sealing the existing pavement surface. If approved by the Engineer, the Contractor may choose to use HMA for Pavement Repair Cl. ½" PG 58H-22 for permanent pavement repair if a bid item for this work has been included in the Proposal. All costs associated with providing and removal of temporary asphalt shall be incidental to the bid item for the pipe being installed and no other compensation will be allowed.

Controlled Density Fill will require 24 hours of cure time, or as directed by the Engineer. Prior to backfill, all appurtenances shall be covered with 11 mill plastic as directed by the Engineer. The Contractor shall have a steel plate cover placed and anchored over the trench until the Engineer determines the mixture is sufficiently cured, so that a temporary or permanent patch can be placed. This process shall be coordinated so that there will be minimum inconvenience to the public.

### 7-08.3(3)B Steel Plating for Pipe Trench
**(February 25, 2015 Lacey GSP)**

Section 7-08.3(3)B is added with the following:

The Contractor shall install steel plating over the trench per the plans to allow for CDF to fully cure and allow vehicle traffic to pass during non-working hours. The steel plating shall remain complete over the trench until the pavement repair is complete. This process shall be coordinated so that there will be minimum inconvenience to the public. All costs for all labor, materials, and equipment to furnish, place, assemble, install, maintain and remove the steel plates and associated materials shall be included in the unit contract price per foot of pipe installed and no additional compensation shall be allowed.

### 7-08.3(5) Pipe Abandonment
**(******)**

Add the following new section:

The Contractor shall abandon or remove pipes where shown on the Plans or directed by the Engineer. All abandonments shall be done after all new utility mains and service connections are installed unless authorized by the Engineer. Abandonments shall include all excavation, pipe cutting and removal, fittings, concrete plugging, and backfilling. Some abandonments require specific fittings as indicated on the Plans. All fittings required to complete the abandonment shall be included in the cost for the abandonment. Potholing per 7-08.3(1) to verify required fittings shall be done as directed by the Engineer. The valve shall not be abandoned in place, the valve shall be removed and a blind flange installed. Pipe abandonments shall be completed in cooperation with the engineer in order to minimize disruption of utility service to the residents. If water services will be interrupted follow the requirements of 7-09.3(19)B.

All pipes to be abandoned shall have the first 2 linear feet of abandoned pipe filled/plugged with a watertight concrete grout. The inspector shall inspect the abandonment prior to backfilling.

In the case of an abandonment associated with a connection to an existing main, no payment shall be made for the bid item "Pipe Abandonment". The Contractor shall include all costs with these associated abandonments under the "Connect to Existing Water Main", "Connect to Existing Reclaimed Water



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Main", "Connect to Existing Gravity Sewer Main", or "Connect to Existing Sanitary Sewer Main" pay item. In addition, payment for "Pipe Abandonment" will only be paid for the locations and quantities called out on the plans or as directed by the Engineer.

### 7-08.3(6) Water Main/Sanitary Sewer Service Crossings
**(February 25, 2015 Lacey GSP)**

Add the following new section:

Notify the Engineer if the waterline is less than 18 inches above sanitary sewer. The minimum cover as shown on the plans may be reduced as approved by the Engineer to maintain minimum vertical separation.

The Contractor shall install the longest standard length of water pipe so that the joints will fall an equal distance from any sewer crossing. In some cases where minimum separation cannot be maintained, it may be necessary to encase the water main as directed by the Engineer. No concrete shall be installed unless specifically directed by the Engineer.

Costs to cut and place water pipe as specified shall be incidental to the water pipe line and no other pay will be allowed.

### 7-08.3(7) Connections to Existing Mains
**(******)**

Add the following new section:

The Contractor shall be responsible for determining the scope of work for connection to existing mains.

It shall be the Contractor's responsibility to field verify the location and depth of the existing main and the fittings required in accordance with 7-08.3(1) to make the connections to the existing mains including any pipe abandonment or restraining of existing pipe associated with the connections to existing mains. Where shown on the plans, connection to existing mains shall include adding joint restraints to the existing pipe. Connect to existing mains shall be completed in cooperation with the engineer in order to minimize disruption of service to the residents. All taps shall be a minimum of 36" away from the bell joint unless otherwise approved by the engineer.

Temporary blow-off assembly required for temporary or permanent release of air, chlorination or flushing purposes shall be provided by the Contractor as a part of the connection to existing main.

In the case of a live tap connection no payment shall be made for the bid item, "Connect to Existing Water Main". The Contractor shall include all costs associated with live taps under "_____ Inch Tapping Valve With Tapping Sleeve" pay items.

Payment for "Connect to Existing _____" will only be paid for the locations and quantities called out on the plans or as directed by the Engineer. For purposes of payment, there will be no distinction made for the difficulty of connecting to the existing main or the quantity of connecting pipes or other materials needed.

### 7-08.3(8) Detectable Marking Tape
**(January 4, 2016 Lacey GSP)**

Add the following new section:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

All pipeline installed under this contract will be identified by a continuous color coded tracer marker. For pressure lines it shall be buried 12 inches to 18 inches below finished grade, and for sewer lines it shall be buried 24 inches to 30 inches below finished grade. The marker shall be imprinted every 30 to 40 inches in permanent black ink indicating the type of line buried below and shall also have the word "Caution" prominently shown.

The tracer marker shall be plastic non-biodegradable and have a metallic core or backing which can be detected by a standard metal detector.

In addition to the detectable marking tape a U.S.E coated 12 gauge tracer wire shall be taped to all mains and service lines. The wire shall be brought up and tied to all valves and meter boxes. The tracer wire shall be looped up into all valve boxes per the plans. A low voltage grease-type splice kits, or better shall be used on all tracer wire connection points. After the wire nut is used to connect the wire together an overhand knot shall be tied just outside the connection to prevent it from coming apart. All service and mainline tracer wires shall be properly connected. A tracer wire magnesium anode shall be installed at all dead ends of the tracer / locate system. On long stretches of pipe anodes may be required at a minimum spacing of 1000'. The anode type shall be Copperhead Anode Part# ANO-14, 1.5# x 1.315"Dx18.5"L or approved equal. When connecting a new main or a new service to an existing main, the new tracer wire shall be connected to the existing tracer wire if available.

Special high strength locate wire may be required for directional drilling where the wire is allowed to be pulled in with the pipe or conduit. High strength wire shall be Neptco Trace-Safe 1800 lb. strength or approved equal and shall be connected with the wire manufacturer's connections.

Continuity or locate testing of the wire will be done by the City. The contractor shall give 72 hours notice for continuity testing by the City. The testing shall be conducted prior to paving or final restoration of landscape areas. The locating device will be connected to the tracer wire at any or all Gate Valves and Services and tracer wire shall transmit an acceptable signal strength as determined by the City for a minimum of 300 feet. Contractor will locate and repair any failed connections.
The wire shall be furnished and installed by the Contractor.

Color coding of tape and wire shall be as follows:

a) Water – Blue
b) Sewer – Green
c) Reclaimed – Purple
d) Electrical conduits – Red
e) Communication Conduits - Orange

Installation of the pipeline tracer marker and 12 gauge coated copper wire is considered incidental to the construction of the pipe and conduits and no other compensation will be allowed.

### 7-08.3(9) Concrete Thrust Blocking
**(January 31, 2025 Lacey GSP)**

Add the following new section:

Install thrust blocking at all bends, tees, dead ends, and crosses. Thrust Blocking shall be commercial concrete poured against undisturbed earth. An 11 mil plastic barrier shall be placed between all thrust blocks and fittings. Thrust blocking of upward vertical bends cannot rely on soil bearing to restrain pipe; the weight of the thrust block must be equal to or exceed anticipated forces. The calculations for thrust blocking are as follows:

Thrust at fittings in pounds at 225 pounds per square inch of water pressure.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| Pipe Diameter | 90° Bend | 45° Bend | 22-1/2° Bend | 11-1/4° Bend | Dead End or Tee |
|---|---|---|---|---|---|
| 4" | 3,600 | 2,000 | 1,000 | 500 | 2,600 |
| 6" | 8,000 | 4,400 | 2,300 | 1,200 | 5,700 |
| 8" | 14,300 | 7,700 | 4,000 | 2,000 | 10,100 |
| 10" | 22,300 | 12,100 | 6,200 | 3,100 | 15,800 |
| 12" | 32,000 | 17,400 | 8,900 | 4,500 | 22,700 |
| 14" | 43,600 | 23,600 | 12,100 | 6,100 | 30,800 |
| 16" | 57,000 | 30,800 | 15,700 | 7,900 | 40,300 |
| 18" | 72,000 | 39,000 | 19,900 | 10,000 | 51,000 |

SAFE SOIL BEARING LOADS:

| Soil | Pounds per Square Foot |
|---|---|
| Muck, Peat | 0,000 |
| Soft clay | 1,000 |
| Sand | 2,000 |
| Sand and gravel | 3,000 |
| Sand and gravel cemented with clay | 4,000 |

Ecology blocks may be used for thrust blocking if approved by the Engineer.

Installation of thrust blocking is considered incidental to the construction of the pipe and no other compensation will be allowed.

### 7-08.4 Measurement
(October 30, 2018 Lacey GSP)

Supplement this section with the following:

"Imported Pipe Bedding" will be measured per ton.
"Bank Run Gravel for Trench Backfill" will be measured per ton.
"Utility Potholing", will be measured per hour.
"Controlled Density Fill" will be measured by the cubic yard for the quantity of material placed.
"Connect to Existing Water Main" will be measured per each location called out in the plans.

### 7-08.5 Payment
(******)

Supplement this section with the following:

"Bank Run Gravel for Trench Backfill" per ton and "Imported Pipe Bedding" per ton.
The unit contract price per ton for "Bank Run Gravel for Trench Backfill" and "Imported Pipe Bedding" shall be full compensation for all labor, material and equipment to furnish, place and compact the backfill. Native material used for backfill shall be considered incidental to the pipe installation and no additional compensation shall be allowed.

Payment shall be based on actual amount of imported bedding or bank run gravel for trench backfill used. The Engineer reserves the right to adjust the bid proposal quantity as required.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

There will be no additional compensation made for the removal and wasting of trench excavation that is unsuitable for backfill.

If no bid item for "Bank Run Gravel for Trench Backfill" or "Imported Pipe Bedding" is included, any work described in these sections shall be included in the unit contract price per foot of pipe installed and no additional compensation shall be allowed.

"Utility Potholing", per hour shall be full compensation for all labor, material and equipment necessary to excavate, backfill, and restore the utility location(s) required by the Engineer and determine its vertical and horizontal location. Utility potholing will only be paid for work approved by the Engineer in advance.

If no bid item for "Utility Potholing" is included, any work described in this section shall be incidental to the project.

If no bid item for "Pipe Abandonment" is included, any work described in this section shall be incidental to the project.

"Controlled Density Fill", per cubic yard.
If no bid item for "Controlled Density Fill" is included, any work described in this section shall be incidental to the project.

"Connect to Existing Water Main", per each.
The unit contract price for "Connect to Existing Water Main" shall be full pay for providing all labor, tools, equipment, and materials necessary to connect to the existing main. For purposes of payment, there will be no distinction made for the difficulty of connecting to the existing main or the quantity of connecting pipes or other materials needed. If no such item exists all costs shall be incidental to the project and no additional compensation shall be allowed.

# 7-09 WATER MAINS

## 7-09.1 Description

(January 3, 2017 Lacey GSP)

Supplement this section with the following:

Various transition couplings, flanged coupling adapters, transition couplings with follower flanges and gaskets, and other miscellaneous couplings and fittings may be required for performance under this project.

It shall be the Contractor's responsibility to determine what specific couplings, adapters, and fittings that will be used to make connections shown on the plans. The Engineer has shown specific existing material types, and nominal sizes using the best information available. The Engineer has not determined the specific dimensions of existing materials. The Contractor shall submit a sketch showing configuration and materials of the proposed connection for review and approval.

Where vertical bends or pipe ends are required, the pipe and fittings shall be restrained on each side of the bend for a distance as recommended by the manufacturer.

## 7-09.2 Materials

(******)



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Supplement this section with the following:

All pipe for water mains shall have flexible gasket joints and shall comply with one of the following two types unless otherwise specified on the plans:

Ductile iron pipe shall conform to AWWA C 151 Standard Thickness Class 52 and have a cement mortar lining conforming to AWWA C 104. All push-on joints shall be made using rubber gaskets conforming to AWWA C 111. All joints on pipe larger than 2" shall be restrained.

PE Pipe: Unless otherwise noted, all 2 inch and smaller diameter pipe shall be NSF Approved, PE3408 or PE4710 blue polyethylene pipe manufactured from virgin materials. Pipe shall meet the following specifications:

- ANSI/AWWA C901
- ASTM D1248, ASTM D 3350, ASTM D 2239, ASTM D 3035 and ASTM D 2737,
- Pressure Class 200, SIDR - 7(Standard Inside Dimension Ration-Pressure Rated),
- Cell classification 345464C,

Pipe shall be manufactured by Interstate Plastics, Philips Driscopipe, Eagle Pacific, Superlon Plastics, U.S. Poly or approved equal.

Pipe restraints shall not be used as a substitute for thrust blocking unless approved by the engineer.

Where restrained joint pipe is identified on the plans the pipe and all associated fittings must be restrained by an approved pipe restraint system within the areas noted. Where vertical bends are used a minimum of 2 pipe joints or 25 lineal feet either side of the fitting (90°, tee, etc.), or as directed by the engineer, shall be restrained using an approved pipe restraint system.

Joint restraints for push-on joint ductile iron pipe shall be "Field Lok" type gaskets rated to 350 p.s.i and tested in accordance with ANSI/AWWA C111/A21.11, TR Flex as furnished by U.S. Pipe , Piranha as furnished by Romac, or Gripper Gasket LLC.

Joint restraints for push-on joint PVC pipe shall be Certa-Lok by CertainTeed Corporation, Eagle Loc 900 by JM Eagle, Diamond Lok-21 by Diamond Plastics, or RieberLok gasket. Bell restraint devices may be used where approved by the engineer. Bell restraint devices for PVC pipe shall have a working pressure of at least 200 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc., MEGALUG series 2800, Uni-Flange Series 1390, Romac Industries, Inc., U.S. Gripper, or approved equal.

All fittings for ductile iron pipe or PVC pipe shall be ductile iron compact fittings conforming to AWWA C 153 or conforming to AWWA C 110 and C 111. All shall be cement mortar lined conforming to AWWA C 104. Plain end fittings shall be ductile iron if mechanical joint retainer glands are installed on the plain ends. All fittings shall be flanged or mechanical joint.

All mechanical joint fittings shall be equipped with a mechanical joint restraint device consisting of wedges or lugs integral to the retaining gland. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1 and shall be EBAA Iron, Inc., MEGALUG, Ford Uni-Flange Series 1400, Romac Industries, Inc., U.S. Gripper, or approved equal.

All pipe shall be new and in good condition with no visible signs of UV damage, fading or other defects.

**7-09.3(19)B Maintaining Service**
**(February 14, 2023 Lacey GSP)**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Supplement this section with the following:

Where existing water services must be interrupted, the Contractor shall notify the Engineer as to the date, time and duration of the interruption, a minimum of 72 hours (3 working days) prior to the interruption. The Contractor shall field verify pipe diameter and fittings prior to requesting a service interruption. The City will notify customers involved or affected by the water service interruption. The Contractor shall make every effort to schedule water main construction with a minimum interruption of water service. Water service can not be interrupted before 8:00 am. Existing pipe shall be cut and connection ready to be made by 11:00 am or the shutdown must be rescheduled unless otherwise approved by the Engineer.

## 7-09.3(24) Disinfection of Water Mains

**(April 1, 2024 Lacey GSP)**

Modify this section with the following:

The Contractor shall provide extra safeguards to prevent contamination, rocks, sand or foreign matter from accumulating in the pipe.

Unless otherwise approved by the Engineer, the method for disinfecting water mains shall be by dry Calcium Hypochlorite conforming to ANSI/
AWWA B300 and NSF/ANSI 61 as defined in Section 7-09.3(24)D of the WSDOT Standard Specifications and AWWA C651-14 Sec. 4.1.3 and Sec. 4.3. If adhesives are used to secure chlorine tablets to the pipe interior, they must meet the requirements of NSF/ANSI 61 and AWWA C651-14 Sec. 4.3.3.

Pipe and fittings used in connections to existing mains shall be less than one pipe length (generally less than 20 ft), and spray disinfected, swabbed or immersed for disinfection as per AWWA C651-14 Sec. 4.10 and 4.11 (1% chlorine solution).

The area affected by such work shall be thoroughly flushed with a minimum of three pipe volumes of water at a velocity greater than 3 fps. Following flushing, the affected area may be returned to limited service under a unidirectional flow regime and isolated from the remainder of the distribution system to the maximum extent feasible. Bacteriological samples will be collected by the City following flushing and the affected area may not be expanded or returned to full service until favorable bacteriological results have been obtained.

Bacteriological testing shall be done by the City per AWWA C651-14 Sec. 5.1 Option A or B. Option B may not be able to be used if the pressure in the line is too low to allow the sample tap to run continuously for 15 minutes without opening the system valve. Bacteriological testing must be scheduled with the Engineer at least 3 days in advance. Any samples needed on a Friday must be completed prior to 10:00 AM. Results are typically provided within four (4) working days but may take up to (7) working days. If the samples fail to produce acceptable results, the main shall be re-chlorinated by the continuous-feed or slug method until satisfactory results are obtained per AWWA C651-14.

The Contractor shall flush the new main. Flushing mains shall require the assistance of City utility personnel and shall be coordinated with the Engineer 3 working days in advance.

## 7-09.3(24)A Flushing

**(December 31, 2014 Lacey GSP)**

Modify this section by deleting the first sentence of the fourth paragraph and replacing it with the following:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The Contractor shall be responsible for disposal of treated water flushed from mains and shall neutralize the wastewater for protection of aquatic life in the receiving water and their associated surface and ground water tributaries, before disposal into any natural drainage channel, i.e., receiving water, waters of the State, including wetlands.

### 7-09.5 Payment
(******)

Supplement this section with the following:

The pay item in quotes is revised to read, "_____ Inch Water Main."
The unit contract price for "_____ Inch Water Main" per linear foot shall be full pay for furnishing all labor, materials, tools and equipment, necessary to install the water main, complete in-place, including but not limited to pipe, couplings, adaptors, crosses, tees, bends, reducers, caps, plugs, restrained joint fittings, bend markers, and other fittings not specifically identified on the plans. Further, all excavation, bedding, backfilling with native material, compacting, temporary patching, formed thrust blocking, testing, flushing, dewatering, and disinfecting shall also be included in the unit contract price. Items not specifically identified on the plans but necessary to properly install the water main shall be considered incidental to the water main and no other compensation shall be allowed.

Temporary blow-off assembly required for temporary or permanent release of air, chlorination or flushing purposes shall be provided by the Contractor as a part of the new water main. The unit contract price for "__ inch Water Main" shall be full pay for providing all labor, tools, equipment, and materials necessary to abandon the pipe including temporary blow-off assembly.

## 7-12 VALVES FOR WATER MAINS

### 7-12.2 Materials
(January 31, 2025 Lacey GSP)

Supplement this section with the following:

All valves shall be non-rising stem, resilient wedge gate valves conforming to AWWA C515 unless otherwise specified and shall be American AVK, Clow, EJ Flowmaster, Kennedy, M & H, Mueller, Waterous Series 2500. The minimum cover over the valve, measured from the valve operator nut to finished grade, shall be 20 inches. Gate valves 14 inches and larger that are unable to provide 20 inches of cover over the valve shall be factory equipped with a bevel gear actuator for horizontal installation as directed by the engineer. The bevel gear actuator shall be rated for buried installations.

Butterfly valves shall meet all the requirements of AWWA C504 Class 150B and shall be Allis Chalmers, Kennedy, Linseal III, M&H, Mueller, Pratt Groundhog.

Valves shall be bolted to the tee and the cross with flanged ends. Joint materials for flanges shall be 1/8 inch thick one piece, cloth inserted rubber gaskets conforming to AWWA C107-78.

Bolts for all flanged and mechanical joints shall be high strength, low alloy steel bolts only, meeting the current provisions of American National Standard ANSI/AWWA C111/A 21.11 for rubber gasket joints for cast iron or ductile iron pipe and fittings.

Valve boxes shall be East Jordan Iron Works #248 or Olympic Foundry VB-950, 6-3/4 inch OD with recessed handle type iron cover marked "CITY OF LACEY WATER."



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Tapping sleeves shall be stainless steel with ductile iron flange and shall be Romac "SST" or approved equal.

Two inch air and vacuum release valve shall be a two inch ARI D-040. Fiberglass enclosure shall be Vent Guard Model No. AVG1824, Beige in color, manufactured by Hot Box, Inc. (800) 736-0238. An insulation pouch shall be placed over the air release assembly. The 18" x 24" insulation pouch shall be beige in color with the opening on the 18" side, and manufactured by DeKorra Products LLC

Valve insertions shall be Romac InsertaValve, Hydra-Stop Insta-Valve Plus, or AVT EZ Valve Insertion Valve and be completed by an experienced installer.

### 7-12.3(3) Raise Valve Box to Grade
**(April 1, 2024 Lacey GSP)**

Add the following new section:

Where shown on the plans or where directed by the Engineer, existing valve boxes shall be raised to the grade as staked or otherwise designated by the Engineer. The Contractor shall supply and install new valve boxes and covers as part of raising valve boxes to grade. The finished installation shall conform to the detail shown in plans.

All new and existing valve boxes located in any unpaved area shall have a concrete pad poured or placed entirely around each valve box. The pad shall be a minimum of 36 inches by 36 inches for each valve box. The concrete shall be commercial concrete or better with a minimum thickness of 8 inches.

Refer to Section 5-04.3(26) Utility Access for additional requirements.

Maximum distance allowed from edge of iron ring or frame of appurtenance to outside edge of pavement restoration is 18 inches. Patches larger than this or clean misses (e.g. where the Contractor excavates in the new pavement mat and does not find the iron appurtenance to raise) shall result in a credit from the Contractor to the City of $1000 for each occurrence. Further, the Contractor shall repair the pavement patch as directed by the Engineer.

See Section 5-04.3(26) Utility Access for additional requirements.

### 7-12.5 Payment
**(April 1, 2024 Lacey GSP)**
Supplement this section with the following:

"Raise Valve Box to Grade," per each.
The unit Contract price per each for "Raise Valve to Grade" shall be full pay for all costs necessary to raise existing valves to include furnishing and installing new materials such as rings, covers, as shown in the details complete in place, including restoration of adjacent areas. New valves will not be paid to be raised. The raising of new valves shall be included in the price of the new valve.

"_____ Inch Gate Valve," per each.
The payment for the various items specified above shall be full pay for furnishing all labor, materials, tools, and equipment necessary to install the unit complete in place on the water main, including trenching, concrete pads and concrete or asphalt restoration of adjacent areas, disinfecting, testing, blocking of valve, valve box and marker post.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 7-14 HYDRANTS

## 7-14.2 Materials
(March 3, 2022 Lacey GSP)

Modify this section with the following:

Fire hydrants shall be Waterous Pacer, Mueller Centurion, M & H Reliant Style 129S, Kennedy K-81, or EJIW 5CD250 conforming to AWWA C 502. The valve opening shall be 5 1/4-inch diameter. Hydrants shall be mechanical joint, 4-1/2 feet standard bury with two 2-1/2 inch outlets and one pumper port, and shall have a 1.25-inch pentagonal operating nut (counter clockwise opening). All hydrants shall be outfitted with a 4-1/2" NST by 5" Storz adapter with cap.

Some locations may require other than the 4-1/2 feet standard bury. Contractor shall be responsible for determining actual required bury and provide proper standpipe height.

Blow-off Hydrants shall be Eclipse MainGuard Model No. 78. Pipe and fittings for blow-off hydrant installation shall conform to the requirements of Section 7-15. The factory 2.5" cap shall be replaced with a plastic/nylon style cap with 2.5" NST thread.

## 7-14.3(1) Setting Hydrants
(December 31, 2014 Lacey GSP)

Supplement this section with the following:

A 6 foot wide cleared area, centered along the pipe, shall extend from the edge of pavement to 3 foot past the new hydrant, not to exceed the right-of-way line. The clearing may include trimming of trees and shrubs to an overhead height of 10 feet as directed by the Engineer. Upon completion of fire hydrant installation, the cleared area shall be graded and restored as directed by the Engineer.

## 7-14.5 Payment
(February 14, 2023 Lacey GSP)

Supplement this section with the following:

The unit contract price for all items in this section shall also include, but not be limited to, trench excavation and backfill, gravel backfill, fill and grading 3' around hydrant and between hydrant and edge of roadway, painting, extensions, fittings, ductile iron spool between the main and hydrant, Storz adapter, Megalug restraining joints, and blue hydrant marker.

# 7-15 SERVICE CONNECTIONS

## 7-15.2 Materials
(January 31, 2025 Lacey GSP)

Supplement this section with the following:

Service pipe from the main to the new meter shall be the appropriate size shown in the table below.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| Meter Size | Pipe Diameter |
|---|---|
| 5/8" Single Meter | 1-1/2" |
| 5/8" Double Meter | 1-1/2" |
| 1" | 1-1/2" |
| 2" | 2" |

One and one-half and two inch diameter service lines shall be NSF Approved, PE4710 blue polyethylene pipe manufactured from virgin materials. Pipe shall meet the following specifications:

- ANSI/AWWA C901
- ASTM D1248, ASTM D 3350, ASTM D 2239, ASTM D 3035 and ASTM D 2737,
- Pressure Class 200, SIDR - 7(Standard Inside Dimension Ration-Pressure Rated),
- Cell classification 345464C,

Pipe shall be manufactured by Interstate Plastics, Philips Driscopipe, Eagle Pacific, Superlon Plastics, U.S. Poly or approved equal.

Service pipe from the new 5/8" meter to the old 5/8" meter location shall be minimum 1" diameter polyethylene plastic pipe minimum pressure Class 200. Service pipe greater than 100 ft. in length from new meter to old meter location shall be 1-1/2" diameter until it is connected to existing service line. The Contractor shall identify the diameter of the existing service line to remain in-place at the old meter location and provide the required fittings necessary for the transition. Contractor shall identify both the City and customer service line material and record the information on either on the Service Line Identification Form in the Appendix or in the table on the plan sheet and submitted with the As-Built Plans,

Service Saddle shall be ductile iron with double stainless steel straps or bands. All clamps or bands shall have rubber gaskets and I.P. threaded outlets (Ford FS202, Romac 202NS or approved equal.)

1-1/2" Corporation Stop shall be all brass, "ball valve" type, male iron pipe thread inlet by pack joint outlet conforming to AWWA C800, Ford FB1101, Mueller E25029, AY McDonald 74704B-1.5" or approved equal. 2" Corporation Stop shall be Ford FB 11017G, Mueller H9969, AY McDonald 74704B-2" or approved equal.

1-1/2" Curb Stop shall be all brass, "ball valve" type, pack joint inlet by female iron pipe thread outlet conforming to AWWA C800, Ford B61, Mueller E25171, AY McDonald 76101-1.5" or approved equal. 2" Curb Stop shall be Ford FOB61-777, Mueller B20283, AY McDonald 76101-2" or approved equal.

"U" Branch Piece for 5/8" double meter shall be all brass, 1" male iron pipe thread inlet by two ¾" male iron pipe outlets conforming to AWWA C800 (Ford U88-43-7.5, Mueller MH15364GFWD, AY McDonald 708UMM 1"x3/4"x7.5" or approved equal.

Stainless steel inserts shall be used with all pack joint fittings. Further, all bushings, reducers, nipples, couplings, adaptors, and fittings required to make service connections shall be all brass conforming to AWWA C800 manufactured by Ford or approved equal.

Meter setters shall be all copper, Ball valve style with locking wing and check valve. The Contractor shall remove and reinstall the existing meter in the new setter after testing of new water main and service line. The Contractor shall use care in removing and reinstalling the existing meter. All fittings and meters shall be kept clean and free of dirt or foreign material and sprayed with a light bleach / chlorine solution prior to installation. Services shall be flushed at the customer hose bib after final meter installation to clear the service line, remove air and to verify good flow. All costs for replacing a broken meter due to the Contractor's neglect shall be borne by the Contractor.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| Meter Size | Meter Setter |
|---|---|
| 5/8" Single Meter | Ford VH 72-15W or Mueller B2404-R2EF15<br>or AY McDonald AY-720-215WCD |
| 5/8" Double Meter | Ford VH 72-15W (2 ea) or Mueller B2404-R2AG15 (2ea)<br>or AY McDonald AY-720-215WCD (2ea) |
| 1" Meter | Ford VBH 74-15W or Mueller B2404-R2AG15<br>or AY McDonald AY-720-415WCDD |
| 1-1/2" Meter | Ford VBH 76-15HB or Mueller B2423-29900015-15 with high by-pass or AY McDonald AY-720R615WDFF |
| 2" Meter | Ford VBH 77-15HB or Mueller B2423-29900015-2 with high by-pass or AY McDonald AY-720R715WDFF |

Meter boxes shall be placed in non-traffic or non-parking areas whenever possible. Meter boxes and lids shall be Christy Fibrelyte. Covers with reader doors in them will not be allowed. Meter boxes may be placed in traffic/parking areas if shown on the plans or as directed by the engineer. In these areas the meter boxes shall be Old Castle or Christy reinforced concrete with a steel H20 traffic rated cover marked water.

| Meter Size | Meter Box | Meter Box |
|---|---|---|
| 5/8" Single Meter | Christy Fibrelyte FL30T-12 | Christy Fibrelyte FL30-D with "City of Lacey" in the lid |
| 5/8" Double Meter | Christy Fibrelyte FL36T-12 | Christy Fibrelyte FL36-D with "City of Lacey" in the lid |
| 1" Meter | Christy Fibrelyte FL36T-12 | Christy Fibrelyte FL36-D with "City of Lacey" in the lid |
| 1-1/2" Meter | Christy Fibrelyte FL36T-18 | Christy Fibrelyte FL36-D with "City of Lacey" in the lid |
| 2" Meter | Christy Synertech SYN2436T-18 | Christy Synertech SYN2436T with "City of Lacey" in the lid |

Imported service line bedding shall meet the requirements of Section 9-03.16. See Section 7-08 "Imported Pipe Bedding" for measurement and payment of service line bedding.

### 7-15.3(6) Irrigation and Electrical Systems Testing and Repair
(******)

Add the following new section:

The Contractor shall operationally test existing irrigation and landscape electrical systems prior to construction. If it is found through the baseline tests that an existing system does not operate correctly, the Contractor shall demonstrate the discrepancy to the Engineer and the problem(s) will be documented. The Contractor shall take precaution to avoid cutting or breaking of lines during construction operations.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

If a line is cut or broke, the Contractor shall immediately repair and test the system prior to continuing on with other work.

Upon completion of the work, the Contractor shall once again test the existing systems and compare to the baseline tests conducted prior to work. Any discrepancies between the baseline test and the final tests shall be repaired.

### 7-15.3(12) Sampling Station
(******)

Add the following new section:

The Contractor shall supply and install new sampling stations where shown on the plans or where directed by the Engineer. The finished installation shall conform to the detail shown in the plans.

### 7-15.5 Payment
(******)
Supplement this section with the following:

"Sampling Station", per each.

The unit contract price for "Sampling Station" per each shall be full compensation for all labor, material, and equipment to furnish and install the sampling station complete in place, including, but not limited to, service saddle, tapping the pipe, curb/corp stops, service lines, valve and valve box, and all miscellaneous couplings, fittings, and adapters to install the sampling station and connect to the water main.

## 8-01 EROSION CONTROL AND WATER POLLUTION CONTROL

### 8-01.3 Construction Requirements

### 8-01.3(1) General
(May 28, 2020 WSDOT GSP)

Section 8-01.3(1) is supplemented with the following:

The Contractor shall identify the ESC Lead at the preconstruction discussions and in the TESC Plan. The ESC Lead shall have, for the life of the Contract, a current Certificate of Training in Construction Site Erosion and Sediment Control from a course approved by the Washington State Department of Ecology. The ESC Lead must be onsite or on call at all times throughout construction. The ESC Lead shall be listed on the Emergency Contact List required under Section 1-05.13(1).

The ESC Lead shall implement the TESC Plan. Implementation shall include, but is not limited to:

1. Installing, adaptively managing, and maintaining temporary erosion and sediment control BMPs to assure continued performance of their intended function. Damaged or inadequate BMPs shall be corrected immediately.

2. Updating the TESC Plan to reflect current field conditions.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

3. Inspecting and reporting on all areas disturbed by construction activities, all on-site erosion and sediment control BMPs, and all storm water discharge points every calendar week and within 24 hours of runoff events in which storm water discharges from the site or as directed by the Engineer.

4. Submit to the Engineer no later than the end of the next working day following the inspection a TESC Inspection Report that includes:

a. When, where, and how BMPs were installed, maintained, modified, and removed.

b. Observations of BMP effectiveness and proper placement.

c. Recommendations for improving future BMP performance with upgraded or replacement BMPs when inspections reveal TESC BMP deficiencies.

d. Identify for each discharge point location whether there is compliance with state water quality standards in WAC 173-201A for turbidity and pH.

Inspection of temporarily stabilized, or inactive sites may be reduced to once every calendar month if allowed by the Engineer.

### 8-01.3(9)A2 Silt Fence
**(October 16, 2014 Lacey GSP)**

Supplement this section with the following:

If the Engineer determines that site conditions dictate additional silt fence throughout the duration of the project, the Contractor shall immediately install additional silt fence as directed by the Engineer.

### 8-01.3(9)D Inlet Protection
**(November 20, 2020 Lacey GSP)**

Delete the first paragraph and replace with the following:

All catch basins and inlets within 500 ft of the project limits, downstream or affected by construction activities shall have inlet protection and as required by the Engineer. Inlet protection devices shall be installed prior to beginning clearing, grubbing, or earthwork activities.

### 8-01.4 Measurement
**(April 30, 2015 Lacey GSP)**

Supplement this section with the following:

All items required for erosion control shall be included in the lump sum bid item "Erosion/Water Pollution Control" unless a specific bid item is included in the proposal.

Modify this section with the following:

No specific unit of measure shall apply to the lump sum item "ESC Lead"

### 8-01.5 Payment
**(******)**

Modify this section with the following:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The lump sum contract price for "ESC Lead" shall be full compensation for all labor, material, tools, and equipment necessary to meet the requirements of Section 8-01.3(1)B to include conduct site inspections, stormwater sampling, report preparation, report submittal, lab work, and personnel certification.

Delete "Erosion/Water Pollution Control", by force account and add the following bid item:
"Erosion/Water Pollution Control", lump sum.
The lump sum contract price for "Erosion/Water Pollution Control" shall be full compensation for all labor, material, and equipment necessary to implement, install, maintain and remove all erosion and water pollution control items including removal and disposal of sediment, stabilization and rehabilitation of soil disturbed by these activities, installation of the construction entrance, high visibility and silt fencing, and any additional Work deemed necessary by the Engineer to control erosion and water pollution and all Work required for compliance with the Construction Stormwater General Permit (CSWGP) including annual permit fees. The requirements for the ESC Lead shall also be included in this lump sum bid item if no bid item is included in the proposal. The Contractor shall bear full responsibility for erosion/water pollution control in all sources of material, disposal sites, and haul roads.

# 8-02 ROADSIDE RESTORATION

## 8-02.2 Materials

**(October 29, 2010 Lacey GSP)**

Supplement this section with the following:
Materials shall meet the requirements of the following publication:
American Standard for Nursery Stock, ANSI Z60.1-2004, American Nursery and Landscape Association.

Plant varieties shall be as specified in the plant material list and be true to botanical name as listed in the latest edition of "Standardized Plant Names" as adopted by American Joint Committee of Horticulture Nomenclature.
Plants shall be nursery-grown unless otherwise indicated. Plants are required to be from stock acclimated to project site environmental conditions, having been consistently cultivated and grown under site conditions. No cold storage plants will be permitted. Grafted trees shall be done within 3 inches of ground level. Plant material conditions shall meet the following requirements:

Be fresh, well foliated, in prime condition when in leaf and exhibiting normal habit of growth.
Have all leaders and buds intact, free of disease, injury, insects, insect eggs, larvae and indications of strawberry root weevil.
Be free of seeds; weeds, weed roots and other such contaminants.

The Contractor shall notify the Engineer 3 days prior to delivery of any plants. The Engineer will approve all plants before unloading. Any plants that are rejected shall be removed from the project site immediately and replaced with acceptable plants.

Ball and burlapped (B&B) stock is required to have a natural ball sufficient to ensure survival and healthy growth.

Bare root (BR) material is required to have sufficient, intact root systems to ensure survival and healthy growth.

Container-grown plants are required to have sufficient growth to hold the earth intact when removed from containers, but shall not be root-bound.

Geotextile root control system shall be NDS Root Barrier Panel Model No. EP-2450 or Engineer approved equal.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## 8-02.3(4) Topsoil
**(November 20, 2020 Lacey GSP)**

Supplement this section with the following:

The Contractor shall thoroughly scarify the subgrade by tilling, disking or harrowing after the subgrade elevation has been established.

Final grading shall include raking, floating, dragging, and rolling to remove all surface irregularities and to provide a firm, smooth surface with positive drainage. Imported topsoil shall not be placed more than 3 days prior to permanent seeding.

The Engineer reserves the right to randomly sample and test the imported topsoil as it is placed. Test results shall be compared to the requirements of Section 9-14. If it is determined the topsoil does not meet requirements, the Contractor shall be required to remove the topsoil quantity as determined by the Engineer and replace it at the Contractor's expense with an acceptable alternative topsoil.

The Contractor may take samples of the topsoil to be removed for testing. If soil samples from areas to be removed are shown to meet the requirements, the Engineer may adjust the quantity to be removed as represented by the passing samples. All costs incurred by the Contractor to test topsoil shall be borne by the Contractor and no further compensation will be allowed.

The Contractor shall construct a construction entrance in a manner consistent with the project plans and details to access the stockpile site.

## 8-02.3(5) Roadside Seeding, Lawn and Planting Area Preparation
**(November 20, 2020 Lacey GSP)**

Section 8-02.3(5) is supplemented with the following:

Planting area preparation will be required in all landscaped areas. Planting area preparation shall include removal of existing vegetation, construction debris, all visible rocks or other detrimental material from planter strips located within the project limits before adding soil amendments to the imported topsoil for the roadside planting areas, uniformly tilling the soil amendments into the top 8"-12" of soil, using a rototiller or similar machine, grading the blended soils, and then thoroughly watering down.

Planting area preparation in the roadside includes preserving and protecting existing trees. Where noted on plan, Engineer shall identify and mark existing trees to be saved. Following marking, Contractor shall provide and place Engineer approved high visibility orange plastic fence around critical root zones of each marked tree or tree groupings. Do not begin construction activity on the roadsides until all plastic mesh fencing is in place, and approved by the Engineer.

Identify existing trees that are to be removed, that were not removed during roadway construction, prior to starting planting. Obtain approval to remove existing trees from Engineer. Contractor to provide, install and maintain tree protection throughout project duration.

All planting area preparation shall be conducted under favorable weather conditions only. Soil shall not be worked when excessively dry or wet. Engineer reserves the right to stop any work taking place when conditions are considered detrimental to soil structure or plant growth.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

All planting areas shall be weed free and approved by the Engineer before starting rototilling (with soil amendments distributed over designated surface areas) and after rototilling has been completed. All beds shall then be approved by the Engineer for fine grading, before starting any planting operations.

All planting surface areas shall be left with a firm, uniform surface, free of weeds and undulations or other irregularities. Remove all rocks, clods, and debris from all planting surfaces, unless otherwise specified on the plans or directed by the Engineer.

Preliminary grading shall be done in such a manner as to anticipate the finished grades after placement of topsoil, soil amendments and bark mulch (if specified). Excess soil shall be removed or redistributed before application of soil mix, fertilizer, and mulch. Where soil is to be replaced by plants and mulch, allowance shall be made so that when finish grading has begun, there shall be no deficiency in the specified depth of mulched planting beds.

The Contractor shall bear final responsibility for proper surface drainage of the site and the features thereon. Any discrepancy in the drawings or specifications, obstructions on the site, or prior work done by another party which the Contractor feels precludes establishing proper drainage, shall be brought immediately to the attention of the Engineer in writing for correction or relief of said responsibility.

### 8-02.3(6)A Compost
**(April 1, 2024 Lacey GSP)**

Supplement this section and replace with the following:
Compost shall be required for all landscaping projects, construction and post construction soil amendments, application to prevent erosion, filter stormwater runoff, promote vegetation growth, or improve the stability and longevity of roadways, low-impact development and green infrastructure to filter pollutants or keep water on-site or both. Compost products shall be purchased from a facility that meets the requirements of RCW 43.19A.150(6) as exists or is hereafter amended.

The Contractor shall give priority to purchasing compost products from companies that produce compost products locally, are certified by a nationally recognized organization, and produce compost products that are derived from municipal solid waste compost programs and meet quality standards comparable to standards adopted by the department of transportation or adopted by rule by the department of ecology.

### 8-02.3(7) Layout of Planting, Lawn and Seeding Areas
**(January 3, 2017 Lacey GSP)**

Delete this section and replace with the following:

All location layout and staking will be the responsibility of the Contractor.

Tree and plant locations shown shall be considered approximate unless otherwise noted or shown with specific distance. Tree locations may be adjusted, with prior Engineer approval, so that the tree does not interfere with sightline requirements, street signs, irrigation, overhead utilities, or any other apparatuses such as utilities.

Do not locate or plant any tree within 15 feet of a streetlight. Do not locate or plant any tree within 3 feet of a utility vault, 2.5 feet of back-of-sidewalks or back-of-curbs, and 15 feet of a fire hydrant.

In mixed planting areas, trees shall be planted first, followed by the larger shrubs, low shrubs, and then groundcover material.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The Contractor shall layout all trees and plants in the approximate location for approval by the Engineer. All coordination shall be done with the Engineer.

## 8-02.3(8) Planting
**(March 3, 2022 Lacey GSP)**

Supplement this section with the following:

The Contractor shall make required field adjustments as directed by the Engineer without additional cost and to avoid obstructions. Plants not properly planted or temporarily heeled-in will be rejected and shall be removed from the site.

Maintenance shall begin following the installation of each plant and shall continue until project acceptance. Work includes, but is not limited to, watering, weeding, cultivating, tightening, and repairing guys, removal of dead materials, resetting plants to proper grades or upright positions and other operations necessary to ensure proper growth and survival of all plant material.

If it is discovered that Common horsetail (Equisetum Arvense) has been imported with plant material, the Contractor shall remove the tree or shrub in its entirety including the rootball and surrounding soil, and replace the tree or shrub in-kind.

Before excavation, plants to be installed shall be placed as indicated on Planting Plan. The Engineer shall check locations of all plants in the field and shall indicate the exact position before actual planting operation proceeds.

Set trees and shrubs in center of pits, plumb and straight. Plant at such a level that after settlement, the crown of the plant will be slightly above finish grade.

Set plants in backfill mixture to such depth that the top of the plant ball will be slightly above finished grade. Backfill the remainder of the hole and soak thoroughly. Water the backfill until saturated to the full depth of the hole.

A mound of earth shall be formed as directed around each tree and shrub so as to produce a shallow basin to retain water, the diameter to exceed the diameter of the root spread at planting. Plants shall be watered in place during and after backfilling.

Prune plants only at time of planting and according to standard horticultural practice to preserve the natural character of the plant. All pruning shall be done under supervision of Engineer. Remove all dead wood, suckers, and broken or badly bruised branches, unless plants are deemed to be unacceptable and rejected by the Engineer. Use only clean, sharp tools.

Immediately after planting operations are complete, all planting beds and plant pits shall be dressed off so as to achieve a neat and presentable appearance. Planting operations shall be identical for all plants to be planted. Refer to Plans, specifications and directions from Engineer.

If applicable, Contractor shall plant trees, shrubs, and groundcover material in non-irrigated areas between October 1, and January 31.

Plant bare root and live cutting material during winter dormancy (November 30 and February 1) unless otherwise directed by the Engineer. Install live cuttings the same day as harvest or cutting from parent material.

Notify the Engineer a minimum of 48-hours before beginning any roadside planting-related work.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### 8-02.3(9) Seeding, Fertilizing and Mulching
(November 20, 2020 Lacey GSP)

Supplement this section with the following:

The Contractor shall provide water or irrigation to all seeded areas as often as conditions dictate depending on weather and soil conditions. Water will be provided as described in Section 2-07.

Seed shall be broadcast with approved hydraulic seeding equipment, in combination with wood cellulose fiber mulch, soil stabilizer and fertilizer distributed uniformly over designated areas. Half of seed shall be sown with sower moving in one direction, the other half with sower moving at right angles to first sowing. Hydroseeding operator shall remove all seed mulch in its entirety from adjoining paving, structures and plants

Fertilizer shall be applied over the surface of plant basin. Install fertilizer tablets as specified.

All trees shall have an application of beneficial mycorrhizal fungi applied at time of planting in accordance with the manufacturer's recommendations.

### 8-02.3(9)A Dates For Application of Seed
(November 20, 2020 Lacey GSP)

Delete the second paragraph of this section and replace with the following:

In areas receiving automatic irrigation, seeding may occur between May 15 and September 1. Actual planting shall be performed only when weather and soil conditions are suitable and in accordance with locally accepted practice and/or approved by the Engineer.

### 8-02.4 Measurement
(******)

Supplement this section with the following:

No specific unit of measure shall apply to the lump sum item "Landscaping"

### 8-02.5 Payment
(******)

Supplement this section with the following:

The lump sum contract price for "Landscaping" shall be full compensation for all landscaping shown on the plans or described in these specifications. The lump sum contract price shall be full pay for furnishing all labor, materials, tools, and equipment necessary to excavate, scarify the subgrade, rake, remove debris such as rocks and organic material, and shape the material as shown in the plans. The price shall also include but not be limited to plant material, preparation, delivery, planting, protecting, pruning, rebar ties, tree stakes, guying, wrapping, rubber tree tie, fertilizers, mulch, topsoil, soil amendments, pre-emergent and post-emergent herbicides, geotextile root control systems, and seeding as shown on the plans.

## 8-05 LAWN AND LANDSCAPE RESTORATION
(October 16, 2014 Lacey GSP)



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Add the following new section:

### 8-05.1 Description

The Contractor shall take every precaution to preserve and protect existing lawn and landscape areas. Only those landscaped areas necessary for construction shall be disturbed. All lawn areas and landscaping damaged or removed shall be repaired as directed by the Engineer. Lawn areas damaged or removed shall be restored with sod as directed by the Engineer.

### 8-05.3 Construction Requirements

The Contractor shall repair any vegetation, fencing, culverts, ditch sections, or any other objects or structures that are not covered by a specific bid item. Restoration shall return anything damaged by construction to their original condition or to a condition superior to the original condition. The Contractor shall be responsible to evaluate the site prior to bidding this project to determine the areas to be affected by the particular construction method or machinery proposed to be used.

### 8-05.4 Measurement

No unit of measure shall apply to the lump sum price for Lawn and Landscape Restoration.

### 8-05.5 Payment

"Lawn and Landscape Restoration", lump sum.
The lump sum contract price for "Lawn and Landscape Restoration" shall be full pay for all labor, materials, and equipment to restore the project site to condition equal to, or superior to the original condition.

If no bid item for "Lawn and Landscape Restoration" is included, any work described in this section shall be incidental to the project.

## 8-06 CEMENT CONCRETE DRIVEWAY ENTRANCES

### 8-06.5 Payment

(******)

Supplement this section with the following:

"Cement Concrete", per square yard.

All costs in constructing the driveway entrance or concrete pad in segments, including reinforcement shown on Plan, and installing and removing the temporary approach shall be incidental to this bid item.

## 8-12 CHAIN LINK FENCE AND WIRE FENCE

### 8-12.2 Materials

(October 16, 2016 Lacey GSP)

Supplement this section with the following:

All round posts for chain link fence with barbed wire shall have barbed wire posts attached atop and angled to match the existing fence as shown in the plans.

All chain link fences shall include a continuous top rail with or without barb wire to match existing fencing.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

All fence and gates on this project shall be either 6 foot or 10 foot commercially produced black vinyl coated.

### 8-12.4 Measurement
(October 16, 2016 Lacey GSP)

Supplement this section with the following:

"Chain Link Fence Type ___ with Barbed Wire", will be measured per linear foot.

### 8-12.5 Payment
(******)

Supplement this section with the following:

The unit price per linear foot for "Chain Link Fence Type___with Barbed Wire" shall be full pay for all labor, materials, and equipment to install the fence including chain link fence, barbed wire and end, corner, and pull posts, vinyl coating, and gates as shown on the plans. This shall include barb wire and line post on top each post.

## 8-24 GRAVITY BLOCK WALL
(April 1, 2024 Lacey GSP)

Replace Section 8-24 in its entirety with the following new Section:

### 8-24.1 Description

This Work consists of constructing gravity block wall(s) in accordance with the Plans, Special Provisions, these Specifications, or as designated by the Engineer.

### 8-24.2 Materials

Materials shall meet the requirements of the following sections:

| | |
|---|---|
| Grout Type 4 for Multipurpose Applications | 9-20.3(4) |
| Reinforcing Steel | 9-07 |
| Construction Geotextile | 9-33 |
| Backfill for Rock Wall | 9-13.7(2) |

Blocks for the gravity block retaining wall shall be manufactured by:

Redi-Rock International
Puget Sound Precast
2206 121st Street East
Tacoma, WA 98445
1-800-225-2539
(253) 606-2988 (representative)
www.psprecast.com



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The blocks shall be of the dimensions shown in the Plans. Exterior block dimensions shall be uniform and consistent. Maximum dimensional deviations shall be 1% excluding the architectural surface. Maximum width (face to back) deviation including the architectural surface shall be 1.0 inch.

The blocks shall have a minimum 28-day compressive strength of 4,000 psi.

Anti-graffiti sealer shall be applied to each block prior to delivery to the construction site.

The blocks shall have the Cobblestone texture with integral natural grey color and standard charcoal shake-on face color. All blocks shall be sealed.

Capstone adhesive shall be mortar or construction-grade adhesive as approved by the Engineer.

The manufacturer shall review the retaining wall design.

Height: As shown in the Plans.
Embedment depth: As shown in the Plans.
Backfill: Imported granular material as specified herein and as shown in the Plans.
Capstone: To provide neat matching lines with no opening or gaps. Provide standard straight and tapered edges, or saw cut to fit.
Foundation: Grade to be adjusted to distinguish between final grade in front of the wall, and may consist of suitable native soils, structural fill material, or compacted aggregate piers.
Vertical Wall Slope: As shown in the Plans.

## 8-24.3 Construction Requirements

### 8-24.3(1) Excavation

Excavation shall conform to Section 2-09.3(4), and to the limits and construction stages shown in the Plans and described in the Special Provisions.

The Contractor shall restrict the excavation limits to the length of rock wall that can be constructed in 1 day's Work, except as otherwise noted. The Engineer may permit excavation beyond the limits that can be completed in 1 day's Work provided the Contractor either demonstrates that the excavation will remain stable until the rock wall is completed or shores the excavation in accordance with Section 2-09.3(4).

Contractor shall check the materials upon delivery to assure that proper material has been received.

Contractor shall prevent excessive mud, wet cement, epoxy, and like materials that may affix themselves, from coming in contact with the materials.

Contractor shall protect the materials from damage. Damaged material shall not be incorporated into the retaining wall structure.

Crushed base material shall be placed as shown in the Plans. Crushed base material shall be installed upon undisturbed insitu soils, except within the aggregate pier limits.

Material shall be compacted so as to provide a level hard surface on which to place the first course of units. Compaction shall be with mechanical plate compactors to 95% of standard proctor ASTM D698 or 90% of modified proctor ASTM D1557.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Base material shall be prepared to ensure complete contact of retaining wall unit with base. Gaps shall not be allowed.

After excavation of the wall base, the Contractor shall grade the site to a width as shown on the Plans. The Contractor shall erect the gravity block wall and place the backfill in accordance with the erection sequence as approved by the Engineer. The top of the gravity block wall shall be within two inches of the line and grade shown in the Plans. The backfill shall be compacted in accordance with Section 2-03.3(14) C, Method C.

Prior to installation of capstone, apply at a minimum three 1/8 inch continuous beads of adhesive to top of underlying course of block. Firmly seat Capstone. No movement in any modular block capstone in the top course is the measure of acceptance.

### 8-24.4 Measurement
**(April 1, 2024 Lacey GSP)**

Gravity block wall will be measured by the square foot of completed wall in place. The vertical limits for measurement are from the bottom of the bottom layer of blocks to the top of the top layer of blocks. The horizontal limits for measurement are from the end of the wall to the end of the wall. Construction geotextile used for the wall, railings attached to the wall, structure excavation Class B including haul, shoring, and shoring or extra excavation Class B, will not be measured and will be incidental to the square foot of completed wall in place.

### 8-24.5 Payment
**(******)**

"Gravity Block Wall," per square foot.

The unit contract price per square foot of face area for "Gravity Block Wall" or shall be full payment for all Work necessary to install the block retaining walls as shown in the Plans including materials, tools, labor and equipment. This shall include excavation, CSTC leveling pad, blocks, caps, backfill, grading, underdrain pipe, gravel backfill for drains, gravel backfill for walls, geotextile for underground drainage, anti-graffiti sealer, grout, reinforcement, railings, and shoring.

## 8-34 TEMPORARY CHAIN LINK FENCE

Add the following new section:

### 8-34.1 Description
**(October 29, 2010 Lacey GSP)**

Temporary chain link fence shall be placed at all locations where existing fences are removed for replacement as directed by the Engineer.

The Contractor shall place temporary chain link fence immediately following the removal of existing fences. Temporary fence shall remain in place until the permanent fence is completely installed. Posts shall be supported by stands, pins, or other methods approved by the Engineer. Sand bags shall be placed to add additional support as needed

### 8-34.4 Measurement
**(October 29, 2010 Lacey GSP)**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

"Temporary Chain Link Fence" will be measured by the lineal foot of installed fence.

### 8-34.5 Payment
(October 29, 2010 Lacey GSP)

The unit contract price per linear foot for "Temporary Chain Link Fence" shall be full payment for placing, maintaining, removing the fence as directed by the Engineer.

## 8-40 ARC FLASH STUDY
(February 14, 2023 Lacey GSP)

Add the following new section:

### 8-40.1 Description
(February 14, 2023 Lacey GSP)

This Work consists of a short circuit, protective device coordination, and arc flash hazard study per the requirements set forth in this specification for the following City of Lacey facility(ies):
1. Hawks Prairie Reservoir at 4040 Marvin Road NE, Lacey, WA 98516

### 8-40.2 Materials
(February 14, 2023 Lacey GSP)

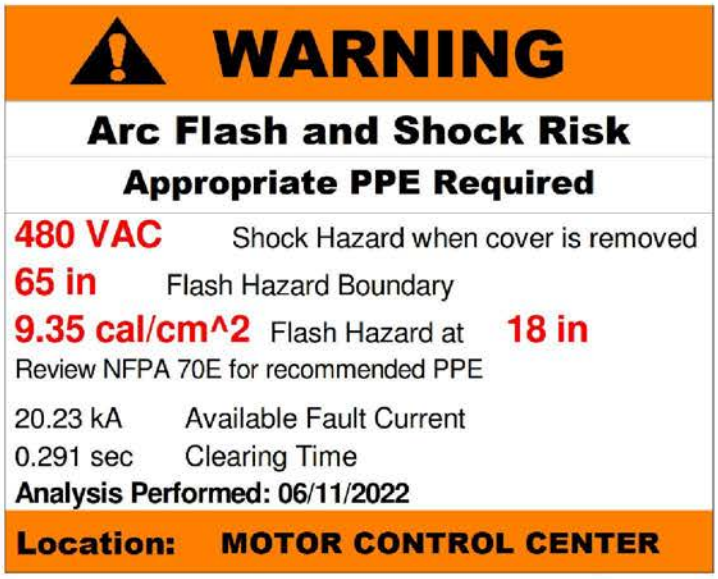
The Contractor shall provide arc flash labels for all equipment in the system. Provide two (2) labels per equipment/bus. The labels shall be 3" x 3.75" high-quality UV-resistant vinyl labels (white with orange warning strip and black letters) with self-adhesive backs conforming to ANSI-Z535. The labels shall be generated directly from the power system software utilized for the study. Labels shall include the following information:

1. Equipment name
2. Shock hazard (voltage)
3. Arc flash boundary
4. Incident energy
5. Available fault current
6. Protective device clearing time
7. Date analysis was performed
8. Name of the firm providing the analysis

An example label is provided below that demonstrates the above requirements.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal




### 8-40.3 Construction Requirements

### 8-40.3(1) Arc Flash Study
(February 14, 2023 Lacey GSP)

The scope of the study shall encompass all new and existing electrical equipment at the facility.

Contractor shall hire a qualified and experienced firm to perform the arc flash study. The firm shall have performed at least five (5) prior, successful arc flash studies to be considered qualified to conduct the study.

An electrical arc flash hazard analysis shall be performed on the facility(ies) electrical system(s) to determine incident energy, arc flash protection boundaries, and required PPE for all electrical equipment in the facility. The calculations shall comply with NFPA 70E and IEEE-1584. The Contractor shall provide an electrical arc flash hazard analysis, including:

1. The development of an up-to-date electrical system one-line diagram and model to provide staff members with an accurate representation of the installed electrical system.
2. Short circuit and equipment duty study to verify that equipment is rated to safely handle short circuit currents without creating hazardous conditions.
3. Protective device coordination study and review to help ensure proper electrical system reliability and to determine if arc flash hazard energy levels can be reduced.
4. Arc flash hazard study to determine maximum incident energy levels, arc flash boundaries, and Personal Protective Equipment (PPE).
5. Arc flash hazard labeling displaying the worst-case arc hazard values for each equipment in the facility.

The study shall consist of the following:

1. Field data collection.
2. Data entry and system one-line modeling in commercially available power system software.
3. Short Circuit and equipment verification study.
4. Protective device coordination study.
5. Arc flash hazard study.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

6. Detailed report and findings of the analysis.
7. Electronic copies of the Project Report and the System Modeling File.
8. Hard copy of the project report
9. Arc Flash Hazard Labels

### 8-40.3(1)A Software Requirements
**(February 14, 2023 Lacey GSP)**

The software shall provide complete integration of the one-line, database, short circuit, protective device coordination and arc flash functions. Software using separate short circuit, protective device coordination, time-current curves (TCC), or arc flash programs is not allowed. Spreadsheet calculations are not allowed. The purpose of this section is to ensure that the arc flash hazard calculations comply with NFPA 70E and IEEE-1584, and that the calculations are programmed with necessary requirements to help eliminate possible errors in the arc flash calculations.

1. Arc flash calculations shall be performed with enhanced IEEE-1584 equations, which eliminate voltage discontinuities and the non-conservative/average results of the standard equations. The purpose of this requirement is to ensure that the calculated incident energies are closer to actual test results ensuring a conservative calculation minimizing personnel risk.Arc flash calculations shall be based on the fastest clearing upstream protective device protecting the equipment for single sources and the slowest upstream protective device for multiple sources. The calculations shall automatically compare all series and parallel upstream protective devices in the system to determine the fastest series device or a conservative parallel clearing time. The algorithm shall incorporate a traversing routine that can search back an unlimited number of buses/nodes and consider all series and parallel branches in the comparison to ensure accurate answers and to prevent hazards associated with incorrect results. The power system software shall provide the following capabilities:Calculates shock hazards, shock hazard boundaries, arc flash boundaries, incident energies, PPE requirements, etc. for power systems.Program shall support creation of arc flash labels.Program shall also have customizable output that includes one-line printing, text report creation, etc.Program shall be Windows based and shall use Windows conventions.Program shall be capable of being installed on standalone personal computers or on networked systems and shall be compatible with all systems operating on Windows 2000 or higher operating systems.SKM Power Tools for Windows, EasyPower, and ETAP are the only acceptable software. Substitutions shall be submitted for approval.

The study shall comply with the following industry recognized standards and recommended practices.

1. IEEE Standard 141-1993, Recommended Practice for Electrical Power Distribution for Industrial Plants.IEEE Standard 242-2001, Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.IEEE Standard 399-1997, Recommended Practice for Industrial and Commercial Power Systems Analysis.IEEE Standard 1584-2018, Guide for Performing Arc-Flash Hazard Calculations' 70: National Electrical Code, latest edition. NFPA 70E: Standard for Electrical Safety in the Workplace, latest edition. Washington Administrative Code, 296-46B, latest revision.

### 8-40.3(1)B Data Collection
**(February 14, 2023 Lacey GSP)**

The Contractor shall collect and furnish all equipment information and data as required by the study, including, but not limited to:

1. Motor nameplate information for all three-phase motors. Transformer nameplate information for all three-phase transformers. Standby generator manufacturer and model number for all standby generators. Circuit breaker manufacturer, model number, and existing settings including trip unit size (if applicable) for all three-phase circuit breakers. Overcurrent relay manufacturer, type, style, trip device, and actual settings for all overcurrent relays. Fuse manufacturer and model



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

number for all fuses for three-phase circuits. Conductor size and length for all three-phase circuits. Equipment interrupting current ratings. All available electrical as-builts and record drawings.

The Contractor shall coordinate with the local utility or relevant electric service provider to obtain specific utility equipment information and fault current contribution at the facility. Equipment information and values shall be specific to the equipment installed at the facility.
This information includes, but is not limited to:

1. Available fault current contribution at the primary side of the utility transformer: Single line-to-ground short circuit current and X/R ratio Three phase line-to-ground short circuit current and X/R ratio Primary fuse size, manufacturer, and model number. Utility transformer size, primary and secondary voltages, connection type, impedance, and X/R ratio.

The Contractor shall review and comply with all facility safety requirements while collecting on-site equipment information. Equipment shall be visually inspected to collect the necessary nameplate data used in the analysis. The Contractor is responsible for visual verification of this data, including transformers, switchgear and breakers, relays, direct-acting trip units, etc. Data that may not be readily accessible or may not have nameplate data such as conductors, busway, etc. shall be taken from drawings. The City of Lacey shall provide qualified personnel to show the Contractor equipment location and to open all equipment doors, locks, etc. necessary to collect nameplate data.

### 8-40.3(1)C Modeling the Electrical System
**(February 14, 2023 Lacey GSP)**

1. The system model shall be developed using a commercially available, fully integrated software package that meets the performance specifications developed in this Section. To ensure compliance with the latest edition of NFPA 70E, ANSI, and IEEE Standards, and OSHA mandates, no exceptions or substitutions to the performance specification are allowed. The system model shall be laid out in a single drawing/view and in a manner that provides for easy viewing of all analysis results. All one-line symbols shall be evenly spaced to aid in ease of viewing. Equipment names used in the modeling software shall be identical to the equipment and naming convention shown on the existing facility drawings and equipment unless conflicts exist. The Contractor shall bring all naming convention conflicts or deficiencies to the attention of City of Lacey staff members for clarification. The facility may have multiple operating conditions, including, but not limited to, generation on/off, shutdown, bus-ties, start-up, emergency operation, etc. The Contractor shall discuss facility operation with City of Lacey staff to determine the normal operating modes of the system to be modeled. Lumped motor groups for MCC's shall be modeled per IEEE standards using groups >50 Hp, and <50 Hp. Where motor list data is not available, single lumped groups may be modeled per IEEE-141.Medium voltage motors greater than 1.0 kV shall be modeled individually on their respective buses including all protective phase and ground overcurrent relays and fuses. All low voltage power circuit breaker (LVPCB), insulated case (ICCB), molded case (MCCB) and fuse data shall be modeled based on the actual nameplate data including manufacturer, type, style, trip device, and actual settings. Generic substitutions or assumptions shall not be allowed unless data cannot be field verified. All assumptions shall be documented in the report. All relay data shall be modeled based on the actual nameplate data including manufacturer, type, style, trip device, and actual settings. Generic substitutions or assumptions shall not be allowed unless data cannot be field verified. All assumptions shall be documented in the report. All overcurrent relay types for the distribution system shall be modeled on the one-line diagram to establish a complete and detailed system model where protective device data can be easily modified and updated by the facility and all data is available for a comprehensive protective device coordination study if required in the future. All equipment modeling must have a corresponding one-line diagram symbol. This means that there can be no hidden database models. The purpose is for the facility to easily see all equipment, its



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

associated data, to be able to link documents to the equipment as a data repository, etc. All system modeling shall conform to accepted modeling practices as outlined in IEEE-399. The Contractor may provide more advanced modeling techniques where compliance with the specification is maintained.

### 8-40.3(1)D Short Circuit Study
**(February 14, 2023 Lacey GSP)**

1. A short circuit study shall be performed to verify all equipment duties in the system. The calculations shall comply with ANSI C37.010, C37.13, C37.5, IEEE-141, and IEEE-399. The short circuit study shall verify the system electrical equipment is properly rated to withstand and interrupt the expected bolted and arcing faults in the system. Improperly rated and applied equipment may not protect personnel against arc flash hazards even if properly applied PPE is used. The software program must comply with the above standards in order to properly verify equipment installed in North America. No substitutions will be allowed.
2. The equipment duty verification shall determine both the line side and load side fault current through each equipment and use the highest current to verify equipment ratings. Standard bus faults are not acceptable for protective devices in that they do not accurately model the current through the device and consequently they provide erroneous results. For solidly grounded systems, both three-phase and single-line-to-ground faults shall be modeled. For other grounding configurations only a three-phase fault is required.
3. Equipment duty results shall be provided in tabular report format.
4. The results of the equipment duty verification tabular format report shall provide the following data:
    a. Equipment name and kV
    b. Manufacturer, type, style, and ratings of the device
    c. Actual line or load side currents through the device
    d. Flag for the device showing VIOLATION or WARNING level for visual identification

### 8-40.3(1)E Protective Device Coordination Study
**(February 14, 2023 Lacey GSP)**

A protective device coordination study shall be performed in order to determine if the system protection characteristics are sufficient to provide reliable power to the facility. The protective device coordination study will also determine if the existing settings entered in the software will provide proper personnel protection in the arc flash portion of this study. For facilities where the main distribution is low voltage (under 600 volts) and only instantaneous breakers or fuses are used, this section may not apply.

The protective device coordination study shall consist of selecting major system feeders and plotting the TCCs to verify proper selective operation of the protective devices. The study shall also determine if the settings can be enhanced to provide increased personnel/equipment protection without sacrificing selective coordination. The Contractor shall determine in conjunction with City of Lacey staff the systems to be studied. It is expected that the protective device coordination include all substation equipment and major distribution and major equipment feeders.

The Contractor shall notify City of Lacey staff of any potential problems in the protective device settings that affect either selective operation and reliability or personnel protection and shall provide recommendations for changes to the settings in writing before continuing with the study. City of Lacey staff may then opt to utilize existing settings or to change the settings before continuing with the arc flash study.

The Contractor shall contact the serving utility and obtain protective device settings for all service entrance overcurrent devices in series with the facility and affecting coordination with the facility's distribution system.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

TCC Specifics: The TCCs shall graphically illustrate on log-log paper that adequate time separation exists between series devices. The specific time current characteristics of each protective device shall be plotted in such a manner that sufficient upstream devices will be clearly depicted on one sheet to prove selective coordination.

1. TCCs shall include protective device coordination curves for each device in the selected area. The TCC shall be printed in color on 8 ½ x 11" paper – full size portrait mode, using a log-log scale.
2. For low voltage systems, TCCs shall be developed for both phase and ground protective devices. The TCC shall show the largest feeder/motor protective device in the MCC or panel up through the switchgear/switchboard feeder breaker, transformer secondary main, and utility primary fuse. For secondary switchboards serving large loads or a wide variety of loads that may affect upstream coordination, additional TCCs may be required.
3. The following specific information shall also be shown on the TCCs:
   a. Device identification.
   b. Voltage and current ratio for curves.
   c. Transformer three phase and single-line-to-ground ANSI damage curves.
   d. Transformer inrush points.
   e. Minimum melting and clearing curves for fuses.
   f. Motor starting locked rotor curves, and if available the motor locked rotor damage point.
   g. Each protective device curve shall be terminated at a point reflecting maximum symmetrical or asymmetrical fault current through the device.
   h. Identify the device associated with each curve by manufacturer type, function, and setting – i.e. tap, time delay, and instantaneous, pickup, etc.

A setting table shall be provided to summarize the settings for the protective devices. The table shall include the following:

1. Device identification.
2. For low voltage breakers, the circuit breaker manufacturer, type and style, long time, short time, instantaneous settings, time bands, and any other settings. For breakers with ground fault capability, the pickup and time delay.
3. Protective relay manufacturer, type, style, function (51, 50, 67, etc.) pickup, current multiplier, time dial, and delay. For multi-function units, list all devices being used. Include the CT and/or PT ratios for each function.

The software shall provide complete integration of the one-line, database, short circuit, protective device coordination and arc flash analysis functions to provide accurate calculations and avoid errors and inefficiencies associated with multiple data entry programs. Programs using separate protective device coordination or TCC plotting packages are not allowed. Complete protective device coordination integration is defined as the following:

1. TCCs shall be developed by simply selecting (highlighting) with the mouse the one-line area to be coordinated. The TCC shall automatically be plotted for the selected area.
2. Programs requiring the user to build a separate TCC one-line are not integral with system short circuit calculations and do not automatically update as the system one-line changes, requiring additional one-line development and are consequently prone to errors as the system changes. These types of programs shall not be considered for the study.
3. The software model shall provide a detailed library for the most common protective devices available in North America. The library shall be user definable.

**8-40.3(1)F Arc Flash Study**
**(February 14, 2023 Lacey GSP)**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

A detailed arc flash study shall be performed to determine potential arc flash incident energies, arc flash boundaries, shock hazard boundaries and proper personal protective equipment (PPE) for all energized electrical system equipment tasks for the electrical system studied. The calculations shall comply with the latest edition of NFPA 70E and IEEE-1584. Bolted short circuit calculations used in the above standards shall comply with ANSI C37.010, C37.13, C37.5, IEEE-141, and IEEE-399. The purpose of this study is to determine arc flash hazards in conformance with NFPA 70E. The software program used in this study shall comply with the above standards. No substitutions in calculation methods will be allowed.

The arc flash study shall determine the following results the system. The results shall be provided in spreadsheet format. The spreadsheet results table shall be capable of providing its output directly to arc flash hazard labels. The spreadsheet results shall include:

1. Equipment name and voltage.
2. Upstream equipment device name
3. Bolted and estimated arcing fault current at the fault point (equipment) in symmetrical amperes. The estimated arcing current shall be based on the arcing current equations used.
4. Trip time, opening time, and total clearing time of the protective device.
5. Working distance in accordance with voltage class as defined by NFPA 70E.
6. Arc flash boundary for each bus/equipment in the model.
7. Arc flash hazard incident energy in cal/cm2 for each bus/equipment in the model.

### 8-40.3(1)G Reporting and Analysis Study
**(February 14, 2023 Lacey GSP)**

Provide a detailed written report that includes the following:

1. Introduction. Methodology. Facility Description. Key Assumptions. Short Circuit Study, including utility contribution information and fault current results in table format at all equipment buses. Protective Device Coordination Study Arc Flash Hazard Study, including the results of Arc flash Hazard Analysis. Overcurrent Protective Device Recommended Settings implemented in the study to reduce arc flash hazard exposure. Overcurrent protective device settings that differ from the observed settings of existing equipment shall be specifically identified so that the existing settings shall be changed in order to validate the study. Project One-Line Diagram showing the complete electrical system used in the Study. Time-Current Characteristic Curves Input Data Summary generated directly from the power system software utilized for the study. Short Circuit Study results generated directly from the power system software utilized for the study. Images of all labels.

### 8-40.3(1)H Deliverables
**(February 14, 2023 Lacey GSP)**

1. One (1) printed copy of the completed study report shall be provided in addition to an electronic version in Portable Document Format (PDF). Arc Flash Hazard Labels in accordance with these specification requirements.

### 8-40.4 Measurement
**(February 14, 2023 Lacey GSP)**

"Arc Flash Study", shall be measured per each.

### 8-40.5 Payment
**(February 14, 2023 Lacey GSP)**

"Arc Flash Study", per each includes the labor, equipment, and materials required to perform one arc flash study based on the IEEE, NFPA, and Washington Administrative Code standards listed in these



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

specifications and prepare an Arc Flash Study report. Contractor shall furnish two (2) arc flash labels per equipment/bus.

## 8-50 MISCELLANEOUS

Add the following new sections:

### 8-50.1 BOLLARDS
**(January 4, 2016 Lacey GSP)**

**Description**

This work shall consist of furnishing and installing steel bollards in accordance with the Plans, Standard Plans, and these Specifications, at the locations shown in the Plans or as staked by the Engineer.

**Materials**

Type 1 and Type 2 bollard posts shall be ASTM A 53, NPS 3 (3" Nom.) schedule 80 steel pipe with tabs for chains. Post sleeves shall be ASTM A 53, NPS 4 (4"Nom.) schedule 40 steel pipe.

Type 3 bollard posts shall be steel structural tubing per ASTM A 500 Gr B.

Steel plate shall be per ASTM A 36.

Chains shall be 5/16" Grade 316, Stainless Steel Chain to connect each bollard.

Locks shall be ANSI Grade 2 outdoor keyed padlock with a minimum 2 inch shackle. All padlocks in the set shall be key alike (2 keys per set).

All steel parts shall be hot-dip galvanized after fabrication in accordance with AASHTO M 111.

Reflective tape shall be one of the following or an approved equal:

Scotchlite High Intensity Grade Series 2870
Reflexite AP-1000
Scotchlite Diamond Grade LDP Series 3970
T-6500 High Intensity (Type IV)

Footings shall be constructed using concrete Class 3000 or Commercial Concrete.

**Construction Requirements**

Bollards shall be constructed in accordance with the Standard Plans. Bollard footing surfaces shall slope away from the bollard to meet pavement grade. The footing shall follow the dimensions and details of the square footing and the surface shall have a smooth trowel finish.

Bollards shall not vary more than 1/2 inch in 30 inches from a vertical plane.

Bollard posts and the exposed parts of the base assembly shall be painted in accordance with Section 6-07.3(11) for galvanized surfaces. The top coat shall match Federal Standard 595, Color No. 33538 Traffic Signal Yellow.

**Measurement**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Measurement for bollards will be by the unit for each type of bollard furnished and installed.

**Payment**

Payment will be made in accordance with Section 1-04.1, for the following bid items:

The unit contract price per each for "Bollard Type ___" shall be full pay for all labor, materials, and equipment required to install a bollard including foundation excavation, concrete footing, finishing, steel pipe and plate, paint, chain, locks, and other items required to install a bollard complete in-place.

### 8-50.2 PROJECT CLOSEOUT
(April 2, 2018 Lacey GSP)

**Description**

This work shall consist of completing all miscellaneous items of work in accordance with the Plans and these Specifications that are required to achieve Completion and Final Acceptance, as identified by the Engineer and the Contracting Agency. This work may include but is not limited to punch list items, record drawings, O&M Manuals, training, material acceptance documents, copies of the approved "Affidavit of Prevailing Wages Paid" for the Contractor and all Subcontractors, and any other work required in these Plans and Specifications that has not been completed.

**Measurement**

No unit of measurement shall apply to the lump sum price for "Project Closeout".

**Payment**

"Project Closeout", lump sum.
The unit contract price per lump sum for "Project Closeout" includes all compensation for all costs of completing the miscellaneous items of work identified by the Contracting Agency prior to final acceptance of the Project. A fixed lump sum price has been included in the Proposal for this work. Any additional costs anticipated or incurred by the Contractor for the work shall be included in the various lump sum and unit price bid items as found in the Proposal. Neither partial payment, nor additional compensation shall be allowed

## 9-03 AGGREGATES

Add the following new Section:

### 9-03.16 Imported Pipe Bedding
(April 30, 2015 Lacey)

Bedding material for pressure mains and services shall be clean sand/gravel mixture free from organic matter and conforming to the following gradation:

| Sieve Size | Percent Passing |
|---|---|
| 3/4" square | 100 |
| 3/8" square | 70-100 |
| U.S. No. 4 | 55-100 |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | |
|---|---|
| U.S. No. 10 | 35-95 |
| U.S. No. 20 | 20-80 |
| U.S. No. 40 | 10-55 |
| U.S. No. 100 | 0-10 |
| U.S. No. 200 | 0-3 |

Bedding material for gravity mains and stubs/or laterals shall be clean sand/gravel mixture free from organic matter and conforming to the following gradation:

| Sieve Size | Percent Passing |
|---|---|
| 3/8" square | 85-100 |
| U.S. No. 4 | 10-30 |
| U.S. No. 8 | 0-10 |
| U.S. No. 16 | 0-5 |

All percentages are by weight

### 9-03.21 Recycled Materials
**(April 30, 2015 Lacey)**

Section 9-03.21 is supplemented with the following:

Recycled materials will not be used unless approved by the Engineer.

## 9-14 EROSION CONTROL AND ROADSIDE PLANTING

### 9-14.2(1) Topsoil Type A
**(March 3, 2022 Lacey GSP)**

Supplement this section with the following:

Topsoil Type A shall be composed of a three way winter mix consisting of 2 parts soil, 2 parts compost, 3 parts sand.

Soil shall be classified as gravelly sand, well-graded sand, poorly graded sand, or silty sand.

Compost shall be a weed free well decomposed, humus-like material derived from the decomposition of grass clippings, leaves, branches, wood, and other organic materials. Compost shall be produced at a permitted solid waste composting facility. Composts containing shavings, cedar sawdust, or straw will not be permitted.

The Contractor shall give priority to purchasing compost products from companies that produce compost products locally, are certified by a nationally recognized organization, and produce compost products that are derived from municipal solid waste compost programs and meet quality standards comparable to standards adopted by the department of transportation or adopted by rule by the department of ecology.

Sand shall consist of 100 percent passing the 3/8 inch sieve, minimum 95 percent passing the #4 sieve, and maximum of 5 percent passing the #100 sieve.

Topsoil shall meet the following requirements:

Screen Size (approximate particle size) 5/8" maximum



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | |
|---|---|
| Maturity measure (C:N ratio) | 30:1 |
| Total Nitrogen | 0.5% minimum |
| PH range | 5.5-8.0 |
| Foreign matter by dry weight | 1% maximum |

The Contractor shall provide a sample of the topsoil and a laboratory analysis with recommendations from the laboratory for desired additives for the Engineers approval. The Contractor shall incorporate any additives recommended by the laboratory.

### 9-14.3 Seed

**(November 20, 2020 Lacey GSP)**

Supplement this section with the following:

There shall be several types of mixes used on this project. The list of approved seed varieties are specifically identified list below. They shall be applied at the given rates. Source identified seed shall be fourth generation or earlier. Non-Source Identified seed shall meet or exceed Washington State Department of Agriculture Certified Seed Standards. Seeds shall be certified "Weed Free", indicating there are no noxious or nuisance weeds in the seed.

Lawn Mix - shall be applied at 200 pounds per acre and the maximum weed seed shall be no more than 0.5%. Grass seed of the following composition, proportion, and quality shall be applied as follows:

| Kind and Variety of Seed | Percent By Weight | Minimum Pure Seed | Minimum Germination |
|---|---|---|---|
| Equal Mix 3-Perennial Ryegrasses | 60% | 98% | 90% |
| One Chewing Fine Fescue | 20% | 98% | 90% |
| One Creeping Red Fescue | 20% | 98% | 90% |

Approved Seed Type:

**Perennial Ryegrasses**

| | | | |
|---|---|---|---|
| Fiesta 4 | Manhattan 5 | Grand Slam GLD | Karma |
| SR 4650 | Karma | Banfield | Sideways |
| Thrive | Wicked | Pavilion | Dasher 3 |
| Tetradark | | | |

**Creeping Red Fescue**

| | | | |
|---|---|---|---|
| Salsa | Cindy | Jasper | Salem |

**Chewing Fescue**

| | | | |
|---|---|---|---|
| Tiffany | Shadow II | Treazure E | Longfellow |
| Weekend | Tamara | Enjoy | Victory |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# E

# TECHNICAL SPECIFICATIONS

*The information contained in this document was prepared by and under the direct supervision of the undersigned:*




THE CONTENT OF THIS DOCUMENT, AS A MEANS OF PROFESSIONAL SERVICE, IS PROTECTED BY 17 U.S.C. § 101. ET SEQ. AS SUCH, IT SHALL NOT BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT OR PURPOSE WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER OR RH2 ENGINEERING.© 2019 RH2 ENGINEERING, INC.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Table of Contents


DIVISION 1 GENERAL ..... 1-1

1.10 GENERAL ..... 1-1

*1.11.02 Reuse of Documents [CSI 01 11 30]* ..... *1-1*

*1.11.03 Electronic Data [CSI 01 31 26]* ..... *1-1*

*1.13 Permits and Licenses* ..... *1-2*

*1.75.16.50 Reservoir Disinfection and Testing* ..... *1-2*

*1.75.16.51 Reservoir Leakage Test* ..... *1-5*

*1.75.16.56 Reservoir Soak Test* ..... *1-6*

1.80 PERFORMANCE REQUIREMENTS [CSI 01 80 00] ..... 1-7

*1.81.30 Seismic Restraint and Anchorage [CSI 01 81 30]* ..... *1-7*

*1.81.40 Pressure Ratings [CSI 01 81 40]* ..... *1-7*

DIVISION 2 SITEWORK ..... 2-1

2.00 GENERAL ..... 2-1

*2.10.3 Well Protection* ..... *2-1*

DIVISION 3 RESERVOIR CONCRETE ..... 3-1

3.00 GENERAL ..... 3-1

*3.05 Common Work for Concrete [CSI 03 05 00]* ..... *3-1*

*3.06 Maintenance of Concrete [CSI 03 01 00]* ..... *3-3*

*3.06.30.71 Resurfacing of Cast-in-Place Concrete [CSI 03 01 30.61]* ..... *3-3*

3.10 FORMING AND ACCESSORIES [CSI 03 10 00] ..... 3-4

*3.11 Formwork [CSI 03 11 00]* ..... *3-5*

*3.11.13 Structural Cast in Place Forming [CSI 03 11 13]* ..... *3-5*

*3.15 Concrete Accessories [CSI 03 15 00]* ..... *3-6*

*3.15.05 Pipe Penetrations through Concrete [CSI 03 15 35]* ..... *3-6*

3.20 REINFORCING [CSI 03 20 00] ..... 3-6

*3.21 Reinforcement Bars [CSI 03 21 00]* ..... *3-6*

*3.21.11 Plain Steel Reinforcement Bars [CSI 03 21 11]* ..... *3-6*

3.30 CAST-IN-PLACE CONCRETE [CSI 03 30 00] ..... 3-7

*3.30.05 Common Work for Cast in Place Concrete [CSI 03 30 05]* ..... *3-7*

*3.31 Structural Concrete [CSI 03 31 00]* ..... *3-10*

*3.31.13 Structural Concrete [CSI 03 31 13]* ..... *3-10*

*3.31.32 Hydraulic Concrete [CSI 03 31 13.12]* ..... *3-10*

*3.31.36 Concrete for Mass Structures [CSI 03 31 13.16]* ..... *3-11*

*3.35 Concrete Finishing [CSI 03 35 00]* ..... *3-11*

*3.35.05 Common Work for Surface Finishing [CSI 03 35 05]* ..... *3-11*

*3.35.50 Ordinary Wall Finish [CSI 03 35 50]* ..... *3-12*

*3.39 Concrete Curing [CSI 03 39 00]* ..... *3-12*

3.60 GROUTING [CSI 03 60 00] ..... 3-13

*3.62 Non-Shrink Grouting [CSI 03 62 00]* ..... *3-13*

*3.62.13 Non-Metallic Non-Shrink Grout [CSI 03 62 13]* ..... *3-13*

DIVISION 5 METALS ..... 5-1

5.00 GENERAL ..... 5-1




Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Table of Contents


*5.05 Common Work for Metals [CSI 05 05 00]* ..... *5-1*
*5.05.23 Bolts and Other Connectors [CSI 05 05 23, 06 05 23]* ..... *5-4*
5.50 METAL FABRICATIONS [CSI 05 50 00] ..... 5-5
5.51 METAL STAIRS [CSI 05 51 00] ..... 5-5
*5.51.05 Common Work for Stairs and Ladders [CSI 05 51 05]* ..... *5-5*
*5.51.19 Metal Grating Stairs [CSI 05 51 19]* ..... *5-6*
5.52 METAL RAILINGS [CSI 05 52 00] ..... 5-6
*5.52.05 Common Work for Railings [CSI 05 52 05]* ..... *5-6*
5.53 METAL GRATINGS [CSI 05 53 00] ..... 5-7
*5.53.05 Common Work for Gratings [CSI 05 53 05]* ..... *5-7*

DIVISION 8 OPENINGS ..... 8-1

8.00 GENERAL ..... 8-1
*8.05 Common Work for Openings [CSI 08 05 00]* ..... *8-1*
8.30 SPECIALTY DOORS [CSI 08 30 00] ..... 8-1
*8.31 Access Doors and Panels [CSI 08 31 00]* ..... *8-1*
*8.31.20 Vault Hatches [CSI 08 31 20]* ..... *8-1*

DIVISION 9 FINISHES ..... 9-1

9.00 GENERAL ..... 9-1
9.90 PAINTING AND COATING ..... 9-1
*9.90.00 Common Work for Painting and Coating* ..... *9-1*
*9.90.01 Color Schedule* ..... *9-8*
*9.90.02 Unpainted Items* ..... *9-8*
9.91 PAINTING AND COATING SYSTEMS ..... 9-8
9.91.13 EXTERIOR PAINTING ..... 9-8
*9.91.13.1 System 1: Metals Exterior (Wet Conditions)* ..... *9-8*
*9.91.13.13 - System 2: Ferrous Metal including Cast/Ductile Iron Pipe (Atmospheric Outdoors)* ..... *9-9*
*9.91.33.02 - System 3: Stainless Steel in Contact with Drinking Water (Welded) [CSI 09 91 33 14 or 09 97 13.24]* ..... *9-10*
*9.97.23.07 – System 4: Concrete Vault Interior [CSI 09 97 23 19]* ..... *9-10*
*9.98 Steel Reservoir Coating* ..... *9-10*
*9.98.1 Common Work for Steel Reservoir Coating* ..... *9-10*
*9.98.3.1 System 5: Welded Steel Reservoir Interior Relining* ..... *9-15*
*9.98.3.2 System 6: Welded Steel Reservoir Exterior Coating Repair (Schedule D)* ..... *9-15*
*9.98.02.03 System 7: Welded Steel Reservoir Exterior Recoating (Schedule C)* ..... *9-17*

DIVISION 13 SPECIAL CONSTRUCTION ..... 13-1

13.00 GENERAL ..... 13-1
13.30 SPECIAL STRUCTURES [CSI 13 30 00] ..... 13-1
*13.31 Water Utility Storage Tanks [CSI 33 16 00]* ..... *13-1*
*13.31.23 Ground Level Steel Water Storage Tanks [CSI 33 16 23]* ..... *13-1*
*13.31.40 Water Storage Tank Appurtenances* ..... *13-4*
*13.47 Facility Protection* ..... *13-5*
*13.47.13.17 Cathodic Protection for Storage Tank* ..... *13-5*
13.50 CENTER COLUMN REPAIR ..... 13-10




Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Table of Contents


13.51 Reservoir Door Sheet ..... 13-10

DIVISION 15 MECHANICAL ..... 15-1

15.00 General ..... 15-1
*15.05 Common Work for Mechanical [CSI 33 05 00]* ..... *15-1*
15.20 Pipe and Fittings ..... 15-2
*15.22 Metal Pipe and Fittings* ..... *15-2*
*15.22.04 Stainless Steel Pipe and Fittings* ..... *15-2*
*15.23.10 Polyethylene Pipe* ..... *15-3*
15.30 Valves ..... 15-4
*15.32.06.01 Seismic Sensor Shutoff Valve System [CSI 40 05 96.13]* ..... *15-4*
*15.33.09 Duckbill Elastomeric Check Valves [CSI 40 05 71.13]* ..... *15-4*
*15.34 Hydraulic Control Valves* ..... *15-5*
*15.34.01 Common Work for Hydraulic Control Valves [CSI 40 05 65.05]* ..... *15-5*
*15.34.12 Reservoir Inlet Flow Control, Altitude, and Check Hydraulic Control Valve [CSI 40 05 67.51]* ..... *15-6*
*15.34.13 Reservoir Outlet Flow Control and Solenoid Shut-off Hydraulic Control Valve [CSI 40 05 67.51]* .... *15-7*
15.40 Piping Specialties ..... 15-7
*15.40.01 Dismantling Joint [CSI 40 05 06.13]* ..... *15-7*
*15.40.02 Expansion Joint [CSI 40 05 06.15 or 33 05 09.15]* ..... *15-8*
*15.40.03 Pipe, Valve, and Conduit Supports [CSI 40 05 07]* ..... *15-8*
*15.40.04 Dielectric Fittings and Adapters* ..... *15-12*
*15.40.06 Above-ground Sampling Station [CSI 40 05 81.35]* ..... *15-13*
*15.40.11 Joint Restraints – Wedge Style [CSI 33 05 09.34]* ..... *15-13*
*15.40.12 Sacrificial Corrosion Control for Buried Metal Pipe [CSI 13 47 13.13]* ..... *15-15*
15.50 Flow Meters [CSI 33 19 00 or 40 71 00] ..... 15-18
*15.50.05 Common Work for Flow Meters [CSI 33 19 05 or 40 71 05]* ..... *15-18*
*15.51 Flow Meter Readout Head [CSI 33 09 01, 33 19 90 or 40 71 90]* ..... *15-19*
*15.51.05 Digital Read Head with Electronic Output [CSI 33 09 01.33, 33 19 94 or 40 71 94]* ..... *15-19*
*15.53 Electronic Flow Meters* ..... *15-20*
*15.53.03 Electromagnetic Flow Meters [CSI 33 19 23 or 40 71 13.13]* ..... *15-20*
15.60 Pressure Measurement [CSI 40 73 00] ..... 15-21
*15.60.01 Common Work for Pressure Measurement [CSI 40 73 05]* ..... *15-21*
*15.61 Pressure Gauges [CSI 40 73 13]* ..... *15-21*
15.70 Plumbing [CSI 22 00 00] ..... 15-22
*15.70.05 Common Work for Plumbing [CSI 22 05 00]* ..... *15-22*

DIVISION 16 ELECTRICAL ..... 16-1

16.00 General ..... 16-1
*16.05 Common Work for Electrical* ..... *16-1*
16.10 Electrical Site Work ..... 16-7
*16.10.1 Common Work for Electrical Site Work* ..... *16-7*
*16.10.3 Handholes and Pull Boxes* ..... *16-8*
*16.15 Grounding and Bonding for Electrical Systems* ..... *16-9*
16.60 Conductors ..... 16-10
*16.61 Low Voltage Wire and Cable* ..... *16-10*
*16.63 Signal Cable* ..... *16-13*




Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Table of Contents


16.70 RACEWAYS, BOXES, AND FITTINGS ..... 16-14
*16.71 Raceways ..... 16-14*
*16.72 Boxes and Enclosures ..... 16-17*
*16.72.2 Outlet and Junction Boxes ..... 16-17*
*16.72.3 Watertight Enclosures ..... 16-18*
*16.75 Wiring Devices ..... 16-19*
*16.75.1 Common Work for Wiring Devices ..... 16-19*
*16.75.2 Receptacles ..... 16-20*

DIVISION 17 AUTOMATIC CONTROL ..... 17-1

17.00 GENERAL ..... 17-1
*17.05 Common Work for Automatic Control ..... 17-1*
*17.06 Facility Integrator ..... 17-6*
*17.07 Programmer ..... 17-7*
*17.08 System Description ..... 17-8*
17.20 PANEL COMPONENTS ..... 17-9
*17.20.3 Terminal Blocks ..... 17-9*
*17.22 Wire and Cable ..... 17-10*
*17.22.2 Wiring ..... 17-10*
*17.22.3 Cables ..... 17-10*
*17.24 Switches and Relays ..... 17-10*
*17.24.4 Panel Relays ..... 17-10*
17.30 INTELLIGENT CONTROL UNITS ..... 17-12
*17.31.2 Programmable Logic Controller (PLC) System ..... 17-12*
17.50 SENSORS AND CONTROLS ..... 17-14
*17.50.1 Common Work for Sensors and Controls ..... 17-14*
*17.51 Emergency Sensors and Controls ..... 17-14*
*17.51.4 Intrusion Alarm Switch ..... 17-14*
*17.52 Pressure and Level Sensors and Controls ..... 17-15*
*17.52.2 Flood Liquid Level Switches ..... 17-15*
*17.52.4 Clean Water Level Float Switches ..... 17-15*
*17.52.10 Gauge Level/Pressure Transmitter ..... 17-16*
17.90 PRE-STARTUP, STARTUP, AND TRAINING ..... 17-17
*17.90.1 Common Work for Pre-startup, Startup, and Training ..... 17-17*
*17.91 Pre-Startup ..... 17-18*
*17.92 Startup ..... 17-20*
*17.93 Training ..... 17-21*
*17.94 Documentation ..... 17-22*
*17.94.2 Operations and Maintenance Manuals ..... 17-22*

DIVISION 18 MEASUREMENT AND PAYMENT ..... 18-1

18.0 GENERAL ..... 18-1
*850-725 Electrical ..... 18-1*
*850-735 Startup ..... 18-1*
*850-850 Reservoir Foundation ..... 18-2*
*850-855 Reservoir Center Column Repair ..... 18-2*




Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Table of Contents

*850-860 Reservoir Mechanical* ..... *18-2*
*850-862 Cathodic Protection* ..... *18-2*
*850-865 Reservoir Finishes (Exterior)* ..... *18-3*
*850-870 Reservoir Finishes (Interior)* ..... *18-3*
*850-875 Reservoir Disinfection* ..... *18-3*
*850-885 Reservoir Structure* ..... *18-3*
*850-890 Reservoir Appurtenances* ..... *18-3*



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 1.10 GENERAL

Sections in these specifications titled "*Common Work for . . .*" shall apply to all following subsections whether directly referenced or not.

Sections in these specifications titled "*Related Sections*" shall be read as integral to the specification as if they were fully detailed within. All work and materials described in such sections shall be provided and performed by the Contractor.

## 1.11.02 Reuse of Documents [CSI 01 11 30]

Contractor and any Subcontractor or Supplier shall not:

1. Have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or
2. Reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.
3. The prohibitions of this Paragraph will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

## 1.11.03 Electronic Data [CSI 01 31 26]

1. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner to Contractor, or by Contractor to Owner, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
2. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 30 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 30-day acceptance period will be corrected by the transferring party.
3. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.
4. Computer Aided Design (CAD) files may be made available to the Contractor upon request, but only at the discretion of the Engineer. This includes AutoCAD™, Civil3D™, or other similar file types. If CAD files are provided, no level of accuracy is implied or should be assumed unless the Engineer expressly states a level of


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

accuracy. CAD files by nature include extraneous information used to develop the drawings but are not part of the final design. Any use of CAD files is solely at the Contractor's risk and the Engineer takes no responsibility for interpretations by the Contractor, missing information, or inaccurate information.

## 1.13 Permits and Licenses

The Owner will secure and pay for the following permits:

- Building Permit

The Contractor shall acquire and pay for all other necessary permits which may include:

- Haul Route Permit
- Electrical Permit
- Disposal Permit
- Plumbing Permit
- Mechanical Permit
- Transportation Permit

A copy of the Owner acquired submitted permits are available at the Owner's office for examination by bidders. Conform to the requirements of these permits and all other permits issued for this project.

## 1.75.16.50 Reservoir Disinfection and Testing

*[CSI 33 16 05.11]*

### Part 1 – General

### Scheduling

The following is a brief overview of the sequence.

1. Submit a Disinfection, Testing, and Dechlorination Plan.
2. Curing of coatings (if applicable).
3. Clean the interior free of debris, dirt, films, form-release agents, etc.
4. Disinfection.
5. Filling.
6. Soak test per the **Reservoir Soak Test** section.
7. Chlorine residual and coliform tests.
8. Leakage test per the **Reservoir Leakage Test** section. Can be done simultaneously with soak test and/or water quality testing.
9. Additional water quality samples after soak test. See **Reservoir Soak Test** section.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

It will take up to 8 days to fill and 8 days to drain the reservoir. These time periods are included in the contract timeframe, assuming that the initial testing passes. Should a test fail and require repeated work, the contractor must anticipate these time periods during scheduling and understand that they may result in liquidated damages.

**Appendix H** Pre-Disinfection checklist must be reviewed and completed by the contractor prior to starting disinfection process.

### Submittals

Submit a Disinfection, Testing, and Dechlorination Plan at least fifteen (15) working days prior to initiation of work. The Plan shall include:

- Schedule with specific dates.
- (If applicable) Interior coating curing times per the coating manufacturer's recommendations.
- Cleaning methods.
- Disinfection methods. If the project includes pipelines outside of the tank, describe those separately.
- Disposal methods of discharging chlorinated water.
- Water quality sampling methods.
- Estimate of time for each laboratory water quality test. Contact a testing lab used by the Owner for assistance.
- Any proposed deviations from procedures described in these specifications.

## Part 3 – Execution

### Preparation

The Owner will provide water for the initial filling of the reservoir at no cost to the Contractor.

Following curing of coatings (if applicable) and prior to disinfection, clean all surfaces and permanent equipment to the satisfaction of the Owner with pressurized potable water and/or scrubbing as appropriate for the reservoir size and type of equipment. After cleaning the surface shall be free of visible dust, dirt, oil, grease, blast media, and similar substances.

Sweep up debris. Do not wash any debris into the drainpipe. Suspended sediment may be washed through the drainpipe if allowed by the Owner, but the drainpipe must be cleared of sediment and sediment may not leave the site by storm water transport.

### Disinfection

Follow the procedures of AWWA C652 (Chlorination Method 2) Disinfection of Water Storage Facilities, at a minimum. The descriptions below are a synopsis of C652 but are not comprehensive and may include modifications to C652. Follow all relevant procedures in C652 and as modified herein.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Filling the reservoir from the water system shall only be performed by the Owner or under the Owner's supervision. Coordinate with the Owner sufficiently in advance. Filling is only allowed Tuesday through Thursday unless coordinated otherwise with the Owner.

1. Chlorination Method 2 (modified).
    a. Disinfect all interior surfaces including walls, floor, piping, ceiling, rafters, columns, ladders, stairs, hatches, overflow funnel/weir, and other appurtenances. Apply a solution containing not less than 200 PPM of chlorine using spray equipment or brushes. Liquid chlorine, sodium hypochlorite, or calcium hypochlorite may be used. Disinfected surfaces shall remain in contact with the strong chlorine solution for at least 30 minutes. Fill the drainpipe with 10 ppm to 50 ppm solution.
    b. If it will be more than 24 continuous hours between initial disinfection and filling, wash the chlorine solution off any stainless steel using potable water no less than 30 minutes nor more than 12 hours after disinfection.
    c. Following initial disinfection, fill the reservoir to overflow with potable water. Filling must occur as soon as practical after disinfection and the 30-minute waiting period. If filling is delayed for more than one week, the disinfection shall be repeated. Purge the water in the drainpipe prior to complete filling of the reservoir (dechlorinate if necessary). Record the free chlorine residual immediately after filling.

## Flushing and Dechlorination

Water with a chlorine residual shall be neutralized until it can be safely disposed of in accordance with all applicable regulations. All disposal is the responsibility of the Contractor. Water containing a chlorine residual shall not be conveyed into the sanitary sewer, stormwater system, or any surface watercourse. Control and monitor the drainage rate to prevent damage.

## Field Tests

After 24 hours, the water must have a chlorine residual no less than 2.0 mg/L or 50-percent of the chlorine residual when the tank was filled, whichever is lower. If the value is less, the reservoir shall either be re-dosed with chlorine, or drained and re-disinfected, at the Owner's discretion.

After the tank has been full for 24 hours, the Owner will take water samples from the reservoir and from the existing water supply for reference. The number of samples will be decided by the Owner. A laboratory certified by the Washington State Department of Ecology will be retained by the Owner to perform tests on the samples.

Absence of coliforms is required for acceptance.

See **Reservoir Soak Test** section for additional test parameters.

Tests shall be performed for the following parameters. Measured values shall be approximately equal to that of the water used for filling. The Owner shall determine exact acceptance criteria.

- pH
- Alkalinity




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Turbidity
- Conductance

The reservoir may be placed in service when:

- All test results have been received, passed, approved by the Owner, and the necessary documents have been submitted to the Washington State Health Department.
- The chlorine residual is appropriate for the water system as determined by the Owner. If the residual is high, reduce by partially draining and blending with system water. If the residual is low, discuss approaches with the Owner.
- The water temperature is appropriate for the water system as determined by the Owner. If the temperature is high, discuss approaches with the Owner.

The Contractor may take their own water quality tests and pay for the testing services. If so, note on all lab submittal forms that the tests are "Investigative". Such tests are for the sole benefit of the Contractor and the Owner reserves the right to accept or reject the results.

### Non-Conforming Work

If any test does not pass on the first attempt, all costs for remediation and retesting are the responsibility of the Contractor. Should any test fail that, in the Owner's sole opinion, requires draining the reservoir, the Contractor will be charged for additional water necessary at the Owner's unit rate for service.

If putting the reservoir into service is delayed more than 4 calendar days following receipt of acceptable test results, the Owner may elect to take follow-up samples before placing the reservoir in service. If the delay is due to the Contractor's actions, the Contractor will be responsible for all costs of remediation should any follow-up tests fail, or if in the sole opinion of the Owner the delay caused unacceptable aesthetic degradation (taste, temperature, etc.).

## 1.75.16.51 Reservoir Leakage Test

*[CSI 33 16 05.13]*

## Part 1 – General

### Warranty

The Contractor shall repair any leaks, running water, wet spots, etc., appearing within the warranty period stated in Division 1.43.20. Leakage standards are described in the **Field Tests** section. All repairs are subject to an additional 1-year warranty starting the date the Owner accepts the repair.

## Part 3 – Execution

### Preparation

A leakage test shall be performed by the Contractor following disinfection. The Owner may elect to take their own measurements and, at their sole discretion, use those measurements to determine compliance. It is recommended that the Contractor coordinate with the Owner so the parties are present (if available) at the same time for each test.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

All exterior surfaces of walls and top of footing shall remain exposed for the full duration of the test, and during any repairs and retesting periods. Surfaces shall not be backfilled, covered, or otherwise obscured until the Owner determines that the reservoir has passed the leak test.

1. Close all valves.
2. Seal vents and overflow outlet with plastic sheeting to reduce evaporation.
3. Fill the reservoir with potable water to the overflow elevation.
4. (Concrete Reservoirs) Let stand for 24 hours to allow the concrete to absorb moisture.

### Field Tests

*Steel Reservoir*

The Contractor shall provide a watertight steel tank with no leakage. Any water appearing outside of the tank will not be accepted.

### Non-Conforming Work

See also the **Non-Conforming Work** section under **Reservoir Disinfection and Testing**.

If leak rate exceeds the allowable rate, the leakage shall be considered excessive and repaired by the Contractor. **Appendix H** pre-startup and startup process checklists shall be completed by the Contractor and provided to the City prior to testing.

## 1.75.16.56 Reservoir Soak Test

***[CSI 33 16 05.15]***

### Part 1 – General

### Summary

Perform a soak test to check the level of chemical contaminants in the field.

### Scheduling

Follow the **Schedule** section in the **Reservoir Disinfection and Testing** section. Allow time for coatings to cure per the manufacturer's recommendations before filling.

Fill the reservoir to the overflow elevation.

The soak test period may begin once the reservoir is filled to at least 50-percent of the surface area wetted, and the filling period continues uninterrupted. The Owner has sole discretion to change this percent based on field conditions, such as slow or inconsistent fill rates. Use the following equation to calculate the fill height for 50-percent coverage.

$$h = H \times [\, 50\% - (\, 12\% \times D/H)\,]$$

h = water height at earliest sample (feet)

H = maximum water height (floor to overflow) (feet)

D = Inside diameter (feet)

If (D/H) is 3.5 or greater, h is no less than 5% of H.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The soak test period is 7-calendar days minimum, 10-calendar days maximum.

### Part 3 – Execution

#### Field Tests

Following the soaking period, the water in the reservoir shall be sampled by the Owner to determine the level of any leached chemicals. Samples of the water shall be analyzed by a laboratory certified by the Washington State Department of Ecology. Cost of initial test shall be borne by the Owner. The samples shall be tested for normal domestic water quality plus the following additional constituents.

- Complete Inorganic Chemical analysis (IOC)
- Volatile Organic Chemical analysis (VOC)

IOCs and VOCs listed in Washington WAC 246-290-310 must be below the MCL before water can be released to the system.

A report of the test results will be sent to the Washington Department of Health regional office for evaluation and approval before delivering water from the reservoir. The report shall include the word "Investigative" in the title or purpose section.

Re-testing is required when contamination exceeds the maximum contaminant level or trigger level. At the Owner's discretion, the Owner may elect to put the facility in operation if the trigger level is exceeded but the maximum contaminant level is not. See **Non-Conforming Wor**k in the **Reservoir Disinfection and Testing** Section should tests fail.

# 1.80 PERFORMANCE REQUIREMENTS [CSI 01 80 00]

## 1.81.30 Seismic Restraint and Anchorage [CSI 01 81 30]

Contractor shall install seismic restraints when called for in the contract or recommended by the product manufacturer. Install in accordance with the manufacturer's requirements as applicable.

Seismic restraint systems shall be installed so as not to interfere with normal operations and maintenance of the equipment and other components as shown on the plans. Interference with normal operations and maintenance shall be as determined by the Owner. Drilled-in anchors for non-rotating equipment shall be Concrete Anchors unless otherwise specified.

## 1.81.40 Pressure Ratings [CSI 01 81 40]

Fittings, valves, pipe, and other fluid systems shall have pressure ratings equal to or greater than the pressures identified herein, unless specifically called out otherwise in the plans or specifications. All pressures listed are gauge pressure, unless specified otherwise.

The pressure class of pipelines and appurtenances shall comply with the Owner's standards for minimum pressure class or the pressure class that meets the requirements of this section, whichever is greater.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| Equipment Function | Working Pressure | Test Pressure |
|---|---|---|
| Reservoir inlet / outlet pipe | 35 psi | 200 psi |
| Reservoir overflow and drain pipe | 35 psi | 200 psi |

Working Pressure: Manufacturer's rating of maximum pressure during extended operation.

Test Pressure: Maximum pressure during project specific testing.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 2.00 GENERAL

Sections in these specifications titled "*Common Work for . . .*" shall apply to all following subsections whether directly referenced or not.

## 2.10.3 Well Protection

### Part 1 – General

The proposed site is located within the Owner's Sanitary Control Area for their potable water supply. The Contractor shall be responsible for preventing accidental release of contaminants due to construction activities. The Contractor is responsible for aquifer water quality during the entire construction phase and should take all means necessary to protect the water quality. This shall include but is not limited to, the use of vegetable oil in construction hydraulic equipment, immediate spill containment and cleanup if it occurs during construction, installation and maintenance of temporary erosion and sedimentation control devices and all other work necessary to protect the water quality of the well.

The Owner has water quality records for the aquifer that indicate that it is not currently contaminated. The Contractor shall be responsible for maintaining this baseline aquifer water quality at the site during construction.

### Submittals

At a minimum, the Contractor shall provide the following as part of a spill control and response plan. A draft of this plan is due at the pre-construction conference. The final approved version of the plan shall be due prior to construction activities commencing on the sites.

1. The contractor shall provide a designated person in charge of spill control and site maintenance. This person shall be on-site during operating hours and be responsible for supervising the use and storage of hazardous materials and shall take appropriate actions in the event of a release. This person shall also be available 24 hours per day in the event of a release during non-working hours.
2. Secondary containment of hazardous materials and refueling areas shall be provided (containment equal to the size of the primary container or the largest container for multiple containers in one containment device). Sanitary, refueling and hazardous material storage shall not be allowed within the 100-foot sanitary radius on the well site, and the Contractor shall designate other areas for this in their plan. Prevent access by the public to hazardous materials left on any site during non-working hours.
3. Construction vehicles and stationary equipment that are found to be leaking fuel, hydraulic fluid, and/or other hazardous materials shall be removed from the well protection area or repaired in place as soon as possible and may remain on the site in the interim only if leakage is completely contained. Contractor shall keep spill containment and treatment materials on-site at all times. Depending on the frequency of occurrence, the contractor may be required to provide spill containment devices on equipment at all times (i.e. diapers).


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

4. Equipment and supplies adequate for the immediate clean-up of the worst-case hazardous materials spill shall be stored on-site in close proximity to hazardous materials; and
5. All spills or leaks shall be immediately contained, reported to the City and cleaned up as required by state and local regulations and Washington Department of Ecology guidelines. Upon detection of a leak, contractor shall immediately stop work and correct the leak, contain the spill, and remove the contaminated material from the site for proper disposal. The contractor shall over-excavate the contaminated site at least 2 feet in all directions to confirm that the spilled material has not penetrated further.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 3.00 GENERAL

Sections in these specifications titled "*Common Work for . . .*" shall apply to all following subsections whether directly referenced or not.

## 3.05 Common Work for Concrete [CSI 03 05 00]

### Part 1 – General

This division covers that work necessary for furnishing and installing all concrete as described in these specifications and as shown on the Plans.

#### References

Materials shall conform to the following standards:

- Cement - ASTM C-150
- Coarse aggregate - ASTM C-33
- Fine aggregate - ASTM C-33
- Admixtures - ASTM C-494
- Air-entraining admixtures – ASTM C-260
- Fly Ash – ASTM C-618

#### Submittals

Submittal information shall be provided to the Owner for the following items:

- Concrete mix design including aggregate gradation and substantiating strength data.
- Admixture Data
- Special placement procedures for hot or cold weather
- Concrete anchors
- Concrete anchor installer certification per ACI/CRSI Adhesive Anchor Installer Certification Program.
- Rebar mill certifications
- Rebar placement shop drawings
- Precast concrete items
- Schedule of form inserts
- Grouts
- Embedded items

Concrete mix designs shall be submitted to the engineer for approval a minimum of two weeks prior to placing any concrete. The mix design shall include the amounts of cement, fine and coarse aggregate, water and admixtures, as well as the water cement ratio, slump,


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

concrete yield, aggregate gradation, and substantiating strength data in accordance with ACI 318, Chapter 5. A batch plant inspection may be required, the cost of which shall be paid by the Contractor. Review of mix submittals by the engineer of record indicates only that information presented conforms generally with contract documents. Contractor or supplier maintains full responsibility for specified performance.

## Part 2 – Products

### Components

Nominal maximum size for aggregates is the smallest standard sieve opening through which the entire amount of aggregate is permitted to pass. Provide intermediate aggregate grades as required to achieve a well-graded mix.

All concrete surfaces exposed to weather or standing water shall be air entrained. Total air content shall be in accordance with IBC requirements unless specified otherwise herein. Air shall be measured at the truck, unless otherwise agreed to.

Water used in concrete shall be potable.

Fly ash may be substituted for up to 15 percent of the required cement, except where noted.

### Mixes

Concrete shall be mixed, conveyed, and proportioned in accordance with IBC section 1905.

The concrete mix shall include the amount of cement, fine and coarse aggregate, including aggregate gradations, water, and admixtures as well as water cement ratio, slump, concrete yield, and sustaining strength data in accordance with these specifications, the requirements of the International Building Code Section 1905, and the requirements of ACI 318.

## Part 3 – Execution

### Inspection

See Statement of Special Inspections on the Drawings (S02) for special inspection requirements. Provide two (2) full working day notice to Owner prior to needing the required inspections.

Also comply with local building department and permit requirements for inspection and notification.

The Contractor shall repair, replace or modify, as appropriate, any items noted in the Special Inspector's inspection or the building department inspection.

### Testing

Concrete strength tests shall be performed per section 1905.6 of the IBC and per the requirements noted herein. The Owner will provide and pay all costs of concrete testing. The Engineer shall be furnished with copies of all inspection reports and test results.

Cylinders used for concrete strength tests shall be 6 by 12. Four by 8 cylinders may be used for mixes with maximum aggregates less than 1-inch, however the testing lab must apply a 0.94 multiplier to the compressive strength test results unless data acceptable to the Engineer




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

is presented that would justify a higher multiplier. All mixes utilizing aggregates over 1 inch shall be tested using 6 by 12 cylinders.

When 4 by 8 cylinders are utilized AASHTO T23 requirements shall be followed, and the retainer used with neoprene pads when testing for compressive strength shall be constructed according to ASTM C 1231.

The Contractor will coordinate all concrete testing with the testing agency. Costs will be paid by the Owner.

Give the Owner and testing agency 48-hour notice prior to concrete placement. If Contractor fails to provide the required notice, the Owner may elect to cancel the affected concrete placement. Contractor shall be responsible for costs and delays due to improper notification.

If the Contractor schedules a concrete placement and does not notify the Owner and testing agency of a cancellation within 24 hours of the scheduled placement, the Contractor shall pay the testing agency costs for an unnecessary trip. If the Contractor fails to provide the testing agency with adequate notification and testing agency cannot attend concrete placement, Contractor shall reschedule placement. Contractor shall be responsible for all associated delays.

The Contractor shall provide all assistance and cooperation necessary to testing personnel to obtain the required concrete tests. Contractor and Owner will have access to testing results as soon as they are available.

The testing agency shall take a minimum of four samples for every 50 yards of concrete placed (and a minimum of four per pour); one for a 7-day test, two for 28-day tests, and one for backup testing in case the other two samples do not meet design strength. Additional samples may be taken to verify strength prior to form removal at the Contractor's expense.

# 3.06 Maintenance of Concrete [CSI 03 01 00]

# 3.06.30.71 Resurfacing of Cast-in-Place Concrete [CSI 03 01 30.61]

## Part 1 – General

This division covers that work necessary for repairing spalled and damaged concrete. Repair any areas with deterioration exceeding ½-inch, where rebar is exposed or where directed by the Owner.

## Part 2 – Products

### Materials

CONCRETE REPAIR MATERIAL: SikaTop 111 PLUS or equal cement-based repair mortar. Mortar shall be ANSI/NSF Standard 61 approved if in contact with potable water and contain a corrosion inhibitor. See Manufacturer's Literature for primer and auxiliary products appropriate for use with the repair material.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

SILANE SEALER shall be alcohol based, 95 percent silane. No fillers, sterates or paraffins are allowed. Use DUR A PELL 100 as manufactured by Chemprobe Coating Systems or equal.

## Part 3 – Execution

### Preparation

The Contractor shall be familiar with the product and methods and be prepared to discuss the repair procedure at the Preconstruction Meeting.

High pressure power-wash the exposed structure to remove all loose, delaminated concrete to sound concrete.

Surface Preparation: Remove loose, delaminated concrete to sound concrete. Where corrosion of the reinforcement exists, continue bulk removal along the reinforcing steel and adjacent areas with evidence of corrosion-induced damage Under-cut all exposed reinforcing steel by a minimum of ¾-inch. The shape of the prepared cavity should be square or rectangular in shape. The edges of the patches shall be saw-cut perpendicular to the surface to a minimum depth of ½-inch. Repair area shall be a minimum of ½-inch deep throughout. Use abrasive blasting to remove residual dust, debris, fractured concrete, and contaminants that prevent proper bonding. Following abrasive blasting, blow out repair areas with oil-free compressed air. The final surface texture should be rough with minimum ⅛-inch amplitude.

Treatment of exposed reinforcement: All signs of corrosion should be removed from exposed reinforcing steel by an abrasive blasting, wire wheel or needle scaler. If the cross-sectional area of the reinforcing steel has been significantly reduced, the engineer should be consulted. Prime reinforcing as recommended by the repair material manufacturer.

### Installation

Surface Saturation: Saturate surface with potable water. The base concrete shall be in a saturated surface dry (SSD) condition prior to application of repair material to prevent a rapid loss of moisture from the repair material and into the substrate.

Mixing and Application of Repair Material: Mixing and application shall be in strict accordance with the manufacturer's instructions. Apply the material with adequate pressure before the bond coat dries. Thoroughly consolidate the repair material into the corners of the patch and around any exposed reinforcement in the repair zone. If a second lift is required, thoroughly roughen the surface of the first lift by scoring the soft mortar to achieve an aggressive finish, similar in profile to the prepared concrete substrate. If the second lift will not be immediately applied, keep the first lift moist until application of the second lift. Finish to match existing surface. Cure using curing compound.

Apply silane sealer as specified to exposed surfaces and edges of roof slab.

# 3.10 FORMING AND ACCESSORIES [CSI 03 10 00]




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 3.11 Formwork [CSI 03 11 00]

# 3.11.13 Structural Cast in Place Forming [CSI 03 11 13]

## Part 1 – General

The Contractor shall submit a construction joint plan to the Engineer for review prior to formwork and rebar installation if altered from that shown on the Plans. Modifications to the construction joints shall be submitted to the Engineer no less than 7 working days prior to placing the forms and rebar.

## Part 2 – Products

### Materials

Unless otherwise directed, coat contact surface of forms with colorless, non-staining, mineral oil that is free from kerosene, or other approved suitable material, to permit satisfactory removal of forms without concrete damage.

Form construction for surfaces covered with backfill shall be made of steel, plywood, or dressed, matched lumber. Form construction for exposed surfaces shall be made of new plywood or steel without surface markings.

## Part 3 – Execution

### Installation/Construction

Concrete forms shall be sufficiently tight to prevent leakage of concrete or mortar and shall be properly braced or tied together to maintain desired position and shape until removed.

Conduits, pipes and sleeves of any material not harmful to concrete and within the limitations of ACI 318, Section 6.3 are permitted to be embedded in concrete with approval of the Engineer. Provide a ¾-inch chamfer or radius at all exposed corners and edges, unless specifically stated otherwise on the Plans.

Forms shall remain in place until the concrete has developed sufficient strength to withstand imposed loads without damage or deflection. Wall and slab forms shall remain in place for a minimum of 24 hours after completion of the pour.

Do not allow water to flow through areas where forms are to be placed. During form construction and prior to placement of concrete, keep footings and floor slab areas free of standing water.

### Field Quality Control

Variations from plumb, specified grade, conspicuous lines, and walls shall not exceed plus or minus ¼-inch in any 10-foot length, and shall not exceed one inch over the entire length. Variations from dimensions shall not exceed plus or minus ½-inch. Closer tolerances shall be achieved by the Contractor as necessary to accommodate equipment and other permanent materials.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 3.15 Concrete Accessories [CSI 03 15 00]

## 3.15.05 Pipe Penetrations through Concrete [CSI 03 15 35]

### Part 1 – General

#### Summary

Water holding structures and structures buried and subject to groundwater contact: As shown on the Plans.

Structures not holding water or unburied structures: Unless identified on the Plans, all pipes larger than two inches passing through poured-in-place concrete floors and walls shall be isolated from the concrete.

### Part 2 – Products

#### Materials

Provide a Link-Seal system (or approved equal).

### Part 3 – Execution

#### Examination

Wrapping must be inspected and approved by Engineer prior to concrete pour. Gaps, tears, or looseness in wrapping will be cause for rejection.

#### Installation

Install Link-Seal per manufacturers instruction either within a cast-in-place sleeve or core drill a clean hole.

# 3.20 REINFORCING [CSI 03 20 00]

## 3.21 Reinforcement Bars [CSI 03 21 00]

## 3.21.11 Plain Steel Reinforcement Bars [CSI 03 21 11]

### Part 1 – General

#### References

ACI – American Concrete Institute- latest edition

CRSI Manual of Standard Practice – latest edition

### Part 2 – Products

#### Materials

Grade – ASTM A706, Grade 60

ASTM A615, Grade 60 shall be permitted if:

(a) The actual yield strength based on mill tests does not exceed fy by more than 18,000 psi; and,




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

(b) The ratio of actual tensile strength to the actual yield strength is not less than 1.25.

Detailing - ACI 318 and ACI 315

Lap requirements - See schedule on Plans or as required by ACI 318

Tie wire - 16 gauge minimum

Bar supports shall conform to "Bar Support Specification" CRSI Manual of Standard Practice, MSP-1-80. Provide Class 1, plastic protected bar supports. Use pre-cast concrete blocks to support bars off ground. Bar supports in water holding and buried structures shall be non-metallic.

Bar supports for the bottom rebar mat of suspended slabs or beams in water holding structures must be point supports (chairs or dobbies), not continuous.

### Part 3 – Execution

#### Installation

Reinforcing steel shall be detailed in accordance with ACI 315 and 318 and as shown on the Plans. Lap all reinforcements in accordance with "the reinforcing splice and development length schedule". Provide corner bars at all wall and footing intersections. Bend wire bar ties away from formwork to provide the same concrete clearance as shown on the Plans to the bars.

Welding of reinforcing steel shall not be performed unless specifically approved by the Engineer. If approved, Contractor will arrange and pay for all required Special Inspections associated with welding of reinforcing steel.

#### Field Quality Control

Reinforcing steel shall be free of rust and loose scale at time of concrete placement. Bars with kinks, improper bends, or reduced cross-section due to any cause will not be used. Bars shall not be field bent. Bars may not be tack-welded or otherwise heated.

If, within the project warranty period, rust spots appear on the concrete due to failure to achieve proper clearance on the rebar or wire ties, the Contractor shall grind out and patch the areas using a method satisfactory to the engineer.

# 3.30 CAST-IN-PLACE CONCRETE [CSI 03 30 00]

## 3.30.05 Common Work for Cast in Place Concrete [CSI 03 30 05]

### Part 1 – General

#### Scheduling

Contractor shall schedule and attend a Concrete Placement meeting at least one week prior to placing concrete. The following shall attend:

- Owner
- Engineer
- Contractor




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Testing Laboratory Representative
- Concrete Supplier

The following shall be discussed at the meeting:

- Safety (Contractor's sole responsibility)
- Batching and Delivery, Adjustments to Mix; Site Dosing
- Placement Rates and Anticipated Schedule of Placing and Finishing
- Site Layout –Holding Area; Pump Truck Location; Truck Wash-out Area; Parking area
- Equipment – Pumps and Appurtenances; Vibrators; Spare Equipment
- Concrete Testing Procedures
- Curing

### Delivery

Concrete shall be transported in a truck mixer to the jobsite and discharged within 1.5 hours after cement has been added to water or aggregates. Rejected concrete will be at Contractor's expense.

## Part 2 – Products

### Components

If allowed, curing materials shall conform to ASTM C-171 and liquid membrane-forming compounds shall conform to ASTM C-309. When concrete is to be coated or stained, use UV-dissipating form release and curing compounds.

## Part 3 – Execution

### Preparation

Do not place concrete during rain, sleet, or snow until water and freezing protection is provided.

Position embedded items accurately, and support against displacement or movement during placement.

Fill voids in sleeves, insets, anchor slots, etc., temporarily with readily removable materials to prevent entry of concrete into voids.

Before beginning placement of concrete, remove hardened concrete and foreign materials from inner surface of mixing and conveying equipment. Before depositing concrete, remove debris from space to be occupied by the concrete. Secure reinforcement in position to prevent movement during concrete placement.

At construction joints, thoroughly clean surface of existing concrete to remove laitance. Roughen existing concrete surface to expose aggregate uniformly and apply approved bonding agent to existing concrete in accordance with manufacturer's recommendations. Prior to placing fresh concrete, dampen joint and coat with grout mixture in accordance with ACI 301, Section 8.5.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Installation

Placement shall be in accordance with IBC, Section 1905.

Place no concrete when air temperature is below or expected to be below 40 degrees during the 28-day curing period unless a low temperature concrete mix has been approved by the Owner. Provide adequate equipment for heating materials and protecting concrete during freezing or near freezing weather. Keep materials, reinforcement, forms, and ground in contact with concrete free from frost at time of placement. Heat mixing water as required. Use no materials containing ice.

Place no concrete when air temperature exceeds or is expected to exceed 85 degrees during the 28-day curing period unless a high temperature placement plan has been approved, and unless adequate precautions are taken to protect work. Cool ingredients prior to mixing. Flake ice or crushed ice of a size that will melt completely during mixing may be substituted for all or part of water. Cool forms and reinforcing prior to placing concrete.

Handle concrete from mixer, ready-mixed truck, or from transporting vehicle to place of final deposit by methods which prevent separation or loss of ingredients. Under no circumstances shall concrete that has partially hardened be deposited.

Place concrete in maximum lifts of 3 feet. Deposit concrete continuously so that no concrete will be deposited on concrete which has hardened sufficiently to cause formation of seams and planes of weakness within the section. If a section cannot be placed continuously, locate and reinforce construction joints at points as provided for in the Plans or as approved by the Owner. Maximum concrete drop shall be 5 feet.

Consolidate concrete by vibration, supplemented by hand spading, rodding, forking, or tamping. Thoroughly work concrete around reinforcement, around embedded items, and into corners of forms to eliminate air or rock pockets which may cause honeycombing, pitting, or planes of weakness. Insert and withdraw internal vibrators at points approximately 18 inches in each direction and extend into the lower concrete lifts. At each insertion, the duration shall be sufficient to consolidate the concrete; but not sufficient to cause segregation. Do not use vibrators to transport concrete within forms. Consolidate slabs by utilizing vibrating screeds, roller pipe screeds, internal vibrators, or other approved methods. Have a spare vibrator available at jobsite during concrete placing operations.

After removal of forms, cut out and patch defects in concrete surfaces. Remove form tie cones. Cut or snap off form ties to a depth of ¾-inch. Chip out rock pockets, holes from form tie removal, and other defects to solid concrete. Repair defects in accordance with 3.01.30.71.

*Placement for mass concrete structures:*

Place no concrete when the air temperature exceeds or is expected to exceed 70 degrees within 4 days of the concrete placement unless concrete precooling procedures have been submitted and approved by the owner.

Mass concrete temperatures shall be monitored for a minimum of 10 days following placement. Thermometers must have the ability to measure temperatures up to 180 degrees Fahrenheit. Insulating blankets shall be placed over all exposed surfaces and kept in place




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

until the hottest portion of the concrete is within 35 degrees of the average air temperature. This may require that the insulation be left in place for several weeks.

*Curing*

See section 3.39.

# 3.31 Structural Concrete [CSI 03 31 00]

# 3.31.13 Structural Concrete [CSI 03 31 13]

## Part 1 – General

### Summary

All concrete as shown on the Plans not used for below-grade structures, ringwalls, and mass concrete and not called out otherwise. Use water reducers as required to achieve slump. Hydraulic Concrete may be substituted.

### Performance Requirements

28-day compressive strength - 4500 psi minimum

Slump - Without plasticizers; 4 inches for floor and roof slabs, 7 inches for walls. With plasticizers, maximum 9 inches or as desired for placement.

## Part 2 – Products

### Mixes

Water/cement ratio - 0.40

Nominal maximum aggregate size – ¾-inch (AASHTO Grading No. 67)

Entrained air ratio – 3.5 percent minimum to 6.5 percent maximum

# 3.31.32 Hydraulic Concrete [CSI 03 31 13.12]

## Part 1 – General

### Summary

All concrete as shown on the Plans for below-grade structures and tank foundations. Use water reducers for all concrete. Use super-plasticizers to achieve required slump.

### Performance Requirements

28-day compressive strength – 4500 psi minimum

Slump – Without plasticizers; 4 inches for floor and roof slabs, 7 inches for walls. With plasticizers, maximum 9 inches and as desired for placement.

## Part 2 – Products

### Mixes

Water/cement ratio - 0.38 maximum

Nominal maximum aggregate size – 1½-inch




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Combined Grading Limits: Limits shown are for all course and all sand mixed together, (combined).

| Sieve Sizes | Combined Grading Limits |
|---|---|
| | 1½" Max. |
| 2" | -100 |
| 1½" | 95 - 100 |
| 1" | 65 - 85 |
| 3/4" | 55 -75 |
| 1/2" | - |
| 3/8" | 40 - 55 |
| No. 4 | 30 - 45 |
| No. 8 | 23 - 38 |
| No. 16 | 16 - 30 |
| No. 30 | 10 - 20 |
| No. 50 | 4 - 10 |
| No. 100 | 0 - 3 |
| No. 200 | 0 - 2 |

Entrained air ratio – 3.0 percent minimum to 6.0 percent maximum

# 3.31.36 Concrete for Mass Structures [CSI 03 31 13.16]

## Part 1 – General

### Summary

This section includes all concrete as shown on the Plans for mass structures. Mass concrete shall be considered any concrete placement with a dimension in three directions of 3 feet or greater.

## Part 2 – Products

### Mixes

Concrete mix for mass concrete shall be the same as Hydraulic Concrete except for the following:

- Class F Fly Ash shall be substituted for 25 percent to 35 percent of the cementitious material.

# 3.35 Concrete Finishing [CSI 03 35 00]

# 3.35.05 Common Work for Surface Finishing [CSI 03 35 05]

## Part 2 – Products

### Finishes

Each concrete area that requires finishing shall conform to one of the following requirements:

- Foundation (exterior) - Ordinary Wall


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Foundation (interior) - Ordinary Wall

### Part 3 – Execution

#### Preparation

Do not place concrete which requires finishing until the materials, tools, and labor necessary for finishing the wet concrete are on the job and acceptable to the Owner. If rainfall is possible, tent the work area prior to the pour and maintain protection until the concrete is cured sufficiently to resist damage.

## 3.35.50 Ordinary Wall Finish [CSI 03 35 50]

### Part 2 – Products

#### Materials

Ordinary Wall Finish requires the use of like-new forms and linings that will produce a uniform surface.

### Part 3 – Execution

#### Construction

After points have set sufficiently, grind or fill form marks and pointings to give a smooth surface even with flat wall surface. Fill all holes greater than ¼-inch with 1:2 mortar floated to an even, uniform finish.

## 3.39 Concrete Curing [CSI 03 39 00]

### Part 2 – Products

#### Materials

Curing compounds are not permitted on surfaces that will receive coatings.

### Part 3 – Execution

#### Installation

All concrete for structures, and where directed by the Owner, shall be water-cured in accordance with ACI 308.1 unless approved in advance by the Owner. If allowed, curing compound shall be applied immediately after finishing or form removal. When plastic or burlap covers are used to augment or protect curing, extend sheeting beyond the edges of the concrete and secure against wind lift. Inspect and adjust curing systems daily, including over weekends and holidays.

Water holding structure floors and bases to be cured by water flooding. Where a continuous waterstop is installed around the perimeter, fill up against the waterstop. Where a waterstop is not part of the final product or is not tall enough, provide temporary barriers. Outside the waterstop, water cure using soaker hoses and plastic, or burlap covers. Use of curing compounds outside the water stop may only occur with the approval of the Owner, approval should not be assumed.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Concrete structures that require differential backfill as shown on the Plans or as required for construction shall cure for a minimum of the following prior to placing backfill:

- Backfill equal or greater than 24 inches: 7 days AND 28-day strength requirements.
- Backfill between 6 and 24 inches: 3 days AND 80-percent of the 28-day strength requirements.

All exposed surfaces of mass concrete structures shall be cured using an approved curing compound. Curing compound shall be sprayed on the concrete surface in a uniform manner and according the manufacturer's recommendations immediately after the concrete has reached sufficient strength to support a person's weight without creating a visible footprint.

# 3.60 GROUTING [CSI 03 60 00]

## 3.62 Non-Shrink Grouting [CSI 03 62 00]

## 3.62.13 Non-Metallic Non-Shrink Grout [CSI 03 62 13]

### Part 1 – General

#### Summary

Use Precision Non-Shrink Grout for grouting all equipment base plates, pipe supports, and base plates for metalwork. Precision Non-Shrink grout may also be used for all other non-shrink grouting operations. General Purpose Non-Shrink grout may be used for any applications other than those noted for Precision Non-shrink Grout. Non-shrink grout shall be used to seal all new pipe and conduit penetrations (watertight) into and out of all concrete and CMU block walled structures.

#### Storage and Handling

Stockpile grout to prevent contamination from foreign materials and store admixtures to prevent contamination or damage from excess temperature change

### Part 2 – Products

#### Materials

Precision Non-Shrink Grout:

Provide a high-precision, fluid, non-shrink, quartz or non-catalyzed metallic aggregate grouting material. Provide a ready-to-use grout that hardens free from bleeding, settlement, or drying shrinkage when mixed, placed and cured at any consistency – fluid, flowable, plastic or damp-pack.

Provide precision, non-shrink natural aggregate grout that when cured produces the following properties:

A. Compressive Strength at fluid consistency (ASTM C 109-90-Modified): 3500 psi (24 MPa) at 1 day, 7500 psi (52 MPa) at 28 days.

B. Passes ASTM C 1107 as a grade B grout when tested as temperature minimum and maximums of 45 degrees Fahrenheit to 90 degrees Fahrenheit (8 degrees Celsius to 32 degrees Celsius) at a working time of 30 minutes. Grout must be tested at a fluid




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

consistency per ASTM C 939 and remain fluid at temperature range minimum and maximums for the 30-minute working time. All materials including water must be mixed and tested at temperature minimum/maximums.

C. Modulus of Elasticity at 28 days at fluid consistency (ASTM C 469): 3.0 x $10^6$ psi (20.7 GPa) minimum, 3.9 x $10^6$ (27.0 GPa) maximum.

D. Coefficient of Thermal Expansion for fluid consistency (ASTM C 531): 7.5 x $10^{-6}$/ degrees Fahrenheit maximum (13.5 x $10^{-6}$/ degrees Celsius).

E. Flexural strength at 28 days for fluid consistency (ASTM C 78): 1300 psi (7.9 MPa).

F. Resistance to rapid freezing – thawing (ASTM C 666, Procedure A): 300 cycles- min RDF 90 percent.

G. Split tensile strength at 28 days at fluid consistency (ASTM C 496): 450 psi (3.1 MPa).

H. Pass 24-hour grout test under stated temperature, time and fluidity constraints. See MBT Protection and Repair 24-hour Grout Form.

Precision non-shrink grout shall be MasterFlow 928 or 885 Grout or approved equal.

General Purpose Non-Shrink Grout:

General Purpose Non-shrink grout shall meet the compressive strength and nonshrink requirements of CRD-C 621, Grades B and C; Corp of Engineers Specification for Non-shrink grout; and ASTM C 1107, Grades B and C. General Purpose Non-shrink grout shall be MasterFlow 713, Dayton Superior 1107 Advantage, or approved equal.

Provide curing compounds as recommended by the grout manufacturer.

Water to be used in mixing the grout shall be potable.

### Mixes

Comply with grout manufacturer's recommendations for mixing procedures.

Adjust water temperature to keep mixed grout temperature in the range of 45 degrees Fahrenheit (7 degrees Celsius) and 90 degrees Fahrenheit (32 degrees Celsius) minimum/maximum.

Use cold or iced water to extend working time in hot weather or in large placements.

Use warm water in cold conditions to achieve minimum as mixed temperatures.

## Part 3 – Installation

### Preparation

Mechanically remove unsound concrete within the limits of the grout placement.

Remove at least ¼-inch (6mm) of existing concrete facing and continue removal as required to expose sound aggregate.

Thoroughly clean the roughened surface of dirt, loose chips, and dust. Maintain substrate in a saturated condition for 24 hours prior to grouting. Surface should be saturated surface dry at time of grouting.


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Clean baseplates and other metal surfaces to be grouted to obtain maximum adhesion. Remove loose rust and scale by grinding or sanding.

Comply with grout manufacturer's recommendations for form construction. Construct forms to be liquid tight.

## Installation

Place grout mixture into prepared areas from one side to the other. Avoid placing grout from opposite sides in order to prevent voids. Work material firmly into the bottom and sides to assure good bond and to eliminate voids.

Ensure that foundation and baseplate are within maximum/minimum placement temperatures. Shade foundation from summer sunlight under hot conditions. Warm foundation when foundation temperature is below 45 degrees Fahrenheit (7 degrees Celsius).

Wet cure exposed shoulders for 48 hours followed by two coats of curing compound for best results. The minimal requirement is to wet cure until grout has reached final set, followed by two coats of curing compounds.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Division 5
# Metals

## 5.00 GENERAL

This division covers that work necessary for furnishing and installing metalwork as described in these specifications and as shown on the Plans.

Sections in these specifications titled "*Common Work for* . . . shall apply to all following subsections whether directly referenced or not.

## 5.05 Common Work for Metals [CSI 05 05 00]

### Part 1 – General

#### Related Sections

- Division 1.81.30 Seismic Restraint
- Division 9.90.00 Common Work for Painting and Coating
- Division 9.91.13.01 Exterior metals
- Division 13.31.23 Ground Level Steel Water Storage Tank

#### Submittals

Submittal information shall be provided to the Owner for the following items:

- Shop Drawings showing details of Fabricated Metalwork including connections and welding
- Calculations and plans stamped by a professional structural engineer licensed in the State of Washington for all Contractor- or Manufacturer-designed components or assemblies.
- Hand rail and guardrail

#### Inspections

Unless otherwise noted on the Plans, specifications, or building department requirements, special inspections related to metal fabrications, placement and welding shall be subject to 48-hour notice to the Engineer prior to the inspection time. 48-hour notice is defined in Division 1, Contractor Responsibility.

Any Field welding shown on the Plans will require special inspections in accordance with section 1704.3 of the IBC and AISC 360.

#### Quality Assurance

Only prequalified welds (as defined by AWS) shall be used.

Fabricator shall be registered and approved by American Institute of Steel Construction (AISC) to perform shop fabrication without special inspection. Submit certificate of compliance to the Owner at the completion of fabrication. Owner will forward this to the Building Official.


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

If fabricator is not registered and approved, or the certificate of compliance is not received, the Contractor shall reimburse the Owner for all Special Inspections required by the IBC on shop fabricated items. The Contractor shall also reimburse the Owner for all Special Inspections required by the IBC for field welding not specifically shown on the Plans. Contractor shall alert Owner at least 30 calendar days in advance if such Special Inspections will be required in order to procure the services of a testing lab.

Special Inspection by the Owner does not relieve the Contractor of responsibility of performing his own inspections and testing to ensure that all items are properly constructed.

Welding of steel and stainless-steel fluid transport pipe that is not a structural member shall be performed by operators qualified for AWS B2.1, AWS D10.18 or the ASME Boiler and Pressure Vessel Code Section IX part A. Welders may also provide other certifications for review and approval by the Owner, though approval of other certifications should not be assumed.

## Part 2 – Products

### Materials

Structural Steel

Structural steel shall conform to the following requirements:

Plates, shapes, angles, rods - ASTM A36 and A992, Fy ≥ 36 ksi

Special shapes, plates - ASTM A572, Fy ≥ 50 ksi

Pipe Columns - ASTM A53, Grade B Type E or S, Fy ≥ 35 ksi (see Division 15.22 for steel pipe carrying fluids).

Structural Tubing - ASTM A500, Grade B, Fy ≥ 46 ksi

Stainless Steel

Stainless steel shall be type 304 (non-welded) or type 304L (welded) or as called out.

Fasteners - ASTM F593

See Section 15.22.04 for information on pipe used for mechanical applications.

All stainless steel shall have a standard mill finish where concealed or No. 4 finish where exposed and shall be cleaned of all foreign matter before delivery to the job site.

Galvanized Steel

Base metal shall be as specified for Mild Steel.

Hot-dip galvanized after fabrication in accordance with ASTM A 924/A 924M.

Finishes: For pieces that will NOT be painted, galvanize with zinc coating in accordance with ASTM A 653/A 653M For pieces that WILL be painted, galvanneal with zinc/10 percent iron coating in accordance with ASTM A 653/A 653M

### Manufactured Units




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Design of Contractor- or Manufacturer-designed components or assemblies shall meet the specific component requirements as provided here-in, as well as all applicable state and federal codes. Design shall include gravity loads and seismic loads in accordance with ASCE 7 Chapter 13 "Seismic Design Requirements for Nonstructural Components". Design criteria shall be as provided herein for components, and as provided on the Plans.

Contractor-designed components and assemblies shall be shop welded and field bolted if possible. Field welding will NOT be allowed unless specifically shown, or there is no reasonable alternative.

### Finishes

All steel fabrications shall be surface prepped, shop primed and field coated in accordance with Division 9. Shop priming shall be protected as required to prevent damage to the coating during shipping. Hold back shop priming from areas to be field welded.

Isolate and coat dissimilar metals to prevent galvanic corrosion.

Non-exposed structural steel: Mill finish or as shown on Plans

Exposed structural steel (damp or wet locations): Division 9

Galvanized steel: Division 9

Stainless steel: Uncoated

## Part 3 – Execution

### Fabrication

All welding shall be in accordance with AISC and American Welding Society (AWS) standards and shall be performed by AISC and/or AWS certified welders using electrodes to match base material. Only prequalified welds (as defined by AWS) shall be used. Welding inspection shall be performed in accordance with the applicable AWS provisions and Chapter 17 of the IBC. Shop welding requiring inspection or testing per IBC Chapter 17 must be tested by an independent testing laboratory certified by AWS and approved by the owner at the Contractor's expense. Field welding, where required or allowed, will be inspected by a representative of the owner at the owner's expense. This does not relieve the Contractor of responsibility of performing his own inspections and testing to ensure that all items are properly constructed.

All shop welds shall be ground smooth.

Any shop paint on metal surfaces adjacent to joints to be field welded shall be wire brushed to remove the paint film prior to welding.

Where steel items to be welded are galvanized, galvanizing must first be removed by grinding with a silicon carbide wheel, by grit blasting or by sand blasting.

Any cutting or grinding equipment used on stainless steel must be new or only previously used on other stainless-steel material.

All stainless-steel shop welds shall be pickled after welding to remove heat damage and contaminants. Field welds must be passivated using an Engineer approved product (Citrisurf 2210 or equal). If the metal will be in contact with potable water, pickling and passivation




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

products must be citric acid based and thoroughly removed, or use a product approved by USDA or NSF.

### Installation

Fabrications shall be installed as shown on the approved shop drawings. All members shall be accurately located and erected plumb and level.

Metal fabrications shall be installed or erected as based on the American Institute of Steel Construction (AISC) "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings", latest edition, plus all referenced code requirements.

Temporary bracing, such as temporary guys, braces, false-work, cribbing, or other elements, shall be provided by the Contractor in accordance with the requirements of the "Code of Standard Practice", wherever necessary to accommodate all loads to which the structure may be subjected, including construction loads. Such bracing shall be left in place as long as may be required for safety. As erection progresses, the work shall be securely bolted or welded to compensate for all loads during construction.

No permanent bolting or welding shall be performed until the structure has been properly aligned.

## 5.05.23 Bolts and Other Connectors [CSI 05 05 23, 06 05 23]

### Part 2 – Products

### Materials

Bolts and other connectors not specifically called out otherwise shall be in accordance with the following.

Under no circumstances shall the fasteners be of lesser strength or higher corrosion potential than the materials being connected.

Connection bolts, nuts and washers for all materials in wet, damp or corrosive locations shall be Stainless Steel, alloy 304 in raw domestic or treated domestic water,. Bolts and nuts shall meet ASTM F593B (bolts ¼-inch to 1½-inch in diameter with 30 ksi yield) and F594B (nuts).

Steel and cast-iron fabrications: Connection bolts for dry locations shall be ASTM A307 galvanized or zinc plated bolts.

Stainless steel fabrications: Fasteners to match same stainless series as structure (e.g. 300 series fasteners with 300 series structure)

Bolts installed into hardened concrete shall be Concrete Anchors per section 3.15.19.

Bolts and studs shall be long enough that at least two threads extend beyond the face of the tightened nut.

For pump anchor bolts, see Division 11.

For mechanical pipe (non-structural) connections, see Division 15, "Common Work for Pipe and Fittings".




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Part 3 – Execution

### Installation

All materials to be joined together shall be connected as shown on the Plans, specifications, as recommended by the manufacturer, or as required by standard industry practices if not otherwise specified.

Dissimilar metals:

In damp locations, isolate dissimilar metals using nylon isolation sleeves and washers, Cooper B-Line Nylon Headed Sleeve Kit or equal.

For wet locations: avoid dissimilar metals unless specifically approved or shown. Use similar metals with welded connections. If approved or shown, use galvanized mild steel bolts installed into prepped and coated holes with additional field coating over the top of bolt.

# 5.50 METAL FABRICATIONS [CSI 05 50 00]

# 5.51 METAL STAIRS [CSI 05 51 00]

## 5.51.05 Common Work for Stairs and Ladders [CSI 05 51 05]

## Part 1 – General

### Related Sections

This section also applies to section 6.72.23 Composite Stair Assemblies, and 6.72.33 Composite Ladders.

### Design Requirements

Stair treads shall be pre- fabricated units that bolt on to stair side rails. Stair treads shall meet all ASCE 7, IBC, and OSHA Section 1910.24 requirements.

Ladders shall meet the requirements set forth in the IBC, ASCE 7, OSHA 1910.27 and WAC 296-876. Ladders within access hatches shall include a ladder safety post to assist in holding hatch in an open position.

Safety cages, platforms, and fall prevention devices shall be provided as shown on the Plans. They shall comply with WAC Section 296-876-60065 through 296-876-60080.

Ladders shall extend the full distance from base landing to top access plus extension. Ladders that are short shall be field extended by method approved by the Engineer or replaced with proper length ladder.

## Part 2 – Products

### Materials

All ladders shall be coated per Division 9. Ladder accessories shall be hot-dipped galvanized steel unless otherwise noted on the Plans.

### Fabrication




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Ladders shall be shop assembled, pre-drilled and prepared for field attachment of standoff clips, or as otherwise shown.

## 5.51.19 Metal Grating Stairs [CSI 05 51 19]

### Part 2 – Products

#### Materials

Width shall be as shown on the drawings. Materials shall match adjacent grating, or stair material. Bearing bar and cross bar configuration shall match adjacent grating. If no adjacent grating, minimum 1-inch by $^{3}/_{16}$-inch bearing bars with cross bars spaced at 4-inch on center, or as required to meet loading requirements.

# 5.52 METAL RAILINGS [CSI 05 52 00]

## 5.52.05 Common Work for Railings [CSI 05 52 05]

### Part 1 – General

#### References

Handrail and Guardrail systems shall be designed to meet the requirements of the IBC, ASCE 7, OSHA, and shall comply with Section 296-24-74015 of the Washington Administrative Code.

#### Performance Requirements

Handrails and guardrails shall be designed to withstand a 200 lbs. concentrated load applied in any direction at any point to the top rail. Handrails and guardrails shall also be designed to withstand a load of 50 lbs./foot applied horizontally to the top rail. The two loads will not be applied simultaneously. The completed handrail installation shall prevent the passage of a sphere not more than 4-inch in diameter in areas with public access or 19-inches in diameter at electrical, mechanical or plumbing access areas not open to the public.

### Part 2 – Products

#### Components

Handrail and guardrail systems shall be supplied and installed complete with posts, rails, toeboards, connectors, plugs, end caps, bolts, nuts and washers, and other accessories as required for a complete installation. Post spacing shall be a maximum of 6 feet, 0 inches on horizontal runs and 4 feet, 0 inches on inclined runs, or as shown on the Plans. Post locations shall be no greater than 24 inches nor less than 9 inches from horizontal or vertical change in handrail direction.

Posts shall not interrupt the continuation of the top rail at any point along the railing, including corners and end terminations. The top surface of handrail or guardrail shall be smooth and shall not be interrupted by a projecting fitting. (OSHA 1910.29(b), WAC 296-24-75011(1))

Toeboard is required where shown on the Plans, and where there is a danger of tools, materials, or equipment falling and striking employees below and shall conform to OSHA




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

standards. Toeboard shall be a minimum of 3.5-inches tall. Toeboard shall begin ¼-inch above the walking surface where the walking surface is a solid surface to allow for drainage (not required for grating walking surface).

Openings in the rail shall be guarded by a self-closing gate (OSHA 1910.23(e)(1)). Safety chains shall not be used unless specifically shown on the Plans.

### Finishes

Steel rail systems shall be coated with the coating system described in Division 9.

# 5.53 METAL GRATINGS [CSI 05 53 00]

## 5.53.05 Common Work for Gratings [CSI 05 53 05]

### Part 1 – General

### Design Requirements

Grating shall be selected for a ¼-inch maximum deflection under a uniform live load of 100 psf or a point live load of 500 pounds at any point on the grating (whichever is more critical), unless otherwise shown on the Plans. Thickness shall be as needed to meet these requirements unless otherwise shown on the Plans.

Panels shall be sized such that any single grating piece shall not weigh more than 50 pounds.

The horizontal clearance between the grating and grating supports shall not be less than ¼-inch nor greater than ½-inch. Contractor shall field measure grating supports as required to achieve required fit. Shop drawings shall be based on field dimensions as appropriate.

### Part 2 – Products

### Materials

Unless shown otherwise, materials used for supporting members shall match the materials used for the grating except all embedded grating supports shall be stainless steel, and grating supports for FRP grating may be stainless steel.

Attachment between grating and supporting members below grating shall be made with a minimum of four clips per panel. All mechanical grating clips shall be manufactured of Type 316SS (stainless steel).

### Fabrication

Grating shall be fabricated in such a manner that field cutting and drilling is not required. Panels shall be fabricated and installed in strict accordance with the manufacturer's recommendations.

### Part 3 – Execution

### Installation

Cut notches around pipes, conduits and other penetrations in such a way that panel removal/installation will not impinge on said objects. The horizontal clearance around grating panels shall not be less than 1/8-inch nor greater than 3/8-inch. File and de-burr cut




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

edges. Contractor shall field measure grating supports as required to achieve required fit. Shop drawings shall be based on field dimensions as appropriate.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 8.00 GENERAL

Sections in these specifications titled "*Common Work for . . .*" shall apply to all following subsections whether directly referenced or not.

## 8.05 Common Work for Openings [CSI 08 05 00]

### Part 1 – General

#### Summary

This division covers furnishing all labor, materials, and equipment necessary for providing all interior and exterior doors, frames, and windows.

#### Related Sections

- Division 5.05.23 Bolts and Other Connectors

#### Submittals

Submittal information shall be provided to the Owner for the following items:

- Hatches

# 8.30 SPECIALTY DOORS [CSI 08 30 00]

## 8.31 Access Doors and Panels [CSI 08 31 00]

## 8.31.20 Vault Hatches [CSI 08 31 20]

### Part 1 – General

#### Summary

Access hatches shall be of the dimensions and type shown on the project Plans.

#### Performance Requirements

Access doors shall be rated for H-20 (AASHTO) loading.

Access openings shall not have any obstructions such as intermediate hatch support beams.

#### Submittals

Provide manufacturer's statement of load rating.

For aluminum frames to be cast in concrete, provide submittal for frame coating.

Locate gutter drain outlet location and routing of drain line to its intended location.

#### Finishes

Aluminum hatch frames shall be protectively coated prior to casting in concrete to prevent the accelerated corrosion that occurs when aluminum is in contact with concrete.


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### Warranty

Manufacturer shall guarantee against defects in material or workmanship for a period of five years.

## Part 2 – Products

### Manufacturers

Hatches shall be equal to LW Products or approved equal.

### Components

Access hatches shall have aluminum diamond plate door leaf (or leaves), stainless steel spring lift, neoprene weather seal, stainless steel hardware, self-latching stainless-steel slam lock, and recessed padlock hasp with cover. An unkeyed internal lever shall open the latch to prevent accidental entrapment. Any drainage provision provided by the hatch or frame shall be routed to the vault or building sump or drain system using Sch 40 PVC anchored to the walls and ceiling unless shown otherwise on the plans.

Frame shall be channel style with a full anchor flange around the perimeter and shall allow for controlled water drainage away from the opening.

Compression spring operator lift system enclosed in telescopic tubes, expansion spring, or torsion springs shall be provided for smooth, easy and controlled door operation throughout the entire arc of opening and closing. Operation shall not be affected by temperature. The door shall automatically lock in the vertical position by means of a heavy steel hold-open arm with release handle.

Access hatches in areas that receive regular vehicle traffic shall be provided with welded clips and hold down bolts to secure the hatch to the frame.

## Part 3 – Execution

### Installation

Installation shall be in accordance with manufacturer's instructions.

Hatch gutter drain shall be connected to 2.5-inch or larger Schedule 40 PVC pipe and routed to daylight or storm drain unless shown otherwise on the plans.

### Field Quality Control

Frame shall be installed square and true without binding of door throughout the full arc of travel. Mis-operation of door shall be corrected by the Contractor.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 9.00 GENERAL

This division covers that work necessary for providing all materials, equipment, and labor to coat all items in accordance with these specifications.

Sections in these specifications titled "Common Work for . . ." shall apply to all following subsections whether directly referenced or not.

# 9.90 PAINTING AND COATING

## 9.90.00 Common Work for Painting and Coating

### Part 1 – General

#### Scope

The work specified in this Section covers the furnishing and installation of protective coatings, complete in place. The Finishes Bid Item includes complete replacement of interior lining system (Schedule C bid item 2) and replacement and containment of the exterior coating system (Schedule C bid item 1). Schedule D includes repair of the interior and exterior coating system for proposed improvements and areas damaged or removed due to proposed improvements. Shop coating and/or factory applied finishes on manufactured or fabricated items may be specified elsewhere.

The nominal dimensions of the existing reservoir are as follows:

90-foot diameter; and

88-foot height.

The reservoir was built in about 1995. No evaluation of the coating system has been performed. According to documentation from the City, the exterior shell and roof underwent coating repair work in 2003. It is believed that the repair coating consisted of two full coats of Tnemec Series 66 epoxy primer and one full coat of Tnemec Series 73 urethane.

**Submittals**

- Contractor qualifications and manufacturer's approval of coating system applicator.
- Before beginning any painting or coating, submit a list of coatings and manufacturers intended for use for review by the Owner. Include the application each coating is intended for, any surface preparation, number of coats, method of application, and coating thickness.
    - If product being used are manufactured by a company other than the specified reference standard, provide complete comparison of proposed products with specified projects including application procedures, coverage rates, and verification that product is designed for intended use. Information must also be provided that demonstrates that the manufacturer's products are equal to the specified products.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Provide Material Safety Data Sheets for all materials to be used including solvents.
- Provide NSF certification for all finishes in potential contact with potable water. Submit this information in accordance with the requirements regarding shop drawings included herein.
- Provide owner with schedule of coating operations and inspection timing. Coating inspections will be scheduled based upon Contractor-provided schedule. Update schedule weekly or as necessary.
- Shop- and field-applicator's quality control program, including quality control personnel credentials and record keeping form
- Work plan describing environmental monitoring, dehumidification and temperature control, abrasive blasting, coating application, and waste handling and disposal
- Date of application of any shop primer.

### Performance Requirements

All finishes potentially in contact with potable water shall be National Sanitation Foundation (NSF) certified for contact with potable water. Certification from the NSF or UL shall be supplied in writing at the time of the submittal process for Finishes. Contractor shall be responsible for verifying all finishes used on the project are compliant with primary and secondary standards of the Safe Drinking Water Act. Any violation shall be remedied at the Contractor's expense.

The completed coating shall produce a minimum dry film thickness in accordance with the specifications as determined by the microtest thickness gauge or comparable instrument. In areas where this thickness is not developed, sufficient additional coats shall be applied to produce it.

## Quality Assurance

The Contractor shall be responsible for compatibility of all shop and field applied paint products including the use of primer, intermediate and top coats by different manufacturers if applicable. For any Contractor-initiated substitutions, the Contractor shall verify complete compatibility between coatings provided for the project. If coatings are not compatible per manufacturer's review it shall be the Contractor's responsibility to remove incompatible coatings fully and replace with compatible coating systems.

Paint used in the first field coat over shop painted or previously painted surfaces shall cause no wrinkling, lifting, or other damage to the underlying paint.

The Contractor shall be responsible for obtaining written documentation from equipment/material manufacturers regarding the date at which shop prime coatings are applied and shall strictly adhere to the coating manufacturer's recommendations for recoat time intervals. The Contractor shall submit to the Engineer such documentation.

## Storage and Handling

Bring all materials to the job site in the original sealed and labeled containers of the paint manufacturer. Materials shall be subject to inspection by the Owner. Store paint supplies as recommended by the manufacturer and as approved by the Owner.


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### Extra Materials

For any products that have a shelf life longer than one year, provide one unbroken gallon container of each type and color of paint and each type of solvent and thinner used, as requested by the Owner. Dispose of all extra materials not desired by the Owner.

### Waste Products

The Contractor shall be responsible for the collection, containment, transportation, and disposal of all waste products generated for this project. Cleaning and disposal shall comply with all federal, state, and local pollution control laws. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.

Cleaning and disposal shall comply with all federal, state, and local pollution control laws. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.

### Site Conditions

Contractor shall take any and all measures necessary to prevent over-spray of structures and/or components in the field from both preparation and coating work. Should over-spray occur, the Contractor is responsible for all costs associated with any damage that occurs as a result of over-spray.

## Part 2 – Products

### Manufacturers

The following coating system manufacturers are approved subject to compliance with the Specifications contained herein:

1. Sherwin Williams
2. Tnemec Company

The specified coating shall be understood as establishing the type and quality of the coating desired. Other manufacturers' products will be accepted provided sufficient information is submitted to allow the Engineer to determine that the coatings proposed are equivalent to those named. Proposed coating shall be submitted for review in accordance with Division 1. Requests for review of equivalency will not be accepted from anyone except the Contractor, and such requests shall not be considered until after the Contract has been awarded.

Substitutions of the coatings of other manufacturers shall be considered only if equivalent systems of coatings can be provided and only if a record of satisfactory experience with the system in equivalent applications is available. Offers for substitutions will not be considered which decrease film thickness, solids by volume or the number of coats to be applied or which propose a change from the generic type of coating specified herein. All substitutions shall include complete test reports to prove compliance with specified performance criteria.

## Part 3 – Execution

### Installers

Contractor shall be responsible for quality assurance including the retention of a coating applicator with experience necessary to complete the work as specified within this Division.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Applicator's personnel shall be adequately trained for application of specified coatings. Applicator must prove adequate experience with the coatings specified for this project. At the discretion of the Owner, the applicator shall be approved to complete the coatings portion of the work. Submit list of a minimum of 5 completed projects of similar size and complexity to this project during the submittal process which include exterior containment. Include for each project:

1. Project name and location.
2. Name and phone number of owner.
3. Name and phone number of Contractor.
4. Name and phone number of engineer.
5. Name and phone number of coating manufacturer.
6. Approximate area of coatings applied.
7. Date of completion.

## Examination

The Owner shall inspect and approve all surface preparations prior to application of any coating. Provide 24-hour notice prior to surface inspection needs.

## Preparation

Prepare surfaces in accordance with the recommendations of the manufacturer of the coating to be applied to the surface, or the surface preparation requirements of these specifications, whichever are stricter. In general all surface preparation shall meet Structural Steel Painting Council (SSPC) Surfacing Preparation (SP) guidelines, the National Association of Pipe Fitters (NAPF), American Water Works Association (AWWA) and/or the National Association of Corrosion Engineers/Association for Materials Protection and Performance (NACE/AMPP) as noted herein unless more strictly described by coating manufacturer.

Coatings shall only be applied during weather meeting the recommendations of the coating manufacturer. Air and surface temperatures, humidity and all other environmental conditions shall be within limits prescribed by the manufacturer for the coating being applied, and work areas shall be reasonably free of airborne dust at the time of application and while coating is drying.

Materials shall be mixed, thinned and applied according to the manufacturer's printed instructions. Dry Film Thickness (DFT) shall be as stated here in or applied based on coverage rates of square feet per gallon (sq. ft./gal).

## Installation/Construction

Paint application shall be in strict accordance with manufacturer's printed instructions except that coating thickness specified herein shall govern. Finished coating on all items shall be clean, undamaged and of uniform thickness and color.


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Coating shall be done in a manner satisfactory to the Owner. The dry film thickness listed in the "Materials" section of this Division must be met, regardless of the applied film thickness or number of coats.

Carefully observe all safety precautions stated in the manufacturer's printed instructions. Provide adequate ventilation and lighting at all times.

The manufacturer's recommended drying time shall be construed to mean "under normal conditions." Where conditions are other than normal because of weather, confined spaces, or other reason, longer drying times may be necessary. The manufacturer's recommendation for recoating time intervals shall be strictly adhered to.

Pipe shall be emptied of water for a minimum of 24 hours prior to surface preparation and painting. Pipe shall not be filled with water until coating is dry. If, in the Engineer's opinion it is not practical to drain the pipes, the water must stand for at least 48 hours to reach ambient temperature prior to coating the pipe. Do not allow water to flow for at least 24 hours after final coating.

Regardless of the number of coats previously applied, at least two coats of paint shall be applied in the field to all coated surfaces unless otherwise specified herein.

## Field Quality Control

The prime Contractor shall be completely responsible for coating quality. The Contractor shall provide both wet and dry film gauges, and make such available to the Engineer when requested. If coating inspector finds anomalies and/or defects requiring further testing or blasting and recoating a meeting shall be held by all involved parties (coatings manufacturer representative, coating applicator and primary coating inspector) to come to a complete resolution as to the cause of the defect. All such remedies to repair defects shall be paid for by the Contractor. If prime Contractor does not agree with coating inspector's recommendations (i.e. there is no defect) they may hire a second coating inspector at Contractor's expense to review the work. If second coating inspector agrees with first, the decision is final. If there is disagreement, a third coating inspector shall be hired and paid for at split 50% cost between prime Contractor and owner and that decision shall be final and all such remedies to defects shall be paid for by the Contractor.

Contractor's Record

For each working day of shop and field coating application the Contractor shall provide:

- Report at least 2 days ahead of time to the owner and coating inspector when shop and field surface preparation and coating application will be completed. The owner and coating inspector shall be allowed to review and inspect surface preparation at any time.
- Note any differences from specifications and manufacturer's written requirements for surface preparation and coating preparation noted herein.
- Date, time, air and surface temperature, relative humidity and weather conditions at start and end of coating application.


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Detailed electronic photographs and detailed written description of items surface prepared and/or coated including location on finished structure and parts (example – 3rd row of interior wall of reservoir, west to north quadrant).
- Signature of applicator certifying work was completed within manufacturer's written requirements for surface preparation and coating.

Manufacturer's Record

A technical representative from the painting manufacturer shall review the process and completed finish work on site. The Certified Paint Manufacturer's Technical Representative employed by the Paint Manufacturer shall be approved by the Owner. All test results shall be approved by the Paint Manufacturer's Representative in writing (with Copy sent to the Engineer for review) prior to shop painting and field painting. Any defects found by the paint manufacturer's technical representative or the owner's representative shall be repaired to their satisfaction at Contractor's expense.

Manufacturer technical representative shall provide a written report that includes the following:

- Verify coatings and other materials are as specified.
- Verify surface preparation and application are as specified.
- Verify DFT of each coat and total DFT of each coating system are as specified using a dry film thickness gauge.
- Note defects that would adversely affect performance or appearance of coating systems.
- Describe inspections made and actions taken to correct nonconforming work.
- Report nonconforming work not corrected.
- Submit copies of report to Engineer and Contractor.

Acceptance of the completed coatings shall be based on the proper application and proper preparation of the coated surfaces, and a finished product that does not contain runs, drips, surface irregularities, overspray, color variations, scratches, pinholes, holidays, and other surface signs that detract from the overall performance and/or appearance of the finished project.

## Inspection

For metals exposed to exterior atmospheric conditions, first coat of paint or primer must be placed within four hours of passing inspection. Bare steel must be re-blasted and reinspected if not successfully coated within this four hour time frame, at the Contractor's expense. Regardless of time interval, under all conditions, re-blast surfaces that have started to rust before they are coated.

Use the Pictorial Surface Preparation Standards for Painting Steel Surfaces (VIS-1) by the Steel Structures Painting Council (SSPC) as a visual standard for inspection of surface preparation of metal surfaces. Test-Tex Tape may also be used to verify surface profile.


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Each coat shall be inspected by NACE/AMPP inspector prior to application of the next coat. Areas found to contain runs, overspray, roughness, streaks, laps, sags, or other signs of improper application shall be repaired or recoated in accordance with the manufacturer's recommendations. Finish coats shall be uniform in color and sheen. Surface preparations and coatings not inspected or approved by owner will be uncovered for inspection and approval at no additional cost to the owner.

Contractor shall inspect the completed and cured coating on metal surfaces in the presence of the Owner for pinholes and holidays with a tinker and rasor or other low voltage (under 100 volts) holiday detector. Areas found to contain pinholes shall be repaired or recoated in accordance with the manufacturer's recommendations. Provide 72-hour notice to owner prior to performing test. For Special coatings the installed lining system shall be checked by high voltage spark detection in accordance with NACE RP0188-90 to verify a pinhole-free surface.

### NACE/AMPP Certified Inspector

A NACE/AMPP Certified Inspector paid for by the **Owner** shall inspect all field coatings related to:

- Steel Reservoir Interior
- Steel Reservoir Exterior

Provide 14 calendar days' notice to the Owner's representative to schedule the inspection. Initial inspection shall result in a written report. If defects are found not matching the specifications below for surface preparation, curing or coating type/thickness, remedies shall be completed by the contractor at their expense. After remedies are complete and approved by the NACE Inspector, shop coated items may be installed at the job site. If defects are found after the second inspection (initial and first defect remedy) for the same components by the NACE Certified Inspector, subsequent NACE Certified Inspector inspections shall be paid for by the Contractor.

### Repair/Restoration

The Contractor is responsible for all costs associated with any damage that occurs as a result of over-spray.

Scratched, chipped or otherwise damaged coatings, including factory coatings, shall be repaired before final acceptance will be given.

### Cleaning

If any cleaning of equipment at the site is performed with solvents, such work shall be done over leak-proof linings. Preparation or coating materials may not be disposed of on site.

## 9.90.01 Color Schedule

Finish coatings, which are applied in the shop by the manufacturer, shall conform to this section. Factory coatings which are damaged during shipment or installation shall be recoated in the field in accordance with these specifications.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Items of similar purpose shall be painted the same color. If items come from the factory with a shop applied coating that does not match said color, they shall be field coated to match.

The contractor shall allow no less than 15 working days from the time the Owner is provided with color selections for the Owner to make color choices.

The Owner will develop a color Schedule Dor painted items after award of the contract. Contractor shall provide a palette of colors from the manufacturer of not less than 30 color choices.

## 9.90.02 Unpainted Items

Do not coat aluminum or stainless steel items unless specifically directed otherwise below or as shown on the plans. Do not coat small diameter pilot systems such as galvanized iron, copper or brass pipe and fittings associated with control valves unless noted otherwise on the plans or herein.

# 9.91 PAINTING AND COATING SYSTEMS

Refer to 9.90.00 for coating application requirements.

# 9.91.13 EXTERIOR PAINTING

## 9.91.13.1 System 1: Metals Exterior (Wet Conditions)

### Part 1 – General

This section refers to the coating of those steel appurtenances that are anticipated to be fabricated and shop primed offsite (e.g. handrail, vandal shield, cable tray and related components).

### Part 2 – Products

#### Materials

Tnemec

| | |
|---|---|
| Primer: Series 1 Omnithane Prime (shop prime) | 2.5 to 3.5 mils DFT |
| Series 27 F.C. Typoxy | 3.0 to 5.0 mils DFT |
| Finish: Series 1095 EnduraShield | 3.0 to 5.0 mils DFT |

### Part 3 – Execution

#### Preparation

SSPC SP1 followed by SP6 Commercial Blast. Surface profile shall be 2.0 mils, minimum.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 9.91.13.13 - System 2: Ferrous Metal including Cast/Ductile Iron Pipe (Atmospheric Outdoors)

## Part 1 - General

This Section applies to all ductile/cast iron and ferrous metals, including bituminous coated pipe and materials unless specified otherwise. This Section generally applies to all pipe materials and equipment, including manufacturer applied coating systems unless otherwise noted.

This section applies to piping within the inlet/outlet vault piping. For items with manufacture applied coating system, provide tie coat per manufacturer's recommendation.

(For the purposes of this coating system, metals which are located below the top of the exterior wall within a water bearing structure or are located within a vault/manhole with no sump drain/pump shall be considered as under immersion service conditions and are not covered within this subsection.)

## Part 2 - Products

1. Tnemec
   a. Primer option 1: Series 1 Omnithane (2.5 to 3.5 Mil DFT).
   b. Primer option 2: Series N69 or N140 (2.5 to 3.5 Mil DFT) may be used if the time between prime coat and intermediate coat is less than 60 days. If more than 60 days occurs, surface will need re-preparation per the manufacturer's instructions.
   c. Intermediate Coat: Series N69 Hi-Build Epoxoline II (6 to 8 mils DFT)
   d. Finish Coat: Series 73 Endura-Shield (3 to 5 mils DFT)
2. Sherwin Williams
   a. Primer: Corothane 1 Mio-Zinc Primer (2.5 to 3.5 Mil DFT)
   b. Intermediate: Macropoxy 646FC B58-600 Series (6 to 8 Mil DFT)
   c. Finish: Acrolon 218HS (3 to 5 Mil DFT)

## Part 3 - Execution

### Surface Preparation

1. Steel
   a. SSPC-SP10 Near white metal blast cleaning
2. Ductile Iron
   a. Provide SSPC-SP1 followed by NAPF 500-03-04/05 Grey White Blast. Ductile Iron pipe shall be purchased **without** the standard asphaltic coating. Removal of asphalt coatings is extremely difficult and overly aggressive preparation can create a damaged surface unsuitable for coating.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 9.91.33.02 - System 3: Stainless Steel in Contact with Drinking Water (Welded) [CSI 09 91 33 14 or 09 97 13.24]

## Part 1 – General

This section applies to all stainless steel piping exteriors and fasteners in contact with potable drinking water. Coatings shall be NSF approved for use in direct contact with potable drinking water.

## Part 2 – Products

### Materials

Coating system shall be equal to that specified for the new steel reservoir interior except the zinc primer shall be omitted.

## Part 3 – Execution

### Preparation

SSPC SP16 Brush-Off Blast Cleaning of Non-Ferrous Metals

# 9.97.23.07 – System 4: Concrete Vault Interior [CSI 09 97 23 19]

## Part 1 – General

### Summary

Do not coat interior walls unless noted otherwise on the Plans or stated herein.

# 9.98 Steel Reservoir Coating

# 9.98.1 Common Work for Steel Reservoir Coating

## Coating Schedule – ***Schedule C***

| | |
|---|---|
| ***Interior*** (Schedule C) | SSPC-SP1 surface preparation entire tank interior to remove soluble contaminants and test for soluble salts.<br>Remove all existing coatings, prepare surface per SSPC SP-10, and install new interior lining system. Reference System 5. |
| ***Exterior*** (Schedule C) | SSPC-SP1 surface preparation entire tank exterior to remove soluble contaminants and test for soluble salts.<br>Remove all existing coatings, prepare surface per SSPC SP-10, and install new exterior coating system. Reference System 7. Provide exterior containment. |




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Coating Schedule – ***Schedule D***

| | |
|---|---|
| ***Interior*** (Schedule D) | Where construction activities damage interior coating for new interior steel welds, install interior coating system. Reference System 5. Manufacturer warranty for this schedule will not be required. |
| ***Exterior*** (Schedule D) | SSPC-WJ 4 surface preparation (pressure wash) entire tank exterior.<br>Where construction activities damage exterior coating and for new exterior steel, install exterior coating system. Reference System 6. Manufacturer warranty for this schedule will not be required.<br>Provide containment as necessary to manage environmental conditions. |

# Part 1 – General

## Design Requirements

All interior coatings are to be certified for contact with potable water per NSF 61/600. This includes coatings above the water line.

Contractor shall supply full containment of any blasting of structures and/or components in the field or wet blasting as required by local clean air agencies such as the Puget Sound Clean Air Agency.

## Warranty

Steel Reservoir Coating System provided under this contract shall be warranted against defects in workmanship for a period of two (2) years after date of project acceptance. Coatings will be warranted for years 1 and 2. During this time the cathodic protection system will be warranted but turned off.

Upon completion of the coating warranty (end of year 2), the cathodic protection will be turned on, and the cathodic protection warranty will extend for one more year.

## Two-Year Guarantee Period

The Contractor shall return to the project and repair or replace all defects in internal and external coating workmanship and materials discovered within two years of the Final Acceptance of the Work. The Contractor shall obtain and provide the Contracting Agency with an inspection report detailing the state of the interior and exterior coating and any apparent defects a minimum of thirty (30) and a maximum of sixty (60) calendar days prior to the expiration of the warranty period. The inspection report shall include a detailed analysis of the state of coatings and be supported by video footage and photographs. The inspection shall be performed by a Contracting Agency approved NACE certified diving inspector. The reservoir shall remain online during inspection. If the Contractor fails to provide the inspection report thirty (30) calendar days prior to the expiration of the warranty




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

period, the warranty period shall be extended sixty (60) calendar days from its original expiration date. Should the Contractor fail to provide an inspection thirty (30) calendar days prior to the expiration of the amended warranty period, the warranty period shall be extended another sixty (60) calendar days beyond the amended warranty period. Sixty (60) calendar day extensions shall continue to accrue until an inspection report, performed by an approved inspector, is submitted to the Contracting Agency a minimum of thirty (30) calendar days prior to the expiration of the latest warranty period.

The Contractor shall start work to remedy any such defects within 7 calendar days of receiving Contracting Agency's written notice of a defect, and shall complete such work within the time stated in the Contracting Agency's notice. In case of an emergency, where damage may result from delay or where loss of services may result, such corrections may be made by the Contracting Agency's own forces or another contractor, in which case the cost of corrections shall be paid by the Contractor. In the event the Contractor does not accomplish corrections within the time specified, the work will be otherwise accomplished and the cost of same shall be paid by the Contractor.

When corrections of coating defects are made, the Contractor shall then be responsible for correcting all defects in workmanship and materials in the corrected work for two years after acceptance of the corrections by the Contracting Agency.

These guarantees are supplemental to and do not limit or affect the requirements that the Contractor's work comply with the requirements of the Contract or any other legal rights or remedies of the Contracting Agency.

## Three-Year Guarantee Period

The Contractor shall return to the project and repair or replace all defects in the cathodic protection system's workmanship and material discovered within three years after Final Acceptance of the Work and within one year of the completion of the coatings two-year guarantee period, whichever is longer. The Contractor shall start work to remedy any such defects within 7 calendar days of receiving Contracting Agency's written notice of a defect, and shall complete such work within the time stated in the Contracting Agency's notice. In case of an emergency, where damage may result from delay or where loss of services may result, such corrections may be made by the Contracting Agency's own forces or another contractor, in which case the cost of corrections shall be paid by the Contractor. In the event the Contractor does not accomplish corrections within the time specified, the work will be otherwise accomplished and the cost of same shall be paid by the Contractor.

When corrections of defects are made, the Contractor shall then be responsible for correcting all defects in workmanship and materials in the corrected work for one year beyond the two-year guarantee of the coating systems or an additional year, whichever is longer. The extended guarantee period shall begin upon acceptance of the corrections by the Contracting Agency.

## Anniversary Inspection

The Owner will conduct an inspection of coated surfaces prior to the end of the warranty period. The Contractor will be notified in advance of this inspection and may attend at its option and at no additional cost to the Owner.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### Repairs and Work Performed Under Warranty Period

A list of all coating defects and failures identified during the inspection will be prepared and transmitted to the Contractor. The list will include color photographs. The list will serve as notice of repairs required under warranty at no additional cost to the Owner.

All requirements of the Contract will apply to warranty repair work. All defective coatings shall be repaired by the Contractor using coating materials, equipment, and methods similar to those used in the original work. Materials shall be of fresh manufacture and within the manufacturer's stated shelf life at the time of application. The Contractor shall provide an extended warranty for all repairs equal to the original coating system warranty duration.

Complete all required coating repairs within 45 calendar days of the Anniversary Warranty Inspection unless otherwise scheduled by the Owner.

## Part 2 – Products

### Mixes

Materials shall be mixed, thinned, and applied according to the manufacturer's printed instructions.

### Colors

Alternate colors in a multiple coat system to provide a visual reference that the required number of coats has been applied. Stripe coats shall be alternated in color similar to a full coat.

## Part 3 – Execution

### Exterior Containment

Refer to – SSPC: The Society of Protective Coatings Technology Guide No. 6 Guide for Containing Surface Preparation Debris Generated During Paint Removal Operations.

Containment for the reservoir exterior shall meet the following criteria, minimum:

1. Containment Type - Class 3A
2. Monitoring Method A
3. Containment Type A2, Flexible
4. Penetrability Type B2a minimum
5. Support Structure Type C1 – Rigid Support Structure
6. Treatment of Joints Type D2 – Partially Sealed Joints
7. Entryways Type E3 – Entryway Through Overlapping Door
8. Ventilation System Components Air Supply (Intake) Points – Type F2 – Open Air Supply
9. Input Air Flow - Type G2 – Natural Air Flow
10. Air Pressure Inside Containment – Type H3 – Not Required




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

11. Air Movement inside Containment – Type I2 Not specified
12. Exhaust Air flow/dust collection – Type J1 – Air filtration required

***If the Contractor decides that exterior containment is not necessary for reservoir preparation and overspray, the Contractor shall assume all liability and risk if cleaning or adjustments are required. Contractor will be required to provide non-containment information to City of Lacey prior to commencing any work on the coating.***

***If Owner's inspector identifies visual monitoring showing preparation or overspray escaping off site or onto adjacent structures on site operations shall cease and a remedy provided by the Contractor. Any cleaning or adjustment shall be provided by the Contractor at no additional cost to the Owner.***

## Environmental Controls

Contractor must facilitate environmental conditions as necessary to facilitate application and curing of the coating.

Heat sources that emit carbon dioxide or carbon monoxide into areas to be coated are not allowed. Locate and vent all heat sources per the heater manufacturer's recommendation to prevent the coatings from being affected by exhaust products.

All equipment, power, and fuel necessary to operate environmental controls equipment must be provided by the contractor.

Equipment, power, and fuel sources operational volume must be less than 60 dBA measured from 25 feet. If equipment is rated higher than the specification the Contractor must provide temporary sound attenuating barriers to reduce the volume to the required specification.

Environmentally controlled areas must be sealed.

## Preparation

Cap or seal all inlet/outlet and overflow piping inside tanks prior to beginning any surface preparation or cleaning work (other than washdown of the tank interior) to prevent entry of foreign material into the piping systems.

Remove oil, grease, welding fluxes, and other surface contaminants prior to blast cleaning.

For shop-primed steel, prepare surface and touch up welds, burned and abraded areas on shop primed steel with specified primer before applying field coats.

Repair corrosion pits by arc welding and grinding flush with the metal surface as directed by the Engineer. Weld undercutting, pits, slag, holes, or splatter shall be removed or corrected before repairs are acceptable. Grind metal protrusions, deformations, and welds on interior of tanks flush with the metal surface where directed by the Engineer.

Where Fabrication Defects of New Steel Are Found:

- Correct steel and fabrication defects revealed by surface preparation.
- Remove weld spatter and slag.
- Round sharp edges and corners of welds to a smooth contour.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Smooth weld undercuts and recesses.
- Remove weld flux from surface.

## Abrasive Blast Cleaning Requirements

After SSPC SP-1 cleaning and prior to abrasive blasting existing steel, surfaces shall be tested for soluble salts. Acceptance criteria shall be provided by the manufacturer for the specified coating system. Test frequency shall be in accordance with NACE SP0716-2016, and the interior shell, floor, and ceiling and exterior shell and roof shall be considered separate areas.

It is the Contractor's responsibility to determine the original steel conditions in selecting the abrasive and equipment required for achieving the specified surface profile and cleanliness.

Blast profile shall be of a sharp, jagged nature, and angular, with no evidence of a polished surface. Peened surface patterns, such as those obtained from shot blasting, are not acceptable. Provide surface profile which meets the prime coating manufacturer's requirements.

## Post-Blast Cleaning

Clean surfaces of dust and residual particles prior to painting.

Vacuum-clean areas where dust settling is a problem. Horizontal surfaces subject to dust settlement, such as welds, floors, and flanges on rafters and girders, shall be cleaned again by dry air blast and vacuum immediately preceding paint application.

Remove all spent steel grit from floor, corners, and other areas as necessary using a magnetic broom and dry air blasting.

Blasted surfaces shall be carefully monitored and inspected for rusting immediately prior to painting. Under all conditions, re-blast surfaces that have started to rust before they are coated.

## Application of Paint

Plan coating application to ensure that specified temperature, humidity, and condensation conditions are met. If conditions do not allow for orderly application of sealant, primer, stripe coat, intermediate coat and topcoat, use appropriate means of controlling air and surface temperatures, as required. Partial or total enclosures, insulation, heating or cooling, or other appropriate measures may be required to control conditions to allow for orderly application of all required coats.

Allow each coat to dry thoroughly before applying next coat. Provide adequate ventilation for tank interior to carry off solvents during dry phase. The use of ventilation shall be in accordance with the requirements for any dehumidification and temperature control.

Coating shall be applied in a manner that results in a smooth and even final appearance. Drips, dapple, runs, waves, laps, or brush marks visible on the final coat will not be accepted. Exceptions to this final appearance requirement are localized areas that require a stripe coat to be brushed or rolled on to the area, at these locations minor brush marks or dappling will be accepted.

## Stripe Coat




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Brush** a stripe coat of coating on all bolted connections, bolt heads and nuts, corners, edges, angles, welds, member intersections, structural steel flanges, crevices, heavily pitted areas, and all other deviations from smooth surfaces where paint application may not result in adequate paint thickness and coverage.

Stripe coat shall be worked into all cracks, crevices, welds, and seams.

Mini-rollers or other tools may be required.

## 9.98.3.1 System 5: Welded Steel Reservoir Interior Relining

### Part 1 – General

This section refers to the tank interior. Existing coating shall be removed and interior steel shall be blasted and coated. This system is applicable for the exterior surfaces of piping within the reservoir; for stainless steel piping, omit the zinc primer. This system is applicable for the interior of the overflow piping except that only prime coat and finish coat shall be required.

### Part 2 – Products

AWWA ICS 5: Zinc-Rich Primer and (2) Coats Epoxy

1. Sherwin Williams
   a. Prime Coat: Corothane GalvaPac (2.5-4.0 Mil DFT)
   b. Stripe Coat: Macropoxy 5500 LT or SherPlate 600
   c. Intermediate Coat: Macropoxy 5500 LT or SherPlate 600 (5.0 – 8.0 Mil DFT)
   d. Finish Coat: Macropoxy 5500LT or SherPlate 600 (5.0 – 8.0 Mil DFT)
2. Tnemec
   a. Prime Coat: Series 91- or 94- H2O Hydro-Zinc (2.5-3.5 Mil DFT)
   b. Stripe Coat: N140 Pota-Pox Plus or Series 21 Epoxoline
   c. Intermediate Coat: Series 21 Epoxoline (5.0 – 8.0 Mil DFT)
   d. Finish Coat: Series 21 Epoxoline (5.0 – 8.0 Mil DFT)

***Minimum film thickness: 12.5 Mil DFT***

***Contractor shall apply primer, first and finish coats utilizing different colors for ease of inspection.***

### Part 3 – Execution

For all shop-prepared surfaces and all field-prepared surfaces, prepare surfaces in accordance with SSPC-SP1.

Abrasive blast clean in accordance with SSPC-SP10 Near White Blast Cleaning.

## 9.98.3.2 System 6: Welded Steel Reservoir Exterior Coating Repair (Schedule D)




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Part 1 – General

Prepare and coat areas of new steel and areas where existing coating is removed/damaged due to welding and proposed construction. Feather existing coating edges where proposed repairs are performed. Additionally, the entire exterior will receive a pressure wash (water-jetting) prior to coating repair.

## Submittals

Provide written documentation of shop primer application.

# Part 2 – Products

## Materials (Shop)

Prime all properly prepared surfaces with one coat:

1. Sherwin Williams Corothane 1 Galvapac One Pack Zinc Primer B65G11 (2.5 to 3.5 Mil DFT) or equal

## Materials (Field)

For properly prepared External Surfaces: Prime all properly prepared new steel including anchor chairs and bolts, holdbacks, and welded and abraded areas of any shop primed or field-damaged surfaces with the following series of coatings:

1. Zinc Primer/Epoxy/Polysiloxane System:
    a. Prime coat: Sherwin Williams Corothane 1 Galvapac One Pack Zinc Primer (2.5 to 3.5 Mil DFT)
    b. Stripe coat: Sherwin Williams Macropoxy 646
    c. Intermediate coat: Sherwin Williams Macropoxy 646 (4 to 6 Mil DFT)
    d. Finish coat: Sherwin Williams Sher-Loxane 800 (4 to 6 Mil DFT)

Minimum total dry film thickness shall be 9.5 Mil.

# Part 3 – Execution

## Surface Preparation (Shop)

All surfaces shall be SSPC SP1 solvent cleaned followed by abrasive blasting in strict accordance with SP10 Near White Metal Cleaning.

Shop applied primers shall be evaluated for recoat window criteria and prepared in accordance with manufacturer's recommendations if recoat window has elapsed for application of specified subsequent coating.

## Surface Preparation (Field)

For entire tank exterior:

Prior to any coating activities, prepare entire tank via a SSPC-SP WJ-4 Waterjet Cleaning of Metals, Light Cleaning and detergent and/or scrubbing as needed. Remove all visible oil, grease, soil, dirt, mold and mildew, and other soluble contaminants.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

For areas of proposed coatings:

Prepare all external surfaces in accordance with SSPC-SP 1 and SSPC-SP 10 Near White Metal Cleaning or SSPC-SP 11 Bare Metal Power Tool Cleaning.

Feather the edges of existing coating adjacent to coating repairs. Apply zinc primer only on the bare steel. Apply intermediate epoxy coat to the feathered edge as well as the primed area.

# 9.98.02.03 System 7: Welded Steel Reservoir Exterior Recoating (Schedule C)

## Part 1 – General

This section applies to the Reservoir exterior and new and existing steel appurtenances. Includes new steel hatches, pipe supports, grating and exterior overflow piping, anchor chairs, vent nozzle, and perimeter guardrails, and staircase.

## Part 2 – Products

### Materials (Shop)

Shop-fabricated exterior structural steel may be shop primed per system below.

### Materials (Field)

For properly prepared External Surfaces: Prime all properly prepared new steel, holdbacks, welded and abraded areas of shop primed surfaces with the following series of coatings:

1. Zinc Primer/Epoxy/Polysiloxane System:
    a. Prime coat: Sherwin Williams Corothane 1 Galvapac One Pack Zinc Primer (2.5 to 3.5 Mil DFT)
    b. Stripe coat: Sherwin Williams Macropoxy 646
    c. Intermediate coat: Sherwin Williams Macropoxy 646 (4 to 6 Mil DFT)
    d. Finish coat: Sherwin Williams Sher-Loxane 800 (4 to 6 Mil DFT)

Minimum total dry film thickness shall be 9.5 Mil.

## Part 3 – Execution

### Surface Preparation (Field)

Shop applied primers shall be evaluated for recoat window criteria and prepared in accordance with manufacturer's recommendations if recoat window has elapsed for application of specified subsequent coating.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 13.00 GENERAL

This division covers that work necessary for supplying, fabricating and installing all furnishings and accessories as described in these specifications and as shown on the Plans.

Sections in these specifications titled "*Common Work for . . .*" shall apply to all following subsections whether directly referenced or not.

# 13.30 SPECIAL STRUCTURES [CSI 13 30 00]

## 13.31 Water Utility Storage Tanks [CSI 33 16 00]

## 13.31.23 Ground Level Steel Water Storage Tanks [CSI 33 16 23]

### Part 1 - General

#### Related Sections

- 1.75.16.50 Reservoir Testing and Disinfection
- 1.75.16.51 Steel Reservoir Leakage Test
- 1.75.16.56 Reservoir Soak Test
- 5.05 Common Work for Metals
- 5.51.05 Common Work for Stairs and Ladders
- 9.90 Steel reservoir coatings
- 13.31.40 Water Storage Tank Appurtenances

#### References

- AWWA D100-21 AWWA Standard for Steel Tanks for Water Storage.
- ANSI American National Standards Institute
- ASTM American Society for Testing and Materials
- NSF National Sanitation Foundation
- UL Underwriters' Laboratories, Inc.

#### Submittals

- The reservoir design, shop drawings, specifications and calculations must be stamped by a Washington State licensed professional engineer and must be submitted to the owner for review and approval prior to fabrication. Shop drawings shall clearly indicate all shop and field fabrication, sequences, and erection details.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Contractor-initiated changes shall be specifically noted on the shop drawings and be submitted in writing to the Engineer for approval prior to fabrication or construction.
- Details of all welded joints shall be submitted for approval.

- Weld procedure specifications and welder qualifications shall be submitted for review and acceptance prior to any field welding.
- Mill test reports (or, if applicable, AISC credential to demonstrate shop compliance) shall be submitted.
- Contractor-provided weld inspector certification, including related experience on AWWA tanks shall be submitted.
- Contractor inspection written report shall be submitted.
- If a door sheet, manway, pipe penetration, or other significant opening is added, submit a work plan in compliance with API 653, describing sequencing, fabrication, shipping, erection procedures including location and geometry of door sheet, manway, or pipe penetration, including its associated doubler plate, shell bracing at the top and sides of the opening to prevent tank sagging or deformation. Bracing shall be added before the opening is cut in and shall remain in place until the door sheet, manway, etc. is completely and satisfactorily reinstalled in accordance with the approved welding plan, and weld testing, including radiographic inspection of any reinstalled or repaired shell penetrations, shall be submitted. Radiographic testing shall be performed by a 3rd party radiographic tester at the contractor's expense. Successful testing results shall be submitted to the Owner or Owner's representative.
- Door (or other) opening bracing plan (PE-stamped).
- Door sheet (or other opening) re-installation welding plan (PE-stamped).
- A summary of previous successful door sheet experience (a minimum of 5 required).

## Part 2 - Products

### Materials

Reservoir Bottom, Shell and Roof Plates

Thickness less than or equal to ½-inch; ASTM A36; Fy 36 KSI or ASTM A131, GR A or ASTM A283, GR C

Thickness greater than ½-inch; ASTM A131, GR B or ASTM A573, Fy 58 KSI

Structural Shapes and Non-Tank Plates

ASTM A572 G.50; Fy 50 KSI

### Source Quality Control

Mill Testing:

Test reports shall be submitted to the Engineer for review and approval prior to fabrication.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Shop inspection shall be provided by a commercial inspection agency and paid for by the Contractor. Shop inspection shall consist of a visual inspection of the fabricating practices and operations to determine compliance with the standard of AWWA D100. Mill test reports shall be furnished to the Owner.

An American Institute of Steel Construction (AISC) compliant shop does not require inspection by a commercial inspection agency or to reimburse the Owner if it is AISC compliant. The Owner and their inspector have the right to inspect at the AISC compliant shop and reject and/or approve the work.

### Finishes

See Division 9.

## Part 3 - Execution

### Construction

All shell welds, except floor shell welds, shall be full penetration butt welds. Remove all inclusions in the steel shells by grinding.

The roof shall be fully seal welded including all plate to plate, plate to rafter, and plate to purlin connections, including all connections to the shell.

Any rough or weld-spattered areas must be smoothed by grinding or other means. Grind all welds installed during this project in accordance with NACE RP0178, Weld Preparation Designation D "Ground smooth and blended."

### Field Quality Control

The Owner shall be furnished with copies of all inspection reports and test results for tests performed by the Contractor or the Contractor's testing agency. The following inspections must be performed:

Foundation Excavation, Surface Preparation, Completion:

To be performed by a representative of the Owner at the Owner's expense.

Foundation reinforcing and concrete pour:

To be performed by a representative of the Owner at the Owner's expense.

Tolerances for plumb/round/level:

To be performed by a representative of the Owner at the Owner's expense.

Welding and Welding Inspection and testing shall be in conformance with AWWA D100 and the following:

Special Inspections:

The Contractor shall provide the required equipment and labor to take the spot radiographs, ultrasonic testing, section segment inspection, and air carbon arc gouging testing. The constructor shall provide all testing results regardless of type to the Owner for review. The Owner shall review all the tests and both the constructor/manufacturer and the Owner shall provide written documentation stating the tests meet AWWA D100 standards as well as the contract documents and shop drawings.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The Contractor's welding inspector shall have prior tank inspection experience and shall be a certified welding inspector (CWI) in accordance with the provisions of AWS QC1. An "in-house" inspector is acceptable if they meet the experience and certification requirements. **Submit inspection experience and certification** for review and approval by the Owner.

The Owner is responsible for IBC special inspections. The Contractor is responsible for AWWA welding inspection. Owner may also inspect AWWA welds at Owner's expense and reject and/or approve the work.

Field Inspection:

Inspection of welded tank shell joints shall be performed in accordance with the requirements of AWWA D100, using radiographic testing as described in AWWA D100, Section 11.6, or by ultrasonic testing as described in AWWA D100, Section 11.7.

Inspection of all complete joint penetration welded-shell butt joints shall be made by the radiographic method. Visual inspection using the sectional segment method will only be allowed by special approval by the Engineer.

Contractor's Inspection Written Report:

The Contractor shall submit a written report at the conclusion of the work, prepared by the Contractor's qualified personnel, certifying that the work was inspected as set forth in AWWA D100, Section 11.2. This report shall include the following:

- A copy of the welder performance qualifications.
- A summary of inspection of radiographs and section segments and inspection by air carbon arc gouging, if used.
- Identification of unacceptable radiographs and section segments and inspection by arc gouging and a statement of the action taken to rectify unsatisfactory welds.
- The constructor shall keep record of the welders on each joint as specified in AWWA D100, Section 8.3. This record shall be submitted as part of this report.
- The radiographs and inspection records shall be delivered to the Owner after acceptance of the structure.

# 13.31.40 Water Storage Tank Appurtenances

## *[CSI 33 16 96]*

## Part 1 - General

### Related Sections

- 8.31.32 Reservoir Roof Hatch

### Submittals

Provide submittal of wall access hatch gasket, fasteners (bolts, nuts, and washers), and fastener tightening instructions in a single submittal package.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### Design Criteria

Live load for stairs, platforms, and balconies shall be 50 psf.

## Part 2 - Products

### Components

The reservoir appurtenances shall be as shown on the Plans.

Roof Vent(s)

Roof vent to be sized for a fill rate of no less than 5,000 gpm and a draw rate of no less than 8,000 gpm. Air flow through the vent shall have a maximum headloss of 0.5 inches of water.

Access Systems

Stairs, ladders, safety cages, railings, lanyards, or lifelines, and other access provisions must be constructed to meet the requirements of WAC 296-24-735 through WAC 296-24-81011 and WAC 296-155-245 and the requirements of OSHA and AWWA D100.

Roof Hatch(es)

There shall be at least one 36 inch access hatch on the reservoir roof near, but no closer than 36-inches from, the exterior ladder. At or near the roof center, there shall be an additional hatch, with a minimum diameter of 20 inches.

Flanged Wall Access Hatch

Provide two flanged wall hatches per plans. Construct flanged wall hatches with hinges to support the flange weight without sagging.

Provide full-face elastomeric gasket matching the flange bolt pattern (custom manufacture may be required). Gasket shall have a Short A hardness of 60 to 85, be suitable for water temperature up to 200 degrees F, have a gasket seating stress of 200 psi minimum, have minimum 1/16-inch thickness, and provide watertight seal regardless of water level. Gasket shall be red rubber, neoprene, or NSF-61 EPDM.

Provide a spare gasket for each hatch in a labeled and sealed container to the Owner in addition to the gasket(s) installed on the access hatch(es). Provide product information in the Operation and Maintenance Manuals for reorder.

## Part 3 – Execution

### Construction

Follow manufacturer's instructions for wall access flange fastener torque and sequence. Do not over-compress the gasket.

# 13.47 Facility Protection

***[CSI 13 47 00]***

# 13.47.13.17 Cathodic Protection for Storage Tank

***[CSI 13 47 13.17]***




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Part 1 – General

## Summary

Provide an impressed current cathodic protection system for the interior of the water tank in accordance with AWWA Standard D104-23 and as specified herein. Provide a cathodic protection system to include rectifier, anode array, reference cells, conduit, wire, hangers, grounding, and all additional components necessary for a complete installation.

The specifications and plans are intended to cover a complete cathodic protection system properly designed and installed, suitable for safe and satisfactory operation. Unless expressly excluded by these specifications, any and all equipment, materials and/or labor not included, but which may be necessary to produce said product are included in the Contractor's bid price. Any unfulfilled requirements of this nature which become apparent upon installation and/or testing of the equipment will be corrected by the Owner or the Owner's agent at the Contractor's expense if, upon notice, the Contractor fails to promptly correct the deficiency.

All work shall be in accordance with local electric code.

## Qualifications

Installation of the cathodic protections systems shall be done under the direct supervision of an installer with a minimum experience of 10 comparable installations.

The rectifier shall be adjusted by a corrosion expert, and that person shall be a Professional Engineer with education and training in cathodic protection, or an AMPP (NACE) Certified CP/Corrosion Control Specialist.

The supplier of the cathodic protection rectifier system, anodes and other special cathodic protection materials and equipment shall have a minimum of five (5) continuous years of successful experience in the manufacture, installation, and service of cathodic protection systems for similar structures.

## Field Conditions

The following data are provided:

1. Tank approximate dimensions: 90-foot diameter, 88-foot height.
2. Materials: Steel bottom, steel shell, steel roof.
3. Interior Lining: see Division 9

The Contractor's is responsible for requesting any additional information as may be required to assure satisfactory design and Installation.

## Submittals

Provide personnel qualifications of the installer and corrosion expert and provide catalog cuts and data sheets for all materials including rectifier, anodes, reference cells, wiring, insulation, handhole covers, hangers, and conduit. Provide drawings of proposed conduit routing and mechanical and electrical connections to structures.

## Closeout Submittals

Provide 3 copies of the rectifier operating manual for each rectifier supplied.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Provide maintenance and operating instructions with sufficient detail to permit the Owner's operator to properly maintain and adjust the system. Include a description of the main components, their function, and a schematic drawing of the power/unit controller.

### Warranty

In addition to other warranties required by the specifications, warrant the entire cathodic protection system against defects in materials and workmanship for a period of three (3) calendar years after date of project acceptance. 1 year after the 2-year coating warranty. Cathodic protection to be warranted for 1 year after coating's 2-year warranty is finished.

## Part 2 – Products

### Materials

All materials shall be new, be the standard product of manufacturers regularly engaged in the production of such equipment, and be the manufacturer's latest design. Materials and equipment supplied shall reflect the best and latest standard and practice for the intended application.

A.C. Power Service

Connect power supply circuit per electrical drawings. Locate rectifier inside Treatment Building.

Impressed Current Rectifiers

Rectifier: CP Sentinel Aqua-Line by Integrated Rectifier, or T.A.S.C. VIII rectifier by Corrpro, or approved equal.

The impressed current cathodic protection rectifier shall include the following functions and components:

1. Both manual mode and fully automatic, with "ON" potential control and automatic "IR-Free" (instant off) potential control to 100% rated output.
2. Digital rectifier meter with an LED display showing voltage, current, and potentials.
3. Automatic current limiting control and automatic shut down on loss of reference cell.
4. Rated output of 30VDC and 16ADC.
5. Transformer with 25 steps.
6. SCR/diode rectifier.
7. Overload and short protection shall include an AC circuit breaker, DC fuse, and AC/DC surge/lightning protection.
8. CSA- or NEC-approved with NEMA 4X stainless steel enclosure and padlock hasp.

Anodes and Anode Header Cable

Anodes: Anomet-40 2X by Anomet, or approved equal.

1. Platinized niobium anodes with 40% niobium cross-section clad on a copper core. The anode shall be 0.125-inch diameter, 0.013-inch Nb, 100 micro-in Pt.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

2. Anodes: 15 ft length with silver soldered, epoxy potted connections to the lead wire.
    a. The lead wire shall be #8 AWG stranded copper wire with HMWPE insulation.
    b. The bottom ends of the anode assembly shall be weighted with a ceramic insulator.

Anode header cable: #8 AWG stranded copper wire with HMWPE insulation.

1. The header shall be un-spliced to the conduit junction box. Both ends of the header cable shall be terminated within the conduit junction box.
2. Make anode splices to the header cable with copper/bronze compression C-clamps or copper/bronze split bolt connectors with epoxy or heat shrink insulating kits, or C-clamps with 2 layers of half-lapped self-annealing butyl rubber tape and an outer wrap of 2 layers half lapped vinyl tape.

Reference Cells and Structure Sensing Leads

1. Reference cells: Copper/copper sulfate permanent reference cells for submerged potable water use.
2. Reference cells shall maintain plus/minus 10 mV potential with 3 microA current draw.
3. Reference cell leads: #14 AWG wire with HMWPE or RHW leads.
4. Each reference cell shall have a dedicated conductor. The leads shall be continuous length to the conduit junction box and the lead connection to the reference cell shall be silver-soldered and insulated.

Conduit

1. Run the wiring between the rectifier and the under-roof anode feeders in rigid steel conduit of a type and size conforming to N.E.C. and all other applicable codes.
2. Provide a service entrance with watertight conduit connections at the connection between conduit and underroof wiring.

### Manufacturers

Suppliers include the following, among others, that advertise on the internet and in the NACE publication Material Performance, typically under corrosion control and/or cathodic protection.

- Farwest Corrosion Control Company: www.farwestcorrosion.com
- Norton Corrosion: www.nortoncorrosion.com
- Corrpro Companies: www.corrpro.com
- MESA: www.mesaproducts.com

## Part 3 – Execution

### Installation




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Route all DC and reference cell/structure sensing wiring along the conduit run as shown on the drawings. Make connections to the tank above the water line or onto welded appurtenances; do not damage the tank interior lining or exterior coating.

Impressed Current Rectifier Installation

1. Connect the AC/DC power and reference cell/structure sensing wiring.
2. Label the reference cells and use the manufacturer's preferred reference cell location for rectifier control.
3. Label and terminate the other reference cells on a block or rotary switch within the rectifier cabinet.

Handholes

1. Existing handholes are present on the tank roof. Modify per plans.
2. Provide porcelain insulator hanger with stainless steel pin, nut, and washer.

Anodes and Anode Header Cable Installation

1. Provide anodes at the hand-holes as shown on the drawings.
2. Hang anode vertically, at the elevations shown.
3. The anode lead wire shall be continuous, uncut, from anode to header cable. Do not cut the anode header cable at the anode splice connections.
4. Install the ceramic insulator to weight the bottom end of the anode assembly and provide knotted connection for the end of wire. Twisting or utilizing zip ties is not acceptable.

Reference Cells and Structure Sensing Leads

1. Provide reference cells at the handholes where shown on the drawings.
2. Hang reference cells vertically, with a hanger and hand-hole similar to that for anodes.
3. The reference cell wiring shall be continuous, uncut, and connected to the rectifier lead in the service entrance.
4. The reference cell and structure sensing wiring from the rectifier to the tank shall be run in a dedicated conduit and the wiring shall be shielded and grounded at one end. At the contractor's option, provide continuous uncut wires from reference cells to rectifier in lieu of cable.

Conduit

1. **Provide separate conduit for DC and for reference cell/structure sensing wiring. Route the CP system in conduit separate from the instrumentation wiring.**
2. Run conduit as shown on the drawings and attach in a manner that does not interfere with safe use of access systems and does not damage the tank coating.

## System Startup




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

1. The rectifier shall be adjusted under the responsible charge of a corrosion expert, and that person shall be a Professional Engineer with education and training in cathodic protection, or an AMPP (NACE) Certified CP/Corrosion Control Specialist.
2. Record the potential of each reference cell prior to energizing. Include a set of readings of the ON potentials of all reference cells at the final setting.
3. Record a potential profile through depth using a portable copper-copper sulfate reference cell from the access hatch. Provide both on- and instant-off potentials for the profile
4. Do not set the rectifier over (-)1.0V instant-off potential versus copper-copper sulfate reference cell, and record the polarized, instant-off potential of each reference cell at this setting.
5. Adjust the rectifier in the automatic IR Free potential control mode. Set the tap setting to the minimum current output required for the adjustment. Turn off rectifier after adjustment and temporarily disconnect anode wires until system is turned back on.
6. Record and submit a stamped letter report of the rectifier settings and resulting on- and instant-off potentials.

# 13.50 CENTER COLUMN REPAIR

## Part 1 – General

### Description of Work

Within the first two weeks of interior reservoir construction, contractor shall provide the Owner/Engineer an opportunity to perform hands-on observation of the rafter/column cap area from inside the tank via the contractor's same access approach which must be OSHA compliant. Duration of observation shall be up to 4 hours. Provide at least 48 hours' notice. Remove the existing roof vent prior to the observation period. Remove loose material on (4) rafter ends and provide 6"x6" power tool cleaned area on the column cap for observation.

# 13.51 RESERVOIR DOOR SHEET

## Part 1 – General

### Description of Work

Door sheets, if used, shall be cut out by and re-installed by an experienced tank contractor with a minimum of 5 successful door sheet re-installations. The tank shall be braced at the top and sides of the proposed door sheet in accordance with the approved Door Opening Stiffening Plan to prevent sagging and deformation. Bracing shall be added before the door is cut in and shall remain in place until the door is completely and satisfactorily reinstalled in accordance with the approved Door Sheet Re-installation Welding Plan.

**Required submittals:**

- Door Opening Stiffening Plan, and




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Door Sheet Re-installation Welding Plan, including fit-up, welding technique/heat input, and welding sequence.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 15.00 GENERAL

This division covers the work necessary for furnishing and installing mechanical appurtenances and accessories as described in these Specifications and shown on the Plans.

Sections in these specifications titled "*Common Work for . . .*" shall apply to all following subsections whether directly referenced or not.

## 15.05 Common Work for Mechanical [CSI 33 05 00]

### Part 1 – General

#### Summary

Provide the necessary piping, plumbing, fittings, and appurtenances to make all piping systems complete, tested, and ready for operation as specified herein and as shown on the Plans. Some fittings that are necessary for the complete piping system installation and operation may not have been shown. Provide fittings, pipe, and appurtenances necessary, whether shown on the Plans or not, to make all piping systems complete, tested and ready for operation.

Some pipe supports, thrust blocking, and tie rods are not shown on the Plans. Provide pipe supports, thrust blocking, and tie rods for pipes as required by accepted design criteria to support and restrain the loads encountered.

#### Related Sections

- Division 1.81.30 Seismic Restraint and Anchorage
- Division 1.81.40 Pressure Ratings

#### References

All products in contact with drinking water to be low-lead (less than 0.25 percent) content in compliance with NSF/ANSI 372.

#### Submittals

Submittal information shall be provided to the Owner for the following items:

- Stainless Steel pipe and fittings
- Isolation valves
- Control valves
- Backflow prevention assembly and certification from DOH
- Flow meters
- Level sensors
- Pressure gauges
- Other mechanical components listed in this division or required by the Engineer


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Part 2 – Products

### Existing Products

Existing pipe and fittings in contact with drinking water that are not compliant with low lead standard NSF/ANSI 372 (generally those installed before 2014) and will be modified under this contract must be upgraded to meet this standard. Existing pipe and fittings that will be reused, but not modified, do not require upgrading.

### Materials

All valves, meters, hydrants, specialties, appurtenances, and other such mechanical and plumbing components that are of similar purpose shall be of a single manufacturer and model line. Do not "mix and match" unless specifically stated otherwise or allowed by the Engineer. The intention of this requirement is to maintain consistency across all components installed on the project for function, maintenance, aesthetics, and details of installation.

## Part 3 – Execution

### Field Quality Control

Pressure gauges used for testing and commissioning shall be in good working order and scaled appropriately for the test. Scale range shall not exceed 160% of the test pressure. For example, for a 250-psi test, the gauge scale shall not exceed 1.6 x 250 = 400-psi. The Owner has the right to reject any gauges that are suspect in their accuracy.

# 15.20 PIPE AND FITTINGS

# 15.22 Metal Pipe and Fittings

# 15.22.04 Stainless Steel Pipe and Fittings

## Part 1 – General

### Related Sections

- Division 5.05 Common Work for Metals

### Design Requirements

Welding shall withstand the hydrostatic testing pressure as stated in Division 1.81.40 without leakage.

The pipe wall thickness shall be as required by Division 1.81.40 and the following table.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Pipe Wall Thickness in inches.**
**Nominal Pipe Diameter**

| Working Pressure | 1" | 2" | 3" | 4" | 6" | 8" | 10" | 12" | 14" | 16" | 18" | 24" | 30" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 psi | 0.109* | 0.109* | 0.120* | 0.120* | 0.134* | 0.148* | 0.165* | 0.180* | 0.188* | 0.188* | 0.188* | 0.250 | 0.312* |

*Per Schedule 10s

## Part 2 – Products

### Materials

All stainless-steel pipe and fittings shown on the Plans in direct bury applications shall meet ASTM A312, Type 304L, Welded. All heat tints and chromium depleted layers caused by welding shall be removed by pickling prior to on-site delivery.

Above-ground stainless steel piping and fittings shall meet ASTM A778 and A774 respectively, welded. Piping systems shall be pickled after welding and prior to on-site delivery. Fittings shall be beveled plain-end for welding, mechanical joint connection, or flange as shown on the Plans.

## Part 3 – Execution

### Installation

Welding of pipe shall be per ASME Welding Code.

Passivate field welds per Division 5.05.

# 15.23.10 Polyethylene Pipe

## Part 1 – General

### Design Requirements

Size shall be as shown on the Plans. Piping shall be able to withstand AASHTO H-20 traffic loads with the soil bury depth.

One-inch diameter poly lines shall be NSF Approved, PE3408 blue polyethylene pipe manufactured from virgin materials. Pipe shall meet the following specifications:

- ANSI/AWWA C901
- ASTM D1248, ASTM D 3350, ASTM D 2239, ASTM D 3035 and ASTM D 2737,
- Pressure Class 200, SIDR - 7(Standard Inside Dimension Ration-Pressure Rated),
- Cell classification 345464C

Pipe shall be manufactured by Interstate Plastics, Philips Driscopipe, Eagle Pacific, Superlon Plastics, U.S. Poly or approved equal.

Service Saddle shall be ductile iron with double stainless steel straps or bands. All clamps or bands shall have rubber gaskets and I.P. threaded outlets (Ford FS202, Romac 202S or approved equal.)




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

1" Corporation Stop shall be all brass, "ball valve" type, male iron pipe thread inlet by pack joint outlet conforming to AWWA C800, Ford FB1101, Mueller E25029, AY McDonald 74704B-1" or approved equal.

### Part 3 – Execution

#### Installation

Installation shall comply with AWWA regulations.

# 15.30 VALVES

## 15.32.06.01 Seismic Sensor Shutoff Valve System [CSI 40 05 96.13]

An existing seismic sensor device exists on-site. All seismic functionality of new control valves as specified will be controlled by a signal from the existing on-site seismic sensor device.

## 15.33.09 Duckbill Elastomeric Check Valves [CSI 40 05 71.13]

### Part 1 – General

#### Summary

Duckbill Elastomeric Check Valves shall be provided on the reservoir overflow discharge pipe.

#### Submittals

Submit product literature including information on performance and operation valve, materials of construction, dimensions/weight, elastomer, flow data, headloss data, and pressure ratings.

Upon request, provide shop drawings that clearly identify the valve dimensions.

#### Performance Requirements

When line pressure inside the valve exceeds the backpressure outside the valve by no more than 6-inches of head, the line pressure forces the bill of the valve open, allowing flow to pass. When backpressure exceeds the line pressure, the bill of the valve is forced closed. Valves shall seal upon flow reversal drip tight.

The valve shall be designed to open with a minimum head pressure of 6-inches of water column.

#### Design Requirements

All components shall be National Sanitation Foundation (NSF) Standard 61 compliant. Flange ends shall conform to ANSI B 16.10, Class 150#.

### Part 2 – Products

#### Manufactured Unit

Check Valves are to be all rubber and of the flow operated check type with a connection end as shown on the plans. The port area shall contour down to a duckbill, which shall allow passage of flow in one direction while preventing reverse flow. The valve shall be one-piece


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

rubber construction. Valves must be self-supporting with no sag in both empty and filled conditions. The bill portion shall be thinner and more flexible than the valve body. The bill-slit-height of the duckbill valve must be larger than the nominal pipe diameter to allow for least restrictive full pipe flow area. Backup rings and any metal components shall be 316 stainless steel. Company name, plant location, valve size and serial number shall be bonded to the check valve.

### Manufacturer

***Valves shall be equal to those manufactured by ProCo, 710 Series ®, Cla-Val, Rubber-Flex ™ Duckbill Check Valve RF DBF or Red Valve, Tideflex ® Series 35.***

## Part 3 – Execution

### Installation

Valve shall be installed as shown on the plans or as directed in the field by rotating pipe flange connections.

# 15.34 Hydraulic Control Valves

# 15.34.01 Common Work for Hydraulic Control Valves [CSI 40 05 65.05]

## Part 1 – General

### Submittals

Valve suppliers shall review the design and certify that the valve provided in the submittal will operate as described and within the conditions specified. Any discrepancies from the design and the specified valves shall be brought to the Engineer's attention during the submittal process.

### Performance Requirements

Hydraulic control valves noted on the Plans or in other parts of the specifications shall meet the requirements herein. Valves shall be designed for the intended service. Install valves in strict accordance with manufacturer's instructions and as shown on the Plans.

Valves that do not operate as intended shall be replaced or modified so that they operate within the design parameters at the Contractor's expense.

All valves shall be rated for the pressures shown in Division 1.81.40, unless stated otherwise within the individual valve specification.

## Part 2 – Products

### Manufactured Units

Valves shall be diaphragm-actuated, hydraulically-operated valves and shall have a cover chamber sealed from the body by a flexible, synthetic rubber diaphragm. Control of the valve shall be from direct-acting, adjustable spring-loaded diaphragm valve(s) and/or solenoid valve(s) as appropriate for the valve function. Pilot controls shall be selected appropriately for the system operational pressure range. Double chamber valves shall be used where




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

independent operating pressure or absolute speed control is required. Double chamber valves shall also be used where line pressure is insufficient to operate the pilot system and a second pressure source is available. All pump control valves shall be double chamber. Valves to be globe or angle style with flanged or threaded ends as shown on the Plans.

### Components

Provide brass or SS nameplates on all valves indicating valve size, inlet side (or flow direction), valve model and control pilot adjustment ranges.

Valves shall be provided with all pilots, solenoids and controls preassembled to operate the valve in its intended function. Solenoids shall be powered by ___ VAC current. Provide each valve with stainless steel trim. Diaphragm shaft shall be stainless steel.

Provide a valve position transmitter equal to ClaVal model X117D for the following valves.

- Inlet Flow Control Valve, DPDT Switch
- Outlet Flow Control Valve, DPDT Switch

Provide a single point valve position limit switch assembly for the following valves.

- Seismic Control Valve, DPDT Switch

Limit switches shall be equal to ClaVal model X105L and mounted on the valve position indicator.

A strainer shall be provided on all valve pilots to prevent clogging by debris in the water.

### Finishes

All hydraulic control valves shall be provided with an epoxy coating on the interior flow path and exterior body. Interior epoxy shall be certified for potable water use.

### Field Quality Control

Installation shall be inspected by manufacturer's representative prior to operating or field testing units. A field test shall be conducted and/or supervised by the valve manufacturer's representative after the piping and controls have been installed. Upon completion of installation and testing, manufacturer's representative shall provide written certification that equipment is fully warranted installed.

## 15.34.12 Reservoir Inlet Flow Control, Altitude, and Check Hydraulic Control Valve [CSI 40 05 67.51]

### Part 2 – Products

### Manufacturers

Valve shall be equal to Cla-Val Model 131G-39BCDSYKCX Electronic Interface and Altitude Powertrol Flow Control Valve.

### Manufactured Units

Flow control, altitude, and solenoid shut-off valve shall limit the maximum flow rate through the valve regardless of the upstream pressure.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Control of the valve shall be through a pilot control that operates on a feedback signal from the booster pump station. The pilot system shall be operated by electrical solenoid valves. The flow range through the valve shall be remotely adjustable by the valve stem position.

Altitude control shall be through a pilot valve that operates on the differential force between the height of the water on the reservoir and an adjustable spring load. This control will close the main valve when the reservoir water is at the overflow elevation and will open the main valve when pressure at the valve inlet lowers below the reservoir pressure.

The solenoid(s) shall operate on 120VAC/60Hz power. Upstream pressure will range from 30 to 55 psi, downstream pressure will range from 5 to 40 psi.

## 15.34.13 Reservoir Outlet Flow Control and Solenoid Shut-off Hydraulic Control Valve [CSI 40 05 67.51]

### Part 2 – Products

#### Manufacturers

Valve shall be equal to Cla-Val Model 131G-14BEYKCX Electronic Interface Powertrol Flow Control Valve.

#### Manufactured Units

Flow control and solenoid shut-off valve shall limit the maximum flow rate through the valve regardless of the upstream pressure.

Control of the valve shall be through a pilot control that operates on a feedback signal from the flow meter or valve stem position. The pilot system shall be operated by electrical solenoid valves. The flow range through the valve shall be remotely adjustable to any value between 0 gpm and 8,000 gpm.

An additional solenoid control shall be provided to intercept the hydraulic operation of the valve and close the valve on the signal of a seismic controller.

The solenoid(s) shall operate on 120VAC/60Hz power. Upstream pressure will range from 5 to 40 psi, downstream pressure will range from 5 to 40 psi.

Valve shall be equipped to close on power failure.

# 15.40 PIPING SPECIALTIES

## 15.40.01 Dismantling Joint [CSI 40 05 06.13]

### Part 1 – General

#### Design Criteria

Dismantling joint shall be accessible and capable of repeated installations and removals and capable of the testing and working pressures as specified in Division 1.81.40. Joint adjustment range of no less than 2-inches for 12-inch diameter and smaller pipe, and 3-inches for 14-inch diameter and larger pipe. Joint assembly to include limiting rods to prevent pull-out.

### Part 2 – Products




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### Manufacturers

Dismantling joint shall be Romac DJ400 with limit rods or equal.

## Part 3 – Execution

### Installation

Install per the manufacturer's instructions. Set the assembly at the midpoint of the adjustment range unless specifically called out otherwise on the Plans.

# 15.40.02 Expansion Joint [CSI 40 05 06.15 or 33 05 09.15]

## Part 1 – General

### Design Criteria

All expansion joints shall be suitable for use with potable water systems if in contact with potable water. Expansion joints shall be rated by the manufacturer for the working pressure as specified in Division 1.81.40. Special covers shall be applied when specified in the Plans to resist weather, ozone, corrosive fumes and direct bury applications. Connections shall be as shown on the Plans (flange, weld, threaded, or mechanical joint).

## Part 2 – Products

### Manufacturers

Direct bury expansion joints shall be EBAA Iron ™ Flex-Tend® Double Ball standard unit expansion joints or approved equal.

### Manufactured Units

Direct Bury

Expansion joints directly buried in the ground shall be suitable to external service conditions, including soil overburden and contact with saturated soils.

Expansion joints larger than 2-inches shall be ductile iron. Ends shall be flanged.

## Part 3 - Execution

### Installation

Align piping prior to installing expansion joints, do not use the expansion joint to make up for misaligned systems. Unless specifically shown otherwise on the plans, the expansion joint shall be in its neutral state following installation.

Rigid Ball Expansion Joints: Bed the assembly in pea gravel (Division 2.11.11 or WSDOT 9-03.5) or sand (WSDOT 9-03.13) with no less than 6-inches of bedding material on all sides.

# 15.40.03 Pipe, Valve, and Conduit Supports [CSI 40 05 07]

## Part 1 – General

### Summary

This section includes providing pipe supports, hangers, guides, and anchors.


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### Related Sections

- Division 1.81.30 Seismic Restraint
- Division 5.05.23 Bolts and other Connectors

### References

Pipe supports furnished under this section shall comply in all respects with the requirements of the following standards.

- ANSI/ASME B31.1 Power Piping
- ANSI/MSS SP-58 Pipe Hangers and Supports - Materials, Design and Manufacture
- ANSI/MSS SP-69 Pipe Hangers and Supports - Selection and Application

### Performance Standards

Piping systems, including connections to equipment, shall be properly supported to prevent deflection and stresses. Supports shall comply with ANSI/ASME B31.1, except as otherwise indicated.

Size hanger rods, supports, clamps, anchors, brackets, and guides in accordance with ANSI/MSS SP 58 and SP 69.

Support plumbing drainage and vents in accordance with the Uniform Plumbing Code.

### Submittals

Pipe Hanger/Support Design Calculations

Shop drawings of engineered pipe hangers/supports, including details of concrete inserts. Drawings shall include location plan showing location of the hanger/support in relation to the structure and/or equipment.

## Part 2 – Products

### Manufacturers

Pipe supports, hangers, guides, and anchors shall be Anvil, Unistrut, Tolco, Standon, or equal.

Flange supports shall be equal to Standon Adjustable Model S89 Flange Support. Pipe supports shall be equal to Standon Adjustable Model S92 Pipe Support. Both flange and pipe supports shall be equal to those manufactured by Material Resources, Hillsboro, Oregon.

### Components

Provide and install all equipment necessary for complete support systems including, but not limited to, base, riser pipe, anchor bolts, hanger rod, support cradle or clamp, and fasteners.

All supports, rods, clips, etc. shall be 316 L stainless steel. Bolts shall be in accordance with 05.05.23.

Except as otherwise noted, pipe support components shall comply with the types in ANSI/MSS SP-58.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Engineered Supports: Pipe hangers, supports for piping and conduits (raceways), and all spring support assemblies shall be completely engineered.

Pipe Hangers: Pipe hangers shall be capable of supporting the pipe in all conditions of operation. Pipe hangers shall allow for free expansion and contraction of the piping and prevent excessive stress on the equipment. Hangers shall have a means of vertical adjustment after erection. Hangers shall be designed so that they cannot become disengaged by any movement of the pipe. Hangers subject to shock, seismic disturbances, or thrust imposed by the actuation of the safety valves shall include hydraulic shock suppressors. All hanger rods shall be subject to tensile loadings only.

Hangers Subject to Horizontal Movement: At hanger locations where lateral or axial movement is anticipated, suitable linkage shall be provided to permit movement. Where horizontal pipe movement is greater than ¼-inch, or where the hanger rod deflection from the vertical is greater than 4 degrees from the minimum to maximum temperature, the hanger rod and structural attachment shall be offset in such a manner that the rod is vertical in the maximum temperature position.

Spring-Type Hangers: Spring-type pipe hangers shall be provided for piping where vibration or vertical expansion and contraction is anticipated (engine exhausts and similar piping). Spring-type hangers shall be sized to the manufacturer's printed recommendations and loading conditions indicated. Variable spring supports shall be provided with means to limit misalignment, buckling and eccentric loading, or to prevent overstressing of the spring. Variable spring supports shall be provided with the means to indicate the compression of the spring at all times. Supports shall be designed for a maximum variation of 25 percent for the total travel resulting from thermal movement.

Thermal Expansion: Wherever expansion and contraction of piping is expected, a sufficient number of expansion loops or joints shall be provided, with rolling or sliding supports, anchors, guides, pivots and restraints. They shall permit the piping to expand and contract freely in directions away from the anchored points and shall be structurally suitable to withstand all loads imposed.

Heat Transmission: Supports, hangers, anchors, and guides shall be designed and insulated so that excessive heat shall not be transmitted to the structure or other equipment.

Freestanding Piping: Freestanding pipe connections to equipment, including chemical feeders and pumps, shall be firmly attached to fabricated steel frames made of angles, channels or I-beams anchored to the structure. Exterior, freestanding overhead piping shall be supported on fabricated pipe stands, consisting of pipe columns anchored to concrete footings, with horizontal, welded steel angles, and U-bolts or clamps installed to secure piping.

Submerged Supports: Submerged piping shall be supported with hangers, brackets, clips, or fabricated supports and stainless-steel anchors.

Point Loads: Any meters, valves, heavy equipment and other point loads on PVC, fiberglass and other plastic pipes shall be supported on both sides according to the manufacturer's recommendations to avoid pipe stresses. Supports on plastic and fiberglass piping shall be equipped with extra wide pipe saddles or stainless-steel shields. No support shall have metal pieces in contact with plastic process piping.


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Noise Reduction: To reduce noise transmissions in the piping systems, copper tubes shall be wrapped with a 2-inch-wide strip of rubber fabric at each pipe support, bracket, clip, and hanger.

### Finishes

Unless otherwise noted, all fabricated pipe supports, other than stainless steel or non-ferrous supports, shall be blast-cleaned after fabrication and hot-dip galvanized in accordance with ASTM 123. Other than stainless steel and non-ferrous supports, supports shall be coated in accordance with Division 9.91.13.1.

## Part 3 – Execution

### Installation

Piping shall be rigidly anchored to walls, slabs, and ceilings by means of suitable pipe supports, wall brackets, or pipe hangers.

Pipe supports, hangers, brackets, anchors, guides, and inserts shall be installed in accordance with the manufacturer's installation instructions and ANSI/ASME B31.1. All concrete inserts for pipe hangers and supports shall be coordinated with the formwork.

Stand-on Pipe Support: Adjust support, secure to pipe and secure to floor as recommended by the manufacturer.

Riser Supports: Risers shall be supported on each floor with riser clamps and lugs, independent of the connected horizontal piping.

Support Spacing: Pipe supports shall be placed to meet the following maximum spacing, unless otherwise noted or shown on the Plans: maximum vertical support spacing of 5 feet, and maximum horizontal support spacing of 10 feet. Support shall be provided at horizontal bends, base of risers (vertical bends), floor penetrations, connections to pumps, blowers, and other equipment, valves and appurtenances. Support spacing shall meet the local plumbing code where applicable. Support spacing may be increased from that noted above provided adequate calculations are provided supporting the change.

Support Anchorage: Concrete anchors shall be as specified in Division 3, Concrete Anchors. All channel strut type supports shall have a minimum of 2 anchors per support.

Suspend pipe hangers from hanger rods, secure with double nuts.

Securely anchor plastic pipe, valves and headers to prevent movement during operation of valves. Anchor plastic pipe between expansion loops and direction changes to prevent axial movement through anchors.

Provide ductile iron elbows or tees supported from floors with base fittings. Support base fittings with metal supports, or when indicated on the Plans, concrete piers.

Do not use chains, plumbers' straps, wire, or similar devices for suspending, supporting or restraining pipes.

Install riser clamps at floor penetrations and where indicated on the Plans.

### Field Quality Control




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Pipe supports and hangers shall be positioned in such a way as to produce an orderly, neat piping system. All hanger rods shall be vertical, without offsets. Hangers shall be adjusted to line up groups of pipes at the proper grade for drainage and venting, as close to ceilings or roofs as possible, without interference with other work.

Properly support, suspend or anchor exposed pipe, fittings, valves and appurtenances to prevent sagging, overstressing or movement of piping and to prevent thrusts or loads on or against connected pumps, blowers or other equipment.

# 15.40.04 Dielectric Fittings and Adapters

*[CSI 40 05 06.17]*

## Part 2 – Products

### Dielectric Isolating (Insulating) Flange Joints

Flange insulation shall include a full-face insulating gasket, a full-length insulating sleeve for each bolt, and two insulating washers and two steel bearing washers for each flange bolt.

*Sleeves and Washers*

Insulating sleeves and washers shall be Pyrox G-10. Both the insulating washers and the steel washers shall fit over the outside diameter of the sleeve and shall fit within the bolt facing of the flange.

*Gaskets*

Gaskets shall be full faced Styrene Butadiene Rubber (SBR), Nitrile (Buna-N), Neoprene, polytetrafluoroethylene (PTFE), or compressed vegetable fiber. Gaskets shall have adequate dielectric properties, 200V/mil minimum, and shall be suitable for the operating and test pressures of the pipe system. Gaskets shall NSF-61 approved. No hard rigid gasket (e.g. phenolic or epoxy-fiberglass (G-10)), even if full-faced elastomeric coated (e.g. neoprene-coated phenolic) or with elastomeric sealing element such as an O-ring or flat band.

For gaskets used at ductile iron pipe flange joints, provide American Toruseal Flange Gasket (yellow only) has sufficient dielectric characteristics to meet the 200V/mil minimum requirement.

*Dielectric Isolation Joint Assembly*

An insulating joint assembly shall consist of 2 flange by plain end or 2 flange by mechanical joint (FLG x PE or FLG x MJ) adapters, a full face insulating gasket, with full length insulating sleeves, 2 insulating washers, and 2 steel bearing washers for each flange bolt.

*Flange Connection*

Submittals for flange connections shall address suitability of gasket, bolts, washers, nuts, and flange characteristics for the specified pipe type and pressure, considering gasket compression, bolt strength, and required torque.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Part 3 - Execution

### Installation

Provide dielectric adapters between dissimilar types of metal pipes, valves and fittings (e.g. copper to stainless steel). Flange isolating kits shall be used when dissimilar metal flanged pipe is connected. The following connections do NOT require dielectric isolators.

| Metal | Connecting to |
|---|---|
| Bronze/brass | Copper or ductile iron |
| Ductile iron | Mild steel, bronze or brass |

For ductile iron flanges requiring dielectric adapters the flange isolating gasket material shall be a fluor elastomer blend equivalent to Garlock Stress Saver XP or approved equal.

# 15.40.06 Above-ground Sampling Station [CSI 40 05 81.35]

## Part 2 – Products

### Manufacturers

Sampling station shall be equal to Koraleen Station Guard XLT.

### Manufactured Units

Sampling stations shall be per City standard detail.

# 15.40.11 Joint Restraints – Wedge Style [CSI 33 05 09.34]

## Part 1 – General

### Summary

This specification is for wedge-action (tooth) style restraints. This type of restraint shall not be used where the Plans or specifications require True Restrained Joints (TRJ). Other terms used for TRJ may include "Bead-locked" or "Fabricated Restrained Joints".

### Performance Requirements.

All naturally unrestrained joints subject to unbalanced forces shall be restrained to resist testing and operational forces. Restraints shall be rated for the testing and operational pressures. Restraints shall be designed specifically for the material and purpose of the pipe and joint.

### Submittals

Provide manufacturer's information describing applicability and performance ratings.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Part 2 – Products

### Manufacturers

EBAA Iron "Mega-Lug" and US Pipe "Field Lok" gaskets or approved equals. If the Owner has construction standards addressing the type of restraints allowed, those standards shall take precedent over this specification unless specifically identified otherwise on the Plans.

### Components

Set-screw type restraints are not permitted. Provide the quantity of restraints required for fully restraining all working and testing forces.

### Finishes

Mechanical joint restraints in all buried applications, and in exposed areas when not being field coated, shall be coated at the factory with fusion bonded polyester based coating (e.g. Romac Romabond, EBAA Mega-bond, Ford Armorguard E-Coat) or approved equal.

## Part 3 – Execution

### Preparation

Verify that the pipe surface where the restraints will affix is not damaged or corroded prior to installation. Any such damaged pipe shall be cut off and disposed of. Clean any dirt or debris from the surface of the pipe.

### Installation/Construction

Install per the restraint manufacturer's instructions. Bolted style restraints shall be tightened in an alternating pattern in stages, do not tighten circumferentially. If bolted restraint does not come with break-off head bolts, a torque wrench must be used. If pipes require deflection at the joints, perform the deflection prior to final tightening of the restraints. Do not exceed the manufacturer's maximum deflection recommendations.

Installation of restrained joint push-on pipe that will be deflected must be installed per the manufacturer's instructions. In general, this requires the pipe to be inserted into the bell at a straight alignment, but not pushed home. The pipe can then be deflected. If the manufacturer's instructions provide differing, or additional instructions, those instructions shall be followed.

Initial setting of wedges may use any commonly used hand tools until the wedge touches the pipe surface. Impact tools are not allowed for wedge engagement and final torqueing.

Bedding material must include sufficient fines for proper soil-to-pipe adhesion and shall not be a clay, rounded gravel, pea gravel, washed rock, or other poorly graded material. Compaction of bedding around restrained pipe shall be performed in maximum 9-inch lifts using mechanical compaction equipment.

### Repair

If restraints are removed for any reason, the restraints shall be disposed of and not reused. The section of pipe to which the restraints were secured shall be cut off and disposed of.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 15.40.12 Sacrificial Corrosion Control for Buried Metal Pipe [CSI 13 47 13.13]

## Part 1 – General

### Description

This work consists of requirements for corrosion control materials and construction methods for buried piping as shown on the plans. ***Impressed current corrosion protection systems are not covered here.***

### Abbreviations

mdft - Mils Dry Film Thickness, referring to coating applications.

NACE/AMPP - National Association of Corrosion Engineers/Association for Materials Protection and Performance

### Definitions

**Exothermic Welding and Pin Brazing** - A specialized process used for electrical connections to the exterior of pipe and fittings.

### Submittals

1. **Products** - Provide submittals for all products referenced in this section.
2. **Testing** - Submit written documentation of experience as a professional engineer regularly performing cathodic protection work or certification as an AMPP/NACE-certified Specialist in cathodic protection/corrosion for all persons in responsible charge for field testing.

## Part 2 - Materials

### Exothermic Welds and Pin Brazing

*Weld Materials*

Molds, cartridges, and all required materials for exothermic (copper) welding shall be as produced by "Cadweld", Erico Products, Inc., or approved equal. Provide molds and cartridges of a size and material as recommended in writing by the manufacturer. Molds for exothermic welding shall be graphite; ceramic molds are not acceptable.

1. Ductile Iron Pipe - For connection to ductile iron pipe, use "Cadweld" XF-19 alloy weld metal or approved equal.
2. Cast Iron Pipe - For connection to cast iron pipe, use "Cadweld" XF-19 alloy weld metal or approved equal.
3. Steel Pipe - For connection to steel pipe, use "Cadweld" F-33 alloy weld metal alloy or approved equal.

*Terminals*

All wires used with exothermic welds shall have formed sleeve terminals and shall be welded using the reduced weld size and special weld mold for formed terminals, as specified in writing




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

by the manufacturer. The formed terminals may be factory fabricated or may be field formed using sleeves and a hammer die. Connections to mortar coated steel or concrete cylinder pipe shall be exothermically welded to a 1/2 inch diameter steel rod preinstalled on the pipe by the pipe manufacturer.

*Pin Brazing*

Pin Brazing - Pins, studs, lugs and ferrules shall be as recommended in writing by the manufacturer for the wire size, pipe material, and pin braze machine settings. The wire crimp tool shall be the crimp tool recommended by the manufacturer in writing for the specific crimp connection.

*Weld Caps*

Furnish weld caps of high-density plastic, 10 mils (minimum) thickness Handy Cap IP, as manufactured by Royston Laboratories, or approved equal. Provide caps that incorporate a dome for the weld, a tunnel to contain the lead wire from the weld connection, and a base plate to cover the prepared pipe surface. Weld caps shall be provided pre-filled with mastic/adhesive and have an integral primer for adhesion to the pipe or structure. Weld caps shall be sized for the exothermic weld or pin brazed connection.

### Galvanic Anodes

Supply galvanic anodes of the quantity, composition, dimensions, metal weight, and packaged backfill as shown or noted on the drawings.

*Magnesium Anodes*

Provide magnesium anodes, nominal 20 inches long and nominal 30 pound bare metal weight. Magnesium anodes shall meet the requirements of ASTM B-843-M1C High Potential Magnesium Alloy and ASTM G97 with an open circuit potential of (-)1.7VDC to CSE and a current efficiency of 50%. The anodes shall be prepackaged in a permeable cloth bag containing the manufacturer's prescribed backfill and the packaged anode shall be a nominal of 2.5 times the bare anode weight. The anode lead wire shall be solid copper wire, AWG #12 or #10, with TW-, THHN-, or USE-type insulation, and the connection to the anode shall be silver soldered by the manufacturer and shall be of an un spliced length specific to the application but not less than 15 feet.

### Wire

Wire for joint bonds larger than AWG #10 shall be single-conductor, stranded copper, with USE-type insulation. Wire AWG #10 or smaller shall be solid not stranded, with TW-, THHN-, or USE-type insulation. Provide the wire size as specified or shown.

### Split Bolts and Insulation for Split Bolt Connections

Provide bronze split bolts, sized for the wire to be joined; insulating putty, 3M Scotchfill or approved equal; and vinyl electrical tape, 3M Scotch Super 33 or approved equal.

## Part 3 - Execution

### Exothermic Welding and Underground Electrical Connections




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Unless otherwise specified, all electrical connections to the pipe shall be by exothermic welding or pin brazing. Install exothermically welded or pin brazed connections per manufacturer's instructions. Properly cover exothermic welds. Provide sufficient space between adjacent exothermic welds or pin-brazed connections to install a full-sized weld cap on each connection. Repair all damaged pipe coating in accordance with the manufacturer's recommendations. Prior to coating, test all exothermic welds or pin brazed connections by striking with a hammer in a manner approved by the professional engineer or Specialist in cathodic protection / corrosion.

*Wiring*

All wiring is to be splice-free, except where splices are specified or shown or as approved. Coil or snake all buried wire with sufficient slack to prevent stress from backfill operations and earth settlement. Repair any damage to the wire insulation with self adhering butyl rubber electrical tape, Scotch No. 130C or approved equal, and over wrap with vinyl electrical tape, Scotch No. 33 or approved equal. Spirally apply each layer at 50% overlap. This repair method is not applicable to repair of any wire in an impressed current system.

*Split Bolt Connections*

Split bolt connections shall be limited to the connection of two wires. Three or more wires at one split bolt are not allowed. Connection of taps to header runs may be accomplished by stripping an appropriate length of insulation from the header without cutting the wire and connecting the tap at that point with a split bolt for each tap.

## Galvanic Anode Installation

Remove anodes from plastic packaging and completely submerse in clean potable water for 24 hours prior to installation.

*Locations and Spacing*

1. Unless specified otherwise, install anodes 5 feet below the pipe invert positioned under the pipe or up to 3 feet perpendicular from the pipe edge.
2. Locate anodes a minimum of 5 feet apart. Do not place the anodes within 3 feet of a neighboring metallic structure.
3. When anodes are distributed along the pipeline and laterally offset, alternate the perpendicular offset from one side of the pipe to the other.
4. Evenly distribute anodes along mains and branching mains, where applicable.
5. Anodes may be grouped at the ends of casings and short runs of pipe, though provide clearances and spacing noted above.

Make anode connections at pipe joints. Exothermically weld the anode lead wire to the pipe. Alternatively, connect the anode to a joint bonding wire by using a split-bolt connection.

Install the anode in clean, native backfill and not in the select bedding material. Compact the backfill to a firm and unyielding condition to 1 foot above the anode.

## Testing and Verification


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*Quality Assurance*

The portion of the work that involves the installation and testing of the galvanic cathodic protection system shall be conducted under the responsible charge of a professional engineer regularly performing cathodic protection work or by an individual who is registered or certified by AMPP/NACE as a Specialist in cathodic protection/corrosion. Submit verification of registration or certification for written approval prior to the start of the work.

*Field Verifications*

The professional engineer or Specialist in cathodic protection / corrosion shall field verify the adequacy of the Contractor's personnel in handling and placing anodes and monitoring coupons, reference cells, exothermic welding, pin brazing, crimp connections, installing split bolt connectors, repairing coatings including weld caps, and measuring dielectric isolation and bonding.

The professional engineer or Specialist in cathodic protection / corrosion shall at the start of the work provide a list of qualified Contractor personnel and only these listed individuals shall perform such work for the Contractor. Submit and review with contractor personnel the RH2 Exothermic Weld Inspection Reference handout and/or pin braze manufacturer's fault diagnoses of unsatisfactory pin brazes as applicable. The professional engineer or Specialist in cathodic protection/corrosion shall demonstrate to the contractor personnel a manner of hammer-striking the exothermic weld or pin brazed connection to verify the quality of installation without causing damage.

# 15.50 Flow Meters [CSI 33 19 00 or 40 71 00]

## 15.50.05 Common Work for Flow Meters [CSI 33 19 05 or 40 71 05]

### Part 1 – General

### Design Criteria

Meter body and register shall have a pressure rating in accordance with Division 1.81.40. Materials, coatings and components shall be appropriate for the fluid being measured. Meters will be installed inside a vault with an anticipated ambient temperature range between 40- and 110-degrees Fahrenheit.

### Submittals

Meter shall fit in the space provided on the Plans. Meters that do not fit in the spacing provided must be approved by the Engineer for acceptance.

Provide information on meter assembly, available and selected options, direct read head, remote transmitter, coatings, and dimensions of all equipment.

### Part 2 – Products

### Components

Each meter shall be equipped with an indicator-totalizer device.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Inlet and Outlet Meter with Digital readout head with electronic output per Division 15.51.05

### Part 3 – Execution

### Installation

Install the meter in strict accordance with the manufacturer's recommendation.

### Field Quality Control

### Testing

Meter shall be rated for working pressure and testing pressure as required in Division 1.81.40. If the meter assembly cannot take the test pressure, a temporary spool or cap(s) must be installed in place of the meter. A visual leak test will then be performed under working pressure with the meter in place.

The Contractor shall prove correct meter and transmitter performance to the Engineer. Should performance not be acceptable, adjust or replace the unit at the Contractor's expense.

## 15.51 Flow Meter Readout Head [CSI 33 09 01, 33 19 90 or 40 71 90]

## 15.51.05 Digital Read Head with Electronic Output [CSI 33 09 01.33, 33 19 94 or 40 71 94]

### Part 2 – Products

### Components

The totalizer shall read in units of thousands of gallons.

Readout shall register in gallons per minute (gpm) for instantaneous flow.

The transmitter shall provide a contact closure (digital pulse) switch and a loop-powered current output (analog) for connection to the instrumentation system. The pulse output shall be plus or minus 2 percent of actual flow with the range specified for each meter.

The current output shall be a 4-20 mA signal that represents the rate of flow through the meter. Scale the transmitter as follows: 0 gpm minimum and 8,000 gpm maximum. The current output shall be plus or minus 0.5 percent of full scale of the instrument the transmitter is controlling.

Transmitter electronics shall consist of easily accessible printed circuit boards for convenient maintenance in a wall mountable NEMA 4X (standard) enclosure and connected to the transducer by cable. The meter manufacturer shall supply an unspliced cable run from the transmitter to the meter tube.

Provide an enclosure with window, that does not negate the enclosure NEMA rating, for viewing the flow rate and totalizing counter on an LCD readout. The transmitter shall display flow rate in gallons per minute, totalized gallons and an empty pipe indicator.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The electronics shall be NEMA 4X rated. Output shall be 4-20 mA into 800 Ohms with an isolated ground and non-interacting zero and span adjustments. The display and output shall be user scalable for GPM, CFS, or MGD, and shall be password protected.

The meter, electronics, and transmitter shall be RFI shielded to prevent interference from adjacent high noise electrical equipment such as variable frequency drives, electromagnetic starters, transformers, or transfer switches.

Provide the necessary interface between remote instrumentation and the transmitter. Provide a meter with power and signal wiring as recommended by the manufacturer. Ground instrumentation shall be as recommended by the manufacturer.

For compound meters with two separate heads, provide compatible unit for each head.

### Part 3 – Execution

#### Installation

Connect outputs to telemetry or data logging system.

Install the remote readout head where shown on the Plans. If not shown on the Plans, confirm location with Engineer prior to installation.

## 15.53 Electronic Flow Meters

## 15.53.03 Electromagnetic Flow Meters [CSI 33 19 23 or 40 71 13.13]

### Part 1 – General

#### Related Sections

- 15.51.05 Digital Read Head with Electronic Output

#### Design Requirements

Provide an electromagnetic flow metering system suitable for measuring and transmitting flow rate in a full-flowing pipe. The meter shall be suitable for either horizontal or vertical mounting. The system shall operate within the accuracy required over an ambient temperature range of -10 to +120 degrees Fahrenheit and a process temperature range of +15 to +120 degrees Fahrenheit.

#### Performance Requirements

The flow meter system shall be microprocessor based, utilizing a DC bipolar pulsed coil that automatically re-zeroes after each pulse cycle. System accuracy shall be ± 1 percent of actual flow rate over a fluid velocity range of 1 to 30 feet per second (fps), and within 0.01 fps for velocities less than 1 fps. Repeatability shall be 0.1 percent of full scale or better. System accuracy shall be traceable to NIST using prototype meters of the same configuration.

### Part 2 – Products

#### Manufacturers

The flow meter shall be Seimens, Foxboro, or approved equal.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### Manufactured Units

The meter tube and coil shall be mounted on the pipe between ANSI B16 pipe flanges and rated for working and test pressures as indicated in Division 1.81.40. The meter tube shall be 304 or 316 stainless steel. The meter and cable connection(s) shall be capable of complete submergence without damage. The meter shall include integral grounding electrodes, or 316 stainless steel or Hastelloy C grounding rings for installation at the inlet. The manufacturer shall verify that the grounding system is appropriate for the proposed use. All wetted parts shall be 316 stainless steel.

### Finishes

The meter liner shall completely encapsulate all wetted areas except for electrodes. The liner shall be certified by the manufacturer as appropriate for the proposed use. The liner shall be EPDM. The meter supplier shall review the liner material specified and confirm that it is appropriate for this project fluid and process. Provide submittal information that the liner material is fully compatible with the liquid it is carrying.

# 15.60 Pressure Measurement [CSI 40 73 00]

## 15.60.01 Common Work for Pressure Measurement [CSI 40 73 05]

### Part 1 – General

### Related Sections

- Division 17 - Electronic Pressure and Level Devices

### Design Requirements

Pressure and level measurement devices shall be scaled and rated for the application.

### Part 3 – Execution

### Installation

All devices shall be installed to be field serviceable without taking the facility out of service. Readouts shall be positioned to be easily read from a standing position and central to the room, unless otherwise allowed by the Engineer.

## 15.61 Pressure Gauges [CSI 40 73 13]

### Part 1 – General

### References

- ASTM B40.1 Grade 2A

### Performance Requirements

Gauge accuracy shall be ± 0.5 percent of full scale.

### Submittals




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Provide catalog sheets showing dimensions, pressure range, accuracy and optional accessories.

## Part 2 – Products

### Manufacturers

Marsh, 3D Instruments or approved equal.

### Materials

Gauges shall be analog stem mount type with 4½-inch scale face, glycerin filled and completely suitable for measuring potable water. Connection shall be ¼-inch threaded. Wetted parts shall be brass, bronze, or stainless steel. The full-scale pressure range for each gauge location shall be as follows:

| Location | Full Scale | Normal Operation Range |
|---|---|---|
| Reservoir Inlet | 0-100 psi | 30-50 psi |
| Reservoir Outlet | 0-100 psi | 30-40 psi |

### Accessories

Unless shown otherwise on the Plans, provide a block and bleed valve for each pressure gauge. Transcat 600/700 series, stainless steel, or approved equal. Do not use in chlorine rooms or chlorination systems.

## Part 3 – Execution

### Installation

Install gauges as shown on the Plans. Support gauges adequately.

### Field Quality Control

Gauges will be compared to each other in the field. Differences of more than 1.5% will be cause for rejection. Contractor will replace with accurate gauge(s) at no additional cost to the Owner. Contractor to build a temporary testing manifold if the facility piping does not permit direct comparison of gauges in place.

# 15.70 PLUMBING [CSI 22 00 00]

# 15.70.05 Common Work for Plumbing [CSI 22 05 00]

## Part 2 – Products

### Components

Joints and Connections

- Steel and Brass: Use factory-cut pipe threads where possible; otherwise, cut pipe ends square, remove all fins and burrs, and cut full-depth tapered threads. Apply joint compound to male threads only and engage so that no more than three threads remain exposed.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Hubless: Install a neoprene gasket and stainless steel clamp and shield coupling joint assemblies with bolts alternatively and incrementally tightened to a minimum 60 inch-pounds torque. Use a single set-point torque wrench manufactured specifically for this purpose. Do not use screwdrivers or other types of wrenches. Re-torque bolts after 24 hours.
- Solvent cement: Use solvent cement approved by pipe and fitting manufacturer and apply in accordance with the manufacturer's installation procedures.

Fixtures and Trim

Use chromium-plated brass bolts, nuts and washers where exposed; otherwise, use brass or bronze bolts, nuts and washers. Make connections gas-tight and water-tight. Do not use bulk material, including putty and plastics, for gaskets.

Trim shall match metal parts used with fixtures. Trim shall be stainless steel, except when provided with plumbing fitting by the manufacturer. Exposed trim shall have a satin type finish. Escutcheons shall be provided at each point where pipe or other fittings enter the wall.

## Part 3 – Execution

### Examination

Prior to work of this section, carefully inspect installed work of other trades and verify that such work is complete to the point where this installation may properly commence. Verify that plumbing may be installed in strict accordance with all pertinent codes and regulations. In the event of a discrepancy, do not proceed with the installation and immediately notify the Owner.

### Installation

Install and locate pipe, fittings and accessories as shown on the Plans.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Division 16
# Electrical

## 16.00 GENERAL

The Contractor shall provide all labor, material, tools, equipment and services required to complete the furnishing, installation, wiring, connection, calibration, adjustment, testing and operation of all electrical equipment, devices and components as indicated and implied by the plans and specifications.

Sections in these specifications titled "*Common Work for . . .*" shall apply to all following sections whether directly referenced or not.

The Contractor shall reference Division 1.25 regarding substitutes and "or-equals".

## 16.05 Common Work for Electrical

*[CSI 26 05 00]*

### Part 1 – General

#### Summary

Plans are diagrammatic and indicate general arrangements of systems and equipment, except when specifically, dimensioned or detailed. The intention of the plans is to show size, capacity, approximated location, direction and general relationship of one work phase to another, but not exact detail or arrangement.

#### Regulatory Requirements

The Contractor shall coordinate and provide all permits, licenses, approvals, inspections by the authority having jurisdiction and other arrangements for work on this project and all fees shall be paid for by the Contractor. The Contractor shall include these fees in the bid price.

#### Related Sections

See the following sections for items that may be provided and/or installed with other electrical equipment.

- Division 15.30 Valves with position indication and controls
- Division 15.51 Flow meter transmitters
- Division 17.50 Sensors and controls
- Division 17 Automatic Control

#### Codes and Standards

Provide all electrical work in accordance with latest edition of National Electrical Code, National Electrical Safety Code, Washington State Electrical Code, and local ordinances. If any conflict occurs between government adopted code rules and these specifications, the codes are to govern. All electrical products shall bear a label from a certified testing laboratory recognized by the State of Washington. Recognized labels in the State of Washington are UL, ETL, and CSA-US.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Definitions

Dry Locations: All those indoor areas which do not fall within the definitions below for wet, damp, or corrosive locations and which are not otherwise designated on the Plans.

Wet Locations: All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Plans.

Damp Locations: All spaces wholly or partially underground, or having a wall or ceiling forming part of a channel or tank unless otherwise designated on the Plans.

Corrosive Locations: Areas where chlorine gas under pressure, sulfuric acid, or liquid polymer are stored or processed. These areas are identified on the Plans.

The words "plans" and "drawings" are used interchangeably in this specification and in all cases shall be interpreted to mean "Plans".

The word "provide" shall be interpreted to mean furnish and install.

## Design Requirements

Unless otherwise noted, provide enclosures as follows:

1. Class 1, Division 1 and 2 Locations: NEMA Type 7
2. Indoors Unclassified Locations: NEMA Type 12
3. Corrosive Locations: NEMA Type 4X
4. Outdoors and/or Wet Locations: NEMA Type 3R
5. Electrical Rooms: NEMA Type 1

## Submittals

Provide submittals of each item specified in this division to engineer for approval in accordance with Division 1 of these specifications. Submittals for motor control centers, motor control panels, control panels, instrumentation panels, and pump control panels shall include at a minimum: a wiring diagram or connection schematic, and an interconnection diagram.

Wiring Diagram or Connection Schematic

1. Include all devices in a system and show their physical relationship to each other including terminals and interconnecting wiring in assembly. This diagram shall be in a form showing interconnecting wiring only by terminal designations (wireless diagram).

Interconnection Diagram

1. Show all external connections between terminals of equipment and outside points, such as motors and auxiliary devices. Show references to all connection diagrams which interface to the interconnection diagrams. Interconnection diagrams shall be of the continuous line type. Show bundled wires on a single line with the direction of entry/exit of the individual wires clearly shown. Identify all devices and equipment. Show terminal blocks as actually installed and identified in the equipment complete with individual terminal identification. All jumpers, shielding and grounding




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

termination details not shown on the equipment connection diagrams shall be shown on the interconnection diagrams. Show spare wires and cables.

Provide submittal information for the following items:

1. Underground Marking Tape
2. Circuit Breakers
3. Conduit and Fittings
4. Outlet and Junction Boxes
5. Electrical Handholes and Vaults
6. Wire and Cables
7. Other Electrical Components listed in this Division and/or required by the Engineer.

### Project Conditions

Contractor shall keep all power shutdown periods to a minimum. Carry out shutdowns only after a shutdown schedule has been submitted and approved by both the Owner and the Engineer.

## Part 2 – Products

### Source Quality Control

Provide adequate space and fit for the electrical installation, including, but not limited to, determination of access-ways and doorways, shipping sections, wall and floor space, and space occupied by mechanical equipment. Provide electrical equipment that fits in the areas shown on the Plans. All equipment shall be readily accessible for maintenance, shall have electrical clearances in accordance with National Electric Code (NEC) and shall be installed in locations which will provide adequate cooling.

Do not use equipment exceeding dimensions indicated or equipment or arrangements that reduce required clearances or exceed specified maximum dimensions unless approved by the Owner.

### Identification of Listed Products

Electrical equipment and materials shall be listed for the purpose for which they are to be used, by an independent testing laboratory. When a product is not available with a testing laboratory listing for the purpose for which it is to serve, the inspection authority may require the product to undergo a special inspection at the manufacturer's place of assembly. All costs and expenses incurred for such inspections shall be included in the original contract price.

### Materials

Use equipment, materials and wiring methods suitable for the types of locations in which they will be located, as defined in Definitions above.

All materials and equipment specified herein shall, within the scope of UL Examination Services, be approved by the Underwriter's Laboratories for the purpose for which they are used and shall bear the UL label.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### Components

Fasteners for securing to walls, floors, and the like shall meet the requirements of Division 5.05.23.

Fasteners for securing equipment to walls, floors, and the like shall be either hot-dip galvanized after fabrication or stainless steel. Provide stainless steel fasteners in corrosive locations. When fastening to existing walls, floors, and the like, provide capsule anchors, not expansion shields. Size capsule anchors to meet load requirements. Minimum size capsule anchor bolt is ⅜-inch.

### Accessories

Wire Identification

1. Identify each wire or cable at each termination and in each pull-box using numbered and lettered wire markers. All electrically common conductors shall have the same number. Each electrically different conductor shall be uniquely numbered. Identify panelboard circuits using the panelboard identification and circuit number. Identify motor control circuits using the equipment identification number assigned to the control unit by the motor control center manufacturer and the motor control unit terminal number. Identify other circuits as approved by the Engineer. Identify each wire or cable in each pull-box with plastic sleeves having permanent markings. Conductors between terminals of different numbers shall have both terminal numbers shown at each conductor end. The terminal number closest to the end of the wire shall be the same as the terminal number.

### Finishes

Refer to each electrical equipment section of these specifications for painting requirements of equipment enclosures.

## Part 3 – Execution

### Installation

General

1. Complete the wiring, connection, adjustment, calibration, testing and operation of mechanical equipment having electrical motors and/or built-in or furnished electrical components in accordance with electrical code, UL listing requirements and manufacturer's instructions. Install electrical components that are furnished with mechanical equipment.
2. Provide the size, type and rating of motor control devices, equipment and wiring necessary to match the ratings of motors furnished with mechanical equipment.
3. Complete the procurement, installation, wiring, connection, calibration, adjustment, testing and operation of all electrical devices, components accessories and equipment which is not shown or specified but which is nonetheless required to make the systems shown and specified properly functional.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Workmanship

1. Assign a qualified representative who shall supervise the electrical construction work from beginning to completion and final acceptance.
2. Provide all labor using qualified craftsmen, who have had experience on similar projects.
3. Ensure that all equipment and materials fit properly in their installations.

Field Services

1. Provide field services of qualified technicians to supervise and check out the installation of the equipment, to supervise and check out interconnecting wiring, to conduct start-up and operation of the equipment, and to correct any problems which occur during testing and start-up.

Installing Equipment

1. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.
2. Install all floor-mounted equipment on 3½-inch high reinforced concrete pads.
3. Install all equipment and junction boxes to permit easy access for normal maintenance.

Cutting, Drilling, and Welding

1. Provide any cutting, drilling, and welding that is required for the electrical construction work.
2. Structural members shall not be cut or drilled, except when approved by the Engineer. Use a core drill wherever it is necessary to drill through concrete or masonry. Perform patch work with the same materials as the surrounding area and finish to match.

Metal Panels

1. Mount all metal panels, which are mounted on, or abutting concrete walls in damp locations or any outside walls ¼-inch from the wall and paint the back side of the panels with a high build epoxy primer with the exception of stainless-steel panels. Film thickness shall be 10 Mils minimum.

Seismic Requirements

1. See Division 1.81.30

Load Balance

1. Balance electrical load between phases as nearly as possible on panelboards, motor control centers, and other equipment where balancing is required.
2. When loads must be reconnected to different circuits to balance phase loads, maintain accurate record of changes made, and provide circuit directory that lists final circuit arrangement.


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Field Quality Control

Minor Deviations

1. The electrical plans are diagrammatic in nature and the location of devices, fixtures, and equipment is approximate unless dimensioned. Based on this, the right is reserved by the owner to provide for minor adjustments and deviations from the locations shown on the Plans without any extra cost. Deviations from the Plans and/or specifications required by code shall also be done, subsequent to Owner's approval, without extra cost.
2. Plans indicate the general location and number of the electrical equipment items. When raceway, boxes, and ground connections are shown, they are shown diagrammatically only and indicate the general character and approximate location. Layout does not necessarily show the total number of raceways or boxes for the circuits required. Furnish, install, and place in satisfactory condition all raceways, boxes, conductors, and connections, and all of the materials required for the electrical systems shown or noted in the contract documents complete, fully operational, and fully tested upon the completion of the project.

Project Record Plans

1. A set of Plans shall be maintained at the job site showing any deviations in the electrical systems from the original design. A set of electrical Plans, marked in red to indicate the routing of concealed conduit runs and any deviations from the original design, shall be submitted to the Owner for review prior to final acceptance.
2. After testing and acceptance of the project the Contractor shall furnish in the O&M manuals an accurate connection schematic and interconnection diagram for every service entrance panel, pump control panel, motor control center, and instrumentation panel provided this project.

## Cleanup and Equipment Protection

Equipment Protection

1. Always exercise care after installation of equipment, motor control centers, control panels, etc., to keep out foreign matter, dust debris, and moisture. Use protective sheet metal covers, canvas, heat lamps, etc., as needed to ensure equipment protection.

Cleaning Equipment

1. Thoroughly clean all soiled surfaces of installed equipment and materials upon completion of the project. Clean out and vacuum all construction debris from the bottom of all equipment enclosures.

Painting

1. Repaint any electrical equipment or materials scratched or marred in shipment or installation, using paint furnished by the equipment manufacturer.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Final Cleanup

1. Upon completion of the electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean and acceptable to the Owner.
2. Lamps and fluorescent tubes shall be cleaned, and defective units replaced at the time of final acceptance.

# 16.10 ELECTRICAL SITE WORK

## 16.10.1 Common Work for Electrical Site Work

*[CSI 33 71 19]*

### Part 1 – General

#### Summary

The work included in this section consists of furnishing and installing conduit, fittings, handholes, pull vaults, warning tape, cables, wires, and related items, complete as specified herein and as indicated on the Plans for a complete and functional underground electrical system. Special vaults, grounding, trench backfill requirements may be specified with the particular equipment or electrical system involved.

#### Related Sections

Wire and cable per Section 16.60.

Raceways and conduit per Section 16.70.

#### Design Requirements

Materials and equipment shall conform to the respective specifications and standards; and to be the specifications herein. Electrical rating shall be as indicated on Plans.

### Part 3 – Execution

#### Construction

Provide all excavation, trenching, backfill, and surface restoration required for the electrical work.

Excavate to depths as required by Code, particular installation, or as shown on the Plans. Trench width and length as required by the installation or as shown. Trench bottom shall be free of debris and graded smooth. Where trench bottom is rock or rocky or contains debris larger than 1 inch or material with sharp edges, over excavate 3 inches and fill with 3 inches of sand. Separation between new electrical utilities and other utilities shall be 12 inches horizontal and 6 inches vertical minimum, except gas line separation shall be 12 inches both vertical and horizontal. Cross concrete or asphalt only after surface material has been saw cut to required width and removed.

Backfill around raceways shall be 3-inches of pea gravel or sand for systems of 600 volt or less. Provide red marker tape over raceways below grade. Place backfill material to obtain a minimum degree of compaction of 95 percent of maximum density at optimum moisture




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

content. Moisten backfill material as required to obtain proper compaction. Do not use broken pavement, concrete, sod, roots or debris for backfill.

## 16.10.3 Handholes and Pull Boxes

*[CSI 33 71 19.13]*

### Part 2 – Products

#### Manufacturers

Handholes and Pull boxes shall be Oldcastle or approved equal unless specified otherwise on the Plans.

#### Materials

Provide handholes of reinforced precast concrete, or injection molded composite plastic material. Handholes shall include a base, a body, extensions and a cover. Provide handholes with a perimeter of 10 feet or more (e.g., 3 feet by 2 feet) with both pulling irons and cable racks. All hardware shall be stainless steel, or hot-dip galvanized after fabrication; cable racking and hardware, however, shall be non-metallic and corrosion resistant. If no handhole size is shown on the Plans, size units per NEC or provide 12 inches by 24 inches by 18 inches deep, whichever is larger.

All handholes located in areas subject to vehicular traffic or where identified on Plans shall be ASSHTO, H-20 rated in accordance with ASTM C857.

The lids to all pull boxes and vaults shall be permanently marked for its intended use, "signal" for all signal and instrumentation handholes and "electrical" for all power handholes. Letter shall be a minimum of 3-inches high.

### Part 3 – Execution

#### Installation

Conduits entering handholes shall have grounding bushings installed and the conduit ends shall be sealed with Permagum sealing compound. Where conduits enter through sides of handholes, the penetration shall be made watertight. Use a core drill wherever it is necessary to drill through concrete. Perform patch work with the same materials as the surrounding area and finish to match.

Pull boxes shall be provided at least every 150 feet on long straight runs. Spacing shall be reduced by 50 feet for each 90-degree bend.

Install handholes flush with finished grade in all paved areas, roadways and walkways. All handhole edges shall be flush with final surface.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 16.15 Grounding and Bonding for Electrical Systems

*[CSI 26 05 26]*

## Part 1 – General

### References

Service and equipment grounding shall be per Article 250 of the NEC.

### Performance Requirements

Verify that a low-resistance ground path is provided for all circuits so an accidental contact to ground of any live conductor will instantly trip the circuit.

## Part 2 – Products

### Components

The grounding systems shall consist of the ground rods, grounding conductors, ground bus, ground fittings and clamps, and bonding conductors to water piping and structural steel as shown on the Plans.

System components shall be as allowed in the NEC unless specified otherwise below:

1. Ground Rods: Ground rods shall be cone pointed copper clad Grade 40 HS steel rods conforming to ASTM B228. The welded copper encased steel rod shall have a conductivity of not less than 27 percent of pure copper.
2. Ground Conductors: Buried conductors shall be medium-hard drawn bare copper; other conductors shall be soft drawn copper. Sizes over No. 6 AWG shall be stranded. Coat all ground connections except the exothermic welds with electrical joint compound, non-petroleum type, UL listed for copper and aluminum applications.
3. Ground Rod Boxes: Boxes shall be a 9-inch diameter precast concrete unit with reinforced concrete cover. Boxes shall be 12-inches deep minimum. Covers shall be embossed with the wording "Ground Rod".

## Part 3 – Execution

### General Grounding Installation

When available a UFER ground per latest edition of NEC shall be provided as the primary means to ground the electrical system.

Ground electrical service neutral at service entrance equipment to supplementary grounding electrodes.

Ground each separately derived system neutral to nearest effectively grounded building structural steel member or separate grounding electrode.

Provide a ground rod box for each ground rod to permit ready access to facilitate testing.

Provide a ground wire in every conduit carrying a circuit of over 110 volts to ground.

Make embedded or buried ground connections, taps and splices with exothermic welds. Coat ground connections.


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Bond metallic water piping at its entrance into each building.

### Motor Grounding Installation

Extend equipment ground bus via grounding conductor installed in motor feeder raceway. Connect to motor frame.

When using nonmetallic flexible tubing install an equipment grounding conductor connected at both ends to noncurrent-carrying grounding bus.

### Vault and Handhole Grounding

Exposed noncurrent-carrying metal parts of equipment, conductor supports or racks, conduits, and other metal appurtenances, including any metal cover and its supporting ring, shall be bonded together and connected to a common ground. The size of the grounding means shall be as prescribed in the NEC. Where the grounding means is exposed, the grounding conductor shall be not smaller than #8 AWG copper.

### Ground Connections

Above grade ground connections shall be exothermic weld, mechanical, or compression-type connectors; or brazing.

Below grade ground connections shall be exothermic weld.

Install all ground connections is strict accordance with connector manufacturer's recommendations and methods.

### Testing

Following completion of the grounding electrode system, if installed, measure ground resistance at each ground rod using the three-rod method. Submit results to engineer prior to final acceptance by the Owner.

Perform testing per NETA Standard ATS paragraph 7.13. Testing methods shall conform to NETA Standard ATS using the three-electrode method for large systems. Conduct tests only after a period of not less than 48 hours of dry weather.

Furnish to the Engineer a test report with recorded data of each ground rod location. See Division 16.95.4.

# 16.60 CONDUCTORS

## 16.61 Low Voltage Wire and Cable

*[CSI 26 05 19]*

### Part 1 – General

### Design Requirements

This section is for power and control conductors for 600 volts or less.

All conductors shall be copper. Wire or cable not shown on the Plans or specified, but required, shall be of the type and size required for the application and in conformance with the applicable code.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Part 2 – Products

## Materials

Conductors

1. Solid and stranded copper wire shall be 600-volt Type THW, THWN, or THHW, Class B stranding, sizes #14 AWG, #12 AWG, and #10 AWG only. Use of THHN insulation shall not be allowed. Aluminum conductors shall not be allowed.
2. Stranded copper wire shall be 600-volt Type XHHW, Class B stranding, sizes #8 AWG and larger. Aluminum conductors shall not be allowed.

Splices

1. For Lighting Systems and Power Outlets: Wire nuts shall be twist-on type insulated connectors utilizing an outer insulating cover and a means for connecting and holding the conductors firmly.
2. All Equipment: Crimp type connectors shall be insulated type, suitable for the size and material of the wires and the number of wires to be spliced and for use with either solid or stranded conductors.
3. Division 16 Equipment and Power Conductors: Bolted pressure connectors shall be suitable for the size and material of the conductors to be spliced.
4. All Equipment: Epoxy splice kits shall include epoxy resin, hardener, mold, and shall be suitable for use in wet and hazardous locations.

Terminations

1. Crimp type terminals shall be self-insulating sleeve type, with ring or rectangular type tongue, suitable for the size and material of the wire to be terminated, and for use with either solid or stranded conductors.
2. Terminal lugs shall be split bolt or bolted split sleeve type in which the bolt or set screw does not bear directly on the conductor.
3. Wire Markers shall be plastic sleeve type. Wire numbers shall be permanently imprinted on the markers.

## Finishes

Color Coding: Provide color coding for all circuit conductors. Insulation color shall be white for neutrals and green for grounding conductors. An isolated ground conductor shall be identified with an orange tracer in the green body. Ungrounded conductor colors shall be as follows:

1. 120/208 Volt, 3 Phase: Red, black and blue.
2. 277/480 Volt, 3 Phase: Yellow, brown and orange.
3. 120/240 Volt, 1 Phase: Red and black.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Part 3 – Execution

## Location (Installment) Schedule

Provide the following conductors for the following applications:

1. Use stranded copper conductors for all power and control circuits unless noted otherwise on plans or below. Size as noted on the Plans.
2. Contractor may use solid copper conductors for lighting and receptacle circuits using screw-type terminals. Size as noted on the Plans.
3. Size #14 AWG wire or smaller shall not be allowed on power circuits.

## Installation

Conductor Splices

1. Splices: Install all conductors without splices unless necessary for installation, as determined by the Engineer. Splices when permitted shall be completed using an approved splice kit intended for the type of conductor and the application. The splice shall be in accordance with the splice kit manufacturer's instructions.
2. Underground Splices: All underground outdoor splices when approved by Engineer shall be completed in an accessible pullbox or handhole using an approved watertight epoxy resin splice kit rated for the application up to 600 volts. Splices will not be allowed to be direct buried.

Conductor Identification

1. Except for interior lighting and receptacle circuits, identify each wire or cable at each termination and in each pullbox, junction box, handhole, and manhole using numbered and lettered wire markers. All electrically common conductors shall have the same number. Each electrically different conductor shall be uniquely numbered. Identify panelboard circuits using the panelboard identification and circuit number. Identify motor control circuits using the equipment identification number assigned to the control unit by the motor control center manufacturer and the motor control unit terminal number. Identify other circuits as shown in the circuit schedule as favorably by the Engineer.
2. Conductors between terminals of different numbers shall have both terminal numbers shown at each conductor end. The terminal number closest to the end of the wire shall be the same as the terminal number.

## Testing

Insulation Resistance Tests: For all circuits 150 volts to ground or more and for all motor circuits over ½ horsepower, test cables per NETA Paragraph 7.3.1. The insulation resistance shall be 20 megohms or more. Submit results to Engineer for review.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 16.63 Signal Cable

*[CSI 27 15 00]*

## Part 2 – Products

### Materials

Twisted Shielded Pairs (TSP)

1. Cable shall conform to IEEE 383, UL 13, and UL 83 and shall be type PLTC cable suitable for direct burial. Each TSP shall consist of two #16 AWG, 7-strand copper conductors per ASTM B8 with 15 Mils PVC insulation and individual conductor jacket of nylon. Conductors shall be twisted with 2-inch or shorter lay, with 100 percent foil shielding and tinned copper drain wires. The cable shall have an overall PVC jacket with a thickness of 35 Mils. The insulation system shall be rated at 90 degrees Celsius and for operation at 600 volts.

## Part 3 – Execution

### Installation

Cable Installation

1. Cables shall be continuous from initiation to termination without splices.
2. Cable shielding shall be grounded at one end of the cable only. Bonding shall be to a single ground point only. Bonding from cable to cable in multiple run installations shall not be permitted.
3. Install instrumentation cables in separate raceway systems with voltages not to exceed 30 volts DC.

Conductor Identification

1. Except for interior lighting and receptacle circuits, identify each wire or cable at each termination and in each pullbox, junction box, handhole, and manhole using numbered and lettered wire markers. All electrically common conductors shall have the same number. Each electrically different conductor shall be uniquely numbered. Identify panelboard circuits using the panelboard identification and circuit number. Identify motor control circuits using the equipment identification number assigned to the control unit by the motor control center manufacturer and the motor control unit terminal number. Identify other circuits as shown in the circuit schedule as determined by the Engineer.
2. Conductors between terminals of different numbers shall have both terminal numbers shown at each conductor end. The terminal number closest to the end of the wire shall be the same as the terminal number.

### Testing

Insulation Resistance Tests: Perform insulation resistance on all circuits. Make these tests before any equipment has been connected. Test the insulation with a 500 Vdc insulation




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

resistance tester with a scale reading 100 mega ohms. The insulation resistance shall be 20 mega ohms or more. Submit results to Engineer for review.

# 16.70 RACEWAYS, BOXES, AND FITTINGS

*[CSI 26 05 33]*

## 16.71 Raceways

*[CSI 26 05 33.23]*

### Part 1 – General

### Design Requirements

Conduit sizes not noted on Plans shall be in accordance with NEC requirements for the quantities and sizes of wire installed therein.

Grounding of the raceway, junction boxes, fittings and any other boxes is the responsibility of the Contractor. Ground conductors, bushings, connections, clamps and other materials as needed to ground the raceway system is the responsibility of the Contractor. All raceways shall be grounded in accordance with the NEC.

### Part 2 – Products

### Components

Conduit and Fittings

1. Galvanized Rigid Steel (GRS): Rigid conduit shall be steel, hot dipped galvanized inside and out. The GRS must meet USA Standards Institute C80-1 Underwriters Laboratories Standard UL6 and carry a UL label. Use cast threaded hub fittings and junction boxes for all rigid conduit except in locations not permitted by the NEC.
2. PVC Coated Rigid Steel Conduit (PVC-GRS): PVC coated conduit shall meet the GRS standard above plus have a 40 Mil PVC factory applied PVC coating.
3. Nonmetallic Conduit: Nonmetallic Conduit shall be rigid PVC, Schedule 40 (PVC-40) or 80 (PVC-80). PVC conduit installed above grade shall be Schedule 80 extra heavy wall 90 degree Celsius. UL listed for aboveground use and UV resistant. Conduit shall be gray in color. Fittings shall be of the same material as the raceway and installed with solvent per the Manufacturer's instructions. Conduit, fittings, and solvent shall all be manufactured by the same Manufacturer.
4. Flexible Metal Conduit (Flex-LT): Flexible conduit shall be interlocking single strip, hot dipped galvanized and shall have a polyvinyl chloride jacket extruded over the outside to form a flexible watertight raceway. Flexible conduit shall be American Brass Company Sealtite Type VA, General Electric Type UA or equal.
5. Electrical Metallic Tubing (EMT): EMT shall be UL 797 and ANSI C80.3; steel tubing, hot dipped galvanized. EMT fittings shall be ANSI/NEMA FB 1; steel, rain tight, insulated throat, compression type.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Conduit and Cable Supports

1. Conduit Supports: Hot dipped galvanized framing channel shall be used to support groups of conduit. Individual conduit supports shall be one-hole galvanized malleable iron pipe straps used with galvanized clamp backs and nesting backs where required. Conduit support for PVC or PVC coated rigid steel shall be one-hole PVC or epoxy coated clamps or PVC conduit wall hangers.
2. Ceiling Hangers: Ceiling hangers shall be adjustable galvanized carbon steel rod hangers. Unless otherwise specified, hanger rods shall be ½-inch all-thread rod and shall meet ASTM A193. Hanger rods in corrosive areas and those exposed to weather or moisture shall be stainless steel.

Conduit Sealants

1. Moisture Barrier Types: Sealant shall be a non-toxic, non-shrink, non-hardening, putty type hand applied material providing an effective barrier under submerged conditions.
2. Fire Retardant Types: Fire stop material shall be a reusable, non-toxic, asbestos-free, expanding, putty type material with a 3-hour rating in accordance with UL 1479. Provide products indicated by the manufacturer to be suitable for the type and size of penetration.

# Part 3 – Installation

## Raceway Applications

Galvanized Rigid Steel (GRS) conduit shall be used in all locations unless noted otherwise below or on the Plans.

ABOVE GRADE CONDUITS (non-corrosive areas) shall be:

1. GRS for power and control wiring.
2. GRS for instrumentation and telecommunications wiring.
3. GRS for motor leads from VFDs.
4. EMT for above-grade lighting circuits.

ABOVE GRADE CONDUITS (wet or corrosive areas, NFPA 70 hazardous areas) shall be:

1. PVC-GRS for power and control wiring.
2. PVC-GRS for instrumentation and telecommunications wiring.
3. PVC-GRS for motor leads from VFDs.

CONCEALED ABOVE GRADE CONDUITS shall be:

1. GRS for all wire and cable types in wood stud frame walls.
2. PVC-40 for power and control wiring in concrete block or brick walls.
3. PVC-40 for instrumentation and telecommunications wiring in CMU or brick walls.
4. GRS for motor leads from VFDs in CMU or brick walls.

BELOW GRADE CONDUITS IN DIRECT EARTH (not under slabs-on-grade) shall be:




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

1. PVC-40 for power and control wiring.
    a) Sweeps and risers for transition of PVC from below grade to above grade shall be PVC-GRS.
2. PVC-GRS for instrumentation and telecommunications wiring.
3. PVC-GRS for motor leads from VFDs.

UNDER SLABS-ON-GRADE CONDUIT shall be:

1. PVC-40 for power and control wiring
    a) Sweeps and risers for transition of PVC from below grade to above grade shall be PVC-GRS.
2. PVC-GRS for instrumentation and telecommunications wiring.
3. PVC-GRS for motor leads from VFDs.

CONCRETE-ENCASED CONDUITS shall be:

1. PVC-40 for power and control wiring
    a) Sweeps and risers for transition of PVC from below grade to above grade shall be PVC-GRS.
2. PVC-40 for instrumentation and telecommunications wiring.
    a) Sweeps and risers for transition of PVC from concrete-encasement to above grade shall be PVC-GRS.
3. PVC-GRS for motor leads from VFDs.

ALL CONNECTIONS TO VIBRATING EQUIPMENT OR MOTORS shall be:

1. Liquidtight flexible metallic conduit for indoor, non-corrosive areas and all motor leads from VFDs.
2. Connection to equipment outdoors or in corrosive areas shall be with non-metallic liquidtight flexible conduit (except for motor leads from VFDs shall be flexible metallic.)

## Installation

All conduits shall be concealed in the floor, walls, ceiling slab, or beneath the floor slab. Surface mounted conduit will not be accepted unless noted otherwise on the construction Plans.

Size of Raceways:

1. Raceway sizes as shown on the Plans, if not shown on the Plans, then size in accordance with NFPA 70.
2. Unless specifically indicated otherwise, the minimum raceway size shall be:
    a) Conduit: ¾-inch
    b) Wireway: 4-inch by 4-inch

All raceways shall contain a separate grounding conductor.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Spare conduits shall contain one $^{3}/_{16}$-inch diameter nylon pull rope.

Conduit routing is shown diagrammatic on the Plans. Contractor is responsible for routing the conduits in a neat manner, parallel and perpendicular to walls and ceilings.

Location of conduit ends are shown approximately. Contractor is responsible for ending conduits in location that will not conflict with electrical equipment. Route conduit ends to facilitate ease of equipment maintenance. Conduits extending from the floor to a device shall be located as close as possible to avoid creating a hazard.

Conduit shall not be routed on exterior of structures except as specifically indicated on the Plans.

Where water cannot drain to openings, provide drain fittings in the low spots of the conduit run.

Securely fasten raceways at intervals and locations required by NEC, or the type of raceway employed.

Provide all required openings in walls, floors and ceilings for conduit penetration.

1. Do not install one (1) inch and larger raceways in or through structural members (beams, slabs, etc.) unless approved by Engineer.
2. New Construction: Avoid cutting openings, where possible, by setting sleeves or frames in masonry and concrete, and by requesting openings in advance.
3. Existing Construction: Core drill openings in masonry and concrete. Avoid structural members and rebar.

Conduit encasement or embedment in the earth shall be separated from the earth by at least 3-inches of concrete unless otherwise shown on the Plans. Plastic conduit spacers shall be located five feet on centers. The spacers shall be secured to the conduits by wire ties. The conduits shall be watertight.

Analog signal conduits shall be separated from power or control conduits. The separation shall be a minimum of 12-inches for metallic conduits and 24-inches for nonmetallic conduits.

Install explosion-proof seal-offs in hazardous areas shown on the Plans and as required by the NEC.

Plastic raceway joints shall be solvent cemented in accordance with recommendations of raceway manufacturer.

All conduit openings not encased in a panel shall be sealed with duct seal.

## 16.72 Boxes and Enclosures

## 16.72.2 Outlet and Junction Boxes

***[CSI 26 05 33.16]***




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Part 1 – General

### Design Requirements

In corrosive areas, all junction boxes shall be NEMA 4X.

Outlet boxes and switch boxes shall be designed for mounting flush wiring devices.

Outlet boxes shall not be less than 4-inch square and 1½-inch deep. Ceiling boxes shall withstand a vertical force of 200 pounds for five minutes. Wall boxes shall withstand a vertical downward force of 50 pounds for five minutes.

## Part 2 – Products

### Materials

Use cast boxes with threaded hubs for all rigid and intermediate conduits. Steel boxes may be used with rigid and intermediate conduits where cast boxes are not allowed by the NEC. All boxes shall be of proper size to accommodate devices, connectors, and number of wires present in the box. Boxes shall be readily accessible.

Cast box bodies and cover shall be cast or malleable iron with a minimum wall thickness of ⅛-inch at every point, and not less than ¼-inch at tapped holes for rigid conduit. Bosses are not acceptable. Mounting lugs shall be provided at the back or bottom corners of the body. Covers shall be secured to the box body with No. 6 or larger brass or bronze flathead screws. Boxes shall be provided with neoprene cover gaskets. Outlet boxes shall be of the FS types. Boxes shall conform to FS W-C-586C and UL 514.

Sheet metal boxes shall conform to UL 50, with a hot-dipped galvanized finish conforming to ASTM A123. Boxes and box extension rings shall be provided with knockouts. Boxes shall be formed in one piece from carbon-steel sheets.

Non-metallic boxes shall be hot-compressed fiberglass, one-piece, molded with reinforcing of polyester material, with a minimum wall thickness of ⅛-inch.

### Finishes

Where only cast aluminum is available for certain types of fixture boxes, an epoxy finish shall be provided.

# 16.72.3 Watertight Enclosures

*[CSI 26 05 33.17]*

## Part 2 – Products

### Manufacturers

The watertight enclosure shall be equal to Hoffman.

### Materials

Watertight enclosures for vault electrical outlets shall be molded from fiberglass reinforced polyester material. A hinged cover shall be gasketed and opened with quick release latches. The conduit penetrations shall be sealed watertight.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Part 3 – Execution

### Installation

An epoxy plug shall be installed in the conduit to prevent the migration of water into the conduit. The enclosure shall be NEMA rated and installed per all applicable codes.

# 16.75 Wiring Devices

*[CSI 26 27 26]*

# 16.75.1 Common Work for Wiring Devices

*[CSI 26 27 26]*

## Part 3 – Execution

### Installation

Wiring Devices

1. Position of Outlets: All outlets shall be centered with regard to building lines, furring and trim, symmetrically arranged in the room or outside the structure. Device outlets shall be set plumb and shall extend flush to the finished surface of the wall, ceiling or floor without projecting beyond the same.
2. Unless otherwise noted, wall mounted outlet devices shall generally be 24-inches above the floor, 18 inches in architecturally treated areas, above process piping near process valve boards. Switches shall be 48 inches above the finished floor unless otherwise noted.

Installation of Wall Plates

1. Interior Dry Locations: Install plates so that all four edges are in continuous contact with the finished wall surfaces. Plaster filled will not be permitted. Do not use oversize plates or sectional plates.
2. Exterior and/or Wet Locations: Install plates with gaskets on wiring devices in such a manner as to provide a rain tight weatherproof installation. For receptacle devices, these plates shall maintain the weatherproof rating with an attachment plug inserted and be rated extra-duty. Cover type shall match box type.

### Testing

After installation of receptacles, circuits shall be energized, and each receptacle tested for proper ground continuity, reversed polarity, and/or open neutral condition.

GFI receptacles shall be tested with the circuits energized. Devices shall be tested with a portable GFI receptacle tester capable of circulating 7.5 milliamperes of current, when plugged in, between the "hot" line and "ground" to produce tripping of the receptacle. Resetting and tripping shall be checked at least twice at each GFI receptacle.

Submit results of all field testing to the Engineer for review.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 16.75.2 Receptacles

*[CSI 26 27 19]*

## Part 1 – General

### Design Requirements

Receptacles shall be heavy duty, high abuse, grounding type conforming to NEMA configurations, NEMA WD1 and UL 514 Standards.

## Part 2 – Products

### Materials

Single and Duplex Receptacles

1. Indoor Clean Areas: Receptacles shall be duplex, 20 amp, NEMA 5-20R, and shall accept NEMA 5-15P and 5-15P plug caps. Receptacles shall be Hubbel 5362, General Electric 4108-2, or equal. Color shall be brown in industrial areas and ivory or white in office and laboratory areas.
2. Outdoor, Process, or Corrosive Areas: Receptacles shall be duplex, 20 amp, NEMA 5-20R, and shall accept NEMA 5-15P and 5-20P plug caps. Receptacle and plug caps shall be corrosion resistant, marine duty with yellow polycarbonate weatherproof lift covers. Receptacles shall be Hubbell 53CM62/53CM21 or equal.

GFI Receptacles

1. Device shall be rated 20 amp, 2-pole, 3-wire, 120-volt, conforming to NEMA WD1.10 configuration. Device shall have a test and reset push buttons. GFI device shall be Hubbell 5362 or equal.

Surface Multiple Outlet Assemblies

1. Units shall have outlets on center-to-center spacing as shown on the Plans. Assembly shall conform to Article 353 of the NEC.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 17.00 GENERAL

This division covers all work necessary for furnishing, installing, adjusting, testing, documenting, and starting-up the Instrumentation and Control (I&C) and Telemetry System. Programmable logic controller (PLC) shall provide local, automatic control of on-site control valves. Computer-based telemetry system will provide remote control, alarm presentation, and data logging activities at the a Owner's maintenance shop.

Sections in these specifications titled "*Common Work for . . .*" shall apply to all following related subsections whether directly referenced or not.

These specifications are an integral part of the contract documents for the I&C and Telemetry portion of this contract. The written descriptions of system performance contained herein are given to assist the Contractor in interpreting the contract plans but are not intended to be all-inclusive. The Contractor shall be aware that all automatic control systems do not require the same components and accessories for complete system operation. Therefore, these specifications do not include all accessories and appurtenances required for a complete system. The Contractor shall, however, provide all accessories and appurtenances to result in a completely operational system as required to meet the functional requirements of these documents. Where specific equipment specifications are given, they are used to represent the level of quality required by these documents.

## 17.05 Common Work for Automatic Control

*[CSI 40 60 05]*

### Part 1 – General

#### Summary

The work under this division covers construction specifically described in these specifications. Project Plans will be provided for this project. All work incidental and necessary to the completion of the project described herein shall be completed under the bid item listed in the bid proposal, and no other compensation will be allowed. The work generally consists of the following:

- Detailed system layout and design for the particular equipment bid in accordance with these functional specifications.
- Furnishing of I&C equipment including delivery, storage, software, programming, installation, testing, startup, and documentation.
- Providing operator maintenance manuals for all equipment and devices provided by this Contract.
- Providing system training to the operators of the proposed equipment.

#### Related Sections

- Division 16 Electrical


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## References

The project Plans are based on Instrument Society of America (ISA) standards numbers S5.1, S5.2, S5.3, and S5.4. The Contractor is encouraged to be familiar with these standards since the project plans do not contain wiring or ladder diagrams, but are based on the functional requirements of the ISA format.

All equipment and materials shall conform to the latest revised editions of applicable standards published by the following organizations:

- American National Standards Institute (ANSI).
- Institute of Electrical and Electronic Engineers (IEEE).
- National Electrical Manufacturers Association (NEMA).
- Underwriters' Laboratories (U/L).
- Instrument Society of America (ISA)

All equipment and materials, and the design, construction, installation, and application thereof shall comply with all applicable provisions of the National Electrical Code (NEC), the Occupational Safety and Health Act (OSHA), and any applicable Federal, State, and local ordinances, rules and regulations. All materials and equipment specified herein shall be within the scope of Underwriter's Laboratory (UL) examination services, be approved by the UL for the purpose for which they are used and shall bear the UL label.

All control panels shall bear a label by UL or by an approved testing authority for the completed assembled panel.

## Definitions

Contractor: The Contractor, as distinct from the Facility Integrator , shall install panels and other materials furnished by the Facility Integrator and provide all materials and work necessary and thereby, satisfy all requirements that are within the scope of this section.

Facility Integrator: A single firm preselected by and subcontracted by the Contractor, who shall design and furnish the system, provide the instrument panels; provide the control panel equipment, test the control panel equipment, calibrate instruments, and provide startup and training services. The Facility Integrator for this contract shall be: Technical Systems Incorporate (TSI), Motor Controls Corporation (MCC), or Quality Controls Corporation (QCC). No other Facility Integrator will be allowed.

Programmer: Furnish all programming, startup and training services related to programming. The Programmer shall be provided by the City. No substitutes will be allowed.

## Submittals

All submittals shall be complete, neat, orderly, and indexed. Partial submittals will not be accepted. Submittal information shall be provided to the Owner for the following items:

- Level Floats
- Liquid Level Switch




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Pressure Transmitter
- Intrusion Alarm Switch
- Operation and Maintenance Manuals per Division 1.79.2 and Division 17.94
- Full size nameplate wording schedules, in lettering style proposed for use.

In addition to the requirements of Division 1.33, the Contractor shall develop and submit the following information provided by the Facility Integrator.

Hardware Submittals

Before any components are fabricated, and/or integrated into assemblies, or shipped to the site, the Contractor shall prepare a complete hardware submittal. The Engineer shall require five (5) sets, including fully detailed shop drawing, catalog cuts, wiring connections, and such other descriptive matter and documentation as may be required to fully describe the equipment and to demonstrate its conformity to these Specifications. The decision of the Engineer, upon the acceptability of any submittal, shall be final. Catalog information shall be submitted for all components and equipment, regardless of whether or not it is of the same manufacture as that listed in the Specifications.

System Plan Submittals

Following approval of the hardware submittal, the Facility Integrator shall prepare complete system interconnect wiring diagrams and panel layout plans for approval.

Plans

The Facility Integrator shall develop all shop drawings required for design, fabrication, assembly and installation of the control system. Shop drawings shall include all plans required in manufacture of specialized components and for assembly and installation of them.

Plans shall be prepared with a CAD program capable of exporting to AutoCAD format, and printed on 11-inch by 17-inch media. Plans shall have borders and title blocks identifying the project system, revisions to the plans, and type of plan. Each revision of a plan shall carry a date and brief description of the revisions. Diagrams shall carry a date and brief description of the revisions. Diagrams shall carry a uniform and coordinated set of wire numbers and terminal block numbers in compliance with panel work wiring. Additionally, one set of electronic .DWG files shall be provided to the Owner.

Elementary Diagrams

The Contractor shall provide elementary diagrams for all discrete loops. Loop diagrams shall be prepared in compliance with ISA S5.4 and shall be provided for all analog loops. Elementary diagrams and loop diagrams shall show circuits and devices of a system. These diagrams shall be arranged to emphasize device elements and their functions as an aid to understanding the operation of a system and maintaining or troubleshooting that system. Elementary and loop diagrams shall also show wire numbers, wire color codes, signal polarities, and terminal block numbers.

Panel Fabrication and Arrangements Plans


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The Contractor shall provide arrangement plans of all panel front- and internal-mounted instruments, switches, devices, and equipment indicated. All panel mounting details shall be shown. Outer dimensions of all panels shall be included on the plan. Deviations from approved arrangements require approval prior to installation.

Arrangement plans shall be drawn to scale using standard Architectural or Engineering scales.

### Site Conditions

Specified instrumentation and control equipment shall be modified, if necessary, to make it suitable for operation in the ambient conditions specified in Division 16.

### Warranty

The Contractor will provide four 2-day site visits during the warranty period to perform inspection and calibration of the equipment or other work at the request of the Owner.

## Part 2 – Products

### Components

These Specifications list major instruments required to provide the process instrumentation system. All instrument functions specified on this list shall be provided by the Facility Integrator. Any additional instruments required to complete the instrument loops because of certain characteristics of the particular equipment selected by the Facility Integrator shall be provided. Such additional instruments shall be provided and included in the original contract price even though not specified in the instrument index or on the Plans.

The following systems utilize automatic control:

- Valve controls

### Accessories

Provide all accessories required to furnish a complete control system that meets the requirements of the Plans and Specifications.

### Source Quality Control

Material shall be new, free from defects, and of the quality specified. All equipment and materials utilized in the system shall be the products of Manufacturers with at least five (5) years of experience in the manufacture of similar equipment. Similar items in the system shall be the products of the same Manufacturer. All equipment shall be of industrial grade and of standard construction, shall be capable of long, reliable, trouble-free service, and shall be specifically intended for control and monitoring of operation of motor-driven pumps and equipment. All equipment shall be of modular design to facilitate interchangeability of parts and to assure ease of servicing.

## Part 3 – Execution

### Installers

Installation shall be performed by the workers who are skilled and experienced in the installation of I&C and Telemetry systems.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Installation

Installation and testing procedures shall be as specified in these and subsequent sections of this division.

The Facility shall be installed in accordance with the installation plans and instructions prepared by the Facility Integrator.

Installation shall include all elements and components of control system and all conduit and interconnecting wiring between all elements, components, sensors, and valve operators.

Equipment shall be located so that it is readily accessible for operation and maintenance.

Field Equipment

Equipment shall be provided as specified on the Plans such that ports and adjustments are accessible for in-place testing and calibration. Where possible, equipment shall be located between 48 inches and 60 inches, unless specified otherwise on the Plans, above the floor or a permanent work platform. Instrumentation equipment shall be mounted for unobstructed access, but mounting shall not obstruct walkways. Equipment shall be mounted where shock or vibration will not impair its operation. Support systems shall not be attached to handrails, process piping or mechanical equipment except for measuring elements and valve positioners. Instruments and cabinets supported directly by concrete or concrete block walls shall be spaced out not less than ⅝-inch by framing channel between instrument and wall.

Steel used for support of equipment shall be hot-dip galvanized after fabrication. Support systems including panels shall be designed in accordance with the Seismic Restraint and Anchorage section of Division 1.81 of these specifications and to prevent deformation greater than ⅛-inch under the attached equipment load and an external load of 200 pounds in any direction.

Electrical Power Connection

Electric power wiring and equipment shall be in compliance with Division 16. Power disconnect switches shall be provided within sight of equipment and shall be labeled to indicate opened and closed positions and specific equipment served. "Within sight of" is defined as having a clear unobstructed view from the equipment served and within 50 feet of the equipment served. Disconnect switches shall be mounted between 36 inches and 72 inches above the floor or permanent work platform. Where equipment location is such that the above requirements cannot be met by a single disconnect switch, two switches, one at the equipment and one at the work platform, shall be provided.

Signal Connection

Electrical signal connections to equipment shall be made on terminal blocks or by locking plug and receptacle assemblies. Jacketed flexible conduit shall be used between equipment and rigid raceway systems except that flexible cable assemblies may be used where plug and receptacle assemblies are provided and the installation is not subject to mechanical damage in normal use. The length of flexible conduit or cord assemblies shall not exceed 2 feet. Flexible cable, receptacle and plug assemblies shall be used only where specified.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 17.06 Facility Integrator

*[CSI 40 61 13]*

## Part 1 – General

### Division of Responsibility

The Facility Integrators shall be enjoined by the Contractor as a Subcontractor. The assignment of specific responsibilities herein to the Facility Integrator shall not, in any way and under any conditions, diminish the Contractor's full and complete responsibility for all work performed and all materials installed under the contract. The contract between the Contractor and the Facility Integrator shall specifically require that the Facility Integrator conform to and meet all requirements specified in the contract documents.

The assignment of a Facility Integrator that is an equipment supplier shall not be acceptable.

Facility Integrator's Responsibility

- Provision of, and the detailed design of, custom control panels. The plans show general layout of the control panels. The Integrator shall provide detailed scaled design of all components on and in the control panels and determine specific requirements.
- The design of all interconnecting wiring of control equipment including remote control panels, packaged equipment panels, mechanical equipment with control components, etc.
- Testing of the control panels in the Facility Integrator's shop.
- Coordinate with the Contractor for specific requirements and locations of raceway penetrations and field wiring in control panels.
- The Facility Integrator shall supply the Contractor with all necessary detailed installation plans and/or written instruction for installation of all control components and sensing devices for proper system operation.
- Develop an assembly and testing schedule to allow for testing of all new programs.
- Provide installation assistance.
- Provide Startup and Training Services.

General and Electrical Contractor's Responsibilities

The General and Electrical Contractor shall be responsible for the following equipment and services:

- Review of the Facility Integrator's submittals and wiring diagrams for coordination with space requirements, raceway requirements of field wiring, etc.
- Supply the Integrator with submittals of equipment related to the control system that the Integrator must include in their submittals and integrate. Such as motors, packaged control panels that the Integrator does not build, etc.


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- Installation of the control panels provided by the Facility Integrator.
- Installation of the interconnecting wiring in accordance with these documents and the Facility Integrators wiring diagrams.
- Installation of I&C and Telemetry System components in accordance with these documents and plans or instructions of the Facility Integrator.

## Part 3 – Execution

### Installers

Integrators List

The Facility Integrator shall be selected by the Contractor from the following acceptable companies (Alphabetical Listing):

- Technical Systems Incorporated. – Lynnwood, Washington
- Motor Controls Corporation – Kent, Washington
- Quality Controls Corporation – Lynwood, Washington

# 17.07 Programmer

## Part 1 – General

### Division of Responsibility

The Programmer shall provide PLC programming that will accomplish control of the proposed systems as described in the Specifications and Plans. The programmer shall be provided by the City and shall be the following company:

- SCADA & Controls, Inc. – Woodinville, Washington, (425) 818-0160,

  suppport@scadace.com

Programmer's Responsibility:

The programmer shall be responsible for the RTU PLC and local OIT programming, master telemetry unit programming, new SCADA screens and database work at the City central HMI. Responsibilities include but are not limited to:

- Coordinate with City staff and Facility Integrator regarding programming requirements
- Programming and assisting with testing the PLC at the Facility Integrator's shop.
- Field testing
- Calibration & Startup
- Software testing of the control panels in the Facility Integrator's shop.
- Programming of the local PLC, master telemetry unit PLC, local operator interface, and HMI Computer System.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Provide required software startup, troubleshooting, and commissioning services needed to complete implementation of programs.

# 17.08 System Description

*[CSI 40 61 96]*

## Part 1 – General

### Summary

The I&C and Telemetry system functions required are specified on the Plans and in subsequent sections of this Division.

### Design and Performance Requirements

The system shall be designed to provide the control capabilities and functions indicated and implied by the Plans and these Specifications and to provide trouble-free operation with minimum maintenance. The system shall readily enable manual operation of any and all functions in the event of failure of any one component.

The control system shall be designed and assembled by the Facility Integrator to provide:

- Control of motor driven pumps, equipment, and processes.
- Monitoring of operation of motor driven pumps, equipment, and processes.
- Indication of operating status of motor driven pumps, equipment, and processes.
- Monitoring and indication of pressures, temperatures, levels, and flows, as indicated and implied by the Plans and Specifications.
- The capabilities indicated and implied by the Plans and Specifications.

The I&C and Telemetry System shall be designed and assembled by the Facility Integrator to be an integrated system composed completely of components which are specifically designed and used for and in conjunction with control and operation of motor-driven pumps and process control equipment. Facility Integrator shall supply all interfacing equipment, appurtenances and accessories and all such devices that may be required for proper interfacing as part of the control system.

## Part 2 – Products

### Manufacturers

The telemetry components of the RTU shall be manufactured by Allen-Bradley to be consistent with the Owner's existing system.

### Components

The I&C and Telemetry System shall include the instruments, control devices, Remote Telemetry Unit, Human Machine Interface, input and output devices, sensors, interfacing devices, cabinets, enclosures and other components indicated and implied by the Plans and Specifications.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The following is a list of the RTUs, Control Panels, Pressure and Level Assemblies, and Motor Control Centers to be provided by the Facility Integrator:

- Booster Pump Station Control Panel Modifications

### Part 3 – Execution

#### Preparation

The Facility Integrator shall be responsible for the coordination and integration of Facility with the motor control and other related equipment. The Facility Integrator shall communicate directly with the Manufacturer(s) and Supplier(s) of all related equipment to determine all details of the equipment, which may influence or affect the Facility. The Facility Integrator shall determine all requirements for and shall cause integration of the Facility into a unified operating system. The Facility Integrator shall define all requirements for all interfacing equipment and shall supply all appurtenances, accessories and all such devices, which may be required for proper interfacing as part of the Facility.

The Facility Integrator shall be responsible to obtain submittal information on equipment supplied by other disciplines and to integrate them into the Facility to form a complete working package as outlined by the contract documents.

#### Installation

The system shall be completely assembled in the shop by the Facility Integrator. All components and equipment shall be prewired to the maximum extent possible.

All Process Control shall be done within the control panels unless specifically listed on the Plans as other.

## 17.20 PANEL COMPONENTS

*[CSI 40 78 00]*

### Part 1 – General

#### Design Requirements

All components shall be suitable for installation inside the I&C and Telemetry system panel enclosure.

## 17.20.3 Terminal Blocks

*[CSI 40 78 71]*

### Part 1 – General

#### Design Requirements

Terminal blocks shall be one-piece molded plastic blocks with screw-type terminals and barriers rated for 600 volts. Terminals shall be double-sided and supplied with removable covers to prevent accidental contact with live circuits. Terminals shall have permanent, legible identification, and be clearly visible with the protective cover removed.

Fusible terminal blocks shall be provided with a LED blown fuse indicator for each terminal.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### Part 3 - Execution

#### Installation

All wires between panel-mounted equipment and other equipment shall be terminated at terminal blocks. Switches shall be terminated at the terminal blocks with crimp-type, pre-insulated, ring-tongue lugs. Lugs shall be of the appropriate size for their terminal block screws and for the number and size of the wires terminated.

## 17.22 Wire and Cable

*[CSI 40 67 33]*

## 17.22.2 Wiring

*[CSI 40 67 33]*

### Part 1 – General

#### References

All electrical wiring shall be in accordance with the NEC.

#### Design Requirements

Wires shall be 600-volt class, PVC insulated, stranded copper and shall be the sizes required for the current to be carried but not less than No. 14 AWG conductor size.

Wires for signal circuits shall be twisted shielded pairs not smaller than No. 18 AWG.

### Part 3 – Execution

#### Installation

All power wiring shall be supported on a sheet metal raceway or enclosed in a plastic wiring duct. Wiring for signal circuits shall be separated at least 6-inch from any power wiring.

## 17.22.3 Cables

*[CSI 40 67 33]*

### Part 1 – General

#### Design Requirements

Cables and connectors shall be industry standard, shielded, and shall be provided to connect all peripherals and equipment.

## 17.24 Switches and Relays

*[CSI 40 78 19, 40 78 53]*

## 17.24.4 Panel Relays

*[CSI 40 78 53]*




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Part 1 – General

## Design Criteria

Relays shall be provided as necessary to perform switching functions required of control panels and other control circuits as shown on the Plans and described in the technical specifications. Appropriate relay type and associated contacts shall be selected based on the application from the control wiring diagrams or the functional description. Where timing relays and control relays require additional contacts, provide auxiliary control relays properly sized for the application.

All contacts and relays shall be NEMA rated and UL recognized.

The electrical life expectancy for the relay shall be over 500,000 operations at 120V AC, 10 amps; (over 200,000 operations at 120V AC, 10 amp for SPDT, 3PDT, and 4PDT). The mechanical life expectancy for the relay shall be over 50,000,000 operations.

# Part 2 – Products

## Manufacturers

Control Relays

Square D Class 8501, Type K or R; Allen Bradley 700 Type HA or HB; IDEC RH Series; or equal.

Time Delay and Timing Relays

Allen Bradley 700 Type HR; IDEC GE1, RTE or GT3 Series; or equal.

## Manufactured Units

Control Relays

Relays for general purpose use shall be DPDT or 3PDT, 10 amp contacts with the appropriate coil voltage for the application. Relays shall be plug-in type with matching socket. All relays shall have LED indicators to signal when the coil is energized. Relay coils shall be rated for continuous duty.

Time Delay Relays

Time delay relays shall be multi-function, multi-range with plug-in base, pin style terminations timing and timed out LED indicators, and calibrated scales. Relays shall have minimum 0.5 seconds to 60 minutes, 8 selectable timing ranges, 5 amp contacts. Select coil voltage for the application. Units shall be sealed to prevent entry of contamination in the form of dust, dirt, or moisture.

Appropriate relay shall be selected based on application from the control wiring diagrams.

Minimum accuracy (plus or minus) shall be as follows:

1. Repeat accuracy – ½ percent.
2. Timing change over full voltage range – ½ percent change over full temperature range.
3. Scale tolerance – 5-percent.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Timing Relays

Timing relays shall be machine tool industrial relay with solid-state timer and external adjustment dial. Range shall be 0 to 120 seconds unless indicated otherwise on the Plans. Relay shall include an LED indictor and instantaneous and time-delay contacts rated at 10 amps, meeting NEMA A600 designation. Timing relays shall be "on delay" or "off delay" as indicated on the Plans. Units shall be sealed to prevent entry of contamination in the form of dust, dirt, or moisture.

Appropriate relay shall be selected based on application from the control wiring diagrams.

Minimum accuracy (plus or minus) shall be as follows:

1. Repeat accuracy – ½ percent.
2. Timing change over full voltage range – ½ percent change over full temperature range.
3. Scale tolerance – 5 percent.

### Part 3 – Execution

#### Installation

Provide adjustable time relays on all alarm and shut down circuits to prevent nuisance tripping of other alarm points. Time delay relays for these functions may not be shown on the Plans; however, provide as required on all circuits.

Provide additional form C contacts over and above the number indicated on the Plans for all relays provided.

120 VAC relays shall not be interchangeable with other voltages to prevent a hazardous interchange of relay voltages.

Provide DIN mounted or panel mounted type depending on application.

## 17.30 INTELLIGENT CONTROL UNITS

## 17.31.2 Programmable Logic Controller (PLC) System

*[CSI 40 63 43]*

### Part 1 – General

#### Summary

Work involved in this Contract includes modifying existing PLC programming to change the existing operation and add additional features.

#### Performance and Design Requirements

- The PLC system modifications shall accomplish the control requirements of the loop descriptions, Plans, and Specifications.
- The design application and installation of the PLCs shall conform to NEMA ICS 1.1.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- PLC programming shall be documented.
- All PLC control system components shall be capable of meeting or exceeding electromagnetic interference tests per ANSI/IEEE C37.90.2.

### Project Conditions

The existing control panel contains an Allen-Bradley ControlLogix PLC that shall be modified to monitor and control equipment added to this project.

## Part 3 – Execution

### Installers

Facility Integrator and programmers shall have had experience in design installation and startup of at least three similar installations using the existing hardware and software existing.

Facility Integrator and programmers shall have had experience in design, installation, and startup of at least three similar installations using the proposed hardware and software.

### Installation

Provide a completely integrated distributed programmable controller system capable of analog and sequential control, data acquisition and display, alarm annunciation and communications using the PLC system. I/O cards and memory shall be added as necessary to complete work shown on the Plans and described in the specifications.

The system shall provide true distributed control wherein each PLC is an intelligent stand-alone controller programmed for the specific functions required at its respective location. Certain information in the form of control commands, interlocks and data will be passed directly between the PLCs for use in executing the local control programs.

Input/Output Connection Requirements

1. Make connections to I/O subsystem by terminating all field wiring on terminal blocks within the I/O enclosure.
2. Prewire I/O modules to terminal blocks.
3. Provide terminal blocks with continuous marking strip.
4. Size terminals to accommodate all active data base points and spares.
5. Provide terminals for individual termination of each signal shield.
6. Field wiring shall not be disturbed when removing or replacing an I/O module.

PLC Installation

1. Component placement:
    a. Mount all components according to manufacturer's instructions.
    b. Locate incoming line devices (isolation or constant voltage transformers, local power disconnects, surge suppressors, etc.) so as to keep power wire runs within an enclosure as short as possible.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

c. If items such as magnetic starters, contactors, relays and other electromagnetic devices are located within the same enclosure as the PLC system components, provide at least 6 inches of separation between the magnetic area and the control area.

d. Oversize enclosure to accommodate future racks and auxiliary devices as required.

2. Provide enclosure with a single quick disconnect of incoming power. Mount disconnect switch or breaker on enclosure exterior and label.
3. Enclosures shall comply with these specifications.
4. Enclosures shall be equipped with H2S inhibitor(s) suitable for the enclosed volume.

# 17.50 SENSORS AND CONTROLS

*[CSI 40 70 00]*

## 17.50.1 Common Work for Sensors and Controls

*[CSI 40 70 05]*

### Part 1 – General

#### Design Requirements

Provide sensors and controls scaled and rated for their intended application.

### Part 3 – Execution

#### Installation

All devices shall be installed to be field serviceable without taking the facility out of service. Readouts shall be positioned to be easily read from a standing position, central to the room unless allowed otherwise by the Engineer.

## 17.51 Emergency Sensors and Controls

## 17.51.4 Intrusion Alarm Switch

*[CSI 28 31 11.23]*

### Part 1 – General

#### Design Requirements

The switch shall be two-pole side plunger type switch with one normally open and one normally closed set of contacts. The switch shall be a Type C and NEMA rated.

### Part 2 – Products

#### Manufacturers

Intrusion switches shall be as specified on the Plans, or equal.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### Components

Provide with a standard box plug-in and connecting cable of significant length to reach a junction box located near the switch.

## Part 3 – Execution

### Installation

The Contractor shall install intrusion alarm switches on all entrance doors and access hatches as shown on the Plans. All components shall be suitable for installation in the environment where installed.

Mount the switch as shown on the Plans to detect the opening of each entrance door and access hatch identified on the Plans. Connect to the normally open contacts so that the switch is closed when the door is closed and open when the door is open. A factory provided cord shall be of significant length to reach from the device to a junction box.

# 17.52 Pressure and Level Sensors and Controls

*[CSI 40 72 00, 40 73 00]*

# 17.52.2 Flood Liquid Level Switches

*[CSI 40 72 83]*

### Design Requirements

The switch shall be SPST rated for 20VA. The float shall be constructed on Buna-N material and the stem shall be constructed from brass.

## Part 2 – Products

### Manufacturers

Switches shall be Omega, LVN-20 or equal.

## Part 3 – Execution

### Installation

The contractor shall install a liquid level switch as shown on the Plans. Mount the switch to the end of ½-inch PVC Coated GRS, depending on the area classification. Provide threaded busing as necessary to provide a complete assembly. Secure pipe to wall with a minimum of two galvanized conduit hangers. Mount the liquid level assembly ½-inch above the finished floor.

# 17.52.4 Clean Water Level Float Switches

*[CSI 40 72 76.15]*




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Part 2 – Products

### Manufacturers

The float switch shall be an NSF Standard 61 rated Model SJE MilliAmpMaster Float as manufactured by SJE Rhombus, or equal.

### Manufactured Units

Float switch body shall be constructed of high impact, corrosion resistant, polypropylene housing measuring not less than 2¾-inch in diameter. A long life, high reliability, potted SPST magnetic reed switch rated for not less than 100 VA at up to 250 Volts shall be mounted inside the float and connected to a multi-stranded, two (2) conductors plus ground, 18 gauge, CPE jacketed cable. The cord shall have fine strand conductors (Not more than 34 Gauge) made especially for heavy flexing service. The cable connection point shall be potted in epoxy providing a strong bond to the float and reed switch forming a water/moisture tight connection.

## Part 3 – Execution

### Installation

Level switches shall be normally closed type and provided for the following:

- Overflow level sensing

The Contractor shall provide a high level backup float. A flexible Neoprene sleeve, not less than ⅛-inch thick, shall be provided over the CPE jacketed cable extending not less than 5 inches from the top of the mounting bracket extending down through the cable mounting bracket hinge point to the top of the float switch body, providing cable stress point relief and extended operational life.

# 17.52.10 Gauge Level/Pressure Transmitter

*[CSI 40 73 26]*

## Part 1 – General

### Design Requirements

Provide transmitter with ¼-inch or ½-inch process connections, and completely suitable for measuring pressure in a potable water pipeline. Select ranges to provide a system that utilizes the largest percentage of available span for each transmitter. Transmitter shall transmit in pounds per square inch at both the device screen and through the 4-20mA output.

| Location | Low end of range | High end of range (maximum) |
|---|---|---|
| Reservoir Level | 0 feet | 100 feet |
| Inlet Pressure | 0 psi | 100 psi |




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Part 2 – Products

### Manufacturers

Pressure transmitter shall be Foxboro IGP10, no substitutions.

### Manufactured Units

Water pressure transmitters shall be all solid state with a 4-20ma output. All wetted parts shall be stainless steel. Transmitter shall be hermetically sealed to withstand submergence or an operating environment of 100 percent humidity for an indefinite period of time. Total error band shall not exceed 0.25 percent of full scale over a temperature range of 0-100 degrees Celsius. Voltage input shall be 9 to 20 VDC without more than a 0.12 percent change in output. Volumetric displacement of bridge from 0 psi to max-rated pressure shall be less than 0.01 cubic inches. Provide electronics with built-in protection against AC line transients and lightning spikes, and an R/F filter to reject external electrical and internal noise. Zero and span adjustments shall be non-interacting.

A digital indicator with on-board pushbuttons shall be provided to display the measurement with a choice of units. The pushbuttons shall allow zero and span adjustments and local configuration without the need for a hand-held terminal.

## Part 3 – Execution

### Installation

Transmitter installations shall be equipped with drain and bleed and isolation valves to remove air from transmitter diaphragm. Contractor shall be completely responsible for proper operation and interface of transmitter with other electronics provided on the project.

# 17.90 Pre-Startup, Startup, and Training

# 17.90.1 Common Work for Pre-startup, Startup, and Training

*[CSI 40 61 21, 40 61 26, 40 80 00]*

## Part 1 – General

### Summary

Total system hardware pre-startup and startup is the responsibility of the Facility Integrator.

### Maintenance

The Facility Integrator shall be solely and completely responsible for all hardware maintenance of the system from time of startup to the date of acceptance, by formal action of the Owner, of all work under the contract. The Facility Integrator shall perform all such work required or considered to be required by the Owner to cause and maintain proper operation of the system and to properly maintain the system.

### Warranty

The Contractor shall cause the Facility Integrator to make any and all repairs, replacements, modifications and adjustments required to eliminate any and all defects in design, materials




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

and workmanship which are disclosed within the one year guarantee period. The Facility Integrator shall begin all repairs, replacements, modifications and adjustments within twenty-four (24) hours of notification by telephone by the Owner and shall complete such repairs, replacements, modifications and adjustments within forty-eight (48) hours of notification. Should the Facility Integrator fail to begin the work within 24 hours or complete the work within 48 hours, the Owner may proceed to undertake or complete the work. In such event, the Contractor and his surety shall be liable for all costs incurred by the Owner.

## Part 3 – Execution

### Field Quality Control

Equipment Manufacturer's Support

1. The Facility Integrator shall pay for services of equipment manufacturer's field service representative(s) to:
    a. Inspect equipment covered by these Specifications.
    b. Supervise adjustments and installation checks.
    c. Conduct pre-startup of equipment and perform operational checks.
    d. Conduct startup of equipment and perform operational checks.
    e. Provide Owner with a written statement that manufacturer's equipment has been installed properly, started up and is ready for operation by Owner's personnel.

### Repairs

The Facility Integrator shall correct all deficiencies and defects and make any and all repairs, replacements, modifications, and adjustments as malfunctions or failures occur.

The Contractor and the Facility Integrator shall anticipate that the Owner may delay acceptance of all work under the contract if, in the judgment of the Owner, malfunctions or failures in operation of the Facility repeatedly occur after startup. Both the Contractor and the Facility Integrator shall not be entitled to an extension of time or to any claim for damages because of hindrances, delays or complications caused by or resulting from delay by the Owner in accepting the work because of malfunctions or failures in operation of the Facility.

# 17.91 Pre-Startup

*[CSI 40 61 21, 40 80 13]*

## Part 1 – General

### Summary

Materials, equipment, and construction included under this specification shall be inspected in accordance with the specifications. Initial testing and checks before filling the reservoir shall be referred to as Pre-startup. Pre-startup shall be performed by the Facility Integrator in accordance with Division 16, and subsequent sections of this division. Pre-startup shall be required to determine if installed equipment and system(s) will operate in the manner in which they are intended to operate for startup. The decision of the Owner upon the acceptability of




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

the pre-startup procedures and conformance shall be final. The work will not be accepted until all pre-startup procedures have been satisfactorily performed.

### Scheduling

The Contractor shall prepare factory and field test procedures to demonstrate conformance of the complete system to this specification. The Contractor shall submit the detailed test procedures within four weeks after the notice to proceed for the Engineer's review and approval.

The Contractor shall furnish all labor, materials, tools, equipment, instruments and services necessary to perform all specific functional testing included in the pre-startup checklists of all installed equipment and systems at no additional cost.

The Facility Integrator and Contractor shall notify the Owner and Programmer of the factory testing date 30 days before testing.

A preliminary schedule shall be submitted to the Engineer for review 60 days before pre-startup. A final schedule shall be submitted to the Engineer for review 30 days before pre-startup.

Factory representatives of all major units shall be present for the pre-startup phase. The test shall continue until it is demonstrated that all functions of controls and machinery are correct and ready for startup.

## Part 3 – Execution

### Field Quality Control

Following installation by the Contractor, the Facility Integrator will verify the correctness of the interconnecting wiring and energize all control equipment in the field. Each point at the controller(s) shall be checked for proper functional operation through communication with the central computer.

### Field Tests

The Facility Integrator in conjunction with the Contractor shall conduct field tests of all panels and instrumentation in the presence of the Engineer after installation of the equipment at the site. Testing shall be conducted by physically actuating signaling devices, installing temporary jumpers, or artificially imposing signals on the field wiring. This shall be done to establish proper operation of the field devices, the integrity of the field wiring, and the proper connection of field devices to the panels. Any operational tests unable to be performed during pre-startup will be performed during startup. The Contractor and Facility Integrator shall coordinate with the Engineer to provide for as complete pre-startup of the Facility to confirm the system is ready for startup. The Contractor and Facility Integrator shall make corrections or repairs to the wiring and/or devices as necessary to provide proper operation of the system for startup.

When the installation of the Facility is substantially complete, the Contractor shall commence with calibration and field testing. Testing shall determine that all system components connect up correctly to each other so that the system works as designed.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

All components of the Facility shall be calibrated by the Facility Integrator after completion of installation. Each component shall be adjusted to be within the Manufacturer's required range and for the specific application.

Components that cannot be properly calibrated or that are found to exceed the Manufacturer's specified range or accuracy shall be removed and replaced at no additional cost to the Owner.

The Facility Integrator shall calibrate all instruments, indicators, recorders, loops, etc. and shall provide a five-point calibration test results sheet for each calibrated instrument supplied by the Facility Integrator. The five-point calibration shall include one point at: Minimum input range value, Maximum input range value, Midrange input value, no other point less than 25 percent of span to any other point. Test forms shall identify each instrument tested, input conditions vs. output signal results in tabulated form. Any additional testing during filling of the reservoir and startup shall be submitted to the Engineer prior to final commissioning.

### Repairs

Should any part of the system fail during pre-startup, the test shall be rescheduled and repeated to the satisfaction of the Owner after repairs.

## Part 4 – Facilities Pre-Startup

The instrument test forms and pre-startup procedures, included in **Appendix H**, shall be used for all devices requiring collaboration. Forms shall be submitted to the Engineer prior to requesting final acceptance data.

# 17.92 Startup

*[CSI 40 80 15]*

## Part 1 – General

### Summary

All testing, startup and operation shall not be cause for claims for delay by the Contractor, and all expenses accruing therefrom shall be deemed to be incidental to this contract. The Contractor shall make arrangement for all materials, supplies and labor necessary to efficiently complete the testing, startup and operation.

Startup shall consist of testing, by a simulated operation, all operational equipment and controls. The purpose of these tests shall be to check that all equipment will function under operating conditions, that all interlocking controls and sequences are properly set, and that the facility will function as an operating unit.

Refer to section 1.75.16.50 Reservoir Disinfection and Testing, City's disinfection scheduling plan, and startup checklists for tests during reservoir fill.

After the completion of a successful startup, operator training will commence, and then a 21-day commissioning period during which the system will operate as intended and any issues that arise will be corrected by the Contractor.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

### Scheduling

Factory representatives of all major units shall be present for the startup phase. The test shall continue until it is demonstrated that all functions of controls and machinery are correct.

## Part 3 – Execution

### Field Quality Control

The Facility shall be placed into operation by the Facility Integrator and Programmer.

### Field Tests

The Contractor and Facility Integrator shall coordinate with the Engineer to provide for as complete startup of the Facility as is practical prior to placing the equipment on line for actual control and monitoring. The Contractor and Facility Integrator shall make corrections or repairs to the wiring and/or devices as necessary to provide proper operation of the system.

After the pre-startup is complete, followed by disinfection and satisfactory samples, startup of the facility shall be accomplished by the Facility Integrator, Programmer, Contractor, Sub-contractors, and manufacturer representatives, with the Owner and Engineer present. Commissioning shall include operation and verification of all control components and features of the entire Facility. Each function shall be demonstrated to the satisfaction of the Owner.

All components of the Facility that were calibrated during pre-startup shall be confirmed during startup.

### Repairs

All deficiencies observed during the startup will be corrected by the Contractor.

## Part 4 – Facilities Startup

The instrument test forms and startup procedures, included in **Appendix H**, shall be used for all devices requiring collaboration. Forms shall be submitted to the Engineer prior to requesting final acceptance data.

# 17.93 Training

***[CSI 40 61 26]***

## Part 1 – General

### Submittals

Submit index of all training offered by PLC system equipment manufacturers including operation and maintenance.

The Facility Integrator shall prepare and assemble specific instruction materials for each training session and shall supply such materials to the Owner at least 2 weeks prior to the time of the training.

The Programmer will provide additional training that is separate from this contract.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Part 3 – Execution

### Hands-On Training

The Facility Integrator shall conduct specifically organized training sessions in operation and maintenance of the Facility for personnel employed by the Owner. The training sessions shall be conducted to educate and train the personnel in maintenance and operation of all components of the Facility. Training shall include, but not be limited to, the following:

1. Preventative maintenance procedures
2. Troubleshooting
3. Calibration
4. Testing
5. Replacement of components

At least two separate training sessions, each at least 4 hours in duration, shall be conducted at the facility after startup of the system.

# 17.94 Documentation

# 17.94.2 Operations and Maintenance Manuals

*[CSI 40 80 23]*

## Part 1 – General

### Summary

Two types of operation and maintenance manuals (O&M) will be required for the contract:

1. General manuals for use by the Water Department staff for daily operation, maintenance, and troubleshooting.
2. Technical manuals for use by trained electronics technicians for technical and "board level" maintenance and repair.

### Submittals

Prior to the receipt of payment for more than 50 percent of the work, the Contractor shall deliver to the Owner five sets of acceptable manufacturer's operating and maintenance instructions covering each piece of mechanical and electrical equipment, or equipment assembly, furnished under this contract. Each set of instructions shall be bound into multiple volumes; each volume to be complete with and index and bound in a suitable hard-cover binder. Manuals shall be assembled and indexed so that information on each piece of equipment can be readily found. Any additional operating and maintenance instructions from the Programmer will be submitted separately.

### Quality Assurance

Manuals shall be purposefully made for this installation, and general manuals which are vague or have limited applicability will not be accepted. The manuals shall be written in a non-technical format suitable for reading by water system operators with no previous




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

automatic control equipment experience. The decision of the Owner on the acceptability of the manual shall be final.

## Part 2 – Products

### Materials

The Facility Integrator shall prepare and assemble detailed operation and maintenance manuals in accordance with the project general requirements. The manuals shall include, but not be limited to, the following:

1. Name, location and phone number of nearest supplier and spare part warehouse.
2. Step by step operating procedures.
3. Narrative of overall system performance and operation.
4. Listing of all equipment setpoints.
5. Preventative maintenance procedures
6. Troubleshooting of master and remote equipment.
7. Calibration
8. Testing
9. Replacement of components
10. System schematics / shop drawings
11. As-built elementary and one-line diagrams
12. Catalog data and complete parts list for all equipment and control devices
13. Listing of recommended spare parts.
14. Listing of recommended maintenance tools and equipment.
15. Warranties.
16. Disassembly and reassembly instructions.
17. Program documentation printout with tag numbers and descriptive comments.
18. Backup program on CD-ROM or flash drive.

All plans shall be provided on hard copy and in electronic form on disk. Electronic drawing files shall be provided in AutoCAD .DWG format with all "xrefs" bound. If "xrefs" are not bound, all "xref".DWG files shall be provided unlinked with instructions to reestablish the links. Files shall be in AutoCAD 2010 or later format.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 18.0 GENERAL

A. It is the intention of these specifications that performance of work under bid items shall result in complete construction, in proper operating condition, of improvements identified in these written specifications and accompanying plans. Work and material not specifically listed in the proposal but required according to the plans and specifications and general practice, shall be included in Contractor's bid price.

B. These bid items will include all equipment, labor, material, and transportation necessary to complete this work.

## SCHEDULE A – Base Bid (Non-FEMA)

This schedule includes items associated with general construction items.

## SCHEDULE B – Base Bid (FEMA)

This schedule includes items associated with reservoir seismic general construction items.

## SCHEDULE C – Alternate 1 (Non-FEMA)

This schedule includes items associated with finishes replacement and containment.

## SCHEDULE D – Alternate 2 (FEMA)

This schedule includes items associated with finishes repair.

## 850-725 Electrical

The lump sum price shown shall cover the complete cost of providing all labor, materials, equipment and incidentals necessary for the electrical work shown on the Plans and detailed in the specifications. This bid item includes the installation of instrumentation, motor control centers and control panels, site and facility electrical and signal conduits, conductors, junction boxes, handholes, coordination with facility integrator and programmer, and all other electrical work not covered elsewhere. Lump sum price shown shall cover the complete cost of providing all labor, materials, and equipment necessary for the automatic control system as shown on the Plans and detailed in the specifications.

## 850-735 Startup

The lump sum price shown shall cover the complete cost of Testing, Start-Up, Operation Demonstration, **Appendix H** checklist completion and Training and shall include all costs of providing the manufacturer's local representatives who shall be available to attend the testing, start-ups, and operation demonstration of all the equipment, including electrical and telemetry equipment, and to lubricate, monitor, adjust, balance and ensure normal operating function of each piece of equipment as often as required to provide a normal operating system. The lump sum price shall also include all costs incidental to training the Owner's staff on the operation and maintenance of the equipment installed including electrical and telemetry equipment as


© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

part of this Project. A lump sum price of $20,000 has been included in the Proposal for this work. Any additional costs anticipated or incurred by the Contractor for the work shall be included in the various lump sum and unit price bid items as found in the Proposal. Partial payment will not be allowed.

Payment shall be lump sum.

## 850-850 Reservoir Foundation

The lump sum price shown shall cover the complete cost of providing all labor, materials, and equipment necessary for construction of the reservoir foundation modifications as shown on the Plans and detailed in the specifications including foundation, concrete, CDF, rebar, seismic anchors, select backfill, and stainless steel piping through the foundation as shown on the Plans and detailed in the contract specifications.

Payment shall be lump sum.

850-852

## 850-855 Reservoir Center Column Repair

The force account price shown shall cover the complete cost of providing all labor, materials, and equipment necessary for the reservoir center column repair. It is unknown what the repairs will include until the roof vent is removed and the column inspected. Once the air vent is removed a structural inspection will be performed and a structural design and/or procedure shall be provided to the contractor for column repair or roof modification installation as necessary.

Payment shall be force account.

## 850-860 Reservoir Mechanical

The lump sum price shown shall cover the complete cost of providing all labor, materials, and equipment necessary for the mechanical work shown on the Plans and detailed in the specifications for the reservoir, including piping, check valves, hydraulic control valves, vaults, altitude valve, seismic equipment, pressure relief valves, pressure transducer, pressure gauges, pipe supports, valves, air vacuum release valves, flow meters, chlorine/pH/temperature analyzer, reservoir sample lines within the existing booster pump station, board, and drain piping, and all mechanical work and equipment not listed in the other bid items. For the reservoir inlet vault, components downstream of the vault inlet mechanical seal are to be included in this bid item. For the reservoir outlet vault, components upstream of and including the expansion joint are to be included.

Payment shall be lump sum.

## 850-862 Cathodic Protection

Lump sum price shown shall cover the complete cost of providing all materials, equipment and labor necessary for installing impressed current and galvanic cathodic protection systems at Hawks Prairie Standpipe Reservoir complete as shown on the Plans and detailed in the contract specifications including startup and testing.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

850-867 & 850-868

Payment shall be lump sum.

## 850-865 Reservoir Finishes (Exterior)

The lump sum price shown shall cover the complete cost of providing all labor, materials, and equipment necessary for the finish work on the reservoir as shown on the Plans and detailed in the specifications, including all exterior coating of the reservoir. Price shall also include all labor and equipment necessary for containment of the reservoir exterior to protect the environment and general public from air pollution and provide a suitable environment for surface preparat and curing. Price shall also include removal of containment after finishes are complete and approved by the coating inspector as detailed in the technical specifications Division 9.

850-872 & 850-873

Payment shall be lump sum.

## 850-870 Reservoir Finishes (Interior)

The lump sum price shown shall cover the complete cost of providing all labor, materials, and equipment necessary for the finish work on the reservoir as shown on the Plans and detailed in the specifications, including all interior coating of the reservoir.

Payment shall be lump sum.

## 850-875 Reservoir Disinfection

The lump sum shall cover the complete cost of providing all labor, materials, and equipment necessary for the reservoir testing and disinfection as identified in Division 1.75.16.50 Reservoir Testing and Disinfection.

Payment shall be lump sum.

## 850-885 Reservoir Structure

The lump sum price shown shall cover the complete cost of providing all labor, materials, and equipment necessary for modifications of the reservoir floor, shell and roof as shown on the Plans and detailed in the specifications including floor, shell, roof, interior column, roof supports, and other structural support members, as shown on the Plans and detailed in the contract specifications.

Payment shall be lump sum.

## 850-890 Reservoir Appurtenances

The lump sum price shown shall cover the complete cost of providing all labor, materials, and equipment necessary for construction of the reservoir appurtenances as shown on the Plans and detailed in the specifications including major and minor piping, platforms, access hatches, security fence, stairs, air vent, ladders, riser pipes, and all appurtenances as shown on the Plans and detailed in the contract specifications.

Payment shall be lump sum.




© 2026 RH2 Engineering, Inc.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# F

# PREVAILING WAGES

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# PREVAILING WAGE RATES

The following wage rates are in effect for this project.

**State of Washington**
**Department of Labor and Industries**
**Washington State Prevailing Wage Rates For Public Works Contracts**

**Thurston County Rates For All Trades**

**Effective: April 21, 2026 including any correction notices issued by Labor and Industries prior to bid.**

Wage Rates and the Benefit Code Key may be found at:
https://secure.lni.wa.gov/wagelookup/

Supplemental to State Wage Rates may be found at:
http://www.wsdot.wa.gov/Design/ProjectDev/WageRates/default.htm

A copy is also available for viewing at the City of Lacey Public Works Engineering office located at 420 College St SE, Lacey, WA 98503. If requested, a hard copy will be mailed to you.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# APPENDIX G

## COL RAM FORM

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| PROJECT: | SUBMITTAL NO. |
|---|---|
| LACEY CONTRACT NO. PW___-20____ | Date sent to City: |

# Request for Approval of Material, Product or Shop Drawing

| Contractor: | Subcontractor: |
|---|---|

| No. of Pages | Item: Material, Product or Shop Drawing | Specification Reference |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

☐ This item is as specified **OR** ☐ This item is a substitution/or equal
Material/Product Substitution Request shall be submitted

☐ Supplier/Subcontractor certifies material/product conforms to contract.

Review Priority: ☐ 1 ☐ 2 ☐ 3 Requested Due Date:

Notes to Engineer:

| City of Lacey Engineer: | Date Approved by City: |
|---|---|

| | |
|---|---|
| ☐ Rejected | New Submittal Required. |
| ☐ Revise and Resubmit | See Engineer's comments. |
| ☐ Conditionally Approved | See items included in Engineer's comments. |
| ☐ Conditionally Approved | No exceptions noted. |

Review of the materials, products or plans do not relieve the contractor from compliance with requirements of the contract documents and does not necessarily constitute acceptance for materials, products or plans to be incorporated in the work. This review is for general conformance of the project's conceptual design and general compliance with the project's plans and specifications.

| Date City Transmitted to Contractor: | Date Contractor Transmitted to Subcontractor/Supplier: |
|---|---|



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| Date Received by<br>City of Lacey: | Reviewed by:<br>(Name/Company) |
|---|---|

Engineer's Comments:

1.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| PROJECT: A | SUBMITTAL NO. C |
|---|---|
| LACEY CONTRACT NO. PW___-20____ B | |

# Request for Approval of Material, Product or Shop Drawing

| Contractor: D | Subcontractor: E |
|---|---|

| No. of Pages | Item: Material, Product or Shop Drawing | Specification Reference |
|---|---|---|
| F | G | H |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

☐ This item is as specified I1 **OR** ☐ This item is a substitution/or equal Material/Product Substitution Request shall be submitted I2

☐ Supplier/Subcontractor certifies material/product conforms to contract.

Review Priority: ☐ 1 K ☐ 2 ☐ 3 Requested Due Date: L

Notes to Engineer:

M

Section 1

| City of Lacey Engineer: R | Date City Transmitted to Contractor: S |
|---|---|
| ☐ Rejected | New Submittal Required. |
| ☐ Revise and Resubmit | See Engineer's comments. |
| ☐ Conditionally Approved | See items included in Engineer's comments. |
| ☐ Conditionally Approved | No exceptions noted. |

Q

Review of the materials, products or plans do not relieve the contractor from compliance with requirements of the contract documents and does not necessarily constitute acceptance for materials, products or plans to be incorporated in the work. This review is for general conformance of the project's conceptual design and general compliance with the project's plans and specifications.

| Date Received by Contractor: T | Date Returned to Subcontractor/Supplier: U |
|---|---|

Section 3



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| Date Received by City of Lacey: N | Reviewed by: (Name/Company) O |
|---|---|

Engineer's Comments:

1. P

Section 2



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Section 1

The **Project Manager** shall fill in items **A** and **B**. The "Request for Approval of Material, Products or Shop Drawing" form shall be included in the specifications.

**A** Project Manager enters in the project title that matches the plans and specifications.

**B** Project Manager enters in PW project number that matches the plans and specifications.

The **Contractor** shall fill out the "Request for Approval of Material, Product or Shop Drawing" form for all materials or products that will be installed and Shop Drawing that will be used in the project. The form and the submittal shall be sent in the same e-mail. Submittals that exceed 10 MB shall either be provided on a CD, a flash drive or an internet link.

The products and materials that are specific to the project shall be circled or highlighted. If a submittal includes products or materials that are not project specific then these items shall be crossed out. Project Submittals that exceed 10 pages shall be submitted in Adobe Acrobat format and include a table of contents. Submittals that are not submitted in this format may be rejected outright and the contractor will be required to resubmit in the correct format.

The contractor shall enter in items **C**, **D**, **E**, **F**, **G**, **H**, **I**, **J**, **K**, **L**, and **M**.

**C** Contractor enters in the submittal number. The first "Request for Approval of Material, Product or Shop Drawing" submittal number shall be 1.0, the second shall be 2.0, the third shall be 3.0, etc.

When a "Request for Approval of Material, Product or Shop Drawing" requires resubmitting, the next submittal shall be the first part of the submittal number and then 0.1. Example: If submittal 9.0 requires resubmitting, then the resubmittal shall be 9.1. If a second resubmittal is required, then the next resubmittal shall be 9.2.

**D** Contractor shall fill in their name.

**E** Contractor shall fill in the subcontractor that is requesting approval. If only the General Contractor is requesting approval, then NA (not applicable) shall be entered.

**F** The number of pages for each specific material, product or shop drawing shall be entered.

**G** The specific material, product or shop drawing shall be entered. Material or product will be the trade name of the product or the name it is most easily recognized by. Materials or products that are similar (i.e. pipe fittings) can be bundled into one submittal.

**H** The specification that pertains to the specific material, product or shop drawing shall be entered. This information is critical in comparing the material, product or shop drawing to the specifications. You may also list Plan Sheet number or Special Provision page in this area.

**I** The Contractor shall check if the items submitted are either specified (I1) or that the submitted item is a substitution or equal (I2). If the product is a substitute or equal, then a Material/Product Substitution Request shall be submitted.

**J** The Contractor shall check that supplier and/or subcontractor certifies the bid item.

**K** The Contractor shall check if the submittal for approval is a high (1), average (2) or low (3) priority. The City of Lacey will review priority submittals as quickly as possible. Note: The majority of the submittals shall be checked as priority 2 or 3. Priority 1 submittals shall be critical or long lead items.

**L** A due date can be entered by the contractor. The City of Lacey will endeavor to review and return the request for approval by the requested due date.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**M** Any additional notes that the Contractor finds would assist the City of Lacey in reviewing the submittal can be entered in here.

## Section 2

The **City of Lacey Engineer** shall fill in items **N**, **O** and **P**.

**N** Enter the date that the City of Lacey received the "Request for Approval of Material, Product or Shop Drawing" from the Contractor.

**O** Enter the name and company of the person that reviewed the submittal.

**P** Any comments regarding changes needed, resubmittals requirements, conditional approval, etc. shall be entered.

## Section 3

The **City of Lacey Engineer** shall fill in items **Q**, **R**, and **S**.

**Q** Either "Rejected: New Submittal Required.", "Review and Resubmit: See Engineer's comments.", "Conditionally Approved: See items included in Engineer's comments:", or "Conditionally Approved: No exceptions noted" shall be checked".

**R** Enter the name of the Engineer sending the submittal back to the Contractor. The Engineering sending the form back may not necessarily be the Engineer completing the review.

**S** Enter the date that the City of Lacey transmits the "Request for Approval of Material, Product or Shop Drawing" to the Contractor.

The **Contractor** shall enter in items **T** and **U** for their own records. If there is a discrepancy between the **S** "Date City Transmitted to Contractor" and **T,** the Contractor shall notify the City of Lacey within 3 working days.

**T** Contractor enters the date that they received the completed "Request for Approval of Material or Shop Drawing".

**U** Contractor enters the date that that they return the completed "Request for Approval of Material or Shop Drawing" to the Subcontractor/Supplier.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# APPENDIX H

# PRE-STARTUP
# &
# STARTUP CHECKLISTS

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill (Pre-Startup)
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill (Startup)

# PRE-STARTUP CHECKLIST

- Disinfection, Testing, and Dechlorination Plan approved by Contracting Agency
  a. Plan includes a description of the procedure, including the type of disinfectant and calculations indicating quantities of disinfectants required to produce specified chlorine concentrations.
  b. A manufacturer's certificate certifying that the disinfection products meet or exceed specified requirements

- Tank coating inspections have been conducted and approved.

- Inlet and outlet pipes have been pressure tested, disinfected, and have passed bacteriological tests.

- Tank interior is free of debris, dirts, films, form-release agents, etc.

- Manufacturers' representatives of transmitters, valves, and sensors are scheduled to be on-site during startup.

- Pre-Startup Checklists are complete:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill (Pre-Startup)
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill (Startup)

## PRE-STARTUP CHECKLISTS

**The following checklists shall be completed by the Contractor and submitted to the Inspector. Note that some inlet vault startup functions can be tested during tank filling for disinfection.**

1. **Inlet Vault and Reservoir Level:** While filling the reservoir for testing and disinfection per Division 1.75.16.50, proceed with commissioning and calibration of the reservoir pressure transmitter and inlet control valve, flowmeter, and pressure transmitter. Owner will confirm reservoir high level and altitude valve closed alarm's function. Confirm that the control valve closes at overflow elevation.

| INLET VALVE VAULTS MECHANICAL VERIFICATION | YES | NO |
|---|---|---|
| Hatch and latch operation | | |
| Depth (matches plans) | | |
| Ladder and safety bar operation and location | | |
| 316 stainless steel tubing on control valve | | |
| Vault drain/sump | | |
| All pipes corrosive coated/epoxy coated | | |
| Pipe jacks/structure supports | | |
| Clean and free of debris | | |
| Pressure sustaining feature of Control Valve functions | | |
| Control Valve closes at Overflow Water Elevation and when BPS pumps in operation | | |
| AIR RELEASE VERIFICATION | YES | NO |
| 316 stainless steel mounting and installation hardware | | |
| Insulated | | |
| | | |
| Easily accessible shut off valve | | |
| Clean and free of debris | | |
| INLET VALVE VAULTS FIELD WIRING VERIFICATION | YES | NO |
| PSI Transmitter constructed properly | | |
| Flow Meter grounded to grounding rings | | |
| Limit Switches adjusted properly | | |
| J-Box connections (NO Wire Nuts) | | |
| Correct sized wire, labeled and color coded properly | | |

2. **Reservoir Drain:** When first filling the reservoir for testing and disinfection per Division 1.75.16.50, proceed with flushing the reservoir drain and altitude valve sensing line. Confirm that reservoir drain and altitude valve sensing line function. Provide sufficient de-chlorination tablets in the storm drain structure to neutralize the chlorinated water during flushing of the drain.

| DRAIN VERIFICATION | YES | NO |
|---|---|---|
| Drain valve operates and reservoir drain functions | | |
| Altitude valve sensing line functions | | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill (Pre-Startup)
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill (Startup)

3. **Outlet Vault**

| OUTLET VALVE VAULTS MECHANICAL VERIFICATION | YES | NO |
|---|---|---|
| Hatch and latch operation | | |
| Depth (matches plans) | | |
| Ladder and safety bar operation and location | | |
| 316 stainless steel tubing on control valve | | |
| Vault drain/sump | | |
| All pipes corrosive coated/epoxy coated | | |
| Pipe jacks/structure supports | | |
| Clean and free of debris | | |
| Typically opened | | |
| Control valve closes in reverse flow, no leaks (step 2 above) | | |
| Seismic feature of Control valve functions | | |
| Sensing line from inlet piping functions | | |
| AIR RELEASE VERIFICATION | YES | NO |
| 316 stainless steel mounting and installation hardware | | |
| Insulated | | |
| | | |
| Easily accessible shut off valve | | |
| Clean and free of debris | | |
| OUTLET VALVE VAULTS FIELD WIRING VERIFICATION | YES | NO |
| PSI Transmitter constructed properly | | |
| Flow Meter grounded to grounding rings | | |
| Limit Switches adjusted properly | | |
| J-Box connections (NO Wire Nuts) | | |
| Correct sized wire, labeled and color coded properly | | |
| Seal offs are properly installed | | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill (Pre-Startup)
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill (Startup)

4. Reservoir, Mixing System, and Water Sampling:

| RESERVOIR FIELD WIRING VERIFICATION | YES | NO |
|---|---|---|
| Is the Level Transducer installed properly? | | |
| Is the Level Transducer Pulling Ell cap copper coated? | | |
| Is the hatch intrusion alarm installed properly? | | |
| FIELD WIRING FOR RESERVOIR CONTROL PANEL VERIFICATION | YES | NO |
| Received program on a thumb drive from TSI | | |
| Is the enclosure free from scratches, dents and clean? | | |
| Is the Main Control Cabinet level? | | |
| Doors and latches operational | | |
| Field wiring correct size, neat, labeled and color coded | | |
| | | |
| Check manuals for all parts | | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill (Pre-Startup)
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill (Startup)

5. **Contractor's Electrician:** Will confirm all AC power circuits, AC relay outputs, DC digital inputs, analog inputs and flow meter cabling are connected properly and function correctly.

| AC POWER CIRCUITS FROM PB01 | FUNCTION TESTED | |
|---|---|---|
| | YES | NO |
| Site Light - Connected Per Print – Wire Size/Color – Labeled on Both Ends | | |
| Site Light - Grounded in Hand Hole | | |
| Remote IO Panel - Connected Per Print – Wire Size/Color – Labeled on Both Ends | | |
| H2O Quality Analyzer - Connected Per Print – Wire Size/Color – Labeled on Both Ends | | |
| Seismic Control - Connected Per Print – Wire Size/Color – Labeled on Both Ends | | |
| Reservoir Roof Recp. - Connected Per Print – Wire Size/Color – Labeled on Both Ends | | |
| | | |
| | | |
| DC INPUT POINTS TO BOOSTER PLC | FUNCTION TESTED | |
| | YES | NO |
| CL2 Transmitter fail - Connected Per Print – Wire Size/Color – Labeled on Both Ends | | |
| PH Transmitter fail - Connected Per Print – Wire Size/Color – Labeled on Both Ends | | |
| | | |
| ANALOG INPUT POINTS TO BOOSTER PLC | | |
| | YES | NO |
| CL2 Transmitter - Connected Per Print – Labeled on Both Ends | | |
| PH Transmitter - Connected Per Print – Labeled on Both Ends | | |
| | | |
| | | |
| DIGITAL INPUT POINTS TO REMOTE IO PANEL | FUNCTION TESTED | |
| | YES | NO |
| Flex IO Power Fail-Connected Per Print-Wire Size/Color-Labeled Both Ends | | |
| Res. IO Panel Intrusion SW - Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Res. Hatch Intrusion SW - Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Res. Vent Intrusion SW - Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Altitude Valve SW- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Res. High Level Float- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Inlet Valve Flood SW- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Disch. Valve Flood SW- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Check Valve Flood SW - Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Inlet Flow Meter Pulse-Connected per Print-Wire Size/Color- Labeled Both Ends | | |
| Discharge Flow Meter Pulse-Connected Per Print-Wire Size/Color-Labeled Both Ends | | |
| Inlet Limit Switch Open/Closed-Connected Per Print-Wire Size/Color- Labeled Both Ends | | |
| Discharge Limit Switch Closed/Open-Connected Per Print-Wire Size/Color- Labeled Both Ends | | |
| Electrician Checklist Continued Next Page | | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill (Pre-Startup)
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill (Startup)

# PRE-STARTUP CHECKLIST

| Electrician Checklist Continued | | |
|---|---|---|
| | | |
| ANALOG INPUT POINTS TO REMOTE IO PANEL | | |
| | YES | NO |
| Reservoir Level - Connected Per Print – Labeled on Both Ends | | |
| Res. Inlet Flow Transmitter - Connected Per Print – Labeled on Both Ends | | |
| Res. Inlet Cla Val Position Sensor - Connected Per Print – Labeled on Both Ends | | |
| Res. Inlet PSI Transmitter - Connected Per Print – Labeled on Both Ends | | |
| Res. Disch. Flow Transmitter - Connected Per Print – Labeled on Both Ends | | |
| Res. Disch. Cla Val Position Sensor - Connected Per Print – Labeled on Both Ends | | |
| | | |
| DIGITAL INPUT TO MAIN CONTROL PANEL | | |
| Water Quality Analyzer General Alarm-Connected Per Print-Wire Size/Color- Labeled Both Ends | | |
| | | |
| AC RELAY OUTPUT POINTS FROM REMOTE IO PANEL | | |
| | YES | NO |
| Inlet Valve Seismic Sol. #1- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Inlet Valve Seismic Sol. #2- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Inlet Valve Seismic Sol. #3- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Inlet Valve Seismic Sol. #4- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Inlet Valve Seismic Latch Sol. #1- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Disch. Valve Seismic Sol. #1- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Disch. Valve Seismic Sol. #2- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Disch. Valve Seismic Sol. #3- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Disch. Valve Seismic Sol. #4- Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Disch. Valve Seismic Latch Sol #1. - Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| Check Valve Seismic Latching Sol. - Connected Per Print – Wire Size/Color – Labeled Both Ends | | |
| ANALOG INPUT POINTS TO MAIN CONTROL PANEL | | |
| Chlorine Transmitter-Connected Per Print-Wire Size/Color- Labeled Both Ends | | |
| pH Transmitter- Connected Per Print-Wire Size/Color-Labeled Both Ends | | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill (Pre-Startup)
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill (Startup)

## PRE-STARTUP CHECKLIST

6. **Contractor's Facility Integrator:** Will work with the Contractor's Electrician to test the inputs and to confirm all instruments function and are calibrated correctly. Will also coordinate with the Programmer and Contracting Agency to ensure the instruments and program values match.

| INSTRUMENT CALIBRATION | 4-20 mA Range | |
|---|---|---|
| CL2 Transmitter - | LOW | HIGH |
| PH Transmitter - | | |
| Reservoir Level - | | |
| Reservoir Inlet Flow Transmitter | | |
| Reservoir Inlet Cla Val Position Sensor | | |
| Reservoir Inlet PSI Transmitter | | |
| Reservoir Outlet Flow Transmitter | | |
| Reservoir Outlet Cla Val Position Sensor | | |
| | | |
| | | |
| | | |
| | | |
| | | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill (Pre-Startup)
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill (Startup)

## PRE-STARTUP CHECKLIST

7. **Telemetry and SCADA:** Owner and Programmer will confirm that alarms are functioning and that telemetry controls and SCADA are connected and functioning on-site and on Shop screens.

| Programmer Checklist | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| HPWTF SCREENS | | | SHOP SCREENS | | |
| | Yes | No | | Yes | No |
| | | | Previous and Next works | | |
| Reservoir Level | | | Reservoir Level | | |
| Inlet PSI | | | Inlet PSI | | |
| Discharge PSI | | | Discharge PSI | | |
| Inlet Flow | | | Inlet Flow | | |
| Discharge Flow | | | Discharge Flow | | |
| CL2 | | | CL2 | | |
| PH | | | PH | | |
| H2O Temp | | | H2O Temp | | |
| Well Call Set Points | | | Well Call Set Points | | |
| | | | | | |

| ALARMS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| HPWTF | | | SHOP | | | CALL OUT GROUP | | |
| | Yes | No | | Yes | No | | Trtm | H2O |
| Reservoir High Level | | | Reservoir High Level | | | Reservoir High Level | | |
| Reservoir Low Level | | | Reservoir Low Level | | | Reservoir Low Level | | |
| CL2 High Level | | | CL2 High Level | | | CL2 High Level | | |
| CL2 Low Level | | | CL2 Low Level | | | CL2 Low Level | | |
| Hatch Intrusion | | | Hatch Intrusion | | | Hatch Intrusion | | |
| IO Panel Intrusion | | | IO Panel Intrusion | | | IO Panel Intrusion | | |
| Security Gate Intrusion | | | Security Gate Intrusion | | | Security Gate Intrusion | | |
| Power Fail | | | Power Fail | | | Power Fail | | |
| Seismic | | | | | | | | |
| Flood | | | | | | | | |
| | | | | | | | | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill (Pre-Startup)
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill (Startup)

## STARTUP CHECKLIST

Coordination with the Owner, Programmer, and Contractor's Facility Integrator shall be required. Owner and Owner Representative will operate all existing and new telemetry controls, SCADA, and valves during testing. It is anticipated that the startup will take a minimum of 5 working days after reservoir testing, disinfection, and pre-startup are complete. Contractor shall be required to make corrections to equipment as necessary. Startup shall occur in the following order:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill (Pre-Startup)
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill (Startup)

## STARTUP CHECKLIST

1. **Telemetry and SCADA:** Owner and Programmer will confirm telemetry controls and SCADA are connected and functioning on-site and on Shop screens.

| Programmer Checklist Continued | | | | | |
|---|---|---|---|---|---|
| HPWTF SCREENS | | | SHOP SCREENS | | |
| | Yes | No | | Yes | No |
| | | | Previous and Next works | | |
| Reservoir Level | | | Reservoir Level | | |
| Inlet PSI trending | | | Inlet PSI trending | | |
| Discharge PSI trending | | | Discharge PSI trending | | |
| Inlet Flow trending | | | Inlet Flow trending | | |
| Discharge Flow trending | | | Discharge Flow trending | | |
| CL2 trending | | | CL2 trending | | |
| PH trending | | | PH trending | | |
| H2O Temp trending | | | H2O Temp trending | | |
| Well Call Set Points | | | Well Call Set Points | | |
| | | | | | |

| HPWTF SCREENS | SHOP SCREENS |
|---|---|
| Reservoir Level Scaling = 0 - ft.<br>Reservoir Over flow = ft.<br>Reservoir High Level = ft.<br>Reservoir Low Level = ft.<br>Current Reservoir Level = ft. | Reservoir Level Scaling = 0 - ft.<br>Reservoir Over flow = ft.<br>Reservoir High Level = ft.<br>Reservoir Low Level = ft.<br>Current Reservoir Level = ft. |
| Inlet PSI Scaling = 0 - psi<br>Current Inlet PSI Level = psi<br>Discharge. PSI Scaling = 0 - psi<br>Current Disch PSI Level = psi<br>Inlet Flow Scaling = 0 - gpm<br>Current Inlet Flow Level = gpm<br>Discharge Flow Scaling = 0 - gpm<br>Current Disch. Flow Level = gpm<br>CL2 Scaling = 0 - ppm<br>CL2 High Level = ppm<br>CL2 Low Level = ppm<br>Current CL2 Level = ppm<br>PH Scaling = 0 -<br>Current PH Level =<br>H2O Temp Scaling = 0 - °C/°F<br>Current H2O Temp = °C/°F | Inlet PSI Scaling = 0 - psi<br>Current Inlet PSI Level = psi<br>Discharge. PSI Scaling = 0 - psi<br>Current Disch PSI Level = psi<br>Inlet Flow Scaling = 0 - gpm<br>Current Inlet Flow Level = gpm<br>Discharge Flow Scaling = 0 - gpm<br>Current Disch. Flow Level = gpm<br>CL2 Scaling = 0 - ppm<br>CL2 High Level = ppm<br>CL2 Low Level = ppm<br>Current CL2 Level = ppm<br>PH Scaling = 0 -<br>Current PH Level =<br>H2O Temp Scaling = 0 - °C/°F<br>Current H2O Temp = °C/°F |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill

# PRESSURE TRANSMITTER STARTUP COMMISSIONING AND CALIBRATION

Date_____

Hawks Prairie Reservoir
Reservoir Level

Tested By_____

PIT-100 Pressure Indicate Transmitter
Manufacturer: Model #:

Serial No._____

| PSI TRANSMITTER SETTINGS |
|---|
| Is the PSI transmitter set to read Zero when the Valves are open to atmosphere _____ |
| Is the PSI transmitter programed to Full scale 20 mA at 150 PSIG _____ |

| STARTUP FIELD TEST RESULTS | | | | | | |
|---|---|---|---|---|---|---|
| Tank Empty | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| Tank at Over Flow | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| | | | | | | |
| | | | | | | |
| | | | | | | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill

# PRESSURE TRANSMITTER STARTUP COMMISSIONING AND CALIBRATION

Date_____

Tested By_____

Hawks Prairie Reservoir
Inlet Valve Vault

PIT-100 Pressure Indicate Transmitter
Manufacturer: Model #:

Serial No._____

| PSI TRANSMITTER SETTINGS |
|---|
| Is the PSI transmitter set to read Zero when the Valves are open to atmosphere _____ |
| Is the PSI transmitter programed to Full scale 20 mA at 150 PSIG _____ |

| STARTUP FIELD TEST RESULTS | | | | | | |
|---|---|---|---|---|---|---|
| At _____gpm low flow | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| At _____gpm medium flow | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| At _____gpm high flow | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill

# FLOW METER STARTUP COMMISSIONING AND CALIBRATION

Date_____ Hawks Prairie Reservoir
Tested By_____ Inlet Piping

FE-100 Flow Element

Manufacturer:

Model No.: Serial No.:

FIT-100 Flow Indicate Controller

Manufacturer:

Model No.: Serial No.:

| FLOW METER SETTINGS |
|---|
| Flow Meter Maximum Flow setting = 8,000 US G /Min |
| Pulse output setting: Volume/pulse = 1,000 US G _____ |

| FLOW METER TOTALIZER TEST | | | |
|---|---|---|---|
| Flow meter reading before filling or pump cycle | | Flow meter reading after filling or pump cycle | |
| Panel View reading before filling or pump cycle | | Panel View reading after filling or pump cycle | |

Filling HP Reservoir by itself

| STARTUP FIELD TEST RESULTS | | | |
|---|---|---|---|
| Flow meter reading with _____gpm flow low = | | Panel View reading at ____gpm low flow = | |
| Flow meter reading with ____gpm medium flow = | | Panel View reading at _____gpm medium flow = | |
| Flow meter reading with _____gpm high flow = | | Panel View reading at ____gpm high flow = | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill

2. **Reservoir, Mixing System, and Water Sampling:** While filling the reservoir, test that the mixing system is functioning per manufacturer's recommendations. Provide appropriate equipment, cameras, and/or lighting to inspect interior of tank from roof hatch and platform. Proceed with inspection and commissioning of the control panel on the reservoir and the sampling analyzers. Owner will confirm hatch intrusion, CL2 analyzer fail, and control voltage fail alarms function.

| SAMPLING VERIFICATION | YES | NO |
|---|---|---|
| CL2 Residual reading | | |
| Water pH reading | | |
| | | |

3. **Outlet Vaults:** Once the new reservoir passes testing and disinfection, proceed with the commissioning and calibration of the outlet control valve, flowmeter, and pressure transmitter. Before running the fire flow pump or 3 pumps simultaneously at the BPS, the Owner will ensure other tanks in the system are prepared to absorb the additional system supply flow. The outlet control valves and flowmeter will be tested in two configurations. The first configuration will be with the HP Standpipe and the HP Reservoir feeding the BPS together. The second configuration will be with the HP Reservoir feeding the BPS alone. Test the seismic valve function per manufacturer's recommendations.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill

# PRESSURE TRANSMITTER STARTUP COMMISSIONING AND CALIBRATION

Date_____

Tested By_____

Hawks Prairie Reservoir
Outlet Valve Vault

PIT-100 Pressure Indicate Transmitter
Manufacturer: Model #:

Serial No._____

| PSI TRANSMITTER SETTINGS |
|---|
| Is the PSI transmitter set to read Zero when the Valves are open to atmosphere _____ |
| Is the PSI transmitter programed to Full scale 20 mA at 150 PSIG _____ |

Hawks Prairie Sister Standpipe is Online

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 pumps running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| Pump 1 running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| Pump 2 running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| Pump 3 running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| Pump 4 running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| 2 pumps running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| 3 pumps running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |

Hawks Prairie Sister Standpipe is Offline

| STARTUP FIELD TEST RESULTS | | | | | | |
|---|---|---|---|---|---|---|
| 0 pumps running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| Pump 1 running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| Pump 2 running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| Pump 3 running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| Pump 4 running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| 2 pumps running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |
| 3 pumps running | PSI XMTR reading = | | Gauge reading = | | PNL View reading = | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill

# FLOW METER STARTUP COMMISSIONING AND CALIBRATION

Date_____ Hawks Prairie Reservoir
Tested By_____ Outlet Piping

FE-100 Flow Element

Manufacturer:

Model No.: Serial No.:

FIT-100 Flow Indicate Controller

Manufacturer:

Model No.: Serial No.:

| FLOW METER SETTINGS |
|---|
| Flow Meter Maximum Flow setting = 8,000 US G/Min |
| Pulse output setting: Volume/pulse = 1,000 US G |

| FLOW METER TOTALIZER TEST | | | |
|---|---|---|---|
| Flow meter reading before filling or pump cycle | | Flow meter reading after filling or pump cycle | |
| Panel View reading before filling or pump cycle | | Panel View reading after filling or pump cycle | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill

Hawks Prairie Sister Standpipe is Online, BPS pumps

| STARTUP FIELD TEST RESULTS | | | |
|---|---|---|---|
| Flow meter reading with 0 pumps running = | | Panel View reading with 0 pumps running = | |
| HP Reservoir | | HP Reservoir | |
| HP Standpipe | | HP Standpipe | |
| Flow meter reading with pump 1 running = | | Panel View reading with pump 1 running = | |
| HP Reservoir | | HP Reservoir | |
| HP Standpipe | | HP Standpipe | |
| Flow meter reading with pump 2 running = | | Panel View reading with pump 2 running = | |
| HP Reservoir | | HP Reservoir | |
| HP Standpipe | | HP Standpipe | |
| Flow meter reading with pump 3 running = | | Panel View reading with pump 3 running = | |
| HP Reservoir | | HP Reservoir | |
| HP Standpipe | | HP Standpipe | |
| Flow meter reading with pump 4 running= | | Panel View reading with pump 4 running= | |
| HP Reservoir | | HP Reservoir | |
| HP Standpipe | | HP Standpipe | |
| Flow meter reading with 2 pumps running = | | Panel View reading with 2 pumps running = | |
| HP Reservoir | | HP Reservoir | |
| HP Standpipe | | HP Standpipe | |
| Flow meter reading with 3 pumps running = | | Panel View reading with 3 pumps running = | |
| HP Reservoir | | HP Reservoir | |
| HP Standpipe | | HP Standpipe | |

Hawks Prairie Sister Standpipe is Offline, BPS pumps

| STARTUP FIELD TEST RESULTS | | | |
|---|---|---|---|
| Flow meter reading with 0 pumps running = | | Panel View reading with 0 pumps running = | |
| Flow meter reading with pump 1 running = | | Panel View reading with pump 1 running = | |
| Flow meter reading with pump 2 running = | | Panel View reading with pump 2 running = | |
| Flow meter reading with pump 3 running = | | Panel View reading with pump 3 running = | |
| Flow meter reading with pump 4 running= | | Panel View reading with pump 4 running= | |
| Flow meter reading with 2 pumps running = | | Panel View reading with 2 pumps running = | |
| Flow meter reading with 3 pumps running = | | Panel View reading with 3 pumps running = | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Key: Red-Test Before Reservoir Fill
Purple-Test During Reservoir Fill
Blue-Test After Reservoir Fill

4. **Balancing Reservoirs:** After testing the outlet vaults, Owner will lower both reservoir levels by 10 feet. It is anticipated that the lowering of the reservoirs will take at least one day. Both reservoirs will then be filled simultaneously. Confirm that the inlet control valves close when the BPS runs. Owner and Programmer will adjust the programming of both inlet control valves during testing.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# APPENDIX I
# APPRENTICESHIP UTILIZATION PLAN

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Washington State Department of Transportation

# Apprentice Utilization Plan

**To be submitted no later than thirty (30) days following Execution**

| Contract Title | Contract Number | Today's Date |
|---|---|---|
| | | |

| Prime Contractor | Apprentice Utilization Requirement |
|---|---|
| | |

*Include all labor hours for all trades (including apprentice hours), including those performed by Subcontractors. Use additional sheets if needed.

| | | | | Estimated | |
|---|---|---|---|---|---|
| Start Date (mm/dd/yy) | Contractor or Subcontractor | Trade/Craft | Trade/Craft Other Description | Total Labor* (Hours) | Apprentice (Hours) |
| | | | | | |
| | | | | | |
| | | | | |

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# APPENDIX J

# CITY PROCURED PERMITS

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# CSWGP

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

STATE OF WASHINGTON
**DEPARTMENT OF ECOLOGY**
PO Box 47600, Olympia, WA 98504-7600 • 360-407-6000

August 25, 2025

Ryan Jewell
City of Lacey
420 College St SE
Lacey, WA 98503
Sent by email only: Ryan.Jewell@CityofLacey.org

**RE: Coverage under the Construction Stormwater General Permit**

| | |
|---|---|
| **Permit number:** | **WAR314848** |
| **Site Name:** | **Hawks Prairie Reservoir Rehabilitation** |
| **Location:** | **4040 Marvin Rd SE** |
| | **Lacey County: Thurston** |
| **Disturbed Acres:** | **1.2** |

Dear Ryan Jewell:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Construction Stormwater General Permit (CSWGP). This is your permit coverage letter. Your permit coverage is effective August 25, 2025.

Retain this letter as an official record of permit coverage for your site. You may keep your records in electronic format if you can easily access them from your construction site. You can get the CSWGP, permit forms, and other information at Ecology's CSWGP eCoverage Packet webpage[1]. Contact your Permit Administrator, listed below, if you want a copy of the CSWGP mailed to you. Please read the permit and contact Ecology if you have any questions.

**Electronic Discharge Monitoring Reports (WQWebDMR)**
This permit requires you to submit monthly discharge monitoring reports (DMRs) for the full duration of permit coverage (from the first full month of coverage to termination). Your first sampling and reporting period will be for the month of **September, 2025** and your first DMR must be submitted by **October 15, 2025**.

You must submit your DMRs electronically using Ecology's secure online system, WQWebDMR. To sign up for WQWebDMR go to Ecology's WQWebPortal guidance webpage[2]. If you have

[1] http://www.ecology.wa.gov/eCoverage-packet
[2] https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

questions, contact the portal staff at (360) 407-7097 (Olympia area), or (800) 633-6193/Option 3, or email WQWebPortal@ecy.wa.gov.

**Appeal Process**

You have a right to appeal coverage under the general permit to the Pollution Control Hearing Board (PCHB). Appeals must be filed within 30 days of the date of receipt of this letter. Any appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2). For more information regarding your right to appeal, please reference Ecology's Focus Sheet: *Appeal of General Permit Coverage*[3].

**Annual Permit Fees**

RCW 90.48.465 requires Ecology to recover the costs of managing the permit program. Permit fees are invoiced annually until the permit is terminated. Termination conditions are described in the permit. For permit fee related questions, please contact the Water Quality Fee Unit at wqfeeunit@ecy.wa.gov or (800) 633-6193/Option 2. You can also visit Water Quality Permit Fees Webpage[4] for more information.

**Ecology Field Inspector Assistance**

If you have questions regarding stormwater management at your construction site, please contact your Regional Inspector, Jacob Neuharth of Ecology's Southwest Regional Office in Lacey at Jacob.neuharth@ecy.wa.gov or (360) 742-9751

**Questions or Additional Information**

Ecology is here to help. Please review our Construction Stormwater General Permit webpage[5] for more information. If you have questions about the Construction Stormwater General Permit, please contact your Permit Administrator, Jasper Sogn at jasper.sogn@ecy.wa.gov or (360) 972-6524.

Sincerely,

Jeff Killelea, Manager
Permit and Technical Services Section
Water Quality Program

[3] https://apps.ecology.wa.gov/publications/summarypages/1710007.html
[4] https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Fees
[5] www.ecology.wa.gov/constructionstormwaterpermit

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Instructions for Transfer of Coverage
# Construction Stormwater General Permit

**Instructions**

This form is used to process two types of permit transfers: 1) Complete Transfer, or 2) Partial Transfer. Determine which type of transfer applies to your situation before filling out this form.

**1. Complete Transfer:** The original permittee has sold or otherwise released control of the entire site to another party.

**Required Paperwork for Complete Transfer**:

- Either the current permittee, or the new permittee(s), must submit a complete and accurate Transfer of Coverage form to Ecology for each new party. The form must be signed by the current permittee ***and*** the new permittee. Please include a site map.

**2. Partial Transfer:** The original permittee retains control over some portion of the site after selling or releasing control over a portion of the site.

**Required Paperwork for Partial Transfer**

- Either the current permittee or the new permittee(s) must submit a complete and accurate Transfer of Coverage Form for each new operator to Ecology. The form must be signed by the current permittee and the new permittee. Please include site maps.
- For partial transfers, once all transfers are submitted, the original permittee should submit the Notice of Termination only if the portion(s) they still own or control have undergone final stabilization and meet the criteria for termination.

**For Your Information**

- When this form is 1) completed, 2) signed by the current and new permittee, and 3) submitted to Ecology, permit transfers are effective on the date specified at the top of page 1 (unless Ecology notifies the current permittee and new permittee of its intention to revoke coverage under the General Permit or if Ecology sends notice that the application is incomplete). If no date for the transfer of coverage is specified, Ecology will use the date of the last signature.
- The new permittee should keep a copy of the signed Transfer of Coverage form (which serves as proof of permit coverage) until Ecology sends documentation in the mail.
- Following the transfer, the new permittee must either: (1) use the Stormwater Pollution Prevention Plan (SWPPP) developed by the original operator, and modified as necessary, or (2) develop and use a new SWPPP that meets the requirements of the Construction Stormwater General Permit.
- For projects for which the original permittee has completed a Proposed New Discharge to an Impaired Waterbody Form (ECY 070-399), or for projects that are operating on sites with soil or groundwater contamination: Upon completion of the Transfer of Coverage form, the new permittee will adopt any special provisions made to protect water quality for sites that have existing contamination or that discharge to an impaired waterbody.

To request ADA accommodation including materials in a format for the visually impaired, call the Water Quality Program at 360-407-6600 or visit **Department of Ecology's Accessibility & the Americans with Disabilities Act (ADA) Webpage**[1]. People with impaired hearing may call Washington Relay Service at 711. People with speech disability may call TYY at 877-833-6341.

[1] https://ecology.wa.gov/about-us/accessibility-equity/accessibility



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

DEPARTMENT OF ECOLOGY
State of Washington

# Construction Stormwater General Permit
# Transfer of Coverage

This form transfers permit of coverage for all, or a portion of a site to one or more new operators.

## General Information

Permit #WAR 314848

**Type of permit transfer (choose one):**

☐ Partial transfer (complete the Partial Transfer acreage below) | ☑ Complete/Full Transfer

**Specific date that permit responsibility, coverage, and liability is transferred to new operator:**

***If no date is indicated Ecology will determine the date of transfer.**

Please see instructions for details on type of transfer:

---

**For PARTIAL TRANSFERS indicate the acreage remaining under your operational control:**

- List **total size of project/site** remaining under your operational control following the **partial transfer:** acres.
- List **total area of soil disturbance** remaining under your operational control following the **partial transfer:** acres.
- Submitting this form meets the requirement to submit an updated NOI (General Permit Condition G9)

---

## Current Operator/Permittee Information

Current Operator/Permittee Name: Ryan Jewell

Company: City of Lacey

Business Phone: 564-669-4232

Ext.:

Cell Phone: 564-669-4232

Email: Ryan.Jewell@CityofLacey.org

Mailing Address: 420 College St SE

City: Lacey

State: WA

Zip+4: 98503

**Signature* (see signatory requirements in Section VIII)**

Title: Utility Engineer

Date: 5/05/26

ECY 020-87a (10/2025)

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## New Operator/Permittee Information

(the remainder of this form applies to the **new** Operator/Permittee)

### I. New Operator/Permittee

(Party with operational control over plans and specifications or day-today operational control of activities which ensure compliance with Stormwater Pollution Prevention Plan (SWPPP) and permit conditions. Ecology will send correspondence and permit fee invoices to the permittee on record.)

Name:

Company:

E-mail:

Unified Business Identifier (UBI):

*(UBI is a nine-digit number used to identify a business entity*. **Write "none" if you do not have a UBI number**.)

Business Phone:

Ext.:

Cell Phone (optional):

Mailing Address:

City:

State:

Zip + 4:

### II. Property Owner

**(**The party listed on the County Assessor's records as owner and taxpayer of the parcel[s] for which permit coverage is requested. Ecology will **not** send correspondence and permit fee invoices to the Property Owner unless he/she is also the permittee. The Property Owner information will be used for emergency contact purposes.)

Name: City of Lacey

Company: City of Lacey

Business Phone: 564-669-4232

Ext.:

Unified Business Identifier (UBI):

(UBI is a nine-digit number used to identify a business entity. **Write "none" if you do not have a UBI number**.)

Cell Phone (optional): 564-669-4232

E-mail: Ryan.Jewell@CityofLacey.org

Mailing Address: 420 College St SE

City: Lacey

State: WA

Zip + 4: 98503

### III. On-Site Contact Person(s)

(Typically, the Certified Erosion and Sediment Control Lead or Operator/Permittee)

Name:

Company:

Business Phone:

Ext.:

Cell Phone:

Email:

Mailing Address:

City:

State:

Zip+4:

### IV. Site/Project Information

Site or Project Name Hawks Prairie Reservoir Rehabilitation; 4040 Marvin Road NE

Street Address or Location Description

City (or nearest city): Lacey County: Thurston Zip Code: 98516



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

(If the site lacks a street address, list its specific location. For example, Intersection of Highway 61 and 34.)

Parcel ID#: (optional)

Type of Construction Activity (check all that apply):

- ☐ Residential
- ☐ Commercial
- ☐ Industrial
- ☐ Highway or Road (city, county, state)
- ☑ Utilities
- ☐ Other (specify):

**Site Acreage**

Total size of your site/project (that you own/control): 5.7 acres.

Total area of soil disturbance for your site/project over the life of the project: 1.2 acres.
Including grading, equipment staging, excavation, borrow pit, material storage areas, dump areas, haul roads, side-cast areas, off-site construction support areas, and all other soil disturbance acreage associated with the project. (Note: 1 acre=43,560 sq. ft.)

Estimated project start-up date (mm/dd/yy): 06/01/2026

Estimated project completion date (mm/dd/yy): 10/01/2027

Record the latitude and longitude of the *main entrance* to the site or the approximate center of site:

Latitude: 47.089459 Longitude: -122.779850

## V. Existing Site Conditions

1. Are you aware of contaminated soils present on the site? ☐ Yes ☑ No
2. Are you aware of groundwater contamination located within the site boundary? ☐ Yes ☑ No
3. If you answered yes to questions 1 or 2, will any contaminated soils be disturbed, or will any contaminated groundwater be discharged due to the proposed construction activity? ☐ Yes ☐ No

("Contaminated" and "contamination" here mean containing any hazardous substance (as defined in WAC 173-340-200) that does not occur naturally or occurs at greater than natural background levels.)

If you answered yes to Question 3, please provide detailed information with the NOI (as known and readily available) on the nature and extent of the contamination (concentrations, locations, and depth), as well as pollution prevention and/or treatment Best Management Practices (BMPs) proposed to control the discharge of soil and/or groundwater contaminants in stormwater. This should include information that would be included in related portions of the Stormwater Pollution Prevention Plan (SWPPP) that describe how contaminated and potentially contaminated construction stormwater and dewatering water will be managed.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## VI. WQWebDMR (Electronic Discharge Monitoring Reporting)

**You must submit monthly discharge monitoring reports using Ecology's WQWebDMR system.**

To sign up for WQWebDMR, or to register a new site, go to WQWebPortal[2]. If you are unable to submit your DMRs electronically, you may contact Ecology to request a waiver. Ecology will generally only grant waiver requests to those permittees without Internet access. Only a permittee or representative, designated in writing, may request access to or a waiver from WQWebDMR. To have the ability to use the system immediately, **you must submit the Electronic Signature Agreement with your transfer of coverage form.** If you have questions on this process, contact Ecology's WQWebDMR staff at WQWebPortal@ecy.wa.gov or 800-633-6193 or 360-407-7097 (local).

## VII. Discharge/Receiving Water Information

Indicate whether your site's stormwater and/or dewatering water could enter surface waters, **directly** and/or **indirectly**:

☑ Water will discharge directly or indirectly (through a storm drain system or roadside ditch) into one or more surface waterbodies (wetlands, creeks, lakes, and all other surface waters and water courses).

If your discharge is to a storm sewer system, provide the name of the operator of the storm sewer system:

(e.g., City of Tacoma): City of Lacey

☐ Water will discharge to ground with 100% infiltration, with no potential to reach surface waters under any conditions.

If your project includes dewatering, you **must** include dewatering plans and discharge locations in your site Stormwater Pollution Prevention Plan.

**Location of Outfall into Surface Waterbody**

Enter the outfall identifier code, waterbody name, and latitude/longitude of the point(s) where the site has the potential to discharge into a waterbody (the outfall). Enter all locations. **See illustration of Surface Waterbody Outfall locations at the end of this form.**

- Include the names and locations of both direct and indirect discharges to surface waterbodies, even if the risk of discharge is low or limited to periods of extreme weather. **Attach a separate list if necessary.**
- Give each point a unique 1–4-digit alpha numeric code. This code will be used for identifying these points in WQWebDMR.
- Some large construction projects (for example, subdivisions, roads, or pipelines) may discharge into several waterbodies.
- If the creek or tributary is unnamed, use a format such as "unnamed tributary to Deschutes River."
- If the site discharges to a stormwater conveyance system that in turn flows to a surface waterbody, include the surface waterbody name and location.

[2] https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| Outfall Identifier Code. These cannot be symbols. (Maximum of four characters). | | | | Surface Waterbody Name at the Outfall | Latitude | Longitude |
|---|---|---|---|---|---|---|
| **Example**: 001A | | | | **Example:** Puget Sound | 47.5289047 | -122.3123550 |
| 0 | 0 | 1 | | Stormpond | 47.089394 | -122.778798 |
| 0 | 0 | 2 | | Infiltration Structur | 47.089542 | -122.780550 |
| 0 | 0 | 3 | | Catch Basin | 47.090392 | -122.779941 |

If your site discharges to a waterbody that is on the impaired waterbodies list (e.g., 303[d] list) for turbidity, fine sediment, high pH, low dissolved oxygen or phosphorus, Ecology will require additional documentation before issuing permit coverage and these sites will be subject to additional sampling and numeric effluent limits (per Permit Condition S8). Ecology will notify you if any additional sampling requirements apply. Information on impaired waterbodies is available online at: Water Quality Assessment & 303(d)List[3]

**Before signing, please use the following checklist to ensure this form is complete:**

☐ All spaces on this form have been completed. (Attach additional sheets if necessary)

☐ The transfer form has been signed by both the current permittee (see Page 1) ***and*** the new permittee (see Section VIII below).

☐ The date permit responsibility was transferred is specified. (See Page 1)

☐ New Operator/Permittee: Before you submit this form to Ecology, please retain a copy for your records – this will serve as proof of permit coverage until documentation arrives from Ecology.

☐ For partial transfers: If the original permittee no longer owns or controls any portions of the site that meet the criteria for termination, the original permittee must submit a Notice of Termination (NOT) to terminate permit coverage. See the CSWGP website for a link to the NOT form: Notice of Termination Form[4]

☐ For sites with contaminated soils/groundwater or a new discharge to an impaired waterbody: Any special provisions to protect water quality put in place at the time of initial coverage have been reviewed and adopted by the new permittee.

Administrative Order Docket No.

[3] http://www.ecy.wa.gov/programs/wq/303d/index.html

[4] https://apps.ecology.wa.gov/publications/documents/ecy02087.pdf



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## VIII. Certification of New Permittee

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

| Printed/Typed Name | Company (operator/permittee only) | Title |
|---|---|---|
| Signature of New Operator/Permittee | | Date |

*** Signature of Operator/Permittee requirements:**

A. For a corporation: By a responsible corporate officer.

B. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively.

C. For a municipality, state, federal, or other public facility: By either a principal executive officer or ranking elected official.

To request ADA accommodation including materials in a format for the visually impaired, call the Water Quality Program at 360-407-6600 or visit **Department of Ecology's Accessibility & the Americans with Disabilities Act (ADA) Webpage**[5]. People with impaired hearing may call Washington Relay Service at 711. People with speech disability may call TYY at 877-833-6341.

Please sign and email a copy of the completed form and attachments to ecyrewqianoi@ecy.wa.gov, then mail this **ORIGINAL** document to the following address:

Department of Ecology
Attn: Water Quality Program, Construction Stormwater

PO Box 47696

Olympia, WA 98504-7696

If you have questions, please contact the appropriate permit administrator based on project location. Contact information can be found at: Construction Stormwater General Permit-Washington State Department of Ecology[6].

[5] https://ecology.wa.gov/about-us/accessibility-equity/accessibility

[6] https://ecology.wa.gov/regulations-permits/permits-certifications/stormwater-general-permits/construction-stormwater-permit#contact:~:text=Stormwater%20Manuals-,Contact%20information,-Please%20find%20your

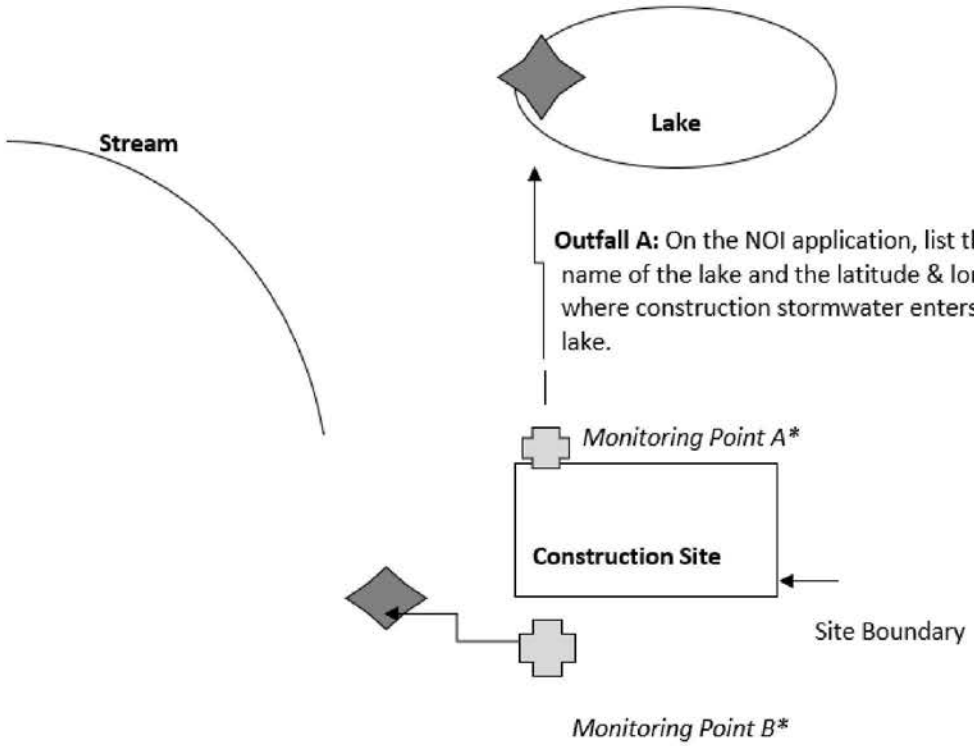


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**You must submit monthly discharge monitoring reports using Ecology's WQWebDMR system**. To sign up for WQWebDMR, or to register a new site, go to WQWebPortal Guidance[7]. If you are unable to submit your DMRs electronically, you may contact Ecology to request a waiver. Ecology will generally only grant waiver requests to those permittees without internet access. Only a permittee or representative, designated in writing, may request access to or a waiver from WQWebDMR. To have the ability to use the system immediately, **you must submit the Electronic Signature Agreement with your application**.

If you have questions on this process, contact Ecology's WQWebDMR staff at WQWebPortal@ecy.wa.gov or 800-633-6193
or 360-407-7097 (local).

**Example Surface Waterbody Outfall location for Section IX:**




*Note: The monitoring points are for illustration only and are not required on this Notice of Intent application form. Monitoring point information will be entered on the monthly discharge monitoring report as required for active permits.

[7] https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# BUILDING PERMIT FORMS

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

PLEASE EMAIL APPLICATION AND REQUIRED DOCUMENTS TO BUILD@CITYOFLACEY.ORG

**CITY OF LACEY**
Community & Economic Development Department
420 College Street SE
Lacey, WA 98503
(360) 491-5642

# MISCELLANEOUS BUILDING PERMIT APPLICATION

☑ **INCLUDED A SET OF CONSTRUCTION PLANS, STRUCTURAL CALCULATIONS, A FULLY DIMENSIONED SITE PLAN, AND A DETAILED LANDSCAPING PLAN, IF APPLICABLE. A 65% PLAN CHECK FEE MAY BE REQUIRED AT TIME OF SUBMITTAL.**

| **Type of Permit (check one):** | ☐ | **RESIDENTIAL** | ☑ | **COMMERCIAL** |
|---|---|---|---|---|

Project Address: 4040 Marvin Road NE Suite: Parcel Number: 11935310200

Project Value: $8,000,000 Construction Type: Reservoir Retrofit Occupancy Type:

**Proposed Scope of Work:** Construction of structural modifications to the foundation and roof of the 4MG Hawks Prairie Reservoir, site improvements, and replacing inlet and outlet vaults and appurtenances.

**OWNER:** City of Lacey Phone Number: 564-669-4232

Address: 420 College St SE City: Lacey State: WA Zip: 98503

**TENANT:**

**CONTACT PERSON:** Ryan Jewell Address: 420 College St SE

Phone Number: 564-669-4232 Cell Phone: 568-669-4232 Email: Ryan.Jewell@CityOfL

**General Contractor:** Phone: Email:

Address: City: State: Zip:

Contractor's License No. Exp: Lacey Endorsement #

I hereby certify that the above information is correct and that the construction on, and the occupancy and the use of the above described property will be in accordance with the laws, rules and regulations of the State of Washington.

Ryan Jewell Digitally signed by Ryan Jewell DN: CN=Ryan Jewell, OU=PW, OU=Users, OU=LaceyNT, DC=LACEYNT, DC=LOCAL Date: 2025.10.20 07:52:29-07'00'

Applicant's Signature | Ryan Jewell (Print Applicant's Name) | 10/20/2025 (Date)

FORM: MISC-2

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**CITY OF LACEY**
Community & Economic Development Department
420 College Street SE
Lacey, WA 98503
(360) 491-5642

# SPECIAL INSPECTION AND TESTING AGREEMENT

## City of Lacey Building Department

**Permit # _____**

Prior to issuance of a permit, this form must be completed in its entirety and returned to the City for approval. The completed form must have the original signatures of acknowledgement of all parties.

Project: Hawks Prairie Reservoir Rehabilitation

Address: 4040 Marvin Road NE, Lacey WA, 98516

Owner: City of Lacey

Architect: N/A

Engineer: RH2 Engineering, Inc.

Contractor: TBD

## DUTIES AND RESPONSIBILITIES

**Special Inspection Firm and Special Inspectors:**

The Special Inspection firm of Intertek will perform special inspection for the following types of work (separate forms must be submitted if more than one firm is to be employed):

| | |
|---|---|
| Reinforced Concrete | ( ) |
| Bolting in Concrete | ( ) |
| Pre-stressed Concrete | ( ) |
| Shotcrete | ( ) |
| Structural Masonry | ( ) |
| Structural Steel & Welding | ( ) |
| High-Strength Bolting | ( ) |
| Spray-Applied Fireproofing | ( ) |
| Smoke-Control Systems | ( ) |
| Grading* | ( ) |
| Other | (✓) Specify: Tank coating inspection |

**Grading does not require WABO certification.*

All individual inspectors to be employed on this project will be WABO certified for the type of inspection they are to perform. If inspection is for work that is not covered by the WABO categories, a detailed resume of the inspector and firm must be submitted. The resume must show the inspector and firm are qualified to perform the work and testing required by the project design and specifications.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The work shall be inspected for conformance with the plans and specifications approved by the City. Revisions and addenda sheets will not be used for inspection unless they have been approved by the City. The special inspector shall report to the City any revisions that are not approved.

A daily record will be maintained on site itemizing the inspections performed, for the review of all parties. Any nonconforming items shall be brought to the immediate attention of the contractor for resolution. A weekly report shall be submitted to the City; detailing the inspections and testing performed, listing any nonconforming items and resolution of nonconforming items. Unresolved nonconforming items will be detailed on a discrepancy report and presented to the building department.

A final report shall be submitted to the building department prior to the Certificate of Occupancy being issued. This report will indicate that inspection and testing was completed in conformance with the approved plans, specifications and approved revisions or addenda. Any unresolved discrepancies must be detailed in the final report.

The special inspector and special inspection firm serve in the role as "deputy" City of Lacey inspectors and as such are responsible to the City of Lacey Building Department in the performance of the required work.

**Contractor:**
The contractor shall provide the special inspector or agency adequate notification of work requiring inspection.

The city approved plans and specifications must be made available, at the job site for the use of the special inspector and the City inspector. The contractor shall maintain all daily inspection reports, on site, for review.

The special inspection functions are considered to be in addition to the normal inspections performed by the City and the contractor is responsible for contracting the City to schedule regular inspections. No concrete shall be poured or other work covered until approval is given by the City inspector.

**Building Department:**
The building department shall review any revisions and addenda. Approved copies will be given to the contractor to maintain as part of the approved plan set.

The City inspector will monitor the special inspection functions for compliance with the agreement and the approved plans.

The City inspector shall be responsible for approving various stages of construction to be covered and work to proceed.

**Design Professionals:**
The architect and engineer will clearly indicate on the plans and specifications for the specific types of special inspection required, and shall include a schedule for inspection and testing. The architect and engineer will coordinate their revision and addenda process in such a way as to insure all required City approvals are obtained, prior to work shown on the revisions being performed.

**Owner:**
The project owner, or the architect or engineer acting as the owners agent, shall employ the special inspector or agency.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## ENFORCEMENT

A failure of the special inspector or firm to perform in keeping the requirements of the UBC, the approved plans and this document may void this agreement and the Building Officials approval of the special inspector. In such a case a new special inspector and/or firm would need to be proposed for approval. A failure of the design and/or construction parties to perform in accordance with this agreement may result in a STOP WORK notice being posted on the project, until nonconforming items have been resolved.

ACKNOWLEDGEMENTS

I have read and agree to comply with the terms and conditions of this agreement.

Owner: Ryan Jewell (City of Lacey) Date: 01/08/2026

Contractor: _____ Date: _____

Architect: _____ Date: _____

Engineer: RH2 Engineering - [signature] Date: 01/09/2026

Special Inspector
or Inspection Agency: _____ Date: _____

ACCEPTED FOR THE CITY OF LACEY BUILDING DEPARTMENT

By: _____ Date: _____



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**CITY OF LACEY**
Community & Economic Development Department
420 College Street SE
Lacey, WA 98503
(360) 491-5642

# SPECIAL INSPECTION AND TESTING AGREEMENT

## City of Lacey Building Department

**Permit # _____**

Prior to issuance of a permit, this form must be completed in its entirety and returned to the City for approval. The completed form must have the original signatures of acknowledgement of all parties.

Project: Hawks Prairie Reservoir Rehabilitation

Address: 4040 Marvin Road NE, Lacey WA, 98516

Owner: City of Lacey

Architect: N/A

Engineer: RH2 Engineering, Inc.

Contractor: TBD

## DUTIES AND RESPONSIBILITIES

**Special Inspection Firm and Special Inspectors:**

The Special Inspection firm of M.T.C. will perform special inspection for the following types of work (separate forms must be submitted if more than one firm is to be employed):

| | | |
|---|---|---|
| Reinforced Concrete | (✓) | |
| Bolting in Concrete | ( ) | |
| Pre-stressed Concrete | ( ) | |
| Shotcrete | ( ) | |
| Structural Masonry | ( ) | |
| Structural Steel & Welding | (✓) | |
| High-Strength Bolting | ( ) | |
| Spray-Applied Fireproofing | ( ) | |
| Smoke-Control Systems | ( ) | |
| Grading* | ( ) | |
| Other | ( ) | Specify: _____ |

**Grading does not require WABO certification.*

All individual inspectors to be employed on this project will be WABO certified for the type of inspection they are to perform. If inspection is for work that is not covered by the WABO categories, a detailed resume of the inspector and firm must be submitted. The resume must show the inspector and firm are qualified to perform the work and testing required by the project design and specifications.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The work shall be inspected for conformance with the plans and specifications approved by the City. Revisions and addenda sheets will not be used for inspection unless they have been approved by the City. The special inspector shall report to the City any revisions that are not approved.

A daily record will be maintained on site itemizing the inspections performed, for the review of all parties. Any nonconforming items shall be brought to the immediate attention of the contractor for resolution. A weekly report shall be submitted to the City; detailing the inspections and testing performed, listing any nonconforming items and resolution of nonconforming items. Unresolved nonconforming items will be detailed on a discrepancy report and presented to the building department.

A final report shall be submitted to the building department prior to the Certificate of Occupancy being issued. This report will indicate that inspection and testing was completed in conformance with the approved plans, specifications and approved revisions or addenda. Any unresolved discrepancies must be detailed in the final report.

The special inspector and special inspection firm serve in the role as "deputy" City of Lacey inspectors and as such are responsible to the City of Lacey Building Department in the performance of the required work.

**Contractor:**
The contractor shall provide the special inspector or agency adequate notification of work requiring inspection.

The city approved plans and specifications must be made available, at the job site for the use of the special inspector and the City inspector. The contractor shall maintain all daily inspection reports, on site, for review.

The special inspection functions are considered to be in addition to the normal inspections performed by the City and the contractor is responsible for contracting the City to schedule regular inspections. No concrete shall be poured or other work covered until approval is given by the City inspector.

**Building Department:**
The building department shall review any revisions and addenda. Approved copies will be given to the contractor to maintain as part of the approved plan set.

The City inspector will monitor the special inspection functions for compliance with the agreement and the approved plans.

The City inspector shall be responsible for approving various stages of construction to be covered and work to proceed.

**Design Professionals:**
The architect and engineer will clearly indicate on the plans and specifications for the specific types of special inspection required, and shall include a schedule for inspection and testing. The architect and engineer will coordinate their revision and addenda process in such a way as to insure all required City approvals are obtained, prior to work shown on the revisions being performed.

**Owner:**
The project owner, or the architect or engineer acting as the owners agent, shall employ the special inspector or agency.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## ENFORCEMENT

A failure of the special inspector or firm to perform in keeping the requirements of the UBC, the approved plans and this document may void this agreement and the Building Officials approval of the special inspector. In such a case a new special inspector and/or firm would need to be proposed for approval. A failure of the design and/or construction parties to perform in accordance with this agreement may result in a STOP WORK notice being posted on the project, until nonconforming items have been resolved.

ACKNOWLEDGEMENTS

I have read and agree to comply with the terms and conditions of this agreement.

Owner: Ryan Jewell (City of Lacey) _____ Date: 01/08/26

Contractor: _____ Date: _____

Architect: _____ Date: _____

Engineer: RH2 Engineering - _____ Date: 01/09/26

Special Inspector
or Inspection Agency: _____ Date: _____

ACCEPTED FOR THE CITY OF LACEY BUILDING DEPARTMENT

By: _____ Date: _____



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

City of Lacey
Hawks Prairie Reservoir Rehabilitation
Structural Calculations
By Casey Cooper, P.E.
Reviewed by Jon Conner, P.E., S.E.
June 2025

## Index to Calculations


| Description | Subcategory | Page |
|---|---|---|
| General | Design Criteria | i |
| ATC Hazards | Wind and Seismic | ii-iv |
| Shell Design | Design Parameters | 1 |
| | Existing Structure Weights | 2 |
| | Shell Design | 3-5 |
| Lateral Loads | Seismic Design Parameters | 6-8 |
| | Tank Anchorage Requirements | 9-10 |
| | Shell Stress Checks | 10-19 |
| | Freeboard Calculation | 20 |
| Wind Design | Wind Load Calculation | 21 |
| Foundation Analysis | Foundation Improvements | 22-24 |
| | Anchor Improvements | 25-30 |
| | Foundation Reinforcement | 31-35 |
| Roof Modifications | Davit Crane Member Design | 36-37 |
| | Shell-Rafter Connection Design | 38-39 |
| Attachments | Hilti Profis Report - Ringwall to Existing Footing | |
| | Hilti Profis Report - Ringwall to Existing Ringwall | |
| | Hilti Profis Report - Existing Footing to Footing | |
| | Enercalc Report - Add'l C8x11.5 | |
| | Enercalc Report - Existing W14x30 Rafter | |
| | Enercalc Report - Existing C8x11.5 Sub-Rafter | |





8/27/2025

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

City of Lacey
Hawks Prairie Reservoir Rehabilitation
Structural Design Criteria
By Casey Cooper, E.I.T.
Reviewed by Jon Conner, P.E., S.E.
August 2025

## Structural Design Criteria

***Description: The structure is a welded steel water tank approximately 88 feet in height and 90 feet in diameter. It is an unoccupied, non-combustible non-building structure.***

***Governing Structural Design Criteria: 2021 IBC and ASCE 7-16 loads***

Risk and Use Category: (ASCE 7-16, Table 1.5-1)
- HP Reservoir, Essential facility: Risk Category IV - Essential
- 4.0 Million Gallon Utility Use (Occupancy Group U) welded steel tank

Construction Type: IIB

Geotechnical Parameters:
- Minimum frost depth: 12-inches below adjacent final grade (per Building Dep.)
- Maximum Net Bearing: 4,000 psf on weathered till at ground surface. Add 1/3 for seismic or wind.
- Site Class: C

Other Loading Parameters:
- Wind Load: 107 MPH, Exposure B, Importance Factor 1.0 (ASCE Table 1.5-2)
- Snow Load: 25 psf
- Snow Importance Factor 1.20 (ASCE Table 1.5-2)
- Earthquake Load: Lat: 47.09 N, Long: -122.78 W
- Sds = 1.122g, Sd1 = 0.505g, Seismic Importance Factor 1.5
- Seismic Design Category D (ASCE 7-16, Tables 11.6-1 and 11.6-2)

Other Design Information:
- Structural System: welded steel plate
- Concrete Slab on Grade Foundation: 4,500psi with 60,000psi reinforcing

Live Loads:
- Roof: 20 psf

Dead Loads:
- Concrete: 150 pcf.

Design Codes and References:
- 2021 IBC for load calculations and general design criteria
  - ASCE 7-16 for load calculations and general design criteria
  - 2015 NEHRP for seismic lateral loads where those are greater than 2021 IBC/ASCE 7-16 loads
- Concrete: ACI 318 – 19



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Hazards by Location

## Search Information

**Coordinates:** 47.09, -122.78

**Elevation:** 299 ft

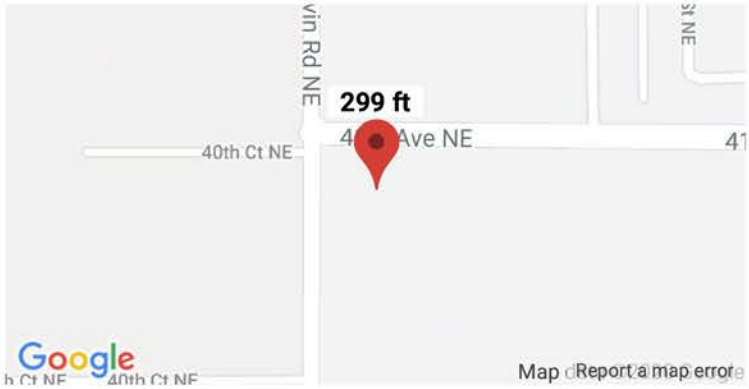
**Timestamp:** 2020-01-08T21:33:09.699Z

**Hazard Type:** Seismic

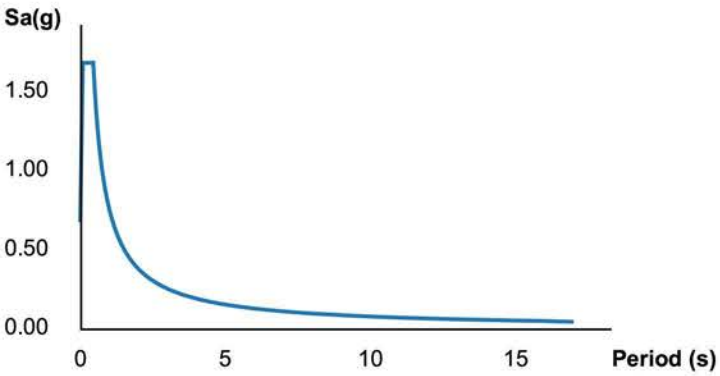
**Reference Document:** ASCE7-16

**Risk Category:** IV

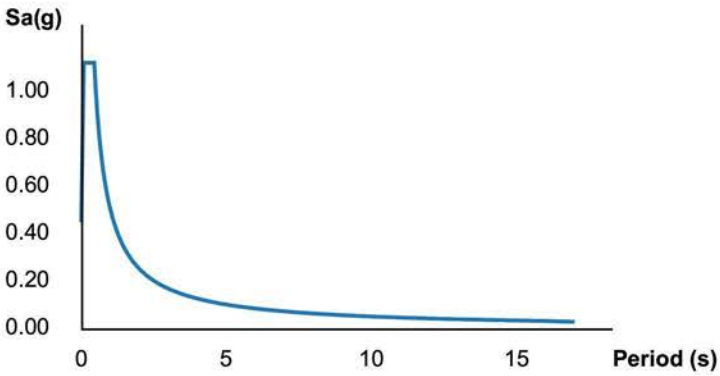
**Site Class:** C




## MCER Horizontal Response Spectrum




## Design Horizontal Response Spectrum




## Basic Parameters

| Name | Value | Description |
|---|---|---|
| $S_S$ | 1.402 | $MCE_R$ ground motion (period=0.2s) |
| $S_1$ | 0.507 | $MCE_R$ ground motion (period=1.0s) |
| $S_{MS}$ | 1.683 | Site-modified spectral acceleration value |
| $S_{M1}$ | 0.757 | Site-modified spectral acceleration value |
| $S_{DS}$ | 1.122 | Numeric seismic design value at 0.2s SA |
| $S_{D1}$ | 0.505 | Numeric seismic design value at 1.0s SA |

## Additional Information

| Name | Value | Description |
|---|---|---|
| SDC | D | Seismic design category |
| $F_a$ | 1.2 | Site amplification factor at 0.2s |
| $F_v$ | 1.493 | Site amplification factor at 1.0s |
| $CR_S$ | 0.904 | Coefficient of risk (0.2s) |

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | |
|---|---|---|
| $CR_1$ | 0.889 | Coefficient of risk (1.0s) |
| PGA | 0.586 | $MCE_G$ peak ground acceleration |
| $F_{PGA}$ | 1.2 | Site amplification factor at PGA |
| $PGA_M$ | 0.703 | Site modified peak ground acceleration |
| $T_L$ | 16 | Long-period transition period (s) |
| SsRT | 1.402 | Probabilistic risk-targeted ground motion (0.2s) |
| SsUH | 1.55 | Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years) |
| SsD | 1.5 | Factored deterministic acceleration value (0.2s) |
| S1RT | 0.507 | Probabilistic risk-targeted ground motion (1.0s) |
| S1UH | 0.57 | Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years) |
| S1D | 0.701 | Factored deterministic acceleration value (1.0s) |
| PGAd | 0.586 | Factored deterministic acceleration value (PGA) |

*The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.*

## Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Hazards by Location

## Search Information

**Coordinates:** 47.09, -122.78

**Elevation:** 299 ft

**Timestamp:** 2021-11-22T17:11:30.303Z

**Hazard Type:** Wind




Map data ©2021 Imagery ©2021 , Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency

### ASCE 7-16

| | |
|---|---|
| MRI 10-Year | 66 mph |
| MRI 25-Year | 73 mph |
| MRI 50-Year | 77 mph |
| MRI 100-Year | 82 mph |
| Risk Category I | 91 mph |
| Risk Category II | 97 mph |
| Risk Category III | 103 mph |
| Risk Category IV | 107 mph |

### ASCE 7-10

| | |
|---|---|
| MRI 10-Year | 72 mph |
| MRI 25-Year | 79 mph |
| MRI 50-Year | 85 mph |
| MRI 100-Year | 91 mph |
| Risk Category I | 100 mph |
| Risk Category II | 110 mph |
| Risk Category III-IV | 115 mph |

### ASCE 7-05

| | |
|---|---|
| ASCE 7-05 Wind Speed | 85 mph |

*The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.*

## Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Welded Steel Water Tank Design Parameters

Design per AWWA D100-21, IBC 2021, ASCE 7-16

General Tank Properties:

Latitude: N 47.089882 Longitude: W -122.779566

Risk Category: IV

| | |
|---|---|
| $h_p := 85\ ft$ | Water Height/Overflow Elevation |
| $h_r := 88\ ft$ | Roof Height/Top of shell |
| $D_t := 90\ ft$ | Tank Diameter |
| $CA := 0\ in$ | Corrosion allowance |
| $t_{floor} := 0.25\ in + CA$ | Floor thickness |
| $t_{roof} := 0.287\ in + CA$ | Roof thickness per RH2 Field Measurement |
| $Vol := \frac{\pi \cdot D_t^2}{4} \cdot h_p = 4045065.544\ gal$ | Tank volume |

Wind Design Parameters:

Reference: ATC Hazards Report

| | |
|---|---|
| $V_w := 107\ mph$ | Basic wind speed per ASCE 7-16 Risk Category IV |
| $I_w := 1.15$ | Wind importance factor per AWWA D100 Section 3.1.4 |
| $E_x := \text{"C"}$ | Default exposure per AWWA D100 3.1.4.2 |

Seismic Design Parameters:

Reference: ATC Hazards Report

| | |
|---|---|
| $SC := \text{"C"}$ | Soil site class per RH2 Technical Memorandum 2021 |
| $I_E := 1.5$ | Seismic Importance Factor - ASCE Table 1.5-2 |
| $S_s := 1.402$ | 2-sec period mapped spectral acceleration |
| $S_1 := 0.507$ | 1-sec period mapped spectral acceleration |
| $S_{DS} := 1.122$ | Numeric seismic design value at 0.2s SA |
| $SDC := \text{"D"}$ | Seismic Design Category |
| | Site amplification factor at 0.2s |
| | Site amplification factor at 1.0s per ASCE 7-16 Table 11.4-2 |
| $T_L := 16\ s$ | Transition period (sec) - ASCE Figure 22-12 |
| $S_{D1} := 0.505$ | Numeric seismic design value at 1.0s SA |

NOTE: Per ASCE 7-16 Section 11.4.8 EXCEPTION: A ground motion hazard analysis is not required for structures other than seismically isolated structures and structures with damping systems where: 2. Structures Site Class D sites with S1 greater than or equal to 0.2.

Foundation Design Parameters:

| | |
|---|---|
| $FdnType := \text{"ring"}$ | Type of foundation |
| $f'c := 4500\ psi$ | Concrete strength |


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Existing Structure Design Weights

*Member/dimensional assumptions made per observations on site.

Roof Plate:

$R_t := \frac{D_t}{2} = 45\ ft$ — Tank/roof radius

$A_r := \pi \cdot R_t^2 = 6361.725\ ft^2$ — Total Roof area

$t_{roof} = 0.287\ in$ — Roof thickness per RH2 Inspection

$\delta_{steel} := 490\ pcf$ — Density of steel

$W_{pl} := A_r \cdot t_{roof} \cdot \delta_{steel} = 74.554\ kip$ — Roof plate weight

Roof Supports:

Existing roof consists of C8x11.5 sub-rafters, W14x30 rafters, and 18-inch dia. column.

$w_{rdl} := t_{roof} \cdot \delta_{steel} = 11.719\ psf$ — Roof DL

$w_{ll} := 25\ psf$ — Roof LL

$L_{max} := 84\ in$ — Max spacing of rafters (in)
Per AWWA 3.6.1.7

$L' := \frac{2575 \cdot t_{roof}}{\sqrt{w_{rdl} + w_{ll}}} \cdot \frac{(lbf^{0.5})}{ft} = 121.959\ in$ — AWWA Eq 3-39 (in)

$L := min(L_{max}, L') = 84\ in$ — Design spacing of rafters (in)

$N_{rafter} := \left(\frac{(2 \cdot \pi \cdot R_t)}{L}\right) = 40.4$ — Minimum number of rafters required

$N_{rafter} := 41$ — Total number of rafters used

Assume (20) C8x11.5 Sub Rafters and (21) W14x30 Rafters

$l_{W14} := R_t = 45\ ft$ — Assumed length of W14x30 Rafters

$l_{C8} := 0.5 \cdot R_t = 22.5\ ft$ — Assumed length of C8x11.5 Rafters

$W_{W14} := (21) \cdot l_{W14} \cdot 14\ plf = 13230\ lbf$ — Weight of W14 Rafters

$W_{C8} := (20) \cdot l_{C8} \cdot 8\ plf = 3600\ lbf$ — Weight of C8 Rafters

$W_{sup} := W_{W14} + W_{C8} = 16830\ lbf$ — Estimated weight of roof supports

$W_{col} := (1) \cdot h_r \cdot 94\ plf = 8272\ lbf$ — Estimated weight of center column

Floor:

$A_{floor} := \pi \cdot (R_t + 2\ in)^2 = 6408.936\ ft^2$ — Area of floor plate

$t_{floor} = 0.25\ in$ — Thickness of floor plate

$W_f := A_{floor} \cdot t_{floor} \cdot \delta_{steel} = 65.425\ kip$ — Floor plate weight

Miscellaneous:

$W_{misc} := 0.1 \cdot (W_{pl} + W_f) = 13.998\ kip$ — Misc.equipment (10% floor + roof assumed)

Roof Total Weight:

$W_r := W_{pl} + W_{sup} + W_f + W_{col} + W_{misc} = 179.079\ kip$ — Total roof + supports weight
(Used in overturning moment calc)



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Tank Shell Design

Per AWWA D100-11

Design Parameters:

$h_p = 85\ ft$ — Water Height/Overflow Elevation

$h_r = 88\ ft$ — Roof Height/Top of shell

$h_s := 8\ ft$ — Shell course height

$Section := \text{“14”}$ — Code Section used for shell design (3 or 14)

$E := \text{if}\left(Section = \text{“14”}, 1.0, 0.85\right) = 1$ — Joint Efficiency per Table 15

$Spec1 := \text{“A573-70”}$ — Steel specification per McClure & Sons design calculations

$Spec2 := \text{“A36”}$ — Steel specification per McClure & Sons design calculations

$s_{allow1} := 23330\ psi$ — Allowable design tensile stress per D100 Table 31

$s_{allow2} := 19330\ psi$ — Allowable design tensile stress per D100 Table 31

Hydrostatic Shell Design:

$\delta_{fluid} := 62.4\ pcf$ — Density of fluid (water)

$n_{course} := \text{trunc}\left(\frac{h_r}{h_s}\right) = 11$ — Number of shell courses

$$H := \begin{bmatrix} 0 \\ 8 \\ 16 \\ 24 \\ 32 \\ 40 \\ 48 \\ 56 \\ 64 \\ 72 \\ 80 \\ 88 \end{bmatrix} ft$$

Bottom of first course

Height at the top of each shell course

Top of last course

$$s_{allow} := \begin{bmatrix} s_{allow1} \\ s_{allow1} \\ s_{allow1} \\ s_{allow1} \\ s_{allow1} \\ s_{allow1} \\ s_{allow1} \\ s_{allow2} \\ s_{allow2} \\ s_{allow2} \\ s_{allow2} \\ s_{allow2} \end{bmatrix}$$

Allowable stress based on Steel Specification.


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$i := 0 .. n_{course}$

$$h_{p.water_i} := \text{if}\left(h_p > H_i, h_p - H_i, 0\ ft\right) = \begin{bmatrix} 85 \\ 77 \\ 69 \\ 61 \\ 53 \\ 45 \\ 37 \\ 29 \\ 21 \\ 13 \\ 5 \\ 0 \end{bmatrix} ft$$

Height of water above each course

$$t_{min} := \frac{h_{p.water} \cdot \frac{D_t}{2} \cdot \delta_{fluid}}{s_{allow} \cdot E} + CA \qquad t_{min_i} := \text{if}\left(t_{min_i} < 0.25\ in, 0.25\ in, t_{min_i}\right)$$

$$t_{min} = \begin{bmatrix} 0.853 \\ 0.772 \\ 0.692 \\ 0.612 \\ 0.532 \\ 0.451 \\ 0.371 \\ 0.351 \\ 0.254 \\ 0.25 \\ 0.25 \\ 0.25 \end{bmatrix} in$$

Minimum shell thickness' required per Section 3.7

$$t_{shell} := \begin{bmatrix} 0.915 \\ 0.823 \\ 0.725 \\ 0.645 \\ 0.57 \\ 0.505 \\ 0.455 \\ 0.405 \\ 0.355 \\ 0.335 \\ 0.335 \end{bmatrix} in$$

Measured shell thicknesses per RH2 Inspection. (Used for following analysis)



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$$wt_{shell} := \left\| \begin{array}{l} x \leftarrow H \\ \text{for } i \in 0 \ldots n_{course} - 1 \\ \quad \left\| \begin{array}{l} h \leftarrow \left\| \begin{array}{l} \text{if } H_{i+1} \le h_r \\ \quad \left\| H_{i+1} - H_i \right. \\ \text{else} \\ \quad \left\| 0 \right. \end{array} \right. \\ w \leftarrow h \cdot t_{shell_i} \cdot \delta_{steel} \cdot \pi \cdot D_t \\ x_i \leftarrow w \\ x_{i+1} \leftarrow 0 \ \textit{kip} \end{array} \right. \\ x \end{array} \right.$$

Weight of each shell course

$$wt_{shell_i} = \begin{bmatrix} 84.512 \\ 76.015 \\ 66.963 \\ 59.574 \\ 52.647 \\ 46.643 \\ 42.025 \\ 37.407 \\ 32.789 \\ 30.942 \\ 30.942 \\ 0 \end{bmatrix} \textit{kip}$$

Bottom

Top

Summary:

$$H = \begin{bmatrix} 0 \\ 8 \\ 16 \\ 24 \\ 32 \\ 40 \\ 48 \\ 56 \\ 64 \\ 72 \\ 80 \\ 88 \end{bmatrix} \textit{ft} \qquad Course := \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \end{bmatrix} \qquad t_{shell} = \begin{bmatrix} 0.915 \\ 0.823 \\ 0.725 \\ 0.645 \\ 0.57 \\ 0.505 \\ 0.455 \\ 0.405 \\ 0.355 \\ 0.335 \\ 0.335 \end{bmatrix} \textit{in} \qquad wt_{shell_i} = \begin{bmatrix} 84.512 \\ 76.015 \\ 66.963 \\ 59.574 \\ 52.647 \\ 46.643 \\ 42.025 \\ 37.407 \\ 32.789 \\ 30.942 \\ 30.942 \\ 0 \end{bmatrix} \textit{kip}$$

$W_s := \sum wt_{shell} = 560.458 \ \textit{kip}$ Total shell weight

$W_p := h_p \cdot \pi \cdot R_t^{\,2} \cdot \delta_{fluid} = 33742.59 \ \textit{kip}$ Total Fluid weight (AWWA Eq 13-27)

$W_{TOTAL.steel} := W_r + W_s = 739.536 \ \textit{kip}$ Total weight of tank steel



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Tank Lateral Design

Seismic Design Parameters:
Per AWWA D100 Section 13

$S_{DS} = 1.122$ — Numeric seismic design value at 0.2s SA

$S_{D1} = 0.505$ — Numeric seismic design value at 1.0s SA

$I_E = 1.5$ — Seismic Importance Factor - ASCE Table 1.5-2

$R_i := 3.0$ — Impulsive Response Modification Factor (2.5 for unanchored, 3.0 for anchored) per Table 28

$R_c := 1.5$ — Convective response modification factor per AWWA Table 28

$T_L = 16\ s$ — Transition period (sec) - ASCE Figure 22-12

Seismic Design:

$$T_c := 2 \cdot \pi \cdot \sqrt{\frac{D_t}{3.68 \cdot g \cdot \tanh\left(\frac{3.68 \cdot h_p}{D_t}\right)}} = 5.483\ s$$

Natural period of the first mode of sloshing per AWWA D100 (Eq. 13-22)

$K := 1.5$ — Damping scaling factor to convert spectrum from 5% damping to 0.5% damping (13.2.7.3.2)

$S_{ai} := S_{DS} = 1.122$ $\quad S_{D1} = 0.505$ $\quad T_c = 5.483\ s$ $\quad K = 1.5$

$$\frac{K \cdot S_{D1} \cdot s}{T_c} = 0.138$$

Design spectral response acceleration for impulsive components (Eq. 13-9)
NOTE: The natural period, Ti is assumed to be 0 for Ground Supported Flat-Bottom Tanks per AWWA D100 Section 13.5

$$S_{ac} := \mathbf{if}\left(T_c > T_L, \frac{K \cdot T_L \cdot S_{D1} \cdot sec}{{T_c}^2}, min\left(\frac{K \cdot S_{D1} \cdot sec}{T_c}, S_{DS}\right)\right)$$

$S_{ac} = 0.138$

Design spectral response acceleration for the convective component, 0.5% damped, first sloshing mode (g). (AWWA D100 Eq. 13-12 and 13-13 page 132) (13.2.7.3.2)

$$A_i := \max\left(\frac{0.36 \cdot S_1 \cdot I_E}{R_i}, \frac{S_{ai} \cdot I_E}{1.4 \cdot R_i}\right) = 0.401$$

Impulsive design acceleration (g) (Eq. 13-17) (13.2.9.2)

$$A_c := \frac{S_{ac} \cdot I_E}{1.4 \cdot R_c} = 0.099$$

Convective Design acceleration (g) (Eq. 13-18) (13.2.9.2)

$A_v := 0.14 \cdot S_{DS} = 0.157$ — Vertical Design acceleration (g) (13.5.4.3)


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$$W_i := \text{if}\left(\frac{D_t}{h_p} \geq 1.333\,,\ \frac{\tanh\left(0.866 \cdot \frac{D_t}{h_p}\right)}{0.866\ \frac{D_t}{h_p}} \cdot W_p\,,\ \left(1 - 0.218 \cdot \frac{D_t}{h_p}\right) \cdot W_p\right)$$

$W_i = 25954.006\ \textit{kip}$ Effective Impulsive Weight (Eq 13-24 and 13-25)

$$W_c := 0.23 \cdot \frac{D_t}{h_p} \cdot \tanh\left(\frac{3.67 \cdot h_p}{D_t}\right) \cdot W_p$$

$W_c = 8201.291\ \textit{kip}$ Effective Convective Impulsive Weight (Eq 13-26)

$$X_i := \text{if}\left(\frac{D_t}{h_p} \geq 1.333\,,\ 0.375 \cdot h_p\,,\ \left(0.5 - 0.094 \cdot \frac{D_t}{h_p}\right) \cdot h_p\right)$$

$X_i = 34.04\ \textit{ft}$ Height from bottom of tank shell to centroid of effective Impulsive Weight (Eq 13-28 and 13-29)

$$X_c := \left(1 - \frac{\cosh\left(3.67 \cdot \frac{h_p}{D_t}\right) - 1}{\left(3.67 \cdot \frac{h_p}{D_t}\right) \cdot \sinh\left(3.67 \cdot \frac{h_p}{D_t}\right)}\right) \cdot h_p$$

$X_c = 61.963\ \textit{ft}$ Height from bottom of tank shell to centroid of effective convective weight (Eq. 13-30)

$M_i := X_i \cdot W_i \cdot A_i = 354020.803\ \textit{kip} \cdot \textit{ft}$ Impulsive moment

$M_c := X_c \cdot W_c \cdot A_c = 50144.8\ \textit{kip} \cdot \textit{ft}$ Convective moment

$$X_{imf} := \text{if}\left(\frac{D_t}{h_p} \geq 1.333\,,\ 0.375 \cdot h_p \cdot \left(1 + 1.333 \cdot \left(\frac{0.866 \cdot \frac{D_t}{h_p}}{\tanh\left(0.866 \cdot \frac{D_t}{h_p}\right)} - 1\right)\right),\ \left(0.5 + 0.06 \cdot \frac{D_t}{h_p}\right) \cdot h_p\right)$$

$X_{imf} = 47.9\ \textit{ft}$ Height from bottom of shell to effective impulsive weight adjusted to include varying bottom pressures for mat foundation (Eq. 13-33 and 13-34)

$$X_{cmf} := \left(1 - \frac{\cosh\left(\frac{3.67 \cdot h_p}{D_t}\right) - 1.937}{\left(\frac{3.67 \cdot h_p}{D_t}\right) \cdot \sinh\left(\frac{3.67 \cdot h_p}{D_t}\right)}\right) \cdot h_p$$

$X_{cmf} = 63.4\ \textit{ft}$ Height from bottom of shell to effective convective weight adjusted to include varying bottom pressures for mat foundation (Eq. 13-35)



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$i := 0 .. n_{course} - 1$

$W_{x_i} := wt_{shell_i} \cdot \left( \frac{H_{i+1} + H_i}{2} \right)$

$$W_x = \begin{bmatrix} 338.048 \\ 912.175 \\ 1339.261 \\ 1668.073 \\ 1895.285 \\ 2052.302 \\ 2185.304 \\ 2244.417 \\ 2229.639 \\ 2351.557 \\ 2599.09 \end{bmatrix} \; kip \cdot ft$$

Weight * CL height of each shell course

$sumwx := \sum W_x = 19815.151 \; kip \cdot ft$

Sum of Weight * CL height of each shell course

$X_s := \frac{sumwx}{W_s} = 35.355 \; ft$

Height from the bottom of shell to the center of gravity of the shell

**Summary of values used to determine overturning moment and shear:**

| | |
|---|---|
| $A_i = 0.401$ | Impulsive design acceleration (g) (Eq. 13-17) (13.2.9.2) |
| $A_c = 0.099$ | Vertical Design acceleration (g) (13.5.4.3) |
| $W_s = 560457.616 \; lbf$ | Total shell weight |
| $X_s = 35.355 \; ft$ | Height from the bottom of shell to the center of gravity of the shell |
| $W_r = 179.079 \; kip$ | Total roof + supports weight |
| $h_r = 88 \; ft$ | Roof Height/Top of shell |
| $W_i = 25954.006 \; kip$ | Effective Impulsive Weight (Eq 13-24 and 13-25) |
| $X_i = 34.04 \; ft$ | Height from bottom of tank shell to centroid of effective Impulsive weight (Eq 13-28 and 13-29) |
| $W_c = 8201.291 \; kip$ | Convective Impulsive Weight (Eq 13-26) |
| $X_c = 61.963 \; ft$ | Height from bottom of tank shell to centroid of effective convective weight (Eq. 13-30) |
| $W_f = 65.425 \; kip$ | Floor plate weight |
| $X_{cmf} = 63.4 \; ft$ | Ht. from bot. to centroid of eff. convective wt. Wc adj. for varying bottom pressures |
| $X_{imf} = 47.9 \; ft$ | Ht. from bot. to centroid of eff. impulsive wt. Wi adj. for varying bottom pressures |

$$M_s := \sqrt{\left(A_i \cdot \left(W_s \cdot X_s + W_r \cdot h_r + W_i \cdot X_i\right)\right)^2 + \left(A_c \cdot W_c \cdot X_c\right)^2}$$

**Design Overturning Moment at Bottom of Shell**
(Eq 13-23)

$M_s = 371674 \; kip \cdot ft$

$$V_f := \sqrt{\left(A_i \cdot \left(W_s + W_r + W_f + W_i\right)\right)^2 + \left(A_c \cdot W_c\right)^2}$$

**Design Shear at Top of Foundation**
(Eq. 13-31)

$V_f = 10753 \; kip$



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Tank Anchorage Requirements:**

Check resistance to overturning:

Per AWWA Section 13

$t_b := 0.5\ in$ — Thickness of tank bottom or annular ring (if required)

$F_y := 30\ ksi$ — Minimum specified yield strength of tank bottom or annular ring (if required) - A283, Grade C (Class 1)

$$w_L := min\left(7.9 \cdot t_b \cdot \frac{lbf}{ft \cdot in} \cdot \sqrt{\frac{F_y \cdot h_p}{psi \cdot ft}}\ ,\ 1.28 \cdot h_p \cdot D_t \cdot \frac{lbf}{ft^3}\right)$$

Maximum resisting weight of the tank contents in pounds per foot of shell circumference that may be used to resist the shell overturning moment. (Eq. 13-37)

$w_L = 6307.644\ plf$

$A_r = 6361.725\ ft^2$ — Total roof area

$$w_{rs} := \frac{W_r}{\pi \cdot D_t} = 633.361\ plf$$

Permanent roof loads acting on the shell per foot of shell circumference.

$$w_t := \frac{W_s}{\pi \cdot D_t} + w_{rs} = 2615.574\ plf$$

Weight of the tank shell and portion of the roof acting on the shell per foot of shell circumference. (Eq. 13-41)

$A_v = 0.157$ — Vertical design acceleration

$$J := \frac{M_s}{D_t^{\,2}\ \left(w_t \cdot \left(1 - 0.4 \cdot A_v\right) + w_L\right)} = 5.239$$

Overturning ratio (Eq. 13-36)

$uplift := \mathbf{if}\left(J \geq 1.54\ ,\ \text{“Provide Anchors”}\ ,\ \mathbf{if}\left(J \leq 0.785\ ,\ \text{“Self Anchored”}\ ,\ \text{“Check Section 13.5.4.2”}\right)\right)$

$uplift = \text{“Provide Anchors”}$

Conclude:
The existing tank includes mechanical anchors, check current design below.

AWWA D100 requires tank to be mechanically anchored.

Existing tank has 2.5" dia. A36 anchors, 4'-0" O.C. MAX typical spacing.



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Sliding Check:
Per Section 13.5.4.6

$W_s = 560.458$ *kip* — Total shell weight
$W_r = 179.079$ *kip* — Total roof + supports weight
$W_i = 25954.006$ *kip* — Effective Impulsive Weight (Eq 13-24 and 13-25)
$W_c = 8201.291$ *kip* — Convective Impulsive Weight (Eq 13-26)
$A_v = 0.157$ — Vertical Design acceleration (g) (13.5.4.3)

$V_{allow} := \tan(30\ deg)\ (W_s + W_r + W_i + W_c)\ (1 - 0.4 \cdot A_v)$
$V_{allow} = 18880.694$ *kip* — Allowable lateral shear
$V_f = 10753.196$ *kip* — Design shear at top of foundation (Eq. 13-31)

$Sliding := \text{if}\ (V_{allow} \geq V_f, \text{"OK"}, \text{"NG"})$ → $Sliding = \text{"OK"}$

**Shell Stress Checks:**

Per Section 13.5.4.2

In order to check compressive stresses at each shell course, recalculate the shell overturning moment with respect to each shell course:

$X_s = 35.355$ *ft* — Height from the bottom of shell to the center of gravity of the shell
$X_i = 34.04$ *ft* — Height from bottom of tank shell to centroid of effective Impulsive Weight
$X_c = 61.963$ *ft* — Height from bottom of tank shell to centroid of effective convective weight

$i := 0 .. n_{course} - 1$

$$H_i = \begin{bmatrix} 0 \\ 8 \\ 16 \\ 24 \\ 32 \\ 40 \\ 48 \\ 56 \\ 64 \\ 72 \\ 80 \end{bmatrix} \ ft$$

$$X_{s_i} := \text{if}\left(H_i > X_s, 0, X_s - H_i\right) = \begin{bmatrix} 35.355 \\ 27.355 \\ 19.355 \\ 11.355 \\ 3.355 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix} \ ft$$

Height from bottom of each course to c.g. of shell (ft)



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$$X_i := \text{if}\left(H_i > X_i, 0, X_i - H_i\right) = \begin{bmatrix} 34.04 \\ 26.04 \\ 18.04 \\ 10.04 \\ 2.04 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix} \; ft$$

Height from bottom of each course to centroid of the effective impulsive weight, (ft)

$$X_{c_i} := \text{if}\left(H_i > X_c, 0, X_c - H_i\right) = \begin{bmatrix} 61.963 \\ 53.963 \\ 45.963 \\ 37.963 \\ 29.963 \\ 21.963 \\ 13.963 \\ 5.963 \\ 0 \\ 0 \\ 0 \end{bmatrix} \; ft$$

Height from bottom of each course to centroid of the effective convective weight, (ft)

$$M_s := \sqrt{\left(A_i \cdot \left(W_s \cdot X_s + W_r \cdot h_r + W_i \cdot X_i\right)\right)^2 + \left(A_c \cdot W_c \cdot X_c\right)^2} = \begin{bmatrix} 371674.043 \\ 286624.441 \\ 201739.008 \\ 117374.469 \\ 37255.681 \\ 18862.228 \\ 12944.378 \\ 7947.387 \\ 6314.821 \\ 6314.821 \\ 6314.821 \end{bmatrix} \; kip \cdot ft$$

Overturning moment calculated at the base of each shell course (Eq 13-23)

$$\sigma_{c1_i} := \left(w_t \cdot \left(1 + 0.4 \cdot A_v\right) + \frac{1.273 \cdot M_{s_i}}{D_i^{\,2}}\right) \cdot \frac{1}{t_{shell_i} - CA} = \begin{bmatrix} 5573.078 \\ 4842.644 \\ 3963.83 \\ 2742.448 \\ 1262.432 \\ 947.906 \\ 881.733 \\ 828.998 \\ 885.53 \\ 938.397 \\ 938.397 \end{bmatrix} \; psi$$

Maximum longitudinal shell compression stress at bottom of the shell when there is no uplift (0.785<J)

NOTE: Per section 13.5.4.2.2 max compression stresses shall be calculated using Eq. 13-39 for mechanically anchored tanks. (J<0.154)


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$$\sigma_{c2} := \left(\frac{w_t \cdot (1 + 0.4 \cdot A_v) + w_L}{0.607 - 0.18667 \cdot J^{2.3}} - w_L\right) \cdot \frac{1}{t_{shell} - CA} = \begin{bmatrix} -680.402 \\ -756.461 \\ -858.714 \\ -965.221 \\ -1092.224 \\ -1232.807 \\ -1368.28 \\ -1537.204 \\ -1753.711 \\ -1858.41 \\ -1858.41 \end{bmatrix} \textit{psi}$$

Maximum longitudinal shell compression stress at bottom of the shell when there is uplift (0.785<J<1.54)

$$\sigma_c := \text{if}\left(J \geq 1.54, \sigma_{c1}, \text{if}\left(J \leq 0.785, \sigma_{c1}, \sigma_{c2}\right)\right) = \begin{bmatrix} 5573.078 \\ 4842.644 \\ 3963.83 \\ 2742.448 \\ 1262.432 \\ 947.906 \\ 881.733 \\ 828.998 \\ 885.53 \\ 938.397 \\ 938.397 \end{bmatrix} \textit{psi}$$

Maximum longitudinal shell compression stress

Note: J<0.785

$J = 5.239$

$R_t = 45\ \textit{ft}$ Tank radius

$$R_{thick} := \frac{t_{shell}}{R_t} = \begin{bmatrix} 0.001694 \\ 0.001524 \\ 0.001343 \\ 0.001194 \\ 0.001056 \\ 0.000935 \\ 0.000843 \\ 0.00075 \\ 0.000657 \\ 0.00062 \\ 0.00062 \end{bmatrix}$$

Ratio of shell plate thickness (in) to shell radius (in). at which buckling changes from elastic to inelastic. To be used with AWWA D100 Table 10 (page 29).

Determine allowable local compressive stress:

$$p_i := \delta_{fluid} \cdot \left(h_p - H_i\right) = \begin{bmatrix} 36.83 \\ 33.37 \\ 29.9 \\ 26.43 \\ 22.97 \\ 19.5 \\ 16.03 \\ 12.57 \\ 9.1 \\ 5.63 \\ 2.17 \end{bmatrix} \textit{psi}$$

Bottom Course

Top Course

Hydrostatic pressure at each course


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$$method_i := \text{if}\left(0.001 < R_{thick_i} \le 0.003\ ,\ \text{if}\left(p_i > 2\ psi\ ,\ \text{“Method 2”}\ ,\ \text{“Method 1”}\right)\ ,\ \text{“Method 1”}\right)$$

$$method = \begin{bmatrix} \text{“Method 2”} \\ \text{“Method 2”} \\ \text{“Method 2”} \\ \text{“Method 2”} \\ \text{“Method 2”} \\ \text{“Method 1”} \\ \text{“Method 1”} \\ \text{“Method 1”} \\ \text{“Method 1”} \\ \text{“Method 1”} \\ \text{“Method 1”} \end{bmatrix}$$

Bottom Course

Top Course

Method used to determine allowable local compressive stress

*Method 1:*

Per Section 3.4.3.1.2 Class 2 Materials (Fy>34,000 psi)

Note: (t/R)c = 0.0035372

$$F_{L1_i} := \text{if}\left(R_{thick_i} \le 0.0035372\ ,\ psi \cdot 17.5 \cdot \left(10^5\right) \cdot R_{thick_i} \cdot \left(1 + 50000 \cdot \left(R_{thick_i}\right)^2\right)\ ,\ \text{if}\left(R_{thick_i} > 0.0125\ ,\ 18000\ psi\ ,\ psi \cdot 6925 + psi \cdot 886\ (10)^3 \cdot R_{thick_i}\right)\right)$$

Allowable local compressive stress from AWWA Table 10. (Eq. 3-11 and 3-13)

*Method 2:*

Per Section 3.4.3.2

$$K_{1_i} := \left(950 - \frac{50 \cdot p_i}{psi}\right) = \begin{bmatrix} -891.667 \\ -718.333 \\ -545 \\ -371.667 \\ -198.333 \\ -25 \\ 148.333 \\ 321.667 \\ 495 \\ 668.333 \\ 841.667 \end{bmatrix}$$

(Eq. 3-16)

$$K_{0_i} := \text{if}\left(p_i \ge 10\ psi\ ,\ 1.0 + \left(\frac{0.25}{116}\right) \cdot \left(\frac{R_t}{t_{shell_i}} - 334\right)\ ,\ \text{if}\left(p_i < 2\ psi\ ,\ 0\ ,\ 1.0 + \left(\frac{0.25}{K_{1_i} - 334}\right) \cdot \left(\frac{R_t}{t_{shell_i}} - 334\right)\right)\right)$$


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$$K_0 = \begin{bmatrix} 1.552 \\ 1.694 \\ 1.885 \\ 2.085 \\ 2.322 \\ 2.585 \\ 2.838 \\ 3.154 \\ 2.843 \\ 1.956 \\ 1.629 \end{bmatrix}$$ (Eq. 3-15 and 3-17)

$$F_{L2_i} := psi \cdot K_{0_i} \cdot 17.5 \left(10^5\right) \cdot R_{thick_i} \cdot \left(1 + 50000 \cdot \left(R_{thick_i}\right)^2\right)$$ Allowable local compressive stress Method 2. (Eq. 3-14)

$$F_{L_i} := \text{if}\left(method_i = \text{“Method 1”}, F_{L1_i}, F_{L2_i}\right)$$

$$F_L = \begin{bmatrix} 5263.039 \\ 5043.623 \\ 4829.078 \\ 4668.009 \\ 4528.037 \\ 1708.139 \\ 1526.88 \\ 1349.414 \\ 1175.324 \\ 1106.539 \\ 1106.539 \end{bmatrix} psi$$

Bottom Course

Top Course

Allowable local compressive stress using either Method 1 or 2

$$Summary.F_L := \text{augment}\left(F_L, method\right)$$

$$Summary.F_L = \begin{bmatrix} 5263.039\ psi & \text{“Method 2”} \\ 5043.623\ psi & \text{“Method 2”} \\ 4829.078\ psi & \text{“Method 2”} \\ 4668.009\ psi & \text{“Method 2”} \\ 4528.037\ psi & \text{“Method 2”} \\ 1708.139\ psi & \text{“Method 1”} \\ 1526.88\ psi & \text{“Method 1”} \\ 1349.414\ psi & \text{“Method 1”} \\ 1175.324\ psi & \text{“Method 1”} \\ 1106.539\ psi & \text{“Method 1”} \\ 1106.539\ psi & \text{“Method 1”} \end{bmatrix}$$

Bottom Course

Top Course

Summary of allowable local compressive stress and method used



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$E_{steel} := 29\ (10)^6 \cdot psi$ Modulus of elasticity of steel

$C_{b_i} := \frac{p_i}{E_{steel}} \cdot \left(\frac{R_t}{t_{shell_i} - CA}\right)^2$ $C_b := \text{if}\left(C_{b_i} \le 0\ ,0\ ,C_{b_i}\right) = \begin{bmatrix} 0.442 \\ 0.495 \\ 0.572 \\ 0.639 \\ 0.711 \\ 0.769 \\ 0.779 \\ 0.77 \\ 0.726 \\ 0.505 \\ 0.194 \end{bmatrix}$

Ratio to determine pressure-stabilizing buckling coeff. at each course.

$\Delta C_{c_i} := \text{if}\left(C_{b_i} \le 0.064\ ,0.72 \cdot \left(C_{b_i}\right)^{0.84}, min\left(.045 \cdot \ln\left(C_{b_i} + 0.0018\right) + 0.194\ ,0.22\right)\right)$

$\Delta C_{c_i} = \begin{bmatrix} 0.157 \\ 0.163 \\ 0.169 \\ 0.174 \\ 0.179 \\ 0.182 \\ 0.183 \\ 0.182 \\ 0.18 \\ 0.163 \\ 0.121 \end{bmatrix}$

Pressure stabilizing buckling coef. at each shell course (AWWA D100 Eq. 13-50, 13-51)

$\Delta\sigma_{cr_i} := \Delta C_{c_i} \cdot E_{steel} \cdot \frac{t_{shell_i} - CA}{R_t} = \begin{bmatrix} 7738.423 \\ 7184.416 \\ 6580.143 \\ 6025.959 \\ 5471.78 \\ 4943.407 \\ 4467.978 \\ 3966.444 \\ 3426.063 \\ 2939.56 \\ 2170.583 \end{bmatrix} psi$

Critical buckling stress increase due to pressure for unanchored tanks calculated at each course(AWWA D100 Eq. 13-49)

$\sigma_{e_i} := \text{if}\left(J > 1.54\ ,1.333 \cdot F_{L_i}\ ,1.333 \cdot \left(F_{L_i} + \frac{\Delta\sigma_{cr_i}}{2}\right)\right)$

$\sigma_{e_i} = \begin{bmatrix} 7015.632 \\ 6723.149 \\ 6437.16 \\ 6222.457 \\ 6035.874 \\ 2276.949 \\ 2035.331 \\ 1798.769 \\ 1566.706 \\ 1475.017 \\ 1475.017 \end{bmatrix} psi$

Bottom Course

Top Course

Seismic allowable longitudinal shell compression stress at each course (AWWA D100 Eq. 13-47 and 13-48)


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$$C_{ratio_i} := \frac{\sigma_{c_i}}{\sigma_{e_i}} = \begin{bmatrix} 0.794 \\ 0.72 \\ 0.616 \\ 0.441 \\ 0.209 \\ 0.416 \\ 0.433 \\ 0.461 \\ 0.565 \\ 0.636 \\ 0.636 \end{bmatrix}$$

Ratio of compressive stress to allowable compressive stress at each shell course.
NO GOOD if ratio is greater than 1.0

$$Compression_i := \text{if}\left(\sigma_{c_i} \le \sigma_{e_i}, \text{“OK”}, \text{“No Good”}\right) = \begin{bmatrix} \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \\ \text{“OK”} \end{bmatrix}$$

Compression Buckling Check for Each Course

Check Hydrodynamic Hoop Tensile Stresses:
Per Section 13.5.4.2.3

Course height and Thicknesses calculated previously.

$i := 0 .. n_{course} - 1$

$$Y_i := \text{if}\left(h_p - H_i < 0, 0, h_p - H_i\right) = \begin{bmatrix} 85 \\ 77 \\ 69 \\ 61 \\ 53 \\ 45 \\ 37 \\ 29 \\ 21 \\ 13 \\ 5 \end{bmatrix} ft$$

Bottom Course

Distance from fluid surface to each course (ft, positive down)

Top Course

$$H = \begin{bmatrix} 0 \\ 8 \\ 16 \\ 24 \\ 32 \\ 40 \\ 48 \\ 56 \\ 64 \\ 72 \\ 80 \\ 88 \end{bmatrix} ft$$

$h_p = 85\ ft$

$h_r = 88\ ft$

$$N_{i1_i} := \max\left(\left(4.5 \cdot A_i \cdot D_t \cdot h_p \cdot \left(\frac{Y_i}{h_p} - 0.5 \cdot \left(\frac{Y_i}{h_p}\right)^2\right) \cdot \tanh\left(0.866 \cdot \frac{D_t}{h_p}\right) \frac{lbf}{ft^2 \cdot in}\right), 0\right)$$

$$N_{i2_i} := 2.77 \cdot A_i \cdot D_t^2 \cdot \left(\frac{Y_i}{0.75 \cdot D_t} - 0.5 \cdot \left(\frac{Y_i}{0.75 \cdot D_t}\right)^2\right) \cdot \frac{lbf}{ft^2 \cdot in}$$

$$N_{i3_i} := 1.39 \cdot A_i \cdot D_t^2 \cdot \frac{lbf}{ft^2 \cdot in}$$


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$$N_{i_i} := \text{if}\left(\frac{D_t}{h_p} \geq 1.333, N_{i1_i}, \text{if}\left(Y_i < 0.75 \cdot D_t, N_{i2_i}, N_{i3_i}\right)\right)$$

$$N_{i_i} = \begin{bmatrix} 4511.642 \\ 4511.642 \\ 4511.642 \\ 4453.727 \\ 4287.971 \\ 3995.923 \\ 3577.584 \\ 3032.955 \\ 2362.034 \\ 1564.823 \\ 641.321 \end{bmatrix} \frac{lbf}{in}$$

Impulsive hoop stress at each course (AWWA D100 Eq. 13-43, 42, and 45)

$$N_{c_i} := \frac{0.98 \cdot A_c \cdot D_t^{\,2} \cdot \cosh\left(3.68 \cdot \frac{h_p - Y_i}{D_t}\right)}{\cosh\left(3.68 \cdot \frac{h_p}{D_t}\right)} \cdot \frac{lbf}{ft^2 \cdot in} = \begin{bmatrix} 48.431 \\ 51.045 \\ 59.171 \\ 73.684 \\ 96.152 \\ 129 \\ 175.775 \\ 241.527 \\ 333.354 \\ 461.17 \\ 638.772 \end{bmatrix} \frac{lbf}{in}$$

Convective hoop force at each course, (Eq. 13-46)

$$N_{h_i} := 2.6 \cdot D_t \cdot Y_i \cdot \frac{lbf}{ft^2 \cdot in} = \begin{bmatrix} 19890 \\ 18018 \\ 16146 \\ 14274 \\ 12402 \\ 10530 \\ 8658 \\ 6786 \\ 4914 \\ 3042 \\ 1170 \end{bmatrix} \frac{lbf}{in}$$

Hydrostatic hoop tensile force at each course.

$$\sigma_{s_i} := \frac{\sqrt{\left(N_{i_i}\right)^2 + \left(N_{c_i}\right)^2 + \left(N_{h_i} \cdot A_v\right)^2}}{t_{shell_i} - CA} = \begin{bmatrix} 5997.864 \\ 6471.635 \\ 7139.286 \\ 7731.508 \\ 8264.453 \\ 8567.631 \\ 8420.653 \\ 7960.192 \\ 7062.589 \\ 5074.344 \\ 2757.116 \end{bmatrix} psi$$

Hydrodynamic hoop stress at each course (Eq. 13-42)


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$$s_i := \frac{\delta_{fluid} \cdot \frac{D_t}{2} \cdot Y_i}{t_{shell_i}} = \begin{bmatrix} 21737.705 \\ 21893.074 \\ 22270.345 \\ 22130.233 \\ 21757.895 \\ 20851.485 \\ 19028.571 \\ 16755.556 \\ 13842.254 \\ 9080.597 \\ 3492.537 \end{bmatrix} \textit{psi}$$

Hydrostatic hoop stress at each course (psi)

$$STRESS := s + \sigma_s = \begin{bmatrix} 27735.569 \\ 28364.709 \\ 29409.631 \\ 29861.74 \\ 30022.348 \\ 29419.116 \\ 27449.224 \\ 24715.748 \\ 20904.842 \\ 14154.941 \\ 6249.653 \end{bmatrix} \textit{psi}$$

Total hoop stress at each course (psi)

$$S_E := \begin{bmatrix} 23330 \\ 23330 \\ 23330 \\ 23330 \\ 23330 \\ 23330 \\ 23330 \\ 19330 \\ 19330 \\ 19330 \\ 19330 \end{bmatrix}$$

Max allowable design tensile stress per AWWA Section 14.3 Table 3

(First 7 courses A573-70 steel, the rest are A36 steel)

$$Stress_{allow} := 1.33 \cdot S_E = \begin{bmatrix} 31028.9 \\ 31028.9 \\ 31028.9 \\ 31028.9 \\ 31028.9 \\ 31028.9 \\ 31028.9 \\ 25708.9 \\ 25708.9 \\ 25708.9 \\ 25708.9 \end{bmatrix}$$

Allowable dynamic steel tensile stress (psi)


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

$$Stress_{ratio} := \frac{STRESS}{Stress_{allow}} = \begin{bmatrix} 0.894 \\ 0.914 \\ 0.948 \\ 0.962 \\ 0.968 \\ 0.948 \\ 0.885 \\ 0.961 \\ 0.813 \\ 0.551 \\ 0.243 \end{bmatrix} \ psi$$

Ratio of actual hoop tensile stress to allowable tensile stress. NO GOOD if ratio is greater than 1.0

Summary of Shell Stresses:

$$H_i = \begin{bmatrix} 0 \\ 8 \\ 16 \\ 24 \\ 32 \\ 40 \\ 48 \\ 56 \\ 64 \\ 72 \\ 80 \end{bmatrix} \ ft \qquad t_{shell_i} = \begin{bmatrix} 0.915 \\ 0.823 \\ 0.725 \\ 0.645 \\ 0.57 \\ 0.505 \\ 0.455 \\ 0.405 \\ 0.355 \\ 0.335 \\ 0.335 \end{bmatrix} \ in$$

Ratio of compressive stress to allowable compressive stress at each shell course

$$C_{ratio_i} = \begin{bmatrix} 0.794 \\ 0.72 \\ 0.616 \\ 0.441 \\ 0.209 \\ 0.416 \\ 0.433 \\ 0.461 \\ 0.565 \\ 0.636 \\ 0.636 \end{bmatrix}$$

Ratio of hoop tensile stress to allowable tensile stress at each shell course

$$Stress_{ratio} = \begin{bmatrix} 0.894 \\ 0.914 \\ 0.948 \\ 0.962 \\ 0.968 \\ 0.948 \\ 0.885 \\ 0.961 \\ 0.813 \\ 0.551 \\ 0.243 \end{bmatrix} \ psi$$

Bottom Course

Top Course

Conclusion:
All courses OK for compression buckling.
All courses OK for hoop tensile stresses.



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Freeboard Calculation:**

Per AWWA D100 Section 13.5.4.4 Freeboard

$$A_f := \begin{cases} \text{if } T_c \le T_L \\ \quad \dfrac{K \cdot S_{D1}}{T_c} \cdot sec \\ \text{else} \\ \quad \dfrac{K \cdot S_{D1} \cdot T_L}{T_c^{\,2}} \cdot sec \end{cases}$$

$A_f = 0.138$

Convective design acceleration for sloshing for seismic use group III (g).

$d_{slosh} := 0.42 \cdot D_t \cdot A_f$ $\quad d_{slosh} = 5.222\ ft$

Sloshing wave height (ft) (AWWA Eq. 13-52)

Existing Tank Freeboard:

$h_p = 85\ ft$ — Water Height/Overflow Elevation

$h_r = 88\ ft$ — Roof Height/Top of shell

$Freeboard := h_r - h_p = 3\ ft$ — Existing Freeboard

Conclusion:
Risk of a 5.5 ft sloshing wave during a seismic event. Existing 3 ft of freeboard insufficient to eliminate risk of roof damage.

Risk of roof damage exists.



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Wind Design - AWWA D100-11 Section 3.1.4**

$V_w = 107\ mph$ Basic wind speed per ASCE 7-16 Risk Category IV (mph)

$C_f := 1$ Force coeff per AWWA D100 Table 2

$I_w := 1.15$ Wind importance factor per AWWA D100 Section 3.1.4

$E_x := \text{"C"}$ Default exposure per AWWA D100 3.1.4.2

$K_{50} := 1.09$

$K_{100} := 1.27$ Velocity pressure coefficients at heights 50, 100 and 150 ft heights per AWWA D100 Table 3

$q_{50} := 0.00256 \cdot K_{50} \cdot I_w \cdot \left(\frac{V_w}{mph}\right)^2 \cdot psf = 36.739\ psf$

$q_{100} := 0.00256 \cdot K_{100} \cdot I_w \cdot \left(\frac{V_w}{mph}\right)^2 \cdot psf = 42.806\ psf$ Velocity pressure at 50, and 100 ft heights per AWWA D100 Eq. 3-2

$G := 1.0$ Gust effect factor per AWWA D100 Section 3.1.4

$P_{min} := 30\ psf \cdot C_f$ $P_{min} = 0.208\ psi$ Minimum pressure applied at any height per AWWA D100 Eq. 3-2

$$P_{50} := \left\| \begin{array}{l} \text{if } q_{50} \geq 30\ psf \\ \quad \| q_{50} \cdot G \cdot C_f \\ \text{else} \\ \quad \| P_{min} \end{array} \right\| = 36.739\ psf$$

$$P_{100} := \left\| \begin{array}{l} \text{if } q_{100} \geq 30\ psf \\ \quad \| q_{100} \cdot G \cdot C_f \\ \text{else} \\ \quad \| P_{min} \end{array} \right\| = 42.806\ psf$$

Applied wind pressures at 50, 100 ft heights

$h_r = 88\ ft$ Height to top of shell

$M_w := \left(\left(P_{50} \cdot D_t \cdot 50\ ft\right) \cdot 50\ ft\right) + \left(\left(P_{100} \cdot D_t \cdot \left(h_r - 50\ ft\right)\right) \cdot \left(h_r\right)\right)$

$$Check := \left\| \begin{array}{l} \text{if } M_{s_0} \geq M_w \\ \quad \| \text{"Seismic Forces Govern"} \\ \text{else} \\ \quad \| \text{"Wind Forces Govern"} \end{array} \right\|$$

$M_w = 21149.386\ ft{\cdot}kip$ Moment due to wind

$M_{s_0} = 371674.043\ ft{\cdot}kip$ Moment due to seismic

$Check = \text{"Seismic Forces Govern"}$


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Required Foundation Improvements:**

Foundation Design Parameters:

$FdnType = \text{“ring”}$ Type of foundation

$\sigma_{allow} := 4000\ psf$ Allowable soil bearing capacity per Technical Memorandum 2021

$\delta_{soil} := 115\ pcf$ Soil density per Technical Memorandum 2021

$\delta_c := 150\ pcf$ Concrete density

Foundation Geometry:

$ftg_{od} := 104\ ft + 10\ in + 12\ ft = 116.833\ ft$ Foundation outside diameter (Existing + 12 ft)

$ftg_{id} := 76\ ft + 10\ in = 76.833\ ft$ Foundation inside diameter (Existing)

$ftg_d := 5\ ft$ Foundation footing depth (Existing)

$ring_d := 6\ ft$ Ringwall depth (Existing)

$ring_{od} := 93\ ft + 4\ in + 6\ ft = 99.333\ ft$ Ringwall outside diameter (Add 2-ft for new anchor embed)

$ring_{id} := 88\ ft + 4\ in = 88.333\ ft$ Ringwall outside diameter (Existing)

Global Overturning Stability:

(Ratio for mechanically-anchored tank system per API 650 13th Ed. E.6.2.3-1)

$W_s = 560.458\ kip$ Total shell weight

$W_r = 179.079\ kip$ Total weight of fixed tank roof including framing and misc attachments

$W_p = 33742.59\ kip$ Total weight of tank contents

$W_f = 65.425\ kip$ Floor plate weight

$W_T := W_s + W_r + W_p + W_f = 34547.551\ kip$ Total Weight. (Contents + Steel)

$A_{ftg} := \pi \cdot \left(\left(\frac{ftg_{od}}{2}\right)^2 - \left(\frac{ftg_{id}}{2}\right)^2\right) = 6084.218\ ft^2$ Area of the footing

$A_{ring} := \pi \cdot \left(\left(\frac{ring_{od}}{2}\right)^2 - \left(\frac{ring_{id}}{2}\right)^2\right) = 1621.324\ ft^2$ Area of the ringwall

$W_{fd} := \left(\left(A_{ftg} \cdot ftg_d\right) + \left(A_{ring} \cdot ring_d\right)\right) \cdot \delta_c = 6022.355\ kip$ Total weight of tank foundation

$W_g := \pi \cdot \left(\left(\frac{ftg_{od}}{2}\right)^2 - \left(\frac{ring_{od}}{2}\right)^2\right) \cdot \left(ring_d - 6\ in\right) \cdot \delta_{soil} = 1879.218\ kip$ Weight of soil directly over tank foundation footing

$M_{design} := M_{s_0} + V_f \cdot \left(ftg_d + ring_d\right) = 489959.202\ kip \cdot ft$ Moment at base of shell due to seismic

$M_r := 0.6 \cdot \left(0.5 \cdot D_t \cdot \left(W_T + W_{fd} + W_g\right)\right) = 1146126.333\ kip \cdot ft$ Resisting moment. 0.6 Factor for ASD

$OT := \frac{M_r}{M_{design}} = 2.339$ Overturning ratio for mechanically anchored tank system per API 650 (E.6.2.3-1)

$Check_{OT} := \text{if}\left(OT > 2, \text{“OK”}, \text{“NG”}\right)$

$Check_{OT} = \text{“OK”}$ Tank is OK for Global Overturning Stability



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Ringwall Soil Bearing:

Static Bearing Pressure on the Footing (P/A):

$A_{p.col} := \pi \cdot \left( \left( \frac{D_t}{2} \right)^2 - \left( \frac{ftg_{id}}{2} \right)^2 \right) = 1725.236\ ft^2$ Area of water column above ringwall

$W_{p.FTG} := A_{p.col} \cdot h_p \cdot \delta_{fluid} = 9150.653\ kip$ Weight of water column above ringwall

$P_{FTG} := W_s + W_r + W_{fd} + W_g + W_{p.FTG} = 17791.761\ kip$ Load directly over ringwall

$A_{ftg} = 6084.218\ ft^2$ Area of the footing

$\sigma_{static.1} := \frac{P_{FTG}}{A_{ftg}} = 2924.248\ psf$ Static bearing pressure directly below footing

Static Bearing Pressure below tank floor (P/A):

$\sigma_{static.2} := h_p \cdot \delta_{fluid} = 5304\ psf$ Static bearing pressure inside ringwall

**Soil Bearing** - Roark & Young Table 12.1, Stress reversal impossible.
- Table 12.1 is only applicable if eccentricty falls outside of kern

$M_{design} := M_{s_0} + V_f \cdot (ftg_d + ring_d) = 489959.202\ kip \cdot ft$ Foundation design moment

$e := \frac{M_{design}}{W_T + W_{fd} + W_g} = 11.54\ ft$ Load Eccentricity

$r := \frac{ftg_{od}}{2} = 58.42\ ft$ Footing outside radius

$r_1 := \frac{ftg_{id}}{2} = 38.42\ ft$ Footing inside radius

$m_{ring} := \frac{0.25}{r} \cdot (r^2 + {r_1}^2) = 20.92\ ft$ Radius of Kern

$S_{ring} := \frac{\pi \cdot (r^4 - {r_1}^4)}{4 \cdot r} = 127282.892\ ft^3$ Slab section modulus

$\sigma_{dynamic} := \frac{M_{design}}{S_{ring}} = 3849.372\ psf$ Dynamic Bearing Pressure

$\sigma_{st.dy} := \sigma_{static.1} + \sigma_{dynamic} = 6773.62\ psf$ Static + Dynamic Bearing Pressure



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Allowable Bearing Pressures:

$ob_{net} := \delta_{soil} \cdot (ftg_d + ring_d) = 1265$ ***psf***

Overburden Pressure to be added to static allowable soil pressure

$\sigma_{static.allow} := \sigma_{allow} + ob_{net} = 5265$ ***psf***

Static Allowable Bearing Pressure

$\sigma_{dynamic.allow} := 1.333 \cdot (\sigma_{allow} + ob_{net}) = 7018.245$ ***psf***

Dynamic Allowable Bearing Pressure

$check_1 := \mathbf{if}(\sigma_{static.allow} \geq \sigma_{static.1}, \text{“OK”}, \text{“NG”}) = \text{“OK”}$

Static Check 1 (directly below footing)

$check_2 := \mathbf{if}(\sigma_{static.allow} \geq \sigma_{static.2}, \text{“OK”}, \text{“NG”}) = \text{“NG”}$

Static Check 2 (below tank floor)

$DCR_2 := \frac{\sigma_{static.2}}{\sigma_{static.allow}} = 1.007$

Less than 1% over allowable,
OK by inspection.

$check_3 := \mathbf{if}(\sigma_{dynamic.allow} \geq \sigma_{st.dy}, \text{“OK”}, \text{“NG”}) = \text{“OK”}$

Dynamic Check (directly below footing)

Conclusion:
- Increase the Footing OD by 12'-0" to provide sufficient bearing area during a seismic event.
- Increase the ringwall OD by 6'-0" to accept new anchors.


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Anchor Improvements**- AWWA D100 Section 3.8.9.1

$D_t = 90\ ft$ Tank Diameter

$M_{s_0} = 371674.043\ kip \cdot ft$ Overturning Moment of Tank Shell to be resisted by anchors

$d_{off} := 15\ in + 6\ in + 9\ in = 30\ in$ Anchor offset from shell

$D_{ac} := D_t + 2 \cdot d_{off} = 95\ ft$ Diameter of anchor bolt circle

$N_{anch} := 140$ Number of proposed anchors

$S_{anch} := \frac{2 \cdot \pi \cdot R_t}{N_{anch}} = 2.02\ ft$ Proposed anchor spacing

$F_{bolt} := \left( \frac{4 \cdot M_{s_0}}{N_{anch} \cdot D_{ac}} \right) - \frac{(1 - 0.4 \cdot A_v) \cdot (W_s)}{N_{anch}} = 108.03\ kip$ Demand per anchor per Equation 3-38

$F_{y.bolt} := 36\ ksi$ Yield strength of bolt

$F_{u.bolt} := 58\ ksi$ Tensile rupture strength of bolt

$F_{all} := min\left(0.8 \cdot F_{y.bolt}, 0.5 \cdot F_{u.bolt}\right) = 28.8\ ksi$ Allowable bolt stress

$A_{req} := \frac{F_{bolt}}{F_{all}} = 3.751\ in^2$ Required area of bolt

F1554-55 bolts

$d_{bolt} := 2.5\ in$ Nominal diameter

$A_{root} := 3.90\ in^2$ Bolt Minimum Root Area (AISC Table 7-17)

$\sigma_{bolt} := \frac{F_{bolt}}{A_{root}} = 27.7\ ksi$ Tensile stress in bolts

$check := \left\| \begin{array}{l} \text{if } F_{all} \geq \sigma_{bolt} \\ \quad \| \text{“OK”} \\ \text{else} \\ \quad \| \text{“NG”} \end{array} \right\| = \text{“OK”}$

Conclusion:
Install $N_{anch} = 140$ $d_{bolt} = 2.5\ in$ diameter anchors.
Approximate spacing: $S_{anch} = 2.02\ ft$



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Anchor Chair Design**

- AISC Steel Plate Engineering Data - Volume 1: Steel Tanks for Liquid Storage, 1992 Ed. and AISC Steel Construction Manual 13th Ed.

$D_t = 90\ ft$ — Shell diameter

$P_{bolt.y} := F_{y.bolt} \cdot A_{root} = 140\ kip$ — Anchor yield capacity

$P_{ab} := 4 \cdot \left( \frac{4 \cdot M_{s_0}}{N_{anch} \cdot D_{ac}} \right) - \frac{(1 - 0.4 \cdot A_v) \cdot (W_s)}{N_{anch}} = 443\ kip$ — Net uplift force per anchor considering 4 times seismic load (Eq. 3-38)

$P_{chair} := min\left(P_{ab}, P_{bolt.y}\right) = 140.4\ kip$ — Design Anchor Chair Load per section 3.8.5.3

$a := S_{anch} = 24.235\ in$ — Top plate width along shell

$b_a := 34\ in$ — Top plate length in radial direction

$d_{bolt} = 2.5\ in$ — Anchor bolt diameter

$m := 0.25\ in$ — Bottom plate thickness (Annular Ring)

$e := d_{off} = 30\ in$ — Anchor bolt eccentricity

$e_{min} := 0.886 \cdot d_{bolt} + 0.572\ in = 2.787\ in$ — Minimum eccentricity

$f_{min} := \frac{d_{bolt}}{2} + \frac{1}{8}\ in = 1.375\ in$ — Minimum distance from outside top plate to edge of bolt hole

$f := b_a - \left(e - \frac{d_{bolt}}{2}\right) - d_{bolt} = 2.75\ in$ — Distance from outside of top plate to edge of bolt hole

$g := d_{bolt} + 6\ in = 8.5\ in$ — Distance between vert plates (in)

$h := 30\ in$ — Chair height (in)

$k_1 := b_a - 0.5\ in = 33.5\ in$ — Vertical plate width at top (in)

$k_2 := 3\ in$ — Vertical plate width at bottom (in)

$R := \frac{D_t}{2} = 540\ in$ — Nominal shell radius (in)

$S_{allow.shell} := 1.333 \cdot 20000\ psi = 26.66\ ksi$ — Allowable stress in shell per 3.8.5.1 increased for seismic per Section 3.12

$S_{chair} := 25\ ksi$ — Allowable stress in chair plates



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Top Plate**

$$c_{min} := \sqrt{\frac{P_{chair}}{S_{chair} \cdot f} \cdot \left(0.375 \cdot g - 0.22 \cdot d_{bolt}\right)} = 2.321 \ in$$

Min thickness (in), Eq. 7-2

$c := 2.625 \ in$

Selected top plate thickness

$check_{TP} := \text{if}\left(c_{min} > c, \text{“NG”}, \text{“OK”}\right)$

$check_{TP} = \text{“OK”}$

**Chair Height**

$$Z := \frac{1.0 \ in}{\left(\frac{0.177 \cdot a \cdot m}{\sqrt{R \cdot t_{shell}}}\right) \cdot \left(\frac{m}{t_{shell}}\right)^2 + 1.0 \ in} = 0.815$$

Reduction factor, Eq 7-4

$$S_{shell} := \frac{P_{chair} \cdot e}{t_{shell}^{\ 2}} \cdot \left(\frac{1.32 \cdot Z}{\left(\frac{1.43 \cdot a \cdot h^2}{R \cdot t_{shell}}\right) + \left(4 \cdot a \cdot h^2\right)^{\frac{1}{3}}} + \frac{0.031}{\sqrt{R \cdot t_{shell}}}\right) = 1730.802 \ ksi$$

Vertical Stress in shell at top of chair (psi), Eq 7-3

Adjust chair height and number of anchors to limit stress to 25,000 psi

$Check_S := \text{if}\left(S_{shell} \le S_{allow.shell}, \text{“OK”}, \text{“no good”}\right)$ $Check_S = \text{“no good”}$

No good, therefore use continuous top plate ring. Check hoop tension in continuous ring.

**Continuous Ring Hoop Stress:**

$$T_{chair} := \frac{P_{chair} \cdot e}{h \cdot S_{anch}} = 5.793 \ \frac{kip}{in}$$

Circumferential hoop tension in top plate

$$A_{top.pl} := \left(c \cdot b_a\right) = 89.25 \ in^2$$

Cross-Section Area of Top Plate

$$\sigma_{top.pl} := \frac{T_{chair}}{A_{top.pl}} = 0.065 \ \frac{ksi}{in}$$

Circumferential hoop tensile stress

$$S_{hoop} := S_{E_0} \cdot \frac{psi}{1 \ in} = 23.33 \ \frac{ksi}{in}$$

Allowable Hoop Stress in the Shell

$Check_{hoop} := \text{if}\left(\left(\sigma_{top.pl}\right) \le S_{hoop}, \text{“OK”}, \text{“no good”}\right)$ $Check_{hoop} = \text{“OK”}$


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Vertical Side Plates**

$j_{min} := \max(0.5\ in, 0.04 \cdot (h - c)) = 1.095\ in$ — Minimum side plate thickness (in)

$j := 1.25\ in$ — Side plate thickness selected (in)

$k := \frac{k_1 + k_2}{2} = 18.25\ in$ — Average side plate width (in)

$check := \left\| \begin{array}{l} \text{if } j \cdot k \geq \frac{P_{chair} \cdot 1\ in^2}{25000\ lbf} \\ \quad \| \text{“OK”} \\ \text{else} \\ \quad \| \text{“NG”} \end{array} \right\| = \text{“OK”}$ $\quad j \cdot k = 22.813\ in^2$

$\frac{P_{chair} \cdot 1\ in^2}{25000\ lbf} = 5.616\ in^2$

Assures a maximum of L/r of 86.6 and a max average stress in the side plates of 12.5 ksi

**Check Welds**

$W_v := \frac{P_{chair}}{(a + 2 \cdot h)} = 1.667\ kpi$ — Load on vert welds (kips/in)

$W_H := \frac{P_{chair} \cdot e}{(a \cdot h + 0.667 \cdot h^2)} = 3.173\ kpi$ — Load on horz weld (kips/in)

$W := \sqrt{W_v^2 + W_H^2} = 3.584\ kpi$ — Total load on welds (kips/in)

$w := \frac{W}{9.6\ \frac{kip}{in^2}} = 0.373\ in$ — Required weld size (in) per AISC Steel Plate Engineering Data reference

$w_{select} := \frac{\text{round}\left(\frac{w \cdot 8}{in}\right)}{8} \cdot in = 0.375\ in$ — Selected weld size (rounded to nearest 1/8")

Conclusion:

Select $w_{select} = 0.375\ in$ fillet welds chair to shell.


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Check bolt capacity in ringwall**

*ACI 318-19 17.6.2 Concrete breakout strength if anchors in tension:*

$P_{bolt.y} = 140\ kip$ — Selected Bolt Yield Capacity

$f'c = 4500\ psi$ — Concrete compressive strength

$c_{a1} := 12\ in$ — Distance from bolt CL to concrete face

$c_{a2} := 12\ in$ — Distance from bolt CL to opposite conc face

$h_{ef} := 48\ in$ — Embed depth (in)

$A_{Nc} := (c_{a1} + c_{a2}) \cdot (3 \cdot h_{ef}) = 3456\ in^2$ — Net projected concrete failure area (17.6.2.1.1)

$A_{Nco} := (2 \cdot 1.5 \cdot h_{ef}) \cdot (2 \cdot 1.5 \cdot h_{ef}) = 20736\ in^2$ — Gross projected concrete failure area (17.6.2.1.4)

$\psi_{edN} := 0.7 + 0.3 \cdot \frac{c_{a1}}{1.5 \cdot h_{ef}} = 0.75$ — Modification factor for edge effects (17.6.2.4)

$\psi_{cN} := 1.25$ — Modification factor for cast-in anchors (17.6.2.5)

$c_{ac} := 6 \cdot d_{bolt} = 15\ in$ — Critical edge distance

$\psi_{cpN} := \frac{c_{a1}}{c_{ac}} = 0.8$ — Edge reduction factor (17.6.2.6)

$k_c := 24$ — Factor for cast-in anchors (17.6.2.2.1)

$\lambda_a := 1.0$ — Factor for normal weight concrete

$N_b := k_c \cdot \lambda_a \cdot \sqrt{\frac{f'c}{psi}} \cdot \left(\frac{h_{ef}}{in}\right)^{1.5} \cdot 1\ lbf = 535.401\ kip$ — Basic concrete breakout strength (17.6.2.2.3)

$N_{cb} := \frac{A_{Nc}}{A_{Nco}} \cdot \psi_{edN} \cdot \psi_{cN} \cdot \psi_{cpN} \cdot N_b = 66.925\ kip$ — Nominal concrete breakout strength (17.6.2.1a)

$Check := \left\| \begin{array}{l} \text{if } N_{cb} \geq P_{bolt.y} \\ \quad \| \text{“OK”} \\ \text{else} \\ \quad \| \text{“NG”} \end{array} \right\| = \text{“NG”}$ — Check anchor breakout strength vs. Anchor Yield

Conclusion: Concrete breakout strength is insufficient. Provide anchor reinforcement strength in place of concrete breakout strength per ACI 17.5.2.1



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Basic single anchor pullout strength, Np:**

ACI 17.6.3.2.2a

$d_{bolt} = 2.5\ in$ — Nominal anchor diameter

$F_{nut} := 3.875\ in$ — Nut dimension, width across the flats

$A_{bolt} := \frac{\pi}{4} \cdot d_{bolt}^{2} = 4.91\ in^2$ — Nominal bolt area based on diameter

$A_{brg.std} := \left(0.866 \cdot F_{nut}^{2}\right) - \left(A_{bolt}\right) = 8.095\ in^2$ — Net bearing area of anchor bolt with standard nut

$\phi N_{p.std} := 0.75 \cdot 8 \cdot A_{brg.std} \cdot f'c = 218.559\ kip$ — Single anchor pullout strength factored per Table 17.5.3(c)

$P_{bolt.y} = 140.4\ kip$ — Bolt pullout demand

$Check_{nut} := \text{if}\left(\phi N_{p.std} > P_{bolt.y}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$ — Check pullout strength vs. Anchor Yield

$A_{req.nut} := \frac{P_{bolt.y}}{0.75 \cdot 8 \cdot f'c} = 5.2\ in^2$ — Required net bearing area to resist pullout

$w_{plate} := 6\ in$ — Selected width of bearing plate

$A_{brg.prov} := \left(w_{plate}^{2}\right) - A_{bolt} = 31.091\ in^2$ — Selected bearing plate bearing area

$\phi N_{p.prov} := 0.75 \cdot 8 \cdot A_{brg.prov} \cdot f'c = 839.464\ kip$ — Single anchor pullout strength factored per Table 17.5.3(c)

$Check_{pl.w} := \text{if}\left(\phi N_{p.prov} > P_{bolt.y}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$ — Check pullout strength vs. Anchor Yield

**Bearing Plate Design:**

$b_{x.pl} := 1\ in$ — Cross-sectional width of plate

$t_{x.pl} := 2.75\ in$ — Selected plate thickness

$l_{pl} := 0.5 \cdot \left(w_{plate} - d_{bolt}\right) = 1.75\ in$ — Cantilever span of plate

$q_{pl} := \frac{P_{bolt.y}}{A_{brg.prov}} \cdot b_{x.pl} = 54188.86\ plf$ — Linearly distributed load on 1" section

$M_{pl} := 0.5 \cdot \left(q_{pl} \cdot l_{pl}^{2}\right) = 0.576\ kip \cdot ft$ — Max moment to plate

$F_{b.pl} := 24000\ psi$ — Allowable bending stress in plate (ASD)

$S_{x.pl} := \frac{b_{x.pl} \cdot t_{x.pl}^{2}}{6} = 1.26\ in^3$ — Section modulus of selected plate dimensions

$f_{b.pl} := \frac{M_{pl}}{S_{x.pl}} = 5486\ psi$ — Actual bending stress in plate

$Check_{pl.t} := \text{if}\left(f_{b.pl} < F_{b.pl}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$

Conclusion:
$Pl_{bear} = \text{“PL2.75" x 6" x 6”}$



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Concrete Side Face Blowout, Nsb**

$A_{brg.prov} = 31.091\ in^2$ — Bearing area provided by bolt/plate

$h_{ef} = 48\ in$ — Anchor embedment

$c_{a1} = 12\ in$ — Anchor minimum edge distance

$Eq := \text{if}\left(h_{ef} > 2.5\ c_{a1}, \text{“Check Eq. 17.6.4.1”}, \text{“NA”}\right) = \text{“Check Eq. 17.6.4.1”}$ — Side face blowout applicability check

$\phi N_{sb} := 0.75 \cdot 160 \cdot \frac{c_{a1}}{in} \cdot \sqrt{\left(\frac{A_{brg.prov}}{in^2}\right)} \cdot \lambda_a \cdot \sqrt{\left(\frac{f'c}{psi}\right)} \cdot lbf = 538.627\ kip$ — Side face blowout strength factored per 17.5.3(b)

$Check_{Nsb} := \text{if}\left(\phi N_{sb} > P_{bolt.y}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$ — Check side face blowout strength vs. Anchor Yield

**Anchor Reinforcing for tension**
Reference: ACI 318-19 (17.6.3.2.2a)

$P_{bolt.y} = 140\ kip$ — Anchor bolt yield

$f_y := 60\ ksi$ — Yield capacity of anchor verts

$Rst.Num_{anch.verts} := \text{“\#5”}$ — Selected Rst

$A_{s.vert} := 2 \cdot 0.31\ in^2 = 0.62\ in^2$ — Rst Area of anchor verts

$\phi P_{vert} := 0.75 \cdot A_{s.vert} \cdot f_y = 27.9\ kip$ — Factored tensile strength of (1) anchor vert

$N_{req} := \frac{P_{bolt.y}}{\phi P_{vert}} = 5.03$ — Number of anchor verts required per bolt

$N_{bar.vert} := 6$ — Selected number of bars

$\phi N_n := N_{bar.vert} \cdot \phi P_{vert} = 167.4\ kip$ — Factored tensile capacity of anchor verts at (1) anchor bolt

$DCR_{anch.rst} := \frac{P_{bolt.y}}{\phi N_n} = 0.839$ — DCR for provided anchor reinforcement

$Check_{verts} := \text{if}\left(\phi N_n \geq P_{bolt.y}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$ — NOTE: Shear capacity is not considered due to the Sliding Check

Conclusion:

$Rst_{anch.verts} = \text{“[6] Grade 60 \#5 Verts, Each Anchor, E.F.of Ringwall.”}$


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Ringwall to Existing Footing Connection:**

$V_{uplift} := \frac{P_{bolt.y}}{S_{anch}} = 69.52\ klf$ — Uplift along (per foot) ringwall due to anchor loading

Existing Ringwall Connection To Existing Footing

Existing ringwall has #5 @ 8" O.C., E.F. Vertical bars transferring load into the foundation.
Note: #5 @ 8" O.C. = As = 0.47 in^2

$f_{y.ex} := 60\ ksi$ — Yield capacity of vert rebar

$As_{v.ex} := 2 \cdot 0.47\ in^2 = 0.94\ in^2$ — Area of steel per foot of ringwall (provided by existing rst)

$C_{v.ex} := \frac{0.75 \cdot f_{y.ex} \cdot As_{v.ex}}{ft} = 42.3\ klf$ — Existing Bar Capacity to Existing Footing

42.3 klf of the proposed anchor's shear force can be transferred via the existing ringwall.

$V_{epoxy} := V_{uplift} - C_{v.ex} = 27.22\ klf$ — Uplift demand to be transferred via epoxy anchors

Proposed Ringwall Connection To Existing Footing:

Try:
#5 bar E.F. Drill and Epoxied into existing footing (As = 0.31in^2 each)

$N_{bars} := \text{ceil}\left(\frac{V_{epoxy}}{f_{y.ex} \cdot 0.31\ in^2} \cdot ft\right) = 2$ — Minimum bars required per foot based only on steel strength

Width of proposed ringwall to be 3'-0" for anchor breakout spacing.

Reference: Hilti Report

$N_{bar.ring_to_ftg} := 3$ — Selected Number of Bars

$Rst.Num_{ring_to_ftg} := \text{"\#5"}$ — Selected bar size

$Embed_{ring_to_ftg} := 8\ in$ — Embed depth

$Epoxy_{ring_to_ftg} := \text{"Hilti HIT-RE V3"}$ — Selected Epoxy

---

$Rst_{ring_to_ftg} = \text{"[3] Grade 60 \#5 Verts Per Foot of Ringwall. Embed 8 inches into existing footing. Use Hilti HIT-RE V3 adhesive."}$



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Ringwall to Existing Ringwall Connection**

$V_{uplift} = 69.519\ klf$ Shear force due to anchor uplift transferred from anchors.

Use epoxy anchors to connect proposed ringwall to existing.

Minimum number bars based on steel strength:

$$N_{\#6} := \text{ceil}\left(\frac{V_{uplift} \cdot ft}{\left(0.75 \cdot f_y \cdot 0.44\ in^2\right)}\right) = 4$$

See attached Hilti Profis Report

Conclusion:
Use Hilti HIT-RE 500 V3 adhesive with Gr. 60 #6 Bars embedded 10" MIN
Layout - 12" from TOC, (2) columns 6" apart (horz) and 8" O.C. vertical for (4) rows.
Total of (8) bars per lineal foot.



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Design Reinforcement Between Existing and Proposed Footing:**

$\sigma_{st.dy} = 6773.62\ psf$ Maximum bearing pressure at outside toe of footing

$ftg_{od} = 116.833\ ft$ Footing outside diameter

Note:
- Bearing pressure at center of tank is 0 psf and is distributed as a triangular load linearly increasing to outside face of the footing (max dynamic bearing pressure)
- Footing diameter was increased by 12 ft

$$\sigma_{int} := \left(\frac{\sigma_{st.dy}}{\left(\frac{ftg_{od}}{2}\right)}\right) \cdot \left(\left(\frac{ftg_{od}}{2}\right) - \left(\frac{12\ ft}{2}\right)\right) = 6077.899\ psf$$ Bearing pressure at intersection

$$V_{int} := \sigma_{int} \cdot \left(\frac{12\ ft}{2}\right) + 0.5 \cdot \left(\left(\sigma_{st.dy} - \sigma_{int}\right) \cdot \frac{12\ ft}{2}\right) = 38.555\ klf$$ Shear at the intersection

Use Hilti Profis to determine epoxy anchor layout.

Conclusion:
Use Hilti HIT-RE 500 V3 adhesive with Gr. 60 #6 Bars embedded 6" MIN
Layout - 24" from TOC, (1) columns and 15" O.C. vertical for (3) bars.
Total of (3) bars per lineal foot.

Determine Flexure at Base of Proposed Footing:

$M_{u.ftg} := V_{int} \cdot ft \cdot 6\ ft = 231.327\ kip \cdot ft$ Worst case flexure in additional slab

$d_{rst} := 5\ ft - 6\ in - (2 \cdot 0.75\ in) = 52.5\ in$ Depth to base rst in section

**Determine factored moment capacity for a unit strip, given section and material properties.**

| | | | | | | |
|---|---|---|---|---|---|---|
| d | 52.50 | $\beta_1$ | 0.83 | $\Phi M_n$ | 2784.00 | kip-in/ft |
| $A_s$ | 0.99 in^2/ft | a | 1.30 in | $\Phi M_n$ | 232.00 | kip-ft/ft |
| f'c | 4500 psi | $\rho_{bal}$ | 0.0311 | | (must be tension controlled) | |
| $F_y$ | 60000 psi | j | 0.99 | | | |

Based on shear rst design #6 @ 12" O.C. exist across the bottom of footing (As = 0.44in^2)
Add #7 @ 12" on bottom face alternating with #6 @ 12". (Bars at 6" O.C. alternating #6 and #7)



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Design Horizontal Ringwall Reinforcing:**

$K_o := 0.5$ — Assumed factor for radial distribution

$L_w := 1.6\ h_p \cdot 62.4\ psf \cdot K_o = 4.243\ klf$ — Hydrostatic pressure at base of shell

$T := L_w \cdot \left(1 + 0.4 \cdot A_v\right) \cdot \frac{D_t}{2} = 202.941\ kip$ — Hoop tension in ringwall

$f_{y.horz} := 60\ ksi$ — Yield capacity of horizontal rebar

$F_{rst} := 0.9 \cdot f_{y.horz} = 54000\ psi$ — Allowable stress in rst

$A_{srw} := \frac{T}{F_{rst}} = 3.76\ in^2$ — Required hoop steel (in^2)

Existing hoop steel = #8 @ 10" O.C., E.F.

$A_{srw.ex} := 0.79\ in^2 \cdot \left(\frac{6\ ft}{10\ in}\right) \cdot 2 = 11.376\ in^2$ — Area if steel in existing ringwall

Conclusion:
Specify (3) #5 hoop bars T&B proposed ringwall for T&S (not required for strength)



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Design Davit Crane Connection to Rafters:**

Secure to Existing C8x11.5 sub-rafters, W14x30 rafters

Thern Captain Series Davit Crane Model 5FT25X-E2X
Weight 755 lb
Capacity 2800 lb

**Table 1 – Crane Reactions**

| Crane Model | Mast Moment | | Suggested Bolt Size | Force per Bolt (tension) | |
|---|---|---|---|---|---|
| 5FT20 | 116,640 in-lbs | 13,180 N-m | 5/8 inch (M16) | 4,700 lbs | 20,908 N |
| 5FT25 | 199,730 in-lbs | 22,568 N-m | 3/4 inch (M20) | 6,430 lbs | 28,604 N |

This information may change without prior notice. It is the responsibility of the installer and/or end user to ensure the most current information is used.

Crane Reactions - per Owners manual

$M_{mast} := 199730\ in \cdot lbf$ — Mast Moment

$F_{bolt.crane} := 6430\ lbf$ — Force per Bolt (tension)

$s_{exist} := 6\ ft + 9\ in$ — Max span between rafters

Design will be (2) Channel Shapes spanning between roof rafters which will accept the bolts from the crane base.

$x_{bolt} := \frac{M_{mast}}{2 \cdot F_{bolt.crane}} = 15.531\ in$ — Approximate bolt layout dimension at base of crane

Analyze as 2-bolt point loads:

$x_1 := s_{exist} - (0.5 \cdot s_{exist}) - (0.5 \cdot x_{bolt}) = 2.728\ ft$ — Location of bolt load 1

$x_2 := x_1 + x_{bolt} = 4.022\ ft$ — Location of bolt load 2

Per ENERCALC Selection: C8x11.5 for Davit Mount Members


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Check existing C8x11.5 Sub-Rafters for loads transferred from Davit Crane:

Each selected mounting beam transfers it's Live Load Reaction to the Sub-Rafter in (2) locations near the end.

$R_L := 6.43\ kip$ — Transferred reaction

$trib_{rafter} := 6\ ft + 8\ in = 6.667\ ft$ — Tributary Dimension of Rafter

$s_{rafter} := 22.5\ ft$ — Rafter span

Existing Sub-Rafter Loads:

$w_{snow} := 25\ psf$ — Roof snow load

$w_{rdl} = 11.719\ psf$ — Roof DL

$w_{ll} = 25\ psf$ — Roof LL

$P_{L.adl} := R_L = 6.43\ kip$ — Add'l live load to rafter in (2) locations

$x_1 := s_{rafter} - 1.5\ ft = 21\ ft$ — Add'l live load Location 1

$x_2 := s_{rafter} - 1.5\ ft - 1\ ft - 4\ in = 19.667\ ft$ — Add'l live load Location 2

Existing single C8x11.5 NO GOOD per Enercalc

Install add'l C8x11.5 rafter.

Factored Demand:
Flexural = 50.227 k-ft; Shear = 22.778 kip

Factored Capacity ((2) C8x11.5):
Flexural = 2*36.113 kip-ft = 72.226 kip-ft OK ; Shear = 2*47.52 kip = 95.04 kip

Check existing W14x30 Rafters for loads transferred from Davit Crane:

Each selected mounting beam transfers it's Live Load Reaction to the Sub-Rafter in (2) locations near the end.

$R_L := 6.43\ kip$ — Transferred reaction

$trib_{rafter} := 6\ ft + 8\ in = 6.667\ ft$ — Tributary Dimension of Rafter

$s_{W14} := 45\ ft$ — Rafter span

Existing Rafter Loads:

$w_{snow} = 0.025\ ksf$ — Roof snow load

$w_{rdl} = 0.012\ ksf$ — Roof DL

$w_{ll} = 0.025\ ksf$ — Roof LL

$P_{L.adl} := R_L = 6.43\ kip$ — Add'l live load to rafter in (2) locations

$x_1 := s_{W14} - 1.5\ ft = 43.5\ ft$ — Add'l live load Location 1

$x_2 := s_{W14} - 1.5\ ft - 1\ ft - 4\ in = 42.167\ ft$ — Add'l live load Location 2

W14x30 is OK per Enercalc



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Design Improved Shell-Rafter Connection:**

**Existing: (21) W14x30 Rafters**

Use PL8x8x3/8 welded to both tank shell and each rafter.

| | |
|---|---|
| $w_{snow} := 25\ psf$ | Roof snow load |
| $w_{rdl} = 11.719\ psf$ | Roof DL |
| $w_{ll} = 25\ psf$ | Roof LL |
| $L := 14\ ft$ | W14x30 tributary dimension |
| $s := R_t = 45\ ft$ | Span of W14x30 |

$w_{des} := 1.2 \cdot w_{rdl} + 1.6 \cdot w_{snow} + w_{ll} = 79.063\ psf$ — Load combination 3 controls per ASCE 7-16 2.3.1

Full load is traced to W14x30 Rafters:

$V_{W14x30} := \frac{s \cdot L \cdot w_{des}}{2} + \left(1.6 \cdot 2 \cdot R_L\right) = 45.5\ kip$ — Shear load to W14x30 Connection

Note: Additional shear due to davit crane included (2*RL)

Shear Capacity of Plate:

| | |
|---|---|
| $\phi_v := 0.9$ | LRFD Factor |
| $F_{y.pl} := 36\ ksi$ | Plate yield strength |
| $A_{pl} := 8\ in \cdot 0.375\ in = 3\ in^2$ | Cross-sectional area of plate |
| $\phi V_n := \phi_v \cdot 0.6 \cdot F_{y.pl} \cdot A_{pl} = 58.32\ kip$ | Design strength of plate |

Shear Capacity of Welds:

| | |
|---|---|
| $\phi_w := 0.75$ | LRFD Factor |
| $L_{weld} := 8\ in$ | Length of weld on member side |
| $t_{weld} := 0.25\ in$ | Weld size |
| $A_{we} := 0.7 \cdot t_{weld} \cdot L_{weld} = 1.4\ in^2$ | Weld area |
| $A_{BM} := A_{pl} = 3\ in^2$ | Base Metal area |
| $F_{nBM} := F_{y.pl} = 36\ ksi$ | Base metal nominal stress |
| $F_{nw} := 70\ ksi$ | Weld metal nominal stress |
| $\phi R_{nBM} := \phi_w \cdot F_{nBM} \cdot A_{BM} = 81\ kip$ | Design base metal strength |
| $\phi R_{nwe} := \phi_w \cdot F_{nw} \cdot A_{we} = 73.5\ kip$ | Design weld strength |

$check := \text{if}\left(\phi V_n \geq V_{W14x30}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$
$check := \text{if}\left(\phi R_{nBM} \geq V_{W14x30}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$
$check := \text{if}\left(\phi R_{nwe} \geq V_{W14x30}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$

Specify welded PL8x8x3/8 connection for W14x30 Rafters.



C:\Users\casey\OneDrive - RH2 ENGINEERING, INC\1.0 Project Desktop Notes\LAC HP Rehabilitation\LAC - HP Retrofit Detailed Calcs.mcdx
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Existing: (20) C8x11.5 *Sub* Rafters**

Use PL6x6x3/8 welded to both tank shell and each rafter.

$w_{snow} := 25\ psf$ Roof snow load
$w_{rdl} = 11.719\ psf$ Roof DL
$w_{ll} = 25\ psf$ Roof LL
$L_{sub} := 7\ ft$ C8x11.5 tributary dimension
$s_{sub} := 22.5\ ft$ Span of C8x11.5

$w_{des} = 79.063\ psf$ Load combination 3 controls per ASCE 7-16 2.3.1

Load traced to C8x11.5 Sub Rafter

$V_{C8x11.5} := \frac{s_{sub} \cdot L_{sub} \cdot w_{des}}{2} + \left(1.6 \cdot 2 \cdot R_L\right) = 26.8\ kip$ Shear load to C8x11.5 Connection

Note: Additional shear due to davit crane included (2*RL)

Shear Capacity of Plate:

$\phi_v := 0.9$ LRFD Factor
$F_{y.pl.sub} := 36\ ksi$ Plate yield strength
$A_{pl.sub} := 4.5\ in \cdot 0.375\ in = 1.688\ in^2$ Cross-sectional area of plate
$\phi V_{n.sub} := \phi_v \cdot 0.6 \cdot F_{y.pl.sub} \cdot A_{pl.sub} = 32.805\ kip$ Design strength of plate

Shear Capacity of Welds:

$\phi_w := 0.75$ LRFD Factor
$L_{weld.sub} := 4.5\ in$ Length of weld on member side
$t_{weld.sub} := 0.25\ in$ Weld size
$A_{we.sub} := 0.7 \cdot t_{weld.sub} \cdot L_{weld.sub} = 0.788\ in^2$ Weld area
$A_{BM.sub} := A_{pl.sub} = 1.688\ in^2$ Base Metal area
$F_{nBM.sub} := F_{y.pl.sub} = 36\ ksi$ Base metal nominal stress
$F_{nw.sub} := 70\ ksi$ Weld metal nominal stress
$\phi R_{nBM.sub} := \phi_w \cdot F_{nBM.sub} \cdot A_{BM.sub} = 45.563\ kip$ Design base metal strength
$\phi R_{nwe.sub} := \phi_w \cdot F_{nw.sub} \cdot A_{we.sub} = 41.344\ kip$ Design weld strength

$check := \text{if}\left(\phi V_{n.sub} \geq V_{C8x11.5}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$
$check := \text{if}\left(\phi R_{nBM.sub} \geq V_{C8x11.5}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$
$check := \text{if}\left(\phi R_{nwe.sub} \geq V_{C8x11.5}, \text{“OK”}, \text{“NG”}\right) = \text{“OK”}$

Specify welded PL4.5x4.5x3/8 connection for C8x11.5 Rafters.


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Ringwall to Existing Footing Connection

**Hilti PROFIS Engineering 3.1.16**

**www.hilti.com**

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 1 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Jun 20, 2025 | Date: | 6/22/2025 |
| Fastening point: | | | |

**Specifier's comments:**

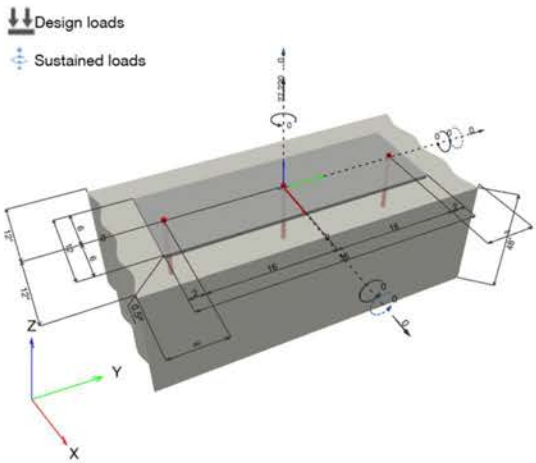
## 1 Input data



| | |
|---|---|
| **Anchor type and diameter:** | **HIT-RE 500 V3 + Rebar A615 Gr.60 #5** |
| Item number: | not available (element) / 2123401 HIT-RE 500 V3 (adhesive) |
| Specification text: | #5 Rebar with Hilti HIT-RE 500 V3 + Rebar A615 Gr.60 with 8 in nominal embedment depth per ICC-ES ESR-3814 , Hammer drill bit installation per MPII, |
| Effective embedment depth: | $h_{ef,act}$ = 8.000 in. ($h_{ef,limit}$ = - in.) |
| Material: | ASTM A 615 Gr.60 |
| Evaluation Service Report: | ESR-3814 |
| Issued I Valid: | 1/1/2025 \| 1/1/2027 |
| Proof: | Design Method ACI 318-19 / Chem |
| Shear edge breakout verification: | Row closest to edge (Case 3 only from ACI 318-19 Fig. R.17.7.2.1b) |
| Stand-off installation: | $e_b$ = 0.000 in. (no stand-off); t = 0.500 in. |
| Anchor plate[R] : | $l_x$ x $l_y$ x t = 12.000 in. x 36.000 in. x 0.500 in.; (Recommended plate thickness: not calculated) |
| Profile: | no profile |
| Base material: | cracked concrete, 2500, $f_c'$ = 2,500 psi; h = 48.000 in., Temp. short/long: 32/32 °F |
| **Installation:** | **Hammer drilled hole, Installation condition: Dry** |
| Reinforcement: | tension: not present, shear: not present; no supplemental splitting reinforcement present<br>edge reinforcement: none or < No. 4 bar |

[R] - The anchor calculation is based on a rigid anchor plate assumption.

**Geometry [in.] & Loading [lb, in.lb]**




Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2025 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



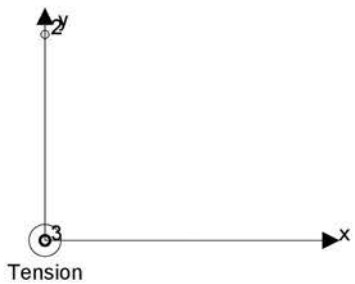
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 2 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Jun 20, 2025 | Date: | 6/22/2025 |
| Fastening point: | | | |

### 1.1 Design results

| Case | Description | Forces [lb] / Moments [in.lb] | Seismic | Max. Util. Anchor [%] |
|---|---|---|---|---|
| 1 | Combination 1 | N = 27,220; $V_x$ = 0; $V_y$ = 0; $M_x$ = 0; $M_y$ = 0; $M_z$ = 0; | no | 94 |

## 2 Load case/Resulting anchor forces




**Anchor reactions [lb]**
Tension force: (+Tension, -Compression)

| Anchor | Tension force | Shear force | Shear force x | Shear force y |
|---|---|---|---|---|
| 1 | 9,073 | 0 | 0 | 0 |
| 2 | 9,073 | 0 | 0 | 0 |
| 3 | 9,073 | 0 | 0 | 0 |

Max. concrete compressive strain: - [‰]
Max. concrete compressive stress: - [psi]
Resulting tension force in (x/y)=(0.000/0.000): 27,220 [lb]
Resulting compression force in (x/y)=(-/-): 0 [lb]

Anchor forces are calculated based on the assumption of a rigid anchor plate.

## 3 Tension load

| | Load $N_{ua}$ [lb] | Capacity $\phi$ $N_n$ [lb] | Utilization $\beta_N = N_{ua}/\phi$ $N_n$ | Status |
|---|---|---|---|---|
| Steel Strength* | 9,073 | 16,119 | 57 | OK |
| Bond Strength** | 27,220 | 42,576 | 64 | OK |
| Sustained Tension Load Bond Strength* | N/A | N/A | N/A | N/A |
| Concrete Breakout Failure** | 27,220 | 29,171 | 94 | OK |

* highest loaded anchor **anchor group (anchors in tension)

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2025 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 3 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Jun 20, 2025 | Date: | 6/22/2025 |
| Fastening point: | | | |

### 3.1 Steel Strength

| | |
|---|---|
| $N_{sa}$ = ESR value | refer to ICC-ES ESR-3814 |
| $\phi\ N_{sa} \geq N_{ua}$ | ACI 318-19 Table 17.5.2 |

**Variables**

| $A_{se,N}$ [in.$^2$] | $f_{uta}$ [psi] |
|---|---|
| 0.31 | 80,000 |

**Calculations**

| $N_{sa}$ [lb] |
|---|
| 24,799 |

**Results**

| $N_{sa}$ [lb] | $\phi_{steel}$ | $\phi\ N_{sa}$ [lb] | $N_{ua}$ [lb] |
|---|---|---|---|
| 24,799 | 0.650 | 16,119 | 9,073 |

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2025 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 4 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Jun 20, 2025 | Date: | 6/22/2025 |
| Fastening point: | | | |

### 3.2 Bond Strength

$N_{ag} = \left(\frac{A_{Na}}{A_{Na0}}\right) \Psi_{ec1,Na} \Psi_{ec2,Na} \Psi_{ed,Na} \Psi_{cp,Na} N_{ba}$ — ACI 318-19 Eq. (17.6.5.1b)

$\phi N_{ag} \geq N_{ua}$ — ACI 318-19 Table 17.5.2

$A_{Na}$ see ACI 318-19, Section 17.6.5.1, Fig. R 17.6.5.1(b)

$A_{Na0} = (2 c_{Na})^2$ — ACI 318-19 Eq. (17.6.5.1.2a)

$c_{Na} = 10 d_a \sqrt{\frac{\tau_{uncr}}{1100}}$ — ACI 318-19 Eq. (17.6.5.1.2b)

$\Psi_{ec,Na} = \left(\frac{1}{1 + \frac{e'_N}{c_{Na}}}\right) \leq 1.0$ — ACI 318-19 Eq. (17.6.5.3.1)

$\Psi_{ed,Na} = 0.7 + 0.3 \left(\frac{c_{a,min}}{c_{Na}}\right) \leq 1.0$ — ACI 318-19 Eq. (17.6.5.4.1b)

$\Psi_{cp,Na} = MAX\left(\frac{c_{a,min}}{c_{ac}}, \frac{c_{Na}}{c_{ac}}\right) \leq 1.0$ — ACI 318-19 Eq. (17.6.5.5.1b)

$N_{ba} = \lambda_a \cdot \tau_{k,c} \cdot \pi \cdot d_a \cdot h_{ef}$ — ACI 318-19 Eq. (17.6.5.2.1)

#### Variables

| $\tau_{k,c,uncr}$ [psi] | $d_a$ [in.] | $h_{ef}$ [in.] | $c_{a,min}$ [in.] | $\alpha_{overhead}$ | $\tau_{k,c}$ [psi] |
|---|---|---|---|---|---|
| 1,720 | 0.625 | 8.000 | 12.000 | 1.000 | 1,390 |

| $e_{c1,N}$ [in.] | $e_{c2,N}$ [in.] | $c_{ac}$ [in.] | $\lambda_a$ |
|---|---|---|---|
| 0.000 | 0.000 | 13.111 | 1.000 |

#### Calculations

| $c_{Na}$ [in.] | $A_{Na}$ [in.$^2$] | $A_{Na0}$ [in.$^2$] | $\Psi_{ed,Na}$ |
|---|---|---|---|
| 7.780 | 726.35 | 242.12 | 1.000 |

| $\Psi_{ec1,Na}$ | $\Psi_{ec2,Na}$ | $\Psi_{cp,Na}$ | $N_{ba}$ [lb] |
|---|---|---|---|
| 1.000 | 1.000 | 1.000 | 21,834 |

#### Results

| $N_{ag}$ [lb] | $\phi_{bond}$ | $\phi N_{ag}$ [lb] | $N_{ua}$ [lb] |
|---|---|---|---|
| 65,502 | 0.650 | 42,576 | 27,220 |

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2025 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 5 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Jun 20, 2025 | Date: | 6/22/2025 |
| Fastening point: | | | |

### 3.3 Concrete Breakout Failure

$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nc0}}\right) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ — ACI 318-19 Eq. (17.6.2.1b)

$\phi N_{cbg} \geq N_{ua}$ — ACI 318-19 Table 17.5.2

$A_{Nc}$ see ACI 318-19, Section 17.6.2.1, Fig. R 17.6.2.1(b)

$A_{Nc0} = 9 h_{ef}^2$ — ACI 318-19 Eq. (17.6.2.1.4)

$\Psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e'_N}{3 h_{ef}}}\right) \leq 1.0$ — ACI 318-19 Eq. (17.6.2.3.1)

$\Psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}}\right) \leq 1.0$ — ACI 318-19 Eq. (17.6.2.4.1b)

$\Psi_{cp,N} = \text{MAX}\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}}\right) \leq 1.0$ — ACI 318-19 Eq. (17.6.2.6.1b)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ — ACI 318-19 Eq. (17.6.2.2.1)

#### Variables

| $h_{ef}$ [in.] | $e_{c1,N}$ [in.] | $e_{c2,N}$ [in.] | $c_{a,min}$ [in.] | $\Psi_{c,N}$ |
|---|---|---|---|---|
| 8.000 | 0.000 | 0.000 | 12.000 | 1.000 |

| $c_{ac}$ [in.] | $k_c$ | $\lambda_a$ | $f'_c$ [psi] |
|---|---|---|---|
| 13.111 | 17 | 1.000 | 2,500 |

#### Calculations

| $A_{Nc}$ [in.$^2$] | $A_{Nc0}$ [in.$^2$] | $\Psi_{ec1,N}$ | $\Psi_{ec2,N}$ | $\Psi_{ed,N}$ | $\Psi_{cp,N}$ | $N_b$ [lb] |
|---|---|---|---|---|---|---|
| 1,344.00 | 576.00 | 1.000 | 1.000 | 1.000 | 1.000 | 19,233 |

#### Results

| $N_{cbg}$ [lb] | $\phi_{concrete}$ | $\phi N_{cbg}$ [lb] | $N_{ua}$ [lb] |
|---|---|---|---|
| 44,878 | 0.650 | 29,171 | 27,220 |

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2025 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 6 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Jun 20, 2025 | Date: | 6/22/2025 |
| Fastening point: | | | |

## 4 Shear load

| | Load $V_{ua}$ [lb] | Capacity $\phi$ $V_n$ [lb] | Utilization $\beta_V = V_{ua}/\phi$ $V_n$ | Status |
|---|---|---|---|---|
| Steel Strength* | N/A | N/A | N/A | N/A |
| Steel failure (with lever arm)* | N/A | N/A | N/A | N/A |
| Pryout Strength (Bond Strength controls)* | N/A | N/A | N/A | N/A |
| Concrete edge failure in direction ** | N/A | N/A | N/A | N/A |

* highest loaded anchor **anchor group (relevant anchors)

## 5 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2021, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- The equations presented in this report are based on imperial units. When inputs are displayed in metric units, the user should be aware that the equations remain in their imperial format.
- Condition A applies where the potential concrete failure surfaces are crossed by supplementary reinforcement proportioned to tie the potential concrete failure prism into the structural member. Condition B applies where such supplementary reinforcement is not provided, or where pullout or pryout strength governs.
- Design Strengths of adhesive anchor systems are influenced by the cleaning method. Refer to the INSTRUCTIONS FOR USE given in the Evaluation Service Report for cleaning and installation instructions.
- For additional information about ACI 318 strength design provisions, please go to https://viewer.joomag.com/profis-design-guide-us-en-summer-2021/0841849001625154758?short&/
- Installation of Hilti adhesive anchor systems shall be performed by personnel trained to install Hilti adhesive anchors. Reference ACI 318-19, Section 26.7.

**Fastening meets the design criteria!**


PROFIS Engineering ( c ) 2003-2025 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 7 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Jun 20, 2025 | Date: | 6/22/2025 |
| Fastening point: | | | |

## 6 Installation data

Anchor type and diameter: HIT-RE 500 V3 + Rebar A615 Gr.60 #5

Profile: no profile

Item number: not available (element) / 2123401 HIT-RE 500 V3 (adhesive)

Hole diameter in the fixture: $d_f$ = 0.625 in.

Maximum installation torque: -

Plate thickness (input): 0.500 in.

Hole diameter in the base material: 0.750 in.

Recommended plate thickness: not calculated

Hole depth in the base material: 8.000 in.

Drilling method: Hammer drilled

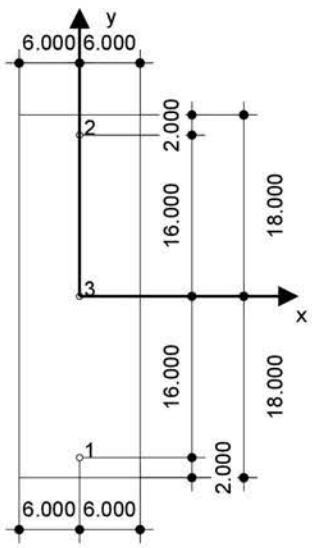
Minimum thickness of the base material: 9.500 in.

Cleaning: Compressed air cleaning of the drilled hole according to instructions for use is required

#5 Rebar with Hilti HIT-RE 500 V3 + Rebar A615 Gr.60 with 8 in nominal embedment depth per ICC-ES ESR-3814 , Hammer drill bit installation per MPII

### 6.1 Recommended accessories

| Drilling | Cleaning | Setting |
|---|---|---|
| • Suitable Rotary Hammer<br>• Properly sized drill bit | • Compressed air with required accessories to blow from the bottom of the hole<br>• Proper diameter wire brush | • Dispenser including cassette and mixer<br>• For deep installations, a piston plug is necessary<br>• Torque wrench |




**Coordinates Anchor [in.]**

| Anchor | x | y | $c_{-x}$ | $c_{+x}$ | $c_{-y}$ | $c_{+y}$ |
|---|---|---|---|---|---|---|
| 1 | 0.000 | -16.000 | 12.000 | 12.000 | - | - |
| 2 | 0.000 | 16.000 | 12.000 | 12.000 | - | - |
| 3 | 0.000 | 0.000 | 12.000 | 12.000 | - | - |

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2025 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 8 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Concrete - Jun 20, 2025 | Date: | 6/22/2025 |
| Fastening point: | | | |

## 7 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2025 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Ringwall to Existing Ringwall Connection

**Hilti PROFIS Engineering 3.0.79**

**www.hilti.com**

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 1 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Copy - Concrete - Jul 15, 2022 | Date: | 7/15/2022 |
| Fastening point: | | | |

**Specifier's comments:**

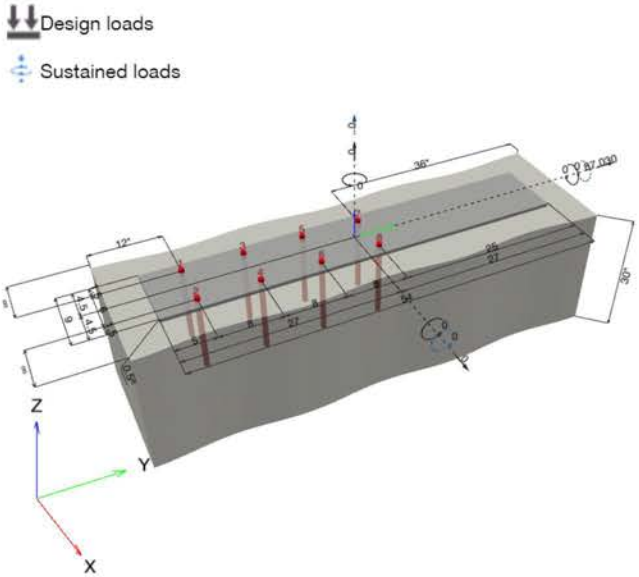
## 1 Input data



| | |
|---|---|
| **Anchor type and diameter:** | **HIT-RE 500 V3 + Rebar A615 Gr.60 #6** |
| Item number: | not available (element) / 2123401 HIT-RE 500 V3 (adhesive) |
| Effective embedment depth: | $h_{ef,act}$ = 10.000 in. ($h_{ef,limit}$ = - in.) |
| Material: | ASTM A 615 Gr.60 |
| Evaluation Service Report: | ESR-3814 |
| Issued I Valid: | 3/1/2021 \| 1/1/2023 |
| Proof: | Design Method ACI 318-08 / Chem |
| Stand-off installation: | $e_b$ = 0.000 in. (no stand-off); t = 0.500 in. |
| Anchor plate[R] : | $l_x$ x $l_y$ x t = 9.000 in. x 54.000 in. x 0.500 in.; (Recommended plate thickness: not calculated) |
| Profile: | no profile |
| Base material: | cracked concrete, 4000, $f_c'$ = 4,000 psi; h = 30.000 in., Temp. short/long: 32/32 °F |
| **Installation:** | **hammer drilled hole, Installation condition: Dry** |
| Reinforcement: | tension: condition B, shear: condition B; no supplemental splitting reinforcement present<br>edge reinforcement: > No. 4 bar with stirrups |
| Seismic loads (cat. C, D, E, or F) | no |

[R] - The anchor calculation is based on a rigid anchor plate assumption.

**Geometry [in.] & Loading [lb, in.lb]**




Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2022 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 2 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Copy - Concrete - Jul 15, 2022 | Date: | 7/15/2022 |
| Fastening point: | | | |

### 1.1 Design results

| Case | Description | Forces [lb] / Moments [in.lb] | Seismic | Max. Util. Anchor [%] |
|---|---|---|---|---|
| 1 | Combination 1 | $N = 0$; $V_x = 0$; $V_y = 87{,}030$; $M_x = 0$; $M_y = 0$; $M_z = 0$; $N_{sus} = 0$; $M_{x,sus} = 0$; $M_{y,sus} = 0$; | no | 96 |

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2022 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 3 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Copy - Concrete - Jul 15, 2022 | Date: | 7/15/2022 |
| Fastening point: | | | |

## 2 Proof I Utilization (Governing Cases)

| | | Design values [lb] | | Utilization | |
|---|---|---|---|---|---|
| **Loading** | **Proof** | **Load** | **Capacity** | **$\beta_N$ / $\beta_V$ [%]** | **Status** |
| Tension | - | - | - | - / - | N/A |
| Shear | Pryout Strength (Concrete Breakout Strength controls) | 87,030 | 91,278 | - / 96 | OK |

| Loading | $\beta_N$ | $\beta_V$ | $\zeta$ | Utilization $\beta_{N,V}$ [%] | Status |
|---|---|---|---|---|---|
| Combined tension and shear loads | - | - | - | - | N/A |

## 3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

**Fastening meets the design criteria!**

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2022 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 4 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Copy - Concrete - Jul 15, 2022 | Date: | 7/15/2022 |
| Fastening point: | | | |

## 4 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2022 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Existing Footing to Footing Connection

**Hilti PROFIS Engineering 3.0.79**

**www.hilti.com**

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 1 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Footing Connection | Date: | 7/15/2022 |
| Fastening point: | | | |

**Specifier's comments:**

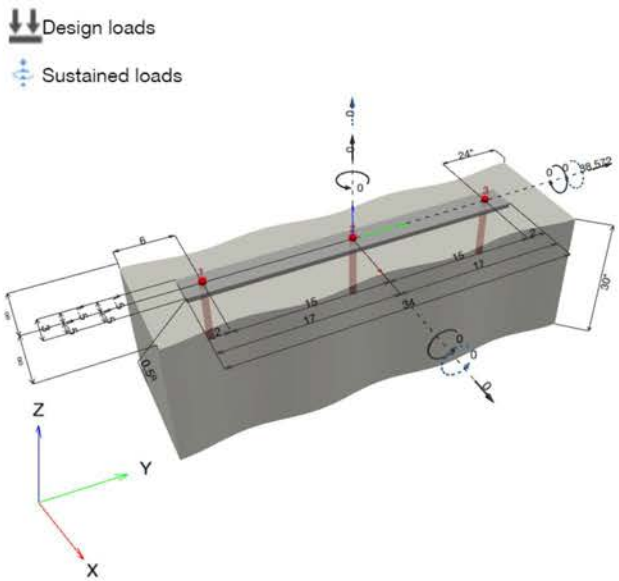
## 1 Input data



| | |
|---|---|
| **Anchor type and diameter:** | **HIT-RE 500 V3 + Rebar A615 Gr.60 #6** |
| Item number: | not available (element) / 2123401 HIT-RE 500 V3 (adhesive) |
| Effective embedment depth: | $h_{ef,act}$ = 6.000 in. ($h_{ef,limit}$ = - in.) |
| Material: | ASTM A 615 Gr.60 |
| Evaluation Service Report: | ESR-3814 |
| Issued I Valid: | 3/1/2021 \| 1/1/2023 |
| Proof: | Design Method ACI 318-08 / Chem |
| Stand-off installation: | $e_b$ = 0.000 in. (no stand-off); t = 0.500 in. |
| Anchor plate[R] : | $l_x$ x $l_y$ x t = 3.000 in. x 34.000 in. x 0.500 in.; (Recommended plate thickness: not calculated) |
| Profile: | no profile |
| Base material: | cracked concrete, 4000, $f_c'$ = 4,000 psi; h = 30.000 in., Temp. short/long: 32/32 °F |
| **Installation:** | **hammer drilled hole, Installation condition: Dry** |
| Reinforcement: | tension: condition B, shear: condition B; no supplemental splitting reinforcement present<br>edge reinforcement: > No. 4 bar |
| Seismic loads (cat. C, D, E, or F) | no |

[R] - The anchor calculation is based on a rigid anchor plate assumption.

**Geometry [in.] & Loading [lb, in.lb]**




Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2022 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 2 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Footing Connection | Date: | 7/15/2022 |
| Fastening point: | | | |

### 1.1 Design results

| Case | Description | Forces [lb] / Moments [in.lb] | Seismic | Max. Util. Anchor [%] |
|---|---|---|---|---|
| 1 | Combination 1 | $N = 0$; $V_x = 0$; $V_y = 38{,}572$; $M_x = 0$; $M_y = 0$; $M_z = 0$; $N_{sus} = 0$; $M_{x,sus} = 0$; $M_{y,sus} = 0$; | no | 91 |

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2022 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 3 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Footing Connection | Date: | 7/15/2022 |
| Fastening point: | | | |

## 2 Proof I Utilization (Governing Cases)

| | | Design values [lb] | | Utilization | |
|---|---|---|---|---|---|
| **Loading** | **Proof** | **Load** | **Capacity** | **$\beta_N$ / $\beta_V$ [%]** | **Status** |
| Tension | - | - | - | - / - | N/A |
| Shear | Steel Strength | 12,857 | 14,256 | - / 91 | OK |

| **Loading** | **$\beta_N$** | **$\beta_V$** | **$\zeta$** | **Utilization $\beta_{N,V}$ [%]** | **Status** |
|---|---|---|---|---|---|
| Combined tension and shear loads | - | - | - | - | N/A |

## 3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

**Fastening meets the design criteria!**

Input data and results must be checked for conformity with the existing conditions and for plausibility!
PROFIS Engineering ( c ) 2003-2022 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| | | | |
|---|---|---|---|
| Company: | RH2 Engineering | Page: | 4 |
| Address: | 1201 Pacific Ave Suite 1750 | Specifier: | |
| Phone I Fax: | \| | E-Mail: | |
| Design: | Footing Connection | Date: | 7/15/2022 |
| Fastening point: | | | |

## 4 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.


PROFIS Engineering ( c ) 2003-2022 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Project Title:
Engineer:
Project ID:
Project Descr:

# Steel Beam

Project File: Hawks Prairie Retrofit.ec6



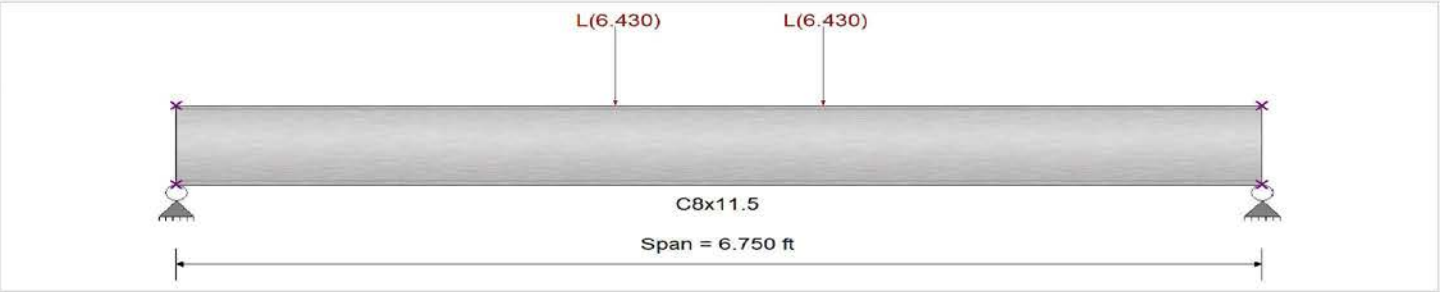
**DESCRIPTION:** --None--

## CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : ASCE 7-16

### Material Properties

| | | | |
|---|---|---|---|
| Analysis Method : | Load Resistance Factor Design | Fy : Steel Yield : | 50.0 ksi |
| Beam Bracing : | Completely Unbraced | E: Modulus : | 29,000.0 ksi |
| Bending Axis : | Major Axis Bending | | |




### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Load(s) for Span Number 1
Point Load : L = 6.430 k @ 2.728 ft

Point Load : L = 6.430 k @ 4.022 ft

## DESIGN SUMMARY

**Design OK**

| | | | |
|---|---|---|---|
| Maximum Bending Stress Ratio = | 0.950 : 1 | Maximum Shear Stress Ratio = | 0.216 : 1 |
| Section used for this span | C8x11.5 | Section used for this span | C8x11.5 |
| Mu : Applied | 28.066 k-ft | Vu : Applied | 10.288 k |
| Mn * Phi : Allowable | 29.534 k-ft | Vn * Phi : Allowable | 47.520 k |
| Load Combination | +1.60L | Load Combination | +1.60L |
| | | Location of maximum on span | 0.000 ft |
| Span # where maximum occurs | Span # 1 | Span # where maximum occurs | Span # 1 |

**Maximum Deflection**

| | | | | |
|---|---|---|---|---|
| Max Downward Transient Deflection | 0.000 in | Ratio = | 0 | <360 |
| Max Upward Transient Deflection | 0.000 in | Ratio = | 0 | <360 |
| Max Downward Total Deflection | 0.144 in | Ratio = | 563 | >=180 Span: 1 : L Only |
| Max Upward Total Deflection | 0.000 in | Ratio = | 0 | <180 |

### Maximum Forces & Stresses for Load Combinations

| Load Combination / Segment Length | Span # | Max Stress Ratios M | V | Summary of Moment Values max Mu + | max Mu - | Mu Max | Mnx | Phi*Mnx | Cb | Rm | Summary of Shear Values VuMax | Vnx | Phi*Vnx |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dsgn. L = 6.75 ft | 1 | | 0.000 | | | | 26.81 | 24.13 | 1.00 | 1.00 | -0.00 | 52.80 | 47.52 |
| +1.60L | | | | | | | | | | | | | |
| Dsgn. L = 6.75 ft | 1 | 0.950 | 0.216 | 28.07 | | 28.07 | 32.82 | 29.53 | 1.22 | 1.00 | 10.29 | 52.80 | 47.52 |
| L Only | | | | | | | | | | | | | |
| Dsgn. L = 6.75 ft | 1 | 0.594 | 0.135 | 17.54 | | 17.54 | 32.82 | 29.53 | 1.22 | 1.00 | 6.43 | 52.80 | 47.52 |

### Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|---|---|---|---|---|---|---|
| L Only | 1 | 0.1439 | 3.394 | | 0.0000 | 0.000 |

### Vertical Reactions

Support notation : Far left is #1 Values in KIPS

| Load Combination | Support 1 | Support 2 |
|---|---|---|
| Overall MAXimum | 6.430 | 6.430 |
| Overall MINimum | 4.823 | 4.823 |
| L Only | 6.430 | 6.430 |
| +0.750L | 4.823 | 4.823 |

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

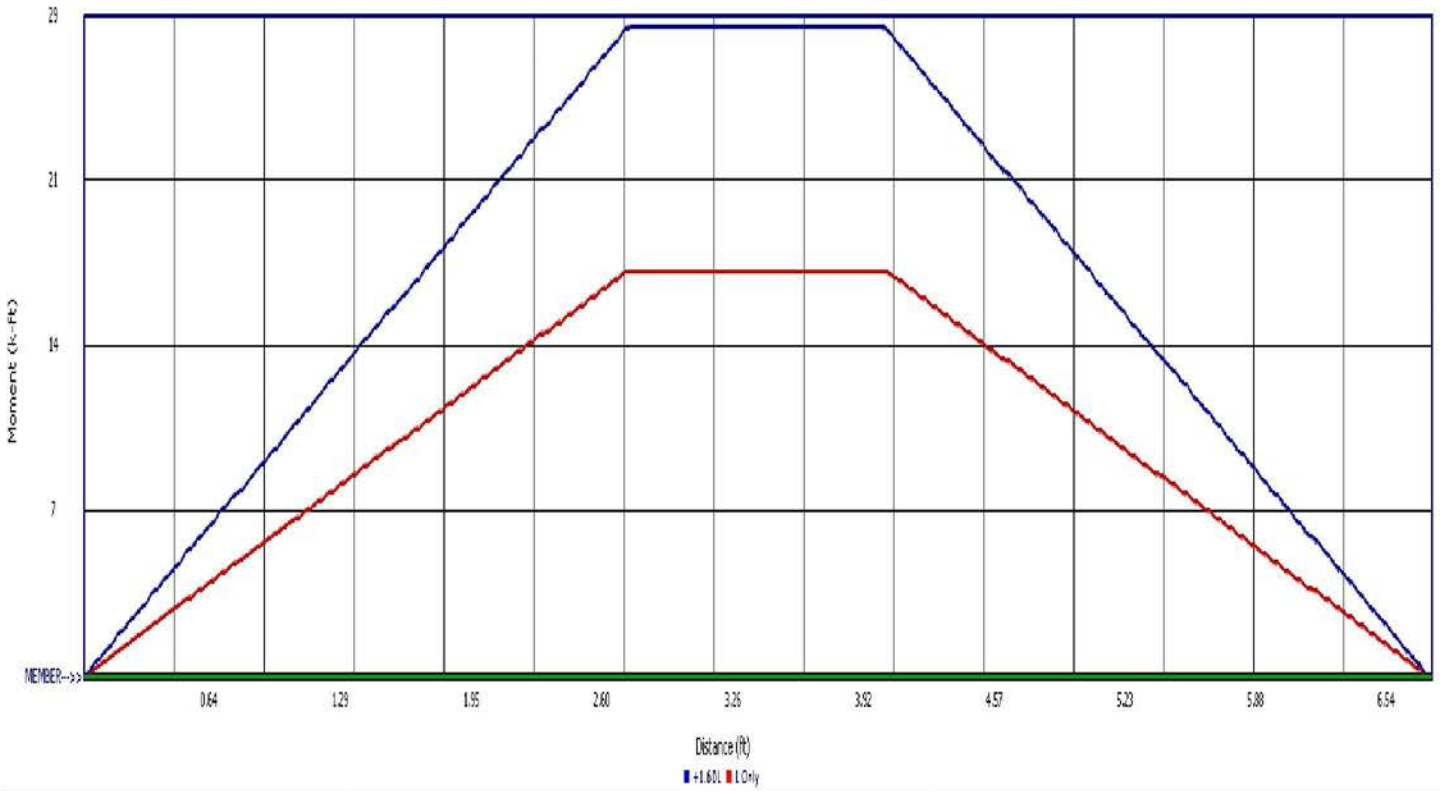
Project Title:
Engineer:
Project ID:
Project Descr:

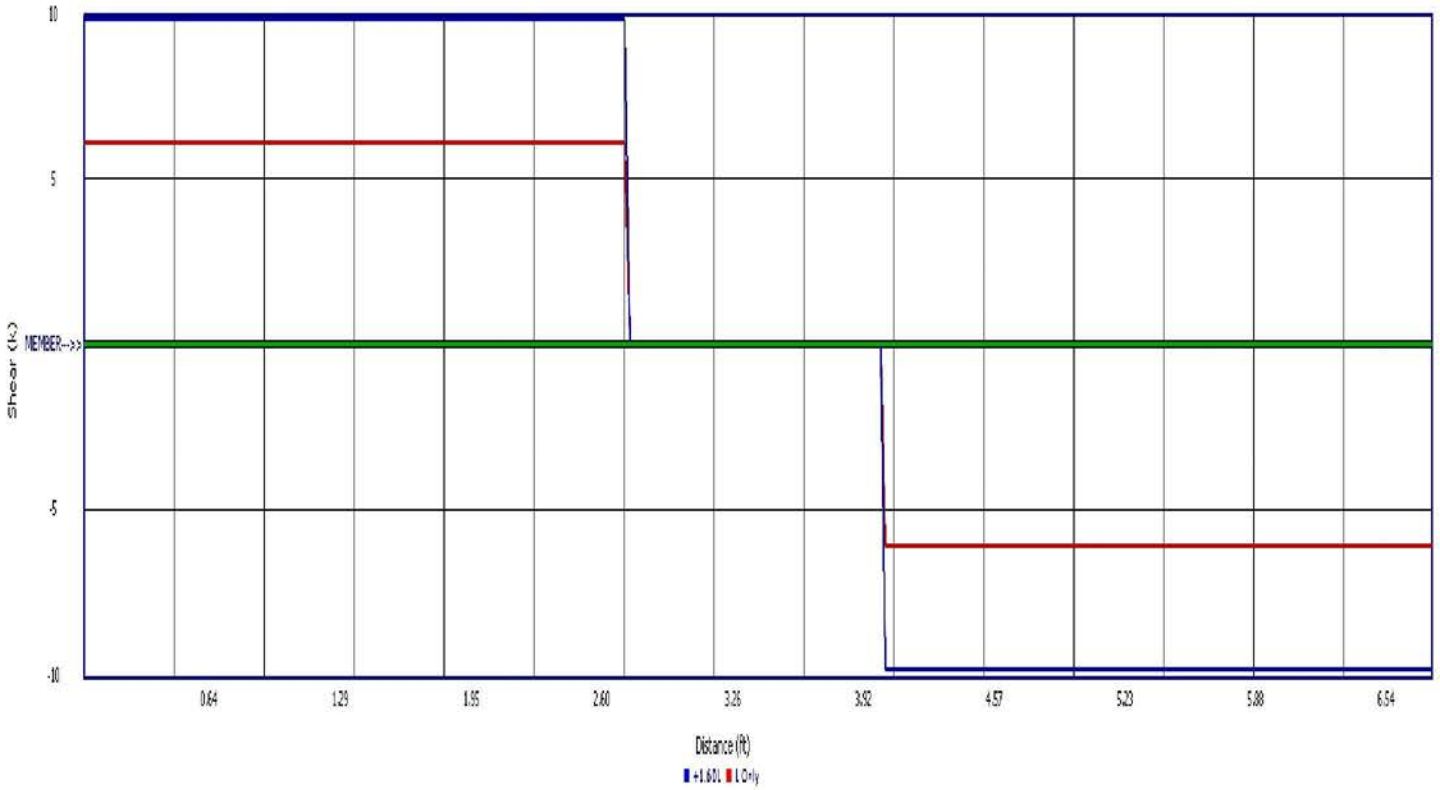
## Steel Beam

Project File: Hawks Prairie Retrofit.ec6

LIC# : KW-06013788, Build:20.22.7.14 RH2 Engineering, Inc. (c) ENERCALC INC 1983-2022

**DESCRIPTION:** --None--




Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

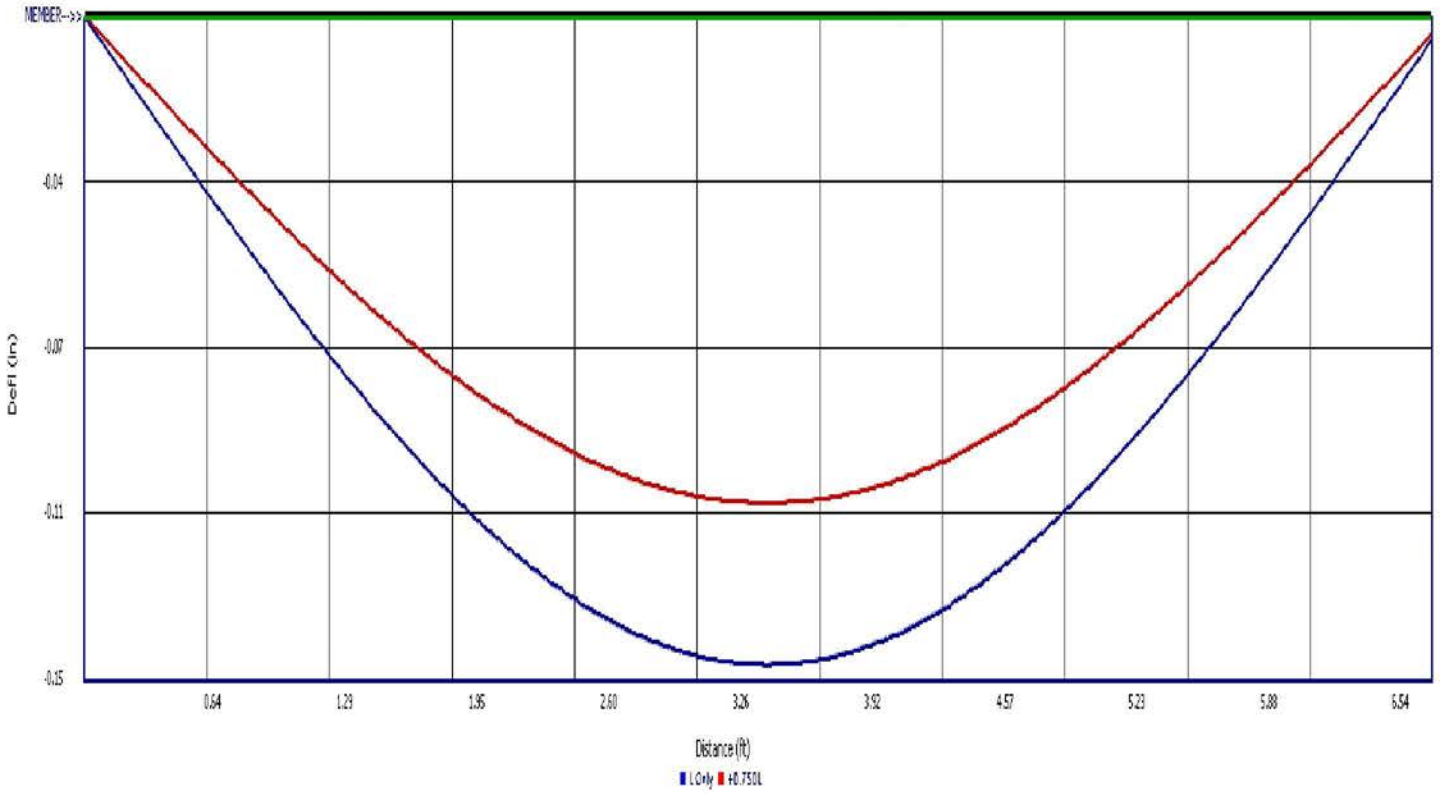
Project Title:
Engineer:
Project ID:
Project Descr:

## Steel Beam

Project File: Hawks Prairie Retrofit.ec6

LIC# : KW-06013788, Build:20.22.7.14 RH2 Engineering, Inc. (c) ENERCALC INC 1983-2022

**DESCRIPTION:** --None--




Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Project Title:
Engineer:
Project ID:
Project Descr:

# Steel Beam

Project File: Hawks Prairie Retrofit.ec6

LIC# : KW-06013788, Build:20.22.12.28 RH2 Engineering, Inc. (c) ENERCALC INC 1983-2022

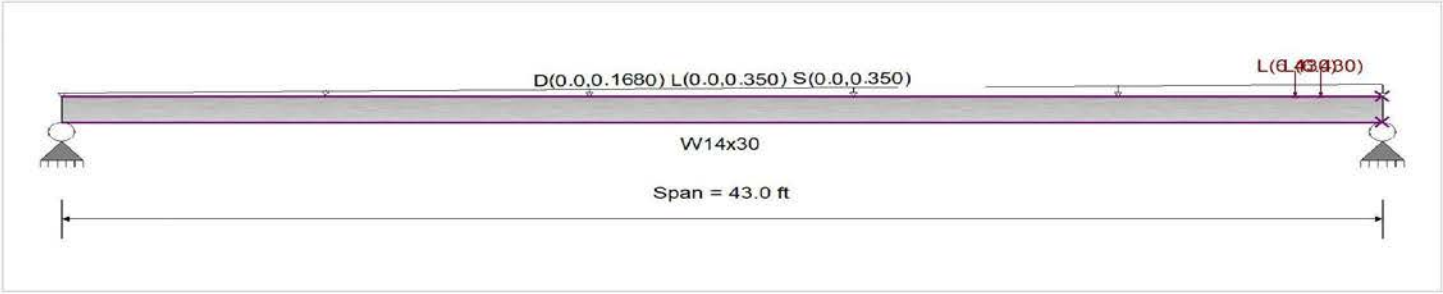
**DESCRIPTION:** Existing Rafter

## CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

### Material Properties

| | | | |
|---|---|---|---|
| Analysis Method : | Load Resistance Factor Design | Fy : Steel Yield : | 50.0 ksi |
| Beam Bracing : | Beam is Fully Braced against lateral-torsional buckling | E: Modulus : | 29,000.0 ksi |
| Bending Axis : | Major Axis Bending | | |




### Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Load for Span Number 1
Varying Uniform Load : D= 0.0->0.1680, L= 0.0->0.350, S= 0.0->0.350 k/ft, Extent = 0.0 -->> 43.0 ft, Trib Width = 1.0 ft

Point Load : L = 6.430 k @ 41.0 ft, (Davit Crane Reaction 1)

Point Load : L = 6.430 k @ 40.167 ft

## DESIGN SUMMARY

**Design OK**

| | | | |
|---|---|---|---|
| Maximum Bending Stress Ratio = | 0.795 : 1 | Maximum Shear Stress Ratio = | 0.294 : 1 |
| Section used for this span | W14x30 | Section used for this span | W14x30 |
| Mu : Applied | 141.003 k-ft | Vu : Applied | 32.844 k |
| Mn * Phi : Allowable | 177.375 k-ft | Vn * Phi : Allowable | 111.780 k |
| Load Combination | +1.20D+1.60L+0.50S | Load Combination | +1.20D+1.60L+0.50S |
| | | Location of maximum on span | 43.000 ft |
| Span # where maximum occurs | Span # 1 | Span # where maximum occurs | Span # 1 |

**Maximum Deflection**

| | | | | |
|---|---|---|---|---|
| Max Downward Transient Deflection | 2.346 in | Ratio = | 219 | >=180. |
| Max Upward Transient Deflection | 0.000 in | Ratio = | 0 | <180.0 Span: 1 : L Only |
| Max Downward Total Deflection | 3.736 in | Ratio = | 138 | >=120. Span: 1 : +D+0.750L+0.750S |
| Max Upward Total Deflection | 0.000 in | Ratio = | 0 | <120.0 |

### Maximum Forces & Stresses for Load Combinations

| Load Combination / Segment Length | Span # | Max Stress Ratios M | V | Summary of Moment Values max Mu + | max Mu - | Mu Max | Mnx | Phi*Mnx | Cb | Rm | Summary of Shear Values VuMax | Vnx | Phi*Vnx |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +1.40D | | | | | | | | | | | | | |
| Dsgn. L = 43.00 ft | 1 | 0.157 | 0.030 | 27.90 | | 27.90 | 197.08 | 177.38 | 1.00 | 1.00 | 3.37 | 111.78 | 111.78 |
| +1.20D+1.60L | | | | | | | | | | | | | |
| Dsgn. L = 43.00 ft | 1 | 0.679 | 0.271 | 120.51 | | 120.51 | 197.08 | 177.38 | 1.00 | 1.00 | 30.34 | 111.78 | 111.78 |
| +1.20D+1.60L+0.50S | | | | | | | | | | | | | |
| Dsgn. L = 43.00 ft | 1 | 0.795 | 0.294 | 141.00 | | 141.00 | 197.08 | 177.38 | 1.00 | 1.00 | 32.84 | 111.78 | 111.78 |
| +1.20D+0.50L | | | | | | | | | | | | | |
| Dsgn. L = 43.00 ft | 1 | 0.304 | 0.103 | 53.93 | | 53.93 | 197.08 | 177.38 | 1.00 | 1.00 | 11.47 | 111.78 | 111.78 |
| +1.20D | | | | | | | | | | | | | |
| Dsgn. L = 43.00 ft | 1 | 0.135 | 0.026 | 23.91 | | 23.91 | 197.08 | 177.38 | 1.00 | 1.00 | 2.89 | 111.78 | 111.78 |
| +1.20D+0.50L+1.60S | | | | | | | | | | | | | |
| Dsgn. L = 43.00 ft | 1 | 0.678 | 0.174 | 120.18 | | 120.18 | 197.08 | 177.38 | 1.00 | 1.00 | 19.49 | 111.78 | 111.78 |
| +1.20D+1.60S | | | | | | | | | | | | | |
| Dsgn. L = 43.00 ft | 1 | 0.509 | 0.098 | 90.34 | | 90.34 | 197.08 | 177.38 | 1.00 | 1.00 | 10.92 | 111.78 | 111.78 |
| +1.20D+0.50L+0.50S | | | | | | | | | | | | | |
| Dsgn. L = 43.00 ft | 1 | 0.421 | 0.125 | 74.60 | | 74.60 | 197.08 | 177.38 | 1.00 | 1.00 | 13.97 | 111.78 | 111.78 |

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Project Title:
Engineer:
Project ID:
Project Descr:

# Steel Beam

Project File: Hawks Prairie Retrofit.ec6

LIC# : KW-06013788, Build:20.22.12.28 | RH2 Engineering, Inc. | (c) ENERCALC INC 1983-2022

**DESCRIPTION:** Existing Rafter

## Maximum Forces & Stresses for Load Combinations

| Load Combination / Segment Length | Span # | Max Stress Ratios M | V | Summary of Moment Values max Mu + | max Mu - | Mu Max | Mnx | Phi*Mnx | Cb | Rm | Summary of Shear Values VuMax | Vnx | Phi*Vnx |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +1.20D+0.50L+0.70S | | | | | | | | | | | | | |
| Dsgn. L = 43.00 ft | 1 | 0.467 | 0.134 | 82.88 | | 82.88 | 197.08 | 177.38 | 1.00 | 1.00 | 14.98 | 111.78 | 111.78 |
| +0.90D | | | | | | | | | | | | | |
| Dsgn. L = 43.00 ft | 1 | 0.101 | 0.019 | 17.93 | | 17.93 | 197.08 | 177.38 | 1.00 | 1.00 | 2.17 | 111.78 | 111.78 |

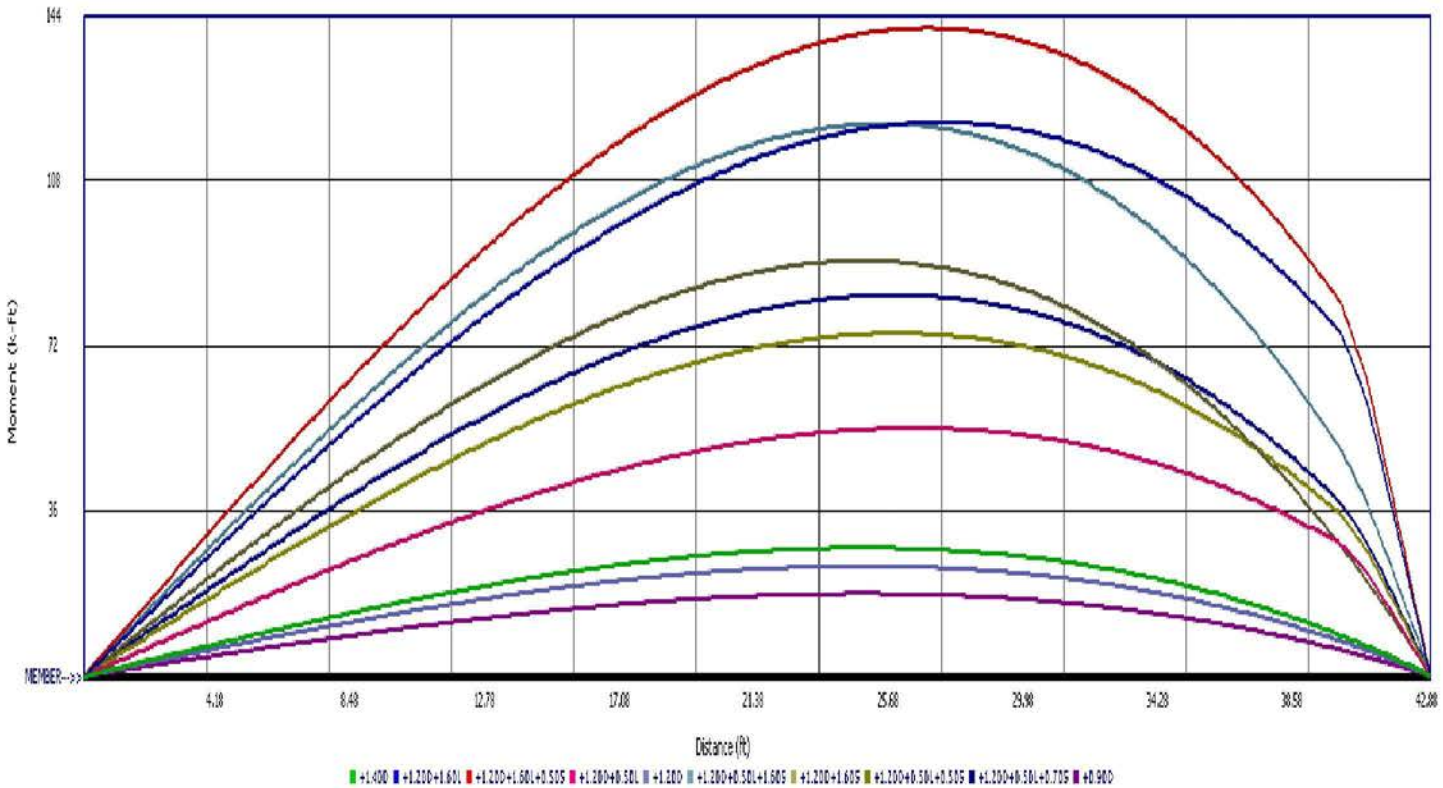
## Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|---|---|---|---|---|---|---|
| +D+0.750L+0.750S | 1 | 3.7359 | 22.729 | | 0.0000 | 0.000 |

## Vertical Reactions

Support notation : Far left is #1 Values in KIPS

| Load Combination | Support 1 | Support 2 |
|---|---|---|
| Max Upward from all Load Conditions | 5.509 | 19.562 |
| Max Upward from Load Combinations | 5.509 | 19.562 |
| Max Upward from Load Cases | 3.231 | 17.154 |
| D Only | 1.204 | 2.408 |
| +D+L | 4.435 | 19.562 |
| +D+S | 3.712 | 7.425 |
| +D+0.750L | 3.627 | 15.273 |
| +D+0.750L+0.750S | 5.509 | 19.036 |
| +0.60D | 0.722 | 1.445 |
| L Only | 3.231 | 17.154 |
| S Only | 2.508 | 5.017 |




Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

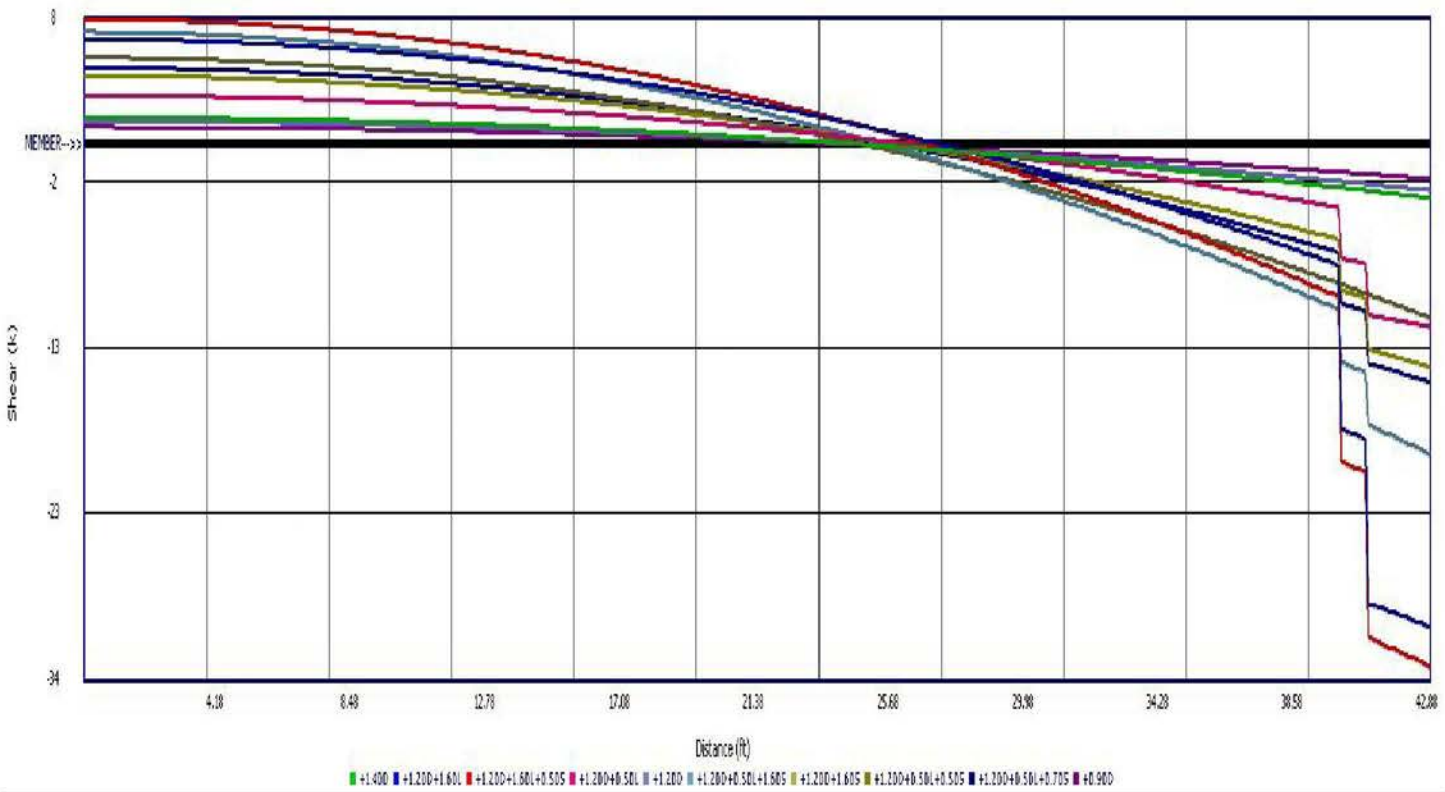
Project Title:
Engineer:
Project ID:
Project Descr:

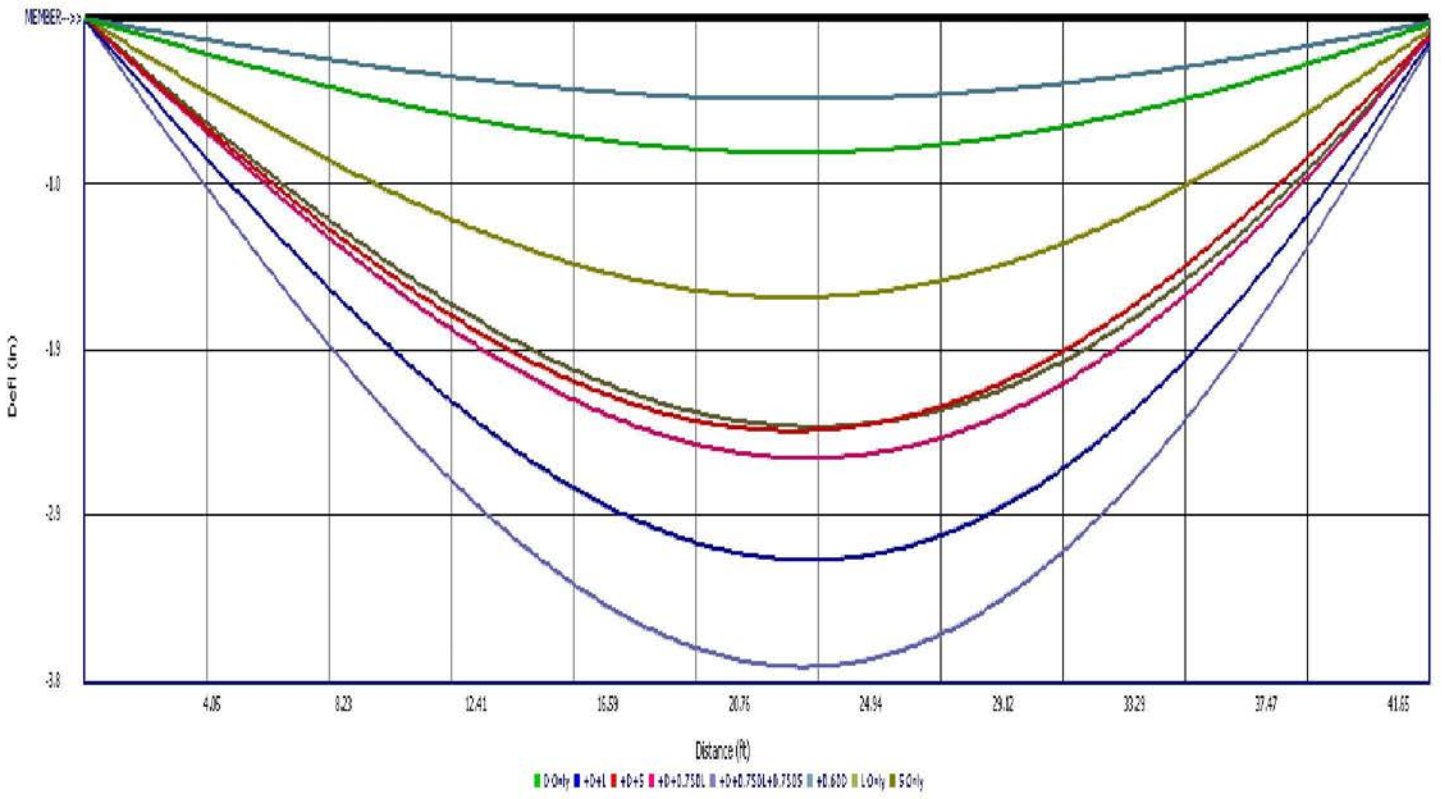
## Steel Beam

Project File: Hawks Prairie Retrofit.ec6

LIC# : KW-06013788, Build:20.22.12.28 RH2 Engineering, Inc. (c) ENERCALC INC 1983-2022

**DESCRIPTION:** Existing Rafter




Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Project Title:
Engineer:
Project ID:
Project Descr:

# Steel Beam

Project File: Hawks Prairie Retrofit.ec6

LIC# : KW-06013788, Build:20.22.12.28 RH2 Engineering, Inc. (c) ENERCALC INC 1983-2022

**DESCRIPTION:** Existing Sub-Rafter

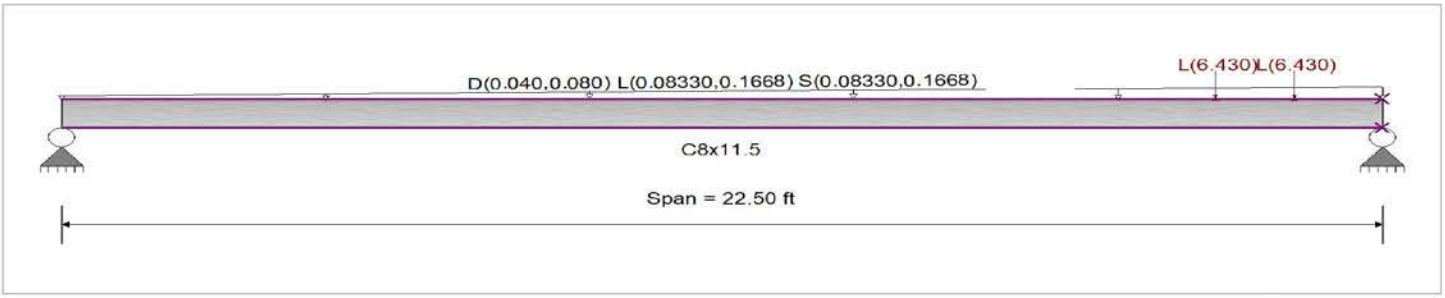
## CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

## Material Properties

Analysis Method : Load Resistance Factor Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending

Fy : Steel Yield : 50.0 ksi
E: Modulus : 29,000.0 ksi




## Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Load for Span Number 1
Varying Uniform Load : D= 0.040->0.080, L= 0.08330->0.1668, S= 0.08330->0.1668 k/ft, Extent = 0.0 -->> 22.50 ft, Trib Width = 1.0 ft
Point Load : L = 6.430 k @ 21.0 ft, (Davit Crane Reaction 1)
Point Load : L = 6.430 k @ 19.667 ft, (Davit Crane Reaction 2)

## DESIGN SUMMARY

**Design N.G.**

| | | | |
|---|---|---|---|
| Maximum Bending Stress Ratio = | 1.391 : 1 | Maximum Shear Stress Ratio = | 0.479 : 1 |
| Section used for this span | C8x11.5 | Section used for this span | C8x11.5 |
| Mu : Applied | 50.227 k-ft | Vu : Applied | 22.778 k |
| Mn * Phi : Allowable | 36.113 k-ft | Vn * Phi : Allowable | 47.520 k |
| Load Combination | +1.20D+1.60L+0.50S | Load Combination | +1.20D+1.60L+0.50S |
| | | Location of maximum on span | 22.500 ft |
| Span # where maximum occurs | Span # 1 | Span # where maximum occurs | Span # 1 |

### Maximum Deflection

| | | | | | |
|---|---|---|---|---|---|
| Max Downward Transient Deflection | 2.389 in | Ratio = | 112 | <180.0 | |
| Max Upward Transient Deflection | 0.000 in | Ratio = | 0 | <180.0 | Span: 1 : L Only |
| Max Downward Total Deflection | 2.759 in | Ratio = | 98 | <120.0 | Span: 1 : +D+L |
| Max Upward Total Deflection | 0.000 in | Ratio = | 0 | <120.0 | |

## Maximum Forces & Stresses for Load Combinations

| Load Combination / Segment Length | Span # | Max Stress Ratios M | V | Summary of Moment Values max Mu + | max Mu - | Mu Max | Mnx | Phi*Mnx | Cb | Rm | Summary of Shear Values VuMax | Vnx | Phi*Vnx |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +1.40D | | | | | | | | | | | | | |
| Dsgn. L = 22.50 ft | 1 | 0.148 | 0.022 | 5.33 | | 5.33 | 40.13 | 36.11 | 1.00 | 1.00 | 1.05 | 52.80 | 47.52 |
| +1.20D+1.60L | | | | | | | | | | | | | |
| Dsgn. L = 22.50 ft | 1 | 1.314 | 0.463 | 47.44 | | 47.44 | 40.13 | 36.11 | 1.00 | 1.00 | 22.00 | 52.80 | 47.52 |
| +1.20D+1.60L+0.50S | | | | | | | | | | | | | |
| Dsgn. L = 22.50 ft | 1 | 1.391 | 0.479 | 50.23 | | 50.23 | 40.13 | 36.11 | 1.00 | 1.00 | 22.78 | 52.80 | 47.52 |
| +1.20D+0.50L | | | | | | | | | | | | | |
| Dsgn. L = 22.50 ft | 1 | 0.477 | 0.158 | 17.23 | | 17.23 | 40.13 | 36.11 | 1.00 | 1.00 | 7.49 | 52.80 | 47.52 |
| +1.20D | | | | | | | | | | | | | |
| Dsgn. L = 22.50 ft | 1 | 0.127 | 0.019 | 4.57 | | 4.57 | 40.13 | 36.11 | 1.00 | 1.00 | 0.90 | 52.80 | 47.52 |
| +1.20D+0.50L+1.60S | | | | | | | | | | | | | |
| Dsgn. L = 22.50 ft | 1 | 0.807 | 0.210 | 29.14 | | 29.14 | 40.13 | 36.11 | 1.00 | 1.00 | 9.99 | 52.80 | 47.52 |
| +1.20D+1.60S | | | | | | | | | | | | | |
| Dsgn. L = 22.50 ft | 1 | 0.478 | 0.072 | 17.27 | | 17.27 | 40.13 | 36.11 | 1.00 | 1.00 | 3.40 | 52.80 | 47.52 |
| +1.20D+0.50L+0.50S | | | | | | | | | | | | | |
| Dsgn. L = 22.50 ft | 1 | 0.576 | 0.174 | 20.79 | | 20.79 | 40.13 | 36.11 | 1.00 | 1.00 | 8.27 | 52.80 | 47.52 |

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Project Title:
Engineer:
Project ID:
Project Descr:

# Steel Beam

Project File: Hawks Prairie Retrofit.ec6

LIC# : KW-06013788, Build:20.22.12.28 RH2 Engineering, Inc. (c) ENERCALC INC 1983-2022

**DESCRIPTION:** Existing Sub-Rafter

## Maximum Forces & Stresses for Load Combinations

| Load Combination / Segment Length | Span # | Max Stress Ratios M | V | Summary of Moment Values max Mu + | max Mu - | Mu Max | Mnx | Phi*Mnx | Cb | Rm | Summary of Shear Values VuMax | Vnx | Phi*Vnx |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +1.20D+0.50L+0.70S | | | | | | | | | | | | | |
| Dsgn. L = 22.50 ft | 1 | 0.617 | 0.181 | 22.27 | | 22.27 | 40.13 | 36.11 | 1.00 | 1.00 | 8.59 | 52.80 | 47.52 |
| +0.90D | | | | | | | | | | | | | |
| Dsgn. L = 22.50 ft | 1 | 0.095 | 0.014 | 3.43 | | 3.43 | 40.13 | 36.11 | 1.00 | 1.00 | 0.67 | 52.80 | 47.52 |

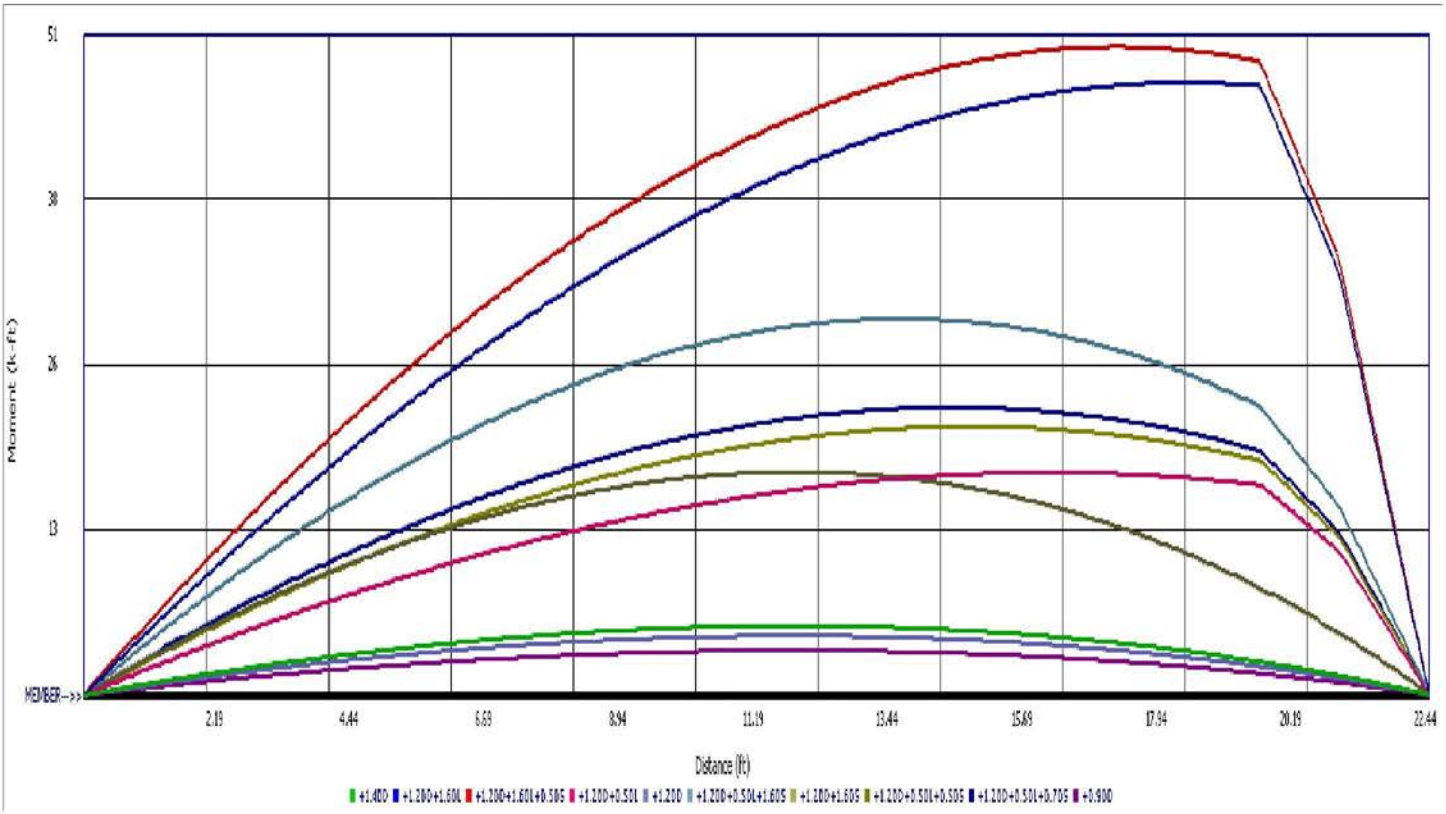
## Overall Maximum Deflections

| Load Combination | Span | Max. "-" Defl | Location in Span | Load Combination | Max. "+" Defl | Location in Span |
|---|---|---|---|---|---|---|
| +D+L | 1 | 2.7588 | 12.279 | | 0.0000 | 0.000 |

## Vertical Reactions

Support notation : Far left is #1 Values in KIPS

| Load Combination | Support 1 | Support 2 |
|---|---|---|
| Max Upward from all Load Conditions | 3.404 | 13.935 |
| Max Upward from Load Combinations | 3.404 | 13.935 |
| Max Upward from Load Cases | 2.489 | 13.185 |
| D Only | 0.600 | 0.750 |
| +D+L | 3.089 | 13.935 |
| +D+S | 1.850 | 2.313 |
| +D+0.750L | 2.466 | 10.639 |
| +D+0.750L+0.750S | 3.404 | 11.811 |
| +0.60D | 0.360 | 0.450 |
| L Only | 2.489 | 13.185 |
| S Only | 1.250 | 1.563 |




Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

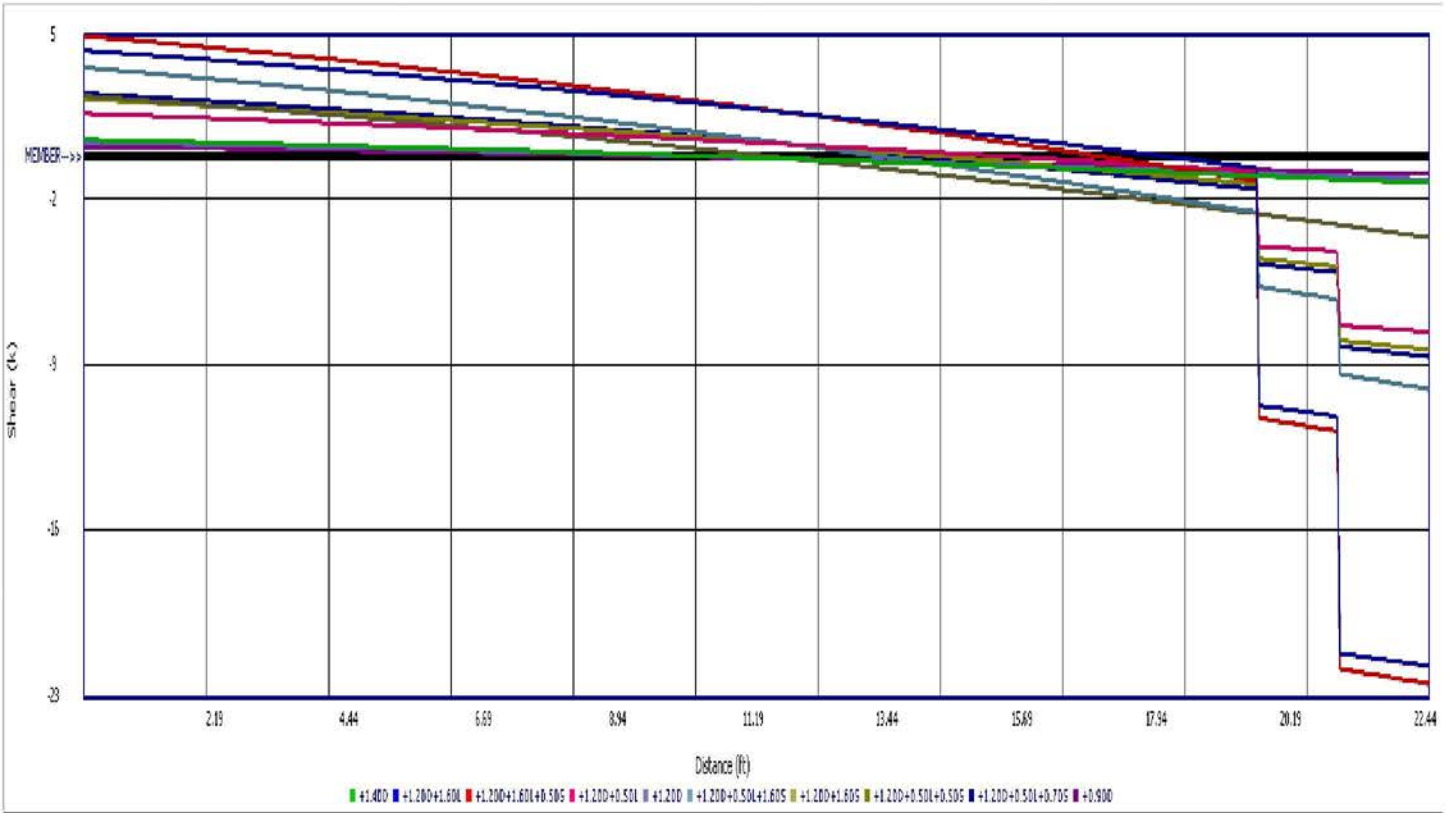
Project Title:
Engineer:
Project ID:
Project Descr:

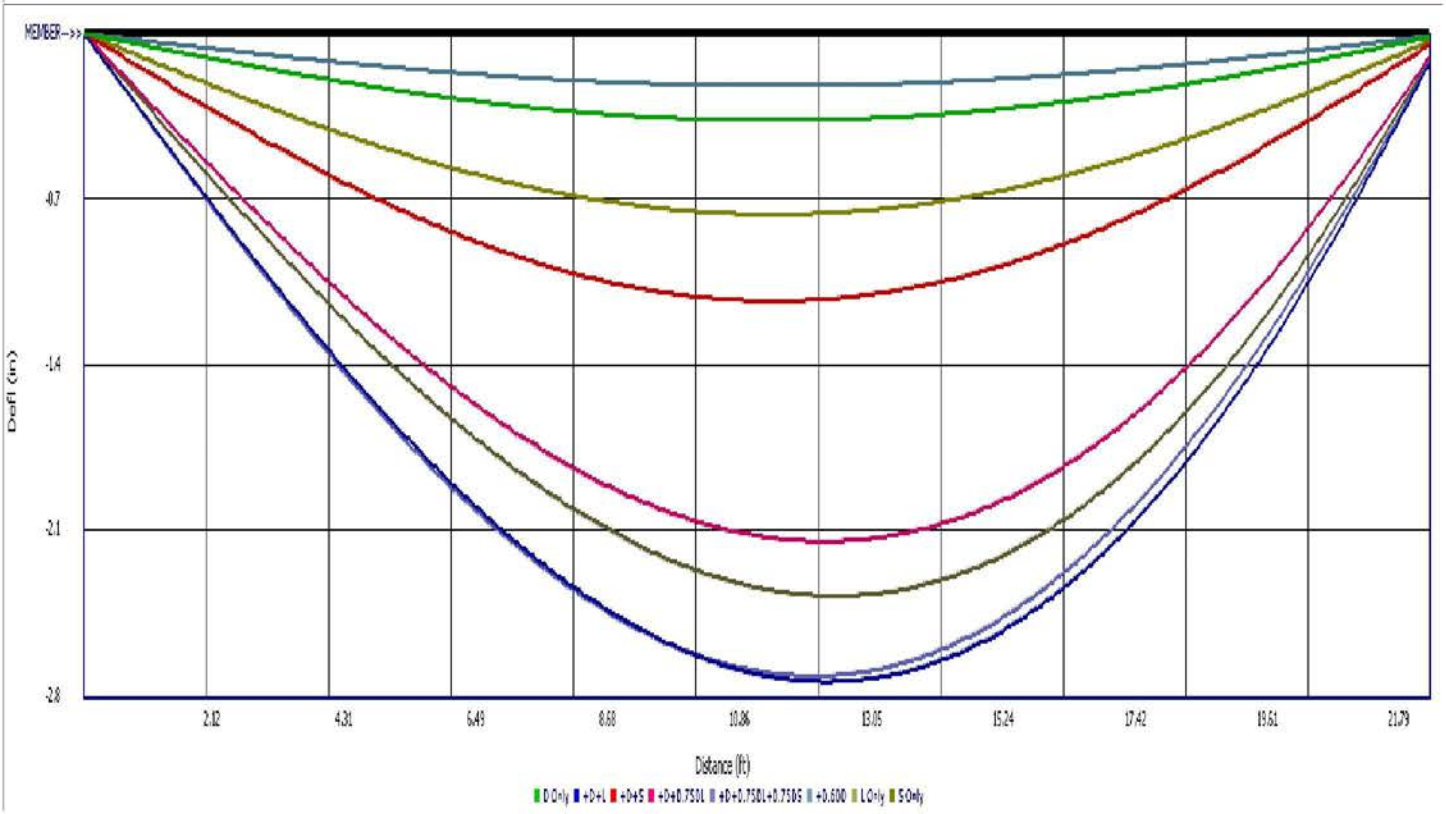
## Steel Beam

Project File: Hawks Prairie Retrofit.ec6

LIC# : KW-06013788, Build:20.22.12.28 RH2 Engineering, Inc. (c) ENERCALC INC 1983-2022

**DESCRIPTION:** Existing Sub-Rafter




Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# ELECTRICAL PERMIT FORMS

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**CITY OF LACEY**
Community & Economic Development Department
420 College Street SE
Lacey, WA 98503
(360) 491-5642

# ELECTRICAL PERMIT APPLICATION

**PLEASE EMAIL APPLICATION TO BUILD@CITYOFLACEY.ORG**

**Type of Permit (check one):** ☐ **Residential** ☑ **Commercial**

Project Address 4040 Marvin Road NE Parcel Number 11935310200

**Owner** City of Lacey Phone Number 564-669-4232

Address 420 College St SE City Lacey State WA Zip Code 98503

**Contact Person** Ryan Jewell Phone Number 564-669-4232

Cell Phone 564-669-4232 E-mail Ryan.Jewell@CityOfLacey.org

**SCOPE OF WORK:** _____

**NUMBER OF NEW CIRCUITS:** 3

**NUMBER OF THERMOSTATS:** 0

**NUMBER OF GENERATORS:** 0

**LOW VOLTAGE SYSTEMS**

Building Sq. Ft. 1320

Scope of Work Sq. Ft. 1320

| TEMPORARY POWER | SERVICE/PANEL CHANGE | FEEDER | ALTERED SERVICE |
|---|---|---|---|
| _____ 0-60 | X 0 - 100 | _____ 0 - 100 | _____ 0 - 100 |
| _____ 61-100 | _____ 101-200 | _____ 101-200 | _____ 101-200 |
| _____ 101-200 | _____ 201-400 | _____ 201-400 | _____ 201-400 |
| _____ 201-400 | _____ 401-600 | _____ 401-600 | _____ 401-600 |
| _____ 401-600 | _____ 601-800 | _____ 601-800 | _____ 601-800 |
| _____ 601+ | _____ 801-1,000 | _____ 801-1,000 | _____ 801-1,000 |
| | _____ 1,000+ | _____ 1,000+ | _____ 1,000+ |

**Contractor** _____ Phone _____

Address _____ City _____ State _____ Zip _____ E-mail _____

Contractor's License Number _____ Expiration _____ Lacey Endorsement # _____

I hereby certify that the above information is correct and that the construction on, and the occupancy and the use of the above-described property will be in accordance with the laws, rules and regulations of the State of Washington.

_____ 10/20/2025

Applicant's Signature Date

Ryan Jewell/City of Lacey

Print Applicant's Name

FORM: ELC-1

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# GRADING PERMIT FORMS

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**CITY OF LACEY**
Community & Economic Development Department
420 College Street SE
Lacey, WA 98503
(360) 491-5642

# GRADING PERMIT APPLICATION

**Type of Permit (check one)**

- [ ] **Commercial Bldg. Site**
- [ ] **Commercial Subdivision**
- [ ] **Residential Subdivision**
- [x] **Staging Permit**
- [ ] **Residential Bldg. Site**
- [ ] **Other** _____

| **GRADING REQUIRMENTS**<br>THIS APPLICATION MUST BE ACCOMPANIED BY TWO SETS OF GRADING PLANS SHOWING THE FOLLOWING: | | **STAGING REQUIREMENTS** |
|---|---|---|
| ( ) Property lines and boundaries<br>( ) Existing contours<br>( ) Final grade contours<br>( ) Location of drainage and stream courses<br>( ) Location of existing structures<br>( ) Location of proposed structures<br>( ) Design of any soil retention structures (retaining walls) | ***Provide one of the following 3 plans***<br>( ) SWPPP Short Form Plan<br>( ) Abbreviated Plan<br>( ) Drainage Control Plan<br>( ) Soils report<br>( ) Construction Stormwater General Permit (if Applicable) | ( ) Duration (Months) ____<br>( ) SWPPP Short Form |

Amount of Cut (cubic yards) 2,700 Amount of Fill (cubic yards) 2,600

Proposed New Impervious Surface (square feet) 7,900 Total Disturbed Area (square feet) 44,000

Project Location/Address 4040 Marvin Rd NE Parcel Number 11935310200

**Owner** City of Lacey Phone Number 564-669-4232

Address 410 College St SE City Lacey State WA Zip 98503

**Contact Person** Ryan Jewell Phone Number 564-669-4232

Cell Phone 564-669-4232 Fax Number _____ E-mail Ryan.Jewell@CityOfLacey.org

Address 420 College St SE City Lacey State WA Zip 98503

**Contractor** _____ Phone _____ Fax _____

Address _____ City _____ State _____ Zip _____ E-mail _____

Contractor's License Number _____ Expiration _____ City Bus. Reg. _____

I hereby certify that the above information is correct and that the construction on, and the occupancy and the use of the above-described property will be in accordance with the laws, rules and regulations of the State of Washington.

Applicant's Signature — Date: 8/26/2025

Ryan Jewell
Print Applicant's Name

DKC

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# APPENDIX K

## SWPPP

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Construction Stormwater Pollution Prevention Plan (CSWPPP)

**City of Lacey**
420 College Street SE
Lacey, WA 98503

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# TABLE OF CONTENTS

**CONTACT INFORMATION/RESPONSIBLE PARTIES** ..... I

**KEY TERMS** ..... ii

**1. CONSTRUCTION STORMWATER POLLUTION PREVENTION ELEMENTS** ..... 1

1.1 Objective of the Stormwater Pollution Prevention Plan ..... 1

1.2 Summary of Elements ..... 1

1.3 Element #1: Preserve Vegetation/Mark Clearing Limits ..... 1

1.4 Element #2: Establish Construction Access ..... 2

1.5 Element #3: Control Flow Rates ..... 2

1.6 Element #4: Install Sediment Controls ..... 3

1.7 Element #5: Stabilize Soils ..... 3

1.8 Element #6: Protect Slopes ..... 4

1.9 Element #7: Protect Drain Inlets ..... 5

1.10 Element #8: Stabilize Channels and Outlets ..... 5

1.11 Element #9: Control Pollutants ..... 5

1.12 Element #10: Control Dewatering ..... 6

1.13 Element #11: Maintain BMPs ..... 6

1.14 Element #12: Manage the Project ..... 6

1.14.1 Phasing of Construction ..... 6

1.14.2 Seasonal Work Limitations ..... 6

1.14.3 Inspection and Monitoring ..... 7

1.14.4 Maintenance of the SWPPP ..... 7

1.15 Element #13: Protect Low-Impact Development (LID) BMPs ..... 7



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# KEY TERMS

| | |
|---|---|
| BMPs | best management practices |
| CESCL | Certified Erosion and Sediment Control Lead |
| CSWGP | Construction Stormwater General Permit |
| DOE | Washington State Department of Ecology |
| LID | low-impact development |
| SDM | City of Lacey Storm Design Manual |
| SPCC | Spill Prevention, Control, and Countermeasures |
| SWPPP | Stormwater Pollution Prevention Plan |
| TESC | Temporary Erosion and Sediment Control |
| TMDL | total maximum daily load |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# 1. CONSTRUCTION STORMWATER POLLUTION PREVENTION ELEMENTS

## 1.1 Objective of the Stormwater Pollution Prevention Plan

The purpose of a Construction Stormwater Pollution Prevention Plan (SWPPP) is to describe the potential for pollution problems on a construction project. The SWPPP also explains and illustrates the measures to be taken on the construction site to control these problems. This SWPPP is prepared according to the guidance of the City of Lacey 2022 Stormwater Design Manual (SDM) which is based on the 2019 Stormwater Management Manual for Western Washington – Washington State Department of Ecology (DOE) that has been revised for local application. The SDM describes thirteen necessary elements of construction stormwater pollution prevention. These thirteen elements include: preserving vegetation/mark clearing limits, establish construction access, control flow rates, install sediment controls, stabilize soils, protect slopes, protect drain inlets, stabilize channels and outlets, control pollutants, control de-watering, maintain Best Management Practices (BMPs), manage the project, and protect low-impact development BMPs. These elements have been addressed as follows.

## 1.2 Summary of Elements

The BMPs listed in this report, or their equivalent, are required. For linear projects such as roadway construction, modifying or adapting a BMP may be necessary to address unique stormwater protection challenges. Any revisions by the contractor to the BMPs listed in the SWPPP shall be approved by the Engineer. Therefore, if the contractor does not require a BMP or needs to modify a BMP, the contractor shall document the reasons and update the SWPPP to match what is being implemented in the field. A copy of the BMPs can be found in Appendix A.

## 1.3 Element #1: Preserve Vegetation/Mark Clearing Limits

Prior to any land disturbing activities, the construction limits shall be marked prior to any clearing to restrict clearing to the approved limits. Sensitive areas, wetland buffers, and preserved trees/vegetation shall be marked with fencing or staking flags. A high visibility fence shall be installed to delineate the location and control access of each site to be demolished prior to any work in accordance with BMP C103. The Contractor shall use best judgement selecting of the type of fencing (high orange fencing, chain-link with placards, or high visible silt fence) to be utilized based off public access to site location. A silt fence shall be installed separately or in conjunction with the high visibility fence to contain loose sediment associated with project demolition or grading within the project limits in accordance with BMP C233.

The native top soil, natural vegetation, and existing trees shall be retained in an undisturbed state to the maximum extent practicable. If it is not practicable to retain the native top soil in place, it should be stockpiled on-site, covered to prevent erosion, and replaced immediately upon completion of the ground disturbing activities. The Contractor shall determine if construction is not possible due to presence of vegetation/tree, and shall clear, grub, and dispose of accordingly.

**Installation Schedule:** Prior to land clearing activities.

**Inspection and Maintenance Plan:**



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- If the fencing or clearing limits are observed to be damaged or visibility is reduced, it shall be repaired and/or replaced immediately and visibility restored.

## 1.4 Element #2: Establish Construction Access

Existing asphalt roads and parking lots within in the construction perimeter will be utilized as construction access to the maximum extent feasible. Locations where the existing roads are to be removed or intersections with an existing road not within the construction perimeter a stabilized construction entrance shall be constructed to minimize the tracking of sediment onto any public road. Construction vehicle access and exit shall be limited to one route, if feasible. This stabilized construction entrance shall be constructed in accordance with the requirements of BMP C105.

If sediment is tracked off-site, public roads shall be cleaned thoroughly at the end of each day, or more frequently during wet weather. Sediment shall be removed from roads by shoveling or pickup sweeping and shall be transported to a controlled sediment disposal area. Street washing will be allowed only after sediment is removed.

Should tracking of sediments off-site continue to occur, wheel washes or construction road and parking area stabilization may be needed (BMPs 106 and 107).

**Installation Schedule:** As Contractor sees fit per construction phasing

**Inspection and Maintenance Plan:**

- If sediment or quarry spalls are observed being tracked onto pavement, then alternative measures to keep the street free of sediment shall be used. This may include replacement/cleaning of existing quarry spalls, street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash.
- If a wheel wash is installed, the wheel wash should start out the day with fresh water, and the wash water should be changed a minimum once per day. The Contractor shall determine the frequency of changing the wash water.

## 1.5 Element #3: Control Flow Rates

Permanent and temporary stormwater facilities shall be constructed as one of the first steps of site grading, and will be observed to function properly before constructing site improvements. Stormwater runoff shall be observed during storm events to ensure flow rates are not increased to cause erosion to off-site locations. Temporary interceptor swales are proposed to convey runoff into a temporary sediment pond before discharging and infiltrating on-site or to existing roadside ditches and storm system catch basins. If substantial flow rates are observed, check dams shall be installed to promote ponding and reduce flow rates within the swales. Temporary swales shall be constructed according to BMP C200, and shall be stabilized with temporary vegetation or other channel protection during construction. Temporary sediment ponds shall be constructed according to BMP C241.

**Installation Schedule:** As Contractor sees fit per construction phasing

**Inspection and Maintenance Plan:**

- Immediately remove sediment from within the flow path of the temporary swale following a rainfall event.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

- If a temporary sediment pond is utilized, the sediment collected shall be removed from the pond when it reaches 1-foot in depth.
- Any damage to the temporary sediment pond embankments or slopes shall be repaired.

## 1.6 Element #4: Install Sediment Controls

To minimize the discharge of pollutants offsite, erosion and sediment controls will be installed along site perimeter as needed. Stormwater runoff from disturbed areas shall be routed through an appropriate sediment removal BMP per the Contractor's best judgement prior to runoff discharging off-site or into drain inlets. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must ensure downstream waterways are protected from erosion due to increases in the volume, velocity, and peak flow rate of stormwater from the project site. Silt fence barriers shall be constructed in accordance with BMP C233.

In addition to silt fencing, the following BMPs are may be implemented where appropriate:

- BMP C231 – Brusher Barrier
- BMP C232 – Gravel Filter Berm
- BMP C234 – Vegetated Strip
- BMP C235 – Straw Wattles
- BMP C240 – Sediment Trap
- BMP C241 – Temporary Sediment Pond
- BMP C 251 – Construction Stormwater Filtration

**Installation Schedule:** As Contractor sees fit per construction phasing

**Inspection and Maintenance Plan:**

- Repair any damage immediately.
- Intercept and convey all evident concentrated flows uphill of the silt fence to a sediment pond.
- Remove sediment deposits when the deposit reaches approximately one-third of the height of the silt fence, or install a second silt fence.
- Replace filter fabric that has deteriorated due to ultraviolet breakdown.

## 1.7 Element #5: Stabilize Soils

All exposed and unworked soils shall be stabilized by application of effective BMPs, which protect the soil from the erosive forces of raindrop impact, flowing water, and from wind erosion. Construction schedule phasing shall be planned to reduce the amount of soil exposed during construction activity.

From October 1 through April 30, no soils shall remain exposed and un-worked for more than 2 days. A wet weather SWPPP Amendment (Attachment 1) will be required for any work that occurs during this time period. From May 1 to September 30, no soils shall remain exposed and un-worked for more than 7 days. This condition applies to all soils on-site, whether at final grade or not. Soils to be stabilized at the end of shifts prior to holidays or weekends based on weather forecasts per Contractor's best judgement.

In areas where the soils will remain un-worked for more than 30 days or have reached final grade, seeding and mulching shall be used in accordance with BMPs C120 and C121. If the soil stockpile slope is 2H:1V or greater with at least 10 feet of vertical relief, nets, or blankets shall be used according to BMP C122.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Plastic covering shall be used on disturbed areas that require cover less than 30 days per BMP C123. Sod shall be used in accordance with BMP C124 for disturbed areas that require immediate vegetative cover. Dust control shall be used as needed to prevent wind transport of dust from disturbed soil surfaces and in accordance with BMP C140. Contractor to utilize available non-potable water from on-site sources or provide water tanker in order to spray down disturbed soils to minimize dust produced from construction activities.

In addition, the following BMPs may be used to stabilize soils where appropriate:

- BMP C125 – Topsoiling
- BMP C130 – Surface Roughening
- BMP C131 – Gradient Terraces

**Installation Schedule:** As Contractor sees fit per construction phasing

**Inspection and Maintenance Plan:**

- Reseed any seeded areas that fail to establish at least 80 percent cover. If reseeding is ineffective, use an alternative method such as sodding, mulching, or nets/blankets to stabilize soils.
- Reseed and protect by mulch any areas that experience erosion after achieving adequate cover.
- Supply seeded areas with adequate moisture, but do not water to the extent that runoff is generated.
- If the grass is unhealthy, the cause shall be determined and appropriate action taken to reestablish a healthy groundcover. If it is impossible to establish a healthy groundcover due to frequent saturation, instability, or some other cause, the sod shall be removed, the area seeded with an appropriate mix, and protected with a net or blanket.
- Damaged or torn plastic sheets shall be replaced and open seams shall be repaired.
- Respray areas as needed to keep dust to a minimum.

## 1.8 Element #6: Protect Slopes

Slopes will be stabilized as indicated in Element #5 above. Cut and fill slopes shall be constructed in a manner that will minimize erosion. In addition, the following BMPs may be implemented where appropriate:

- BMP C200 – Interceptor Dike and Swale
- BMP C205 – Subsurface Drains
- BMP C206 – Level Spreader
- BMP C207 – Check Dams

**Installation Schedule:** As Contractor sees fit per construction phasing

**Inspection and Maintenance Plan:**

- BMPs to be inspected after every runoff event to ensure that they are functioning correctly.

## 1.9 Element #7: Protect Drain Inlets

All storm drain inlets made operable during construction, as well as all existing structures within the project limits, shall be marked and protected so that stormwater runoff shall not enter the conveyance



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

system without first being filtered or treated to remove sediment. Install catch basin sock filters or approved equal as shown on the TESC Plans and in accordance with BMP C220 or WSDOT standard I-40.20-00.

Contractor to prevent sediment and street wash water to enter storm drains without prior and adequate treatment.

**Installation Schedule:** As Contractor sees fit per construction phasing

**Inspection and Maintenance Plan:**

- Inlets to be inspected weekly at a minimum and daily during storm events.
- Inlet protection devices shall be cleaned and removed and replaced when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).
- Do not wash sediment into storm drains while cleaning.

## 1.10 Element #8: Stabilize Channels and Outlets

The temporary drainage swales shall provide stabilization, including armoring material, adequate to prevent erosion of outlets, slopes, and downstream reaches. The Contractor to contact Design Engineer for appropriate dimensions of conveyance channels if utilized.

**Installation Schedule:** As Contractor sees fit per construction phasing

**Inspection and Maintenance Plan:**

- Inspect and repair as needed.
- Install channel lining if erosion is observed.
- Install check dams if concentrated flow rates are observed during and after a runoff event.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## 1.11 Element #9: Control Pollutants

All pollutants, including waste materials and demolition debris, that occur on-site during construction shall be handled and disposed of in a manner that does not cause contamination of stormwater. Maintenance and repair of heavy equipment and vehicles involving oil changes, hydraulic system drain down, solvent and de-greasing cleaning operations, fuel tank drain down and removal, and other activities which may result in discharge or spillage of pollutants to the ground or into stormwater runoff must be conducted using spill prevention measures, such as drip pans. Emergency repairs may be performed on-site using temporary plastic placed beneath, and if raining, over the vehicle. Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations shall be followed for application rates and procedures.

The following pollutants are anticipated to be present on-site (to be filled out by Contractor):

| Pollutant (and source, if applicable) |
|---|
| |
| |
| |
| |
| |
| |
| |

Four source control BMPs will apply to this project:

- A Spill Prevention Control and Countermeasures Plan (prepared by Contractor)
- Street Sweeping (as needed during construction by Contractor)
- BMP S419: Mobile Fueling (as needed during construction by Contractor)
- BMP C152: Sawcutting and Surfacing Pollution Prevention (as needed during construction by Contractor)

**Installation Schedule:** As Contractor sees fit per construction phasing

**Inspection and Maintenance Plan:**

- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.
- Source control BMPs shall be utilized to prevent the likelihood of pollutants being introduced on-site.

## 1.12 Element #10: Control Dewatering

It is not anticipated that dewatering will be required for this project.

## 1.13 Element #11: Maintain BMPs

All temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function. All maintenance and repair shall be in accordance with BMPs.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Sediment control BMPs shall be inspected weekly or after a runoff-producing storm event during the dry season and daily during the wet season.

All temporary erosion and sediment control BMPs shall be removed within 30 days after final site stabilization is achieved, or after the temporary BMPs are no longer needed. Trapped sediment shall be 23 removed or stabilized on-site. Disturbed soil areas resulting from removal of BMPs or vegetation shall be permanently stabilized.

## 1.14 Element #12: Manage the Project

### 1.14.1 Phasing of Construction

The project shall be phased where feasible in order to prevent, to the maximum extent practicable, the transport of sediment from the site during construction. Revegetation of exposed areas and maintenance of that vegetation shall be an integral part of the clearing activities for each phase. Installation of temporary sediment control devices shall be implemented in accordance with the respective phase of construction activities.

### 1.14.2 Seasonal Work Limitations

From October 1 through April 30, clearing, grading, and other soil disturbing activities shall only be permitted if silt-laden runoff will be prevented from leaving the construction site.

The following activities are exempt from the seasonal clearing and grading limitations:

- Routine maintenance and necessary repair of erosion and sediment control BMPs;
- Routine maintenance of public facilities or existing utility structures that do not expose the soil or result in the removal of the vegetative cover to the soil; and
- Activities where there is 100 percent infiltration of surface water runoff within the site in approved and installed erosion and sediment control facilities.

### 1.14.3 Inspection and Monitoring

All BMPs shall be inspected, maintained, and repaired as needed to ensure continued performance of their intended function.

Sampling and analysis of the stormwater discharges from the construction site may be necessary to ensure compliance with standards.

Whenever inspection and/or monitoring reveals that the BMPs identified in the construction SWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of any pollutant, the construction SWPPP shall be modified, as appropriate, in a timely manner.

Site inspections shall be conducted by the identified CESCL. The CESCL must be on-site or on-call at all times during the duration of construction activities. The CESCL must examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen, and it is upon the CESCL's evaluation of the effectiveness of BMPs to determine if it is necessary to install, maintain, or repair BMPs to improve quality of stormwater discharges.

The CESCL must inspect all areas disturbed by construction activities, all BMPs, and all stormwater discharge points at least once every calendar week and within 24 hours of any discharge from the site.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The CESCL may reduce this inspection frequency for temporary stabilized or inactive sites to once every calendar month through the duration of construction activities.

### 1.14.4 Maintenance of the SWPPP

A copy of this Construction SWPPP must be on-site or within reasonable access to the site.

If there is a change in the design, operation or maintenance at the construction site that could have a significant effect on the discharge of pollutants to the waters of the State, this Construction SWPPP must be modified to meet those changes.

Additionally, the SWPPP must be modified if, during inspections, it is determined that the Construction SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. Additional or modified BMPs will be included to correct problems identified. Revisions to the Construction SWPPP must be made within 7-days following the inspection.

BMPs that apply to the maintenance of the SWPPP include:

- BMP C150: Materials on Hand
- BMP C160: Certified Erosion and Sediment Control Lead
- BMP C162: Scheduling



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## 1.15 Element #13: Protect Low Impact Development (LID) BMPs

The primary purpose of On-Site Stormwater Management is to reduce the disruption of the natural site hydrology through infiltration. BMPs used to meet CR5: On-Site Stormwater Management, also called LID BMPs, are permanent BMPs.

Protection of all LID BMPs will be necessary throughout the duration of the project, and as required per the Contract Agreement. Protection of the LID BMPs includes, but is not limited to:

- Protection from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the LID BMPs. Restore the BMPs to their functioning condition if they accumulate sediment during construction. Restoring the BMP must include removal of sediment and any sediment-laden Bioretention/Rain Garden soils, and replacing the removed soils with soils meeting the design specification.
- Maintain the infiltration capabilities of LID BMPs by protecting against compaction by construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment.
- Keep all heavy equipment off existing soils under LID BMPs that have been excavated to final grade to retain the infiltration rate of the soils.

The Pollution Prevention Team is as follows (to be filled out by Contractor):

### Pollution Prevention Team

| Title | Name(s) | Phone Number |
|---|---|---|
| **Certified Erosion and Sediment Control Lead (CESCL)** | | |
| **Resident Engineer** | | |
| **Emergency Ecology Contact** | | |
| **Emergency Permittee/ Owner Contact** | | |
| **Non-Emergency Owner Contact** | | |
| **Monitoring Personnel** | | |
| **Ecology Regional Office** | | |

Additional information is available in the *Low impact Development Technical Guidance Manual for Puget Sound* (Hinman and Wulkan 2012) for more details on protecting LID integrated management practices. This information regarding this manual is for additional information purposes only.

BMPs that may be implemented for protection where appropriate:

- BMP C102: Buffer Zone
- BMP C103: High-Visibility Fence
- BMP C207: Check Dams
- CMP C233: Silt Fence



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# ATTACHMENT 1

## WET WEATHER SWPPP AMENDMENT FORM



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Wet-Season Construction SWPPP Supplemental Requirements

*Requirements for construction site activities between October 1 and April 30*

This is a template for a Wet-Season Amendment to the Construction Stormwater Pollution Prevention Plan (SWPPP-WS). To allow construction during the annual "wet season" (defined as October 1 to April 30), most sites will need to apply erosion and sediment control measures that go beyond the basic minimums used during summer, by implementing wet-season supplemental measures in addition to the approved construction SWPPP.

The City of Lacey (City) averages more than 43 inches of rainfall during the 7-month wet season. Erosion of exposed soils at construction sites is a leading cause of sediment pollution in drainage systems and surface waters, so site work during the wet season is restricted. Most construction sites should be fully stabilized by the end of September, with soil-disturbing activities suspended until the following spring; sites continuing work during the wet season must implement specific practices to address the likelihood of extended rainy periods and excessively wet site conditions.

**For a project site to be eligible for wet-season construction, the following shall apply:**

| | |
|---|---|
| ☐ | The site shall meet the criteria in Core Requirement #2, Element #12 ("Manage the Project") of the Stormwater Design Manual (SDM). |
| ☐ | The site shall not have had any past significant erosion and sediment control issues. |
| ☐ | The project must apply for, and be granted, permission to do site work during the wet season. |
| ☐ | The SWPPP-WS must be submitted and approved by the City **prior to October 1** each year. |
| ☐ | The SWPPP-WS must be reviewed by the Certified Erosion and Sediment Control Lead (CESCL) and appropriate staff during the preconstruction meeting. |
| ☐ | The SWPPP-WS must be implemented on-site during the period of October 1 through April 30. |
| ☐ | The construction site must pass inspections by the City's erosion & sediment control inspector. |

By submitting this request for wet-season work activities for a construction site, the project proponent, design team, CESCL, and construction contractors shall implement the following:

- **Prepare an updated site map** with locations of additional best management practices (BMPs) and other activities that will be implemented during the wet season.

- **Complete the following table.** If the element and/or wet-season requirement is not applicable at the site, indicate 'Not Applicable' in the "Describe how this will be implemented at the site" column. If the wet-season requirement is met by the existing SWPPP, include a reference to the applicable page number of the existing SWPPP. The SWPPP elements refer to the 13 elements for construction stormwater BMPs described in Ecology's SWPPP template (*https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit*) and in Chapter 5 of the City's SDM (*https://cityoflacey.org/resource_library/2022-stormwater-design-manual*).

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Wet-Season SWPPP Amendment

*Document additional requirements for construction site activities occurring between October 1 and April 30*

| **SWPPP-WS Prepared By** | | | |
|---|---|---|---|
| Name: | | | |
| Organization: | | | |
| Address: | | | |
| E-mail Address: | | Phone Number: | |
| **Project Information** | | | |
| Project Name: | | | |
| Project Location: | | | |
| Project CESCL: | | CESCL Number: | |

Wet-season construction is subject to prior approval by the City of Lacey based upon site conditions and the submittal, approval and implementation of both the project construction SWPPP and the wet-season SWPPP amendment (SWPPP-WS).

| SWPPP Element | Wet-Season Requirements | Describe how this will be implemented at the site |
|---|---|---|
| Element #1: Preserve Vegetation/ Mark Clearing Limits | **Minimize** the area of vegetation removal and soil disturbance. | |
| Element #2: Establish Construction Access | **Designated parking area:** All vehicles must be parked on pavement, a rock construction access, or a rock/gravel parking pad.<br><br>Do not park any vehicles on bare soil, seeded areas, or areas protected with plastic or mulch cover. | |
| | **Prevent track off:** Wherever construction access routes meet paved roads, use a **wheel wash, tire bath**, and/or other provisions (in addition to the stabilized access) to remove dirt/mud, to minimize track-out onto pavement. | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| SWPPP Element | Wet-Season Requirements | Describe how this will be implemented at the site |
|---|---|---|
| Element #3:<br>Control Flow Rates | Prepare for wet-weather work BEFORE the wet season begins. Plan a mitigation strategy for a multi-day storm with suitable BMPs.<br><br>Have **pumps, storage tanks, and other provisions** on standby for quick implementation in case of excessive rainfall/water accumulation. | |
| Element #4:<br>Install Sediment Controls | Sediment-laden runoff water shall not leave the site.<br><br>Be prepared to address stormwater runoff from a multi-day winter storm:<br>• Construct **temporary sediment ponds** and channels to direct flows to them<br>• Construct **check dams and erosion control** as needed. | |
| Element #5:<br>Stabilize Soils | No soils shall remain exposed and unworked for more than **2 days**, including weekends and holidays.<br><br>Implement the following practices to provide protective cover and to stabilize bare soils during work stoppages exceeding 2 days:<br>• Temporary seeding<br>• Mulching (straw, etc.)<br>• Plastic covering<br>• Other practices | |
| | Select appropriate **stockpile location(s):**<br>• Within the site away from the perimeter<br>• Away from storm drains<br>• Away from waterways and drainage channels<br><br>**Stabilize soil/material piles** to prevent erosion.<br><br>Use **sediment-trapping measures** for containment. | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| SWPPP Element | Wet-Season Requirements | Describe how this will be implemented at the site |
|---|---|---|
| Element #6:<br>Protect Slopes | **Minimize erosion** on slopes:<br>• Terracing<br>• Surface roughening<br>• Rolled erosion-control mats<br>• Other practices | |
| Element #7:<br>Protect Drain Inlets | **Inspect drain inlets daily** during the wet season.<br><br>**Clean or remove and replace** inlet protection devices when sediment has filled one-third of the available storage. | |
| Element #8:<br>Stabilize Channels and Outlets | Describe how the project will **prevent downstream erosion** during the wet season.<br><br>**Provide stabilization** for outlets, adjacent stream banks, slopes, and downstream reaches. | |
| Element #9:<br>Control Pollutants | Ensure that waste materials and demolition debris are **covered and contained** to prevent water from collecting.<br><br>Dispose of waste materials and demolition debris more frequently during the wet season, if possible. | |
| Element #10:<br>Control Dewatering | Describe any changes in the **dewatering process** for implementation during the wet season. | |
| Element #11:<br>Maintain BMPs | **Inspect, maintain, and repair** all temporary and permanent construction stormwater BMPs as needed so that they are fully functional. | |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| SWPPP Element | Wet-Season Requirements | Describe how this will be implemented at the site |
|---|---|---|
| Element #12:<br>Manage the Project | Develop a **wet season construction schedule** that includes additional details about tasks and areas to be worked compared to a dry season schedule.<br><br>The CESCL must **conduct site inspections at least once every other day** and within 24 hours of discharge from the site. The CESCL must monitor weather conditions and adjust BMPs accordingly. The CESCL must be on-site or on-call at all times.<br><br>Construction site operators must **address any issues within 24 hours** of receiving notification from a City representative. | |
| Element #13:<br>Protect Low Impact Development (LID) BMPs | Soil compaction can have a larger impact in wet conditions compared to dry conditions<br>• **Protect LID BMPs from compaction** by construction equipment and foot traffic.<br>• Protect completed lawn and landscaped areas from compaction by construction equipment. | |
| Other considerations | Regularly monitor site discharge for turbidity. | |

**Note:**
The City may take enforcement action (e.g., notice of violation, administrative order, penalty, stop-work order) under the following circumstances:

a. If, during the course of any construction activity or soil disturbance, sediment leaves the construction site causing a violation of the surface water quality standard; or
b. If clearing and grading limits shown in the plans are not observed, or if erosion and sediment control measures shown in the approved plan are not installed or maintained.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# APPENDIX L

## SEPA DNS EXEMPTION

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Shaping our community together

CITY OF LACEY

**CITY COUNCIL**
ANDY RYDER
Mayor
CYNTHIA PRATT
Deputy Mayor

LENNY GREENSTEIN
MICHAEL STEADMAN
CAROLYN COX
ED KUNKEL
MALCOLM MILLER

**CITY MANAGER**
SCOTT SPENCE

December 3, 2021

Gagan Brar
City of Lacey Public Works

RE: SEPA Requirements for HP Reservoir Rehabilitation Project

Dear Gagan;

After review of the scope for the Hawks Prairie Reservoir rehabilitation project (attached), we have determined that the project is exempt from the requirements for a threshold determination under the State Environmental Policy Act, WAC Section 197-11-800(23)(e). A SEPA checklist is not required.

Should you have any further questions, please feel free to call me at (360) 491-5642.

Sincerely,

Sarah Schelling

Sarah Schelling
Senior Planner

CC: Rick Walk, SEPA Responsible Official & Director of Community and Economic Development



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# APPENDIX M
# ARBORIST REPORT

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# Memo

**To:** City of Lacey Community Development Department
**From:** Kevin M McFarland, City of Lacey Tree Protection Professional
**Date:** 8/14/2025
**Re:** Case #25-0207

---

The following information presents my findings and comments regarding the request for review application submitted by Ryan Jewell, Utility Engineer with the City of Lacey. The City has requested that I review the proposed tree removal and protection with the Hawks Prairie Reservoir Rehabilitation project at 4040 Marvin Road I visited the site and met with Mr. Jewell on August 8, 2025.

**Findings and Comments**

The project will involve the clearing of an area for a construction access road off of 41st Ave NE and a materials/equipment storage area to the north of the existing facility. An inventory of the proposed tree removals (4"+) is presented below. None of the trees measure more than 12" DBH. Please reference the attached diagram and photos.

**Table 1. Tally of Trees Proposed for Removal**

| Species | Number of Trees |
|---|---|
| Douglas Fir | 32 |
| Western Red Cedar | 3 |
| White Pine | 9 |
| Pacific Madrone | 2 |
| Red Alder | 18 |
| | **Total = 64** |

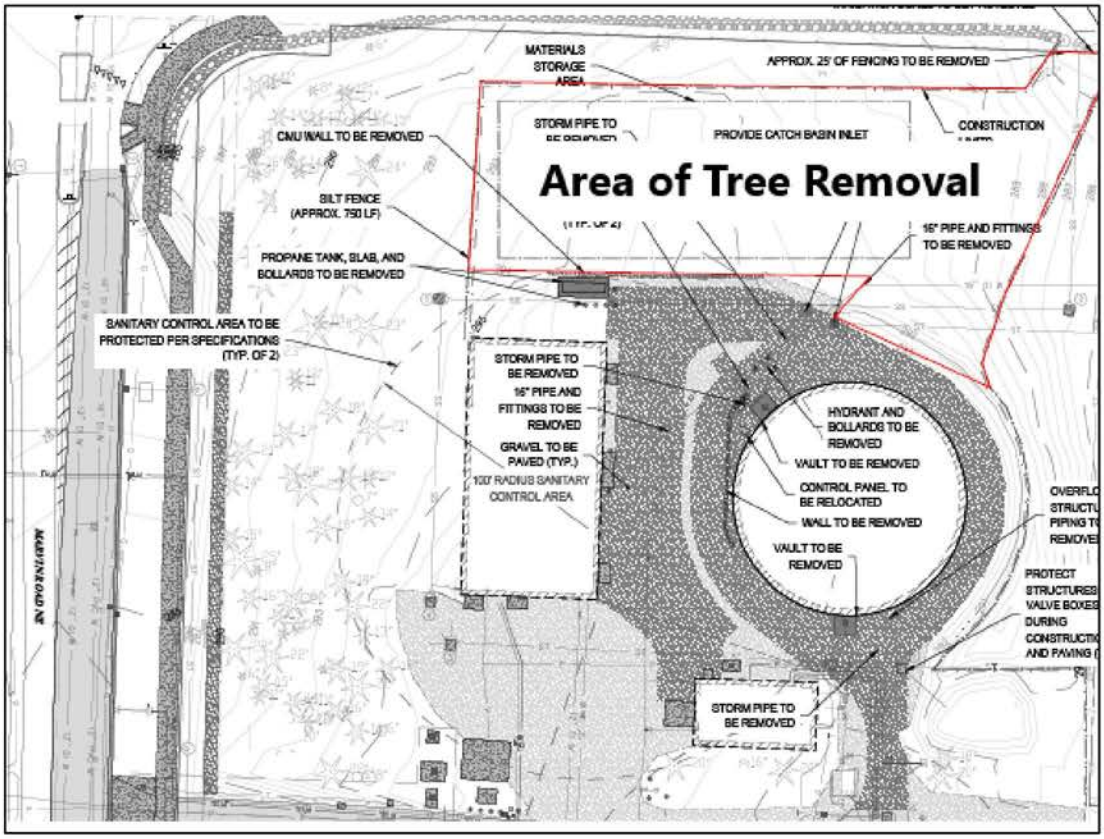
The vegetation buffer along Marvin Road and a 20-25' buffer along 41st Ave will remain. The silt fencing indicated on the site plan I have been provided will suffice for protection of trees to be retained. Per the City code, no materials or equipment will be allowed within the protected areas.

This project will result in the removal of many trees that were replanted to mitigate previous removals due to Laminated Root Rot. I recommend that the impacted area be replanted once this project is complete with species that are not susceptible to the disease (no Douglas firs).

If you should have questions, please feel free to contact me at 360-870-2511 or suf1234@comcast.net.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Location of Proposed Tree Removals




Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Photos



Western area of tree removal



Looking north into area of tree removal

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# APPENDIX N

## STRUCTURAL CONDITION ASSESSMENT

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

MSA
Murray, Smith & Associates, Inc.
Engineers/Planners

888 SW 5th Avenue, Suite 1170 ▪ Portland, Oregon 97204 ▪ PHONE 503.225.9010 ▪ FAX 503.225.9022

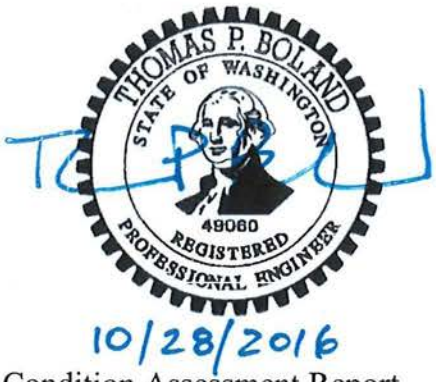
# TECHNICAL MEMORANDUM

**DATE:** October 28, 2016

**PROJECT NO.:** 16-1823

**TO:** Mr. Jeff Johnstone, P.E.
City of Lacey, WA

**FROM:** Thomas P. Boland, P.E.
Justin H. Ford
Murray, Smith & Associates, Inc.




10/28/2016

**RE:** Hawks Prairie Reservoir – Structural and Condition Assessment Report

## Purpose and Background

The purpose of this technical memorandum is to summarize and document the structural and condition assessment of the City of Lacey's (City) 4.0 Million Gallon (MG) Hawks Prairie Reservoir performed by Murray, Smith & Associates, Inc. (MSA) and our structural engineer Peterson Structural Engineers, Inc. (PSE). This report presents the findings and recommendations for reservoir rehabilitation, including budgetary cost estimates and construction schedule.

The Hawks Prairie Reservoir (reservoir) is a 4.0 MG, 90-foot-diameter welded steel tank with a wall height of 88 feet and overflow depth of 85 feet. The reservoir has a floor elevation of 295 feet and an overflow elevation of 380 feet. City staff reported that the reservoir is typically operated within a water depth range of approximately 78 to 83 feet, with 79 feet as the desired design water depth for this assessment. Available City records show that the reservoir was constructed in 1995 by Rocky Mountain Fabricators, as a subcontractor to McClure & Sons. Original reservoir structural calculations were performed by Quality Engineering & Design for McClure & Sons. Subsequent exterior coating repairs were completed in 2003.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Reservoir Inspection and Document Review

MSA and PSE conducted a site visit of the reservoir on June 29th, 2016. On that date, MSA and PSE inspected the interior of the nearly-full reservoir from a raft and the reservoir exterior from the ground, the spiral stairway, and the roof. An inspection of the drained reservoir interior was not performed. However, the August 2015 dive inspection video and report completed by Liquivision Technologies was reviewed. The following reservoir elements were observed during the site visit or as part of the review of the dive inspection documentation:

- Reservoir Structure
- Interior and Exterior Coating Systems
- Interior and Exterior Appurtenances and Piping

The assessment of the reservoir also included a review of the reservoir design drawings, and various reports and documentation provided by the City. Efforts were made to contact the reservoir fabricator and general contractor to obtain shop drawings and/or record drawings, but no data was available. **Appendix A** to this *Structural and Condition Assessment Report* includes photographs of the interior and exterior of the reservoir.

## Reservoir Structural Condition Assessment

The structural assessment was completed by PSE, and is discussed in detail in the attached report titled *Structural Evaluation and Recommendations Report*. PSE reports that two structural issues were identified through their inspection and analysis, the primary being the roof adequacy and observed corrosion throughout the roof system. For Code gravity loads the reservoir has been found to be mostly adequate with only the rafter bearing seats found to be undersized.

Since the rafters are seal-welded to the roof, their removal would be cost-prohibitive and unnecessary as the exterior ends are the primary location where heavy corrosion issues have been identified. The rafters themselves have adequate area to handle the applied shear loads, but the support angles are inadequate and severely corroded in many cases. To mitigate these issues, it is recommended that the angles be removed and the rafters be reconnected to the wall via the installation of flat plates as shown below in PSE's **Figure 26**.


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

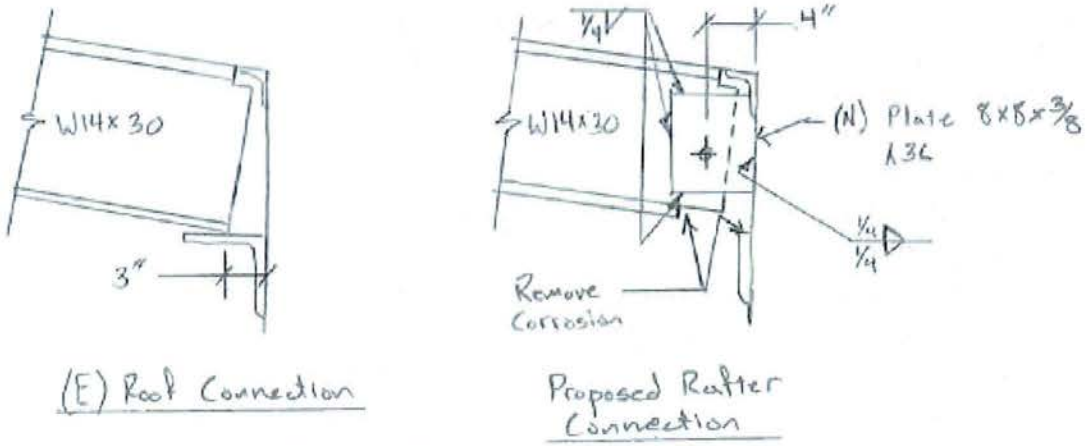



Figure 26: Rafter Support Proposed Repair.

Because the existing angle supports are undersized even without corrosion, the new plate would provide required support for the Code level gravity loads. The proposed plate could be attached to the current roof rafter system even in locations where the flange has been compromised. In addition to the new plate being installed, the corroded portions of the angle supports and bottom rafter flanges should be removed. The remaining portion of the angle supports should be seal welded and left in place. Once repairs have been made the interior roof should be recoated with a focus on difficult to reach areas such as the rafter edges facing the walls and inside the dollar plate.

The maximum Code gravity load case includes a full snow load set to a 50-year recurrence. In the absence of such a load the rafter bearing seats, even those that are corroded, have a reserve capacity to support the roof self-weight along with incidental light maintenance loads. As a result, the roof is not at risk of immediate failure and this should provide the City with time for project planning and funding regarding upgrades. Cost estimates for the recommended structural upgrades presented later in this report.

The second structural issue is with the foundation anchorage and footing, of which the City is already aware. Based on our understanding, the City does not intend to upgrade the reservoir anchorage or foundation at this time. As a result, footing and anchorage upgrade evaluation or design are not part of this report.

## Coating Systems

### *Interior Coating Assessment and Repair Alternatives*

*Current Condition Assessment*

A visual inspection of the interior head space of the reservoir was completed while floating in a raft with the water level at approximately 83 feet-6 inches, 1.5 feet below the overflow level. Areas of the interior surfaces below the water level were observed through our review of the dive inspection video. Based on available data, it is understood that the interior coating is the original system installed in 1995. Most of the interior coating system observed appears


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

to be well adhered to the tank ceiling, walls, and floor, with a few isolated areas of delamination present on the ceiling. The highest levels of coating failure and corrosion are evident at the following locations:

- Rafter ends and rafter supports at the wall
- Weld seams along the rafter-to-ceiling connections
- Top flange of the joists
- Entire length of the painter's rail and support standoffs
- Support angles for the overflow pipe
- Ladder rungs and stringers, especially above the water line
- Overflow cone and baffle
- "All-thread" rod and supports for the abandoned aeration pipe suspended from rafters

It should be noted that the reservoir roof plates and rafters are seal welded, which eliminates "inaccessible areas" for coating application. Therefore, the observed corrosion and rust bleed can be attributed to poor surface preparation or substandard coating or application, which has resulted in coating failure.

As seen on the photo plates provided in **Appendix A**, the coating on the floor and walls below the water level is generally in good condition. The more accelerated corrosion in the head space of the reservoir can likely be attributed to chlorine vapor creating an aggressively corrosive atmosphere. City staff reported that in 2005 the City began chlorinating at the adjacent water treatment facility, and the presence of coating failure visible from the roof access hatch became much more evident. Also present in the reservoir is a thin film of reddish-brown sediment that was easily vacuumed from the floor by the divers, and was wiped off fairly easy when the divers ran their hand over the wall. This is believed to be iron residue, and is not believed to be a corrosion issue or a water quality concern.

The interior coating dry film thickness (DFT) was measured at various locations using a Defelsko PosiTector digital electromagnetic gauge while floating in the reservoir. Average and ranges of DFT measurements are presented in **Table 1** below.

**Table 1**
**Interior Reservoir Coating Thickness Testing Results**

| Location | No. of Readings | Average DFT, mils | DFT Range, mils |
|---|---|---|---|
| Wall near South Hatch | 10 | 15.5 | 12.4 – 20.6 |
| Ceiling near South Hatch | 10 | 12.8 | 11.6 – 14.5 |
| Rafter Bottom Flange South | 10 | 7.6 | 6.6 – 8.9 |
| Rafter Bottom Flange North | 10 | 17.1 | 15.5 – 18.7 |
| Wall near Ladder | 10 | 14.4 | 11.1 – 18.3 |
| Ceiling at North Hatch | 10 | 11.4 | 10.3 – 12.3 |


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The exact interior coating material is unknown, but based on MSA's experience with similar structures and the era of construction, it was likely a two-part epoxy applied in three coats. Since the manufacturer of the exterior coating is known to be Tnemec through our review of documents provided by the City, it is very likely that the interior coating is Tnemec Series 20 Pota-Pox epoxy. The coating thicknesses are in line with what would be expected for this coating system, and its quality of performance below the waterline appears to have been satisfactory over its service life thus far.

*Interior Coating Repairs and Upgrade Alternatives*

Though the interior coating system is generally in good condition, especially considering its age, much of the ceiling and roof support system are showing signs of heavy corrosion. This is especially true of the rafters and supports at the wall. Photos of corroded areas above the water line and other areas of concern are included in **Appendix A**. It is recommended that coating repairs only be made in conjunction with structural repairs to the rafter supports and other heavily corroded areas such as the painter's rail. Coating the corroded areas that have steel section loss, without making structural repairs, would not provide a long-term solution. The options for repairing or replacing the coating are as follows:

Interior Alternative 1: Abrasive Blast and Recoat Above the Water Line only

Interior Alternative 1 provides the minimum recommended repair to address both existing coating failures to stop further corrosion of members and remediation work required as a result of recommended structural repairs. The scope of this alternative involves a full abrasive blast of the existing coating above the water line on the walls, the ceiling and entire roof support system, and all carbon steel appurtenances such as piping, ladders and supports. MSA typically defines the water line as two feet below the lowest normal operating level of the reservoir. City Staff report that the normal low water level is 78 feet above the floor, which is seven feet below the overflow. Therefore, it is recommended that the water line be defined as 76 feet above the floor, which is nine feet below the overflow level. Based on that, all surfaces above 76 feet above the floor should be abrasive blasted to the Society for Protective Coatings (SSPC) Surface Preparation Standard 10 (SP10) Near-White Blast Cleaning. This level of abrasive blast cleaning of the interior surface will adequately remove all existing coating and rust to provide a suitable substrate for a new high quality coating system. Following abrasive blast cleaning, the recommended coating system is a three-coat spray-applied two-component epoxy system, with back-brushing at all weld seems and irregular areas. The first coat is a zinc-rich epoxy primer which forms the bond between the steel substrate and the protective coating. The materials used shall be approved by the National Sanitation Foundation (NSF) for potable water service. This approach is considered to provide a 15- to 20-year interior coating solution.

Interior Alternative 2: Abrasive Blast and Recoat Entire Reservoir Interior

Interior Alternative 2 involves a full blast of existing interior coating and repainting all surfaces above and below the water line. Although the coating system below the water line has not deteriorated to the point of being beyond its useful service life, the age of the coating


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

(21 years) lends itself to being near the typical recoat window. There are isolated areas of pinhole corrosion, coating failure at irregular shaped areas, and potential blistering under the coating that would be addressed if this alternative is implemented. The result would be a new modern protective coating system with a long service life. The surface preparation and coatings applied would be identical to Alternative 1, although the coating system below the water line would not include a zinc-rich epoxy primer but rather three coats of high solids two-component epoxy paint. This approach is considered to provide a 30-year interior coating solution.

Costs for the above alternatives are presented at the end of the report. Alternative 1 would address the biggest areas of concern inside the reservoir following structural repairs, but would result in the City needing to recoat the areas below the water level at a future date, as the interior coating system is the original system that was applied in 1995. Because Alternative 1 would ultimately result in two interior maintenance painting projects over a relatively short period of time, there is a loss of potential cost efficiencies from performing a single project on the entire interior at one time. Alternative 2 replaces the entire interior coating system and provides the most thorough and economically efficient procedure to rehabilitate the interior coating system and extend the reservoir service life.

### *Exterior Coating Assessment and Repair Alternatives*

#### *Background and Current Condition Assessment*

Based on documentation provided by the City, the exterior shell and roof underwent coating repair work in 2003 to address the poorly performing coating that was applied during tank construction. It was reported that several years after the reservoir was placed into service, it became apparent that the original coating system was not fully adhered and was experiencing near full-scale failure. It is believed that there were two central problems: 1) The shop-primed exterior was beyond its recoat window when the second coat was applied in the field; and 2) The weld seams were not prepared properly following field erection and welding. Seven years after initial painting, the City engaged the original tank fabricators and painters to remedy the tank coating. The repair work included field abrasive blast cleaning of all weld seams to an SSPC-SP 6 Commercial Blast Cleaning standard, and sweep blasting the remainder of the shell to remove all intermediate and final coat paint that was not adhered to the primer. Since the primer was intact where it had been shop-prepared and primed, it was roughened by abrasive blasting during the sweep blast to provide an anchor profile for adhesion of the new primer. It is believed that the repair coating consisted of two full coats of Tnemec Series 66 epoxy primer, and one full coat of Tnemec Series 73 urethane.

Based on MSA's observations during the on-site inspection, the existing exterior coating system appears to be in fair condition. Few locations of rust or areas of coating failure were noted during the inspection. A contributing factor for the limited areas observed with compromised coating and corrosion, is that City staff have prioritized making spot repairs to the damaged coating when visible. Maintenance personnel noted that they use mechanical means of paint removal for surface preparation, followed by touch-up coating with a Behr


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

exterior satin enamel paint. Based on record documents, it is believed that the existing coating system does not contain lead.

Existing reservoir coatings can be overcoated if the existing coating is well adhered and the paint layers are not excessively thick. Field observations and results of cross-cut tape adhesion testing performed at various locations around the tank shell and roof per ASTM D3359, indicate the bond between the layers of existing coating system is good, which is a primary factor used to determine whether the reservoir is a candidate for overcoating. Photos of adhesion testing procedures are included in **Appendix A**.

Coating thickness measurements are presented in **Table 2** below. These results confirm that the coating thickness on the reservoir shell is thinner near the weld seams, which should be expected based on the surface preparation and coatings applied during the remedial work done in 2003, in which the weld seams were blasted down to bare metal.

**Table 2**
**Exterior Coating Thickness Testing Results**

| Location | No. of Readings | Average DFT, mils | DFT Range, mils |
|---|---|---|---|
| Roof, South Side | 5 | 16.4 | 13.7 – 18.8 |
| Roof, North Side | 5 | 24.1 | 22.9 – 25.7 |
| Roof, West Side | 5 | 19.0 | 18.3 – 19.6 |
| Roof, East Side | 5 | 15.9 | 14.9 – 16.4 |
| Shell, Southeast Side, Top Course, Panel | 5 | 24.3 | 23.4 – 26.3 |
| Shell, Southeast Side, Top Course, Weld | 5 | 11.3 | 10.7 – 11.9 |
| Shell, Northeast Side, Middle Course, Panel | 5 | 26.0 | 23.5 – 28.4 |
| Shell, Northeast Side, Middle Course, Weld | 5 | 18.9 | 15.6 – 22.5 |
| Shell, Northwest Side, Bottom Course, Panel | 5 | 20.5 | 19.3 – 21.9 |

*Exterior Coating Repairs and Upgrade Alternatives*

There are several alternatives the City can consider for rehabilitation of the reservoir coating, each with different levels of service life and cost. These generally include: 1) Spot repair; 2) Overcoating; and 3) Full coating removal and replacement. Discussions for three exterior coating upgrade alternatives are presented below.

Exterior Alternative 1: Spot Prepare and Recoat only at Locations of Structural Upgrades

Exterior Alternative 1 provides the minimum amount of effort and cost associated with exterior maintenance painting, and is focused only on repairing coating that is damaged from welding completed as part of the recommended structural repairs. These damaged areas will be power tool prepared to bare metal (SSPC-SP 11) and products similar to the existing coating system will be re-applied. This approach would result in the reservoir exterior coating continuing to need maintenance touch-up on occasion, similar to what is currently occurring. The color and gloss of the spot repairs will be more noticeable than the


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

surrounding areas. However, the reservoir is not in a highly visible location, so the resulting discoloration and aesthetics may not be an issue. The exterior coating system was applied in 2003, and due to its age, will likely need to be overcoated or replaced within the next 10 years.

Exterior Alternative 2: Spot Prepare and Recoat Full Reservoir with Overcoat System

Epoxy/urethane systems similar to the existing coating can be overcoated at higher DFT than other coating materials, if an appropriate product is used for that application. The existing materials at the measured thickness, coupled with the good adhesion test results, indicate that overcoating the City's reservoir is an option. However, the resulting total DFT's would require complete coating removal during the next future maintenance painting project. Therefore, it is likely that this would be the last overcoating that could be completed before full abrasive blasting would be required.

Exterior Alternative 2 includes an initial cleaning step, where all surfaces are treated with an anti-mildew agent and pressure washed. Loose coating can typically be removed when pressure washed at 3,500 psi, exposing compromised areas to view for further preparation and providing a platform for successful maintenance painting to occur. The next step is spot surface preparation to the SP 11 standard for all locations damaged from welding of structural repairs, all coating failure areas with exposed bare steel or corrosion, and all areas where the City has performed touch-up preparation and application of the enamel touch-up paint. Following spot repair with an epoxy primer, a full intermediate coat of an elastomeric waterborne acrylic would be applied, followed by a urethane finish coat to provide long term color and gloss. Use of the acrylic product for the intermediate coat (also called a tie-coat) is an innovative solution for reservoirs with a higher DFT (25 plus mils), as it does not overstress the base coatings like epoxy tie-coats can through the process of solvent drive. For optimum results and efficiency, it is recommended that exterior coatings be applied while the reservoir is empty and during the more favorable seasonal weather window from May through September, to limit effects of ambient conditions. This overcoat approach is considered to be a 15-year exterior coating solution.

Exterior Alternative 3: Abrasive Blast and Recoat Full Reservoir Exterior

Exterior Alternative 3 includes removing all of the exterior coating on the walls and roof with abrasive blasting methods to the SP 6 standard. After coating removal, the reservoir would be primed with a zinc-rich epoxy, followed by an epoxy intermediate coat, and finished with a polyurethane top coat. For optimum results and efficiency, it is recommended that exterior coatings be applied while the reservoir is empty and during the more favorable seasonal weather window from May through September, to limit effects of ambient conditions. Alternative 3 provides the longest-lasting solution as the system would be entirely modern and applied to a suitable substrate following all structural welding and other selected repairs. The blast and recoat approach is considered to be a 30-year exterior coating solution.


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Cost estimates for the three alternatives are presented later in this report. Alternative 1 represents the minimum effort required in the short-term, with full upgrades to the reservoir exterior coatings deferred to the future. Alternative 2 provides a long-lasting and aesthetically appealing solution, with full removal and recoating deferred until the next required maintenance painting. Alternative 3 offers the longest-term solution with full removal and recoating, but is also the most expensive option.

***Reservoir Appurtenances and Piping***

The following discussion presents observed conditions, deficiencies and recommended improvements for reservoir appurtenances. Photos of reservoir appurtenances and piping are included in **Appendix A**.

*Interior Ladder and Platform with Handrail*

The interior ladder above the water line and the platform handrail appear to have significant coating failure and corrosion. Due to the poor condition of the two ladders, and uncertainty regarding rung section loss, the reservoir repair alternatives should include replacement of approximately 16 feet of ladder, which includes all sections above the normal low operating depth of 78 feet. The remainder of the ladder should be abrasive blasted and recoated to halt further corrosion related losses. A portion of the handrail appears to be highly corroded and in need of replacement. In the absence of further investigation, it is assumed that 20 linear feet of nominal 2-inch schedule 40 steel pipe railing would need to be furnished and installed to replace corroded railing.

The platform, which the original construction drawings identify as fiberglass-reinforced plastic, appears to be in good condition. It is challenging to assess the platform supports, but based on photographs taken during the inspection, there appears to be coating failure and corrosion, but it may be at a level that can be carefully abrasive blasted and recoated.

*Center Column*

The 24-inch center support column, which rests on a square steel base plate, appears to be in good condition. Mild corrosion is apparent on the top of the "dollar plate", which is the steel plate at the cent where the roof support rafters rest.

*Painter's Rail*

The painter's rail appears to be in very poor condition. The majority of the rail's coating has failed, resulting in heavy corrosion of the angle steel and the supports. The rail is not in a condition that can be safely used for supporting painting equipment.

To replace the rail, welders could install a temporary door sheet through the reservoir shell at the base and work from a manlift to reach the height of the rail. Alternatively, a ring of painter's plugs could be installed through the roof near the reservoir wall around the entire perimeter. The plugs would need to be spaced properly to allow workers to suspend cabling


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

and a platform to access the wall for removal of the rail and welding of new rail supports. Typical spacing for these are 12 feet on center at three feet from the edge, which would result in a total of 22 plugs needed. The painter's plugs would also assist painters to prepare and paint the reservoir wall, while the rail would assist painters to prepare and paint the reservoir ceiling.

*Anode Junction Boxes*

There are 12 anode junction boxes on the reservoir roof. These boxes can be used as painters plugs, but they are not close enough to the wall to facilitate interior painting (since the outer ring is 15 feet from the wall). The boxes appear to be 6-inch nipples with bolted flange covers, and all pipes appear to be in good condition. There is currently no cathodic protection system installed.

*Exterior Spiral Staircase*

The exterior ladder system is a spiral staircase made of welded steel, welded to the reservoir wall. The staircase has a locked chain link fence and gate that extends beyond the sides of the staircase to prevent unauthorized access to the roof. The staircase is in good condition and does not appear to need repairs or upgrades.

*Roof Center Vent*

The existing reservoir vent is a circular 30-inch diameter screened assembly with a sheet metal rain cover on top. There is moderate corrosion indicated by visible rust staining. The roof vent does not include a turn-down hood or a lock for enhanced security. Although the vent appears to have adequate insect protection, it is classified as a "chimney vent" and does not meet DOH guidelines.

Based on our vent sizing calculations, when considering a rapid unexpected draining of the reservoir that could result during a pipe break scenario, the size of existing screened opening appears to be inadequate due to the chimney vent configuration. However, if the vent is replaced with a mushroom style vent which utilizes a larger screened area across the whole diameter, the vent opening through the tank roof would be adequate.

*Side Entry Manways*

There are two 36-inch diameter side entry manways located at ground level. The hatches appear to be functional and in good condition, although they were not opened during the inspection.

*Roof Hatches*

There are two 30-inch by 36-inch roof hatches that include curbs for weather protection and hinged steel covers with 2.5-inch lips over the curbs. Adhesive weather-stripping is installed where the cover rests on the curb to protect the coatings, but needs replacement. Both


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

hatches were generally in good condition with minor corrosion. The hatches appear to comply with AWWA recommendations.

*Roof Gutter*

The reservoir roof has a steel gutter that runs around the entire perimeter, with four downspouts routed to concrete splash blocks at grade. The downspouts are constructed of 4-inch steel piping with steel standoff tabs that are welded to the reservoir shell. Standing water was evident at several locations near the outer edges of the roof, with areas of coating damage. The painted steel gutter also has significant coating failure.

*Inlet Pipe*

The 12-inch diameter steel inlet pipe enters the reservoir through the floor and was visible in the dive inspection video. It extends vertically with a tee just above the floor that has a tapped blind flange on the branch and an HDPE "duckbill" style check valve at the top for reservoir mixing. The inlet pipe appears to be in good condition with a minor corrosion.

*Outlet/Drain Pipe*

The 12-inch diameter steel outlet pipe enters the reservoir through the floor and was visible in the dive inspection video. It includes a vertical silt stop apparatus. The reservoir is drained through a tee connection downstream of the outlet pipe chamber, which drains to the restrictor manhole and eventually daylights into the detention pond. The outlet pipe and silt stop appear to be in good condition with minor corrosion.

*Overflow Pipe*

The 12-inch diameter steel overflow pipe has a 30-inch diameter baffled steel cone and exits through the reservoir shell approximately eight feet below the top of the wall. The pipe runs down the reservoir shell on the exterior and terminates at an HDPE "duckbill" style check valve oriented vertically. The overflow pipe has an air-gap before it discharges into a catch basin which drains to the restrictor manhole, and eventually daylights into the detention pond. The overflow pipe appears to be in good condition with minor corrosion. The overflow cone and baffle appear to be heavily corroded and may need to be replaced during upgrades.

*Abandoned Aeration Pipe*

There is an abandoned aeration pipe located near the water surface, suspended from the reservoir rafters. It is recommended that the pipe be removed during the future upgrade project.

## Cost Estimates

Preliminary construction cost estimates for the reservoir rehabilitation are presented below. **Cost Estimate 1** is approximately $378,000 and includes the base level recommended upgrades to address structural concerns, appurtenance modernization, and coating


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

replacement of the most critical and damaged areas. **Cost Estimate 2** is approximately $1,257,000 and includes mid-level recommendations to upgrade the reservoir with a 15-year exterior coating life and a 30-year interior coating life, including full replacement of the interior protective coating system and an overcoat of the exterior protective coating system. **Cost Estimate 3** is approximately $1,580,000 and includes recommendations to upgrade the reservoir with a 30- year exterior coating life and a 30-year interior coating life, including full replacement of the interior and exterior protective coating systems.

These preliminary estimates are an opinion of probable costs of known project elements based on information available at the time of the estimate. These cost estimates include the cost of rehabilitating the reservoir structure and do not include any site improvements, engineering, construction observation, construction administration or inflation factors. Actual costs will depend upon the final project scope, method of implementation, actual labor and material costs, construction market conditions, schedule and other variables. The ENR Construction Cost Index (CCI) for August 2016 is 10596, and should be referenced for future updates to these cost estimates.

**Cost Estimate 1**
**Base Level Upgrade Option**

| Description | Estimated Cost |
|---|---|
| Install Perimeter Painter's Plugs in Roof | $6,000 |
| Install a Temporary Door Sheet for Interior Access | $20,000 |
| Remove and Replace Rafter Supports at Reservoir Wall | $36,000 |
| Remove and Replace Painter's Rail | $10,000 |
| Remove and Replace Roof Vent | $10,000 |
| Remove Abandoned Aeration Pipe | $1,000 |
| Remove and Replace Select Sections of Interior Platform Handrail | $3,000 |
| Interior Coating Alternative 1:<br>Abrasive Blast and Recoat Above the Water Line only | $151,000 |
| Exterior Coating Alternative 1:<br>Spot Prepare and Recoat only at Locations of Structural Upgrades | $30,000 |
| **Subtotal** | $267,000 |
| Mobilization, Demobilization, Bonding & Insurance at 8% | $22,000 |
| **Subtotal** | $289,000 |
| Washington State Tax at 8.7% | $26,000 |
| **Subtotal** | $315,000 |
| Contingency (20%) | $63,000 |
| **Total Cost for Base Level Upgrade Option** | **$378,000** |


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## Cost Estimate 2
## Mid-level Upgrade Option (15-year Exterior, 30-year Interior)

| Description | Estimated Cost |
|---|---|
| Install Perimeter Painter's Plugs in Roof | $6,000 |
| Install a Temporary Door Sheet for Interior Access | $20,000 |
| Remove and Replace Rafter Supports at Reservoir Wall | $36,000 |
| Remove and Replace Painter's Rail | $10,000 |
| Remove and Replace Roof Vent | $10,000 |
| Remove Abandoned Aeration Pipe | $1,000 |
| Remove and Replace Select Sections of Interior Platform Handrail | $3,000 |
| Interior Coating Alternative 2:<br>Abrasive Blast and Recoat Entire Reservoir Interior | $476,000 |
| Exterior Coating Alternative 2:<br>Spot Prepare and Recoat Full Reservoir with Overcoat System | $329,000 |
| **Subtotal** | $891,000 |
| Mobilization, Demobilization, Bonding & Insurance at 8% | $72,000 |
| **Subtotal** | $963,000 |
| Washington State Tax at 8.7% | $84,000 |
| **Subtotal** | $1,047,000 |
| Contingency (20%) | $210,000 |
| **Total Cost for Mid-Level Upgrade Option** | **$1,257,000** |


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Cost Estimate 3**
**Highest Level Upgrade Option (30-year Exterior, 30-year Interior)**

| Description | Estimated Cost |
|---|---|
| Install Perimeter Painter's Plugs in Roof | $6,000 |
| Install a Temporary Door Sheet for Interior Access | $20,000 |
| Remove and Replace Rafter Supports at Reservoir Wall | $36,000 |
| Remove and Replace Painter's Rail | $10,000 |
| Remove and Replace Roof Vent | $10,000 |
| Remove Abandoned Aeration Pipe | $1,000 |
| Remove and Replace Select Sections of Interior Platform Handrail | $3,000 |
| Interior Coating Alternative 2:<br>Abrasive Blast and Recoat Entire Reservoir Interior | $476,000 |
| Exterior Coating Alternative 3:<br>Abrasive Blast and Recoat Full Reservoir Exterior | $558,000 |
| **Subtotal** | $1,120,000 |
| Mobilization, Demobilization, Bonding & Insurance at 8% | $90,000 |
| **Subtotal** | $1,210,000 |
| Washington State Tax at 8.7% | $106,000 |
| **Subtotal** | $1,316,000 |
| Contingency (20%) | $264,000 |
| **Total Cost for Highest Level Upgrade Option** | **$1,580,000** |

## Conclusion and Recommendations

This report is intended to summarize and document the findings of the reservoir structural and condition assessment. Draft report review discussions and correspondence were conducted with the City, and City input and guidance on particular items discussed throughout the report were incorporated in this final report.

*Structural Assessment*

Overall the reservoir is in good condition. The roof system is generally in good condition, with the exception being the inadequacy of the rafter bearing seat design under gravity and seismic loads. The bearing seat issue is further exacerbated by the corrosion of these supports. The areas of the tank that have been affected by corrosion are typically difficult to keep corrosion-free and many municipalities have experienced problems in these areas. However, the excessive corrosion and section loss identified is on a scale that is unusual for a tank of this age. Also, as the City previously reported, the foundation anchorage is undersized for the current seismic loads, based on current design criteria.


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The maximum Code gravity load case includes a full snow load set to a 50-year recurrence. In the absence of such a load the rafter bearing seats, even those that are corroded, have a reserve capacity to support the roof self-weight along with incidental light maintenance loads. As a result, the roof is not at risk of immediate failure and this should provide the City with time for project planning and funding regarding upgrades.

PSE has outlined a repair option that can be implemented economically, based on an acceptable risk level as defined by the City. To meet this objective, PSE recommends that repairs be performed to ensure the reservoir's roof system is upgraded to support Code level design gravity loads and that the roof support system be blast cleaned and recoated to mitigate future corrosion concerns.

*Coatings and Appurtenances*

Interior Coating - Though the interior coating system is generally in good condition, especially considering its age, much of the ceiling and roof support system are showing signs of heavy corrosion. This is especially true of the rafters and supports at the wall. This corrosion has led to additional structural deficiency noted by PSE.

Interior Alternative 1 would address the biggest areas of concern inside the reservoir following structural repairs, but would result in the City needing to recoat the areas below the water line at a future date (possibly within 10 years). Because Alternative 1 would ultimately result in two interior maintenance painting projects over a relatively short period of time, there is a loss of potential cost efficiencies from performing a single project on the entire interior at one time.

Interior Alternative 2 is the recommended alternative, which replaces the entire interior coating system and provides the most thorough and economically efficient procedure to rehabilitate the interior coating system and extend the reservoir service life with an estimated 30-year interior coating life.

Exterior Coating – The existing exterior coating system appears to be in fair condition. Few locations of rust or areas of coating failure were noted during the inspection. A contributing factor for the limited areas observed with compromised coating and corrosion, is that City staff have prioritized making spot repairs to the damaged coating when visible.

Exterior Alternative 1 represents the minimum effort required in the short-term to make spot repairs associated with the structural upgrades, with full upgrades to the reservoir exterior coatings deferred to the future.

Exterior Alternative 2 provides a long-lasting and aesthetically appealing overcoat solution, but while it provides a lower initial cost than Alternative 3, those costs are deferred to the future when the multiple layers of overcoating would need to be fully removed with abrasive blasting and replaced as part of the next maintenance painting following then end of the expected 15-year coating life.


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Exterior Alternative 3 is the recommended alternative which offers the longest-term solution with full removal and recoating now to provide a new coating system with an estimated 30-year exterior coating life.

Reservoir Appurtenances – Previously described recommended improvements to reservoir appurtenances are summarized in the coat estimate tables and listed below:

- Install Perimeter Painter's Plugs in Roof
- Remove and Replace Rafter Supports at Reservoir Wall
- Remove and Replace Painter's Rail
- Remove and Replace Roof Vent
- Remove Abandoned Aeration Pipe
- Remove and Replace Select Sections of Interior Platform Handrail

**Construction Schedules**

*Estimated Construction Milestone Schedule – Cost Estimate 1 – Base Level Upgrade Option*

The following estimated construction milestone schedule represents an anticipated construction duration if the City elects to perform the base level upgrade option (Interior Coating Alternative 1 & Exterior Coating Alternative 1), structural upgrades as recommended, and appurtenance upgrades as recommended and presented in Cost Estimate 1 – Base Level Upgrade Option.

For optimum results and efficiency, it is recommended that exterior coatings be applied while the reservoir is empty and during the more favorable seasonal weather window from May through September, to limit effects of ambient conditions, with all interior work preceding the exterior work. The timeline is representative of the estimated amount of time the reservoir will be offline to facilitate construction. The following milestones represent the anticipated duration of construction for the major project elements:


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| Schedule Milestone | Estimated Duration |
|---|---|
| • Reservoir Dewatering: | 1 Week |
| • Contractor Mobilization and Set-up, Remove Door Sheet: | 1 Week |
| • Structural Roof Upgrades – Abrasive Blast Cleaning and Inspection: | 2 Weeks |
| • Structural Roof Upgrades – Perform Upgrades: | 1 Week |
| • Interior Appurtenance Upgrades – Install Upgrades: | 1 Week |
| • Interior Coating – Abrasive Blast Cleaning and Priming: | 2 Weeks |
| • Interior Coating – Intermediate and Final Coat Application: | 1 Week |
| • Re-install Door Sheet and Interior Surface Preparation and Coating: | 1 Week |
| • Exterior Coating – Surface Preparation and Priming: | 2 Weeks |
| • Exterior Coating – Intermediate and Final Coat Application: | 1 Week |
| • Reservoir Filling, Disinfection, and Testing: | 2 Weeks |
| **Total Duration:** | **15 Weeks** |

With a total estimated duration of 15 weeks, an ideal schedule would have interior work beginning in February to accommodate final completion by June, with the reservoir back in service prior to the warm weather months. Alternatively, the exterior coating repairs (which are mostly above the waterline, with the exception of the door sheet) could be performed with the reservoir in service, reducing the duration of reservoir downtime by approximately 3 weeks.

*Estimated Construction Milestone Schedule – Cost Estimate 3 – Highest Level Upgrade Option*

The following estimated construction milestone schedule represents an anticipated construction duration if the City elects to perform full interior and exterior maintenance painting (Interior Coating Alternative 2 & Exterior Coating Alternative 3), structural upgrades as recommended, and appurtenance upgrades as recommended and presented in Cost Estimate 3 – Highest Level Upgrade Option (30-year Exterior, 30-year Interior).

For optimum results and efficiency, it is recommended that exterior coatings be applied while the reservoir is empty and during the more favorable seasonal weather window from May through September, to limit effects of ambient conditions, with all interior work preceding the exterior work. The timeline is representative of the estimated amount of time the reservoir will be offline to facilitate construction. The following milestones represent the anticipated duration of construction for the major project elements:


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| Schedule Milestone | Estimated Duration |
|---|---|
| • Reservoir Dewatering: | 1 Week |
| • Contractor Mobilization and Set-up, Remove Door Sheet: | 1 Week |
| • Structural Roof Upgrades – Abrasive Blast Cleaning and Inspection: | 2 Weeks |
| • Structural Roof Upgrades – Perform Upgrades: | 1 Weeks |
| • Interior Appurtenance Upgrades – Install Upgrades: | 2 Weeks |
| • Interior Coating – Abrasive Blast Cleaning and Priming: | 3 Weeks |
| • Interior Coating – Intermediate and Final Coat Application: | 2 Weeks |
| • Exterior Coating – Containment, Abrasive Blast Cleaning and Priming: | 4 Weeks |
| • Exterior Coating – Intermediate and Final Coat Application: | 2 Weeks |
| • Reservoir Filling, Disinfection, and Testing: | 2 Weeks |
| **Total Duration:** | **20 Weeks** |

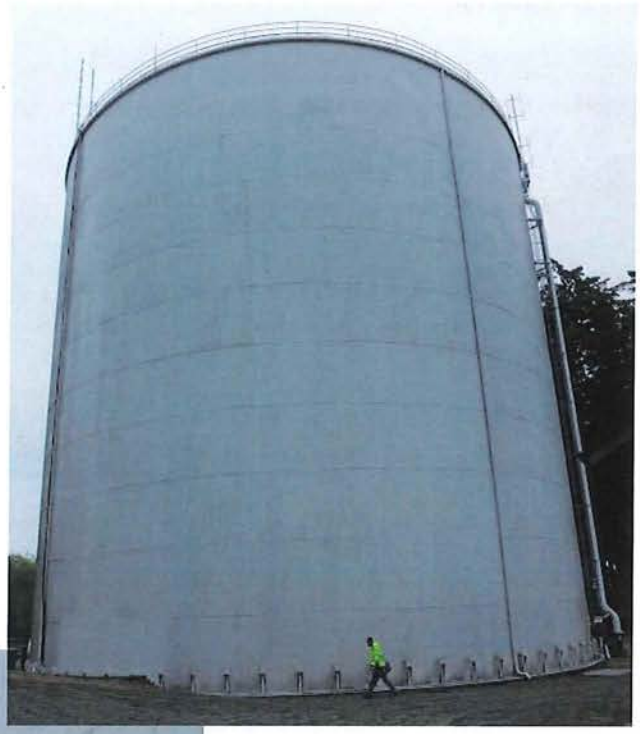
With a total estimated duration of 20 weeks, an ideal schedule would have interior work beginning in March to provide a month of float to accommodate final completion in August.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A

## Reservoir Exterior

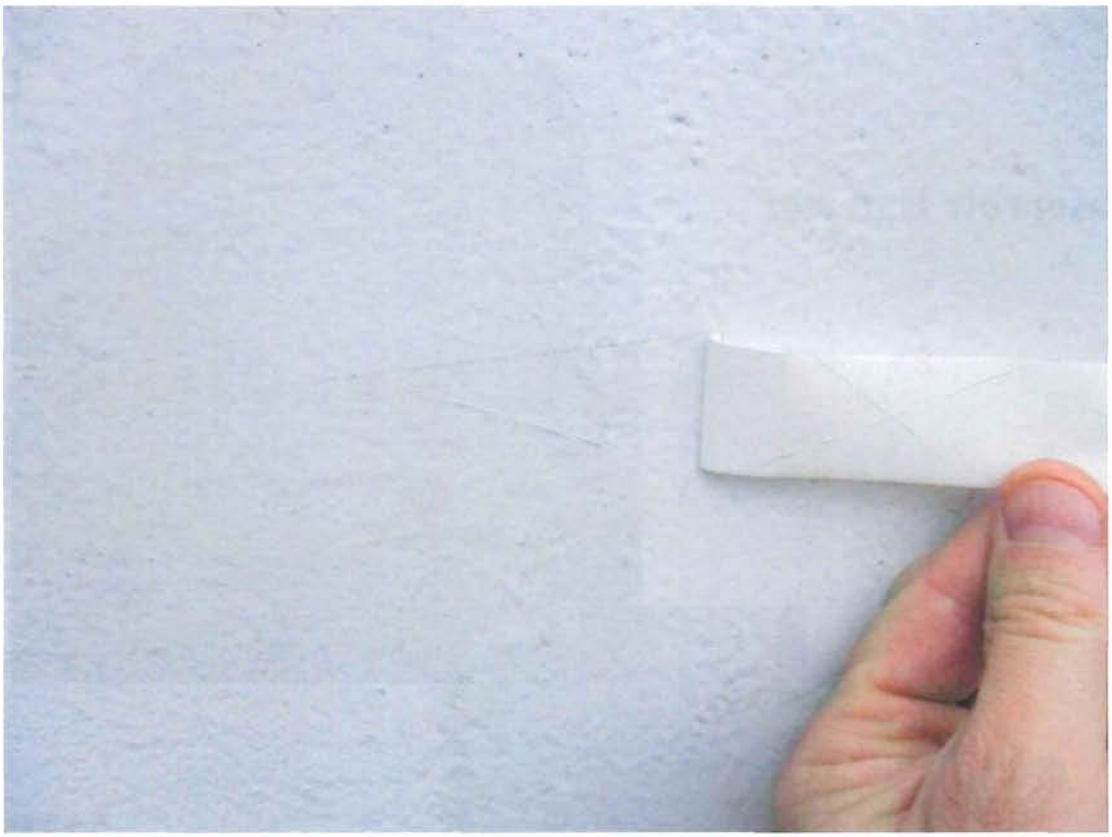




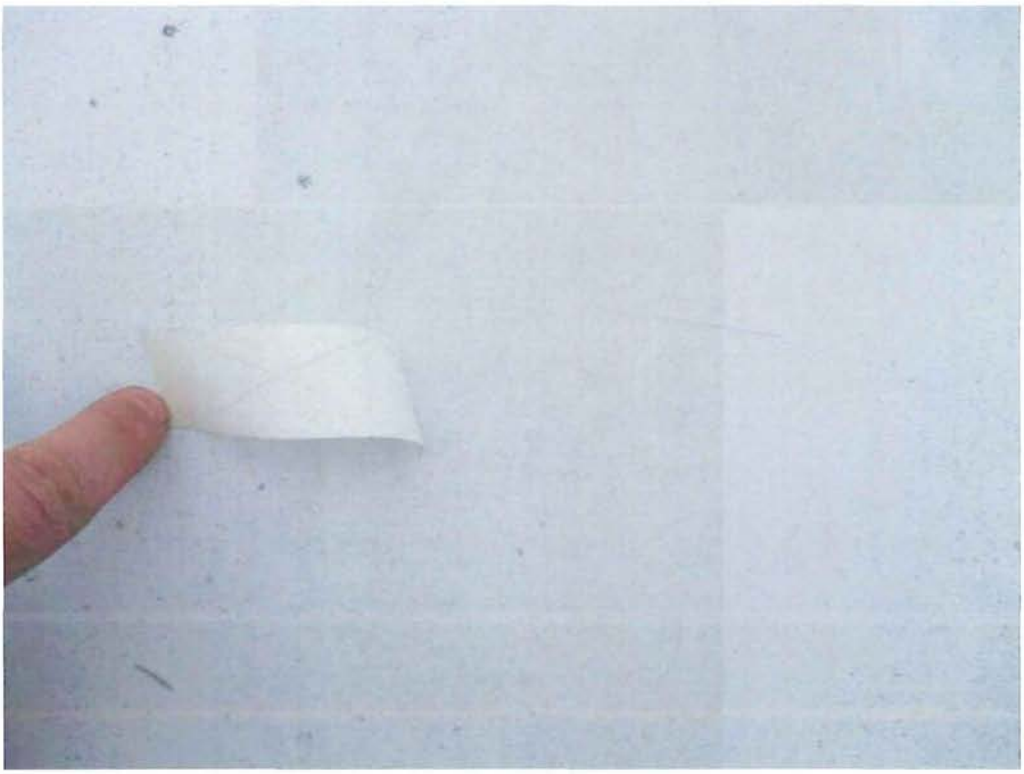


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A



Adhesion Testing



Adhesion Testing

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A



Ultrasonic Steel
Thickness Testing



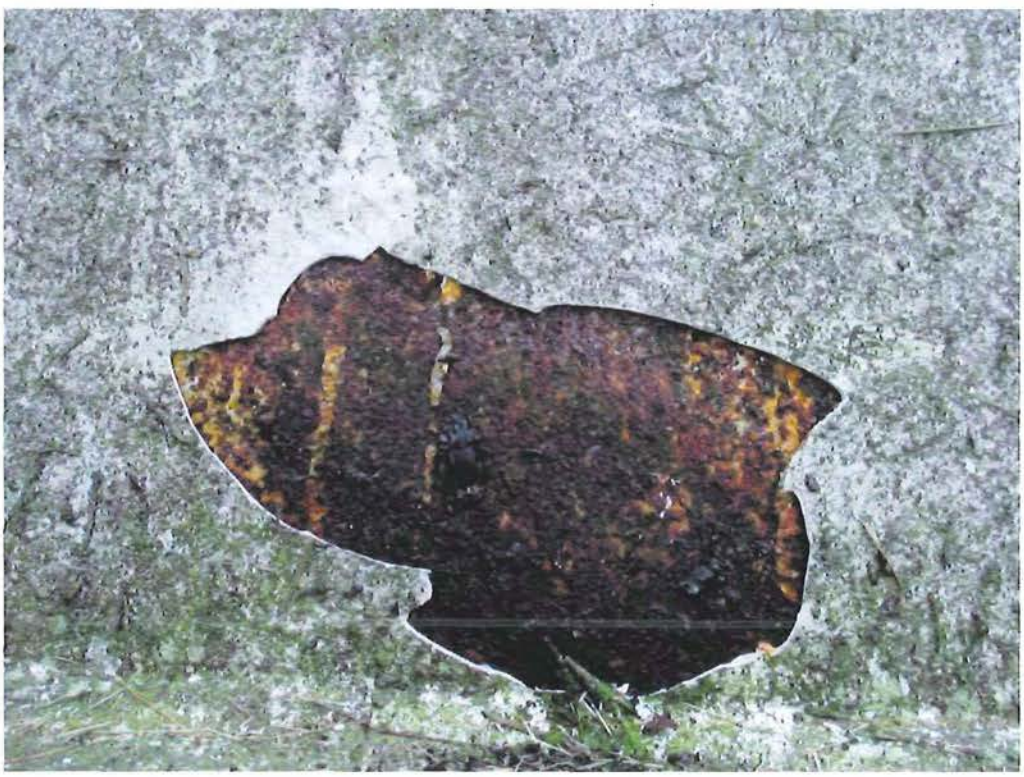
Dry Film Thickness Testing

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A



Coating Failure on Reservoir Shell



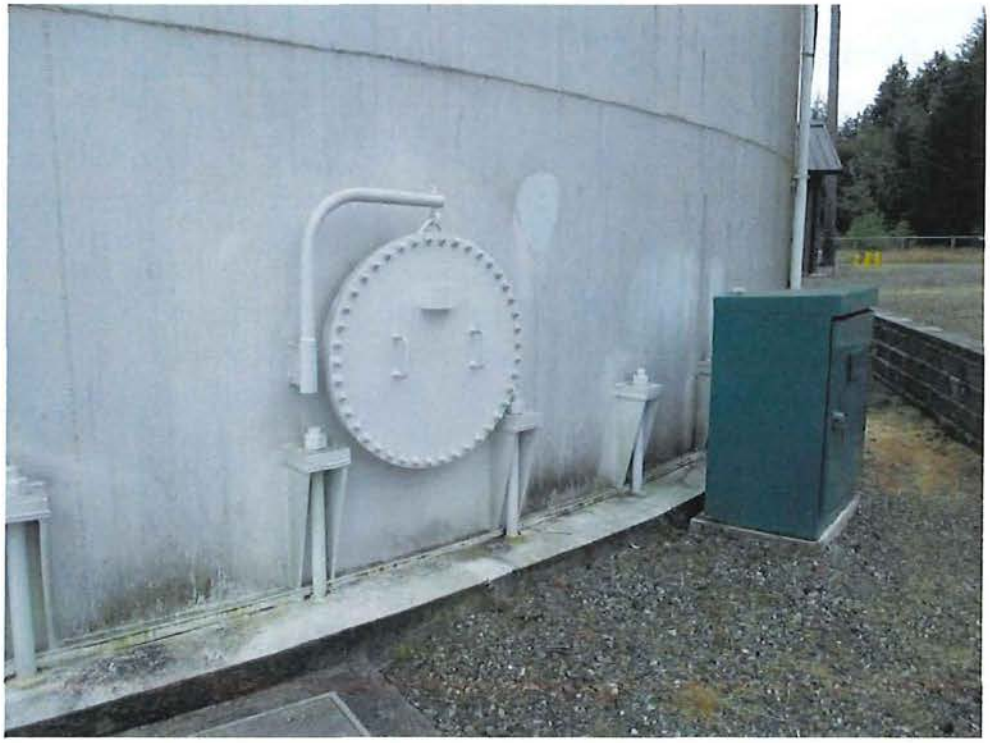
Coating Failure on Reservoir Roof

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A



East Manway Showing Coating Repairs



Northwest Manway by Inlet Vault

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A




Reservoir Overflow Pipe and Catch Basin



Reservoir Overflow Pipe

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A



Chimney-style Roof Vent



Roof Support Beam and Dollar Plate Coating Failure below Roof Vent

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A



Roof Gutter and Perimeter Coating Failure



Roof Access Hatch to Interior Ladder

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A

# Reservoir Interior Above the Waterline



Interior Ladder, Platform, Handrail, and Painter's Rail



Overflow Pipe Cone and Screen

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A



Center Column and Roof Support System



Roof Support Rafters and Girders

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A



Roof Support Clips and Rafters



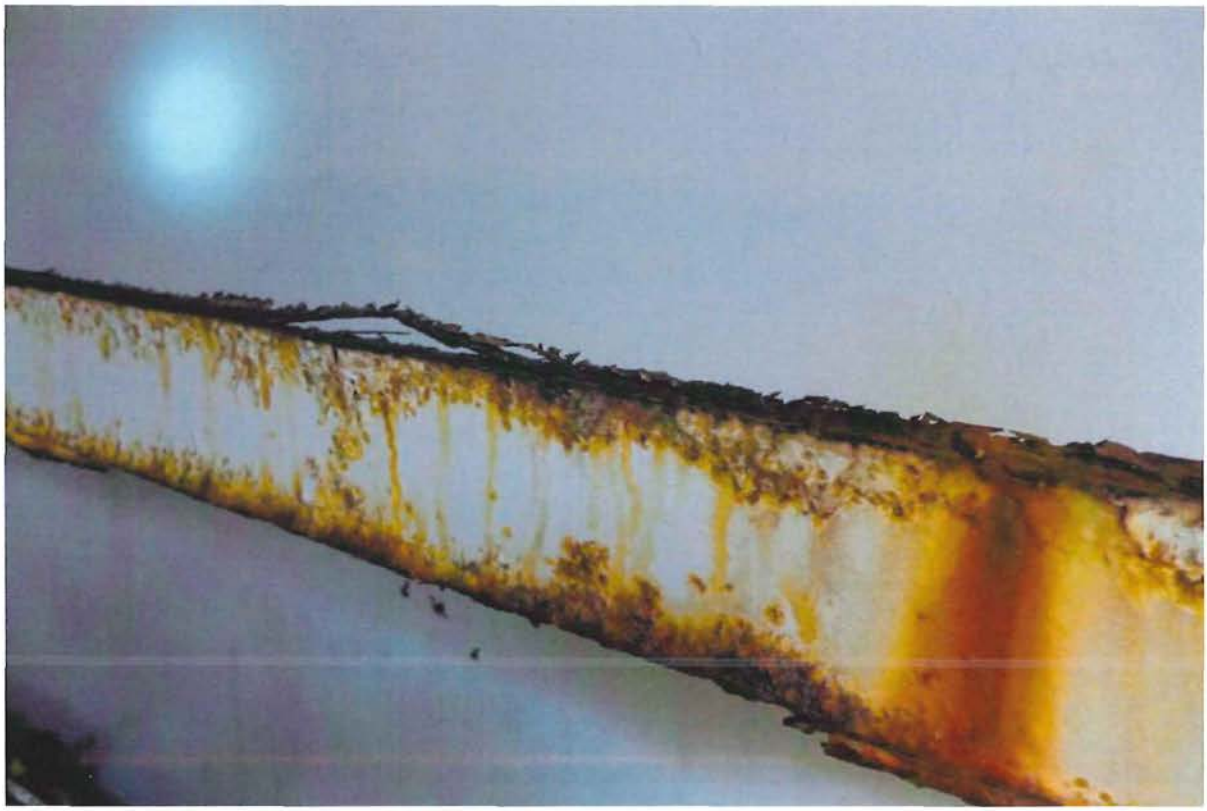
Roof Support Clips and Rafters

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A



Painter's Rail and Support



Painter's Rail

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A



Abandoned Aeration Pipe



Abandoned Aeration Pipe Support

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Ceiling Coating Failure



Ceiling Coating Failure

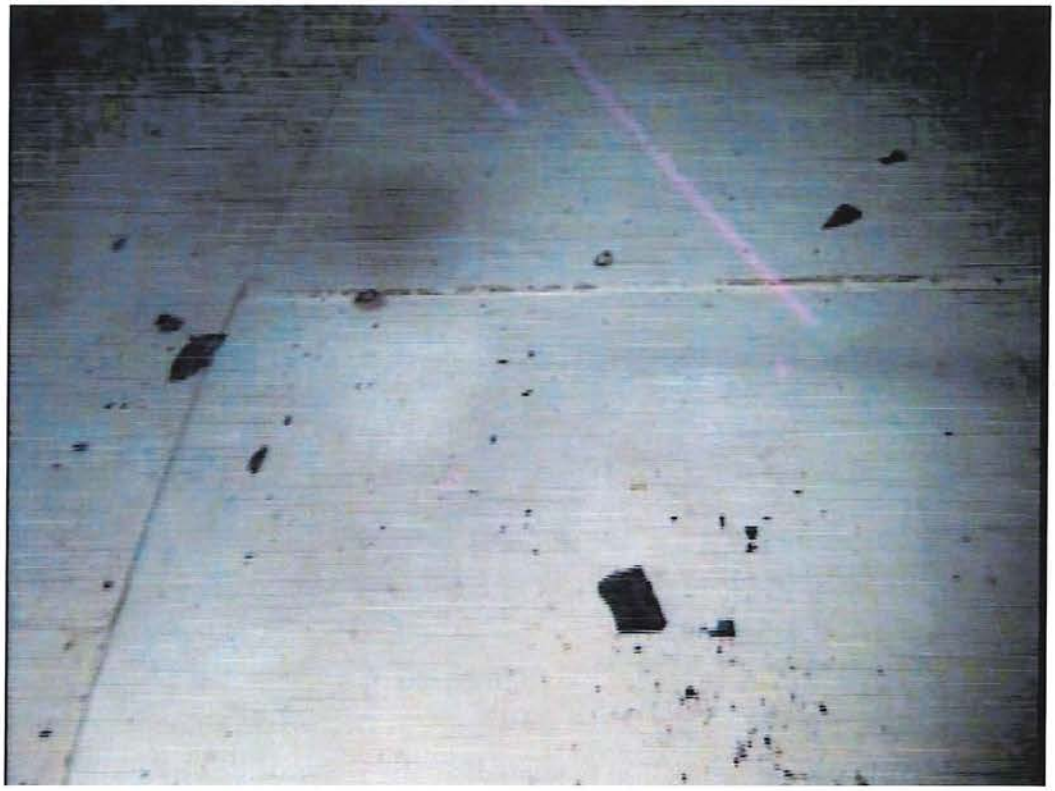
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A

# Reservoir Interior Below the Waterline



Outlet / Drain with Silt Stop



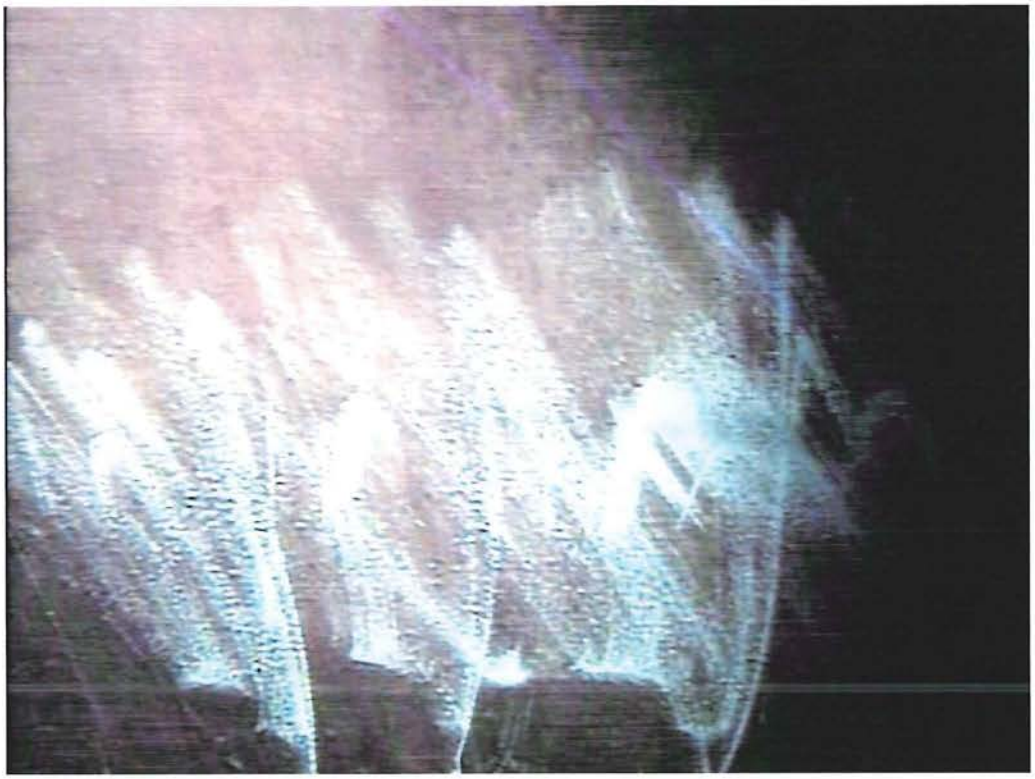
Reservoir Floor

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A



Ladder and Fall Prevention System



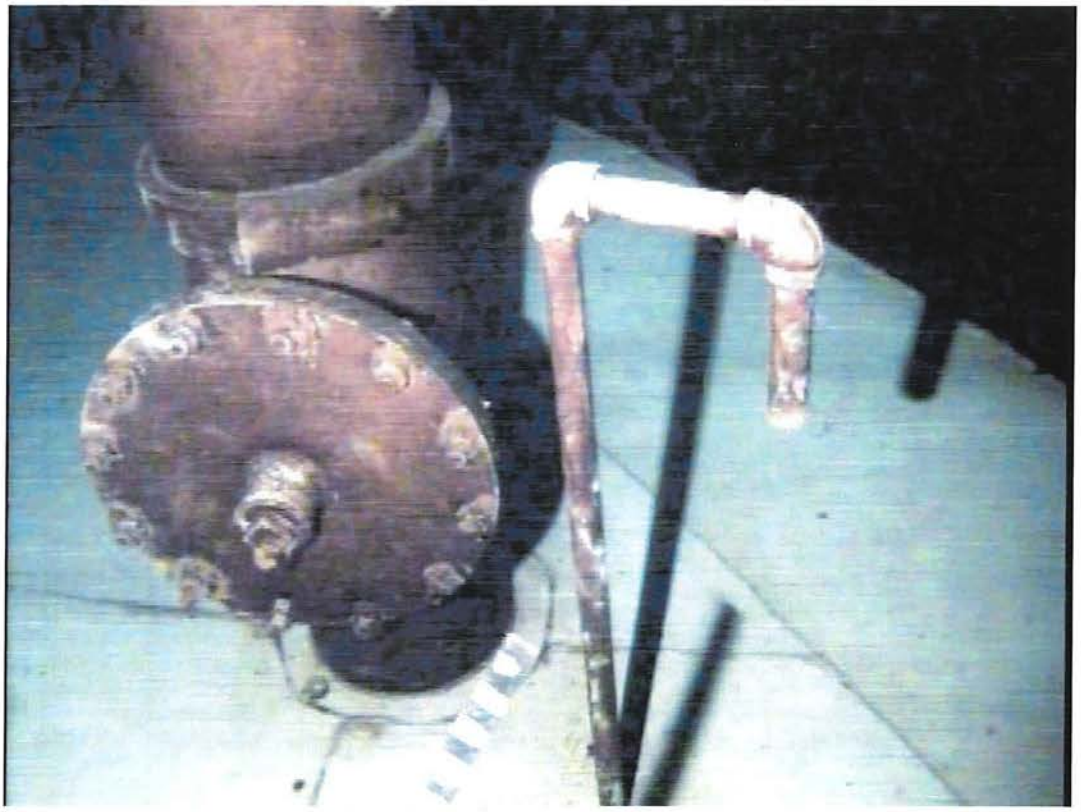
Reservoir Wall Showing Iron Staining Partially Rubbed Off by Diver

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CITY OF LACEY
Hawks Prairie Reservoir Assessment
Appendix A



Inlet Pipe



Inlet Pipe and Pilot Line

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Center Roof Support Column and Base



Steel Overflow Pipe and Supports

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

PETERSON STRUCTURAL ENGINEERS

TACOMA OFFICE
708 Broadway
Suite 110
Tacoma, WA 98402
Phone: 253.830.2140

10/25/16

Tom Boland, P.E.
Murray, Smith & Associates
121 SW Salmon, Suite 900
Portland, OR 97204

File: PSE\16-091-02

Re: City of Lacey – Hawks Prairie Reservoir Inspection
Structural Evaluation and Recommendations Report

Dear Tom:

The following report has been generated in order to provide the results from our structural condition observation and analysis, as well as to provide upgrade recommendations, for the Hawks Prairie 4.0 Million Gallon (MG) welded steel reservoir. The reservoir is located at 4040 Marvin Rd NW, Lacey, WA 98516, and is owned and operated by the City of Lacey in Thurston County. Per drawings provided by the City, the reservoir was designed by Gray & Osborne, Inc., (G&O) in 1995 and constructed in 1995 by McClure & Sons and Rocky Mountain Fabricators.

A site visit to inspect and evaluate the reservoir was performed on June 29th, 2016 by Peterson Structural Engineers (PSE) and Murray, Smith & Associates (MSA). The reservoir was filled to a depth of approximately 83'-6" (1.5 feet below overflow) to facilitate the interior inspection by raft. Representatives from the City of Lacey were also present. Figure 1 shows the reservoir and surrounding site.

The G&O design drawings, design calculations from McClure & Sons, and an evaluation report from the City were available for reference in the development of this report. Although the documentation provided was extensive for various elements, the roof rafter bearing seats in particular were not found in the provided documents. PSE took additional measurements where possible to verify as-built conditions. Personnel from PSE and MSA floated the interior of the reservoir in a raft to observe the condition of the upper shell, roof, and rafters. During the visit, detailed photographs and measurements were taken of the reservoir exterior, manways, piping connections, and various other appurtenances.

## Hawks Prairie 4.0MG Reservoir Structural Inspection Results

### General Site Visit Observations

The existing reservoir has a 90'-0" inside diameter with a wall height of 88'-0". Figure 2 depicts the shell heights and the associated average shell thicknesses based on MSA's ultrasonic thickness measurements. The floor plate thickness was measured to be 0.5-inches at the exterior edges which extended beyond the base course ring of the shell plate. This matches references in the drawings and calculations to a half-inch thick annular ring plate. The roof of the reservoir is composed of four (4)



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

rings of plates with an approximate slope of 4.5°, slightly steeper than the minimum roof slope of ¾:12 required by the governing design standard AWWA D100-11: Weld Carbon Steel Tanks for Water Storage. The roof shell thickness was measured as 0.253-inches.

The roof plate is primarily supported by 24 W-section rafters. Based on field measurements and the record documents these members are W14x30. Intermediate channel rafters are used to support the roof along the exterior roof plate ring. The rafters are approximately 24-feet long and are internally supported on channels which span between the W-sections as shown in Figure 3. Based on measurements and documents, the channel rafters are C8x11.5 members. All rafters are seal welded along their flanges to the roof plates.

The W-section rafters are supported on a central cap "dollar plate" with a diameter of 6-feet. The lip of the dollar plate is stiffened with a circumferential C5x9 channel. The cap plate is supported on a central 18-inch diameter column as shown in Figure 4. Per the design calculations, the column wall thickness is 0.375-inches. At the reservoir perimeter the W-section and channel rafters are supported on 7-inch wide L8x8x1/2 angle supports, which are welded to the reservoir shell.

The elevation of the overflow cone is located at 85'-0" above the floor, which is 3'-0" below the wall edge. The top of the overflow cone is shown in Figure 5. The design drawings indicate that the 3'-0" freeboard is to accommodate reservoir overflow. As the City noted in their seismic review of the structure, the slosh for this reservoir is 5'-6" based on the AWWA D100 slosh equation. As the current code requires that rafters and other supporting elements be located out of the overflow zone the actual available slosh zone above the reservoir cone is approximately 1'-10". It is our understanding that the reservoir is typically operated within a water depth range of approximately 78 to 83 feet. Water depths above 79'-6" result in a freeboard for a seismic slosh wave that is less than required by the AWWA.

The design drawings for the reservoir show the footing as an inverted T with a 14-foot wide base and 30-inch concrete ringwall as shown in Figure 6. The reservoir is connected to the foundation with 2-1/2" diameter, mechanical anchors with a 3'-0" minimum embedment. The exact grade of the material is uncertain, with the drawings indicating A36 steel and the design calculations indicating a yield strength of 38 ksi. The design drawings did not define the anchor chairs in detail, but PSE's measurements of the as-built chairs indicate the actual chairs are much larger in size than shown in the design drawing sketch. This change appears to be covered in a change order submitted by G&O on October 6th, 1995. The change moved the top of the chair down 2-inches in order to install a new 2-inch thick top plate.

While the general reservoir coating condition will be reported in more detail by MSA, PSE will discuss coating failure and the resulting corrosion as it pertains to any adverse effects on or weakening of the structural system. The exterior shell and wall conditions appeared to be in generally good condition. City personnel noted that the reservoir has had past issues with exterior coating delaminating, and they perform touch-up spot repair work to accessible areas as soon as possible. During the inspection, coating cracks and delamination were observed along the exterior base and on the roof, with the underlying steel in various states of corrosion but believed to be structurally sound. No water was retained on the roof at the time of inspection. However, staining indicated that water may collect at the edges of the low-slope roof, although no major corrosion was present. The reservoir interior above the typically



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

submerged zone showed multiple areas of extensive corrosion and several areas of large-scale coating delamination, further discussed below.

**Observation Discussion**

Corrosion Extent

City personnel noted that the reservoir has experienced issues with coating delamination and corrosion on both the interior and exterior of the tank. It is typical for thin and easily compromised coatings to be found in areas where sharp corners or rough surfaces are located. In wet or damp conditions found within a reservoir, a small failure in the coating can quickly lead to extensive damage as oxide jacking causes the metal to expand, pushing the protective coating further away and opening a larger surface area for additional corrosion to occur.

Rafter and Support Condition

Corrosion was found throughout the interior roof support structure, with a greater tendency of occurrence at edges and corners. The worst affected areas appeared to be around the rafter ends and supports. The reservoir construction procedures are likely the primary cause of the excessive corrosion of the rafter elements. In order to weld the rafters to the dollar plate (Figure 7) and the angle supports to the rafters, a bare metal surface without coating is needed. Once welded into position, it becomes difficult to apply coatings to the ends of the rafters. Furthermore, because the rafters are supported at a slight angle, a gap exists between the rafter and support that is difficult to coat.

The corrosion has impacted the perimeter ends of the rafters and supports, causing steel section loss. It is difficult to observe the extent of potential section loss because oxide jacking has caused the base metal to expand in sheets. Observed members appeared to have a section loss of approximately 20%, although the extent of damage is an approximation without the removal of corroded material down to clean steel. Effects of oxide jacking on the rafter flanges and supports are shown in Figure 8 and Figure 9.

Shell Plate and Ancillary Component Conditions

The majority of the roof and wall coating was found to be intact. However, in several locations where the coating was compromised on the interior roof, corrosion appeared to be extensive. In Figure 10, Figure 11, and Figure 12 the three largest areas of interior roof coating loss are shown. In the roof sections between the access hatches and the central roof vent, corrosion along the top of the rafters appeared to be especially aggressive as shown in Figure 13. Some aspect of the airflow in these zones might play a part in the additional corrosion observed in these areas. Figure 14 shows a close-up of the failure area shown in Figure 12. Various levels of corrosion are present – scale, pitting, and jacking. Figure 15 shows the beginning a roof delamination failure as the corrosion expands and peels back the coating.

The wall coating above the water line generally appeared to be in good condition, with some staining from corrosion on the rafter supports, as shown in Figure 16. Below the waterline the wall appeared to be discolored. MSA's report discusses a potential cause for the discoloration.

Other non-structural appurtenances such as the access ladder (Figure 17), painter's rail (Figure 18), and aerator pipe support structures (Figure 19) were found to have extensive corrosion at their connections and supports. As such, use of items such as the ladders and painter's rail should be limited and only



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

used with the addition of redundant fall protection systems. The aerator system, currently unused, shows signs of corrosion at its attachment points and support rods. While not likely at risk of imminent failure, care should be taken when working under the system until it can be detached and permanently removed.

Reservoir Base, Foundation, and Anchorage

The exterior of the reservoir was found to be in a clean and well maintained condition. Although the exterior coating has had issues, it looked as if coating spot repair work was carried out on a regular basis. An overview of the reservoir's base is shown in Figure 20,Figure 21, and Figure 22. Some coating failures were found near the base as shown in Figure 23. Corrosion in these areas is difficult to address as water attacks the un-coated, grout side, of the base plate. The corrosion present appeared to be surface corrosion with minor pitting in some locations. No observed corrosion appeared to have resulted in any appreciable steel section loss.

The concrete foundation appeared to be competent with no noticeable cracking observed. Figure 24 shows a line of anchorage with Figure 25 showing a close-up of a single anchor. Assembly and condition of the anchor chairs looked to be in good condition and in full working order. The difference in elevation between the top of the footing and adjacent finished grade varied, with an area as low as 4-inches in locations bordering the retaining wall. While the AWWA requires the top of the foundation to be a minimum of 6-inches above the finished grade to prevent inundation from drainage runoff, the overall site grading and configuration does not seem to indicate any issues.

## Reservoir Structural Analysis

### Analysis Results Overview

PSE's primary focus of the structural evaluation was the adequacy of the roof system. Additional checks were performed using in-situ measured dimensions and estimates of corroded steel thicknesses when there was a potential impact to structural performance. The reservoir was evaluated at an operating level of 79'-0" which is the City's stated typical operating level.

The original reservoir design calculations by McClure & Sons show the design was per AWWA D100 Appendix C: Alternative Design Basis for Standpipes and Reservoirs. This information is covered in Section 14 of the current version of AWWA D100. Based on McClure & Sons design calculations, the first 7 courses of the reservoir used A573-70 Plate Steel while courses 8-11 use A36 steel. Per AWWA D100, a reservoir designed to Appendix C (current Section 14) should include a name plate on the outside of the tank which indicates the design criteria. No name plate was found during the site visit.

While no name plate is present and no plate mill certificates or weld inspection reports are available to verify that the reservoir was indeed built per the Alternative Design method, PSE performed its evaluation assuming the Alternative Design method is correct. This decision was based on the collaborating information found in the available design documents.

Geotechnical criteria were taken from the Sheet 17 Notes of the G&O design drawings. Although a geotechnical investigation was performed by GeoEngineers, the report was not available, therefore some soil values were conservatively assumed for the analysis.



PSE
PETERSON STRUCTURAL ENGINEERS

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Roof Adequacy

The roof consists of plates supported by rafters which, in turn, are supported by a central column and the exterior shell. Analysis evaluated the roof for gravity and seismic load conditions. Gravity cases were controlled by the Dead plus Snow load combination and used a Dead load of 15 pounds per square foot (psf) and a Snow load of 25 psf (rain-on-snow surcharge loading).

For the Gravity loads the 0.253-inch roof plate, 18-inch diameter central column, W14x30 rafters and C8x11.5 sub-rafters were found to be adequate. Corrosion was found in various locations in all of the listed members, but corrosion did not typically appear to have caused a level of corrosion that would impact the structural system's load capacity. Most members were found to have an adequate allowable reserve capacity.

For the rafters and subrafters, the flange elements bearing at the bearing seats were found to be severely corroded. This corrosion occurred primarily in the 2 to 3-inches of the member's bottom flanges. The corrosion of the flanges reduces the bearing capacity of the members and could lead to issues with the roof and upper shell of the reservoir as material is lost and the members settle.

For the roof plates, steel section loss was found to be occurring due to oxide jacking. The amount of loss appeared minimal at the time of the inspection, with an estimated loss of thickness of approximately 10 to 20 mils. The flat surface against which the corrosion is acting provides few nucleation sites, as water is not retained against the steel. The existing 0.253-inch roof plate has a capacity to support a Dead plus Snow load of 120 psf while the design loads is 40 psf. Section loss will cause an exponential loss in roof plate capacity, but currently the roof capacity appears to be sufficient for the level of corrosion present.

The bearing seats at the roof edge were found to be undersized for the International Building Code (IBC or Code) level design loads. The bearing seats are typical of unstiffened bearing seat connections, which are usually designed with a ½-inch gap at the face of the vertical support surface. Due to the slope of the roof, the base of the rafters sit 2 to 3-inches proud of the wall edge and thus increase the applied moment in the supports, exceeding their design capacity. As these supports were observed to have approximately 20% corrosion, they are further compromised, thus reducing their allowable carrying capacity even further.

While the bearing seats are undersized for Code level loads they are adequate for the day-to-day, Dead load only, condition. The recurrence interval for the design snow load is around 50 years. With the roof loads limited to standard maintenance crews and not overloaded by the addition of heavy equipment, the support should prove adequate for continued daily and maintenance operations. Based on this limited load case the support could handle an additional uniform corrosion of up to 40% before their allowable capacities were exceeded. Please note that this statement is not meant to say the supports should be allowed to get to a state of 40% corrosion, as the existing corrosion level and rate of corrosion is uncertain, but rather to indicate that an imminent support failure is unlikely at this time.

Shell Plate Adequacy

The shell plates were evaluated per the design criteria outlined in AWWA D100 Section 14 and utilized the in-situ measured shell plate thickness. The City's preliminary analysis found that the shell was



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

approximately 5% overstressed per modern design standards when utilizing the thickness found in the McClure & Sons design calculations.

PSE re-evaluated the shell using the actual measured plate thickness and for a seismic importance factor of 1.5 equating to an AISC 7-10 Risk Category IV structure. The original design used an importance factor of 1.25. PSE found that most courses were below the maximum allowable stress level based on the above noted information. Only courses 4 and 5 were overstressed by a small amount, 0.3%. Longitudinal compressive stress was also checked and the plate capacity was found to be adequate for the design loads.

Foundation Adequacy

The existing foundation was evaluated per AWWA D100 and American Concrete Instituted 318-11 (ACI) load criteria. The loads included additional uplift loads caused by constrained slosh. In general, the foundation was found to be adequate to resist overturning, and the seismic and gravity bearing pressures were at level which provided Factors of Safety (FS) within AWWA D100 Section 12.3.2 guidelines. AWWA D100 requires a FS equal to 3.0 for gravity loads and 2.25 for seismic loads. The central roof support column was also evaluated and found to have sufficient bearing capacity for the applied loads.

Based on PSE's analysis, the foundation does have a footing toe capacity issue, due to toe loading during overturning uplift. In an uplift situation, the weight on the toe is such that there is a shear failure potential near the face of the ring portion of the foundation. Were the foundation to be fully replaced or upgraded then reinforcing or stabilization of the toe would be advisable.

Anchorage Adequacy

The existing anchorage was evaluated per AWWA, ACI, and the AISI T-192. Modern design of reservoir anchorages requires the design of an unyielding anchor chair and concrete connection point which then relies on the yielding of the anchor itself to create system ductility. The analysis of the anchors, chairs, and concrete found that all were undersized or under designed by modern Code standards.

The original design is based on an anchor load of 187 kips which is based on the anchor bolt yield capacity. There is some disparity between the design drawings and calculations, in which the drawings note the anchors are A36 while the calculations list the material yield as 38 ksi. The PSE analysis determined the actual anchor load to be 142 kips at an operating elevation of 79'-0". Based on PSE's anchor load using an assumed A36 anchor, the original anchor chair design was found to be mostly adequate with the top plate slightly undersized. The retrofit to the top plate implemented by the change order discussed earlier, added and additional 2-inch plate to create a 3-inch thick top plate. This modification ensured that the as-built chair had an adequate capacity.

Issues for the anchorage resulted due to an undersized anchor and a brittle connection to the concrete ringwall. Design calculations were not available to identify the procedure or assumptions used in the original design and so the connection was checked using available information and per the current ACI code. As the current ACI code design uses Load and Resistance Factor Design (LRFD), the anchor loads were increased to LRFD levels. For such conditions, the anchor design loads were found to be 205 kips per anchor (versus the 142 kip load listed previously). The yield capacity of the anchors



PSE
PETERSON STRUCTURAL ENGINEERS

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

themselves was found to be only 155 kips, well below the required capacity needed to resist the applied LRFD load. Further, for the reinforced concrete foundation, the maximum calculated capacity was determined to be 98 kips. As the concrete capacity is not only below the required LRFD load but also lower than the anchor's yield capacity, the anchor would suffer a brittle failure rather than a ductile yielding failure during a seismic event.

## Reservoir Inspection & Analysis Recommendations

Two structural issues were identified through PSE's inspection and analysis, the primary being the roof adequacy and observed corrosion throughout the roof system. For Code gravity loads the reservoir has been found to be mostly adequate with only the rafter bearing seats found to be undersized.

Since the rafters are seal-welded to the roof, their removal would be cost-prohibitive and unnecessary as the exterior ends are the primary location where heavy corrosion issues have been identified. The rafters themselves have adequate area to handle the applied shears loads, but the support angles are inadequate and severely corroded in many cases. To mitigate these issues, it is recommended that the angles be removed and the rafters be reconnected to the wall via the installation of flat plates as shown in Figure 26. Because the existing angle supports are undersized even without corrosion, the new plate would provide required support for the Code level gravity loads. The proposed plate could be attached to the current roof rafter system even in locations where the flange has been compromised. In addition to the new plate being installed, the corroded portions of the angle supports and bottom rafter flanges should be removed. The remaining portion of the angle supports should be seal welded and left in place. Once repairs have been made the interior roof should be re-coated with a focus on difficult to reach areas such as the rafter edges facing the walls and inside the dollar plate.

The maximum Code gravity load case includes a full snow load set to a 50-year recurrence. In the absence of such a load the rafter bearing seats, even those that are corroded, have a reserve capacity to support the roof self-weight along with incidental light maintenance loads. As a result, the roof is not at risk of immediate failure and this should provide the City with time for project planning and funding regarding upgrades.

The second structural issue is with the foundation anchorage and footing, of which the City is already aware. Based on PSE's understanding, the City does not intend to upgrade the reservoir anchorage or foundation at this time. As a result, footing and anchorage upgrade evaluation or design are not part of this report.

## Conclusions & Summary

Overall the reservoir is in good condition. The roof system is generally in good condition, with the exception being the inadequacy of the rafter bearing seat design under gravity and seismic loads. The bearing seat issue is further exacerbated by the corrosion of these supports. In our experience, the areas of the tank that have been affected by corrosion are typically difficult to keep corrosion-free and many municipalities have experienced problems in these areas. However, the excessive corrosion and section loss identified is on a scale that is unusual for a tank of this age. Also, as the City previously reported, the foundation anchorage is undersized for the current seismic loads, based on current design criteria.



PSE
PETERSON STRUCTURAL ENGINEERS

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The City's future plans for this reservoir should dictate the level of effort and investment that is put into upgrades. PSE has outlined a repair option that can be implemented economically, based on an acceptable risk level as defined by the City. To meet this objective, PSE recommends that repairs be performed to ensure the reservoir's roof system is upgraded to support Code level design gravity loads and that the roof support system be blast cleaned and recoated to mitigate future corrosion concerns.

We appreciate this opportunity to serve the City.

Sincerely,

Peterson Structural Engineers, Inc.

Greg Lewis, P.E.
Project Manager






Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Figure 1: Hawks Prairie Reservoir Site



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

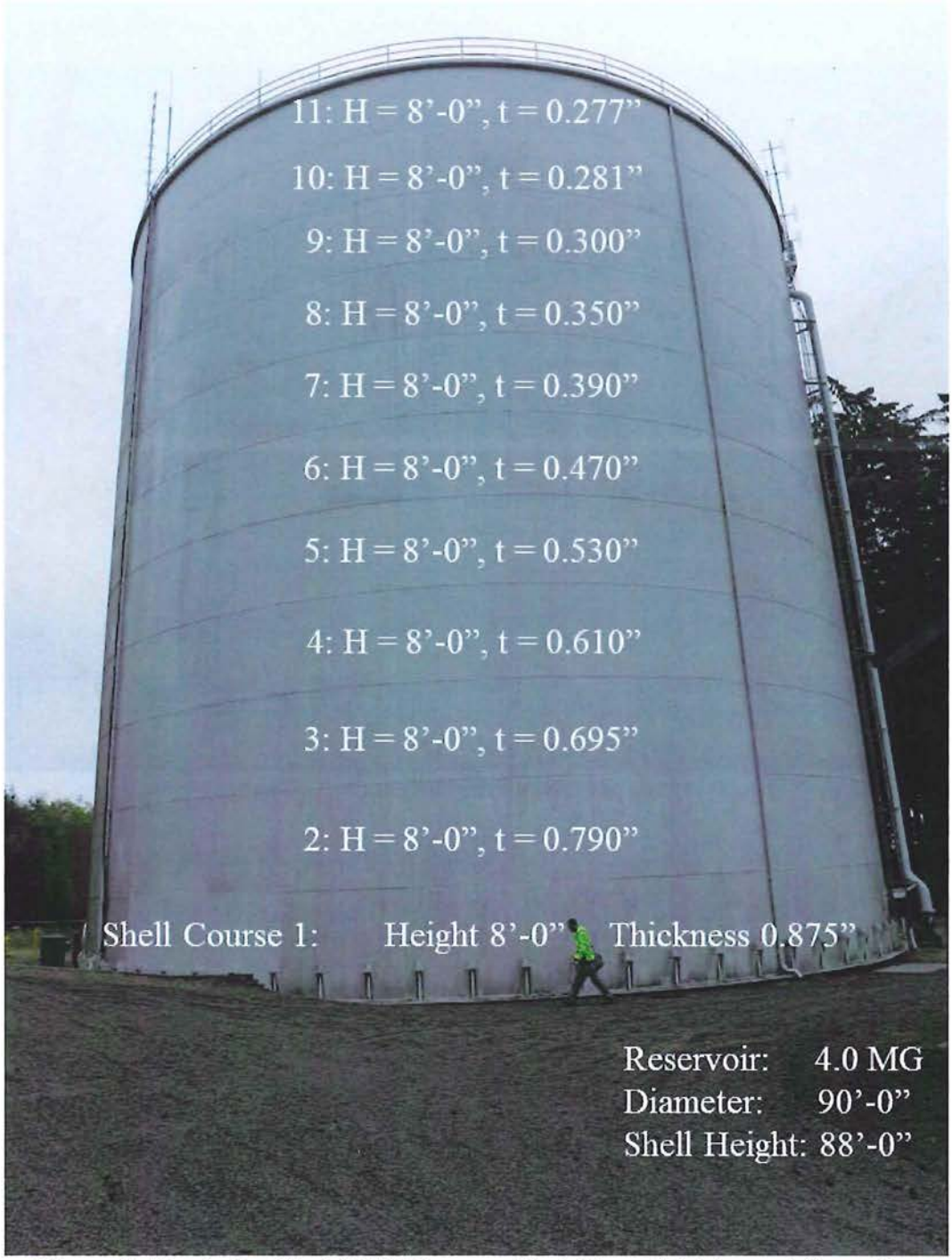



Figure 2: Hawks Prairie 4.0 MG Res., wall heights and thickness information.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Figure 3: Intermediate Channel Support Configuration.



Figure 4: Central Support Hub



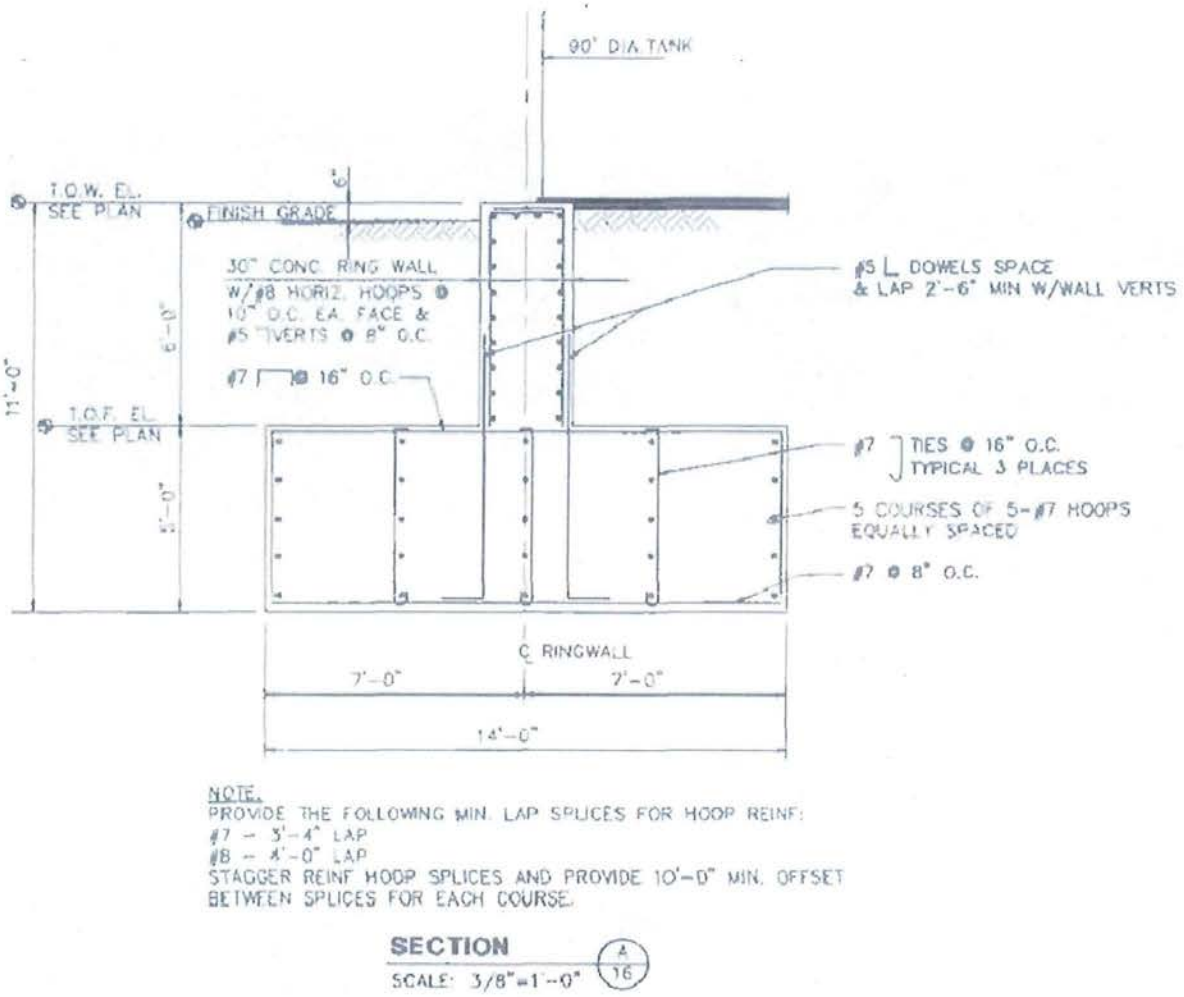
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Figure 5: Overflow Bell with Bar Screen



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal




NOTE:
PROVIDE THE FOLLOWING MIN. LAP SPLICES FOR HOOP REINF:
#7 – 3'-4" LAP
#8 – 4'-0" LAP
STAGGER REINF HOOP SPLICES AND PROVIDE 10'-0" MIN. OFFSET BETWEEN SPLICES FOR EACH COURSE.

**SECTION** A/16
SCALE: 3/8"=1'-0"

Figure 6: Footing Per Drawings



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Figure 7: W-Section Rafters, Interior, Dollar Plate Supported



Figure 8: Rafter Support – Channel Flange Corrosion



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Figure 9: Rafter Support – Support Corrosion



Figure 10: Roof Coating Failure – Location 1



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Figure 11: Roof Coating Failure – Location 2



Figure 12: Roof Coating Failure – Location 3



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Figure 13: Corrosion along Rafter Seal Welds



Figure 14: Roof Coating Failure – Location 3 (Close-up)



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Figure 15: Roof Coating Failure – Location 4



Figure 16: Wall Staining due to Rafter Support



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Figure 17: Ladders and Landing at Entry

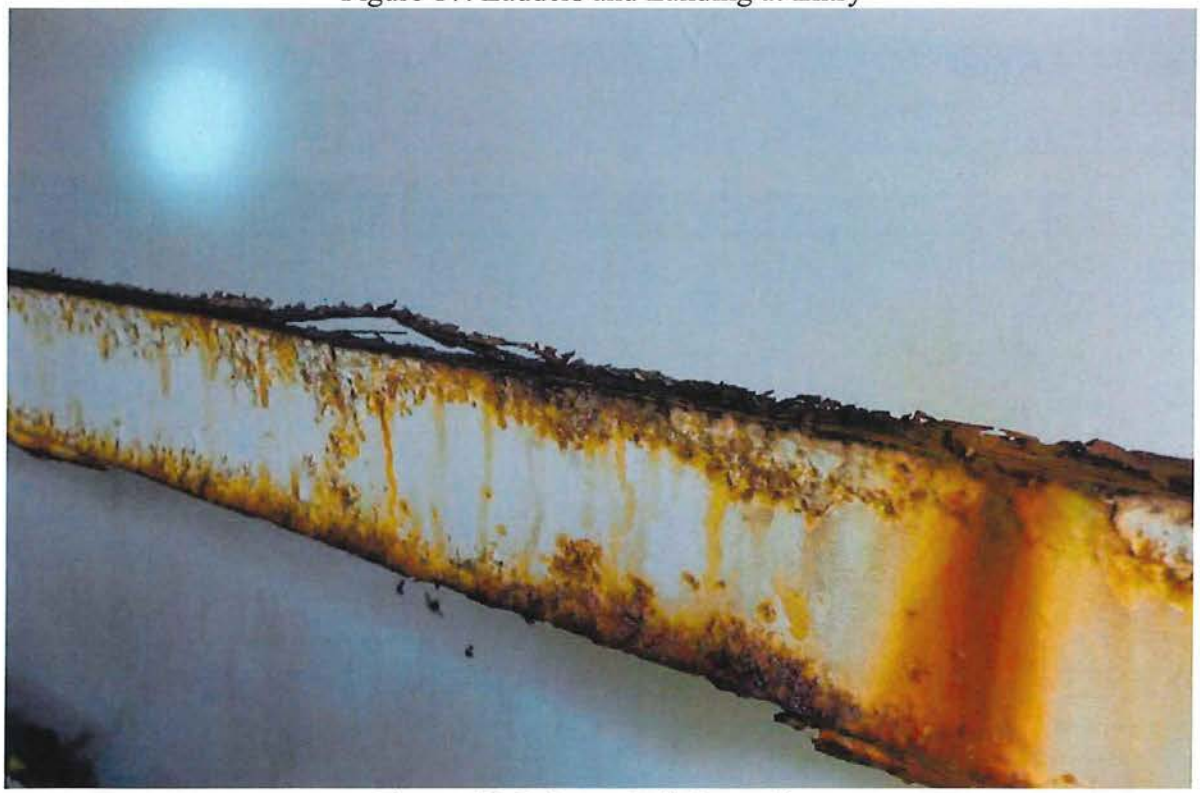


Figure 18: Painters Rail Corrosion



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Figure 19: Aerator Threaded-Rod Support

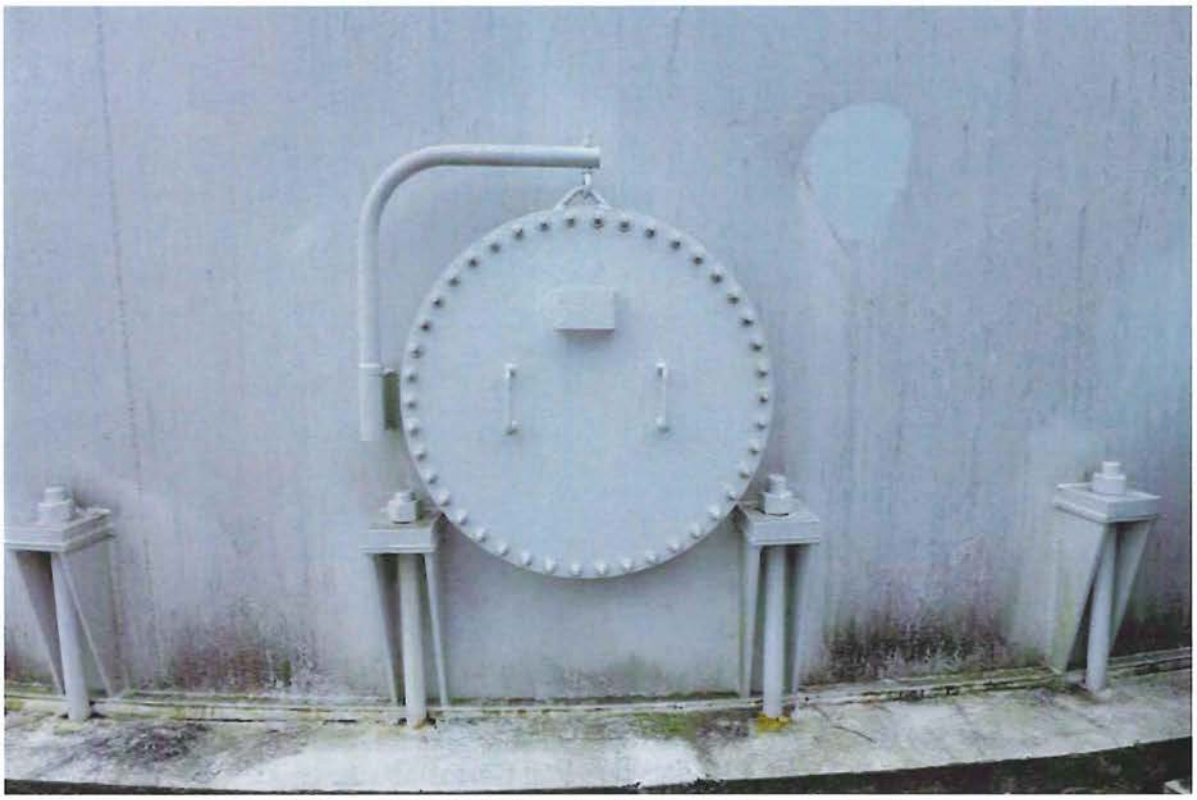


Figure 20: 36" Diameter Manway Access Hatch



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

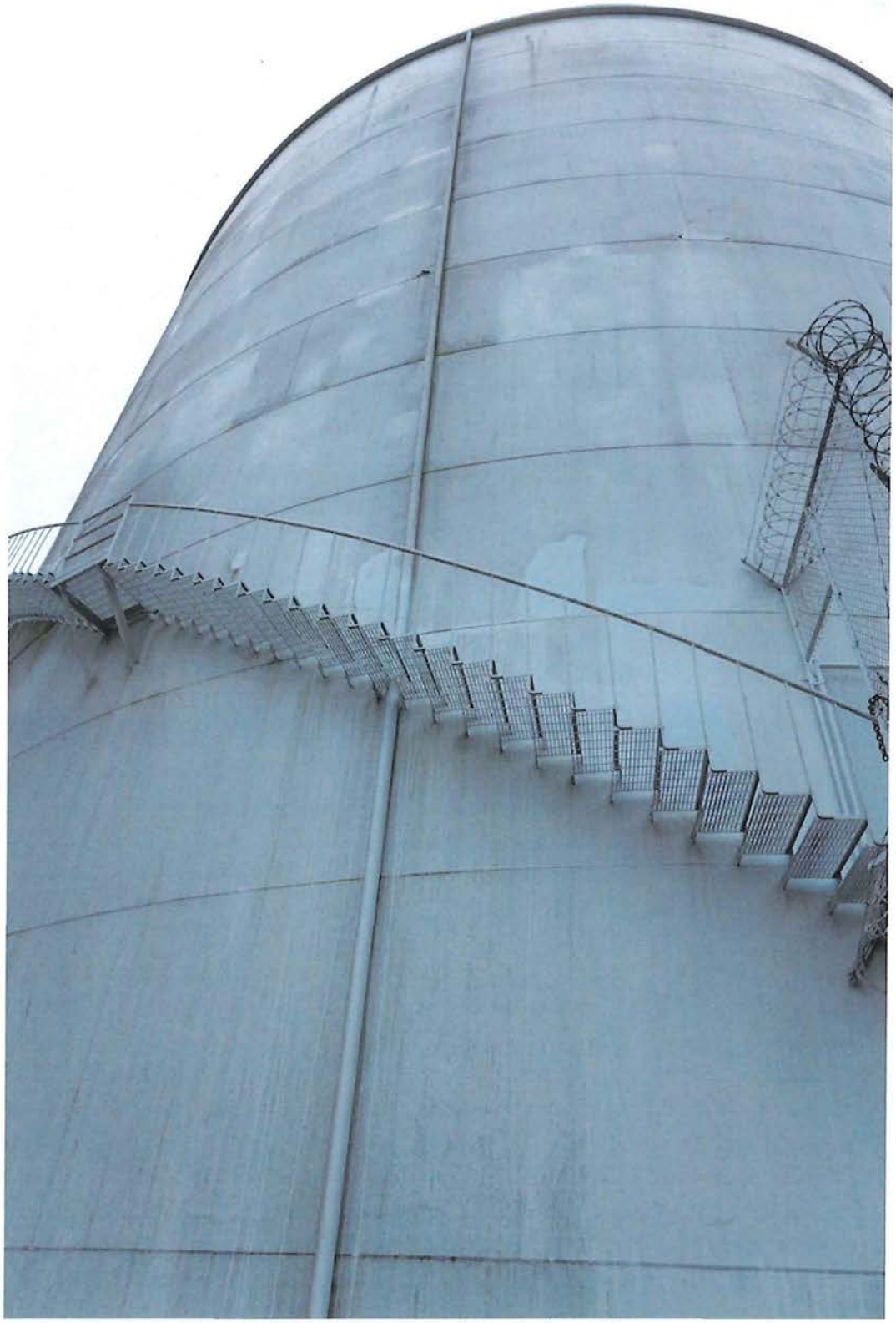


Figure 21: Reservoir Exterior Stairs



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Figure 22: Base of Overflow Pipe



Figure 23: Corrosion at Reservoir Base Plate



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal



Figure 24: Reservoir Anchors



Figure 25: Anchor and Chair Close-up



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

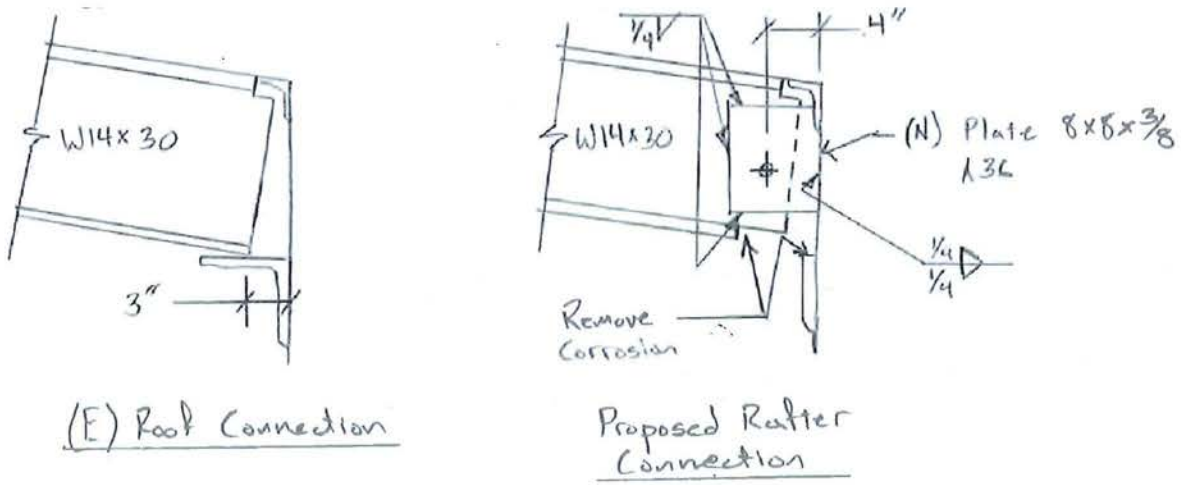



Figure 26: Rafter Support Proposed Repair.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# APPENDIX O

## FEMA FUNDING AGREEMENT

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Docusign Envelope ID: 9D41F677-6052-4281-A550-AFD444CCA029

# Washington State Military Department
# HAZARD MITIGATION GRANT AGREEMENT FACE SHEET

| | | |
|---|---|---|
| 1. Subrecipient Name and Address:<br>**City of Lacey**<br>**420 College St SE**<br>**Lacey, WA 98503** | 2. Total Grant Amount (excl. SubMC):<br>$3,998,585.33<br>**State: $199,929.26**<br>**Federal: $3,598,726.80**<br>**Local: $199,929.27**<br>**SubMC: $199,929.26** | 3. Grant Number:<br>**D25-005** |
| 4. Subrecipient Contact, phone/email:<br>**Gagan Brar, (360) 412-2895**<br>**Gagan.Brar@cityoflacey.org** | 5. Grant Start Date:<br>**June 21, 2024** | 6. Grant End Date:<br>**April 4, 2025** |
| 7. Department Program Manager, phone/email:<br>**Tim Cook, (253) 512-7072**<br>**tim.cook@mil.wa.gov** | 8. Unique Entity ID (UEI):<br>**F3Q7BEH9DFK4** | 9. UBI # (state revenue):<br>**349-001-275** |

10. Funding Authority:
**Washington State Military Department** (the "DEPARTMENT"), and **Federal Emergency Management Agency** (FEMA)

| | | |
|---|---|---|
| 11. Federal Funding Identification #:<br>**DR-4584-WA**<br>**4584-04-R** | 12. Federal Award Date<br>**June 21, 2024** | 13. Assistance Listing # & Title:<br>**97.039 (HMGP)** |
| 14. Program Index # & OBJ/SUB-OBJ:<br>**(Fed) 712F3 NZ, (State) 712S3 NZ, (SubMC) 712L3** | | 15. TIN or SSN:<br>**91-0819427** |
| 16. Service Districts:<br>(BY LEGISLATIVE DISTRICT): **22**<br>(BY CONGRESSIONAL DISTRICT): **10** | 17. Service Area by County(ies):<br>**Thurston** | 18. Women/Minority-Owned, State Certified?:<br>x N/A ☐ NO<br>☐ YES, OMWBE #_____ |
| 19. Contract Classification:<br>☐ Personal Services ☐ Client Services x Public/Local Gov't<br>☐ Research/Development ☐ A/E ☐ Other_____ | | 20. Contract Type (check all that apply):<br>☐ Contract x Grant x Agreement<br>☐ Intergovernmental (RCW 39.34) ☐ Interagency |
| 21. Contractor Selection Process:<br>x "To all who apply & qualify" ☐ Competitive Bidding<br>☐ Sole Source ☐ A/E RCW ☐ N/A<br>☐ Filed w/OFM? ☐ Advertised? ☐ YES ☐NO _____ | | 22. Contractor Type (check all that apply)<br>☐ Private Organization/Individual ☐ For-Profit<br>x Public Organization/Jurisdiction x Non-Profit<br>☐ VENDOR x SUBRECIPIENT x OTHER |

23. PURPOSE/DESCRIPTION:
FEMA's Hazard Mitigation Grant Program provides grants for mitigation planning and cost-effective mitigation actions after a Presidential disaster declaration to reduce the risk of loss of life and property damage in future disasters.
**Title: City of Lacey Hawks Prairie Reservoir Seismic Analysis and Retrofit.** The purpose of this Agreement is to provide funds to the SUBRECIPIENT for the herein proposed project as noted in Statement of Work and/or Description of the Project (Attachment 3), Project Development Schedule (Attachment 4), Project Budget (Attachment 5), and the FEMA approved project application, each of which are incorporated herein by this reference. The DEPARTMENT is the Recipient and Pass-through Entity of the 4584-04-R City of Lacey Hawks Prairie Reservoir Seismic Analysis and Retrofit and FEMA State Agreement, which are incorporated by reference, and makes a subaward of Federal award funds to the SUBRECIPIENT pursuant to this Agreement. The SUBRECIPIENT is accountable to the DEPARTMENT for use of Federal award funds provided under this Agreement and the associated matching funds.

IN WITNESS WHEREOF, the DEPARTMENT and SUBRECIPIENT acknowledge and accept the terms of this Agreement, including all referenced attachments which are hereby incorporated and made a part hereof, and have executed this Agreement as of the date below. This Agreement Face Sheet; Special Terms & Conditions (Attachment 1); General Terms and Conditions (Attachment 2); Statement of Work and/or Description of Project (Attachment 3); Project Development Schedule (Attachment 4); Project Budget (Attachment 5); and all other documents, exhibits and attachments expressly referenced and incorporated herein contain all the terms and conditions agreed upon by the parties and govern the rights and obligations of the parties to this Agreement. No other understandings, oral or otherwise, regarding the subject matter of this Agreement shall be deemed to exist or to bind any of the parties.

In the event of an inconsistency in this Agreement, unless otherwise provided herein, the inconsistency shall be resolved by giving precedence in the following order:

1. **Applicable Federal and State Statutes and Regulations**
2. **DHS/FEMA Award and program documents**
3. **Work Plan, Schedule, and Budget**
4. **Special Terms and Conditions**
5. **General Terms and Conditions, and,**
6. **Other provisions of the Agreement incorporated by reference**

WHEREAS the parties hereto have executed this Agreement on the day and year last specified below.

FOR THE DEPARTMENT:

Regan Anne Hesse 9/27/2024
Signature Date
Regan Anne Hesse, Chief Financial Officer
Washington State Military Department

BOILERPLATE APPROVED AS TO FORM:
Dierk Meierbachtol 4/4/2023
Assistant Attorney General

FOR THE SUBRECIPIENT: 9/13/2024

DocuSigned by:
Rick Walk
FB22A0AE8941409...
Signature Date
Rick Walk
City Manager

APPROVED AS TO FORM:

Signed by:
David Schneider 9/10/2024
E08EBB47FF4C4B1...
Date



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Docusign Envelope ID: 9D41F677-6052-4281-A550-AFD444CCA029



**Washington State Military Department**
**SPECIAL TERMS AND CONDITIONS**

## ARTICLE I. KEY PERSONNEL:

The individuals listed below shall be considered key personnel for point of contact under this Agreement. Any substitution of key personnel by either party shall be made by written notification to the current key personnel.

| SUBRECIPIENT | | MILITARY DEPARTMENT | |
|---|---|---|---|
| Name | **Gagan Brar** | Name | **Tim Cook** |
| Title | **Utilities Engineer** | Title | **State Hazard Mitigation Officer** |
| E-Mail | Gagan.Brar@cityoflacey.orgmailto: | E-Mail | **tim.cook@mil.wa.gov** |
| Phone | **(360) 412-2895** | Phone | **(253) 512-7072** |
| Name | **Teri O'Neal** | Name | **Ryan Chandler** |
| Title | **Senior Utility Engineer** | Title | **HMA Program Supervisor** |
| E-Mail | **(360) 438-2647** | E-Mail | **Ryan.chandler@mil.wa.gov** |
| Phone | **Teri.ONeal@cityoflacey.org** | Phone | **(253) 512-7460** |
| Name | **Peter C. Brooks** | Name | **Chris Reilly** |
| Title | **Water Resources Manager** | Title | **HMA Program Coordinator** |
| E-Mail | **(360) 438-2675** | E-Mail | **Christopher.reilly@mil.wa.gov** |
| Phone | **Peter.Brooks@cityoflacey.org** | Phone | **(253) 359-6680** |

## ARTICLE II ADMINISTRATIVE REQUIREMENTS

The SUBRECIPIENT shall comply with all applicable state and federal laws, rules, regulations, requirements, and program guidance identified or referenced in this Agreement and the informational documents published by DHS/FEMA applicable to the HMGP program including, but not limited to, all criteria, restrictions, and requirements of the Presidential Disaster Declaration, the federal regulations commonly applicable to FEMA grants, and the FEMA Award Letter and its attachments, all of which are incorporated herein by reference.

The SUBRECIPIENT acknowledges that since this Agreement involves federal award funding, the period of performance described herein may begin prior to the availability of appropriated federal funds. The SUBRECIPIENT agrees that it will not hold the DEPARTMENT, the State of Washington, or the United States liable for any damages, claim for reimbursement, or any type of payment whatsoever for services performed under this Agreement prior to distribution of appropriated federal funds, or if federal funds are not appropriated or in a particular amount.

### A. STATE AND FEDERAL REQUIREMENTS FOR HAZARD MITIGATION GRANTS:

The following requirements apply to all DHS/FEMA Hazard Mitigation Grants administered by the DEPARTMENT.

#### 1. SUBAWARDS & CONTRACTS BY SUBRECIPIENTS

a. The SUBRECIPIENT must make a case-by-case determination whether each agreement it makes for the disbursement of HMGP funds received under this Agreement casts the party receiving the funds in the role of a SUBRECIPIENT or contractor in accordance with 2 CFR 200.331.

b. If the SUBRECIPIENT becomes a pass-through entity by making a subaward to a non-federal entity as its subrecipient:

i. The Subrecipient must comply with all federal laws and regulations applicable to pass-through entities of HMGP funds, including, but not limited to, those contained in 2 CFR 200.

ii. The Subrecipient shall require its subrecipient(s) to comply with all applicable state and federal laws, rules, regulations, requirements, and program guidance identified or referenced in this Agreement and the informational documents published by DHS/FEMA applicable to **4584-04-R**, including, but not limited to, all criteria, restrictions, and requirements of the Presidential Disaster Declaration



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

HMGP document, the Manual, the DHS Award Letter for the Grant, and the federal regulations commonly applicable to DHS/FEMA grants.

iii. The SUBRECIPIENT shall be responsible to the DEPARTMENT for ensuring that all HMGP federal award funds provided to its subrecipients, and associated matching funds, are used in accordance with applicable federal and state statutes and regulations, and the terms and conditions of the federal award set forth in Attachment 2 of this Agreement.

## 2. PROJECT FUNDING

The DEPARTMENT will administer 4584-04-R and will pass through the federal match and commit the available state match. The SUBRECIPIENT will commit the required local match.

a. The total cost of the project for the purposes of this Agreement is **$3,998,585.33** dollars; PROVIDED that, if the total cost of the project when completed, or when this Agreement is terminated, is actually less than above, the actual cost shall be substituted herein.

b. The value of the contributions by the SUBRECIPIENT to the project shall be **$199,929.27** dollars, or 5 percent, at minimum, of the total project cost. The SUBRECIPIENT's contributions may be cash or in-kind, must be from a non-federal source, must be reasonable, allowable and allocable, and must comply with all Federal requirements and regulations.

c. When the DEPARTMENT enters into an agreement with the Federal Emergency Management Agency (FEMA) to contribute federal funds to this project, that federal contribution will be **$3,598,726.80** dollars, or 90 percent of the total project cost, whichever is less.

d. The value of the contributions by the DEPARTMENT to the project shall be **$199,929.26** dollars, or 5 percent, at minimum, of the total project cost and is contingent on legislative approval of DEPARTMENT funding pursuant to the prerequisites provided in subsection g. The DEPARTMENT's contributions must be from a non-federal source and must comply with all Federal requirements and regulations.

e. The Federal Emergency Management Agency (FEMA) has contributed federal funds for SUBRECIPIENT Management Costs (SubMC). SubMC includes costs for administering the grant and indirect costs. This federal contribution is in addition to the federal award for project costs and is suitable for 100% reimbursement for eligible expenses. The maximum amount available for SubMC is **$199,929.26** dollars, limited to 5% of the eligible project expenditures for administrative, indirect, or overhead costs, whichever is less.

f. The DEPARTMENT shall not be obligated to pay any amount beyond that set out in Subsections c, d, and e above, unless that additional amount has been approved in advance by both the DEPARTMENT and SUBRECIPIENT and is incorporated by written amendment into this Agreement.

g. The Washington State Legislature may authorize the DEPARTMENT to provide a match to the SUBRECIPIENT's non-federal share of eligible projects. Provision of a match by the DEPARTMENT, if authorized by the Washington State Legislature, shall not require amendment of this Agreement. If DEPARTMENT match funds are committed to the non-federal share by the DEPARTMENT pursuant to legislative authorization, the DEPARTMENT will formally notify the SUBRECIPIENT of the match in writing which will include information identifying any related reduction in the SUBRECIPIENT's percentage commitment.

h. A written amendment will be required if the SUBRECIPIENT expects cumulative transfers between project budgets, as identified in the Project budget (Attachment 5) and the Statement of Work and/or description of Project (Attachment 3), to exceed 10% of the Grant Agreement Amount. Any changes to project budgets other than in compliance with this paragraph will not be reimbursed.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Docusign Envelope ID: 9D41F677-6052-4281-A550-AFD444CCA029

## 3. GRANT AGREEMENT PERIOD

Activities payable under this Agreement and to be performed by the SUBRECIPIENT under this Agreement shall only be those after the obligation of federal funds on **June 21, 2024** and shall terminate on **April 4, 2025**. This period shall be referred to herein as the Grant Agreement Period and/or Period of Performance, unless expressly stated otherwise. Costs incurred during the Grant Agreement Period shall include pre-award costs authorized in writing by FEMA as well as eligible costs incurred after the effective date of the Grant Agreement Period and before termination.

a. The SUBRECIPIENT shall complete the project as described in the FEMA approved project application 4584-04-R, incorporated in and made a part of this Agreement by reference, and as described in Attachments 3, 4, and 5. In the event of extenuating circumstances, the SUBRECIPIENT may request, in writing, that the DEPARTMENT extend the deadline for Grant Agreement completion.

b. The Grant Agreement Period shall only be extended by (1) written notification of FEMA approval of the Grant Agreement Period followed by execution of a mutually agreed written amendment, or (2) written notification from the DEPARTMENT to the SUBRECIPIENT addressing extensions of the DEPARTMENT'S underlying federal grant performance period or to provide additional time for completion of the SUBRECIPIENT's project(s).

c. No expenditure made, or obligation incurred, before or after the Grant Agreement Period shall be eligible, in whole or in part, for grant funds with the exception of pre-award costs authorized in writing by FEMA. In addition to any remedy the DEPARTMENT may have under this Agreement, the amounts set out in Article II, section A.2 **Project Funding,** above, may be reduced to exclude any such expenditure from participation.

d. Failure to complete the project in a timely manner, as outlined in Attachment 4, is a material breach of this Agreement for which the DEPARTMENT is entitled to termination or suspension under Attachment 2, section A.37.

## 4. REIMBURSEMENT AND BUDGET REQUIREMENTS

The DEPARTMENT, using mitigation funds from PL 93-288, the Robert T. Stafford Disaster Relief and Emergency Assistance Act, and the State of Washington, for the HMGP program, shall issue payments to the SUBRECIPIENT as follows:

a. All payment requests shall be made to the SUBRECIPIENT upon submission and approval of eligible, reimbursable work completed and billed on an A-19, form, State of Washington Invoice Voucher Distribution. Approval is subject to receipt of acceptable documentation by the DEPARTMENT, to include, but not limited to, copies of receipts for all goods and services purchased, copies of invoices from contractors and subcontractors for work completed, and copies of timesheets for staff involved with the project, sign-in/sign-out sheets for donated personnel and/or volunteer time spent on the project, and documentation to support other in-kind contributions.

b. The DEPARTMENT reserves the right to withhold disbursement of up to 10 percent of the total project cost to the SUBRECIPIENT until the project has been completed and given final approval by the DEPARTMENT.

c. Final Payment: Final payment of any remaining, or withheld, funds will be made within 60 days after submission by the SUBRECIPIENT of the final report, final A-19, Voucher Distribution, and completion of all final inspections by the DEPARTMENT.

Final payment by the DEPARTMENT also may be conditioned upon a financial review, if determined necessary by the DEPARTMENT. Adjustments to the final payment may be made following any audits conducted by the DEPARTMENT, Washington State Auditor's Office, the United States Inspector General, or their authorized representatives.

d. Within the total Grant Amount of this Agreement, budget categories will be reimbursed on an actual cost basis unless otherwise provided in this Agreement.

e. The maximum amount of all reimbursement requests permitted to be submitted under this Agreement, including the final reimbursement request, is limited to and shall not exceed the total Grant Amount of this Agreement.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

f. For travel costs, SUBRECIPIENT shall comply with 2 CFR 200.475 and should consult their internal policies, state rates set pursuant to RCW 43.03.050 and RCW 43.03.060 as now existing or amended, and federal maximum rates set forth at http://www.gsa.gov, and follow the most restrictive. If travel costs exceed set state or federal limits, travel costs shall not be reimbursed without written approval by DEPARTMENT's Key Personnel.

g. Receipts and/or backup documentation for any approved items that are authorized under this Agreement must be maintained by the SUBRECIPIENT consistent with record retention requirements of this Agreement, and be made available upon request by the DEPARTMENT, and local, state, or federal auditors.

h. The SUBRECIPIENT will submit reimbursement requests to the DEPARTMENT by submitting a properly completed State A-19 Invoice Form, Interagency Electronic Funds Transfer, or Agency/Business invoice with support documentation detailing the expenditures for which reimbursement is sought. Reimbursement requests must be submitted by email to both the DEPARTMENT's Hazard Mitigation Program Coordinator and the Program Manager no later than the due dates listed within the Grant Timeline (Attachment 4), but not more frequently than monthly.

i. All work under this Agreement must end on or before the Grant Agreement End Date, and the final reimbursement request must be submitted to the DEPARTMENT within 45 days after the Grant Agreement End Date, except as otherwise authorized by written amendment of this Agreement and issued by the DEPARTMENT.

j. If applicable, no costs for purchases of equipment/supplies will be reimbursed until the related equipment/supplies have been received by the SUBRECIPIENT, its contractor, or any non-federal entity to which the SUBRECIPIENT makes a subaward, and is invoiced by the vendor.

k. Failure to timely submit complete reports and reimbursement requests as required by this Agreement (including but not limited to those reports in the Project Development Schedule Attachment 4) will prohibit the SUBRECIPIENT from being reimbursed until such complete reports and reimbursement requests are submitted and the DEPARTMENT has had reasonable time to conduct its review. Final reimbursement requests will not be approved for payment until the SUBRECIPIENT is current with all reporting requirements contained in this Agreement.

l. SUBRECIPIENTs shall only use federal award funds under this Agreement to supplement existing funds, and will not use them to replace (supplant) non-federal funds that have been budgeted for the same purpose.

The SUBRECIPIENT may be required to demonstrate and document that the reduction in non-federal resources occurred for reasons other than the receipt or expected receipt of federal funds.

## 5. REPORTING REQUIREMENTS

In addition to the reports as may be required elsewhere in this Agreement, the SUBRECIPIENT shall promptly prepare and submit the following reports to the DEPARTMENT's Key Personnel:

a. Quarterly progress reports, no later than the 15th day following the end of the fiscal quarter, indicating the status of the project, to include a brief narrative on progress during the quarter. The report shall identify the costs incurred to date, the percentage of work completed, the anticipated completion date of the project, and whether cost under runs or over runs are expected. In addition, the SUBRECIPIENT should note any challenges or issues associated with the project. Failure to submit a complete quarterly report within 15 days following the end of the quarter will result in suspension of all payments to the SUBRECIPIENT until a complete quarterly report is received by the DEPARTMENT.

b. A final report when the project is completed, prematurely terminated, or project assistance is terminated. The report shall include a final accounting of all expenditures and a description of work accomplished. If the project is not completed, the report shall contain



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

an estimate of the percentage of completion, and shall indicate the degree of usefulness of the completed project. The report shall account for all expenditures not previously reported and shall include a summary for the entire project.

c. The SUBRECIPIENT shall submit a quarterly progress report describing current activities as outlined in the Timeline.

d. The SUBRECIPIENT shall submit a Final Report with final reimbursement no later than 45 days after Agreement End Date.

e. The SUBRECIPIENT shall comply with the Federal Funding Accountability and Transparency Act (FFATA) and related OMB Guidance consistent with Public Law 109-282 as amended by section 6202(a) of Public Law 110-252 (see 31 U.S.C. 6101 note) and complete and return to the DEPARTMENT an *Audit Certification/FFATA* Form. This form is required to be completed once per calendar year, per SUBRECIPIENT, and not per agreement. The DEPARTMENT'S Contracts Office will request the SUBRECIPIENT submit an updated form at the beginning of each calendar year in which the SUBRECIPIENT has an active agreement.

## 6. PROCUREMENT

a. The SUBRECIPIENT shall comply with all procurement requirements of 2 CFR Part 200.317 through 200.327 and as specified in the General Terms and Conditions, **Attachment 2**, A.11.
b. For all contracts expected to exceed $250,000, the DEPARTMENT may request pre-procurement documents, such as request for proposals, invitations for bids and independent cost estimates. This request may apply to any non-federal entity to which the SUBRECIPIENT makes a subaward, at which point the SUBRECIPIENT will be responsible for reviewing and approving procurement requests of any non-federal entity to which the SUBRECIPIENT makes an award.
c. For all sole source contracts expected to exceed the micro-purchase threshold per 2 CFR 200.1, the SUBRECIPIENT must submit justification to the DEPARTMENT for review and approval. This requirement must be passed on to any non-federal entity to which the SUBRECIPIENT makes a subaward, at which point the SUBRECIPIENT will be responsible for reviewing and approving sole source justifications to any non-federal entity to which the SUBRECIPIENT makes an award.

## 7. TIME EXTENSIONS

A time extension request for Agreement completion must be submitted by the SUBRECIPIENT to the DEPARTMENT no later than 60 days before the end of the Period of Performance. A time extension request must be in writing and identify the project, the reason the project will not be completed within the approved Period of Performance, a current status of the completion of the work, a detailed timeline for completion of the remaining elements, and an anticipated completion date for the completion of the remaining work. Failure to timely submit a complete time extension request may result in denial of the time extension and loss of funding for the project.

## 8. SUBRECIPIENT MONITORING

a. The DEPARTMENT will monitor the activities of the SUBRECIPIENT from award to closeout. The goal of the DEPARTMENT'S monitoring activities will be to ensure that agencies receiving federal pass-through funds are in compliance with this Agreement, federal and state audit requirements, federal grant guidance, and applicable federal and state financial regulations, as well as 2 CFR Part 200 Subpart F.

b. To document compliance with 2 CFR Part 200 Subpart F requirements, the SUBRECIPIENT shall complete and return to the DEPARTMENT "2 CFR Part 200 Subpart F Audit Certification Form" located at http://mil.wa.gov/emergency-management-division/grants/requiredgrantforms along with the signed Agreement. The SUBRECIPIENT shall complete and return the form to the DEPARTMENT each fiscal year thereafter until the Agreement is closed. The form is incorporated by reference herein and made a part of this Agreement.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Docusign Envelope ID: 9D41F677-6052-4281-A550-AFD444CCA029

c. Monitoring activities may include, but are not limited to:
   i. Review of financial and performance reports;
   ii. Monitoring and documenting the completion of Agreement deliverables;
   iii. Documentation of phone calls, meetings, e-mails, and correspondence;
   iv. Review of reimbursement requests and supporting documentation to ensure allowability and consistency with Agreement work plan, budget, and federal requirements;
   v. Observation and documentation of Agreement related activities, such as exercises, training, funded events, and equipment demonstrations; and
   vi. On-site visits to review equipment records and inventories, to verify source documentation for reimbursement requests and performance reports, and to verify completion of deliverables.

d. The SUBRECIPIENT is required to meet or exceed the monitoring activities, as outlined above and in 2 CFR Part 200, for any non-federal entity to which the SUBRECIPIENT makes a subaward as a pass-through entity under this Agreement.

e. Compliance will be monitored throughout the performance period to assess risk. Concerns will be addressed through a Corrective Action Plan.

## 9. CLOSE-OUT

To initiate close-out, the SUBRECIPIENT is required to certify in writing the date completed and total amount expended on the project on FINAL PROJECT REPORT form to the DEPARTMENT. After receipt of the FINAL PROJECT REPORT form, the DEPARTMENT will conduct a site inspection and review supporting documentation for compliance with the requirements of the Agreement.

Prior to project close-out, the SUBRECIPIENT shall provide the DEPARTMENT with acceptable documentation supporting compliance with the Agreement. General documentation supporting compliance with the Agreement typically includes, but is not limited to, the following:

a. Photographs of the structures or properties involved in the project **prior** to project implementation **and after** project implementation.
b. Digital geospatial coordinates (latitude and longitude) for each structure with an accuracy of ± 20 meters (64) feet.
c. Certificate of occupancy or equivalent documentation from the appropriate regulatory authority for each structure to certify it is code-compliant.
d. Certification that the SUBRECIPIENT has met the environmental and historic preservation conditions of the grant award as described in this Agreement.
e. Copies of all compliance and consultation documentation required by the grant award as described in the Agreement (e.g., coastal zone management consistency determination from Department of Ecology).
f. Copies of all documentation related to inspection for and removal and disposal of asbestos and other hazardous materials from each property.

Specific additional documentation requirements for projects to acquire properties for open space include, but are not limited to, the following:

a. Signed Statement of Voluntary Participation from the owner of each acquired property.
b. Documentation of dates of acquisition and structure demolition or removal from property for each property.
c. Copy of recorded open space deed restrictions for each acquired property.
d. Copy of the AW-501 form filed with the NFIP for each acquired repetitive loss property.
e. Documentation of consultation with the Army Corps of Engineers and Washington State Department of Transportation regarding future use of each property.

Specific additional documentation requirements for projects to elevate structures above the base flood elevation include, but are not limited to, the following:

a. Photographs of the structures prior to elevation, and front, rear and side photos post-elevation.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

b. Copies of the pre-project elevation certificate for each structure, or documentation of methodology used to calculate the first-floor elevations.
c. Copies of the post-project elevation certificate for each structure.
d. Copies of the certificate of occupancy for each elevated structure to certify that it is code compliant.
e. Certification by an engineer, floodplain manager or other senior official of the SUBRECIPIENT that each completed structural elevation is in compliance with local ordinances and NFIP regulations and technical bulletins.
f. Copy of the AW-501 form filed with the NFIP for each elevated repetitive loss property.
g. Copies of proof of flood insurance for each elevated structure.
h. Copies of the recorded deed restriction related to maintenance of flood insurance for each property within the Special Flood Hazard Area.

The DEPARTMENT will consult with the SUBRECIPIENT regarding other documentation requirements of the Agreement throughout the Period of Performance.

The SUBRECIPIENT is required to retain all documentation which adequately identifies the source and application of all mitigation grant funds for six years following the closure of this grant. For all funds received, source documentation includes adequate accounting of actual costs and recoveries incurred.

## 10. LIMITED ENGLISH PROFICIENCY (CIVIL RIGHTS ACT OF 1964 TITLE VI)

All SUBRECIPIENTS must comply with the Title VI of the Civil Rights Act of 1964 (Title VI) prohibition against discrimination on the basis of national origin, which requires that SUBRECIPIENTs of federal financial assistance take reasonable steps to provide meaningful access to persons with limited English proficiency (LEP) to their programs and services. Providing meaningful access for persons with LEP may entail providing language assistance services, including oral interpretation and written translation. Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency (August 11, 2000), requires federal agencies to issue guidance to recipients, assisting such organizations and entities in understanding their language access obligations. DHS published the required recipient guidance in April 2011, DHS Guidance to Federal Financial Assistance Recipients Regarding Title VI Prohibition Against National Origin Discrimination Affecting Limited English Proficient Persons, 76 Fed. Reg. 21755-21768, (April 18, 2011). The Guidance provides helpful information such as how a recipient can determine the extent of its obligation to provide language services; selecting language services; and elements of an effective plan on language assistance for LEP persons. For additional assistance and information regarding language access obligations, please refer to the DHS Recipient Guidance at https://www.dhs.gov/guidance-published-help-department-supported-organizations-provide-meaningful-access-people-limited and additional resources on http://www.lep.gov.

## 11. ENVIRONMENTAL AND HISTORICAL PRESERVATION

a. The SUBRECIPIENT shall ensure full compliance with the DHS/FEMA Environmental Planning and Historic Preservation (EHP) program. EHP program information can be found at https://www.fema.gov/grants/guidance-tools/environmental-historic, which is incorporated into and made a part of this Agreement.
b. Projects that have historical impactors or the potential to impact the environment, including, but not limited to, construction of communication towers; modification or renovation of existing buildings, structures and facilities; or new construction including replacement of facilities, must participate in the DHS/FEMA EHP review process prior to initiation. Modification of existing buildings, including minimally invasive improvements such as attaching monitors to interior walls, and training or exercises occurring outside in areas not considered previously disturbed, also require a DHS/FEMA EHP review before project initiation.
c. The EHP review process involves the submission of a detailed project description that includes the entire scope of work, including any alternatives that may be under consideration, along with supporting documentation so FEMA may determine whether the



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

proposed project has the potential to impact environmental resources and/or historic properties.

d. The SUBRECIPIENT agrees that to receive any federal preparedness funding, all EHP compliance requirements outlined in applicable guidance must be met. The EHP review process **must be completed, and FEMA approval received by the SUBRECIPIENT, before any work is started** for which reimbursement will be later requested. Expenditures for projects started before completion of the EHP review process, and receipt of approval by the SUBRECIPIENT will not be reimbursed.

## 12. ADDITIONAL SPECIAL CONDITIONS

**a.** Construction Documents, Contracts, Change Orders

i. Construction Document Approval: Upon request, the SUBRECIPIENT agrees to submit one copy of all construction plans and specifications to the DEPARTMENT prior to solicitation of bids. This request is to ensure bid set consistency with the subgrant's approved scope of work.

ii. The SUBRECIPIENT shall use a competitive procurement process in the procurement and award of any contracts with contractors or sub-contractors that are entered into under the original contract award. Copies of all bids and contracts awarded shall be submitted to the DEPARTMENT upon request. Where all bids are substantially in excess of project estimates, the DEPARTMENT may, by notice in writing, suspend the project for determination of appropriate action, which may include termination of the Agreement.

iii. Construction Change Order: All change orders must be in writing and shall be submitted to the DEPARTMENT. The SUBRECIPIENT shall pay any increase in the cost of the project as the result of a change order, unless the DEPARTMENT has agreed to the change with a written amendment to this Agreement.

## 13. EQUIPMENT AND TRACKABLE ASSETS MANAGEMENT

a. If applicable, the SUBRECIPIENT and any non-federal entity to which the SUBRECIPIENT makes a subaward shall comply with 2 CFR 200.317 through 200.327, and all Washington State procurement requirements, when procuring any equipment or trackable assets under this Agreement, 2 CFR 200.313 for management of equipment, and 2 CFR 200 to include but not limited to:

i. Upon successful completion of the terms of this Agreement, all equipment and trackable assets purchased through this Agreement will be owned by the SUBRECIPIENT, or a recognized non-federal entity to which the SUBRECIPIENT has made a subaward, for which a contract or other means of legal transfer of ownership is in place.

ii. All equipment, and trackable assets as applicable, purchased under this Agreement will be recorded and maintained in the SUBRECIPIENT's inventory system.

iii. Inventory records shall include:

A. Description of the property

B. Manufacturer's serial number, or other identification number

C. Funding source for the property, including the Federal Award Identification Number (FAIN) (Face Sheet, Box 11)

D. Assistance Listings Number (formerly CFDA Number) (Face Sheet, Box 13)

E. Who holds the title

F. Acquisition date

G. Cost of the property and the percentage of federal participation in the cost



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

H. Location, use, and condition of the property at the date the information was reported

I. Disposition data including the date of disposal and sale price of the property.

iv. The SUBRECIPIENT shall take a physical inventory of the equipment, and trackable assets as applicable, and reconcile the results with the property records at least once every two years. Any differences between quantities determined by the physical inspection and those shown in the records shall be investigated by the SUBRECIPIENT to determine the cause of the difference. The SUBRECIPIENT shall, in connection with the inventory, verify the existence, current utilization, and continued need for the equipment.

v. The SUBRECIPIENT shall be responsible for any and all operational and maintenance expenses and for the safe operation of their equipment and trackable assets including all questions of liability. The SUBRECIPIENT shall develop appropriate maintenance schedules and procedures to ensure the equipment and trackable assets are well maintained and kept in good operating condition.

vi. The SUBRECIPIENT shall develop a control system to ensure adequate safeguards to prevent loss, damage, and theft of the property. Any loss, damage, or theft shall be investigated, and a report generated and sent to the DEPARTMENT'S Key Personnel.

vii. The SUBRECIPIENT must obtain and maintain all necessary certifications and licenses for the equipment.

viii. If the SUBRECIPIENT is authorized or required to sell the property, proper sales procedures must be established and followed to ensure the highest possible return. For disposition, if upon termination or at the Grant Agreement End Date, when original or replacement trackable assets or equipment acquired under a federal award are no longer needed for the original project or program or for other activities currently or previously supported by a federal awarding agency, the SUBRECIPIENT must comply with the following procedures:

A. For Trackable assets: If there is a residual inventory of unused trackable assets exceeding $5,000 in total aggregate value upon termination or completion of the project or program and the trackable assets are not needed for any other federal award, the SUBRECIPIENT must retain the trackable assets for use on other activities or sell them, but must, in either case, compensate the federal government for its share. The amount of compensation must be computed in the same manner as for equipment.

B. For Equipment:

1. Items with a current per-unit fair-market value of $5,000 or less may be retained, sold, transferred, or otherwise disposed of with no further obligation to the federal awarding agency.

2. Items with a current per-unit fair-market value in excess of $5,000 may be retained or sold. The SUBRECIPIENT shall compensate the federal awarding agency in accordance with the requirements of 2 CFR 200.313 (e) (2).

ix. Records for equipment shall be retained by the SUBRECIPIENT for a period of six years from the date of the disposition, replacement, or transfer. If any litigation, claim, or audit is started before the expiration of the six year period, the records shall be retained by the SUBRECIPIENT until all litigation, claims, or audit findings involving the records have been resolved.

b. The SUBRECIPIENT shall comply with the DEPARTMENT'S Purchase Review Process, which is incorporated by reference and made part of this Agreement. No reimbursement will be provided unless the appropriate approval has been received.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

c. Unless Expressly provided otherwise, all equipment must meet all mandatory regulatory and/or DHS/FEMA adopted standards to be eligible for purchase using federal award funds.

d. If funding is allocated to emergency communications, the SUBRECIPIENT must ensure that all projects comply with SAFECOM Guidance on Emergency Communications Grants, located at https://www.cisa.gov/safecom/funding, ensuring the investments are compatible, interoperable, resilient, and support national goals and objectives for improving emergency communications.

e. Effective August 13, 2020, FEMA recipients and SUBRECIPIENT, as well as their contractors and subcontractors, may not obligate or expend any FEMA award funds to:

i. Procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;

ii. Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system; or

iii. Enter into, extend, or renew contracts with entities that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.

This prohibition regarding certain telecommunications and video surveillance services or equipment is mandated by section 889 of the *John S. McCain National Defense Authorization Act for Fiscal Year 2019 (FY 2019 NDAA), Pub. L. No. 115-232 (2018)*. Recipients and SUBRECIPIENTS may use DHS/FEMA grant funding to procure replacement equipment and services impacted by this prohibition, provided the costs are otherwise consistent with the requirements of the Manual and applicable NOFO.

Per subsections 889(f)(2)-(3) of the FY 2019 NDAA, and 2 CFR 200.216, covered telecommunications equipment or services means:

i. Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities);
ii. For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities);
iii. Telecommunications or video surveillance services provided by such entities or using such equipment; or
iv. Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

The SUBRECIPIENT must pass through equipment and trackable assets management requirements that meet or exceed the requirements outlined above to any non-federal entity to which the SUBRECIPIENT makes a subaward under this Agreement.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## B. DHS FFY24 STANDARD TERMS AND CONDITIONS

As a SUBRECIPIENT of HMGP funding, the SUBRECIPIENT shall comply with all applicable FEMA/DHS terms and conditions of the FEMA Award Letter and its associated documents for DHS, which are incorporated in and made a part of this Agreement.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Docusign Envelope ID: 9D41F677-6052-4281-A550-AFD444CCA029



**Washington State Military Department**
**GENERAL TERMS AND CONDITIONS**
**Department of Homeland Security (DHS)/**
**Federal Emergency Management Agency (FEMA)**
**Grants**

## A.1 DEFINITIONS

As used throughout this Agreement, the following terms will have the same meaning as defined in 2 CFR 200 Subpart A (which is incorporated herein by reference), except as otherwise set forth below:

a. "Agreement" means this Grant Agreement.
b. "**DEPARTMENT**" means the Washington State Military Department, as a state agency, any division, section, office, unit or other entity of the DEPARTMENT, or any of the officers or other officials lawfully representing that DEPARTMENT. The DEPARTMENT is a recipient of a federal award directly from a federal awarding agency and is pass-through entity making a subaward to a SUBRECIPIENT under this Agreement.
c. "**SUBRECIPIENT**" when capitalized is primarily used throughout this Agreement in reference to the non-federal entity identified on the Face Sheet of this Agreement that has received a subaward from the DEPARTMENT. However, the definition of "SUBRECIPIENT" is the same as in 2 CFR 200.93 for all other purposes.
d. "**Monitoring Activities**" means all administrative, construction, financial, or other review activities that are conducted to ensure compliance with all state and federal laws, rules, regulations, authorities and policies.
e. "**Project**" means those actions funded through the Hazard Mitigation Assistance Grant Program and described in approved Project Worksheets. Projects may include one or more of the following: reimbursement of costs for emergency response, debris removal and/or repair or restoration of damaged public facilities. A project may be a small, large, improved, or alternate project.

## A.2 ADVANCE PAYMENTS

The DEPARTMENT shall make no payments in advance or in anticipation of goods or services to be provided under this Agreement, except as required under 2 CFR 200.305 for federal grants. SUBRECIPIENT shall not invoice the DEPARTMENT in advance of delivery and invoicing of such goods or services, except as authorized under 2 CFR 200.305.

Pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C §5121-5207), Advance Payment process, FEMA may process a SUBRECIPIENT project worksheet which is provided to the state of Washington for direct disbursement to SUBRECIPIENT Pursuant to these provisions and RCW 43.88.160(5), these grant funds are not subject to the advance payments prohibition and will be disbursed immediately to SUBRECIPIENT as grants authorized by law with subsequent authentication and certification of expenditures.

## A.3 AMENDMENTS AND MODIFICATIONS

The SUBRECIPIENT or the DEPARTMENT may request, in writing, an amendment or modification of this Agreement. Modifications may be requested for Grant Agreement end date, budget or scope change. However, such amendment or modification shall not be binding, take effect or be incorporated herein until made in writing and signed by the authorized representatives of the DEPARTMENT and the SUBRECIPIENT. No other understandings or agreements, written or oral, shall be binding on the parties.

## A.4 AMERICANS WITH DISABILITIES ACT (ADA) OF 1990, PUBLIC LAW 101-336, 42 U.S.C. 12101 ET SEQ. AND ITS IMPLEMENTING REGULATIONS ALSO REFERRED TO AS THE "ADA" 28 CFR Part 35.

The SUBRECIPIENT must comply with the ADA, which provides comprehensive civil rights protection to individuals with disabilities in the areas of employment, public accommodations, state and local government services, and telecommunication.

## A.5 APPLICATION REPRESENTATION-MISREPRESENTATION, INACCURACY AND BREACH

The DEPARTMENT relies upon the SUBRECIPIENT's application in making its determinations as to eligibility for, selection for, and scope of funding grants. Any misrepresentation, error or inaccuracy in any part of the application may be deemed a breach of this Agreement.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**A.6 ASSURANCES**

DEPARTMENT and SUBRECIPIENT agree that all activity pursuant to this Agreement will be in accordance with all the applicable current federal, state and local laws, rules and regulations. In addition, as a SUBRECIPIENT of FEMA funding, the SUBRECIPEINT shall comply with all applicable DHS terms and conditions as specified in B.3. Statement of Assurances of the Hazard Mitigation Assistance Program and Policy Guide dated March 23, 2023.

**A.7 CERTIFICATION REGARDING DEBARMENT, SUSPENSION, OR INELIGIBILITY**

As federal funds are a basis for this Agreement, the SUBRECIPIENT certifies that the SUBRECIPIENT is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in this Agreement by any federal department or agency.

The SUBRECIPIENT shall complete, sign, and return a Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion form located at http://mil.wa.gov/emergency-management-division/grants/requiredgrantforms. Any such form completed by the SUBRECIPIENT for this Agreement shall be incorporated into this Agreement by reference.

Further, the SUBRECIPIENT agrees to comply with all applicable federal regulations concerning the federal debarment and suspension system, including 2 CFR Part 180. The SUBRECIPIENT certifies that it will ensure that potential sub-contractors or sub-recipients or any of their principals are not debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in "covered transactions" by any federal department or agency. "Covered transactions" include procurement contracts for goods or services awarded under a non-procurement transaction (e.g. grant or cooperative agreement) that are expected to equal or exceed $25,000, and sub-awards to sub-recipients for any amount. With respect to covered transactions, the SUBRECIPIENT may comply with this provision by obtaining a certification statement from the potential sub-contractor or sub-recipient or by checking the System for Award Management (http://www.sam.gov) maintained by the federal government. The SUBRECIPIENT also agrees not to enter into any arrangements or contracts with any party on the Washington State Department of Labor and Industries' "Debarred Contractor List" (https://secure.lni.wa.gov/debarandstrike/ContractorDebarList.aspx).

**A.8 CERTIFICATION REGARDING RESTRICTIONS ON LOBBYING**

As required by 44 CFR Part 18, the SUBRECIPIENT hereby certifies that to the best of their knowledge and belief: (1) no federally appropriated funds have been paid or will be paid by or on behalf of the SUBRECIPIENT to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement; (2) that if any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Agreement, grant, loan, or cooperative agreement, the SUBRECIPIENT will complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions; (3) and that, as applicable, the SUBRECIPIENT will require that the language of this certification be included in the award documents for all subawards at all tiers (including sub-contracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into, and is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352.

**A.9 COMPLIANCE WITH APPLICABLE STATUTES, RULES AND DEPARTMENT POLICIES**

The SUBRECIPIENT and all its contractors shall comply with, and the DEPARTMENT is not responsible for determining compliance with, any and all applicable federal, state, and local laws, regulations, executive orders, OMB Circulars, and/or policies. This obligation includes, but is not limited to: nondiscrimination laws and/or policies, Equal Employment Opportunity, as amended by Executive Order 11375 of October 13, 1967, as supplemented by Department of Labor regulations (41 CFR chapter 60); Copeland Anti-Kickback Act (18 U.S.C. 874) as supplemented in Department of Labor regulations (29



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

CFR Part 3); Davis-Bacon Act (40 U.S.C. 276a to 276a-7) as supplemented by Department of Labor regulations (29 CFR Part 5); Clean Air Act (42 U.S.C. 1857(h), section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, Environmental Protection Agency regulations (40 CFR part 15); Sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330) as supplemented by Department of Labor regulations (29 CFR Part 5); Energy Policy and Conservation Act (PL 94-163, 89 Stat. 871, as amended), the Americans with Disabilities Act (ADA), Age Discrimination Act of 1975, Title VI of the Civil Rights Act of 1964, Civil rights Act of 1968, the Robert T. Stafford Disaster Relief and Emergency Assistance Act, (PL 93-288, as amended), Title 44 of the Federal Regulations, 2 CFR Part 3002, Ethics in Public Service (RCW 42.52), Covenant Against Contingent Fees (48 CFR Section 52.203-5), Public Records Act (RCW 42.56), Prevailing Wages on Public Works (RCW 39.12), State Environmental Policy Act (RCW 43.21C), Shoreline Management Act of 1971 (RCW 90.58), State Building Code (RCW 19.27), Energy Related Building Standards (RCW 19.27A), Provisions in Buildings for Aged and Handicapped Persons (RCW 70.92), and safety and health regulations.

DEPARTMENT and SUBRECIPIENT agree that all activity pursuant to this Agreement will be in accordance with all the applicable current federal, state and local laws, rules and regulations.

In the event of the SUBRECIPIENT's or its contractor's noncompliance or refusal to comply with any applicable law, regulation, executive order, OMB Circular or policy, the DEPARTMENT may rescind, cancel, or terminate the Agreement in whole or in part in its sole discretion.

The SUBRECIPIENT is responsible for all costs or liability arising from its failure to comply with applicable laws, regulations, executive orders, OMB Circulars or policies.

**A.10 CONFLICT OF INTEREST**

No officer or employee of the DEPARTMENT; no member, officer, or employee of the SUBRECIPIENT or its designees or agents; no member of the governing body of the jurisdiction in which the project is undertaken or located; and no other official of such the SUBRECIPIENT who exercises any functions or responsibilities with respect to the project during his or her tenure, shall have any personal or pecuniary gain or interest, direct or indirect, in any contract, subcontract, or the proceeds thereof, for work to be performed in connection with the project assisted under this Agreement.

The SUBRECIPIENT shall incorporate, or cause to incorporate, in all such contracts or subcontracts, a provision prohibiting such interest pursuant to this provision.

**A.11 CONTRACTING & PROCUREMENT**

a. The SUBRECIPIENT shall use a competitive procurement process in the procurement and award of any contracts with contractors or sub-contractors that are entered into under the original contract award. The procurement process followed shall be in accordance with 2 CFR Part 200.318 General procurement standards through 200.327, Contract Provisions.

As required by Appendix II to 2 CFR Part 200, all contracts entered into by the SUBRECIPIENT under this Agreement must include the following provisions, as applicable:

1. Contracts for more than the simplified acquisition threshold, which is the inflation adjusted amount determined by the Civilian Agency Acquisition Council and the Defense Acquisition Regulations Council (Councils) as authorized by 41 U.S.C. 1908, must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as appropriate.
2. All contracts in excess of $10,000 must address termination for cause and for convenience by the non-Federal entity including the manner by which it will be effected and the basis for settlement.
3. Equal Employment Opportunity. Except as otherwise provided under 41 CFR Part 60, all contracts that meet the definition of "federally assisted construction contract" in 41 CFR Part 60-1.3 must include the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor."
4. Davis-Bacon Act, as amended (40 U.S.C. 3141-3148). When required by Federal program legislation, all prime construction contracts in excess of $2,000 awarded by non-Federal entities must include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute, contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must be required to pay wages not less than once a week. The non-Federal entity must place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation. The decision to award a contract or subcontract must be conditioned upon the acceptance of the wage determination. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency. The contracts must also include a provision for compliance with the Copeland "Anti-Kickback" Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that each contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

5. Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708). Where applicable, all contracts awarded by the non-Federal entity in excess of $100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.
6. Rights to Inventions Made Under a Contract or Agreement. If the Federal award meets the definition of "funding agreement" under 37 CFR § 401.2 (a) and the recipient or SUBRECIPIENT wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the recipient or SUBRECIPIENT must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.
7. Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387), as amended - Contracts and subgrants of amounts in excess of $150,000 must contain a provision that requires the non-Federal award to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).
8. Debarment and Suspension (Executive Orders 12549 and 12689) - A contract award (see 2 CFR 180.220) must not be made to parties listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.
9. Byrd Anti-Lobbying Amendment (31 U.S.C. 1352) - Contractors that apply or bid for an award exceeding $100,000 must file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award.

10. Procurement of recovered materials -- As required by 2 CFR 200.322, a non-Federal entity that is a state agency or agency of a political subdivision of a state and its contractors must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds $10,000 or the value of the quantity acquired during the preceding fiscal year exceeded $10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.
11. Notice of Federal awarding agency requirements and regulations pertaining to reporting.
12. Federal awarding agency requirements and regulations pertaining to copyrights and rights in data.
13. Access by the DEPARTMENT, the SUBRECIPIENT, the Federal awarding agency, the Comptroller General of the United States, or any of their duly authorized representatives to any books, documents, papers, and records of the contractor which are directly pertinent to that specific contract for the purpose of making audit, examination, excerpts, and transcriptions.
14. Retention of all required records for six years after the SUBRECIPIENT has made final payments and all other pending matters are closed.
15. Mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L. 94–163, 89 Stat. 871).
16. The DEPARTMENT reserves the right to review the SUBRECIPIENT procurement plans and documents, and require the SUBRECIPIENT to make changes to bring its plans and documents into compliance with the requirements of 2 CFR Part 200.318 through 2 CFR 200.327. The SUBRECIPIENT must ensure that its procurement process requires contractors and subcontractors to provide adequate documentation with sufficient detail to support the costs of the project and to allow both the SUBRECIPIENT and DEPARTMENT to make a determination on eligibility of project costs.
17. All sub-contracting agreements entered into pursuant to this Agreement shall incorporate this Agreement by reference.

**A.12 DISCLOSURE**

The use or disclosure by any party of any information concerning the DEPARTMENT for any purpose not directly connected with the administration of the DEPARTMENT's or the SUBRECIPIENT's responsibilities with respect to services provided under this Agreement is prohibited except by prior written consent of the DEPARTMENT or as required to comply with the state Public Records Act, other law, or court order.

**A.13 DISPUTES**

Except as otherwise provided in this Agreement, when a bona fide dispute arises between the parties and it cannot be resolved through discussion and negotiation, either party may request a dispute resolution panel to resolve the dispute. A request for a dispute resolution board shall be in writing, state the disputed issues, state the relative positions of the parties, and be sent to all parties. The panel shall consist of a representative appointed by the DEPARTMENT, a representative appointed by the SUBRECIPIENT and a third party mutually agreed upon by both parties. The panel shall, by majority vote, resolve the dispute. Each party shall bear the cost for its panel member and its attorney fees and costs, and share equally the cost of the third panel member.

**A.14 DUPLICATION OF BENEFITS**

The SUBRECIPIENT agrees that the funds for which federal or state assistance is requested does not, or will not, duplicate benefits or funds received for the same loss from any other source. The SUBRECIPIENT will pursue, and require sub-recipients to pursue, full payment of eligible insurance benefits for properties or any other losses covered in a project under this Agreement. The SUBRECIPIENT will repay the DEPARTMENT any funds provided under this grant agreement that are



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

duplicated by other benefits, funds, or insurance proceeds. The SUBRECIPIENT will also seek recovery against any party or parties whose negligence or other intentional or tortious conduct may have caused or contributed to the expenditures for which these grants funds are provided. The SUBRECIPIENT will repay the DEPARTMENT any funds recovered by settlement, judgment or other court order in an action to recover funds provided by this grant. The SUBRECIPIENT shall notify the DEPARTMENT as early as possible and work in conjunction with the DEPARTMENT and FEMA to ensure appropriate apportionment of any duplicated or recovered payment.

**A.15 HAZARDOUS SUBSTANCES**

The SUBRECIPIENT shall inspect and investigate the proposed development/construction site for the presence of hazardous substances. The SUBRECIPIENT shall fully disclose to the DEPARTMENT the results of its inspection and investigation and all other knowledge the SUBRECIPIENT has as to the presence of any hazardous substances at the proposed development/construction project site. The SUBRECIPIENT will be responsible for any associated clean-up costs. "Hazardous Substance" is defined in RCW 70A.305.020.

**A.16 LEGAL RELATIONS**

It is understood and agreed that this Agreement is solely for the benefit of the parties to the Agreement and gives no right to any other party. No joint venture or partnership is formed as a result of this Agreement.

To the extent allowed by law, the SUBRECIPIENT, its successors or assigns, will protect, save and hold harmless the DEPARTMENT, the State of Washington, and the United States Government and their authorized agents and employees, from all claims, actions, costs, damages or expenses of any nature whatsoever by reason of the acts or omissions of the SUBRECIPIENT, its sub-contractors, assigns, agents, contractors, consultants, licensees, invitees, employees or any person whomsoever arising out of or in connection with any acts or activities authorized by this Agreement.

To the extent allowed by law, the SUBRECIPIENT further agrees to defend the DEPARTMENT and the State of Washington and their authorized agents and employees in any litigation; including payment of any costs or attorneys' fees for any claims or action commenced thereon arising out of or in connection with acts or activities authorized by this Agreement.

This obligation shall not include such claims, costs, damages or expenses which may be caused by the sole negligence of the DEPARTMENT; provided, that if the claims or damages are caused by or result from the concurrent negligence of (1) the DEPARTMENT, and (2) the SUBRECIPIENT, its agents, or employees, this indemnity provision shall be valid and enforceable only to the extent of the negligence of the SUBRECIPIENT, or SUBRECIPIENT's agents or employees.

Insofar as the funding source, the DEPARTMENT of Homeland Security (DHS)/Federal Emergency Management Agency (FEMA), is an agency of the federal government, the following shall apply:

44 CFR 206.9 Non-liability. The federal government shall not be liable for any claim based upon the exercise or performance of, or the failure to exercise or perform a discretionary function or duty on the part of a federal agency or an employee of the Federal government in carrying out the provisions of the Stafford Act.

**A.17 LIMITATION OF AUTHORITY – AUTHORIZED SIGNATURE**

The signatories to this Agreement represent that they have the authority to bind their respective organizations to this Agreement. Only the DEPARTMENT's Authorized Signature and the Authorized Signature of the assigned SUBRECIPIENT Agent or Alternate for the SUBRECIPIENT Agent, formally designated in writing, shall have the express, implied, or apparent authority to alter, amend, modify, or waive any clause or condition of this Agreement. Any alteration, amendment, modification, or waiver of any clause or condition of this Agreement is not effective or binding unless made in writing and signed by both parties Authorized Signature representatives. Further, only the Authorized Signature representative or Alternate for the SUBRECIPIENT shall have authority to sign reimbursement requests, certification of project completion, time extension requests, amendment and modification requests, requests for changes to project status, and other requests, certifications and documents authorized by or required under this Agreement.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**A.18 LOSS OR REDUCTION OF FUNDING**

In the event funding from state, federal, or other sources is withdrawn, reduced, or limited in any way after the effective date of this Agreement and prior to normal completion or end date, the DEPARTMENT may unilaterally reduce the scope of work and budget or unilaterally terminate or suspend all or part of the Agreement as a "Termination for Cause" without providing the SUBRECIPIENT an opportunity to cure. Alternatively, the parties may renegotiate the terms of this Agreement under "Amendments and Modifications" to comply with new funding limitations and conditions, although the DEPARTMENT has no obligation to do so.

**A.19 NONASSIGNABILITY**

Neither this Agreement, nor any claim arising under this Agreement, shall be transferred or assigned by the SUBRECIPIENT.

**A.20 NONDISCRIMINATION**

The SUBRECIPIENT shall comply with all applicable federal and state non-discrimination laws, regulations, and policies. No person shall, on the grounds of age, race, creed, color, sex, sexual orientation, religion, national origin, marital status, honorably discharged veteran or military status, or disability (physical, mental, or sensory) be denied the benefits of, or otherwise be subjected to discrimination under any project, program, or activity, funded, in whole or in part, under this Agreement.

**A.21 NOTICES**

The SUBRECIPIENT shall comply with all public notices or notices to individuals required by applicable local, state and federal laws and shall maintain a record of this compliance.

**A.22 OCCUPATIONAL SAFETY/HEALTH ACT and WASHINGTON INDUSTRIAL SAFETY/ HEALTH ACT (OSHA/WISHA)**

The SUBRECIPIENT represents and warrants that its workplace does now or will meet all applicable federal and state safety and health regulations that are in effect during the SUBRECIPIENT's performance under this Agreement. To the extent allowed by law, the SUBRECIPIENT further agrees to indemnify and hold harmless the DEPARTMENT and its employees and agents from all liability, damages and costs of any nature, including but not limited to, costs of suits and attorneys' fees assessed against the DEPARTMENT, as a result of the failure of the SUBRECIPIENT to so comply.

**A.23 OWNERSHIP OF PROJECT/CAPITAL FACILITIES**

The DEPARTMENT makes no claim to any capital facilities or real property improved or constructed with funds under this Agreement, and by this grant of funds does not and will not acquire any ownership interest or title to such property of the SUBRECIPIENT. The SUBRECIPIENT shall assume all liabilities arising from the ownership and operation of the project and agrees to hold the DEPARTMENT and the State of Washington and the United States government harmless from any and all causes of action arising from the ownership and operation of the project.

**A.24 POLITICAL ACTIVITY**

No portion of the funds provided herein shall be used for any partisan political activity or to further the election or defeat of any candidate for public office or influence the approval or defeat of any ballot issue.

**A.25 PRIVACY**

Personal information collected, used or acquired in connection with this Agreement shall be used solely for the purposes of this Agreement. SUBRECIPIENT and its subcontractors agree not to release, divulge, publish, transfer, sell or otherwise make known to unauthorized persons personal information without the express written consent of the DEPARTMENT or as provided by law or court order. SUBRECIPIENT agrees to implement physical, electronic and managerial safeguards to prevent unauthorized access to personal information.

The DEPARTMENT reserves the right to monitor, audit, or investigate the use of personal information collected, used or acquired by the SUBRECIPIENT through this Agreement. The monitoring, auditing or investigating may include but is not limited to "salting" by the DEPARTMENT. Salting is the act of placing a record containing unique but false information in a database that can be used later to identify inappropriate disclosure of data contained in the database.

Any breach of this provision may result in termination of the Agreement and the demand for return of all personal information. The SUBRECIPIENT agrees to indemnify and hold harmless the DEPARTMENT for any damages related to the SUBRECIPIENT's unauthorized use, loss or disclosure of personal information.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

For purposes of this provision, personal information includes, but is not limited to, information identifiable to an individual that relates to a natural person's health, finances, education, business, use or receipt of governmental services, or other activities, names, addresses, telephone numbers, social security numbers, driver license numbers, financial profiles, credit card numbers, financial identifiers and other identifying numbers.

**A.26 PROHIBITION AGAINST PAYMENT OF BONUS OR COMMISSION**

The assistance provided under this Agreement shall not be used in payment of any bonus or commission for the purpose of obtaining approval of the application for such assistance or any other approval or concurrence under this Agreement provided; however, that reasonable fees or bona fide technical consultant, managerial, or other such services, other than actual solicitation, are not hereby prohibited if otherwise eligible as project costs.

**A.27 PUBLICITY**

The SUBRECIPIENT agrees to submit to the DEPARTMENT prior to issuance all advertising and publicity matters relating to this Agreement wherein the DEPARTMENT's name is mentioned or language used from which the connection of the DEPARTMENT's name may, in the DEPARTMENT's judgment, be inferred or implied. The SUBRECIPIENT agrees not to publish or use such advertising and publicity matters without the prior written consent of the DEPARTMENT. The SUBRECIPIENT may copyright original work it develops in the course of or under this Agreement; however, pursuant to 2 CFR Part 200.315, FEMA reserves a royalty-free, nonexclusive, and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use the work for government purposes.

The SUBRECIPIENT shall include language which acknowledges the funding contribution of the DEPARTMENT and FEMA to this project in any release or other publication developed or modified for, or referring to, the project.

Publication resulting from work performed under this Agreement shall include an acknowledgement of the DEPARTMENT and FEMA's financial support, by CFDA number, and a statement that the publication does not constitute an endorsement by FEMA or reflect FEMA's views.

**A.28 RECAPTURE PROVISION**

In the event the SUBRECIPIENT fails to expend funds under this Agreement in accordance with applicable federal, state, and local laws, regulations, and/or the provisions of the Agreement, the DEPARTMENT reserves the right to recapture funds in an amount equivalent to the extent of noncompliance. Such right of recapture shall exist for the life of the project following Agreement termination. Repayment by the SUBRECIPIENT of funds under this recapture provision shall occur within 30 days of demand. In the event the DEPARTMENT is required to institute legal proceedings to enforce the recapture provision, the DEPARTMENT shall be entitled to its costs and expenses thereof, including attorney fees.

**A.29 RECORDS AND REPORTS**

a. The SUBRECIPIENT agrees to maintain all books, records, documents, receipts, invoices and all other electronic or written records necessary to sufficiently and properly reflect the SUBRECIPIENT's contracts, subawards, grant administration, and payments, including all direct and indirect charges, and expenditures in the performance of this Agreement (the "records").

b. The SUBRECIPIENT's records related to this Agreement and the projects funded may be inspected and audited by the DEPARTMENT or its designee, by the Office of the State Auditor, DHS, FEMA or their designees, by the Comptroller General of the United States or its designees, or by other state or federal officials authorized by law, for the purposes of determining compliance by the SUBRECIPIENT with the terms of this Agreement and to determine the appropriate level of funding to be paid under the Agreement.

c. The records shall be made available by the SUBRECIPIENT for such inspection and audit, together with suitable space for such purpose, at any and all times during the SUBRECIPIENT's normal working day.

d. The SUBRECIPIENT shall retain and allow access to all records related to this Agreement and the funded project(s) for a period of at least six (6) years following final payment and closure of the grant under this Agreement. Despite the minimum federal retention requirement of three (3) years, the more stringent State requirement of six (6) year must be followed.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**A.30 RECOVERY OF FUNDS**

Any person who intentionally causes a condition for which funds are provided under this Agreement shall be liable for the costs incurred by the state and federal governments in responding to such disaster. In addition to its own duty to recover duplicated funds or funds expended due to the intentional or negligent actions of others. SUBRECIPIENT will cooperate in a reasonable manner with the DEPARTMENT and the United States in efforts to recover expenditures under this Grant Agreement.

**A.31 RESPONSIBILITY FOR PROJECT/STATEMENT OF WORK/WORK PLAN**

While the DEPARTMENT undertakes to assist the SUBRECIPIENT with the project/statement of work/work plan (project) by providing grant funds pursuant to this Agreement, the project itself remains the sole responsibility of the SUBRECIPIENT. The DEPARTMENT undertakes no responsibility to the SUBRECIPIENT, or to any third party, other than as is expressly set out in this Agreement.

The responsibility for the design, development, construction, implementation, operation and maintenance of the project, as these phrases are applicable to this project, is solely that of the SUBRECIPIENT, as is responsibility for any claim or suit of any nature by any third party related in any way to the project.

Prior to the start of any construction activity, the SUBRECIPIENT shall ensure that all applicable Federal, State, and local permits and clearances are obtained, including but not limited to FEMA compliance with the National Environmental Policy Act, the National Historic Preservation Act, the Endangered Species Act, and all other environmental laws and executive orders.

The SUBRECIPIENT shall defend, at its own cost, any and all claims or suits at law or in equity, which may be brought against the SUBRECIPIENT in connection with the project. The SUBRECIPIENT shall not look to the DEPARTMENT, or to any state or federal agency, or to any of their employees or agents, for any performance, assistance, or any payment or indemnity, including but not limited to cost of defense and/or attorneys' fees, in connection with any claim or lawsuit brought by any third party related to any design, development, construction, implementation, operation and/or maintenance of a project.

**A.32 SEVERABILITY**

If any court of rightful jurisdiction holds any provision or condition under this Agreement or its application to any person or circumstances invalid, this invalidity does not affect other provisions, terms or conditions of the Agreement, which can be given effect without the invalid provision. To this end, the terms and conditions of this Agreement are declared severable.

**A.33 SINGLE AUDIT ACT REQUIREMENTS (including all AMENDMENTS)**

Non-federal entities as subrecipients that expend **$750,000** or more in one fiscal year of federal funds from all sources, direct and indirect, are required to have a single or a program-specific audit conducted in accordance with 2 CFR Part 200 Subpart F. Non-federal entities that spend less than **$750,000** a year in federal awards are exempt from federal audit requirements for that year, except as noted in 2 CFR Part 200 Subpart F. As defined in 2 CFR Part 200, the term "non-federal entity" means a State, local government, Indian Tribe, institution of higher education, or non-profit organization that carries out a federal award as a recipient or SUBRECIPIENT.

SUBRECIPIENTs that are required to have an audit must ensure the audit is performed in accordance with Generally Accepted Government Auditing Standards (GAGAS) as found in the Government Auditing Standards (the Revised Yellow Book) developed by the United States Comptroller General and the OMB Compliance Supplement. The SUBRECIPIENT has the responsibility of notifying its auditor and requesting an audit in compliance with 2 CFR Part 200 Subpart F, to include the Washington State Auditor's Office, a federal auditor, or a public accountant performing work using GAGAS, as appropriate. Costs of the audit may be an allowable grant expenditure as authorized by 2 CFR Part 200 Subpart F.

The SUBRECIPIENT shall maintain auditable records and accounts so as to facilitate the audit requirement and shall ensure that any SUBRECIPIENTS or contractors also maintain auditable records.

The SUBRECIPIENT is responsible for any audit exceptions incurred by its own organization or that of its subcontractors. Responses to any unresolved management findings and disallowed or questioned costs shall be included with the audit report.

The SUBRECIPIENT must respond to DEPARTMENT requests for information or corrective action concerning audit issues or findings within 30 days of the date of request. The DEPARTMENT reserves the right to recover from the SUBRECIPIENT all disallowed costs resulting from the audit.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Once the single audit has been completed and includes and audit findings, the SUBRECIPIENT must send a full copy of the audit to the DEPARTMENT and its corrective action plan no later than nine (9) months after the end of the SUBRECIPIENT's fiscal year(s) to:

**Contracts.Office@mil.wa.gov**
**Subject: City of Lacey, Single Audit and Corrective Action Plan**

**OR**

**Contracts Office**
**Washington Military Department**
**Finance Division, Building #1 TA-20**
**Camp Murray, WA 98430-5032**

If Contractor claims it is exempt from the audit requirements of 2 CFR Part 200 Subpart F, the SUBRECIPIENT must send a letter identifying this Agreement and explaining the criteria for exemption no later than nine (9) months after the end of the SUBRECIPIENT's fiscal year(s) to the address listed above.

The DEPARTMENT retains the sole discretion to determine whether a valid claim for an exemption from the audit requirements of this provision has been established.

The SUBRECIPIENT shall include the above audit requirements in any subawards.

Conducting a single or program-specific audit in compliance with 2 CFR Part 200 Subpart F is a material requirement of this Agreement. In the absence of a valid claim of exemption from the audit requirements of 2 CFR Part 200 Subpart F, the SUBRECIPIENT's failure to comply with said audit requirements may result in one or more of the following actions in the DEPARTMENT's sole discretion: a percentage of federal awards being withheld until the audit is completed in accordance with 2 CFR Part 200 Subpart F; the withholding or disallowing of overhead costs; the suspension of federal awards until the audit is conducted and submitted; or termination of the federal award.

**A.34 SUBRECIPIENT NOT EMPLOYEE**

The parties intend that an independent contractor relationship will be created by this Agreement. The SUBRECIPIENT, and/or employees or agents performing under this Agreement are not employees or agents of the DEPARTMENT in any manner whatsoever. The SUBRECIPIENT will not be presented as nor claim to be an officer or employee of the DEPARTMENT or of the State of Washington by reason of this Agreement, nor will the SUBRECIPIENT make any claim, demand, or application to or for any right or privilege applicable to an officer or employee of the DEPARTMENT or of the State of Washington by reason of this Agreement, including, but not limited to, Workmen's Compensation coverage, unemployment insurance benefits, social security benefits, retirement membership or credit, or privilege or benefit which would accrue to a civil service employee under Chapter 41.06 RCW.

It is understood that if the SUBRECIPIENT is another state department, state agency, state university, state college, state community college, state board, or state commission, that the officers and employees are employed by the State of Washington in their own right and not by reason of this Agreement.

**A.35 TAXES, FEES AND LICENSES**

Unless otherwise provided in this Agreement, the SUBRECIPIENT shall be responsible for, pay and maintain in current status all taxes, unemployment contributions, fees, licenses, assessments, permit charges and expenses of any other kind for the SUBRECIPIENT or its staff required by statute or regulation that are applicable to Agreement performance.

**A.36 TERMINATION FOR CONVENIENCE**

Notwithstanding any provisions of this Agreement, the SUBRECIPIENT may terminate this Agreement by providing written notice of such termination to the DEPARTMENTs Key Personnel identified in the Agreement, specifying the effective date thereof, at least thirty (30) days prior to such date.

Except as otherwise provided in this Agreement, the DEPARTMENT, in its sole discretion and in the best interests of the State of Washington, may terminate this Agreement in whole or in part by providing ten (10) calendar days written notice, beginning on the second day after e-mailing to the SUBRECIPIENT.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Upon notice of termination for convenience, the DEPARTMENT reserves the right to suspend all or part of the Agreement, withhold further payments, or prohibit the SUBRECIPIENT from incurring additional obligations of funds. In the event of termination, the SUBRECIPIENT shall be liable for all damages as authorized by law. The rights and remedies of the DEPARTMENT provided for in this section shall not be exclusive and are in addition to any other rights and remedies provided by law.

**A.37 TERMINATION OR SUSPENSION FOR CAUSE**

In the event the DEPARTMENT, in its sole discretion, determines the SUBRECIPIENT has failed to fulfill in a timely and proper manner its obligations under this Agreement, is in an unsound financial condition so as to endanger performance hereunder, is in violation of any laws or regulations that render the SUBRECIPIENT unable to perform any aspect of the Agreement, or has violated any of the covenants, agreements or stipulations of this Agreement, the DEPARTMENT has the right to immediately suspend or terminate this Agreement in whole or in part.

The DEPARTMENT may notify the SUBRECIPIENT in writing of the need to take corrective action and provide a period of time in which to cure. The DEPARTMENT is not required to allow the SUBRECIPIENT an opportunity to cure if it is not feasible as determined solely within the DEPARTMENT's discretion. Any time allowed for cure shall not diminish or eliminate the SUBRECIPIENT's liability for damages or otherwise affect any other remedies available to the DEPARTMENT. If the DEPARTMENT allows the SUBRECIPIENT an opportunity to cure, the DEPARTMENT shall notify the SUBRECIPIENT in writing of the need to take corrective action. If the corrective action is not taken within ten (10) calendar days or as otherwise specified by the DEPARTMENT, or if such corrective action is deemed by the DEPARTMENT to be insufficient, the Agreement may be terminated in whole or in part.

The DEPARTMENT reserves the right to suspend all or part of the Agreement, withhold further payments, or prohibit the SUBRECIPIENT from incurring additional obligations of funds during investigation of the alleged compliance breach, pending corrective action by the SUBRECIPIENT, if allowed, or pending a decision by the DEPARTMENT to terminate the Agreement in whole or in part.

In the event of termination, the SUBRECIPIENT shall be liable for all damages as authorized by law, including but not limited to, any cost difference between the original Agreement and the replacement or cover Agreement and all administrative costs directly related to the replacement Agreement, e.g., cost of administering the competitive solicitation process, mailing, advertising and other associated staff time. The rights and remedies of the DEPARTMENT provided for in this section shall not be exclusive and are in addition to any other rights and remedies provided by law.

If it is determined that the SUBRECIPIENT: (1) was not in default or material breach, or (2) failure to perform was outside of the SUBRECIPIENT's control, fault or negligence, the termination shall be deemed to be a "Termination for Convenience".

**A.38 TERMINATION PROCEDURES**

In addition to the procedures set forth below, if the DEPARTMENT terminates this Agreement, the SUBRECIPIENT shall follow any procedures specified in the termination notice. Upon termination of this Agreement and in addition to any other rights provided in this Agreement, the DEPARTMENT may require the SUBRECIPIENT to deliver to the DEPARTMENT any property specifically produced or acquired for the performance of such part of this Agreement as has been terminated.

If the termination is for convenience, the DEPARTMENT shall pay to the SUBRECIPIENT the agreed upon price, if separately stated, for properly authorized and completed work and services rendered or goods delivered to and accepted by the DEPARTMENT prior to the effective date of Agreement termination, and the amount agreed upon by the SUBRECIPIENT and the DEPARTMENT for (i) completed work and services and/or equipment or supplies provided for which no separate price is stated, (ii) partially completed work and services and/or equipment or supplies provided which are accepted by the DEPARTMENT, (iii) other work, services and/or equipment or supplies which are accepted by the DEPARTMENT, and (iv) the protection and preservation of property.

Failure to agree with such amounts shall be a dispute within the meaning of the "Disputes" clause of this Agreement. If the termination is for cause, the DEPARTMENT shall determine the extent of the liability of the DEPARTMENT. The DEPARTMENT shall have no other obligation to the SUBRECIPIENT for termination. The DEPARTMENT may withhold from any amounts due the SUBRECIPIENT such sum as the DEPARTMENT determines to be necessary to protect the DEPARTMENT against potential loss or liability.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

The rights and remedies of the DEPARTMENT provided in this Agreement shall not be exclusive and are in addition to any other rights and remedies provided by law.

After receipt of a notice of termination, and except as otherwise directed by the DEPARTMENT in writing, the SUBRECIPIENT shall:

a. Stop work under the Agreement on the date, and to the extent specified, in the notice;
b. Place no further orders or sub-contracts for materials, services, supplies, equipment and/or facilities in relation to this Agreement except as may be necessary for completion of such portion of the work under the Agreement as is not terminated;
c. Assign to the DEPARTMENT, in the manner, at the times, and to the extent directed by the DEPARTMENT, all of the rights, title, and interest of the SUBRECIPIENT under the orders and sub-contracts so terminated, in which case the DEPARTMENT has the right, at its discretion, to settle or pay any or all claims arising out of the termination of such orders and contracts;
d. Settle all outstanding liabilities and all claims arising out of such termination of orders and sub-contracts, with the approval or ratification of the DEPARTMENT to the extent the DEPARTMENT may require, which approval or ratification shall be final for all the purposes of this clause;
e. Transfer title to the DEPARTMENT and deliver in the manner, at the times, and to the extent directed by the DEPATMENT any property which, if the Agreement had been completed, would have been required to be furnished to the DEPARTMENT;
f. Complete performance of such part of the work as shall not have been terminated by the DEPARTMENT in compliance with all contractual requirements; and
g. Take such action as may be necessary, or as the DEPARTMENT may require, for the protection and preservation of the property related to this Agreement which is in the possession of the SUBRECIPIENT and in which the DEPARTMENT has or may acquire an interest.

**A.39 UTILIZATION OF MINORITY AND WOMEN BUSINESS ENTERPRISES (MWBE)**

The SUBRECIPIENT shall comply with 2 CFR §200.321 and will take all necessary affirmative steps to assure that minority firms, women's business enterprises, and labor surplus area firms are used when possible and will take all necessary affirmative steps to utilize business firms that are certified as minority-owned and/or women-owned in carrying out the purposes of this Agreement. The following steps are required by the SUBRECIPIENT if any contracts with contractors or sub-contractors are entered into under the original contract award:

a. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
b. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;
c. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises;
d. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and
e. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

The SUBRECIPIENT may also set utilization standards, based upon local conditions or may utilize the State of Washington MWBE goals, as identified in. WAC 326-30-041.

**A.40 VENUE**

This Agreement shall be construed and enforced in accordance with, and the validity and performance shall be governed by the laws of the State of Washington. Venue of any suit between the parties arising out of this Agreement shall be the Superior Court of Thurston County, Washington. The SUBRECIPIENT, by execution of this Agreement acknowledges the jurisdiction of the courts of the State of Washington.

**A.41 WAIVERS**

No conditions or provisions of this Agreement can be waived unless approved in advance by the DEPARTMENT in writing. The DEPARTMENT's failure to insist upon strict performance of any provision of the Agreement or to exercise any right based upon a breach thereof, or the acceptance of any performance during such breach, shall not constitute a waiver of any right under this Agreement.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Docusign Envelope ID: 9D41F677-6052-4281-A550-AFD444CCA029



## STATEMENT OF WORK AND/OR DESCRIPTION OF PROJECT

SUBRECIPIENT: City of Lacey
PROJECT TITLE: City of Lacey Hawks Prairie Reservoir Seismic Analysis and Retrofit

The purpose of this project is for City of Lacey to conduct a seismic analysis and retrofit the City of Lacey's Hawks Prairie reservoir to meet current seismic performance codes.

Work activities associated with this seismic retrofit will include:

1) Updates to the piping and to the foundation
2) Anchorage
3) Installation of steel stiffeners
4) Replacing existing bearing plate connections
5) Portions of exterior and interior coating repair (only areas directly impacted by the retrofit work)

All other activities related to the overall project will be funded by the City's water utility.

Site location: 4040 Marvin Rd NE Lacey, WA (47.089872, -122.779990)

A specific and more detailed scope of work is found in the FEMA approved Project Application 4584-04-R, which is incorporated herein by reference.

**City of Lacey Agrees To:**

1. Comply with the terms of this Agreement and all Attachments, including but not limited to, accomplish tasks and conditions outlined in the Statement of Work And/Or Description of Project (Attachment 3), comply with the Project Development Schedule-Attachment 4, and comply with the Project Budget (Attachment 5).
2. Submit quarterly reports that cover the previous three months no later than the 15th of the following month (or the next work day) in January, April, July and October until all requirements are fulfilled. Quarterly reports are required regardless of the level of work completed during the reporting period. Quarterly reports must include sufficient narrative to determine the degree to which the project has been implemented, the estimated time for completion, and significant developments such as delays or adverse conditions that might raise costs or delay completion, as well as favorable conditions allowing lower costs or earlier completion. Failure of the SUBRECIPIENT to submit a complete quarterly report within 15 days following the end of the quarter will result in suspension of all payments until a complete quarterly report is received by the DEPARTMENT. SUBRECIPIENT is required to return all final closeout documentation to the DEPARTMENT within 45 days following the Period of Performance End Date determined by FEMA's Notice of Award. The DEPARTMENT reserves the right to withhold the final reimbursement request until final closeout documentation is submitted by the SUBRECIPIENT to the satisfaction of the DEPARTMENT. No final reimbursements shall be paid if submitted more than 60 days after the Period of Performance End Date.
3. Submit pen-and-ink signed, approved invoice vouchers (state form A-19) for eligible, reimbursable work completed, no more frequently than monthly and no less frequently than quarterly. Each billing must identify the task(s) completed and any other funding identification pertinent to the task(s), including match. Supporting documentation is required for all costs, to include tracking of staff time spent on the project through timesheets or other documentation approved by the DEPARTMENT; dated invoices from all contractors and subcontractors for work completed; dated invoices for goods and services purchased; and documentation tracking in-kind contributions of personnel, equipment and supplies, if used on the project. Project costs must be tracked and reported by approved budget cost categories as found in Project Budget, Attachment 5. Documentation of expenditures by approved budget cost categories should be made on a separate spreadsheet or table and included with each A-19, along with documentation to substantiate all project costs.
4. Return by DEPARTMENT staff of invoices to the SUBRECIPIENT if the SUBRECIPIENT is unable to provide sufficient documentation to staff within 15 calendar days of the staff's written request for additional documentation to support the reimbursement request.
5. Submit a signed final project report before final reimbursement is made by the DEPARTMENT.
6. PROGRAMMATIC, ENVIRONMENTAL AND HISTORIC PRESERVATION CONDITIONS



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

In completing this project, the SUBRECIPIENT must adhere to the following programmatic, environmental and historic preservation conditions:

a. Scope of Work Change: Requests for changes to the Scope of Work after grant award are permissible as long as they do not change the nature or total project cost of the activity, properties identified in the application, the feasibility and effectiveness of the project, or reduce the Benefit Cost Ratio below 1.0. Requests must be supported by adequate justification, including a description of the proposed change; a written explanation of the reason or reasons for the change; an outline of remaining funds available to support the change; and a full description of the work necessary to complete the activity.

   A proposed change to the approved Scope of Work (as presented in the FEMA approved project application) must be submitted to the DEPARTMENT and FEMA in advance of implementation for re-evaluation for compliance with National Environmental Policy Act (NEPA) and other Laws and Executive Orders. Prior approval for a change to the approved Scope of Work must be obtained from the DEPARTMENT and FEMA before the change is implemented. Failure to obtain prior approval for a revised Scope of Work could result in ineligibility of resulting costs.

b. Comply with all applicable federal, state and local laws and regulations. Failure to obtain all appropriate federal, state and local environmental permits and clearances may jeopardize federal funding provided by this Agreement.

c. Ensure that all completed work is in compliance with applicable state and local buildings codes and flood damage prevention legislation.

d. Monitor site work during ground-disturbing activities for evidence of potential archaeological resources that are uncovered. SUBRECIPIENT must halt the project in the event historically or archaeologically significant materials or sites (or evidence thereof) are discovered. By way of example, such evidence may include, but is not limited to, artifacts such as arrowheads, bone fragments, pottery shards, and features such as fire pits or structural elements. All reasonable measures must be taken to avoid or minimize harm to such resources until such time as the SUBRECIPIENT notifies the DEPARTMENT, and FEMA, in consultation with the State Historic Preservation Officer (SHPO) and appropriate Native American tribes, determines appropriate measures have been taken to ensure that the project is in compliance with the National Historic Preservation Act. In addition, upon discovery of human skeletal remains, the SUBRECIPIENT is required by state law to notify the county coroner and local law enforcement in the most expeditious manner possible and to immediately stop any activity which may cause further ground disturbance.

e. Determine the presence of hazardous materials and/or toxic waste, and identifying, handling, managing, abating and disposing of such materials in accordance with the requirements and to the satisfaction of the governing local, state and federal agencies, including but not limited to the Washington Department of Ecology. Such materials may include, but are not limited to, asbestos, lead-based paint, propane cylinders, sand blasting residue, discarded paints and solvents, cleaning chemicals, containers of pesticides, lead-acid batteries, items containing chlorofluorocarbons (CFCs), motor oil and used oil filters, and unlabeled tanks or containers.

f. Conduct work during the non-flood season as determined by the local floodplain administrator. However, should construction be required during the flood season, as determined by the local floodplain administrator, all construction equipment shall be staged in an area not susceptible to flood events or be readily transportable out of the floodplain to minimize flood damage.

g. Dispose of all debris at an approved and permitted location. No debris shall be temporarily staged or disposed of in a floodplain and/or a wetland.

h. Confirm with the State Department of Ecology whether this project will require a consistency determination under the Coastal Zone Management Act. If required, the SUBRECIPIENT shall obtain and comply with all requirements of the determination prior to starting the project.

i. Select, implement, monitor, and maintain Best Management Practices (BMPs) to control soil erosion and sedimentation, reduce spills and pollution, and provide habitat protection. The acquisition site shall be stabilized from erosion and silt laden runoff by implementing these BMPs and securing the site from transient vehicle access. Any excavation and/or grading shall be done within and/or adjacent to the existing building footprint area and not beyond undisturbed portions of the site.

j. Resubmit the project to the DEPARTMENT and FEMA prior to implementation if any in-water work will occur or if any work will occur below the ordinary high water mark of any water resource in the area, so further coordination/consultation can take place with the National Marine Fisheries Service (NMFS) to



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

determine whether appropriate measures have been taken to ensure the project is in compliance with the Endangered Species Act.

k. Resubmit the project to the DEPARTMENT and FEMA for re-evaluation for compliance with national environmental policies if the "Project Limits" (including clearing, excavation, temporary staging, construction, and access areas) extend into: 1) an area not previously identified for environmental and historic preservation review, or 2) previously undisturbed ground. Additionally, all work on the project in these areas must stop until this re-evaluation is completed.

l. National Historic Preservation Act Section 106 requirement: All proposed repair and construction activities on buildings listed in or eligible for the National Register of Historic Places (historic properties) should be done in-kind to match existing materials and form. In-kind means that the result of the proposed activities will match all physical and visual aspects of existing historic materials, including form, color and workmanship. In-kind mortar also will match the strength and joint tooling of existing historic mortar.

**m. <u>Additional requirements as noted by FEMA in grant award document</u>:**

**a. Environmental Conditions of Approval:** April 14, 2022

**i. Special Conditions required on implementation of Projects:**

1. The Applicant shall handle, manage, and dispose of all solid and hazardous waste in accordance with requirements of local, state, and federal laws, regulations, and ordinances. The sub-grantee shall ensure that all debris is separated and disposed in a manner consistent with the WA Dept of Ecology guidelines at a permitted site or landfill.

**ii. Standard Conditions:**

1. Any change to the approved scope of work will require re-evaluation for compliance with NEPA and other Laws and Executive Orders.
2. This review does not address all federal, state and local requirements. Acceptance of federal funding requires recipient to comply with all federal, state and local laws. Failure to obtain all appropriate federal, state and local environmental permits and clearances may jeopardize federal funding.
3. If ground disturbing activities occur during construction, applicant will monitor ground disturbance and if any potential archeological resources are discovered, will immediately cease construction in that area and notify the State and FEMA.

n. Cost overruns in excess of the approval budget are fully the responsibility of the SUBRECIPIENT, including those costs resulting from a change in the Scope of Work. The project must remain cost effective (i.e., Benefit Cost Ratio of 1.0 or greater) in the event of cost overrun.
A request for additional funds to cover a cost overrun may be granted by the DEPARTMENT and FEMA only if funds are available within the HMGP ceiling for this disaster, (FEMA-DR-4584-WA). A request for additional funds must be fully documented and justified.

7. <u>SPECIAL FLOOD HAZARD AREA REQUIREMENTS</u>

Pursuant to the Flood Disaster Protection Act of 1973, those structures that remain in the Special Flood Hazard Area (SFHA) after the implementation of the mitigation project, flood insurance must be maintained for the life of the structure. The SFHA is defined as the land in the floodplain within a community subject to a 1 percent or greater chance of flooding in any given year.

The following National Flood Insurance Program Eligibility Requirements contained in the 2023 Hazard Mitigation Assistance Program and Policy Guide apply to any project involving the alteration of existing structures, to include Mitigation Reconstruction projects that are sited within an SFHA.

a. When the project is implemented, all structures that will not be demolished or relocated out of the SFHA must be covered by a National Flood Insurance Program (NFIP) flood insurance policy to an amount at least equal to the project cost or to the maximum limit of coverage made available with respect to the particular property, whichever is less.

b. The SUBRECIPIENT (or property owner) must legally record with the county or appropriate jurisdiction's land records agency a notice that includes the name of the current property owner (including book/page reference to record of current title, if readily available), a legal description of the property, and the following notice of flood insurance requirements as identified on page 244 of the 2023 Hazard Mitigation Assistance Program and Policy Guide:



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

"This property has received Federal hazard mitigation assistance. Federal law requires that flood insurance coverage on this property must be maintained during the life of the property regardless of transfer of ownership of such property. Pursuant to 42 U.S.C. § 5154a, failure to maintain flood insurance on this property may prohibit the owner from receiving Federal disaster assistance with respect to this property in the event of a flood disaster. The Property Owner is also required to maintain this property in accordance with the floodplain management criteria of 44 CFR § 60.3 and City/County Ordinance."

c. Copies of the recorded notices for each property will be provided to the DEPARTMENT at project closeout.

8. PROVISIONS APPLYING ONLY TO ACQUISITION OF PROPERTIES FOR OPEN SPACE

a. The SUBRECIPIENT must ensure that prospective participants are informed in writing that property owner participation in this acquisition program is voluntary and that the SUBRECIPIENT will not use its eminent domain authority to acquire the property for the project purposes should negotiations fail.

Copies of the Statement of Voluntary Participation signed by each participating property owner will be provided to the DEPARTMENT by project close-out.

b. The SUBRECIPIENT agrees that land acquired for open space purposes under this grant will be restricted in perpetuity to open space uses and will be unavailable for the construction of flood damage reduction levees, transportation facilities, and other incompatible purposes and agrees to comply with the requirements of 44 CFR Part 80 Property Acquisition and Relocation for Open Space.

c. The SUBRECIPIENT agrees to prepare, execute and record Deed Restrictions for each affected property utilizing the current Model Deed Restriction provided on the FEMA website or available from the DEPARTMENT.

Copies of the recorded deed and attached deed restrictions for each property will be provided to the DEPARTMENT by project close-out.

d. The SUBRECIPIENT accepts all of the requirements of the deed restriction governing the use of the land.

e. The SUBRECIPIENT ensures that, prior to acquisition of the property, in consultation with the U.S. Army Corps of Engineers, it has addressed and considered the potential future use of these lands for the construction of flood damage reduction levees, has rejected consideration of such measures in the future in the project area, and instead has chosen to proceed with acquisition of permanent open space.

Documentation of this consultation and the SUBRECIPIENT's consideration of this issue will be provided to the DEPARTMENT by project close-out.

f. The SUBRECIPIENT must, prior to acquisition of the property, consult with the Washington State Department of Transportation to ensure that no future planned improvements or enhancements are under consideration that will affect the proposed project area.

Documentation of this consultation will be provided to the DEPARTMENT by project close-out.

g. The SUBRECIPIENT will remove existing buildings from acquired properties within 90 days of settlement. The SUBRECIPIENT will provide confirmation to the DEPARTMENT as to the date of demolition of each structure included in the project in its quarterly reports, as well as confirmation that the property has been returned to "natural" or park/open space condition.

The SUBRECIPIENT will provide digital latitude and longitude coordinates and digital photographs of each property site after project implementation to the DEPARTMENT by project close-out.

h. The SUBRECIPIENT agrees to complete FEMA Form AW-501, NFIP Repetitive Loss Update Worksheet for each property identified on FEMA's Repetitive Loss list to document completion of mitigation on the property. The form is available on FEMA's Web site or available from the DEPARTMENT.

The SUBRECIPIENT will provide a copy of the completed form to the DEPARTMENT by project close-out.

i. The SUBRECIPIENT agrees to comply with the requirements of 44 CFR § 80.19 Land Use and Oversight, which are incorporated into these conditions by reference. These requirements include, but are not limited to, the following (which are described further in the 2023 Hazard Mitigation Assistance Program and Policy Guide which are incorporated herein by reference):

1. Restriction on future disaster assistance for damages to the property.
2. Lists of allowable open space uses as well as uses generally not allowed on acquired open space land.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

3. Provision for salvage of pre-existing structures and paved areas.
4. Requirements pertaining to future transfer of property interest.
5. Requirement for SUBRECIPIENT monitoring and inspection of the acquired property at least every 3 years. The SUBRECIPIENT will provide the DEPARTMENT with a report on the result of the inspection within 90 days of the inspection.
6. Provisions for enforcement of violation of open space requirements.

**The Military Department Agrees To:**

1. Provide staff coordination and input regarding grant administration for funding and technical assistance for project and reviews for mitigation construction projects, as necessary.
2. Except as otherwise provided in Article II, A.4, of this Agreement, reimburse City of Lacey within 45 days of receipt and approval of signed, dated invoice voucher(s) (state form A-19) with sufficient documentation of costs to include completion of tasks to date and dated invoices for goods and services purchased. Costs must be categorized according to the budget item and cost classification shown in the Project Budget, Attachment 5. The DEPARTMENT will return invoices to the SUBRECIPIENT if the SUBRECIPIENT is unable to provide sufficient documentation within 15 calendar days of the DEPARTMENT's request for additional documentation to support the reimbursement request. Any reimbursement requests that are returned to the SUBRECIPIENT and are not returned within the 15 calendar days will be required to submit a revised reimbursement request with a new signature and date.
3. Coordinate with the staff of City of Lacey to schedule any sub-recipient monitoring, site visits or final inspections by DEPARTMENT staff.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Attachment 4**

## PROJECT DEVELOPMENT SCHEDULE

SUBRECIPIENT: City of Lacey
PROJECT TITLE: City of Lacey Hawks Prairie Reservoir Seismic Analysis and Retrofit

| *DESCRIPTION OF ACTIVITY/TASK* | *SCHEDULED COMPLETION DATE (months)* |
|---|---|
| Seismic Report & BCA | 2 Months |
| Design & Permitting to 30%, 60%, & 90% Design and Review | 16 Months |
| Bid & Award | 2 Months |
| Construction | 14 Months |
| Project Closeout | 3 Months |
| Total Time Required to Complete This Project: 36 months | |
| Quarterly Reports Due on Project Progress, Final Project Report and all documentation, site visits and inspections. | July 15, 2024;<br>October 15, 2024;<br>January 15, 2025;<br>April 15, 2025;<br>July 15, 2025;<br>October 15, 2025;<br>**January 15, 2026 (Final Report)** |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**Attachment 5**

## PROJECT BUDGET

SUBRECIPIENT: City of Lacey
PROJECT TITLE: City of Lacey Hawks Prairie Reservoir Seismic Analysis and Retrofit

| *APPROVED BUDGET CATEGORY* | *ESTIMATED COST* |
|---|---|
| Pre-Award Costs | $163,120.32 |
| Architectural, Engineering, Geotechnical, Etc. | $742,214.01 |
| Construction | $2,683,000.00 |
| Site Work | $150,000.00 |
| Miscellaneous | $260,251.00 |
| *Project Total* | *$3,998,585.33* |
| SubMC – This category is restricted to eligible grant administration costs, including indirect costs, and is limited to 5% of eligible *project* expenditures. The amount shown here reflects the maximum amount available, based on the approved project budget. | $199,929.26 |
| **TOTAL (Project Total + SubMC):** | **$4,198,514.59** |

**Tracking and Reporting Project Costs**: Project expenses for which reimbursement is sought must be tracked and reported by approved budget cost categories, above. Documentation of expenditures by approved budget cost categories should be made on a separate spreadsheet or table and included with each A-19. Supporting documentation of all costs shall include, but not be limited to: tracking of staff time spent on the project through timesheets or other similar documentation; dated invoices from contractors and subcontractors for work completed; dated invoices for goods and services purchased; and documentation of in-kind contributions of personnel, equipment and supplies.

**Final Payment:** Final payment of any remaining, or withheld, funds will be made upon submission by the SUBRECIPIENT within 60 days of completion of the project of the final report and an A-19, Voucher Distribution, and completion of all final inspections by the DEPARTMENT. Final payment also may be conditioned upon a financial review, if determined necessary by the DEPARTMENT. Adjustments to the final payment may be made following any audits conducted by the DEPARTMENT, Washington State Auditor's Office, the United States Inspector General, or their authorized representatives.

A request for additional funds to cover a cost overrun may be granted by the DEPARTMENT and FEMA only if funds are available within the HMGP ceiling for this disaster, (FEMA-DR-4584-WA). A request for additional funds must be fully documented and justified.



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# SIGNATURE AUTHORIZATION FORM

WASHINGTON STATE MILITARY DEPARTMENT
Camp Murray, Washington 98430-5122

*Please read instructions on reverse side before completing this form.*

| NAME OF ORGANIZATION | DATE SUBMITTED |
|---|---|
| City of Lacey | |
| **PROJECT DESCRIPTION** | **CONTRACT NUMBER** |
| Hawks Prairie Reservoir Rehabilitation | PW 2021-19 |

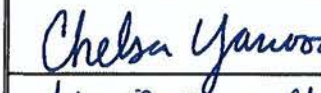
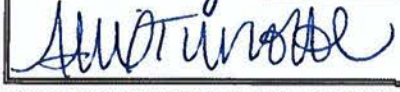
1. AUTHORIZING AUTHORITY

| SIGNATURE | PRINT OR TYPE NAME | TITLE/TERM OF OFFICE |
|---|---|---|
|  | Rick Walk | City Manager |
| | | |
| | | |

2. AUTHORIZED TO SIGN CONTRACTS/CONTRACT AMENDMENTS

| SIGNATURE | PRINT OR TYPE NAME | TITLE |
|---|---|---|
|  | Rick Walk | City Manager |
| | | |
| | | |

3. AUTHORIZED TO SIGN REQUESTS FOR REIMBURSEMENT

| SIGNATURE | PRINT OR TYPE NAME | TITLE |
|---|---|---|
|  | Chelsea Yarwood | Accounting Manager |
|  | Alix Turcotte | Senior Accountant |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Washington Military Department Contract Number:_____

# Debarment, Suspension, Ineligibility or Voluntary Exclusion Certification Form

| NAME<br>City of Lacey | | Doing business as (DBA)<br>City of Lacey | |
|---|---|---|---|
| ADDRESS<br>420 College St SE, Lacey WA 98503 | **Applicable Procurement or Solicitation #, if any:** | WA Uniform Business Identifier (UBI)<br>349001275 | Federal Employer Tax Identification #:<br>91-0819427 |
| **This certification is submitted as part of a request to contract.** | | | |

## Instructions For Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions

**READ CAREFULLY BEFORE SIGNING THE CERTIFICATION. Federal regulations require contractors and bidders to sign and abide by the terms of this certification, without modification, in order to participate in certain transactions directly or indirectly involving federal funds.**

1. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the department, institution or office to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or had become erroneous by reason of changed circumstances.
4. The terms covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded, as used in this clause, have the meaning set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is proposed for debarment under the applicable CFR, debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
6. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled ``Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction,'' without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not proposed for debarment under applicable CFR, debarred, suspended, ineligible, or voluntarily excluded from covered transactions, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the List of Parties Excluded from Federal Procurement and Non-procurement Programs.
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business activity.
9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is proposed for debarment under applicable CFR, suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

## Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions

**The prospective lower tier participant certifies, by submission of this proposal or contract, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this form.**

Bidder or Contractor Signature: _____ Date: 9/25/2024

Print Name and Title: Rick Walk, City Manager

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

Washington Military Department Contract Number:_____

# FEDERAL DEBARMENT, SUSPENSION INELIGIBILITY and VOLUNTARY EXCLUSION

## (FREQUENTLY ASKED QUESTIONS)

**What is "Debarment, Suspension, Ineligibility, and Voluntary Exclusion"?**
These terms refer to the status of a person or company that cannot contract with or receive grants from a federal agency.

In order to be debarred, suspended, ineligible, or voluntarily excluded, you must have:

- had a contract or grant with a federal agency, and
- gone through some process where the federal agency notified or attempted to notify you that you could not contract with the federal agency.
- Generally, this process occurs where you, the contractor, are not qualified or are not adequately performing under a contract, or have violated a regulation or law pertaining to the contract.

**Why am I required to sign this certification?**
You are requesting a contract or grant with the Washington Military Department. Federal law (Executive Order 12549) requires Washington Military Department ensure that persons or companies that contract with Washington Military Department are not prohibited from having federal contracts.

**What is Executive Order 12549?**
Executive Order 12549 refers to Federal Executive Order Number 12549. The executive order was signed by the President and directed federal agencies to ensure that federal agencies, and any state or other agency receiving federal funds were not contracting or awarding grants to persons, organizations, or companies who have been excluded from participating in federal contracts or grants. Federal agencies have codified this requirement in their individual agency Code of Federal Regulations (CFRs).

**What is the purpose of this certification?**
The purpose of the certification is for you to tell Washington Military Department in writing that you have not been prohibited by federal agencies from entering into a federal contract.

**What does the word "proposal" mean when referred to in this certification?**
Proposal means a solicited or unsolicited bid, application, request, invitation to consider or similar communication from you to Washington Military Department.

**What or who is a "lower tier participant"?**
Lower tier participants means a person or organization that submits a proposal, enters into contracts with, or receives a grant from Washington Military Department, OR any subcontractor of a contract with Washington Military Department. If you hire subcontractors, you should require them to sign a certification and keep it with your subcontract.

**What is a covered transaction when referred to in this certification?**
Covered Transaction means a contract, oral or written agreement, grant, or any other arrangement where you contract with or receive money from Washington Military Department. Covered Transaction does not include mandatory entitlements and individual benefits.

## Sample Debarment, Suspension, Ineligibility, Voluntary Exclusion Contract Provision

**Debarment Certification.** The Contractor certifies that the Contractor is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in this Contract by any Federal department or agency. If requested by Washington Military Department, the Contractor shall complete a Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion form. Any such form completed by the Contractor for this Contract shall be incorporated into this Contract by reference.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# WASHINGTON MILITARY DEPARTMENT

## Audit Certification and FFATA Reporting Form

| CONTACT INFORMATION | |
|---|---|
| Subrecipient Name (Agency, Local Government, or Organization): | City of Lacey, WA |
| Subrecipient Data Universal Numbering System (DUNS) / Unique Entity Identifier (UEI) Number: | F3Q7BEH9DFK4 |
| Authorized Financial Representative (Name and Title): | Troy Woo, Finance Director |
| Address: | 420 College Street SE |
| Email: Troy.woo@cityoflacey.org | Phone Number: (360) 438-2624 |

**Directions:** As required by 2 CFR Part 200 Subpart F, non-federal entities that expend $750,000 in federal awards in a fiscal year shall have a single or program-specific audit conducted for that year. If your entity ***is not*** subject to these requirements, you must complete Section A of this Form. If your entity ***is*** subject to these requirements, you must complete Section B of this form. All subrecipients must complete the Federal Funding Accountability and Transparency Act (FFATA) related questions in Section C of this Form. Failure to return this completed Form to contracts.office@mil.wa.gov may result in delay of grant agreement processing, withholding of federal awards or disallowance of costs, and suspension or termination of federal awards.

| ***SECTION A: Entities NOT subject to the audit requirements of 2 CFR Part 200 Subpart F (check all that apply)*** |
|---|
| ☐ We did not expend $750,000 or more of total federal awards during the preceding fiscal year. |
| ☐ We are a for-profit organization. |
| ☐ We are exempt for other reasons (describe): |
| However, by signing below, I agree that we are still subject to the audit requirements, laws, and regulations governing the program(s) in which we participate; that we are required to maintain records of federal funding and to provide access to such records by federal and state agencies and their designees; and that WMD may request and be provided access to additional information and/or documentation to ensure proper stewardship of federal funds. |

| ***SECTION B: Entities that ARE subject to the audit requirements of 2 CFR Part 200 Subpart F*** (Complete the information below and check the appropriate box) |
|---|
| ☐ We completed our last 2 CFR Part 200 Subpart F Audit on [enter date] for fiscal year [enter date]. There were no findings related to federal awards or internal controls. |
| ☒ We completed our last 2 CFR Part 200 Subpart F Audit on August 27, 2024 for fiscal year 2023 and there was a finding related to federal awards and internal controls. |
| ☒ Our completed 2 CFR Part 200 Subpart F Audit will be available on September 13, 2024 for fiscal year 2023. |
| **Provide a complete copy of the audit report electronically to contracts.office@mil.wa.gov or provide the state audit number [enter number].** |



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

| ***SECTION C: Federal Funding Accountability and Transparency Act (check the corresponding answer)*** |
|---|
| In your preceding fiscal year, did your organization receive 80% or more of its gross revenues from federal funding? ☐ Yes ☒ No |
| In your preceding fiscal year, did your organization receive $25,000,000 or more in federal funding? ☐ Yes ☒ No |
| If you answered *yes* to the previous questions, WMD Contracts staff will request additional information to comply with FFATA reporting. |

I hereby certify that I am an individual authorized by the above identified entity (subrecipient) to complete this form. Further, I certify that the above information is true and correct, and all material findings contained in the audit report/statement have been disclosed. Additionally, I understand this form is to be submitted every fiscal year for which this entity is a subrecipient of federal award funds from the Department until the grant agreement is closed.

Signature of Authorized Financial Representative: Date: 8/29/2024



Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# APPENDIX P

## ACKNOWLEDGEMENT OF RESPONSIBILITIES FOR PROFESSIONALS DOING TREE REMOVAL IN THE CITY OF LACEY

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

**CITY OF LACEY**
Community & Economic Development Department
420 College Street SE
Lacey, WA 98503
(360) 491-5642

OFFICIAL USE ONLY

Case Number: _____
Date Received: _____
By: _____

Related Case Numbers:
_____
_____

# ACKNOWLEDGEMENT OF RESPONSIBILITIES FOR PROFESSIONALS DOING TREE REMOVAL IN THE CITY OF LACEY

I, _____, a duly licensed professional contractor in the State of Washington or professional forester, hereby attest that I have read and am knowledgeable of Chapter 14.32, "Tree and Vegetation Protection and Preservation," of the City of Lacey.

I further attest that, as a professional doing land clearing work in the City of Lacey, I am accountable for following the City's tree and vegetation protection and conservation requirements, including obtaining a land clearing permit or exemption prior to performing land clearing work, as defined by Chapter 14. 32.030(C) of the Lacey Municipal Code, as well as following all conditions and requirements of said permit or exemption.

I attest that if I fail to follow tree protection requirements, I will be held jointly responsible with the landowner for any restitution required as a result of environmental damage determined by the City's tree protection professional to be the result of improper land clearing activities at the site. This may result in claims against my bond pursuant to Section 18.27.040 of the Revised Code of Washington and other monetary penalties as allowed by this Chapter or State law.

Signed: _____

_____
(Print Name)

Date: _____

City Business License Number: _____

FORM: ACK-1

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# APPENDIX Q

## RECORD DRAWINGS

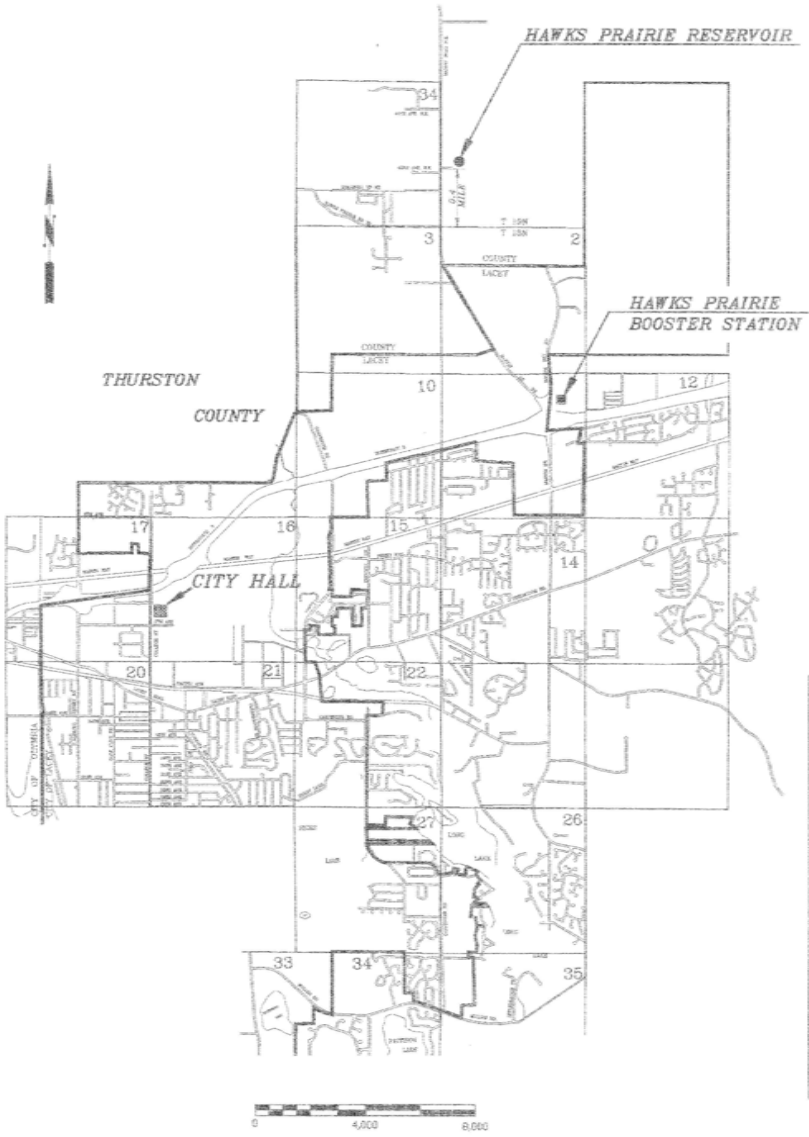
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/1

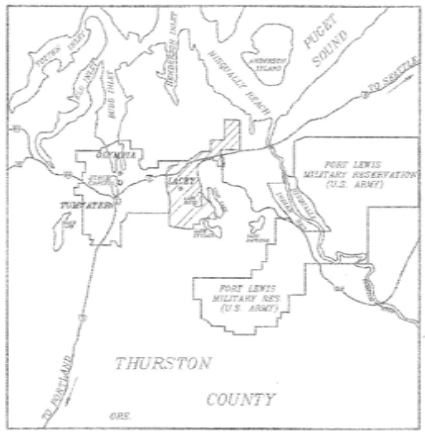
# LACEY CONTRACT NO. PW 95-06

# HAWKS PRAIRIE RESERVOIR

PROJECT ADDRESS: 4040 MARVIN ROAD N.E., OLYMPIA, WA.




LOCATION MAP
CITY OF LACEY, WASHINGTON




VICINITY MAP
CITY OF LACEY

LACEY CITY OFFICIALS

| | |
|---|---|
| MAYOR: | JON HALVORSON |
| DEPUTY MAYOR: | EARLYSE A. SWIFT |
| CITY COUNCIL: | ANN BURGMAN<br>WILLIAM A. BUSH<br>HERB JONES<br>NANCY J. PETERSON<br>JAMES J. WEBER |
| CITY MANAGER: | GREG J CUOIO |
| CITY ATTORNEY: | KENNETH R. AHLF |
| ACTING DIRECTOR OF PUBLIC WORKS | DENNIS E. RITTER P.E. |
| CITY ENGINEER: | DENNIS E. RITTER P.E. |

3-1-95
DATE:

Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH, SUITE 200
SEATTLE, WASHINGTON 98109 • (206) 284-0880

DATE: FEB. 1995
SCALE: NOTED
DRAWN: R.L.O.
CHECKED: R.O.G.
APPROVED: K.F.K.

| No. | REVISION | DATE | APPD |
|---|---|---|---|

Construction Contract No. PW 95-06

CITY OF LACEY
THURSTON COUNTY WASHINGTON

HAWKS PRAIRIE RESERVOIR

COVER SHEET

SHEET: 1
OF: 21

FILE NO. SHT-1
JOB NO. 94723

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/2

## SYMBOL LEGEND

### ABBREVIATIONS

| | |
|---|---|
| AVE. | AVENUE |
| AC | ASBESTOS CEMENT PIPE |
| ADJ | ADJUST |
| ALT | ALTERNATE |
| ALUM | ALUMINUM |
| ANSI | AMERICAN NATIONAL STANDARDS INSTITUTE |
| ASPH | ASPHALT |
| ASTM | AMERICAN SOCIETY OF TESTING AND MATERIALS |
| ASSY | ASSEMBLY |
| BF | BLIND FLANGE |
| BLDG | BUILDING |
| BLK | BLOCK |
| BO | BLOW OFF |
| CTR | CENTER |
| CAP | CORRUGATED ALUMINUM PIPE |
| CB | CATCH BASIN |
| CI | CAST IRON |
| ℄ | CENTER LINE |
| CLR | CLEARANCE |
| CMP | CORRUGATED METAL PIPE |
| CO | CLEANOUT |
| CONC | CONCRETE |
| C | CONDUIT |
| CONN | CONNECTION |
| CONTR | CONTRACTOR |
| CONT | CONTINUOUS |
| CPLG | COUPLING |
| CY | CUBIC YARD |
| CONT | CONTINUED |
| CL | CLASS |
| CF | CUBIC FEET |
| CFS | CUBIC FEET PER SECOND |
| DC | DEGREE OF CURVATURE |
| DI | DUCTILE IRON |
| DIA | DIAMETER |
| DOT | DEPARTMENT OF TRANSPORTATION |
| DIM | DIMENSION |
| DWGS | DRAWING(S) |
| D | DRAIN |
| EOA | EDGE OF ASPHALT |
| E | EAST |
| EA | EACH |
| EL | ELEVATION |
| EL | ELBOW |
| ELEC | ELECTRICAL |
| (XIST | EXISTING |
| FIG | FIGURE |
| FIN | FINISHED |
| FL | FLANGE |
| FT | FEET |
| F | FORCE MAIN |
| GA | GAUGE |
| GALV | GALVANIZED |
| GI | GALVANIZED IRON |
| GV | GATE VALVE |
| ID | INSIDE DIAMETER |
| IE | INVERT ELEVATION |
| INV | INVERT |
| IN | INCH |
| L | LENGTH |
| LB | POUND |
| LF | LINEAR FEET |
| MAX | MAXIMUM |
| MFR | MANUFACTURER |
| MH | MANHOLE |
| MIN | MINIMUM |
| MJ | MECHANICAL JOINT |
| MISC | MISCELLANEOUS |
| N | NORTH |
| NO | NUMBER |
| NTS | NOT TO SCALE |
| OC | ON CENTER |
| OD | OUTSIDE DIAMETER |
| PI | POINT OF INTERSECTION |
| PP | POWER POLE |
| PVI | POINT OF VERTICAL INTERSECTION |
| PE | PLAIN END |
| PERF | PERFORATED |
| PVC | POLYVINYL CHLORIDE |
| PVMT | PAVEMENT |
| PVT | POINT OF VERTICAL TANGENT |
| PC | POINT OF CURVATURE |
| PT | POINT OF TANGENCY |
| QTY | QUANTITY |
| RET | RETAINING |
| RR | RAILROAD |
| R | RADIUS |
| RED | REDUCER |
| REINF | REINFORCE |
| REQD | REQUIRED |
| R/W | RIGHT-OF-WAY |
| SL | SLOPE |
| S | SOUTH |
| SCH | SCHEDULE |
| SF | SQUARE FEET |
| SHT | SHEET |
| SPECS | SPECIFICATIONS |
| SQ | SQUARE |
| STA | STATION |
| STD | STANDARD |
| TC | TOP OF CURB |
| TEL | TELEPHONE |
| THRD | THREADED |
| THRU | THROUGH |
| TYP | TYPICAL |
| VERT | VERTICAL |
| W | WEST |
| W/ | WITH |
| W/O | WITHOUT |

| EXISTING | PROPOSED | DESCRIPTION |
|---|---|---|
| | | ASPHALT PAVEMENT |
| | | GRAVEL SURFACING |
| | | CONCRETE SURFACING |
| | | CONCRETE SIDEWALK |
| | | RIGHT-OF-WAY LINE |
| | | CENTERLINE OF RIGHT-OF-WAY |
| | | CENTERLINE OF ROADWAY |
| | | PROPERTY LINE |
| | | PERMANENT EASEMENT LINE |
| | | TEMPORARY EASEMENT LINE |
| 10 | 10 | CONTOUR LINE |
| E | E | BURIED ELECTRICAL |
| T | T | BURIED TELEPHONE |
| W | W | WATER MAIN (SIZE AS NOTED) |
| G | | GAS MAIN |
| S | S | SANITARY SEWER |
| D | D | STORM DRAIN (SIZE AS NOTED) |
| F | F | SANITARY SEWER FORCE MAIN |
| | | DITCH |
| D | | CULVERT (SIZE & TYPE AS NOTED) |
| | | FENCE (TYPE AS NOTED) |
| | | FENCE (WITH GATE) |
| P | P | POWER VAULT |
| T | T | TELEPHONE VAULT |
| T | T | TELEPHONE MANHOLE |
| | | MANHOLE |
| | | TYPE 1 CATCH BASIN OR CURB INLET |
| | | TYPE 2 CATCH BASIN |
| | | POLE WITH GUY WIRE |
| | | POWER / TELEPHONE / GUY POLE |
| | | LUMINAIRE |
| | | YARD LIGHT |
| | | JUNCTION BOX (AS NOTED) |
| M | M | GATE VALVE |
| M | M | BUTTERFLY VALVE |
| N | N | CHECK VALVE |
| M | M | PLUG VALVE |
| M | M | WATER METER |
| | | FIRE HYDRANT |
| | | REDUCER |
| | | THRUST BLOCK |
| | | TRANSITION COUPLING OR FLANGE COUPLING ADAPTER |
| J | J | CAP/PLUG |
| | | BLOW-OFF |
| W | W | WELL |

| EXISTING | PROPOSED | DESCRIPTION |
|---|---|---|
| | | NAIL BOX (NOTED) |
| | | SIGN |
| | | RIP RAP |
| | | EMBANKMENT |
| NOTED | NOTED | TREE (CONIFER) |
| NOTED | NOTED | TREE (DECIDUOUS) |
| | NOTED | SHRUBS |
| | | WET LANDS |
| | | BUILDINGS |
| | | ROCK WALL |
| | | ELEVATION POINT |
| | | MONUMENT |
| | | BORING AND TEST PIT LOCATIONS |
| | | SECTION CORNER |
| | | 1/4 CORNER |
| | | ANGLE POINT / CONTROL POINT |
| | | BENCH MARK |
| | | OWNERSHIP TIE |
| | | RAILROAD TRACK |

DETAIL NUMBER (1/20)

SHEET REFERENCE

## INDEX


| SHEET NO. | DESCRIPTION |
|---|---|
| 1 | COVER SHEET |
| 2 | LEGEND, ABBREVIATIONS, AND INDEX |
| 3 | EXISTING SITE PLAN |
| 4 | CLEARING & EROSION PLAN |
| 5 | GRADING PLAN |
| 6 | PIPING PLAN |
| 7 | SITE DEVELOPMENT & PIPING DETAILS |
| 8 | PIPING VAULTS & DETAILS |
| 9 | RESERVOIR PLAN & ELEVATIONS |
| 10 | INLET PIPE CHAMBER & DETAILS |
| 11 | OUTLET PIPE CHAMBER & RESERVOIR DETAILS |
| 12 | EXTERIOR STAIRWAY & PLATFORMS |
| 13 | RESERVOIR DETAILS |
| 14 | RESERVOIR DETAILS |
| 15 | RESERVOIR DETAILS |
| 16 | FOUNDATION PLAN & SECTIONS |
| 17 | STRUCTURAL NOTES & DETAILS |
| 18 | ELECTRICAL/TELEMETRY |
| 19 | ELECTRICAL/TELEMETRY |
| 20 | SITE RESTORATION/LANDSCAPING |
| 21 | BOOSTER STATION MODIFICATION |



Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH, SUITE 200
SEATTLE, WASHINGTON 98109 • (206) 284-0565


DATE: FEB. 1995
SCALE: NOTED
DRAWN: R.L.O.
CHECKED: R.A.G.
APPROVED: K.E.F.

| No. | REVISION | DATE APPD |
|---|---|---|

Construction Contract No. (92-95-06)

CITY OF LACEY
THURSTON COUNTY
WASHINGTON

HAWKS PRAIRIE RESERVOIR

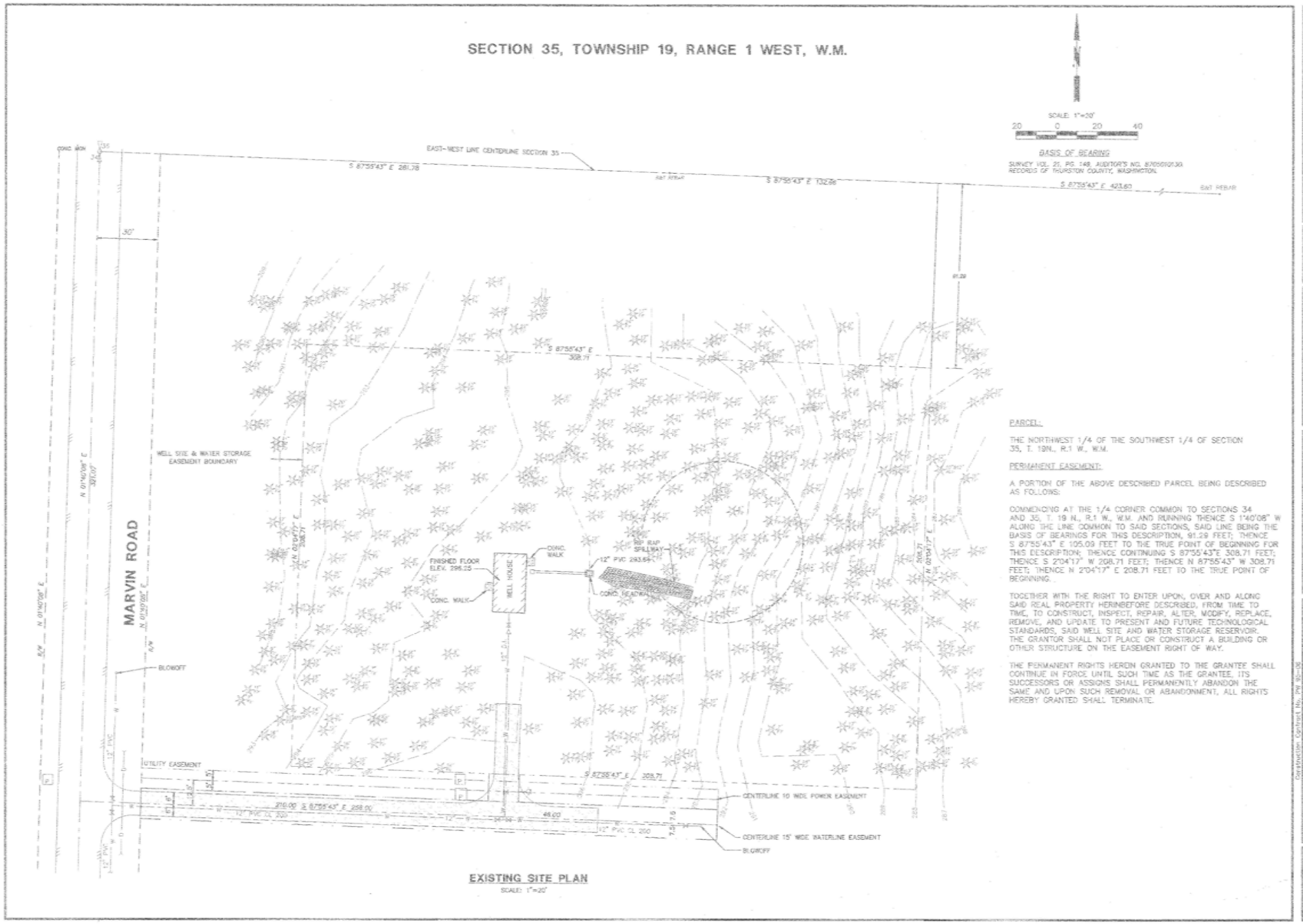
LEGEND, ABBREVIATIONS & INDEX

SHEET: 2
OF: 21

FILE NO. SHT-2
JOB NO. 94723

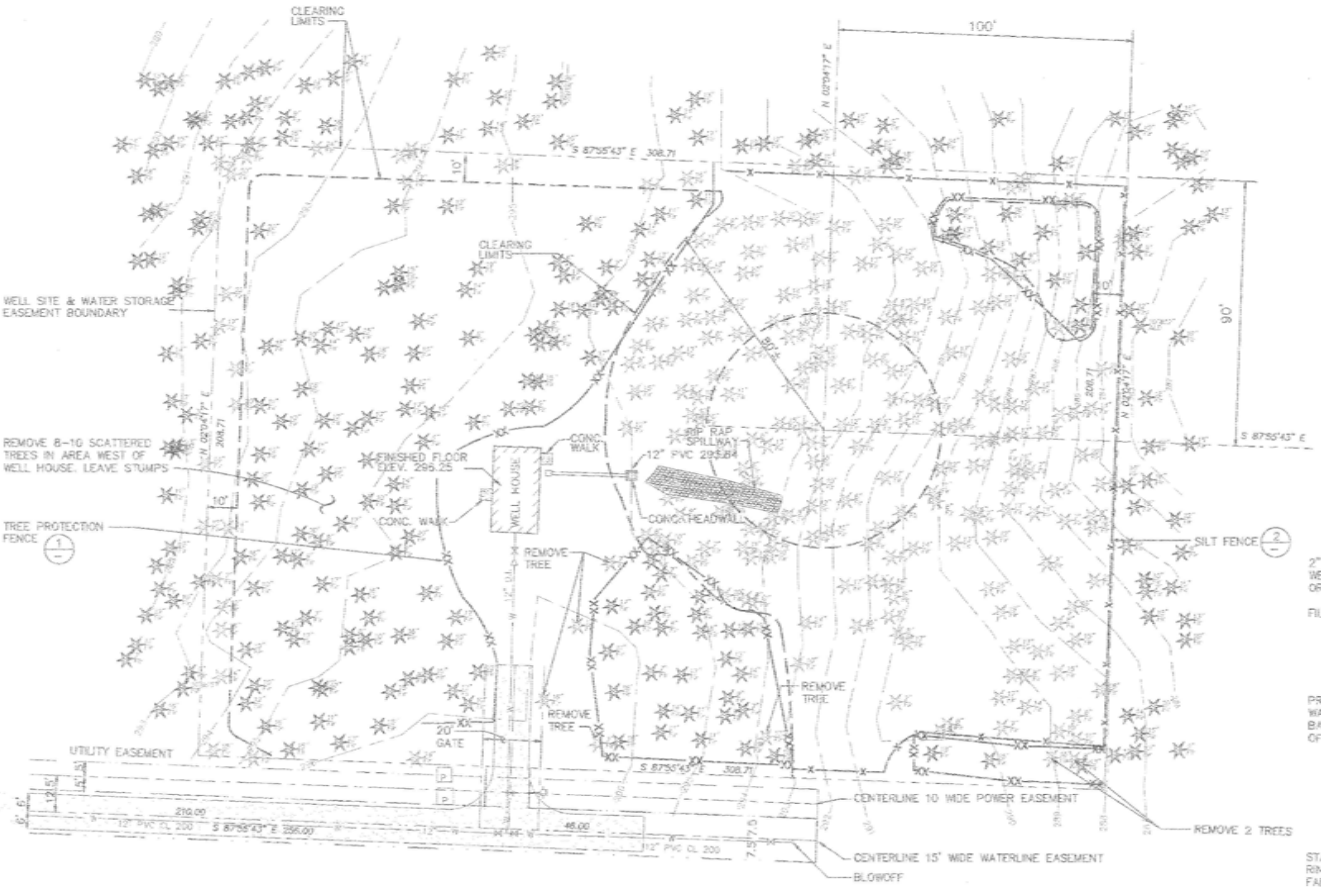

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/3




Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

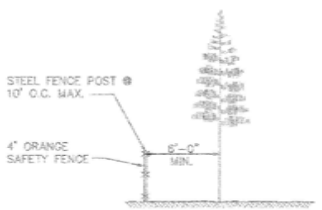
D-95-13/4




CLEARING & EROSION CONTROL PLAN

SCALE: 1"= 20'

20 0 20 40 60

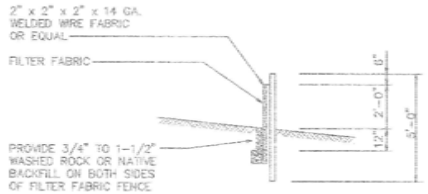



TREE PROTECTION FENCE (1/-)

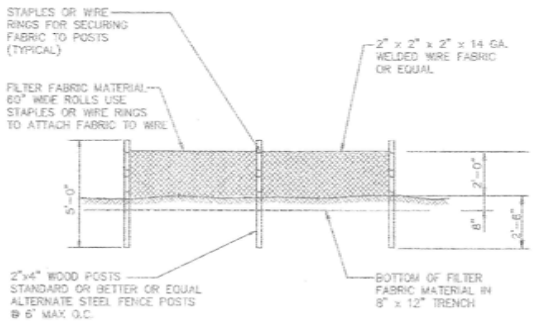
SCALE: 1/4"= 1'-0"

NOTES:

1. WHERE POSSIBLE, MAINTAIN NATURAL VEGETATION FOR SILT CONTROL
2. TEMPORARY SILTATION CONTROL TO BE CONSTRUCTED BY PLACING FILTER FABRIC FENCES ACROSS SWALES UTILIZING FILTER SYSTEM PRIOR TO DISCHARGE
3. ALL TEMPORARY SILTATION CONTROL SHALL BE MAINTAINED IN A SATISFACTORY CONDITION UNTIL SUCH TIME THAT CLEARING EARTHWORKS, PERMANENT STORMWATER RUN OFF FACILITIES ARE COMPLETED AND SURFACE RESTORATION HAS BEEN COMPLETED
4. RETURN SILTATION CONTROL AREAS TO ORIGINAL GROUND CONDITIONS, UNLESS SPECIFICALLY DIRECTED OTHERWISE BY THE ENGINEER




SECTION




ELEVATION

SILT FENCE (2/-)

SCALE: 3/8"= 1'-0"

Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH SUITE 200
SEATTLE, WASHINGTON 98109 (206) 284-0460

DATE: FEB. 1995
SCALE: NOTED
DRAWN: R.L.O.
CHECKED: R.R.G.
APPROVED: A.E.C.

| NO. | REVISION | DATE APPD |
|---|---|---|

CITY OF LACEY
THURSTON COUNTY WASHINGTON

HAWKS PRAIRIE RESERVOIR

CLEARING & EROSION PLAN

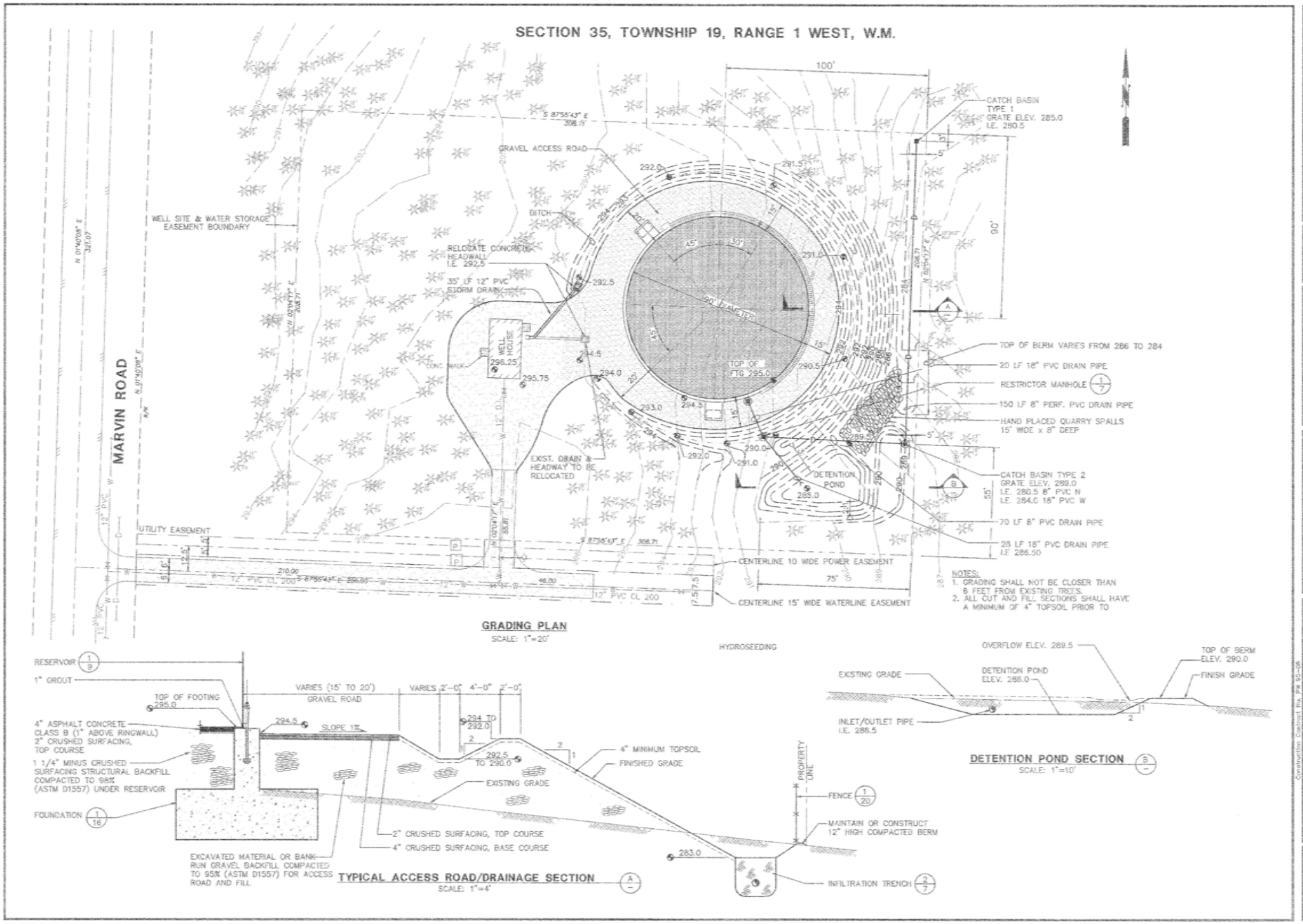
Construction Contract No. PW 95-06

SHEET 4
OF 21

FILE NO. SHT-4
JOB NO. 94723

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/5




Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH, SUITE 200
SEATTLE, WASHINGTON 98109 • (206) 284-0860

DATE: FEB. 1995
SCALE: NOTED
DRAWN: R.L.O.
CHECKED: R.R.C.
APPROVED: K.E.E.

| No. | REVISION | BY/APP'D | DATE/APP'D |
|---|---|---|---|
| 1. | REVISED PER THURSTON COUNTY | K/RR | K.E.E. |

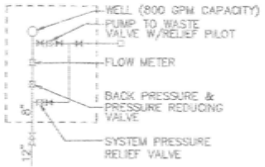
CITY OF LACEY
WASHINGTON
THURSTON COUNTY
Construction Contract No. PW 95-08
HAWKS PRAIRIE RESERVOIR
GRADING PLAN

SHEET: 5
OF: 21
FILE NO. SHT-5
JOB NO. 94723

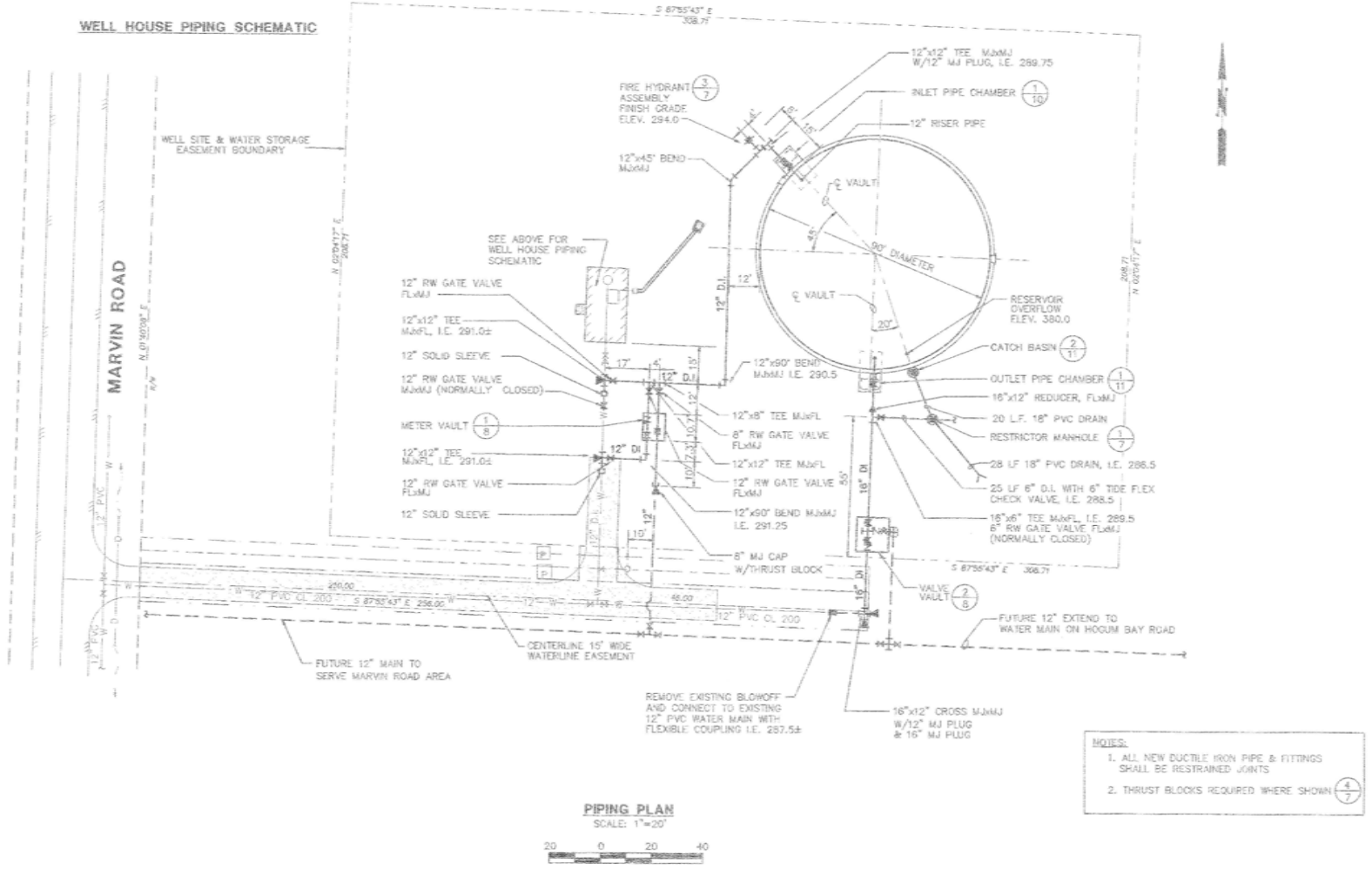
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/6

SECTION 35, TOWNSHIP 19, RANGE 1 WEST, W.M.




WELL HOUSE PIPING SCHEMATIC




NOTES:
1. ALL NEW DUCTILE IRON PIPE & FITTINGS SHALL BE RESTRAINED JOINTS
2. THRUST BLOCKS REQUIRED WHERE SHOWN (4/7)

PIPING PLAN
SCALE: 1"=20'
20 0 20 40

Gray & Osborne, Inc.
CONSULTING ENGINEERS
700 DEXTER AVENUE NORTH, SUITE 200
SEATTLE, WASHINGTON 98109 • (206) 284-0860

DATE: FEB. 1995 | SCALE: NOTED | DRAWN: R.L.O. | DESIGNED: R.G.C. | APPROVED: K.E.E.

| No. | REVISION | DATE | APP'D |
|---|---|---|---|

CONSTRUCTION CONTRACT NO. PW 95-30

CITY OF LACEY
THURSTON COUNTY
WASHINGTON

HAWKS PRAIRIE RESERVOIR

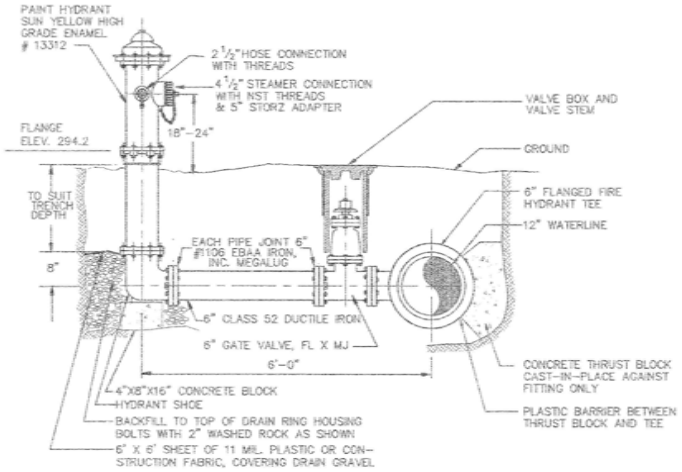
PIPING PLAN

SHEET: 6
OF: 21

FILE NO. SHT-6
JOB NO. 94723

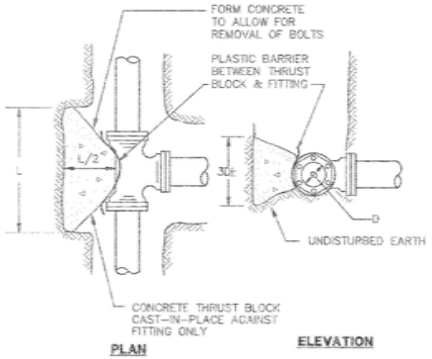
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/7



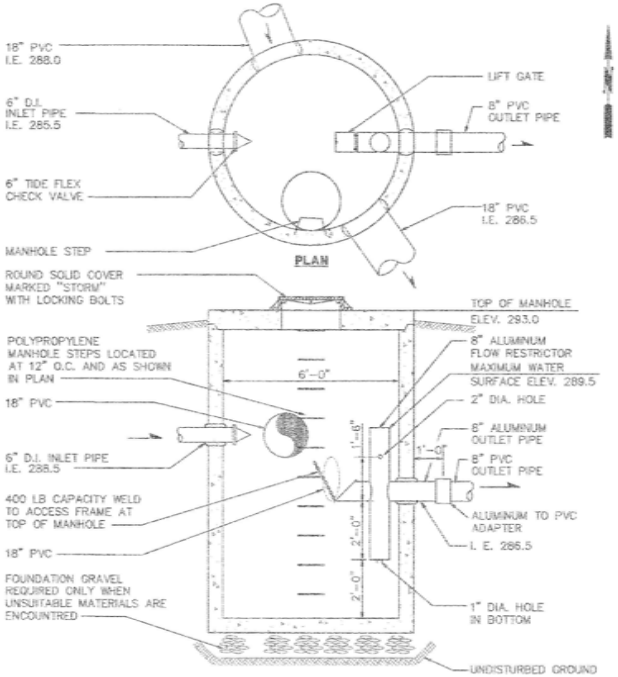

FIRE HYDRANT DETAIL (3/6)
NOT TO SCALE

| MINIMUM BEARING AREA TABLE | | | | | |
|---|---|---|---|---|---|
| FITTING D | TEE | 90° | 45° | 22 1/2° | 11 1/4° |
| 6" | 4 SQ.FT. | 6 SQ.FT. | 3 SQ.FT. | 2 SQ.FT. | 2 SQ.FT. |
| 8" | 7 SQ.FT. | 10 SQ.FT. | 4 SQ.FT. | 3 SQ.FT. | 2 SQ.FT. |
| 10" | 10 SQ.FT. | 15 SQ.FT. | 5 SQ.FT. | 5 SQ.FT. | 3 SQ.FT. |
| 12" | 14 SQ.FT. | 22 SQ.FT. | 12 SQ.FT. | 6 SQ.FT. | 4 SQ.FT. |
| 16" | 25 SQ.FT. | 38 SQ.FT. | 21 SQ.FT. | 11 SQ.FT. | 7 SQ.FT. |
| 18" | 32 SQ.FT. | 48 SQ.FT. | 27 SQ.FT. | 14 SQ.FT. | 8 SQ.FT. |

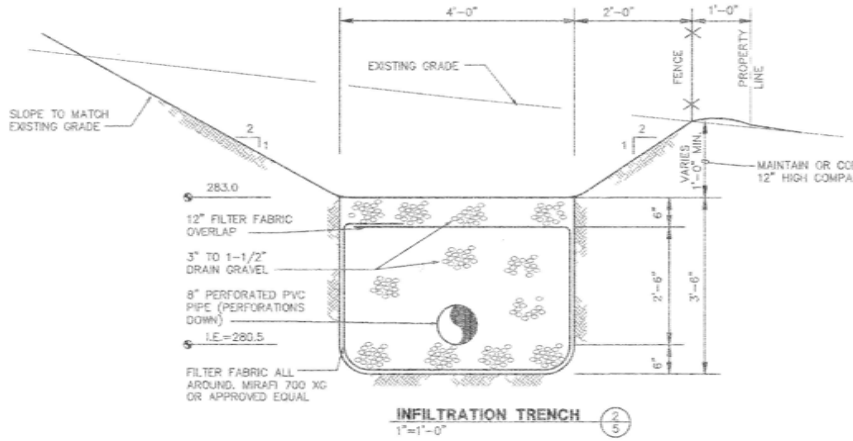



NOTE:
BEARING AREA TABLE BASED ON 250 PSI PRESSURE AND 2000 PSF SOIL BEARING. IF PRESSURE IS GREATER OR SOIL BEARING IS LESS, THE THRUST BLOCK SIZE SHALL BE INCREASED.

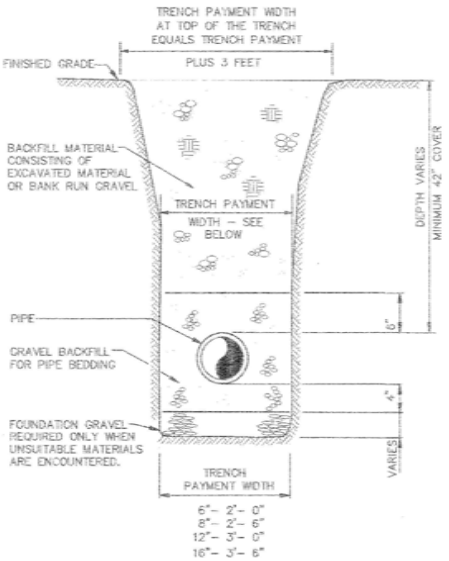
THRUST BLOCK DETAIL (4/6)
NOT TO SCALE



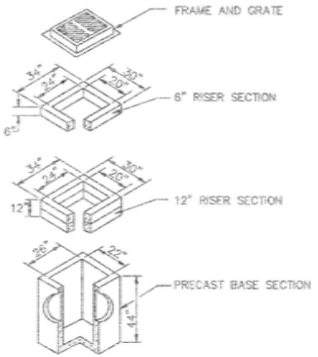

RESTRICTOR MANHOLE (1/5)
SCALE: 1/2"= 1'-0"




INFILTRATION TRENCH (2/5)
1"=1'-0"




TYPICAL TRENCH SECTION
NOT TO SCALE




CATCH BASIN TYPE 1
NOT TO SCALE

Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH, SUITE 300
SEATTLE, WASHINGTON 98109 (206) 284-0460

DATE: FEB. 1995 | SCALE: NOTED | DRAWN: R.L.O. | CHECKED: R.R.G. | APPROVED: K.E.E.

| NO. | REVISION | DATE | APP'D |
|---|---|---|---|
| 1. | REVISED PER THURSTON COUNTY | 4/95 | K.E.E. |

Construction Contract No. PW 95-06

CITY OF LACEY
THURSTON COUNTY WASHINGTON

HAWKS PRAIRIE RESERVOIR

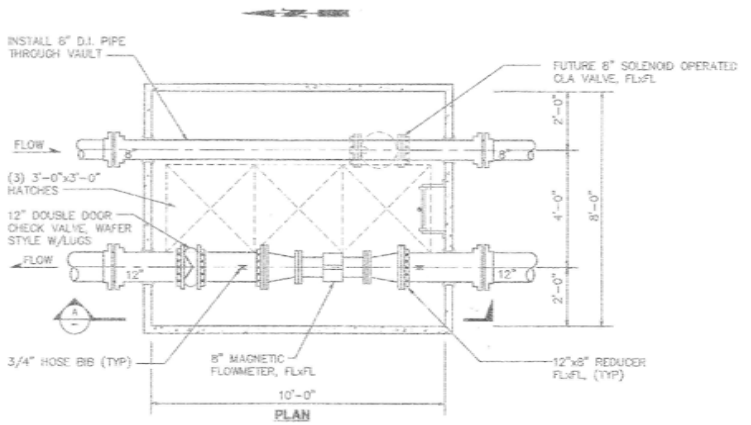
SITE DEVELOPEMENT DETAILS

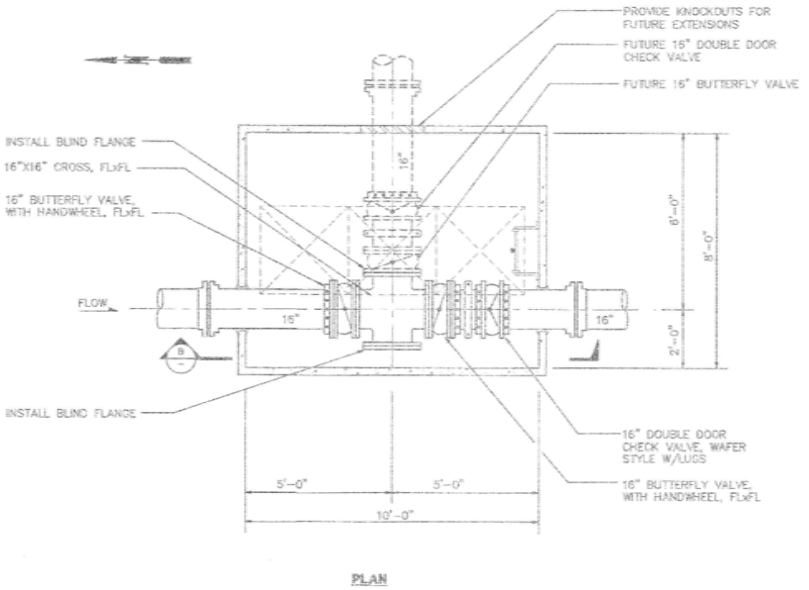
SHEET: 7
OF: 21

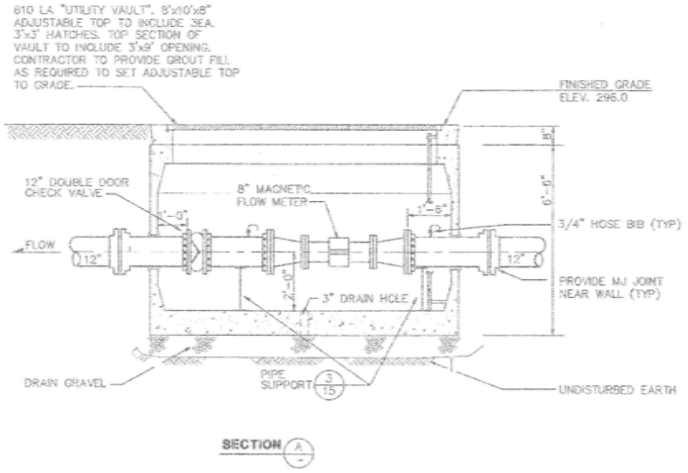
FILE NO. SHT-7
JOB NO. 94723

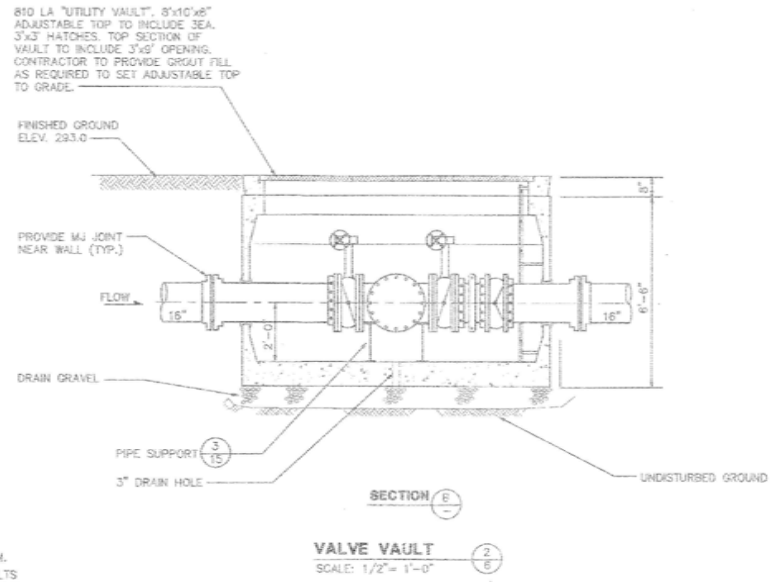
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/8




NOTES:
1. SEAL ALL VAULT PENETRATIONS WITH HYDROPHILIC URETHANE FOAM.
2. ALL FLANGED FITTING IN THE VAULTS TO BE CONNECTED WITH UNI-FLANGES. ALL MECHANICAL JOINT FITTINGS TO BE RESTRAINED WITH MEGALUGS. ALL NEW DUCTILE IRON PIPE AND FITTINGS TO BE RESTRAINED JOINT.

Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH, SUITE 200
SEATTLE, WASHINGTON 98109 • (206) 284-0860

DATE: FEB. 1995
SCALE: NOTED
DRAWN: R.L.O.
CHECKED: R.H.C.
APPROVED: K.E.E.

| No. | REVISION | DATE APPD |
|---|---|---|

Construction Contract No. PW 95-08

CITY OF LACEY
THURSTON COUNTY WASHINGTON

HAWKS PRAIRIE RESERVOIR

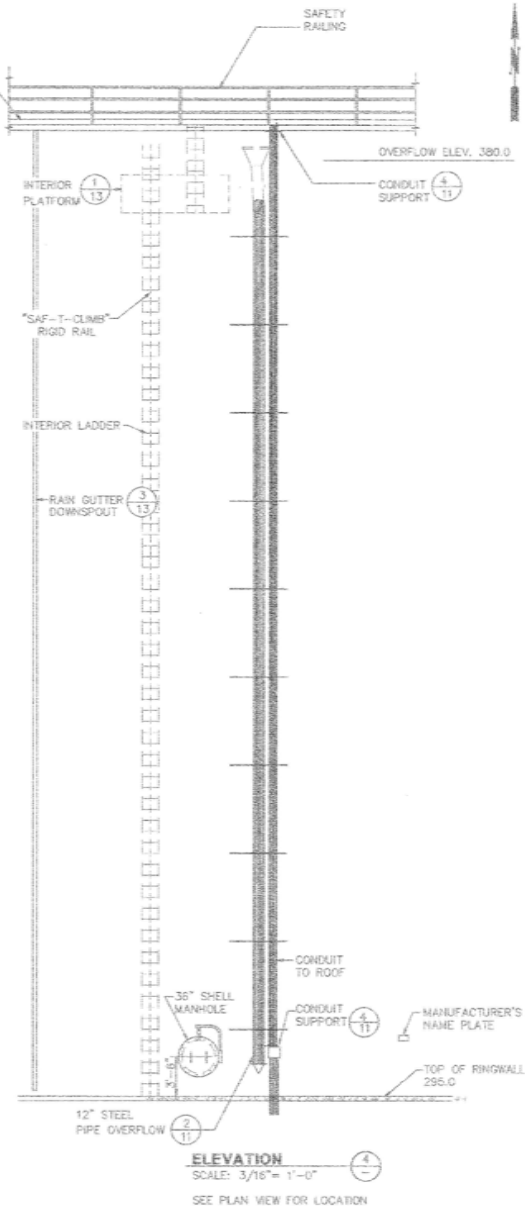
PIPING VAULTS & DETAILS

SHEET: 8
OF: 21

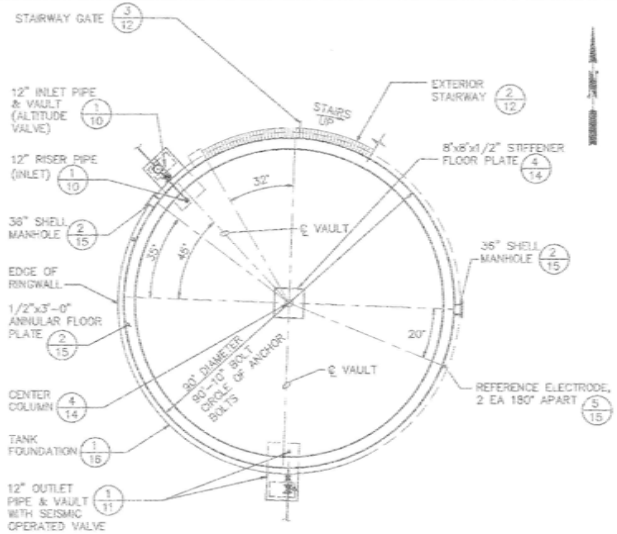
FILE NO. SST-8
JOB NO. 94723

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

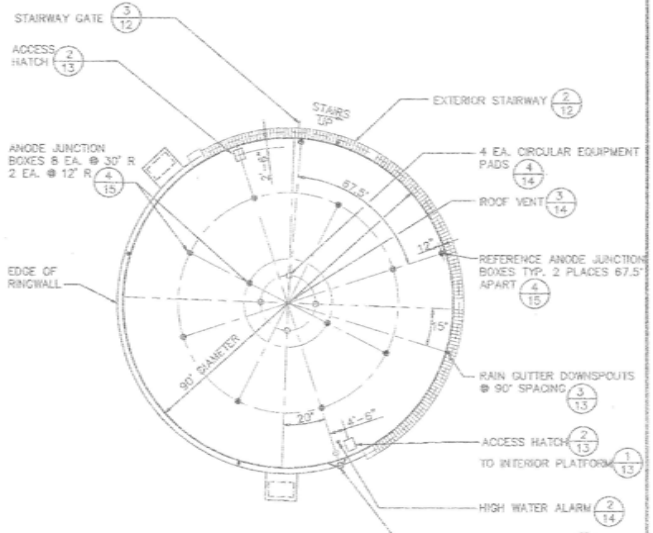
D-95-13/9



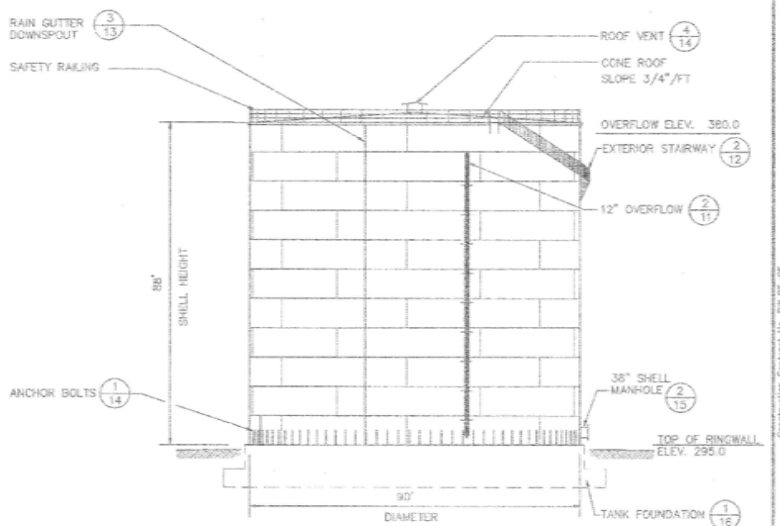

ELEVATION 4/—
SCALE: 3/16"= 1'-0"
SEE PLAN VIEW FOR LOCATION




RESERVOIR FLOOR PLAN 3/—
SCALE: 1/16"= 1'-0"




RESERVOIR ROOF PLAN 2/—
SCALE: 1/16"= 1'-0"




ELEVATION 1/5
SCALE: 1/16"= 1'-0"

Gray & Osborne, Inc.
CONSULTING ENGINEERS
709 DEXTER AVENUE NORTH, SUITE 200
SEATTLE, WASHINGTON 98109 • (206) 284-0690

DATE: FEB. 1995
SCALE: NOTED
DRAWN: R.L.G.
CHECKED: R.L.G.
APPROVED: K.E.E.

| No. | REVISION | DATE/APPD |
|---|---|---|
| | | |

Construction Contract No. PW 95-05

CITY OF LACEY
THURSTON COUNTY WASHINGTON

HAWKS PRAIRIE RESERVOIR

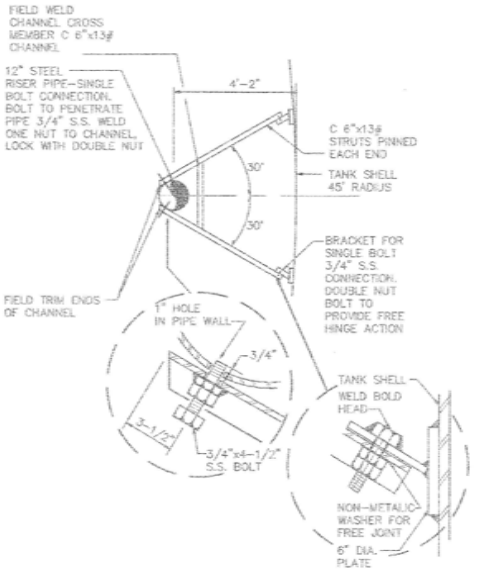
RESERVOIR PLAN & ELEVATIONS

SHEET: 9
OF: 21

FILE NO. SHT-9
JOB NO. 94723

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/10

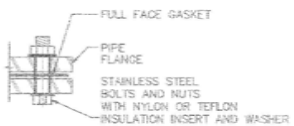



**BRACKET DETAIL** (2/—)

SCALE: 1/2"= 1'-0"

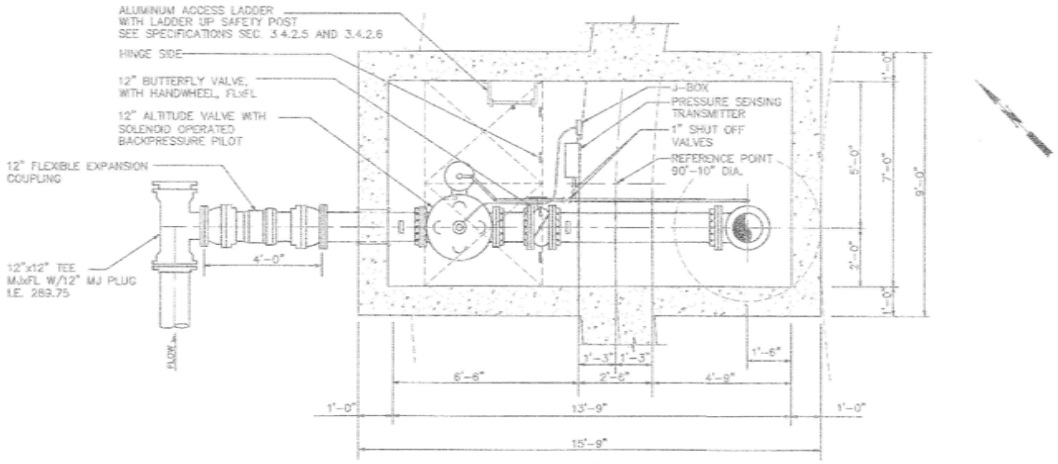
NOTES:

1. SEAL ALL VAULT PENETRATIONS WITH HYDROPHILIC URETHANE FOAM.
2. ALL FLANGED FITTING IN THE VAULTS TO BE CONNECTED WITH UNI-FLANGES. ALL MECHANICAL JOINT FITTINGS TO BE RESTRAINED WITH NEGALUGS. ALL NEW DUCTILE IRON PIPE AND FITTING TO BE RESTRAINED JOINT.

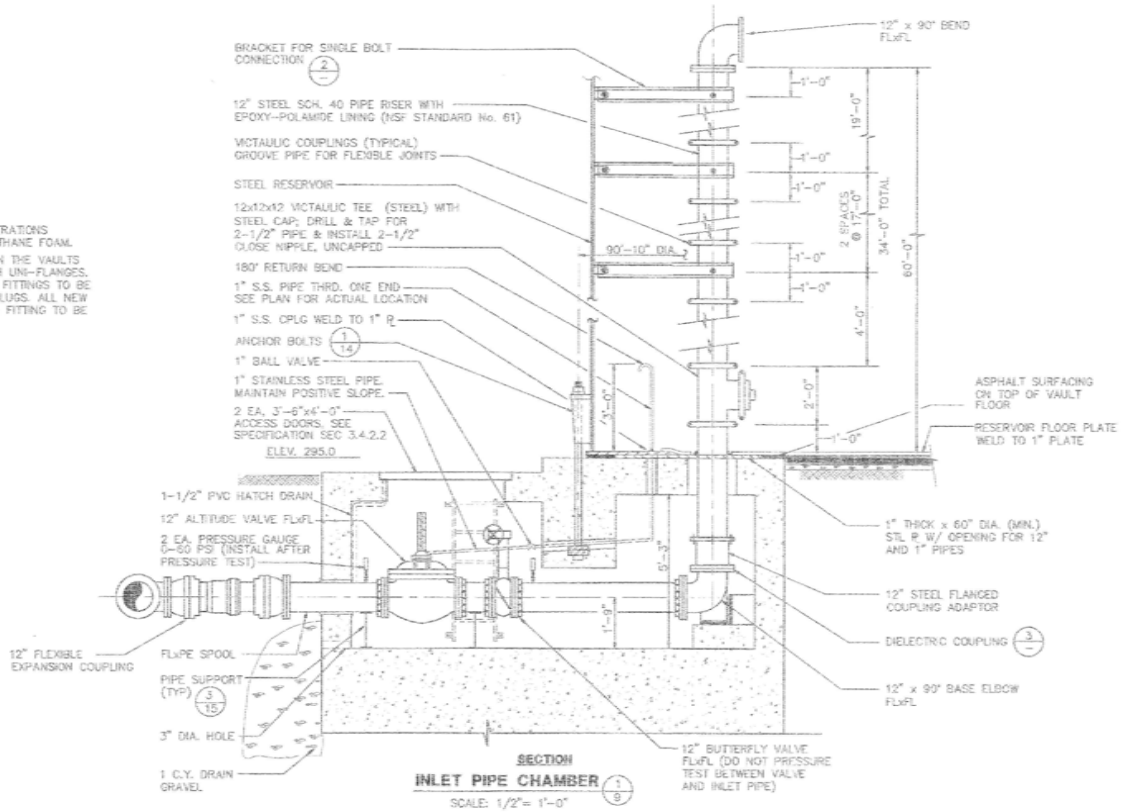



**DIELECTRIC COUPLING AT RESERVOIR PIPING** (3/11)

SCALE: 3"= 1'-0"




**PLAN**




**SECTION**

**INLET PIPE CHAMBER** (1/9)

SCALE: 1/2"= 1'-0"

Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH, SUITE 200
SEATTLE, WASHINGTON 98109 • (206) 284-0860

DATE: FEB. 1995
SCALE: NOTED
DRAWN: R.L.O.
CHECKED: R.R.C.
APPROVED: K.E.F.

| No. | REVISION | DATE | APP'D |
|---|---|---|---|

Construction Contract No. PW 95-06

CITY OF LACEY
THURSTON COUNTY WASHINGTON

HAWKS PRAIRIE RESERVOIR

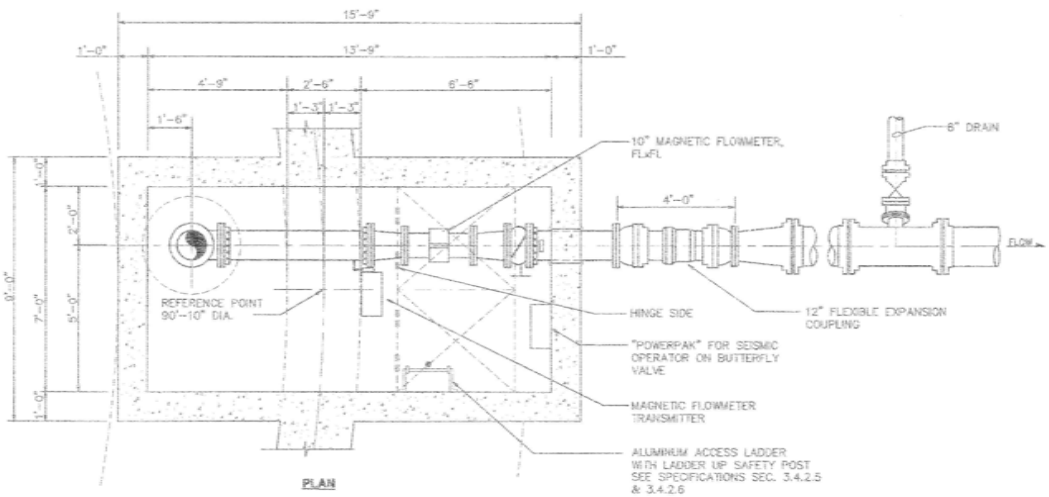
INLET VAULT & DETAILS

SHEET: 10
OF: 21

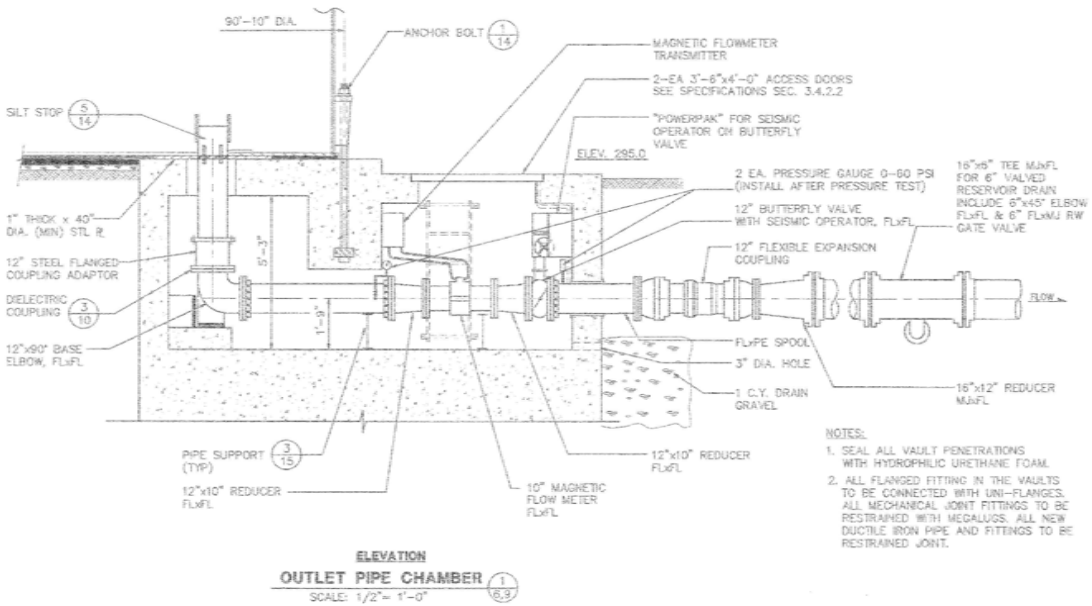
FILE NO. SHT-10
JOB NO. 94723

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/11




PLAN



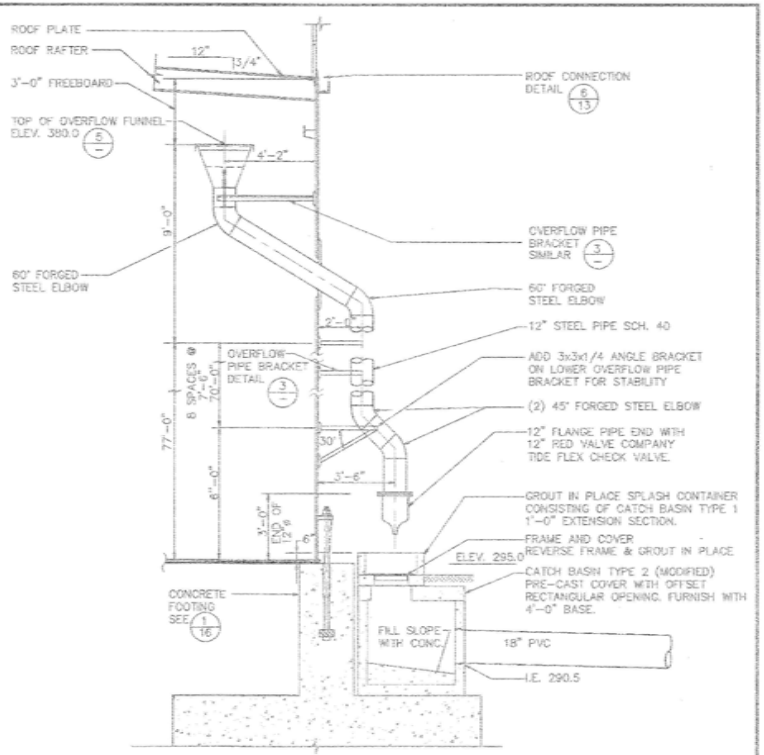

ELEVATION

OUTLET PIPE CHAMBER 1/6,9

SCALE: 1/2"= 1'-0"

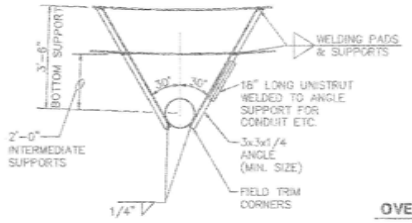
NOTES:

1. SEAL ALL VAULT PENETRATIONS WITH HYDROPHILIC URETHANE FOAM.
2. ALL FLANGED FITTING IN THE VAULTS TO BE CONNECTED WITH UNI-FLANGES. ALL MECHANICAL JOINT FITTINGS TO BE RESTRAINED WITH MEGALUGS. ALL NEW DUCTILE IRON PIPE AND FITTINGS TO BE RESTRAINED JOINT.



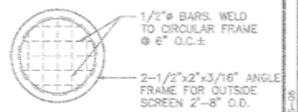

OVERFLOW PIPE 2/6,9

SCALE: 3/8"= 1'-0"



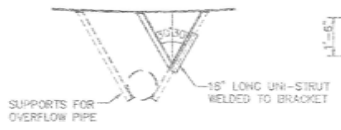

OVERFLOW PIPE BRACKET 3/-

SCALE: 1/2"= 1'-0"



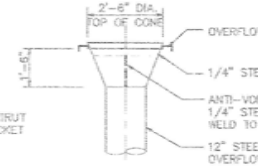

OVERFLOW SCREEN

SCALE: 1/2"= 1'-0"




ELECTRICAL CONDUIT BRACKET ABOVE OVERFLOW PIPE (2 EACH) 4/9

SCALE: 1/2"= 1'-0"




OVERFLOW FUNNEL 5/13

SCALE: 1/2"= 1'-0"

Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH, SUITE 200
SEATTLE, WASHINGTON 98109 (206) 284-0690

DATE: FEB. 1995
SCALE: NOTED
DRAWN: R.L.O.
CHECKED: R.R.C.
APPROVED: K.E.E.

| No. | REVISION | DATE | APPR |
|---|---|---|---|
| | | | |

Construction Contract No. PW 95-05

CITY OF LACEY
THURSTON COUNTY WASHINGTON

HAWKS PRAIRIE RESERVOIR

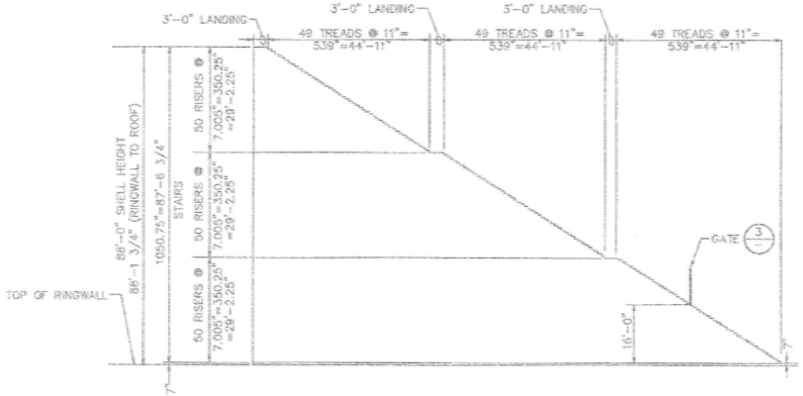
OUTLET PIPE CHAMBER & RESERVOIR DETAILS

SHEET: 11
OF: 21

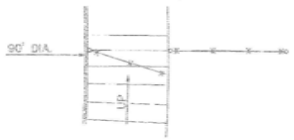
FILE NO. Sht-11
JOB NO. 94.733

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

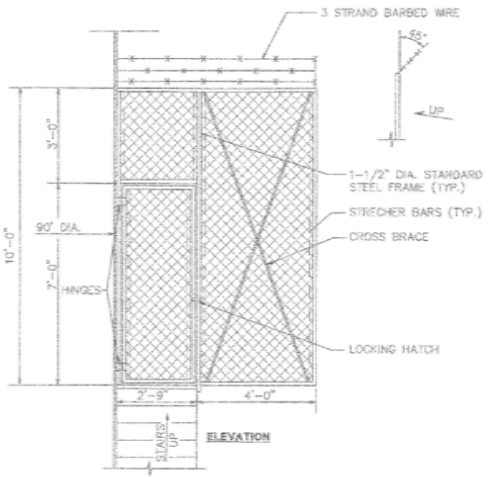
D-95-13/12



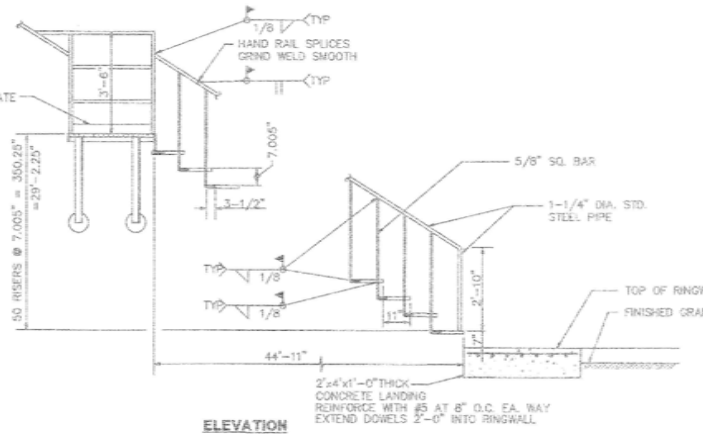

EXTERIOR STAIRWAY SCHEMATIC 1/1
SCALE: 1/16"=1'-0"



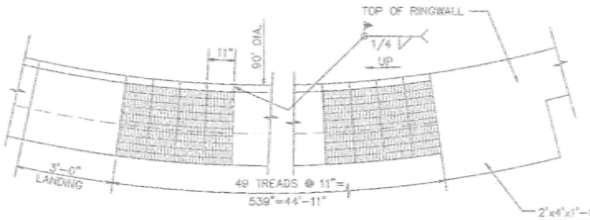

PLAN




STAIRWAY GATE 3/9
SCALE: 1/2"=1'-0"

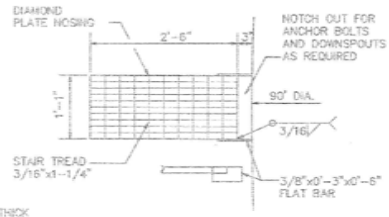



ELEVATION

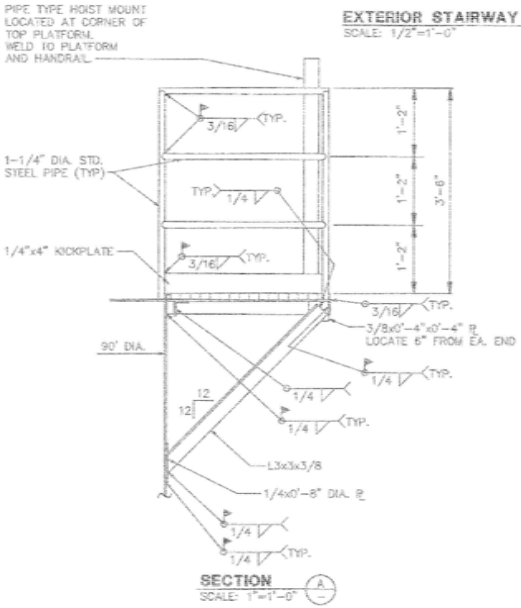



PLAN

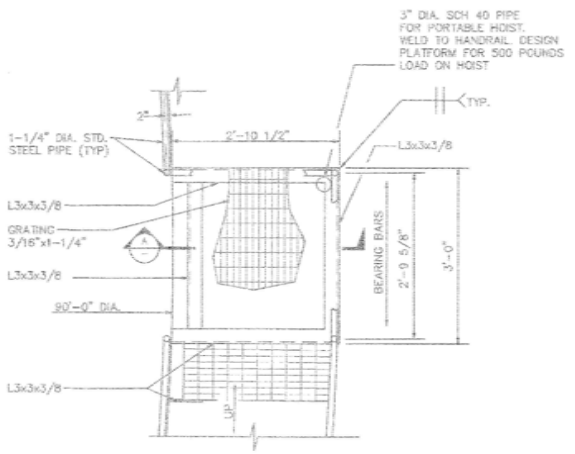
EXTERIOR STAIRWAY 2/9
SCALE: 1/2"=1'-0"




STAIR TREAD
SCALE: 1"=1'-0"




SECTION A/1
SCALE: 1"=1'-0"




LANDING PLATFORM 4/1
SCALE: 1"=1'-0"

Gray & Osborne, Inc.
CONSULTING ENGINEERS
707 DEXTER AVENUE NORTH SUITE 375
SEATTLE, WASHINGTON 98109 (206) 284-0860

| No. | REVISION | DATE APP'D |
|---|---|---|

DATE: FEB. 1995
SCALED: NOTED
DRAWN: R.L.O.
CHECKED: K.E.L.
APPROVED: K.E.L.

Construction Contract No. PW 95-08

CITY OF LACEY
THURSTON COUNTY WASHINGTON

HAWKS PRAIRIE RESERVOIR

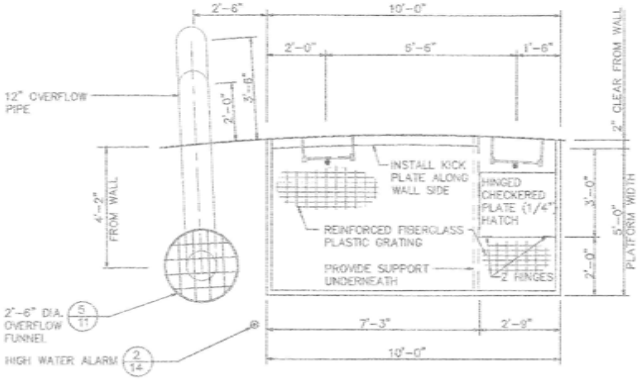
EXTERIOR STAIRWAY & PLATFORMS

SHEET 12
OF 21

FILE NO. SHT-12
JOB NO. 94723

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

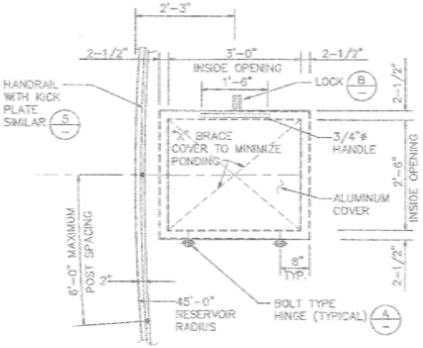
D-95-13/13




PLAN

INTERIOR PLATFORM (1/9)

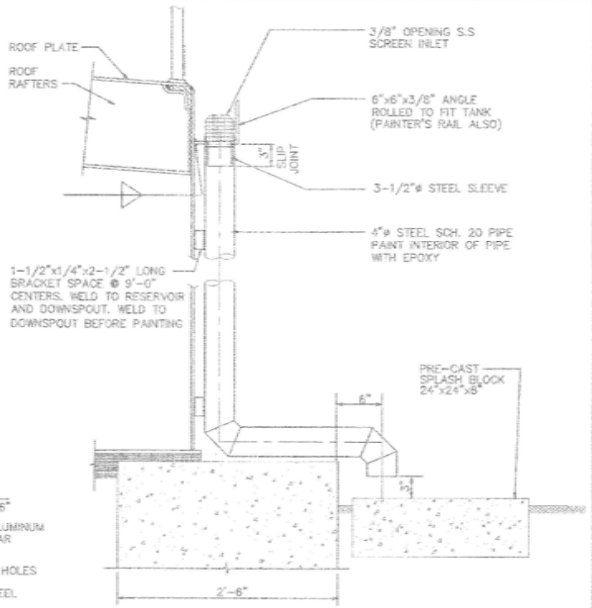
SCALE: 1/2"=1'-0"




PLAN

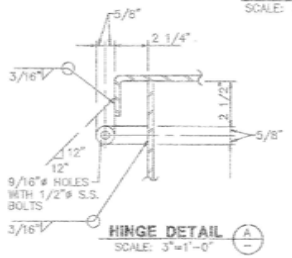
ACCESS HATCH (2/9)

SCALE: 3/4"=1'-0"



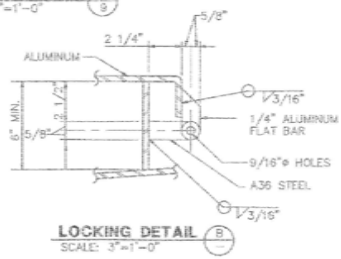

RAIN GUTTER & DOWNSPOUT (3/9)

SCALE: 1-1/2"= 1'-0"



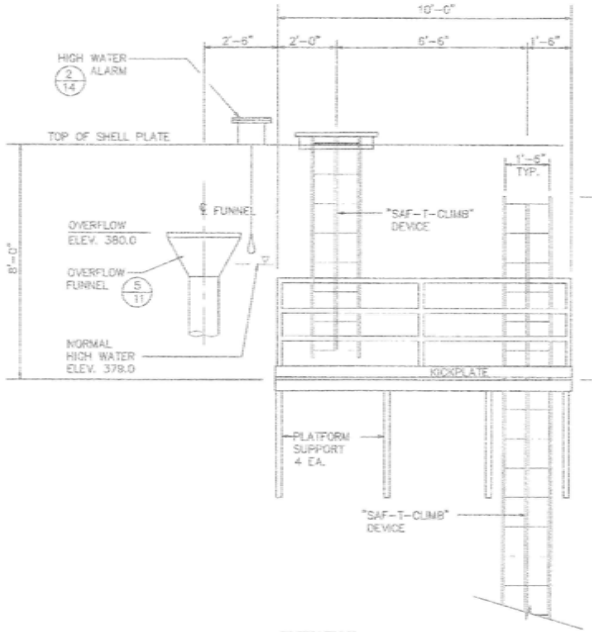

HINGE DETAIL (A/-)

SCALE: 3"=1'-0"




LOCKING DETAIL (B/-)

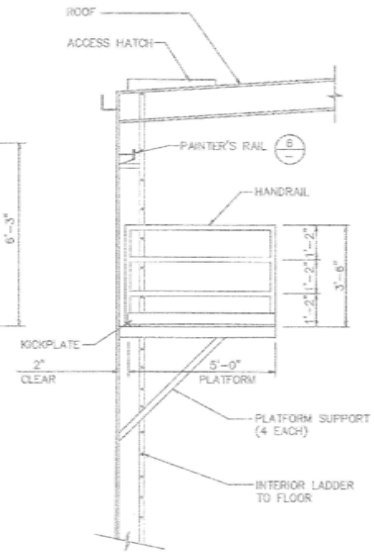
SCALE: 3"=1'-0"




ELEVATION

INTERIOR PLATFORM (4/9)

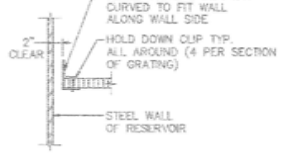
SCALE: 1/2"=1'-0"




SECTION

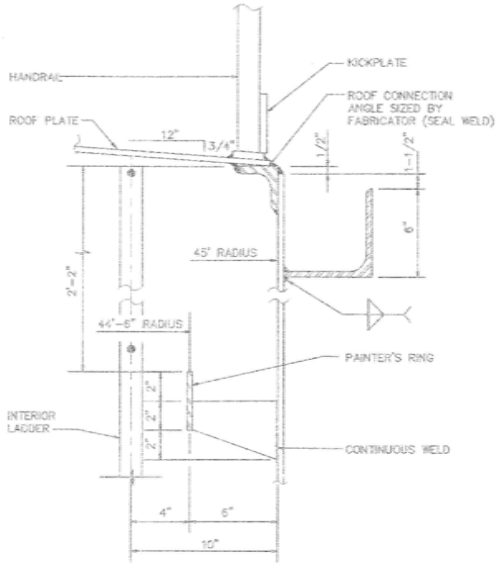
INTERIOR PLATFORM (5/9)

SCALE: 1/2"=1'-0"




SUPPORT FOR GRATING DETAIL (C/-)

SCALE: 1"=1'-0"




ROOF CONNECTION & PAINTERS RAIL (6/11)

SCALE: 3"= 1'-0"

Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH, SUITE 200
SEATTLE, WASHINGTON 98109 • (206) 284-0460

DATE: FEB. 1995
SCALE: NOTED
DRAWN: R.L.O.
CHECKED: R.P.G.
APPROVED: K.E.E.

| NO. | REVISION | DATE APPD |
|---|---|---|

Construction Contract No. PW 95-16

CITY OF LACEY
THURSTON COUNTY
WASHINGTON

HAWKS PRAIRIE RESERVOIR

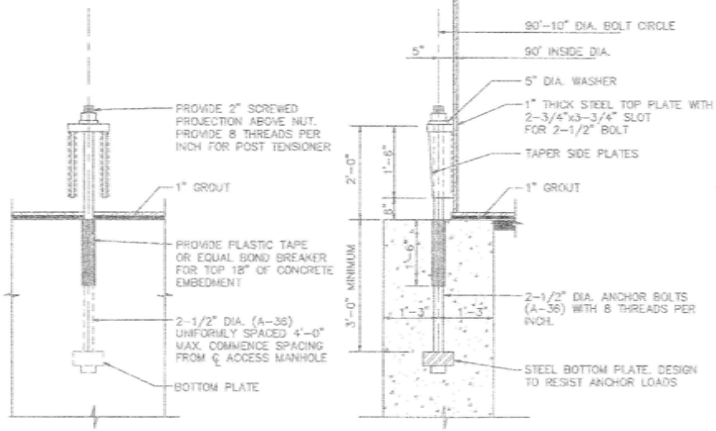
RESERVOIR DETAILS

SHEET: 13
OF: 21

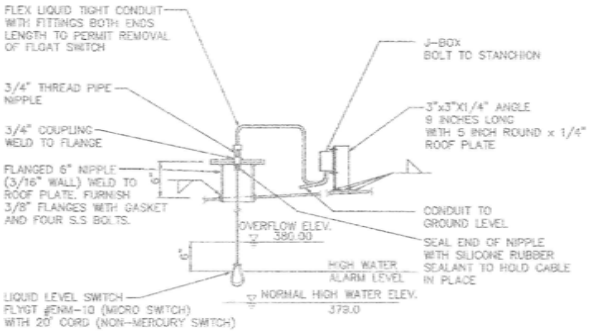
FILE NO. SHT-13
JOB NO. 94723

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

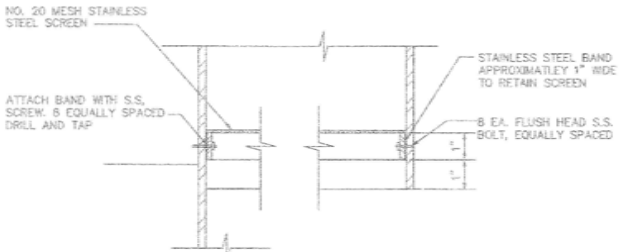
D-95-13/14



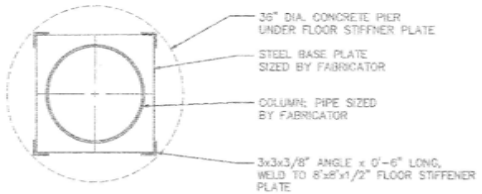

**ANCHOR BOLT DETAIL** (1/9)
SCALE: 3/4"= 1'-0"

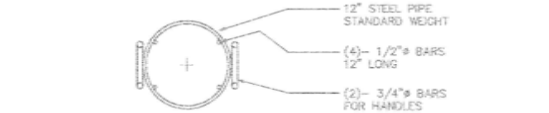


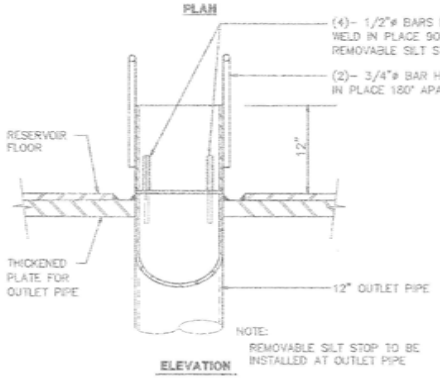

**HIGH WATER ALARM LEVEL SWITCH** (2/9,13)
SCALE: 1"= 1'-0"



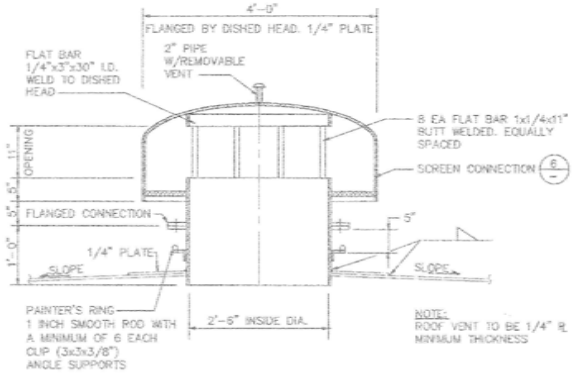

**SCREEN CONNECTION** (6/—)
SCALE: 6"= 1'-0"



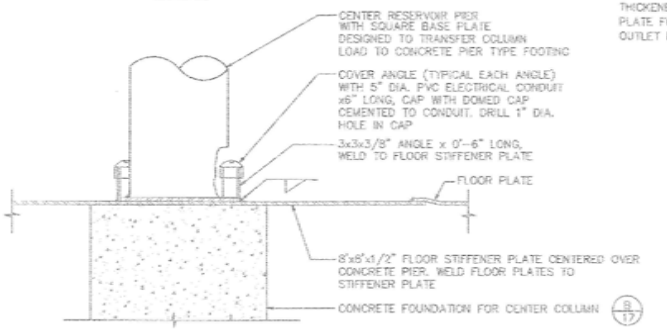




**REMOVABLE SILT STOP** (5/11)
SCALE: 1-1/2"= 1'-0"




**SECTION - ROOF VENT** (4/9)
SCALE: 1"= 1'-0"




PAINT NOTE:
PRIOR TO FIELD ERECTION OF COLUMN PAINT COLUMN BASE PLATE AND THE FULL SQUARE AREA BETWEEN RETAINER ANGLES WITH ONE SINGLE COAT OF TNEMEC ℊ264 (BLACK) "ELASTO SHIELD" MODIFIED POLYURETHANE (RUBBER) NSF APPROVED COATING, APPLIED AT 50 MILS THICKNESS TO EACH SURFACE. ALLOW 12 HOUR CURING TIME BEFORE SETTING COLUMN. ℊ264 IS COMPATIBLE WITH SPECIFIED TNEMEC PRIME & FINISH COATS.

**CENTER COLUMN FOOTING** (3/9)
SCALE: 1"= 1'-0"

Gray & Osborne, Inc.
CONSULTING ENGINEERS
700 DEXTER AVE. NORTH, SUITE 200
SEATTLE, WASHINGTON 98109-5013 (206) 284-0860

DATE: FEB. 1995
SCALE: NOTED
DRAWN: R.L.O.
CHECKED: R.R.O.
APPROVED: K.E.E.

| No. | REVISION | DATE APP'D |
|---|---|---|

Construction Contract No. PW 95-06

CITY OF LACEY
THURSTON COUNTY
WASHINGTON

HAWKS PRAIRIE RESERVOIR

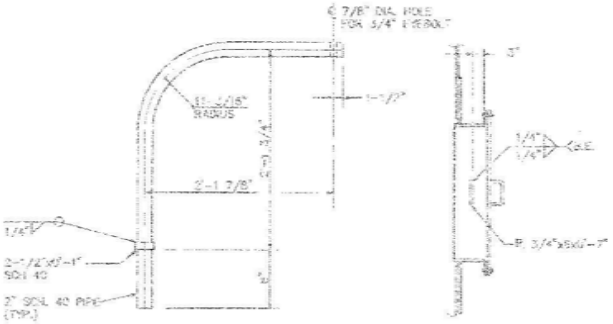
RESERVOIR DETAILS

SHEET: 14
OF: 21

FILE NO. SHT-14
JOB NO. 94723

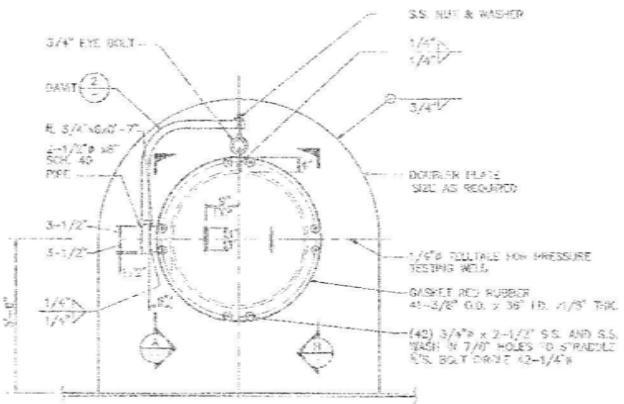
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/15

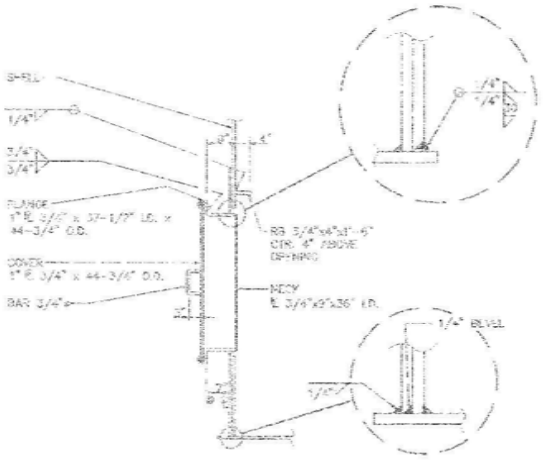



DAVIT DETAIL 1/1 — SCALE: 1-1/2"= 1'-0"

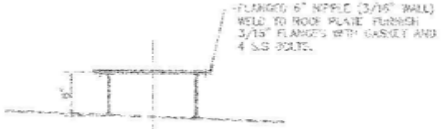
SECTION 1/1 — SCALE: 3/4"= 1'-0"




38" SHELL MANHOLE (2 REQ'D) 2/9 — SCALE: 3/4"= 1'-0"



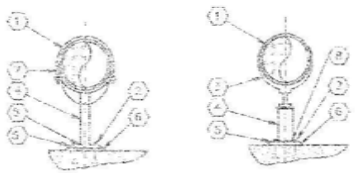

SECTION 2/1 — SCALE: 3/4"= 1'-0"



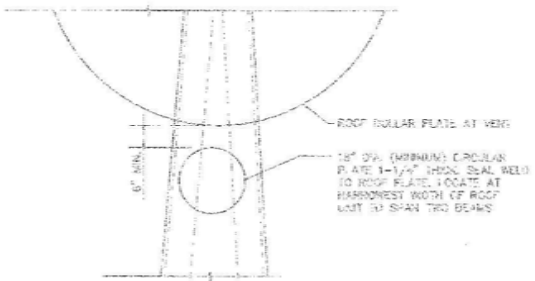

ANODE JUNCTION BOX 4/9 — SCALE: 1-1/2"= 1'-0"

NOTES:

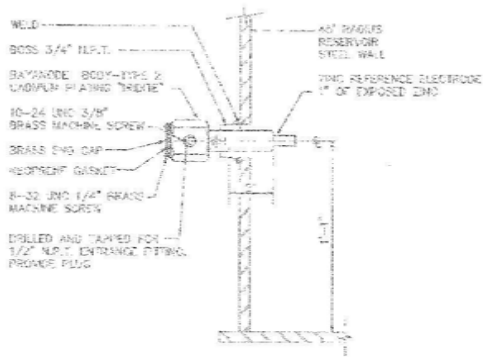
1. PIPE SIZE VARIES
2. 5/8" DIAMETER EXPANSION BOLTS X 6" MIN. LENGTH EQUALLY SPACED
3. ADJUSTABLE STEEL PIPE, SADDLE SUPPORT (GRINNEL STYLE 264) SIZE VARIES
4. SUPPORT, PIPE SIZE VARIES
5. 1/4" STEEL ø (BASE PLATE) DIAMETER VARIES
6. LEVELING COURSE "NON SHRINK" GROUT
7. GRINNELL PIPE SUPPORT (FIGURE No. 256)
8. WELD ALL AROUND




PIPE SUPPORT DETAIL 3/9 & 4/9 — SCALE: 3/4"= 1'-0"




EQUIPMENT MOUNTING PLATE 5/9 — SCALE: 3/4"= 1'-0"




TEFLON TAPE THREAD SEAL SHALL BE APPLIED TO THE THREADS

REFERENCE ELECTRODE INSTALLATION DETAIL 5/9 — SCALE: 1"= 1'-0"

Gray & Osborne, Inc.
Consulting Engineers
Seattle, Washington

CITY OF LACEY
THURSTON COUNTY, WASHINGTON

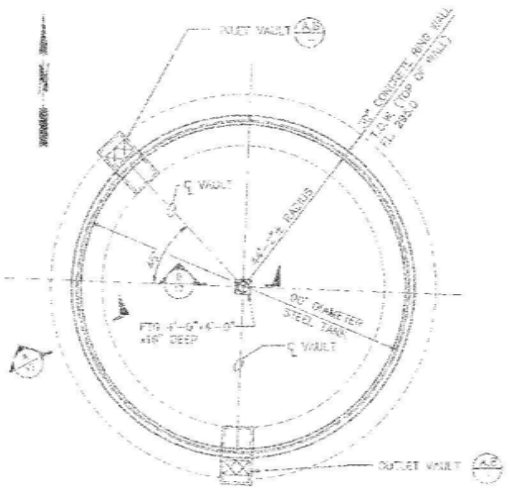
HAWKS PRAIRIE RESERVOIR

RESERVOIR DETAILS

SHEET 15
OF 21

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

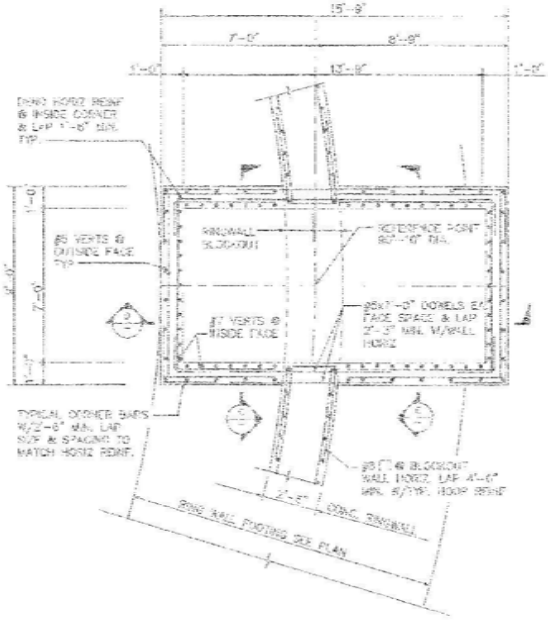
D-95-13/16




FOUNDATION PLAN

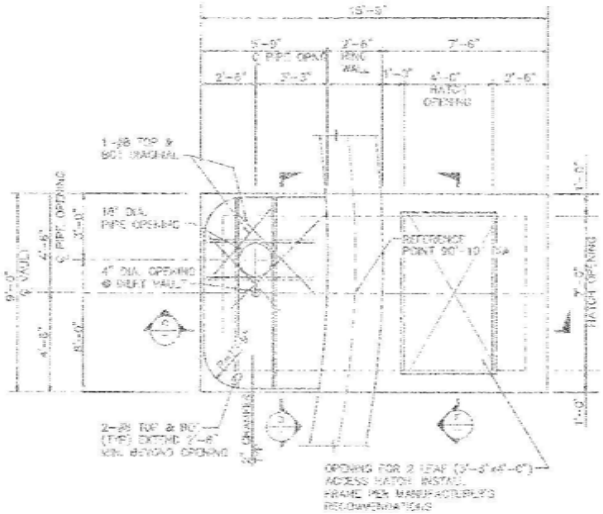
SCALE: 1/16"= 1'-0"

NOTE:
RINGWALL AND CENTER COLUMN FOOTING AND VAULTS SHALL BE INSTALLED ON UNDISTURBED EARTH OR STRUCTURAL BACKFILL COMPACTED TO 95% (ASTM D557-78)



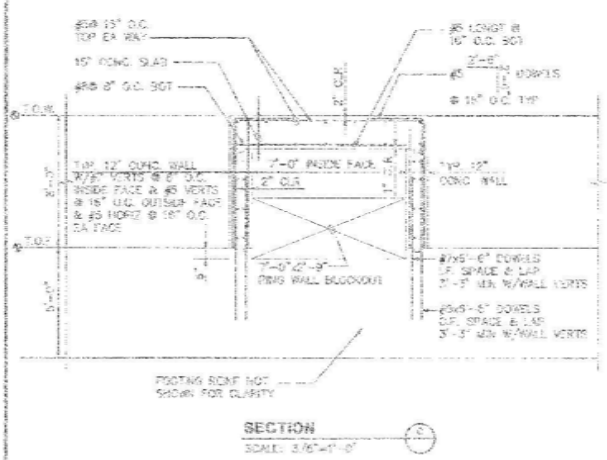

INLET/OUTLET VAULT FOUNDATION PLAN

SCALE: 3/8"= 1'-0"



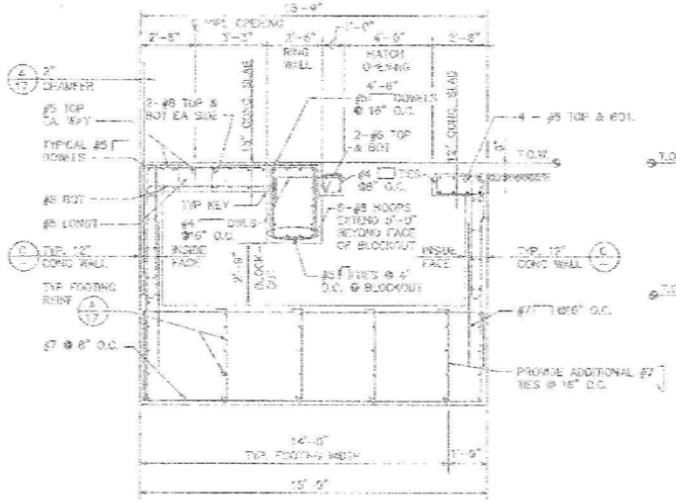

INLET/OUTLET VAULT PLAN

SCALE: 3/8"= 1'-0"



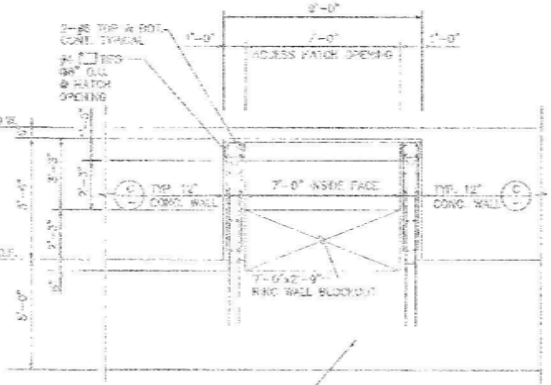

SECTION

SCALE: 3/8"=1'-0"




SECTION

SCALE: 3/8"=1'-0"




SECTION

SCALE: 3/8"=1'-0"

Gray & Osborne, Inc.

CITY OF LACEY

THURSTON COUNTY

WASHINGTON

HAWKS PRAIRIE RESERVOIR

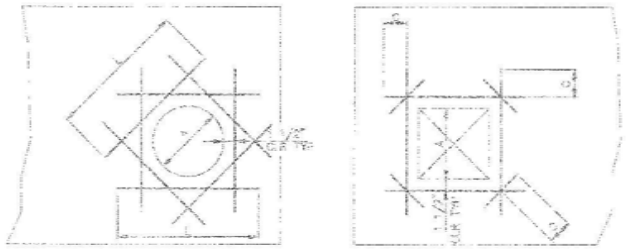
FOUNDATION PLAN AND SECTIONS

SHEET 16

OF 21

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/17




| OPENING SIZE (A) | TYPE I LENGTH (Z' BAR 'L') #5 | #6 | TYPE II (O) |
|---|---|---|---|
| 0" - 12" | 3' - 0" | | 1' - 0" |
| 13" - 18" | 4' - 0" | | 1' - 3" |
| 19" - 24" | 6 - #5 | | 2' - 0" |
| 25" - 36" | 7 - #5 | | 2' - 6" |
| 37" - | N - #5 | | 3' - 0" |

NOTE:
ALL BARS, EACH FACE. USE THESE BAR SIZES UNLESS OTHERWISE NOTED.

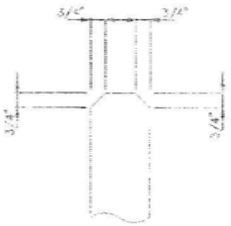
PIPE OPENINGS REINFORCING DETAILS (1/S10)
NOT TO SCALE

STRUCTURAL ABBREVIATIONS & LEGENDS

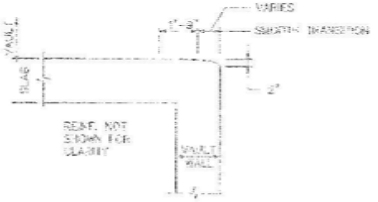
| | |
|---|---|
| EL. | ELEVATION |
| T.O.F. | TOP OF FOOTING |
| T.O.S. | TOP OF SLAB |
| T.O.W. | TOP OF WALL |

| REINF. | LAPS |
|---|---|
| #4 | 2'-4" |
| #5 | 3'-0" |
| #6 | 3'-6" |
| #7 | 4'-3" |
| #8 | 4'-10" |
| #9 | 5'-3" |
| #10 | 5'-8" |
| #11 | 6'-0" |

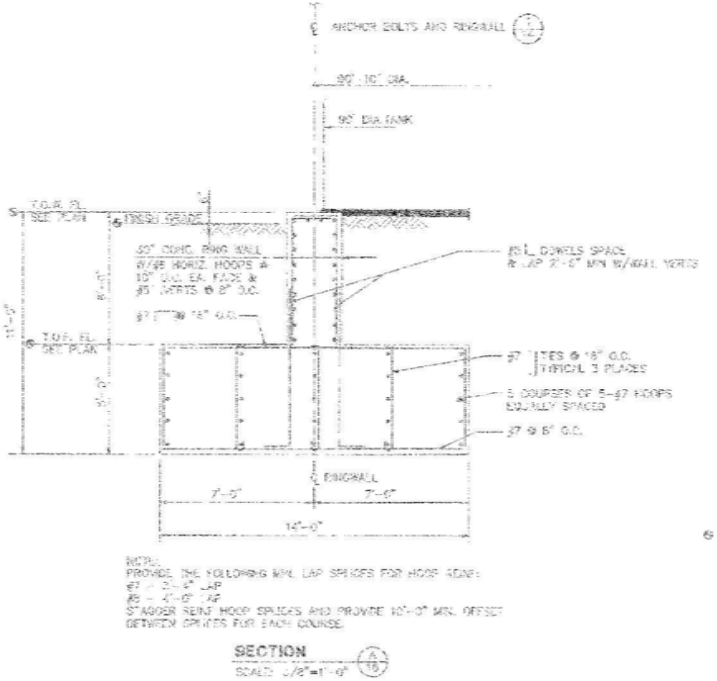
TYPICAL LAP SCHEDULE UNLESS NOTED OTHERWISE (2/TYP)
NOT TO SCALE




CHAMFER (3/S10)
NOT TO SCALE

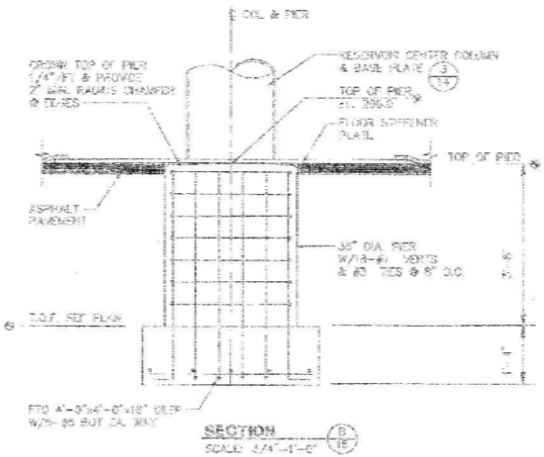



CHAMFER TRANSITION (4/S10)
SCALE: 3/4"= 1'-0"




NOTE:
PROVIDE THE FOLLOWING MIN. LAP SPLICES FOR HOOP REINF:
#7 - 2'-4" LAP
#5 - 1'-8" LAP
STAGGER REINF HOOP SPLICES AND PROVIDE 10"-0" MIN. OFFSET BETWEEN SPLICES FOR EACH COURSE.

SECTION (A/S10)
SCALE: 1/2"=1'-0"




SECTION (B/S10)
SCALE: 3/4"=1'-0"

## GENERAL STRUCTURAL NOTES

**GENERAL**

THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS BEFORE STARTING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY. USE DETAIL MARKED "TYPICAL" WHEREVER APPLICABLE. CHANGES, OMISSIONS OR SUBSTITUTIONS ARE NOT PERMITTED WITHOUT WRITTEN APPROVAL OF THE ENGINEER. REFER TO THE SPECIFICATIONS FOR FURTHER REQUIREMENTS. TO COMPLY WITH UBC SECTION 306, SPECIAL INSPECTION ARE REQUIRED FOR THE FOLLOWING:

a) CONCRETE, UBC SECTION 306(c)1
b) WELDING, UBC SECTION 306(c)5-B
c) HIGH STRENGTH BOLTED, UBC SECTION 306(c)5

THE DESIGN, ADEQUACY AND SAFETY OF EROSION BRACING, SHORING, TEMPORARY SUPPORTS, ETC., IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR, AND HAS NOT BEEN CONSIDERED BY THE ENGINEER OF RECORD. THE CONTRACTOR SHALL PROVIDE THE NECESSARY BRACING TO PROVIDE STABILITY OF THE STRUCTURE DURING AND ERECTION OF THE TANK. STRUCTURAL OBSERVATION WILL BE CONDUCTED DURING THE CONSTRUCTION PERIOD BY THE ENGINEER OF RECORD TO COMPLY WITH SECTION 307, ITEM 1 OF THE UBC FOR OCCUPANCY CATEGORY 1, ESSENTIAL FACILITIES NOTED IN TABLE 23-K.

THE GENERAL NOTES APPLY TO ALL STRUCTURES UNLESS NOTED OTHERWISE (U.N.O.). LOCATION AND SIZE OF ANCHOR BOLTS FOR SPECIFIC EQUIPMENT SHALL BE SPECIFIED BY THE VENDOR. CONTRACTOR SHALL COORDINATE LOCATIONS OF STRUCTURAL OPENINGS, PENETRATIONS AND EMBEDDED ITEMS WITH THE MECHANICAL, ARCHITECTURAL, ELECTRICAL, PLUMBING AND VENTILATION SECTIONS OF THE DRAWINGS AND WITH SUPPLIERS AND SUBCONTRACTORS AS MAY BE REQUIRED.

**SHOP DRAWINGS**

SHOP DRAWINGS, WHERE REQUIRED, SHALL BE CHECKED AND APPROVED BY THE GENERAL CONTRACTOR PRIOR TO SUBMITTAL FOR ENGINEER REVIEW. GENERAL CONTRACTOR IS RESPONSIBLE FOR VERIFICATION AND COORDINATION OF DIMENSIONS AND DETAILS FOR EACH SUBCONTRACTOR.

**DESIGN LOADS**

SNOW LOAD ..... 25 PSF
BASIC WIND SPEED PER UBC ..... 100 MPH, EXPOSURE B
SEISMIC LOADING PER UBC ZONE 3, I = 1.25

**FOUNDATION**

DESIGN ALLOWABLE SOIL BEARING PRESSURE = 10,000 PSF
EXTEND ALL EXTERIOR FOOTINGS 3'-0" MINIMUM BELOW FINISHED GRADE. BOTTOM OF ALL FOOTINGS TO BEAR ON NATIVE, INORGANIC, UNDISTURBED SOIL. NO FOOTING SHALL BEAR HIGHER THAN 1 VERTICAL TO 1.5 HORIZONTAL SLOPE ABOVE ANY EXCAVATION, EXISTING OR PLANNED. CONTRACTOR SHALL PROVIDE TEMPORARY SHORING TO PREVENT MOVEMENT OF WALLS DURING PLACEMENT OF BACKFILL. THERE SHALL BE 95% COMPACTION (ASTM D1557 MODIFIED PROCTOR DENSITY) OF ALL BACKFILL SOIL UNDER SLABS ON GRADE. REFER TO GEOTECHNICAL REPORT #0233-008-193, DATED JULY 5, 1994, AND PREPARED BY GRETTENGINEERS, INC., FOR ADDITIONAL RECOMMENDATIONS.

**CAST-IN-PLACE CONCRETE**

ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3,500 PSI AT 28 DAYS.
MAXIMUM SLUMP: 3" FOR SLABS AND FOOTINGS, 4" FOR WALLS, COLUMNS AND BEAMS.
CONSTRUCTION TO BE IN ACCORDANCE WITH ACI 318-89, "PART 2 -- STANDARDS FOR TESTS AND MATERIALS" AND "PART 3 -- CONSTRUCTION REQUIREMENTS".

**REINFORCING STEEL**

WELDED WIRE FABRIC (W.W.F.): ASTM A185
DEFORMED BARS: ASTM A615, GRADE 40 FOR #3, GRADE 60 FOR #4 & LARGER.

SECURELY TIE IN PLACE WITH DOUBLE ANNEALED 16 GAUGE IRON WIRE OR APPROVED CLIPS.

UNLESS OTHERWISE NOTED ON THESE DRAWINGS, PROVIDE CLEAR DISTANCE AT REINFORCING BARS AS FOLLOWS:
CONCRETE CAST AGAINST SOIL = 3".
FORMED CONCRETE AGAINST SOIL = 2".
WALLS, COLUMNS AND BEAMS EXPOSED TO WEATHER = 2".
WALLS, COLUMNS AND BEAMS (NOT EXPOSED TO WEATHER) = 1 1/2"
SLAB ON GRADE = 2".

SUBMIT SHOP DRAWINGS OF REINFORCING STEEL FOR REVIEW BY THE ENGINEER PRIOR TO FABRICATION.

**STRUCTURAL AND MISC. STEEL**

SHAPES, PLATES AND BARS: ASTM A36, FY = 36 KSI.
BOLTS: ASTM A325 HIGH STRENGTH BOLTS (H.S.B.) UNLESS NOTED AS ASTM A307 MACHINE BOLTS (M.B.).
WHERE HIGH STRENGTH BOLTS ARE USED, THEY SHALL BE INSTALLED WITH LOAD INDICATOR DEVICES (LOAD INDICATOR WASHERS OR SNAP-OFF HEADS).
EXPANSION BOLTS (E.B.): "HILTI KWIK BOLT" OR APPROVED EQUAL.
FLUSH EXPANSION ANCHORS: "HILTI DROP-IN ANCHOR" OR APPROVED EQUAL.
ADHESIVE ANCHORS: "HILTI HY-A" OR APPROVED EQUAL.
HEADED ANCHOR STUD (H.A.S.): ASTM A108-1541, FY = 50 KSI, END WELDED PER MANUFACTURER'S RECOMMENDATIONS.
DEFORMED BAR ANCHORS (D.B.A.): ASTM A496 FY = 70 KSI, END WELDED PER MANUFACTURER'S RECOMMENDATIONS.
WELDING ELECTRODES OR RODS: AWS A5.1 OR A5.5, E70XX; AWS A5.17, E709-X; AWS A5.20, E70T-X.
ERECTION AND FABRICATION IN ACCORDANCE WITH AISC "SPECIFICATIONS FOR DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
WELDING SHALL CONFORM TO AWS "CODE FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION". ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
ALL COLUMNS AND BEAMS TO BE FROM UNSPECIFIED LENGTHS UNLESS NOTED OTHERWISE ON THE DRAWINGS. SUBMIT SHOP DRAWINGS SHOWING SIZES, DIMENSIONS AND REQUIRED CONNECTION DETAILS FOR REVIEW BY THE ENGINEER PRIOR TO FABRICATION.

**WELDED STEEL RESERVOIR**

SEE PROJECT SPECIFICATIONS FOR CONSTRUCTION REQUIREMENTS

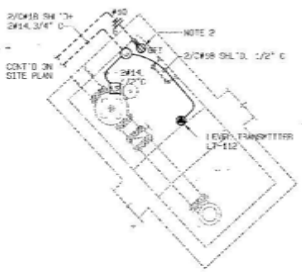
Gray & Osborne, Inc.
CONSULTING ENGINEERS
ISSAQUAH, WASHINGTON

CITY OF LACEY
THURSTON COUNTY, WASHINGTON
HAWKS PRAIRIE RESERVOIR
STRUCTURAL NOTES AND DETAILS

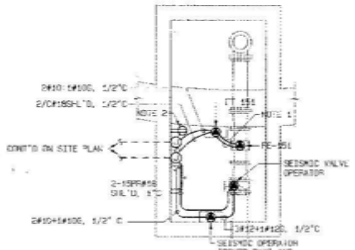
SHEET 17
OF 21

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

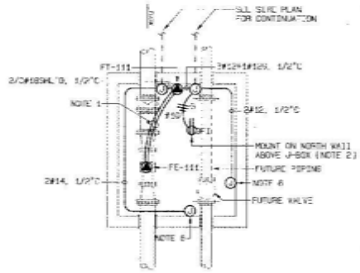
D-95-13/18



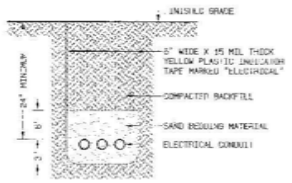
DETAIL 1/18
ELECTRICAL PLAN
INLET VAULT
SCALE: 1/4" = 1'-0"



DETAIL 2/18
ELECTRICAL PLAN
OUTLET VAULT
SCALE: 1/4" = 1'-0"



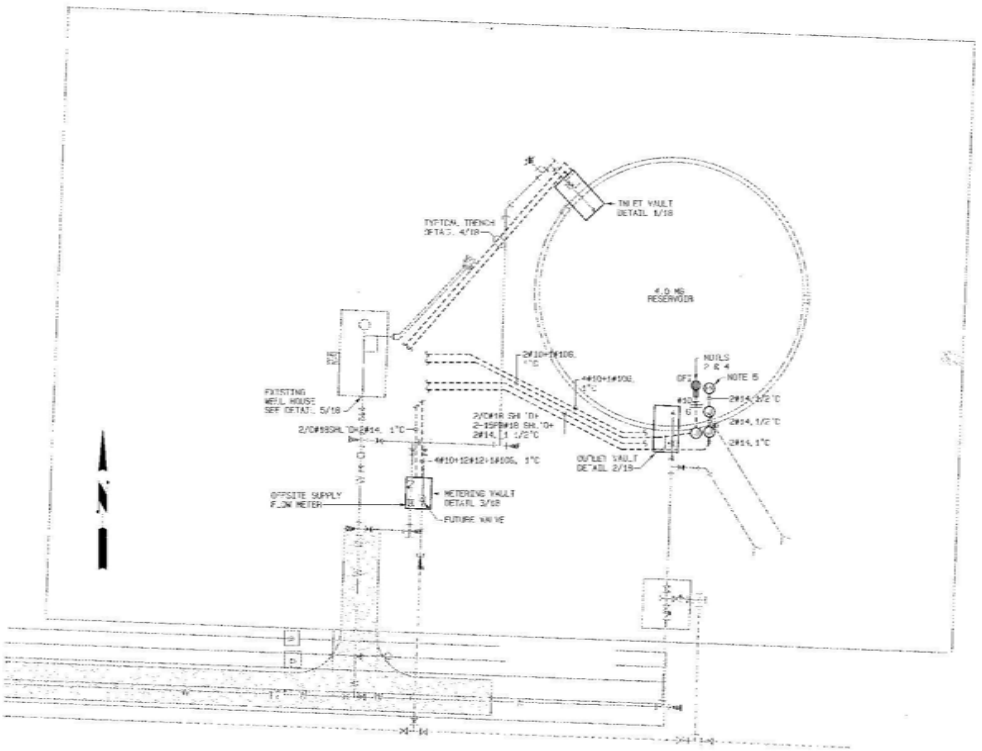
DETAIL 3/18
ELECTRICAL PLAN
METER VAULT
SCALE: 1/4" = 1'-0"



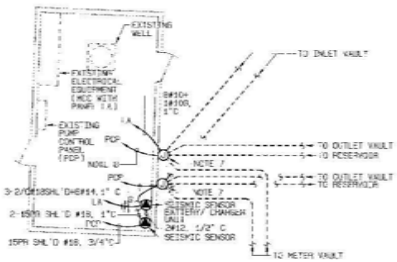
DETAIL 4/18
TRENCH FOR ELECTRICAL CIRCUITS
SECONDARY POWER OR SIGNAL CIRCUITS
SCALE: 1"=1'-0"

SYMBOL SCHEDULE FOR
ELECTRICAL PLAN DRAWINGS

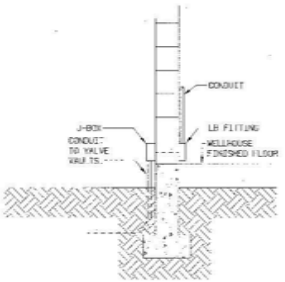
| SYMBOL | DESCRIPTION |
|---|---|
| | RECEPTACLE OUTLETS |
| | DUPLEX RECEPTACLE OUTLET - WALL MOUNTED (NEMA 5-15R UNLESS OTHERWISE SPECIFIED) |
| | GENERAL WIRING SYMBOLS |
| LS | LIMIT SWITCH |
| SV | SOLENOID VALVE |
| FS | FLOAT SWITCH |
| SE | SPECIAL PURPOSE EQUIPMENT CONNECTION |
| J | JUNCTION BOX |
| | WIRING RUN EXPOSED ON BUILDING STRUCTURE |
| | WIRING RUN CONCEALED UNDER SLAB OR BELOW GRADE |
| | INDICATES WIRE SIZE IF OTHER THAN NO. 12AWG. # OF PHASE CONDUCTOR. CROSSMARKS INDICATE NEUTRAL CONDUCTOR. QUANTITY AND USE GROUNDING CONDUCTOR. OF CONDUCTORS. |
| | ARROWHEAD INDICATES HOMERUN TO EQUIPMENT/DEVICE NOTED AT END OF ARROWHEAD. NUMBER (where NOTED) INDICATES CIRCUIT WITHIN EQUIPMENT/DEVICE NOTED. |
| | FLOOR/CEILING PENETRATION |



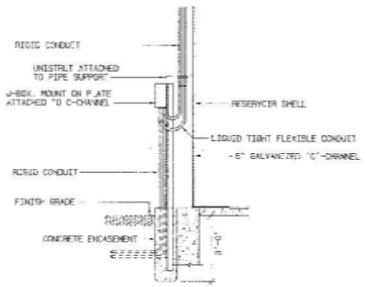
ELECTRICAL SITE PLAN
SCALE: 1"=20'-0"



DETAIL 5/18
ELECTRICAL PLAN
WELL HOUSE
SCALE: NONE



DETAIL 6/18
CONDUIT ENTRANCE AT WELLHOUSE
SCALE: NONE



DETAIL 7/18
ELEVATION
J-BOX AT RESERVOIR
SCALE: 1/2"=1'-0"

1. PROVIDE 2 CONDUITS BETWEEN FLOW TRANSMITTER AND FLOW ELEMENT FOR MANUFACTURER'S CABLES. SIZE CONDUIT PER MANUFACTURER'S RECOMMENDATIONS. INSTALL MANUFACTURER'S CABLES IN CONDUIT AND CONNECT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. PROVIDE GROUND FAULT TRIP CIRCUIT BREAKER IN PANEL TO SUPPLY ALL RECEPTACLES SHOWN IN VAULTS AND AT RESERVOIR.
3. PROVIDE INDIVIDUAL 1P-20A CIRCUIT BREAKER IN PANEL BOARD TO SUPPLY THE FOLLOWING CIRCUITS:
   METER VAULT FLOWMETER
   OUTLET VAULT FLOWMETER
   SEISMIC OPERATOR
   SEISMIC SENSOR
4. MOUNT RECEPTACLE ON 3"x2"x1/4" ANGLE ON TOP OF RESERVOIR, ADJACENT TO FLOAT SWITCH J-BOX. SEE DETAIL 2/14.
5. SEE DETAIL 2/14.
6. COIL CONDUCTORS IN J-BOX FOR FUTURE CONNECTION TO VALVE EQUIPMENT. PROVIDE WIRE NUTS ON CONDUCTORS AND LEAVE 12" MINIMUM SLACK FOR FUTURE SPLICING.
7. SEE DETAIL 6/18.
8. 2#12+1#12G,3/4"C FOR FUTURE VALVE EQUIPMENT.


Gray & Osborne, Inc.
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH, SUITE 201
SEATTLE, WASHINGTON 98109 • (206) 285-3980


| DATE: FEB. 1995 | SCALE: NOTED | DRAWN: DAB | CHECKED: PLC | APPROVED: PLC |
|---|---|---|---|---|

| No. | REVISION | DATE | APP'D |
|---|---|---|---|

CITY OF LACEY
THURSTON COUNTY, WASHINGTON

HAWKS PRAIRIE RESERVOIR

ELECTRICAL SITE PLAN

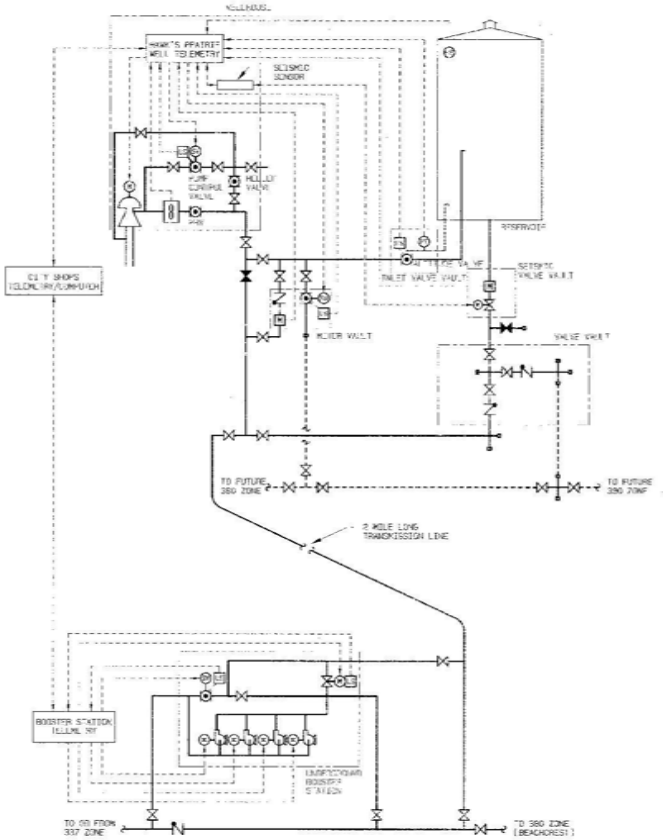
Construction Contract No. PW 95-06

SHEET: 18
OF: 21

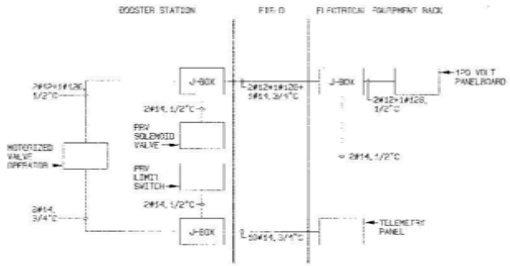
FILE NO. 94723-18
JOB NO. 94723


Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/19




PIPING AND INSTRUMENTATION DIAGRAM
HAWK'S PRAIRIE WELL, RESERVOIR
AND BOOSTER STATION




BLOCK DIAGRAM
BOOSTER STATION ELECTRICAL MODIFICATIONS
SCALE: NONE

SYMBOL SCHEDULE
PROCESS INSTRUMENTATION DIAGRAM

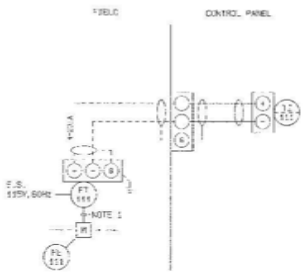
| SYMBOL | DESCRIPTION |
|---|---|
| | INSTRUMENTATION EQUIPMENT |
| | OTHER CONTROL EQUIPMENT |
| N | CHECK VALVE |
| | GENERAL VALVE (NORMALLY OPEN) |
| | GENERAL VALVE (NORMALLY CLOSED) |
| | SPECIALTY VALVE |
| | MAGNETIC FLOWMETER |
| | PRESSURE TRANSMITTER |
| | MOTOR OPERATOR |
| | SOLENOID OPERATOR |
| | FLOAT SWITCH |
| | LIMIT SWITCH |
| | PROPELLER FLOWMETER |
| | DEEPWELL TURBINE PUMP |
| | PUMP |
| | PROCESS PIPING |
| | FUTURE PIPING |
| | ELECTRICAL SIGNAL |

SYMBOL SCHEDULE
ANALOG LOOP DIAGRAM

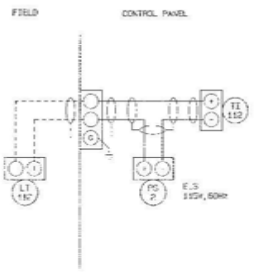
| SYMBOL | DESCRIPTION |
|---|---|
| M | MAGNETIC FLOW METER |
| | TERMINAL |
| | GROUND |
| | SHIELD |
| | DEVICE MOUNTING |
| TT | FRONT OF PANEL |
| T | INTERIOR OF PANEL |
| FE | FIELD |
| | WIRING |
| | PANEL WIRING |
| | FIELD WIRING |

ABBREVIATIONS

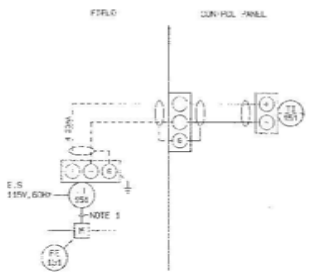
| | |
|---|---|
| ES | ELECTRICAL SUPPLY |
| FE | FLOW ELEMENT |
| FIT | FLOW INDICATING TOTALIZER |
| FIR | FLOW INDICATING RECORDER |
| FT | FLOW TRANSMITTER |
| LIR | LEVEL INDICATOR RECORDER |
| LT | LEVEL TRANSMITTER |
| PS | POWER SUPPLY |
| TI | TELEMETRY INPUT |




LOOP 111
OFFSITE SUPPLY FLOW
NOTE 1: TWO CIRCUITS. INSTALL MANUFACTURER'S CABLES IN SEPERATE CONDUITS PER MANUFACTURER'S RECOMMENDATIONS




LOOP 112
RESERVOIR LEVEL




LOOP 151
RESERVOIR OUTLET FLOW
NOTE 1: TWO CIRCUITS. INSTALL MANUFACTURER'S CABLES IN SEPERATE CONDUITS PER MANUFACTURER'S RECOMMENDATIONS

Gray & Osborne, Inc
CONSULTING ENGINEERS
701 DEXTER AVENUE NORTH, SUITE 300
SEATTLE, WASHINGTON 98109 • (206) 284-0860

DATE: FEB. 1998
SCALE: NOTED
DRAWN: DJB/MFG
CHECKED: PLC
APPROVED: PLC

| NO. | REVISION | DATE | APP'D |
|---|---|---|---|

EXPIRES 9/14/98

CITY OF LACEY
THURSTON COUNTY
WASHINGTON

HAWKS PRAIRIE RESERVOIR

LOOP AND PID DIAGRAMS

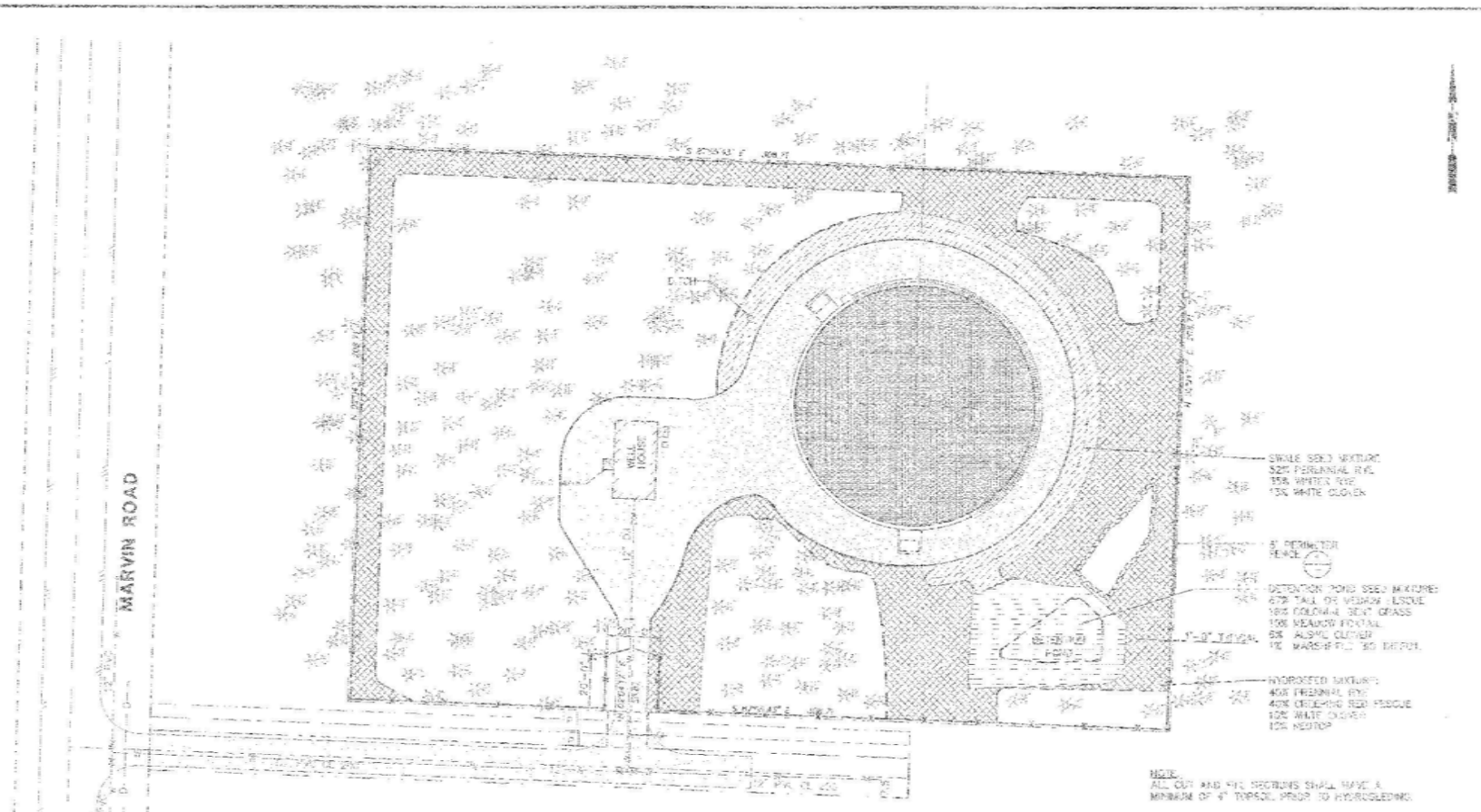
Construction Contract No. PW 95-08

SHEET: 19
OF: 21

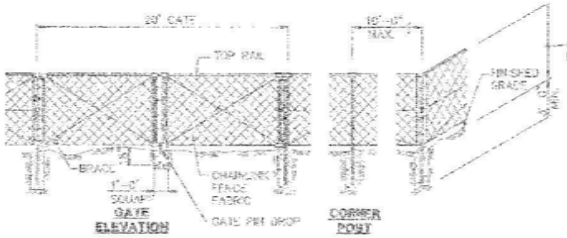
FILE NO. 94723-19
JOB NO. 94723

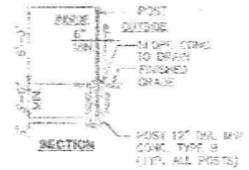
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/20




SITE RESTORATION/LANDSCAPING PLAN
SCALE 1"=40'



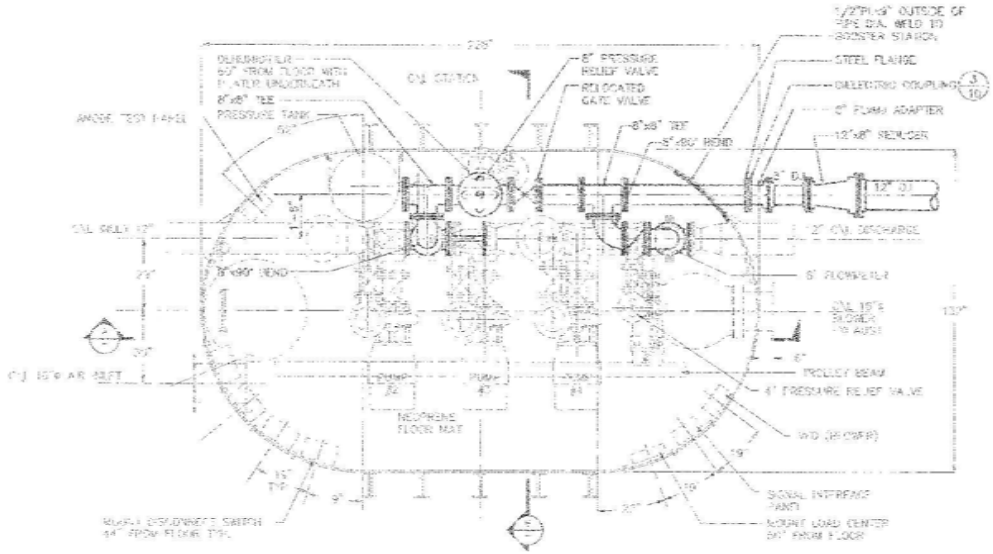

NOTES:
1. CHAINLINK FENCE AND GATE SHALL BE FURNISHED AND INSTALLED ACCORDING TO THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS 1994 FOR CHAINLINK FENCE TYPE 1 AS DETAILED ON STANDARD PLANS L-2 AND L-5.
2. CORNER POSTS SHALL BE INSTALLED AT ALL POINTS WHERE THE ALIGNMENT CHANGES 30° OR MORE.

TYPICAL SWING GATE AND FENCE DETAILS (1/5)
SCALE 1" = 5'-0"

Gray & Osborne, Inc.
CONSULTING ENGINEERS
ROBERT L. OSBORNE 12/31/20
DATE FEB 1994
SCALE NONE
DESIGN R.L.O.
DRAWN R.B.O.
APPROVED
NO. REVISION BY DATE
CITY OF LACEY
HAWKS PRAIRIE RESERVOIR
SITE RESTORATION/LANDSCAPING
DWG 20
OF 21
FILE NO. 1-13-20
JOB NO. 94023

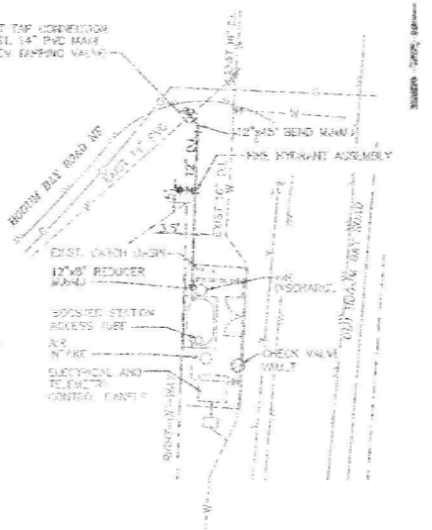
Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

D-95-13/21

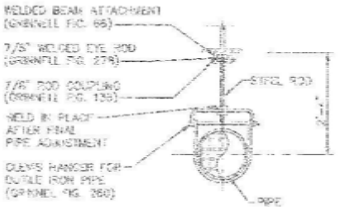


BOOSTER STATION PLAN
SCALE: 1/2"= 1'-0"

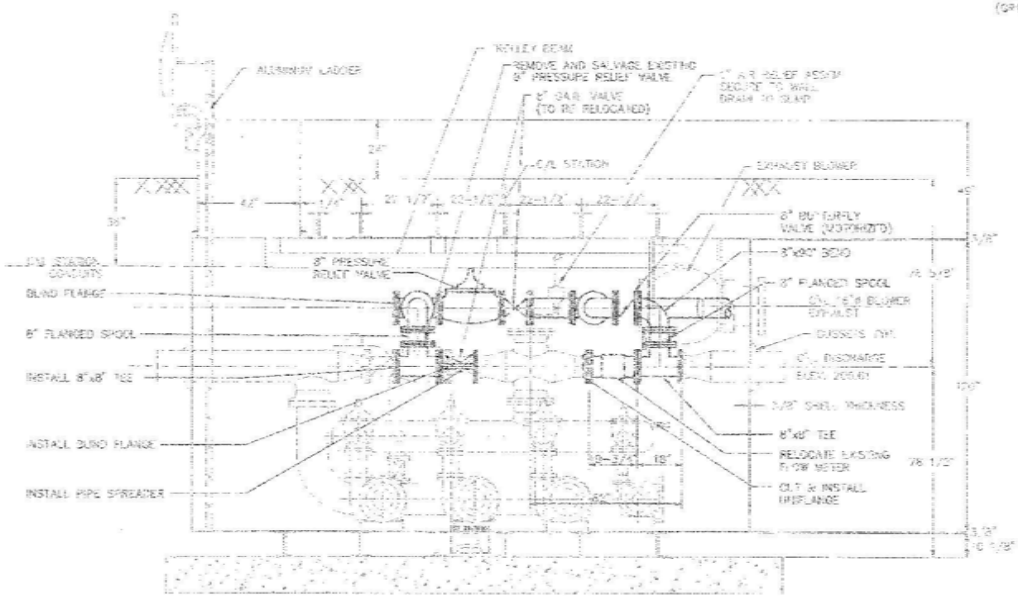
NOTES:
1. ALL PIPE JOINTS & FITTINGS SHALL BE RESTRAINED WITH MEGALUGS.
2. TEMPORARILY PLUG ENDS OF NEW PIPE AND COMPLETE PRESSURE AND BACTERIOLOGICAL TESTS; PROVIDE TAPS FOR TESTING & FLUSHING INCLUDING REMOVAL OF CHLORINATED WATER.
3. ALL PIPE AND FITTINGS, REQUIRED FOR CONNECTING TO EXISTING WATER MAIN SHALL BE THOROUGHLY CLEANED AND DISINFECTED PRIOR TO INSTALLATION, AND PROTECTED FROM CONTAMINATION THROUGHOUT INSTALLATION, INCLUDING MAINTENANCE OF A DRY TRENCH.
4. NOTIFY CITY 72 HOURS IN ADVANCE OF MAKING TIE CONNECTION TO THE EXISTING MAIN. CONTRACTOR IS ALLOWED ONE DAY FOR A PERIOD OF 6 HOURS OF WATER SHUT-OFF TO MAKE CONNECTIONS & RESTORE WATER SERVICE. NO CONNECTIONS PERFORMED ON FRIDAY, SATURDAY, SUNDAY OR MONDAY.



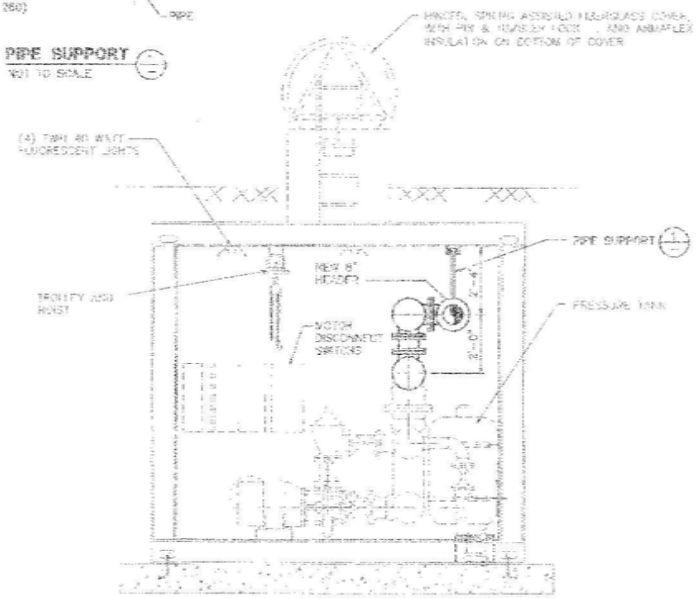
BOOSTER STATION SITE PLAN
SCALE: 1"= 20'



PIPE SUPPORT
NOT TO SCALE



SECTION
SCALE: 1/2"= 1'-0"



SECTION
SCALE: 1/2"= 1'-0"

Gray & Osborne, Inc.
CONSULTING ENGINEERS
SEATTLE (206) 284-0463 TACOMA (253) 383-2389
WATER WASTEWATER STORM DRAINAGE

CITY OF LACEY
THURSTON COUNTY
WASHINGTON

HAWKS PRAIRIE NEIGHBORHOOD

BOOSTER STATION MODIFICATIONS

SHEET 21
OF 21

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# APPENDIX R

## DISCLOSURE OF LOBBYING ACTIVITIES

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

*This page left intentionally blank*

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

# DISCLOSURE OF LOBBYING ACTIVITIES

Approved by OMB
0348-0046

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure.)

**1. Type of Federal Action:**
[B] a. contract
b. grant
c. cooperative agreement
d. loan
e. loan guarantee
f. loan insurance

**2. Status of Federal Action:**
[B] a. bid/offer/application
b. initial award
c. post-award

**3. Report Type:**
[A] a. initial filing
b. material change
**For Material Change Only:**
year _____ quarter _____
date of last report _____

**4. Name and Address of Reporting Entity:**
☐ Prime ☑ Subawardee
Tier _____, *if known*:

**Congressional District**, *if known*: WA10

**5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime:**
Washington Military Department
Emergency Management Division
20 Aviation Dr
Building 20, MS TA-20
Camp Murray, WA 98430-5112
**Congressional District**, *if known*:

**6. Federal Department/Agency:**
Federal Emergency Management Division

**7. Federal Program Name/Description:**
Hazard Mitigation Program

CFDA Number, *if applicable*: _____

**8. Federal Action Number**, *if known*:

**9. Award Amount**, *if known*:
$ 3,998,585.33

**10. a. Name and Address of Lobbying Registrant**
(*if individual, last name, first name, MI*):

**b. Individuals Performing Services** (*including address if different from No. 10a*)
(*last name, first name, MI*):

**11.** Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less that $10,000 and not more than $100,000 for each such failure.

Signature: _____
Print Name: _____
Title: _____
Telephone No.: _____ Date: _____

**Federal Use Only:**

Authorized for Local Reproduction
Standard Form LLL (Rev. 7-97)

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal

## INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.

2. Identify the status of the covered Federal action.

3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.

4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.

5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.

6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.

7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.

8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."

9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.

10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

    (b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).

11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.

Provided to Builders Exchange of WA, Inc. For usage Conditions Agreement see www.bxwa.com - Always Verify Scal