PORT OF BELLINGHAM

BID SOLICITATION

PROJECT:

Harris Ave Shipyard Upland Cleanup Action

Bellingham Washington

Whatcom County, Washington

Bids: July 17, 2025
***at* 11:00 a.m.**

PORT OF BELLINGHAM
HARRIS AVE SHIPYARD UPLAND CLEANUP ACTION

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DRAWINGS

EXHIBIT "A" Contract (form of)
EXHIBIT "B" Performance and Payment Bond form
EXHIBIT "C" Wage Laws Compliance Certification
EXHIBIT "D" Prevailing Wage Rate(s)
EXHIBIT "E" Statement of Subcontractors form
EXHIBIT "F" Apprenticeship Utilization

PORT OF BELLINGHAM

HARRIS AVE SHIPYARD UPLAND CLEANUP ACTION

NOTICE OF BID

Notice is hereby given that sealed bids for the Harris Ave Shipyard Upland Cleanup Action in Bellingham, Washington will be received at the Administrative Offices of the Port of Bellingham, 1801 Roeder Avenue, Bellingham, Washington until 11:00 a.m., Thursday, July 17, 2025. The official time shall be taken from the designated clock at the Administrative Offices. Any bids received after the specified time and date will not be considered. Bids will then and there be publicly opened and read aloud.

The scope of work for this project consists of furnishing all labor, materials, and equipment necessary for the project identified above including the following major work items:

- Before construction starts, prepare and submit for Engineer approval an Excavation and Water Management Plan and Stormwater Pollution Prevention Plan (SWPPP) describing means and methods to accomplish the Work.
- Maintain site security, limit public access to project site, and conduct Work activities in a manner to not interfere with pedestrian or vehicle traffic on adjacent public rights-of-way.
- Conduct a utility locate.
- Install and maintain temporary erosion and sedimentation control (TESC) best management practices (BMPs) to prevent any off-site stormwater runoff or materials track-out and maintain them in full compliance with the approved SWPPP and applicable laws, regulations, and ordinances throughout construction.
- Establish lined and bermed stockpile areas for contaminated soil and for inert (uncontaminated) debris and maintain appropriate BMPs for all stockpiles, including capture and treatment of runoff from the stockpile area, throughout the Work.
- Conduct abatement of regulated building materials, demolish, and properly dispose of six above-grade buildings and various water treatment structures.
- Remove existing concrete and asphalt surfaces.
- Excavate contaminated soil to a depth of approximately 2 feet (actual depth varies) below Existing Grade to achieve specified subgrade elevations across most of the site (Cleanup Area 1).
- In two subareas (termed Cleanup Area 2), excavate contaminated soil to anticipated maximum depths of 5 feet and 9 feet below Existing Grade. Assist the Engineer with soil sampling in the Cleanup Area 2 excavations and, based on testing results, excavate additional contaminated soils laterally and/or vertically as directed by the Engineer.
- Remove and replace existing 8-inch water main and hydrant located within the Cleanup Area 2 excavation area.
- Remove subsurface structural elements (e.g., wood pilings, concrete, metal, etc.) and inactive subsurface utilities to the extent necessary to complete the excavation of contaminated soils, achieve specified Final Grades, or as otherwise directed by Engineer. Cut, plug, remove, and dispose of buried pipes that are encountered during excavation.

- Load, transport, and properly dispose the contaminated soil with associated debris at a Subtitle D landfill permitted to receive the material.
- Load, transport, and properly recycle all removed inert debris (concrete, asphalt, and metal) at a facility permitted to recycle it.
- Throughout excavation, remove groundwater as necessary to allow excavation and handling of unsaturated soil and otherwise perform the Work. The Contractor is responsible for all dewatering efforts including providing and installing sumps, pumps, power source (e.g., electrical generators), treatment equipment, temporary storage, conveyance, and to operate the system without leakage.
- Treat the extracted groundwater and stormwater collecting within the Project Limits and discharge it to an onsite storm drain in accordance with a NPDES Construction Stormwater General Permit (CSGWP) with Project-specific Administrative Order obtained by Owner. Upon execution of the Contract, the Owner will conduct complete full transfer of the CSWGP with Administrative Order to the Contractor who will then become solely responsible for compliance with its requirements.
- Complete trenching and other excavation as needed to install new stormwater catch basins, conveyance piping, a pretreatment vault for settling solids and capturing oil, and a treatment vault with sluice gates. Connect existing remaining catch basins to new stormwater conveyance system. Connect new stormwater conveyance piping to an existing outfall near the north end of the site and install an in-line check valve.
- Backfill and compact excavations to achieve specified Final Grades and compaction requirements using a combination of imported uncontaminated gravel borrow and crushed surfacing base course, as specified depending on location.
- Raise electrical infrastructure (one transformer, two vaults, and associated panels/racks) to match final grades.

A non-mandatory pre-bid conference for prospective bidders will be held Tuesday, July 8, 2025, at 2:00 p.m. in the Harbor Center room at the Port of Bellingham's Administrative Offices located at 1801 Roeder Avenue, Bellingham, Washington 98225. A site visit will follow.

Engineers estimate: $6,598,419.00.

In accordance with RCW 39.04.320, for all public works estimated to cost two million dollars or more, the Port of Bellingham requires no less than 15% of the labor hours be performed by apprentices, unless otherwise stated in the bid advertisement. A contractor or subcontractor may not be required to exceed the 15% requirement. The project's apprenticeship utilization rate will be calculated using the approved affidavits from the L&I PWIA portal.

Each bid must be accompanied by a cashier's check, money order, or an original signed and stamped surety bid bond in an amount not less than five percent (5%) of the total bid, made payable to the Port of Bellingham.

All questions related to this project must be submitted via email prior to 5:00 PM, local time, on Friday, July 11, 2025. No questions will be answered after that time.

The Port of Bellingham reserves the right to reject any or all bids and to waive any irregularities or informalities.

To register your company on the Plan Holders list, please contact Procurement by email at procurement@portofbellingham.com.

All bids submitted shall be considered as valid offers for a period of forty-five (45) days from the date of the bid opening during which time the Port of Bellingham will make the award or return all bids.

Notice to be published: Wednesday, June 25, 2025

PORT OF BELLINGHAM

BIDDER'S CHECKLIST

The bidder's attention is especially called to the following forms which must be completed in full as required and submitted collectively as the bid proposal package:

____**1. PROPOSAL FORM** – The unit prices **must** be shown in the space provided. Show **all** unit prices in both words and figures when indicated. If a discrepancy exists between the price per unit and the extended amount of any item, the price per unit will control.

____**2. BID GUARANTEE** – Original signed and stamped surety Bid Bond or Bid Deposit (cashier's check). The amount of the bid guarantee shall not be less than five percent (5%) of the total amount of the bid. See POB General Conditions #7 & the "Form of Bid Guarantee" for instructions on how to prepare the bid guarantee.

____**3. LIST OF SUBCONTRACTORS** – If the invitation to bid is expected to cost one million dollars or more then the bidder shall comply with RCW 39.30.060.

The following forms shall be executed and submitted within ten (10) business days after Notice of Award.

____**1. CONTRACT** – To be executed by the successful bidder.

____**2. PAYMENT AND PERFORMANCE BOND** – Owner provided form to be completed by Contractor's Surety and submitted with Contractor executed Contracts.

____**3. CERTIFICATE OF INSURANCE** – Contractor shall furnish a Certificate of Insurance and all applicable Endorsements naming the Port as additional insured on its Commercial General Liability and Automobile Liability Policies.

____**4. WAGE LAWS COMPLIANCE CERTIFICATION** – To be submitted by Contractor with executed Contract.

____**5. SCHEDULE OF VALUES** – To be submitted by Contractor with executed Contract.

____**6. MATERIAL PROCUREMENT AND CONSTRUCTION SCHEDULE** – To be submitted by Contractor with executed Contract.

____**7. LIST OF SUBCONTRACTORS** – To be submitted by Contractor with executed Contract.

____**8. PROJECT LABOR RATES AND EQUIPMENT RATES FOR CHANGE ORDER WORK** - To be submitted by Contractor **and** Subcontractors with executed Contract.

____**9. APPRENTICESHIP UTLIZATION PLAN** – To be submitted by Contractor with executed Contract.

____**10. CONTRACTOR'S W-9** – To be submitted by Contractor with executed Contract.

The following shall be filed prior to Notice to Proceed.

____**1. STATEMENT OF INTENT TO PAY PREVAILING WAGES** – To be filed immediately by the Prime Contractor after Contract is awarded and before work begins and subsequently by all those providing labor on the project.

PORT OF BELLINGHAM

HARRIS AVE SHIPYARD UPLAND CLEANUP ACTION

PROPOSAL FORM

PORT OF BELLINGHAM
1801 ROEDER AVENUE
BELLINGHAM, WA 98225

1. BIDS - Having carefully examined the project site(s), bid documents, and specifications for Harris Ave Shipyard Upland Cleanup Action located in Bellingham, Washington the undersigned proposes to furnish all labor, materials and equipment required to perform all work in accordance with the above named documents for the following price. The Total Bid Amount includes all work, regardless of whether or not it is specifically itemized below.

BID SCHEDULE: Harris Ave Shipyard Upland Cleanup Action

Item No.	Description of Item	Approx. Quantity	Units	Unit Price Dollars/Cents	Total Price Dollars/Cents
01	MOBILIZATION	LS	1	$	$
02A	CUT AND PLUG PIPE ≤ 6-INCH DIAMETER	EA	30	$	$
02B	CUT AND PLUG PIPE BETWEEN 6 AND 12-INCH DIAMETER	EA	20	$	$
02C	ELECTRICAL MODIFICATIONS	LS	1	$	$
03	ABATEMENT AND DEMOLITION OF ABOVE-GRADE STRUCTURES	LS	1	$	$
04	CONTAMINATED SOIL	TON	17,100	$	$
05	CONCRETE INERT DEBRIS	TON	640	$	$
06	ASPHALT INERT DEBRIS	TON	280	$	$
07	METAL INERT DEBRIS	TON	30	$	$
08	POTENTIAL ABATEMENT OF SUBSURFACE ACM	F.A.	1	$25,000.00	$25,000.00
09	FURNISH AND REMOVE WATER MANAGEMENT SYSTEM	LS	1	$	$
10	OPERATE WATER MANAGEMENT SYSTEM	DAY	45	$	$
11	CRUSHED SURFACING BASE COURSE	TON	9,200	$	$
12	GRAVEL BORROW	TON	10,000	$	$
13	SEPARATION GEOTEXTILE	SY	14,500	$	$
14A	POLYPROPYLENE STORM SEWER PIPE 4 IN. DIAM.	LF	72	$	$
14B	POLYPROPYLENE STORM SEWER PIPE 12 IN. DIAM.	LF	642	$	$
14C	POLYPROPYLENE STORM SEWER PIPE 18 IN. DIAM.	LF	341	$	$
14D	CATCH BASIN TYPE 2, 48 In. Diam.	EA	10	$	$
14E	CATCH BASIN TYPE 2, 60 In. Diam.	EA	2	$	$
14F	CONNECTION TO DRAINAGE STRUCTURE	EA	2	$	$
14G	PRETREATMENT VAULT	EA	1	$	$
14H	MODULAR WETLAND	EA	1	$	$
14I	INLINE CHECK VALVE	EA	1	$	$

14J	SLUICE GATE VALVE	EA	3	$	$
14K	GRAVEL BACKFILL FOR PIPE ZONE BEDDING	TON	516	$	$
14L	REPLACE WATER MAIN AND HYDRANT	LS	1	$	$
15	CONCRETE DRIVE PADS	SF	500	$	$
16	ECOLOGY BLOCK WALL	VSF	2,000	$	$

LS = Lump Sum. FA = Force Account. SY = Square Yard. SF = Square Foot. VSF = Vertical Square Foot.

SUB-TOTAL: **$**_____

9.0% WSST: **$**_____

TOTAL BID AMOUNT: **$**_____

2. BID GUARANTY - Accompanying this proposal is a Bid Guaranty in the amount of five percent (5%) of the total bid amount.

3. WITHDRAWAL - The above proposal will not be withdrawn within forty-five (45) days after the actual date of the opening hereof.

4. CONTRACT - If the undersigned be notified of acceptance of this Proposal within forty-five (45) days of the time set for opening of bids, they agree to execute a contract for the above stated sum, and shall bond their work as required by law and that they will begin work within ten (10) days after Notice to Proceed. The undersigned also agrees to execute the contract contained in this Bid Solicitation without modification.

5. SIGNING AUTHORITY – By signing below, the undersigned hereby acknowledges that they are authorized and duly bound to execute this Bid Proposal Form on behalf of the Contractor and that their signature is binding upon the Contractor. The signing party further certifies that the Contractor represented has visited the Port of Bellingham's website before the bid due date and time to familiarize themselves with the bid documents and all changes made via Addendum.

6. CONTRACTOR VERIFICATION - The bidder is instructed to provide with this bid submittal the following registration and identification numbers.

CONTRACTOR REGISTRATION NO.

*(insert number here)*_____

DEPT. OF LABOR AND INDUSTRIES ACCOUNT NO.

*(insert number here)*_____

EMPLOYMENT SECURITY DEPARTMENT NO.

*(insert number here)*_____

WASHINGTON UNIFIED BUSINESS IDENTIFIER (*UBI*) NO.

*(insert number here)*_____

7. CONTRACTOR - certifies by signing below that they are not disqualified from bidding on any public works contract under RCW 39.06.010 or RCW 39.12.065(3).

8. CONTRACTOR - certifies by signing below that they have not violated RCW 39.04.370 more than one time as determined by the Department of Labor and Industries.

9. NON-COLLUSION DECLARATION - CONTRACTOR (as signed below), under penalty of perjury under the laws of the State of Washington, do state and affirm that the quote submitted to the Port of Bellingham is a genuine and not a sham or collusive quote, or made in the interest or on behalf of any person not herein named; and further says that the said Contractor has not directly or indirectly induced or solicited any Contractor on the above work or supplies to put in a sham quote or any other person or corporation to refrain from quoting; and that said Contractor has not in any manner sought by collusion to secure an advantage over any other Contractor or Contractors.

BID PROPOSAL FORM CONTINUED NEXT PAGE

BID PROPOSAL FORM (con't.)

10. APPRENTICE UTILIZATION REQUIREMENTS – The apprentice labor hours required for this project are 15% of the total labor hours. The undersigned agrees to utilize this level of apprentice participation. A monetary incentive will be paid to the Contractor for meeting the apprentice utilization requirement. A monetary penalty will be applied to the Contractor for failing to meet the utilization requirement and failing to demonstrate a Good Faith Effort. Refer to Exhibit F Apprentice Utilization. The Contractor shall include all related costs in the unit Bid prices of the Contract, including 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 requirement.

11. **ADDENDA – Bidder acknowledges receipt of Addenda by checking the box(es):**

N/A ☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐

CONTRACTOR - _____

SIGNED - _____

_____

Print name and title

ADDRESS - _____

_____

EMAIL - _____

TELEPHONE - _____ DATE: _____

NOTE: PLEASE PUT NAME OF PROJECT ON ENVELOPE CONTAINING BID DOCUMENTS.

BID BOND

(surety bond)

KNOW ALL BY THESE PRESENTS:

That we _____, as Principal, and _____, as Surety, are held and firmly bound unto the **Port of Bellingham,** as Obligee, in the penal sum at least equal to FIVE PERCENT (5%) OF THE TOTAL AMOUNT OF THE BID, for the payment of which the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by these presents.

The Condition of this Obligation is such that if the obligee shall make any award to the Principal for _____ according to the terms of the proposal or bid made by the Principal therefor and the Principal shall duly make and enter into a contract with the Obligee in accordance with the terms of said proposal or bid and award and shall give bond for the faithful performance thereof, with Surety or Sureties approved by the Obligee; or if the Principal shall in case of failure so to do, pay and forfeit to the Obligee the penal amount of the deposit specified in the call for bids, then this obligation shall be null and void; otherwise it shall be and remain in full force and effect and the Surety shall forthwith pay and forfeit to the Obligee, as penalty and liquidated damages, the amount of this bond.

SIGNED, SEALED AND DATED THIS _____, DAY OF _____, 2025.

BY: _____
Principal

(**ORIGINAL SEAL HERE)**

BY: _____
Surety

The Bid Bond consists of this form and a Power of Attorney of the Surety evidencing the authority of the signor of this Bid Bond. Both this Bid Bond and the Power of Attorney shall be submitted in a fully executed, original hard copy document. The Bid Bond shall have original signatures for the principal and surety and include the original surety seal. The Power of Attorney shall be an original document and include the original corporate seal of surety represented. Submission of copies will render bid non-responsive.

BID DEPOSIT

(certified or cashier's checks)

Attached is a deposit in the form of a certified check or cashier's check in an amount at least equal to five percent (5%) of the total bid.

The condition of this obligation is that if the Port of Bellingham (the "Port") shall make an award to the Principal for

_____

(title of Project)

according to bid or proposal made by the Principal, and the Principal enters into a contract with the Port in accordance therewith and provides the Port with a bond for the faithful performance thereof, with Surety or Sureties approved by the Port, the attached Bid Deposit shall be returned to the Principal. Alternatively, if the Principal, after submitting a bid for the above named project, is awarded the Contract and fails to provide a performance bond acceptable to the Port, Principal shall forfeit to the Port the penal amount of the Bid Deposit.

SIGNED, SEALED and DATED this _____day of_____ , 2025.

_____
Principal (Signature)

_____
Company Name

_____
Address

_____
City/State

PORT OF BELLINGHAM

GENERAL CONDITIONS

1. **STANDARD SPECIFICATIONS**

The term “Standard Specifications” as used herein means the most recent version of the "M 41-10 Standard Specifications for Road, Bridge and Municipal Construction," as published by the Washington State Department of Transportation. Except as may be otherwise provided in the Contract Documents, the Standard Specifications are expressly incorporated into the Contract Documents and shall govern all aspects of the Project.

2. **SUBMITTALS**

Prior to commencing the work, Contractor shall provide to the Engineer submittals for all materials and equipment installed on the project **AND** all other submittals required by the Contract Documents. The Project Engineer may also request that the Contractor develop, submit to the Engineer, and maintain a Submittals Log to track the progress of all Contract-required Submittals. Contractor shall update and submit the Submittal Log to the Engineer on a weekly basis until all Submittals are determined by the Engineer to be complete. No portion of the Work requiring a Submittal shall be commenced until the Submittal has been reviewed and returned as set forth in the Contract Documents. All portions of the Work involving Submittals shall be performed in accordance with the returned Submittals. Submittals marked "subject to change" or the like will not be reviewed.

By providing Submittals the Contractor represents that it has determined and verified all materials, field measurements, and related field construction criteria are in accordance with the Contract Documents, and that the Contractor has checked and coordinated the information contained within the submittal with the requirements of the Work and the Contract Documents. The Engineer’s review of any Submittal shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, sequences, techniques, or procedures of construction, or to safety precautions or programs incident thereto. Review by the Engineer of the Contractor’s Submittals shall not relieve the Contractor of responsibility for the accuracy of dimensions and details.

At the time of submission of each Submittal, Contractor shall in writing call Engineer's attention to any deviations that the Submittals or Samples may have from the requirements of the Contract Documents. Such Submittals shall be given to the Port in a complete and final version and the Contractor shall take into account sufficient time for the possibility of rejection of the Submittal, needed revisions, and resubmittal review time. Any Work delayed because of a rejected or reviewed “Amend and Resubmit” or revised Submittal is deemed to be entirely the Contractor’s risk and shall not be the basis for a claim by the Contractor for additional compensation or an extension of Contract Time.

When resubmitting a Submittal, the Contractor shall direct specific attention, in writing or on the resubmittal itself, to all revisions it has made. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals. The Port will allow one (1) review of the original Submittal and one (1) submittal reiteration, which is included in the cost of the project. The Port has the right to recover any additional cost that may result from the review of any subsequent resubmittals. Cost recovery will be in the form of a deductive change order to the Contract.

3. **BIDS**

All bids received by the Port of Bellingham shall be considered valid for a period of forty-five (45) calendar days from the date of the opening of bids. Contractors or vendors that withdraw their bid during this 45-calendar-day period will forfeit their bid guarantee. The right is reserved by the Port of Bellingham to reject any or all bids and to waive any informalities or irregularities.

3.1 The Total Bid constitutes a price for all work on the Project, regardless of whether it is specifically itemized on the Proposal Form. If the Proposal for this Project required the Total Bid to be allocated to various items of work, those allocations were solely for the benefit of the Port and are not to be construed as a limitation on the work to be performed. Accordingly, WSDOT Section 1-04.1(2) shall not apply to this Contract.

4. **LIQUIDATED DAMAGES**

In the event that a contractor and/or vendor does not complete the proposed work in the contractually-specified time limit, the Port shall be entitled to liquidated damages pursuant to the Standard Specifications and the Contractor and/or surety under the performance bond shall be liable for payment of such damages.

5. **PREVAILING WAGES**

The rate of wages to be paid to all workmen, laborers or mechanics employed in the performance of any part of this contract shall be in accordance with the provisions of CHAPTER 39.12 R.C.W., as amended, and the rules and regulations of the Department of Labor and Industries.

INASMUCH AS THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR PAYING THE PREVAILING WAGE, IT IS IMPERATIVE THAT ALL CONTRACTORS FAMILIARIZE THEMSELVES WITH THE CURRENT WAGE RATES BEFORE SUBMITTING ON THESE SPECIFICATIONS.

All work performed under a public works contract must be classified into one or more of the many labor classifications for which prevailing wage rates have been established so that the appropriate wage can be applied. The successful contractor will need to file, and have approved, their Statement of Intent to Pay Prevailing Wages ("Statement of Intent") before any subcontractors can file their Statement of Intent for the same project.

The Port cannot make any payment(s) to any contractor or subcontractor who has not submitted a Statement of Intent form which includes all classifications of persons performing work on the Project and which has been approved by the Industrial Statistician. If the Port subsequently finds that an approved Statement of Intent omits classifications of persons that are performing work on the Project, the Port may withhold progress payments until such time as contractor (or subcontractor) files, and has approved, a revised Statement of Intent which includes the previously omitted classifications. The Port will not release final payment until all contractors and all subcontractors have submitted Affidavit of Wages Paid forms that have been certified by the Industrial Statistician.

Each contractor performing work on the project shall keep accurate Certified Payroll records for three (3) years from the date of acceptance of the public works project in complete compliance with WAC 296-127-320 and RCW 39.12.120. It is the responsibility of the Contractor to collect and maintain Certified Payroll records from Sub-Contractors and provide upon request.

6. **INSURANCE**

CONTRACTORS ARE STRONGLY ENCOURAGED TO SEND THIS ENTIRE SECTION TO THEIR INSURANCE PROVIDER(S) TO CAPTURE ANY PREMIUM COSTS PRIOR TO SUBMITTING THEIR BID.

Delete WSDOT Standard Specification Section 1-07.18 and replace with:

The Contractor shall procure and maintain for the duration of the contract, and for one (1) year from Physical Completion, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the contractor, their agents, representatives, employees, or subcontractors. The Contractor shall furnish a Certificate of Insurance naming the Port as an additional insured on its Commercial General Liability and Automobile Liability Policies. The Contractor shall furnish the Port with original Certificates of Insurance including all required additional insured endorsements or copies of the applicable policy language effecting coverage and a copy of the Declarations and Endorsement Page of the policies listing all policy endorsements.

MINIMUM SCOPE AND LIMIT OF INSURANCE

A. **Commercial General Liability (CGL):** Insurance Services Office Form CG 00 01, including products and completed operations, with limits of no less than $5,000,000 per occurrence for bodily injury, personal injury, and property damage. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.

B. **Automobile Liability:** Insurance Services Office Form Number CA 0001 covering Code 1 (any auto), with limits no less than $1,000,000 per accident for bodily injury and property damage.

C. **Worker's Compensation** insurance as required by the State of Washington Statutory Limits, and Employers' Liability insurance with a limit of no less than $1,000,000 per accident for bodily injury or disease.

D. **Contractors' Pollution Legal Liability** and/or Asbestos Legal Liability and/or Errors and Omissions (if project involves environmental hazards) with limits of no less than $1,000,000 per occurrence or claim, and $2,000,000 policy aggregate.

E. **Builder's Risk:** Provided by Owner.

F. **Marine General Liability**: In the event that Contractor will be utilizing marine vessels to perform any portion of the Project, Contractor shall procure and maintain a Marine General Liability policy with limits of not less than $5,000,000 per occurrence for bodily injury, personal injury, property damage, and fuel and other spills. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.

G. **Unmanned Aerial Vehicles** (UAVs or Drones): If Unmanned Aerial Vehicles (UAVs or Drones) are to be used during the project, contractor shall procure and maintain for the duration of the contract, insurance against claims for injuries to persons or damage to property which may arise from or in connection with the ownership, maintenance or use of UAVs. This insurance shall include limits of no less than $1,000,000 per occurrence and $2,000,000 in the aggregate and shall name the Port of Bellingham as an additional insured. The Contractor shall furnish the Port with original Certificates of Insurance including all required additional insured endorsements or copies of the applicable policy language effecting coverage as required by this clause, and a copy of the Declarations and Endorsement Page of the policy listing all policy endorsements.

The insurance policies are to contain, or be endorsed to contain, the following provisions:

A. **The Port, its officers, officials, employees, and volunteers are to be covered as additional insured** on the CGL and automobile liability policies with respect to liability arising out of work or operations performed by or on behalf of the Contractor including materials, parts, or equipment furnished in connection with such work or operations and automobiles owned, leased, hired, or borrowed by or on behalf of the Contractor. General Liability coverage can be provided in the form of an endorsement to the Contractor's insurance (at least as broad as ISO Form CG 20 10, 11 85 or both CG 20 10 and CG 20 37 forms if later revisions used). A blanket Additional Insured Endorsement is not acceptable.

B. For any claims related to this project, the **Contractor's insurance coverage shall be primary** insurance as respects the Port, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the Port, its officers, officials, employees, or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

C. Each insurance policy required by this clause shall provide that coverage shall not be canceled, except with at least thirty (30) day notice to the Port. The Contractor shall have an independent duty to notify the Port of any cancellation.

Claims Made Policies

If any coverage required is written on a claims-made coverage form:

A. The retroactive date must be shown, and this date must be before the execution date of the contract or the beginning of contract work.

B. Insurance must be maintained and evidence of insurance must be provided (upon request) for at least three (3) years after completion of contract work.

C. If coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a retroactive date prior to the contract effective, or start of work date, the Contractor must purchase extended reported period coverage for a minimum of one (1) year after Physical Completion of contract work.

D. A copy of claims reporting requirements must be submitted to the Port of Bellingham for review.

E. If the services involve lead-based paint or asbestos identification/remediation, the Contractors Pollution Liability policy shall not contain lead-based paint or asbestos exclusions. If the services involve mold identification/remediation, the Contractors Pollution Liability policy shall not contain a mold exclusion, and the definition of Pollution shall include microbial matter, including mold.

Acceptability of Insurers

Insurance is to be placed with insurers with a current A.M. Best rating of no less than A VII.

Waiver of Subrogation

Contractor hereby agrees to waive rights of subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss. Contractor agrees to obtain any endorsement that may be necessary to effect this waiver of subrogation.

Verification of Coverage

Contractor shall furnish the Port of Bellingham with original certificate and amendatory endorsements, or copies of the applicable insurance language, effecting coverage required by this contract. All certificates and endorsements are to be received and approved by the Port of Bellingham before work commences. The Port of Bellingham reserves the right to require complete, certified copies of all required insurance policies, including endorsements, required by these specifications, at any time. The Port's receipt and acceptance of the Contractor's certificate of insurance does not waive the Contractor's obligation to comply with the insurance requirements of the Contract Documents.

In the event that the contractor fails to provide said certificates prior to commencement of work, then the contractor shall be considered as not performing and the Bid Guarantee shall be forfeited. The Contractor shall bear all cost for such insurance, including any payments of deductible amounts.

Prospective bidders are advised that projects with Work on or adjacent to water may require insurance coverage in compliance with:

A. The Longshoremen's and Harbor Worker's Compensation Act (administered by U.S. Department of Labor), or

B. The State Industrial Insurance (administrated by the Washington State Department of Labor and Industries) or

C. Both.

The project may require USL & H insurance. Unless the Contract expressly requires USL&H insurance, the contractor is SOLELY responsible for determining whether this project has situs (location) and status (work type)

under the Longshore and Harbor Workers' Compensation Act. The Contractor must procure any US L & H coverage that (i) is expressly required by the Port as a contract requirement in the Special Provisions or (ii) if not so required by the Port, is required by law, regardless of whether this Contract expressly requires it. If the Contractor fails to procure such coverage and the Port later determines that it is required by law, then (i) the Port may withhold progress payments until such time as the Contractor obtains such insurance and provides proof thereof to the Port and (ii) the Contractor shall defend, indemnify, and hold the Port of Bellingham harmless from any and all claims, losses, damages, and costs resulting from the Contractor's failure to timely obtain such insurance.

Subcontractors

The required insurance shall cover all of the Contractors' operations of whatever nature connected in any way with this Contract, including any operations under subcontract. It is the obligation of the Contractor to ensure that all Subcontractors (at whatever level) carry a similar program which provides the identified types of coverage and limits of liability, unless otherwise specifically indicated within the Special Provisions.

Contractor shall require and verify that all subcontractors maintain insurance meeting the requirements stated herein.

7. **BID GUARANTEE**

The contractor/vendor shall supply with their proposal a Bid Guarantee in the amount of five percent (5%) of the total amount of the bid underwritten either by an authorized surety insurer under RCW 48.05.110, or an unauthorized surety insurer as a surplus line pursuant to RCW 48.15 utilizing the Bid Bond form provided **OR** a Bid Deposit in the amount of five percent (5%) of the total amount of the bid by utilizing the Bid Deposit form provided and attaching a certified check or cashier's check payable to the Port of Bellingham. **The Bid Bond consists of the Bid Bond form provided in the Bid Solicitation Documents and a Power of Attorney of the Surety evidencing the authority of the signor of the Bid Bond. Both the Bid Bond and the Power of Attorney shall be submitted in a fully executed, original hard copy document. The Bid Bond shall have original signatures for the principal and surety and include the original surety seal. The Power of Attorney shall be an original document and include the original corporate seal of surety represented. Submission of copies will render bid non-responsive.**

In the event that the selected contractor/vendor fails to execute a contract within the timeframe specified by the Port of Bellingham bid documents, the surety on such bond shall be liable for the penal amount of the bond. To the extent that this provision conflicts with WSDOT Section 1-03.3, this section controls.

The Owner will return bid guarantees (surety bid bonds upon request only) to unsuccessful bidders as soon as practicable, but not sooner than the execution of a contract with the successful bidder.

8. **PERFORMANCE and PAYMENT BOND REQUIREMENTS**

The successful Contractor / Vendor will be required to comply with the bonding requirements of RCW 39.08.010. If a Payment and Performance Bond is used to fulfill this requirement, the successful Contractor / Vendor shall use owner provided Payment and Performance Bond form and shall execute and deliver to the Port of Bellingham the bond or other surety for one hundred percent (100%) of the bid amount for the entire project in compliance with RCW 39.08.010. The Contractor is also responsible for forwarding copies of Payment and Performance Bonds to all sub-contractors, suppliers and all other service providers as requested. **The Payment and Performance Bond consists of the Payment and Performance Bond form provided in the Bid Solicitation Documents and a Power of Attorney of the Surety evidencing the authority of the signor of the bond. Both the Payment and Performance Bond and the Power of Attorney shall be submitted in a fully executed, original hard copy document. The Payment and Performance Bond shall have original signatures for the principal and surety and include the original surety seal. The Power of Attorney shall be an original document and include the original corporate seal of surety represented. Submission of copies will not be accepted.**

9. **WAGE COMPLIANCE CERTIFICATION**

The successful Contractor / Vendor shall use the owner provided Wage Laws Compliance Certification form stating that the Contractor / Vendor has not violated Washington State wage laws in a three year period prior to award of contract in accordance with RCW 39.04.350.

10. **RETAINAGE**

The Port of Bellingham will retain funds in accordance with RCW 60.28.

ALL RETAINAGE (subject to allowance for claims) WILL BE HELD AND RELEASED AUTOMATICALLY ONCE ALL OF THE FOLLOWING CONDITIONS ARE MET:

- Receipt of the Department of Labor and Industries Affidavit of Wages Paid.
- Receipt of release from Department of Labor and Industries.
- Receipt of certificate of payment of excise taxes from the Department of Revenue.
- Receipt of release from Employment Security Dept.

If the Contractor wishes to submit a bond for all or any portion of the contract retainage, the Contractor shall satisfy all of the following conditions:

- Comply with RCW 60.28 in all respects;
- Submit a bond written on owner provided bond form;
- Assure that the Bond in Lieu of Retained Funds is underwritten by an authorized surety insurer having a minimum A.M. Best financial strength rating of A-.
- By submitting a bond for contract retainage, the Contractor attests (i) that Contractor will accept like bonds from any subcontractors or suppliers from which the Contractor has retained funds and further (ii) that Contractor shall then release the funds retained from the subcontractor or supplier to the subcontractor or supplier within thirty days of accepting the bond from the subcontractor or supplier.

11. **MOBILIZATION AND DEMOBILIZATION**

Mobilization shall be included in the contractor's bid and shall consist of preparatory work and operations performed by contractor, including, but not limited to, those necessary for movement of their personnel, equipment, supplies, and incidentals to the project site. Demobilization shall also be included in bid, and the job site will be inspected upon completion by the Port to ensure all contractor/vendor property and personnel have been properly removed. Final payment will not be made prior to said inspection and Port site approval.

12. **ADDENDA TO SPECIFICATIONS**

To the extent that they are legally permissible, changes, additions or clarifications to the contract documents, specifications, or design drawings made after advertising and before the bid submittal and bid opening will be posted on the Port's *Bid Postings* page (https://www.portofbellingham.com/bids.aspx) as numbered and dated addenda. All such deletions, additions, clarifications or corrections will be in written or graphic form. All bidders must acknowledge receipt of any addenda on the bid form to ensure that all bidders have submitted their bids on the same information. Sufficient time, as determined solely by the Port of Bellingham, will be provided between issuance of addenda and submittal of bids to permit the bidders to incorporate the addenda data into their proposal.

Any prospective bidder desiring an explanation or interpretation of the bid documents must request the explanation or interpretation in writing soon enough to allow a written reply to reach all prospective bidders before the submission of their bids. The bidder agrees that the Port shall not be liable for any claim based on ambiguity of which the bidder knew and did not inform the Port of or of which the bidder should have reasonably known. **It is the sole responsibility of the Contractor to visit the Port of Bellingham's website daily throughout the bidding process for any changes to the bid documents issued via Addendum; the bidder agrees that the Port shall not be liable for any claim based on the Contractors failure to monitor the Port of Bellingham's website.**

13. **NON-COLLUSION STATEMENT**

By signing the Proposal Form, the bidder certifies that the Bid submitted herewith is a genuine and not a collusive or sham bid and is not made in the interest of or on behalf of any person herein named and that the person, firm, association, joint venture, co-partnership 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 submittal of this bid.

14. **TAXES**

All bid proposals shall include an allocation for the appropriate sales and use taxes.

15. **PAYMENT**

Progress payments will be made monthly for Work duly certified, approved by the Port Engineer, and performed (based on the Schedule of Values and actual quantities of Work performed) during the calendar month preceding the Application for Payment. The Port of Bellingham processes payments on the last Wednesday of each month. All Applications for Payment must be received no later than the 2nd business day of each month to be considered for payment in that month or it will automatically be entered into the next month's payment cycle. Following receipt of an Application for Payment, the Port Engineer will either authorize payment, thereby making it "Complete", or indicate in writing to the Contractor the specific reasons why the payment request is being denied, in whole or in part, and the remedial action the Contractor must take to receive the withheld amount. A "Complete" Application for Payment dated by the Port Engineer on or before the 15th of each month will be paid on the last Wednesday of the same month, subject to Commission approval. A "Complete" Application for Payment dated by the Port Engineer after the 15th of each month will be paid on the last Wednesday of the following month, subject to Commission approval. All Applications for Payment shall be submitted to the attention of the Project Engineer. By submitting an application for payment the Contractor certifies that: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for

Payment will pass to owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); (3) all Work covered by the Application for Payment is in accordance with the Contract Documents and is not defective; and (4) Prevailing Wages Rates have been paid in accordance with RCW 39.12.

The Port cannot make any payments to any contractor or subcontractor who has not submitted an Intent form that has been approved by the Industrial Statistician. The Port may not release final payment until all contractors and all subcontractors have submitted Affidavit forms that have been certified by the Industrial Statistician.

Prior to application for final payment, the contractor shall provide proof of payment of all subcontractors. The Port reserves the right to require proof of payment of all subcontractors in a form acceptable to the Port. The Port may, in its sole discretion, withhold final payment until such proof of payment has been received.

16. **CONTRACT EXTENSION**

The Port of Bellingham may, at its sole discretion, extend the time to complete the project if so requested by the contractor/vendor and the contractors'/vendors' bondsmen. Both the request and the authority to extend must be in writing and approved by the appropriate representative of each party.

17. **STATUTES, LAWS, CODES, AND REGULATIONS**

All statutes, codes, municipal ordinances and regulations shall be complied with in the pursuit of all portions of the work.

18. **OBLIGATION TO REPORT EMPLOYEES WHO USED EARLY RETIREMENT FACTORS; LIABILITY FOR FAILURE TO REPORT**

The Port is an employer of one or more members of the Washington State Department of Retirement Systems (DRS). As a DRS covered employer, the Port is required to advise DRS of any retiree performing services for the Port who has used the 2008 Early Retirements Factors (ERFs) to retire early and is under age 65. Workers meeting these factors cannot perform services in any capacity for a DRS-covered employer and continue to receive a pension benefit (WAC 415-02-325).

Concurrently with the execution of the Contract and prior to commencing work, Contractor shall verify if any person who will be performing work on this project retired from a DRS employer using ERFs. Contractor must report any such persons to the Port by: (1) completing the DRS Contractor or Third-Party Worker Retirement Status Verification form that can be downloaded by following this link (https://www.portofbellingham.com/DocumentCenter/View/9921/DRS_StatusForm) and (2) emailing it to payroll@portofbellingham.com or mailing it to Port of Bellingham Payroll at 1801 Roeder Ave, Suite 146 – Bellingham, WA 98225.

If Contractor fails to timely report any employee who used ERFs to the Port in accordance with this section, Contractor shall be liable for all assessments issued to the Port by DRS and all legal fees and costs incurred by the Port in connection with such assessment. Contractor agrees that the Port may deduct such amounts from any amounts that may be owed to Contractor. Any additional amounts owed will be paid to the Port within fifteen (15) days of receiving an invoice from the Port.

19. **EXAMINATION OF SITE AND CONDITIONS**

Bids shall reflect the bidder's anticipated costs for completing the work, including labor, materials and equipment. Before submitting their bid, the bidder shall examine the site of the work to ascertain all the physical conditions in relation thereto. Failure to take this precaution will not release the successful bidder from entering into contracts or excuse the bidder from performing the work in strict accordance with the terms of the contract.

In submitting the bid, the bidder warrants that it understands: (1) the requirements for the performance of completed work; (2) the nature and location of the work; (3) the general and local conditions which can affect the work and/or its costs (including surface and subsurface materials or obstacles); (4) the time necessary to complete the work; (5) the bid documents and contract; and (6) the applicable Federal, State and local laws, ordinances and regulations. The bidder agrees that the Port shall not be liable for any change order, claim for additional payment of additional time, or any other claim whatsoever that arises from bidder's failure to fully investigate and familiarize itself with the project conditions.

No oral statements made by any officer, agent, or employee of the Port in relation to the physical conditions pertaining to the site of the work will be binding on the Port.

20. **ASSIGNMENT OF CONTRACT AND SUBLETTING**

The contractor shall not assign this contract nor any part thereof, nor any monies due or to become due thereunder without the prior written approval of the Port. The contractor shall not sublet any part of this contract without first having obtained the written consent of the Port to do so. In case such consent is given, it shall in no way release the contractor from any responsibility, but the contractor shall be held in all respects accountable for the same as if no consent had been given. The contractor will be required to give personal attention to the work which is sublet.

21. **CLAIMS FOR DAMAGES**

Except for unreasonable delays as referenced in RCW 4.24.360, the contractor or subcontractor shall not be entitled to any claim for damages on account of hindrance or delays in the completion of the work due to the acts of the Port or the acts of another contractor in the performance of a contract with the Port.

The contractor or subcontractor shall not be charged with liquidated damages because of any delays in the completion of the work due to unforeseeable causes beyond the contractor's control and without fault or negligence of the contractor, including, but not restricted to, unusually severe weather, fire or other casualty, strikes and other exceptional causes as provided herein or in the Standard Specifications or delays of subcontractors due to such causes; provided the contractor shall first give notice in writing of the cause of any such act, hindrance or delay within ten (10) days after its occurrence.

22. **PROTECTION OF WORK SITE**

The contractor shall erect and maintain good and sufficient guards, barricades, and signals at all unsafe places at or near the work, and shall in all cases maintain safe passageways at all road crossings, crosswalks and street intersections, and shall do all other things necessary to prevent accident or loss of any kind.

The contractor shall protect from damage all water, sewer, gas, steam or other pipes or conduits and all hydrants and all other property likely to become displaced or damaged by the execution of the work.
The contractor shall routinely, and at the conclusion of each workday, inspect the work site and the guards, barricades and signals thereon to ensure that there are no safety hazards or attractive nuisances which may cause injury.

23. **PERMITS**

The contractor shall procure all necessary permits (unless otherwise instructed by the Port), pay for the same, and obtain all official licenses for the construction of the work and for temporary obstructions, enclosures and opening of streets for pipes, walls, etc., arising from the construction and completion of the work as mentioned in the specifications. The contractor shall be responsible for all violations of the law for any cause in connection with the construction of the work or obstructing streets, sidewalks, etc., and shall give all requisite notices to public authorities.

24. **ROYALTIES AND PATENTS**

The contractor shall pay royalties and license fees and defend all suits resulting from claims for same on all materials and equipment purchased outright and installed according to the specifications of the Port.

25. **INSPECTION OF WORK**

All materials furnished by the contractor shall be subject to the inspection and approval of the Port's representative at any time during the progress of the work and until final completion thereof. The materials shall be delivered by the contractor sufficiently in advance of the work to enable the Port's representative to make the proper tests and inspection. As soon as materials have been tested and inspected, the contractor shall immediately remove all rejected materials from the work to such place as distant therefrom as the Port's representative may require, but the neglect or failure on the part of the Port's representative to condemn or reject inferior materials or work shall not be construed to imply an acceptance of the material or work. The contractor shall furnish, at their own expense, such labor as may be required to enable the Port's representative to make a thorough inspection and culling of the materials.

The Port will not pay for unauthorized or defective work. At the direction of the Port’s representative, the contractor shall immediately remedy, remove, replace or dispose of unauthorized or defective work or materials and bear all costs of doing so.

26. **DEFECTIVE AND NON-CONFORMING WORK**

The contractor, upon being notified by the Port representative, shall remove or reconstruct, or make good without cost to the Port, any work which the Port representative may deem to have been defectively executed or not performed in accordance with the Contract Documents.

27. **CLEANUP**

From time to time as may be ordered by the Port's representative and, in any event, immediately after completion of work, the contractor shall, at their own expense, clean up and remove all refuse and unused materials of any kind resulting from the work. Upon failure to do so within twenty-four (24) hours after having been notified by the Port's representative, the work may be done by the Port and the costs thereof charged to the contractor and deducted from the final estimate.

28. **WARRANTY**

The contractor shall warranty against defects appearing or developing in the material or workmanship provided or performed under this contract for a period of one year after the Physical Completion Date, unless noted otherwise in the Contract Documents, which may extend the warranty period. The Physical Completion Date will be, as established in writing, by the Port of Bellingham. Contractor warrants that its workmanship will meet or exceed

industry standards for work performed in the Puget Sound region.

29. **BIDDER RESPONSIBILITY CRITERIA**

It is the intent of the Owner to award a contract to the "responsible" bidder submitting the lowest "responsive" bid for the project. Before award of a public works contract, a bidder must meet the following responsibility criteria to be considered a responsible bidder and qualified to be awarded a public works project. In addition, the bidder may be required by the Port to submit documentation demonstrating compliance with these requirements. The bidder must:

- At the time of bid submittal, have a certificate of registration in compliance with chapter 18.27 RCW;
- Have a current state unified business identifier number;
- If applicable, have industrial insurance coverage for the bidder's employees working in Washington as required in Title 51 RCW; an employment security department number as required in Title 50 RCW; and a state excise tax registration number as required in Title 82 RCW; and
- Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065(3).
- A bidder must not have violated the "Off-Site Prefabricated Non-Standard Project Specific Items" reporting requirements more than one time as determined by the Department of Labor and Industries.

Pursuant to RCW 39.04.350 the Port may establish relevant Supplemental Bidder Responsibility Criteria applicable to a particular project for determining bidder responsibility and if so, Bidders are advised that the Port has adopted criteria for determining bidder responsibility, including the basis for evaluation and the deadline for appealing a determination that a bidder is not responsible. The Bidder, by written request in a timely manner but not later than seven (7) days prior to bid opening, may request the Port modify the supplemental criteria. The Port will evaluate the request submitted by the potential bidder and respond before the bid submittal deadline. If the evaluation results in a change of the criteria, the Port will issue an addendum to the bidding documents identifying the new criteria.

30. **CONTRACTOR and SUBCONTRACTOR RESPONSIBILITY CRITERIA**

At the time of subcontract execution, the Contractor shall verify that each of its first tier subcontactors meet the following bidder responsibility criteria:

- Have a current certificate of registration in compliance with chapter 18.27 RCW, which must have been in effect at the time of subcontract bid submittal;
- Have a current Washington Unified Business Identifier (UBI) number;
- If applicable, have:
  i. Industrial Insurance (workers' compensation) coverage for the subcontractor's employees work in Washington, as required in Title 51 RCW;
  ii. A Washington Employment Security Department number, as required in Title 50 RCW;
  iii. A Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW;
  iv. An electrical contractor license, if required by Chapter 19.28 RCW;
  v. An elevator contractor license, if required by Chapter 70.87 RCW.
- Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065(3).

31. **MINIMUM LEVELS OF APPRENTICESHIP PARTICIPATION**

In accordance with RCW 39.04.320, the State of Washington requires 15% apprenticeship participation for projects estimated to cost two million dollars or more unless otherwise stated on the Bid Advertisement. Contractors who meet or exceed minimum participation requirement are eligible for monetary incentive of $1,000.00 and will be paid to the contractor meeting the apprentice utilization requirement. A monetary penalty of $500.00 will be applied to the contractor failing to meet the utilization requirement and failing to demonstrate a Good Faith Effort.

A. Apprentice participation, under this contract, may be counted towards the required percentage (%) only if the apprenticeship program is registered and approved by the Washington State Apprenticeship and Training Council (RCW 49.04 and WAC 296-05).

B. Bidders may contact L&I to obtain more information about apprenticeship programs.

C. No changes to the required percentage (%) of apprentice participation shall be allowed without written approval of the Owner. In any request for the change, the Contractor shall clearly demonstrate a good faith effort to comply with the requirements for apprentice participation.

D. Any substantive violation of the mandatory requirements of this part of the contract may be a material breach of the contract by the Contractor. The Owner may withhold payment, stop the work for cause, and terminate the contract for cause.

32. **SUBCONTRACTORS AND SUPPLIERS**

Subcontractor Responsibility:

The Contractor shall include the language of this paragraph in each of its first-tier subcontracts and shall require each of its subcontractors to include the same language of this section in each of their subcontracts, adjusting only as necessary the terms used for the contracting parties. Upon request of the Owner, the Contractor shall promptly provide documentation to the Owner demonstrating that the subcontractor meets the subcontractor responsibility criteria below. The requirements of this paragraph apply to all subcontractors regardless of tier. At the time of subcontract execution, the Contractor shall verify that each of its first-tier subcontractors meets the following bidder responsibility criteria:

On a project subject to the apprenticeship utilization requirements in RCW 39.04.320, not have been found out of compliance by the Washington state apprenticeship and training council for working apprentices out of ratio, without appropriate supervision, or outside their approved work processes as outlined in their standards of apprenticeship under chapter 49.04 RCW for the one-year period immediately preceding the date of the Owner's first advertisement of the project.

33. **DEBARMENT / SUSPENSION COMPLIANCE**

The bidder must not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065(3). The bidder/offeror certifies, by submission of this bid proposal or acceptance of this contract, that neither it nor its principals is presently debarred, suspended, proposed for debarment, or declared ineligible or voluntarily excluded from participation in this transaction by any State or Federal department or agency. It further agrees by submitting this proposal or acceptance of the Contract that it will include this clause without modification in all lower tier transactions, solicitations, proposals, agreements, contracts, and subcontracts. Where the bidder/offeror or any lower tier participant is unable to certify to this statement it shall attach an explanation to this Proposal. The Port reserves the right to require Contractor to replace a sub-contractor or lower tier participant who cannot meet the foregoing certification requirements.

34. **CONFLICT OF INTEREST**

Contractor covenants that it presently has no interest and shall not acquire an interest, directly or indirectly, which would conflict in any manner or degree with its performance under this Contract. Contractor further covenants that in the performance of this Contract, no person having such interest shall be employed by it or any of its sub-contractors.

35. **SUBCONTRACTORS' LIST**

If the invitation to bid is expected to cost one million dollars or more the bidder shall comply with RCW 39.30.060.

Regardless of the expected cost of the project, the Contractor shall at the time of executing this Contract provide the Port with a list of all subcontractors to be utilized on the project. Contractor shall provide the Port with an updated list if any of the subcontractors change.

36. **PROJECT CLOSE-OUT DOCUMENTS**

As part of the project close-out the Contractor shall submit the following **directly to the Port:**

- Manufacturer information for all product use (PDF)
- O & M Manuals (2 hard copies, PDF)
- Warranties (PDF)
- Shop Drawings (CAD, PDF, Paper 11x17)

and to the Consultant:

- Complete set of Redline drawings

37. **DEFINITIONS**

The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

38. **CERTIFICATION OF NON-SEGREGATED FACILITIES**

[THIS SECTION FOR USE IN CONTRACTS FOR PROJECTS INVOLVING FEDERAL FUNDS]

The **Contractor** agrees by signature herein below, and for purposes of this project, that they are deemed to have signed and agreed to the provisions of Certification of Non-Segregated Facilities, which is included as Exhibit "A" and made a part hereof.

39. **EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES**

[THIS SECTION FOR USE IN CONTRACTS FOR PROJECTS INVOLVING FEDERAL FUNDS]

The **Contractor** by signing this Contract hereby agrees to fully comply with all equal employment opportunity

requirements not to discriminate and to take affirmative action to assure equal employment opportunity as required by Executive Orders 11246 and 11375 and the Standard Specifications which are imposed pursuant to Section 140 of Title 23, U.S.C.

40. **MODIFICATIONS TO STANDARD SPECIFICATIONS**. The Standard Specifications are modified in the following respects:

Section 1-01 DEFINITIONS AND TERMS

Section 1-01.3 DEFINITIONS:

"CONTRACTING AGENCY" or "OWNER": Port of Bellingham is substituted for "State," "Department," and "Department of Transportation" when the context indicates that such term refers to the owner of the Project.

"ENGINEER" and "PROJECT ENGINEER": Whenever Contractor is required or entitled to provide notice to the Engineer or Project Engineer under Section 1-04.5 (Procedure and Protest by the Contractor) or 1-09.11 (Disputes and Claims), such notice shall be given to the Director of Facilities of the Port of Bellingham.

Section 1-02 BID PROCEDURES AND CONDITIONS:

Section 1-02.2 is deleted.

Section 1-02.4(1) - The **first sentence** of the last paragraph in this section beginning with "Any prospective Bidder desiring an explanation…" **is deleted in its entirety** and replaced with "Any prospective Bidder desiring an explanation or interpretation of the Bid Documents, shall request the explanation or interpretation in writing four (4) business days prior to the bid opening to allow a written reply to reach all prospective Bidders before the submission of their Bids."

Section 1-04.2 COORDINATION OF CONTRACT DOCUMENTS, PLANS, SPECIAL PROVISIONS SPECIFICATIONS, AND ADDENDA

Delete the second paragraph and replace with the following:

Any inconsistency in the parts of the Contract shall be resolved by following this order of precedence (e.g., A presiding over B,C,D,E,F,G, and H; B presiding over C,D,E,F,G, and H; and so forth):

A. Addenda,
B. Proposal Form,
C. Port of Bellingham Special Provisions,
D. Port of Bellingham General Conditions,
E. Technical Specifications
F. Contract Plans (i.e., Drawings)
G. Standard Specifications, WSDOT
H. Standard Plans – WSDOT

Section 1-05.10 GUARANTEES:

Delete the existing Section and replace with the following:

Section 1-05.10 Guarantees:

The Contractor shall furnish to the Contracting Agency any guarantee or warranty furnished as a normal trade practice in connection with the purchase of any equipment, materials, or items used in the completion of Work in the Contract.

When corrections are required pursuant to this warranty, the Contractor shall be responsible for correcting all defects in workmanship and/or materials in the Work at Contractor's sole expense. The Contractor shall commence remedying such defects within five (5) calendar days of receipt of notice of discovery thereof from the Owner and shall complete such Work within a reasonable time. In emergencies, where damage may result from delay or where loss of service may result, such corrections may be made by the Owner, in which case the cost shall be the obligation of the Contractor. In the event the Contractor **does not complete corrections within a reasonable time, the Work shall be otherwise accomplished and the** cost of same shall be paid by the Contractor.

The Contractor shall be liable for any costs, losses, expenses, or damages, including consequential damages, suffered by the Owner resulting from defects in the Contractor's Work, including, but not limited to, costs, labor, materials, equipment, and administration incurred by Owner in making emergency repairs of such defective Work and associated costs of construction, inspection, and supervision by the Owner. The Contractor shall defend, indemnify, and hold the Owner harmless from any and all claims which may be made against the Owner as a result of Contractor's defective Work.

Section 1-08.3 PROGRESS SCHEDULE:

1-08.3(1) General Requirements - Add the following to the end of this section, "If the Contractor changes Work outlined in the schedule without sufficient notification to the Project Engineer, as solely determined by the Project Engineer, the Port reserves the right to recover any additional costs incurred by the Port as a result of insufficient notice from the Contractor to the Project Engineer; these costs may include, but are not limited to: financial impacts to the Port's or its Tenant's operations and staff, the Port's consultants,

cancelled or rescheduled special inspections, etc. Cost recovery will be in the form of a deductive change order to the Contract."

Section 1-09 MEASUREMENT AND PAYMENT:

Section 1-09.1 Measurement of Quantities clarification; At the Owners discretion and direction the Contractor shall be required to show specific units of measurements for Items of payment that have "Lump Sum' or "Force Account" in the Bid item of Work.

Sections 1-09.13 (1) – (4) Disputes and Claims are deleted.

Section 1-09.6 Force Account is deleted in its entirety and replaced with the following:
All ***Work*** which will increase or decrease the total project cost, or project completion time, to the Port of Bellingham must be authorized in writing by the Port of Bellingham as provided for herein prior to the contractor/vendor undertaking the work. Any increase in price due to a change order which is not authorized in writing by the Port prior to the contractor/vendor undertaking the work will not be paid for by the Port. Although the Engineer can negotiate such changes, they cannot approve change orders; such approval must come from the Executive Director or their designee.

All change orders will be executed in accordance with the Standard Specifications and when executed shall be inclusive of all costs and time extensions. The Port shall not be bound by any statements which have not been incorporated into an approved change order as provided for herein.

The amount to be paid for Work by Change Order shall be determined as follows:

A. For Labor – Labor reimbursement calculations shall be based on a "Project Labor Rates" prepared and submitted by the Contractor and by any Subcontractor before that firm commences the work. Throughout the term of the Contract, as needed, Contractor shall provide updated Project Labor Rates for labor classifications and/or Subcontractors not previously identified. Once Rates are approved by the Engineer, it shall be used to calculate all the change order labor for the duration of the Contract.

To be approved, the List must be accurate and meet the requirements of this Section. It shall include regular time and overtime rates for all employees (or work classifications) expected to participate in the Work. The rates shall include the basic wage and fringe benefits, the current rates for Federal Insurance Compensation Act (FICA), Federal Unemployment Tax Act (FUTA) and State Unemployment Tax Act (SUTA), the company's present rates for Medical Aid and Industrial Insurance premiums and the planned payments for travel and per diem compensation.

In addition to compensation for direct labor costs defined above, the Contracting Agency will pay **22** percent of the sum of the costs calculated for labor reimbursement to cover project overhead, general company overhead, profit, bonding, insurance required by Sections 1-07.10 and 1-07.18, Business & Occupation tax, and any other costs incurred. This amount will include any costs of safety training and health tests. All Labor costs shall be inclusive of small tools, no additional payments for Contractor-owned small tools will be made. For further detail see Tables A, B & C below.

B. For Materials – The Contracting Agency will reimburse for Contractor supplied materials. For the purpose of this provision, "Materials" shall include those items incorporated into the Work, supplies used during the Work and items consumed. This cost shall include freight and handling charges and applicable taxes. Before Work is started, or as reasonably practicable, the Engineer will require the Contractor to attach invoices or quotes and may be required to obtain multiple quotations for each material(s) anticipated to cost over $250. To support the prices, the Contractor shall attach valid copies of vendor invoices or quotes.

If invoices are not available for materials from the Contractor's stocks, the Contractor shall certify, by affidavit, actual cost for material reimbursement requests up to $250. If, in the case of non-invoice materials supported by Contractor affidavit, the price appears to be unreasonable the Engineer will determine the cost for all or part of those materials, utilizing the best data available.

The Contracting Agency reserves the right to provide materials. In this case, the Contractor will receive no payment for any costs, overhead, or profit arising from the value of the materials themselves. Additional costs to handle and place the Agency-furnished material shall be compensated as described in this Subsection.

In addition to compensation for direct materials cost, the Contracting Agency will pay **15** percent of the sum of the costs calculated for materials reimbursement to cover project overhead, general company overhead, profit, bonding, insurance, required by Section 1-07.10 and 1-07.18, Business & Occupation tax, and any other costs incurred. For further detail see Tables A, B & C below.

C. For Equipment – The Contracting Agency will reimburse the Contractor for the cost of equipment utilized in the Work. The equipment provided by the Contractor shall be of modern design and in good working condition. For the purpose of this provision, "provided" shall mean the equipment is owned (either through

outright ownership or through a long-term lease) and operated by the Contractor or Subcontractor or that the equipment is rented and operated by the Contractor or Subcontractor. Equipment that is rented with operator shall not be included here, but shall be considered a service and addressed according to Subsection D.

The amount of payment for any Contractor-owned equipment that is utilized shall be determined according to the Contractor and Subcontractor's "Equipment Rates" in effect at the time of the Contract execution, or updated as needed throughout the Contract, to account for equipment needs not previously identified. Rates shall be full compensation for all fuel, oil, lubrication, ordinary repairs, maintenance, and all other costs incidental to furnishing and operating the equipment except labor for operation.

Payment for rented equipment will be made on the basis of a valid invoice, covering the time period of the Work. Before Work is started, the Engineer may require the Contractor to obtain multiple quotations for the rental of equipment to be utilized and select the Vendor with prices and terms most advantageous to the Contracting Agency.

The Contracting Agency will add **15** percent to equipment costs to cover project overhead, general company overhead, profit, bonding, insurance, required by Sections 1-07.10 and 1.07.18, Business & Occupation tax, and any other costs incurred. For further detail see Tables A, B & C below.

D. For Services – Compensation for specialized services shall be made on the basis of receipt of an invoice from the providing entity. A "specialized service" shall be one that is typically billed through invoice in standard industry practice. Before Work is started, the Engineer may require the Contractor to obtain multiple quotations for the service to be utilized and select the provider with prices and terms most advantageous to the Contracting Agency.

Except as noted below, the Contracting Agency will pay an additional **15** percent of the sum of the costs included on invoices for specialized services to cover project overhead, general company overhead, profit, bonding, insurance, required by Sections 1-07.10 and 1-07.18, Business & Occupation tax, and any other costs incurred.

When a supplier of services is compensated through invoice, but acts in the manner of a Subcontractor, as described Subsection F of this provision, then markup for that invoice shall be according to Subsection F, "Contractor Mark-up on Subcontractor "Work". For further detail see Tables A, B & C below.

E. For Mobilization – Mobilization is defined as the preparatory Work performed by the contractor including procurement, loading and transportation of tools and equipment, personal travel time (when such travel time is a contractual obligation of the Contractor or a customary payment for the Contractor to all employees). Mobilization also includes the costs incurred during demobilization. The Contracting Agency will pay for mobilization for off-site preparatory Work provided notice has been provided sufficiently in advance to allow the Engineer to witness the activity, if desired.

All costs experienced during mobilization activities for labor, equipment, materials or services shall be listed in the Sections herein described and paid accordingly.

F. For Contractor Markup on Subcontractor's Work – When Change Order work is performed by one or more approved Subcontractors, lower-tier subcontractors or suppliers, or through invoice by firm(s) acting in the manner of a Subcontractor, the Port will pay one (1) additional markup to the Contractor calculated using Table C below to compensate for all administrative costs, including project overhead, general company overhead, profit, bonding, insurance required by Sections 1-07.10 and 1-07.18, Business & Occupation tax, and any other costs incurred. For further detail see Tables A, B & C below.

A firm may be considered to be acting as a Subcontractor when the Engineer observes one or more of the following characteristics:

- The person in charge of the firm's activities takes an active role in managing the overall project, including extensive coordination, interpretation of Plans, interaction with the Contracting Agency or management of a complex and interrelated operation.
- Rented equipment is provided fueled, operated and maintained by the firm. Operators of rented equipment are supervised directly by the firm's representative. There is little interaction between the Contractor and the employees of the firm.
- The firm appears to be holding the risk of performance and quality of the Work.
- The firm appears to be responsible for liability arising from the Work.

The payments above shall be full payment for all Work done on a change order. The calculated payment shall cover all expenses of every nature, kind, and description, including those listed above and any others incurred on the Work being paid by change order.

Table A: Markup For Work Completed by Contractor		
Costs	**Contractor Markup**	**Subcontractor Markup**
Labor	22%	N/A
Materials	15%	N/A
Equipment	15%	N/A
Services	15%	N/A

Table B: Markup For Work Completed by Subcontractor		
Costs	**Contractor Markup**	**Subcontractor Markup****
Labor	See Table C	22%
Materials		15%
Equipment		15%
Services		15%

** Markup applies to subcontractor performing the work, only, regardless of tiered subcontracting. There is no additional markup for tiered subcontracting (e.g., first-tier subcontractor markup on second-tier subcontractor work).

Table C: Contractor Markup for Work Completed by Subcontractor		
Costs	**Contractor Markup**	**Subcontractor Markup**
< $25,000	12%	N/A
$25,000 - $100,000	10%	
> $100,000	7%	

Section 1-09.7 **Mobilization is deleted in its entirety and replaced with the following:**

Section 1-09.7 Mobilization and Demobilization

Mobilization consists of preconstruction expenses and the costs of preparatory Work and operations performed by the Contractor which occur before 10 percent of the total original Contract amount is earned from other Contract items. The following items are excluded from Mobilization:

1. Any portion of the Work covered by the specific Contract item or incidental Work which is to be included in a Contract item or items.
2. Profit, interest on borrowed money, overhead, or management costs.
3. Any costs of mobilizing equipment for force account Work.

Demobilization consists of work to demobilize from the project site including project cleanup, site restoration, removal of Contractor-owned materials and equipment from the site, return of any keys or other loaned materials provided by the Port, and as-built drawings.

Based on the lump sum Contract price for “Mobilization and Demobilization”, partial payments will be made as follows:

1. 50 percent of the amount Bid for Mobilization and Demobilization will be paid when 10 percent of the total original Contract amount is earned from other Contract items, excluding amounts paid for materials on hand.
2. 80 percent of the amount Bid for Mobilization and Demobilization will be paid when 50 percent of the total original Contract amount is earned from other Contract items, excluding amounts paid for materials on hand.
3. 100 percent of the amount Bid for Mobilization and Demobilization will be paid when all of the following conditions are met:
    a. 100 percent of the total original Contract amount is earned from other Contract Items (excluding amounts paid for materials on hand).
    b. All work included in Demobilization, as described above, has been completed to the satisfaction of the Port.
    c. All work included in the Punch List generated by the Port has been completed to the satisfaction of the Port.

Nothing herein shall be construed to limit or preclude partial payments otherwise provided by the Contract.

END OF SECTION

PORT OF BELLINGHAM
HARRIS AVE SHIPYARD UPLAND CLEANUP ACTION
SPECIAL PROVISIONS

All Work shall be performed in accordance with the plans, bid item descriptions, technical specifications, Washington State Department of Transportation Standard Specifications (Standard Specifications), and the following Special Provisions.

1. **Bid Proposal Form:** This project is a unit price contract comprised of individual unit price items with estimated quantities and lump sum items. Bidders are required to complete all sections of the proposal form.

2. **Detailed Scope of Work:** The primary purpose of the Work is to remove from the Project Site soil contaminated with heavy metals, also involving demolition of above-grade structures and of remnant subsurface structural elements. The primary Work items include, but are not limited to, the following:

   - Before construction starts, prepare and submit for Engineer approval an Excavation and Water Management Plan and Stormwater Pollution Prevention Plan (SWPPP) describing means and methods to accomplish the Work.
   - Maintain site security, limit public access to project site, and conduct Work activities in a manner to not interfere with pedestrian or vehicle traffic on adjacent public rights-of-way.
   - Conduct a utility locate.
   - Install and maintain temporary erosion and sedimentation control (TESC) best management practices (BMPs) to prevent any off-site stormwater runoff or materials track-out and maintain them in full compliance with the approved SWPPP and applicable laws, regulations, and ordinances throughout construction.
   - Establish lined and bermed stockpile areas for contaminated soil and for inert (uncontaminated) debris and maintain appropriate BMPs for all stockpiles, including capture and treatment of runoff from the stockpile area, throughout the Work.
   - Conduct abatement of regulated building materials, demolish, and properly dispose of six above-grade buildings and various water treatment structures.
   - Remove existing concrete and asphalt surfaces.
   - Excavate contaminated soil to a depth of approximately 2 feet (actual depth varies) below Existing Grade to achieve specified subgrade elevations across most of the site (Cleanup Area 1).
   - In two subareas (termed Cleanup Area 2), excavate contaminated soil to anticipated maximum depths of 5 feet and 9 feet below Existing Grade. Assist the Engineer with soil sampling in the Cleanup Area 2 excavations and, based on

testing results, excavate additional contaminated soils laterally and/or vertically as directed by the Engineer.

- Remove and replace existing 8-inch water main and hydrant located within the Cleanup Area 2 excavation area.
- Remove subsurface structural elements (e.g., wood pilings, concrete, metal, etc.) and inactive subsurface utilities to the extent necessary to complete the excavation of contaminated soils, achieve specified Final Grades, or as otherwise directed by Engineer. Cut, plug, remove, and dispose of buried pipes that are encountered during excavation.
- Load, transport, and properly dispose the contaminated soil with associated debris at a Subtitle D landfill permitted to receive the material.
- Load, transport, and properly recycle all removed inert debris (concrete, asphalt, and metal) at a facility permitted to recycle it.
- Throughout excavation, remove groundwater as necessary to allow excavation and handling of unsaturated soil and otherwise perform the Work. The Contractor is responsible for all dewatering efforts including providing and installing sumps, pumps, power source (e.g., electrical generators), treatment equipment, temporary storage, conveyance, and to operate the system without leakage.
- Treat the extracted groundwater and stormwater collecting within the Project Limits and discharge it to an onsite storm drain in accordance with a NPDES Construction Stormwater General Permit (CSGWP) with Project-specific Administrative Order obtained by Owner. Upon execution of the Contract, the Owner will conduct complete full transfer of the CSWGP with Administrative Order to the Contractor who will then become solely responsible for compliance with its requirements.
- Complete trenching and other excavation as needed to install new stormwater catch basins, conveyance piping, a pretreatment vault for settling solids and capturing oil, and a treatment vault with sluice gates. Connect existing remaining catch basins to new stormwater conveyance system. Connect new stormwater conveyance piping to an existing outfall near the north end of the site and install an in-line check valve.
- Backfill and compact excavations to achieve specified Final Grades and compaction requirements using a combination of imported uncontaminated gravel borrow and crushed surfacing base course, as specified depending on location.
- Raise electrical infrastructure (one transformer, two vaults, and associated panels/racks) to match final grades.

Details of the Work are provided in the Specifications and Plans. The Contractor is responsible to provide all equipment, labor, materials, and other resources to

complete the Work in compliance with all permit conditions and environmental regulations governing the Work.

The Engineer will be present during construction activities (at the Engineer's discretion) to conduct sampling and testing, to observe and monitor the Contractor's methods and progress, and to provide direction on selected activities as described in the Specifications. The presence of the Engineer does not relieve the Contractor of his duties to perform the Work in accordance with the Contract Documents.

3. **Time of Completion:** The project shall be Substantially Complete with all aspects of the Work within **Ninety (90) calendar days**. By executing the Contract, the Contractor confirms that the Contract Days are reasonable for performing all the Work as specified within the time allotted. Should the Contractor fail to complete the Work within the time allotted, including the completion dates listed for each segment below, liquidated damages shall be assessed per Section 1-08.9 of the Standard Specifications.

4. **Pre-bid Conference**: A non-mandatory pre-bid conference for prospective bidders will be held **Tuesday July 8th at 2:00 PM PDT in the Harbor Center room of the Port of Bellingham main office at 1801 Roeder Avenue**. A site walk-through will be conducted immediately after.

5. **Safety:** Safe and proper operation is the responsibility of the Contractor. All equipment, excavations, stockpiles, shall be properly marked, and barricaded as needed to prevent unauthorized persons from touching them. The Contractor shall supply and maintain continual and proper barricading, fencing, and other necessary equipment or supplies for safety and security during the project. Physical barricades are required to properly surround and separate the Work and hazards from the public. Plastic or other barrier tape shall not be allowed. All barricades shall be properly weighted to prevent movement by high winds.

6. **Substitutions:** Requests for product substitutions prior to bidding will be considered only if they are received prior to a minimum of seven (7) calendar days before the time specified for receipt of bid proposals.

7. **Utility Interruptions:** The Contractor shall give at least one (1) week's advance notice to the Engineer for interruptions to power and water services.

8. **Temporary Utilities:** The Contractor shall provide all temporary power and any other utilities required to complete the Work as incidental costs of the Work.

9. **Surveying:** Contractor is responsible to conduct surveying that includes but is not limited to: excavation lateral extents and Subgrades, Finish Grades, locations of subsurface utilities cut/plugged during excavation, and new stormwater infrastructure. The Engineer retains the right to conduct independent professional surveying for quality assurance purposes.

10. **Potential Chemical Hazards:** The Project Site contains media contaminated by heavy metals including arsenic, copper, and zinc. Tabulations of the upland soil and groundwater quality data collected at the Project Site are presented in Appendix A to the Technical Specifications.

11. **Site Health and Safety:** The Contractor shall be responsible for all matters relating to the health and safety of its employees at the Project Site during the Work. The Contractor shall prepare a site-specific Site Health and Safety Plan and submit it to the Engineer prior to the preconstruction meeting. The Site Health and Safety Plan shall address all pertinent health and safety issues at the Project Site; a copy shall always be at the Project Site and all Contractor employees shall be thoroughly trained in all aspects of the plan. Neither the Owner nor the Engineer accepts responsibility for the adequacy or implementation of the Contractor's Site Health and Safety Plan.

    This Work shall be performed in compliance with OSHA 29 CFR 1910.120, applicable state regulations, the Contractor's Site Health and Safety Plan, and other health and safety plans provided to the Contractor.

    Without limiting the Contractor's responsibilities above, the Contractor warrants that all its employees who engage in activities, which could expose them to potentially hazardous substances, dangerous conditions, or other health hazards, have obtained the necessary health and safety training specified in 29 CFR 1910.120 and applicable local and state regulations. The Contractor shall submit to the Engineer evidence of the necessary certifications for each of its employees before beginning Work on the Project Site.

    Failure to comply with either general safety practices or health and safety practices as described above may result in temporary shutdown or termination at the Contractor's expense. The safety requirements of the Work as described above apply without regard to time, place, or presence of the Engineer.

15. **Submittals including Contractor's Schedule:** The Contractor shall transmit the required submittals to the Engineer by the deadline specified for each submittal. The Contractor shall not commence Work on any task or transport any material or supplies to the Project Site for any activity that requires a submittal before the activity is to commence.

    Within five (5) business days after Notice of Award, the Contractor shall submit to Engineer an Excavation and Water Management Plan and SWPPP. The Contractor shall allow three (3) business days for review and comment by the Engineer. The Contractor shall incorporate comments received from Engineer and produce the final Excavation and Water Management Plan and SWPPP for approval within two (2) business days of receipt of comments. No Work at the Project Site, except site inspections and surveys, shall be performed until both Plans are approved. No adjustment for time or money will be made if re-submittals of the Plans are required due to deficiencies in them.

    Within five (5) business days of receipt of Notice of Award, the Contractor shall submit a material procurement and construction schedule for the Engineer's review and approval. Any revisions to the schedule shall be made within three (3) business days of the Engineer's completing the review. The schedule and all subsequent revisions shall be kept at the Contractor's field office with copies available for the Engineer.

The Schedule shall be arranged chronologically by the start date of each item, and shall provide the following:

A) Show complete sequence of construction by activity.
B) Show start and stop dates of each major construction element.
C) Throughout construction, the Contractor shall record progress of each major construction element.
D) Revisions shall show changes relative to previously submitted schedules and updated projections of progress and completion.

At a minimum, the Contractor shall submit the following for Engineer review:

- Contractor's Schedule
- Site Health and Safety Plan
- Employee Health and Safety Certifications
- Excavation and Water Management Plan
- SWPPP
- Record Drawings
- Documentation of all materials recycled or disposed of off-site including Certificates of Disposal for Contaminated Soil landfilled.

16. **Record Drawings:** Contractor shall produce one set of Record Drawings that include "red-lined" corrections/additions/deletions that encompass all changes to the original Construction Drawings. The Record Drawing set shall be: kept up to date, maintained in legible markings, available in Contractor's field office for review at all times by the Engineer, and delivered to the Engineer as part of the final punch list.

END OF SECTION

Technical Specifications (100%)
Harris Avenue Shipyard Upland Cleanup Action

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DIVISION 1 GENERAL REQUIREMENTS

1-07 LEGAL RELATIONS AND RESPONSIBILITIES TO PUBLIC

1-07.15 Temporary Water Pollution Prevention

WSDOT Standard Specifications Section 1-07.15 is supplemented with the following:

1-07.15(1) Description of Work

The Contractor shall perform the Work and prevent environmental pollution and damage as the result of construction operations. This section outlines specific requirements to control and prevent spills of hazardous materials, and measures to keep the site clean and control impacts to any traveled roadways. This includes spills or overflows of dewatering water produced during soil excavation activities.

1-07.15(2) References

The publications listed below are incorporated by reference and are part of this Specification. The Contractor must be familiar with these and other laws and regulations concerning spill prevention and reporting.

33 U.S.C. 2701	Oil Pollution Act
40 CFR 302	Designation, Reportable Quantities, and Notification
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
WAC 173-303-340	Preparedness and Prevention
WAC 173-303-350	Contingency Plan and Emergency Procedures

1-07.15(3) Spill Response Materials

The Contractor shall provide spill response materials including, but not limited to, the following: containers, adsorbents (booms, sweeps and pads), shovels, and personal protective equipment. Spill response materials shall be available at all times in areas where there is the potential for hazardous materials to be accumulated, handled, or transported. Spill response materials shall be compatible with the type of materials and contaminants being handled. Proper spill response measures must be on site and in proper working condition at all times during the Work.

1-07.15(4) Equipment and Tools

The Contractor shall provide all necessary equipment and tools to handle hazardous materials in a safe and environmentally sound manner. At a minimum, the Contractor shall provide

emergency response equipment to respond to releases, fires, and explosions involving hazardous materials. The Contractor shall provide secondary containment as necessary for liquid materials and wastes.

1-07.15(5) Spill Prevention and Control

The Contractor shall comply with the Preparedness and Prevention Requirements specified in WAC 173-303-340.The Contractor shall avoid any disturbance to existing property and to the landscape in the areas surrounding the Project Limits. The Contractor shall ensure work crews do not enter controlled or contaminated areas, unless properly clothed and prepared.

1-07.15(6) Spill Response

In the event of a spill or release of a hazardous substance (material or waste as designated in 40 CFR 302), pollutant, contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), the Contractor shall notify the Engineer immediately. Immediate actions shall be taken to minimize the effect of any spill or release. Cleanup and disposal of cleanup materials shall be in accordance with applicable federal, state, and local regulations. As directed by the Engineer, additional sampling and testing shall be performed to verify that spills have been cleaned up. Spill cleanup and testing shall be done at no additional cost to the Owner.

The Contractor shall respond to any spill or release of hazardous materials that are in the custody or care of the Contractor during the Work. Any direction from the Engineer concerning a spill or release shall not be considered a change under the contract. The Contractor shall comply with all applicable requirements of federal, state, or local laws or regulations regarding any spill or release incident.

The Contractor is fully responsible for any spill or release as a consequence of their work and shall fully clean up the spill or release to the Engineer’s satisfaction. This includes any spill of water collected or produced during soil excavation activities.

1-07.15(7) Measurement and Payment

Separate payment will not be made for providing and maintaining environmental controls, or for cleanup of spills or releases. These costs shall be incidental to the contract and shall be included in the applicable unit cost prices or lump sum prices contained in the Bid Schedule.

The Owner reserves the right for cost reimbursement in-kind of any related costs deemed prudent and necessary by the Owner due to the Contractor’s work, which may include response to a spill or cleanup of spilled materials. Any Owner costs will be deducted from Contractor payments.

END OF SECTION

1-07.17 Utilities and Similar Facilities

WSDOT Standard Specifications Section 1-07.17 is supplemented with the following:

1-07.17(1) Description of Work

The Contractor shall conduct a private Utility locate in coordination with the Engineer prior to receiving written Notice to Proceed. Protection of active Utilities is the responsibility of the Contractor. Natural gas, water, power, and/or sewer service to buildings and structures outside of the Project Limits shall remain active and available for the duration of the Work, unless otherwise approved by the Owner. Active Utilities shall be rerouted or protected during excavation in consultation with Owner. The Contractor shall remove inactive subsurface Utilities to the extent necessary to complete the Work. Any Utilities encountered during the Work shall be communicated to the Engineer and Owner.

Drawing Sheet G-03 depicts existing Utility locations based on available information that includes:

1. City of Bellingham, 2022, CityIQ Map of Utilities – Sewer, Water, Storm, November 7, 2022.
2. Wilson Engineering, 2022, Fairhaven Shipyard UAV-Based Topographic Survey for Anchor QEA / Port of Bellingham, May 20, 2022.
3. BergerABAM, 2018, Port of Bellingham Harris Avenue Shipyard Site Interim Action Cleanup, As-Built, Existing Site – Upland, Drawing No. C2.0, December 7, 2018.
4. Pacific Survey & Engineering, Inc., 2014, All American Marine 200 Harris Ave. Building Expansion, Preliminary Site Plan, June 3, 2014.

Drawing Sheets C-04 and C-06 shows Utility locations relative to excavation areas. Actual conditions may be different than depicted and all features shown, unless otherwise noted, shall be field-verified by the Contractor when encountered.

1-07.17(2) Definitions

Utility. For the purpose of these specifications, Utility (or Utilities) shall refer to conduit, piping, and related appurtenances that may include but are not limited to concrete utilidors, catch basins, structures, poles, chases, Utility trenches, mechanical equipment, blocks, and wiring.

Project Limits. Defined by the Project Limits depicted on Drawing Sheet G-03.

1-07.17(3) Submittals

Contractor shall transmit to the Engineer a copy of the documented Utility locate within two business days of Utility locate completion.

The Contractor shall identify the methods for plugging piping and conduits as a component of the Excavation and Water Management Plan described in Section 2-04.1(2).

1-07.17(4) Utility Locate

Prior to receiving written Notice to Proceed from the Owner, the Contractor shall conduct a private Utility locate of the Project Limits depicted on Drawing Sheet G-03 and extend the locate a minimum of 25 feet beyond the Project Limits, horizontally. The Contractor shall coordinate the Utility locate with the Engineer a minimum of four days prior to it occurring. The Utility locate shall identify, to the extent possible: natural gas lines, electrical and telecommunications (above ground and underground); water lines; drainage inlets, structures, and piping; and sewer (process and sanitary). Contractor shall also conduct a public One-Call Utility locate for the Project.

Based on the private Utility locate, Utilities located shall be identified in the field using Utility-standard paint and Contractor shall mark up a copy of the Contract Drawings to document the results of the Utility locate. Any Utilities located that differ more than 5 feet in location in comparison to the Utilities shown on the Contract Drawings shall be communicated to the Engineer. All Utilities (e.g., natural gas, electrical, telecommunications, storm drain, water) encountered during the Work shall be communicated to the Engineer.

The Engineer shall review the documented Utility locate, follow-up with the Contractor on coordination issues within five days of receiving an approved Utility locate document.

1-07.17(5) Protection of Utilities

The Contractor and Owner or Engineer shall review and verify condition of the active Utilities within and adjacent to the Project Limits prior to beginning work to ascertain existing conditions.

During excavation activities, the Contractor shall anticipate encountering active natural gas, water, electrical, telecommunications, storm, and sewer Utilities as well as inactive Utilities potentially constructed of metal, concrete, masonry, wood, clay, fiberglass, plastic, etc. Concrete may include steel reinforcement.

If an active Utility is encountered within the Project Limits (e.g., during Utility locate or excavation) it shall not be disturbed without prior approval by the Engineer. Following approval by the Engineer, the Contractor shall temporarily disconnect and relocate or replace active Utilities (underground and/or overhead) as necessary to allow completion of the Work. Removal of Utilities shall occur as described in Section 1-07.17(6). Any damage documented as a result of the Contractor’s activities will be assessed to the Contractor for repair, at no additional cost to the Owner.

Known electrical utilities that require protection, removal, or other modifications because of excavation activities or grade changes are shown on the Plans. Specifications for electrical work are provided in Division 26.

1-07.17(6) Subsurface Utilities Shown on the Contract Drawings within the Project Limits

The Contractor shall remove inactive subsurface Utilities to the extent that is necessary to complete the earthwork as described in Division 2 in a safe and efficient manner. Buried Utilities (and appurtenances) that are encountered during the course of earthwork and require removal shall be managed as Inert Debris as defined in Section 2-04, unless otherwise directed by Engineer. Contractor shall cut inactive piping or conduit at the edge of the excavation, plug the remaining piping or conduit to prevent the flow of liquids into or out of the excavation, and remove the cut piping or conduit and related appurtenances from the excavation. Once removed from the excavation, the debris shall be managed and disposed of, by the Contractor, in accordance with the requirements of Section 2-04.

Methods for plugging piping and conduits shall be approved by the Engineer. Plugging piping or conduit shall include filling the terminal end of a pipe or conduit with concrete a minimum length of five diameters of the pipe or conduit. If approved by the Engineer, pipes or conduits may be capped by installing a cap or blind flange to form a permanent, leak-proof seal. The use of flexible couplings shall not be allowed without prior approval by the Engineer.

If piping or conduit (and appurtenances) containing flowing liquid are encountered within the excavation, Contractor shall contain/collect the liquid in an appropriate container for proper off-site disposal.

1-07.17(7) Subsurface Utilities Not Shown on the Contract Drawings

In the event that subsurface Utilities not shown on the Contract Documents are encountered in the course of earthwork activities, the Contractor shall immediately notify the Engineer before further disturbing the Utility. Removal of the identified Utility shall not be allowed without prior approval by the Engineer and shall be considered on a case-by-case basis.

1-07.17(8) Measurement and Payment

No separate payment for the Utility locate will be made. The cost to the Contractor for the Utility locate shall be included in the lump sum price for Item No. 01 Mobilization.

Payment for cutting, collecting/routing flowing liquids, and capping at the excavation edge pipes less than or equal to 6 inches in diameter encountered during excavation shall be per pipe (each) for Item No. 02A Cut and Plug Pipe ≤ 6-Inch Diameter. Payment per unit shall constitute full compensation for Item No. 02A Cut and Plug Pipe ≤ 6-Inch Diameter. This item will include all labor, equipment, and materials required to complete the Work as described in this section.

Payment for cutting, collecting/routing flowing liquids, and capping at the excavation edge pipes with diameters between 6 and 12 inches encountered during excavation shall be per pipe (each) for Item No. 02B Cut and Plug Pipe Between 6 and 12-Inch Diameter. Payment per unit shall constitute full compensation for Item No. 02B Cut and Plug Pipe Between 6 and 12-Inch Diameter. This item will include all labor, equipment, and materials required to complete the Work as described in this section.

Payment for raising electrical utilities as well as disconnection, removal, and/or replacement of buried electrical lines shown on the Plans shall be included in the lump sum price for Item No. 2C Electrical Modifications. This item will include all labor, equipment, and materials required to complete the Work as described in this section, on the Plans, and in Division 26.

END OF SECTION

END OF DIVISION 1

DIVISION 2 – EARTHWORK

2-02 REMOVAL OF ABOVE-GRADE STRUCTURES

2-02.1 Description

2-02.1(1) Description of Work

The structures to be removed, known obstructions, and locations of utilities are indicated on the drawings. The Work includes the requirements for the removal, wholly or in part, and satisfactory disposal of all buildings, building foundations, building's contents, utilities, fences, structures, light fixtures, or other features as identified on the drawings and within these specifications. This work also includes siding and framing repairs required to the Maintenance and Fabrication shop post select demolition. The Demolition Work also includes conduits and wires which are designated to be demolished on the drawings. The Engineer may identify other structures and obstructions that require removal during the Work.

2-02.1(2) Submittals

A. Pre-construction submittals shall include the following:

1. The Contractor shall submit to the Port of Bellingham a demolition plan that, at a minimum, addresses the following:
    a. Demolition Items – as indicated on the Contract Documents.
    b. Project-specific Asbestos Work Plan and Lead Work Plan as detailed in Sections 2-13.1(5) and 2-14.1(5), respectively.
    c. Worker safety.
    d. Protection of the public.
    e. Protection of workers or other persons in areas surrounding, and demolition site.
    f. Work sequence.
    g. Means and methods to minimize waste and maximum salvage.
    h. Disposal procedures including selected landfills and recyclers.
    i. Protection of the environment.
2. Job Submittals
    a. Daily Logs - Each Daily log will summarize the work completed that day and any unanticipated events, such as accidents or delays. Daily logs will include sign-in sheets that indicated the date, time, identity of entrant, company or agency represented and reason for entry for all persons entering the work area. Submit copies of all the preceding week's daily logs to the Engineer by Wednesday of the following week.
3. Final Submittal
    a. Provide written certification that Contractor has fully completed work in strict accordance with the Specifications and note any deviations from the Specifications and applicable regulations, reasons, and impacts to the

Project. The certification will include a short summary report describing total quantities of all Regulated Building Materials and final disposition.

2-02.1(3) Quality Assurance

A. Regulatory Requirements

1. Comply with governing EPA, Washington State Department of Ecology (Ecology), and local jurisdictional notification regulations before starting selective demolitions. Comply with hauling and disposal regulations of authorities having jurisdiction.

2-02.2 Construction Requirements

2-02.2(1) Preparation for Execution of Work

A. Products that are required to accomplish, or to be incorporated into, the Work of this section shall be as selected by the Contractor, subject to the approval of the Engineer.

B. All stormwater protection measures must be installed prior to any work taking place. Stormwater protection measures shall be maintained regularly during site demolition to ensure effectiveness of stormwater protection measures. Also refer to Section 8-01.

2-02.2(2) Demolition of Structures

A. Completely remove and legally dispose of off-site the designated buildings, building contents, foundations, structures, fences, and other obstructions as indicated on the drawings.

B. Care shall be taken in removing the foundations, so that damage does not occur to the existing pavement which is to remain in place and that all removals are accomplished by making a neat full depth vertical neat line saw cut at the boundaries of the area to be removed. Jack hammering to establish boundaries of the area to be removed is prohibited. Neat line saw cut edge to remain shall be protected during construction until completion of pavement repair.

C. Adjacent materials designated to remain that are damaged by the Contractor due to his operations shall be replaced at no additional cost to the Port.

D. Provide shoring, bracing, and screening, as needed, to prevent damage to adjacent facilities that are to remain in place.

E. Ensure safe passage of people outside the demolition area.

F. Blasting is not permitted. Other special operations necessary for the removal of an existing structure or obstruction shall be subject to the approval of the Engineer.

2-02.2(3) Demolition of Utilities

1) Well in advance of the demolition of any utilities, the Contractor shall advise the appropriate agency of the impending action and arrange with each utility, including, but not limited to, the Port of Bellingham, Puget Sound Energy, and the City of Bellingham for all Work required by that utility under this contract. Special conditions required by the utility shall be the sole responsibility of the Contractor. Contact the utilities for bond requirements, if any, prior to bid.

a) Piping: Remove and/or cap all piping in the demolition area as shown on the drawings, including underground piping, exposed piping, or piping fixed to timber structures.

b) Electrical and Telephone Items: Remove and/or cap electrical conduit, fixtures and equipment from the demolition area as shown on the drawings.

c) Water Lines: Remove and cap water and other utility lines as shown on the drawings in accordance with applicable codes.

d) Coordinate utility capping and disconnections with the Port. Submit documentation of utility capping and disconnection work, such as, photographs and detailed swing tie location measurements.

e) Excavation and Backfill for utility disconnections; excavation and backfill for required utility disconnection work shall comply with Section 02 06 – Grade Preparation, Backfill, and Compaction.

2-02.2(4) Disposal

A. General: All materials, except those materials containing substances classified as hazardous or potentially hazardous by local, state or Federal regulating agencies, shall upon their demolition become the property of the Contractor. All such material, including those containing hazardous or potentially hazardous substances shall be removed promptly and legally disposed of away from the site and on property not owned by the Port of Bellingham, except as otherwise provided in these specifications. No material shall be disposed of in adjoining waterways or in the fill. Burning of materials in these areas falls under the jurisdiction of the Whatcom County regulations and is forbidden under all circumstances.

B. Cleanup: After removal of structures, buildings, and foundations, clean and grade the area. There shall be no debris, rubble, or litter left at the site from any of the demolition operations.

C. The Port of Bellingham encourages the salvage and recycling of materials from demolished structures. The Contractor shall salvage or recycle, in an acceptable manner to environmental agencies and the Port of Bellingham, at his option any of the materials designated for disposal.

2-02.2(5) Job Conditions

A. The Contractor assumes full responsibility for the proper disposal of all demolition materials.

B. Regulated building materials are known to be in the buildings slated for demolition. Reference Sections 2-13, 2-14, and 2-15 within this specification for proper containment, treatment, demolition, and disposal of regulated building materials.

C. Contractor shall be responsible for all safety measures and other protection measures, as required, for abatement and building demolition.

D. During construction, the Contractor shall allow Port of Bellingham access to the construction site as needed.

2-02.3 Measurement and Payment

The unit of measurement for Item No. 03 Abatement and Demolition of Above-Grade Structures will be Lump Sum. This lump sum payment shall represent full compensation for furnishing all labor, equipment and incidentals required to accomplish the abatement of regulated building materials (see Sections 2-13, 2-14, and 2-15), siding repairs to Maintenance and Fabrication Shop and demolition of above-grade structures and below-grade foundations as specified.

END OF SECTION

2-03 EXCAVATION

WSDOT Standard Specifications Section 2-03 is supplemented with the following:

2-03.1 Description

2-03.1(1) Description of Work

The Work consists of removing Contaminated Soil to Subgrades at depths generally less than 4 feet, but with localized depths as great as approximately 9 feet below Existing Grade. There are four excavation Cleanup Areas (CA 1, CA 2-A, CA 2-B, and CA 2-C) as depicted on the Drawings. The Contractor is responsible for sequencing all excavation and backfill Work to minimize disturbance of the Owner's Tenant activities, as described further in Section 2-03.2(7). The Contractor shall coordinate excavation and backfill phasing with the Owner and Engineer. All of the work within CA 2 areas (i.e., CA 2-A, CA 2-B, and CA 2-C), including Engineer's performance sampling in the excavation, and any over-excavation required based on that, shall be accomplished in the minimum time practical.

The Work includes on-Site handling and segregation of excavated material as directed by the Engineer. Dewatering may be required for excavation below the water table to maintain unsaturated conditions (no standing water). The excavation will be backfilled and compacted using a combination of Gravel Borrow and Crushed Surfacing Base Course to meet specified Final Grades as described in Section 2-06.

The excavation of Contaminated Soil will be conducted concurrently with the removal of paved areas and subsurface obstructions described in Section 2-09. Demolition and removal of above ground buildings and obstructions shall be completed as described in Section 2-02 prior to excavation activities to facilitate availability of space for staging and storing Contractor and Tenant equipment.

2-03.1(2) Subsurface Conditions Relative to Soil Removal

For the Contractor's reference, the Subsurface Information Compilation, included as Appendix A to these Specifications, provides available information on subsurface soil and groundwater conditions for the Project Limits, including geologic logs and water level monitoring data.

2-03.1(3) Definitions

Contaminated Soil. Soil to be excavated that requires special handling and disposal as directed by Engineer. All Contaminated Soil handling and disposal requirements are defined in Section 2-04.

Existing Grade. Pre-existing (prior to Project start) grade elevation.

Final Grade. Specified grade elevation after backfill placement and at Work completion.

Over-Excavation. Excavation beyond the excavation extents shown on the Drawings.

Subgrade. Grade elevation at the final excavation limits.

Terms defined in previous sections apply to this section as well.

2-03.1(4) Submittals

An Excavation and Water Management Plan shall be prepared and submitted by the Contractor, as described in Section 2-04.1(2).

Excavation Support System Drawings: If excavation support systems, such as trench boxes, are used shop drawings shall show the proposed system and details not less than 10 days prior to use.

2-03.2 Construction Requirements

2-03.2(1) General Requirements

The excavation height shall be calculated within a vertical plane as the difference between the lowest elevation in the excavation and the elevation of the ground surface immediately adjacent to the excavation. Pavement thickness and other surface treatments existing at the time of the excavation shall be included in the height calculation.

All excavation, trenching, and shoring shall be performed in strict compliance with Chapter 296-155 WAC and all other applicable local, state, and federal laws and regulations.

2-03.2(2) Excavation Side Slopes

The excavation limits shown on the Construction Plans are estimated based on environmental investigations and include maximum sidewall slope restrictions. Maintenance of safe working conditions, including temporary excavation stability, is the responsibility of the Contractor. All temporary cuts exceeding 4 feet in height should be sloped or shored in accordance with Part N of WAC 296-155 for worker safety.

The soils where excavation is expected to occur across the Property classify as OSHA Soil Classification Type C. Temporary excavation slopes in Type C Soil should be inclined no steeper than 1.5H:1V.

The cut-slope inclinations estimated above are for planning purposes only and should be evaluated in the field by the Engineer. Flatter slopes will be necessary if groundwater seepage exists, if traffic or construction surcharges are present, or where less stable soils are present. The Contractor should monitor the stability of the temporary cutslopes and adjust the construction schedule and slope inclination accordingly.

Contractor shall protect exposed soil along the slope from surface erosion. Construction activities shall be scheduled so that the length of time the temporary cut is left open is reduced to the extent practical. Surface water shall be diverted away from the excavation.

2-03.2(3) Shoring

2-03.2(3)(a) General

The type of excavation shoring or shielding shall be determined by the Contractor, as necessary to complete the Work and approved by the Engineer. The Contractor shall select and design excavation support systems, methods, and details to ensure safety to the public and adjacent structures or Utilities. Excavation support systems shall be designed in accordance with Chapter 296-155 WAC, Part N and other applicable standards. Excavation support system designs, including trench box shop drawings, shall be provided by the Contractor to the Engineer for review prior to use if the support system is needed.

2-03.2(3)(b) Trench Shielding

This section applies if the Contractor elects to use trench shielding.

All components of trench box systems, as delivered and erected, shall be free of winds, warps, local deformations, or unauthorized bends. Holes and other provisions for field connections shall be accurate, so that proper fit will result when the trench box components are assembled in the field. Before assembly, surfaces to be in contact with each other shall be thoroughly cleaned. All parts shall be assembled accurately as shown on the Contractor’s Shop Drawings.

Trench box systems shall be monitored daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or leaks, to ensure that excavation remains stable.

If trench box system components are rejected from the Work because of deviation from location, excessive bending, twisting, or other reasons, the Contractor shall take suitable corrective action at no additional cost to the Engineer or Owner. Corrective action shall be reviewed by the Engineer. Suitable action includes extracting, furnishing, and installing of replacement components, so that all components installed meet the requirements of this Section.

Remove excavation support and protection systems in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and Utilities; repair the above items as needed. Voids left after removal of the trench box system shall be filled with subgrade soil. No trench box components shall remain in the excavation.

Following use and extraction of a trench box component, the Contractor shall clean/decontaminate each component prior to any re-use in the removal area. The component shall also be inspected for any damage that may have occurred through installation and/or extraction.

2-03.2(4) Control of Water Inflow into Excavations

The Contractor shall control groundwater inflow during excavation, Engineer's confirmation sampling, and backfilling activities below the water table as needed to maintain unsaturated conditions (i.e., no standing water) within the excavation. All water generated during performance of Work shall be managed in accordance with Section 2-05. The Subsurface Information Compilation, included as Appendix A to these Specifications, provides available information on subsurface conditions for the Project Limits including geologic logs and groundwater level monitoring data.

2-03.2(5) Sampling in Excavations

Contractor shall coordinate with Engineer for chemical sampling of soils on the excavation bottom and sidewalls to verify compliance with Project cleanup levels for the CA 2-A, CA 2-B, and CA 2-C excavation work areas shown on the Drawings. The excavation limits and Subgrades for the CA 1 soil removal are not subject to Engineer's verification sampling.

At Engineer's request, Contractor shall use the excavator bucket to collect samples and otherwise provide assistance with sample collection. The excavation shall be kept open to allow the Engineer time to sample and conduct lab analysis. The Contractor shall allow for up to 3 business days from time of sample collection for laboratory analysis and Engineer's direction if over-excavation is required at each location. Under no circumstances will additional payment be made for the Contractor's coordination of Engineer sampling in excavations. The Contractor shall conduct other Work while awaiting sample results. No additional payment will be made for the Contractor's time spent awaiting sample results.

2-03.2(6) Anticipate Low Rate of Excavation in CA 2

Due to the complexity of subsurface structures, uncertainties in the extent of contamination within CA 2, and the requirement for the Engineer's performance sampling to verify CA 2 excavation lateral and vertical limits, the Engineer will direct the excavation to proceed slowly and carefully. In addition, multiple rounds of sampling may be required in the CA 2 excavations, during which time the Contractor shall need to keep excavations open and equipment available.

Contractor is responsible to over-excavate portions of the CA 2 excavations as directed by Engineer based on testing results, and the quantities of over-excavation at any one time and location may be very small. Therefore, the rate of excavation within CA 2 will be lower than on projects that do not have these constraints. Under no circumstances will additional payment be made based on lower-than-anticipated production rates for any excavation on the Project.

2-03.2(7) Sequencing of Earthwork Activities

Vehicle access to the shipyard piers shall be maintained at all times. The proposed sequencing plan for excavation and backfill activities shall be included as an element of the Excavation and Water Management Plan as described in Section 2-04.1(2).

2-03.3 Measurement and Payment

The measurement and payment for the excavation-related pay items are detailed in Section 2-04. No separate payment will be made for the Excavation and Water Management Plan.

END OF SECTION

2-04 SOIL AND DEBRIS MANAGEMENT AND DISPOSITION

2-04.1 Description

2-04.1(1) Description of Work

The Work consists of managing all excavated material including Contaminated Soil with associated debris, Concrete, Asphalt, Ancillary Metal, and other Inert Debris generated from excavation. The waste streams shall be segregated, temporarily stockpiled if needed, and exported for off-Site disposal. Concrete, asphalt, metal, and other Inert Debris shall undergo any size reduction on-Site, as required the meet requirements of the receiving recycling facility. The Contractor is responsible for accumulating, stockpiling, transporting, and final disposition of all removed soil and debris in accordance with all applicable laws, regulations, and receiving facility permits.

2-04.1(2) Submittals

A. Excavation and Water Management Plan

The Contractor shall prepare and submit to the Engineer for review an Excavation and Water Management Plan that addresses management of all excavated materials to include:

1) Proposed excavation sequencing plan and schedule.

2) Proposed stockpile areas for Inert Debris and Contaminated Soils.

3) Construction methods and management procedures as well as methods and equipment to be used for transporting material from the excavation locations to the stockpiles, and for loading material for off-Site transport. This includes but is not limited to:

    a. Excavation methods and equipment to be used;
    b. Means and methods for handling, breaking, and segregating reinforced concrete or wood pilings if encountered in excavations;
    c. Means and methods to plug inactive Utilities at excavation extents;
    d. Excavation dewatering extraction methods and equipment to be used;
    e. Means and methods of conveying, treating, and discharging to designated locations any excavation dewatering water and water accumulating in stockpile areas in accordance with requirements in these specifications;
    f. Methods of placing and compacting backfill materials, both above and below the groundwater table; and
    g. Quality control/quality assurance.

4) The plan shall list name, location, and applicable state and federal identification numbers of the off-Site facilities to be used for disposition or recycling of excavated material from this Project. The Contractor shall also submit a letter of commitment or other pre-approval documentation from each landfill or recycling facility proposed for disposal or recycling of material.

5) The plan shall specify the haul route for trucks to use for each off-Site facility, hauling materials to and from the Project Limits.

The Contractor is responsible for independently developing a workable construction approach and schedule to meet the performance requirements of this Contract, and describing them in detail in the Excavation and Water Management Plan.

B. Reports

The Contractor shall be responsible for maintaining adequate records and documentation to support information provided to the Engineer during construction.

C. Certificates

The Contractor shall submit copies of trip and tonnage tickets and Certificates of Disposal signed by the receiving disposal facility for any waste or recyclable material transported from the Project Limits.

2-04.2 Construction Requirements

2-04.2(1) Buried Asbestos-Containing Materials

Subsurface Utilities, structures, or debris encountered during the Work may contain asbestos-containing material (ACM). If suspected ACM is encountered during the excavation-related Work, excavation will be ceased pending evaluation by the Contractor's Asbestos Hazardous Emergency Response Act (AHERA)-certified asbestos inspector, including collecting samples for laboratory analysis as needed, to confirm the suspect material as ACM or not. Confirmed ACM will not be further disturbed or touched without appropriate worker protection and environmental controls.

Contractor's qualified personnel will properly abate ACM encountered during the Work in accordance with applicable codes, standards, regulations, and accepted industry practices, Contractor is responsible to obtain necessary permits, and notify and provide necessary communications to the responsible regulatory agencies for the required ACM abatement activities. All required permits and notifications shall be kept valid for the duration of the abatement activities.

All workers involved in ACM abatement activities shall be the bearers of a current Certified Asbestos Worker card issued by the Washington State Department of Labor and Industries Division of Occupational Safety and Health (DOSH). Worker's cards must be available for inspection at the Project Limits. The Contractor will also provide at least one person certified by DOSH as an Asbestos Abatement Supervisor and this person will be responsible for overall abatement activities.

2-04.2(2) Segregation of Excavated Materials

Unless otherwise proposed by the Contractor and approved by the Engineer, the Contractor shall segregate excavated materials into the following types, as defined in Sections 2-03.1(3) and 2-04.2(4):

A. Concrete Inert Debris
B. Asphalt Inert Debris
C. Metal Inert Debris
D. Contaminated Soil

The Contractor shall make reasonable efforts to remove any adhering soil from Inert Debris prior to stockpiling, and to separate Inert Debris from Contaminated Soils removed during excavation.

2-04.2(3) Stockpiling of Excavated Materials

The Contractor shall establish stockpiling/staging locations for Inert Debris and Contaminated Soil identified in their Excavation and Water Management Plan. Separate stockpile areas shall be maintained for Inert Debris and Contaminated Soils and Debris. However, because all debris that has indications of contamination in the judgement of Engineer, or Inert Debris that cannot be practically segregated from Contaminated Soil in the judgement of Engineer, shall be disposed of as part of the Contaminated Soil waste stream, Contaminated Soils and associated debris may be stockpiled together subject to Engineer approval. The individual stockpile areas may be moved within the Project Limits throughout the duration of the Work as needed.

Areas designated for stockpiling of any excavated material shall be cleared of debris before stockpiling thereon. No material shall be stockpiled in such a manner as to create surface water accumulation or be detrimental to the completed Work in any way. Stockpiles shall be constructed to isolate stockpiled materials from the environment and encourage drainage of water. Stockpiles shall be underlain by a polyethylene, scrim-reinforced geomembrane with a minimum thickness of 10 mils and a minimum weight of 40 pounds per 1,000 square feet, or an equivalent means approved by the Engineer providing equal or improved containment. Adjacent geomembrane sections shall be continuously overlapped by a minimum of 3 feet. It is not necessary to seam adjacent geomembrane sections below the stockpiles.

The ground surface on which the geomembrane is to be placed shall be free of rocks greater than 1/2 inch in diameter and any other object that could damage the geomembrane. Alternatively, the Contractor may place a layer of Geotextile or plywood to fully underlie and protect the membrane. The Contractor shall also place plywood, geotextile, or other means acceptable to Engineer on top of the liner within each stockpile area to protect it throughout use of the stockpile area.

Berms shall be constructed around each stockpile area to a minimum height of 12 inches and shall contain sufficient area to allow for ponding and control of stormwater that may accumulate. The geomembrane liners of stockpiles shall be bathtub construction to collect excess water, unless an alternative method is approved by Engineer. Liquid accumulating in stockpiles shall be collected and disposed of in accordance with Section 2-05.

Stockpiles shall be covered to protect against erosion by wind and rain and to prevent precipitation from entering the stockpile. Stockpile covers shall be polyethylene geomembrane with a minimum thickness of 10 mils. The stockpile cover shall be anchored to prevent it from being removed by wind.

2-04.2(4) Off-Site Waste Disposition

Unless otherwise proposed by the Contractor and approved by the Engineer, excavated debris and Contaminated Soil shall be recycled or disposed of offsite as follows:

A. **Inert Debris.** Concrete, Asphalt, and Metal Inert Debris shall be removed and resized as needed in order to be handled and transported for offsite recycling.

B. **Contaminated Soil**. Contaminated Soil with incidental debris that shall be disposed of at a Subtitle D landfill.

Contractor is responsible to profile and receive acceptance for disposal of Contaminated Soil at a landfill permitted to accept it. The available analytical data for Contaminated Soil is provided in Appendix B to these Specifications. The Contaminated Soil is anticipated to be acceptable for disposal at Subtitle D landfills operated by Waste Management and Republic Services. The Contractor is solely responsible for obtaining acceptance for disposal of Contaminated Soil at a permitted landfill acceptable to Engineer.

2-04.2(5) Trucking

Contractor’s truck traffic shall use only arterial streets designated by Bellingham Municipal Code 11.63.140 as truck routes.

Trucks hauling all material from the Project Limits shall be covered immediately after loading and shall remain covered until they off-load at the designated facility.

2-04.3 Measurement and Payment

No separate payment will be made for the Excavation and Water Management Plan. This cost shall be incidental to the contract and shall be included in the lump sum price for Item No. 01 Mobilization.

The unit of measurement for Item No. 04 Contaminated Soil shall be the TON, based on the measured weight of material hauled off-site. Payment per unit shall constitute full compensation for Item No. 04 Contaminated Soil. This item includes all labor, equipment, and materials required for excavating, segregating, stockpiling, loading, transporting, and disposing of Contaminated Soil, including excavation for new stormwater conveyance system and structures, and preparation and submittal of reports and certificates as specified.

The unit of measurement for Item No. 05 Concrete Inert Debris shall be the TON, based on the measured weight of material hauled off-Site. Payment per unit shall constitute full compensation for Item No. 05 Concrete Inert Debris. This item includes all labor, equipment, and materials required for excavating, size reduction, segregating, stockpiling, loading, transporting, and recycling of Concrete, and preparation and submittal of reports and certificates.

The unit of measurement for Item No. 06 Asphalt Inert Debris shall be the TON, based on the measured weight of material hauled off-Site. Payment per unit shall constitute full compensation for Item No. 06 Asphalt Inert Debris. This item includes all labor, equipment, and materials required for excavating, size reduction, segregating, stockpiling, loading, transporting, and recycling of Asphalt, and preparation and submittal of reports and certificates.

The unit of measurement for Item No. 07 Metal Inert Debris shall be the TON, based on the measured weight of material hauled off-site. Payment per unit shall constitute full compensation for Item No. 07 Metal Inert Debris. This item includes all labor, equipment, and materials required for excavating, size reduction, segregating, stockpiling, loading, transporting, and recycling of Metal, and preparation and submittal of reports and certificates.

Item No. 08 Potential Abatement of Subsurface ACM shall be paid by Force Account and shall include all labor, equipment, and materials to test, identify, segregate, abate, load, transport, and dispose of ACM offsite, as directed by Engineer and in accordance with applicable laws, regulations, ordinances, and permits, and for preparation and submittal of reports and certificates as specified.

All material hauled off-Site shall be weighed on off-site certified scales at the disposal sites. The scales shall be of sufficient capacity to permit weighing the transporting vehicle both empty and full. Classes of material shall not be mixed in any given load. Scales shall be of the type that will print weigh tickets. A duplicate copy of each weigh ticket and a copy of the latest scale certification shall be furnished to the Engineer. END OF SECTION

2-05 WATER MANAGEMENT AND DISPOSAL

2-05.1 Description

2-05.1(1) Description of Work

All water accumulating within the stockpile areas, all water generated from excavation dewatering, and any stormwater that is not infiltrated shall be collected, conveyed to the Contractor's water management system for treatment to meet applicable water quality performance standards, and then conveyed to the one of two existing stormwater outfalls located at the northern or western edge of the Project Limits.

The Contractor shall discharge treated water in accordance with all requirements in the Project-specific Administrative Order on the National Pollution Discharge Elimination System (NPDES) Construction Stormwater General Permit (CSGWP) issued by Ecology to the Owner for this Project. The Project-specific Administrative Order is not available at the time of the bid solicitation for this Project. For purposes of bid preparation, the Bidder is to assume that the requirements of the Project-specific Administrative Order will match those in the example Administrative Order included in Appendix C. The project-specific Administrative Order for this project will be provided in when it becomes available. All water discharged must comply with CSGWP Water Quality Performance Standards defined in Section 2-05.1(2).

The Contractor shall be responsible for all operation and maintenance (O&M) activities associated with their Water Management System.

2-05.1(2) Definitions

Water Management System. Facilities, equipment, instrumentation, and supplies needed to dewater excavations and collect stormwater within the stockpile areas, store water, treat water to meet applicable water quality performance standards prior to discharge, and convey the treated water to the Contractor's selected discharge point.

CSGWP Water Quality Performance Standards. All construction-generated water discharged from the Project Limits to surface waters of the state, via the onsite storm drain, shall comply with the indicator levels and all other requirements of the Project-specific Administrative Order on the CSGWP.

Terms defined in previous sections apply to this section as well.

2-05.1(3) Subsurface Conditions Relative to Water Management and Disposal

For the Contractor's reference, the Subsurface Information Compilation, included as Appendix A to these Specifications, provides available information on groundwater chemical and aquifer testing (hydraulics) data.

2-05.1(4) Submittals

A. Excavation and Water Management Plan

The Contractor shall present planned means and methods of excavation dewatering, conveyance of stormwater, water treatment and conveyance, and discharge in the Excavation and Water Management Plan as described in Section 2-04.1(2).

B. Reports

For Contractor's discharge under the CSGWP with Administrative Order, the Contractor shall be responsible for maintaining adequate records of discharge flow rates and volumes, and all other records and documentation including Discharge Monitoring Reports required by the Administrative Order. Contractor shall provide the Engineer with a copy of all documentation submitted to Department of Ecology.

2-05.1(5) Regulatory Requirements

The Owner will obtain the CSGWP with Project-Specific Administrative Order. Upon execution of the Contract for this Project, the Owner will transfer in full the CSWGP with Administrative Order to the Contractor and thereafter the Contractor shall be fully responsible for compliance with the requirements therein, and for any permit-related communications with or obtaining additional approvals from Department of Ecology. Upon start of the Project Work under the Contract, the Contractor shall be responsible for meeting all requirements of the Project-Specific Administrative Order and CSWGP.

2-05.2 Construction Requirements

The Contractor shall properly manage all water generated during the Work. Water management requirements are as follows:

2-05.2(1) Excavation Dewatering

The Contractor shall devise and operate an excavation dewatering system that works in conjunction with the Contractor's means and methods of completing excavation and backfilling. Groundwater shall be removed from the excavation(s) as necessary to achieve unsaturated

conditions (no standing water) within the excavation, which will assist excavation and materials handling, allow for Engineer's verification sampling, and facilitate compaction of backfill material. The Contractor shall determine the dewatering approach and the required water pumping capacity of the excavation dewatering system, using the information provided in the Subsurface Information Compilation (Appendix A), which provides available geologic logs and groundwater level for the Project Limits. It is the Contractor's responsibility to review the information in Appendix A and the planned excavation requirements, and then implement whatever dewatering is required to achieve unsaturated excavation conditions. All water pumped from the excavations shall be treated to achieve the Water Quality Performance Standards applicable for the Contractor's chosen method of discharge, and then conveyed to the selected discharge point described in Section 2-05.1(1).

2-05.2(2) Stormwater Accumulation

All stormwater that is not infiltrated and accumulates within the Project Limits, including within the stockpile areas, shall be collected and treated to achieve the Water Quality Performance Standards applicable for the Contractor's chosen method of discharge, and then conveyed to the selected discharge point described in Section 2-05.1(1).

2-05.2(3) Water Treatment and Discharge

Excavation dewatering and stormwater shall be treated as needed to meet the Project Water Quality Performance Standards. The Contractor shall provide a water management system with storage and flow-through capacity equal to or greater than the expected influent flow rates from excavation dewatering and drainage from the stockpile areas. At a minimum, the water management system shall include the following components/capabilities:

1. A chambered weir tank(s), with minimum 20,000 gallons of usable detention capacity, that effectively removes any floating sheens and minimizes settleable solids in water discharged.
2. A non-resettable, totalizing flow meter, certified accurate to within 10 gallons (for every 1,000 gallons discharged), for measuring the quantity of water discharged each day from the Project Limits.
3. Other treatment equipment and media as needed to meet the Indicator Levels defined in the Administrative Order for the Project
4. A spigot or equivalent means for the Engineer to collect samples of the treatment system effluent water throughout its operation for the Project.

Operation and maintenance of the water management system is solely the Contractor's responsibility. The Contractor shall be responsible for cleaning up any spills or leaks to the satisfaction of the Engineer.

2-05.3 Measurement and Payment

The unit of measurement for Item No. 09 Furnish and Remove Water Management System will be Lump Sum. This lump sum payment will constitute full compensation for Item No. 09 Furnish and Remove Water Management System. This item will include all labor, equipment, and materials required to furnish, mobilize, install, test, decontaminate, and demobilize the equipment and systems required to extract water from excavations or the stockpile area and treat that extracted water to achieve the applicable Water Quality Performance Standards, to convey treated water to the selected discharge point, and to properly dispose of all water treatment media used for the Work. For the purposes of bidding, Contractor shall assume that the duration of water management for the Project will be 90 calendar days.

The unit of time measurement for Item No. 10 Operate Water Management System will be the Day. Operating pumps as part of Contractor's Water Management System for 3 hours or more in a 24-hour period constitutes one day of operation. Payment per unit will constitute full compensation for Item No. 10 Operate Water Management System. This item will include all labor and materials required to operate, inspect, monitor, record discharge quantities daily, and maintain the Water Management System throughout the processes of water extraction, conveyance, treatment, and discharge. For the purposes of bidding, Contractor shall assume that the Water Treatment System will be operated on 45 days within the Project duration.

END OF SECTION

2-06 GRADE PREPARATION, BACKFILL, AND COMPACTION

WSDOT Standard Specifications Section 2-06 is supplemented with the following:

2-06.1 Description

The dewatered excavation subgrade will be prepared and backfilled to the Final Grades shown on Drawing Sheet C-08. A nonwoven separation geotextile shall be placed over the exposed prepared Subgrades, and then the excavations will be backfilled with Gravel Borrow to 1-foot below Final Grades, then with 1-foot of Crushed Surfacing Base Course to achieve Final Grade elevations.

2-06.2 Construction Requirements

2-06.2(1) Subgrade Preparation

Subgrade preparation shall include removal of all debris, loose fill soils, roots, and other deleterious materials from the excavation subgrades. Drain water from all low spots and ruts. Contractor shall compact the Subgrade to a firm and unyielding condition. If the underlying material is too soft to allow proper compaction of the Subgrade, the Contractor shall loosen, aerate (or excavate and remove), and compact the Subgrade until the top layer can be compacted as required.

2-06.2(2) Construction Geosynthetic

Contractor shall place geotextile in excavation to separate the prepared Subgrade from overlying imported backfill materials, with no gaps in accordance with Section 2-12 of the Specifications.

2-06.2(2) Backfill Compaction

Compaction required for all types of fills shall be in accordance with Table 2-01-A of this Section. Moisten material or aerate the material as necessary to provide the moisture content that will facilitate obtaining the required compaction.

TABLE 2-06-A
MINIMUM DENSITY REQUIREMENTS

Fill Material	Maximum Uncompacted Lift Thickness (inches)	Minimum Percent of Maximum Dry Density for Compaction (as determined by ASTM D1557)
Crushed Surfacing Base Course	8	95
Gravel Borrow		
More Than Four Feet Below Final Grade	12	90
Within Four Feet of Final Grade	8	95
Gravel Backfill for Walls	6	90

Fill thicknesses are based on using relatively large compaction equipment, such as a vibrating plate attachment to an excavator (hoe pack) or a drum roller. If small, hand-operated compaction equipment is used to compact structural fill, lifts shall not exceed 6 inches in loose thickness. When working within two feet of existing or new walls, small compaction equipment should be utilized and backfill shall be compacted to 90 percent to avoid overstressing walls.

The Contractor shall adjust moisture content during compaction to produce firm, stable backfill lifts. The backfill lifts shall be free from pumping and rutting due to excessive moisture and is the Contractor's responsibility to manage and adjust as necessary. The Contracting Agency will consider all costs for drying embankment material to be incidental to other Work, including excessive moisture due to inclement weather.

2-06.2(3) Backfill Inspection

Contractor shall subcontract a qualified third-party geotechnical testing company to verify adequate compaction of the Crushed Surface Base Course, Gravel Borrow, and Gravel Backfill for Walls using a nuclear densometer. Contractor shall test the following lifts:

1. Where subgrade is 3 feet or deeper below final grades: Initial layer of Gravel Borrow or Gravel Backfill for Walls to verify compaction methods.
2. All areas: Top of Gravel Borrow, prior to installing overlaying Crushed Surfacing Base Course.
3. All areas: Top of Crushed Surfacing Base Course layer (Final Grades).

The compaction tests shall be distributed across the Site as approved by Engineer. Nuclear densometer testing shall be performed only after placement and compaction, unless otherwise directed by Engineer. At a minimum, one test shall be performed every 5,000 square feet or with

each change in material type or compaction methodology. Frequency of testing may be reduced with the Engineer's approval once compaction procedures are established and verified. The compaction test results shall be provided in writing by the testing company to Engineer.

Once a placement and compaction procedure are established, the Contractor's operations should be monitored to verify that proper compaction is being achieved. Backfill and compaction observations shall be provided to the Engineer in weekly field reports by the Contractor's qualified materials inspection personnel.

2-06.2(4) Backfill Surrounding Protected Structures, Utilities, and Pavements

The Contractor shall place backfill evenly around all sides and parts of existing Structures. Use of small compactors may be required to compact the backfill around the Structure.

2-06.3 Measurement and Payment

The unit of measurement for Item No. 11 Crushed Surfacing Base Course shall be by the TON, based on measured weight of Crushed Surfacing Base Course material used. Only truckloads of material actually used for an approved purpose in accordance with these Specifications will be considered part of the measurement. Imported material that is not used and is hauled away shall be weighed and deducted from the amount brought on site. Payment per unit shall constitute full compensation for Item No. 11 Crushed Surfacing Base Course. This item will include transportation of material, on-site stockpiling and handling, placement of material, compaction, and all other Work required for placement.

The unit of measurement for Item No. 12 Gravel Borrow shall be by the TON, based on measured weight of Gravel Borrow material used. Only truckloads of material actually used for an approved purpose in accordance with these Specifications will be considered part of the measurement. Imported material that is not used and is hauled away shall be weighed and deducted from the amount brought on site. Payment per unit shall constitute full compensation for Item No. 12 Gravel Borrow. This item will include transportation of material, on-site stockpiling and handling, placement of material, compaction, and all other Work required for placement.

Compaction testing will be incidental to the Contract and will be included in the applicable prices contained in the Proposal Form.

END OF SECTION

2-09 REMOVAL OF PAVEMENTS, FOUNDATIONS, AND OBSTRUCTIONS

2-09.1 Description

2-09.1(1) Description of Work

The structures and obstructions referred to in this section include pavements, building foundations, below-ground man-made structures, and miscellaneous features within the Project Limits that are in conflict with Site cleanup and that are not specifically identified on the Contract Drawings to remain, as well as other structures and obstructions that may be identified by Engineer during the Work. The Contractor shall anticipate encountering buried structural elements including in-place vertical wood pilings 8 inches or larger in diameter; reinforced concrete pile caps, grade beams, footings, foundations, stem walls, slabs; and other structures of various materials. The structural elements may be large and require cutting or breaking to allow their removal from the excavation and handling.

The structures and obstructions include the foundations for buildings to be demolished, buried concrete structures, asphalt pavement, metal associated with the concrete structural elements, etc. Structures and obstructions do not include soil. The known structures and obstructions to be demolished and removed are shown on the Drawings.

2-09.1(2) Subsurface Conditions Relative to Structure Removal

Appendix A includes logs of borings and test pits conducted to verify presence and dimensions of buried concrete structures.

2-09.1(3) Definitions

Ancillary Metal. All structural metal or metal equipment removed from within the Project Limits.

Concrete. Includes concrete and associated steel reinforcement and embedded steel appurtenances.

Contaminated Debris. Debris that, due to coatings, staining, or other characteristics, cannot be recycled and does not classify as Inert Debris.

Inert Debris. Concrete, asphalt, and ancillary metal removed during the Work that Engineer determines to be not contaminated and that will therefore be recycled at a permitted recycling facility.

Proper Disposal: As defined by the jurisdiction receiving the waste in accordance with applicable laws, regulations, and permits.

Terms defined in previous sections apply to this section as well.

2-09.1(4) Submittals

An Excavation and Water Management Plan shall be prepared, as described in Section 2-04.1(2). The Excavation and Water Management Plan shall include Contractor's means and methods for the demolition and removal of structures and obstructions.

2-09.2 Construction Requirements

The Contractor shall remove and dispose of the building foundations, concrete pads, and asphalt areas indicated on the Drawings. Removal of structures and obstructions shall be performed concurrently with soil excavation activities described in Section 2-03.

Replace at no expense to the Owner any existing pavement designated to remain that is damaged during the removal of other pavement.

2-09.2(1) Remove Concrete

The Contractor shall remove all above ground and buried concrete structures and ancillary structures shown on the Drawings, including pavements and former building foundations. All concrete structures shall be removed in entirety unless otherwise directed by Engineer. All concrete removed shall be properly recycled off-Site in accordance with Section 2-04. Concrete shall not be crushed on site.

2-09.2(2) Remove Wood

For any wooden pile-supported concrete structures encountered, the wooden pilings shall be cut approximately 6 inches below the Subgrade. All concrete removed shall be properly recycled off-Site in accordance with Section 2-04. Concrete shall not be crushed on site. All wood removed shall be included with the Contaminated Soil waste stream and properly disposed off-Site in accordance with Section 2-04.

2-09.2(3) Remove Asphalt

The Contractor shall remove all asphalt shown on Drawing Sheet C-03. The Contractor shall sawcut where asphalt extends beyond the existing asphalt to be demolished limits. Sawcuts shall be neat, vertical, and full depth to protect asphalt to remain in place adjacent to the Work area. All asphalt removed shall be properly recycled off-Site in accordance with Section 2-04.

2-09.2(4) Remove Ancillary Metal

All Ancillary Metal within the Project Limits shall be removed during the removal of structures and obstructions. All ancillary metal shall be properly recycled or disposed off-Site in accordance with Section 2-04.

2-09.3 Measurement and Payment

The measurement and payment for the removal of structures and obstructions is detailed in Section 2-04. No separate payment will be made for the Excavation and Water Management Plan submittal requirements. The cost for preparation of that Plan shall be incidental to the Contract and shall be included in the lump sum price for Item No. 01 Mobilization.

END OF SECTION

2-12 CONSTRUCTION GEOSYNTHETIC

WSDOT Standard Specification Section 2-12 is supplemented with the following:

2-12.2(4) Separation Geotextile

Separation Geotextile shall be a high-visibility, orange, nonwoven, permeable geotextile conforming to the requirements of Section 9-33 (Table 3) of the WSDOT Standard Specifications for a nonwoven separation geotextile. Separation Geotextile will be approved by the Engineer prior to its use.

2-12.3 Construction Requirements

Contractor shall place geotextile in excavation to separate the prepared Subgrade from overlying imported backfill materials, with no gaps. All prepared subgrades shall be overlain with a nonwoven geotextile as a high-visibility separation barrier prior to any backfill. The geotextile shall either be overlapped a minimum of 2 feet at all longitudinal and transverse joints, or the geotextile joints shall be sewn together. The initial lift thickness above the geosynthetic shall be 6 inches or more.

The geotextile material shall be approved by the Engineer prior to use.

2-12.3 Measurement and Payment

The unit of measurement for Item No. 13 Separation Geotextile shall be the SQUARE YARD, based on material actually used for an approved purpose in accordance with these Specifications. Payment per unit shall constitute full compensation for Item No. 13 Separation Geotextile. This item will include procurement of material, and all other Work required for placement.

END OF SECTION

2-13 ASBESTOS ABATEMENT

2-13.1 Description

2-13.1(1) SUMMARY OF WORK

A. The Contractor shall supply all labor, materials, services, insurance, special permits and equipment necessary to remove and dispose of asbestos-containing materials (ACM) in accordance with all applicable federal, state and local regulations and the Contract Documents, including the Drawings and Specifications. Asbestos materials to be removed, as detailed in the attached Hazardous Building Materials Survey Report dated September 2023 submitted by Med-Tox Northwest (Appendix D to these specifications) include the following:

Material	Location	Friable	Quantity
Conex Building			
Roof sealant	North container roof	No	288 SF
Paint Shop Building			
There were no asbestos containing materials identified in this building.			
Sandblast Building			
There were no asbestos containing materials identified in this building.			
Winch Building			
There were no asbestos containing materials identified in this building.			
Water Treatment Building			
There were no asbestos containing materials identified in this building.			
Tank Farm			
There were no asbestos containing materials identified with the associated tanks or piping systems.			
Paint Building			
There were no asbestos containing materials identified in this building.			

B. General Requirements

1. The Contractor is responsible to notify and provide all necessary communications to the responsible regulatory agencies for all required work.
2. The Contractor is responsible to take appropriate measures ensuring that the project site will be safeguarded from contamination during the asbestos abatement project period.
3. All work is to be performed in accordance with applicable codes, standards, regulations, and accepted industry practices. This includes compliance with regulatory requirements applicable at the time the work is performed and is not limited to requirements at the time of bid. All work, including work practices, is to be craftsman-like and is subject to inspection by the Owner and regulatory agency personnel.

C. All required permits and notifications shall be kept valid for the duration of the Contract. This includes any permit and/or notification revisions, such as changes of abatement dates, shift times, work locations, Contractor personnel, etc.

D. The Contractor is responsible for restoring the work area and auxiliary areas utilized during the abatement to conditions equal to or better than original. Damages caused during the performance of abatement activities shall be repaired by the Contractor (including, but not limited to, paint peeled off by barrier tape, nail holes, water damage, broken glass) at no additional cost to the Owner.

E. All air and bulk sampling information shall be legibly entered on forms.

F. Each employee involved in asbestos abatement activities shall be the bearer of a current Certified Asbestos Worker card issued by the Washington State Department of Labor and Industries (L&I). Cards shall be available for inspection at the jobsite. The Contractor shall also provide, at a minimum, one (1) person certified by L&I as an Asbestos Abatement Supervisor, and this person shall be responsible for overall abatement activities. This person shall be immediately available on site when any project work is done. If abatement work is performed on multiple shifts, each shift shall have a certified Asbestos Abatement Supervisor.

G. Use of the Site: Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed.

H. Contractor's Use of the Existing Building: Maintain the existing building in a safe condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building during the construction period.

I. Smoking or open fires will not be permitted within the building enclosure or on the premises.

J. Occupancy

    1. Contractor to secure buildings and prevent occupancy during the project.

    2. Partial Occupancy: The Owner reserves the right to place and install equipment as necessary in areas of the building in which all asbestos abatement and project decontamination procedures have been completed, and to occupy such completed areas prior to substantial completion, provided that such occupancy does not substantially interfere with completion of work. Such placing of equipment and partial occupancy shall not constitute acceptance of the work or any part of the work.

K. Site Conditions:

    1. Power and water are not currently available. Contractor is responsible for providing temporary power and water to perform the work.

L. The Contractor is responsible for all air sampling for Washington State Department of Labor & Industries (L&I) Division of Occupational Safety and Health (DOSH) and other local, state and federal compliance. Refer to Article 1.07 of this Section for requirements for Contractor air monitoring.

M. On-Site Observation

    1. The safety and protection of Contractor employees, subcontractor employees, Owners employees, consultants, the facility, and the public is the sole responsibility of the Contractor.

    2. The Owner or representatives of local, State or Federal agencies may make unannounced visits to the site during the work. The Contractor shall provide two complete sets of clean, protective clothing and respirators with the same protection factor as required in the regulated area available daily for such visitor use. It is the

visitor's responsibility to ensure all necessary medical qualification, training, and "fit test" certificates are current prior to using any respirator or protective clothing provided by the Contractor.

3. If the Owner or agency visitor determines that practices are in violation of applicable regulations, or are endangering workers, the general public or the facility, they will immediately notify the Contractor orally that operations must cease until corrective action is taken. Such notification from the Owner will be followed by written confirmation within three (3) workdays.
4. The Contractor shall immediately stop work after receiving such notification, verbally or written. The work may not be restarted until the Contractor receives written authorization from the Owner.

N. All costs resulting from such stop work order and any necessary corrective actions will be borne solely by the Contractor and will not be a basis for an increase in the contract amount or an extension of time

2-13.1(2) ASBESTOS ABATEMENT DEFINITIONS

1. Abatement: Procedures to control fiber release from asbestos-containing materials. Includes removal, encapsulation, enclosure, repair, demolition and renovation activities.
2. ACGIH: American Conference of Governmental Industrial Hygienists
3. ACM: Asbestos-containing material
4. Aerosol: A system consisting of particles, solid or liquid, suspended in air
5. AIHA: American Industrial Hygiene Association
6. Air Cell: Insulation normally used on pipes and ductwork that is comprised of a corrugated cardboard that frequently contains asbestos
7. Airlock: A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways separated by a distance of at least 3-feet
8. Air Monitoring: The process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure most commonly utilized in industry for asbestos follows the WISHA reference method outlined in WAC 296-62-07735, Appendix A, and WAC 296-62-07737, Appendix B.
9. Air Sampling Firm (ASF): A professional firm providing specialized services by trained and certified or qualified personnel in the field of asbestos abatement and project management, contracted with or employed by the Contractor or tenant to supervise and/or conduct inspection, monitoring, and analysis services
10. Amended Water: Water to which a surfactant has been added in order to accomplish more thorough penetration and saturation of the asbestos-containing material
11. ANSI: American National Standards Institute
12. Asbestos: The mineral varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite (amosite), anthophyllite, actinolite and tremolite. For purposes of determining respiratory and worker protection, both the asbestiform

and non-asbestiform varieties of the above minerals, and these minerals that have been chemically treated and/or altered, shall be considered as asbestos.

13. Asbestos-Containing Material (ACM): Any material containing more than one percent (1%) asbestos as defined under NESHAP (40 CFR Part 61) OSHA (29 CFR Part 1926.1101), L&I (WAC 296-62-07703), and Northwest Sound Clean Air Agency (Section 570)
14. Asbestos-Containing Waste Material: Any confirmed or suspect asbestos-containing material, or any material contaminated with an asbestos-containing material, which is to be removed from a work area for disposal.
15. Asbestos Project: An asbestos project includes the construction, demolition, repair, remodeling, maintenance or renovation of any public or private building or structure, mechanical piping equipment or system involving the demolition, removal, encapsulation, salvage, or disposal of material or outdoor activity releasing or likely to release asbestos fibers into the air.
16. ASTM: American Society for Testing and Materials
17. Authorized Visitor: Designated representatives of the Contractor or the Port, and representatives of a regulatory or other agency having jurisdiction over the Project
18. Breathing Zone: A hemisphere forward of the shoulders with a radius of approximately 6- to 9-inches
19. Bridging Encapsulant: The application of a sealant over the surface of an asbestos-containing material to prevent the release of asbestos fibers
20. Category I; Non-Friable Asbestos-Containing Material (ACM): Asbestos-containing packings, gaskets, resilient floor covering and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy
21. Category II; Non-Friable ACM: Any material, excluding Category I non-friable ACM, containing more than 1 percent asbestos as determined using the methods specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure
22. Certified Industrial Hygienist (CIH): An industrial hygienist certified in the Comprehensive Practice or Chemical Aspects of Industrial Hygiene by the American Board of Industrial Hygiene
23. Class I Asbestos Work: Activities involving the removal of thermal system insulation or surfacing ACM/PACM
24. Class II Asbestos Work: Activities involving the removal of ACM, which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.
25. Class III Asbestos Work: Repair and maintenance operations where “ACM”, including TSI and surfacing ACM and PACM, may be disturbed
26. Class IV Asbestos Work: Maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities

27. Clean Room: An uncontaminated area or room, which is a part of the worker decontamination enclosure system with provisions for storage of worker's street clothes and clean protective equipment
28. Containment: An enclosure system
29. Contractor: The individual or business with which the Owner contract with to perform the asbestos abatement
30. Competent Person: The individual onsite (a representative of the Contractor) who is capable of identifying existing asbestos, identifying hazards in the workplace, and selecting the appropriate control strategy for asbestos exposure, and who has the authority to take prompt corrective measures to eliminate them as specified in WAC 296-62-07728. The competent person shall meet all requirements specified in WAC 296-62-07728. The competent person shall be certified as an asbestos supervisor in compliance with WAC 296-65-030(3) and 296-65-012.
31. Curtained Doorway: A device to allow ingress or egress from one room to another, typically constructed by placing three overlapping sheets of plastic over an existing or temporarily framed doorway
32. Cutting: Penetrating with a sharp-edged instrument; includes sawing, but does not include shearing, slicing, or punching.
33. Demolition: The wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of any facility
34. Differential Pressure System: A containment system utilizing HEPA machines in an airtight enclosure
35. Disposal Bag: 6-mil thick leak-tight plastic bags used for transporting asbestos waste from the work site and to the disposal site. Each shall be labeled in accordance with WAC 296-62-07721, 40 CFR 61.150 and PSCAA Regulation III, Article 4.05(b)(10).
36. DOSH: Washington State Department of Labor and Industries (L&I) Division of Occupational Safety and Health
37. Encapsulant: A material which is applied to asbestos-containing material to reduce or control the potential release of asbestos fibers from the material, either by creating a membrane over the surface (bridging encapsulant), or by penetrating into the material and binding its components together (penetrating encapsulant)
38. Encapsulation: The application of an encapsulant to asbestos-containing materials in accordance with the manufacturer's specifications
39. Enclosure: A semi-airtight system used to segregate and isolate an asbestos abatement area, and which is continuously served by a negative pressure ventilation system once abatement activities start
40. EPA: U.S. Environmental Protection Agency, Region X
41. Equipment Room: An area or room, which is part of the worker decontamination enclosure system, with provisions for storage of contaminated clothing and equipment

42. Excursion Limit: The maximum personal exposure concentration of asbestos fibers in air for any 30-minute period. Per WAC 296-62-07705, the excursion limit is 1.0 fiber per cubic centimeter (1.0 f/cc).
43. Facility: Any institutional, commercial, public, industrial, or residential structure, installation, or building (including any structure, installation, or building containing condominiums or individual dwelling units operated as a residential cooperative but excluding residential dwellings having four or fewer dwelling units); any ship; and any active or inactive waste disposal site. For purposes of this definition, any building, structure or installation that contains a loft used as a dwelling is not considered a residential structure, installation, or building.
44. Facility Component: Any part of a facility including equipment
45. Filter: A media component used in respirators or equipment to remove solid or liquid particles from air or water
46. Fixed Object: A piece of equipment or furniture in the work area, which cannot be removed from the work area
47. Friable Asbestos Material: Any material containing more than 1 percent asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763 Section 1, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure
48. Friable Upon Removal: A non-friable material, which becomes friable when disturbed during removal
49. Fugitive Source: Any source of emissions not controlled by an air pollution control device
50. Glovebag Technique: A method for removing small amounts of friable asbestos-containing material from fireproof beams, HVAC ducts, short piping run, valves, joints, elbows and other non-planar surfaces in a non-contained work area. The glovebag assembly is a manufactured or fabricated device consisting of a bag (typically constructed of plastic), two inward projecting long sleeve gloves, an internal tool pouch and an attached or pre-printed label. All workers who are permitted to use the glovebag technique must be trained, experienced and skilled in this abatement method.
51. Grinding: To reduce to powder or small fragments, including mechanical chipping or drilling
52. HEPA Filter: A high efficiency particulate air filter capable of removing particles greater than 0.3 microns in diameter with 99.97% efficiency using Dop testing methodology
53. HEPA Vacuum: A vacuum system equipped with HEPA filtration
54. HEPA Machine: Negative air machine
55. HVAC: Heating, Ventilation and Air Conditioning System
56. Installation: Any building or structure or any group of buildings or structures at a single demolition or renovation site that are under the control of the same owner or operator (or owner or operator under common control)
57. L&I: Washington State Department of Labor and Industries
58. Leak-Tight: Solids or liquids cannot escape or spill out. It also means dust tight.

59. Malfunction: Any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner so that emissions of asbestos are increased. Failures of equipment shall not be considered malfunctions if they are caused in any way by poor maintenance, careless operation, or any other preventable upset conditions, equipment breakdown, or process failure.
60. Material Decon Unit: A decontamination system, which is utilized for transferring containerized waste from inside to outside of the work area
61. Movable Object: A piece of equipment or furniture in the work area, which can be removed from the work area
62. SDS: Safety Data Sheet
63. Mudded Pipe Insulation Section: A continuous section of pipe insulation less than 12" in length, which may contain one or more plumbing fitting(s) (i.e., elbows, tees, valves, "y's", unions, etc.)
64. Negative Air Machine: A specially designed fan mounted in a cabinet that draws air from the contaminated space into pre-filters and a HEPA filter
65. Negative Pressure Respirator: A respirator in which the air pressure inside the respirator is negative during inhalation in relation to the air pressure outside the respirator
66. Negative Pressure Enclosure: The negative pressure/local exhaust system, utilizing HEPA filtration capable of maintaining a negative pressure of -0.02 inches of water inside the work area and a minimum of four (4) air exchanges per hour from adjacent areas into the work area and exhausting clean, filtered air outside work area
67. Negative Pressure: Air pressure lower than surrounding areas, generally caused by exhausting air from within the containment work area. A sufficient volume or air shall be exhausted to create a minimum pressure of -0.02 inches of water within the enclosure with respect to the area outside of the containment work area.
68. NESHAP: The National Emission Standard for Hazardous Air Pollutants (40 CFR Part 61)
69. Non-Friable Asbestos-Containing Material: Any material containing more than 1 percent asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure
70. NIOSH: The National Institute for Occupational Safety and Health
71. OSHA: The Occupational Safety and Health Administration
72. Outside Air: The air outside building, structure, negative air enclosure or containment
73. Owner or Operator of a Demolition or Renovation Activity: Any person, who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person, who owns, leases, operates, controls, or supervises the demolition or renovation operation or both

74. PACM: Presumed asbestos-containing material; includes thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980.
75. PAT Program: Proficiency Analytical Testing Program to determine quality of laboratory performing PCM analysis, as administered by the AIHA
76. PCM: Phase Contrast Microscopy
77. PLM: Polarized Light Microscopy
78. Particulate Asbestos Material: Finely divided particles of asbestos or material containing asbestos
79. Penetrating Encapsulant: Liquid material applied to asbestos-containing material to control airborne fiber release by penetrating into the material and binding its components together.
80. PEL: Permissible Exposure Limit. The maximum personal exposure concentration of asbestos fibers in air as an eight-hour time weighted average (TWA). Per WAC 296-62-07705, the PEL is 0.1 fiber per cubic centimeter (0.1 f/cc).
81. Personal Monitoring: Sampling the asbestos fiber concentrations within the breathing zone of an employee during representative operations as required by applicable regulations
82. Protection Factor: The ratio of the ambient concentration of an airborne substance to the concentration of the substance outside the respirator to the concentration inside the respirator at the breathing zone of the wearer.
83. Regulated Area: An area established by the Contractor to demarcate areas where airborne concentrations of asbestos exceed or can reasonably be expected to exceed the permissible exposure limits. The regulated area may take the form of (a) a temporary enclosure, as required by WAC 296-62-07711, or (b) an area demarcated in any manner that minimizes the number of employees exposed to asbestos.
84. Regulated Asbestos-Containing Material (RACM): (a) Friable asbestos material; (b) Category I Non-friable ACM that has become friable; (c) Category I Non-friable ACM that will be or has been subjected to sanding, grinding, cutting or abrading; or (d) Category II Non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by 40 CFR Part 763, Subpart F
85. Regulated Materials (RM) Project Monitor: The RM Project Monitor is the Owners on-site representative directly involved with project oversight, abatement inspections and record keeping. The RM Project Monitor reports directly to the Owner.
86. Regulated Materials (RM) Project Designer: A person or firm under contract with the Owner to develop project designs associated with the removal/abatement of regulated materials. The RM Project Designer reports directly to the Owner.
87. Removal: To take off asbestos containing materials from surfaces or components of a facility
88. Renovation: Altering a facility or one or more facility components in any way, including the stripping or removal of RACM from a facility component. Operations

in which load-supporting structural members are wrecked or taken out are demolitions.

89. Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres

90. Shower Room: A room between the clean room and the equipment room within the worker decontamination system supplied with hot and cold running water controllable at the tap and suitably arranged for complete showering

91. Staging Area: Either the holding area or some areas near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the work area

92. Structural Member: Any loaded-bearing member of a facility, such as beams and load-bearing walls or any non-load supporting member, such as ceilings and non-load supporting walls

93. Surfactant: A chemical wetting agent added to water to improve penetration

94. "Tattletale": A material or method providing a positive visual method of checking material leakage, such as cardboard or chalk, which becomes noticeably darker when wet

95. Time Weighted Average (TWA): The average exposure to a contaminant in air measured during a specific time period, usually a shift, adjusted to eight hours.

96. Visible Emissions: An emission containing particulate asbestos material that is visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

97. Waste Generator: Any owner or operator of a source covered by Department of Transportation regulations whose act or process produces asbestos-containing waste material. All demolition debris materials, including asbestos-containing materials, except those containing substances classified as hazardous or dangerous by controlling local, state or federal regulatory agencies, shall upon their demolition become the property of the Contractor.

98. Waste Shipment Record: The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

99. Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with water and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.

100. Work Area: Designated rooms, spaces, or areas of the project in which asbestos abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions.

101. Worker Decontamination System: A series of connected rooms, consisting of a clean room, a shower room and an equipment room separated from each other and from the work area by curtained doorways. This system is used for all worker entries and exits from the work area.

102. WSDOT: Washington State Department of Transportation

2-13.1(3) STANDARDS AND REFERENCES

A. General Requirements

1. All work under this contract shall be done in strict accordance with all applicable regulations, standards and codes governing asbestos abatement and in accordance with the “Standards of the Industry”.
2. The Owner will utilize and enforce the recommendations of various references as guides including:
    a. Skoog, Robert F., and Twombly, Jr., Robert C. “The Asbestos Abatement Worker’s Handbook”, and
    b. Levins, Hoag, “The Glove Bag Book and Asbestos Maintenance Safety Guide”.
3. The most recent edition of any relevant regulation, standard, document or code shall be in effect during the work, regardless of the effective date of this specification’s governing contract. Where conflict among the requirements or with these specifications exists, the most stringent requirements shall be utilized. All regulatory revisions and requirements relating to this Contract after the Contract is signed shall, nonetheless, be incorporated at no additional cost to the Owner.

B. Standards: Standards that govern asbestos abatement work or hauling and disposal of asbestos waste materials include the following:

1. American National Standards Institute (ANSI)
2. Fundamentals Governing the Design and Operation of the Local Exhaust Systems, ANSI Standard Z 9.2-2012
3. Practices for Respiratory Protection, ANSI Standards Z88.6-2006, Z88.7-2010, Z88.10-2010 and Z88.2-2015
4. American Society for Testing and Materials (ASTM)
5. Specification for Encapsulant for Friable Asbestos Containing Building Materials Proposal P-18
6. Safety and Health Requirements Relating to Occupational Exposure to Asbestos E 849-82

C. EPA Guidance Documents: Guidance documents that discuss asbestos abatement work or hauling and disposal of asbestos waste materials are listed below for the Contractor’s information only. These documents do not describe the work and are not a part of the work of this contract. EPA maintains an information number (800) 334-8571.

1. Asbestos-Containing Materials in Buildings - A Guidance Document. Parts 1&2 (Orange Books) EPA C00090 (out of print)
2. Guidance for Controlling Asbestos-Containing Materials in Buildings (Purple Book) EPA 560/5-85-024
3. Friable Asbestos-Containing Materials in Schools: Identification and Notification Rule (40 CFR Part 763)
4. Evaluation of the EPA Asbestos-in-Schools Identification and Notification Rule. EPA 560/5-84-005

5. Asbestos in Buildings: National Survey of Asbestos-Containing Friable Materials. EPA 560/5-84-006
6. Asbestos in Buildings: Guidance for Service and Maintenance Personnel. EPA 560/5-85-018
7. Asbestos Waste Management Guidance. EPA 530-SW-85-007
8. Asbestos Fact Book. EPA Office of Public Affairs
9. Asbestos in Buildings. Simplified Sampling Scheme for Friable Surfacing Materials
10. Commercial Laboratories with Polarized Light Microscopy Capabilities for Bulk Asbestos Identification
11. A Guide to Respiratory Protection for the Asbestos Abatement Industry. EPA-560-OPTS-86-001

2-13.1(4) CODES AND REGULATIONS

A. General Applicability of Codes, Regulations and Standards: Except to the extent that more stringent requirements are written directly into the Contract Documents, all applicable codes, regulations and standards have the same force and effect and are incorporated into the Contract Documents by reference as if copied directly into the Contract Documents.

B. Contractor Responsibility: The Contractor shall assume full responsibility and liability for compliance with all applicable federal state and local regulations pertaining to work practices, hauling, disposal and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable federal, state and local regulations. The Contractor shall hold the Owner and Owner's Representative harmless for failure to comply with applicable work, hauling, disposal, safety, health or other regulation on the part of himself, his employees or his subcontractors including without limitation: the costs of compliance, payment of all fines levied against the Owner and Owner's representative, and payment of all attorney's fees and costs incurred in defense of the Owner or Owner's representative for alleged regulatory violations.

C. Federal Requirements: Federal requirements that govern asbestos abatement work or hauling and disposal of asbestos waste materials including but not limited to the following:

1. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA)
    a. Occupational Exposure to Asbestos, Tremolite, Anthophyllite and Actinolite; Final Rules, 29 CFR Part 1910, Section 1001 and 29 CFR Part 1926, Section 58
    b. Respiratory Protection, 29 CFR Part 1910, Section 134
    c. Construction Industry, 29 CFR Part 1926
    d. Access to Employee Exposure and Medical Records, 29 CFR Part 1910, Section 2
    e. Hazard Communication, 29 CFR Part 1910, Section 1200
    f. Specifications for Accident Prevention Signs and Tags, 29 CFR Part 1910, Section 145

2. U.S. Environmental Protection Agency (EPA)
    a. Asbestos, 40 CFR 763
    b. National Emission Standard for Hazardous Air Pollutants; Asbestos, NESHAP Revision; Final Rule, 40 CFR Part 61
    c. Office of Solid Waste publication Asbestos: Waste Management Guidance (EPA/530-SW-85-007)
3. U.S. Department of Transportation (DOT)
    a. Hazard Material Regulations (HMR), 49 CFR Parts 171-180
    b. Performance-Oriented Packaging Standards; Changes of Classification, Hazard Communication, Packaging and Handling Requirements Based on UN Standards and Agency Initiative; Final Rule, 49 CFR Part 107

D. Washington State Requirements: DOSH rules that govern asbestos abatement work or hauling and disposal of asbestos waste material include but are not limited to the following:
    1. General Occupational Health Standards - WAC 296-62
    2. Asbestos Removal and Encapsulation - WAC 296-65
    3. Safety Standards for Construction Work - WAC 296-155
    4. Demolition - WAC 296-155-775 through 830
    5. Respirators - WAC-296-842
    6. WISHA Regional Directives: Occupational Exposure to Asbestos, WRD 23-10; Asbestos Project Notification, WRD 23.25; Asbestos-Containing Joint Compound in Wallboard Systems, WRD 23.34; Demolition of Building with Asbestos-Containing Materials, WRD 23.35
    7. WISHA Interim Interpretative Memos (WIIM): Mechanical Removal of Asbestos-Containing Floor Tile, WIIM #97-7-G
    8. Safety Standards - WAC 296-24

E. Local Requirements that govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:
    1. Northwest Clean Air Agency (NWCAA) Section 570

2-13.1(5) SUBMITTALS

A. The Contractor shall provide complete submittals as specified below.

B. Preconstruction Submittals
    1. Asbestos Work Plan, as a component of the Demolition Work Plan described in Specifications Section 2092.1(2): Include a detailed plan of the procedures proposed for use in complying with the specifications. At a minimum, the Work Plan shall include the following:
        a. Methods: Include a description of all techniques, methods, and special equipment to be used during the Contract, including methods for typical abatement work required for the Contract. Examples include Class I asbestos work (e.g., fireproofing abatement), spot abatement of fireproofing,

spot abatement of pipe insulation, tile and mastic removal, pre-cleaning of various surfaces, and ceiling tile cleaning.

b. Shop Drawings: For asbestos work that requires the use of a negative pressure enclosure, provide shop drawings to show the layout of containment, exhaust route, regulated area barriers, and construction barriers. Show the locations of negative air machines, decontamination areas, loadout areas, and make-up air entry points. Include view window locations.

c. Handling of Waste: Include specific information relating to handling, transport, and disposal of asbestos-containing waste.

d. Landfill: Identify the proposed disposal site at which any waste material generated during the project will be disposed of and furnish evidence of all necessary government approvals to dispose of the waste.

e. Laboratory Qualification Information: Submit the name, address, phone number, and web address of proposed Independent Testing Laboratories.

(1). The Laboratory shall prove proficiency in the AIHA/NIOSH PAT Program.

f. Air Monitoring Program

(1). The Air Monitoring Program shall include the proposed sampling plan, sampling procedures, and field quality control procedures of the firm conducting the air monitoring.

g. Worker Certification: Submit current copies of Asbestos Supervisor and Worker Certifications for employees scheduled to work on the project in compliance with WAC 296-65-010.

h. Contractor Certification: Submit proof of current certification of Contractor by Washington Department of Labor & Industries as a certified asbestos abatement firm.

i. Asbestos Supervisor/Competent Person: Submit the name, current Asbestos Supervisor Certification, and resume of experience of the assigned on-site Supervisor. At a minimum, the supervisor shall have successfully completed a Supervisor Training Course in accordance with WAC 296-65-007. References and work on similar projects will also be reviewed. The Owner reserves the right to reject the Supervisor from the project. Should this be the case, the Contractor shall then submit another on-site Supervisor for approval as described above.

j. Respirator Fit Test Records: Submit a copy of current quantitative respirator fit testing records for personnel performing asbestos work.

k. Notifications: Submit a copy of all required notifications and permits obtained by the Contractor to perform asbestos work, including the Washington State Department of Labor & Industries and Northwest Clean Air Agency.

C. Construction Phase Submittals

1. Daily Work Records: Submit the following information to the Owner daily. This information shall be submitted prior to the start of work on the next scheduled work shift.

a. Air and bulk sample data sheets and laboratory analytical results, including chain of custody

b. Certified Asbestos Supervisor daily inspection report, including scope of work completed, engineering controls used, hours worked, and equipment and materials used.

D. Post-Construction Closeout Submittals

1. Project Overview: Provide a basic project summary identifying the scope and summarizing the work performed by the Contractor. Provide enough information to have a basic understanding of the project and include project, contact names, and ID numbers; Contractor's company name; where, when, and what type of work was completed; and a discussion of significant problems encountered during the course of the work. The written summary shall include a description of all changes or modifications to the Contractor's Pre-Construction Work Plan.

2. Certification: Provide written certification from the Contractor's Project Manager or Supervisor that the Contractor has fully inspected the work area and completed work in strict accordance with the Specifications.

3. Air Monitoring: Submit documentation of all Contractor air monitoring results relative to regulatory compliance. Include copies of all air monitoring data sheets, chain-of-custody documentation and analytical reports for sampling conducted at the site.

4. Project Record Documents: Provide project records including documentation of all contract changes, and copies of work site entry logbooks, safety logs, sign-in sheets, and supervisor daily field reports. Provide copies of project meetings for pre-abatement, construction period, and project closeout meetings.

5. Disposal Manifests: Submit copies of all asbestos waste disposal transportation and disposal manifests including signed receipts from the landfill, and chain-of-custody forms.

6. Submit copies of amendments or modifications to pre-construction Notices and Permits that were filed with regulatory agencies during the course of the project.

7. Submit copies of inspections or visits by regulatory agencies. Include copies of any citations or notices received by the Contractor from regulatory agencies during the course of the project.

2-13.1(6) CONTRACTOR AND OWNER RESPONSIBILITIES

A. The Contractor shall coordinate with the Owner to accomplish the following tasks, prior to Commencement of Work.

1. The Contractor shall place and maintain an information board at the project site for the duration of the Project. The information board shall be a minimum of 2'x 4' in dimensions and placed in a conspicuous location where Contractor employees, the Owner and Owner Representative(s), and authorized visitors may view project information. Typical locations include staging area, entrance to clean room of decontamination unit, job trailer, or similar location. On multiple work areas, information shall be kept at a central meeting place.

2. The following information shall be placed on the information board:

a. A telephone contact list containing the names, telephone numbers, including cell phone, numbers of Owner's emergency contact, Contractors, Contractor's air sampling firm, the Manager, Project Monitor, supervisors, and any other persons who may assist and other personnel involved in the project. These contacts must include persons with decision-making authority and provide 24 hour 7 days per week availability.

b. Notifications to appropriate Federal, State and local regulatory agencies including building permit if applicable

c. Air monitoring results

d. Current prevailing wages rates

e. Current project schedule

f. Washington State Industrial Insurance and Workman's Compensation information

g. Hazard communication information

h. Asbestos Abatement Contractor's License

i. Current work plan/working drawing form

j. Other information the Contractor wishes to convey to personnel, which may be affected by the work, or which is required by governing regulations

B. The Contractor will notify the Owner in writing (utilizing the daily work log) of work area, start and stop time of work, outline of work, and areas that will be affected by the work.

C. Identify and coordinate activities with the Contractor's Electrical Contractor to provide the following services:

1. Lock-out/tag-out for electrical circuits within the abatement boundary.

2. Hook-up and, if required, Washington State Department of Labor and Industries electrical permits for the provision of temporary power requirements.

2-13.1(7) AIR MONITORING

A. The following describes air monitoring to verify that the building beyond the work area and the outside environment remain uncontaminated. This section also sets forth airborne fiber levels both inside and outside the work area as action levels and describes the action required by the Contractor if an action level is met or exceeded.

B. The RM Project Monitor may monitor inside and outside the work area, as well as collect personal samples used for quality control. Note: The purpose of the RM Project Monitor's air monitoring and inspection activities is to provide quality assurance only, not to replace any air monitoring and/or inspections required of the Contractor by Federal, State, or local regulations or by this Section. The Contractor shall perform the monitoring required by DOSH asbestos regulations for inside and outside areas of the abatement work.

C. In addition to the air monitoring requirements described elsewhere in this Section, the Contractor is responsible for all air monitoring as required by the Washington State Department of Labor and Industries, including pre-abatement samples, personal time-weighted average and short-term excursion limit samples, negative pressure enclosure samples at the entrance to the decontamination chamber and the discharge from the HEPA exhaust, post- abatement clearance sampling, and "other" sampling as required by

Federal, State, or local regulations. In addition, the Contractor is responsible for post-abatement final inspection to determine that all required asbestos has been removed and that the area is sufficiently clean for post-abatement clearance sampling. The Owner and the RM Project Monitor shall be held harmless from any legal action taken as a result of such sampling. The Contractor shall also indemnify, hold harmless, and defend the Owner, its agents, and employees for the use of any Owner supplied air-monitoring data.

D. The Contractor is required, at its own expense, to take its own employee air samples per the following regulations:
    1. WAC 296-62-07709 - (Exposure Monitoring)
    2. WAC 296-62-07735 - (Appendix A)

E. The air samples must be analyzed by a laboratory in accordance with the following:
    1. Personnel conducting on site asbestos air sample analysis shall be listed on the AIHA Registry of Proficiency and shall have successfully completed NIOSH 582 (or equivalent) training.
    2. The laboratory conducting bulk sample analysis shall be accredited by the U.S. Department of Commerce, National Institute of Standards and Technology (NIST) National Voluntary Laboratory Accreditation Program (NVLAP).
    3. The laboratory conducting analysis of air samples shall be satisfactory participants in the NIOSH Proficiency Analytical Testing (PAT) program and AIHA Registry and shall produce their PAT number and results on request.

F. See Article 2-13.3(9) of this specification section for additional requirements relating to Clearance Requirements.

G. Air Monitoring Requirements
    1. Baseline/Pre-abatement Air Monitoring: Prior to beginning asbestos abatement tasks, the Contractor shall conduct pre-abatement air monitoring.
    2. Outside Work Area Air Monitoring: The Contractor shall daily conduct air monitoring to document acceptable condition or detect faults in the work procedures and engineering controls. Samples will be collected outside the work area at HEPA exhausts and at the decontamination entrance every shift.
    3. Personal Samples: The Contractor shall daily conduct representative personal monitoring in each abatement work area on each representative work activity.
    4. Clearance: The regulated area will remain in place until the Owner certifies visual clearance and the Contractor's post-abatement air sampling results meet acceptable levels. Article 2-13.0 details the work area clearance process.
    5. Where feasible, samples shall be collected according to the WISHA Reference Method (WAC 296-62-07735, Appendix A) and Detailed Procedure for Asbestos Sampling and Analysis (WAC 296-62-07737, Appendix B) and NIOSH Method 7400 (as revised). All samples shall be collected at a height of approximately 60 inches above the working floor for projects with 8-10 foot ceiling heights, unless otherwise directed.

H. Airborne Fiber Counts
    1. Personnel Exposures on workers inside "regulated areas". The Contractor shall notify the Owner in writing regarding elevated levels above 0.1 f/cc. The Contractor and the Owner will conduct an assessment of removal procedures. The Contractor

shall identify corrective action and ensure that corrective action is taken to lower fiber counts at no additional cost or delay to the Owner.

2. Outside Work Area: If any air sample taken outside of the work (outside enclosures) exceeds 0.01 f/cc, the Contractor shall:
    a. The Contractor shall notify the Owner immediately.
    b. Investigate with the Owner for possible causes of elevated fiber levels. The Contractor shall ensure that corrective action is taken to lower fiber counts at no additional cost or delay to the Owner.
    c. After corrective action is taken, the Contractor will resample the area. If airborne level is below 0.01 f/cc, the work may recommence with appropriate changes in work practices. If the airborne fiber levels remain above 0.01 f/cc, The Contractor will continue to conduct assessments of removal procedures until acceptable air counts (0.01 f/cc or less) are reached. The Contractor shall ensure that corrective action is taken to lower fiber counts at no additional cost or delay to the Owner.
    d. If the analytical results of any outside area sample exceed 0.05 f/cc for any sample taken, the Contractor shall stop all removal work, leave negative air system in operation and re-clean the entire work area. The Contractor shall notify the Owner immediately. The Contractor shall not recommence work until the cause of the elevated count is corrected and the Owner authorizes start up. The Owner will not be charged for the cleanup time, materials, and air monitoring costs or delay costs. Delays resulting from non-compliant analytical results will not constitute an extension to the project time.
    e. If the Contractor has stopped work due to elevated airborne fiber counts, the Contractor shall secure air samples in the same area as the samples with elevated readings. These samples shall be analyzed by transmission electron microscopy in accordance with NIOSH 7402. The Contractor may not resume work until the average of airborne asbestos fibers in all samples taken is at or below 0.01 fibers per cubic centimeter. The cost of such analysis and any delays will be borne solely by the Contractor.

I. Analytical Methods: The following methods will be used for analyzing filters used to collect air samples:
    1. Twenty-five-millimeter (25 mm) cellulose ester filters with 50 mm conductive cowl extensions will be used for all sampling. Sampling and analysis for personal samples will be conducted according to the OSHA/WISHA Reference Method. Area clearance samples will be analyzed according to the NIOSH Method 7400 using airflow rates between 1 – 10 liters per minute. At least 1200 liters of air will be sampled for area air samples. All inside and outside air sampling shall be continuous throughout work shift.
    2. TEM analysis will be NIOSH Method 7402.

J. Laboratory Testing:
    1. The Contractor will have a qualified laboratory perform analysis of the air samples required to monitor abatement procedures. The laboratory results, signed by the lab manager, shall be returned to the site prior to the start of abatement for the same work shift the following day. A complete record of inspections and all air monitoring tests and results will be furnished to the Owner and the Contractor daily.

2. Written Reports: All air monitoring test results and daily inspection logs will be posted on the job board on a daily basis.

K. Conflicts in air monitoring analytical results: QA/QC discrepancies identified in any of the reported analytical results will be resolved by TEM analysis (NIOSH 7402 method).

1. The Contractor and the Owner will conduct an assessment of air monitoring results.
2. The Contractor shall resample the area. The RM Project Monitor may resample the area.
3. The Owner will not be charged for any and all costs associated with any additional sampling resulting from QA/QC air monitoring conflicts.

2-13.1(8) ASBESTOS ABATEMENT - SPECIAL REPORTS

A. Except as otherwise indicated, the Contractor must submit special reports directly to the Owner and others affected by occurrence within (24) hours of occurrence requiring special report.

B. Reporting Unusual Events: When an event of unusual and significant nature occurs at site (examples: failure of negative pressure system, rupture of temporary enclosures), the Contractor must prepare and submit a special report listing chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects and similar pertinent information. When such events are known or predictable, the Contractor must advise the Owner in advance at earliest possible date.

C. Reporting Accidents: The Contractor must prepare and submit reports of significant accidents, at site and anywhere else where work is in progress. Record and document data and actions; comply with industry standards. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

2-13.2 MATERIALS AND EQUIPMENT

2-13.2(1) MATERIAL REQUIREMENTS

A. General

1. Deliver all materials in the original packages, containers or bundles bearing the name of the manufacturer and the brand name (where applicable).
2. Store all materials subject to damage off the ground, away from wet or damp surfaces and under cover sufficient to prevent damage or contamination. Replacement materials shall be stored outside the work area until abatement is completed.
3. Damaged, deteriorating or previously used materials shall not be used, shall be removed from the worksite, and disposed of properly.
4. Polyethylene sheeting for walls and stationary objects shall be a minimum of 6-mil thick. For floors and all other uses sheeting of at least 6-mil thickness shall be used in widths selected to minimize the frequency of joints. Polyethylene shall be fire retardant per UL Ratings.

5. Method of attaching polyethylene sheeting shall be selected to minimize damage to equipment and surfaces. The Contractor will be responsible for any damage to equipment and surfaces created by this attachment of polyethylene sheeting. If the Contractor uses foam, the foam shall be fire retardant as per UL ratings and the Contractor shall cut the foam back to within 1/4 inch of base surface if applied to an asbestos-containing material for all other materials it shall be completely removed.
6. Polyethylene sheeting utilized for worker decontamination enclosure shall be opaque white or black in color.
7. Disposal bags shall be 6-mil polyethylene, pre-printed with labels as required by EPA regulation 40 CFR 61.150 (a) (i) (iv) (v) or WAC 296-62-0072.
8. Disposal drums shall be metal or fiberboard with locking ring tops; labeled in accordance with EPA regulation 40 CFR 61.150 (a) (i) (iv) (v).
9. Warning signs as required by WAC 296-62-07721.
10. Tape: Tape shall be capable of sealing joints of adjacent sheets of plastic sheet and for attachment of plastic sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under dry wet conditions, including use of amended water. Minimum 2" wide tape must be used.
11. Other materials: The Contractor shall provide all other materials such as lumber, nails and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the work area, and as required to complete the work as specified.

B. Surfactant (wetting agent): Surfactant shall be a 50/50 mixture of polyethylene ester and polyoxymethylene ester, or equivalent, mixed in a proportion of 1 fluid ounce to 5-gallons of water as specified by manufacturer. An equivalent surfactant shall be understood to mean a material with surface tension of 29 dynes/cm as tested in its properly mixed concentration, using ASTM method D1331-11- "Standard Test Methods for Surface and Interfacial Tension of Solutions of Surface-Active Agents."

2-13.2(2) EQUIPMENT

A. General

1. A sufficient quantity of negative pressure ventilation units equipped with HEPA filtration and operated in accordance with ANSI Z9.2-2018 (local exhaust ventilation requirements) and EPA guidance document EPA 560/5-83-002 Guidance for Controlling Friable Asbestos-Containing Materials in Buildings Appendix F: Recommended Specifications and operating procedures for the use of negative pressure systems for asbestos abatement shall be utilized so as to provide one work place air change every 15-minutes.

To calculate total air flow requirement:

$$\text{Total ft}^3\text{/min} = \frac{\text{Vol. of work area (in ft}^3\text{)}}{15 \text{ min}}$$

To calculate the number of units needed for the abatement:

$$\text{Number of units needed} = \frac{[\text{Total ft}^3/\text{min}]}{[\text{Capacity of unit in ft}^3/\text{min} \times 70\%]}$$

If air-supplied respirators are utilized, estimate the volume of supplied air and add to workplace air volume when calculating ventilation requirements. For small enclosures and glove bags, an HEPA filtered vacuum system may be utilized to provide negative air pressure. A sufficient quantity of air shall be exhausted to create a minimum pressure of -0.02 inches of water at all times within the enclosure with respect to outside the enclosure.

2. The Contractor shall install and maintain a continuous read strip chart, or similar digital recording differential pressure meter (manometer).
    a. Adhere strictly to manufacturer's recommendations for calibration of manometer.
    b. Manometer records must be submitted, on 8-1/2 X 11 paper, weekly to the Owner along with current calibration data.
    c. The manometer must be equipped with an audible system programmed to sound if pressure within the enclosure drops to -0.01 inches of water or lower with respect to pressure outside the enclosure.
3. Type "C" air supplied respirators operated in the pressure demand mode with full face pieces and escape cylinders or HEPA filters are required by WISHA for negative pressure containment abatement work until the successful completion of final clearance air monitoring. Spectacle kits and eyeglasses must be provided for employees who wear glasses and who must wear full-face piece respirators. Respirators shall be provided that have been tested and approved by the National Institute of Occupational Safety and Health for use in asbestos contaminated atmospheres.
4. Compressed air systems shall be designed to provide air volumes and pressures to accommodate respirator manufacturer's specifications. The compressed air systems shall have a receiver of adequate capacity to allow escape of all respirator wearers from contaminated areas in the event of compressor failure. Compressors must meet the requirements of 29 CFR 1910.134(d). Compressors must have an in-line carbon monoxide monitor, and periodic inspection of the carbon monoxide monitor must be evidenced. Documentation of adequacy of compressed air systems/respiratory protection system must be retained on site at all times. This documentation will include a list of compatible components with the maximum number and type of respirators that may be used with systems providing air of sufficient quality (Grade D breathing air as described in Compressed Gas Association Commodity Specifications G-7.1.)

    At least two (2) dedicated airlines and respirators shall be available to the Owner or, Owner's Consultants or regulatory agency personnel at all times. The Contractor shall provide clean respirators in good repair for the Owner or regulatory agency personnel use. The Contractor shall provide airlines for the Owner, RM Project Designer, or regulatory agency personnel and Project Monitor use upon demand.
5. Full body disposable protective clothing, including head, body and foot coverings (unless using footwear as described in 2-13.2(2)) consisting of material

impenetrable by asbestos fibers shall be provided to all workers and authorized visitors in sizes adequate to accommodate movement without tearing.

6. Additional safety and fall protection equipment (e.g., hard hats meeting the requirements of ANSI Standard Z89.1-2014, eye protection meeting the requirements of ANSI Standard Z87.1-2015, safety shoes meeting the requirements of ANSI Standard F 2412-05 and F 2413-05, disposable PVC gloves) as necessary shall be provided to all workers and authorized visitors.
7. Non-skid footwear shall be provided to all abatement workers. Disposable clothing shall be adequately sealed to the footwear to prevent body contamination.
8. Only single-use, disposable towels and clothing will be allowed.
9. A sufficient supply of disposable mops, rags and sponges for work area decontamination shall be available.
10. For mini-enclosures and glove bags, an HEPA filtered vacuum system shall be utilized to provide negative air.

B. Removal Equipment

1. A sufficient supply of scaffolds, ladders, lifts and hand tools (e.g., scrapers, wire cutters, brushes, utility knives, wire saws, etc.) shall be provided by the Contractor.
2. Rubber dustpans and rubber squeegees shall be employed for cleanup.
3. Brushes utilized for removing loose asbestos containing material shall have nylon or fiber bristles, not metal.
4. A sufficient supply of HEPA filtered vacuum systems shall be available during cleanup.

C. Encapsulation Equipment

1. Encapsulants shall be applied in accordance with manufacturer's specifications.
2. Tools, sprayers, and other additional support and fall protection equipment as needed.
3. The nature of the encapsulant may affect the requirements for respiratory protection. Vapors that may be given off during encapsulant application must be taken into account when selecting respirators if types other than air supplied are used.

D. Enclosure Equipment

1. Hand tools equipped with HEPA filtered local exhaust ventilation shall be utilized during the installation of enclosures and supports if there is any need to disturb asbestos containing materials during this process. (As alternative asbestos material may be partially removed following proper removal procedures prior to the installation of supports and enclosures.)
2. Tools, ladders, and other additional support equipment as needed.

E. Scaffolding

1. Any scaffolding used must be cleaned with no visible debris prior to bringing scaffolding on site and shall be completely free of debris during and after installation.

2. Follow all manufacturer recommendations and all applicable regulations in the set-up, use and teardown of all scaffolding used.
3. The Contractor's Certified Asbestos Supervisor shall be on-site during all scaffolding set-up, use and teardown.

2-13.3 EXECUTION

2-13.3(1) INSPECTIONS

A. Pre-Abatement
   1. The abatement work shall not begin until pre-abatement air monitoring has been conducted by the Contractor.
   2. The Contractor and the Owner have inspected the site to ensure that work can begin.
   3. When enclosure systems are in use, the Contractor's Certified Asbestos Supervisor shall inspect the enclosure on a daily basis as it is being constructed and approve the completed enclosure, controls, and decontamination and waste load-out facilities when completed. Enclosure systems shall be smoke tested prior to ACM removal.
   4. Negative pressure ventilation and supplied air systems, if used, are functioning adequately. Contractor must test all systems. Submit written verification that the system has been tested as per specifications to the Owner prior to ACM removal.
   5. All required pre-work submittals, notifications, postings and permits have been provided and are satisfactory to the Owner.
   6. All equipment for abatement cleanup and disposal are on hand.
   7. All worker and supervisor training, certification and medical monitoring are current, and documentation is available on the job site.

B. Throughout the Project: The Contractor's competent person shall perform daily inspections of the site. The RM Project Monitor may perform routine inspections of the site to assure compliance with applicable regulations and the project plans and specifications. The Owner, RM Project Designer and RM Project Monitor may also conduct spot checks throughout the project. The Contractor's competent person must generate a written daily report. The Contractor's competent person will also be required to co-sign the daily quality control report generated by the RM Project Monitor.

C. Post-Abatement: The Clearance process is discussed in Article 2-13.3(9) of this specification.

2-13.3(2) SITE SECURITY

A. The work area is to be restricted only to authorize, trained and protected personnel. These may include the Contractor's employees; employees of subcontractors; and Owner employees and representatives; federal, state and local inspectors and other authorized or designated individuals.

B. Secure the work area from access by occupants, staff or users of the building. Accomplish this where possible by locking doors, windows, or other means of access to the work area, or by constructing temporary framing with plywood or gypsum board barriers. All emergency exits/corridors must be kept open.

C. Entry into the work area by unauthorized individuals shall be reported immediately by the Contractor to the Owner.

D. For projects requiring the use of a negative pressure enclosure, a logbook shall be maintained in the clean room area of the worker decontamination system. Everyone who enters the work area must sign in, recording name, affiliation (Contractor, Owner, regulatory agency, etc.), work phone number, purpose of entry, acknowledge existence, review and understanding of the project's emergency contingency plan and time in and time out for each entry.

E. Contractor shall be responsible for site security during abatement operations.

2-13.3(3) EMERGENCY PLANNING

A. Emergency contingency plans shall be developed by the Contractor for approval by the Owner prior to initiation of any work. These plans shall be a component of the Contractor's Health and Safety Plan.

B. Emergency procedures shall be in written form and prominently posted in the clean room, adjacent to the containment in the project area, or as directed by the Owner. Prior to performing any abatement activities, all personnel must read and sign these procedures to acknowledge an understanding of work site layout, location of emergency exits and the contents of the plan.

C. Emergency planning shall include written notification of police, fire and emergency medical personnel of planned abatement activities, work schedule and layout of containment area, particularly barriers that may affect response capabilities. These notifications will be coordinated through the Owner.

D. Emergency planning shall include consideration of containment collapse (through negative pressure pull-down) or breach (hit, cut or torn by), fire explosion, toxic atmosphere, electrical hazards, slips, trips and falls, confined spaces and heat related injury. Written procedures shall be developed and employee training in these procedures shall be provided and documented. Emergency planning shall include procedures to follow in the event of power disruptions during work in a negative air enclosure.

E. Employees shall be trained in evacuation procedures in the event of workplace emergencies.

    1. For non-life-threatening situations - employees injured or otherwise incapacitated shall decontaminate following normal procedures with assistance from fellow workers, if necessary, before exiting the work place to obtain proper medical treatment.

    2. For a life-threatening injury or illness, measures to stabilize the injured worker, remove them from the workplace and secure proper medical treatment shall take priority over worker decontamination.

F. Telephone numbers of all emergency response personnel shall be prominently posted in the clean room, adjacent to the containment in the project area, or as directed by the Owner. To assist the Contractor, the Owner will provide a list of phone numbers for emergency response to the project at the Pre-Construction meeting.

G. General Requirements

    1. If at any time after barriers or enclosures have been erected, any visible material is observed outside of the work area or if damage to the barrier or enclosure

occurs, work shall immediately stop, repairs shall be made, and debris and residue shall immediately be cleaned up using appropriate HEPA vacuuming and wet cleaning procedures. Area air monitoring shall be started immediately in the public space to measure the asbestos concentration in the public area as a result of breaching the enclosure.

2. Clean and isolate the work area in accordance with these specifications.

H. The Contractor must provide a minimum of three phone numbers at which its supervisory personnel may be contacted on or off site at any time during the contract duration. The telephone used outside the work area must be of a non-coin operated type.

2-13.3(4) PERSONNEL PROTECTION REQUIREMENTS

A. Training: Each individual accomplishing asbestos abatement shall be the bearer of current "Certified Asbestos Worker Certificate" issued by the Washington State Department of Labor and Industries.

1. Special on-site training specific to equipment and procedures unique to this job site shall be performed as required.

2. Training in emergency response and evacuation procedures shall be provided.

B. Safety Meeting: The Contractor shall conduct a safety meeting at the beginning of the contract and weekly thereafter. Topic to be discussed include, but are not limited to: emergency exiting routes and procedures, location of telephone and emergency numbers, fire extinguisher locations, first aid kit, special precautions for toxic or hazardous materials (SDS information), protective equipment, scaffolding procedures, proper use of ladders, electrical safety, previous week's air sample results, etc. Minutes of these meetings shall be recorded with copies provided to the Owner weekly. All attendees shall sign an acknowledgment of attendance.

C. Protective Clothing: Provide protective equipment to all workers in the work area per WAC 296-62-077.

D. Additional Protective Equipment: Respirators, disposable coveralls and footwear shall be provided by the Contractor to the Owner, Owner representative(s), or other authorized visitors inspecting the jobsite. Provide up to two personally issued respirators, and air lines where required by the Owner. Removal of workers from the work area to provide airlines will not be acceptable.

2-13.3(5) PREPARATION OF THE WORK AREA

A. Post barrier tape and caution signs meeting the specifications of WAC 296-62-07711 at the locations and approaches to a location where airborne concentrations of asbestos may be expected to exceed the pre-abatement concentration. Signs shall be posted at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of workplace enclosures or barriers.

B. Pre-clean, remove furnishings and install drop cloths using HEPA filtered vacuums or wet cleaning methods as appropriate. Do not use methods that would raise dust such as dry sweeping or vacuuming with equipment not equipped with HEPA filters. Do not disturb asbestos containing materials during the pre-cleaning phase.

C. Remove from the work area all objects that are movable to protect them from potential asbestos contamination.

2-13.3(6) GENERAL REMOVAL PROCEDURES

A. Wet all asbestos containing material with amended water solution using equipment capable of providing a fine spray mist. Avoid knocking the material loose during the wetting operation. Saturate the material to substrate prior to removal; however, do not allow excessive water to accumulate in the work area. Keep all removed material saturated until it can be containerized for disposal. Maintain a high humidity in the barrier or enclosure throughout the abatement period by misting or spraying to ensure material saturation and reduce the potential for elevated airborne concentrations. Wetting procedures are not equally effective on all types of asbestos containing materials. Nonetheless, they shall be used in all cases.

B. Saturated asbestos containing material shall be removed in manageable sections. Containerize removed material immediately and prior to moving it to a new location for continuance of work. Adjacent areas shall be periodically sprayed and maintained in a saturated condition until all visible material is sealed and removed from the barrier or enclosure.

C. Removed material shall not be dropped or thrown. Remove material intact or as components whenever possible and carefully lower to the floor. If this cannot be feasibly accomplished, a dust-tight chute shall be constructed to transport the material to containers on the floor, or the material may be containerized at elevated levels (e.g., on scaffolds) and carefully lowered to the ground by mechanical means.

D. Double bag all waste material prior to removal from the enclosure system or immediately upon removal of the barrier (glove bag).

E. Disposal bags shall not be overfilled. Additionally, handcarts or equivalent shall be used to transport waste containers or materials. Waste containers or materials shall be raised and securely transported and shall not be dropped or slid.

F. Disposal containers shall be securely sealed to prevent accidental opening and leakage by taping in a gooseneck fashion, then labeled and dated. Do not seal bags with wire or cord. Bags may be placed in drums for staging and transportation to the landfill. Bags shall be decontaminated on exterior surfaces by wet cleaning and HEPA vacuuming.

G. Large components removed intact may be wrapped in 2-layers of reinforced 6-mil polyethylene sheeting secured with tape for transport to the landfill.

H. The work area shall be cleaned of all suspect ACM prior to the visual inspection by the designated Project Monitor and Project Designer. If any accumulation of residue is observed, it will be assumed to be asbestos. Re-cleaning may be required, at no additional cost to the Owner, until all suspect material is removed. Re-cleaning and inspection will continue until no visible suspect material remains. After the work area passes the visual inspection, the Contractor shall perform encapsulation of all cleaned surfaces.

2-13.3(7) CONTAINMENT ENTRY AND EXIT PROCEDURES

A. Personnel Entry and Exit

1. All workers and authorized personnel shall enter the containment area through the worker decontamination enclosure system.
2. All personnel who enter the containment area must sign the entry log located in the clean room upon entry and exit.

3. All personnel before entering the containment area shall read and be familiar with all posted regulations, personnel protection requirements (including workplace entry and exit procedures), and emergency procedures. A sign-off sheet shall be used to acknowledge that these have been reviewed and understood by all personnel prior to entry.
4. When entering a containment, all personnel shall proceed first to the clean room, remove all street clothes and don appropriate respiratory protection and disposable coveralls, head covering and foot covering. Hard hats, eye protection and gloves shall also be utilized as required. Clean respirators and protective clothing shall be provided and utilized by each person for each separate entry into the containment area.
5. Personnel wearing designated personal protective equipment shall proceed from the clean room through the shower room and equipment room to the main containment area.
6. Before leaving the containment area, all personnel shall remove gross contamination from the outside of respirators, air hoses, and protective clothing. Each person shall clean bottoms of protective footwear just prior to entering the equipment room.
7. Personnel shall proceed to equipment room where they remove all protective equipment except respirators. Deposit disposable clothing into appropriately labeled containers for disposal.
8. Reusable contaminated footwear shall be stored in the equipment room when not in use in the containment area. Upon completion of abatement, it shall be disposed of as asbestos contaminated waste (rubber boots may be decontaminated for reuse at the completion of the abatement).
9. Still wearing respirators, personnel shall proceed naked to the shower area, clean the outside of the respirators and the exposed face area under running water prior to removal of respirator, and shower and shampoo to removal residual asbestos contamination. The HEPA filters on airline respirators are for emergency escape only. The airline may not be disconnected in the equipment room. The airline shall be placed in a bucket of clean water or hung on a hook next to the shower. A powered air purifying respirator face piece will have to be disconnected from the filter/power pack assembly, which is not waterproof upon entering the shower. A dual cartridge respirator may be worn into the shower. Tape over inlet(s) into HEPA filter(s) between usages.
10. After showering and drying off, proceed to the clean room and don clean disposable clothing if there will be later re-entry into the containment area or street clothes of it are the ends of the work shift.
11. These procedures shall be posted in the clean room and equipment room.

B. Waste Container Pass-Out Procedures

1. Asbestos contaminated waste that has been containerized shall be transported out of the containment area through the material decontamination facility.
2. Waste pass-out procedure shall utilize two teams of workers, an “inside” team and an “outside” team.
3. The inside team wearing appropriate protective clothing and respirators for inside the containment area shall clean the outside, including bottoms, of properly labeled

containers (bags, or wrapped components) using HEPA vacuums and wet wiping techniques. The workers shall then enclose the single layered ACM waste with another 6-mil layer of plastic sheeting or disposal bag. The double-bagged material must be carefully placed into the middle chamber of the material decontamination unit. No worker from the inside team shall further exit the containment area through this airlock.

4. The outside team, wearing protective clothing and HEPA-filtered respirators, shall enter the airlock from outside the containment area, enclose the labeled container in a second clean, labeled, 6-mil polyethylene bags and remove them from the airlock to outside and placed into a secure storage/transport container. No worker from the outside team shall further enter the containment area through this airlock. Public view shall be blocked with a temporary screen constructed around the load out during pass-out.
5. The exit from this airlock shall be secured to prevent unauthorized entry.

2-13.3(8) NEGATIVE PRESSURE ENCLOSURE

A. Prepare work area as indicated in Article 2-13.3(5) of this section.

B. Verify shut down and lock out all heating, cooling and air conditioning system (HVAC) components that are in, supply, or pass through the containment area, if possible. Seal all ducts and smoke test the containment before beginning abatement work within the enclosure.

C. Pre-clean all areas of the building in the containment area using HEPA filtered vacuums and/or wet cleaning techniques as appropriate. Pay particular attention to wall, floor, and ceiling penetrations behind fixed items. After pre-cleaning, enclose fixed objects in 6-mil polyethylene sheeting and seal securely in place with tape.

D. Seal off all windows, doorways, elevator openings, corridor entrances, drains, ducts, grills, grates, diffusers and all other openings between the containment area and uncontaminated areas outside of the containment area including the outside of the building and crawl spaces with 6-mil polyethylene sheeting and tape (see Article D).

E. Cover floors in the containment area with polyethylene sheeting as follows:

1. Seal all floor drains and other floor openings in area with 6-mil sheeting and duct tape.
2. Floors shall be covered with two (2) individual layers of 6-mil (minimum) sheeting. Use “tattletales” beneath sheeting in order to detect water leaks from the enclosure. Protect layers of sheeting as necessary against rips and tears.
3. Plastic shall be sized to minimize seams. If the floor area necessitates seams, those on successive layers of sheeting shall be staggered to reduce the potential for water to penetrate to the flooring material. A distance of at least 6-feet between seams is required. Do not locate seams at wall/floor joints or cracks in the concrete flooring.
4. Floor sheeting shall extend to at least 12” up the sidewalls of the containment area.
5. Sheeting shall be installed in a fashion so as to prevent slippage between successive layers of material.

F. Provide sufficient lighting throughout the work area to maintain a minimum lighting level of 50-foot candles at any surface where asbestos is to be removed. Handheld lights, such

as flashlights, are not acceptable except for augmentation beyond 50-foot candle minimum illumination.

G. Clearly identify and maintain emergency and fire exits from the work area.

H. Cover walls in the containment area with polyethylene sheeting as follows:

1. Seal all openings in wall with critical barriers with 6-mil polyethylene sheeting and duct tape. Insure airtight seal.
2. Each wall surface shall be covered with three (3) layers of 6-mil polyethylene sheeting.
3. Plastic shall be sized to minimum seams. Seams shall be staggered and separated by a distance of at least 6-feet.
4. Wall sheeting shall overlap floor sheeting by at least 12-inches beyond the wall/floor joint to provide a better seal against water damage and for negative pressure.
5. Wall sheeting shall be secured adequately to prevent it from falling away from the walls. This will require additional support/attachment when negative pressure ventilation systems are utilized. Wall sheeting shall not be taped to asbestos materials.
6. Install one or more transparent plastic viewing ports in the walls of the enclosure in such a manner to allow unobstructed viewing of all components within the enclosure, which are involved in the project. Existing windows may be utilized for viewing ports as needed.

I. Worker Decontamination Facility

1. Worker decontamination enclosure systems shall be provided for workers entering or exiting the containment area. The worker decontamination shall consist of a clean change room, a shower and an equipment room, each separated from each other and from the containment area by curtained doorways. The decontamination unit shall be constructed of metal, wood or plastic framing systems. A worker decon facility is required for any Class I asbestos work involving greater than 25 linear feet or 10 square feet. Remote decontamination facility may be required for projects less than 25 linear feet or 10 square feet and class III work; coordinate with the Owner for location.
2. The worker decontamination enclosure systems constructed at the work site shall utilize 6-mil opaque black or white polyethylene sheeting or other acceptable materials for privacy.
3. The worker decontamination facility should be constructed contiguous to the negative - pressure work area or regulated area for Class I work. Where construction contiguous to work area is not feasible, the decontamination facility shall be constructed with a polyethylene lined tunnel connecting the decon facility to the work.
4. Entry to and exit from all material decontamination chambers and decontamination enclosure systems shall be through curtained doorways consisting of two (2) sheets of overlapping polyethylene sheeting. One sheet shall be secured at the top and left side, the other sheet at the top and right side. Both sheets shall have weights attached to the bottom to ensure that they hang straight and maintain a seal over the doorway when not in use. Doorway designs providing equivalent

protection and acceptable to the Owner may be utilized. Inverted T double sheet doorway with a flap door is also acceptable.

5. Access between any two rooms in the decontamination enclosure system shall be through a curtained doorway. Pathways in from clean to contaminated, and out from contaminated to clean in the containment area shall be clearly designated.

6. Clean room shall be sized to adequately accommodate the work crew. Benches shall be provided as well as storage for employees' street clothes. Shelves for storing respirators shall also be provided in this area. Clean work clothes (if required under disposables); clean disposable clothing, replacement filters for respirators, towels and other necessary items shall be provided in adequate supply in the clean room. A location for postings shall be provided in this area. Lighting, heat, and electricity shall be provided as necessary for comfort. This shall not be used for storage of tools, equipment or materials, except as specifically designated by the RM Project Designer.

7. Shower room shall be lighted, heated and contain one or more showers as necessary to adequately accommodate workers. Each showerhead shall be supplied with hot (100 degrees F. minimum) and cold water adjustable at the tap. The shower enclosure shall be constructed to ensure against leakage of any kind. The Contractor shall supply an adequate supply of soap, shampoo and towels at all times. See Article 3.15 Disposal Procedures, Paragraph A for water filtration/disposal procedures.

8. The equipment room shall be used for storage of equipment and tools at the end of a shift after they have been decontaminated. A 6-mil polyethylene bag for collection of disposable clothing shall be located in this room. Contaminated footwear (e.g., rubber boots, other reusable footwear) shall be stored in this area for reuse the following workday.

J. Material Decontamination Facility and Emergency Exits

1. The Material Decontamination Facility shall be constructed separate from the worker decontamination facility. Wherever possible, this shall be located where there is direct access from the containment area to the outside of the building.

2. The Material Decontamination Facility shall consist of an airlock, a container storage area and another airlock with access to outside the containment area.

3. The Material Decontamination Facility shall be constructed in similar fashion to the worker decontamination facility using similar materials and airlock and curtain doorway design.

4. This Material Decontamination Facility airlock shall not be used to enter or exit the containment.

5. Emergency exits shall be established and clearly marked with duct tape arrows or other effective designations to permit easy location from anywhere within the containment area. They shall be secured to prevent access from uncontaminated areas and permit emergency exiting. These exits shall be properly sealed with polyethylene sheeting, which can be cut to permit egress if needed. These exits may be the worker decontamination facility, the material decontamination facility and/or other alternative exits satisfactory to the Fire officials.

K. Air Pressure Differential

1. Provide a fully operational negative air system within the work area and continuously maintain a pressure differential across work area enclosures of negative 0.02 inches column of water. Demonstrate to the RM Project Monitor the pressure differential by use of a pressure differential meter or a manometer recording with strip chart, or similar digital equipment with alarm before disturbance of any asbestos containing materials.
2. Provide fully operational negative pressure systems supplying a minimum of one air change every 15 minutes. Determine the volume in cubic feet of the work area by multiplying floor area by ceiling height. Determine total ventilation requirement in cubic feet per minute (cfm) for the work area by dividing this volume by the air change rate.
3. Vent to outside of building.
4. Supplemental Makeup Air Inlets: Provide where required for proper airflow through the workspace.
5. Test negative pressure system for a 24-hour time period before any asbestos-containing material is wetted or removed. After the work area has been prepared, the decontamination facility set up, and the exhaust unit(s) installed, start the unit(s) (one at a time). Indications of correct negative air system shall include the following:
    a. Plastic barriers and sheeting move lightly in toward work area.
    b. Curtain of decontamination units moves lightly in toward work area.
    c. There is a noticeable movement of air through the decontamination unit. Use smoke tube to demonstrate air movement from the Clean Room to Shower Room, from Shower Room to Equipment Room, and from Equipment Room to Work Area.
    d. Use smoke tubes to demonstrate a positive motion of air across all areas in which work is performed.
    e. Use a differential pressure meter or manometer to demonstrate a pressure difference of at least 0.02 inches column of water across every barrier separating the Work Area from the balance of the building or outside.
    f. Modify the Negative Pressure System as necessary to successfully demonstrate the above.
    g. Contractor's on-site competent person shall smoke test the NPE at least once every shift and document testing in daily log.
6. Provide a minimum of one back-up negative air for every four primary negative air units used. A minimum of one back-up negative air unit will be required if less than four primary units are used. The back-up negative air unit(s) shall be of equal capacity to primary unit(s).

L. Maintenance of Containment Barriers and Worker Decontamination Facility

1. Following completion of the construction of all polyethylene barriers and decontamination system enclosures, the negative air machines shall be turned on.
2. All polyethylene barriers inside the containment, in the worker decontamination enclosure system and in the waste container pass-out airlock shall be inspected

by the Contractor at least twice daily including prior to the start of each day's abatement activities. Document inspections and observations into the daily project log and submit to the Owner weekly at the weekly progress meetings.

3. Damage and defects in the enclosure system are to be repaired immediately upon discovery. Use smoke tubes to test the effectiveness of the barrier system when directed by the RM Project Monitor.

4. At any time during the abatement activities after barriers have been erected, if visible material is observed outside of the containment area or if damage occurs to barriers, the work shall immediately stop, repairs made to the barriers, and debris/residue cleaned up using appropriate HEPA vacuuming and wet mopping procedures.

M. Once constructed and reinforced as necessary with negative pressure ventilation units in operation as required, test enclosure for leakage utilizing smoke tubes. Repair or reconstruct as needed.

N. Clearly identify and maintain emergency and fire exits from the containment area.

O. Remove, clean and enclose in polyethylene the ceiling mounted objects such as lights and other items that may interfere with the abatement process and were not previously cleaned and sealed off. Utilize localized spraying of amended water and/or HEPA vacuums to reduce fiber dispersal during the removal of these fixtures.

P. Removal of Building System Components, Finishes and Appurtenances: Remove lighting fixtures, clean and store as directed by the Owner. Remove carpet and suspended ceiling system, including hangers. Replace building system components as specified or as directed by the Owner upon completion of abatement activity per all applicable codes and regulations.

2-13.3(9) WORK AREA CLEARANCE

A. The abatement work is complete when the work area is visually clean and airborne fiber levels have been reduced to the level specified below.

B. To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to the specified level, the Contractor will conduct a final visual inspection of the Work Area for completeness of work and the presence of any visible debris following all abatement per ASTM E1368-14, "Standard Practice for Visual Inspection of Asbestos Abatement Projects." Following the Contractor's successful visual inspection, the work area must pass the following visual inspection process.

1. The RM Project Monitor will perform a visual inspection of the project area and note deficiencies.

2. If deficiencies are noted, the RM Project Monitor shall create a punch list and forward it to the Contractor. The Contractor shall resolve all punch list items.

3. If the Contractor fails the visual inspection after a punch list has been created, the Owner will not be charged for the cleanup time, materials, air monitoring costs, or delay costs. Delays resulting from non-compliant visual inspections will not constitute an extension to the project time.

4. After abatement and final visual inspection, the Contractor shall apply a lockdown type asbestos encapsulant to surfaces on which asbestos has been removed.

a. In cases when negative pressure enclosures have been used, maintain operation of negative air system during the encapsulation process.

b. Mix ratio of encapsulant shall be per manufacturer's recommendations.

c. Apply encapsulant with airless sprayer onto substrate.

5. Allow encapsulant to dry for eight (8) hours (minimum) or until surfaces are dry before removing containment.

C. Following the successful visual inspection and application of lockdown encapsulant, the Contractor will be responsible for collecting air clearance samples.

D. General: The number and volume of air samples taken, and analytical methods used will be in accordance with the following schedule. Sample volumes given may vary depending upon the analytical instruments used.

E. In each work area after completion of all cleaning work and successful visual inspection, a minimum of one (1) sample will be taken at a flow rate of 1 to 12 liters per minute with a minimum of 1,200 liters of air to be sampled and analyzed as follows:

1. Analysis: Fibers on each filter will be measured using the NIOSH 7400 procedures and WISHA reference method. This shall include, at a minimum, the analysis of two blanks from the same lot as the filters used for sample collection. The Contractor shall provide the blanks for analysis.

2. Release Criteria: Decontamination of the work area is complete when every clearance sample is equal to or less than 0.01 fibers/cc, or less than pre-abatement levels, whichever is lower. If any sample exceeds 0.01 fibers/cc, then the decontamination is incomplete and re-cleaning is required.

3. The services of a testing laboratory will be employed by the Contractor to perform laboratory analysis of the air samples. Verbal laboratory results will be available within eight (8) hours of taking clearance samples. A complete record of all air monitoring tests and inspections will be furnished to the Owner by the Contractor within 24 hours of sample collection.

F. After acceptable clearance samples are received, the Contractor will provide the Owner with signed clearance forms with air sampling results attached.

G. The Project Monitor shall conduct a final visual inspection after all containment and equipment has been removed.

2-13.3(10) DISPOSAL PROCEDURES

A. Shower water shall be drained, collected and filtered through a system with at least a 5.0-micron particle size collection capability.

B. Sealed and labeled containers of asbestos-containing waste shall be removed from the immediate project area and transported to the prearranged disposal location as the work progresses.

C. Labeling: Each bag of asbestos waste shall be pre-labeled in accordance with WAC 296-62-07721 as follows:

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST

In addition, a second pre-printed label must be present on each bag in accordance with 49 CFR Parts 171 and 172 of the U.S. Department of Transportation hazardous materials regulations, as follows:

RQ HAZARDOUS SUBSTANCE
SOLID, NOS
ORM-E, NA 9188
(ASBESTOS)

The Contractor shall mark each container with a permanent label listing the Contractor's name, the name of the Certified Asbestos Supervisor, the Contractor's phone number, the Contractor's certification information, the date of removal, the location where the waste was generated and the facility owner.

D. All demolition debris materials, including asbestos-containing materials, except those containing substances classified as hazardous or dangerous by controlling local, state or federal regulatory agencies, shall upon their demolition became the property of the Contractor. All such material, including those containing hazardous or dangerous substances, shall be removed and properly disposed of away from the site and on property not owned by the Owner.

E. Disposal must occur at an authorized site in accordance with regulatory requirements of NWCAA and applicable state and local guidelines and regulations.

F. Waste shipment, waste manifest, and disposal records shall be delivered to the Owner within 45 days of completion of the abatement work. This information shall document the pickup site and disposal site, the quantity of the asbestos waste and the type of containers used. The Contractor and the Disposal Site Operator shall sign the waste manifest. If a separate hauler is employed, their name, address, telephone number and signature shall also appear on the manifest.

G. Transportation to the Landfill

1. All transportation of asbestos-containing waste material shall adhere to federal, state and local regulations, including, but not limited to:
    a. 49 CFR Parts 171 through 180
    b. 49 CFR Part 107
2. Once drums, bags and wrapped components have been removed from the work areas, they shall be loaded into an enclosed or covered truck for transportation.
3. Utilize hand trucks or carts when moving containers. Containers shall not be dragged, dropped, or thrown.

4. The enclosed cargo area of the truck shall be free of debris and lined with 6-mil polyethylene sheeting to prevent contamination from leaking or spilling containers. Floor sheeting shall be installed first and extend up the sidewalls. Wall sheeting shall be overlapping and taped into place.
5. Personnel transferring or loading asbestos containing waste shall be protected by disposable clothing (including head, body; and foot protection) and, at a minimum, half-face respirators using HEPA filters.
6. Any debris or residue observed on containers or surfaces outside the work area shall be immediately cleaned up using HEPA filtered vacuum equipment, or wet methods.
7. Large metal dumpsters are sometimes used for asbestos waste disposal. These shall have doors or tops that can be closed and locked to prevent vandalism or other disturbances. Containers shall be placed, not thrown, into these containers to avoid rupture.
8. Asbestos-containing or-contaminated wastes shall be segregated and transferred separately from non-asbestos wastes.

H. Disposal at the Landfill

1. Upon reaching the landfill, trucks are to approach the dump location as closely as possible for unloading the asbestos-containing waste.
2. Personnel off-loading containers at the disposal site shall wear protective equipment consisting of disposable head, body, and foot protection, and at a minimum, half-face piece, air-purifying respirators equipped with high-efficiency filters.
3. Bags, drums and components may be inspected, as they are off-loaded at the disposal site. Material in damaged containers shall be repacked in empty drums or bags, as necessary.
4. Waste containers shall be placed on the ground at the disposal site, not pushed, thrown or dumped out of trucks.
5. Following the removal of all containerized waste, the truck cargo shall be decontaminated using HEPA vacuums or wet methods to meet the no visible residue criteria. Polyethylene sheeting shall be removed and discarded along with contaminated cleaning materials and protective clothing in bags or drums at the disposal site.

2-13.3(11) RE-ESTABLISHMENT OF THE WORK AREA AND SYSTEMS

A. Re-establishment of the work area shall occur following the completion of cleanup procedures and after clearance air monitoring has been performed and documented per Contract Documents.

B. Polyethylene barriers shall be removed from walls and floors at this time, maintaining decontamination enclosure systems and barriers over floors, windows, etc., as required.

C. Comply with safety standards and governing regulations for cleaning operations. Remove waste materials from the site and dispose of in a lawful manner.

D. Following this Section is an example of a "Certificate of Clearance". This certification is to be completed by the Contractor and RM Project Monitor during the clearance process.

2-13.4 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to and included in lump sum Item No. 03 Abatement and Demolition of Above-Grade Structures.

END OF SECTION

2-14 LEAD CONTROLS IN DEMOLITION

2-14.1 GENERAL

2-14.1(1) SUMMARY OF WORK

A. The Contractor shall establish, provide, and maintain lead controls for the duration of the work conducted during this Contract. The tasks to be completed under this Contract are generally not considered lead abatement projects. Refer to the Hazardous Building Materials Survey Report submitted by Med-Tox Northwest dated September 2023 (Appendix D to these specifications), for specific information about location of lead-based paint on structures.

B. The intent of this section is to require the Contractor to establish procedures and controls to prevent airborne lead emissions during painting, general construction and demolition; comply with Washington Administrative Code (WAC) 296-155-176; and manage lead waste in accordance with WAC 173-303, Dangerous Waste Regulations. The work may include:

1. Abatement of asbestos building materials and/or other hazardous building materials that may consist of lead or be coated with paints or coatings that contain lead.
2. Demolition of buildings with concrete, concrete block, steel, sheetrock, plaster and other items that may consist of lead or be coated with paints that contain lead.
3. Waste designation including samples collected in accordance with ASTM Standard E 1908 and subsequent Toxic Characteristic Leaching Procedure analysis (EPA Method 1311) conducted by a laboratory certified by the Washington State Department of Ecology.
4. Disposal of lead waste in accordance with WAC 173-303, Dangerous Waste Regulations.
5. Providing personnel that have received training as defined in WAC 296-155-17625.

2-14.1(2) GOVERNING CODES, STANDARDS, AND REFERENCES

A. The Contractor is responsible for monitoring work activities and determining conditions that require conformance with specified regulatory requirements and standards. The following rules, requirements, and standards may apply to the work:

1. United States Occupational Safety and Health Administration (OSHA)
    a. 29 CFR 1910 - Occupational Safety and Health Standards
    b. 29 CFR 1910.134 - Respiratory Protection
    c. 29 CFR 1910.1200 - Hazard Communication
    d. 29 CFR 1926.55 - Gases, Vapors, Fumes, Dusts, and Mists
    e. 29 CFR 1926.57 - Ventilation
    f. 29 CFR 1926.62 - Lead in Construction Standard

2. United States Environmental Protection Agency (EPA)
    a. 40 CFR 260 - Hazardous Waste Management Systems: General
    b. 40 CFR 261 - Identification and Listing of Hazardous Waste
    c. 40 CFR 262 - Standards Applicable to Generators of Hazardous Waste
    d. 40 CFR 263 - Standards Applicable to Transporters of Hazardous Waste
    e. 40 CFR 268 - Land Disposal Restrictions
    f. 40 CFR Part 745, Subpart L - Lead Based Paint Activities
    g. 40 CFR Part 745, Subpart E (Ref. 8) - Lead Renovation, Repair, and Painting Program
    h. EPA Publication SW-846 - *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*
    i. EPA Publication EPA-740-K-10-001 - *Lead Safe Certified Guide to Renovate Right*
3. Department of Transportation
    a. 49 CFR Subchapter C - Hazardous Materials Regulations
4. National Institute for Occupational Safety and Health (NIOSH)
    a. NIOSH/OSHA Booklet 3142 - *Lead in Construction*
5. American Society for Testing and Materials
    a. Standard E 1908 - *Standard Guide for Sample Selection of Debris Waste from a Building Renovation or Lead Abatement Project for Toxicity Characteristic Leaching Procedure (TCLP) Testing for Leachable Lead (Pb)*
6. Washington State Regulations that are codified in the Washington Administrative Code (WAC) and govern lead work and lead waste management include but are not limited to:
    a. WAC 296-62 - General Occupational Health Standards
    b. WAC 296-24 - Safety Standards for Construction Work
    c. WAC 296-155-176 - Lead
    d. WAC 296-841 - Airborne Contaminants
    e. WAC 173-303 - Dangerous Waste Regulations
    f. WAC 365-230 - Accreditation of Firms And Individuals Conducting Lead-Based Paint Activities

2-14.1(3) DEFINITIONS

A. Definitions relevant to lead:
    1. Action Level (Lead): Employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8-hour period.

2. Air Monitoring: The process of measuring the concentration of lead in a specific volume of air in a stated period of time. Air samples shall be collected and analyzed in accordance with the methods specified by the National Institute for Occupational Safety and Health (NIOSH) and as required by WAC-296-155-176.
3. Area Monitoring: Sampling of lead concentrations within the lead control area, inside the physical boundaries, which is representative of the airborne lead concentrations that may reach the breathing zone of personnel potentially exposed to lead.
4. Dangerous Waste: Solid wastes designated as dangerous wastes in accordance with WAC 173-303, Dangerous Waste Regulations. Dangerous waste is the State of Washington equivalent to hazardous waste under the Federal Resource Conservation and Recovery Act (RCRA).
5. DOT: Department of Transportation
6. Eight Hour Time Weighted Average (TWA): Airborne concentration of lead averaged over an 8-hour workday, to which an employee is exposed.
7. Hazardous Waste: Solid waste designated in accordance with 40 CFR Part 261 as hazardous and regulated as hazardous waste by the United States Environmental Protection Agency.
8. Lead: Metallic lead, inorganic lead compounds, and organic lead compounds
9. Permissible Exposure Limit (PEL - Lead): A lead concentration of 50 micrograms per cubic meter of air as an 8-hour time weighted average.
10. Personal Monitoring: Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with WAC 296 155 176 and 296-841. Samples shall be representative of the employee's work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6- to 9-inches and the center at the nose or mouth of an employee.
11. Industrial Hygienist: The Industrial Hygienist shall be subject to approval as specified under Paragraph 2-14.1(5) of this section and shall have one of the following certifications:
    a. Certified Industrial Hygienist certified by the American Board of Industrial Hygiene with prior experience in the health and safety aspects of a lead hazard control work project.
    b. Professional Engineer, Certified Safety Professional or Certified Hazardous Materials Manager with a minimum of three (3) years prior experience in industrial hygiene relating to lead hazard control work.
12. Waste Designation: The process of determining whether waste is regulated under WAC 173-303, Dangerous Waste Regulations.

2-14.1(4) QUALITY ASSURANCE

A. The Contractor shall submit a Lead Controls Work Plan pursuant to Paragraph 2-14.1(5) of this section. The Work Plan shall establish procedures and controls to: prevent airborne lead emissions during general construction and demolition, comply with (WAC) 296-155-176 (Lead) and 296-841 (Airborne Contaminants), and manage waste in accordance with WAC 173-303, Dangerous Waste Regulations. The Work Plan will be submitted, as a

component of the Demolition Work Plan, to the Owner for review and approval prior to the start of any lead work.

B. The Owner will perform periodic observation of the site work to ensure that it is being performed in a manner consistent with the approved Work Plan and this section. The Owner's representative will have the authority to issue a "Stop Work" order for health and safety concerns or non-compliance with regulations or this section.

2-14.1(5) SUBMITTALS

C. The Contractor shall provide complete submittals in accordance as specified below.

D. Preconstruction Submittals: Provide a site-specific Lead Work Plan, as a component of the Demolition Work Plan described in Specifications Section 2092.1(2), which demonstrates the methods by which impact, handling and disposal of lead-containing materials will be performed. The Owner realizes that this project may or may not involve actual "lead abatement"; instead, the project work may involve asbestos abatement, demolition, alteration, and/or painting of building components that are coated with paint of varying lead concentrations. Therefore, a statement is required that identifies how the Contractor will be complying with the specifications and regulations as they pertain to lead. At a minimum the Work Plan shall include:

1. A general description of work practices, engineering controls, air monitoring, and decontamination for work involving lead-containing coatings. Describe whether the job will involve removing paint that contains lead (i.e., abatement), or demolition of materials containing or coated with lead.
2. Qualifications, certifications, training certificates and role of each Contractor's personnel
3. Qualifications of the proposed testing laboratory (to perform analysis of air and waste characterization samples)
4. Site inspection process, logs and documents
5. Respirator fit testing records for personnel performing lead work
6. Lead Air Monitoring Program
    a. The Air Monitoring Program shall include the proposed sampling plan, sampling procedures, and field quality control procedures of the firm conducting the air monitoring.
7. Procedures for personnel and equipment cleanup and decontamination
8. Lead Waste Management and Disposal Plan, including:
    a. Waste minimization efforts
    b. Container selection and labeling
    c. Qualifications and certificates of lead waste transporter
    d. Qualifications and certifications of lead waste disposal facilities
    e. Documentation of final lead waste transportation and disposition

E. Construction Phase Submittals

1. Daily Work Records: Submit the following information to the Owner daily. This information shall be submitted prior to the start of work on the next scheduled work shift.

    a. Air and bulk sample data sheets and laboratory analytical results, including chain of custody

    b. Supervisor daily inspection report, including scope of work completed, engineering controls used, hours worked, and equipment and materials used.

F. Post-Construction Closeout Submittals

1. Project Overview: Provide a basic project summary identifying the scope and summarizing the work performed by the Contractor. Provide enough information to have a basic understanding of the project and include project and contact names and ID numbers; Contractor's company name; where, when, and what type of work was completed; and a discussion of significant problems encountered during the course of the work. The written summary shall include a description of all changes or modifications to the Contractor's Pre-Construction Work Plan.

2. Certification: Provide written certification from the Contractor's Project Manager or Supervisor that the Contractor has fully inspected the work area and completed work in strict accordance with the Specifications.

3. Air Monitoring: Submit documentation of all Contractor air monitoring results relative to regulatory compliance. Include copies of all air monitoring data sheets, chain-of-custody documentation and analytical results to the Owner for sampling conducted at the site.

4. Project Record Documents: Provide project records including documentation of all contract changes, and copies of work site entry logbooks, safety logs, sign-in sheets, and supervisor daily field logs to the Owner. Provide copies of project meetings for pre-construction, construction period, and project closeout meetings.

5. Disposal Manifests: Submit copies of all lead waste disposal transportation and disposal manifests including signed receipts from the landfill, and chain-of-custody forms to the Owner. Lead dangerous waste or hazardous waste disposal documentation shall be signed by a representative from the Owner.

6. Submit copies of inspections or visits by regulatory agencies. Include copies of any citations or notices received by the Contractor from regulatory agencies during the course of the project.

2-14.2 MATERIALS AND EQUIPMENT

2-14.2(1) MATERIAL REQUIREMENTS

A. Containers

1. All wastes that designate as Hazardous Waste or Dangerous Waste shall be packaged in sealed containers with appropriate UN Performance Package Ratings.

2. All drums and containers must be in shipping condition with gaskets intact.

B. Labels

1. All containers holding hazardous wastes will be labeled in accordance with WAC 173-303-190.

2-14.3 EXECUTION

2-14.3(1) WORK AREA PREPARATION

A. Perform the following preliminary steps to prepare the Work Areas prior to demolition of lead coatings and lead-containing materials.

1. Establish a control area that includes a perimeter sufficient to perform the demolition work around each building or area that contains lead or lead-containing materials and/or renovation work that is expected to disturb lead-containing paint. The control area shall also consist of the pathway for transport of any lead-contaminated material to a stockpile or storage receptacle if the demolition debris is not immediately transport from the site. Provide and display caution signs, in clearly visible areas, at entrances indicating that hazardous material work is being conducted, that state that unauthorized persons should not enter. Signs shall comply with WAC 296-155-176.
2. Emergency Procedures: Establish and post written emergency procedures within each work area, including emergency contact names and contact phone numbers, plans for medical emergencies, plans for temporary loss of electrical power or water, and procedures for an emergency. The Contractor is responsible for establishing and posting contingency procedures for all workers on site.
3. Health and Safety Briefing: Conduct a health and safety briefing prior to the start of work and weekly to discuss the Health and Safety Plan, hazardous materials, hazardous work and other related items per the specified Health and Safety Plan. More frequent briefings should be performed as required by project activities or changes in the work.
4. Utilities: Request and coordinate the use and shut down of all utilities. Request and coordinate the use and shutdown of electric service to the work area and install temporary electric supply with ground fault interrupt protection.
5. Prepare all storm drains, floor and area drains and drainage routes using the methods described in the approved Work Plan to prevent contaminated runoff.
6. Lead Waste Accumulation Area: Prepare the lead-waste storage area as described in the approved Work Plan.
7. Decontamination Areas: Prepare the decontamination areas for use at all entrances and exits from the Work Area as described in the approved Work Plan.

2-14.3(2) WORK PROCEDURE

A. General Procedures: Perform all work and comply with the safety and health provisions in the site-specific Health and Safety Plan. The work includes all measures necessary to adequately protect workers, authorized personnel, Owner staff and the public from lead exposures during the demolition/renovation process and surface preparation activities.

B. Coordination of work of all trades: Coordinate the work of all trades to assure that work is performed in accordance with the applicable regulations and that the control limits are maintained at all times both inside and outside the control area.

C. Access to work Area: Access to work areas shall be through decontamination areas. Only the Contractor, subcontractors, authorized Owner personnel, and project consultants shall have access to the Work Area.

D. Means of Egress: Establish and maintain emergency and fire exits from the work area.

E. Prevent dust generation at all times to the maximum extent practicable.

F. The use of water shall be restricted to the smallest quantity necessary to minimize dust and to avoid the potential of contaminant migration through run-off or ponding. In no case shall liquids generated during building demolition/renovation come into contact with uncontaminated soils, drains, surfaces or conduits which may constitute a release to the environment.

G. Demolition Procedures: Perform demolition in areas of lead-containing paints and lead-containing materials in accordance with the approved Health and Safety Plan. Use procedures and equipment to limit occupational and environmental exposure to lead when lead-containing paint is impacted or when lead-containing building components are demolished. The procedures employed by the Contractor shall not create the potential for contaminating surrounding areas or materials with lead-containing coatings or dust. Dust generation shall be kept to a minimum. Dry scraping, dry sanding, or dry grinding on lead-containing paints or lead contaminated surfaces will not be permitted without a full enclosure.

H. Personnel and equipment decontamination shall occur whenever workers or equipment leave the work site as described in the approved Work Plan. Decontamination waste shall be packaged, stored, labeled and disposed according to all applicable requirements at the cost of the Contractor.

I. The Owner may inspect the Contractor's operations and work areas daily for job site cleanliness and conformance with the specifications.

J. While performing the work, the Contractor may be subject to on-site inspection by L&I/DOSH, OSHA, EPA/Ecology inspectors and/or local building or health officials. If found to be in violation of pertinent regulations, the Contractor shall cease all work immediately and may not resume work until the violation is resolved. Standby time required to resolve the violation shall be at the Contractor's expense. Complete sets of equipment (such as respirators and disposable clothing) that may be required for entry to the control area shall be made available at all times by the Contractor to the Owner and/or agency inspectors for inspection of the control area. Such requests will only be made during working hours.

2-14.3(3) LEAD CONTROLS AND AIR MONITORING

A. Lead Controls

1. Restrict the spread of dust and debris from being distributed over the work area.
2. Prevent dust generation at all times to the maximum extent practicable. The use of water shall be restricted to the smallest quantity necessary to minimize dust and to avoid potential run-off or ponding.
3. Dry scraping, dry sanding, or dry grinding on lead-containing paints, lead-containing materials or lead-contaminated surfaces will not be permitted without a full enclosure.

B. Air Monitoring

1. Monitoring of airborne concentrations of lead shall be in accordance with WAC 296-155-176, WAC 296-841, and as specified herein. Air monitoring, testing, and reporting shall be performed in accordance with an Air Monitoring Plan prepared and signed by the Contractor's Industrial Hygienist. The Plan shall include personal monitoring in accordance with regulatory requirements and area monitoring outside the lead control area.

    a. Submit results of air monitoring samples, signed by the Contractor's Industrial Hygienist, within 24 hours after the air samples were taken.

    b. Notify the Owner immediately of the corrective action taken if the exposure to lead is at or in excess of the lead action level (30 micrograms per cubic meter) outside of the lead control area.

    c. If the area air monitoring results are above the lead action level, the Owner shall have the option of stopping all work until the work procedures and lead hazard controls are revised to the Owner's satisfaction.

2-14.3(4) CLEAN-UP, TESTING AND DISPOSAL

A. Cleanup

1. Maintain surfaces of the lead control area free of accumulation of paint chips and dust. Restrict the spread of dust and debris; keep waste from being distributed over the work area. The use of compressed air to clean up the area is strictly prohibited. At the end of each shift, clean the area of visible lead paint and dust contamination by vacuuming with a HEPA filtered vacuum cleaner, wet mopping the area, or cleanup by other appropriate means.

2. All abated lead waste shall be stored in sealed steel containers with appropriate UN Performance Package Ratings.

3. Demolition debris that is found to designate as Dangerous Waste per WAC 173-303 can be stored in closed top roll off containers. Tops must be closed when not adding waste to the container.

B. Testing of Lead Waste and Demolition Debris

1. The Contractor is responsible for sampling and testing any abated lead waste or lead demolition debris. If the Hazardous Building Materials report includes testing of lead waste and/or demolition debris, the Contractor is responsible for testing demolition debris that is managed differently than the whole building testing already performed.

2. Sampling of abated lead and lead demolition debris shall be in accordance with the most current version of ASTM Standard E 1908 - Standard Guide for Sample Selection of Debris Waste from a Building Renovation or Lead Abatement Project for Toxicity Characteristic Leaching Procedure (TCLP) Testing for Leachable Lead (Pb).

3. If any lead waste is found to designate as Dangerous Waste per WAC 173-303, the Contractor must immediately notify the Owner.

C. Disposal of Lead Demolition Waste

1. Lead-containing waste that does not designate as Dangerous Waste per WAC 173-303 must be managed at a permitted disposal facility.
2. The following requirements shall be met for the disposal of any lead-containing Dangerous Waste:
    a. The Contractor shall submit the name, address, and EPA Identification Number of the transporter and disposal facility to the Owner prior to shipment of any hazardous waste.
    b. A representative from the Owner must be present for any Dangerous Waste shipment and will sign all hazardous waste manifests, waste material profiles, land disposal restriction forms and any other documents requiring generator signature. Contractor shall give notice of any Dangerous Waste shipments to the Owner at least 2 business days prior to shipment.
    c. Any lead-containing Dangerous Waste for disposal must be packaged in appropriate UN performance packages or roll off containers according to all DOT specifications.

2-14.4 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to and included in lump sum Item No. 03 Abatement and Demolition of Above-Grade Structures.

END OF SECTION

2-15 LIGHT BALLAST AND LAMP REMOVAL AND MANAGEMENT

2-15.1 GENERAL

2-15.1(1) SUMMARY OF WORK

A. The Contractor shall supply all labor, materials, vehicles, services, insurance and equipment necessary to remove, transport, recycle and dispose universal waste lamps, and non-PCB ballasts in accordance with all applicable federal and state regulations and these specifications.

B. The Contractor shall supply all labor, materials, vehicles, services, insurance and equipment necessary to remove, containerize and transfer to a treatment, storage or disposal (TSD) facility all Polychlorinated Biphenyls (PCB) containing light ballasts (PCB ballasts) or other PCB containing equipment regulated by 40 CFR 761 or WAC 173-303.

C. This project involves complete removal of light fixtures in areas of demolition.

D. Refer to the Hazardous Building Materials Survey Report submitted by Med-Tox Northwest dated September 2023 (Appendix D to these specifications), for specific information about location of lamps and/or ballast removal. The Work includes the following:

1. Dismantling of light fixtures and separation of ballasts and lamps.
2. Determination whether ballasts are PCB ballasts or non-PCB ballasts. Unmarked ballasts shall be considered PCB ballasts. For bid purposes, assume all light ballasts are PCB containing until proven otherwise.
3. Package, label and store lamps in accordance with WAC-173-303-573, Standards for Universal Waste Management.
4. Package, mark, label and store all PCB or PCB containing/contaminated waste generated as a result of work activities in in accordance with 40 CFR 761.
5. Collection and containerization of all non-PCB ballasts.
6. Coordinating transfer of all PCB ballasts or other PCB containing/PCB contaminated waste to a licensed TSD facility within 30 days of generation of waste.
7. Coordinate proper recycling of all non-PCB ballasts to approved recycling facility.
8. Coordinate transportation and recycling of lamps in accordance with WAC-173-303-573, Standards for Universal Waste Management.
9. Provide disposal documentation for all ballasts and lamps removed during the Project.

2-15.1(2) GOVERNING CODES, STANDARDS, AND REFERENCES

A. The applicable sections, latest editions and addenda of the following government regulations, codes, industry standards and recommended practices, form a part of these specifications.

1. U.S. EPA - Environmental Protection Agency, Toxic Substances Control Act, Title 40, Code of Federal Regulations, Part 761 (40 CFR 761)

2. U.S. EPA - Environmental Protection Agency, Standards for Universal Waste Management (40 CFR 273)
3. U.S. DOT - Department of Transportation, Title 49 Code of Federal Regulations
4. DOE - Washington State Department of Ecology, Dangerous Waste Regulations, Washington Administrative Code 173-303 (WAC 173-303)
5. Washington State Department of Labor and Industries (L&I) WISHA - Washington State Industrial Safety & Health Act, Chapter 296-800 Washington Administrative Code (WAC), Safety and Health Core Rules
    a. WAC 296-800-170 Hazard Communication Standard
6. L&I Chapter 296 -24 WAC, General Safety and Health Standards
    a. L&I Chapter 296-62 WAC, Occupational Health Standards including: WAC 296-842 Respiratory Protection
7. L&I Chapter 296-155 WAC, Construction Standards
8. All other applicable Federal, State, county and city standards codes

2-15.1(3) DEFINITIONS

A. ASTM: American Society for Testing and Materials

B. Certified Industrial Hygienist (CIH): An industrial hygienist certified in the Comprehensive Practice of Industrial Hygiene by the American Board of Industrial Hygiene

C. Contractor: The individual or business with whom the Owner has contracted to perform the work as specified herein

D. DOE: Washington State Department of Ecology

E. EPA: United States Environmental Protection Agency

F. L&I: Washington State Department of Labor & Industries

G. NIOSH: The National Institute for Occupational Safety and Health

H. Non-PCB ballast: Electronic (non-magnetic) light ballasts, which are not suspected of containing PCBs.

I. OSHA: The Occupational Safety and Health Administration

J. PCB ballast: All magnetic light ballasts, which are considered PCB ballasts, even if labeled with “No PCBs” or equivalent language.

K. Universal Waste Lamps: Any light bulb, lamp or tube that contain constituents, such as mercury or lead, which could otherwise cause a Dangerous Waste designation when discarded but can be managed as universal waste. The following lamps must be considered universal waste lamps and managed accordingly:
    1. Fluorescent tubes
    2. High intensity discharge lamps (including mercury vapor, metal halide, and high pressure sodium)
    3. Compact fluorescent lamps
    4. Incandescent bulbs
    5. Any other lights or lamps that are Dangerous Waste

L. WAC: Washington Administrative Code

M. WISHA: Washington Industrial Safety and Health Act as enforced by the Washington State Department of Labor & Industries

2-15.1(4) QUALITY CONTROL

A. Use properly trained and experienced workers to perform the removal and containerization of PCB ballasts and universal waste lights and lamps.

2-15.2 MATERIALS AND EQUIPMENT

2-15.2(1) MATERIAL REQUIREMENTS

A. Containers

1. All PCB ballasts (or PCB contaminated material) and non-PCB ballasts shall be packaged in sealed steel drums with appropriate UN Performance Package Ratings.
2. All drums must be in shipping condition and watertight with gaskets intact.

B. Labels

1. All containers holding PCB ballasts or PCB contaminated material shall be labeled with the Large PCB Mark (M_L) in accordance with 49 CFR 761.40 marking requirements.
2. All containers holding non-PCB ballasts shall be labeled with the words “Non-PCB Ballasts”.
3. All containers that contain universal waste lamps shall be labeled with the words “Universal Waste”.
4. All containers designated for disposal shall be marked with the project number.

2-15.2(2) EQUIPMENT

A. Personal Protective Equipment

1. Provide proper and appropriate personal protective equipment, as necessary for the performance of this Work.

B. Removal Equipment

1. A sufficient supply of scaffolds, ladders, lifts and hand tools shall be provided as needed.
2. Additional support equipment as needed.

2-15.3 EXECUTION

2-15.3(1) WASTE STREAM DETERMINATION, PACKAGING, AND MARKING

A. Waste Stream Determination – Ballasts

1. Before removing the ballast from the fixture, the Contractor shall distinguish PCB ballasts from non-PCB ballasts. All magnetic ballasts are considered PCB ballasts, even if labeled with “No PCBs”. Electronic (non-magnetic) ballasts are not

suspected of containing PCBs and are considered non-PCB ballasts. Contractor will also determine if the ballast is leaking.

2. The determinations made by the Contractor will result in the following three possible waste streams that must be segregated:
    a. PCB ballasts
    b. Leaking PCB ballasts and PCB contaminated materials
    c. Non-PCB ballasts (leaking non-PCB ballasts can be packaged with the non-leaking, non-PCB ballasts).
3. Any leaking PCB ballasts must be reported to the Owner immediately.

B. Waste Stream Determination – Universal Waste Lamps
1. All lamps removed from the site shall be considered universal waste lamps as defined by 40 CFR 273.5 and WAC 173-303-040, provided the lamps are managed accordingly.
2. Any accidentally broken lamps are fully regulated under Federal Resource Conservation and Recovery Act (40 CFR 261) and Washington State Dangerous Waste Regulations (WAC 173-303).
3. Any onsite disposal of universal waste lamps constitutes improper disposal of fully regulated Dangerous Waste and would be considered a violation of the Federal Resource Conservation and Recovery Act and the Washington State Dangerous Waste Regulations.

C. Containerization and Marking
1. All non-leaking PCB ballasts shall be packaged in steel drums marked or labeled with the Large M_L PCB Mark. The “taken out of service” date shall be marked on the drum as the date the first ballast is removed and placed in the drum.
2. All leaking PCB ballasts shall be double bagged, packed in steel drums and marked or labeled with the Large M_L PCB Mark. The “taken out of service” date and “Leaking PCB Ballasts” shall be marked on the drum.
3. Any PCB contaminated material generated as a result of the Work shall be packaged in steel drums marked or labeled with the Large M_L PCB Mark. The accumulation start date shall be indicated on the drum as the date the first piece of contaminated material is placed in the drum.
4. All non-PCB ballasts shall be packaged in steel drums and marked with the words “Non-PCB Ballasts for Recycling”.
5. Lamps shall be removed and containerized in a manner to prevent breakage. If a lamp breaks, the Contractor shall immediately clean-up debris, place debris in double plastic taped bags, and place the bagged debris in a container specified for broken lamps and labeled and managed in accordance with 40 CFR 261.

2-15.2(2) CLEANUP PROCEDURES

A. All leaking PCB ballasts shall be addressed immediately. Upon discovery of leaking PCB ballasts, the Contractor shall commence with cleanup as follows:
1. Clear the area and prohibit those not involved with cleanup from entering the area. Ventilate area if possible.

2. Contact the Owner immediately.
3. Don appropriate personal protection equipment for handling organic liquids as specified in the site specific safety plan.
4. Ensure that the light fixture is turned off and disconnect electricity at the fuse or breaker box. Follow all lockout/tagout procedures.
5. Remove the fluorescent lamp if it is still affixed and manage according to this Section.
6. Remove the ballast and immediately double bag in plastic.
7. Place ballast in steel drum, seal the drum, and mark the drum as indicated in 3.01.
8. If there are any uncontained liquids or other material on a surface other than the ballast, contact the Owner immediately and prevent the area from being disturbed.

B. Clean-up Procedures for Broken Lamps

1. The Contractor shall have a cleanup kit on site prior to removing or dismantling universal waste lamp fixtures.
2. Avoid breathing dust created by broken lamps. Allow vapor to dissipate.
3. Do not vacuum the broken lamps.
4. Ventilate area and leave area for 5 minutes prior to returning to clean up broken glass. Keep people from the site.
5. Use approved and appropriate cleanup solvents and neutralizers.
6. Place all broken glass and phosphor powder in double plastic taped bags, place the bagged debris in sealed containers, and label as specified in this Section.

2-15.2(3) TEMPORARY STORAGE, TRANSPORTATION AND DISPOSAL

A. Temporary Storage

1. The Contractor may temporarily store non-leaking PCB ballasts onsite for a maximum of 30 days. Contractor must arrange for transfer to the TSD facility within 30 days. Contractor cannot store PCB ballasts onsite for more than 30 days.
2. Leaking PCB ballasts cannot be temporarily stored onsite. If leaking PCB ballasts are discovered, immediately contact the Owner.
3. Universal waste lamps that have been removed, properly packaged, and are awaiting disposal must be stored in a manner consistent with WAC-173-303-573 and the Contractor's Pollution Prevention Plan.
4. Under no circumstances shall universal waste be stored onsite for longer than 30 days.

B. Transportation and Recycling

1. PCB Ballasts
    a. The Contractor shall take possession of and remove from the project site all non-leaking PCB ballasts at a minimum of every 30 days.
    b. The Contractor is responsible for scheduling transfer of drums to the TSD facility.

2. Non-PCB Ballasts

    a. The Contractor is responsible for soliciting a waste service provider and any cost negotiations regarding disposal.

    b. The Owner requires that all non-PCB ballasts be recycled. Landfill of any light ballast is not allowed under this contract. The Contractor must ensure that the disposal/recycling facility will separate metal components from the ballast for recovery.

C. Universal Waste Lamps

1. Universal waste lamps shall be packaged, labeled and transported to an approved recycling facility. Include documentation in the form of log, invoice, manifest, bill of lading or other shipping documents. This documentation shall include the name and address of the generator, address of the site where the waste was generated, quantity, date of shipment, name and address of hauler and name and address of waste facility receiving waste.
2. The Owner shall be listed as the Generator of the universal waste lamps on all shipping papers.
3. The Contractor shall provide a shipping record to the Owner at the time of shipment.

2-15.4 MEASUREMENT AND PAYMENT

2-15.4(1) PAYMENT

A. No separate measurement or payment will be made for the Work required by this Section. The cost for this portion of the Work will be considered incidental to and included in lump sum Item No. 03 Abatement and Demolition of Above-Grade Structures.

END OF SECTION

END OF DIVISION 2

DIVISION 3 – AGGREGATE PRODUCTION AND ACCEPTANCE

3-01 PRODUCTION FROM QUARRY AND PIT SITES

3-01.2(1) Approval of Source

WSDOT Standard Specifications Section 3-01.2(1) is supplemented with the following:

Documentation of Imported Fill Chemical Quality
Imported backfill materials must be virgin aggregate or crushed rock from a mine site (recycled materials, including recycled concrete aggregate, are not allowed), be free of excessive organic matter or other deleterious material and must not contain environmental contamination as determined by Engineer.

Prior to delivery of any imported backfill material to the Project Limits, the Contractor shall submit documentation of the fill chemical quality. The supplier must provide an environmental certification, signed by the owner or office of the supplier, that the material is free of contamination. If material is from a WSDOT-approved source, the certification and acceptance information must be submitted. For material that is native to the source area (e.g., material from non-WSDOT-approved construction site or borrow pit), the supplier must provide documentation of the source area land use and operational history and chemical composition sufficient to identify the site as free from environmental contamination. Material not native to the source area will not be allowed. For the purposes of these Specifications, environmental contamination is defined as detectable concentrations of petroleum hydrocarbons or other organic chemicals (e.g., PCBs, solvents); concentrations of metals above Puget Sound background levels defined by Department of Ecology (including 20 mg/kg arsenic); or any other characteristic (e.g., unpleasant odor) making the fill unsuitable for use at the Project Limits. Acceptance of fill material will be at the Engineer's discretion. In the absence of soil quality testing data/documentation acceptable to Engineer, the Engineer may require the Contractor, at the Contractor's expense, to submit the results of analytical testing of representative samples from the proposed fill source, at a minimum sampling frequency as follows: 5 samples for up to 1,000 cubic yards of material, and 1 additional sample for every additional 1,000 cubic yards of material. Necessary analytical test methods will be determined by the Engineer and will depend on the fill source documentation.

The Contractor shall not import any backfill material to the Project Limits until written approval of its use is received from the Engineer. Any non-approved material imported to the site shall be removed and the site restored at the Contractor's expense. The Contractor shall allow 3 Working Days for review by the Engineer. If the submitted documentation or test results are unsatisfactory, the Engineer may require additional testing at any time. All testing costs shall be borne by the Contractor. Delivery tickets shall be provided to the Engineer when the material arrives on the Project Limits.

END OF SECTION END OF DIVISION 3

DIVISION 07 – DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS AND CONDUITS

7-04 STORM SEWER

7-04.3 Construction Requirements

WSDOT Standard Specifications Section 7-04.3 is supplemented with the following:

7-04.4 Measurement and Payment

The unit of measurement for Item No. 14A Polypropylene Storm Sewer Pipe 4 In. Diam. shall be by the LINEAR FOOT based on the actual number of linear feet of completed installation measured along the invert and will include the length through elbows, tees, and fittings. The number of linear feet will be measured from the center of manhole to center of manhole or to the inside face of catch basins and similar type Structures. Payment per unit shall constitute full compensation for Item No. 14A Polypropylene Storm Sewer Pipe 4 In. Diam. This item will include procurement of material, and all other Work required for installation, as shown on the Plans, including adjustment of inverts to manholes.

The unit of measurement for Item No. 14B Polypropylene Storm Sewer Pipe 12 In. Diam. shall be by the LINEAR FOOT based on the actual number of linear feet of completed installation measured along the invert and will include the length through elbows, tees, and fittings. The number of linear feet will be measured from the center of manhole to center of manhole or to the inside face of catch basins and similar type Structures. Payment per unit shall constitute full compensation for Item No. 14B Polypropylene Storm Sewer Pipe 12 In. Diam. This item will include procurement of material, and all other Work required for installation, as shown on the Plans, including adjustment of inverts to manholes.

The unit of measurement for Item No. 14C Polypropylene Storm Sewer Pipe 18 In. Diam. shall be by the LINEAR FOOT based on the actual number of linear feet of completed installation measured along the invert and will include the length through elbows, tees, and fittings. The number of linear feet will be measured from the center of manhole to center of manhole or to the inside face of catch basins and similar type Structures. Payment per unit shall constitute full compensation for Item No. 14C Polypropylene Storm Sewer Pipe 18 In. Diam. This item will include procurement of material, and all other Work required for installation, as shown on the Plans, including adjustment of inverts to manholes.

END OF SECTION

7-05 MANHOLES, INLETS, CATCH BASINS, AND DRYWELLS

7-05.1 Description

WSDOT Standard Specifications Section 7-05.1 is supplemented with the following:

The work consists of the procurement, site preparation, and installation of Pretreatment Vault, including connections to drainage system, backfill and compaction, and any other miscellaneous materials all in accordance with the Plans, manufacturer's specifications, and as directed by the Engineer.

The work consists of the procurement, site preparation, and installation of Contech Modular Wetland MWS-L-8-16-5'-9"-V-UG, including connections to drainage system, backfill and compaction, and any other miscellaneous materials all in accordance with the Plans, manufacturer's specifications, and as directed by the Engineer.

The work consists of furnishing and installing inline check valves all in accordance with the Plans, manufacturer's specifications, and as directed by the Engineer.

The work consists of furnishing and installing sluice gate valves all in accordance with the Plans, manufacturer's specifications, and as directed by the Engineer.

7-05.2 Materials

WSDOT Standard Specifications Section 7-05.2 is supplemented with the following:

All materials necessary for the site preparation and installation of Pretreatment Vault shall be procured by the Contractor.

All materials necessary for the site preparation and installation of Contech Modular Wetland MWS-L-8-16-5'-9"-V-UG shall be procured by the Contractor.

All materials necessary for the site preparation and installation of sluice gate valves shall be procured by the Contractor.

7-05.3 Construction Requirements

WSDOT Standard Specifications Section 7-05.3 is supplemented with the following:

7-05.3(5) Pretreatment Vault

Pretreatment Vault shall be Clara Basic Separator 70CP manufactured by StormwateRx, or an equivalent approved by the Owner and Engineer. Pretreatment Vault shall be installed per manufacturer's recommendations, as specified in the Plans, and as directed by the Engineer.

Pretreatment Vault shall be a gravity separation wetvault, capable of providing pretreatment meeting Washington State Department of Ecology (Ecology) Pretreatment Performance Criteria for a water quality flow rate 0.35 cfs.

Pretreatment Performance Criteria:

- For influent concentrations of 50-100 mg/L of Total Suspended Solids (TSS): effluent must have less than 50 mg/L of TSS.
- For influent concentrations of 100-200 mg/L of TSS: achieve at least 50% removal of total suspended solids.

Pretreatment Vault shall provide a minimum of 5 cubic yards of sediment storage.

Pretreatment Vault shall provide a minimum of 510 gallons of oil/floatable storage.

Pretreatment Vault shall have an internal high flow bypass capable of passing the 100-year, 24-hour Type IA peak flow rate of 4.1 cfs, while trapping pollutants.

Outlet chamber of Pretreatment Vault shall be able to accept an integrated pump package (to be provided by Owner) capable of pumping the water quality flow rate to an aboveground treatment system (to be provided by Owner).

Pretreatment Vault lid shall have large easy opening hatches for ease of inspection and maintenance rather than manhole lids.

Pretreatment Vault lid and hatches shall be designed to meet airport loading criteria.

7-05.3(6) Contech Modular Wetland MWS-L-8-16-5'-9"-V-UG

Contech Modular Wetland MWS-L-8-16-5'-9"-V-UG shall be manufactured by Contech, or an equivalent approved by the Owner and Engineer. Contech Modular Wetland MWS-L-8-16-5'-9"-V-UG shall be installed per manufacturer's recommendations and as specified in the Plans.

7-05.3(7) Inline Check Valves

Inline check valves shall be Red Valve Inline Checkmate elastomeric check valves with all rubber with slip- in cuff, or an equivalent approved by the Owner and Engineer. Inline check valves shall be installed in clean, continuous pipes, with no joints crossing the valve. The

downstream end of the valve shall be circumferentially in contact with the pipe while in the closed position. Inline check valves shall meet the following requirements:

1. Installed according to the manufacturer's recommendations.

2. Flow operated check type with slip-in cuff connection.

3. Must hold back 40 feet of back-pressure and open under a maximum of 1 inch of head.

4. The pipe internal diameters must be measured and reported to the manufacturer prior to procurement.

5. Ply reinforced rubber throughout the body, saddle and bill, and cured and vulcanized into a one-piece unit.

6. Valve Material: All rubber, Buna-N. No metal or mechanical hinges or fasteners.

7. The port area of the saddle shall contour into a circumferential sealing area concentric with the pipe and shall allow passage of flow in one direction while preventing reverse flow.

8. The entire valve shall fit within the pipe inside diameter. Once installed, the valve shall not protrude beyond the face of the structure or end of the pipe.

9. The outside diameter of the upstream and downstream sections of the valve must be circumferentially in contact with the inside diameter of the pipe.

10. Valve shall be furnished with a set of 316 stainless steel expansion clamps. The clamps, which will secure the valve in place, shall expand outwards by means of a turnbuckle. Each band shall be pre-drilled allowing for the valve to be pinned and secured into position in accordance with the manufacturer's installation instructions.

11. Manufacturer must have flow test data from an accredited hydraulics laboratory to confirm pressure drop and hydraulic data.

12. Company name, plant location, valve size patent number, and serial number shall be bonded to the check valve.

13. After installation, the check valves shall be inspected either by the manufacturer or video inspection to ensure proper valve function.

7-05.3(8) Sluice Gate Valves

Sluice gate valves shall be installed to isolate and "turn-off" the Contech Modular Wetland, as shown in the Plans. Sluice gate valves shall be contained within the manholes and not protrude above the ground surface. Sluice gate valves shall be watertight with true non-rising stem

operation or equivalent as approved by the Engineer. Sluice gate valves shall be installed according to the manufacturer's recommendations and as specified in the Plans.

7-05.3(9) Submittals

The Contractor shall submit manufacturer's shop drawings stamped and signed by a professional engineer registered in the State of Washington to the Engineer for Pretreatment Vault. The Contractor shall not start fabrication of Pretreatment Vault until the shop drawings and other submitted data are reviewed and approved by the Engineer and the shop drawings have been returned to the Contractor.

The Contractor shall submit manufacturer's shop drawings stamped and signed by a professional engineer registered in the State of Washington to the Engineer for the Contech Modular Wetland MWS-L-8-16-5'-9"-V-UG. The Contractor shall not start fabrication of Contech Modular Wetland MWS-L-8-16-5'-9"-V-UG until the shop drawings and other submitted data are reviewed and approved by the Engineer and the shop drawings have been returned to the Contractor.

The Contractor shall submit manufacturer's literature to the Engineer for inline check valves. The Contractor shall not install check valves until the submitted information are reviewed and approved by the Engineer.

The Contractor shall submit manufacturer's literature to the Engineer for sluice gate valves. The Contractor shall not install sluice gate valves until the submitted information are reviewed and approved by the Engineer.

7-05.4 Measurement and Payment

The unit of measurement for Item No. 14D Catch Basin Type 2, 48 In. Diam. Shall be per catch basin (each). Payment per unit shall constitute full compensation for Item No. 14D Catch Basin Type 2, 48 In. Diam. This item will include procurement of material, and all other Work required for installation as shown on the Plans. Payment for connections to existing pipes shall be included in the unit Contract price for Item No. 14D Catch Basin Type 2, 48 In. Diam.

The unit of measurement for Item No. 14E Catch Basin Type 2, 60 In. Diam. Shall be per catch basin (each). Payment per unit shall constitute full compensation for Item No. 14E Catch Basin Type 2, 60 In. Diam. This item will include procurement of material, and all other Work required for installation as shown on the Plans. Payment for connections to existing pipes shall be included in the unit Contract price for Item No. 14E Catch Basin Type 2, 60 In. Diam.

The unit of measurement for Item No. 14F Connection to Drainage Structure shall be per connection (each). Payment per unit shall constitute full compensation for Item No. 14F

Connection to Drainage Structure as shown on the Plans. All costs associated with connecting to an existing drainage structure shall be in the unit Contract price for each connection.

The unit of measurement for Item No. 14G Pretreatment Vault shall be per Pretreatment Vault (each). Payment per unit shall constitute full compensation for Item No. 14G Pretreatment Vault. This item will include procurement of material, and all other Work required for installation as shown on the Plans and in accordance with manufacturer's specifications.

The unit of measurement for Item No. 14H Modular Wetland. Shall be per Contech Modular Wetland MWS-L-8-16-5'-9"-V-UG (each). Payment per unit shall constitute full compensation for Item No. 14H Modular Wetland. This item will include procurement of material, and all other Work required for installation as shown on the Plans and in accordance with manufacturer's specifications. All costs associated with dewatering for the installation of Item No. 14H Modular Wetland shall be included in the unit Contract price for the item installed.

The unit of measurement for Item No. 14I Inline Check Valve shall be per each. Payment per unit shall constitute full compensation for Item No. 14I Inline Check Valve. This item will include procurement of all material, and all other Work required for installation as shown on the Plans, as per the manufacturer's specification, and as directed by the Engineer.

The unit of measurement for Item No. 14J Sluice Gate Valve shall be per each. Payment per unit shall constitute full compensation for Item No. 14J Sluice Gate Valve. This item will include procurement of all material, and all other Work required for installation as shown on the Plans, as per the manufacturer's specification, and as directed by the Engineer.

END OF SECTION

7-08 GENERAL PIPE INSTALLATION REQUIREMENTS

7-08.2 Materials

WSDOT Standard Specifications Section 7-08.2 is supplemented with the following:

Crushed Surfacing Base Course	9-03.9(3)

7-08.3 Construction Requirements

7-08.3(3) Backfilling

Paragraph 2 of WSDOT Standard Specifications Section 7-08.3(3) is replaced with the following:

Trench backfill material shall consist of Gravel Backfill for Pipe Zone Bedding and Crushed Surfacing Base Course.

7-08.4 Measurement and Payment

Measurement and Payment for Crushed Surfacing Base Course used as Trench Backfill shall be included in Item No. 11 Crushed Surfacing Base Course.

The unit of measurement for Item No. 14K Gravel Backfill for Pipe Zone Bedding shall be by the TON, based on measured weight of Gravel Backfill for Pipe Zone Bedding material used. Only truckloads of material actually used for an approved purpose in accordance with these Specifications will be considered part of the measurement. Imported material that is not used and is hauled away shall be weighed and deducted from the amount brought on site. Payment per unit shall constitute full compensation for Item No. 14K Gravel Backfill for Pipe Zone Bedding. This item will include transportation of material, on-site stockpiling and handling, placement of material, compaction, and all other Work required for placement.

END OF SECTION

7-09 WATER MAIN AND HYDRANT REMOVAL AND REPLACEMENT

WSDOT Standard Specifications Section 7-09 is supplemented with the following:

7-09.1 Description

This Work consists of removal and replacement of the existing 8-inch water main and hydrant located within the CA 2 excavation area. Prior to the start of excavation for pipe removal, City staff will take the water line out of service (de-energize) and install a blowoff assembly. After the pipe has been taken out of service, Contractor will excavate and remove the pipe and hydrant from the excavation area. Following completion of the excavation and commencement of final backfilling, the pipe and hydrant will be replaced by the Contractor as shown on the permitted plans provided in Appendix E.

All Work in this Section shall conform to 6-3.03 Standards for Water Main Construction in the City of Bellingham Development Guidelines and Improvement Standards Version 2.0.

7-09.2 Materials

All pipe shall conform to AWWA Standards H3-71, C151-71 and cement lining C104-71, and shall be ductile cast iron, Thickness Class 50 push-on joints or M.J. joints. The pipe shall be of 150 psi Working pressure, plus 100 psi surge pressure. No PVC or asbestos-cement (AC) pipe will be allowed.

Material for fittings such as crosses, tees, bends, reducers and sleeves shall be ductile iron. Joints shall be M.J. or push-on joints and shall conform to AWWA Specification C-110-71 and C-104-71. All fittings shall have full bolting holes and no knockouts. Fittings shall be Tyler, Clow or equivalent.

Hydrants shall be supplied according to City of Bellingham Standard Plan No. WA-802 and as of January 1, 1990, shall include a Storz-type fire hose adapter fitting. Hydrants shall be M&H 929, Clow Madalion, Waterous Pacer or equivalent.

7-09.3 Construction Requirements

7-09.3(22) Blowoff Assemblies

The City will install the blowoff assembly per City of Bellingham Standard Plan No. WA-810 at the location shown on the permitted plans provided in Appendix E.

7-09.3(25) Pipe and Hydrant Removal

After the City has taken the water main out of service, Contractor shall trench to expose pipe and remove the pipe and hydrant from the planned excavation area. The disconnected pipe

may contain residual water, and the Contractor shall direct that water into the excavation where it can drain or otherwise be removed by the Contractor's excavation dewatering system.

7-09.3(26) Pipe and Hydrant Replacement

Pipe laying shall meet the requirements of Section 7-09 of the WSDOT Standard Specifications. Pipe shall be installed with bedding and backfill as specified in City on Bellingham Standard Plan No. WA-820. The piping and hydrant shall be installed at the locations shown on the permitted plans provided in Appendix E. The hydrant shall be installed according to City of Bellingham Standard Plan No. WA-802 and protected with bollards according to City of Bellingham Standard Plan No. WA-804.

7-09.3(27) Disposition of Removed Pipe and Hydrant

The water pipe and hydrant removed from the excavation shall be designated as Metal Inert Debris for Contractor handling and disposition in accordance with Section 2-04.

7-09.4 Submittals

The Contractor shall submit to the Engineer manufacturer's literature for water pipe and appurtenances meeting these specifications. The Contractor shall not install new pipe until the submitted information is reviewed and approved by the Engineer. Contractor shall detail their means and methods for isolating, cutting and plugging, and replacing pipe in the Excavation and Backfill Plan.

7-09.5 Measurement and Payment

The unit of measurement for Item No. 14L Replace Water Main and Hydrant shall be Lump Sum, based on the scope of Work specified. Payment per unit shall constitute full compensation for Item No. 14L Replace Water Main and Hydrant. This item includes procurement of all necessary materials, and coordination required by the City of Bellingham, and all Work required for removal and replacement.

END OF SECTION

END OF DIVISION 7

DIVISION 08 – MISCELLANEOUS CONSTRUCTION

8-01 EROSION CONTROL AND WATER POLLUTION CONTROL

8-01.1 Description

8-01.1(1) Description of Work

This Work includes controlling erosion of excavation slopes and stockpiled materials, fugitive dust emissions, and discharges of stormwater and sediment from the limits of the Project Limits. Care must be part of the work to prevent any stormwater, soil track out, and fugitive dust from leaving the Project Limits.

Contractor shall install temporary erosion and sediment control measures including reinforced silt fence around perimeter of the Project Limits, compost socks, and catch basin inserts within the Project Limits, as shown on the Plans. The temporary erosion control measures shall be installed by the Contractor and the Contractor shall provide an on-site collection, pumping, conveyance, and treatment system as necessary to contain, treat, and dispose of all stormwater generated within the Project Limits during on-site activities. This system may be combined with the Water Management System described in Section 2-05.

8-01.1(2) Submittals

The Contractor shall adopt the Temporary Erosion and Sediment Control (TESC) Plan illustrated on Drawing Sheets C-01 and C-02. The Engineer has prepared a Stormwater Pollution Prevention Plan (SWPPP) for a Construction Stormwater General Permit with Administrative Order (CSWGP) for the Project (see Section 2-05 and Appendix C). Upon execution of the Contract, the Owner shall assign the CSWGP with SWPPP to the Contractor, and Contractor may modify the SWPPP for Engineer approval.

8-01.2 Construction Requirements

8-01.2(1) Installation of Erosion and Sediment Controls

Soil erosion due to precipitation runoff or run-on to or from excavations, stockpiles, or other soil areas exposed or disturbed during the Work shall be prevented using berms, surface water control, straw bales, temporary sturdy plastic covers (at least 10 mil in thickness), or other appropriate measures.

Contractor shall install, monitor, and maintain all site BMPs and apply all available and reasonable methods to prevent runoff from leaving the Project Limits. Contractor shall routinely inspect entire site to ensure that BMPs are functioning properly, and that Project Limits is in full

compliance with all federal, state, and local permits and codes. Contractor shall remove any accumulation of silt and material at no more than 30% accumulation level.

8-01.2(2) Removal of Erosion and Sediment Controls

After completion of construction and project site stabilization, erosion and sediment control equipment and materials shall be completely removed, and the area restored to its previous condition. Removal of BMPs and control measures shall be at the Engineer's discretion. Any sediment, soil, sludge, or other material that has accumulated in or around the erosion and sediment controls shall be properly disposed of.

8-01.2(3) Inspection

Throughout construction, the ESC Lead will make inspections of all erosion and sediment controls following the Construction Stormwater General Permit and Administrative Order. If, in the opinion of the ESC Lead or Engineer, any of these controls are insufficient or not operating properly, the Contractor shall make necessary repairs or replacements to these features at no additional cost to the Owner.

8-01.2(4) Control of Fugitive Dust Emissions

Contractor shall prevent fugitive emissions of solid materials during on-site activities. No visible dust shall be allowed to migrate outside of the Project Limits shown on Drawing Sheet C-01.

8-01.2(5) Prevention of Track-out of Contaminated Material

Contractor shall minimize equipment traffic through known contaminated areas to prevent contaminated material from being transported via track-out to other parts of the Property, or off the Property. To further minimize track-out, Contractor shall establish a stabilized construction entrance to the Property. All vehicles exiting the Property shall exit only through the stabilized construction entrance. If track-out of material is noted after a vehicle exits the stabilized construction entrance, Contractor shall immediately remove the tracked-out material in accordance with Section 8-05 and modify the stabilized construction entrance to prevent further track-out.

8-01.3 Measurement and Payment

Payment for ESC Lead; installation, inspection, and maintenance of erosion and sediment controls; and compliance with the Construction Stormwater General Permit and Administrative Order shall be part of the lump sum payment for Item No. 01 Mobilization. This item will include all labor, equipment, and materials required to accomplish the Work as specified, including placement, inspection, maintenance, and removal of erosion and sediment controls, stabilized construction entrance, and removal of all accumulated sediment.

Separate payment will not be made for modifying the existing TESC Plan or SWPPP. This cost shall be incidental to the contract and shall be included in the applicable unit cost prices or lump sum prices contained in the Bid Schedule.

END OF SECTION

8-05 STREET CLEANING

8-05.1 Description

8-05.1(1) Description of Work

The Work includes cleaning any roadways or surfaces impacted due to the Work. Contractor will fully remove, at no cost to Owner, any materials from the Project Limits that are deposited outside the Project Limits as a result of Contractor's activities completing the Work.

8-05.2 Construction Requirements

Contractor shall make every effort to clean trucks and equipment to prevent soil or debris from being deposited on paved streets. If soil or debris from the Work is deposited on the streets, the Contractor shall, as a minimum, remove each Day any deposits which may accumulate on the roadway surface. If removal each Day be insufficient to keep the streets clean, the Contractor shall perform removal operations on a more frequent basis. If the Engineer determines that a more frequent cleaning is impractical or if the Contractor fails to keep the streets free from deposits resulting from the Work, the Contractor shall, upon request by the Engineer, provide facilities to remove soil or other deposits from the tires or between wheels before trucks or other equipment will be allowed to travel over paved streets. If the Contractor fails or refuses to clean the streets in question, or the trucks or equipment in question, the Engineer may order the Work suspended at the Contractor's risk until compliance with the Contractor's obligations is assured, or the Engineer may order the streets in question cleaned by others. The Engineer may suspend the Work until the Contractor complies with the requirements and Contractor shall have no claim for delay or additional costs should the Owner choose to suspend the Contractor's Work until compliance is achieved.

8-05.3 Measurement and Payment

Separate payment will not be made for any necessary street cleaning. These costs shall be incidental to the contract and shall be included in the applicable unit cost prices or lump sum prices contained in the Bid Schedule.

The Owner reserves the right for cost reimbursement in-kind of any related costs deemed prudent and necessary by the Engineer due to the Contractor's work, which may include street cleaning. Any Owner costs associated with street cleaning will be deducted from Contractor payments.

END OF SECTION

8-06 CEMENT CONCRETE DRIVEWAY ENTRANCES

WSDOT Standard Specifications Section 8-06 is supplemented with the following:

8-06.1 Description

The work consists of installing two 10-foot by 25-foot concrete drive pads in front of entrances to the Maintenance and Fabrication Shop and Warehouse as shown on Drawing Sheet C-08.

8-06.4 Measurement and Payment

The unit of measurement for Item No. 15 Concrete Drive Pads shall be by the SQUARE FOOT of finished surface. Payment per unit shall constitute full compensation for Item No. 15 Concrete Drive Pads. This item will include subgrade preparation, forming, transportation of material, placement of material and all other Work required for placement.

8-24.2(2) GRAVITY BLOCK WALL

The contractor shall take the proposed wall layout and alignment in the field for onsite review with the engineer and owner prior to beginning ecology block wall construction. Wall alignment may be adjusted from the alignment on the drawings based upon actual field conditions. WSDOT Standard Specifications Section 8-24.3(2) is supplemented with the following:

8-24.2(2)a Description

The work consists of installing an ecology block wall with exposed heights ranging from 6 to 30 inches as depicted on the Drawings and typical total wall height of 4 feet from the top of wall to bottom of wall. Ecology blocks shall be standard 2’ wide by 2’ high by 6’ long or approved equal. Ecology blocks shall have a minimum weight of 3,500 pounds and have grooves on the top and bottom such that they can be stacked. Ecology blocks shall be placed on properly prepared, firm and unyielding subgrade in accordance with Section 2-06.2(1) and as shown on the Drawings. Ecology blocks shall be installed vertically or at a slight inward batter (up to 2 degrees towards retained side of wall). Ecology Blocks shall be submitted to the Engineer for approval.

8-24.2(2)b Measurement and Payment

The unit of measurement for Item No. 16 Ecology Block Wall shall be by the LINEAR FOOT of gravity block retaining wall. Payment per unit shall constitute full compensation for Item No. 16 Ecology Block Wall. This item will include all time and materials for subgrade preparation, separation geotextile installation, ecology block installation, gravel backfill for walls and backfill material placement.

END OF SECTION

END OF DIVISION 8

DIVISION 9 – MATERIALS

9-03 AGGREGATES

Aggregates shall be in accordance with the WSDOT Standard Specifications without amendments. The required aggregates for the project are:

9-03.9(3) Crushed Surfacing Base Course

9-03.12(2) Gravel Backfill for Walls

9-03.12(3) Gravel Backfill for Pipe Zone Bedding

9-03.14(1) Gravel Borrow

END OF SECTION

END OF DIVISION 9

SECTION 26 00 10 – BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01. APPLICABLE PROVISIONS

A. The General, Supplementary and other Conditions of the Contract, modifications to the General Conditions, the Drawings, and the applicable provisions of the other Divisions are hereby made a part of this Division and all its sections.

1.02. SUMMARY

A. The requirements of this Section and the other Division 26 Sections apply to all the electrical work.

B. Coordinate electrical work with related work shown and specified elsewhere.

C. Work Included: The Contractor shall perform all the Work required (including the furnishing of all supervision, labor, services, tools, materials and equipment and the performance of all operations and incidentals necessary) for a complete, safe and reliable electrical installation, adjusted, tested and ready for operation. The electrical work is generally described as follows:

1. Demolition.

2. Removal of existing equipment, protecting & storing of existing equipment during construction, and reinstalling existing equipment.

3. 12,470 volt primary power distribution system and re-connection to existing system, equipment, components, etc.

4. Temporary generators and necessary temporary connections where the expected change-over/shutdown time will exceed the time available.

5. Normal power distribution system including panelboards, feeders, transformers, circuit breakers, disconnect switches, marina ground fault controllers, etc.

6. Grounding.

7. Control and branch circuit wiring system for lighting, outlets, equipment, etc.

8. Wiring devices.

9. Vaults and concrete pads.

10. Locating of existing underground utilities; including power, telephone, cable television, water, sewer, natural gas, etc.

11. Excavation, trenching, backfilling and finish grading; including import of new fill and offsite disposal of excess for electrical work.

12. Repair and/or replacement of any existing facilities damaged by the Contractor (known or unknown, located or not located).

13. Site restoration to existing or better condition; including replacement and/or patching of existing crushed gravel areas, etc.

14. Traffic control, barricades, flagging, etc. at open excavations, trenches, etc.

15. Cutting, core drilling, etc. and patching.

16. Silica hazard control.

17. Moisture, fire and dust stopping and sealing.

18. Supports.

19. Moving of existing equipment, boxes, miscellaneous (storage, maintenance, etc.) objects and materials, attached or unattached, as required to perform the work and returning the items to their original location in their original condition.

20. Temporary facilities and power.

21. Obtaining and paying for all required licenses, permits, inspections and any other fees, unless specifically noted otherwise.

22. Testing and completing, including providing testing of medium voltage cables and connections by an independent testing company.

1.03. ALTERNATES

A. See Section 01 23 00 for description of Alternates. Include work associated with each alternate in the alternate bid price.

1.04. EXISTING CONDITIONS

A. Before submitting bid, examine existing site, building, tunnels, vaults and equipment conditions to determine effect on execution of the work and include costs in bid.

B. Underground utilities are known to exist in the area of construction. The location of existing utilities shown on the drawings is approximate only and is not guaranteed to be an indication of all utilities in the area. The contractor is responsible for contacting the Owner and all utility owners for field location of all utilities prior to construction. The one-call number for underground utility location services is 1-800-424-5555. The Contractor shall promptly notify the Engineer of any conflicts between the contract documents and field location of existing utilities. The Contractor is responsible for maintaining the integrity of all existing utilities during construction.

C. Damaged electrical and telecommunications (telephone, computer/data, television, fiber, copper, etc.) cables shall be replaced in their entirety. Splicing will not be allowed.

1.05. PLAN REVIEW AND PERMITS

A. The Contractor shall arrange for inspections and pay for all required licenses, permits, inspections and fees. Owner will pay plan review fees.

1.06. DEFINITIONS

A. The term "Contractor" used throughout Division 26 of these specifications and on the electrical drawings shall be understood to mean the Electrical Contractor. All other work shall be called out by name.

B. “Approved” means approved by the Engineer. “For approval” means for the Engineer’s approval.

C. “Provide” means furnish and install.

D. "Remove" means to remove the existing item indicated and all associated conduit, boxes, cables, etc. to their point of origin and/or destination; except, concealed conduits and flush boxes may be abandoned in place and/or re-used in the new installation. Cables shall be removed and/or replaced.

E. "Replace" means to remove the existing and add in lieu the new as indicated.

F. “As directed” means as directed by the Engineer.
G. “Concealed” means hidden from sight in trenches, walls, chases, ceilings, etc.

H. “Exposed” means within sight; that is, not concealed as defined above, and installed on the surface of walls, ceilings, etc.

I. “C.O.” means conduit only; that is, without cable (except, provide pull string or rope).

J. “F.O.I.C.” means Furnished by Others outside of prime contract (e.g. Owner, systems contractors working directly with the Owner, etc.), Installed by Contractor.

K. “Furnish” means supply.

L. “Install” means to put or place into position and anchor, support, connect, adjust, etc. for use.

M. Definitions of all other terms, etc. are in accordance with AIA, ANSI, IEEE, IES, NEMA, etc. standard definitions.

1.07. DRAWINGS & SPECIFICATIONS

A. The electrical plan drawings are general in form and do not attempt to show complete details or list every item of the electrical systems, the building construction or the various equipment; however, the routing of raceways and circuits, and the locations of equipment, devices, fixtures, etc. represent the desired finished arrangement; except, as governed by structural or mechanical conditions or obstructions.

B. Specifications are, in some cases, written in an abbreviated form. Words such as shall, shall be, the Contractor shall, and similar mandatory phrases are supplied by inference.

C. Investigate the structural and finish conditions affecting the work. Refer to the architectural, structural and mechanical drawings, supplier shop drawings and submittals, etc. for additional details, equipment ratings, dimensions, location and swing of doors, location and size of partitions, cabinets, etc. and similar features. Verify all dimensions, equipment ratings, etc. with the actual before installation. Arrange the work accordingly.

D. The intent of the drawings and specifications is to include all items necessary for the proper execution and completion of the Work; however, any item or detail not specifically mentioned in the specifications or shown on the drawings, but which is necessary to produce the intended results shall be included.

E. The Contractor shall bring to the Engineer's attention any discrepancies within the Contract Documents, between the Contract Documents and field conditions, and any design and layout changes required due to specific equipment selection, etc. prior to equipment and material purchasing and installation. Corrective work necessitated by discrepancies after purchasing and installation shall be at the Contractor's expense.

F. Verify all equipment and device locations with the Owner and Engineer prior to rough-in

G. Verify exposed conduit routing with the Owner and Engineer prior to rough-in.

1.08. SUBMITTALS

A. Submittals shall provide sufficient detail so compliance with the drawings and specifications can be ascertained. Clearly identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and review materials and equipment. Obtain approval before purchasing. Items not in accordance with the drawings and specifications will be rejected.

B. Prepare detail layout drawings to a larger scale than the contract drawings in areas where the work is of sufficient complexity to warrant additional detailing. Prepare these drawings on tracings the same size as the contract drawings.

C. Submit M.S.D.S. (Manufacturer's Safety Data Sheets) for all chemicals or hazardous materials. All chemicals and hazardous materials to meet NIOSH Permissible Exposure Levels (P.E.L.) and OSHA Time Weighted Average (T.W.A.) requirements before commencing work.

D. If requested by the Owner, provide samples of materials for evaluation.

E. Forward all submittals to the Engineer, together, at one time, in bound folders with tabs and index for each section. Individual or incomplete submittals are not acceptable.

F. The Contractor shall establish quantities, check drawings and data, verify space requirements, dimensions, and possible interferences prior to submittal.

G. The Engineer will review each submittal, mark to indicate action taken, and return. Compliance with specified characteristics is the Contractor's responsibility. Approval of submittals does not release the Contractor from a proper installation, compliance with the drawings, specifications, codes, standards, etc. or coordination of the work.

1.09. SUBSTITUTE PRODUCTS APPROVAL

A. During Bidding:

1. Substitutions for equipment and materials other than that specified will be considered if equal (or better and/or higher) in quality, ratings and function; and similar in type, style, size and appearance.

2. Submit written requests to Owner and Engineer.

a. If received no later than 7 work days prior to Bid opening, requests will be considered, but not thereafter.

b. Bidders will be informed by Addendum of any approved items.

3. Requests shall be accompanied by complete specifications, samples, record or performance, certified tests by impartial, recognized laboratories, and other such information as required to clearly represent the proposed substitution.

4. Final decisions as to quality and suitability of proposed substitutions rest solely with the Owner and Engineer, and will be based on proof submitted.

5. The cost of changes required in order to incorporate the proposed substitution, such as revisions to controls, raceways, wiring, openings, appurtenances, etc., shall be included in the bid. Any cost reduction resulting from substitutions shall benefit the Owner through a reduced bid.

6. When Owner and Engineer approve a proposed substitution, it is with the understanding that Bidder certifies that substitute articles or materials are equal to or better than those specified and that no exception is taken with any of the performance objectives, service or warranty requirements or features herein specified.

B. After Bidding:

1. Substitute products requests will not be considered.

1.10. RECORD DOCUMENTS

A. Submit record documents at completion of the project in accordance with the specific submittal requirements listed elsewhere in these documents.

B. Provide “as-built” drawings in both full size reproducible bond paper form and in software form as AutoCAD current version .dwg type files. Remove all revision clouds. Provide PDF plot files from Autocad.

C. All record documents in software form shall be provided electronically and uploaded in e-Builder project folder. Include the necessary program(s) to read test results. Separate submittals for the various disciplines will not be accepted.

1.11. "AS BUILT" DRAWINGS

A. The Contractor shall continuously maintain a marked job set of as-built drawings as the work progresses, to indicate deviations from the original design, including change orders. Maintain records of all concealed wiring and of actual equipment, device, etc. locations. Provide dimensions from accepted reference lines as needed. The as-built drawings shall be kept on-site and available for inspection by the Owner.

B. Include any detailed equipment, raceway, wiring, etc. diagrams and layouts prepared by Contractor or his subcontractors, suppliers, etc.

C. At substantial completion, Contractor shall modify one complete set of reproducible copies, with all "as built" information and submit these drawings to the Owner for approval. Each sheet shall be marked "CORRECTED TO AS BUILT"; or, if there are no changes, drawings shall be marked "NO CHANGES, INSTALLATION PER PLAN".

D. After approval, Contractor shall transfer all "as built" information from the marked job set and other information as appropriate to AutoCAD .dwg type files. (Consultant/Engineer will provide construction drawings AutoCAD files to contractor.) Utilize the layering scheme, font types, line types, title block, etc. provided in the AutoCAD drawing files. All drawings shall be noted as “As-Built” with a stamp and date. After adding the “as-built” information, return the AutoCAD files to the Consultant/Engineer for inclusion into the final project record set.

E. “As-built” drawings for all portions of the work shall be combined into a single set matching the contract documents. Separate submittals for the various disciplines will not be accepted.

1.12. OPERATION AND MAINTENANCE MANUALS

A. Following installation of the electrical systems, but prior to acceptance of the work, Contractor shall submit to Engineer one electronic copy with information systematically segregated and indexed for easy reference to be reviewed by the Owner and Engineer. After approval of preliminary copy, but prior to project completion, submit 2 finished hard copies and 1 electronic pdf copy.

B. Format shall be $8^1/_2$" x 11" size with neat, clean copies, drawings (accordion folded), etc.

C. Manuals shall include:

1. Record documents (see above); except, full size reproducible bond paper copy of drawings to be provided separately.

2. Submittals, updated to "as built" conditions.

3. Description of systems configuration and operation including component identification and interrelations, including diagrams and supplementary drawings where necessary.

4. Installation, operation, maintenance and programming manuals covering the installed systems, equipment and materials.

5. Maintenance instructions (frequency of service, type of service, etc.).

6. Parts lists for all equipment; including recording information, recommended spares and anticipated useful life.

7. Supplier's names, addresses, telephone and reference order numbers for all equipment and materials.

8. Warranties and Bonds.

9. Copies of final inspection certificates from the authorities having jurisdiction.

D. Omit non-applicable data.

1.13. WARRANTY

A. The complete installation shall be guaranteed for a period of one (1) year after date of project completion. For warranty purposes, the date of project completion shall be considered the date of substantial acceptance of the installation by the Owner certified in writing, and after Owner has received all project close-out requirements specified in Section 01 77 00. All corrective work, if needed and requested by the Owner, shall be provided without cost to the Owner during the guarantee period.

B. All corrective work performed by the Contractor in remedying defective work during the guarantee period following the Owner's acceptance of the project shall be subject to the same guarantee requirements of the original work for a period as specified from the date of completion of the corrective work.

C. Corrective work shall include on-site service by the Contractor, subcontractor or supplier, and/or nearest technical service representative of the equipment manufacturer. Service shall be provided within 24 hours from the time of request for warranty service by the Owner.

1.14. TRAINING/INSTRUCTION AND ASSISTANCE

A. After the installation is complete and operating, and prior to acceptance of the work, Contractor shall conduct instruction period(s) at the site, to point out locations of servicing and maintenance points, and instruct the Owner's representatives in the operation and maintenance of the systems and/or equipment as needed.

B. The person(s) who conduct these instructions and demonstrations shall be Manufacturer's or Contractor's representatives with substantial training and operating experience on this equipment and project. Their qualifications shall be submitted to the Owner before conducting the instruction period.

C. Each period shall include preliminary discussion and presentation of information using the actual maintenance manuals required for this project. Contractor shall notify Owner at least 48 hours in advance of readiness to conduct the instruction period. The actual time and date of instruction period shall be acceptable to the Owner and the Contractor.

1.15. QUALITY ASSURANCE

A. Contractor and Contractor's personnel shall be experienced, thoroughly trained and completely familiar with the systems, equipment, devices, fixtures, materials, etc. and the required methods of installation.

B. Medium Voltage Systems

1. The Contractor shall engage personnel with minimum 5 years experience in terminating and testing medium voltage cabling systems. If requested, the Contractor shall submit qualifications of the person(s) responsible for terminating and testing medium voltage cabling systems for Owner review and acceptance. Acceptance shall be at the sole discretion of the Owner.

C. Contractor shall provide proof, upon request, that all personnel are licensed according to Washington State RCW19.28.161.

D. All materials, equipment and workmanship shall be properly inspected by the Contractor and shall at all times be subject to inspection by the Owner and Engineer. Contractor shall provide all samples, data and documents necessary for such inspection. Owner and Engineer shall be afforded full and free access at the jobsite and the shops and places of business of the Contractor for such inspection and to determine the status of the work. If Contractor covers all or any part of the work prior to any inspection or test specifically requested by Owner and/or Engineer, the cost of any necessary uncovering and replacing shall be borne by the Contractor.

E. Neither the failure to make inspections or tests, nor to discover defective workmanship, materials or equipment, shall prejudice the rights of the Owner or Engineer thereafter to reject the work and/or require its correction.

F. The completed installation shall comply with the more stringent of the requirements of the drawings and specifications, the authorities having jurisdiction, and all laws, ordinances, rules, regulations and requirements in effect at the site, including current editions of the following:

1. NEC - National Electrical Code.
2. National Electrical Safety Code.
3. OSHA - Occupational Safety and Health Act (and its Washington State equivalent).
4. ADA - Americans with Disabilities Act (and its Washington State equivalent).
5. UFC - Uniform Fire Code (and its Washington State equivalent).
6. Washington State Rules and Regulations for Installing Electrical Wires and Equipment (WAC 296-46).
7. Washington State Safety Standards for Electrical Workers (WAC 296-45).
8. Washington State Energy Code.
9. City of Bellingham Fire Protection Development Standards.

G. The following standards establish the minimum requirements for the equipment and installation, unless exceeded by the requirements of the drawings or specifications:

1. ANSI - American National Standards Institute.
2. ICEA - Insulated Cable Engineers Association.
3. IEEE - Institute of Electrical and Electronics Engineers.
4. NEMA - National Electrical Manufacturers Association.

5. NEIS – National Electrical Installation Standards
6. NFPA - National Fire Protection Association.
7. EIA - Electronic Industries Association.
8. TIA - Telecommunications Industry Association.

H. Nothing in the drawings or specifications shall be construed to direct or permit work not conforming to applicable laws, ordinances, rules, regulations, requirements or standards. Discrepancies or conflicts shall be brought to the attention of the Owner and Engineer promptly for resolution.

I. The Owner and Engineer shall be advised whenever an inspection is requested. Any materials, equipment or workmanship that is not (in the opinion of the Owner, Engineer or Inspector) as it should be, shall be taken out and replaced without cost to the Owner.

PART 2 - PRODUCTS

2.01. GENERAL

Coordinate the features of materials and equipment so they form an integrated system.

A. Contractor shall make certain that all materials selected by him, his subcontractors or by his suppliers, conform exactly to requirements of the drawings and specifications. Transmittal of such specifications and drawing information to subcontractors, person manufacturing and/or supplying materials to the project, and rigid adherence thereto, is the Contractor's responsibility.

B. All equipment, devices, fixtures, materials, etc. shall be UL (Underwriter's Laboratories, Inc.) listed, labeled and approved for the service intended where UL standards have been established. If no UL label is available, the label of a testing agency or conformance to national standards recognized and approved by the electrical inspector having jurisdiction is required.

C. All equipment, devices, fixtures, materials, etc. shall be new and installed only if in first class condition.

1. Unless specifically designated as existing.

2. Existing raceways, boxes, etc. may be re-used if in "like new condition" and appropriate for the new installation. (Note that unless specifically noted otherwise existing underground conduits may not be re-used.)

D. All equipment, devices, etc. and their components shall be designed for continuous duty without degradation of function or performance.

E. In the event that any item is not available exactly as specified, the Contractor shall so notify the Owner and Engineer in writing prior to bidding as early as possible to allow ample time for an alternate item to be selected without delay to the project.

2.02. EQUIPMENT MANUFACTURERS

A. Unless specifically noted otherwise, all references to manufacturer’s or supplier's model numbers and other pertinent information herein is intended to establish minimum standards of performance, function and quality.

B. All equipment, devices, materials, etc. shall be of a type manufactured by reputable recognized vendors. Each type or groups of items, system components, etc. having the same or similar function shall be the same manufacturer, make and quality throughout the facility.

C. Approval of a manufacturer's name and/or type does not release the Contractor of the responsibility for providing materials which comply in all details with requirements in the contract documents.

2.03. SPARE CAPACITY

A. Unless sizes and/or quantities are specifically indicated, provide at least 20% spare wiring capacity in all cabinets, panels and raceways.

2.04. ENCLOSURES

A. Equipment, devices, luminaires, boxes, etc. located indoors shall have general purpose (NEMA 1) enclosures.

B. Equipment, devices, luminaires, boxes, etc. located outdoors shall be provided with weatherproof (NEMA 3R) enclosures.

C. Provide gaskets, seals, etc. as required to prevent the entrance of moisture, debris, insects, etc.

D. Enclosures and boxes shall be fabricated from code gauge, or heavier, galvanized steel. Surface preparation and finish shall be manufacturer's standard unless noted otherwise.

E. Include all necessary mounting, etc. accessories.

2.05. SUPPORT CHANNEL

A. Channel, framing members, etc. shall be 12 gauge steel, galvanized, $1^{5}/_{8}$ inch channel width with all necessary accessories.

B. Threaded rod shall be steel, minimum $^{3}/_{8}$ inch diameter.

2.06. ANCHORS AND FASTENERS

A. Anchors and fasteners used shall be of a type designed for use in the base material to which the item is to be attached. Attach to wood with wood or lag screws, to metal with machine screws or bolts and to concrete with carbon steel wedge or sleeve type expansion anchors or self-drilling metal anchors and machine screws or bolts.

B. Powder actuated fasteners, plastic expansion type anchors, nails and toggle bolts are not permitted.

C. Anchors shall be non-corrosive or have suitable corrosion resistant coatings or treatment.

D. Bolts, nuts, screws and other threaded devices shall have standard threads and heads, unless required for tamper-proof installation.

2.07. IDENTIFICATION

A. Provide nameplates for all equipment and other devices used for the control of circuits, equipment, etc. Nameplates shall adequately describe the function or operation of the identified equipment, devices, etc. and, where applicable, include the panel and circuit number(s) from which it is fed. Nameplate designations shall be consistent with the project documents. Submit proposed inscriptions for approval.

B. Definite purpose devices shall be labeled with a description of the device's function, rating and include the panel and circuit number(s) from which it is fed.

C. All outlets shall be labeled with the panel and circuit number(s) from which the device is fed.

D. All non-underground conduits containing medium voltage cable shall be provided with suitable labels every 10 feet identifying the voltage of the cables within the conduits.

E. Nameplates shall be laminated plastic, with lettering etched through the outer covering. Character size as appropriate for the application, approved by Engineer; except minimum 1/8 inch. Nameplates shall be securely fastened with suitable adhesive or self tapping screws. Character and background colors shall conform to the following system color code:

Background.	Char.	System
Black	White	Power & Lighting
Orange	White	Emergency Systems

F. Identification tags shall be plastic, flexible type with a label. Identification tags shall be securely fastened with cable ties. Tags shall be mounted so as to be clearly visible.

G. Labels shall be heavy duty adhesive type, clear with black letters on light colored devices and clear with white letters on dark colored devices; except, labels on devices connected to the emergency power system shall have red letters. Lettering shall be appropriately sized for the application, except minimum $^{1}/_{8}$ inch. Labels on ceiling mounted devices shall be large enough to read from the floor. Labels shall be as manufactured by Kroy, Brothers, or approved equal. Self-adhesive circuit numbers, masking tape, plastic punch type "Dymo" labels, etc. are not acceptable.

PART 3 - EXECUTION

3.01. CONSTRUCTION/WIRING METHODS

A. All wire and cable shall be enclosed within the raceway system.

B. Raceways and cables shall be run concealed in the walls, above the ceiling or below the floor where possible unless indicated otherwise; except, exposed within utility rooms and other similar type spaces. Raceways may be run exposed within public spaces, classrooms, offices, dormitory rooms and the like only where indicated and with prior approval of the Owner and Engineer. Exposed raceways shall be run as neatly and unobtrusively as possible, to the approval of the Owner and Engineer.

C. Equipment shall be surface mounted unless noted otherwise.

D. Devices, etc. shall be flush or semi-flush mounted where connected to a concealed raceway system, and surface mounted where connected to the exposed raceway system.

3.02. GENERAL

A. The installation and demolition shall be done in a neat and workmanlike manner and shall be suitable for the location. Conduit stub-ups, sleeves and ends left open for future connection, unused hubs in fittings and unused holes in boxes shall be plugged or capped to prevent the entrance of moisture and debris.

B. For the actual fabrication, installations, and testing, use only persons thoroughly trained, experienced and completely familiar with the items required and with the manufacturers' recommended methods of installation. In acceptance or rejection of the work, no allowance will be made for lack of skill or experience.

C. The Contractor shall personally, or through a competent superintendent, constantly supervise the work and check all materials prior to installation for conformance with the Contract Documents.

D. Circuits shall be run from equipment to equipment, outlet to outlet, fixture to fixture, device to device, etc. and all homeruns shall be run exactly as shown on the drawings unless permission is obtained from the Engineer to alter the arrangement.

E. Changes in location (e.g. equipment and devices up to 10 feet, trench and conduit routing, etc.) made before installation and deviations to avoid interferences shall be made without increase in Contract Sum.

F. The Contractor shall conduct operations in a manner to avoid the risk of bodily harm to persons or damage to any property. Construction equipment and tools shall be in good operating condition and be designed to perform the work required. The Contractor shall continuously inspect all work to discover any unsafe conditions and be solely responsible for their correction.

G. Use all means necessary to protect the equipment and materials and the work, materials, etc. of the other trades before, during and after installation. Do all cutting carefully to prevent damage to the work. Correct lifting, jacking and/or moving methods shall be used. In the event of damage,

immediately make all repairs and replacements necessary to the approval of the Owner and Engineer without increase in Contract Sum.

H. The Contractor shall provide all cutting, patching, core drilling, etc. as required for the work. Use only journeymen skilled in the necessary cutting or patching operation. Patching shall match adjacent work. Structural members shall not be cut without approval of the Engineer. Where penetrations in structural members for conduits, cables, etc. are allowed, the holes shall be no larger than absolutely necessary.

I. Contractor shall determine the exact location of existing structural components, conduits, piping, wiring, ducts and the like prior to making any new penetrations or openings (or expanding existing openings) in any floor, wall or ceiling.

J. The premises shall be kept free from the accumulation of rubbish and debris caused by the work.

K. The Contractor shall provide all backboards, hangers, supports, chases, anchor bolts, inserts, sleeves and other openings in the construction required for the electrical work.

L. The Contractor shall move existing furniture, bookcases, equipment, etc. as required to perform the work and return the items to their original location in their original condition.

M. Wall, ceiling and floor penetrations by raceways (both inside and outside the raceway), cables, etc. shall be sealed to maintain the original moisture, dust and fire resistance to the approval of the Engineer. Flash and counter-flash all roof penetrations.

3.03. PROTECTION OF PERSONS, FACILITIES & UTILITIES

A. Provide all traffic control, flagging, barricades, barriers, guards, warnings, notifications, etc. at equipment, materials, open excavations, open trenches, etc. and post with warning lights. Barricades on or adjacent to public use and/or vehicular traffic areas such as buildings, roads, parking areas, pathways, etc. shall be chain link construction fence (minimum 6 feet high), locked when Contractor’s personnel are not in the immediate vicinity.

B. Provide heavy-duty steel plate (suitable for vehicle traffic) and/or encircle with chain link construction fence (minimum 6 feet high and locked) over all open excavations, open trenches, etc. when Contractor’s personnel are not present in the immediate vicinity.

C. Provide devices and methods and proceed with sufficient caution to preclude damaging any facilities, utilities (e.g. power, water, sewer, natural gas, telecommunications, etc.) or similar, above ground or underground, concealed or exposed, known or unknown, located or not located. In the event unidentified utilities are encountered, notify the utility, Owner and Engineer.

D. Unless otherwise provided by the drawings or specifications, do not cut or alter any existing utility or similar without authorization of the Owner and Engineer. The Contractor shall pay all costs, as determined by the Engineer, of remedial work necessitated by unauthorized or accidental cutting, patching, trenching, excavating, backfilling, etc. which damages and/or impairs the performance of existing utilities or similar (e.g. power, water, sewer, natural gas, telecommunications, etc.), above ground or underground, concealed or exposed, known or unknown, located or not located.

E. All such work shall be verified with Owner and Engineer before execution of replacement, re-routing, relocation, repair or termination commences.

F. Notify Regulating Agencies, Locator Service, Utility Companies, Engineer and Owner's Project Manager a minimum of a minimum of fourteen (14) days in advance and re-confirmed a minimum of 48 hours in advance, or as mutually agreed upon with Owner, prior to commencement of any such work. Submit procedures to assure safe and continuous operation of the utilities for approval.

G. Proceed with sufficient caution to preclude damaging any utilities or similar (e.g. power, water, sewer, natural gas, telecommunications, etc.), above ground or underground, concealed or exposed, known or unknown, located or not located. In the event unidentified utilities are encountered, notify the utility, Owner and Engineer.

H. Provide a spotter at all times when excavation occurs by use of a backhoe or other mechanical equipment.

I. Provide adequate means of support and protection during earthwork operations.

J. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of Owner and utility, without increase in Contract Sum.

K. Damaged electrical and telecommunications (telephone, computer/data, television, fiber, copper, etc.) cables shall be replaced in their entirety. Splicing will not be allowed.

3.04. COORDINATION AND SCHEDULING

A. The Contractor shall coordinate the work and cooperate with the Owner, other trades and System Contractors to have the work completed to the best advantage, insure there are no interferences, provide reasonable opportunity for the other trades and Contractors to complete their work and to not delay the work.

B. Work under this project will be undertaken with the facility in full operation.

C. Contractor shall coordinate work to avoid disturbance to building operations and personnel, and to allow access for both persons to and within all portions of the facility and vehicles to the facility.

D. Contractor shall schedule all equipment, utility, electrical, telecommunications, fire alarm, fire protection, etc. interruptions with the Owner. When the power is interrupted to an entire building or to a portion of a building, Contractor shall provide a temporary generator and temporary connections as required to provide sufficient power to the building for the extent of the power interruption.

E. Contractor shall schedule building closures, complete or partial, with the Owner.

F. Closures will not be allowed to extend beyond the time the Contractor's personnel are present.

G. All power outages shall be performed during non-standard hours, shall only effect 1 building and/or panel at a time, and shall not exceed 1 hour without temporary generators being provided to power the building and/or panel.

H. Any and all costs incurred for non-standard hours, double-shifts, overtime, etc. or any other costs associated with completing the project within the completion times required shall be included without increase in contract sum.

I. Contractor is responsible for scheduling and to keep work within the time limits for power outages. All other work shall be submitted for approval and acceptance to owner. Contractor will disconnect and reconnect 15kv elbows.

3.05. DELIVERY, STORAGE AND HANDLING

A. All equipment and materials shall be stored neatly and out of the way. Conduit, fittings, cable, etc. shall be stored off the ground, protected from the weather in racks or bins or on shelves. Equipment, panelboards, fixtures, devices, etc. shall be stored indoors in a dry, warm area, free of dust and one in which condensation will not occur.

B. Ship equipment in its original package to prevent damage or entrance of foreign matter. Perform all handling and shipping in accordance with manufacturer's recommendations and packing label instructions. Provide protective coverings during construction.

C. Identify materials and equipment delivered to the site and storage organized to permit checking against approved material lists and submittals.

3.06. TEMPORARY POWER

A. The Contractor shall provide all temporary power services, facilities, equipment, devices, material, etc. required for the construction; including adequate lighting, outlets, balancing, testing, etc. as may be necessary for the proper performance and inspection of the work.

B. All power outages shall be performed during non-standard hours, shall only effect 1 building and/or panel at a time, and shall not exceed 1 hour without temporary power being provided.

C. Any time power is interrupted to any portion of a building and elsewhere where the expected change-over/shutdown time will exceed the time available, Contractor shall provide a temporary generator and temporary connections as required to provide sufficient power to the building for the extent of the power interruption. Provide and maintain temporary equipment in accordance with all applicable safety regulations and subject to approval by the Owner and Engineer.

D. Engine generator sets shall be provided with sound attenuated housings. Sound levels shall not exceed 72dba at 23 feet in any direction from the engine generator set. Submit sound levels for approval prior to bid if other than specified.

E. Contractor shall provide all necessary cables, connections, terminations, mobilization, fuel, de-mobilization and temporary transformers to provide the voltage and power required.

F. Contractor shall provide all necessary receptacles, circuit protection, etc.

G. Electrical power at 120 volts, 1 phase for operation of lighting, small power construction tools and light-duty equipment may be obtained from the existing buildings, free of utility costs; however, doorways shall not be blocked with cords and the like. During power interruptions, and

if Contractor's equipment will not operate on the available power, the contractor shall supply all equipment needed, such as transformer(s), generator(s), etc. and pay all costs involved.

H. The temporary power system shall be provided in a neat and safe manner, in compliance with governing codes and good working practice.

I. The temporary power system shall be removed when no longer required.

3.07. DEMOLITION

A. Contractor shall remove all items indicated as to be removed and all associated equipment, devices, raceways, boxes, cables, etc. back to their point of origin and/or destination; except, concealed conduits & boxes may be abandoned in place and/or existing conduits and boxes may be re-used if in good condition and appropriate for the new installation, at the option of the Contractor. (Note that existing below grade conduits are not suitable for the new installation and shall not be re-used unless specifically noted otherwise.) Existing cables shall be removed or replaced. Provide pull strings in existing conduits being abandoned in place. Existing below grade conduits shall be cut off and capped flush with the floor or grade. Existing concealed boxes shall be provided with suitable blank covers and/or wallplates.

B. Existing equipment, fixtures, devices, etc. to remain shall be protected as required during demolition and construction. In the event of damage, immediately make all repairs and/or replacements necessary to the approval of the Owner and Engineer without increase in Contract Sum.

C. Existing equipment, fixtures, devices, etc. to be re-used in the new work shall be removed carefully, and protected as required during demolition and construction. In the event of damage, immediately make all repairs and/or replacements necessary to the approval of the Engineer without increase in Contract Sum.

D. Items not indicated shall remain "as is"; except, shall be re-connected as required if its circuit is interrupted during the demolition.

E. Holes, openings, etc. where existing raceways, cables, boxes, outlets, etc. are removed and not replaced shall be patched to match adjacent surface.

F. All surplus materials removed during the demolition shall be inspected by the Owner and those items selected shall remain the property of the Owner. All remaining surplus materials shall be removed from the site and disposed of by the Contractor without increase in Contract Sum.

3.08. INTERRUPTIONS

A. Power, fire alarm, telecommunications and other systems interruptions, whether to individual equipment or to the entire system, shall not be done without prior approval and scheduling with the Owner. When the power is interrupted to an entire building or to a portion of a building, Contractor shall provide a temporary generator and temporary connections as required to provide sufficient power to the building for the extent of the power interruption.

B. Power, fire alarm, telecommunications and other systems interruptions that affect operation of the existing facility shall not be done during normal working hours. Some working of non-standard hours will be required, without increase in Contract Sum.

C. Change-over of individual items shall be done 1 at a time where interruptions affect operation of the existing facility (unless building is unoccupied and permission is obtained from the Owner).

D. As much as possible, items shall be pre-assembled and systems prefabricated to minimize the change-over time.

E. Closures will not be allowed to extend beyond the time the Contractor's personnel are present.

3.09. LOCATIONS

A. Locations and mounting heights of equipment, devices, etc. shall be consistent, and in accordance with the requirements of NFPA, ADA and the authority having jurisdiction.

B. Devices and associated wallplates shall be located so as to not span different types of building finishes.

C. In general, surface raceways, etc. shall be mounted as unobtrusively as possible, tight against whiteboard trim, chair rails, in room corners, against ceilings, against chases, etc. and other breaks in the construction.

D. Prior to beginning work, the Contractor shall mark or otherwise show the location of all equipment, vaults, trenches, conduit runs, etc. Obtain specific approval for the location of the work from the Owner and Engineer before beginning.

E. Changes in location (e.g. equipment and devices up to 10 feet, trench and conduit routing, etc.) made before installation and deviations to avoid interferences shall be made without increase in Contract Sum.

3.10. EQUIPMENT, FIXTURES AND DEVICES

A. Equipment, fixtures, devices, etc. shall be installed plumb and true, and shall be square with the adjacent walls, ceilings, structural members and other equipment; in a horizontal or vertical position as intended. The location of similar items shall be consistent.

B. Equipment, cabinets, boxes, fixtures, devices, etc. shall be accurately mounted and leveled and be firmly supported either directly or indirectly by a sound and safe structural member of the building in accordance with manufacturer's instructions, or as directed. Supports shall be neatly placed and properly fastened.

C. The correct lifting, jacking and/or moving gear which will prevent damage shall be used.

D. All bolts, nuts, screws and other fastenings shall be tightened in accordance with manufacturers or listing instructions and all covers replaced on equipment and boxes. All electrical connections, particularly those on bus work in panelboards, etc. shall be checked to ensure tightness and electrical conductivity.

E. Follow manufacturer's installation and/or listing instructions and details where available. Provide all boxes, mountings, wiring or fittings required, standard or special.

F. Provide gaskets, seals, etc. as required to prevent the entrance of moisture, debris, insects, etc. Check for proper fit.

G. Repair damaged corrosion protection and touch-up paint all scratched, marred or damaged factory finish on equipment, devices, fixtures, enclosures, etc.

3.11. SUPPORTS

A. Provide all necessary supports, anchors, fasteners, and backing for all raceways, boxes, enclosures and equipment.

B. Hangers and supports shall be made from standard structural shapes and hardware or systems of shapes, fittings and hardware designed for the purpose.

C. Hangers and supports shall be adequately and safely attached to the building structure. Equipment or materials to be supported shall be securely fastened to the supporting means. Use size and number of attachments as required for a safety factor of at least four. In addition to the weight of the material, consideration shall be given to the weight of the support itself, the weight of materials within, vibration, external operational forces, shock load, etc.

D. Brace all equipment, conduit racks, etc. as required to meet the requirements of seismic zone 3.

E. Attach to wood with wood or lag screws, to metal with machine screws or bolts and to concrete with carbon steel wedge or sleeve type expansion anchors or self-drilling metal anchors and machine screws or bolts.

F. Pad and floor mounted equipment shall be secured with suitable stainless steel anchor bolts, washers, hex nuts, etc.

3.12. CORROSION PROTECTION

A. Maintain the integrity of factory provided corrosion protection. Damaged corrosion protection shall be repaired per manufacturer’s instructions.

B. Paint field cuts with a suitable cold galvanizing compound.

3.13. APPROVALS

A. Prior to rough-in, the Contractor shall mark or otherwise show the location of all equipment and devices, and the proposed routing of raceways, cables, etc. Obtain specific approval for the location of each from the Owner and Engineer before rough-in.

B. Prior to beginning installation of cables, obtain approval of the raceway installation from the Owner and Engineer.

3.14. TESTING

A. The Contractor shall perform all tests required in the various sections of the specifications and shall record the results of those tests.

B. All testing shall be performed by personnel that are trained in the specific task to be performed

C. Medium voltage (15kv) cables and equipment shall be tested by an independent testing company. Both the company and the personnel performing the tests shall have minimum 5 years experience in testing medium voltage cabling and equipment systems. If requested, the Contractor shall submit qualifications of the company and person(s) responsible for terminating and testing medium voltage cabling systems for Owner review and acceptance. Acceptance shall be at the sole discretion of the Owner.

D. Upon completion, all equipment and systems shall be tested for functional operation, including correct phase rotation and all intended modes and sequences of operation.

E. Readings of the voltage and amperage shall be taken on each phase at each panelboard and at the end of the longest branch circuit at no load and full load conditions.

F. All systems shall test free from shorts and grounds and shall be without mechanical and electrical defects. If any test indicates a failure, in the opinion of the Engineer; the item shall be replaced or suitably repaired to the approval of the Owner and Engineer, and the test repeated without additional cost to the Owner.

3.15. CONTRACT CLOSE-OUT

A. Upon completion of the work, and prior to final acceptance, the Contractor shall thoroughly check the installation. Checking shall consist of visual inspection and manual adjustment to confirm correct installation and arrangement and to assure the intended function, response and operability. Checking shall include, as a minimum, the following:

1. Check that equipment, devices, etc. are of the correct type and rating.

2. Check that all raceways, fittings, devices, boxes, enclosures, etc. are secure and that all conduit connections are tight.

3. Check that all electrical connections are correctly tightened.

4. Check that equipment, devices, panelboard circuit directories, etc. are correctly labeled.

5. Check that equipment, fixtures, devices, etc. are clean with all unnecessary labels removed.

B. Upon completion of the work, and before substantial completion and payment, the Contractor shall:

1. Remove from the site and dispose of all surplus and discarded equipment, materials, rubbish, and debris which may have accumulated during the execution of the work.

2. Submit approved "As Built" Drawings, Record Documents, Test Records, Manuals, etc.

3. Submit written warranty statements for equipment, materials and installation.

4. Conduct system tests.

5. Obtain final inspections from the authorities having jurisdiction.

C. Subsequent to final completion and testing operations, instruct Owner's authorized representatives as required in operation, adjustment and maintenance of equipment and systems.

End of Section 26 00 10

SECTION 26 05 00 – COMMON WORK RESULTS

PART 1 - GENERAL

1.01. APPLICABLE PROVISIONS

A. The General, Supplementary and other Conditions of the Contract, modifications to the General Conditions, the Drawings, and the applicable provisions of the other Divisions are hereby made a part of this Division and all its sections.

1.02. SUMMARY

A. The requirements of this Section and the other Division 26 Sections apply to all the electrical work.

B. Coordinate electrical work with related work shown and specified elsewhere.

C. Provide all materials necessary for the proper execution and completion of the work as herein specified or called for on the drawings. Required items not specifically mentioned in the specifications or indicated on the drawings shall be provided as necessary to produce the intended results.

D. In the event that any item is not available exactly as specified, the Contractor shall so notify the Engineer in writing as early as possible to allow ample time for an alternate item to be selected without delay to the project.

1.03. SUBMITTALS

A. Provide submittals for the following:

1. Handholes.
2. Vaults.
3. Warning Tape.
4. Primary cables.
5. Low voltage cables.
6. Load break and Dead break elbows, splices, terminations, stress cones, etc.
7. Independent testing company qualifications.

PART 2 - PRODUCTS

2.01. RACEWAYS

A. Raceways shall be of the types listed below, unless noted otherwise:

1. Electrical Metallic Tubing (EMT) - above grade and in tunnels, except as noted below.

2. Polyvinyl Chloride Conduit (PVC) - below grade, except as noted below.

3. Galvanized Rigid Steel Conduit (GRS) –

a. Below grade conduit bends and risers.

b. Exterior exposed conduits, above grade.

c. Conduits containing primary power system 15 kv cables, above grade.

d. Conduits containing low voltage service and outside transformer secondary cables, above grade and in tunnels.

4. Flexible Metal Conduit (FLEX) - final connections to vibrating equipment only.

B. Raceways shall be sized so that the cable fill does not exceed 40%; except, minimum conduit sizes shall be as follows:

1. $^{3}/_{4}$ inch – above grade branch circuits, ancillary systems circuits or similar, except as noted below.

2. 1 inch – branch circuit homeruns.

3. 1 inch – below grade.

C. PVC conduit shall be heavy-wall (Schedule 40), flame-retardant, suitable for use with 90°C cable, shall not distort from heat it will normally encounter and shall be resistant to low temperature and sunlight effects, impact and crushing.

D. Rigid steel conduit shall be hot-dipped galvanized with threaded couplings and connectors. Below grade steel conduits shall be coated with a suitable asphalt (or equivalent) compound for corrosion protection.

E. Electrical metallic tubing shall be electro-galvanized steel.

F. Flexible conduit shall be galvanized steel; except outdoors, flexible conduit shall be liquidtight type PVC coated galvanized steel. Flexible conduit connections shall be a minimum of 18 inches long.

G. Wireways shall be lay-in type with standard knockouts, screw covers for full channel access and the necessary complement of fittings, connectors, supports, etc. Wireways shall be of sufficient size to accommodate the required number of conduits and cables. Where indicated, or considered necessary, steel barriers shall be installed to separate circuits.

H. Conduit elbows and bends in conduits 2 inch diameter and smaller shall be not less than 6 times the conduit diameter and bends in larger conduits shall be not less than 10 times the conduit diameter; except, minimum 36 inch radius when containing 15 KV cables.

I. Spare, c.o., etc. conduits shall be provided with pull rope below grade and pull string above grade.

J. Below grade spare, c.o., etc. conduits shall be plugged at both ends and their location properly marked.

K. Yellow 3" wide metalized polyethylene warning tape, printed with the words "Caution, Buried Electric Line Below" shall be direct buried 18 inches above the topmost underground electrical conduits, and above pipes. For multi-use excavations and trenches, provide multiple tapes.

2.02. RACEWAY FITTINGS

A. Fittings for steel conduit shall be steel, galvanized or cadmium plated, threaded type. Couplings shall be galvanized steel. Locknuts and bushings shall be galvanized steel.

B. Connectors, couplings, etc. for EMT shall be steel set-screw type; except, steel raintight compression type in potentially wet or damp locations (e.g. outdoors and in tunnels).

C. Fittings for flexible metal conduit shall be of a type specifically designed for the purpose.

D. Fittings for PVC shall be of same manufacturer and material as the conduit.

E. End bells and/or insulated bushings shall be used on all underground conduit system terminations at vaults, junction boxes, padmounted equipment, etc. Conduit terminations at equipment, etc. shall be suitably sealed and/or plugged at both ends to prevent the entrance of moisture. Spare, c.o., etc. conduits shall be provided with removable gasketed covers at the high end to prevent the flow of moisture from one box to another.

F. “Open” end of ancillary, telecommunications, spare, c.o., etc. conduits shall be provided with insulated bushings.

G. Connectors at sheet metal enclosures shall have insulated throats.

H. Provide approved properly bonded expansion fittings, deflection couplings, etc. wherever raceways pass over or through building expansion joints or other locations where raceways may be affected by dissimilar movements of the supporting structure.

2.03. BOXES

A. The use of exposed boxes in areas readily visible to building occupants shall be kept to a minimum. Use conduit outlet bodies (e.g. T, LB, LR, etc.) at conduit intersections unless specifically noted or approved otherwise.

B. Boxes shall accommodate any devices to be installed and shall be sized as required by the applicable codes for number and size of conduits and cables entering and leaving; except minimum as noted below.

C. Indoor boxes above grade in dry locations shall be standard stamped galvanized steel type, suitable for embedment in concrete and/or masonry where required.

D. Boxes installed in wet or damp locations and outdoors shall be threaded rigid body type, cast aluminum or galvanized iron.

E. Unless noted otherwise, larger size pull, splice and terminal boxes shall be fabricated from code gauge galvanized steel, with full access screw type cover unless noted otherwise. Sizes shall be

as required, except minimum as indicated. Terminal boxes shall be provided with power distribution type terminal blocks, with main and branch lugs sizes and quantities as required.

F. Switch, power outlet, device, etc. boxes shall be single or ganged to accommodate the required number of devices; except, flush mounted boxes shall be minimum 4 inches square for conduits 1 inches or less and $4^{11}/_{16}$ inches square for larger conduits. Boxes containing a single device shall be minimum $1^{1}/_{2}$ inches deep. Boxes containing multiple devices shall be minimum $2^{1}/_{8}$ inches deep. Flush mounted boxes shall be equipped with plaster rings and suitable wallplates. Surface mounted boxes shall have raised surface type covers.

G. Branch circuit junction and pull boxes shall be sized as required by the NEC except the minimum size shall be 4 inch, square or octagonal as required, by $1^{1}/_{2}$ inches deep. Branch circuit junction and pull boxes shall have full-access screw covers.

H. Boxes shall be equipped with mud rings where required and proper wallplates and/or covers.

I. Openings in boxes, etc. through which cables are intended to pass shall be provided with suitable nonmetallic grommets.

2.04. HAND HOLES

A. Hand holes shall be precast concrete, $22^{1}/_{2}$" wide x 33" long x 12" deep, open bottom, in accordance with the Washington State Department of Transportation type J-11A, type 2. Covers shall be diamond plated galvanized steel, with lettering "Electric", "Controls", "Street Lighting", "Lighting" or "Communications" according to wiring enclosed within.

B. Mounting hardware (unless specifically noted otherwise), bolts, nuts, washers, etc. shall be stainless steel. All steel parts (except stainless steel) shall be hot-dipped galvanized after fabrication.

2.05. VAULTS

A. Vaults shall be precast concrete with base, 1-piece cover, galvanized diamond plate steel access doors (with pentahead locking bolts), knockouts, drains, galvanized steel C type embedded channels, galvanized steel pulling irons at each bottom corner, etc.

1. Transformer vaults shall be suitable size for the transformer and be in accordance with the manufacturer's recommendations. For 3 phase transformers sized 750 – 2500KVA, Vaults shall be generally sized 4'-8" wide x 7'-0" long x 4'-0" deep. Top lid shall be 8'-0" x 9'-0" x 6" deep with one opening 50" x 18" to match transformer cable compartment. Old Castle Precast #575-LA with custom SNO-PUD cover (#1000825), or approved equal. Contractor shall be responsible to verify it is compatible with the transformer.

B. Mounting hardware (unless specifically noted otherwise), bolts, nuts, washers, etc. shall be stainless steel. All steel parts (except stainless steel) shall be hot-dipped galvanized after fabrication.

C. Ground terminals shall be a #2/0 AWG bare copper cable around the entire perimeter of the vault. Support as required. Tap connections to neutral and ground cables shall be with copper compression type C-taps.

2.06. PRIMARY POWER CABLES

A. Wire and cable sizes indicated and/or specified are minimums only and shall be increased as required due to NEC, system, load, voltage drop, etc. requirements.

B. All wire and cable shall be suitable for wet or dry locations, in conduit, above ground and underground.

C. Primary power cable installed in conduit shall be 15 kv power distribution cable, single conductor, type MV105, copper, shielded, Class B stranded (non-compacted) with an extruded semiconducting conductor shield, minimum 220 mil ethylene propylene (EPR) insulation (133% insulation level), an extruded semiconducting insulation shield, nonmagnetic uncoated copper tape, and an outer PVC jacket. Cable shall be suitable for installation in conduit at maximum conductor temperatures of 105^{o}C for continuous normal operation, 140^{o}C for emergency overload conditions and 250^{o}C for short circuit conditions.

D. Ground cable shall be single conductor stranded copper with 600 volt type XHHW or USE/RHH/RHW insulation.

E. Primary power cable shall be factory tested in accordance with the requirements of ICEA and AEIC, and include with each shipment of cable a certified test report in duplicate together with a statement that the cable meets all the requirements of this specification and industry standards.

F. Cable pulling lubricants shall be of the best quality and shall have no damaging effect on the insulation, shielding or jacket. (Ideal Yellow 77 is not approved.)

G. Cables shall be provided with suitable cable identification tags at all terminations. Tags shall indicate the circuit and the phase of each cable, and shall be large enough and be located properly so that each cable is readily identifiable from outside the vault or equipment. Color coding shall be A – Black, B – Red, C – Blue.

H. 15 kv primary cable shall be manufactured by Okonite, Southwire, Pirelli, Rome or Cablec.

2.07. LOW VOLTAGE WIRE AND CABLE

A. Wire and cable sizes indicated and/or specified are minimums only and shall be increased as required due to NEC, system, load, voltage drop, etc. requirements.

B. All wire and cable shall be suitable for wet or dry locations, in conduit, above ground and underground.

C. Ground electrode conductors shall be copper, bare below grade.

D. Service and below grade feeder cable shall be single conductor stranded copper with 600 volt type XHHW insulation.

E. Branch circuit cable, above grade feeder cable and equipment ground cable shall be single conductor stranded copper with 600 volt type XHHW or THWN/THHN insulation. The minimum conductor size shall be #12 AWG.

F. Line voltage (Class 1) control cable shall be single conductor stranded copper with 600 volt type XHHW or THWN/THHN insulation. The minimum conductor size shall be #14 AWG.

G. Low voltage (Class 2) control cable shall be single conductor copper with 600 volt type XHHW or THWN/THHN insulation if installed in conduit. Low voltage (Class 2) control cable run "open" shall be multi-conductor copper with 300 volt insulation and an overall jacket, type CL2, listed as being resistant to the spread of fire. The minimum conductor size shall be #16 AWG.

H. Color coding for power cable shall be as follows:

1. 480Y/277 volt, 3 phase, 4 wire:
   Phase A = brown, B = orange, C = yellow, N = gray;

2. 208Y/120 volt, 3 phase, 4 wire and 120/240 volt, 1 phase, 3 wire:
   Phase A = black, B = red, C = blue, N = white;

3. Equipment ground cables shall be green.

4. Switch legs shall be the same color as the phase conductors. Switch travelers shall be purple.

I. Cable pulling lubricants shall be of the best quality and shall not have any damaging effect on the insulation.

2.08. CABLE SUPPORTS

A. Cable ties shall be utilized in panelboards, etc. to group and support conductors. All cable shall be fanned-out to terminals and identified by labels; or, if terminated on circuit breakers or control devices, by typewritten indexes or nameplates.

2.09. PRIMARY CABLE TERMINATIONS

A. Taps and splices are not allowed, unless specifically noted otherwise.

B. 200 amp systems primary power cable terminations (e.g. with cables size #3/0 AWG and smaller) at padmounted style switchgear, padmounted style transformers, splice vaults, etc. shall be made up with dead-front, submersible, hot-stick operable 200 amp, 7.2/15 kv load break elbow type terminators with test points. Terminators shall be molded of EPDM rubber, enclosed in a molded semi-conductive jacket that is grounded during operation, and provided with a stainless steel reinforced pulling eye. Cooper LE215 series, 3M 5810 series, or approved equal; provided with cable jacket sealing kit with braided ground strap/bleeder wire for terminating tape shielded cable. The whole assembly shall be complete with all necessary components and/or accessories to make up a complete and operational system.

C. Ground terminals shall be a #2/0 AWG bare copper cable around the entire perimeter of the switchgear, transformers, vaults, etc. Support as required. Tap connections to multi-grounded neutral and/or ground cables shall be with copper compression type C-taps.

D. Quality Assurance

1. The Contractor shall engage personnel with minimum 5 years experience in terminating and testing medium voltage cabling systems. If requested, the Contractor shall submit qualifications of the person(s) responsible for terminating and testing medium voltage cabling systems for Owner review and acceptance. Acceptance shall be at the sole discretion of the Owner.

2.10. LOW VOLTAGE CONNECTIONS AND TERMINATIONS

A. Taps and splices shall be kept to a minimum.

B. Taps and splices in #8 AWG, and smaller, branch circuit cable shall be made with twist-on spring type wire nuts. Taps and splices in larger branch circuit cables, feeder cables, control cables, etc. or below grade will not be allowed without specific approval from the Engineer.

2.11. WARNING TAPE

A. Yellow 3" wide polyethylene metalized warning tape shall be direct buried 12 inches above the topmost underground conduits. For multi-use excavations and trenches, provide multiple tapes.

B. Tape shall be printed with the words:

1. "Caution, Buried Power Line Below" or similar above electrical conduits.

2. "Caution, Buried Lighting Line Below" or similar above lighting conduits.

3. "Caution, Buried Data Line Below" or similar above telecommunications conduits.

2.12. PULL STRING AND ROPE

A. Pull string shall be resistant to rot and mildew and shall not deteriorate when exposed to oil, grease, etc.

B. Pull rope shall be twisted polypropylene treated with ultraviolet stabilizers, minimum 1/4 inch diameter. Rope shall be resistant to rot and mildew and shall not deteriorate when exposed to oil, grease, etc.

PART 3 - EXECUTION

3.01. RACEWAYS

A. Raceways shall be installed straight, plumb and true and shall be without kinks or sags. Exposed raceway runs shall be either parallel or at right angles to walls and structural members, as neatly and unobtrusively as possible (e.g. adjacent to window and door trims and base, at wall/wall or wall/ceiling intersections, etc.).

B. Below grade primary power system conduits shall be direct buried and concrete encased a minimum of 36 inches below grade and/or as required to bury conduits below footings, grade beams, etc., and spaced a minimum of 2 inches between conduits; except, where required to avoid interferences with existing utilities and where rock is encountered, primary system conduits depth may be reduced to 24 inches below grade in roadways and parking areas, and 18 inches below grade elsewhere.

C. Below grade low voltage systems (600v and below) conduits shall be direct buried between 24 and 30 inches below grade (except, conduits below the building concrete floor slab may be run immediately below the floor) and/or as required to bury conduits below footings, grade beams, etc., and spaced a minimum of 2 inches between conduits; except, where required to avoid interferences with existing utilities and where rock is encountered, low voltage systems conduit depth may be reduced to 24 inches below grade in roadways and parking areas, and 18 inches below grade elsewhere.

D. Underground conduits extending into buildings and at transformers, switchgear, etc. shall be suitably sealed or plugged at both ends. Underground conduits between vaults shall be suitably sealed or plugged at the high end. Sealant shall be removable. Ductseal is not acceptable.

E. PVC conduit shall be solvent welded to prevent the entrance of moisture.

F. Verify location, heights, etc. of exposed raceways and cable trays from the Owner and Engineer prior to installation.

G. Raceways and cable trays shall be located to not interfere with the removal of pipes or equipment for maintenance or repair. All raceways shall be kept a minimum of 6 inches away from items producing heat.

H. Above grade raceways, cable trays fittings, etc. shall be securely supported from permanent structural members of building, either directly or indirectly. Raceways shall be fastened at intervals of 8 feet, nominally, and within 36 inches of each outlet, fitting, panel, etc. Caddy clips or wire ties using not less than No. 14 wire and "ladder-ties" which will prevent displacement, may be used only for concealed runs of EMT or GRS to $1^1/_2$ inch. Single runs of exposed conduit shall be supported with steel pipe straps. Conduit shall not be supported from ducts, plumbing or other piping or from other conduits but only from building structural elements.

I. Bends in raceways shall be made without flattening, kinking or reducing the cross-sectional area of the raceway.

J. Bends or intersections in cable tray shall be full radius style, made without flattening, kinking or reducing the cross-sectional area of the cable tray.

K. All raceway and cable trays cuts shall be made square with a proper cutting tool. The inside and outside of all raceway ends shall be reamed after cutting and/or threading to eliminate burrs and rough edges, then wiped clean. Joints shall be cut square and shall butt solidly into couplings. Running threads will not be permitted.

L. Raceways and cable trays shall be closely and tightly fitted in couplings, connectors, boxes, etc. to provide an electrically continuous low resistance ground fault return path. Threaded joints shall be made up with at least 5 threads fully engaged.

M. The raceway and cable tray systems shall be complete (including the installation of bushings, grommets, etc.), snaked and cleaned, and approval of the installation is obtained from the Owner and Engineer, before pulling any cable.

N. Provide red concrete cap above underground conduits.

3.02. EQUIPMENT PADS AND VAULTS

A. Equipment pads, vaults, etc. shall be installed plumb and true and shall be square with the adjacent buildings, property lines and roadway. The location of similar equipment shall be consistent.

B. Prior to excavation, the Contractor shall mark or otherwise show the location of all equipment, vaults, handholes, etc. and obtain specific approval from the Owner and Engineer for the location of each.

C. Vaults and bedding material shall consist of a minimum of 3 to 6 inches compacted sand or gravel, graded level. Backfill shall be good compactable material without large rocks, chunks or sticks. Backfill shall be progressively compacted from the bottom to the top surface to 95% of maximum density, and shall be without voids.

D. Lids, conduit and cable entrances, etc. shall be suitably sealed and/or grouted to prevent the entrance of moisture.

E. Conduit into vaults shall extend no more than 5 inches and no less than 3 inches from the bottom of the box surface. Care shall be taken to assure a neat and convenient arrangement.

F. Core and/or saw cut vaults for conduit entrances.

G. Provide vault drains, sump, etc. as indicated (see civil drawings).

H. Vaults shall be drained from at, or near, its bottom to the nearest point.

3.03. EXCAVATION AND BACKFILLING

A. Excavate to depths noted, and as required for proper completion of all below grade work and cut to sufficient size to provide ample room for construction of forms, shoring and bulkheads as required.

B. Cut existing asphalt, concrete, etc. as required. Push under existing curbs, sidewalks, etc. where possible.

C. Underground utilities (electrical, water, sewer, cable television, etc.) are known to exist in the area of construction. The location of existing utilities shown on the drawings is approximate only and is not guaranteed to be an indication of all utilities in the area. The contractor is responsible for contacting the Owner and all utility companies and for field location of all utilities prior to construction. The one-call number for underground utility location services is 811 (1-800-424-5555). The Contractor shall promptly notify the Engineer of any conflicts between the contract documents and field location of existing utilities. The Contractor is responsible for maintaining the integrity of all existing utilities during construction.

D. Damaged electrical and telecommunications (telephone, computer/data, television, fiber, copper, etc.) cables shall be replaced in their entirety. Splicing will not be allowed.

E. Provide a spotter at all times when excavation occurs by use of a backhoe, excavator or other mechanical equipment.

F. Shore and brace excavations where necessary to prevent cave-ins and in accordance with all safety laws and codes.

G. During excavations and backfilling, extreme care shall be taken to keep rocks and other rough material away from conduits and cables. Pack a minimum of 6 inches of soft fill material (free from stones, rocks and other rough material that might be forced against the conduits and cables during backfilling, or when settling or frost-heaving disturbs the surrounding earth) around conduits and cables. Wash in to avoid air gaps.

H. Backfill shall be good compactable material without large rocks, chunks or sticks. Backfill in all excavations shall be progressively compacted in maximum 12 inch lifts to 95% of maximum density, and shall be without voids.

I. Prior to excavation, the Contractor shall mark or otherwise show the location of all equipment and vaults, and obtain specific approval from the Owner and Engineer for the location of each prior to installing equipment, boxes, raceways, etc.

J. Maintain all bench marks, control monuments and stakes, whether newly established by Surveyor or previously existing. Protect from damage and dislocation. If necessary to disturb existing benchmark, re-establish in a safe place.

K. The clearance between the underground conduit systems and other underground items, such as water and sewer lines shall be as large as necessary to permit maintenance of any of the systems without damage to the other items.

L. Keep all excavations, pits, trenches, etc., entirely free from water. Protect excavations from rain or water from any source during construction. Use suitable pumping equipment or other means as required by conditions. Continue pumping as necessary until completion of work.

M. When operations are interrupted by unfavorable weather conditions, prepare areas by grading and compaction to avoid ponding and erosion.

N. Dirt shall not be permitted to accumulate on roads or adjacent green belts, nor to be washed into drainage ditches.

O. Appropriate steps, such as the application of water, shall be taken to prevent airborne dust due to the work, particularly during excavation and moving of materials.

P. Trenches, excavations and any damage to adjoining areas shall be repaired/restored to existing or better condition to the approval of the Owner, Architect and Engineer.

3.04. WARNING TAPES

A. Direct bury warning tape 12 inches above topmost conduits. For multi-use excavations and trenches, provide multiple tapes. Tapes shall extend into vaults and be stubbed up with and secured to conduits as required for access when testing.

B. Tape shall be printed with the words:

1. "Caution, Buried Power Line Below" or similar above electrical conduits.

3.05. LABELING & IDENTIFICATION

A. Junction boxes concealed in ceiling spaces and exposed in electrical, mechanical, utility rooms, and the like shall be marked with the panel and circuit numbers contained within. Marking shall be legibly hand-written with black indelible ink marker.

B. In each junction and pull box, neutral conductors shall be grouped with associated phase conductors by taping the conductors together.

C. Interior spare, C.O., etc. conduits shall be labeled with their destination. Labeling shall be made by neatly hand writing on the conduits or enclosures with indelible marker.

D. Exterior below grade conduits entering electrical rooms, communications rooms, enclosures, vaults, etc. shall be labeled with their destination. Labeling shall be made by neatly hand writing on the conduits or enclosures with indelible marker.

E. Color coding for power cable shall be as follows:

2. 480Y/277 volt, 3 phase, 4 wire:
Phase A = brown, B = orange, C = yellow, N = gray;

1. 208Y/120 volt, 3 phase, 4 wire:
Phase A = black, B = red, C = blue, N = white;

2. 120/240 volt, 1 phase, 3 wire:
Phase A = black, B = red, N = white;

3. Equipment ground cables shall be green.

3.06. BOXES

A. Boxes shall be installed plumb and true and be firmly supported either directly or indirectly by a sound and safe structural member of the building, and shall be readily accessible for maintenance.

B. Pull boxes or fittings shall be provided in conduit runs as required to prevent excessive stress on the cables during pulling and to allow the minimum required bending radius.

3.07. WIRE AND CABLE

A. All wire and cable shall be enclosed within the raceway system.

B. Inspect cable prior to installation to verify that it is identified properly on the reel or box identification label, is of proper gauge, containing correct number of pairs, etc. Note any buckling of the jacket which would indicate possible problems. Damaged cable or any other components failing to meet specification shall not be used in the installation.

C. Conductors of different voltages, systems, functions, etc. shall not be combined in the same raceway or cable unless specifically noted otherwise.

D. Wire and cable shall not be exposed to weather or mechanical damage longer than necessary. Cut ends of cable shall immediately be sealed.

E. Cable shall be unrolled from reels, or removed from cartons, and installed in a manner which will prevent kinking, crushing or excessive tension on conductors and insulation. Use only guides, rollers, sheaves, etc. that are free-turning and clean. Cable shall not be dragged on the ground or over sharp edges or abrasive surfaces. Slack wire shall be provided at all pull points.

F. The minimum bending and sheave radius for pulling 15 kv individual cable is 24 inches. The minimum bending and sheave pulling radius for 15 kv interlocked armored cable is 60 inches.

G. Cable shall be installed or drawn into the raceway system only after all work of any nature that might cause injury to the cable is completed. The raceway system shall be complete, snaked and cleaned before pulling any cable.

H. All cables shall terminate in an approved enclosure or fitting.

I. Provide wire/cable markers (Brady type or equivalent/better) identifying its circuit number and/or final destination on all cables/conductors (power, telephone/computer, and other ancillary systems) at panels, devices, junction points, etc.

J. Cable pulling lubricants shall be used to minimize pulling stresses on cable pulled into raceways.

K. All cable is subject to subtle damage that may degrade future performance, if abused during installation. In all cable installation, set reels and use sufficient pulleys and manpower so that cables are not pulled around corners or against material that might cause chafing.

OBSERVATION OF IMPROPER CABLING HANDLING TECHNIQUES MAY CAUSE THE CONSULTANT/ENGINEER AND/OR OWNER TO REQUIRE THE CONTRACTOR TO

DISCARD AFFECTED CABLES, INCLUDING ANY OTHERS ALREADY INSTALLED BY THE PERSONNEL FOUND USING INCORRECT PROCEDURE.

L. Conductor connections shall be made with connectors of the proper size and type. Compression connections shall be made with the correct die and number of crimps, or the correct tightening torque in the case of mechanical connectors, according to manufacturer's instructions and recommendations. Use suitable oxide inhibiting joint compound on all aluminum terminations. Care shall be taken to not nick conductors during insulation removal.

M. At pulling points, the cables shall be neatly bundled by circuit.

N. Taps and splices shall be kept to a minimum; and are not allowed in cables larger than #8 AWG, control cable, ancillary systems cable, etc. and below grade without prior approval from the Engineer.

O. Conductor connections shall be made with connectors of the proper size and type. Compression connections shall be made with the correct die and number of crimps, or the correct tightening torque in the case of mechanical connectors, according to manufacturer's instructions and recommendations. Care shall be taken to not nick conductors during insulation removal.

P. Splices and terminations in medium voltage (15kv) cable shall be made with factory engineered kits designed for relieving the electrical stress concentration in the cable insulation. Cutting or splicing of cable shall be done during dry weather or under cover which will insure dry working conditions, by experienced personnel, in strict accordance with manufacturer's recommendations. Clamp shield immediately below connector.

Q. The Contractor shall engage personnel with minimum 5 years experience in terminating and testing medium voltage cabling systems. If requested, the Contractor shall submit qualifications of the person(s) responsible for terminating and testing medium voltage cabling systems for Owner review and acceptance. Acceptance shall be at the sole discretion of the Owner.

3.08. CABLE TESTING:

A. Medium voltage (15kv) cables and equipment shall be tested by an independent testing company. Both the company and the personnel performing the tests shall have minimum 5 years experience in testing medium voltage cabling and equipment systems. If requested, the Contractor shall submit qualifications of the company and person(s) responsible for terminating and testing medium voltage cabling systems for Owner review and acceptance. Acceptance shall be at the sole discretion of the Owner.

B. Medium voltage (15kv) cables shall be tested as follows, in the presence of Owner's personnel:

1. After the cables are installed, but before splices and terminations are made, the insulation resistance to ground shall be measured with a 1000 volt megger with the other phases grounded. The minimum reading shall be 30 megohms.

2. High potential (hipot) tests using DC test equipment shall be done after all splices and termination stress cones have been made and cables are in place but not connected. The step method of hipot testing shall be used, where the voltage is increased in 5kv steps at 10 second intervals to 45kv and held at that point for 15 minutes, per IEEE 576. Readings of

the voltage and leakage current shall be taken every 10 seconds until the maximum is reached, then every minute thereafter.

3. A test failure will indicate either an improper cable termination or faulty cable insulation. Test failure requires the cable to be inspected and the stress cone or connector removed. A cable test can then be made by applying the tester to the conductor and the cable shield to determine the cable insulation resistance. If the cable test indicates the cable to be sound, it can be assumed the failure was in the stress cone or connection. Where cable failure is indicated, the fault shall be located and the entire cable replaced. Where stress cone or connector failure was assumed, rework should eliminate the cause of failure.

4. After reworking the cable termination, the above procedure shall be repeated. Any cable or termination replacement, repeating of tests, etc. shall be done without additional cost to the Owner.

   CAUTION: Grounding and clearances are very important safety items in hipot testing. Shields, ground wire, conductors not under test must be tied to a good grounding system. The conductor under test must have a safe clearance between itself and any of the grounded conductors, shields or other nearby metallic structures. As soon as testing is completed on a conductor, it should immediately be grounded after the residual voltage has decayed to 20% or less of the test value. The ground should be maintained for at least 30 minutes after the test.

5. All primary cable tests shall be performed by an independent testing company acceptable to the Owner.

C. Service and feeder cables, including panels with branch circuit breakers open, shall have the insulation resistance to ground measured with other phases grounded after all splices and terminations are made; except, before connection to utilization equipment, fixtures, etc. Test cables phase to phase and phase to ground, with the other phase(s) grounded. Insulation resistance shall be measured using a 500 volt megger, minimum resistance shall be 1.0 megohm.

D. Branch lighting and general purpose receptacle circuits do not require an insulation test, functional tests only are required; except, all receptacles shall be tested for correct connection using a suitable receptacle tester.

3.09. PENETRATIONS

A. Wall, ceiling and floor penetrations by raceways (both inside and outside the raceway), cables, etc. shall be sealed to maintain the original moisture, dust and fire resistance to the approval of the Engineer.

B. Do not cut, notch or drill structural framing members for the installation of raceways without the Engineer's approval in each case. Holes and penetrations where allowed in studs, joists and other structural members for raceways and cables shall be of a size to allow for a tight fit.

C. Contractor shall x-ray or otherwise determine the exact location of existing structural components, conduits, piping, wiring, ducts and the like prior to making any new penetrations or openings (or expanding existing openings) in any floor, wall or ceiling.

3.10. PULL STRINGS AND ROPES

A. Provide pull ropes in all below grade spare, c.o., etc. conduits, and in all existing conduits where cables are removed.

B. Provide pull strings in all above grade spare, c.o., etc. conduits, and in all existing conduits where cables are removed.

End of Section 26 05 00

SECTION 26 05 26 - GROUNDING

PART 1 - GENERAL

1.01. APPLICABLE PROVISIONS

A. The General, Supplementary and other Conditions of the Contract, modifications to the General Conditions, the Drawings, and the applicable provisions of the other Divisions are hereby made a part of this Division and all its sections.

1.02. SUMMARY

A. The requirements of this Section and the other Division 26 Sections apply to all the grounding work.

B. Coordinate grounding work with related work shown and specified elsewhere.

C. Provide all materials necessary for the proper execution and completion of the work as herein specified or called for on the drawings. Required items not specifically mentioned in the specifications or indicated on the drawings shall be provided as necessary to produce the intended results.

D. In the event that any item is not available exactly as specified, the Contractor shall so notify the Engineer in writing as early as possible to allow ample time for an alternate item to be selected without delay to the project.

PART 2 - PRODUCTS

2.01. GROUNDING

A. Ground rods shall be copper clad steel, $^{5}/_{8}$ inch diameter by 10 feet long minimum.

B. Ground clamps, nuts, washers, etc. shall be corrosion resistant high copper alloy or silicon bronze; except, below grade and foundation rebar ground connections shall be exothermic welded, Cadweld or approved equal.

C. Feeder (high voltage and low voltage) circuits, branch circuits, control circuits, etc. shall include a separate equipment ground cable (sized the same as the largest circuit conductor, unless otherwise noted) run in the same raceway with the circuit conductors or bundled with the circuit conductors if run “open”.

D. Equipment ground conductors for feeder (high voltage and low voltage) circuits, branch circuits, control circuits, etc. installed in metallic raceways shall be redundant, consisting of both an electrically continuous metal raceway system and a separate equipment ground cable (sized the same as the largest circuit conductor, unless otherwise noted) run in the same raceway with the circuit conductors.

2.02. PANELS

A. Provide both ground and neutral bars in panels (new and existing where required). All connectors and lugs shall be solderless, pressure type suitable for copper or aluminum wire.

2.03. WIRE AND CABLE

A. Ground wire and cable sizes indicated and/or specified are minimums only and shall be increased as required due to NEC, system, load, voltage drop, etc. requirements.

B. Ground electrode conductors shall be copper, bare below grade.

C. Ground terminals in power vaults shall be a #2/0 AWG bare copper cable around the entire perimeter of the vault. Support as required. Tap connections to multi-grounded neutral and/or ground cables shall be with copper compression type C-taps.

D. Equipment ground cables for feeder (high voltage and low voltage) circuits, branch circuits, control circuits, etc. shall be single conductor stranded copper with 600 volt type XHHW or THWN/THHN insulation. Conductor size shall match feeder, branch circuit, etc. conductor size unless noted otherwise.

PART 3 - EXECUTION

3.01. GROUNDING

A. All electrical equipment, enclosures, boxes, devices, etc. shall be provided with a ground fault return path by means of an insulated grounding conductor installed with the circuit conductors, and the integrity of the raceway system if applicable. Bond raceway system as required.

B. Ground terminals of all equipment, devices, etc. shall be grounded by the equipment ground conductor.

C. Raceways shall be closely and tightly fitted in couplings, connectors, boxes, etc. to provide an electrically continuous low resistance ground fault return path. Threaded joints shall be made up with at least 5 threads fully engaged.

D. Building steel and interior metal piping systems shall be suitably bonded.

E. Exothermic welded connections shall be done strictly in accordance with manufacturer's instructions, then enclosed in an air-tight sealing compound to prevent moisture intrusion and minimize corrosion. Molds shall not be altered. All connection materials shall be of the same manufacturer.

F. Compression connections shall be made with the correct die and number of crimps, or the correct tightening torque in the case of mechanical connectors, according to manufacturer's instructions and recommendations.

G. Grounding conductors exposed to mechanical damage shall be protected with PVC conduit sleeves with bushings.

H. Before grounding connections are made, contact surfaces shall be thoroughly cleaned. Connections shall be both mechanically and electrically secure.

I. Tests shall be made to verify the continuity of the ground system and all ground fault return paths.

3.02. PRIMARY POWER SYSTEM GROUNDING

A. A ground ring, as detailed, shall be installed at each vault, transformer, and switchgear.

End of Section 26 00 26

SECTION 26 07 00 – THERMAL AND MOISTURE PROTECTION

PART 1 – GENERAL

1.01. APPLICABLE PROVISIONS

A. The General, Supplementary and other Conditions of the Contract, modifications to the General Conditions, the Drawings, and the applicable provisions of the other Divisions are hereby made a part of this Division and all its sections.

1.02. SUMMARY

A. The requirements of this Section and the other Division 26 Sections apply to all the moisture, fire and dust stopping and sealing work.

B. Coordinate moisture, fire and dust stopping and sealing work with related work shown and specified elsewhere.

C. Provide all materials necessary for the proper execution and completion of the Work as herein specified or called for on the drawings. Required items not specifically mentioned in the specifications or indicated on the drawings shall be provided as necessary to produce the intended results.

D. In the event that any item is not available exactly as specified, the Contractor shall so notify the Engineer in writing as early as possible to allow ample time for an alternate item to be selected without delay to the project.

1.03. SUBMITTALS

A. Provide submittals for all moisture, fire and dust stop materials, complete with a description of where each type is proposed to be used.

PART 2 - PRODUCTS

2.01. MOISTURE PROOFING

A. Moisture proofing systems shall be designed and installed to allow the passage of cable, conduit or pipe through exterior walls or floors. They shall provide a barrier seal to prevent the penetration of water and gases into the structure to be penetrated.

B. Underground conduits extending into buildings and at transformers, switchgear, etc. shall be suitably sealed or plugged at both ends. Underground conduits between vaults shall be suitably sealed or plugged at the high end. Sealant shall be removable. Ductseal is not acceptable.

2.02. FIRE STOPPING AND SEALING MATERIALS

A. Fire-stop systems shall be designed and installed to allow the passage of cable, conduit or pipe through fire rated walls or floors. They shall provide a barrier seal to prevent the penetration of fire, smoke, water, and gases, with a fire rating to match the rating of the architectural assembly or structure to be penetrated.

B. Fire-stop systems shall consist of one or more of the following materials:

1. Ablative (typical of silicone-based technology);

2. Cementitious (Can be troweled like grout or mortar, but is specifically designed or the purpose. Grout shall not be permitted);

3. Elastomeric (Flexible substance which resembles rubber);

4. Endothermic (Absorbing heat energy.);

5. Intumescent (Swelling under the influence of heat, pillows, etc.);

6. Mechanical (Assemblies that allow additions or deletions)

C. Fire-stop systems shall be qualified for the intended use.

D. Fire-stop material within wall and floor sleeves and the like shall be intumescent bags. Fire-stop material around cable penetrations, within raceways (except wall and floor sleeves), etc. shall be intumescent bags or soft, pliable, non-hardening intumescent putty, with high dielectric strength (insulator). Material shall allow removal of the material(s)/system(s) for future cable additions and/or removals.

E. Fire-stop products shall be as manufactured by "Nelson", "Dow Corning" or approved equal.

2.03. DUST SEALING MATERIALS

A. Dust seal systems shall be designed and installed to allow the passage of cable, conduit or pipe through non-rated ceilings, walls, partitions or floors.

B. Dust sealant around raceways and the like shall be top grade paintable silicone based or poly-sulfite caulk, or expanding foam type sealant.

C. Dust sealant around cable penetrations, within raceways, etc. shall allow removal of the material for future cable additions and/or removals.

PART 3 - EXECUTION

3.01. INSTALLATION

A. Provide all fire-stop sealing for all penetrations through fire-resistance-rated floors, walls and partition construction; including empty openings and openings containing cables, raceways, cable trays, cable racks, sleeves, supports and other penetrating items as required, both new and existing where new cables, raceways and the like have been installed. Contractor is responsible for verifying the fire rating of the barrier to be penetrated.

1. Provide all fire-stop sealing for all penetrations through fire-resistance-rated floors, walls and partition construction; including empty openings and openings containing cables, raceways, cable trays, cable racks, sleeves, supports and other penetrating items as required, both new and existing where new cables, raceways and the like have been installed. Contractor is responsible for verifying the fire rating of the barrier to be penetrated.

2. Install fire-stop systems in accordance with manufacturer-tested methods and to manufacturer's instructions. If required, extend fire-stop system through the full thickness of the wall or floor and through the full length of the sleeve.

3. Seal openings with a removable fire-stop material after each shift. Do not leave unattended openings in building fire-resistance-rated walls, partitions and floors at any time during construction.

B. Where sleeves or penetrations are installed through non-rated partitions, provide a dust seal to prevent dust from migrating between the spaces separated by the partition. Also, where fire stop material does not completely fill an opening (e.g. intumescent pillows), provide suitable dust sealant as required.

C. Underground conduits extending into buildings and at transformers, switchgear, etc. shall be suitably sealed or plugged at both ends. Underground conduits between vaults shall be suitably sealed or plugged at the high end. Sealant shall be removable. Ductseal is not acceptable.

D. Conduit penetrations into vaults, through retaining walls and through building exterior walls shall be core and/or saw cut, and suitably sealed and/or grouted to prevent the entrance of moisture.

E. PVC conduit shall be solvent welded to prevent the entrance of moisture.

F. Vault lids shall be suitably sealed and/or grouted to prevent the entrance of moisture.

G. Vaults shall be drained from at, or near, its bottom to the nearest point in a storm drainage ditch below the level of the vault base. Provide suitable rodent screen on the end of each drain.

End of Section 26 07 00

SECTION 26 20 00 – LOW VOLTAGE ELECTRICAL TRANSMISSION

PART 1 - GENERAL

1.01. APPLICABLE PROVISIONS

A. The General, Supplementary and other Conditions of the Contract, modifications to the General Conditions, the Drawings, and the applicable provisions of the other Divisions are hereby made a part of this Division and all its sections.

1.02. SUMMARY

A. The requirements of this Section and the other Division 26 Sections apply to all the electrical work.

B. Coordinate electrical work with related work shown and specified elsewhere.

C. Provide all materials necessary for the proper execution and completion of the work as herein specified or called for on the drawings. Required items not specifically mentioned in the specifications or indicated on the drawings shall be provided as necessary to produce the intended results.

D. In the event that any item is not available exactly as specified, the Contractor shall so notify the Engineer in writing as early as possible to allow ample time for an alternate item to be selected without delay to the project.

1.03. SUBMITTALS

A. Provide submittals for the following:

1. Panelboards.
2. Circuit breakers.
3. Transformers.
4. Marine Ground Fault Controller.

PART 2 - PRODUCTS

2.01. PANELS

A. Panels shall be dead-front, door in door, circuit breaker type panelboards, suitable for use as service entrance equipment where required. Branch circuits shall be arranged using double row construction. Interiors shall be rigid and so designed that circuit breakers can be replaced, changed or added without disturbing adjacent units and without machining, drilling, or tapping.

B. Busses shall be copper or tinned aluminum. Ground and neutral bars shall be provided. All connectors and lugs shall be solderless, pressure type suitable for copper or aluminum wire.

C. Circuit breakers shall be bolt-on in panelboards, molded-case, thermal magnetic, quick make-quick break type with trip indicating handles. Branch circuit breakers for motor loads shall be HACR type. Branch circuit breakers for lighting loads shall be SWD type. Multi-pole breakers shall be single-handle, internal common trip. Tandem breakers shall not be used. Provide padlocking devices on circuit breakers where required.

D. Panels and circuit breakers shall be fully short circuit rated. Series rating of circuit breakers are not allowed.

E. Circuit breakers for installation in the existing panelboard(s) shall be of the same manufacturer, and be of a type manufactured specifically for that type and vintage of panelboard.

F. Spaces shall be bussed for the maximum device that can be fitted into them, and shall be equipped with mounting and connecting accessories for future installation of circuit breakers.

G. Panels shall be suitable for top and bottom entry of feeder and branch circuit conduits, cables, etc.

H. Panels shall be industrial/commercial type panelboards with hinged door in door cover, catch and lock (all keyed alike). Residential type loadcenters will not be allowed.

I. Panels and each feeder breaker in each (clearly and accurately identifying the function and location) shall have laminated plastic master nameplates. The panelboard nameplate shall include the name of the panel and the name and location of the equipment from which the power originates.

J. Panels shall be provided with laminated plastic nameplates to identify the system color coding scheme for phase and neutral conductors as required.

K. Panels shall be provided with warning nameplates to warn personnel of potential arc flash and shock hazards in compliance with the NFPA 70E standard. Nameplates shall include the voltage system, arc flash boundary limits and PPE category specific to the location.

L. Panels shall have a circuit directory frame and card with a transparent cover furnished on the door. Directory cards shall have a typewritten index clearly and accurately identifying the function and location (using the room name and numbering system shown on the Architectural plans) of the circuit. Provide new typewritten circuit directory cards for all existing panels that are modified in any way.

M. Circuit directory cards shall be arranged to match the physical arrangement of the breakers, with odd numbered circuits on the left side of the card and even numbered circuits on the right side of the card. Where required due to the size of the directory frame, the odd numbered circuits may be on a separate card from the even numbered circuits. Odd and even numbered circuits shall not be intermingled together.

2.02. SEPARATELY MOUNTED CIRCUIT BREAKERS

A. Circuit breakers shall be molded-case, thermal magnetic, quick make-quick break type with trip indicating handles, suitable for use as service entrance equipment where required. Multi-pole breakers shall be single-handle, internal common trip. Main and/or feeder and branch circuit

breakers shall be series short circuit rated. Provide padlocking devices on circuit breakers where required.

B. Circuit breakers shall be fully short circuit rated.

C. Where not immediately obvious from its location, circuit breakers shall be identified with laminated nameplates, black face, white core, engraved with minimum $^1/_4$ inch letters describing its function.

2.03. POWER TRANSFORMERS

A. Transformers shall be ventilated dry type with steel enclosure. Transformers shall meet the latest NEMA & DOE energy efficiency standards.

B. Transformers shall be designed to have low no load (core) losses, meet the requirements of the Class I Efficiency Levels for distribution transformers.

C. Transformers shall have a minimum of two 2.5% full capacity primary taps above and below rated primary voltage.

D. Insulation system shall be Class 220 designed for 150°C rise above 40°C ambient. The maximum temperature at the top of the enclosure shall not exceed 50°C rise above 40°C ambient.

E. Coils shall be continuous wound, impregnated with high quality varnish. Coils shall be securely bonded and braced to resist possible winding displacement.

F. Cores shall be constructed of highest quality grain-oriented non-aging cold-rolled silicon steel. Magnetic flux densities shall be kept well below the saturation point.

G. Sound levels shall be guaranteed by the manufacturer to not exceed NEMA Standard. The core and coil assembly shall be isolated from the enclosure by means of rubber vibration absorbing mounts.

2.04. MARINE GROUND FAULT CONTROLLER

A. Ground fault control panel shall be capable of detecting ground faults and tripping shunt-trip type breakers, be suitable for salt water marina environment, contain adjustable trip setting that are capable of 30mA and 100mA settings.

B. Enclosure shall be NEMA 4X, with concealed test and reset buttons, power and alarm LED’s, no strobe light. System must satisfy NEC Article 555.3 requirements.

C. Ground fault control panel shall be multiple channel type, capable of monitoring and tripping up to 2 circuits. Current transformers (CTs), shall be provided for each monitoring circuit as indicated on the drawings.

D. Control panels, current transformers (CTs), wiring, etc., shall be both individually mounted and/or factory mounted and wired within substations as indicated on the drawings.

E. Ground fault control panels shall be capable of monitoring 480V, 3phase, 120/240V single phase circuits as indicated on the drawings. Provide 480V-120V control power transformers in NEMA 3R enclosure at locations where only 480 volt is present.

F. Ground fault control panels shall be manufactured by Bender of Coatesville, PA, model Marina Guard, or approved equal.

2.05. EQUIPMENT IDENTIFICATION

A. Provide nameplates for all equipment and other devices used for the control of circuits, equipment, etc.

B. All outlets shall be labeled with the panel and circuit number(s) from which the device is fed. Labels shall be heavy duty adhesive type, clear with black letters on light colored devices and clear with white letters on dark colored devices. Lettering shall be appropriately sized for the application, except minimum $^{1}/_{8}$ inch. Labels on ceiling mounted devices shall be large enough to read from the floor. Labels shall be as manufactured by Kroy, Brothers, or approved equal. Self-adhesive circuit numbers, masking tape, plastic punch type "Dymo" labels, etc. are not acceptable.

C. Nameplates shall adequately describe the function or operation of the identified equipment, devices, etc. and, where applicable, include the panel and circuit number(s) from which it is fed. Nameplate designations shall be consistent with the project documents. Submit proposed inscriptions for approval.

2.06. WIRING DEVICES

A. Wiring devices shall be specification grade, all of the same manufacturer, color to match existing devices.

B. Lighting switches shall be toggle, AC quiet type rated 20 amps, 120-277 volt.

C. General purpose receptacles shall be 20 amp, 125 volt, AC, straight blade, 3-wire grounding type.

D. Ground fault interrupter (GFI) type receptacles shall be duplex, Class A, 15 amp, 125 volt. Provide individual ground fault interrupter type receptacles at each location indicated or as required. Feed-through type protection of multiple outlets will not be allowed.

E. Special purpose receptacles shall be of the type, ratings and design for the use intended, NEMA configuration.

F. Surface mounted devices shall have raised surface type covers, galvanized steel.

G. Weather-proof receptacles shall be equipped with heavy duty die cast while-in-use covers. Covers shall maintain a weatherproof rating whether or not an attachment plug is inserted. Intermatic WP1010MC series, or approved equal.

H. Definite purpose devices shall be labeled with a description of the device's function, rating and circuit identification.

I. All outlets shall be labeled with the panel and circuit number(s) from which the device is fed. Labels shall be heavy duty adhesive type, clear with black letters on light colored devices and clear with white letters on dark colored devices. Lettering shall be appropriately sized for the application, except minimum $^1/_4$ inch. Labels on ceiling mounted devices shall be large enough to read from the floor. Labels shall be as manufactured by Kroy, Brothers, or approved equal. Self-adhesive circuit numbers, masking tape, plastic punch type "Dymo" labels, etc. are not acceptable.

PART 3 - EXECUTION

3.01. TEMPORARY POWER

A. The Contractor shall provide all temporary power services, facilities, equipment, devices, material, etc. required for the construction; including adequate lighting, outlets, balancing, testing, etc. as may be necessary for the proper performance and inspection of the work.

B. During power interruptions, and if Contractor's equipment will not operate on the available power, the contractor shall supply all equipment needed, such as transformer(s), generator(s), etc. and pay all costs involved.

C. The temporary power system shall be provided in a neat and safe manner, in compliance with governing codes and good working practice.

D. The temporary power system shall be removed when no longer required.

3.02. LOCATIONS

A. The mounting heights and location of similar equipment and devices shall be consistent, in accordance with the requirements of the ADA where applicable. Special purpose items shall be located conveniently for the purpose intended.

B. Disconnect switches, circuit breakers, etc. shall, in no case, be installed so that the grip of the operating handle, when in its highest position, is more than $6^1/_2$ feet above the floor or working platform.

C. Prior to rough-in, the Contractor shall mark or otherwise show the location of all equipment and devices, and obtain specific approval from the Owner and Architect for the location of each prior to installing enclosures, boxes, raceways, etc.

3.03. EQUIPMENT AND DEVICES

A. Equipment, devices, enclosures, etc. shall be installed plumb and true and shall be square with the adjacent walls, ceilings and structural members. The location of similar items shall be consistent.

B. Equipment, cabinets, boxes, etc. shall be accurately mounted and leveled and be firmly supported either directly or indirectly by a sound and safe structural member of the building in accordance with manufacturer's instructions, or as directed. Supports shall be neatly placed and properly fastened.

C. The correct lifting, jacking and/or moving gear which will prevent damage to the equipment shall be used.

D. All bolts, nuts, screws and other fastenings shall be tightened and all covers replaced on equipment and boxes. All electrical connections, particularly those on bus work in panelboards, etc. shall be checked to ensure tightness and electrical conductivity. All gaskets, seals, etc. shall be checked for proper fit.

E. Follow manufacturer's installation details wherever available. Provide all boxes, mountings, wiring or fittings required, standard or special.

F. The Contractor shall touch-up paint all scratched, marred or damaged factory finish on equipment, devices, enclosures, etc.

3.04. EQUIPMENT TESTING

A. Before testing, visually inspect equipment thoroughly, and perform mechanical operation tests in accordance with manufacturer’s instructions.

B. Before energization, verify proper phase markings and test from phase to phase and phase to ground for each phase.

C. Before energization, the insulation resistance of the transformer windings shall be tested with a 500 volt megger. Test primary insulation to ground with tank and secondary winding grounded. Test secondary winding insulation to ground with tank and primary winding grounded. The minimum acceptable insulation resistance to ground is 8 times the KV rating of the winding under test.

D. Insulation Resistance Tests:

1. Test using a 500 VDC or 1000 VDC megohmmeter.

2. Ground all phases not being tested.

3. Measure insulation resistance at one minute following the application of the test voltage.

4. Ground each phase at the completion of the test.

E. Compare test results with factory-obtained results and results on similar equipment. Investigate variations. Consult manufacturer for recommendations.

F. Upon completion, all equipment and systems shall be tested for functional operation, including all intended modes and sequences of operation.

G. Record the values of each test, along with the description of the instrument, voltage level, temperature, time, and date of the test on the form included in the contract documents. Sign the results.

End of Section 26 20 00

APPENDIX A

Compilation of Relevant Subsurface Information for Upland Cleanup

Boring Logs from Remedial Investigation (1998-2015)

Legend

- Floyd|Snider Vibracore Location (2015)
- Floyd|Snider Geoprobe Location (2011, 2013, 2015)
- Floyd|Snider Grab Sample Location (2011, 2013)
- Floyd|Snider Hand Auger Location (2011, 2013)
- Floyd|Snider Monitoring Well (2011, 2013, 2015)
- Floyd|Snider Surface Soil Sample Location (2013)
- Geoengineers Grab Sample Location (1996)
- Inaccessible or Decommissioned Monitoring Well
- MCI and Ecology Upland Grab Sample Location (1993)
- RETEC Monitoring Well
- RETEC PSDDA Vibracore Sample Location (2004)
- RETEC Phase 2 Boring Location (1998)
- RETEC Phase 2 Grab Sample Location (1998)
- RETEC Phase 2 Test Pit Location (1998)
- RETEC Phase 2 Vibracore Sample Location (1998)
- RETEC RI/FS Cesium Core Sample Location (2000)
- RETEC RI/FS Grab Sample Location (2000, 2003)
- RETEC RI/FS Offshore Sample Location (2005)
- RETEC RI/FS Upland Sample Location (2005)
- RETEC RI/FS Vibracore Sample Location (2000)
- Tax Parcel
- 1998 Bathymetry Data
- Harbor Line
- 0-feet Mean Lower Low Water Level
- Riprap
- Preliminary Site Boundary

N

0 62.5 125 250

Scale in Feet

Notes:
- Basemap and locations of previous investigations provided by The RETEC Group (Phase 2 and RI/FS sampling).
- Interim Action confirmation sample locations not shown.
- Aerial image provided by City of Bellingham, 2013.

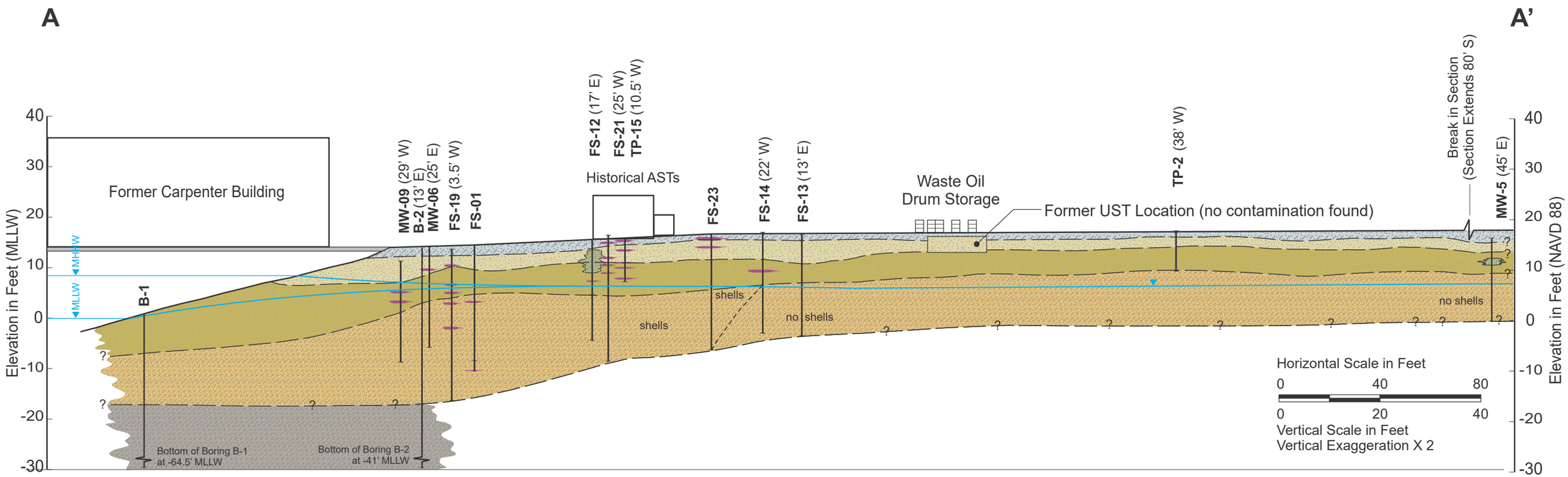
Abbreviations:
Ecology = Washington State Department of Ecology.
MCI = Maritime Contractors, Inc.
MLLW = Mean Lower Low Water.
PSDDA = Puget Sound Dredged Disposal Analysis.
RI/FS = Remediation Investigation/Feasibility Study.

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Remedial Investigation/Feasibility Study
Harris Avenue Shipyard
Bellingham, Washington

Figure 2.5
Historical and Current Sample Locations

I:\GIS\Projects\POB-HARRIS\MXD\RIFS_Figures\RIFS 2018 Figures\Figure 2.5 Historical and Current Sample Locations.mxd
6/7/2019



Gravel Base

Sand with Gravel

Sand with Gravel, Increased Silt

Silty Sand

Silty Sand with Gravel (TILL)

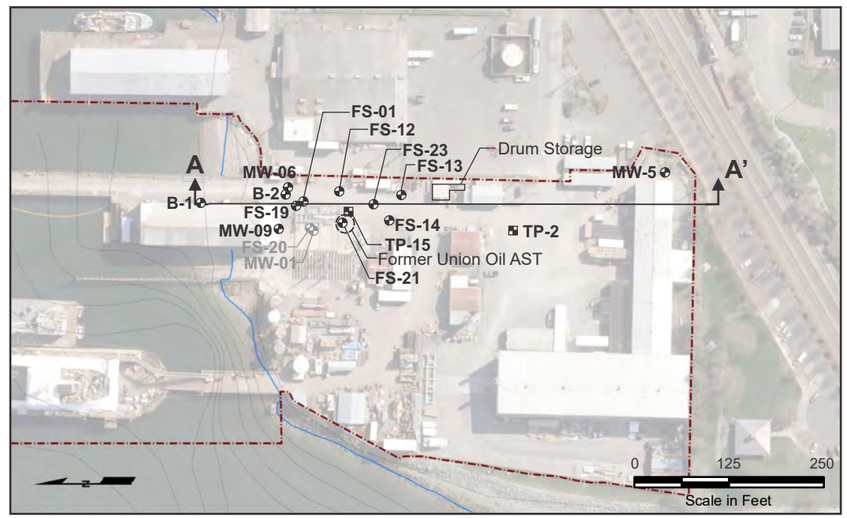
Silt Lense

Petroleum Indications in Soil Samples
(sheen, odor, TPH concentration, > MTCA Method A)

Groundwater Surface

Monitoring Well or Soil Boring Location

(17' E) Offset Distance and Direction



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Remedial Investigation/Feasibility Study
Harris Avenue Shipyard
Bellingham, Washington

Figure 3.1
Site Geology Cross Section A-A'

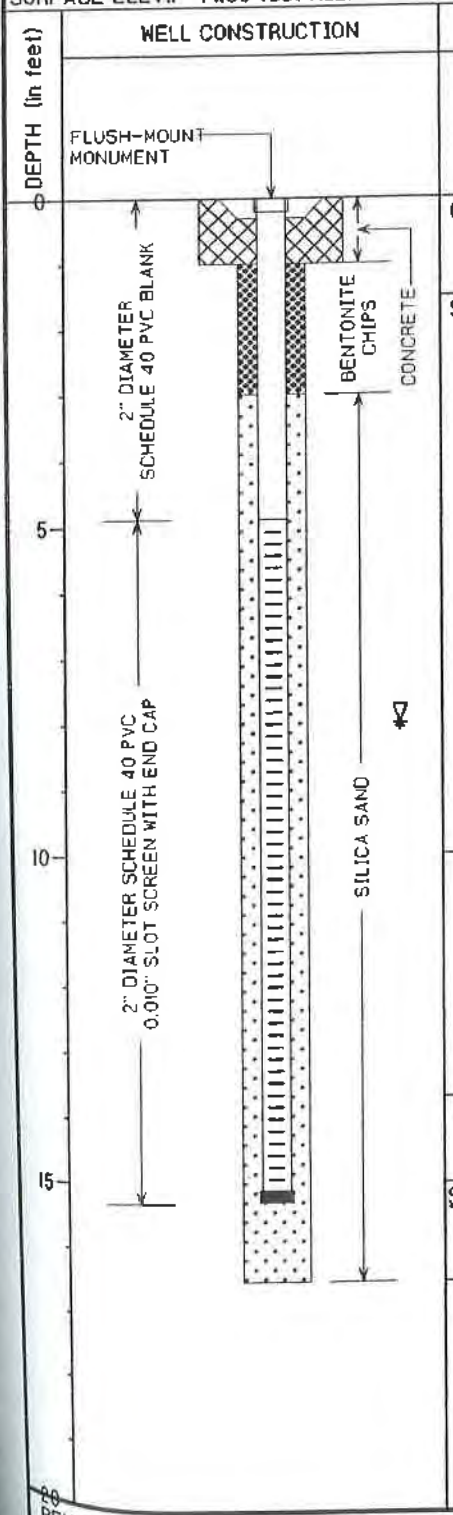
g:projects/clients/floydsnider/harrisavenue/2018/Figure 3.1.cdr

RETEC

WELL INSTALLATION LOG
Monitoring Well MW-1

1011 S.W. Klickitat Way
Suite #207
Seattle, Washington 98134
(206) 624-9349

PROJECT NO: 3-3579-150 Phase 2 Sampling		CLIENT: Port of Bellingham
LOCATION: Bellingham, Washington; E of Marine Railway, S of Pier Building		DRILLING CO.: Cascade Drilling
START DATE: 04/28/98 TIME: 17:00	BORING ID: 8 inches	DRILLER: Rodney
COMPLETION DATE: 04/28/98 TIME: 18:30	TOTAL DEPTH: 16.5 feet bgs	RIG TYPE: Limited Access
WATER LEVEL DURING DRILLING: 8.0' bgs	TOP OF CASING: 13.96 feet MLLW	METHOD: Hollow-stem Auger
SURFACE ELEV.: 14.30 feet MLLW	MP ELEV.: 13.96 feet MLLW	LOGGED BY: J. J. Henley



DEPTH (in feet)	U.S.C.S.	LITHOLOGY	SOIL DESCRIPTION	SAMPLE DATA TYPE	DEPTH	BLOWS/6"	% RECOVERY	PID (ppm)
0	GP		GRAVEL WITH SAND: Gray/black; tightly packed. *0.5'* – Trace wood debris; nail.					
	SW		SAND WITH GRAVEL: Gray/black; very fine- to coarse-grained; with fine to medium gravel; 10% fines; no sheen; no odor.	H				7.0
5			*5.0'* – Brown; trace fine gravel. *5.2'-5.5'* – Gray; trace fine gravel; moist.	SS		16 50	33	3.0
			7.5'-8.0' – Moist.	SS		16 32 50/4"	60	150
10			*8.5'-9.0'* – Grades to fine- to coarse-grained sand; with fine gravel; 5% to 10% fines; very moist to saturated; slight LNAPL on surface; petroleum odor.					
	SP		SAND: Gray; very fine- to medium-grained; 10% fines; saturated; slight sheen; slight petroleum odor.	SS		NR	80	7.4
			12.5'-13.7' – Grades to fine- to medium-grained sand; trace fine gravel; little to no fines; saturated; no sheen; no odor.	SS		20 50	90	2.6
	SM		SILTY SAND: Gray; very fine-grained; trace clay; not sticky; no sheen; no odor.					
15	SP-SM		SAND WITH SILT: Gray; very fine-grained, with fine-grained; with silt; 5% to 10% shell material; trace clay; trace fine cobble; trace coarse gravel; very saturated; no sheen; no odor.	SS		30 50/5"	60	2.1
			Total depth = 16.5 feet bgs.					
20								

REMARKS:
H – Hand Auger
NR – Not Recorded
SS – Split Spoon
■ – Analytical Sample
Ø – Sample Interval

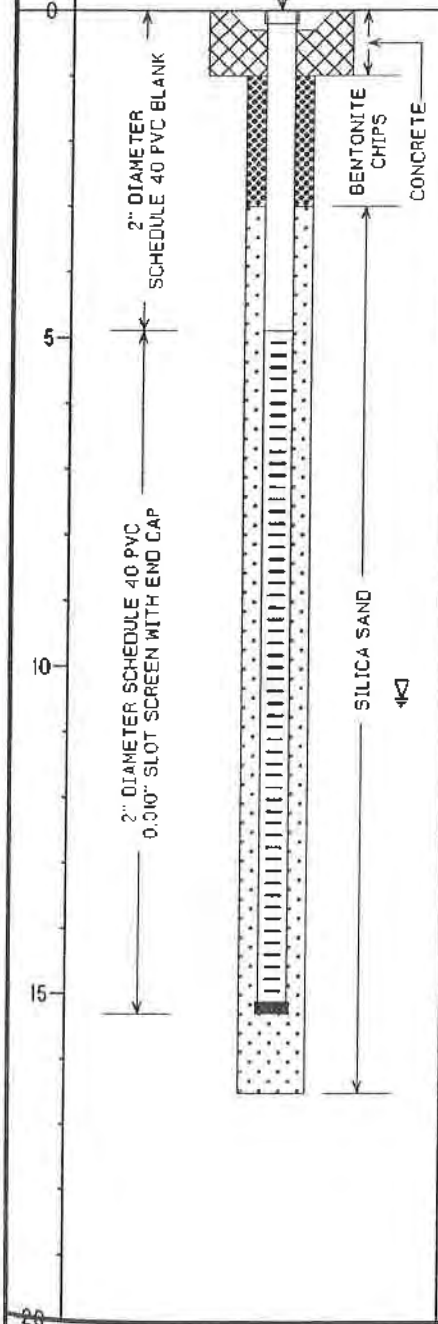
D-1-1-H-00428

RETEC

WELL INSTALLATION LOG
Monitoring Well MW-2

1011 S.W. Klickitat Way
Suite #207
Seattle, Washington 98134
(206) 624-9349

PROJECT NO: *3-3579-150 Phase 2 Sampling*			CLIENT: *Port of Bellingham*
LOCATION: *Bellingham, Washington; Harris Ave. Shipyard N of Water Treatment Building*			DRILLING CO.: *Cascade Drilling*
START DATE: *04/28/98* TIME: *12:18*	BORING ID: *8 inches*		DRILLER: *Rodney*
COMPLETION DATE: *04/28/98* TIME: *13:20*	TOTAL DEPTH: *16.5 feet bgs*		RIG TYPE: *Limited Access*
WATER LEVEL DURING DRILLING: *10.5' bgs*	TOP OF CASING: *15.05 feet MLLW*		METHOD: *Hollow-stem Auger*
SURFACE ELEV.: *15.32 feet MLLW*	MP ELEV.: *15.05 feet MLLW*		LOGGED BY: *J. J. Henley*



DEPTH (in feet)	U.S.C.S.	LITHOLOGY	SOIL DESCRIPTION	TYPE	DEPTH	BLOWS/6"	% RECOVERY	PID (ppm)
0	SW		SAND: Brown; fine- to coarse-grained; 5% fine to medium gravel; 5% to 10% fines; damp; no sheen; no odor.	H				25
5	SW		SAND: Brown; fine- to coarse-grained; with 5% to 10% fines; damp; no sheen; no odor.	SS		50 50/ 3"	NR	5.7
	SP		SAND: Black (oily appearance); very fine- to fine-grained; trace fines; moist to very moist; LNAPL on surface during shake test; strong petroleum odor.	SS		32 47 48	NR	44.7
10	SW		*9.5'-10.0'* - Grades to brown gravelly sand; slight petroleum odor.	SS		8 11 14	67	6.1
			SAND: Brown/gray; very fine- to coarse-grained; ~10% fines; trace coarse gravel; very moist; no sheen; no odor.	SS		21 27 30	33	4.8
			10.5'-10.8' - Grades to gray very fine- to fine-grained.					
			10.8'-11.0' - With 10% fine to medium gravel; saturated.					
15	SP		*12.0'* - Grades to brown/gray very fine- to coarse-grained; 10% fines; trace fine gravel; very saturated.	SS		50 50/ 3"	44	2.8
			SAND: Gray; very fine- to fine-grained, trace coarse-grained; 10% to 15% fines; very saturated; no sheen; no odor.					
20			Total depth = 16.5 feet bgs.					

REMARKS:
H - Hand Auger
NR - Not Recorded
SS - Split Spoon
■ - Analytical Sample
▣ - Sample Interval

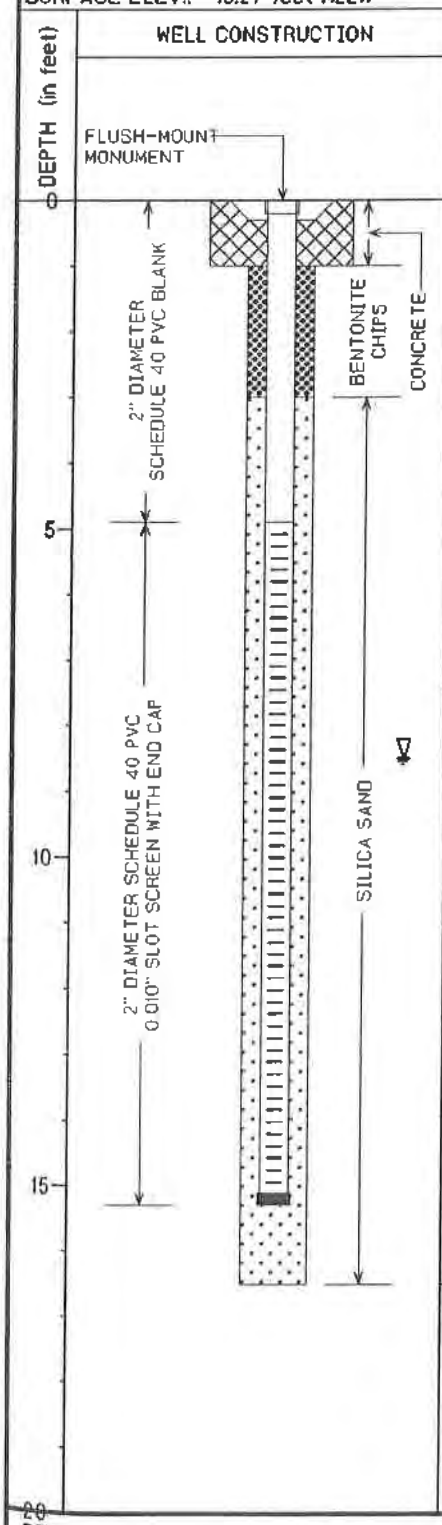
D-1-1-H-00429

RETEC

WELL INSTALLATION LOG
Monitoring Well MW-3

1011 S.W. Klickitat Way
Suite #207
Seattle, Washington 98134
(206) 624-9349

PROJECT NO: *3-3579-150 Phase 2 Sampling*		CLIENT: *Port of Bellingham*	
LOCATION: *Bellingham, Washington; Harris Ave. Shipyard, W of Fabrication Building*		DRILLING CO.: *Cascade Drilling*	
START DATE: *04/28/98* TIME: *10:49*	BORING ID: *8 inches*	DRILLER: *Rodney*	
COMPLETION DATE: *04/28/98* TIME: *11:50*	TOTAL DEPTH: *16.5 feet bgs*	RIG TYPE: *Limited Access*	
WATER LEVEL DURING DRILLING: *8.5' bgs*	TOP OF CASING: *14.78 feet MLLW*	METHOD: *Hollow-stem Auger*	
SURFACE ELEV.: *15.27 feet MLLW*	MP ELEV.: *14.78 feet MLLW*	LOGGED BY: *J. J. Henley*	



DEPTH (in feet)	U.S.C.S.	LITHOLOGY	SOIL DESCRIPTION	TYPE	DEPTH	BLOWS/6"	% RECOVERY	PID (ppm)
0	GW		GRAVEL: Gray; appears clean (new).					
			1.5' – Darker; appears clean.					
	SW		SAND: Brown; very fine- to fine-grained; trace shell fragments; dry to damp; no sheen; no odor.	H		NR	NR	0.0
5			*5.0'* – No sheen; no odor. *5.5'* – Rocks.	SS		55	20	1.8
	SW		SAND WITH GRAVEL: Gray/brown; fine- to coarse-grained; with fine gravel, trace medium gravel; ~5% shell fragments; moist; no sheen; no odor.	SS		47 42 32	33	4.2
10	SP		SAND: Gray; very fine- to fine-grained; trace fines; 5% shells; very moist to saturated; no sheen; no odor. *10.5'* – Trace wood debris. *10.5'–11.2'* – 10% shell fragments.	SS		16 18 19	95	0.0
			12.5' – 5% to 10% fines; trace to 5% wood/plant debris; 5% shell fragments; saturated; sand-size brown particles; no sheen; no odor.	SS		12 13 17	80	0.0
15				SS		22 30 35	75	0.0
			Total depth = 16.5 feet bgs.					
20								

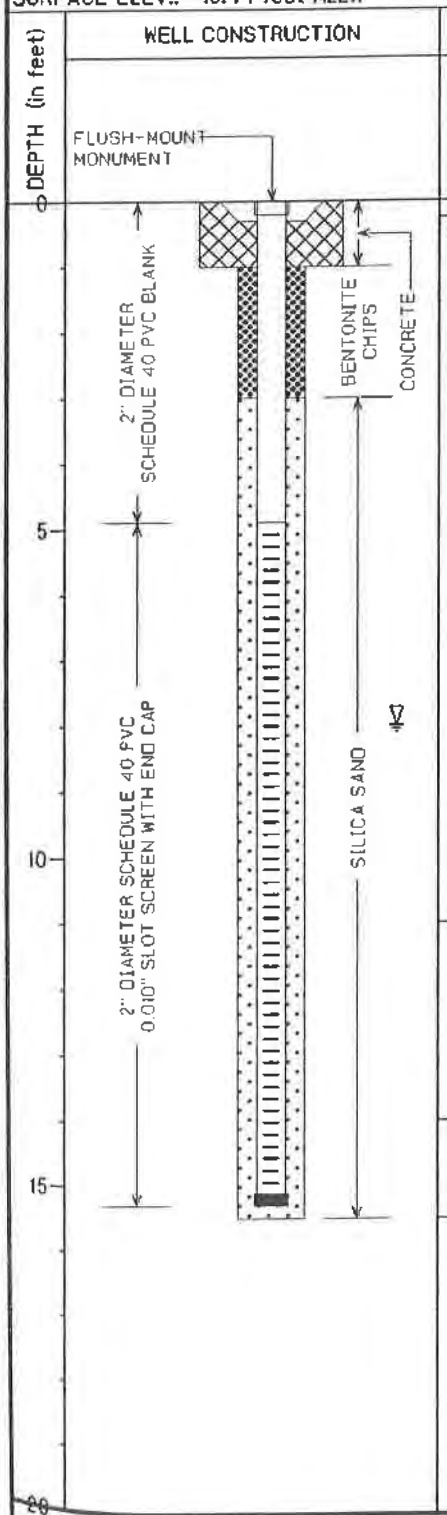
REMARKS: Blow counts for 7.5' & 12.5' inaccurate due to insufficient rig height
H – Hand Auger
SS – Split Spoon
▮ – Analytical Sample
▯ – Sample Interval

D-1-1-H-00430

WELL INSTALLATION LOG
Monitoring Well MW-4

RETEC
1011 S.W. Klickitat Way
Suite #207
Seattle, Washington 98134
(206) 624-9349

PROJECT NO: *3-3579-150 Phase 2 Sampling*		CLIENT: *Port of Bellingham*	
LOCATION: *Bellingham, Washington; Harris Ave. Shipyard, N of Sand Blast Shed*		DRILLING CO.: *Cascade Drilling*	
START DATE: *04/28/98* TIME: *14:20*	BORING ID: *8 inches*	DRILLER: *Rodney*	
COMPLETION DATE: *04/28/98* TIME: *16:40*	TOTAL DEPTH: *15.5 feet bgs*	RIG TYPE: *Limited Access*	
WATER LEVEL DURING DRILLING: *8.0' bgs*	TOP OF CASING: *16.01 feet MLLW*	METHOD: *Hollow-stem Auger*	
SURFACE ELEV.: *16.44 feet MLLW*	MP ELEV.: *16.01 feet MLLW*	LOGGED BY: *J. J. Henley*	



DEPTH (in feet)	U.S.C.S.	LITHOLOGY	SOIL DESCRIPTION	TYPE	DEPTH	BLOWS/6"	% RECOVERY	PID (ppm)
0			ASPHALT					
	SW		SAND: Black/brown; very fine- to fine-grained; with fine to coarse gravel; ~5% to 10% fines; 5% wood debris (¼-inch particles); organic odor.					
			1.5' – Metal plate (1 foot long, 3 inches wide).	H				23.5
			2.0'–3.0' – Trace 1-inch wood fragments.	H				27.2
			3.0' – Brown; damp; no sheen; organic odor.	H				0.0
5			*5.0'–5.5'* – Grades to very fine- to coarse-grained; trace fine gravel; trace small wood debris (¼-inch particles); dense; no sheen; no odor.	SS		9 12 15	44	0.0
			6.5' – Brown/tan; 10% fines; moderately densely packed; no sheen; no odor.	SS		12 15 19	100	0.0
			8.0' – Brown; very fine- to medium-grained, with trace coarse-grained; ~10% fines; moist; no sheen; no odor.	SS		20 27 32	61	0.0
			9.5' – Very moist.	SS		25 30 37	39	0.0
10				SS		50 50/ 5"	0	
			NO RECOVERY	SS		23 27 28	0	
	SW		SAND: Gray/brown; fine- to coarse-grained; with fine to coarse gravel; trace fines; very saturated; moderately dense; no sheen; no odor.	SS		32 45 47	80	0.0
15			Total depth = 15.5 feet bgs.					
20								

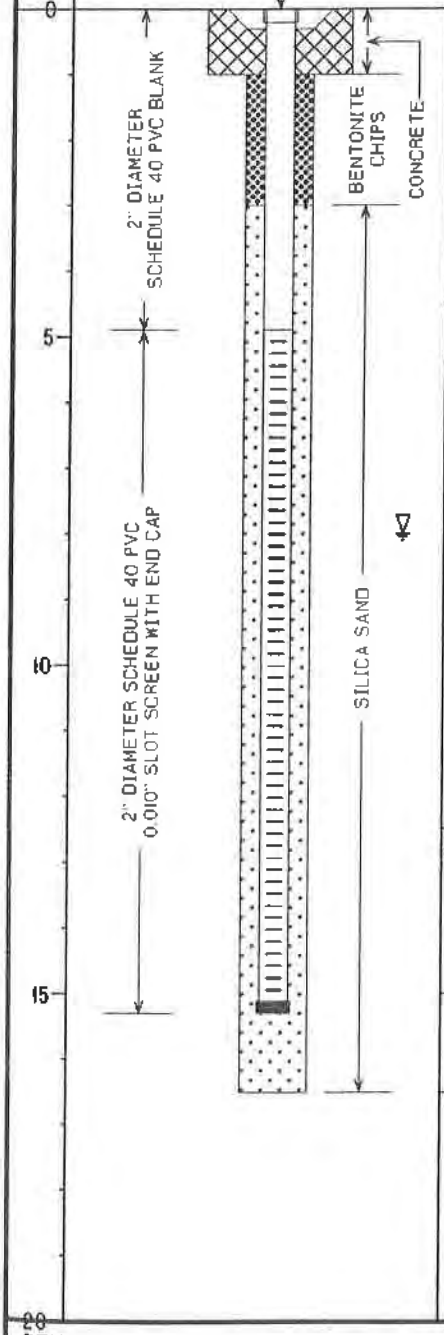
REMARKS:
H – Hand Auger
SS – Split Spoon
■ – Analytical Sample
▯ – Sample Interval

D-1-1-H-00431

WELL INSTALLATION LOG
Monitoring Well MW-5

RETEC
1011 S.W. Klickitat Way
Suite #207
Seattle, Washington 98134
(206) 624-9349

PROJECT NO: 3-3579-150 Phase 2 Sampling		CLIENT: Port of Bellingham
LOCATION: Bellingham, Washington; Harris Avenue Shipyard, SE of Main Office		DRILLING CO.: Cascade Drilling
START DATE: 04/29/98 TIME: 10:40	BORING ID: 8 inches	DRILLER: Rodney
COMPLETION DATE: 04/29/98 TIME: 12:10	TOTAL DEPTH: 16.5 feet bgs	RIG TYPE: Limited Access
WATER LEVEL DURING DRILLING: 8.0' bgs	TOP OF CASING: 15.43 feet MLLW	METHOD: Hollow-stem Auger
SURFACE ELEV.: 15.67 feet MLLW	MP ELEV.: 15.43 feet MLLW	LOGGED BY: J. J. Henley



DEPTH (in feet)	U.S.C.S.	LITHOLOGY	SOIL DESCRIPTION	TYPE	DEPTH	BLOWS/6"	% RECOVERY	PID (ppm)
0	GW		GRAVEL: Clean (new).					
	SW		SAND: Brown with very slight orange tint; very fine- to coarse-grained; fine to coarse gravel; with 10% silt; trace clay; damp; no sheen; no odor.	H				0.0
5	ML		SILT WITH SAND AND GRAVEL: Brown; very fine-grained sand; fine to medium gravel; discontinuous ¼-inch line of black sandy silt (does not appear to be sand blast grit); trace clay; densely packed; no sheen; no odor.	SS		37 50/ 4"	33	0.0
	SM		SILTY SAND: Brown; fine to medium gravel; moist to very moist; no sheen; no odor.	SS		23 50/ 4"	65	0.0
	SP		7.9' - Trace coarse gravel. SAND WITH GRAVEL: Brown with an orange tint; very fine- to coarse-grained; with fine gravel; 5% to 10% silt; very moist to saturated; dense; no sheen; no odor.					
10			10.0'-10.5' - Very small discontinuous silt/clay lense (coating around gravel); weathered rock; saturated; no sheen; no odor.	SS		50	33	0.0
	SP-SM		SAND WITH SILT: Brown; very fine- to fine-grained with trace coarse-grained; with silt; trace clay; 3-inch cobble and angular gravel in shoe; very saturated; no sheen; no odor.	SS		50/ 5"	11	0.0
15	SP		SAND: Brown; very fine- to coarse-grained; with fine to medium gravel; trace silt; very saturated; moderately densely packed; no sheen; no odor.	SS		38 50/ 4"	80	NR
			Total depth = 16.5 feet bgs.					
20								

REMARKS:
H - Hand Auger
NR - Not Recorded
SS - Split Spoon
■ - Analytical Sample
⊠ - Sample Interval

D-1-1-H-00432

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Soil Boring ID: FS-01

Drill Date: 3/14/2011
Logged By: Kristin Anderson
Drilled By: Eli Floyd/Cascade Drilling
Drill Type: Direct Push Geoprobe
Sample Method: Direct Push 2"x5' core
Boring Diameter: 2"
Boring Depth (ft bgs): 25'
Groundwater ATD (ft bgs): 14'

Coordinate System: NAD83/98
Ground Surface Elevation: 14.46; NAVD88
Latitude/Northing: 632230.63
Longitude/Easting: 1234614.39
Boring Location: See below.

Client: Port of Bellingham
Project: POB-Harris
Task: 4000
Address: Fairhaven Shipyard
Bellingham, Wa

Remarks: Boring located in the Former Union Oil AST Area.

PID (ppm)	SAMPLE INTERVAL (ft bgs)	SAMPLE ID	DRIVE / RECOVERY	DEPTH (ft bgs)	USCS SYMBOL	LITHOLOGIC DESCRIPTION AND OBSERVATIONS (color, grading, Group Name [with MAJOR and minor constituents], moisture content, etc.)
0.1	2.5-3.5	FS01-2.5 -031411		0	GW	Brown well graded fine angular GRAVEL with fine sand, dry. (FILL)
28.9				5	SP	Dark brown poorly graded medium to coarse SAND, trace gravel, dry. Contains sandblast grit.
30.3				10	SM	Dark brown grading to dark gray poorly graded SILTY fine SAND, trace small gravel, moist. Hydrocarbon odor and moderate sheen.
						At 11 feet, gray silty SAND with fine gravel, wet. Hydrocarbon odor, no sheen.
40	14-15	FS01-14 -031411		14		
				15		Contains shell fragments.
1.4				18		Same as above. Shell fragments no longer present.
8.8				23	GW-GM	Gray well graded GRAVEL with silt and fine to medium sand, wet.
	24-24.8	FS01-24.8 -031411		24		Becomes black with heavy sheen on core and contains NAPL droplets inside core barrel. Strong hydrocrabon odor. 2-inch lense of dark brown, poorly graded silty fine SAND at 24.8 ft.
3.3				25		Total depth = 25.0 ft bgs.
				28		

Notes:
ft bgs = feet below ground surface
ppm = parts per million
--- Gradational unit contact
USCS = Unified Soil Classification System
▼ = denotes groundwater table

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Soil Boring ID: FS-01

Drill Date: 3/14/2011
Logged By: Kristin Anderson
Drilled By: Eli Floyd/Cascade Drilling
Drill Type: Direct Push Geoprobe
Sample Method: Direct Push 2"x5' core
Boring Diameter: 2"
Boring Depth (ft bgs): 25'
Groundwater ATD (ft bgs): 14'

Coordinate System: NAD83/98
Ground Surface Elevation: 14.46; NAVD88
Latitude/Northing: 632230.63
Longitude/Easting: 1234614.39
Boring Location: See below.

Client: Port of Bellingham
Project: POB-Harris
Task: 4000
Address: Fairhaven Shipyard
Bellingham, Wa

Remarks: Boring located in the Former Union Oil AST Area.

PID (ppm)	SAMPLE INTERVAL (ft bgs)	SAMPLE ID	DRIVE / RECOVERY	DEPTH (ft bgs)	USCS SYMBOL	LITHOLOGIC DESCRIPTION AND OBSERVATIONS (color, grading, Group Name [with MAJOR and minor constituents], moisture content, etc.)
8.8	24-24.8	FS01-24.8 -031411		20 21 22 23 24 25	GW-GM	Gray well graded GRAVEL with silt and fine to medium sand, wet. Becomes black with heavy sheen on core and contains NAPL droplets on core barrel. Strong hydrocrabon odor. 2-inch lense of dark brown, poorly graded silty fine SAND at 24.8 ft.
3.3						

Total depth = 25.0 ft bgs.

Notes:
ft bgs = feet below ground surface
ppm = parts per million
--- Gradational unit contact
USCS = Unified Soil Classification System
▼ = denotes groundwater table

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Soil Boring ID: FS-20

Drill Date: January 29, 2013
Logged By: Elena Ramirez
Drilled By: Eli Floyd/Cascade Drilling
Drill Type: Direct Push Geoprobe
Sample Method: Direct Push 2"x5' Core
Boring Diameter: 2 inches
Boring Depth (ft bgs): 40
Groundwater ATD (ft bgs): 5.25

Coordinate System: NAVD88
Ground Surface Elevation: 13.61
Latitude/Northing: 1234578.62
Longitude/Easting: 632221
Boring Location: Adjacent to MW-4

Client: Port of Bellingham
Project: POB-Harris
Task: 4030 Data Gaps Investigation
Address: Harris Avenue Shipyard
Bellingham, WA

Remarks: Weather overcast, rainy.

PID (ppm)	SAMPLE INTERVAL (ft bgs)	SAMPLE ID	DRIVE / RECOVERY	DEPTH (ft bgs)	USCS SYMBOL	LITHOLOGIC DESCRIPTION AND OBSERVATIONS (color, grading, Group Name [with MAJOR and minor constituents], moisture content, etc.)
4.1				0	SW	Very dark grayish brown, well graded, fine to coarse SAND with gravel and trace fines, damp.
3.0				2	SC	Dark greenish gray, poorly graded, fine CLAYEY SAND, moist to wet.
10.1	2.5-3.0	FS-20-2.5-3.0-012913				
1.2				3		
3.6				5		
50.1				6		Strong petroleum odor, staining, wood fragments.
93.8	10.5-11.0	FS-20-10.5-11.0-012913		10		Clay content decreases, visible sheen present, strong odor, stained.
83.5				12		
14.5	15.5-16.0	FS-20-15.5-16.0-012913		15		
16.4				16		
11.7				19		Becomes olive gray; contains fine to coarse gravel.
				20		

Notes:
ft bgs = feet below ground surface
ppm = parts per million
--- Gradational unit contact
USCS = Unified Soil Classification System
▼ = denotes groundwater table

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Soil Boring ID: FS-20

Drill Date: January 29, 2013
Logged By: Elena Ramirez
Drilled By: Eli Floyd/Cascade Drilling
Drill Type: Direct Push Geoprobe
Sample Method: Direct Push 2"x5' Core
Boring Diameter: 2 inches
Boring Depth (ft bgs): 40
Groundwater ATD (ft bgs): 5.25

Coordinate System: NAVD88
Ground Surface Elevation: 13.61
Latitude/Northing: 1234578.62
Longitude/Easting: 632221
Boring Location: Adjacent to MW-4

Client: Port of Bellingham
Project: POB-Harris
Task: 4030 Data Gaps Investigation
Address: Harris Avenue Shipyard
Bellingham, WA

Remarks: Weather overcast, rainy.

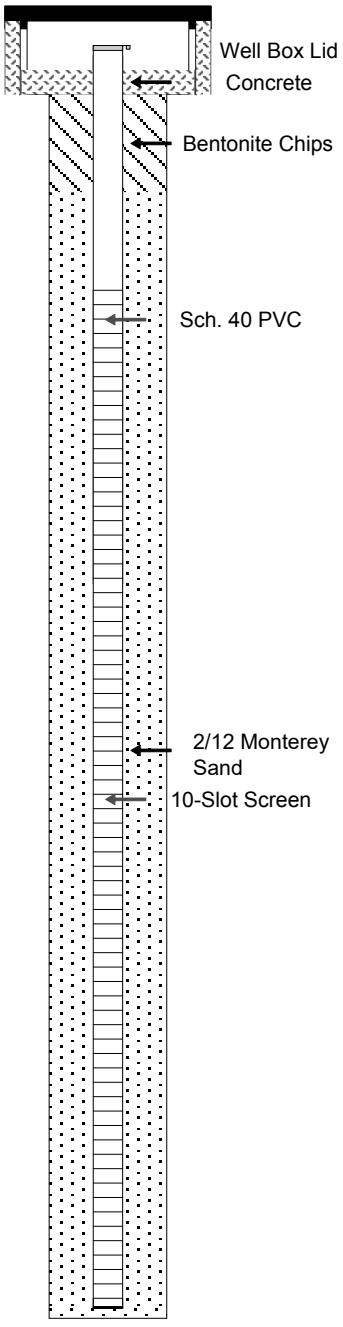
PID (ppm)	SAMPLE INTERVAL (ft bgs)	SAMPLE ID	DRIVE / RECOVERY	DEPTH (ft bgs)	USCS SYMBOL	LITHOLOGIC DESCRIPTION AND OBSERVATIONS (color, grading, Group Name [with MAJOR and minor constituents], moisture content, etc.)
7.1				20		
3.4				21		Becomes grayish brown.
				22		
				23		
				24		
0.6				25		Light hydrocarbon odor; becomes dark gray.
0.6				26		
4.3				27		4-inch lense of clean sand.
				28		
				29		
				30		
				31		
				32		
				33		
				34		
				35		
				36		
				37	SM	Dark greenish gray, poorly graded SILTY SAND.
				38		
				39		Total depth = 40.0 feet bgs.
				40		

Notes:
ft bgs = feet below ground surface
ppm = parts per million
--- Gradational unit contact
USCS = Unified Soil Classification System
▼ = denotes groundwater table

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PROJECT: **Harris Avenue Shipyard**	LOCATION: **201 Harris Ave, Bellingham, WA**	WELL ID: **MW-11**
LOGGED BY: **Gabe Cisneros**	COORDINATE SYSTEM: **WA SPCS NAD83 N FT**	ECOLOGY WELL ID: **BJA-549**
DRILLED BY: **Aaron Ocheltree/Cascade Drilling, LP**	NORTHING: **632256.1657**	EASTING: **1234512.9216**
DRILLING EQUIPMENT: **CME 75 Limited Access Drill Rig**	GROUND SURFACE ELEV.: **9.68**	TOC ELEVATION: **9.33**
DRILLING METHOD: **Hollow-Stem Auger**	TOTAL DEPTH (ft bgs): **13.4**	DEPTH TO WATER (ft bgs): **6**
SAMPLING METHOD: **Split-Spoon**	BORING DIAMETER: **8.25**	DRILL DATE: **2/9/2015**

Depth (feet)	USCS Symbol	Description	# of Blows	PID (ppm)	Sample ID
0	SP	Railroad ties and fill material in the top 2 feet.		0	MW-11-0.0-1.0 -020915
1	SP	Brown, loose, medium **SAND** with 15% rounded gravel, wood debris (lumber or railroad ties), and shells; no odor; no sheen; wet. Hand cleared to 2 feet bgs.		0	MW-11-1.0-2.0 -020915
2	ML	Thin **SILT** layer at 2 feet bgs.	15	3	MW-11-2.0-3.0 -020915
3	SP	Brown to gray, medium dense, medium to coarse **SAND** with 20% large gravel and wood; no odor; no sheen; moist.	16		
4	SP	Gray, medium dense, medium to coarse **SAND** with 15% fine to large gravel; no odor; no sheen; moist.	16	2.9	MW-11-3.0-4.0 -020915
5	SP		11		
6	SP	Gray, medium dense, fine to medium **SAND** with 10% gravel; no odor; no sheen; wet.	26	0.9	
7	SP	Same as above with shells; saturated.	31		
7	SW	Gray, medium dense, fine to coarse **SAND** with 20% fine gravel; no odor; no sheen; saturated.	11	0.4	MW-11-5.0-6.0 -020915
8	SP	Gray, medium dense, fine **SAND** with 5% silt; no odor; no sheen; saturated.	7		
9	SM	Gray, medium dense, silty, fine **SAND**; no odor; no sheen.	3	0.6	MW-11-6.0-7.0 -020915
10	ML	Gray to olive gray, stiff, sandy **SILT**; no odor; no sheen; saturated.	11		
11	ML		17	0.8	MW-11-7.0-8.0 -020915
12	ML	Same as above; encountered wood debris at 11.5 to 12.5 feet.	16		
13	ML	Same as above; shells at 12.5 feet.	10	0.4	MW-11-8.0-9.0 -020915
14			11		
			13	0.3	
			10		
			10	0.3	
			14		
			30		
			30		
			30		
			40		



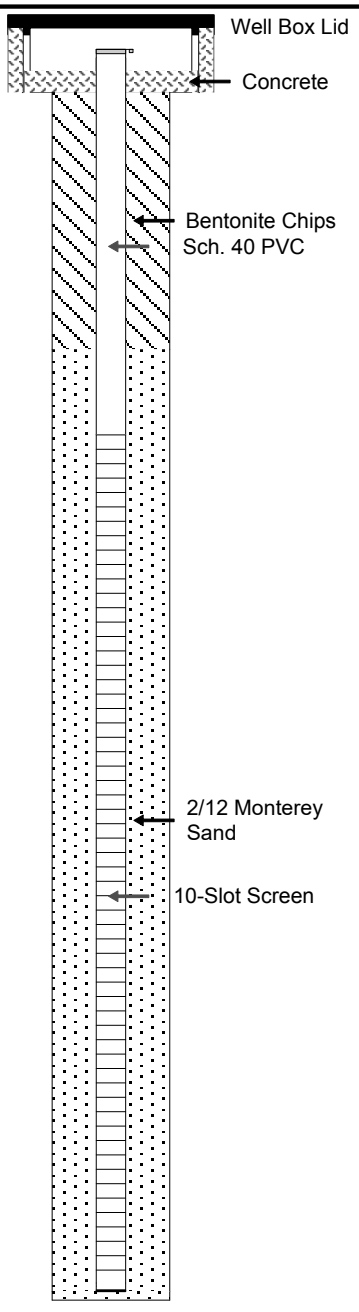
ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

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PROJECT: **Harris Avenue Shipyard**	LOCATION: **201 Harris Ave, Bellingham, WA**	WELL ID: **MW-12**
LOGGED BY: **Gabe Cisneros**	COORDINATE SYSTEM: **WA SPCS NAD83 N FT**	ECOLOGY WELL ID: **BJA-550**
DRILLED BY: **Aaron Ocheltree/Cascade Drilling, LP**	NORTHING: **632221.7187**	EASTING: **1234368.9675**
DRILLING EQUIPMENT: **CME 75 Limited Access Drill Rig**	GROUND SURFACE ELEV.: **14.71**	TOC ELEVATION: **14.5**
DRILLING METHOD: **Hollow-Stem Auger**	TOTAL DEPTH (ft bgs): **15.03**	DEPTH TO WATER (ft bgs): **9.25**
SAMPLING METHOD: **Split-Spoon**	BORING DIAMETER: **8.25**	DRILL DATE: **2/9/2015**

Depth (feet)	USCS Symbol	Description	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	SW	Brown, silty, sandy, crushed gravel Road Base Fill. Hand cleared down to 3 feet bgs.			7.1	MW-12-0.0-1.0 -020915
1		Metal pipe encountered at 1 foot bgs; moved boring location.				
		Brown, medium dense, gravelly, fine to coarse **SAND** with 20% gravel up to 4 inches in diameter; no odor; no sheen; moist.			0.4	MW-12-1.0-2.0 -020915
2					0.3	MW-12-2.0-3.0 -020915
		Same as above; no odor; no sheen; moist.				
3		Same as above; no odor; no sheen.		22		
	SM	Brown with olive gray, medium dense to dense, silty, fine to medium **SAND** with 20% silt, 10% fine gravel, and wood debris at 4.25 feet bgs; no odor; no sheen.		48	0.2	MW-12-3.0-4.0 -020915
4				80		
		Dark gray, medium dense, silty, fine **SAND** with 30% silt and 15% fine to large gravel; slight hydrocarbon odor; no sheen; moist.		20	91.5	MW-12-4.0-5.0 -020915
5				50		
					35.1	
6	ML	Olive gray, stiff, sandy **SILT** with low plasticity; slight odor; no sheen; moist.		12	1.7	
				14		
7				11	2.2	
	SP	Brown, dense, medium to coarse **SAND** with 20% fine gravel; no odor; no sheen; moist.		50		
8				50		MW-12-8.0-8.5 -020915
		No recovery to 10.5 feet bgs				
9 ▼				15		
				15		
10		Brown, medium dense, gravelly, fine to coarse **SAND** with 25% fine to medium gravel; no odor; no sheen; saturated.		15	2	
	SW			11		MW-12-10.5-1 1.0-020915
11				17	1.5	MW-12-11.0-1 2.0-020915
				22		
12		Same as above; no odor; no sheen; saturated.		6		
				6	1.6	
13	SM	Olive gray, medium dense, silty gravelly, fine to medium **SAND** with 15% silt and 15% gravel; no odor; no sheen.		8		
				3	0.2	
14	SW	Olive gray, medium dense, gravelly, fine to coarse **SAND** with 25% fine to medium, rounded gravel and 5% silt; no odor; no sheen.		4		
				6	0.3	
15						
16						



ABBREVIATIONS:
ft bgs = feet below ground surface
USCS = Unified Soil Classification System
ppm = parts per million
▼ = denotes groundwater table

NOTES:

Drilled	Start	End	Total Depth (ft)	Logged By	Checked By	Driller	Drilling Method
	8/4/2011	8/4/2011	66.5	AF2	AJH	Cascade Drilling	Hollow-stem Auger

Surface Elevation (ft) Vertical Datum	1.0 MLLW	Hammer Data	140lb Autohammer
Latitude Longitude		System Datum	Geographic

Drilling Equipment: CME 75 Truck-mounted Drill Rig

Groundwater — Date Measured | Depth to Water (ft) | Elevation (ft)

Notes: Drilled from deck; surface elevation is mudline

Elevation (feet)	Depth (feet)	Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
0	0	6	6		1			SM	Dark gray silty fine to coarse sand with numerous shell fragments (loose, wet) (beach deposits)			
-5	5	12	34		2a 2b			SP	Gray fine to medium sand with trace silt, occasional gravel and shell fragments (medium dense to dense, wet)			Blowcount likely overstated %F=4
-10	10	10	48		3a SA 3b			GP-GM	Light gray fine to coarse gravel with sand and silt (dense, wet)			%F=9
								ML/SM	Gray sandy silt to silty fine sand with occasional gravel (hard/dense, wet)			
-15	15	18	49		4a SA 4b			SP	Gray fine to coarse sand with gravel and trace silt (dense, wet)			%F=4
								ML/SM	Gray silty fine to coarse sand to fine to coarse sandy with with occasional gravel (hard, wet)			
-20	20	18	69		5 SA			SM	Gray silty fine to coarse sand with occasional gravel (very dense, wet) (glacial till)			%F=21
-25	25	18	69		6							
-30	30	12	30		7 SA				Becomes dense			%F=31
	35											

Note: See Figure A-1 for explanation of symbols.

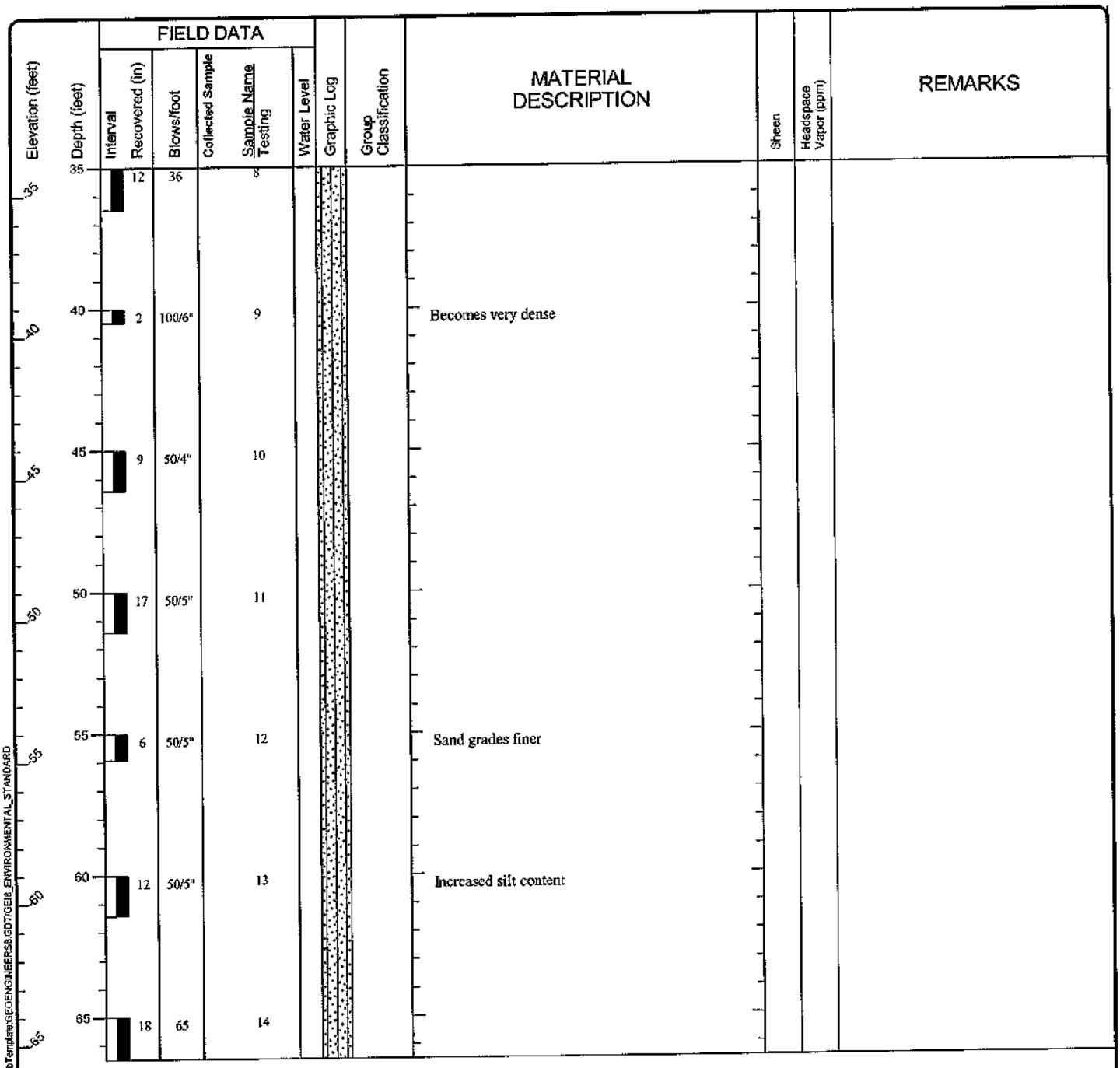
Log of Boring B-1

GeoEngineers

Project: Harris Avenue Shipyard Partial Replacement
Project Location: Bellingham, Washington
Project Number: 00307-075-00

Figure A-2
Sheet 1 of 2

Bellingham Date:3/21/12 Path:C:\USERS\TNASH\DESKTOP\00307-075-00 BORING LOGS.GPJ DBTemplate.LibTemplate:GEOENGINEERS&GDTIGER_ENVIRONMENTAL_STANDARD



Note: See Figure A-1 for explanation of symbols.

Log of Boring B-1 (continued)

GeoEngineers

Project: Harris Avenue Shipyard Partial Replacement
Project Location: Bellingham, Washington
Project Number: 00307-075-00

Figure A-2
Sheet 2 of 2

Bellingham Date:3/21/12 Path:C:\USERS\TNASH\DESKTOP\00307-075-00 BORING LOGS.GPJ DBTemplate\LibTemplate\GEOENGINEERS6.GDT\GEI8_ENVIRONMENTAL_STANDARD

Drilled Start	End	Total Depth (ft)	Logged By / Checked By	Driller	Drilling Method
8/5/2011	8/5/2011	55.5	AJH / AJH	Cascade Drilling	Hollow-stem Auger

Surface Elevation (ft) / Vertical Datum	Hammer Data	Drilling Equipment
14.5 MLLW	140lb Autohammer	CME 75 Truck-mounted Drill Rig

Latitude / Longitude	System Datum	Groundwater: Date Measured	Depth to Water (ft)	Elevation (ft)
	Geographic			

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor (ppm)	REMARKS
	0							SP	Light-brown fine to coarse sand with gravel (medium dense to dense, moist) (fill)			
10	5	12	83/8"		1					SS-MS		Blowcount overstated
		12	27		2					MS		
5	10	12	3		3			SM	Gray silty fine to medium sand with occasional gravel (loose, wet) (beach deposits)	SS		
0	15	3	13		4 SA			SP	Gray fine to medium sand with gravel and shell fragments (dense, wet)	SS		%F = 28
-5	20	18	48		5					SS		
-10	25	18	48		6				Grades to fine to coarse sand with gravel and shell fragments	NS		
-15	30	6	100/7"		7			SM	Light brown silty fine to coarse sand with gravel (very dense, wet) (glacial till)	NS		Blowcount overstated
								SP-SM	Brown-gray fine to coarse sand with silt and gravel (very dense, wet)			
-20	35	12	73		8 SA					NS		%F = 11

Note: See Figure A-1 for explanation of symbols.

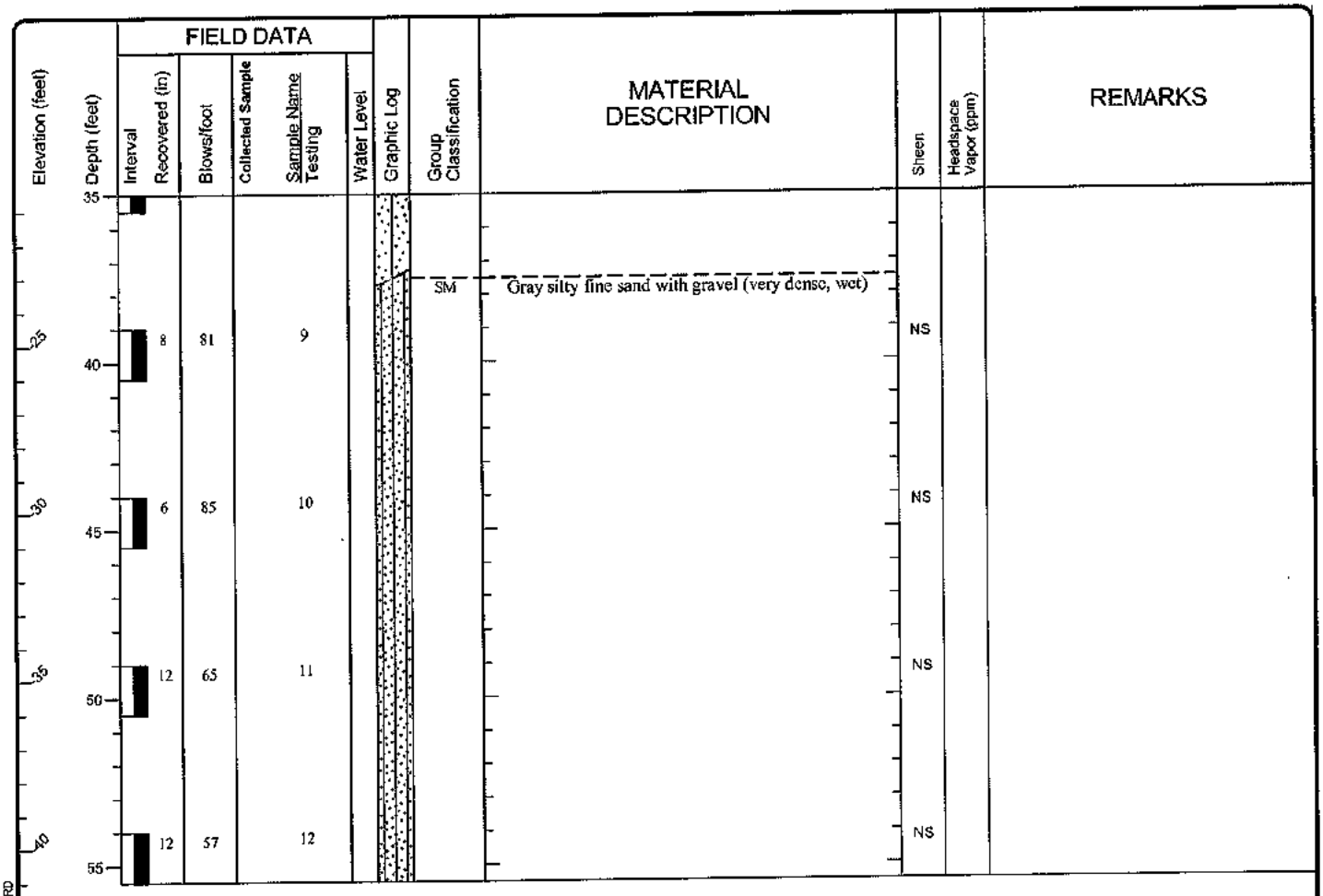
Log of Boring B-2

GeoEngineers

Project: Harris Avenue Shipyard Partial Replacement
Project Location: Bellingham, Washington
Project Number: 00307-075-00

Figure A-3
Sheet 1 of 2

Bellingham: Date:3/21/12 Path:C:\USERS\TMASH\DESKTOP\00307-075-00 BORING LOGS.GPJ D8Template\LibTemplate\GEOENGINEERS8.GDT\GE18_ENVIRONMENTAL_STANDARD



Note: See Figure A-1 for explanation of symbols.

Log of Boring B-2 (continued)

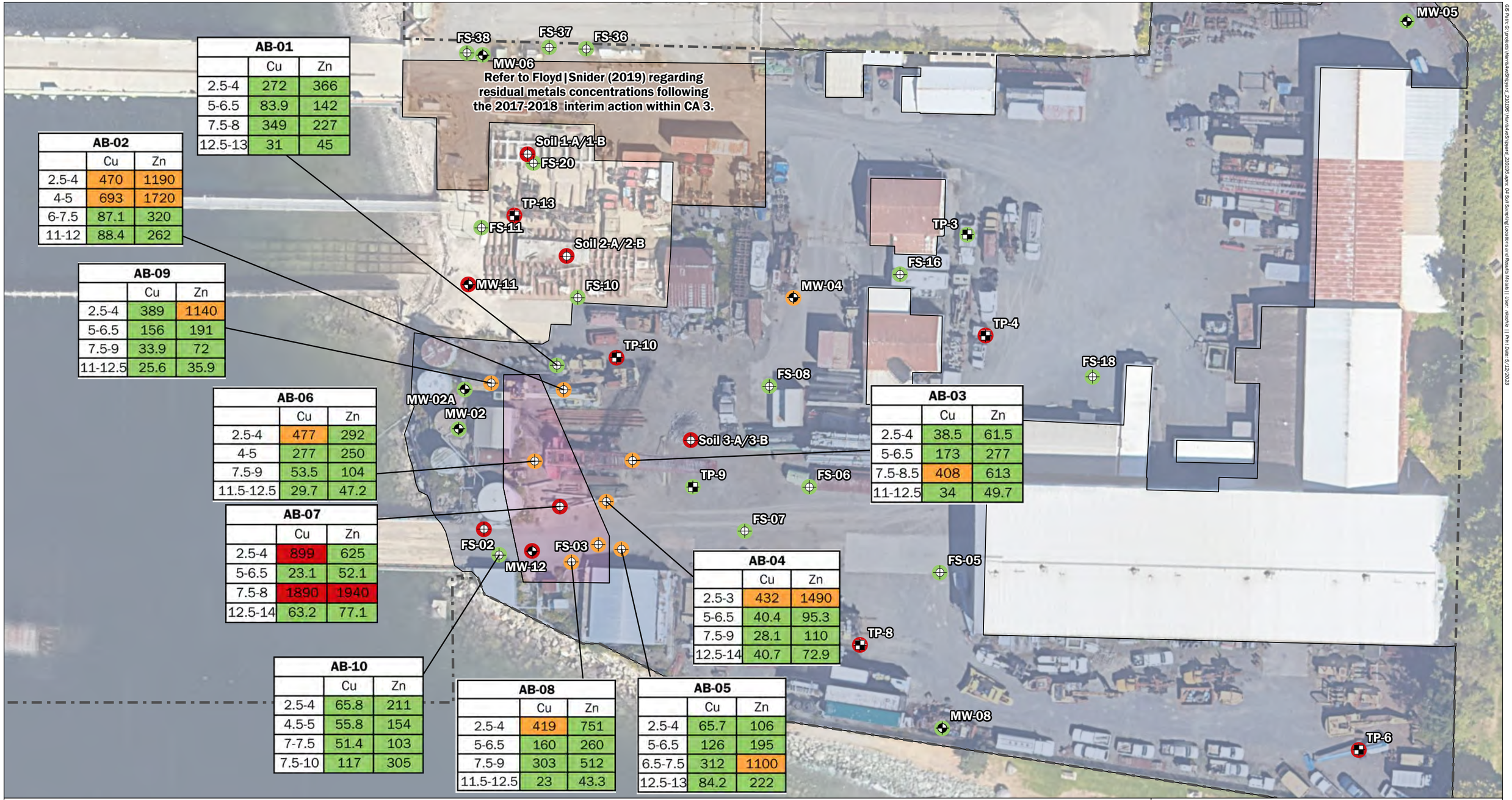
GeoEngineers

Project: Harris Avenue Shipyard Partial Replacement
Project Location: Bellingham, Washington
Project Number: 00307-075-00

Figure A-3
Sheet 2 of 2

Bellingham; Date:9/21/12 Path:C:\USERS\TNASH\DESKTOP\00307-075-00 BORING LOGS.GPJ GBTemplate.lib Template:GEOENGINEERS8.GDT\GEI8_ENVIRONMENTAL_STANDARD

Boring Logs from Pre-Remedial Design Investigation (2022)



AB-01	Cu	Zn
2.5-4	272	366
5-6.5	83.9	142
7.5-8	349	227
12.5-13	31	45

AB-02	Cu	Zn
2.5-4	470	1190
4-5	693	1720
6-7.5	87.1	320
11-12	88.4	262

AB-09	Cu	Zn
2.5-4	389	1140
5-6.5	156	191
7.5-9	33.9	72
11-12.5	25.6	35.9

AB-06	Cu	Zn
2.5-4	477	292
4-5	277	250
7.5-9	53.5	104
11.5-12.5	29.7	47.2

AB-07	Cu	Zn
2.5-4	899	625
5-6.5	23.1	52.1
7.5-8	1890	1940
12.5-14	63.2	77.1

AB-10	Cu	Zn
2.5-4	65.8	211
4.5-5	55.8	154
7-7.5	51.4	103
7.5-10	117	305

AB-08	Cu	Zn
2.5-4	419	751
5-6.5	160	260
7.5-9	303	512
11.5-12.5	23	43.3

AB-05	Cu	Zn
2.5-4	65.7	106
5-6.5	126	195
6.5-7.5	312	1100
12.5-13	84.2	222

AB-04	Cu	Zn
2.5-3	432	1490
5-6.5	40.4	95.3
7.5-9	28.1	110
12.5-14	40.7	72.9

AB-03	Cu	Zn
2.5-4	38.5	61.5
5-6.5	173	277
7.5-8.5	408	613
11-12.5	34	49.7

Monitoring Well
Soil Boring
Test Pit

Copper and/or Zinc in Soil >2x CUL
Copper and/or Zinc in Soil > CUL
Copper and/or Zinc in Soil < CUL

Upland Cleanup Areas Defined in Cleanup Action Plan

Cleanup Area 1
Cleanup Area 2
Cleanup Area 3
Site Boundary

N

0 50 100 Feet

Soil Sampling Locations and Results – Metals

Engineering Design Report
Harris Avenue Shipyard
Bellingham, Washington

Aspect CONSULTING

	MAY-2023	BY: EJM / MRE / NLK	FIGURE NO. 4
	PROJECT NO. 210195	REVISED BY: ---/---	

Data source credits: None || Basemap Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA

GIS Path: G:\projects\HarrisAveShipyard_210195\HarrisAveShipyard_210195.aprx: 04 Soil Sampling Locations and Results Metals|| User: nsoohe || Print Date: 5/12/2023

Harris Ave Shipyard Cleanup PRDI - 210195

Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
201 Harris Ave, Bellingham, WA 98225, Cleanup Area 2	48.7209, -122.5151 (est)	**AB-01**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)
Cascade Drilling	TSI 150CC Sonic Rig	Autohammer; 140 lb hammer; 30" drop	15.5' (est)

Operator	Exploration Method(s)	Work Start/Completion Dates	Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
Charles Winland	Sonic	4/26/2022	NA	11' (ATD)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	15							SILTY SAND WITH GRAVEL (SM); loose, moist, brown to gray; fine to coarse sand; fine to coarse, subrounded to subangular gravel.	0
1	14	Backfilled with hydrated bentonite chips.							1
2	13							Becomes brown yellow with subtrace shell and wood fragments.	2
3	12		S1	▲	7 7 8	AB-01-2.5-4.0			3
4	11							SILTY SAND (SM); medium dense, moist, gray; mottled brown and orange; fine sand; little fine, subrounded gravel.	4
5	10		S2	▲	0 0 1	AB-01-5.0-6.5			5
6	9							SAND WITH GRAVEL (SW); very loose, moist, brown; fine to coarse sand; fine to coarse, subrounded gravel.	6
7	8	Blow counts likely overstated due to presence of gravel.							7
8	7		S3	▲	21 21 19	AB-01-7.5-8.0		SAND WITH GRAVEL (SP); dense, moist, gray; fine sand; fine, subrounded gravel.	8
9	6								9
10	5								10
11	4	▽ 4/26/2022						Mottled brown and orange.	11
12	3							SILTY SAND WITH GRAVEL (SM); very loose, wet, brown; fine to coarse sand; fine, subrounded gravel.	12
13	2		S4	▲	1 1 2	AB-01-12.5-13.0			13
14	1							Bottom of exploration at 14 ft. bgs.	14

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◫ Continuous core 4" ID
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢—⊣ Liquid Limit

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JRG
Approved by: MVDA/SG

Exploration Log AB-01

Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\210195 - PORT OF BHAM - HARRIS AVE SHIPYARD.GPJ February 6, 2023

Harris Ave Shipyard Cleanup PRDI - 210195

Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
201 Harris Ave, Bellingham, WA 98225, Cleanup Area 2	48.7209, -122.5151 (est)	**AB-02**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Cascade Drilling	TSI 150CC Sonic Rig	Autohammer; 140 lb hammer; 30" drop	15.4' (est)	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Charles Winland	Sonic	4/26/2022	NA	10' (ATD)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	15							SAND WITH GRAVEL (SW); loose, moist, brown; fine to coarse sand; fine to coarse, subangular to subrounded gravel.	0
1	14	Backfilled with hydrated bentonite chips.						GRAVEL WITH SAND (GW); loose, moist, gray; fine to coarse sand; fine to coarse, subangular to subrounded gravel.	1
2	13							SAND WITH GRAVEL (SW); loose, moist, brown; fine to coarse sand; fine to coarse, subangular to subrounded gravel.	2
3	12		S-1	▲	6 5 4	AB-02-2.5-4.0			3
4	11					AB-02-4.0-5.0		SILTY SAND WITH GRAVEL (SM); loose, moist, brown; fine to coarse sand; fine to coarse, subangular to subrounded gravel; trace shell fragments.	4
5	10		S-2		2 2 2			GRAVEL WITH SAND (GW); very loose, moist, gray; fine to coarse sand; fine to coarse, subrounded gravel.	5
6	9			▲		AB-02-6.0-7.5		CLAYEY SAND WITH GRAVEL (SC); very loose, moist, gray; fine to coarse sand; fine, subrounded gravel; trace shell fragments.	6
7	8								7
8	7		S-3	▲	3 5 9			SILTY GRAVEL (GM); medium dense, wet, brown; fine to coarse sand, coarse, subrounded gravel.	8
9	6								9
10	5	▽ 4/26/2022						Becomes wet and mottled brown and orange.	10
11	4					AB-02-11.0-12.0		SILTY SAND WITH GRAVEL (SM); medium dense, wet, gray; fine to coarse sand; fine to coarse, subrounded gravel; trace wood fragments.	11
12	3								12
13	2							Bottom of exploration at 12.5 ft. bgs.	13
14	1								14

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◫ Continuous core 4" ID
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⟶⊣ Liquid Limit

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JRG
Approved by: MVDA/SG

Exploration Log AB-02

Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\210195 - PORT OF BHAM - HARRIS AVE SHIPYARD.GPJ February 6, 2023

Aspect CONSULTING	Harris Ave Shipyard Cleanup PRDI - 210195		Geotechnical Exploration Log	
	Project Address & Site Specific Location 201 Harris Ave, Bellingham, WA 98225, Cleanup Area 2		*Coordinates (Lat,Lon WGS84)* 48.7208, -122.5153 (est)	*Exploration Number* **AB-03**
Contractor Cascade Drilling	*Equipment* TSI 150CC Sonic Rig	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface Elev. (NAVD88)* 15.1' (est)	
Operator Charles Winland	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 4/26/2022	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	15							SAND WITH GRAVEL (SW); loose, moist, brown; fine to coarse sand; fine to coarse, subangular to subrounded gravel.	0
1	14	Backfilled with hydrate bentonite chips.							1
2	13							SAND WITH GRAVEL (SP); loose, moist, gray to brown; fine sand; fine, subangular to subrounded gravel; trace shell fragments; creosote odor.	2
3	12		S1	▲	5 5 5	AB-03-2.5-4.0		SILTY SAND WITH GRAVEL (SM); very loose to loose, moist, gray; low plasticity; fine sand; fine to coarse, subangular to subrounded gravel.	3
4	11								4
5	10		S2	▲	0 2 2	AB-03-5.0-6.5 AB-D-2		Mottled brown and orange.	5
6	9								6
7	8	Blow counts likely overstated due to presence of gravel.							7
8	7		S3	▲	8 16 18	AB-03-7.5-8.5		Trace wood and rootlets; black staining.	8
9	6							Mottled brown and orange.	9
10	5							Few rootlets.	10
11	4					AB-03-11.0-12.5			11
12	3								12
13	2		S4	▲	0 0 2				13
14	1							Bottom of exploration at 14 ft. bgs.	14

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◧ Continuous core 4" ID
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level
- No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JRG
Approved by: MVDA/SG

Exploration Log AB-03
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\210195 - PORT OF BHAM - HARRIS AVE SHIPYARD.GPJ February 6, 2023

Aspect CONSULTING	Harris Ave Shipyard Cleanup PRDI - 210195		Geotechnical Exploration Log	
	Project Address & Site Specific Location 201 Harris Ave, Bellingham, WA 98225, Cleanup Area 2		*Coordinates (Lat,Lon WGS84)* 48.7209, -122.5154 (est)	*Exploration Number* **AB-04**
Contractor Cascade Drilling	*Equipment* TSI 150CC Sonic Rig	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface Elev. (NAVD88)* 15' (est)	
Operator Charles Winland	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 4/25/2022	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 9' (ATD)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0								SILTY GRAVEL WITH SAND (GM); medium dense, moist, gray; fine to coarse sand; fine to coarse, subangular gravel.	0
1	14	Backfilled with hydrated bentonite chips.							1
								2-inches SAND (SP); very loose, moist, light brown; fine sand.	
2	13							SILTY SAND WITH GRAVEL (SM); very dense, moist, black; fine to coarse sand; fine to coarse, subangular to subrounded gravel; with lumber debris; slight creosote odor.	2
3	12	Blow counts likely overstated due to presence of gravel.	S1	▲	50/6"	AB-04-2.5-3.0		GRAVEL WITH SAND (GP); medium dense, moist, gray; fine to coarse sand; fine to coarse, subangular gravel.	3
4	11								4
5	10				14 15 20	AB-04-5.0-6.5		SAND WITH GRAVEL (SW); medium dense to dense, moist, gray to brown; fine to coarse sand; fine to coarse, subrounded gravel.	5
6	9		S2	▲					6
7	8								7
8	7		S3	▲	3 8 8	AB-04-7.5-9.0			8
9	6	▽ 4/25/2022						Becomes wet.	9
10	5							CLAYEY GRAVEL WITH SAND (GC); medium dense, wet, light brown mottled orange; fine to coarse sand; fine to coarse, subrounded gravel.	10
11	4								11
12	3								12
13	2		S4	▲	2 3 2	AB-04-12.5-14.0		CLAY WITH GRAVEL (CL); medium stiff, wet, gray; medium plasticity; fine sand; fine, subrounded gravel.	13
								2-inches CLAYEY SAND WITH GRAVEL (GC).	
14	1							Bottom of exploration at 14 ft. bgs.	14

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◫ Continuous core 4" ID
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⊣ Liquid Limit

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JRG
Approved by: MVDA/SG

Exploration Log AB-04
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\210195 - PORT OF BHAM - HARRIS AVE SHIPYARD.GPJ February 6, 2023

Harris Ave Shipyard Cleanup PRDI - 210195

Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
201 Harris Ave, Bellingham, WA 98225, Cleanup Area 2	48.7208, -122.5155 (est)	**AB-05**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)
Cascade Drilling	TSI 150CC Sonic Rig	Autohammer; 140 lb hammer; 30" drop	15.1' (est)

Operator	Exploration Method(s)	Work Start/Completion Dates	Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
Charles Winland	Sonic	4/25/2022	NA	12' (ATD)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	15							GRAVEL WITH SILT (GP-GM); medium dense, moist, grayfew fine sand; fine to coarse, subangular gravel.	0
1	14	Backfilled with hydrated bentonite chips.						SAND WITH GRAVEL (SW); medium dense, moist, brown; fine to coarse sand; fine to coarse, sub angular gravel.	1
2	13							SILTY SAND (SM); medium dense, moist, dark brown; fine to coarse sand; trace fine to coarse, sub angular gravel.	2
3	12		S1	▲	10 9 8	AB-05-2.5-4.0		SILTY GRAVEL WITH SAND (GM); medium dense, moist, brown; fine to coarse sand; fine to coarse, subrounded to subangular gravel.	3
4	11							SAND WITH SILT AND GRAVEL (SW-SM); medium dense, moist, brown; fine to coarse sand; fine to coarse, subangular gravel; trace shell fragments.	4
5	10		S2		13 10 9	AB-05-5.0-6.5 AB-D-1			5
6	9			▲					6
7	8					AB-05-6.5-7.5			7
8	7		S3	▲	1 1 1			Becomes very loose.	8
9	6								9
10	5								10
11	4							Trace wood fragments.	11
12	3	▽ 4/25/2022						CLAYEY GRAVEL WITH SAND (GC); very loose to loose, wet, gray; low plasticity; fine to coarse sand; fine to coarse, subrounded gravel.	12
13	2		S4	▲	5 4 2	AB-05-12.5-13.0		CLAY WITH GRAVEL (CL); medium stiff, wet, gray; low plasticity; fine to coarse sand; fine to coarse, subrounded gravel.	13
14	1							Bottom of exploration at 14 ft. bgs.	14

Plastic Limit ⊢—⊣ Liquid Limit

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◧ Continuous core 4" ID
- ◪ Split Barrel 2" X 1.375" (SPT)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JRG
Approved by: MVDA/SG

Exploration Log AB-05

Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\210195 - PORT OF BHAM - HARRIS AVE SHIPYARD.GPJ February 6, 2023

Aspect CONSULTING	Harris Ave Shipyard Cleanup PRDI - 210195		Geotechnical Exploration Log	
	Project Address & Site Specific Location 201 Harris Ave, Bellingham, WA 98225, Cleanup Area 2		*Coordinates (Lat,Lon WGS84)* 48.7210, -122.5153 (est)	*Exploration Number* **AB-06**
Contractor Cascade Drilling	*Equipment* TSI 150CC Sonic Rig	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface Elev. (NAVD88)* 15.1' (est)	
Operator Charles Winland	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 4/25/2022	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 11' (ATD)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	15							SILTY GRAVEL WITH SAND (GM); loose to medium dense, moist, brown to gray; fine to coarse sand; fine to coarse, subrounded gravel.	0
1	14	Backfilled with hydrated bentonite chips.							1
2	13							2-inches SAND (SP); very loose, moistm light brown; find sand.	2
3	12		S1	▲	11 6 9	AB-06-2.5-4.0			3
4	11					AB-06-4.0-5.0			4
5	10		S2		3 3 4			Trace lumber debris with slight creosote odor; few shell fragments.	5
6	9			▲				Mottled brown and orange.	6
7	8								7
8	7		S3	▲	3 2 5	AB-06-7.5-9.0			8
9	6								9
10	5							CLAYEY SAND WITH GRAVEL (SC); loose, moist to wet, gray; fine to coarse sand; fine to coarse, subrounded gravel.	10
11	4	▽ 4/25/2022							11
12	3					AB-06-11.5-12.5			12
13	2	No recovery.	S4	▲	0 0 0				13
14	1							Bottom of exploration at 14 ft. bgs.	14

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◧ Continuous core 4" ID
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⟶⊣ Liquid Limit

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JRG
Approved by: MVDA/SG

Exploration Log AB-06
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\210195 - PORT OF BHAM - HARRIS AVE SHIPYARD.GPJ February 6, 2023

Harris Ave Shipyard Cleanup PRDI - 210195

Geotechnical Exploration Log

Aspect CONSULTING

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
201 Harris Ave, Bellingham, WA 98225, Cleanup Area 2	48.7209, -122.5154 (est)	**AB-07**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Cascade Drilling	TSI 150CC Sonic Rig	Autohammer; 140 lb hammer; 30" drop	14.8' (est)	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Charles Winland	Sonic	4/25/2022	NA	10' (ATD)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	14	Backfilled with hydrated bentonite chips.						SILTY GRAVEL WITH SAND (GM); loose to medium dense, moist, brown; fine to coarse sand; fine to coarse, subangular to subrounded gravel.	0
1	13							2-inches SAND (SP); very loose, moist, light brown; fine sand.	1
2	12		S1	▲	5 5 5	AB-07-2.5-4.0		SILTY SAND WITH GRAVEL (SM); medium dense, moist, brown; fine to coarse sand; fine to coarse, subrounded gravel.	2
3	11							SAND WITH GRAVEL (SW); dense, moist, light brown; fine to coarse sand; fine to coarse, subrounded gravel; few shell fragments.	3
4	10		S2	▲	13 15 16	AB-07-5.0-6.5			4
5	9								5
6	8		S3	▲	11 5 3	AB-07-7.5-8.0		SILTY SAND WITH GRAVEL (SM); loose, moist, brown to gray; fine to coarse sand; fine to coarse, subrounded gravel.	6
7	7								7
8	6								8
9	5	▽ 4/25/2022						Becomes wet.	9
10	4								10
11	3							CLAYEY GRAVEL WITH SAND (GC); loose, very moist, gray; fine to coarse sand; fine to coarse, subrounded gravel.	11
12	2		S4	▲	5 3 2	AB-07-12.5-14.0		CLAYEY SAND WITH GRAVEL (SC); loose, moist, gray; fine sand; fine, subrounded gravel.	12
13	1							Bottom of exploration at 14 ft. bgs.	13
14	0								14

Plastic Limit ⊢—⊣ Liquid Limit

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◧ Continuous core 4" ID
- ◩ Split Barrel 2" X 1.375" (SPT)

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JRG
Approved by: MVDA/SG

Exploration Log AB-07
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\210195 - PORT OF BHAM - HARRIS AVE SHIPYARD.GPJ February 6, 2023

Harris Ave Shipyard Cleanup PRDI - 210195

Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
201 Harris Ave, Bellingham, WA 98225, Cleanup Area 2	48.7209, -122.5155 (est)	**AB-08**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)
Cascade Drilling	TSI 150CC Sonic Rig	Autohammer; 140 lb hammer; 30" drop	14.8' (est)

Operator	Exploration Method(s)	Work Start/Completion Dates	Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
Charles Winland	Sonic	4/25/2022	NA	9.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	14	Backfilled with hydrated bentonite chips.						GRAVEL WITH SILT AND SAND (GW-GM); medium dense, moist, gray to brown; fine to coarse sand; fine to coarse, subrounded to angular gravel. Becomes well graded and brown.	0
1	13								1
2	12		S1	▲	14 21 22	AB-08-2.5-4.0		SILTY SAND WITH GRAVEL (SM); dense, moist, brown; fine to coarse sand; coarse, subangular gravel.	2
3	11							SILTY GRAVEL WITH SAND (GM); very loose to medium dense, moist, gray to brown; fine to coarse sand; fine to coarse, subrounded gravel.	3
4	10								4
5	9		S2	▲	20 10 13	AB-08-5.0-6.5		3-inches SILT WITH SAND (ML).	5
6	8								6
7	7		S3	▲	9 9 8	AB-08-7.5-9.0		Becomes wet.	7
8	6								8
9	5	▽ 4/25/2022							9
10	4								10
11	3					AB-08-11.5-12.5		SILTY SAND WITH GRAVEL (SM); very loose, wet, gray brown with orange mottle; fine sand; fine, subrounded gravel.	11
12	2				1 0 1				12
13	1		S4	▲					13
14	0							Bottom of exploration at 14 ft. bgs.	14

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◧ Continuous core 4" ID
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢——⊣ Liquid Limit

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JRG
Approved by: MVDA/SG

Exploration Log AB-08

Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\210195 - PORT OF BHAM - HARRIS AVE SHIPYARD.GPJ February 6, 2023

Harris Ave Shipyard Cleanup PRDI - 210195

Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
201 Harris Ave, Bellingham, WA 98225, Cleanup Area 2	48.7210, -122.5151 (est)	**AB-09**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Cascade Drilling	TSI 150CC Sonic Rig	Autohammer; 140 lb hammer; 30" drop	15.1' (est)	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Charles Winland	Sonic	4/26/2022	NA	10' (ATD)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0	15							GRAVEL WITH SILT (GP-GM); medium dense, moist, gray; few fine sand; fine to coarse, subangular gravel.	0
1	14	Backfilled with hydrated bentonite chips.						GRAVEL WITH SAND (GW); loose to medium dense, moist, brown; fine to coarse sand; fine to coarse, subrounded to subangular gravel. 4-inches black SILTY SAND (SM).	1
2	13							Wood, nails, rags, and miscellaneous debris.	2
3	12		S1	▲	10 8 6	AB-09-2.5-4.0			3
4	11							4-inches of black SILTY SAND (SM); lumber debris and nails.	4
5	10							SILTY SAND WITH GRAVEL (SM); medium dense, moist to very moist, brown to gray; fine to coarse sand; fine to coarse, subrounded gravel.	5
6	9		S2	▲	7 7 5	AB-09-5.0-6.5			6
7	8							Mottled brown and orange.	7
8	7		S3	▲	6 8 11	AB-09-7.5-9.0		Becomes gray with trace wood fragments.	8
9	6								9
10	5	▽ 4/26/2022						Becomes wet.	10
11	4					AB-09-11-12.5			11
12	3								12
13	2							Bottom of exploration at 12.5 ft. bgs.	13
14	1								14

Legend

Sample Type
- Continuous core 4" ID
- Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢—⊣ Liquid Limit

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JRG
Approved by: MVDA/SG

Exploration Log AB-09

Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\210195 - PORT OF BHAM - HARRIS AVE SHIPYARD.GPJ February 6, 2023

Harris Ave Shipyard Cleanup PRDI - 210195

Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
201 Harris Ave, Bellingham, WA 98225, Cleanup Area 2	48.7210, -122.5155 (est)	**AB-10**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Cascade Drilling	TSI 150CC Sonic Rig	Autohammer; 140 lb hammer; 30" drop	15' (est)	
Operator	**Exploration Method(s)**	**Work Start/Completion Dates**	**Top of Casing Elev. (NAVD88)**	**Depth to Water (Below GS)**
Charles Winland	Sonic	4/25/2022	NA	9' (ATD)

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0								GRAVEL WITH SILT (GP-GM); medium dense, moist, gray; few fine sand; fine to coarse, subangular gravel.	0
1	14	Backfilled with hydrated bentonite chips.						SILTY SAND WITH GRAVEL (SM); medium dense, moist, brown; fine to coarse sand; fine to coarse, subrounded gravel.	1
2	13								2
3	12		S1	▲	10 7 6	AB-10-2.5-4.0		SILTY GRAVEL WITH SAND (GM); medium dense, moist, gray; fine sand; fine to coarse, sub angular gravel.	3
								SILTY SAND WITH GRAVEL (SM); medium dense, moist, gray; fine sand; fine, subrounded gravel.	
4	11								4
						AB-10-4.5-5.0		SILT WITH SAND (ML); soft, moist to very moist, light brown with orange mottle; non plastic to low pasticity; fine sand; trace fine, subangular to subrounded gravel.	
5	10		S2		1 1 2			Traces of wood, gravel, and mottling noted throughout ML layer.	5
6	9			▲					6
								SILT (ML); soft, very moist, light brown; trace fine sand; trace fine, subrounded gravel; trace lumber derbis.	
7	8					AB-10-7.0-7.5			7
					1	AB-10-7.5-9.0			
8	7		S3		1 2				8
				▲					
9	6	▽ 4/25/2022						GRAVEL WITH SAND (GW); very loose, wet, brown to gray; fine to coarse sand; fine to coarse, subrounded gravel.	9
10	5								10
11	4								11
12	3								12
13	2								13
14	1							Bottom of exploration at 14 ft. bgs.	14

Legend

Sample Type
- ◯ No Soil Sample Recovery
- ◫ Continuous core 4" ID
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ⊢⟷⊣ Liquid Limit

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JRG
Approved by: MVDA/SG

Exploration Log AB-10

Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\210195 - PORT OF BHAM - HARRIS AVE SHIPYARD.GPJ February 6, 2023

Aquifer Testing Data from Pre-Remedial Design Investigation (2022)

D. Aquifer Hydraulic Testing Methods and Results

This appendix describes the methods and results conducted to document hydraulic characteristics of the shallow water-bearing unit at the Harris Avenue Shipyard site (Site). The hydraulic data were collected to assist the Port of Bellingham's selected cleanup construction contractor with design of their dewatering approach for soil excavation within the Site's Cleanup Area 2 (CA 2). The testing included both continuous water level monitoring in two shallow monitoring wells adjacent to the CA 2 excavation area (MW-2A and MW-12)[1] as well as hydraulic conductivity (K) testing (slug testing) of the two wells. Each data collection activity is described below.

D.1. Continuous Water Level Monitoring

Continuous water level monitoring was performed in monitoring wells MW-2A and MW-12 to document groundwater elevations and the magnitude of tidal influence on them. The monitoring wells were equipped with a downhole pressure transducer/data logger to allow automated collection of water level data on a 6-minute interval throughout the 5-day monitoring period of April 28 through May 3, 2022. The 6-minute interval matches that used by the National Oceanic and Atmospheric Administration (NOAA) for tidal stage readings. The closest NOAA tide station to the Site is at Cherry Point, approximately 14 miles northwest of the Site. The tidal stage data from that station were obtained for inclusion and evaluation with the groundwater level data. A barometric pressure data logger was also installed on Site to allow the groundwater level data to be corrected for changes in atmospheric pressure throughout the study.

Figure D.1 depicts the continuous water level data from the two wells and from the Cherry Point tidal station; the groundwater and tide level data are plotted on separate y axes, with different scales, for presentation purposes.

The groundwater levels at both wells show a definitive tidal influence with very little time lag from changes in tidal stage. The groundwater levels at well MW-12S, located west of CA 2, show a somewhat greater magnitude of tidal response (up to 3 feet) than does MW-2A located east of CA 2 (up to 2 feet). That is even though well MW-12S is located slightly farther inland from the shoreline (as defined by the mean higher high water [MHHW] elevation contour) than is well MW-2A—approximately 32 feet versus 20 feet inland, respectively. The difference in tidal response (tidal efficiency) is likely attributable to more permeable aquifer conditions in the MW-12A area (as is indicated by slug testing data described in Section D.2) and/or a more hydraulically open shoreline structure (e.g., rip rap versus solid bulkhead) in the MW-12A area.

[1] Each well is located between the planned CA 2 excavation and the Site's Bellingham Bay shoreline (refer to figures in main body of this report).

D.2. Hydraulic Conductivity (Slug) Testing

Aspect performed slug testing in wells MW-2A and MW-12 to estimate the hydraulic conductivity (K) of the shallow water-bearing zone near the planned CA 2 excavation. A slug test produces a change in water level within a well and measures the rate of return to the static water level (SWL). This rate of water level change in the well is used to compute the K of the water-bearing zone.

D.2.1.1. Slug Test Methods

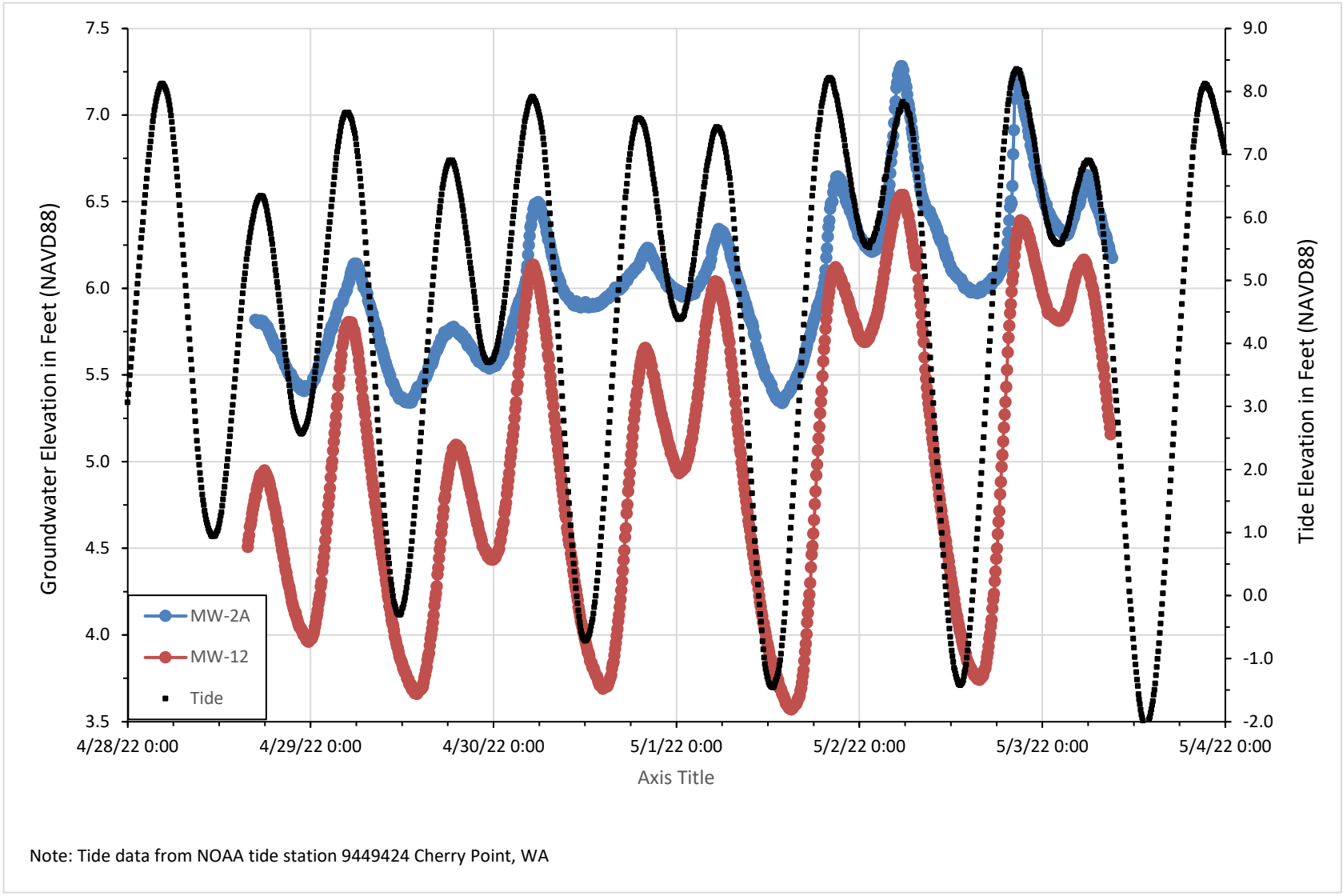
A slug rod (a solid cylinder of known volume suspended with a fiberglass cable) was used to displace water in each well. Prior to the rising-head slug test, the slug rod was inserted into the water column and the water level was allowed to return to SWL. Then the test was performed by rapidly removing the slug rod from the water, causing the water level to rapidly fall before rising back to the SWL over time. To verify the precision of the results, the test was performed three times at each well. To evaluate the results for dependency on hydraulic head, the rising head tests were performed with two slug rods of at least two different lengths in each well. Falling head tests (when the slug is rapidly submerged in the water column) are not valid in wells where the water level intersects the screen interval and therefore were not used in the analysis.

The water levels in the wells during testing were measured using a vented pressure transducer and collected electronically on a data logger set to a nearly continuous time interval (1 second or less). Water levels were measured manually with an electronic tape before and after testing was completed to confirm transducer readings and determine tidal-induced change during the test duration.

D.2.1.2. Slug Test Results

After reviewing the slug test data, we estimated K using the Bouwer & Rice method for unconfined aquifer conditions as updated (Bouwer, 1989[2]). Table D.1 summarizes the well parameters and resulting K estimates for the replicate tests, and the geometric mean of the replicates, for each well. The resulting K estimates from replicate testing were consistent at each well, and the geometric mean value for the two wells were 1 and 12 feet per day (4×10^{-4} to 4×10^{-3} centimeters per second) in wells MW-2A and MW-12, respectively. The geometric mean estimate for the shallow water-bearing zone across the CA 2 area (combining data from both wells) is 3 feet per day (1×10^{-3} centimeters per second). These estimates are consistent with the silty sands described within the monitoring well screen intervals.

[2] Bouwer, H., 1989, The Bouwer and Rice Slug Test – an Update, Ground Water, Vol. 27, No. 3, May-June 1989.



Note: Tide data from NOAA tide station 9449424 Cherry Point, WA

Aspect Consulting
February 2023
V:\210195 Harris Ave Shipyard Remedial Design\Deliverables\2023.02 EDR\Draft\App D_Aquifer Testing Data\Fig D.1 WL Data plot

Figure D.1.
Groundwater Level (MW-2A, MW-12) and Tide Elevation Data, 4/28-5/3/2022

Table D.1. Aquifer Hydraulic Conductivity Estimates from Slug Tests

210195 Harris Ave Shipyard Site, Port of Bellingham

Monitoring Well	MW-02A			MW-12		
Well Depth in Feet	11.9			15.0		
Screen Length in Feet	10.0			10.0		
Depth to Screen in Feet	4.0			5.0		
Depth to Aquitard in Feet	14			25		
Depth to Water in Feet bTOC	9.10			10.03		
Depth to Sandpack in Feet	3.0			3.0		
Slug Displacement (Ho) in Feet	0.81	0.95	0.44	0.54	1.06	1.07
Porosity (n)	0.30			0.30		
Radius of Casing (rc) in Feet	0.08			0.08		
Radius of Borehole (rw) in Feet	0.35			0.35		
Saturated Aquifer Thickness (H) in Feet	**4.9**			**15.0**		
Saturated Well Thickness (Lw) in Feet	**4.9**			**5.0**		
Effective Radius (reff) in Feet	**0.206**			**0.206**		
Effective Screen Length (Le) in Feet	**4.9**			**5.0**		
Slug Size *Rising/Falling Head Test*	*2.5' x1.7"* *Rising*	*2.5' x1.7"* *Rising*	*1.5' x1.7"* *Rising*	*1.5' x1.7"* *Rising*	*2.5' x1.7"* *Rising*	*2.5' x1.7"* *Rising*
Fully Submerged Sandpack	*No*	*No*	*No*	*No*	*No*	*No*
Transiently Exposed Sandpack	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Transiently Exposed Screen	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Partially Submerged Screen	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Bouwer and Rice Analysis Parameters						
Normalized Head at t1 (y1) in Feet	**0.21**	**0.18**	**0.26**	**0.30**	**0.35**	**0.32**
Time - t1 in Seconds	**66**	**58**	**54**	**27**	**30**	**31**
Normalized Head at t2 (y2) in Feet	**0.19**	**0.17**	**0.23**	**0.18**	**0.22**	**0.20**
Time - t2 in Seconds	**147**	**184**	**146**	**50**	**55**	**56**
Calculated K in cm/sec	**3E-04**	**2E-04**	**3E-04**	**5E-03**	**4E-03**	**4E-03**
Calculated K in ft/day	**0.8**	**0.6**	**0.7**	**13**	**11**	**11**
Geometric Mean K in ft/day	**1**			**12**		
Site Geometric Mean K in ft/day	**3**					
Screened Interval Soil Type	SP + ML			SW + ML		

Notes:

Data analysis by method of Bouwer and Rice (1976; 1989).

For each well, analyses are run for three individual tests and geometrically averaged.

Bold values are entered from field data and other values are calculated.

All depths are below ground surface

Groundwater Analytical Data from Remedial Investigation and Pre-Remedial Design Investigation(1998-2022)

Harris Avenue Shipyard

Remedial Investigation/ Feasibility Study

Appendix C
Current and Historical Data

FINAL

Legend

- Floyd|Snider Vibracore Location (2015)
- Floyd|Snider Geoprobe Location (2011, 2013, 2015)
- Floyd|Snider Grab Sample Location (2011, 2013)
- Floyd|Snider Hand Auger Location (2011, 2013)
- Floyd|Snider Monitoring Well (2011, 2013, 2015)
- Floyd|Snider Surface Soil Sample Location (2013)
- Geoengineers Grab Sample Location (1996)
- Inaccessible or Decommissioned Monitoring Well
- MCI and Ecology Upland Grab Sample Location (1993)
- RETEC Monitoring Well
- RETEC PSDDA Vibracore Sample Location (2004)
- RETEC Phase 2 Boring Location (1998)
- RETEC Phase 2 Grab Sample Location (1998)
- RETEC Phase 2 Test Pit Location (1998)
- RETEC Phase 2 Vibracore Sample Location (1998)
- RETEC RI/FS Cesium Core Sample Location (2000)
- RETEC RI/FS Grab Sample Location (2000, 2003)
- RETEC RI/FS Offshore Sample Location (2005)
- RETEC RI/FS Upland Sample Location (2005)
- RETEC RI/FS Vibracore Sample Location (2000)
- Tax Parcel
- 1998 Bathymetry Data
- Harbor Line
- 0-feet Mean Lower Low Water Level
- Riprap
- Preliminary Site Boundary

N

0 62.5 125 250

Scale in Feet

Notes:
- Basemap and locations of previous investigations provided by The RETEC Group (Phase 2 and RI/FS sampling).
- Interim Action confirmation sample locations not shown.
- Aerial image provided by City of Bellingham, 2013.

Abbreviations:
Ecology = Washington State Department of Ecology.
MCI = Maritime Contractors, Inc.
MLLW = Mean Lower Low Water.
PSDDA = Puget Sound Dredged Disposal Analysis.
RI/FS = Remediation Investigation/Feasibility Study.

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Figure 2.5
Historical and Current Sample Locations

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6/7/2019

Legend

- More Than Two Times Greater Than Criteria
- Greater Than Criteria
- Less Than Criteria
- Not Detected
- Monitoring Well
- 1998 Bathymetry Data
- Fence Line
- Harbor Line
- 0-feet Mean Lower Low Water Level
- Riprap

Analyte	Proposed CULs (µg/L)[1]
Arsenic (As)	5
Copper (Cu)	3.1
Zinc (Zn)	81

Notes:
1. Proposed CULs are the lowest of the screening levels to protect surface water quality and sediment quality as modified by natural background for arsenic.
· Results shown are the average concentrations from all 2013 and 2015 sampling events.
· Results are in dissolved fraction.
· Basemap and locations of previous investigations provided by the RETEC Group (1998 Phase 2 Sampling of Soil and Groundwater at the Harris Avenue Shipyard).
· All results are reported in µg/L.
· Aerial image provided by City of Bellingham, 2013.

Abbreviations:
AST = Aboveground storage tank.
CUL = Cleanup level.
MLLW = Mean Lower Low Water.
µg/L = Micrograms per liter.

Qualifiers:
J = The analyte was detected and the result should be considered an estimate.
U = Analyte was not detected at given reporting limit.

0 30 60 120
Scale in Feet

MW-10
2013
As: 3.9
Cu: 0.44
Zn: 8.3 U

MW-06
2013-2015
As: 4.0 J
Cu: 1.4 J
Zn: 2.3

MW-01
2013-2015
As: 19
Cu: 0.84
Zn: 5.0 U

MW-09
2013-2015
As: 17
Cu: 0.37 J
Zn: 2.6

MW-11
2015
As: 8.6
Cu: 0.52 J
Zn: 0.50 U

MW-02A
2013-2015
As: 3.6 J
Cu: 7.2
Zn: 100

MW-12
2015
As: 3.9 J
Cu: 10
Zn: 260

MW-07
2013-2015
As: 2.7 J
Cu: 1.2 J
Zn: 3.8

MW-04
2013
As: 1.8
Cu: 2.1
Zn: 8.3 U

MW-05
2013
As: 0.38
Cu: 0.84
Zn: 8.3 U

MW-08
2013-2015
As: 2.1 J
Cu: 2.2
Zn: 1.0 U

HARRIS AVENUE PIER
CARPENTER BUILDING AND PIER
WASTE OIL DRUM STORAGE
HISTORICAL ASTs
MARINE RAILWAY
WINCH HOUSE
PAINT SHOP
SANDBLAST SHED
MACHINE SHOP
WATER TREATMENT BUILDING
PAINT BUILDING
FORMER ALL AMERICAN MARINE
FAIRHAVEN MARINE PARK
0' MLLW
-5
-10
10

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Harris Avenue Shipyard
Bellingham, Washington

Figure 5.7
Average Arsenic, Copper, and Zinc Concentrations in Groundwater

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Table C.8

Chemistry Data for Groundwater Samples

		Event	Phase 2 Groundwater Sampling (RETEC)				
		Location	MW-01	MW-01	MW-02	MW-02	MW-03
		Sample ID	**MW-1-98**	**MW-1-98-F**	**MW-2-98**	**MW-2-98-F**	**MW-3-98**
		Date	05/14/1998	05/14/1998	05/14/1998	05/14/1998	05/14/1998
Dissolved Metals							
Antimony	µg/L			1 U		5 U	
Arsenic	µg/L			4		2	
Beryllium	µg/L			1 U		1 U	
Cadmium	µg/L			2 U		2 U	
Chromium	µg/L			5 U		5 U	
Copper	µg/L			2 U		3	
Lead	µg/L			1 U		5 U	
Mercury (inorganic)	µg/L			0.1 U		0.1 U	
Nickel	µg/L			10 U		10 U	
Selenium	µg/L			2 U		10 U	
Silver	µg/L			3 U		3 U	
Thallium	µg/L			1 U		10 U	
Zinc	µg/L			4 U		71	
Total Metals							
Antimony	µg/L	3 J		6		1 U	
Arsenic	µg/L	34		24		12	
Beryllium	µg/L	2		1 U		1 U	
Cadmium	µg/L	2 U		5		5	
Chromium	µg/L	205		255		149	
Copper	µg/L	248		194		72	
Lead	µg/L	116		72		41	
Mercury (inorganic)	µg/L	0.4		0.3		0.1 U	
Nickel	µg/L	280		250		120	
Selenium	µg/L	6		5 U		1 U	
Silver	µg/L	3 U		3 U		3 U	
Thallium	µg/L	5 U		5 U		5 U	
Zinc	µg/L	352		459		163	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							
Naphthalene	µg/L	14		5 U		5 U	
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH							
1,3,5-Trimethylbenzene	µg/L	6.4		1 U		1 U	
Benzene	µg/L	1 U		1 U		1 U	
Ethylbenzene	µg/L	1.4		1 U		1 U	
Iso-Propylbenzene	µg/L	3.4		1 U		1 U	
n-Propylbenzene	µg/L	2.9		1 U		1 U	
Toluene	µg/L	1 U		1 U		1 U	
Xylenes (meta & para)	µg/L	6.6		1 U		1 U	
Xylene (ortho)	µg/L	2.5		1 U		1 U	
Other VOCs							
1,2,4-Trimethylbenzene	µg/L	15		1 U		1 U	
Acetone	µg/L	9 JB		5.9 JB		9.5 JB	
Cymene	µg/L	4.5		1 U		1 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	Phase 2 Groundwater Sampling (RETEC)				
		Location	MW-01	MW-01	MW-02	MW-02	MW-03
		Sample ID	**MW-1-98**	**MW-1-98-F**	**MW-2-98**	**MW-2-98-F**	**MW-3-98**
		Date	05/14/1998	05/14/1998	05/14/1998	05/14/1998	05/14/1998
Other VOCs							
n-Butylbenzene	µg/L		1.5		1 U		1 U
sec-Butylbenzene	µg/L		1.8		1 U		1 U
Total Petroleum Hydrocarbons (TPH)							
Gasoline-Range Hydrocarbons	µg/L		580		250 U		250 U
Diesel-Range Hydrocarbons	µg/L		4600		400		250 U
Oil-Range Hydrocarbons	µg/L		500 U		500 U		500 U

Table C.8
Chemistry Data for Groundwater Samples

	Event	Phase 2 Groundwater Sampling (RETEC)				
	Location	MW-03	MW-03	MW-03	MW-04	MW-04
	Sample ID	**MW-3-98 Dup**	**MW-3-98-F**	**MW-3-98-F Dup**	**MW-4-98**	**MW-4-98-F**
	Date	05/14/1998	05/14/1998	05/14/1998	05/14/1998	05/14/1998
Dissolved Metals						
Antimony	µg/L		1 U	1 U		1 U
Arsenic	µg/L		1 U	1 U		4
Beryllium	µg/L		1 U	1 U		1 U
Cadmium	µg/L		2 U	2 U		2 U
Chromium	µg/L		5 U	5 U		5 U
Copper	µg/L		2 U	2 U		4
Lead	µg/L		1 U	1 U		1 U
Mercury (inorganic)	µg/L		0.1 U	0.1 U		0.1 U
Nickel	µg/L		10 U	10 U		30
Selenium	µg/L		1 U	1 U		1 U
Silver	µg/L		3 U	3 U		3 U
Thallium	µg/L		1 U	1 U		1 U
Zinc	µg/L		4 U	4 U		4 U
Total Metals						
Antimony	µg/L	1 U			1 U	
Arsenic	µg/L	12			82	
Beryllium	µg/L	1 U			2	
Cadmium	µg/L	6			2 U	
Chromium	µg/L	151			176	
Copper	µg/L	83			310	
Lead	µg/L	47			102	
Mercury (inorganic)	µg/L	0.2			0.6	
Nickel	µg/L	120			330	
Selenium	µg/L	2 U			5 U	
Silver	µg/L	3 U			3 U	
Thallium	µg/L	5 U			5 U	
Zinc	µg/L	178			317	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Naphthalene	µg/L	5 U			5 U	
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH						
1,3,5-Trimethylbenzene	µg/L	1 U			1 U	
Benzene	µg/L	1 U			1 U	
Ethylbenzene	µg/L	1 U			1 U	
Iso-Propylbenzene	µg/L	1 U			1 U	
n-Propylbenzene	µg/L	1 U			1 U	
Toluene	µg/L	1 U			1 U	
Xylenes (meta & para)	µg/L	1 U			1 U	
Xylene (ortho)	µg/L	1 U			1 U	
Other VOCs						
1,2,4-Trimethylbenzene	µg/L	1 U			1 U	
Acetone	µg/L	8.6 JB			5.5 JB	
Cymene	µg/L	1 U			1 U	

Table C.8
Chemistry Data for Groundwater Samples

	Event	Phase 2 Groundwater Sampling (RETEC)				
	Location	MW-03	MW-03	MW-03	MW-04	MW-04
	Sample ID	**MW-3-98 Dup**	**MW-3-98-F**	**MW-3-98-F Dup**	**MW-4-98**	**MW-4-98-F**
	Date	05/14/1998	05/14/1998	05/14/1998	05/14/1998	05/14/1998
Other VOCs						
n-Butylbenzene	µg/L	1 U			1 U	
sec-Butylbenzene	µg/L	1 U			1 U	
Total Petroleum Hydrocarbons (TPH)						
Gasoline-Range Hydrocarbons	µg/L	250 U			250 U	
Diesel-Range Hydrocarbons	µg/L	250 U			730	
Oil-Range Hydrocarbons	µg/L	500 U			500 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	Phase 2 Groundwater Sampling (RETEC)				
		Location	MW-05	MW-05			
		Sample ID	**MW-5-98**	**MW-5-98-F**			
		Date	05/14/1998	05/14/1998			
Dissolved Metals							
Antimony	µg/L			1 U			
Arsenic	µg/L			1 U			
Beryllium	µg/L			1 U			
Cadmium	µg/L			2 U			
Chromium	µg/L			5 U			
Copper	µg/L			3			
Lead	µg/L			1 U			
Mercury (inorganic)	µg/L			0.1 U			
Nickel	µg/L			10 U			
Selenium	µg/L			1 U			
Silver	µg/L			3 U			
Thallium	µg/L			1 U			
Zinc	µg/L			4 U			
Total Metals							
Antimony	µg/L		1 U				
Arsenic	µg/L		20				
Beryllium	µg/L		9				
Cadmium	µg/L		8				
Chromium	µg/L		2120				
Copper	µg/L		1730				
Lead	µg/L		150				
Mercury (inorganic)	µg/L		4.6				
Nickel	µg/L		3810				
Selenium	µg/L		10 U				
Silver	µg/L		6 U				
Thallium	µg/L		20 U				
Zinc	µg/L		1210				
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							
Naphthalene	µg/L		5 U				
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH							
1,3,5-Trimethylbenzene	µg/L		1 U				
Benzene	µg/L		1 U				
Ethylbenzene	µg/L		1 U				
Iso-Propylbenzene	µg/L		1 U				
n-Propylbenzene	µg/L		1 U				
Toluene	µg/L		1 U				
Xylenes (meta & para)	µg/L		1 U				
Xylene (ortho)	µg/L		1 U				
Other VOCs							
1,2,4-Trimethylbenzene	µg/L		1 U				
Acetone	µg/L		7.6 JB				
Cymene	µg/L		1 U				

Table C.8
Chemistry Data for Groundwater Samples

		Event	Phase 2 Groundwater Sampling (RETEC)				
		Location	MW-05	MW-05			
		Sample ID	**MW-5-98**	**MW-5-98-F**			
		Date	05/14/1998	05/14/1998			
Other VOCs							
n-Butylbenzene	µg/L		1 U				
sec-Butylbenzene	µg/L		1 U				
Total Petroleum Hydrocarbons (TPH)							
Gasoline-Range Hydrocarbons	µg/L		250 U				
Diesel-Range Hydrocarbons	µg/L		250 U				
Oil-Range Hydrocarbons	µg/L		500 U				

Table C.8
Chemistry Data for Groundwater Samples

		Event	Shipyard Sediments RI/FS Intertidal Data (RETEC)				
		Location	MW-04				
		Sample ID	**HAS-MW-4**				
		Date	08/17/2005				
Dissolved Metals							
Antimony	µg/L		50 U				
Arsenic	µg/L		2				
Cadmium	µg/L		2 U				
Chromium	µg/L		5 U				
Copper	µg/L		2 U				
Lead	µg/L		2				
Mercury (inorganic)	µg/L		0.1 U				
Nickel	µg/L		10 U				
Silver	µg/L		3 U				
Zinc	µg/L		6 U				
Total Metals							
Antimony	µg/L		50 U				
Arsenic	µg/L		2				
Cadmium	µg/L		2 U				
Chromium	µg/L		5 U				
Copper	µg/L		2 U				
Lead	µg/L		2				
Mercury (inorganic)	µg/L		0.1 U				
Nickel	µg/L		10				
Silver	µg/L		3 U				
Zinc	µg/L		6 U				
Polychlorinated Biphenyls (PCBs)							
Aroclor 1016	µg/L		1 U				
Aroclor 1221	µg/L		1 U				
Aroclor 1232	µg/L		1 U				
Aroclor 1242	µg/L		1 U				
Aroclor 1248	µg/L		1 U				
Aroclor 1254	µg/L		1 U				
Aroclor 1260	µg/L		1 U				
Total PCBs	µg/L		1 U				
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)							
Benz(a)anthracene	µg/L		1 U				
Benzo(a)pyrene	µg/L		1 U				
Benzo(b)fluoranthene	µg/L		1 U				
Benzo(k)fluoranthene	µg/L		1 U				
Benzofluoranthenes (total)	µg/L		1 U				
Chrysene	µg/L		1 U				
Dibenzo(a,h)anthracene	µg/L		1 U				
Indeno(1,2,3-cd)pyrene	µg/L		1 U				
cPAHs (MTCA TEQ-HalfND)	µg/L		0.76 U				
cPAHs (MTCA TEQ-ZeroND)	µg/L		0 U				
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							

Table C.8
Chemistry Data for Groundwater Samples

		Event	Shipyard Sediments RI/FS Intertidal Data (RETEC)				
		Location	MW-04				
		Sample ID	**HAS-MW-4**				
		Date	08/17/2005				
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							
Total LPAH	µg/L		1 U				
Naphthalene	µg/L		1 U				
Acenaphthylene	µg/L		1 U				
Acenaphthene	µg/L		1 U				
Fluorene	µg/L		1 U				
Phenanthrene	µg/L		1 U				
Anthracene	µg/L		1 U				
2-Methylnaphthalene	µg/L		1 U				
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Total HPAH	µg/L		1 U				
Fluoranthene	µg/L		1 U				
Pyrene	µg/L		1 U				
Benzo(g,h,i)perylene	µg/L		1 U				
Other SVOCs							
Dibenzofuran	µg/L		1 U				
Total Petroleum Hydrocarbons (TPH)							
Gasoline-Range Hydrocarbons	µg/L		250 U				
Diesel-Range Hydrocarbons	µg/L		250 U				
Oil-Range Hydrocarbons	µg/L		500 U				

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Round 1 Sampling (Floyd|Snider)				
	Location	FS-07	FS-09	FS-09	FS-15	FS-17
	Sample ID	**FS07-GW16-031611**	**FS09-GW17-031511**	**FS09A-GW17-031511**	**FS15-GW19-031411**	**FS17-GW17-031611**
	Date	03/16/2011	03/15/2011	03/15/2011	03/14/2011	03/16/2011
Dissolved Metals						
Arsenic	µg/L	47	4.9	5.8	7	3.5
Cadmium	µg/L	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Calcium	mg/L	160	0.17 U	0.17 U	0.17 U	38
Chromium	µg/L	7	0.59 U	0.59 U	0.59 U	0.59 U
Copper	µg/L	9	2.6 U	2.6 U	3.6	2.6 U
Lead	µg/L	1	0.62 U	0.62 U	0.62 U	0.62 U
Mercury (inorganic)	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	µg/L	14	1.7 U	1.7 U	1.7 U	2.3
Silver	µg/L	0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Zinc	µg/L	19	25	27	3.9 U	3.9 U
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Naphthalene	µg/L	2 U	1100	1300	1.5	2 U
Other SVOCs						
1,2,4-Trichlorobenzene	µg/L	2 U	1 U	1 U	1 U	2 U
1,2-Dichlorobenzene	µg/L	2 U	1 U	1 U	1 U	2 U
1,3-Dichlorobenzene	µg/L	2 U	1 U	1 U	1 U	2 U
Hexachlorobutadiene	µg/L	2 U	1 U	1 U	1 U	2 U
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH						
1,3,5-Trimethylbenzene	µg/L	2 U	1 U	1 U	1 U	2 U
Benzene	µg/L	2 U	1 U	1 U	1 U	2 U
Ethylbenzene	µg/L	2 U	3.1	3.2	1 U	2 U
Iso-Propylbenzene	µg/L	2 U	1.8	1.9	1 U	2 U
n-Propylbenzene	µg/L	2 U	1.8	2	1 U	2 U
Toluene	µg/L	2 U	1 U	1 U	1 U	2 U
Xylenes (meta & para)	µg/L	4 U	2.5	2.6	2 U	4 U
Xylene (ortho)	µg/L	2 U	3.8	3.7	1 U	2 U
Xylenes (total)	µg/L	4 U	6.3	6.3	2 U	4 U
Other VOCs						
1,1,1,2-Tetrachloroethane	µg/L	2 U	1 U	1 U	1 U	2 U
1,1,1-Trichloroethane	µg/L	2 U	1 U	1 U	1 U	2 U
1,1,2,2-Tetrachloroethane	µg/L	2 U	1 U	1 U	1 U	2 U
1,1,2-Trichloroethane	µg/L	2 U	1 U	1 U	1 U	2 U
1,1-Dichloroethane	µg/L	2 U	1 U	1 U	1 U	2 U
1,1-Dichloroethene	µg/L	2 U	1 U	1 U	1 U	2 U
1,1-Dichloropropene	µg/L	2 U	1 U	1 U	1 U	2 U
1,2,3-Trichlorobenzene	µg/L	2 U	1 U	1 U	1 U	2 U
1,2,3-Trichloropropane	µg/L	2 U	1 U	1 U	1 U	2 U
1,2,4-Trimethylbenzene	µg/L	2 U	11	12	1 U	2 U
1,2-Dibromo-3-chloropropane	µg/L	10 U	1 U	1 U	1 U	10 U
1,2-Dibromoethane (EDB)	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,2-Dichloroethane (EDC)	µg/L	2 U	1 U	1 U	1 U	2 U
1,2-Dichloropropane	µg/L	2 U	1 U	1 U	1 U	2 U

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Round 1 Sampling (Floyd|Snider)				
		Location	FS-07	FS-09	FS-09	FS-15	FS-17
		Sample ID	**FS07-GW16-031611**	**FS09-GW17-031511**	**FS09A-GW17-031511**	**FS15-GW19-031411**	**FS17-GW17-031611**
		Date	03/16/2011	03/15/2011	03/15/2011	03/14/2011	03/16/2011
Other VOCs							
1,3-Dichloropropane	µg/L		2 U	1 U	1 U	1 U	2 U
1,4-Dichlorobenzene	µg/L		2 U	1 U	1 U	1 U	2 U
2,2-Dichloropropane	µg/L		2 U	1 U	1 U	1 U	2 U
2-Chlorotoluene	µg/L		2 U	1 U	1 U	1 U	2 U
2-Hexanone	µg/L		10 U	2 U	2 U	2 U	10 U
4-Chlorotoluene	µg/L		2 U	1 U	1 U	1 U	2 U
Acetone	µg/L		25 U	2 U	2 U	2 U	25 U
Acrylonitrile	µg/L		10 U	1 U	1 U	1 U	10 U
Bromobenzene	µg/L		2 U	1 U	1 U	1 U	2 U
Bromochloromethane	µg/L		2 U	1 U	1 U	1 U	2 U
Bromodichloromethane	µg/L		2 U	1 U	1 U	1 U	2 U
Bromoform	µg/L		2 U	1 U	1 U	1 U	2 U
Bromomethane	µg/L		2 U	1 U	1 U	1 U	2 U
Carbon disulfide	µg/L		2 U	1 U	1 U	1 U	2 U
Carbon tetrachloride	µg/L		2 U	1 U	1 U	1 U	2 U
Chlorobenzene	µg/L		2 U	1 U	1 U	1 U	2 U
Chloroethane	µg/L		2 U	1 U	1 U	1 U	2 U
Chloroform	µg/L		2 U	1 U	1 U	1 U	2 U
Chloromethane	µg/L		2 U	1 U	1 U	1 U	2 U
cis-1,2-Dichloroethene	µg/L		2 U	1 U	1 U	1 U	2 U
cis-1,3-Dichloropropene	µg/L		2 U	1 U	1 U	1 U	2 U
Cymene	µg/L		2 U	2.2	2.6	1 U	2 U
Dibromochloromethane	µg/L		2 U	1 U	1 U	1 U	2 U
Dibromomethane	µg/L		2 U	1 U	1 U	1 U	2 U
Dichlorodifluoromethane	µg/L		2 U	1 U	1 U	1 U	2 U
Methyl ethyl ketone	µg/L		10 U	2 U	2 U	2 U	10 U
Methyl iso butyl ketone	µg/L		10 U	2 U	2 U	2 U	10 U
Methyl-Tert-Butyl Ether	µg/L		2 U	1 U	1 U	1 U	2 U
Methylene chloride	µg/L		5 U	1 U	1 U	1 U	5 U
n-Butylbenzene	µg/L		2 U	1 U	1 U	1 U	2 U
sec-Butylbenzene	µg/L		2 U	1 U	1 U	1 U	2 U
Styrene	µg/L		2 U	1 U	1 U	1 U	2 U
tert-Butylbenzene	µg/L		2 U	1 U	1 U	1 U	2 U
Tetrachloroethene	µg/L		2 U	1 U	1 U	1 U	2 U
trans-1,2-Dichloroethene	µg/L		2 U	1 U	1 U	1 U	2 U
trans-1,3-Dichloropropene	µg/L		2 U	1 U	1 U	1 U	2 U
Trichloroethene	µg/L		2 U	1 U	1 U	1 U	2 U
Trichlorofluoromethane	µg/L		2 U	1 U	1 U	1 U	2 U
Vinyl chloride	µg/L		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Total Petroleum Hydrocarbons (TPH)							
Gasoline-Range Hydrocarbons	µg/L		50 U	1900	1600	50 U	50 U
Diesel-Range Hydrocarbons	µg/L		130 U	3200	1600	820	130 U

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Round 1 Sampling (Floyd|Snider)				
	Location	FS-07	FS-09	FS-09	FS-15	FS-17
	Sample ID	**FS07-GW16-031611**	**FS09-GW17-031511**	**FS09A-GW17-031511**	**FS15-GW19-031411**	**FS17-GW17-031611**
	Date	03/16/2011	03/15/2011	03/15/2011	03/14/2011	03/16/2011
Total Petroleum Hydrocarbons (TPH)						
Oil-Range Hydrocarbons	µg/L	250 U	250 U	250 U	250 U	250 U

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Round 1 Sampling (Floyd|Snider)				
	Location	MW-01	MW-02A	MW-02A	MW-04	MW-05
	Sample ID	**MW1-GW-032311**	**MW02A-GW-032311**	**MW02A-GW-032311-D**	**MW4-GW-032211**	**MW5-GW-032311**
	Date	03/23/2011	03/23/2011	03/23/2011	03/22/2011	03/23/2011
Dissolved Metals						
Arsenic	µg/L	23	8.9 U	8.9 U	4.1	2
Cadmium	µg/L	0.27 U	1.4 U	1.4 U	0.27 U	0.27 U
Calcium	mg/L	140	240	230	130	19
Chromium	µg/L	1.4	3 U	3 U	0.59 U	2
Copper	µg/L	2.6 U	13 U	13 U	2.6 U	2.6 U
Lead	µg/L	0.73	3.3	4	0.62 U	0.62 U
Mercury (inorganic)	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	µg/L	3.9	18	19	2.1	4.5
Silver	µg/L	0.38 U	1.9 U	1.9 U	0.38 U	0.38 U
Zinc	µg/L	3.9 U	20 U	20 U	3.9 U	3.9 U
Polychlorinated Biphenyls (PCBs)						
Aroclor 1016	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1221	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1232	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1242	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1248	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1254	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1260	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1268	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total PCBs	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L	2 U	2 U	2 U	2 U	2 U
Benzo(a)pyrene	µg/L	2 U	2 U	2 U	2 U	2 U
Benzo(b)fluoranthene	µg/L	2 U	2 U	2 U	2 U	2 U
Benzo(k)fluoranthene	µg/L	2 U	2 U	2 U	2 U	2 U
Benzofluoranthenes (total)	µg/L	2 U	2 U	2 U	2 U	2 U
Chrysene	µg/L	2 U	2 U	2 U	2 U	2 U
Dibenzo(a,h)anthracene	µg/L	2 U	2 U	2 U	2 U	2 U
Indeno(1,2,3-cd)pyrene	µg/L	2 U	2 U	2 U	2 U	2 U
cPAHs (MTCA TEQ-HalfND)	µg/L	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
cPAHs (MTCA TEQ-ZeroND)	µg/L	2 U	2 U	2 U	2 U	2 U
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L	51.5	2 U	1.1	2 U	2 U
Naphthalene	µg/L	5.5	1 U	1.1	2 U	1 U
Acenaphthylene	µg/L	2 U	2 U	2 U	2 U	2 U
Acenaphthene	µg/L	21	2 U	2 U	2 U	2 U
Fluorene	µg/L	15	2 U	2 U	2 U	2 U
Phenanthrene	µg/L	10	2 U	2 U	2 U	2 U
Anthracene	µg/L	2 U	2 U	2 U	2 U	2 U
1-Methylnaphthalene	µg/L	78	2 U	2 U	2 U	2 U
2-Methylnaphthalene	µg/L	63	2 U	2 U	2 U	2 U
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Round 1 Sampling (Floyd|Snider)				
		Location	MW-01	MW-02A	MW-02A	MW-04	MW-05
		Sample ID	**MW1-GW-032311**	**MW02A-GW-032311**	**MW02A-GW-032311-D**	**MW4-GW-032211**	**MW5-GW-032311**
		Date	03/23/2011	03/23/2011	03/23/2011	03/22/2011	03/23/2011
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Total HPAH	µg/L		2 U	2 U	2 U	2 U	2 U
Fluoranthene	µg/L		2 U	2 U	2 U	2 U	2 U
Pyrene	µg/L		2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)perylene	µg/L		2 U	2 U	2 U	2 U	2 U
Other SVOCs							
1,2,4-Trichlorobenzene	µg/L		1 U	1 U	1 U	2 U	1 U
1,2-Dichlorobenzene	µg/L		1 U	1 U	1 U	2 U	1 U
1,3-Dichlorobenzene	µg/L		1 U	1 U	1 U	2 U	1 U
2,3,4,6-Tetrachlorophenol	µg/L		2 U	2 U	2 U	2 U	2 U
2,4,5-Trichlorophenol	µg/L		2 U	2 U	2 U	2 U	2 U
2,4,6-Trichlorophenol	µg/L		2 U	2 U	2 U	2 U	2 U
2,4-Dichlorophenol	µg/L		2 U	2 U	2 U	2 U	2 U
2,4-Dimethylphenol	µg/L		2 U	2 U	2 U	2 U	2 U
2,4-Dinitrophenol	µg/L		10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	µg/L		2 U	2 U	2 U	2 U	2 U
2,6-Dichlorophenol	µg/L		2 U	2 U	2 U	2 U	2 U
2,6-Dinitrotoluene	µg/L		2 U	2 U	2 U	2 U	2 U
2-Chloronaphthalene	µg/L		2 U	2 U	2 U	2 U	2 U
2-Chlorophenol	µg/L		2 U	2 U	2 U	2 U	2 U
2-Methylphenol	µg/L		2 U	2 U	2 U	2 U	2 U
2-Nitroaniline	µg/L		2 U	2 U	2 U	2 U	2 U
2-Nitrophenol	µg/L		2 U	2 U	2 U	2 U	2 U
3,3'-Dichlorobenzidine	µg/L		2 U	2 U	2 U	2 U	2 U
4,6 Dinitro-o-cresol	µg/L		2 U	2 U	2 U	2 U	2 U
4-Chloro-3-methylphenol	µg/L		2 U	2 U	2 U	2 U	2 U
4-Chloroaniline	µg/L		2 U	2 U	2 U	2 U	2 U
4-Nitrophenol	µg/L		2 U	2 U	2 U	2 U	2 U
Aniline	µg/L		2 U	2 U	2 U	2 U	2 U
Azobenzene	µg/L		2 U	2 U	2 U	2 U	2 U
Benzoic acid	µg/L		10 U	10 U	10 U	10 U	10 U
Benzyl alcohol	µg/L		2 U	2 U	2 U	2 U	2 U
bis(2-chloroethoxy)methane	µg/L		2 U	2 U	2 U	2 U	2 U
Bis(2-chloroethyl) ether	µg/L		2 U	2 U	2 U	2 U	2 U
Bis(2-ethylhexyl) phthalate	µg/L		2 U	2 U	2 U	2 U	2 U
Butyl benzyl phthalate	µg/L		2 U	2 U	2 U	2 U	2 U
Carbazole	µg/L		22	2 U	2 U	2 U	2 U
Dibenzofuran	µg/L		7.7	2 U	2 U	2 U	2 U
Diethyl phthalate	µg/L		2 U	2 U	2 U	2 U	2 U
Dimethyl phthalate	µg/L		2 U	2 U	2 U	2 U	2 U
Di-n-butyl phthalate	µg/L		2 U	2 U	2 U	2 U	2 U
Di-n-octyl phthalate	µg/L		2 U	2 U	2 U	2 U	2 U
Hexachlorobenzene	µg/L		2 U	2 U	2 U	2 U	2 U

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Round 1 Sampling (Floyd|Snider)				
	Location	MW-01	MW-02A	MW-02A	MW-04	MW-05
	Sample ID	**MW1-GW-032311**	**MW02A-GW-032311**	**MW02A-GW-032311-D**	**MW4-GW-032211**	**MW5-GW-032311**
	Date	03/23/2011	03/23/2011	03/23/2011	03/22/2011	03/23/2011
Other SVOCs						
Hexachlorobutadiene	µg/L	1 U	1 U	1 U	2 U	1 U
Hexachlorocyclopentadiene	µg/L	2 U	2 U	2 U	2 U	2 U
Hexachloroethane	µg/L	2 U	2 U	2 U	2 U	2 U
Isophorone	µg/L	2 U	2 U	2 U	2 U	2 U
m,p-Cresol (2:1 ratio)	µg/L	2 U	2 U	2 U	2 U	2 U
Nitrobenzene	µg/L	2 U	2 U	2 U	2 U	2 U
N-Nitrosodimethylamine	µg/L	2 U	2 U	2 U	2 U	2 U
N-Nitroso-di-n-propylamine	µg/L	2 U	2 U	2 U	2 U	2 U
N-Nitrosodiphenylamine	µg/L	2 U	2 U	2 U	2 U	2 U
Pentachlorophenol	µg/L	5 U	5 U	5 U	5 U	5 U
Phenol	µg/L	2 U	2 U	2 U	2 U	2 U
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH						
1,3,5-Trimethylbenzene	µg/L	1 U	1 U	1 U	2 U	1 U
Benzene	µg/L	1 U	1 U	1 U	2 U	1 U
Ethylbenzene	µg/L	1 U	1 U	1 U	2 U	1 U
Iso-Propylbenzene	µg/L	3	1 U	1 U	2 U	1 U
n-Propylbenzene	µg/L	2.7	1 U	1 U	2 U	1 U
Toluene	µg/L	1 U	1 U	1 U	2 U	1 U
Xylenes (meta & para)	µg/L	2.1	2 U	2 U	4 U	2 U
Xylene (ortho)	µg/L	1 U	1 U	1 U	2 U	1 U
Xylenes (total)	µg/L	2.1	2 U	2 U	4 U	2 U
Other VOCs						
1,1,1,2-Tetrachloroethane	µg/L	1 U	1 U	1 U	2 U	1 U
1,1,1-Trichloroethane	µg/L	1 U	1 U	1 U	2 U	1 U
1,1,2,2-Tetrachloroethane	µg/L	1 U	1 U	1 U	2 U	1 U
1,1,2-Trichloroethane	µg/L	1 U	1 U	1 U	2 U	1 U
1,1-Dichloroethane	µg/L	1 U	1 U	1 U	2 U	1 U
1,1-Dichloroethene	µg/L	1 U	1 U	1 U	2 U	1 U
1,1-Dichloropropene	µg/L	1 U	1 U	1 U	2 U	1 U
1,2,3-Trichlorobenzene	µg/L	1 U	1 U	1 U	2 U	1 U
1,2,3-Trichloropropane	µg/L	1 U	1 U	1 U	2 U	1 U
1,2,4-Trimethylbenzene	µg/L	1 U	1 U	1 U	2 U	1 U
1,2-Dibromo-3-chloropropane	µg/L	1 U	1 U	1 U	10 U	1 U
1,2-Dibromoethane (EDB)	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,2-Dichloroethane (EDC)	µg/L	1 U	1 U	1 U	2 U	1 U
1,2-Dichloropropane	µg/L	1 U	1 U	1 U	2 U	1 U
1,3-Dichloropropane	µg/L	1 U	1 U	1 U	2 U	1 U
1,4-Dichlorobenzene	µg/L	1 U	1 U	1 U	2 U	1 U
2,2-Dichloropropane	µg/L	1 U	1 U	1 U	2 U	1 U
2-Chlorotoluene	µg/L	1 U	1 U	1 U	2 U	1 U
2-Hexanone	µg/L	2 U	2 U	2 U	10 U	2 U
3-Nitroaniline	µg/L	5 U	5 U	5 U	5 U	5 U

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Round 1 Sampling (Floyd|Snider)				
	Location	MW-01	MW-02A	MW-02A	MW-04	MW-05
	Sample ID	**MW1-GW-032311**	**MW02A-GW-032311**	**MW02A-GW-032311-D**	**MW4-GW-032211**	**MW5-GW-032311**
	Date	03/23/2011	03/23/2011	03/23/2011	03/22/2011	03/23/2011
Other VOCs						
4-Bromophenyl phenyl ether	µg/L	2 U	2 U	2 U	2 U	2 U
4-Chlorophenyl phenyl ether	µg/L	2 U	2 U	2 U	2 U	2 U
4-Chlorotoluene	µg/L	1 U	1 U	1 U	2 U	1 U
4-Nitroaniline	µg/L	2 U	2 U	2 U	2 U	2 U
Acetone	µg/L	2 U	2 U	2 U	25 U	2 U
Acrylonitrile	µg/L	1 U	1 U	1 U	10 U	1 U
bis(2-chloroisopropyl)ether	µg/L	2 U	2 U	2 U	2 U	2 U
Bromobenzene	µg/L	1 U	1 U	1 U	2 U	1 U
Bromochloromethane	µg/L	1 U	1 U	1 U	2 U	1 U
Bromodichloromethane	µg/L	1 U	1 U	1 U	2 U	1 U
Bromoform	µg/L	1 U	1 U	1 U	2 U	1 U
Bromomethane	µg/L	1 U	1 U	1 U	2 U	1 U
Carbon disulfide	µg/L	1 U	1 U	1 U	2 U	1 U
Carbon tetrachloride	µg/L	1 U	1 U	1 U	2 U	1 U
Chlorobenzene	µg/L	1 U	1 U	1 U	2 U	1 U
Chloroethane	µg/L	1 U	1 U	1 U	2 U	1 U
Chloroform	µg/L	1 U	1 U	1 U	2 U	1 U
Chloromethane	µg/L	1 U	1 U	1 U	2 U	1 U
cis-1,2-Dichloroethene	µg/L	1 U	1 U	1 U	2 U	1 U
cis-1,3-Dichloropropene	µg/L	1 U	1 U	1 U	2 U	1 U
Cymene	µg/L	3.2	1 U	1 U	2 U	1 U
Dibromochloromethane	µg/L	1 U	1 U	1 U	2 U	1 U
Dibromomethane	µg/L	1 U	1 U	1 U	2 U	1 U
Dichlorodifluoromethane	µg/L	1 U	1 U	1 U	2 U	1 U
Methyl ethyl ketone	µg/L	2 U	2 U	2 U	10 U	2 U
Methyl iso butyl ketone	µg/L	2 U	2 U	2 U	10 U	2 U
Methyl-Tert-Butyl Ether	µg/L	1 U	1 U	1 U	2 U	1 U
Methylene chloride	µg/L	1 U	1 U	1 U	5 U	1 U
n-Butylbenzene	µg/L	1 U	1 U	1 U	2 U	1 U
Pyridine	µg/L	2 U	2 U	2 U	2 U	2 U
sec-Butylbenzene	µg/L	1.6	1 U	1 U	2 U	1 U
Styrene	µg/L	1 U	1 U	1 U	2 U	1 U
tert-Butylbenzene	µg/L	1 U	1 U	1 U	2 U	1 U
Tetrachloroethene	µg/L	1 U	1 U	1 U	2 U	1 U
trans-1,2-Dichloroethene	µg/L	1 U	1 U	1 U	2 U	1 U
trans-1,3-Dichloropropene	µg/L	1 U	1 U	1 U	2 U	1 U
Trichloroethene	µg/L	1 U	1 U	1 U	2 U	1 U
Trichlorofluoromethane	µg/L	1 U	1 U	1 U	2 U	1 U
Vinyl chloride	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Total Petroleum Hydrocarbons (TPH)						
Gasoline-Range Hydrocarbons	µg/L	730 J	50 U	50 U	50 U	50 U
Diesel-Range Hydrocarbons	µg/L	1400	130 U	130 U	130 U	130 U

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Round 1 Sampling (Floyd|Snider)				
	Location	MW-01	MW-02A	MW-02A	MW-04	MW-05
	Sample ID	**MW1-GW-032311**	**MW02A-GW-032311**	**MW02A-GW-032311-D**	**MW4-GW-032211**	**MW5-GW-032311**
	Date	03/23/2011	03/23/2011	03/23/2011	03/22/2011	03/23/2011
Total Petroleum Hydrocarbons (TPH)						
Oil-Range Hydrocarbons	µg/L	250 U	250 U	250 U	250 U	250 U

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Round 1 Sampling (Floyd|Snider)				
	Location	MW-06	MW-07	MW-08	MW-09	
	Sample ID	**MW06-GW-032211**	**MW07-GW-032311**	**MW08-GW-032211**	**MW09-GW-032211**	
	Date	03/22/2011	03/23/2011	03/22/2011	03/22/2011	
Dissolved Metals						
Arsenic	µg/L	4.6	4.4	4.8	6.7	
Cadmium	µg/L	0.27 U	0.27 U	0.27 U	0.27 U	
Calcium	mg/L	47	180	52	85	
Chromium	µg/L	0.59 U	2.1	0.59 U	0.61	
Copper	µg/L	2.6 U	2.6 U	2.6 U	2.6 U	
Lead	µg/L	0.62 U	0.62 U	0.62 U	0.62 U	
Mercury (inorganic)	µg/L	0.2 U	0.2 U	0.2 U	0.2 U	
Nickel	µg/L	1.7 U	5.5	1.7 U	1.8	
Silver	µg/L	0.38 U	0.38 U	0.38 U	0.38 U	
Zinc	µg/L	3.9 U	3.9 U	3.9 U	3.9 U	
Polychlorinated Biphenyls (PCBs)						
Aroclor 1016	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1221	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1232	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1242	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1248	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1254	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1260	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1268	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	
Total PCBs	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L	4 U	2 U	2 U	2 U	
Benzo(a)pyrene	µg/L	4 U	2 U	2 U	2 U	
Benzo(b)fluoranthene	µg/L	4 U	2 U	2 U	2 U	
Benzo(k)fluoranthene	µg/L	4 U	2 U	2 U	2 U	
Benzofluoranthenes (total)	µg/L	4 U	2 U	2 U	2 U	
Chrysene	µg/L	4 U	2 U	2 U	2 U	
Dibenzo(a,h)anthracene	µg/L	4 U	2 U	2 U	2 U	
Indeno(1,2,3-cd)pyrene	µg/L	4 U	2 U	2 U	2 U	
cPAHs (MTCA TEQ-HalfND)	µg/L	3.2 U	1.6 U	1.6 U	1.6 U	
cPAHs (MTCA TEQ-ZeroND)	µg/L	4 U	2 U	2 U	2 U	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L	4 U	2 U	2 U	5.4	
Naphthalene	µg/L	2 U	1 U	2 U	2 U	
Acenaphthylene	µg/L	4 U	2 U	2 U	2 U	
Acenaphthene	µg/L	4 U	2 U	2 U	2.2	
Fluorene	µg/L	4 U	2 U	2 U	3.2	
Phenanthrene	µg/L	4 U	2 U	2 U	2 U	
Anthracene	µg/L	4 U	2 U	2 U	2 U	
1-Methylnaphthalene	µg/L	4 U	2 U	2 U	32	
2-Methylnaphthalene	µg/L	4 U	2 U	2 U	4.1	
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Round 1 Sampling (Floyd|Snider)				
	Location	MW-06	MW-07	MW-08	MW-09	
	Sample ID	**MW06-GW-032211**	**MW07-GW-032311**	**MW08-GW-032211**	**MW09-GW-032211**	
	Date	03/22/2011	03/23/2011	03/22/2011	03/22/2011	
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Total HPAH	µg/L	4 U	2 U	2 U	2 U	
Fluoranthene	µg/L	4 U	2 U	2 U	2 U	
Pyrene	µg/L	4 U	2 U	2 U	2 U	
Benzo(g,h,i)perylene	µg/L	4 U	2 U	2 U	2 U	
Other SVOCs						
1,2,4-Trichlorobenzene	µg/L	2 U	1 U	2 U	2 U	
1,2-Dichlorobenzene	µg/L	2 U	1 U	2 U	2 U	
1,3-Dichlorobenzene	µg/L	2 U	1 U	2 U	2 U	
2,3,4,6-Tetrachlorophenol	µg/L	4 U	2 U	2 U	2 U	
2,4,5-Trichlorophenol	µg/L	4 U	2 U	2 U	2 U	
2,4,6-Trichlorophenol	µg/L	4 U	2 U	2 U	2 U	
2,4-Dichlorophenol	µg/L	4 U	2 U	2 U	2 U	
2,4-Dimethylphenol	µg/L	4 U	2 U	2 U	2 U	
2,4-Dinitrophenol	µg/L	20 U	10 U	10 U	10 U	
2,4-Dinitrotoluene	µg/L	4 U	2 U	2 U	2 U	
2,6-Dichlorophenol	µg/L	4 U	2 U	2 U	2 U	
2,6-Dinitrotoluene	µg/L	4 U	2 U	2 U	2 U	
2-Chloronaphthalene	µg/L	4 U	2 U	2 U	2 U	
2-Chlorophenol	µg/L	4 U	2 U	2 U	2 U	
2-Methylphenol	µg/L	4 U	2 U	2 U	2 U	
2-Nitroaniline	µg/L	4 U	2 U	2 U	2 U	
2-Nitrophenol	µg/L	4 U	2 U	2 U	2 U	
3,3'-Dichlorobenzidine	µg/L	4 U	2 U	2 U	2 U	
4,6 Dinitro-o-cresol	µg/L	4 U	2 U	2 U	2 U	
4-Chloro-3-methylphenol	µg/L	4 U	2 U	2 U	2 U	
4-Chloroaniline	µg/L	4 U	2 U	2 U	2 U	
4-Nitrophenol	µg/L	4 U	2 U	2 U	2 U	
Aniline	µg/L	4 U	2 U	2 U	2 U	
Azobenzene	µg/L	4 U	2 U	2 U	2 U	
Benzoic acid	µg/L	20 U	10 U	10 U	10 U	
Benzyl alcohol	µg/L	4 U	2 U	2 U	2 U	
bis(2-chloroethoxy)methane	µg/L	4 U	2 U	2 U	2 U	
Bis(2-chloroethyl) ether	µg/L	4 U	2 U	2 U	2 U	
Bis(2-ethylhexyl) phthalate	µg/L	4 U	2 U	2 U	2 U	
Butyl benzyl phthalate	µg/L	4 U	2 U	2 U	2 U	
Carbazole	µg/L	4 U	2 U	2 U	2.7	
Dibenzofuran	µg/L	4 U	2 U	2 U	2 U	
Diethyl phthalate	µg/L	4 U	2 U	2 U	2 U	
Dimethyl phthalate	µg/L	4 U	2 U	2 U	2 U	
Di-n-butyl phthalate	µg/L	4 U	2 U	2 U	2 U	
Di-n-octyl phthalate	µg/L	4 U	2 U	2 U	2 U	
Hexachlorobenzene	µg/L	4 U	2 U	2 U	2 U	

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Round 1 Sampling (Floyd|Snider)				
	Location	MW-06	MW-07	MW-08	MW-09	
	Sample ID	**MW06-GW-032211**	**MW07-GW-032311**	**MW08-GW-032211**	**MW09-GW-032211**	
	Date	03/22/2011	03/23/2011	03/22/2011	03/22/2011	
Other SVOCs						
Hexachlorobutadiene	µg/L	2 U	1 U	2 U	2 U	
Hexachlorocyclopentadiene	µg/L	4 U	2 U	2 U	2 U	
Hexachloroethane	µg/L	4 U	2 U	2 U	2 U	
Isophorone	µg/L	4 U	2 U	2 U	2 U	
m,p-Cresol (2:1 ratio)	µg/L	4 U	2 U	2 U	2 U	
Nitrobenzene	µg/L	4 U	2 U	2 U	2 U	
N-Nitrosodimethylamine	µg/L	4 U	2 U	2 U	2 U	
N-Nitroso-di-n-propylamine	µg/L	4 U	2 U	2 U	2 U	
N-Nitrosodiphenylamine	µg/L	4 U	2 U	2 U	2 U	
Pentachlorophenol	µg/L	10 U	5 U	5 U	5 U	
Phenol	µg/L	4 U	2 U	2 U	2 U	
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH						
1,3,5-Trimethylbenzene	µg/L	2 U	1 U	2 U	2 U	
Benzene	µg/L	2 U	1 U	2 U	2 U	
Ethylbenzene	µg/L	2 U	1 U	2 U	2 U	
Iso-Propylbenzene	µg/L	2 U	1 U	2 U	2	
n-Propylbenzene	µg/L	2 U	1 U	2 U	2 U	
Toluene	µg/L	2 U	1 U	2 U	2 U	
Xylenes (meta & para)	µg/L	4 U	2 U	4 U	4 U	
Xylene (ortho)	µg/L	2 U	1 U	2 U	2 U	
Xylenes (total)	µg/L	4 U	2 U	4 U	4 U	
Other VOCs						
1,1,1,2-Tetrachloroethane	µg/L	2 U	1 U	2 U	2 U	
1,1,1-Trichloroethane	µg/L	2 U	1 U	2 U	2 U	
1,1,2,2-Tetrachloroethane	µg/L	2 U	1 U	2 U	2 U	
1,1,2-Trichloroethane	µg/L	2 U	1 U	2 U	2 U	
1,1-Dichloroethane	µg/L	2 U	1 U	2 U	2 U	
1,1-Dichloroethene	µg/L	2 U	1 U	2 U	2 U	
1,1-Dichloropropene	µg/L	2 U	1 U	2 U	2 U	
1,2,3-Trichlorobenzene	µg/L	2 U	1 U	2 U	2 U	
1,2,3-Trichloropropane	µg/L	2 U	1 U	2 U	2 U	
1,2,4-Trimethylbenzene	µg/L	2 U	1 U	2 U	2 U	
1,2-Dibromo-3-chloropropane	µg/L	10 U	1 U	10 U	10 U	
1,2-Dibromoethane (EDB)	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	
1,2-Dichloroethane (EDC)	µg/L	2 U	1 U	2 U	2 U	
1,2-Dichloropropane	µg/L	2 U	1 U	2 U	2 U	
1,3-Dichloropropane	µg/L	2 U	1 U	2 U	2 U	
1,4-Dichlorobenzene	µg/L	2 U	1 U	2 U	2 U	
2,2-Dichloropropane	µg/L	2 U	1 U	2 U	2 U	
2-Chlorotoluene	µg/L	2 U	1 U	2 U	2 U	
2-Hexanone	µg/L	10 U	2 U	10 U	10 U	
3-Nitroaniline	µg/L	10 U	5 U	5 U	5 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Round 1 Sampling (Floyd|Snider)				
		Location	MW-06	MW-07	MW-08	MW-09	
		Sample ID	**MW06-GW-032211**	**MW07-GW-032311**	**MW08-GW-032211**	**MW09-GW-032211**	
		Date	03/22/2011	03/23/2011	03/22/2011	03/22/2011	
Other VOCs							
4-Bromophenyl phenyl ether	µg/L		4 U	2 U	2 U	2 U	
4-Chlorophenyl phenyl ether	µg/L		4 U	2 U	2 U	2 U	
4-Chlorotoluene	µg/L		2 U	1 U	2 U	2 U	
4-Nitroaniline	µg/L		4 U	2 U	2 U	2 U	
Acetone	µg/L		25 U	2 U	25 U	25 U	
Acrylonitrile	µg/L		10 U	1 U	10 U	10 U	
bis(2-chloroisopropyl)ether	µg/L		4 U	2 U	2 U	2 U	
Bromobenzene	µg/L		2 U	1 U	2 U	2 U	
Bromochloromethane	µg/L		2 U	1 U	2 U	2 U	
Bromodichloromethane	µg/L		2 U	1 U	2 U	2 U	
Bromoform	µg/L		2 U	1 U	2 U	2 U	
Bromomethane	µg/L		2 U	1 U	2 U	2 U	
Carbon disulfide	µg/L		2 U	1 U	2 U	2 U	
Carbon tetrachloride	µg/L		2 U	1 U	2 U	2 U	
Chlorobenzene	µg/L		2 U	1 U	2 U	2.7	
Chloroethane	µg/L		2 U	1 U	2 U	2 U	
Chloroform	µg/L		2 U	1 U	2 U	2 U	
Chloromethane	µg/L		2 U	1 U	2 U	2 U	
cis-1,2-Dichloroethene	µg/L		2 U	1 U	2 U	2 U	
cis-1,3-Dichloropropene	µg/L		2 U	1 U	2 U	2 U	
Cymene	µg/L		93	1 U	2 U	2.9	
Dibromochloromethane	µg/L		2 U	1 U	2 U	2 U	
Dibromomethane	µg/L		2 U	1 U	2 U	2 U	
Dichlorodifluoromethane	µg/L		2 U	1 U	2 U	2 U	
Methyl ethyl ketone	µg/L		10 U	2 U	10 U	10 U	
Methyl iso butyl ketone	µg/L		10 U	2 U	10 U	10 U	
Methyl-Tert-Butyl Ether	µg/L		2 U	1 U	2 U	2 U	
Methylene chloride	µg/L		5 U	1 U	5 U	5 U	
n-Butylbenzene	µg/L		2 U	1 U	2 U	2 U	
Pyridine	µg/L		4 U	2 U	2 U	2 U	
sec-Butylbenzene	µg/L		2 U	1 U	2 U	2 U	
Styrene	µg/L		2 U	1 U	2 U	2 U	
tert-Butylbenzene	µg/L		2 U	1 U	2 U	2 U	
Tetrachloroethene	µg/L		2 U	1 U	2 U	2 U	
trans-1,2-Dichloroethene	µg/L		2 U	1 U	2 U	2 U	
trans-1,3-Dichloropropene	µg/L		2 U	1 U	2 U	2 U	
Trichloroethene	µg/L		2 U	1 U	2 U	2 U	
Trichlorofluoromethane	µg/L		2 U	1 U	2 U	2 U	
Vinyl chloride	µg/L		0.2 U	0.2 U	0.2 U	0.2 U	
Total Petroleum Hydrocarbons (TPH)							
Gasoline-Range Hydrocarbons	µg/L		1000	50 U	50 U	520 J	
Diesel-Range Hydrocarbons	µg/L		3500	130 U	130 U	620	

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Round 1 Sampling (Floyd|Snider)				
	Location	MW-06	MW-07	MW-08	MW-09	
	Sample ID	**MW06-GW-032211**	**MW07-GW-032311**	**MW08-GW-032211**	**MW09-GW-032211**	
	Date	03/22/2011	03/23/2011	03/22/2011	03/22/2011	
Total Petroleum Hydrocarbons (TPH)						
Oil-Range Hydrocarbons	µg/L	1200	250 U	250 U	250 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Round 2 Sampling (Floyd|Snider)				
		Location	MW-01	MW-02A	MW-02A	MW-04	MW-05
		Sample ID	**MW1-GW-072911**	**MW2A-GW-072911**	**MW16B-GW-072911**	**MW4-GW-072911**	**MW5-GW-072911**
		Date	07/29/2011	07/29/2011	07/29/2011	07/29/2011	07/29/2011
Dissolved Metals							
Arsenic	µg/L		29	8	7.4	6.6	3.4
Cadmium	µg/L		0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Chromium	µg/L		1.6	1.6	1.7	0.71	2.9
Copper	µg/L		2.7	7.7	5.8	3	5.6
Lead	µg/L		0.62 U	0.62 U	0.62 U	0.62 U	0.62 U
Mercury (inorganic)	µg/L		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	µg/L		5.9	6.7	7.8	4.3	10
Silver	µg/L		0.38 U	0.38 U	0.38 U	0.38 U	0.38 U
Zinc	µg/L		8.3	38	43	3.9 U	7.3
Polychlorinated Biphenyls (PCBs)							
Aroclor 1016	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1221	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1232	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1242	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1248	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1254	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1260	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1268	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total PCBs	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)							
Benz(a)anthracene	µg/L		2 U	2 U	2 U	2 U	2 U
Benzo(a)pyrene	µg/L		2 U	2 U	2 U	2 U	2 U
Benzo(b)fluoranthene	µg/L		2 U	2 U	2 U	2 U	2 U
Benzo(k)fluoranthene	µg/L		2 U	2 U	2 U	2 U	2 U
Benzofluoranthenes (total)	µg/L		2 U	2 U	2 U	2 U	2 U
Chrysene	µg/L		2 U	2 U	2 U	2 U	2 U
Dibenzo(a,h)anthracene	µg/L		2 U	2 U	2 U	2 U	2 U
Indeno(1,2,3-cd)pyrene	µg/L		2 U	2 U	2 U	2 U	2 U
cPAHs (MTCA TEQ-HalfND)	µg/L		1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
cPAHs (MTCA TEQ-ZeroND)	µg/L		2 U	2 U	2 U	2 U	2 U
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							
Total LPAH	µg/L		39.2	2 U	2 U	2 U	2 U
Naphthalene	µg/L		5.8	1 U	1 U	1 U	1 U
Acenaphthylene	µg/L		2 U	2 U	2 U	2 U	2 U
Acenaphthene	µg/L		20	2 U	2 U	2 U	2 U
Fluorene	µg/L		11	2 U	2 U	2 U	2 U
Phenanthrene	µg/L		2.4	2 U	2 U	2 U	2 U
Anthracene	µg/L		2 U	2 U	2 U	2 U	2 U
1-Methylnaphthalene	µg/L		54	2 U	2 U	2 U	2 U
2-Methylnaphthalene	µg/L		30	2 U	2 U	2 U	2 U
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Total HPAH	µg/L		2 U	2 U	2 U	2 U	2 U

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Round 2 Sampling (Floyd|Snider)				
		Location	MW-01	MW-02A	MW-02A	MW-04	MW-05
		Sample ID	**MW1-GW-072911**	**MW2A-GW-072911**	**MW16B-GW-072911**	**MW4-GW-072911**	**MW5-GW-072911**
		Date	07/29/2011	07/29/2011	07/29/2011	07/29/2011	07/29/2011
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Fluoranthene	µg/L		2 U	2 U	2 U	2 U	2 U
Pyrene	µg/L		2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)perylene	µg/L		2 U	2 U	2 U	2 U	2 U
Other SVOCs							
1,2,4-Trichlorobenzene	µg/L		1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	µg/L		1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	µg/L		1 U	1 U	1 U	1 U	1 U
2,3,4,6-Tetrachlorophenol	µg/L		2 U	2 U	2 U	2 U	2 U
2,4,5-Trichlorophenol	µg/L		2 U	2 U	2 U	2 U	2 U
2,4,6-Trichlorophenol	µg/L		2 U	2 U	2 U	2 U	2 U
2,4-Dichlorophenol	µg/L		2 U	2 U	2 U	2 U	2 U
2,4-Dimethylphenol	µg/L		2 U	2 U	2 U	2 U	2 U
2,4-Dinitrophenol	µg/L		10 U	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	µg/L		2 U	2 U	2 U	2 U	2 U
2,6-Dichlorophenol	µg/L		2 U	2 U	2 U	2 U	2 U
2,6-Dinitrotoluene	µg/L		2 U	2 U	2 U	2 U	2 U
2-Chloronaphthalene	µg/L		2 U	2 U	2 U	2 U	2 U
2-Chlorophenol	µg/L		2 U	2 U	2 U	2 U	2 U
2-Methylphenol	µg/L		2 U	2 U	2 U	2 U	2 U
2-Nitroaniline	µg/L		2 U	2 U	2 U	2 U	2 U
2-Nitrophenol	µg/L		2 U	2 U	2 U	2 U	2 U
3,3'-Dichlorobenzidine	µg/L		2 U	2 U	2 U	2 U	2 U
4,6 Dinitro-o-cresol	µg/L		2 U	2 U	2 U	2 U	2 U
4-Chloro-3-methylphenol	µg/L		2 U	2 U	2 U	2 U	2 U
4-Chloroaniline	µg/L		2 U	2 U	2 U	2 U	2 U
4-Nitrophenol	µg/L		2 U	2 U	2 U	2 U	2 U
Aniline	µg/L		2 U	2 U	2 U	2 U	2 U
Azobenzene	µg/L		2 U	2 U	2 U	2 U	2 U
Benzoic acid	µg/L		10 U	10 U	10 U	10 U	10 U
Benzyl alcohol	µg/L		2 U	2 U	2 U	2 U	2 U
bis(2-chloroethoxy)methane	µg/L		2 U	2 U	2 U	2 U	2 U
Bis(2-chloroethyl) ether	µg/L		2 U	2 U	2 U	2 U	2 U
Bis(2-ethylhexyl) phthalate	µg/L		2 U	2 U	2 U	2 U	2 U
Butyl benzyl phthalate	µg/L		2 U	2 U	2 U	2 U	2 U
Carbazole	µg/L		25	2 U	2 U	2 U	2 U
Dibenzofuran	µg/L		5.6	2 U	2 U	2 U	2 U
Diethyl phthalate	µg/L		2 U	2 U	2 U	2 U	2 U
Dimethyl phthalate	µg/L		2 U	2 U	2 U	2 U	2 U
Di-n-butyl phthalate	µg/L		2 U	2 U	2 U	2 U	2 U
Di-n-octyl phthalate	µg/L		2 U	2 U	2 U	2 U	2 U
Hexachlorobenzene	µg/L		2 U	2 U	2 U	2 U	2 U
Hexachlorobutadiene	µg/L		1 U	1 U	1 U	1 U	1 U

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Round 2 Sampling (Floyd|Snider)				
	Location	MW-01	MW-02A	MW-02A	MW-04	MW-05
	Sample ID	**MW1-GW-072911**	**MW2A-GW-072911**	**MW16B-GW-072911**	**MW4-GW-072911**	**MW5-GW-072911**
	Date	07/29/2011	07/29/2011	07/29/2011	07/29/2011	07/29/2011
Other SVOCs						
Hexachlorocyclopentadiene	µg/L	2 U	2 U	2 U	2 U	2 U
Hexachloroethane	µg/L	2 U	2 U	2 U	2 U	2 U
Isophorone	µg/L	2 U	2 U	2 U	2 U	2 U
m,p-Cresol (2:1 ratio)	µg/L	2 U	2 U	2 U	2 U	2 U
Nitrobenzene	µg/L	2 U	2 U	2 U	2 U	2 U
N-Nitrosodimethylamine	µg/L	2 U	2 U	2 U	2 U	2 U
N-Nitroso-di-n-propylamine	µg/L	2 U	2 U	2 U	2 U	2 U
N-Nitrosodiphenylamine	µg/L	2 U	2 U	2 U	2 U	2 U
Pentachlorophenol	µg/L	5 U	5 U	5 U	5 U	5 U
Phenol	µg/L	2 U	2 U	2 U	2 U	2 U
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH						
1,3,5-Trimethylbenzene	µg/L	1 U	1 U	1 U	1 U	1 U
Benzene	µg/L	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	µg/L	1 U	1 U	1 U	1 U	1 U
Iso-Propylbenzene	µg/L	2.7	1 U	1 U	1 U	1 U
n-Propylbenzene	µg/L	2.4	1 U	1 U	1 U	1 U
Toluene	µg/L	1 U	1 U	1 U	1 U	1 U
Xylenes (meta & para)	µg/L	2 U	2 U	2 U	2 U	2 U
Xylene (ortho)	µg/L	1 U	1 U	1 U	1 U	1 U
Xylenes (total)	µg/L	2 U	2 U	2 U	2 U	2 U
Other VOCs						
1,1,1,2-Tetrachloroethane	µg/L	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	µg/L	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	µg/L	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	µg/L	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	µg/L	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	µg/L	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	µg/L	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	µg/L	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	µg/L	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	µg/L	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	µg/L	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane (EDB)	µg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,2-Dichloroethane (EDC)	µg/L	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	µg/L	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	µg/L	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	µg/L	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	µg/L	1 U	1 U	1 U	1 U	1 U
2-Chlorotoluene	µg/L	1 U	1 U	1 U	1 U	1 U
2-Hexanone	µg/L	2 U	2 U	2 U	2 U	2 U
3-Nitroaniline	µg/L	5 U	5 U	5 U	5 U	5 U
4-Bromophenyl phenyl ether	µg/L	2 U	2 U	2 U	2 U	2 U

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Round 2 Sampling (Floyd|Snider)				
		Location	MW-01	MW-02A	MW-02A	MW-04	MW-05
		Sample ID	**MW1-GW-072911**	**MW2A-GW-072911**	**MW16B-GW-072911**	**MW4-GW-072911**	**MW5-GW-072911**
		Date	07/29/2011	07/29/2011	07/29/2011	07/29/2011	07/29/2011
Other VOCs							
4-Chlorophenyl phenyl ether	µg/L		2 U	2 U	2 U	2 U	2 U
4-Chlorotoluene	µg/L		1 U	1 U	1 U	1 U	1 U
4-Nitroaniline	µg/L		2 U	2 U	2 U	2 U	2 U
Acetone	µg/L		14	3.4	2.6	2.6	3.9
Acrylonitrile	µg/L		1 U	1 U	1 U	1 U	1 U
bis(2-chloroisopropyl)ether	µg/L		2 U	2 U	2 U	2 U	2 U
Bromobenzene	µg/L		1 U	1 U	1 U	1 U	1 U
Bromochloromethane	µg/L		1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	µg/L		1 U	1 U	1 U	1 U	1 U
Bromoform	µg/L		1 U	1 U	1 U	1 U	1 U
Bromomethane	µg/L		1 U	1 U	1 U	1 U	1 U
Carbon disulfide	µg/L		1 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	µg/L		1 U	1 U	1 U	1 U	1 U
Chlorobenzene	µg/L		1 U	1 U	1 U	1 U	1 U
Chloroethane	µg/L		1 U	1 U	1 U	1 U	1 U
Chloroform	µg/L		1.2	1 U	1 U	1 U	1 U
Chloromethane	µg/L		1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	µg/L		1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	µg/L		1 U	1 U	1 U	1 U	1 U
Cymene	µg/L		2.2	1 U	1 U	1 U	1 U
Dibromochloromethane	µg/L		1 U	1 U	1 U	1 U	1 U
Dibromomethane	µg/L		1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	µg/L		1 U	1 U	1 U	1 U	1 U
Methyl ethyl ketone	µg/L		2 U	2 U	2 U	2 U	2 U
Methyl iso butyl ketone	µg/L		2 U	2 U	2 U	2 U	2 U
Methyl-Tert-Butyl Ether	µg/L		1 U	1 U	1 U	1 U	1 U
Methylene chloride	µg/L		1 U	2.5	1.6	1.3	1.4
n-Butylbenzene	µg/L		8.6	1 U	1 U	1 U	1 U
Pyridine	µg/L		2 U	2 U	2 U	2 U	2 U
sec-Butylbenzene	µg/L		1.6	1 U	1 U	1 U	1 U
Styrene	µg/L		1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	µg/L		1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	µg/L		1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	µg/L		1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	µg/L		1 U	1 U	1 U	1 U	1 U
Trichloroethene	µg/L		1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	µg/L		1 U	1 U	1 U	1 U	1 U
Vinyl chloride	µg/L		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Total Petroleum Hydrocarbons (TPH)							
Gasoline-Range Hydrocarbons	µg/L		770 J	50 U	50 U	50 U	50 U
Diesel-Range Hydrocarbons	µg/L		1900	130 U	160	130 U	130 U
Oil-Range Hydrocarbons	µg/L		250 U	250 U	250 U	250 U	250 U

Table C.8
Chemistry Data for Groundwater Samples

Event	RI/FS Round 2 Sampling (Floyd|Snider)				
Location	MW-01	MW-02A	MW-02A	MW-04	MW-05
Sample ID	**MW1-GW-072911**	**MW2A-GW-072911**	**MW16B-GW-072911**	**MW4-GW-072911**	**MW5-GW-072911**
Date	07/29/2011	07/29/2011	07/29/2011	07/29/2011	07/29/2011

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Round 2 Sampling (Floyd|Snider)				
		Location	MW-06	MW-07	MW-08	MW-09	
		Sample ID	**MW6-GW-072911**	**MW7-GW-072911**	**MW8-GW-072911**	**MW9-GW-072911**	
		Date	07/29/2011	07/29/2011	07/29/2011	07/29/2011	
Dissolved Metals							
Arsenic	µg/L		16	4.9	6.4	12	
Cadmium	µg/L		0.27 U	0.27 U	0.27 U	0.27 U	
Chromium	µg/L		0.61	0.9	1.2	1.5	
Copper	µg/L		2.6 U	2.6 U	4.7	2.6 U	
Lead	µg/L		0.62 U	0.62 U	0.62 U	0.62 U	
Mercury (inorganic)	µg/L		0.2 U	0.2 U	0.2 U	0.2 U	
Nickel	µg/L		2.2	4.5	5.1	2.5	
Silver	µg/L		0.38 U	0.38 U	0.38 U	0.38 U	
Zinc	µg/L		3.9 U	16	3.9 U	8.4	
Polychlorinated Biphenyls (PCBs)							
Aroclor 1016	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1221	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1232	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1242	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1248	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1254	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1260	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	
Aroclor 1268	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	
Total PCBs	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)							
Benz(a)anthracene	µg/L		2 U	2 U	2 U	2 U	
Benzo(a)pyrene	µg/L		2 U	2 U	2 U	2 U	
Benzo(b)fluoranthene	µg/L		2 U	2 U	2 U	2 U	
Benzo(k)fluoranthene	µg/L		2 U	2 U	2 U	2 U	
Benzofluoranthenes (total)	µg/L		2 U	2 U	2 U	2 U	
Chrysene	µg/L		2 U	2 U	2 U	2 U	
Dibenzo(a,h)anthracene	µg/L		2 U	2 U	2 U	2 U	
Indeno(1,2,3-cd)pyrene	µg/L		2 U	2 U	2 U	2 U	
cPAHs (MTCA TEQ-HalfND)	µg/L		1.6 U	1.6 U	1.6 U	1.6 U	
cPAHs (MTCA TEQ-ZeroND)	µg/L		2 U	2 U	2 U	2 U	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							
Total LPAH	µg/L		2 U	5	2 U	3.8	
Naphthalene	µg/L		1 U	1 U	1 U	1.2	
Acenaphthylene	µg/L		2 U	2 U	2 U	2 U	
Acenaphthene	µg/L		2 U	5	2 U	2 U	
Fluorene	µg/L		2 U	2 U	2 U	2.6	
Phenanthrene	µg/L		2 U	2 U	2 U	2 U	
Anthracene	µg/L		2 U	2 U	2 U	2 U	
1-Methylnaphthalene	µg/L		2.9	2 U	2 U	31	
2-Methylnaphthalene	µg/L		2 U	2 U	2 U	4.2	
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Total HPAH	µg/L		2 U	2 U	2 U	2 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Round 2 Sampling (Floyd|Snider)				
		Location	MW-06	MW-07	MW-08	MW-09	
		Sample ID	**MW6-GW-072911**	**MW7-GW-072911**	**MW8-GW-072911**	**MW9-GW-072911**	
		Date	07/29/2011	07/29/2011	07/29/2011	07/29/2011	
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Fluoranthene	µg/L		2 U	2 U	2 U	2 U	
Pyrene	µg/L		2 U	2 U	2 U	2 U	
Benzo(g,h,i)perylene	µg/L		2 U	2 U	2 U	2 U	
Other SVOCs							
1,2,4-Trichlorobenzene	µg/L		1 U	1 U	1 U	1 U	
1,2-Dichlorobenzene	µg/L		1 U	1 U	1 U	1 U	
1,3-Dichlorobenzene	µg/L		1 U	1 U	1 U	1 U	
2,3,4,6-Tetrachlorophenol	µg/L		2 U	2 U	2 U	2 U	
2,4,5-Trichlorophenol	µg/L		2 U	2 U	2 U	2 U	
2,4,6-Trichlorophenol	µg/L		2 U	2 U	2 U	2 U	
2,4-Dichlorophenol	µg/L		2 U	2 U	2 U	2 U	
2,4-Dimethylphenol	µg/L		2 U	2 U	2 U	2 U	
2,4-Dinitrophenol	µg/L		10 U	10 U	10 U	10 U	
2,4-Dinitrotoluene	µg/L		2 U	2 U	2 U	2 U	
2,6-Dichlorophenol	µg/L		2 U	2 U	2 U	2 U	
2,6-Dinitrotoluene	µg/L		2 U	2 U	2 U	2 U	
2-Chloronaphthalene	µg/L		2 U	2 U	2 U	2 U	
2-Chlorophenol	µg/L		2 U	2 U	2 U	2 U	
2-Methylphenol	µg/L		2 U	2 U	2 U	2 U	
2-Nitroaniline	µg/L		2 U	2 U	2 U	2 U	
2-Nitrophenol	µg/L		2 U	2 U	2 U	2 U	
3,3'-Dichlorobenzidine	µg/L		2 U	2 U	2.1 U	2 U	
4,6 Dinitro-o-cresol	µg/L		2 U	2 U	2.1 U	2 U	
4-Chloro-3-methylphenol	µg/L		2 U	2 U	2 U	2 U	
4-Chloroaniline	µg/L		2 U	2 U	2 U	2 U	
4-Nitrophenol	µg/L		2 U	2 U	2.1 U	2 U	
Aniline	µg/L		2 U	2 U	2.1 U	2 U	
Azobenzene	µg/L		2 U	2 U	2 U	2 U	
Benzoic acid	µg/L		10 U	10 U	10 U	10 U	
Benzyl alcohol	µg/L		2 U	2 U	2 U	2 U	
bis(2-chloroethoxy)methane	µg/L		2 U	2 U	2 U	2 U	
Bis(2-chloroethyl) ether	µg/L		2 U	2 U	2 U	2 U	
Bis(2-ethylhexyl) phthalate	µg/L		2 U	2 U	2 U	2 U	
Butyl benzyl phthalate	µg/L		2 U	2 U	2 U	2 U	
Carbazole	µg/L		2 U	2 U	2 U	2.3	
Dibenzofuran	µg/L		2 U	2 U	2 U	2 U	
Diethyl phthalate	µg/L		2 U	2 U	2 U	2 U	
Dimethyl phthalate	µg/L		2 U	2 U	2 U	2 U	
Di-n-butyl phthalate	µg/L		2 U	2 U	2 U	2 U	
Di-n-octyl phthalate	µg/L		2 U	2 U	2 U	2 U	
Hexachlorobenzene	µg/L		2 U	2 U	2 U	2 U	
Hexachlorobutadiene	µg/L		1 U	1 U	1 U	1 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Round 2 Sampling (Floyd|Snider)				
		Location	MW-06	MW-07	MW-08	MW-09	
		Sample ID	**MW6-GW-072911**	**MW7-GW-072911**	**MW8-GW-072911**	**MW9-GW-072911**	
		Date	07/29/2011	07/29/2011	07/29/2011	07/29/2011	
Other SVOCs							
Hexachlorocyclopentadiene	µg/L		2 U	2 U	2.1 U	2 U	
Hexachloroethane	µg/L		2 U	2 U	2.1 U	2 U	
Isophorone	µg/L		2 U	2 U	2 U	2 U	
m,p-Cresol (2:1 ratio)	µg/L		40	2 U	2 U	2 U	
Nitrobenzene	µg/L		2 U	2 U	2 U	2 U	
N-Nitrosodimethylamine	µg/L		2 U	2 U	2 U	2 U	
N-Nitroso-di-n-propylamine	µg/L		2 U	2 U	2.1 U	2 U	
N-Nitrosodiphenylamine	µg/L		2 U	2 U	2 U	2 U	
Pentachlorophenol	µg/L		5 U	5 U	5 U	5 U	
Phenol	µg/L		2 U	2 U	2 U	2 U	
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH							
1,3,5-Trimethylbenzene	µg/L		1 U	1 U	1 U	1 U	
Benzene	µg/L		1 U	1 U	1 U	1 U	
Ethylbenzene	µg/L		1 U	1 U	1 U	1 U	
Iso-Propylbenzene	µg/L		1 U	1 U	1 U	1.5	
n-Propylbenzene	µg/L		1 U	1 U	1 U	1 U	
Toluene	µg/L		1 U	1 U	1 U	1 U	
Xylenes (meta & para)	µg/L		2 U	2 U	2 U	2 U	
Xylene (ortho)	µg/L		1 U	1 U	1 U	1 U	
Xylenes (total)	µg/L		2 U	2 U	2 U	2 U	
Other VOCs							
1,1,1,2-Tetrachloroethane	µg/L		1 U	1 U	1 U	1 U	
1,1,1-Trichloroethane	µg/L		1 U	1 U	1 U	1 U	
1,1,2,2-Tetrachloroethane	µg/L		1 U	1 U	1 U	1 U	
1,1,2-Trichloroethane	µg/L		1 U	1 U	1 U	1 U	
1,1-Dichloroethane	µg/L		1 U	1 U	1 U	1 U	
1,1-Dichloroethene	µg/L		1 U	1 U	1 U	1 U	
1,1-Dichloropropene	µg/L		1 U	1 U	1 U	1 U	
1,2,3-Trichlorobenzene	µg/L		1 U	1 U	1 U	1 U	
1,2,3-Trichloropropane	µg/L		1 U	1 U	1 U	1 U	
1,2,4-Trimethylbenzene	µg/L		1 U	1 U	1 U	1 U	
1,2-Dibromo-3-chloropropane	µg/L		1 U	1 U	1 U	1 U	
1,2-Dibromoethane (EDB)	µg/L		0.01 U	0.01 U	0.01 U	0.01 U	
1,2-Dichloroethane (EDC)	µg/L		1 U	1 U	1 U	1 U	
1,2-Dichloropropane	µg/L		1 U	1 U	1 U	1 U	
1,3-Dichloropropane	µg/L		1 U	1 U	1 U	1 U	
1,4-Dichlorobenzene	µg/L		1 U	1 U	1 U	1 U	
2,2-Dichloropropane	µg/L		1 U	1 U	1 U	1 U	
2-Chlorotoluene	µg/L		1 U	1 U	1 U	1 U	
2-Hexanone	µg/L		2 U	2 U	2 U	2 U	
3-Nitroaniline	µg/L		5 U	5 U	5 U	5 U	
4-Bromophenyl phenyl ether	µg/L		2 U	2 U	2 U	2 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Round 2 Sampling (Floyd|Snider)				
		Location	MW-06	MW-07	MW-08	MW-09	
		Sample ID	**MW6-GW-072911**	**MW7-GW-072911**	**MW8-GW-072911**	**MW9-GW-072911**	
		Date	07/29/2011	07/29/2011	07/29/2011	07/29/2011	
Other VOCs							
4-Chlorophenyl phenyl ether	µg/L		2 U	2 U	2 U	2 U	
4-Chlorotoluene	µg/L		1 U	1 U	1 U	1 U	
4-Nitroaniline	µg/L		2 U	2 U	2.1 U	2 U	
Acetone	µg/L		4.9	6	2 U	6.6	
Acrylonitrile	µg/L		1 U	1 U	1 U	1 U	
bis(2-chloroisopropyl)ether	µg/L		2 U	2 U	2 U	2 U	
Bromobenzene	µg/L		1 U	1 U	1 U	1 U	
Bromochloromethane	µg/L		1 U	1 U	1 U	1 U	
Bromodichloromethane	µg/L		1 U	1 U	1 U	1 U	
Bromoform	µg/L		1 U	1 U	1 U	1 U	
Bromomethane	µg/L		1 U	1 U	1 U	1 U	
Carbon disulfide	µg/L		1 U	1 U	1 U	1 U	
Carbon tetrachloride	µg/L		1 U	1 U	1 U	1 U	
Chlorobenzene	µg/L		1 U	1 U	1 U	1	
Chloroethane	µg/L		1 U	1 U	1 U	1 U	
Chloroform	µg/L		1 U	1 U	1.2	1 U	
Chloromethane	µg/L		1 U	1 U	1 U	1 U	
cis-1,2-Dichloroethene	µg/L		1 U	1 U	1 U	1 U	
cis-1,3-Dichloropropene	µg/L		1 U	1 U	1 U	1 U	
Cymene	µg/L		120	1 U	1 U	1 U	
Dibromochloromethane	µg/L		1 U	1 U	1 U	1 U	
Dibromomethane	µg/L		1 U	1 U	1 U	1 U	
Dichlorodifluoromethane	µg/L		1 U	1 U	1 U	1 U	
Methyl ethyl ketone	µg/L		2 U	2 U	2 U	2 U	
Methyl iso butyl ketone	µg/L		2 U	2 U	2 U	2 U	
Methyl-Tert-Butyl Ether	µg/L		1 U	1 U	1 U	1 U	
Methylene chloride	µg/L		1.7	1.4	1 U	1.2	
n-Butylbenzene	µg/L		1 U	1.3	1 U	2.4	
Pyridine	µg/L		2 U	2 U	2.1 U	2 U	
sec-Butylbenzene	µg/L		1 U	1 U	1 U	1.2	
Styrene	µg/L		1 U	1 U	1 U	1 U	
tert-Butylbenzene	µg/L		1 U	1 U	1 U	1 U	
Tetrachloroethene	µg/L		1 U	1 U	1 U	1 U	
trans-1,2-Dichloroethene	µg/L		1 U	1 U	1 U	1 U	
trans-1,3-Dichloropropene	µg/L		1 U	1 U	1 U	1 U	
Trichloroethene	µg/L		1 U	1 U	1 U	1 U	
Trichlorofluoromethane	µg/L		1 U	1 U	1 U	1 U	
Vinyl chloride	µg/L		0.2 U	0.2 U	0.2 U	0.2 U	
Total Petroleum Hydrocarbons (TPH)							
Gasoline-Range Hydrocarbons	µg/L		380	50	50 U	450 J	
Diesel-Range Hydrocarbons	µg/L		1000	230	130 U	1300	
Oil-Range Hydrocarbons	µg/L		310	250 U	250 U	250 U	

Table C.8
Chemistry Data for Groundwater Samples

Event	RI/FS Round 2 Sampling (Floyd|Snider)				
Location	MW-06	MW-07	MW-08	MW-09	
Sample ID	**MW6-GW-072911**	**MW7-GW-072911**	**MW8-GW-072911**	**MW9-GW-072911**	
Date	07/29/2011	07/29/2011	07/29/2011	07/29/2011	

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
	Location	FS-19	FS-19	FS-21	FS-21	FS-21
	Sample ID	**FS-19-GW-012913**	**FS-19-GWF-012913**	**FS-21-GW-013013**	**FS-79-GW-013013**	**FS-21-GWF-013013**
	Date	01/29/2013	01/29/2013	01/30/2013	01/30/2013	01/30/2013
Dissolved Metals						
Antimony	µg/L		0.247			0.41
Arsenic	µg/L		3.17			1.09
Beryllium	µg/L		0.048			0.013 U
Cadmium	µg/L		0.0738			0.121
Chromium	µg/L		16.4			0.199
Copper	µg/L		27.4			1.85
Lead	µg/L		13.7			0.0406
Nickel	µg/L		26.2			39.6
Selenium	µg/L		0.015 U			0.0231
Silver	µg/L		0.00289			0.002 U
Thallium	µg/L		0.008 U			0.0424
Zinc	µg/L		26.3			3.79
Total Metals						
Mercury (inorganic)	µg/L	0.875		0.00308	0.00286	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L	0.018 U		0.49	0.018 U	
Benzo(a)pyrene	µg/L	0.012 J		0.087	0.04	
Benzo(b)fluoranthene	µg/L	0.02 J		0.13	0.067	
Benzo(k)fluoranthene	µg/L	0.007 U		0.12	0.063	
Chrysene	µg/L	0.043		0.42	0.29	
Dibenzo(a,h)anthracene	µg/L	0.008 J		0.028	0.0094 J	
Indeno(1,2,3-cd)pyrene	µg/L	0.005 U		0.012 J	0.005 U	
cPAHs (MTCA TEQ-HalfND)	µg/L	0.017 J		0.17 J	0.058 J	
cPAHs (MTCA TEQ-ZeroND)	µg/L	0.015 J		0.17 J	0.057 J	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Naphthalene	µg/L	0.36		240	210	
Acenaphthylene	µg/L	0.02 U		0.25	0.19	
Acenaphthene	µg/L	3.3		65	48	
Fluorene	µg/L	1.6		37	29	
Phenanthrene	µg/L	1.9		68	58	
Anthracene	µg/L	0.13		71	5.2	
1-Methylnaphthalene	µg/L	5		39	30	
2-Methylnaphthalene	µg/L	4.1		59	45	
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Fluoranthene	µg/L	0.27		9.6	9.1	
Pyrene	µg/L	0.31		8.1	7	
Benzo(g,h,i)perylene	µg/L	0.02 U		0.057	0.02 U	
Other SVOCs						
1,2,4-Trichlorobenzene	µg/L	2 U		2 U	2 U	
1,2-Dichlorobenzene	µg/L	2 U		2 U	2 U	
1,3-Dichlorobenzene	µg/L	2 U		2 U	2 U	
2,3,4,6-Tetrachlorophenol	µg/L	2 U		2 U	2 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	FS-19	FS-19	FS-21	FS-21	FS-21
		Sample ID	**FS-19-GW-012913**	**FS-19-GWF-012913**	**FS-21-GW-013013**	**FS-79-GW-013013**	**FS-21-GWF-013013**
		Date	01/29/2013	01/29/2013	01/30/2013	01/30/2013	01/30/2013
Other SVOCs							
2,4,5-Trichlorophenol	µg/L		2 U		2 U	2 U	
2,4,6-Trichlorophenol	µg/L		2 U		2 U	2 U	
2,4-Dichlorophenol	µg/L		2 U		2 U	2 U	
2,4-Dimethylphenol	µg/L		2 U		5.1	4.7	
2,4-Dinitrophenol	µg/L		10 U		10 U	10 U	
2,4-Dinitrotoluene	µg/L		2 U		2 U	2 U	
2,6-Dichlorophenol	µg/L		2 U		2 U	2 U	
2,6-Dinitrotoluene	µg/L		2 U		2 U	2 U	
2-Chloronaphthalene	µg/L		2 U		2 U	2 U	
2-Chlorophenol	µg/L		2 U		2 U	2 U	
2-Methylphenol	µg/L		2 U		2 U	2 U	
2-Nitroaniline	µg/L		2 U		2 U	2 U	
2-Nitrophenol	µg/L		2 U		2 U	2 U	
3,3'-Dichlorobenzidine	µg/L		5 U		5 U	5 U	
4,6 Dinitro-o-cresol	µg/L		4 U		4 U	4 U	
4-Chloro-3-methylphenol	µg/L		2 U		2 U	2 U	
4-Chloroaniline	µg/L		2 U		2 U	2 U	
4-Nitrophenol	µg/L		5 U		5 U	5 U	
Aniline	µg/L		4 U		4 U	4 U	
Azobenzene	µg/L		2 U		2 U	2 U	
Benzoic acid	µg/L		10 U		10 U	10 U	
Benzyl alcohol	µg/L		2 U		2 U	2 U	
bis(2-chloroethoxy)methane	µg/L		2 U		2 U	2 U	
Bis(2-chloroethyl) ether	µg/L		1 U		1 U	1 U	
Bis(2-ethylhexyl) phthalate	µg/L		2 U		2 U	2 U	
Butyl benzyl phthalate	µg/L		1 U		1 U	1 U	
Carbazole	µg/L		4.4		48	39	
Dibenzofuran	µg/L		2 U		31	24	
Diethyl phthalate	µg/L		2 U		2 U	2 U	
Dimethyl phthalate	µg/L		2 U		2 U	2 U	
Di-n-butyl phthalate	µg/L		2 U		2 U	2 U	
Di-n-octyl phthalate	µg/L		1 U		1 U	1 U	
Hexachlorobenzene	µg/L		1 U		1 U	1 U	
Hexachlorobutadiene	µg/L		2 U		2 U	2 U	
Hexachlorocyclopentadiene	µg/L		4 U		4 U	4 U	
Hexachloroethane	µg/L		2 U		2 U	2 U	
Isophorone	µg/L		2 U		2 U	2 U	
m,p-Cresol (2:1 ratio)	µg/L		2 U		2 U	2 U	
Nitrobenzene	µg/L		2 U		2 U	2 U	
N-Nitrosodimethylamine	µg/L		2 U		2 U	2 U	
N-Nitroso-di-n-propylamine	µg/L		0.7 U		0.7 U	0.7 U	
N-Nitrosodiphenylamine	µg/L		2 U		2 U	2 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	FS-19	FS-19	FS-21	FS-21	FS-21
		Sample ID	**FS-19-GW-012913**	**FS-19-GWF-012913**	**FS-21-GW-013013**	**FS-79-GW-013013**	**FS-21-GWF-013013**
		Date	01/29/2013	01/29/2013	01/30/2013	01/30/2013	01/30/2013
Other SVOCs							
Pentachlorophenol	µg/L		5 U		5 U	5 U	
Phenol	µg/L		2 U		2 U	2 U	
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH							
Benzene	µg/L		1 U		1 U	1 U	
Ethylbenzene	µg/L		1 U		1 U	1 U	
Toluene	µg/L		1 U		1 U	1 U	
Xylenes (total)	µg/L		3 U		3 U	3 U	
Other VOCs							
1,4-Dichlorobenzene	µg/L		2 U		2 U	2 U	
3-Nitroaniline	µg/L		5 U		5 U	5 U	
4-Bromophenyl phenyl ether	µg/L		2 U		2 U	2 U	
4-Chlorophenyl phenyl ether	µg/L		2 U		2 U	2 U	
4-Nitroaniline	µg/L		4 U		4 U	4 U	
bis(2-chloroisopropyl)ether	µg/L		2 U		2 U	2 U	
Pyridine	µg/L		4 U		4 U	4 U	
Total Petroleum Hydrocarbons (TPH)							
Gasoline-Range Hydrocarbons	µg/L		110 JM		92 JM	100 JM	
Diesel-Range Hydrocarbons	µg/L		5500 JM		840 JM	730 JM	
Oil-Range Hydrocarbons	µg/L		1200 JM		250 U	250 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	FS-21	FS-22	FS-22	MW-01	MW-01
		Sample ID	**FS-79-GWF-013013**	**FS-22-GW-013013**	**FS-22-GWF-013013**	**MW-01-GW-021513**	**MW-01-GWF-021513**
		Date	01/30/2013	01/30/2013	01/30/2013	02/15/2013	02/15/2013
Dissolved Metals							
Antimony	µg/L		0.391		0.146		0.28
Arsenic	µg/L		1.15		1.02		14.4
Beryllium	µg/L		0.013 U		0.013 U		0.00563 U
Cadmium	µg/L		0.104		0.0399		0.015
Chromium	µg/L		0.211		0.528		0.192 U
Copper	µg/L		2.19		0.934		0.241 U
Lead	µg/L		0.0697		0.154		0.0183 U
Nickel	µg/L		39.2		10		4.19
Selenium	µg/L		0.067		0.015 U		0.1033
Silver	µg/L		0.002 U		0.00248		0.00263 U
Thallium	µg/L		0.0446		0.008 U		0.00113 U
Zinc	µg/L		4.37		1.18		8.26 U
Total Metals							
Mercury (inorganic)	µg/L			0.00132		0.0053	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)							
Benz(a)anthracene	µg/L			0.049		0.018 U	
Benzo(a)pyrene	µg/L			0.0096 U		0.028 J	
Benzo(b)fluoranthene	µg/L			0.01 U		0.01 U	
Benzo(k)fluoranthene	µg/L			0.007 U		0.007 U	
Chrysene	µg/L			0.0064 U		0.049 UB	
Dibenzo(a,h)anthracene	µg/L			0.0062 U		0.012 J	
Indeno(1,2,3-cd)pyrene	µg/L			0.005 U		0.0087 J	
cPAHs (MTCA TEQ-HalfND)	µg/L			0.011		0.032 J	
cPAHs (MTCA TEQ-ZeroND)	µg/L			0.0049		0.03 J	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							
Naphthalene	µg/L			0.032		4.6	
Acenaphthylene	µg/L			0.02 U		0.02 U	
Acenaphthene	µg/L			0.02 U		25	
Fluorene	µg/L			0.02 U		14	
Phenanthrene	µg/L			0.033		6.7	
Anthracene	µg/L			0.02 U		0.42	
1-Methylnaphthalene	µg/L			0.02 U		93	
2-Methylnaphthalene	µg/L			0.02 U		67	
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Fluoranthene	µg/L			0.02 U		0.88	
Pyrene	µg/L			0.033 U		0.49	
Benzo(g,h,i)perylene	µg/L			0.02 U		0.02 U	
Other SVOCs							
1,2,4-Trichlorobenzene	µg/L			2 U		1 U	
1,2-Dichlorobenzene	µg/L			2 U		2 U	
1,3-Dichlorobenzene	µg/L			2 U		2 U	
2,3,4,6-Tetrachlorophenol	µg/L			2 U		2 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	FS-21	FS-22	FS-22	MW-01	MW-01
		Sample ID	**FS-79-GWF-013013**	**FS-22-GW-013013**	**FS-22-GWF-013013**	**MW-01-GW-021513**	**MW-01-GWF-021513**
		Date	01/30/2013	01/30/2013	01/30/2013	02/15/2013	02/15/2013
Other SVOCs							
2,4,5-Trichlorophenol	µg/L			2 U		2 U	
2,4,6-Trichlorophenol	µg/L			2 U		2 U	
2,4-Dichlorophenol	µg/L			2 U		2 U	
2,4-Dimethylphenol	µg/L			2 U		2 U	
2,4-Dinitrophenol	µg/L			10 U		10 U	
2,4-Dinitrotoluene	µg/L			2 U		2 U	
2,6-Dichlorophenol	µg/L			2 U		2 U	
2,6-Dinitrotoluene	µg/L			2 U		2 U	
2-Chloronaphthalene	µg/L			2 U		2 U	
2-Chlorophenol	µg/L			2 U		2 U	
2-Methylphenol	µg/L			2 U		2 U	
2-Nitroaniline	µg/L			2 U		2 U	
2-Nitrophenol	µg/L			2 U		2 U	
3,3'-Dichlorobenzidine	µg/L			5 U		5 U	
4,6 Dinitro-o-cresol	µg/L			4 U		4 U	
4-Chloro-3-methylphenol	µg/L			2 U		2 U	
4-Chloroaniline	µg/L			2 U		2 U	
4-Nitrophenol	µg/L			5 U		5 U	
Aniline	µg/L			4 U		4 U	
Azobenzene	µg/L			2 U		2 U	
Benzoic acid	µg/L			10 U		10 U	
Benzyl alcohol	µg/L			2 U		2 U	
bis(2-chloroethoxy)methane	µg/L			2 U		2 U	
Bis(2-chloroethyl) ether	µg/L			1 U		1 U	
Bis(2-ethylhexyl) phthalate	µg/L			2 U		2 U	
Butyl benzyl phthalate	µg/L			1 U		1 U	
Carbazole	µg/L			2 U		49	
Dibenzofuran	µg/L			2 U		7.7	
Diethyl phthalate	µg/L			2 U		2 U	
Dimethyl phthalate	µg/L			2 U		2 U	
Di-n-butyl phthalate	µg/L			2 U		2 U	
Di-n-octyl phthalate	µg/L			1 U		1 U	
Hexachlorobenzene	µg/L			1 U		1 U	
Hexachlorobutadiene	µg/L			2 U		2 U	
Hexachlorocyclopentadiene	µg/L			4 U		4 U	
Hexachloroethane	µg/L			2 U		2 U	
Isophorone	µg/L			2 U		2 U	
m,p-Cresol (2:1 ratio)	µg/L			2 U		2 U	
Nitrobenzene	µg/L			2 U		2 U	
N-Nitrosodimethylamine	µg/L			2 U		2 U	
N-Nitroso-di-n-propylamine	µg/L			0.7 U		0.7 U	
N-Nitrosodiphenylamine	µg/L			2 U		2 U	

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
	Location	FS-21	FS-22	FS-22	MW-01	MW-01
	Sample ID	**FS-79-GWF-013013**	**FS-22-GW-013013**	**FS-22-GWF-013013**	**MW-01-GW-021513**	**MW-01-GWF-021513**
	Date	01/30/2013	01/30/2013	01/30/2013	02/15/2013	02/15/2013
Other SVOCs						
Pentachlorophenol	µg/L		5 U		5 U	
Phenol	µg/L		2 U		2 U	
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH						
1,3,5-Trimethylbenzene	µg/L				2 U	
Benzene	µg/L		1 U		2 U	
Ethylbenzene	µg/L		1 U		2 U	
Iso-Propylbenzene	µg/L				3.1	
n-Propylbenzene	µg/L				2.5	
Toluene	µg/L		1 U		2 U	
Xylenes (meta & para)	µg/L				4 U	
Xylene (ortho)	µg/L				2 U	
Xylenes (total)	µg/L		3 U		3 U	
Other VOCs						
1,1,1,2-Tetrachloroethane	µg/L				2 U	
1,1,1-Trichloroethane	µg/L				2 U	
1,1,2,2-Tetrachloroethane	µg/L				2 U	
1,1,2-Trichloroethane	µg/L				2 U	
1,1-Dichloroethane	µg/L				2 U	
1,1-Dichloroethene	µg/L				2 U	
1,1-Dichloropropene	µg/L				2 U	
1,2,3-Trichlorobenzene	µg/L				2 U	
1,2,3-Trichloropropane	µg/L				2 U	
1,2,4-Trimethylbenzene	µg/L				2 U	
1,2-Dibromo-3-chloropropane	µg/L				10 U	
1,2-Dibromoethane (EDB)	µg/L				0.01 U	
1,2-Dichloroethane (EDC)	µg/L				2 U	
1,2-Dichloropropane	µg/L				2 U	
1,3-Dichloropropane	µg/L				2 U	
1,4-Dichlorobenzene	µg/L		2 U		2 U	
2,2-Dichloropropane	µg/L				2 U	
2-Chlorotoluene	µg/L				2 U	
2-Hexanone	µg/L				10 U	
3-Nitroaniline	µg/L		5 U		5 U	
4-Bromophenyl phenyl ether	µg/L		2 U		2 U	
4-Chlorophenyl phenyl ether	µg/L		2 U		2 U	
4-Chlorotoluene	µg/L				2 U	
4-Nitroaniline	µg/L		4 U		4 U	
Acetone	µg/L				25 U	
Acrylonitrile	µg/L				10 U	
bis(2-chloroisopropyl)ether	µg/L		2 U		2 U	
Bromobenzene	µg/L				2 U	
Bromochloromethane	µg/L				2 U	

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
	Location	FS-21	FS-22	FS-22	MW-01	MW-01
	Sample ID	**FS-79-GWF-013013**	**FS-22-GW-013013**	**FS-22-GWF-013013**	**MW-01-GW-021513**	**MW-01-GWF-021513**
	Date	01/30/2013	01/30/2013	01/30/2013	02/15/2013	02/15/2013
Other VOCs						
Bromodichloromethane	µg/L				0.9 U	
Bromoform	µg/L				2 U	
Bromomethane	µg/L				2 U	
Carbon disulfide	µg/L				2 U	
Carbon tetrachloride	µg/L				1.6 U	
Chlorobenzene	µg/L				2 U	
Chloroethane	µg/L				2 U	
Chloroform	µg/L				2 U	
Chloromethane	µg/L				2 U	
cis-1,2-Dichloroethene	µg/L				2 U	
cis-1,3-Dichloropropene	µg/L				2 U	
Cymene	µg/L				3.1	
Dibromochloromethane	µg/L				2 U	
Dibromomethane	µg/L				2 U	
Dichlorodifluoromethane	µg/L				2 U	
Methyl ethyl ketone	µg/L				10 U	
Methyl iso butyl ketone	µg/L				10 U	
Methyl-Tert-Butyl Ether	µg/L				2 U	
Methylene chloride	µg/L				5 U	
n-Butylbenzene	µg/L				2 U	
Pyridine	µg/L		4 U		4 U	
sec-Butylbenzene	µg/L				2 U	
Styrene	µg/L				2 U	
tert-Butylbenzene	µg/L				2 U	
Tetrachloroethene	µg/L				2 U	
trans-1,2-Dichloroethene	µg/L				2 U	
trans-1,3-Dichloropropene	µg/L				2 U	
Trichloroethene	µg/L				2 U	
Trichlorofluoromethane	µg/L				2 U	
Vinyl chloride	µg/L				0.2 U	
Total Petroleum Hydrocarbons (TPH)						
Gasoline-Range Hydrocarbons	µg/L		50 U		680 JM	
Diesel-Range Hydrocarbons	µg/L		130 U		1500 JM	
Oil-Range Hydrocarbons	µg/L		250 U		250 U	
EPH/VPH						
C5-C6 Aliphatics	µg/L				50 U	
C6-C8 Aliphatics	µg/L				50 U	
C8-C10 Aliphatics	µg/L				50 U	
C10-C12 Aliphatics	µg/L				50 U	
C12-C16 Aliphatics	µg/L				50 U	
C16-C21 Aliphatics	µg/L				50 U	
C21-C34 Aliphatics	µg/L				50 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	FS-21	FS-22	FS-22	MW-01	MW-01
		Sample ID	**FS-79-GWF-013013**	**FS-22-GW-013013**	**FS-22-GWF-013013**	**MW-01-GW-021513**	**MW-01-GWF-021513**
		Date	01/30/2013	01/30/2013	01/30/2013	02/15/2013	02/15/2013
EPH/VPH							
C8-C10 Aromatics	µg/L					78	
C10-C12 Aromatics	µg/L					530	
C12-C16 Aromatics	µg/L					400	
C16-C21 Aromatics	µg/L					140	
C21-C34 Aromatics	µg/L					170	
n-Hexane	µg/L					2 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-02A	MW-02A	MW-04	MW-04	MW-05
		Sample ID	**MW-02A-GW-021513**	**MW-02A-GWF-021513**	**MW-04-GW-021413**	**MW-04-GWF-021413**	**MW-05-GW-021413**
		Date	02/15/2013	02/15/2013	02/14/2013	02/14/2013	02/15/2013
Dissolved Metals							
Antimony	µg/L			1.99		0.257	
Arsenic	µg/L			1.48		1.81	
Beryllium	µg/L			0.00563 U		0.00563 U	
Cadmium	µg/L			0.276		0.0115	
Chromium	µg/L			0.192 U		0.192 U	
Copper	µg/L			9.09		2.07	
Lead	µg/L			0.0234		0.0291	
Nickel	µg/L			4.71		1.92	
Selenium	µg/L			0.0823 U		0.396	
Silver	µg/L			0.0164		0.0031	
Thallium	µg/L			0.0147		0.0037	
Zinc	µg/L			71		8.26 U	
Total Metals							
Mercury (inorganic)	µg/L	0.0058		0.0025		0.035	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)							
Benz(a)anthracene	µg/L	0.018 U		0.018 U		0.018 U	
Benzo(a)pyrene	µg/L	0.0099 U		0.0096 U		0.0096 U	
Benzo(b)fluoranthene	µg/L	0.01 U		0.01 U		0.01 U	
Benzo(k)fluoranthene	µg/L	0.0073 U		0.007 U		0.007 U	
Chrysene	µg/L	0.0066 U		0.0064 U		0.0064 U	
Dibenzo(a,h)anthracene	µg/L	0.0064 U		0.0062 U		0.0062 U	
Indeno(1,2,3-cd)pyrene	µg/L	0.0051 U		0.005 U		0.005 U	
cPAHs (MTCA TEQ-HalfND)	µg/L	0.0073 UB		0.0071 U		0.0071 U	
cPAHs (MTCA TEQ-ZeroND)	µg/L	0.0099 U		0.0096 U		0.0096 U	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							
Naphthalene	µg/L	0.063		0.02 U		0.02 U	
Acenaphthylene	µg/L	0.02 U		0.02 U		0.02 U	
Acenaphthene	µg/L	0.02 U		0.02 U		0.02 U	
Fluorene	µg/L	0.02 U		0.02 U		0.02 U	
Phenanthrene	µg/L	0.02 U		0.02 U		0.02 U	
Anthracene	µg/L	0.037		0.02 U		0.02 U	
1-Methylnaphthalene	µg/L	0.026		0.02 U		0.02 U	
2-Methylnaphthalene	µg/L	0.027		0.02 U		0.02 U	
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Fluoranthene	µg/L	0.02 U		0.02 U		0.02 U	
Pyrene	µg/L	0.034 U		0.033 U		0.094	
Benzo(g,h,i)perylene	µg/L	0.021 U		0.02 U		0.02 U	
Other SVOCs							
1,2,4-Trichlorobenzene	µg/L	1 U		1 U		1 U	
1,2-Dichlorobenzene	µg/L	2 U		2 U		2 U	
1,3-Dichlorobenzene	µg/L	2 U		2 U		2 U	
2,3,4,6-Tetrachlorophenol	µg/L	2 U		2 U		2 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-02A	MW-02A	MW-04	MW-04	MW-05
		Sample ID	**MW-02A-GW-021513**	**MW-02A-GWF-021513**	**MW-04-GW-021413**	**MW-04-GWF-021413**	**MW-05-GW-021413**
		Date	02/15/2013	02/15/2013	02/14/2013	02/14/2013	02/15/2013
Other SVOCs							
2,4,5-Trichlorophenol	µg/L		2 U		2 U		2 U
2,4,6-Trichlorophenol	µg/L		2 U		2 U		2 U
2,4-Dichlorophenol	µg/L		2 U		2 U		2 U
2,4-Dimethylphenol	µg/L		2 U		2 U		2 U
2,4-Dinitrophenol	µg/L		10 U		10 U		10 U
2,4-Dinitrotoluene	µg/L		2 U		2 U		2 U
2,6-Dichlorophenol	µg/L		2 U		2 U		2 U
2,6-Dinitrotoluene	µg/L		2 U		2 U		2 U
2-Chloronaphthalene	µg/L		2 U		2 U		2 U
2-Chlorophenol	µg/L		2 U		2 U		2 U
2-Methylphenol	µg/L		2 U		2 U		2 U
2-Nitroaniline	µg/L		2 U		2 U		2 U
2-Nitrophenol	µg/L		2 U		2 U		2 U
3,3'-Dichlorobenzidine	µg/L		5 U		5 U		5 U
4,6 Dinitro-o-cresol	µg/L		4 U		4 U		4 U
4-Chloro-3-methylphenol	µg/L		2 U		2 U		2 U
4-Chloroaniline	µg/L		2 U		2 U		2 U
4-Nitrophenol	µg/L		5 U		5 U		5 U
Aniline	µg/L		4 U		4 U		4 U
Azobenzene	µg/L		2 U		2 U		2 U
Benzoic acid	µg/L		10 U		10 U		10 U
Benzyl alcohol	µg/L		2 U		2 U		2 U
bis(2-chloroethoxy)methane	µg/L		2 U		2 U		2 U
Bis(2-chloroethyl) ether	µg/L		1 U		1 U		1 U
Bis(2-ethylhexyl) phthalate	µg/L		2.8		2 U		2 U
Butyl benzyl phthalate	µg/L		1 U		1 U		1 U
Carbazole	µg/L		2 U		2 U		2 U
Dibenzofuran	µg/L		2 U		2 U		2 U
Diethyl phthalate	µg/L		2 U		2 U		2 U
Dimethyl phthalate	µg/L		2 U		2 U		2 U
Di-n-butyl phthalate	µg/L		3.3		2 U		2 U
Di-n-octyl phthalate	µg/L		1 U		1 U		1 U
Hexachlorobenzene	µg/L		1 U		1 U		1 U
Hexachlorobutadiene	µg/L		2 U		2 U		2 U
Hexachlorocyclopentadiene	µg/L		4 U		4 U		4 U
Hexachloroethane	µg/L		2.1 U		2 U		2 U
Isophorone	µg/L		2 U		2 U		2 U
m,p-Cresol (2:1 ratio)	µg/L		2 U		2 U		2 U
Nitrobenzene	µg/L		2 U		2 U		2 U
N-Nitrosodimethylamine	µg/L		2 U		2 U		2 U
N-Nitroso-di-n-propylamine	µg/L		0.72 U		0.7 U		0.7 U
N-Nitrosodiphenylamine	µg/L		2 U		2 U		2 U

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-02A	MW-02A	MW-04	MW-04	MW-05
		Sample ID	**MW-02A-GW-021513**	**MW-02A-GWF-021513**	**MW-04-GW-021413**	**MW-04-GWF-021413**	**MW-05-GW-021413**
		Date	02/15/2013	02/15/2013	02/14/2013	02/14/2013	02/15/2013
Other SVOCs							
Pentachlorophenol	µg/L		5 U		5 U		5 U
Phenol	µg/L		2 U		2 U		2 U
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH							
1,3,5-Trimethylbenzene	µg/L		2 U		2 U		2 U
Benzene	µg/L		2 U		2 U		2 U
Ethylbenzene	µg/L		2 U		2 U		2 U
Iso-Propylbenzene	µg/L		2 U		2 U		2 U
n-Propylbenzene	µg/L		2 U		2 U		2 U
Toluene	µg/L		2 U		2 U		2 U
Xylenes (meta & para)	µg/L		4 U		4 U		4 U
Xylene (ortho)	µg/L		2 U		2 U		2 U
Xylenes (total)	µg/L		3 U		3 U		3 U
Other VOCs							
1,1,1,2-Tetrachloroethane	µg/L		2 U		2 U		2 U
1,1,1-Trichloroethane	µg/L		2 U		2 U		2 U
1,1,2,2-Tetrachloroethane	µg/L		2 U		2 U		2 U
1,1,2-Trichloroethane	µg/L		2 U		2 U		2 U
1,1-Dichloroethane	µg/L		2 U		2 U		2 U
1,1-Dichloroethene	µg/L		2 U		2 U		2 U
1,1-Dichloropropene	µg/L		2 U		2 U		2 U
1,2,3-Trichlorobenzene	µg/L		2 U		2 U		2 U
1,2,3-Trichloropropane	µg/L		2 U		2 U		2 U
1,2,4-Trimethylbenzene	µg/L		2 U		2 U		2 U
1,2-Dibromo-3-chloropropane	µg/L		10 U		10 U		10 U
1,2-Dibromoethane (EDB)	µg/L		0.01 U		0.01 U		0.01 U
1,2-Dichloroethane (EDC)	µg/L		2 U		2 U		2 U
1,2-Dichloropropane	µg/L		2 U		2 U		2 U
1,3-Dichloropropane	µg/L		2 U		2 U		2 U
1,4-Dichlorobenzene	µg/L		2 U		2 U		2 U
2,2-Dichloropropane	µg/L		2 U		2 U		2 U
2-Chlorotoluene	µg/L		2 U		2 U		2 U
2-Hexanone	µg/L		10 U		10 U		10 U
3-Nitroaniline	µg/L		5 U		5 U		5 U
4-Bromophenyl phenyl ether	µg/L		2 U		2 U		2 U
4-Chlorophenyl phenyl ether	µg/L		2 U		2 U		2 U
4-Chlorotoluene	µg/L		2 U		2 U		2 U
4-Nitroaniline	µg/L		4 U		4 U		4 U
Acetone	µg/L		25 U		25 U		25 U
Acrylonitrile	µg/L		10 U		10 U		10 U
bis(2-chloroisopropyl)ether	µg/L		2 U		2 U		2 U
Bromobenzene	µg/L		2 U		2 U		2 U
Bromochloromethane	µg/L		2 U		2 U		2 U

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
	Location	MW-02A	MW-02A	MW-04	MW-04	MW-05
	Sample ID	**MW-02A-GW-021513**	**MW-02A-GWF-021513**	**MW-04-GW-021413**	**MW-04-GWF-021413**	**MW-05-GW-021413**
	Date	02/15/2013	02/15/2013	02/14/2013	02/14/2013	02/15/2013
Other VOCs						
Bromodichloromethane	µg/L	0.9 U		0.9 U		0.9 U
Bromoform	µg/L	2 U		2 U		2 U
Bromomethane	µg/L	2 U		2 U		2 U
Carbon disulfide	µg/L	2 U		2 U		2 U
Carbon tetrachloride	µg/L	1.6 U		1.6 U		1.6 U
Chlorobenzene	µg/L	2 U		2 U		2 U
Chloroethane	µg/L	2 U		2 U		2 U
Chloroform	µg/L	2 U		2 U		2 U
Chloromethane	µg/L	2 U		2 U		2 U
cis-1,2-Dichloroethene	µg/L	2 U		2 U		2 U
cis-1,3-Dichloropropene	µg/L	2 U		2 U		2 U
Cymene	µg/L	2 U		2 U		2 U
Dibromochloromethane	µg/L	2 U		2 U		2 U
Dibromomethane	µg/L	2 U		2 U		2 U
Dichlorodifluoromethane	µg/L	2 U		2 U		2 U
Methyl ethyl ketone	µg/L	10 U		10 U		10 U
Methyl iso butyl ketone	µg/L	10 U		10 U		10 U
Methyl-Tert-Butyl Ether	µg/L	2 U		2 U		2 U
Methylene chloride	µg/L	5 U		5 U		5 U
n-Butylbenzene	µg/L	2 U		2 U		2 U
Pyridine	µg/L	4 U		4 U		4 U
sec-Butylbenzene	µg/L	2 U		2 U		2 U
Styrene	µg/L	2 U		2 U		2 U
tert-Butylbenzene	µg/L	2 U		2 U		2 U
Tetrachloroethene	µg/L	2 U		2 U		2 U
trans-1,2-Dichloroethene	µg/L	2 U		2 U		2 U
trans-1,3-Dichloropropene	µg/L	2 U		2 U		2 U
Trichloroethene	µg/L	2 U		2 U		2 U
Trichlorofluoromethane	µg/L	2 U		2 U		2 U
Vinyl chloride	µg/L	0.2 U		0.2 U		0.2 U
Total Petroleum Hydrocarbons (TPH)						
Gasoline-Range Hydrocarbons	µg/L	50 U		50 U		50 U
Diesel-Range Hydrocarbons	µg/L	340 JM		130 U		130 U
Oil-Range Hydrocarbons	µg/L	250 U		250 U		250 U

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
	Location	MW-05	MW-06	MW-06	MW-06	MW-06
	Sample ID	**MW-05-GWF-021413**	**MW-06-GW-021413**	**MW-94-GW-021413**	**MW-06-GWF-021413**	**MW-94-GWF-021413**
	Date	02/14/2013	02/14/2013	02/14/2013	02/14/2013	02/14/2013
Dissolved Metals						
Antimony	µg/L	0.0689			0.29	0.309
Arsenic	µg/L	0.382			4.23	4.34
Beryllium	µg/L	0.00563 U			0.00563 U	0.00563 U
Cadmium	µg/L	0.011 U			0.0221	0.0137
Chromium	µg/L	0.446			0.192 U	0.192 U
Copper	µg/L	0.836			1.6	1.51
Lead	µg/L	0.0183 U			0.0183 U	0.0183 U
Nickel	µg/L	1.62			1.14	1.21
Selenium	µg/L	0.1749			0.0823 U	0.0823 U
Silver	µg/L	0.00263 U			0.00263 U	0.00263 U
Thallium	µg/L	0.00113 U			0.0013	0.0015
Zinc	µg/L	8.26 U			8.26 U	8.26 U
Total Metals						
Mercury (inorganic)	µg/L		0.00135 U	0.00135 U		
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L		0.018 U	0.018 U		
Benzo(a)pyrene	µg/L		0.0096 U	0.0096 U		
Benzo(b)fluoranthene	µg/L		0.01 U	0.01 U		
Benzo(k)fluoranthene	µg/L		0.007 U	0.007 U		
Chrysene	µg/L		0.0064 U	0.0064 U		
Dibenzo(a,h)anthracene	µg/L		0.0062 U	0.0062 U		
Indeno(1,2,3-cd)pyrene	µg/L		0.005 U	0.005 U		
cPAHs (MTCA TEQ-HalfND)	µg/L		0.0071 U	0.0071 U		
cPAHs (MTCA TEQ-ZeroND)	µg/L		0.0096 U	0.0096 U		
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Naphthalene	µg/L		0.02 U	0.02 U		
Acenaphthylene	µg/L		0.02 U	0.02 U		
Acenaphthene	µg/L		0.031	0.039		
Fluorene	µg/L		0.02 U	0.02 U		
Phenanthrene	µg/L		0.02 U	0.02 U		
Anthracene	µg/L		0.02 U	0.02 U		
1-Methylnaphthalene	µg/L		0.02 U	0.02 U		
2-Methylnaphthalene	µg/L		0.02 U	0.02 U		
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Fluoranthene	µg/L		0.02 U	0.02 U		
Pyrene	µg/L		0.033 U	0.033 U		
Benzo(g,h,i)perylene	µg/L		0.02 U	0.02 U		
Other SVOCs						
1,2,4-Trichlorobenzene	µg/L		1 U	1 U		
1,2-Dichlorobenzene	µg/L		2 U	2 U		
1,3-Dichlorobenzene	µg/L		2 U	2 U		
2,3,4,6-Tetrachlorophenol	µg/L		2 U	2 U		

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-05	MW-06	MW-06	MW-06	MW-06
		Sample ID	**MW-05-GWF-021413**	**MW-06-GW-021413**	**MW-94-GW-021413**	**MW-06-GWF-021413**	**MW-94-GWF-021413**
		Date	02/14/2013	02/14/2013	02/14/2013	02/14/2013	02/14/2013
Other SVOCs							
2,4,5-Trichlorophenol	µg/L			2 U	2 U		
2,4,6-Trichlorophenol	µg/L			2 U	2 U		
2,4-Dichlorophenol	µg/L			2 U	2 U		
2,4-Dimethylphenol	µg/L			2 U	2 U		
2,4-Dinitrophenol	µg/L			10 U	10 U		
2,4-Dinitrotoluene	µg/L			2 U	2 U		
2,6-Dichlorophenol	µg/L			2 U	2 U		
2,6-Dinitrotoluene	µg/L			2 U	2 U		
2-Chloronaphthalene	µg/L			2 U	2 U		
2-Chlorophenol	µg/L			2 U	2 U		
2-Methylphenol	µg/L			2 U	2 U		
2-Nitroaniline	µg/L			2 U	2 U		
2-Nitrophenol	µg/L			2 U	2 U		
3,3'-Dichlorobenzidine	µg/L			5 U	5 U		
4,6 Dinitro-o-cresol	µg/L			4 U	4 U		
4-Chloro-3-methylphenol	µg/L			2 U	2 U		
4-Chloroaniline	µg/L			2 U	2 U		
4-Nitrophenol	µg/L			5 U	5 U		
Aniline	µg/L			4 U	4 U		
Azobenzene	µg/L			2 U	2 U		
Benzoic acid	µg/L			10 U	10 U		
Benzyl alcohol	µg/L			2 U	2 U		
bis(2-chloroethoxy)methane	µg/L			2 U	2 U		
Bis(2-chloroethyl) ether	µg/L			1 U	1 U		
Bis(2-ethylhexyl) phthalate	µg/L			2 U	2 U		
Butyl benzyl phthalate	µg/L			1 U	1 U		
Carbazole	µg/L			2 U	2 U		
Dibenzofuran	µg/L			2 U	2 U		
Diethyl phthalate	µg/L			2 U	2 U		
Dimethyl phthalate	µg/L			2 U	2 U		
Di-n-butyl phthalate	µg/L			2 U	2 U		
Di-n-octyl phthalate	µg/L			1 U	1 U		
Hexachlorobenzene	µg/L			1 U	1 U		
Hexachlorobutadiene	µg/L			2 U	2 U		
Hexachlorocyclopentadiene	µg/L			4 U	4 U		
Hexachloroethane	µg/L			2 U	2 U		
Isophorone	µg/L			2 U	2 U		
m,p-Cresol (2:1 ratio)	µg/L			2 U	2 U		
Nitrobenzene	µg/L			2 U	2 U		
N-Nitrosodimethylamine	µg/L			2 U	2 U		
N-Nitroso-di-n-propylamine	µg/L			0.7 U	0.7 U		
N-Nitrosodiphenylamine	µg/L			2 U	2 U		

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-05	MW-06	MW-06	MW-06	MW-06
		Sample ID	**MW-05-GWF-021413**	**MW-06-GW-021413**	**MW-94-GW-021413**	**MW-06-GWF-021413**	**MW-94-GWF-021413**
		Date	02/14/2013	02/14/2013	02/14/2013	02/14/2013	02/14/2013
Other SVOCs							
Pentachlorophenol	µg/L			5 U	5 U		
Phenol	µg/L			2 U	2 U		
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH							
1,3,5-Trimethylbenzene	µg/L			2 U	2 U		
Benzene	µg/L			2 U	2 U		
Ethylbenzene	µg/L			2 U	2 U		
Iso-Propylbenzene	µg/L			2 U	2 U		
n-Propylbenzene	µg/L			2 U	2 U		
Toluene	µg/L			2 U	2 U		
Xylenes (meta & para)	µg/L			4 U	4 U		
Xylene (ortho)	µg/L			2 U	2 U		
Xylenes (total)	µg/L			3 U	3 U		
Other VOCs							
1,1,1,2-Tetrachloroethane	µg/L			2 U	2 U		
1,1,1-Trichloroethane	µg/L			2 U	2 U		
1,1,2,2-Tetrachloroethane	µg/L			2 U	2 U		
1,1,2-Trichloroethane	µg/L			2 U	2 U		
1,1-Dichloroethane	µg/L			2 U	2 U		
1,1-Dichloroethene	µg/L			2 U	2 U		
1,1-Dichloropropene	µg/L			2 U	2 U		
1,2,3-Trichlorobenzene	µg/L			2 U	2 U		
1,2,3-Trichloropropane	µg/L			2 U	2 U		
1,2,4-Trimethylbenzene	µg/L			2 U	2 U		
1,2-Dibromo-3-chloropropane	µg/L			10 U	10 U		
1,2-Dibromoethane (EDB)	µg/L			0.01 U	0.01 U		
1,2-Dichloroethane (EDC)	µg/L			2 U	2 U		
1,2-Dichloropropane	µg/L			2 U	2 U		
1,3-Dichloropropane	µg/L			2 U	2 U		
1,4-Dichlorobenzene	µg/L			2 U	2 U		
2,2-Dichloropropane	µg/L			2 U	2 U		
2-Chlorotoluene	µg/L			2 U	2 U		
2-Hexanone	µg/L			10 U	10 U		
3-Nitroaniline	µg/L			5 U	5 U		
4-Bromophenyl phenyl ether	µg/L			2 U	2 U		
4-Chlorophenyl phenyl ether	µg/L			2 U	2 U		
4-Chlorotoluene	µg/L			2 U	2 U		
4-Nitroaniline	µg/L			4 U	4 U		
Acetone	µg/L			25 U	25 U		
Acrylonitrile	µg/L			10 U	10 U		
bis(2-chloroisopropyl)ether	µg/L			2 U	2 U		
Bromobenzene	µg/L			2 U	2 U		
Bromochloromethane	µg/L			2 U	2 U		

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-05	MW-06	MW-06	MW-06	MW-06
		Sample ID	**MW-05-GWF-021413**	**MW-06-GW-021413**	**MW-94-GW-021413**	**MW-06-GWF-021413**	**MW-94-GWF-021413**
		Date	02/14/2013	02/14/2013	02/14/2013	02/14/2013	02/14/2013
Other VOCs							
Bromodichloromethane	µg/L			0.9 U	0.9 U		
Bromoform	µg/L			2 U	2 U		
Bromomethane	µg/L			2 U	2 U		
Carbon disulfide	µg/L			2 U	2 U		
Carbon tetrachloride	µg/L			1.6 U	1.6 U		
Chlorobenzene	µg/L			2 U	2 U		
Chloroethane	µg/L			2 U	2 U		
Chloroform	µg/L			2 U	2 U		
Chloromethane	µg/L			2 U	2 U		
cis-1,2-Dichloroethene	µg/L			2 U	2 U		
cis-1,3-Dichloropropene	µg/L			2 U	2 U		
Cymene	µg/L			2 U	2 U		
Dibromochloromethane	µg/L			2 U	2 U		
Dibromomethane	µg/L			2 U	2 U		
Dichlorodifluoromethane	µg/L			2 U	2 U		
Methyl ethyl ketone	µg/L			10 U	10 U		
Methyl iso butyl ketone	µg/L			10 U	10 U		
Methyl-Tert-Butyl Ether	µg/L			2 U	2 U		
Methylene chloride	µg/L			5 U	5 U		
n-Butylbenzene	µg/L			2 U	2 U		
Pyridine	µg/L			4 U	4 U		
sec-Butylbenzene	µg/L			2 U	2 U		
Styrene	µg/L			2 U	2 U		
tert-Butylbenzene	µg/L			2 U	2 U		
Tetrachloroethene	µg/L			2 U	2 U		
trans-1,2-Dichloroethene	µg/L			2 U	2 U		
trans-1,3-Dichloropropene	µg/L			2 U	2 U		
Trichloroethene	µg/L			2 U	2 U		
Trichlorofluoromethane	µg/L			2 U	2 U		
Vinyl chloride	µg/L			0.2 U	0.2 U		
Total Petroleum Hydrocarbons (TPH)							
Gasoline-Range Hydrocarbons	µg/L			50 U	50 U		
Diesel-Range Hydrocarbons	µg/L			130 U	130 U		
Oil-Range Hydrocarbons	µg/L			250 U	250 U		
EPH/VPH							
C5-C6 Aliphatics	µg/L			50 U	50 U		
C6-C8 Aliphatics	µg/L			50 U	50 U		
C8-C10 Aliphatics	µg/L			50 U	50 U		
C10-C12 Aliphatics	µg/L			50 U	50 U		
C12-C16 Aliphatics	µg/L			50 U	50 U		
C16-C21 Aliphatics	µg/L			50 U	50 U		
C21-C34 Aliphatics	µg/L			50 U	50 U		

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
	Location	MW-05	MW-06	MW-06	MW-06	MW-06
	Sample ID	**MW-05-GWF-021413**	**MW-06-GW-021413**	**MW-94-GW-021413**	**MW-06-GWF-021413**	**MW-94-GWF-021413**
	Date	02/14/2013	02/14/2013	02/14/2013	02/14/2013	02/14/2013
EPH/VPH						
C8-C10 Aromatics	µg/L		50 U	50 U		
C10-C12 Aromatics	µg/L		50 U	50 U		
C12-C16 Aromatics	µg/L		50 U	50 U		
C16-C21 Aromatics	µg/L		50 U	50 U		
C21-C34 Aromatics	µg/L		50 U	50 U		
n-Hexane	µg/L		2 U	2 U		

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-06	MW-06	MW-07	MW-07	MW-08
		Sample ID	**MW-06-GW-021513**	**MW-06-GWF-021513**	**MW-07-GW-021413**	**MW-07-GWF-021413**	**MW-08-GW-021413**
		Date	02/15/2013	02/15/2013	02/14/2013	02/14/2013	02/14/2013
Dissolved Metals							
Antimony	µg/L			0.295		0.1762	
Arsenic	µg/L			3.5		0.834	
Beryllium	µg/L			0.00563 U		0.00563 U	
Cadmium	µg/L			0.0155		0.0649	
Chromium	µg/L			0.192 U		0.192 U	
Copper	µg/L			1.55		1.47	
Lead	µg/L			0.0183 U		0.0319	
Nickel	µg/L			1.2		7.09	
Selenium	µg/L			0.0823 U		0.0823 U	
Silver	µg/L			0.00263 U		0.00263 U	
Thallium	µg/L			0.0013		0.0042	
Zinc	µg/L			8.26 U		10.8	
Total Metals							
Mercury (inorganic)	µg/L	0.0017		0.0021		0.00135 U	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)							
Benz(a)anthracene	µg/L			0.018 U		0.018 U	
Benzo(a)pyrene	µg/L			0.0096 U		0.0096 U	
Benzo(b)fluoranthene	µg/L			0.01 U		0.01 U	
Benzo(k)fluoranthene	µg/L			0.007 U		0.007 U	
Chrysene	µg/L			0.0064 U		0.0064 U	
Dibenzo(a,h)anthracene	µg/L			0.0062 U		0.0062 U	
Indeno(1,2,3-cd)pyrene	µg/L			0.005 U		0.005 U	
cPAHs (MTCA TEQ-HalfND)	µg/L			0.0071 U		0.0071 U	
cPAHs (MTCA TEQ-ZeroND)	µg/L			0.0096 U		0.0096 U	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							
Naphthalene	µg/L			0.02 U		0.02 U	
Acenaphthylene	µg/L			0.026		0.02 U	
Acenaphthene	µg/L			0.96		0.02 U	
Fluorene	µg/L			0.02 U		0.02 U	
Phenanthrene	µg/L			0.02 U		0.02 U	
Anthracene	µg/L			0.02 U		0.02 U	
1-Methylnaphthalene	µg/L			0.02 U		0.02 U	
2-Methylnaphthalene	µg/L			0.02 U		0.02 U	
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Fluoranthene	µg/L			0.02 U		0.02 U	
Pyrene	µg/L			0.033 U		0.033 U	
Benzo(g,h,i)perylene	µg/L			0.02 U		0.02 U	
Other SVOCs							
1,2,4-Trichlorobenzene	µg/L			1 U		1 U	
1,2-Dichlorobenzene	µg/L			2 U		2 U	
1,3-Dichlorobenzene	µg/L			2 U		2 U	
2,3,4,6-Tetrachlorophenol	µg/L			2 U		2 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-06	MW-06	MW-07	MW-07	MW-08
		Sample ID	**MW-06-GW-021513**	**MW-06-GWF-021513**	**MW-07-GW-021413**	**MW-07-GWF-021413**	**MW-08-GW-021413**
		Date	02/15/2013	02/15/2013	02/14/2013	02/14/2013	02/14/2013
Other SVOCs							
2,4,5-Trichlorophenol	µg/L				2 U		2 U
2,4,6-Trichlorophenol	µg/L				2 U		2 U
2,4-Dichlorophenol	µg/L				2 U		2 U
2,4-Dimethylphenol	µg/L				2 U		2 U
2,4-Dinitrophenol	µg/L				10 U		10 U
2,4-Dinitrotoluene	µg/L				2 U		2 U
2,6-Dichlorophenol	µg/L				2 U		2 U
2,6-Dinitrotoluene	µg/L				2 U		2 U
2-Chloronaphthalene	µg/L				2 U		2 U
2-Chlorophenol	µg/L				2 U		2 U
2-Methylphenol	µg/L				2 U		2 U
2-Nitroaniline	µg/L				2 U		2 U
2-Nitrophenol	µg/L				2 U		2 U
3,3'-Dichlorobenzidine	µg/L				5 U		5 U
4,6 Dinitro-o-cresol	µg/L				4 U		4 U
4-Chloro-3-methylphenol	µg/L				2 U		2 U
4-Chloroaniline	µg/L				2 U		2 U
4-Nitrophenol	µg/L				5 U		5 U
Aniline	µg/L				4 U		4 U
Azobenzene	µg/L				2 U		2 U
Benzoic acid	µg/L				10 U		10 U
Benzyl alcohol	µg/L				2 U		2 U
bis(2-chloroethoxy)methane	µg/L				2 U		2 U
Bis(2-chloroethyl) ether	µg/L				1 U		1 U
Bis(2-ethylhexyl) phthalate	µg/L				2 U		2 U
Butyl benzyl phthalate	µg/L				1 U		1 U
Carbazole	µg/L				2 U		2 U
Dibenzofuran	µg/L				2 U		2 U
Diethyl phthalate	µg/L				2 U		2 U
Dimethyl phthalate	µg/L				2 U		2 U
Di-n-butyl phthalate	µg/L				2 U		2 U
Di-n-octyl phthalate	µg/L				1 U		1 U
Hexachlorobenzene	µg/L				1 U		1 U
Hexachlorobutadiene	µg/L				2 U		2 U
Hexachlorocyclopentadiene	µg/L				4 U		4 U
Hexachloroethane	µg/L				2 U		2 U
Isophorone	µg/L				2 U		2 U
m,p-Cresol (2:1 ratio)	µg/L				2 U		2 U
Nitrobenzene	µg/L				2 U		2 U
N-Nitrosodimethylamine	µg/L				2 U		2 U
N-Nitroso-di-n-propylamine	µg/L				0.7 U		0.7 U
N-Nitrosodiphenylamine	µg/L				2 U		2 U

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-06	MW-06	MW-07	MW-07	MW-08
		Sample ID	**MW-06-GW-021513**	**MW-06-GWF-021513**	**MW-07-GW-021413**	**MW-07-GWF-021413**	**MW-08-GW-021413**
		Date	02/15/2013	02/15/2013	02/14/2013	02/14/2013	02/14/2013
Other SVOCs							
Pentachlorophenol	µg/L				5 U		5 U
Phenol	µg/L				2 U		2 U
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH							
1,3,5-Trimethylbenzene	µg/L				2 U		2 U
Benzene	µg/L				2 U		2 U
Ethylbenzene	µg/L				2 U		2 U
Iso-Propylbenzene	µg/L				2 U		2 U
n-Propylbenzene	µg/L				2 U		2 U
Toluene	µg/L				2 U		2 U
Xylenes (meta & para)	µg/L				4 U		4 U
Xylene (ortho)	µg/L				2 U		2 U
Xylenes (total)	µg/L				3 U		3 U
Other VOCs							
1,1,1,2-Tetrachloroethane	µg/L				2 U		2 U
1,1,1-Trichloroethane	µg/L				2 U		2 U
1,1,2,2-Tetrachloroethane	µg/L				2 U		2 U
1,1,2-Trichloroethane	µg/L				2 U		2 U
1,1-Dichloroethane	µg/L				2 U		2 U
1,1-Dichloroethene	µg/L				2 U		2 U
1,1-Dichloropropene	µg/L				2 U		2 U
1,2,3-Trichlorobenzene	µg/L				2 U		2 U
1,2,3-Trichloropropane	µg/L				2 U		2 U
1,2,4-Trimethylbenzene	µg/L				2 U		2 U
1,2-Dibromo-3-chloropropane	µg/L				10 U		10 U
1,2-Dibromoethane (EDB)	µg/L				0.01 U		0.01 U
1,2-Dichloroethane (EDC)	µg/L				2 U		2 U
1,2-Dichloropropane	µg/L				2 U		2 U
1,3-Dichloropropane	µg/L				2 U		2 U
1,4-Dichlorobenzene	µg/L				2 U		2 U
2,2-Dichloropropane	µg/L				2 U		2 U
2-Chlorotoluene	µg/L				2 U		2 U
2-Hexanone	µg/L				10 U		10 U
3-Nitroaniline	µg/L				5 U		5 U
4-Bromophenyl phenyl ether	µg/L				2 U		2 U
4-Chlorophenyl phenyl ether	µg/L				2 U		2 U
4-Chlorotoluene	µg/L				2 U		2 U
4-Nitroaniline	µg/L				4 U		4 U
Acetone	µg/L				25 U		25 U
Acrylonitrile	µg/L				10 U		10 U
bis(2-chloroisopropyl)ether	µg/L				2 U		2 U
Bromobenzene	µg/L				2 U		2 U
Bromochloromethane	µg/L				2 U		2 U

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-06	MW-06	MW-07	MW-07	MW-08
		Sample ID	**MW-06-GW-021513**	**MW-06-GWF-021513**	**MW-07-GW-021413**	**MW-07-GWF-021413**	**MW-08-GW-021413**
		Date	02/15/2013	02/15/2013	02/14/2013	02/14/2013	02/14/2013
Other VOCs							
Bromodichloromethane	µg/L				0.9 U		0.9 U
Bromoform	µg/L				2 U		2 U
Bromomethane	µg/L				2 U		2 U
Carbon disulfide	µg/L				2 U		2 U
Carbon tetrachloride	µg/L				1.6 U		1.6 U
Chlorobenzene	µg/L				2 U		2 U
Chloroethane	µg/L				2 U		2 U
Chloroform	µg/L				2 U		2 U
Chloromethane	µg/L				2 U		2 U
cis-1,2-Dichloroethene	µg/L				2 U		2 U
cis-1,3-Dichloropropene	µg/L				2 U		2 U
Cymene	µg/L				2 U		2 U
Dibromochloromethane	µg/L				2 U		2 U
Dibromomethane	µg/L				2 U		2 U
Dichlorodifluoromethane	µg/L				2 U		2 U
Methyl ethyl ketone	µg/L				10 U		10 U
Methyl iso butyl ketone	µg/L				10 U		10 U
Methyl-Tert-Butyl Ether	µg/L				2 U		2 U
Methylene chloride	µg/L				5 U		5 U
n-Butylbenzene	µg/L				2 U		2 U
Pyridine	µg/L				4 U		4 U
sec-Butylbenzene	µg/L				2 U		2 U
Styrene	µg/L				2 U		2 U
tert-Butylbenzene	µg/L				2 U		2 U
Tetrachloroethene	µg/L				2 U		2 U
trans-1,2-Dichloroethene	µg/L				2 U		2 U
trans-1,3-Dichloropropene	µg/L				2 U		2 U
Trichloroethene	µg/L				2 U		2 U
Trichlorofluoromethane	µg/L				2 U		2 U
Vinyl chloride	µg/L				0.2 U		0.2 U
Total Petroleum Hydrocarbons (TPH)							
Gasoline-Range Hydrocarbons	µg/L				50 U		50 U
Diesel-Range Hydrocarbons	µg/L				430 JM		130 U
Oil-Range Hydrocarbons	µg/L				250 U		250 U

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-08	MW-09	MW-09	MW-10	MW-10
		Sample ID	**MW-08-GWF-021413**	**MW-09-GW-021513**	**MW-09-GWF-021513**	**MW-10-GW-021413**	**MW-10-GWF-021413**
		Date	02/14/2013	02/15/2013	02/15/2013	02/14/2013	02/14/2013
Dissolved Metals							
Antimony	µg/L		0.324		0.2136		0.305
Arsenic	µg/L		0.919		4.58		3.89
Beryllium	µg/L		0.00563 U		0.00563 U		0.00563 U
Cadmium	µg/L		0.0578		0.011 U		0.1469
Chromium	µg/L		0.192 U		0.192 U		0.192 U
Copper	µg/L		1.22		0.241 U		0.438
Lead	µg/L		0.0183 U		0.0183 U		0.041
Nickel	µg/L		1.41		1.38		8.97
Selenium	µg/L		0.1541		0.0823 U		0.0823 U
Silver	µg/L		0.004		0.00263 U		0.0061
Thallium	µg/L		0.0072		0.00113 U		0.0069
Zinc	µg/L		8.26 U		8.26 U		8.26 U
Total Metals							
Mercury (inorganic)	µg/L			0.0088		0.0045	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)							
Benz(a)anthracene	µg/L			0.018 U		0.019 U	
Benzo(a)pyrene	µg/L			0.0096 U		0.01 U	
Benzo(b)fluoranthene	µg/L			0.01 U		0.011 U	
Benzo(k)fluoranthene	µg/L			0.007 U		0.0077 U	
Chrysene	µg/L			0.0064 U		0.018 UB	
Dibenzo(a,h)anthracene	µg/L			0.0062 U		0.0067 U	
Indeno(1,2,3-cd)pyrene	µg/L			0.005 U		0.0054 U	
cPAHs (MTCA TEQ-HalfND)	µg/L			0.0071 U		0.0076 UB	
cPAHs (MTCA TEQ-ZeroND)	µg/L			0.0096 U		0.01 U	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							
Naphthalene	µg/L			0.64		0.02 U	
Acenaphthylene	µg/L			0.02 U		0.02 U	
Acenaphthene	µg/L			2		0.02 U	
Fluorene	µg/L			3.9		0.02 U	
Phenanthrene	µg/L			0.02 U		0.02 U	
Anthracene	µg/L			0.092		0.02 U	
1-Methylnaphthalene	µg/L			52		0.02 U	
2-Methylnaphthalene	µg/L			4.3		0.02 U	
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Fluoranthene	µg/L			0.02 U		0.02 U	
Pyrene	µg/L			0.033 U		0.036 U	
Benzo(g,h,i)perylene	µg/L			0.02 U		0.022 U	
Other SVOCs							
1,2,4-Trichlorobenzene	µg/L			1 U		1 U	
1,2-Dichlorobenzene	µg/L			2 U		2 U	
1,3-Dichlorobenzene	µg/L			2 U		2 U	
2,3,4,6-Tetrachlorophenol	µg/L			2 U		2 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-08	MW-09	MW-09	MW-10	MW-10
		Sample ID	**MW-08-GWF-021413**	**MW-09-GW-021513**	**MW-09-GWF-021513**	**MW-10-GW-021413**	**MW-10-GWF-021413**
		Date	02/14/2013	02/15/2013	02/15/2013	02/14/2013	02/14/2013
Other SVOCs							
2,4,5-Trichlorophenol	µg/L			2 U		2 U	
2,4,6-Trichlorophenol	µg/L			2 U		2 U	
2,4-Dichlorophenol	µg/L			2 U		2 U	
2,4-Dimethylphenol	µg/L			2 U		2 U	
2,4-Dinitrophenol	µg/L			10 U		10 U	
2,4-Dinitrotoluene	µg/L			2 U		2 U	
2,6-Dichlorophenol	µg/L			2 U		2 U	
2,6-Dinitrotoluene	µg/L			2 U		2 U	
2-Chloronaphthalene	µg/L			2 U		2 U	
2-Chlorophenol	µg/L			2 U		2 U	
2-Methylphenol	µg/L			2 U		2 U	
2-Nitroaniline	µg/L			2 U		2 U	
2-Nitrophenol	µg/L			2 U		2 U	
3,3'-Dichlorobenzidine	µg/L			5 U		5 U	
4,6 Dinitro-o-cresol	µg/L			4 U		4 U	
4-Chloro-3-methylphenol	µg/L			2 U		2 U	
4-Chloroaniline	µg/L			2 U		2 U	
4-Nitrophenol	µg/L			5 U		5 U	
Aniline	µg/L			4 U		4 U	
Azobenzene	µg/L			2 U		2 U	
Benzoic acid	µg/L			10 U		10 U	
Benzyl alcohol	µg/L			2 U		2 U	
bis(2-chloroethoxy)methane	µg/L			2 U		2 U	
Bis(2-chloroethyl) ether	µg/L			1 U		1 U	
Bis(2-ethylhexyl) phthalate	µg/L			2 U		2 U	
Butyl benzyl phthalate	µg/L			1 U		1 U	
Carbazole	µg/L			6.8		2 U	
Dibenzofuran	µg/L			2 U		2 U	
Diethyl phthalate	µg/L			2 U		2 U	
Dimethyl phthalate	µg/L			2 U		2 U	
Di-n-butyl phthalate	µg/L			2 U		2 U	
Di-n-octyl phthalate	µg/L			1 U		1 U	
Hexachlorobenzene	µg/L			1 U		1 U	
Hexachlorobutadiene	µg/L			2 U		2 U	
Hexachlorocyclopentadiene	µg/L			4 U		4 U	
Hexachloroethane	µg/L			2 U		2.2 U	
Isophorone	µg/L			2 U		2 U	
m,p-Cresol (2:1 ratio)	µg/L			2 U		2 U	
Nitrobenzene	µg/L			2 U		2 U	
N-Nitrosodimethylamine	µg/L			2 U		2 U	
N-Nitroso-di-n-propylamine	µg/L			0.7 U		0.76 U	
N-Nitrosodiphenylamine	µg/L			2 U		2 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-08	MW-09	MW-09	MW-10	MW-10
		Sample ID	**MW-08-GWF-021413**	**MW-09-GW-021513**	**MW-09-GWF-021513**	**MW-10-GW-021413**	**MW-10-GWF-021413**
		Date	02/14/2013	02/15/2013	02/15/2013	02/14/2013	02/14/2013
Other SVOCs							
Pentachlorophenol	µg/L			5 U		5 U	
Phenol	µg/L			2 U		2 U	
Volatile Organic Compounds (VOCs) Associated with Diesel- and Oil-range TPH							
1,3,5-Trimethylbenzene	µg/L			2 U		2 U	
Benzene	µg/L			2 U		2 U	
Ethylbenzene	µg/L			2 U		2 U	
Iso-Propylbenzene	µg/L			2.6		2 U	
n-Propylbenzene	µg/L			2 U		2 U	
Toluene	µg/L			2 U		2 U	
Xylenes (meta & para)	µg/L			4 U		4 U	
Xylene (ortho)	µg/L			2 U		2 U	
Xylenes (total)	µg/L			3 U		3 U	
Other VOCs							
1,1,1,2-Tetrachloroethane	µg/L			2 U		2 U	
1,1,1-Trichloroethane	µg/L			2 U		2 U	
1,1,2,2-Tetrachloroethane	µg/L			2 U		2 U	
1,1,2-Trichloroethane	µg/L			2 U		2 U	
1,1-Dichloroethane	µg/L			2 U		2 U	
1,1-Dichloroethene	µg/L			2 U		2 U	
1,1-Dichloropropene	µg/L			2 U		2 U	
1,2,3-Trichlorobenzene	µg/L			2 U		2 U	
1,2,3-Trichloropropane	µg/L			2 U		2 U	
1,2,4-Trimethylbenzene	µg/L			2 U		2 U	
1,2-Dibromo-3-chloropropane	µg/L			10 U		10 U	
1,2-Dibromoethane (EDB)	µg/L			0.01 U		0.01 U	
1,2-Dichloroethane (EDC)	µg/L			2 U		2 U	
1,2-Dichloropropane	µg/L			2 U		2 U	
1,3-Dichloropropane	µg/L			2 U		2 U	
1,4-Dichlorobenzene	µg/L			2 U		2 U	
2,2-Dichloropropane	µg/L			2 U		2 U	
2-Chlorotoluene	µg/L			2 U		2 U	
2-Hexanone	µg/L			10 U		10 U	
3-Nitroaniline	µg/L			5 U		5 U	
4-Bromophenyl phenyl ether	µg/L			2 U		2 U	
4-Chlorophenyl phenyl ether	µg/L			2 U		2 U	
4-Chlorotoluene	µg/L			2 U		2 U	
4-Nitroaniline	µg/L			4 U		4 U	
Acetone	µg/L			25 U		25 U	
Acrylonitrile	µg/L			10 U		10 U	
bis(2-chloroisopropyl)ether	µg/L			2 U		2 U	
Bromobenzene	µg/L			2 U		2 U	
Bromochloromethane	µg/L			2 U		2 U	

Table C.8
Chemistry Data for Groundwater Samples

		Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
		Location	MW-08	MW-09	MW-09	MW-10	MW-10
		Sample ID	**MW-08-GWF-021413**	**MW-09-GW-021513**	**MW-09-GWF-021513**	**MW-10-GW-021413**	**MW-10-GWF-021413**
		Date	02/14/2013	02/15/2013	02/15/2013	02/14/2013	02/14/2013
Other VOCs							
Bromodichloromethane	µg/L			0.9 U		0.9 U	
Bromoform	µg/L			2 U		2 U	
Bromomethane	µg/L			2 U		2 U	
Carbon disulfide	µg/L			2 U		2 U	
Carbon tetrachloride	µg/L			1.6 U		1.6 U	
Chlorobenzene	µg/L			3.3		2 U	
Chloroethane	µg/L			2 U		2 U	
Chloroform	µg/L			2 U		2 U	
Chloromethane	µg/L			2 U		2 U	
cis-1,2-Dichloroethene	µg/L			2 U		2 U	
cis-1,3-Dichloropropene	µg/L			2 U		2 U	
Cymene	µg/L			2 U		2 U	
Dibromochloromethane	µg/L			2 U		2 U	
Dibromomethane	µg/L			2 U		2 U	
Dichlorodifluoromethane	µg/L			2 U		2 U	
Methyl ethyl ketone	µg/L			10 U		10 U	
Methyl iso butyl ketone	µg/L			10 U		10 U	
Methyl-Tert-Butyl Ether	µg/L			2 U		2 U	
Methylene chloride	µg/L			5 U		5 U	
n-Butylbenzene	µg/L			2.8		2 U	
Pyridine	µg/L			4 U		4 U	
sec-Butylbenzene	µg/L			2.1		2 U	
Styrene	µg/L			2 U		2 U	
tert-Butylbenzene	µg/L			2 U		2 U	
Tetrachloroethene	µg/L			2 U		2 U	
trans-1,2-Dichloroethene	µg/L			2 U		2 U	
trans-1,3-Dichloropropene	µg/L			2 U		2 U	
Trichloroethene	µg/L			2 U		2 U	
Trichlorofluoromethane	µg/L			2 U		2 U	
Vinyl chloride	µg/L			0.2 U		0.2 U	
Total Petroleum Hydrocarbons (TPH)							
Gasoline-Range Hydrocarbons	µg/L			530 JM		50 U	
Diesel-Range Hydrocarbons	µg/L			1200 JM		130 U	
Oil-Range Hydrocarbons	µg/L			250 U		250 U	
EPH/VPH							
C5-C6 Aliphatics	µg/L			50 U			
C6-C8 Aliphatics	µg/L			50 U			
C8-C10 Aliphatics	µg/L			50 U			
C10-C12 Aliphatics	µg/L			50 U			
C12-C16 Aliphatics	µg/L			50 U			
C16-C21 Aliphatics	µg/L			50 U			
C21-C34 Aliphatics	µg/L			50 U			

Table C.8
Chemistry Data for Groundwater Samples

	Event	RI/FS Data Gaps Investigation Sampling (Floyd|Snider)				
	Location	MW-08	MW-09	MW-09	MW-10	MW-10
	Sample ID	**MW-08-GWF-021413**	**MW-09-GW-021513**	**MW-09-GWF-021513**	**MW-10-GW-021413**	**MW-10-GWF-021413**
	Date	02/14/2013	02/15/2013	02/15/2013	02/14/2013	02/14/2013
EPH/VPH						
C8-C10 Aromatics	µg/L		71			
C10-C12 Aromatics	µg/L		420			
C12-C16 Aromatics	µg/L		300			
C16-C21 Aromatics	µg/L		100			
C21-C34 Aromatics	µg/L		63			
n-Hexane	µg/L		2 U			

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action Sampling (Floyd|Snider)				
	Location	MW-02A	MW-02A	MW-06	MW-06	MW-07
	Sample ID	**MW-2A-GW-022515**	**MW-2A-GWF-022515**	**MW-06-GW-022515**	**MW-06-GWF-022515**	**MW-07-GW-022515**
	Date	02/25/2015	02/25/2015	02/25/2015	02/25/2015	02/25/2015
Dissolved Metals						
Arsenic	µg/L		4.23		4.44	
Copper	µg/L		5.21		1.21	
Zinc	µg/L		94		0.5 U	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L	0.01 U		0.01 U		0.01 U
Benzo(a)pyrene	µg/L	0.01 U		0.01 U		0.01 U
Benzofluoranthenes (total)	µg/L	0.02 U		0.02 U		0.02 U
Chrysene	µg/L	0.01 U		0.01 U		0.01 U
Dibenzo(a,h)anthracene	µg/L	0.01 U		0.01 U		0.01 U
Indeno(1,2,3-cd)pyrene	µg/L	0.01 U		0.01 U		0.01 U
cPAHs (MTCA TEQ-HalfND)	µg/L	0.0076 U		0.0076 U		0.0076 U
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L	0.031		0.057 J		0.035 J
Naphthalene	µg/L	0.02		0.05		0.029
Acenaphthylene	µg/L	0.01 U		0.01 U		0.01 U
Acenaphthene	µg/L	0.01 U		0.01 U		0.01 U
Fluorene	µg/L	0.01 U		0.0071 JQ		0.01 U
Phenanthrene	µg/L	0.01 U		0.01 U		0.01 U
Anthracene	µg/L	0.011		0.01 U		0.0063 JQ
1-Methylnaphthalene	µg/L	0.0051 JQ		0.026		0.0064 JQ
2-Methylnaphthalene	µg/L	0.01 U		0.015		0.0055 JQ
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Total HPAH	µg/L	0.02 U		0.02 U		0.0056 J
Fluoranthene	µg/L	0.01 U		0.01 U		0.01 U
Pyrene	µg/L	0.01 U		0.01 U		0.0056 JQ
Benzo(g,h,i)perylene	µg/L	0.01 U		0.01 U		0.01 U
Other SVOCs						
Dibenzofuran	µg/L	0.01		0.0078 JQ		0.0092 JQ
EPH/VPH						
C5-C6 Aliphatics	µg/L	50 U				
C6-C8 Aliphatics	µg/L	50 U				
C8-C10 Aliphatics	µg/L	40 U				
C10-C12 Aliphatics	µg/L	40 U				
C12-C16 Aliphatics	µg/L	40 U				
C16-C21 Aliphatics	µg/L	40 U				
C21-C34 Aliphatics	µg/L	40 U				
C8-C10 Aromatics	µg/L	40 U				
C10-C12 Aromatics	µg/L	40 U				
C12-C16 Aromatics	µg/L	40 U				
C16-C21 Aromatics	µg/L	40 U				
C21-C34 Aromatics	µg/L	40 U				
n-Decane	µg/L	5 U				

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action Sampling (Floyd|Snider)				
	Location	MW-02A	MW-02A	MW-06	MW-06	MW-07
	Sample ID	**MW-2A-GW-022515**	**MW-2A-GWF-022515**	**MW-06-GW-022515**	**MW-06-GWF-022515**	**MW-07-GW-022515**
	Date	02/25/2015	02/25/2015	02/25/2015	02/25/2015	02/25/2015
EPH/VPH						
n-Dodecane	µg/L	5 U				
n-Hexane	µg/L	5 U				
n-Octane	µg/L	5 U				
n-Pentane	µg/L	5 U				
Benzene	µg/L	5 U				
Toluene	µg/L	5 U				
Ethylbenzene	µg/L	5 U				
Xylenes (meta & para)	µg/L	10 U				
Xylene (ortho)	µg/L	5 U				
1,2,3-Trimethylbenzene	µg/L	5 U				
1-Methylnaphthalene	µg/L	5 U				
Methyl-Tert-Butyl Ether	µg/L	5 U				
Naphthalene	µg/L	5 U				

Table C.8
Chemistry Data for Groundwater Samples

		Event	Interim Action Sampling (Floyd|Snider)				
		Location	MW-07	MW-08	MW-08	MW-09	MW-09
		Sample ID	**MW-07-GWF-022515**	**MW-08-GW-022515**	**MW-08-GWF-022515**	**MW-09-GW-022515**	**MW-25-GW-022515**
		Date	02/25/2015	02/25/2015	02/25/2015	02/25/2015	02/25/2015
Dissolved Metals							
Arsenic	µg/L		1.66		1.87		
Copper	µg/L		1.38		1.11		
Zinc	µg/L		2.52 U		2.52 U		
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)							
Benz(a)anthracene	µg/L			0.01 U		0.01 U	0.01 U
Benzo(a)pyrene	µg/L			0.01 U		0.01 U	0.01 U
Benzofluoranthenes (total)	µg/L			0.02 U		0.02 U	0.02 U
Chrysene	µg/L			0.01 U		0.0064 JQ	0.01 U
Dibenzo(a,h)anthracene	µg/L			0.01 U		0.01 U	0.01 U
Indeno(1,2,3-cd)pyrene	µg/L			0.01 U		0.01 U	0.01 U
cPAHs (MTCA TEQ-HalfND)	µg/L			0.0076 U		0.0076 J	0.0076 U
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							
Total LPAH	µg/L			0.0078 J		7.2	6.8
Naphthalene	µg/L			0.0078 JQ		0.29	0.3
Acenaphthylene	µg/L			0.01 U		0.01 U	0.01 U
Acenaphthene	µg/L			0.01 U		2.8	2.6
Fluorene	µg/L			0.01 U		3.9	3.6
Phenanthrene	µg/L			0.01 U		0.18	0.19
Anthracene	µg/L			0.01 U		0.06	0.072
1-Methylnaphthalene	µg/L			0.0089 JQ		60	52
2-Methylnaphthalene	µg/L			0.01 U		12	10
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Total HPAH	µg/L			0.02 U		0.046 J	0.036
Fluoranthene	µg/L			0.01 U		0.016	0.018
Pyrene	µg/L			0.01 U		0.024	0.018
Benzo(g,h,i)perylene	µg/L			0.01 U		0.01 U	0.01 U
Other SVOCs							
Dibenzofuran	µg/L			0.01 U		0.28	0.28

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action Sampling (Floyd|Snider)				
	Location	MW-09	MW-11	MW-11	MW-12	MW-12
	Sample ID	**MW-09-GWF-022515**	**MW-11-GW-022515**	**MW-11-GWF-022515**	**MW-12-GW-022515**	**MW-12-GWF-022515**
	Date	02/25/2015	02/25/2015	02/25/2015	02/25/2015	02/25/2015
Dissolved Metals						
Arsenic	µg/L	21.7		8.13		3.88
Copper	µg/L	0.36		0.09 JQ		6.83
Zinc	µg/L	1.11		2.52 U		128
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L		0.1 U		0.1 U	
Benzo(a)pyrene	µg/L		0.1 U		0.1 U	
Benzofluoranthenes (total)	µg/L		0.1 U		0.1 U	
Chrysene	µg/L		0.1 U		0.1 U	
Dibenzo(a,h)anthracene	µg/L		0.1 U		0.1 U	
Indeno(1,2,3-cd)pyrene	µg/L		0.1 U		0.1 U	
cPAHs (MTCA TEQ-HalfND)	µg/L		0.071 U		0.071 U	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L		1.4		0.05 J	
Naphthalene	µg/L		0.82		0.1 U	
Acenaphthylene	µg/L		0.1 U		0.1 U	
Acenaphthene	µg/L		0.51		0.1 U	
Fluorene	µg/L		0.11		0.1 U	
Phenanthrene	µg/L		0.1 U		0.1 U	
Anthracene	µg/L		0.1 U		0.05 JQ	
1-Methylnaphthalene	µg/L		0.22		0.1 U	
2-Methylnaphthalene	µg/L		0.1 U		0.1 U	
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Total HPAH	µg/L		0.1 U		0.1 U	
Fluoranthene	µg/L		0.1 U		0.1 U	
Pyrene	µg/L		0.1 U		0.1 U	
Benzo(g,h,i)perylene	µg/L		0.1 U		0.1 U	
Other SVOCs						
Dibenzofuran	µg/L		0.1 U		0.1 U	
EPH/VPH						
C5-C6 Aliphatics	µg/L		50 U		50 U	
C6-C8 Aliphatics	µg/L		50 U		50 U	
C8-C10 Aliphatics	µg/L		40 U		40 U	
C10-C12 Aliphatics	µg/L		40 U		40 U	
C12-C16 Aliphatics	µg/L		40 U		40 U	
C16-C21 Aliphatics	µg/L		40 U		40 U	
C21-C34 Aliphatics	µg/L		40 U		40 U	
C8-C10 Aromatics	µg/L		40 U		40 U	
C10-C12 Aromatics	µg/L		40 U		40 U	
C12-C16 Aromatics	µg/L		40 U		40 U	
C16-C21 Aromatics	µg/L		40 U		40 U	
C21-C34 Aromatics	µg/L		40 U		40 U	
n-Decane	µg/L		5 U		5 U	

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action Sampling (Floyd|Snider)				
	Location	MW-09	MW-11	MW-11	MW-12	MW-12
	Sample ID	**MW-09-GWF-022515**	**MW-11-GW-022515**	**MW-11-GWF-022515**	**MW-12-GW-022515**	**MW-12-GWF-022515**
	Date	02/25/2015	02/25/2015	02/25/2015	02/25/2015	02/25/2015
EPH/VPH						
n-Dodecane	µg/L		5 U		5 U	
n-Hexane	µg/L		5 U		5 U	
n-Octane	µg/L		5 U		5 U	
n-Pentane	µg/L		5 U		5 U	
Benzene	µg/L		5 U		5 U	
Toluene	µg/L		5 U		5 U	
Ethylbenzene	µg/L		5 U		5 U	
Xylenes (meta & para)	µg/L		10 U		10 U	
Xylene (ortho)	µg/L		5 U		5 U	
1,2,3-Trimethylbenzene	µg/L		5 U		5 U	
1-Methylnaphthalene	µg/L		5 U		5 U	
Methyl-Tert-Butyl Ether	µg/L		5 U		5 U	
Naphthalene	µg/L		5 U		5 U	

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action 2nd Quarter Groundwater (Floyd|Snider)				
	Location	MW-02A	MW-02A	MW-06	MW-06	MW-07
	Sample ID	**MW-2A-GW-052815**	**MW-2A-GWF-052815**	**MW-06-GW-052815**	**MW-06-GWF-052815**	**MW-07-GW-052815**
	Date	05/28/2015	05/28/2015	05/28/2015	05/28/2015	05/28/2015
Field Measurements						
Conductivity	µS/cm	16900		470		2500
ORP	mV	53		-18		92
pH	pH	6.76		6.89		6.72
Salinity	ppt	12.82		0.28		1.57
Temperature	°C	14.2		15.06		16.37
Turbidity	ntu	0		0		10
Dissolved Metals						
Arsenic	µg/L		3.12		5.67	
Copper	µg/L		4.75		0.9	
Zinc	µg/L		123		0.54	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L	0.01 U		0.01 U		0.01 U
Benzo(a)pyrene	µg/L	0.01 U		0.01 U		0.01 U
Benzofluoranthenes (total)	µg/L	0.02 U		0.02 U		0.02 U
Chrysene	µg/L	0.01 U		0.01 U		0.01 U
Dibenzo(a,h)anthracene	µg/L	0.01 U		0.01 U		0.01 U
Indeno(1,2,3-cd)pyrene	µg/L	0.01 U		0.01 U		0.01 U
cPAHs (MTCA TEQ-HalfND)	µg/L	0.0076 U		0.0076 U		0.0076 U
cPAHs (MTCA TEQ-ZeroND)	µg/L	0.01 U		0.01 U		0.01 U
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L	0.064 J		0.042 J		0.041 J
Naphthalene	µg/L	0.041		0.029		0.034
Acenaphthylene	µg/L	0.0033 JQ		0.01 U		0.01 U
Acenaphthene	µg/L	0.004 JQ		0.0057 JQ		0.01 U
Fluorene	µg/L	0.0078 JQ		0.0077 JQ		0.01 U
Phenanthrene	µg/L	0.01 U		0.01 U		0.0034 JQ
Anthracene	µg/L	0.0083 JQ		0.01 U		0.0036 JQ
1-Methylnaphthalene	µg/L	0.0053 JQ		0.0061 JQ		0.0035 JQ
2-Methylnaphthalene	µg/L	0.0093 JQ		0.0085 JQ		0.0047 JQ
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Total HPAH	µg/L	0.02 U		0.02 U		0.0086 J
Fluoranthene	µg/L	0.01 U		0.01 U		0.0038 JQ
Pyrene	µg/L	0.01 U		0.01 U		0.0048 JQ
Benzo(g,h,i)perylene	µg/L	0.01 U		0.01 U		0.01 U
Other SVOCs						
Dibenzofuran	µg/L	0.015		0.012		0.0078 JQ

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action 2nd Quarter Groundwater (Floyd|Snider)				
	Location	MW-07	MW-08	MW-08	MW-09	MW-09
	Sample ID	**MW-07-GWF-052815**	**MW-08-GW-052815**	**MW-08-GWF-052815**	**MW-09-GW-052815**	**MW-25-GW-052815**
	Date	05/28/2015	05/28/2015	05/28/2015	05/28/2015	05/28/2015
Field Measurements						
Conductivity	µS/cm		5000		1250	
ORP	mV		123		-138	
pH	pH		7.04		6.73	
Salinity	ppt		3.47		0.806	
Temperature	°C		14.01		13.83	
Turbidity	ntu		1		0	
Dissolved Metals						
Arsenic	µg/L	3.1		1.52		
Copper	µg/L	0.25		1.16		
Zinc	µg/L	1.98		1.01 U		
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L		0.01 U		0.01 U	0.01 U
Benzo(a)pyrene	µg/L		0.01 U		0.01 U	0.01 U
Benzofluoranthenes (total)	µg/L		0.02 U		0.02 U	0.02 U
Chrysene	µg/L		0.01 U		0.01 U	0.01 U
Dibenzo(a,h)anthracene	µg/L		0.01 U		0.01 U	0.01 U
Indeno(1,2,3-cd)pyrene	µg/L		0.01 U		0.01 U	0.01 U
cPAHs (MTCA TEQ-HalfND)	µg/L		0.0076 U		0.0076 U	0.0076 U
cPAHs (MTCA TEQ-ZeroND)	µg/L		0.01 U		0.01 U	0.01 U
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L		0.056		5.4	5.2
Naphthalene	µg/L		0.056		0.22	0.22
Acenaphthylene	µg/L		0.01 U		0.075	0.11
Acenaphthene	µg/L		0.01 U		2.2	2.2
Fluorene	µg/L		0.01 U		2.7	2.5
Phenanthrene	µg/L		0.01 U		0.16	0.15
Anthracene	µg/L		0.01 U		0.051	0.043
1-Methylnaphthalene	µg/L		0.0043 JQ		39	39
2-Methylnaphthalene	µg/L		0.01		8.6	8.1
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Total HPAH	µg/L		0.02 U		0.033	0.031
Fluoranthene	µg/L		0.01 U		0.014	0.011
Pyrene	µg/L		0.01 U		0.019	0.02
Benzo(g,h,i)perylene	µg/L		0.01 U		0.01 U	0.01 U
Other SVOCs						
Dibenzofuran	µg/L		0.0058 JQ		0.2	0.21

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action 2nd Quarter Groundwater (Floyd|Snider)				
	Location	MW-09	MW-09	MW-11	MW-11	MW-12
	Sample ID	**MW-09-GWF-052815**	**MW-25-GWF-052815**	**MW-11-GW-052815**	**MW-11-GWF-052815**	**MW-12-GW-052815**
	Date	05/28/2015	05/28/2015	05/28/2015	05/28/2015	05/28/2015
Field Measurements						
Conductivity	µS/cm			2650		29700
ORP	mV			-42		76
pH	pH			6.73		6.75
Salinity	ppt			1.72		23.24
Temperature	°C			15.06		15.04
Turbidity	ntu			33		0
Dissolved Metals						
Arsenic	µg/L	19.4	20.5		8.59	
Copper	µg/L	0.52	0.41		0.11	
Zinc	µg/L	2.63	2.53		0.5 U	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L			0.01 U		0.01 U
Benzo(a)pyrene	µg/L			0.01 U		0.01 U
Benzofluoranthenes (total)	µg/L			0.02 U		0.02 U
Chrysene	µg/L			0.01 U		0.01 U
Dibenzo(a,h)anthracene	µg/L			0.01 U		0.01 U
Indeno(1,2,3-cd)pyrene	µg/L			0.01 U		0.01 U
cPAHs (MTCA TEQ-HalfND)	µg/L			0.0076 U		0.0076 U
cPAHs (MTCA TEQ-ZeroND)	µg/L			0.01 U		0.01 U
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L			7.9		0.047 J
Naphthalene	µg/L			5		0.03
Acenaphthylene	µg/L			0.034		0.01 U
Acenaphthene	µg/L			2.1		0.0032 JQ
Fluorene	µg/L			0.54		0.0054 JQ
Phenanthrene	µg/L			0.21		0.01 U
Anthracene	µg/L			0.037		0.0079 JQ
1-Methylnaphthalene	µg/L			1		0.0042 JQ
2-Methylnaphthalene	µg/L			0.34		0.0076 JQ
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Total HPAH	µg/L			0.054		0.02 U
Fluoranthene	µg/L			0.031		0.01 U
Pyrene	µg/L			0.023		0.01 U
Benzo(g,h,i)perylene	µg/L			0.01 U		0.01 U
Other SVOCs						
Dibenzofuran	µg/L			0.39		0.0098 JQ

Table C.8
Chemistry Data for Groundwater Samples

		Event	Interim Action 2nd Quarter Groundwater (Floyd|Snider)				
		Location	MW-12				
		Sample ID	**MW-12-GWF-052815**				
		Date	05/28/2015				
Dissolved Metals							
Arsenic	µg/L		4.22				
Copper	µg/L		8.68				
Zinc	µg/L		279				

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action 3rd Quarter Groundwater (Floyd|Snider)				
	Location	MW-01	MW-01	MW-02A	MW-02A	MW-06
	Sample ID	**MW-01-GW-082715**	**MW-01-GWF-082715**	**MW-02A-GW-082715**	**MW-02A-GWF-082715**	**MW-06-GW-082715**
	Date	08/27/2015	08/27/2015	08/27/2015	08/27/2015	08/27/2015
Field Measurements						
Conductivity	µS/cm	1740		7660		650
ORP	mV	-77		14		-95
pH	pH	6.23		6.83		7.02
Salinity	ppt	0.6		22.5		0.3
Temperature	°C	19.61		17.35		15.4
Turbidity	ntu	10.4		0		0
Dissolved Metals						
Arsenic	µg/L		25.1		6.23	
Copper	µg/L		1.2		6.87	
Zinc	µg/L		4.98 U		93.4	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L	0.1 U		0.01 U		0.01 U
Benzo(a)pyrene	µg/L	0.1 U		0.01 U		0.01 U
Benzofluoranthenes (total)	µg/L	0.2 U		0.02 U		0.02 U
Chrysene	µg/L	0.1 U		0.01 U		0.01 U
Dibenzo(a,h)anthracene	µg/L	0.1 U		0.01 U		0.01 U
Indeno(1,2,3-cd)pyrene	µg/L	0.1 U		0.01 U		0.01 U
cPAHs (MTCA TEQ-HalfND)	µg/L	0.076 U		0.0076 U		0.0076 U
cPAHs (MTCA TEQ-ZeroND)	µg/L	0.1 U		0.01 U		0.01 U
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L	55 U		0.02 U		0.12 U
Naphthalene	µg/L	6.2		0.016		0.047
Acenaphthylene	µg/L	0.41		0.01 U		0.0051 JQ
Acenaphthene	µg/L	32		0.01 U		0.02
Fluorene	µg/L	14		0.01 U		0.034
Phenanthrene	µg/L	1.8 J		0.01 U		0.0098 JQ
Anthracene	µg/L	0.3		0.0035 JQ		0.01 U
1-Methylnaphthalene	µg/L	25		0.0035 JQ		0.032
2-Methylnaphthalene	µg/L	9		0.01 U		0.02
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Total HPAH	µg/L	1.6		0.02 U		0.02 U
Fluoranthene	µg/L	1.1		0.01 U		0.01 U
Pyrene	µg/L	0.49		0.01 U		0.01 U
Benzo(g,h,i)perylene	µg/L	0.1 U		0.01 U		0.01 U
Other SVOCs						
Dibenzofuran	µg/L	9.3		0.01 U		0.028

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action 3rd Quarter Groundwater (Floyd|Snider)				
	Location	MW-06	MW-07	MW-07	MW-08	MW-08
	Sample ID	**MW-06-GWF-082715**	**MW-07-GW-082715**	**MW-07-GWF-082715**	**MW-08-GW-082715**	**MW-08-GWF-082715**
	Date	08/27/2015	08/27/2015	08/27/2015	08/27/2015	08/27/2015
Field Measurements						
Conductivity	µS/cm		3430		9990	
ORP	mV		-124		28	
pH	pH		6.97		6.56	
Salinity	ppt		1.8		5.6	
Temperature	°C		16.32		22	
Turbidity	ntu		0		0.1	
Dissolved Metals						
Arsenic	µg/L	4.69		6.01		4.26
Copper	µg/L	0.71 JQ		0.29 JQ		3.66
Zinc	µg/L	4.98 U		4.98 U		4.98 U
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L		0.01 U		0.01 U	
Benzo(a)pyrene	µg/L		0.01 U		0.01 U	
Benzofluoranthenes (total)	µg/L		0.02 U		0.02 U	
Chrysene	µg/L		0.01 U		0.01 U	
Dibenzo(a,h)anthracene	µg/L		0.01 U		0.01 U	
Indeno(1,2,3-cd)pyrene	µg/L		0.01 U		0.01 U	
cPAHs (MTCA TEQ-HalfND)	µg/L		0.0076 U		0.0076 U	
cPAHs (MTCA TEQ-ZeroND)	µg/L		0.01 U		0.01 U	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L		0.081 U		0.095 U	
Naphthalene	µg/L		0.031		0.057	
Acenaphthylene	µg/L		0.0051 JQ		0.0037 JQ	
Acenaphthene	µg/L		0.0073 JQ		0.0078 JQ	
Fluorene	µg/L		0.022		0.018	
Phenanthrene	µg/L		0.011 J		0.0084 JQ	
Anthracene	µg/L		0.0048 JQ		0.01 U	
1-Methylnaphthalene	µg/L		0.008 JQ		0.0092 JQ	
2-Methylnaphthalene	µg/L		0.0097 JQ		0.016	
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Total HPAH	µg/L		0.018 U		0.011 U	
Fluoranthene	µg/L		0.0083 JQ		0.0054 JQ	
Pyrene	µg/L		0.0096 JQ		0.0052 JQ	
Benzo(g,h,i)perylene	µg/L		0.01 U		0.01 U	
Other SVOCs						
Dibenzofuran	µg/L		0.026		0.022	

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action 3rd Quarter Groundwater (Floyd|Snider)				
	Location	MW-09	MW-09	MW-09	MW-09	MW-11
	Sample ID	**MW-09-GW-082715**	**MW-25-GW-082715**	**MW-09-GWF-082715**	**MW-25-GWF-082715**	**MW-11-GW-082715**
	Date	08/27/2015	08/27/2015	08/27/2015	08/27/2015	08/27/2015
Field Measurements						
Conductivity	µS/cm	1760				1205
ORP	mV	-185				-46
pH	pH	6.9				6.4
Salinity	ppt	0.9				1.4
Temperature	°C	18.2				21.85
Turbidity	ntu	0				16.1
Dissolved Metals						
Arsenic	µg/L			20.3	19.2	
Copper	µg/L			0.35 JQ	0.25 JQ	
Zinc	µg/L			4.98 U	4.98 U	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L	0.01 U	0.01 U			0.01 U
Benzo(a)pyrene	µg/L	0.0025 JQ	0.0027 JQ			0.01 U
Benzofluoranthenes (total)	µg/L	0.02 U	0.02 U			0.02 U
Chrysene	µg/L	0.0049 JQ	0.0053 JQ			0.01 U
Dibenzo(a,h)anthracene	µg/L	0.01 U	0.01 U			0.01 U
Indeno(1,2,3-cd)pyrene	µg/L	0.01 U	0.01 U			0.01 U
cPAHs (MTCA TEQ-HalfND)	µg/L	0.005 J	0.0053 J			0.0076 U
cPAHs (MTCA TEQ-ZeroND)	µg/L	0.0025 J	0.0028 J			0.01 U
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L	7.4 U	7.2 U			4.8 U
Naphthalene	µg/L	0.21	0.2			1.1
Acenaphthylene	µg/L	0.076	0.087			0.028
Acenaphthene	µg/L	3.3	3			3
Fluorene	µg/L	3.6	3.7			0.59
Phenanthrene	µg/L	0.19 J	0.2 J			0.069 JQ
Anthracene	µg/L	0.013	0.014			0.027
1-Methylnaphthalene	µg/L	48	47			0.73
2-Methylnaphthalene	µg/L	8.3 J	7.7 J			0.024
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Total HPAH	µg/L	0.046 U	0.042 U			0.05
Fluoranthene	µg/L	0.017	0.017			0.03
Pyrene	µg/L	0.022	0.017			0.02
Benzo(g,h,i)perylene	µg/L	0.01 U	0.01 U			0.01 U
Other SVOCs						
Dibenzofuran	µg/L	0.28	0.27			0.26

Table C.8
Chemistry Data for Groundwater Samples

		Event	Interim Action 3rd Quarter Groundwater (Floyd|Snider)				
		Location	MW-11	MW-12	MW-12		
		Sample ID	**MW-11-GWF-082715**	**MW-12-GW-082715**	**MW-12-GWF-082715**		
		Date	08/27/2015	08/27/2015	08/27/2015		
Field Measurements							
Conductivity	µS/cm			22200			
ORP	mV			107			
pH	pH			6.08			
Salinity	ppt			13.3			
Temperature	°C			19.61			
Turbidity	ntu			114			
Dissolved Metals							
Arsenic	µg/L		12.4		5.24		
Copper	µg/L		1 U		11.9		
Zinc	µg/L		4.98 U		387		
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)							
Benz(a)anthracene	µg/L			0.01 U			
Benzo(a)pyrene	µg/L			0.01 U			
Benzofluoranthenes (total)	µg/L			0.02 U			
Chrysene	µg/L			0.01 U			
Dibenzo(a,h)anthracene	µg/L			0.01 U			
Indeno(1,2,3-cd)pyrene	µg/L			0.01 U			
cPAHs (MTCA TEQ-HalfND)	µg/L			0.0076 U			
cPAHs (MTCA TEQ-ZeroND)	µg/L			0.01 U			
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							
Total LPAH	µg/L			0.068 U			
Naphthalene	µg/L			0.036			
Acenaphthylene	µg/L			0.01 U			
Acenaphthene	µg/L			0.0062 JQ			
Fluorene	µg/L			0.013			
Phenanthrene	µg/L			0.0079 JQ			
Anthracene	µg/L			0.0045 JQ			
1-Methylnaphthalene	µg/L			0.0062 JQ			
2-Methylnaphthalene	µg/L			0.01 JQ			
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Total HPAH	µg/L			0.0046 U			
Fluoranthene	µg/L			0.0046 JQ			
Pyrene	µg/L			0.01 U			
Benzo(g,h,i)perylene	µg/L			0.01 U			
Other SVOCs							
Dibenzofuran	µg/L			0.016			

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action 4th Quarter Groundwater (Floyd|Snider)				
	Location	MW-01	MW-01	MW-02A	MW-02A	MW-06
	Sample ID	**MW-01-GW-120315**	**MW-01-GWF-120315**	**MW-02A-GW-120315**	**MW-02A-GWF-120315**	**MW-06-GW-120315**
	Date	12/03/2015	12/03/2015	12/03/2015	12/03/2015	12/03/2015
Field Measurements						
Conductivity	µS/cm	1930		6600		305
ORP	mV	-115		191		76
pH	pH	6.76		6.49		6.66
Salinity	ppt	1.23		3.6		0.1
Temperature	°C	13.05		11.16		13.25
Turbidity	ntu	3.4		1.9		2.9
Dissolved Metals						
Arsenic	µg/L		17.9		2.79 JQ	
Copper	µg/L		1.15		10.4	
Zinc	µg/L		4.98 U		140	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L	0.027		0.01 U		0.01 U
Benzo(a)pyrene	µg/L	0.0084 JQ		0.01 U		0.01 U
Benzofluoranthenes (total)	µg/L	0.019 JQ		0.02 U		0.02 U
Chrysene	µg/L	0.022		0.01 U		0.01 U
Dibenzo(a,h)anthracene	µg/L	0.01 U		0.01 U		0.01 U
Indeno(1,2,3-cd)pyrene	µg/L	0.01 U		0.01 U		0.01 U
cPAHs (MTCA TEQ-HalfND)	µg/L	0.014 J		0.0076 U		0.0076 U
cPAHs (MTCA TEQ-ZeroND)	µg/L	0.013 J		0.01 U		0.01 U
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L	77		0.012		0.005 J
Naphthalene	µg/L	18		0.01 U		0.01 U
Acenaphthylene	µg/L	0.31		0.01 U		0.01 U
Acenaphthene	µg/L	35		0.01 U		0.005 JQ
Fluorene	µg/L	17		0.01 U		0.01 U
Phenanthrene	µg/L	6.6		0.01 U		0.01 U
Anthracene	µg/L	0.44		0.012		0.01 U
1-Methylnaphthalene	µg/L	28		0.01 U		0.0043 JQ
2-Methylnaphthalene	µg/L	22		0.01 U		0.01 U
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Total HPAH	µg/L	2.1 J		0.02 U		0.02 U
Fluoranthene	µg/L	1.3		0.01 U		0.01 U
Pyrene	µg/L	0.68		0.01 U		0.01 U
Benzo(g,h,i)perylene	µg/L	0.01 U		0.01 U		0.01 U
Other SVOCs						
Dibenzofuran	µg/L	11		0.01 U		0.01 U

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action 4th Quarter Groundwater (Floyd|Snider)				
	Location	MW-06	MW-07	MW-07	MW-08	MW-08
	Sample ID	**MW-06-GWF-120315**	**MW-07-GW-120315**	**MW-07-GWF-120315**	**MW-08-GW-120315**	**MW-08-GWF-120315**
	Date	12/03/2015	12/03/2015	12/03/2015	12/03/2015	12/03/2015
Field Measurements						
Conductivity	µS/cm		5030		4790	
ORP	mV		189		-14	
pH	pH		6.78		7.95	
Salinity	ppt		2.7		3.06	
Temperature	°C		11.67		11.35	
Turbidity	ntu		19.3		0	
Dissolved Metals						
Arsenic	µg/L	1.71 JQ		1.77 JQ		2.1 JQ
Copper	µg/L	2.59		2.45		3.85
Zinc	µg/L	4.98 U		4.98 U		4.98 U
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L		0.01 U		0.01 U	
Benzo(a)pyrene	µg/L		0.01 U		0.01 U	
Benzofluoranthenes (total)	µg/L		0.02 U		0.02 U	
Chrysene	µg/L		0.01 U		0.01 U	
Dibenzo(a,h)anthracene	µg/L		0.01 U		0.01 U	
Indeno(1,2,3-cd)pyrene	µg/L		0.01 U		0.01 U	
cPAHs (MTCA TEQ-HalfND)	µg/L		0.0076 U		0.0076 U	
cPAHs (MTCA TEQ-ZeroND)	µg/L		0.01 U		0.01 U	
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L		0.01 U		0.0031 J	
Naphthalene	µg/L		0.01 U		0.01 U	
Acenaphthylene	µg/L		0.01 U		0.01 U	
Acenaphthene	µg/L		0.01 U		0.01 U	
Fluorene	µg/L		0.01 U		0.01 U	
Phenanthrene	µg/L		0.01 U		0.0031 JQ	
Anthracene	µg/L		0.01 U		0.01 U	
1-Methylnaphthalene	µg/L		0.01 U		0.01 U	
2-Methylnaphthalene	µg/L		0.01 U		0.01 U	
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Total HPAH	µg/L		0.02 U		0.0036 J	
Fluoranthene	µg/L		0.01 U		0.0036 JQ	
Pyrene	µg/L		0.01 U		0.01 U	
Benzo(g,h,i)perylene	µg/L		0.01 U		0.01 U	
Other SVOCs						
Dibenzofuran	µg/L		0.01 U		0.01 U	

Table C.8
Chemistry Data for Groundwater Samples

	Event	Interim Action 4th Quarter Groundwater (Floyd|Snider)				
	Location	MW-09	MW-09	MW-09	MW-09	MW-11
	Sample ID	**MW-09-GW-120315**	**MW-25-GW-120315**	**MW-09-GWF-120315**	**MW-25-GWF-120315**	**MW-11-GW-120315**
	Date	12/03/2015	12/03/2015	12/03/2015	12/03/2015	12/03/2015
Field Measurements						
Conductivity	µS/cm	782				4680
ORP	mV	16				-140
pH	pH	6.24				7.09
Salinity	ppt	0.501				2.99
Temperature	°C	12.41				12.17
Turbidity	ntu	12				4.4
Dissolved Metals						
Arsenic	µg/L			15.9	16.5	
Copper	µg/L			1 U	1 U	
Zinc	µg/L			4.98 U	4.98 U	
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)						
Benz(a)anthracene	µg/L	0.01 U	0.01 U			0.012
Benzo(a)pyrene	µg/L	0.01 U	0.01 U			0.011
Benzofluoranthenes (total)	µg/L	0.02 U	0.02 U			0.024
Chrysene	µg/L	0.0038 JQ	0.005 JQ			0.023
Dibenzo(a,h)anthracene	µg/L	0.01 U	0.01 U			0.01 U
Indeno(1,2,3-cd)pyrene	µg/L	0.01 U	0.01 U			0.0035 JQ
cPAHs (MTCA TEQ-HalfND)	µg/L	0.0075 J	0.0076 J			0.016 J
cPAHs (MTCA TEQ-ZeroND)	µg/L	0.000038 J	0.00005 J			0.015 J
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)						
Total LPAH	µg/L	4.9	4.5			2
Naphthalene	µg/L	0.16	0.15			0.2
Acenaphthylene	µg/L	0.06	0.061			0.031
Acenaphthene	µg/L	2.6	2.4			1.2
Fluorene	µg/L	1.9	1.8			0.46
Phenanthrene	µg/L	0.1	0.09			0.026
Anthracene	µg/L	0.039	0.039			0.048
1-Methylnaphthalene	µg/L	35	35			0.14
2-Methylnaphthalene	µg/L	5.7	5.4			0.01
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)						
Total HPAH	µg/L	0.042 J	0.04 J			0.27 J
Fluoranthene	µg/L	0.018	0.016			0.11
Pyrene	µg/L	0.02	0.019			0.083
Benzo(g,h,i)perylene	µg/L	0.01 U	0.01 U			0.0054 JQ
Other SVOCs						
Dibenzofuran	µg/L	0.18	0.16			0.25

Table C.8
Chemistry Data for Groundwater Samples

		Event	Interim Action 4th Quarter Groundwater (Floyd|Snider)				
		Location	MW-11	MW-12	MW-12		
		Sample ID	**MW-11-GWF-120315**	**MW-12-GW-120315**	**MW-12-GWF-120315**		
		Date	12/03/2015	12/03/2015	12/03/2015		
Field Measurements							
Conductivity	µS/cm			29300			
ORP	mV			3			
pH	pH			6.47			
Salinity	ppt			18.2			
Temperature	°C			11.9			
Turbidity	ntu			8			
Dissolved Metals							
Arsenic	µg/L		5.57		2.17 JQ		
Copper	µg/L		1.39		13.1		
Zinc	µg/L		4.98 U		223		
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)							
Benz(a)anthracene	µg/L			0.01 U			
Benzo(a)pyrene	µg/L			0.01 U			
Benzofluoranthenes (total)	µg/L			0.02 U			
Chrysene	µg/L			0.01 U			
Dibenzo(a,h)anthracene	µg/L			0.01 U			
Indeno(1,2,3-cd)pyrene	µg/L			0.01 U			
cPAHs (MTCA TEQ-HalfND)	µg/L			0.0076 U			
cPAHs (MTCA TEQ-ZeroND)	µg/L			0.01 U			
Low Molecular Weight Polycyclic Aromatic Hydrocarbons (LPAHs)							
Total LPAH	µg/L			0.0078 J			
Naphthalene	µg/L			0.01 U			
Acenaphthylene	µg/L			0.01 U			
Acenaphthene	µg/L			0.01 U			
Fluorene	µg/L			0.01 U			
Phenanthrene	µg/L			0.01 U			
Anthracene	µg/L			0.0078 JQ			
1-Methylnaphthalene	µg/L			0.01 U			
2-Methylnaphthalene	µg/L			0.01 U			
Non-Carcinogenic High Molecular Weight Polycyclic Aromatic Hydrocarbons (HPAHs)							
Total HPAH	µg/L			0.02 U			
Fluoranthene	µg/L			0.01 U			
Pyrene	µg/L			0.01 U			
Benzo(g,h,i)perylene	µg/L			0.01 U			
Other SVOCs							
Dibenzofuran	µg/L			0.01 U			

Table C.11
All Geoprobe Sample Results for Groundwater

		Location	FS-07	FS-09	FS-09	FS-15	FS-17	FS-19	FS-19	FS-21	FS-21	FS-21	FS-21	FS-22	FS-22
		Field Sample ID	FS07-GW16-031611	FS09A-GW17-031511	FS09-GW17-031511	FS15-GW19-031411	FS17-GW17-031611	FS-19-GW-012913	FS-19-GWF-012913	FS-21-GW-013013	FS-21-GWF-013013	FS-79-GW-013013	FS-79-GWF-013013	FS-22-GW-013013	FS-22-GWF-013013
		Sample Date	03/16/2011	03/15/2011	03/15/2011	03/14/2011	03/16/2011	01/29/2013	01/29/2013	01/30/2013	01/30/2013	01/30/2013	01/30/2013	01/30/2013	01/30/2013
Analyte	**CAS No.**	**Units**													
Metals															
Arsenic, dissolved	7440-38-2	µg/L	47	5.8	4.9	7	3.5		3.17		1.09		1.15		1.02
Copper, dissolved	7440-50-8	µg/L	9	2.6 U	2.6 U	3.6	2.6 U		27.4		1.85		2.19		0.934
Lead, dissolved	7439-92-1	µg/L	1	0.62 U	0.62 U	0.62 U	0.62 U		13.7		0.0406		0.0697		0.154
Mercury, total	7439-97-6	µg/L						0.875		0.0031		0.00286		0.00132	
Nickel, dissolved	7440-02-0	µg/L	14	1.7 U	1.7 U	1.7 U	2.3		26.2		39.6		39.2		10
Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	83-32-9	µg/L						3.3		65		48		0.02 U	
Anthracene	120-12-7	µg/L						0.13		71		5.2		0.02 U	
Fluoranthene	206-44-0	µg/L						0.27		9.6		9.1		0.02 U	
Fluorene	86-73-7	µg/L						1.6		37		29		0.02 U	
Naphthalene	91-20-3	µg/L	2 U	1,300	1,100	1.5	2 U	0.36		240		210		0.032	
Benz(a)anthracene	56-55-3	µg/L						0.018 U		0.49		0.018 U		0.049	
Benzo(a)pyrene	50-32-8	µg/L						0.012 J		0.087		0.04		0.0096 U	
Benzo(b)fluoranthene	205-99-2	µg/L						0.02 J		0.13		0.067		0.01 U	
Benzo(k)fluoranthene	207-08-9	µg/L						0.007 U		0.12		0.063		0.007 U	
Chrysene	218-01-9	µg/L						0.043		0.42		0.29		0.0064 U	
Dibenzo(a,h)anthracene	53-70-3	µg/L						0.008 J		0.028		0.0094 J		0.0062 U	
Indeno(1,2,3-cd)pyrene	193-39-5	µg/L						0.005 U		0.012 J		0.005 U		0.005 U	
Total cPAHs TEQ (ND Half)	Total cPAHs TEF	µg/L						0.017 J		0.17 J		0.058 J		0.011	
Total Petroleum Hydrocarbons (TPHs)															
Diesel + Oil	Total TPH	µg/L	250 U	1,600	3,200	820	250 U	6,700 JM		840 JM		730 JM		250 U	

Note:

Blank cells are intentional.

Abbreviations:

CAS Chemical Abstracts Service
cPAH Carcinogenic polycyclic aromatic hydrocarbon
µg/L Micrograms per liter
ND Non-detect
TEF Toxic equivalent factor
TEQ Toxic equivalent

Qualifiers:

J Analyte was detected, given result should be considered an estimate.
JM The analyte was detected and the result should be considered an estimate due to a poor chromatographic match to the motor oil and/or diesel standards for the individual analyte results.
U Analyte was not detected at the given reporting limit.

Table 2. Summary of PRDI Groundwater Analytical Results

Project No. 210195, Harris Avenue Shipyard, Bellingham, Washington

		Location	MW-01		MW-04		MW-06		MW-09	
		Date Collected	05/03/2022	06/14/2022	05/02/2022	06/13/2022	05/03/2022	06/13/2022	05/02/2022	06/13/2022
Analyte	Unit	Site Groundwater Cleanup Levels								
PAHs										
1-Methylnaphthalene	ug/L	1.5	**56.3**	**46.6**	--	--	**0.672**	**0.03**	**0.036 J**	**0.799**
2-Methylnaphthalene	ug/L		**36.1**	**30.6**	--	--	**0.433**	**0.015**	**0.158 J**	**0.205**
Acenaphthene	ug/L		**17.3**	**11.5**	--	--	**0.56**	**0.276**	**0.145 J**	**0.745**
Acenaphthylene	ug/L		**0.345**	**0.261**	--	--	**0.025**	**0.017**	**0.079 J**	**0.073**
Anthracene	ug/L		**0.522**	**0.462**	--	--	**0.041**	**0.002 J**	**0.042 J**	**0.042**
Benzo(g,h,i)perylene	ug/L		**0.148**	**0.033**	--	--	**0.025**	0.010 U	**0.057 J**	**0.06 J**
Benzofluoranthene	ug/L		**0.738**	**0.166**	--	--	**0.097**	0.010 U	**0.231 J**	**0.248**
Carbazole	ug/L		**17.1**	**13.8**	--	--	**0.066**	**0.002 J**	**0.105 J**	**0.196**
Dibenzofuran	ug/L		**6.13**	**4.7**	--	--	**0.162**	**0.009 J**	0.01 UJ	**0.345**
Fluoranthene	ug/L		**2.83**	**0.887**	--	--	**0.237**	0.010 U	**0.454 J**	**0.618**
Fluorene	ug/L		**14.9**	**10.5**	--	--	**0.458**	**0.146**	0.01 UJ	**2.68**
Naphthalene	ug/L		**0.457**	**0.375 J**	--	--	0.01 U	0.010 U	**0.035 J**	**0.04**
Perylene	ug/L		**0.169**	**0.042**	--	--	**0.013**	0.010 U	**0.028 J**	**0.03**
Phenanthrene	ug/L		**11.3**	**5.57**	--	--	**0.338**	**0.002 J**	**0.032 J**	**0.056**
Pyrene	ug/L		**2.52**	**0.76**	--	--	**0.283**	**0.003 J**	**0.812 J**	**0.905**
Benz(a)anthracene	ug/L		**0.48**	**0.123**	--	--	**0.049**	0.010 U	**0.167 J**	**0.193**
Benzo(a)pyrene	ug/L		**0.358**	**0.084**	--	--	**0.044**	0.010 U	**0.113 J**	**0.126 J**
Benzo(b)fluoranthene	ug/L		**0.341**	**0.068**	--	--	**0.054**	0.010 U	**0.124 J**	**0.126 J**
Benzo(b,k)fluoranthene	ug/L		**0.738**	--	--	--	**0.097**	--	**0.231**	--
Benzo(j)fluoranthene	ug/L		**0.203**	**0.049**	--	--	**0.02**	0.010 U	**0.046 J**	**0.055**
Benzo(k)fluoranthene	ug/L		**0.195**	**0.049**	--	--	**0.023**	0.010 U	**0.061 J**	**0.066 J**
Chrysene	ug/L		**0.452**	**0.11**	--	--	**0.049**	0.010 U	**0.186 J**	**0.195**
Dibenzo(a,h)anthracene	ug/L		**0.049**	**0.008 J**	--	--	**0.004 J**	0.010 U	**0.011 J**	**0.013 J**
Indeno(1,2,3-cd)pyrene	ug/L		**0.144**	**0.03**	--	--	**0.019**	0.010 U	**0.048 J**	**0.049 J**
Geochemical Indicators for Natural Attenuation										
Alkalinity, Total	mg/L		**329**	**330**	**501**	**520**	**152**	**170**	**147**	**180**
Nitrate as Nitrogen	mg/L		0.01 U	0.010 U	**2.4**	**3.9**	**0.218**	**0.136**	0.01 U	0.010 U
Sulfate	mg/L		**4.22**	**5.19**	**79.8**	**104**	**15.1**	**13.2**	**3.42**	**3.68**
Dissolved Iron	ug/L		**11100**	**12800**	**21.4 J**	**25.3 J**	**1820**	**96.6**	**1760**	**1510**
Dissolved Manganese	ug/L		**2600**	**3450**	**10.9**	**29.6**	**198**	**75.1**	**493**	**503**

Table 2. Summary of PRDI Groundwater Analytical Results

Project No. 210195, Harris Avenue Shipyard, Bellingham, Washington

		Location	MW-01		MW-04		MW-06		MW-09	
		Date Collected	05/03/2022	06/14/2022	05/02/2022	06/13/2022	05/03/2022	06/13/2022	05/02/2022	06/13/2022
Analyte	Unit	Site Groundwater Cleanup Levels								
Groundwater Field Parameters										
Dissolved Oxygen	mg/L		**1.37**	**1.01**	--	**0.42**	**6.65**	**6.66**	**25.7**	**2.66**
Oxidation Reduction Potential	mV		**-110.7**	**-252**	--	**-223**	**-1.2**	**-125**	**-98**	**-261**
Temperature	deg C		**11.3**	**13.7**	--	**14.3**	**11.9**	**13.7**	**11.4**	**13.4**
Specific Conductance	uS/cm		**635.5**	**879**	--	**1435**	**334.3**	**403**	**395.4**	**435.9**
pH	pH units		**7.13**	**6.87**	--	**6.78**	**7.51**	**7.17**	**6.66**	**7.28**
Turbidity	NTU		**9.1**	**4.17**	--	**1.31**	**57.9**	**2.08**	**7.85**	**4.26**

Notes:

Bold - detected

Blue Shaded - Detected result or non-detected RL exceeded screening level

FD - field duplicate sample.

U - Analyte not detected at or above Reporting Limit (RL) shown

J - Result value estimated

"--" - indicates results not available

mg/L = milligram per liter

µg/L = microgram per liter

mV = millivolts

µS/cm = microSiemens per centimeter

deg C = degrees Celsius

NTU = Nephelometric Turbidity Units

APPENDIX B

Analytical Soil Data for Disposal Profiling

Soil Analytical Data from Pre-Remedial Design Investigation (2022)

Analytical Resources, LLC
Analytical Chemists and Consultants

22 August 2022

Jennifer Marsalla
Anchor QEA, LLC
1201 3rd Ave, Suite 2600
Seattle, WA 98101

RE: Harris Avenue Shipyard

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
22G0330	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC



Shelly Fishel, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006-012

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 22G0330	Turn-around Requested: Standard	Page: 1 of 1	
ARI Client Company: Anchor QEA	Phone: 206-287-9130	Date: 7/21/2022	Ice Present?
Client Contact: Matt Waltman		No. of Coolers: 1	Cooler Temps: 6.0°C
Client Project Name: HARRIS AVENUE SHIPYARD			
Client Project #:	Samplers: JANE GREGORY STEVE GERMAT (ASPECT)		

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: RCRA 8 METALS	NWTPH-DX	SVOCs (8270)	PCB AROCLORS					Notes/Comments
CUTTINGS COMPOSITE	7/21/22	11:15	SOIL	3	X	X	X	X					

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Steve Germat	Printed Name: Matthew Bates	Printed Name:	Printed Name:
	Company: Aspect Consulting	Company: ARLLC	Company:	Company:
	Date & Time: 7/22/22 9:29	Date & Time: 7/22/22 0929	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Cuttings Composite	22G0330-01	Solid	21-Jul-2022 11:15	22-Jul-2022 09:31

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Work Order Case Narrative

Client: Anchor QEA, LLC
Project: Harris Avenue Shipyard
Work Order: 22G0330

Revised Report - August 22, 2022

This report was revised to include full list SVOCs by 8270E instead of PAH compounds due to lab error.

Sample receipt

One sample as listed on the preceding page was received 22-Jul-2022 09:31 under ARI work order 22G0330. For details regarding sample receipt, please refer to the Cooler Receipt Form.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except surrogates listed below and Aroclor 1260 which was out of control low in SKH0121-CCV2 on column zb-35 but passes on column zb-5.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except as follows. Tetrachlorometaxylene was out of control high in SKH0121-ICV2, SKH0121-CCV2, SKH0121-CCV4 and SKH0121-CCV6 on column zb-5 but pass on column zb-5. Decachlorobiphenyl was out of control low in SKH0121-CCV3 on column zb-35 but passes on column zb-5.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except as follows. Isophorone and 2,6-Dinitrotoluene which were out of control low and 2,4-Dinitrophenol, 2-Chlorophenol, 2-Nitroaniline, 4-Bromophenyl phenyl ether and surrogate Phenol-d5 which were out of control high in the initial calibration verification. All samples which contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except Phenol-d5 which was out of control high in the initial

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

calibration verification and has been "Q" qualified.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

TCLP Metals

The sample(s) were leached, digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank was clean at the reporting limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Anchor QEA Project Name: Harris Ave Shipyard

COC No(s): _____ NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 22G0330 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 0931 6.0°C

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: THEom03

Cooler Accepted by: Mathew Bates Date: 7-22-2022 Time: 0931

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____			
Was sufficient ice used (if appropriate)?	NA	YES	NO
How were bottles sealed in plastic bags?	Individually	Grouped	Not
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ...	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA	_____	

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: HN Date: 07/22/22 Time: 10:11 Labels checked by: _____

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Cuttings Composite

22G0330-01 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 07/21/2022 11:15

Instrument: NT10 Analyst: VTS — Analyzed: 08/09/2022 13:31

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 22G0330-01 B 03
	Preparation Batch: BKG0573	Sample Size: 11.37 g (wet)	Dry Weight:10.07 g
	Prepared: 07/28/2022	Final Volume: 1 mL	% Solids: 88.53
Sample Cleanup:	Cleanup Method: GPC		Extract ID:22G0330-01 B 03
	Cleanup Batch: CKH0035	Initial Volume: 1 uL	
	Cleaned: 03-Aug-2022	Final Volume: 1 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	4.4	19.9	6.7	ug/kg	J
bis(2-chloroethyl) ether	111-44-4	1	19.2	49.7	ND	ug/kg	U
2-Chlorophenol	95-57-8	1	13.8	19.9	ND	ug/kg	U
1,3-Dichlorobenzene	541-73-1	1	3.1	19.9	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	3.1	19.9	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.4	19.9	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	16.2	19.9	ND	ug/kg	U
2,2'-Oxybis(1-chloropropane)	108-60-1	1	3.3	19.9	ND	ug/kg	U
2-Methylphenol	95-48-7	1	6.6	19.9	ND	ug/kg	U
Hexachloroethane	67-72-1	1	3.4	19.9	ND	ug/kg	U
N-Nitroso-di-n-Propylamine	621-64-7	1	7.4	19.9	ND	ug/kg	U
4-Methylphenol	106-44-5	1	7.3	19.9	ND	ug/kg	U
Nitrobenzene	98-95-3	1	7.2	19.9	ND	ug/kg	U
Isophorone	78-59-1	1	3.9	19.9	ND	ug/kg	U
2-Nitrophenol	88-75-5	1	4.8	19.9	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	3.8	99.3	ND	ug/kg	U
Bis(2-Chloroethoxy)methane	111-91-1	1	4.3	19.9	ND	ug/kg	U
2,4-Dichlorophenol	120-83-2	1	15.2	99.3	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	3.5	19.9	ND	ug/kg	U
Naphthalene	91-20-3	1	4.2	19.9	55.8	ug/kg	
Benzoic acid	65-85-0	1	38.8	199	ND	ug/kg	U
4-Chloroaniline	106-47-8	1	8.3	99.3	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	4.8	19.9	ND	ug/kg	U
4-Chloro-3-Methylphenol	59-50-7	1	12.3	99.3	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	4.5	19.9	38.0	ug/kg	
Hexachlorocyclopentadiene	77-47-4	1	24.3	99.3	ND	ug/kg	U
2,4,6-Trichlorophenol	88-06-2	1	8.9	99.3	ND	ug/kg	U
2,4,5-Trichlorophenol	95-95-4	1	25.6	99.3	ND	ug/kg	U
2-Chloronaphthalene	91-58-7	1	7.9	19.9	ND	ug/kg	U
2-Nitroaniline	88-74-4	1	16.3	99.3	ND	ug/kg	U
Acenaphthylene	208-96-8	1	6.2	19.9	ND	ug/kg	U

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Cuttings Composite

22G0330-01 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 07/21/2022 11:15

Instrument: NT10 Analyst: VTS — Analyzed: 08/09/2022 13:31

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dimethylphthalate	131-11-3	1	4.4	19.9	ND	ug/kg	U
2,6-Dinitrotoluene	606-20-2	1	20.3	99.3	ND	ug/kg	U
Acenaphthene	83-32-9	1	5.2	19.9	229	ug/kg	
3-Nitroaniline	99-09-2	1	22.1	99.3	ND	ug/kg	U
2,4-Dinitrophenol	51-28-5	1	33.6	199	ND	ug/kg	U
Dibenzofuran	132-64-9	1	14.0	19.9	177	ug/kg	
4-Nitrophenol	100-02-7	1	32.4	99.3	ND	ug/kg	U
2,4-Dinitrotoluene	121-14-2	1	16.1	99.3	ND	ug/kg	U
Fluorene	86-73-7	1	14.5	19.9	260	ug/kg	
4-Chlorophenylphenyl ether	7005-72-3	1	19.0	49.7	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	19.6	49.7	ND	ug/kg	U
4-Nitroaniline	100-01-6	1	29.2	99.3	ND	ug/kg	U
4,6-Dinitro-2-methylphenol	534-52-1	1	37.7	199	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	5.3	19.9	ND	ug/kg	U
4-Bromophenyl phenyl ether	101-55-3	1	16.9	19.9	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	13.4	19.9	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	31.0	99.3	ND	ug/kg	U
Phenanthrene	85-01-8	1	8.7	19.9	965	ug/kg	
Anthracene	120-12-7	1	7.1	19.9	81.1	ug/kg	
Carbazole	86-74-8	1	4.3	19.9	19.8	ug/kg	J
Di-n-Butylphthalate	84-74-2	1	5.6	19.9	ND	ug/kg	U
Fluoranthene	206-44-0	1	6.1	19.9	688	ug/kg	
Pyrene	129-00-0	1	5.6	19.9	447	ug/kg	
Butylbenzylphthalate	85-68-7	1	9.3	19.9	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	5.9	19.9	146	ug/kg	
3,3'-Dichlorobenzidine	91-94-1	1	7.0	99.3	ND	ug/kg	U
Chrysene	218-01-9	1	6.0	19.9	96.2	ug/kg	
bis(2-Ethylhexyl)phthalate	117-81-7	1	5.4	49.7	49.3	ug/kg	J
Di-n-Octylphthalate	117-84-0	1	4.4	19.9	ND	ug/kg	U
Benzofluoranthenes, Total		1	9.9	39.7	150	ug/kg	
Benzo(a)pyrene	50-32-8	1	4.2	19.9	68.7	ug/kg	
Indeno(1,2,3-cd)pyrene	193-39-5	1	14.6	19.9	31.4	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	17.1	19.9	ND	ug/kg	U
Benzo(g,h,i)perylene	191-24-2	1	13.5	19.9	35.1	ug/kg	
1-Methylnaphthalene	90-12-0	1	5.2	19.9	39.6	ug/kg	
Surrogate: 2-Fluorophenol				*27-120 %*	*57.5*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*59.0*	*%*	Q

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Cuttings Composite

22G0330-01 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 07/21/2022 11:15

Instrument: NT10 Analyst: VTS — Analyzed: 08/09/2022 13:31

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: 2-Chlorophenol-d4		*31-120 %*	*73.9*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4		*32-120 %*	*65.9*	*%*	
Surrogate: Nitrobenzene-d5		*30-120 %*	*82.5*	*%*	
Surrogate: 2-Fluorobiphenyl		*35-120 %*	*88.3*	*%*	
Surrogate: 2,4,6-Tribromophenol		*24-134 %*	*93.1*	*%*	
Surrogate: p-Terphenyl-d14		*37-120 %*	*83.9*	*%*	

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Cuttings Composite

22G0330-01 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx — Sampled: 07/21/2022 11:15
Instrument: FID4 Analyst: CTO — Analyzed: 07/29/2022 22:46

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 22G0330-01 B 02
Preparation Batch: BKG0572 — Sample Size: 10.01 g (wet) — Dry Weight:8.86 g
Prepared: 07/25/2022 — Final Volume: 1 mL — % Solids: 88.53

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.64	43.0	mg/kg	
HC ID: DIESEL						
Motor Oil Range Organics (C24-C38)	RRO	1	11.3	40.3	mg/kg	
HC ID: MOTOR OIL						
Surrogate: o-Terphenyl			*50-150 %*	*88.0*	*%*	

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Cuttings Composite

22G0330-01 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 07/21/2022 11:15
Instrument: ECD7 Analyst: JGR — Analyzed: 08/09/2022 15:18

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 22G0330-01 B 03
Preparation Batch: BKG0570 — Sample Size: 5.66 g (wet) — Dry Weight:5.01 g
Prepared: 07/28/2022 — Final Volume: 5 mL — % Solids: 88.53

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	8.0	20.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	8.0	20.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	8.0	20.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	8.0	20.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	8.0	20.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	8.0	20.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	9.3	20.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	9.3	20.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	9.3	20.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-133 %*	*89.2*	*%*	
Surrogate: Tetrachlorometaxylene				*53-120 %*	*67.2*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-133 %*	*77.6*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*53-120 %*	*80.3*	*%*	

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Cuttings Composite

22G0330-01 (Solid)

TCLP Metals and Metallic Compounds

Method: EPA 6010D — Sampled: 07/21/2022 11:15

Instrument: ICP2 Analyst: MVP — Analyzed: 08/04/2022 18:29

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: LEN Digestion of EPA 1311 Elutriate — Extract ID: 22G0330-01 A 01

Preparation Batch: BKH0096 — Sample Size: 25 mL (wet)

Prepared: 08/04/2022 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	5	0.0140	0.250	ND	mg/L	U
Barium	7440-39-3	5	0.0075	0.0150	0.280	mg/L	
Cadmium	7440-43-9	5	0.0006	0.0100	0.0054	mg/L	J
Chromium	7440-47-3	5	0.0024	0.0250	0.0203	mg/L	J
Lead	7439-92-1	5	0.0065	0.100	0.0246	mg/L	J
Selenium	7782-49-2	5	0.0408	0.250	0.172	mg/L	J
Silver	7440-22-4	5	0.0022	0.0150	ND	mg/L	U

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Cuttings Composite

22G0330-01 (Solid)

TCLP Metals and Metallic Compounds

Method: EPA 7470A — Sampled: 07/21/2022 11:15

Instrument: HYDRA Analyst: SKD — Analyzed: 08/11/2022 16:52

Analysis by: Analytical Resources, LLC

Sample Preparation: Preparation Method: LEM 7470A Digestion of EPA 1311 Elutriate for Hg — Extract ID: 22G0330-01 A 03

Preparation Batch: BKH0097 — Sample Size: 20 mL (wet)

Prepared: 08/04/2022 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.000007	0.000100	0.000009	mg/L	J

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BKG0573 - EPA 3546 (Microwave)

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKG0573-BLK1)	Prepared: 28-Jul-2022 Analyzed: 09-Aug-2022 12:12										
Phenol	ND	4.4	20.0	ug/kg							U
bis(2-chloroethyl) ether	ND	19.3	50.0	ug/kg							U
2-Chlorophenol	ND	13.9	20.0	ug/kg							U
1,3-Dichlorobenzene	ND	3.1	20.0	ug/kg							U
1,4-Dichlorobenzene	ND	3.1	20.0	ug/kg							U
1,2-Dichlorobenzene	ND	2.4	20.0	ug/kg							U
Benzyl Alcohol	ND	16.3	20.0	ug/kg							U
2,2'-Oxybis(1-chloropropane)	ND	3.4	20.0	ug/kg							U
2-Methylphenol	ND	6.7	20.0	ug/kg							U
Hexachloroethane	ND	3.5	20.0	ug/kg							U
N-Nitroso-di-n-Propylamine	ND	7.5	20.0	ug/kg							U
4-Methylphenol	ND	7.4	20.0	ug/kg							U
Nitrobenzene	ND	7.2	20.0	ug/kg							U
Isophorone	ND	3.9	20.0	ug/kg							U
2-Nitrophenol	ND	4.9	20.0	ug/kg							U
2,4-Dimethylphenol	ND	3.8	100	ug/kg							U
Bis(2-Chloroethoxy)methane	ND	4.3	20.0	ug/kg							U
2,4-Dichlorophenol	ND	15.3	100	ug/kg							U
1,2,4-Trichlorobenzene	ND	3.6	20.0	ug/kg							U
Naphthalene	ND	4.2	20.0	ug/kg							U
Benzoic acid	ND	39.0	200	ug/kg							U
4-Chloroaniline	ND	8.4	100	ug/kg							U
Hexachlorobutadiene	ND	4.8	20.0	ug/kg							U
4-Chloro-3-Methylphenol	ND	12.4	100	ug/kg							U
2-Methylnaphthalene	ND	4.5	20.0	ug/kg							U
Hexachlorocyclopentadiene	ND	24.5	100	ug/kg							U
2,4,6-Trichlorophenol	ND	9.0	100	ug/kg							U
2,4,5-Trichlorophenol	ND	25.8	100	ug/kg							U
2-Chloronaphthalene	ND	8.0	20.0	ug/kg							U
2-Nitroaniline	ND	16.4	100	ug/kg							U
Acenaphthylene	ND	6.2	20.0	ug/kg							U
Dimethylphthalate	ND	4.4	20.0	ug/kg							U
2,6-Dinitrotoluene	ND	20.5	100	ug/kg							U
Acenaphthene	ND	5.2	20.0	ug/kg							U
3-Nitroaniline	ND	22.3	100	ug/kg							U

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BKG0573 - EPA 3546 (Microwave)

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKG0573-BLK1)				Prepared: 28-Jul-2022 Analyzed: 09-Aug-2022 12:12							
2,4-Dinitrophenol	ND	33.8	200	ug/kg							U
Dibenzofuran	ND	14.1	20.0	ug/kg							U
4-Nitrophenol	ND	32.6	100	ug/kg							U
2,4-Dinitrotoluene	ND	16.2	100	ug/kg							U
Fluorene	ND	14.6	20.0	ug/kg							U
4-Chlorophenylphenyl ether	ND	19.2	50.0	ug/kg							U
Diethyl phthalate	ND	19.7	50.0	ug/kg							U
4-Nitroaniline	ND	29.4	100	ug/kg							U
4,6-Dinitro-2-methylphenol	ND	38.0	200	ug/kg							U
N-Nitrosodiphenylamine	ND	5.3	20.0	ug/kg							U
4-Bromophenyl phenyl ether	ND	17.0	20.0	ug/kg							U
Hexachlorobenzene	ND	13.5	20.0	ug/kg							U
Pentachlorophenol	ND	31.3	100	ug/kg							U
Phenanthrene	ND	8.7	20.0	ug/kg							U
Anthracene	ND	7.2	20.0	ug/kg							U
Carbazole	ND	4.3	20.0	ug/kg							U
Di-n-Butylphthalate	ND	5.6	20.0	ug/kg							U
Fluoranthene	ND	6.1	20.0	ug/kg							U
Pyrene	ND	5.7	20.0	ug/kg							U
Butylbenzylphthalate	ND	9.4	20.0	ug/kg							U
Benzo(a)anthracene	ND	6.0	20.0	ug/kg							U
3,3'-Dichlorobenzidine	ND	7.1	100	ug/kg							U
Chrysene	ND	6.1	20.0	ug/kg							U
bis(2-Ethylhexyl)phthalate	ND	5.5	50.0	ug/kg							U
Di-n-Octylphthalate	ND	4.4	20.0	ug/kg							U
Benzofluoranthenes, Total	ND	10.0	40.0	ug/kg							U
Benzo(a)pyrene	ND	4.2	20.0	ug/kg							U
Indeno(1,2,3-cd)pyrene	ND	14.7	20.0	ug/kg							U
Dibenzo(a,h)anthracene	ND	17.2	20.0	ug/kg							U
Benzo(g,h,i)perylene	ND	13.6	20.0	ug/kg							U
1-Methylnaphthalene	ND	5.3	20.0	ug/kg							U
Surrogate: 2-Fluorophenol	371			ug/kg	*750*		*49.5*	*27-120*			
Surrogate: Phenol-d5	351			ug/kg	*750*		*46.8*	*29-120*			*Q*
Surrogate: 2-Chlorophenol-d4	465			ug/kg	*750*		*62.0*	*31-120*			

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BKG0573 - EPA 3546 (Microwave)

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKG0573-BLK1)				Prepared: 28-Jul-2022 Analyzed: 09-Aug-2022 12:12							
Surrogate: 1,2-Dichlorobenzene-d4	286			ug/kg	*500*		*57.2*	*32-120*			
Surrogate: Nitrobenzene-d5	361			ug/kg	*500*		*72.2*	*30-120*			
Surrogate: 2-Fluorobiphenyl	357			ug/kg	*500*		*71.4*	*35-120*			
Surrogate: 2,4,6-Tribromophenol	586			ug/kg	*750*		*78.1*	*24-134*			
Surrogate: p-Terphenyl-d14	374			ug/kg	*500*		*74.9*	*37-120*			
LCS (BKG0573-BS1)				Prepared: 28-Jul-2022 Analyzed: 09-Aug-2022 12:52							
Phenol	354	4.4	20.0	ug/kg	500		70.8	34-120			
bis(2-chloroethyl) ether	372	19.3	50.0	ug/kg	500		74.5	36-120			
2-Chlorophenol	390	13.9	20.0	ug/kg	500		78.1	39-120			Q
1,3-Dichlorobenzene	308	3.1	20.0	ug/kg	500		61.5	40-120			
1,4-Dichlorobenzene	271	3.1	20.0	ug/kg	500		54.1	39-120			
1,2-Dichlorobenzene	327	2.4	20.0	ug/kg	500		65.3	40-120			
Benzyl Alcohol	368	16.3	20.0	ug/kg	500		73.5	19-120			
2,2'-Oxybis(1-chloropropane)	332	3.4	20.0	ug/kg	500		66.4	32-120			
2-Methylphenol	367	6.7	20.0	ug/kg	500		73.4	28-120			
Hexachloroethane	341	3.5	20.0	ug/kg	500		68.1	38-120			
N-Nitroso-di-n-Propylamine	377	7.5	20.0	ug/kg	500		75.3	34-120			
4-Methylphenol	359	7.4	20.0	ug/kg	500		71.8	29-120			
Nitrobenzene	405	7.2	20.0	ug/kg	500		81.0	36-120			
Isophorone	343	3.9	20.0	ug/kg	500		68.6	37-120			Q
2-Nitrophenol	416	4.9	20.0	ug/kg	500		83.2	30-120			
2,4-Dimethylphenol	974	3.8	100	ug/kg	1300		74.9	10-120			
Bis(2-Chloroethoxy)methane	419	4.3	20.0	ug/kg	500		83.7	39-120			
2,4-Dichlorophenol	797	15.3	100	ug/kg	1300		61.3	28-120			
1,2,4-Trichlorobenzene	330	3.6	20.0	ug/kg	500		65.9	35-120			
Naphthalene	346	4.2	20.0	ug/kg	500		69.1	43-120			
Benzoic acid	2080	39.0	200	ug/kg	2300		90.3	10-120			
4-Chloroaniline	839	8.4	100	ug/kg	1300		64.6	11-120			
Hexachlorobutadiene	345	4.8	20.0	ug/kg	500		69.0	37-120			
4-Chloro-3-Methylphenol	1240	12.4	100	ug/kg	1300		95.4	32-120			
2-Methylnaphthalene	362	4.5	20.0	ug/kg	500		72.4	43-120			
Hexachlorocyclopentadiene	889	24.5	100	ug/kg	1300		68.4	10-120			
2,4,6-Trichlorophenol	1320	9.0	100	ug/kg	1300		102	44.6-132			
2,4,5-Trichlorophenol	1180	25.8	100	ug/kg	1300		90.8	51.5-129			

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BKG0573 - EPA 3546 (Microwave)

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BKG0573-BS1)					Prepared: 28-Jul-2022 Analyzed: 09-Aug-2022 12:52						
2-Chloronaphthalene	371	8.0	20.0	ug/kg	500		74.2	40-120			
2-Nitroaniline	1590	16.4	100	ug/kg	1300		122	40-152			Q
Acenaphthylene	370	6.2	20.0	ug/kg	500		74.0	42-120			
Dimethylphthalate	376	4.4	20.0	ug/kg	500		75.2	43-120			
2,6-Dinitrotoluene	812	20.5	100	ug/kg	1300		62.5	31-156			Q
Acenaphthene	358	5.2	20.0	ug/kg	500		71.6	45-120			
3-Nitroaniline	1070	22.3	100	ug/kg	1300		82.4	22-120			
2,4-Dinitrophenol	2440	33.8	200	ug/kg	2300		106	10-120			Q
Dibenzofuran	388	14.1	20.0	ug/kg	500		77.7	43-120			
4-Nitrophenol	1130	32.6	100	ug/kg	1300		86.9	15-138			
2,4-Dinitrotoluene	1270	16.2	100	ug/kg	1300		97.7	44-150			
Fluorene	344	14.6	20.0	ug/kg	500		68.9	45-120			
4-Chlorophenylphenyl ether	390	19.2	50.0	ug/kg	500		78.0	36-141			
Diethyl phthalate	443	19.7	50.0	ug/kg	500		88.6	50-120			
4-Nitroaniline	1190	29.4	100	ug/kg	1300		91.6	24-168			
4,6-Dinitro-2-methylphenol	2710	38.0	200	ug/kg	2300		118	33-144			
N-Nitrosodiphenylamine	350	5.3	20.0	ug/kg	500		70.0	70-154			
4-Bromophenyl phenyl ether	496	17.0	20.0	ug/kg	500		99.1	39-120			Q
Hexachlorobenzene	462	13.5	20.0	ug/kg	500		92.3	33-120			
Pentachlorophenol	1190	31.3	100	ug/kg	1300		91.7	16-120			
Phenanthrene	380	8.7	20.0	ug/kg	500		76.0	49-120			
Anthracene	361	7.2	20.0	ug/kg	500		72.2	45-120			
Carbazole	420	4.3	20.0	ug/kg	500		84.1	43-135			
Di-n-Butylphthalate	385	5.6	20.0	ug/kg	500		77.1	48-126			
Fluoranthene	383	6.1	20.0	ug/kg	500		76.5	53-145			
Pyrene	363	5.7	20.0	ug/kg	500		72.6	52-134			
Butylbenzylphthalate	388	9.4	20.0	ug/kg	500		77.6	45-132			
Benzo(a)anthracene	372	6.0	20.0	ug/kg	500		74.4	49-120			
3,3'-Dichlorobenzidine	268	7.1	100	ug/kg	1300		20.6	10-120			
Chrysene	349	6.1	20.0	ug/kg	500		69.7	47-120			
bis(2-Ethylhexyl)phthalate	409	5.5	50.0	ug/kg	500		81.7	34-130			
Di-n-Octylphthalate	417	4.4	20.0	ug/kg	500		83.5	28-124			
Benzofluoranthenes, Total	743	10.0	40.0	ug/kg	1000		74.3	30-160			
Benzo(a)pyrene	353	4.2	20.0	ug/kg	500		70.6	42-120			
Indeno(1,2,3-cd)pyrene	384	14.7	20.0	ug/kg	500		76.8	42-163			

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BKG0573 - EPA 3546 (Microwave)

Instrument: NT10 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BKG0573-BS1)				Prepared: 28-Jul-2022 Analyzed: 09-Aug-2022 12:52							
Dibenzo(a,h)anthracene	370	17.2	20.0	ug/kg	500		74.0	30-133			
Benzo(g,h,i)perylene	386	13.6	20.0	ug/kg	500		77.3	46-148			
1-Methylnaphthalene	367	5.3	20.0	ug/kg	500		73.4	42-120			
Surrogate: 2-Fluorophenol	550			ug/kg	*750*		*73.4*	*27-120*			
Surrogate: Phenol-d5	586			ug/kg	*750*		*78.2*	*29-120*			*Q*
Surrogate: 2-Chlorophenol-d4	632			ug/kg	*750*		*84.2*	*31-120*			
Surrogate: 1,2-Dichlorobenzene-d4	361			ug/kg	*500*		*72.1*	*32-120*			
Surrogate: Nitrobenzene-d5	454			ug/kg	*500*		*90.9*	*30-120*			
Surrogate: 2-Fluorobiphenyl	424			ug/kg	*500*		*84.7*	*35-120*			
Surrogate: 2,4,6-Tribromophenol	735			ug/kg	*750*		*98.0*	*24-134*			
Surrogate: p-Terphenyl-d14	439			ug/kg	*500*		*87.8*	*37-120*			

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Analysis by: Analytical Resources, LLC

Petroleum Hydrocarbons - Quality Control

Batch BKG0572 - EPA 3546 (Microwave)

Instrument: FID4 Analyst: CTO

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKG0572-BLK1)				Prepared: 28-Jul-2022 Analyzed: 29-Jul-2022 22:05						
Diesel Range Organics (C12-C24)	ND	5.00	mg/kg							U
Motor Oil Range Organics (C24-C38)	ND	10.0	mg/kg							U
Surrogate: o-Terphenyl	10.5		mg/kg	*11.3*		*93.1*	*50-150*			
LCS (BKG0572-BS1)				Prepared: 28-Jul-2022 Analyzed: 29-Jul-2022 22:26						
Diesel Range Organics (C12-C24)	119	5.00	mg/kg	150		79.3	63-120			
Surrogate: o-Terphenyl	9.68		mg/kg	*11.3*		*86.0*	*50-150*			

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BKG0570 - EPA 3546 (Microwave)

Instrument: ECD7 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKG0570-BLK1)				Prepared: 28-Jul-2022 Analyzed: 09-Aug-2022 14:36							
Aroclor 1016	ND	8.0	20.0	ug/kg							U
Aroclor 1221	ND	8.0	20.0	ug/kg							U
Aroclor 1232	ND	8.0	20.0	ug/kg							U
Aroclor 1242	ND	8.0	20.0	ug/kg							U
Aroclor 1248	ND	8.0	20.0	ug/kg							U
Aroclor 1254	ND	8.0	20.0	ug/kg							U
Aroclor 1260	ND	9.3	20.0	ug/kg							U
Aroclor 1262	ND	9.3	20.0	ug/kg							U
Aroclor 1268	ND	9.3	20.0	ug/kg							U
Surrogate: Decachlorobiphenyl	36.6			ug/kg	*40.0*		*91.4*	*40-133*			
Surrogate: Tetrachlorometaxylene	35.0			ug/kg	*40.0*		*87.5*	*53-120*			
Surrogate: Decachlorobiphenyl [2C]	37.3			ug/kg	*40.0*		*93.2*	*40-133*			
Surrogate: Tetrachlorometaxylene [2C]	34.0			ug/kg	*40.0*		*85.0*	*53-120*			
LCS (BKG0570-BS1)				Prepared: 28-Jul-2022 Analyzed: 09-Aug-2022 14:57							
Aroclor 1016 [2C]	414	8.0	20.0	ug/kg	500		82.8	52-120			
Aroclor 1260	399	9.3	20.0	ug/kg	500		79.7	57-120			
Surrogate: Decachlorobiphenyl	39.2			ug/kg	*40.0*		*98.0*	*40-133*			
Surrogate: Tetrachlorometaxylene	37.3			ug/kg	*40.0*		*93.1*	*53-120*			
Surrogate: Decachlorobiphenyl [2C]	40.4			ug/kg	*40.0*		*101*	*40-133*			
Surrogate: Tetrachlorometaxylene [2C]	35.7			ug/kg	*40.0*		*89.2*	*53-120*			

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Analysis by: Analytical Resources, LLC

TCLP Metals and Metallic Compounds - Quality Control

Batch BKH0096 - LEN Digestion of EPA 1311 Elutriate

Instrument: ICP2 Analyst: MVP

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKH0096-BLK1)				Prepared: 04-Aug-2022 Analyzed: 04-Aug-2022 17:50							
Arsenic	ND	0.0140	0.250	mg/L							U
Barium	0.0113	0.0075	0.0150	mg/L							J
Chromium	0.0062	0.0024	0.0250	mg/L							J
Lead	0.0098	0.0065	0.100	mg/L							J
Selenium	ND	0.0408	0.250	mg/L							U
Silver	ND	0.0022	0.0150	mg/L							U
Blank (BKH0096-BLK2)				Prepared: 04-Aug-2022 Analyzed: 08-Aug-2022 17:31							
Cadmium	ND	0.0006	0.0100	mg/L							U
Chromium	ND	0.0024	0.0250	mg/L							U
Duplicate (BKH0096-DUP1)		**Source: 22G0330-01**		Prepared: 04-Aug-2022 Analyzed: 04-Aug-2022 18:26							
Arsenic	ND	0.0140	0.250	mg/L		ND					U
Barium	0.270	0.0075	0.0150	mg/L		0.280			3.72	20	
Lead	0.0383	0.0065	0.100	mg/L		0.0246			43.40	20	L, J
Selenium	0.115	0.0408	0.250	mg/L		0.172			39.30	20	L, J
Silver	ND	0.0022	0.0150	mg/L		ND					U
Duplicate (BKH0096-DUP2)		**Source: 22G0330-01**		Prepared: 04-Aug-2022 Analyzed: 08-Aug-2022 17:44							
Cadmium	0.0023	0.0006	0.0100	mg/L		0.0054			79.60	20	L, J
Chromium	0.0292	0.0024	0.0250	mg/L		0.0203			35.80	20	L
Matrix Spike (BKH0096-MS1)		**Source: 22G0330-01**		Prepared: 04-Aug-2022 Analyzed: 04-Aug-2022 18:32							
Arsenic	4.58	0.0140	0.250	mg/L	4.00	ND	114	75-125			
Barium	4.78	0.0075	0.0150	mg/L	4.00	0.280	112	75-125			
Lead	4.44	0.0065	0.100	mg/L	4.00	0.0246	110	75-125			
Selenium	4.77	0.0408	0.250	mg/L	4.00	0.172	115	75-125			
Silver	1.09	0.0022	0.0150	mg/L	1.00	ND	109	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BKH0096-MS2)		**Source: 22G0330-01**		Prepared: 04-Aug-2022 Analyzed: 08-Aug-2022 17:50							
Cadmium	1.13	0.0006	0.0100	mg/L	1.00	0.0054	113	75-125			
Chromium	1.03	0.0024	0.0250	mg/L	1.00	0.0203	101	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Analysis by: Analytical Resources, LLC

TCLP Metals and Metallic Compounds - Quality Control

Batch BKH0097 - LEM 7470A Digestion of EPA 1311 Elutriate for Hg

Instrument: HYDRA Analyst: SKD

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKH0097-BLK1)				Prepared: 04-Aug-2022 Analyzed: 11-Aug-2022 16:47							
Mercury	0.000009	0.000007	0.000100	mg/L							J
Duplicate (BKH0097-DUP1)		**Source: 22G0330-01**		Prepared: 04-Aug-2022 Analyzed: 11-Aug-2022 16:59							
Mercury	0.000007	0.000007	0.000100	mg/L		0.000009			20.90	20	L, J
Matrix Spike (BKH0097-MS1)		**Source: 22G0330-01**		Prepared: 04-Aug-2022 Analyzed: 11-Aug-2022 17:01							
Mercury	0.000867	0.000007	0.000100	mg/L	0.00100	0.000009	85.8	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Certified Analyses included in this Report

Analyte	Certifications
EPA 6010D in Solid	
Silver	NELAP,WADOE,DoD-ELAP
Arsenic	NELAP,WADOE
Barium	NELAP,WADOE
Cadmium	NELAP,WADOE,DoD-ELAP
Chromium	NELAP,WADOE,DoD-ELAP
Lead	NELAP,WADOE,DoD-ELAP
Selenium	NELAP,WADOE,DoD-ELAP
EPA 7470A in Solid	
Mercury	WADOE,NELAP,DoD-ELAP
EPA 8082A in Solid	
Aroclor 1016	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
EPA 8270E in Solid	
Phenol	DoD-ELAP,NELAP,WADOE
bis(2-chloroethyl) ether	DoD-ELAP,NELAP,WADOE
2-Chlorophenol	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,NELAP,WADOE

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

1,2-Dichlorobenzene	DoD-ELAP,NELAP,WADOE
Benzyl Alcohol	DoD-ELAP,NELAP,WADOE
2,2'-Oxybis(1-chloropropane)	DoD-ELAP,NELAP
2-Methylphenol	DoD-ELAP,NELAP,WADOE
Hexachloroethane	DoD-ELAP,NELAP,WADOE
N-Nitroso-di-n-Propylamine	DoD-ELAP,NELAP,WADOE
4-Methylphenol	DoD-ELAP,NELAP,WADOE
Nitrobenzene	DoD-ELAP,NELAP,WADOE
Isophorone	DoD-ELAP,NELAP,WADOE
2-Nitrophenol	DoD-ELAP,NELAP,WADOE
2,4-Dimethylphenol	DoD-ELAP,NELAP,WADOE
Bis(2-Chloroethoxy)methane	DoD-ELAP,NELAP,WADOE
2,4-Dichlorophenol	DoD-ELAP,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,NELAP,WADOE
Naphthalene	DoD-ELAP,NELAP,WADOE,ADEC
Benzoic acid	DoD-ELAP,NELAP,WADOE
4-Chloroaniline	DoD-ELAP,NELAP,WADOE
Hexachlorobutadiene	DoD-ELAP,NELAP,WADOE
4-Chloro-3-Methylphenol	DoD-ELAP,NELAP,WADOE
2-Methylnaphthalene	DoD-ELAP,NELAP,WADOE,ADEC
Hexachlorocyclopentadiene	DoD-ELAP,NELAP,WADOE
2,4,6-Trichlorophenol	DoD-ELAP,NELAP,WADOE
2,4,5-Trichlorophenol	DoD-ELAP,NELAP,WADOE
2-Chloronaphthalene	DoD-ELAP,NELAP,WADOE
2-Nitroaniline	DoD-ELAP,NELAP,WADOE
Acenaphthylene	DoD-ELAP,NELAP,WADOE,ADEC
Dimethylphthalate	DoD-ELAP,NELAP,WADOE
2,6-Dinitrotoluene	DoD-ELAP,NELAP,WADOE
Acenaphthene	DoD-ELAP,NELAP,WADOE,ADEC
3-Nitroaniline	DoD-ELAP,NELAP,WADOE
2,4-Dinitrophenol	DoD-ELAP,NELAP,WADOE
Dibenzofuran	DoD-ELAP,NELAP,WADOE,ADEC
4-Nitrophenol	DoD-ELAP,NELAP,WADOE
2,4-Dinitrotoluene	DoD-ELAP,NELAP,WADOE
Fluorene	DoD-ELAP,NELAP,WADOE,ADEC
4-Chlorophenylphenyl ether	DoD-ELAP,NELAP
Diethyl phthalate	DoD-ELAP,NELAP,WADOE
4-Nitroaniline	DoD-ELAP,NELAP,WADOE
4,6-Dinitro-2-methylphenol	DoD-ELAP,NELAP,WADOE

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

N-Nitrosodiphenylamine	DoD-ELAP,NELAP,WADOE
4-Bromophenyl phenyl ether	DoD-ELAP,NELAP,WADOE
Hexachlorobenzene	DoD-ELAP,NELAP,WADOE
Pentachlorophenol	DoD-ELAP,NELAP,WADOE
Phenanthrene	DoD-ELAP,NELAP,WADOE,ADEC
Anthracene	DoD-ELAP,NELAP,WADOE,ADEC
Carbazole	DoD-ELAP,NELAP,WADOE,ADEC
Di-n-Butylphthalate	DoD-ELAP,NELAP,WADOE
Fluoranthene	DoD-ELAP,NELAP,WADOE,ADEC
Pyrene	DoD-ELAP,NELAP,WADOE,ADEC
Butylbenzylphthalate	DoD-ELAP,NELAP,WADOE
Benzo(a)anthracene	DoD-ELAP,NELAP,WADOE,ADEC
3,3'-Dichlorobenzidine	DoD-ELAP,NELAP,WADOE
Chrysene	DoD-ELAP,NELAP,WADOE,ADEC
bis(2-Ethylhexyl)phthalate	DoD-ELAP,NELAP,WADOE
Di-n-Octylphthalate	DoD-ELAP,NELAP,WADOE
Benzo(b)fluoranthene	DoD-ELAP,NELAP,WADOE,ADEC
Benzo(k)fluoranthene	DoD-ELAP,NELAP,WADOE,ADEC
Benzofluoranthenes, Total	WADOE,ADEC
Benzo(a)pyrene	DoD-ELAP,NELAP,WADOE,ADEC
Indeno(1,2,3-cd)pyrene	DoD-ELAP,NELAP,WADOE,ADEC
Dibenzo(a,h)anthracene	DoD-ELAP,NELAP,WADOE,ADEC
Benzo(g,h,i)perylene	DoD-ELAP,NELAP,WADOE,ADEC
N-Nitrosodimethylamine	DoD-ELAP,NELAP,WADOE
Aniline	DoD-ELAP,NELAP,WADOE
Retene	DoD-ELAP,NELAP,WADOE
Pyridine	DoD-ELAP,NELAP,WADOE
1-Methylnaphthalene	DoD-ELAP,NELAP,WADOE,ADEC
Azobenzene (1,2-DP-Hydrazine)	NELAP,WADOE
2,3,4,6-Tetrachlorophenol	DoD-ELAP,WADOE
Benzidine	DoD-ELAP,NELAP
Tetrachloroguaiacol	DoD-ELAP,WADOE
3,4,5-Trichloroguaiacol	WADOE
3,4,6-Trichloroguaiacol	WADOE
4,5,6-Trichloroguaiacol	WADOE
Guaiacol	WADOE

NWTPH-Dx in Solid

Diesel Range Organics (C12-C24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP,NELAP,WADOE

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Diesel Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C12-C22)	DoD-ELAP
Motor Oil Range Organics (C24-C38)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP,NELAP,WADOE
Residual Range Organics (C23-C32)	DoD-ELAP
Mineral Oil Range Organics (C16-C28)	DoD-ELAP,NELAP,WADOE
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP,NELAP,WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP,NELAP,WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP,NELAP,WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP,NELAP,WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP,NELAP,WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP,NELAP,WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: [none]	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	22-Aug-2022 14:40

Notes and Definitions

*	Flagged value is not within established control limits.
D	The reported value is from a dilution
D1	Surrogate was not detected due to sample extract dilution
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to +/- RL instead of 20% RPD
P1	The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Analytical Resources, LLC
Analytical Chemists and Consultants

17 May 2022

Jennifer Marsalla
Anchor QEA, LLC
1201 3rd Ave, Suite 2600
Seattle, WA 98101

RE: Harris Avenue Shipyard

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
22D0456	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Shelly Fishel, Project Manager

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006-012

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 22D0456	Turn-around Requested: Standard	Page: 1	of 5
ARI Client Company: ~~Aspect~~ (Anchor)	Phone: ~~206 231 1500~~ 360 715 2721	Date: 4/25/22	Ice Present? Y
Client Contact: ~~Jane Gregg~~ Derek Olmerod		No. of Coolers: 1	Cooler Temps: 0.3°C
Client Project Name: Harris Ave Shipyard			
Client Project #: 210195	Samplers: Jane Gregg		

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Copper, Zinc	Notes/Comments
AB-10-2.5-4.0	4/25/22	908	Soil	1	1	
AB-10-4.5-5.0	"	0936	"	1	1	
AB-10-7.0-5.5	"	0935	"	1	1	
AB-10-7.5-10	"	1000	"	1	1	
AB-08-2.5-4.0	"	1040	"	1	1	
AB-08-5-6.5	"	1050	"	1	1	
AB-08-7.5-9.0	"	1055	"	1	1	
AB-08-11.5-12.5	"	1105	"	1	1	

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Jane Gregg	Printed Name: DUNNITOO	Printed Name:	Printed Name:
	Company: Aspect	Company: ARI	Company:	Company:
	Date & Time: 4/26/22 300 PM	Date & Time: 04/27/22 0925	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 22D0456	Turn-around Requested: Standard	Page: 2 of ~~4~~ 5	
ARI Client Company: ~~Aspect~~ (Anchor)	Phone: 360 715 2721 ~~406 231 1500~~	Date: 4/25/22	Ice Present? Y
Client Contact: ~~Jane Gregg~~ Derek Ormerod		No. of Coolers: 1	Cooler Temps: 0.5°C
Client Project Name: ~~Harris Ave Shipyard~~			
Client Project #: 210195	Samplers: Jane Gregg		

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Copper/Zinc	Notes/Comments
AB-05-2.5-4.0	4/25/22	1140	soil	1	1	
AB-05-5.0-6.5	"	1145	"	1	1	
AB-05-6.5-7.5	"	1150	"	1	1	
AB-05-12.5-13	"	1220	"	1	1	
AB-06-2.5-4.0	"	1325	"	1	1	
AB-06-4.0-5.0	"	1340	"	1	1	
AB-06-7.5-9.0	"	1350	"	1	1	
AB-06-11.5-12.5	"	1400	"	1	1	
AB-D-1			soil	1	1	

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Jane Gregg	Printed Name: DUNMOS	Printed Name:	Printed Name:
	Company: Aspect	Company: ARI	Company:	Company:
	Date & Time: 4/26/22 300PM	Date & Time: 04/27/22 925	Date & Time:	Date & Time:

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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 22D0456	Turn-around Requested: Standard	Page: 3 of ~~4~~ 5	
ARI Client Company: ~~Aspect~~ (Anchor)	Phone: ~~406 231 1500~~	Date: 4/25/22	Ice Present? Y
Client Contact: ~~Jane Gregg~~	See page 1	No. of Coolers: 1	Cooler Temps: 0.3°C
Client Project Name: Harris Ave Shipyard			
Client Project #: 210195	Samplers: Jane Gregg		

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested	Notes/Comments
AB-07-2.5-4.0	4/25/22	1420	Soil	1		
AB-07-5-6.5	"	1430	"	1		
AB-07-7.5-8.0	"	1440	"	1		
AB-07-12.5-14.0	"	1505	"	1		
AB-04-2.5-3.0	"	1540	"	1		
AB-04-5-6.5	"	1545	"	1		
AB-04-7.5-9.0	"	1600	"	1		
AB-04-12.5-14	"	1620	"	1		

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Jane Gregg	Printed Name: DUNNIAOS	Printed Name:	Printed Name:
	Company: Aspect	Company: ARI	Company:	Company:
	Date & Time: 4/26/22 300 PM	Date & Time: 04/27/22 925	Date & Time:	Date & Time:

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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 22D0456	Turn-around Requested: Standard	Page: 4 of ~~X~~ 5	
ARI Client Company: ~~Aspect~~ (Anchor)	Phone: ~~9062311500~~	Date: 4/26/2022	Ice Present? Y
Client Contact: ~~Jane Greggy~~ See Page 1		No. of Coolers: 1	Cooler Temps: 0.3°C
Client Project Name: Harris Ave Shipyard			
Client Project #: 210195	Samplers: Jane Greggy		

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Copper, Zinc								Notes/Comments
AB-09-2.5-4	4/26/22	0900	soil	1	1								
AB-09-5.0-6.5	"	0915	"	1	1								
AB-09-7.5-9.0	"	0920	"	1	1								
AB-09-11-12.5	"	0930	"	1	1								
AB-01-2.5-4	"	0955	"	1	1								
AB-01-5.0-6.5	"	1005	"	1	1								
AB-01-7.5-8	"	1015	"	1	1								
AB-01-12.5-13	"	1025	"	1	1								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Jane Greggy	Printed Name: DUNNING	Printed Name:	Printed Name:
	Company: Aspect	Company: ARI	Company:	Company:
	Date & Time: 4/26/22 300PM	Date & Time: 04/27/22 0925	Date & Time:	Date & Time:

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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 22D0456	Turn-around Requested: Standard	Page: 5 of 5	
ARI Client Company: ~~Arcadis~~ (Anchor)	Phone: ~~906 231 1500~~	Date: 4/26/22	Ice Present? Y
Client Contact: ~~Jane Gregg~~ Seepage 1		No. of Coolers: 1	Cooler Temps: 0.3°C
Client Project Name: Harris Ave Shipyard			
Client Project #: 210195	Samplers: Jane Gregg		

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Copper, Zinc	Notes/Comments
AB-02-2.5-4.0	4/26/22	1110	Soil	1		
AB-02-4.0-5.0	"	1115	"	1		
AB-02-6.0-7.5	4/26/22	1130	"	1		
AB-02-11-12	"	1135	"	1		
AB-03-2.5-4.0	4/26/22	1215	"	1		
AB-03-5.0-6.5	"	1225	"	1		
AB-03-7.5-8.5	"	1235	"	1		
AB-03-11-12.5	"	1245	"	1		
AB-D-2	—	—	—	1		

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Jane Gregg	Printed Name: DUNNIGAN	Printed Name:	Printed Name:
	Company: Aspect	Company: ARI	Company:	Company:
	Date & Time: 4/26/22 3:00PM	Date & Time: 04/27/22 0925	Date & Time:	Date & Time:

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Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Anchor/Aspect Project Name: Harris Ave

COC No(s): NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other:

Assigned ARI Job No: 22D0456 Tracking No: 2724 5933 5950 NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler? UNSIGNED YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 0.3°C

Time

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 9708

Cooler Accepted by: Date: 04/27/22 Time: 0924

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? Sand YES NO

What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other:

Was sufficient ice used (if appropriate)? NA YES NO

How were bottles sealed in plastic bags? Individually Grouped Not

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI. NA

Were the sample(s) split by ARI? NA YES Date/Time: Equipment: Split by:

Samples Logged by: Date: 04/27/2022 Time: 1502 Labels checked by: SLF

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
AB-10-7.0-7.5 @0945	AB-10-7.0-5.5 @0935		
N/A		N/A	

Additional Notes, Discrepancies, & Resolutions:

bottles did not have full sample ID. only lids had all information

By: 04/27/2022 Date:

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: 210195	**Reported:**
Seattle, WA 98101	Project Manager: Jennifer Marsalla	05/17/2022 14:39

ANALYTICAL REPORT FOR SAMPLES

Laboratory ID	Sample ID	Matrix	Date Sampled	Date Received
22D0456-01	AB-10-2.5-4.0	Solid	04/25/22 09:08	04/27/22 09:25
22D0456-02	AB-10-4.5-5.0	Solid	04/25/22 09:30	04/27/22 09:25
22D0456-03	AB-10-7.0-7.5	Solid	04/25/22 09:35	04/27/22 09:25
22D0456-04	AB-10-7.5-10	Solid	04/25/22 10:00	04/27/22 09:25
22D0456-05	AB-08-2.5-4.0	Solid	04/25/22 10:40	04/27/22 09:25
22D0456-06	AB-08-5-6.5	Solid	04/25/22 10:50	04/27/22 09:25
22D0456-07	AB-08-7.5-9.0	Solid	04/25/22 10:55	04/27/22 09:25
22D0456-08	AB-08-11.5-12.5	Solid	04/25/22 11:05	04/27/22 09:25
22D0456-09	AB-05-2.5-4.0	Solid	04/25/22 11:40	04/27/22 09:25
22D0456-10	AB-05-5.0-6.5	Solid	04/25/22 11:45	04/27/22 09:25
22D0456-11	AB-05-6.5-7.5	Solid	04/25/22 11:50	04/27/22 09:25
22D0456-12	AB-05-12.5-13	Solid	04/25/22 12:20	04/27/22 09:25
22D0456-13	AB-06-2.5-4.0	Solid	04/25/22 13:25	04/27/22 09:25
22D0456-14	AB-06-4.0-5.0	Solid	04/25/22 13:40	04/27/22 09:25
22D0456-15	AB-06-7.5-9.0	Solid	04/25/22 13:50	04/27/22 09:25
22D0456-16	AB-06-11.5-12.5	Solid	04/25/22 14:00	04/27/22 09:25
22D0456-17	AB-D-1	Solid	04/25/22 00:00	04/27/22 09:25
22D0456-18	AB-07-2.5-4.0	Solid	04/25/22 14:20	04/27/22 09:25
22D0456-19	AB-07-5-6.5	Solid	04/25/22 14:30	04/27/22 09:25
22D0456-20	AB-07-7.5-8.0	Solid	04/25/22 14:40	04/27/22 09:25
22D0456-21	AB-07-12.5-14.0	Solid	04/25/22 15:05	04/27/22 09:25
22D0456-22	AB-04-2.5-3.0	Solid	04/25/22 15:40	04/27/22 09:25
22D0456-23	AB-04-5-6.5	Solid	04/25/22 15:45	04/27/22 09:25
22D0456-24	AB-04-7.5-9.0	Solid	04/25/22 16:00	04/27/22 09:25
22D0456-25	AB-04-12.5-14	Solid	04/25/22 16:20	04/27/22 09:25
22D0456-26	AB-09-2.5-4	Solid	04/26/22 09:00	04/27/22 09:25
22D0456-27	AB-09-5.0-6.5	Solid	04/26/22 09:15	04/27/22 09:25
22D0456-28	AB-09-7.5-9.0	Solid	04/26/22 09:20	04/27/22 09:25
22D0456-29	AB-09-11-12.5	Solid	04/26/22 09:30	04/27/22 09:25
22D0456-30	AB-01-2.5-4	Solid	04/26/22 09:55	04/27/22 09:25
22D0456-31	AB-01-5.0-6.5	Solid	04/26/22 10:05	04/27/22 09:25
22D0456-32	AB-01-7.5-8	Solid	04/26/22 10:15	04/27/22 09:25
22D0456-33	AB-01-12.5-13	Solid	04/26/22 10:25	04/27/22 09:25
22D0456-34	AB-02-2.5-4.0	Solid	04/26/22 11:10	04/27/22 09:25
22D0456-35	AB-02-4.0-5.0	Solid	04/26/22 11:15	04/27/22 09:25
22D0456-36	AB-02-6.0-7.5	Solid	04/26/22 11:30	04/27/22 09:25
22D0456-37	AB-02-11-12	Solid	04/26/22 11:35	04/27/22 09:25
22D0456-38	AB-03-2.5-4.0	Solid	04/26/22 12:15	04/27/22 09:25
22D0456-39	AB-03-5.0-6.5	Solid	04/26/22 12:25	04/27/22 09:25
22D0456-40	AB-03-7.5-8.5	Solid	04/26/22 12:35	04/27/22 09:25
22D0456-41	AB-03-11-12.5	Solid	04/26/22 12:45	04/27/22 09:25
22D0456-42	AB-D-2	Solid	04/26/22 00:00	04/27/22 09:25

Anchor QEA, LLC	Project: Harris Avenue Shipyard	
1201 3rd Ave, Suite 2600	Project Number: 210195	**Reported:**
Seattle WA, 98101	Project Manager: Jennifer Marsalla	17-May-2022 14:39

Case Narrative

Client: Anchor QEA, LLC
Project: Harris Avenue Shipyard
Project Number: 210195
Work Order: 22D0456

Sample receipt

Sample(s) as listed on the preceding page were received 27-Apr-2022 09:25 under ARI work order 22D0456. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Total Metals - EPA Method 6010D

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits except as flagged. Probable homogeniety issue.

QUALIFIERS AND NOTES

Qualifier	Definition
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
J	Estimated concentration value detected below the reporting limit.
D	The reported value is from a dilution
B	This analyte was detected in the method blank.
*	Flagged value is not within established control limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

NOTE: Do not enter data in blue shaded cells as they are calculated fields. Green shaded cells MAY be altered if a rewigh is called for.

TOTAL SOLIDS (TS) BENCHSHEET for Solid samples

Method: Total Solids, Metals Correction

dry at 104°C (12-24 hr)

Batch:	BKE0135
Date:	5/9/2022 9:34
Analyst:	ml

Instrumentation

Drying Oven:	7
Analytical Balance:	11

Batch drying time

record times as mm/dd/yy hh:mm

date/time in oven:	5/5/2022 16:35	
date/time out:	5/6/2022 15:45	
elapsed hrs =	23.2	OK

Temp in: 105 °C

Temp out: 102 °C

TS (%) calculated as:
Final dry wt (g) = (Dry Wt - Tare Wt)
TS = (Final Dry Wt)/ (grams Sample-Tare)

Sample ID	Tare Weight (g)	Tare + Sample Weight (g)	Tare + Sample Dry Weight @ 104°C (g) 1	2	3	dry Wt (g)	TS (%)	Notes
22D0416-02	1.0210	10.0810	7.4270			6.4060	70.71%	
22D0456-01	1.0510	10.0340	9.5640			8.5130	94.77%	
22D0456-02	1.0620	10.0370	8.5220			7.4600	83.12%	
22D0456-03	1.0630	10.0910	8.2280			7.1650	79.36%	
22D0456-04	1.0010	10.0350	8.5710			7.5700	83.79%	
22D0456-05	0.9900	10.0090	9.1910			8.2010	90.93%	
22D0456-07	0.9940	10.0630	9.0770			8.0830	89.13%	
22D0456-08	0.9990	10.0660	9.1450			8.1460	89.84%	
22D0456-09	0.9950	10.0510	9.7860			8.7910	97.07%	
22D0456-10	0.9940	10.0090	9.6950			8.7010	96.52%	
22D0456-11	1.0020	10.0310	9.7390			8.7370	96.77%	
22D0456-12	1.0050	10.0640	8.4300			7.4250	81.96%	
22D0456-13	1.0220	10.0350	9.3760			8.3540	92.69%	
22D0456-14	0.9990	10.0540	9.1260			8.1270	89.75%	
22D0456-15	1.0190	10.0340	8.9880			7.9690	88.40%	
22D0456-16	1.0220	10.0630	8.6060			7.5840	83.88%	
22D0456-17	1.0150	10.0750	9.7200			8.7050	96.08%	
22D0456-18	1.0160	10.0250	8.9160			7.9000	87.69%	
22D0456-19	1.0040	10.0390	9.3390			8.3350	92.25%	
22D0456-20	1.0020	10.0530	8.8600			7.8580	86.82%	
22D0456-21	1.0000	10.0350	8.4880			7.4880	82.88%	
22D0456-22	0.9990	10.0050	9.4290			8.4300	93.60%	
22D0456-23	1.0000	10.0310	9.7760			8.7760	97.18%	
22D0456-24	1.0030	10.0730	9.7390			8.7360	96.32%	
22D0456-25	1.0010	10.0660	8.1040			7.1030	78.36%	
22D0456-26	1.0110	10.0490	9.3700			8.3590	92.49%	
22D0456-27	0.9790	10.0380	9.4030			8.4240	92.99%	
22D0456-28	1.0040	10.0560	9.0190			8.0150	88.54%	

NOTE: Do not enter data in blue shaded cells as they are calculated fields. Green shaded cells MAY be altered if a rewigh is called for.

TOTAL SOLIDS (TS) BENCHSHEET for Solid samples

Method: Total Solids, Metals Correction

dry at 104°C (12-24 hr)

Batch:	BKE0226
Date:	5/9/2022 15:32
Analyst:	ML

Instrumentation

Drying Oven:	7	**Analytical Balance:**	11

Batch drying time

record times as mm/dd/yy hh:mm

date/time in oven:	5/9/2022 16:20	Temp in:	105	°C
date/time out:	5/10/2022 11:30	Temp out:	104	°C
elapsed hrs =	19.2	OK		

TS (%) calculated as:
Final dry wt (g) = (Dry Wt - Tare Wt)
TS = (Final Dry Wt)/ (grams Sample-Tare)

Sample ID	Tare Weight (g)	Tare + Sample Weight (g)	Tare + Sample Dry Weight @ 104°C (g) 1	2	3	dry Wt (g)	TS (%)	Notes
22D0456-06	1.0000	10.0380	9.2540			8.2540	91.33%	
22D0456-29	1.0200	10.0430	8.5780			7.5580	83.76%	
22D0456-30	1.0180	10.0500	9.3520			8.3340	92.27%	
22D0456-31	1.0210	10.0710	8.7540			7.7330	85.45%	
22D0456-32	1.0260	10.0190	8.9320			7.9060	87.91%	
22D0456-33	1.0180	10.0380	8.8700			7.8520	87.05%	
22D0456-34	1.0050	10.0670	9.2940			8.2890	91.47%	
22D0456-35	0.9950	10.0180	9.2090			8.2140	91.03%	
22D0456-36	0.9910	10.0470	8.8720			7.8810	87.03%	
22D0456-37	1.0180	10.0080	9.0470			8.0290	89.31%	
22D0456-38	1.0210	10.0340	8.9000			7.8790	87.42%	
22D0456-39	1.0370	10.0450	9.1140			8.0770	89.66%	
22D0456-40	1.0220	10.0950	8.5580			7.5360	83.06%	
22D0456-41	1.0250	10.0570	8.7570			7.7320	85.61%	
22D0456-42	1.0140	10.0440	9.0170			8.0030	88.63%	
22E0038-01	1.0180	10.0420	8.1320			7.1140	78.83%	

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Total Metals

AB-10-2.5-4.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-01 A	SDG:	22D0456
Sampled:	04/25/22 09:08	Prepared:	05/05/22 09:26	File ID:	I2220510-074
% Solids:	94.77	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 16:13
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.017 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	65.8	5	0.363	0.778	D
7440-66-6	Zinc	211	5	2.08	5.19	D

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Total Metals

AB-10-4.5-5.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-02 A	SDG:	22D0456
Sampled:	04/25/22 09:30	Prepared:	05/05/22 09:26	File ID:	I2220510-076
% Solids:	83.12	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 16:19
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.084 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	55.8	5	0.388	0.832	D
7440-66-6	Zinc	154	5	2.22	5.55	D

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Total Metals

AB-10-7.0-7.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-03 A	SDG:	22D0456
Sampled:	04/25/22 09:35	Prepared:	05/05/22 09:26	File ID:	I2220510-077
% Solids:	79.36	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 16:22
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.035 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	51.4	5	0.426	0.913	D
7440-66-6	Zinc	103	5	2.43	6.09	D

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Total Metals

AB-10-7.5-10

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-04 A	SDG:	22D0456
Sampled:	04/25/22 10:00	Prepared:	05/05/22 09:26	File ID:	I2220510-078
% Solids:	83.79	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 16:25
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.059 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	117	5	0.394	0.845	D
7440-66-6	Zinc	305	5	2.25	5.63	D

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Total Metals

AB-08-2.5-4.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-05 A	SDG:	22D0456
Sampled:	04/25/22 10:40	Prepared:	05/05/22 09:26	File ID:	I2220510-087
% Solids:	90.93	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 16:55
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.062 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	419	5	0.362	0.777	D
7440-66-6	Zinc	751	5	2.07	5.18	D

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Total Metals

AB-08-5-6.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-06 A	SDG:	22D0456
Sampled:	04/25/22 10:50	Prepared:	05/05/22 09:26	File ID:	I2220510-088
% Solids:	91.33	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 16:58
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.016 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	160	5	0.377	0.808	D
7440-66-6	Zinc	260	5	2.16	5.39	D

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Total Metals

AB-08-7.5-9.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-07 A	SDG:	22D0456
Sampled:	04/25/22 10:55	Prepared:	05/05/22 09:26	File ID:	I2220510-089
% Solids:	89.13	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 17:00
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.008 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	303	5	0.390	0.835	D
7440-66-6	Zinc	512	5	2.23	5.57	D

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Total Metals

AB-08-11.5-12.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-08 A	SDG:	22D0456
Sampled:	04/25/22 11:05	Prepared:	05/05/22 09:26	File ID:	I2220510-090
% Solids:	89.84	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 17:04
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.041 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	23.0	5	0.374	0.802	D
7440-66-6	Zinc	43.3	5	2.14	5.35	D

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Total Metals

AB-05-2.5-4.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-09 A	SDG:	22D0456
Sampled:	04/25/22 11:40	Prepared:	05/05/22 09:26	File ID:	I2220510-095
% Solids:	97.07	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 17:21
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.005 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	65.7	5	0.359	0.769	D
7440-66-6	Zinc	106	5	2.05	5.13	D

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Total Metals

AB-05-5.0-6.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-10 A	SDG:	22D0456
Sampled:	04/25/22 11:45	Prepared:	05/05/22 09:26	File ID:	I2220510-096
% Solids:	96.52	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 17:24
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.009 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	126	5	0.359	0.770	D
7440-66-6	Zinc	195	5	2.05	5.13	D

Analytical Resources, LLC
Analytical Chemists and Consultants

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Total Metals

AB-05-6.5-7.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-11 A	SDG:	22D0456
Sampled:	04/25/22 11:50	Prepared:	05/05/22 09:26	File ID:	I2220510-097
% Solids:	96.77	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 17:27
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.002 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	312	5	0.361	0.773	D
7440-66-6	Zinc	1100	5	2.06	5.16	D

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Total Metals

AB-05-12.5-13

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-12 A	SDG:	22D0456
Sampled:	04/25/22 12:20	Prepared:	05/05/22 09:26	File ID:	I2220510-098
% Solids:	81.96	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 17:31
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.024 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	84.2	5	0.417	0.894	D
7440-66-6	Zinc	222	5	2.38	5.96	D

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Total Metals

AB-06-2.5-4.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-13 A	SDG:	22D0456
Sampled:	04/25/22 13:25	Prepared:	05/05/22 09:26	File ID:	I2220510-099
% Solids:	92.69	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 17:33
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.021 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	477	5	0.370	0.793	D
7440-66-6	Zinc	292	5	2.11	5.28	D

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Total Metals

AB-06-4.0-5.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-14 A	SDG:	22D0456
Sampled:	04/25/22 13:40	Prepared:	05/05/22 09:26	File ID:	I2220510-100
% Solids:	89.75	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 17:36
Batch:	BKE0119	Sequence:	SKE0143	Initial/Final:	1.019 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	277	5	0.383	0.820	D
7440-66-6	Zinc	250	5	2.19	5.47	D

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Total Metals

AB-06-7.5-9.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-15 A	SDG:	22D0456
Sampled:	04/25/22 13:50	Prepared:	05/05/22 10:54	File ID:	I2220506-029
% Solids:	88.40	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 16:51
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.032 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	53.5	2	0.153	0.329	
7440-66-6	Zinc	104	2	0.877	2.19	

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Total Metals

AB-06-11.5-12.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-16 A	SDG:	22D0456
Sampled:	04/25/22 14:00	Prepared:	05/05/22 10:54	File ID:	I2220506-030
% Solids:	83.88	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 16:54
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.017 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	29.7	2	0.164	0.352	
7440-66-6	Zinc	47.2	2	0.938	2.34	

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Total Metals

AB-D-1

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-17 A	SDG:	22D0456
Sampled:	04/25/22 00:00	Prepared:	05/05/22 10:54	File ID:	I2220506-051
% Solids:	96.08	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 18:11
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.014 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	118	5	0.359	0.770	D
7440-66-6	Zinc	220	5	2.05	5.13	D

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Total Metals

AB-07-2.5-4.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-18 A	SDG:	22D0456
Sampled:	04/25/22 14:20	Prepared:	05/05/22 10:54	File ID:	I2220506-053
% Solids:	87.69	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 18:17
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.039 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	899	5	0.384	0.823	D
7440-66-6	Zinc	625	5	2.20	5.49	D

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Total Metals

AB-07-5-6.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-19 A	SDG:	22D0456
Sampled:	04/25/22 14:30	Prepared:	05/05/22 10:54	File ID:	I2220506-049
% Solids:	92.25	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 18:05
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.075 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	23.1	5	0.353	0.756	D
7440-66-6	Zinc	52.1	5	2.02	5.04	D

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Total Metals

AB-07-7.5-8.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-20 A	SDG:	22D0456
Sampled:	04/25/22 14:40	Prepared:	05/05/22 10:54	File ID:	I2220510-064
% Solids:	86.82	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 15:40
Batch:	BKE0127	Sequence:	SKE0143	Initial/Final:	1.036 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	1890	10	0.778	1.67	D
7440-66-6	Zinc	1940	10	4.45	11.1	D

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Total Metals

AB-07-12.5-14.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-21 A	SDG:	22D0456
Sampled:	04/25/22 15:05	Prepared:	05/05/22 10:54	File ID:	I2220506-055
% Solids:	82.88	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 18:25
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.031 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	63.2	5	0.410	0.878	D
7440-66-6	Zinc	77.1	5	2.34	5.85	D

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Total Metals

AB-04-2.5-3.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-22 A	SDG:	22D0456
Sampled:	04/25/22 15:40	Prepared:	05/05/22 10:54	File ID:	I2220506-056
% Solids:	93.60	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 18:28
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.032 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	432	5	0.362	0.776	D
7440-66-6	Zinc	1490	5	2.07	5.18	D

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Total Metals

AB-04-5-6.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-23 A	SDG:	22D0456
Sampled:	04/25/22 15:45	Prepared:	05/05/22 10:54	File ID:	I2220506-057
% Solids:	97.18	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 18:31
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.015 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	40.4	5	0.355	0.760	D
7440-66-6	Zinc	95.3	5	2.03	5.07	D

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Total Metals

AB-04-7.5-9.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-24 A	SDG:	22D0456
Sampled:	04/25/22 16:00	Prepared:	05/05/22 10:54	File ID:	I2220506-058
% Solids:	96.32	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 18:35
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.059 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	28.1	5	0.343	0.735	D
7440-66-6	Zinc	110	5	1.96	4.90	D

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Total Metals

AB-04-12.5-14

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-25 A	SDG:	22D0456
Sampled:	04/25/22 16:20	Prepared:	05/05/22 10:54	File ID:	I2220506-061
% Solids:	78.36	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 18:46
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.07 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	40.7	5	0.417	0.895	D
7440-66-6	Zinc	72.9	5	2.39	5.96	D

Analytical Resources, LLC
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6010D
Total Metals

AB-09-2.5-4

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-26 A	SDG:	22D0456
Sampled:	04/26/22 09:00	Prepared:	05/05/22 10:54	File ID:	I2220506-062
% Solids:	92.49	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 18:49
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.032 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	389	5	0.367	0.786	D
7440-66-6	Zinc	1140	5	2.10	5.24	D

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INORGANIC ANALYSIS DATA SHEET
EPA 6010D

Total Metals

AB-09-5.0-6.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-27 A	SDG:	22D0456
Sampled:	04/26/22 09:15	Prepared:	05/05/22 10:54	File ID:	I2220506-063
% Solids:	92.99	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 18:52
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.068 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	156	5	0.352	0.755	D
7440-66-6	Zinc	191	5	2.01	5.03	D

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INORGANIC ANALYSIS DATA SHEET
EPA 6010D

Total Metals

AB-09-7.5-9.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-28 A	SDG:	22D0456
Sampled:	04/26/22 09:20	Prepared:	05/05/22 10:54	File ID:	I2220506-064
% Solids:	88.54	Preparation:	SWC EPA 3050B	Analyzed:	05/06/22 18:54
Batch:	BKE0127	Sequence:	SKE0106	Initial/Final:	1.087 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00019

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	33.9	5	0.364	0.779	D
7440-66-6	Zinc	72.0	5	2.08	5.20	D

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Total Metals

AB-09-11-12.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-29 A	SDG:	22D0456
Sampled:	04/26/22 09:30	Prepared:	05/09/22 09:50	File ID:	I2220510-102
% Solids:	83.76	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 17:43
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.028 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	25.6	5	0.406	0.871	D
7440-66-6	Zinc	35.9	5	2.32	5.81	D

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INORGANIC ANALYSIS DATA SHEET
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Total Metals

AB-01-2.5-4

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-30 A	SDG:	22D0456
Sampled:	04/26/22 09:55	Prepared:	05/09/22 09:50	File ID:	I2220510-108
% Solids:	92.27	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:04
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.015 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	272	5	0.374	0.801	D
7440-66-6	Zinc	366	5	2.14	5.34	D

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INORGANIC ANALYSIS DATA SHEET
EPA 6010D

Total Metals

AB-01-5.0-6.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-31 A	SDG:	22D0456
Sampled:	04/26/22 10:05	Prepared:	05/09/22 09:50	File ID:	I2220510-110
% Solids:	85.45	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:10
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.018 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	83.9	5	0.402	0.862	D
7440-66-6	Zinc	142	5	2.30	5.75	D

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INORGANIC ANALYSIS DATA SHEET
EPA 6010D

Total Metals

AB-01-7.5-8

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-32 A	SDG:	22D0456
Sampled:	04/26/22 10:15	Prepared:	05/09/22 09:50	File ID:	I2220510-111
% Solids:	87.91	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:13
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.019 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	349	5	0.391	0.837	D
7440-66-6	Zinc	227	5	2.23	5.58	D

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INORGANIC ANALYSIS DATA SHEET
EPA 6010D

Total Metals

AB-01-12.5-13

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-33 A	SDG:	22D0456
Sampled:	04/26/22 10:25	Prepared:	05/09/22 09:50	File ID:	I2220510-112
% Solids:	87.05	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:16
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.07 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	31.0	5	0.376	0.805	D
7440-66-6	Zinc	45.0	5	2.15	5.37	D

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INORGANIC ANALYSIS DATA SHEET
EPA 6010D

Total Metals

AB-02-2.5-4.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-34 A	SDG:	22D0456
Sampled:	04/26/22 11:10	Prepared:	05/09/22 09:50	File ID:	I2220510-113
% Solids:	91.47	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:19
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.046 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	470	5	0.366	0.784	D
7440-66-6	Zinc	1190	5	2.09	5.23	D

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INORGANIC ANALYSIS DATA SHEET
EPA 6010D

Total Metals

AB-02-4.0-5.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-35 A	SDG:	22D0456
Sampled:	04/26/22 11:15	Prepared:	05/09/22 09:50	File ID:	I2220510-114
% Solids:	91.03	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:21
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.005 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	693	5	0.383	0.820	D
7440-66-6	Zinc	1720	5	2.19	5.47	D

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INORGANIC ANALYSIS DATA SHEET
EPA 6010D

Total Metals

AB-02-6.0-7.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-36 A	SDG:	22D0456
Sampled:	04/26/22 11:30	Prepared:	05/09/22 09:50	File ID:	I2220510-117
% Solids:	87.03	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:33
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.017 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	87.1	5	0.395	0.847	D
7440-66-6	Zinc	320	5	2.26	5.65	D

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INORGANIC ANALYSIS DATA SHEET
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Total Metals

AB-02-11-12

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-37 A	SDG:	22D0456
Sampled:	04/26/22 11:35	Prepared:	05/09/22 09:50	File ID:	I2220510-118
% Solids:	89.31	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:35
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.011 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	88.4	5	0.388	0.831	D
7440-66-6	Zinc	262	5	2.22	5.54	D

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INORGANIC ANALYSIS DATA SHEET
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Total Metals

AB-03-2.5-4.0

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-38 A	SDG:	22D0456
Sampled:	04/26/22 12:15	Prepared:	05/09/22 09:50	File ID:	I2220510-119
% Solids:	87.42	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:39
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.052 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	38.5	5	0.381	0.816	D
7440-66-6	Zinc	61.5	5	2.17	5.44	D

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INORGANIC ANALYSIS DATA SHEET
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Total Metals

AB-03-5.0-6.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-39 A	SDG:	22D0456
Sampled:	04/26/22 12:25	Prepared:	05/09/22 09:50	File ID:	I2220510-120
% Solids:	89.66	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:42
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.019 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	173	5	0.383	0.821	D
7440-66-6	Zinc	277	5	2.19	5.47	D

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INORGANIC ANALYSIS DATA SHEET
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Total Metals

AB-03-7.5-8.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-40 A	SDG:	22D0456
Sampled:	04/26/22 12:35	Prepared:	05/09/22 09:50	File ID:	I2220510-121
% Solids:	83.06	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:45
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.009 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	408	5	0.418	0.895	D
7440-66-6	Zinc	613	5	2.39	5.97	D

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INORGANIC ANALYSIS DATA SHEET
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Total Metals

AB-03-11-12.5

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-41 A	SDG:	22D0456
Sampled:	04/26/22 12:45	Prepared:	05/09/22 09:50	File ID:	I2220510-122
% Solids:	85.61	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:49
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.019 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	34.0	5	0.401	0.860	D
7440-66-6	Zinc	49.7	5	2.29	5.73	D

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INORGANIC ANALYSIS DATA SHEET
EPA 6010D

Total Metals

AB-D-2

Laboratory:	Analytical Resources, LLC				
Client:	Anchor QEA, LLC				
Project:	Harris Avenue Shipyard				
Matrix:	Soil	Laboratory ID:	22D0456-42 A	SDG:	22D0456
Sampled:	04/26/22 00:00	Prepared:	05/09/22 09:50	File ID:	I2220510-123
% Solids:	88.63	Preparation:	SWC EPA 3050B	Analyzed:	05/10/22 18:52
Batch:	BKE0200	Sequence:	SKE0143	Initial/Final:	1.036 g Wet / 50 mL
Instrument:	ICP2			Calibration:	FE00029

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	174	5	0.381	0.817	D
7440-66-6	Zinc	265	5	2.18	5.45	D

PREPARATION BATCH SUMMARY

EPA 6010D

Laboratory: Analytical Resources, LLC SDG: 22D0456

Client: Anchor QEA, LLC Project: Harris Avenue Shipyard

Batch: BKE0119 Batch Matrix: Solid Preparation: SWC EPA 3050B

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
AB-10-2.5-4.0	22D0456-01	I2220510-074	05/05/22 09:26	
AB-10-4.5-5.0	22D0456-02	I2220510-076	05/05/22 09:26	
AB-10-7.0-7.5	22D0456-03	I2220510-077	05/05/22 09:26	
AB-10-7.5-10	22D0456-04	I2220510-078	05/05/22 09:26	
AB-08-2.5-4.0	22D0456-05	I2220510-087	05/05/22 09:26	
AB-08-5-6.5	22D0456-06	I2220510-088	05/05/22 09:26	
AB-08-7.5-9.0	22D0456-07	I2220510-089	05/05/22 09:26	
AB-08-11.5-12.5	22D0456-08	I2220510-090	05/05/22 09:26	
AB-05-2.5-4.0	22D0456-09	I2220510-095	05/05/22 09:26	
AB-05-5.0-6.5	22D0456-10	I2220510-096	05/05/22 09:26	
AB-05-6.5-7.5	22D0456-11	I2220510-097	05/05/22 09:26	
AB-05-12.5-13	22D0456-12	I2220510-098	05/05/22 09:26	
AB-06-2.5-4.0	22D0456-13	I2220510-099	05/05/22 09:26	
AB-06-4.0-5.0	22D0456-14	I2220510-100	05/05/22 09:26	
Blank	BKE0119-BLK1	I2220510-057	05/05/22 09:26	
LCS	BKE0119-BS1	I2220510-065	05/05/22 09:26	
AB-10-2.5-4.0	BKE0119-DUP1	I2220510-066	05/05/22 09:26	
AB-10-2.5-4.0	BKE0119-MS1	I2220510-075	05/05/22 09:26	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Digestion Log

Analyst: ML Date: 05105122 Time: 1040 - 1550

Matrix: Soil Block ID: 5 Block Temp: 97° Thermometer: 20-2

ARI Sample ID	Btl #	pH<2	Prep Code: SWC Initial Wt (g) Vol (mL)	Prep Code: SWC Final Vol (mL)	Prep Code: Initial Wt (g) Vol (mL)	Prep Code: Final Vol (mL)	Comments
22D0456-01	A		1.017	50			
-02	↓	↓	1.084	↓			
-03			1.035				
-04			1.059				
-05			1.062				
-06			1.016				
-07			1.008				
-08			1.041				
-09			1.005				
-10			1.009				
-11			1.002				
-12			1.023				
-13			1.024				
-14			1.019				
22E0038-01	↓		1.010				
BKE0119-blk1	—		—				
-bs1	—		—				
-Dup1	—		1.018				22D0456-01
-ms1	—		1.021	↓			↓

MI 05105122

Chemical/Reagent ID:

HNO_3: K3476 1:1 HNO_3: K4309 HCl: J115Z4 H_2O_2: K4238

Tube Lot#: 2111169 Boiling Chip Lot#: — (DoD Only)

PREPARATION BATCH SUMMARY

EPA 6010D

Laboratory: Analytical Resources, LLC
SDG: 22D0456
Client: Anchor QEA, LLC
Project: Harris Avenue Shipyard
Batch: BKE0127 Batch Matrix: Solid
Preparation: SWC EPA 3050B

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
AB-06-7.5-9.0	22D0456-15	I2220506-029	05/05/22 10:54	
AB-06-11.5-12.5	22D0456-16	I2220506-030	05/05/22 10:54	
AB-D-1	22D0456-17	I2220506-051	05/05/22 10:54	
AB-07-2.5-4.0	22D0456-18	I2220506-053	05/05/22 10:54	
AB-07-5-6.5	22D0456-19	I2220506-049	05/05/22 10:54	
AB-07-7.5-8.0	22D0456-20	I2220510-064	05/05/22 10:54	
AB-07-12.5-14.0	22D0456-21	I2220506-055	05/05/22 10:54	
AB-04-2.5-3.0	22D0456-22	I2220506-056	05/05/22 10:54	
AB-04-5-6.5	22D0456-23	I2220506-057	05/05/22 10:54	
AB-04-7.5-9.0	22D0456-24	I2220506-058	05/05/22 10:54	
AB-04-12.5-14	22D0456-25	I2220506-061	05/05/22 10:54	
AB-09-2.5-4	22D0456-26	I2220506-062	05/05/22 10:54	
AB-09-5.0-6.5	22D0456-27	I2220506-063	05/05/22 10:54	
AB-09-7.5-9.0	22D0456-28	I2220506-064	05/05/22 10:54	
Blank	BKE0127-BLK1	I2220506-027	05/05/22 10:54	
LCS	BKE0127-BS1	I2220506-028	05/05/22 10:54	
AB-D-1	BKE0127-DUP1	I2220506-050	05/05/22 10:54	
AB-D-1	BKE0127-MS1	I2220506-052	05/05/22 10:54	

PREPARATION BATCH SUMMARY

EPA 6010D

Laboratory: Analytical Resources, LLC SDG: 22D0456

Client: Anchor QEA, LLC Project: Harris Avenue Shipyard

Batch: BKE0200 Batch Matrix: Solid Preparation: SWC EPA 3050B

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
AB-09-11-12.5	22D0456-29	I2220510-102	05/09/22 09:50	
AB-01-2.5-4	22D0456-30	I2220510-108	05/09/22 09:50	
AB-01-5.0-6.5	22D0456-31	I2220510-110	05/09/22 09:50	
AB-01-7.5-8	22D0456-32	I2220510-111	05/09/22 09:50	
AB-01-12.5-13	22D0456-33	I2220510-112	05/09/22 09:50	
AB-02-2.5-4.0	22D0456-34	I2220510-113	05/09/22 09:50	
AB-02-4.0-5.0	22D0456-35	I2220510-114	05/09/22 09:50	
AB-02-6.0-7.5	22D0456-36	I2220510-117	05/09/22 09:50	
AB-02-11-12	22D0456-37	I2220510-118	05/09/22 09:50	
AB-03-2.5-4.0	22D0456-38	I2220510-119	05/09/22 09:50	
AB-03-5.0-6.5	22D0456-39	I2220510-120	05/09/22 09:50	
AB-03-7.5-8.5	22D0456-40	I2220510-121	05/09/22 09:50	
AB-03-11-12.5	22D0456-41	I2220510-122	05/09/22 09:50	
AB-D-2	22D0456-42	I2220510-123	05/09/22 09:50	
Blank	BKE0200-BLK1	I2220510-105	05/09/22 09:50	
LCS	BKE0200-BS1	I2220510-106	05/09/22 09:50	
AB-01-2.5-4	BKE0200-DUP1	I2220510-107	05/09/22 09:50	
AB-01-2.5-4	BKE0200-MS1	I2220510-109	05/09/22 09:50	

Form I

METHOD BLANK DATA SHEET

EPA 6010D

Total Metals

Blank

Laboratory: Analytical Resources, LLC | SDG: 22D0456

Client: Anchor QEA, LLC | Project: Harris Avenue Shipyard

Batch: BKE0119 | Laboratory ID: BKE0119-BLK1 | Prepared: 05/05/22 09:26

Matrix: Solid | Preparation: SWC EPA 3050B | Analyzed: 05/10/22 15:19

Sequence: SKE0143 | Calibration: FE00029 | Instrument: ICP2

CAS NO.	Analyte	Concentration (mg/kg wet)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	ND	2	0.140	0.300	U
7440-66-6	Zinc	ND	2	0.800	2.00	U

Form I

METHOD BLANK DATA SHEET

EPA 6010D

Total Metals

Blank

Laboratory: Analytical Resources, LLC | SDG: 22D0456

Client: Anchor QEA, LLC | Project: Harris Avenue Shipyard

Batch: BKE0127 | Laboratory ID: BKE0127-BLK1 | Prepared: 05/05/22 10:54

Matrix: Solid | Preparation: SWC EPA 3050B | Analyzed: 05/06/22 16:45

Sequence: SKE0106 | Calibration: FE00019 | Instrument: ICP2

CAS NO.	Analyte	Concentration (mg/kg wet)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	ND	2	0.140	0.300	U
7440-66-6	Zinc	ND	2	0.800	2.00	U

Form I

METHOD BLANK DATA SHEET

EPA 6010D

Total Metals

Blank

Laboratory: Analytical Resources, LLC | SDG: 22D0456

Client: Anchor QEA, LLC | Project: Harris Avenue Shipyard

Batch: BKE0200 | Laboratory ID: BKE0200-BLK1 | Prepared: 05/09/22 09:50

Matrix: Solid | Preparation: SWC EPA 3050B | Analyzed: 05/10/22 17:54

Sequence: SKE0143 | Calibration: FE00029 | Instrument: ICP2

CAS NO.	Analyte	Concentration (mg/kg wet)	Dilution Factor	MDL	MRL	Q
7440-50-8	Copper	ND	2	0.140	0.300	U
7440-66-6	Zinc	ND	2	0.800	2.00	U

LCS / LCS DUPLICATE RECOVERY

EPA 6010D

Total Metals

Laboratory:	Analytical Resources, LLC	SDG:	22D0456
Client:	Anchor QEA, LLC	Project:	Harris Avenue Shipyard
Matrix:	Solid	Analyzed:	05/10/22 15:43
Batch:	BKE0119	Laboratory ID:	BKE0119-BS1
Preparation:	SWC EPA 3050B	Sequence Name:	LCS
Initial/Final:	1 g / 50 mL		

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Copper	50.0	49.5		98.9	80 - 120
Zinc	50.0	51.2		102	80 - 120

* Indicates values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

EPA 6010D

Total Metals

Laboratory:	Analytical Resources, LLC	SDG:	22D0456
Client:	Anchor QEA, LLC	Project:	Harris Avenue Shipyard
Matrix:	Solid	Analyzed:	05/06/22 16:47
Batch:	BKE0127	Laboratory ID:	BKE0127-BS1
Preparation:	SWC EPA 3050B	Sequence Name:	LCS
Initial/Final:	1 g / 50 mL		

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Copper	50.0	49.6		99.1	80 - 120
Zinc	50.0	53.2		106	80 - 120

* Indicates values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

EPA 6010D

Total Metals

Laboratory:	Analytical Resources, LLC	SDG:	22D0456
Client:	Anchor QEA, LLC	Project:	Harris Avenue Shipyard
Matrix:	Solid	Analyzed:	05/10/22 17:57
Batch:	BKE0200	Laboratory ID:	BKE0200-BS1
Preparation:	SWC EPA 3050B	Sequence Name:	LCS
Initial/Final:	1 g / 50 mL		

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Copper	50.0	48.1		96.2	80 - 120
Zinc	50.0	51.2		102	80 - 120

* Indicates values outside of QC limits

DUPLICATES

EPA 6010D

Total Metals

Laboratory: Analytical Resources, LLC
SDG: 22D0456
Client: Anchor QEA, LLC
Project: Harris Avenue Shipyard
Matrix: Solid
Laboratory ID: BKE0119-DUP1
Batch: BKE0119
Lab Source ID: 22D0456-01
Preparation: SWC EPA 3050B
Initial/Final: 1.018 g / 50 mL
Source Sample Name: AB-10-2.5-4.0
% Solids: 94.77

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (mg/kg dry)	C	DUPLICATE CONCENTRATION (mg/kg dry)	C	RPD %	Q
Copper	20	65.8	D	71.3	D	8.07	
Zinc	20	211	D	194	D	8.65	

*: Values outside of QC limits
L: Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to Dup = +/- RL instead of 20% RPD

AB-D-1

DUPLICATES

EPA 6010D

Total Metals

Laboratory: Analytical Resources, LLC
SDG: 22D0456
Client: Anchor QEA, LLC
Project: Harris Avenue Shipyard
Matrix: Solid
Laboratory ID: BKE0127-DUP1
Batch: BKE0127
Lab Source ID: 22D0456-17
Preparation: SWC EPA 3050B
Initial/Final: 1.012 g / 50 mL
Source Sample Name: AB-D-1
% Solids: 96.08

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (mg/kg dry)	C	DUPLICATE CONCENTRATION (mg/kg dry)	C	RPD %	Q
Copper	20	118	D	80.1	*, D	38.4	*
Zinc	20	220	D	138	*, D	45.9	*

*: Values outside of QC limits
L: Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to Dup = +/- RL instead of 20% RPD

DUPLICATES

EPA 6010D

Total Metals

Laboratory: Analytical Resources, LLC
SDG: 22D0456
Client: Anchor QEA, LLC
Project: Harris Avenue Shipyard
Matrix: Solid
Laboratory ID: BKE0200-DUP1
Batch: BKE0200
Lab Source ID: 22D0456-30
Preparation: SWC EPA 3050B
Initial/Final: 1.019 g / 50 mL
Source Sample Name: AB-01-2.5-4
% Solids: 92.27

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (mg/kg dry)	C	DUPLICATE CONCENTRATION (mg/kg dry)	C	RPD %	Q
Copper	20	272	D	267	D	1.69	
Zinc	20	366	D	461	*, D	22.9	*

*: Values outside of QC limits
L: Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to Dup = +/- RL instead of 20% RPD

MS / MS DUPLICATE RECOVERY

EPA 6010D

Total Metals

Laboratory:	Analytical Resources, LLC	SDG:	22D0456
Client:	Anchor QEA, LLC	Project:	Harris Avenue Shipyard
Matrix:	Solid	Analyzed:	05/10/22 16:16
Batch:	BKE0119	Laboratory ID:	BKE0119-MS1
Preparation:	SWC EPA 3050B	Sequence Name:	Matrix Spike
Initial/Final:	1.021 g / 50 mL	Source Sample:	AB-10-2.5-4.0

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	Q	MS CONCENTRATION (mg/kg dry)	Q	MS % REC. #	QC LIMITS REC.
Copper	51.7	65.8	D	124	D	113	75 - 125
Zinc	51.7	211	D	249	*, D	73.6 *	75 - 125

* Values outside of QC limits

MS / MS DUPLICATE RECOVERY

EPA 6010D

Total Metals

Laboratory:	Analytical Resources, LLC	SDG:	22D0456
Client:	Anchor QEA, LLC	Project:	Harris Avenue Shipyard
Matrix:	Solid	Analyzed:	05/06/22 18:14
Batch:	BKE0127	Laboratory ID:	BKE0127-MS1
Preparation:	SWC EPA 3050B	Sequence Name:	Matrix Spike
Initial/Final:	1.012 g / 50 mL	Source Sample:	AB-D-1

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	Q	MS CONCENTRATION (mg/kg dry)	Q	MS % REC. #		QC LIMITS REC.
Copper	51.4	118	D	151	*, D	63.4	*	75 - 125
Zinc	51.4	220	D	241	*, D	41.4	*	75 - 125

* Values outside of QC limits

MS / MS DUPLICATE RECOVERY

EPA 6010D

Total Metals

Laboratory:	Analytical Resources, LLC	SDG:	22D0456
Client:	Anchor QEA, LLC	Project:	Harris Avenue Shipyard
Matrix:	Solid	Analyzed:	05/10/22 18:07
Batch:	BKE0200	Laboratory ID:	BKE0200-MS1
Preparation:	SWC EPA 3050B	Sequence Name:	Matrix Spike
Initial/Final:	1.018 g / 50 mL	Source Sample:	AB-01-2.5-4

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	Q	MS CONCENTRATION (mg/kg dry)	Q	MS % REC. #		QC LIMITS REC.
Copper	53.2	272	D	352	*, D	152	*	75 - 125
Zinc	53.2	366	D	449	*, D	157	*	75 - 125

* Values outside of QC limits

INITIAL CALIBRATION DATA

EPA 6010D

Laboratory: Analytical Resources, LLC
SDG: 22D0456
Client: Anchor QEA, LLC
Project: Harris Avenue Shipyard
Calibration: FE00019
Instrument: ICP2
Calibration Date: 05/06/2022 15:30

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	Conc	RF	Conc	RF	Conc	RF	Conc	RF	Conc	RF	Conc	RF
Copper	0	0	10	115319.9	0		0					
Zinc	0	0			10	3367.266	0					

INITIAL CALIBRATION DATA

EPA 6010D

Laboratory:	Analytical Resources, LLC	SDG:	22D0456
Client:	Anchor QEA, LLC	Project:	Harris Avenue Shipyard
Calibration:	FE00019	Instrument:	ICP2
Calibration Date:	05/06/2022 15:30		

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	COD Limit	Q
Copper	57659.95	141.4	1.0000			
Zinc	1683.633	141.4	1.0000			

Soil Analytical Data from Upland Profiling Investigation (2024)

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
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May 9, 2024

Eric Marhofer, Project Manager
Aspect Consulting
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Mr Marhofer:

Included are the results from the testing of material submitted on April 24, 2024 from the Harris Shipyard AS210195B, F&BI 404381 project. There are 101 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Aspect Data
ASP0509R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 24, 2024 by Friedman & Bruya, Inc. from the Aspect Consulting Harris Shipyard AS210195B, F&BI 404381 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting
404381 -01	HA-1_0-1_20240422
404381 -02	HA-1_1-2_20240422
404381 -03	HA-2_0-1_20240422
404381 -04	HA-2_1-2_20240422
404381 -05	HA-3_0-1_20240422
404381 -06	HA-3_1-1.5_20240422
404381 -07	HA-4_0-1_20240422
404381 -08	HA-4_1-2_20240422
404381 -09	HA-5_0-1_20240422
404381 -10	HA-6_0-1_20240422
404381 -11	HA-6_1-1.4_20240422
404381 -12	HA-8_0-1_20240422
404381 -13	HA-8_1-2_20240422
404381 -14	HA-9_0-1_20240422
404381 -15	HA-9_1-2_20240422
404381 -16	HA-10_0-1_20240422
404381 -17	HA-10_1-2_20240422
404381 -18	HA-11_0-1_20240422
404381 -19	HA-11_1-2_20240422
404381 -20	HA-12_0-1_20240423
404381 -21	HA-12_1-2_20240423
404381 -22	HA-7_0-0.9_20240423
404381 -23	HA-13_0-1_20240423
404381 -24	HA-14_0-1_20240423

An 8270E internal standard failed the acceptance criteria for sample HA-14_0-1_20240423. The sample was diluted and reanalyzed with acceptable results. Both data sets were reported.

The 6020B mercury calibration standard exceeded the acceptance criteria for several samples. The metal was not detected, therefore this did not represent an out of control condition, and the results are not considered estimates.

Silver in the 6020B matrix spike and matrix spike duplicate did not meet the acceptance criteria. The laboratory control sample passed the acceptance criteria, therefore the results were due to matrix effect.

All other quality control requirements were acceptable.

Date of Report: 05/09/24
Date Received: 04/24/24
Project: Harris Shipyard AS210195B, F&BI 404381
Date Extracted: 04/28/24
Date Analyzed: 04/28/24

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
HA-1_0-1_20240422 404381-01	<50	<250	97
HA-1_1-2_20240422 404381-02	<50	<250	97
HA-2_0-1_20240422 404381-03	340	960	93
HA-2_1-2_20240422 404381-04	<50	<250	91
HA-3_0-1_20240422 404381-05	<50	270	93
HA-3_1-1.5_20240422 404381-06	<50	<250	92
HA-4_0-1_20240422 404381-07	<50	<250	91
HA-4_1-2_20240422 404381-08	<50	<250	98
HA-5_0-1_20240422 404381-09	<50	<250	95
HA-6_0-1_20240422 404381-10	<50	<250	96
HA-6_1-1.4_20240422 404381-11	<50	<250	92
HA-8_0-1_20240422 404381-12	<50	520	92

Date of Report: 05/09/24
Date Received: 04/24/24
Project: Harris Shipyard AS210195B, F&BI 404381
Date Extracted: 04/28/24
Date Analyzed: 04/28/24

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
HA-8_1-2_20240422 404381-13	<50	<250	95
HA-9_0-1_20240422 404381-14	<50	<250	94
HA-9_1-2_20240422 404381-15	<50	<250	93
HA-10_0-1_20240422 404381-16	<50	<250	94
HA-10_1-2_20240422 404381-17	<50	<250	92
HA-11_0-1_20240422 404381-18	<50	<250	94
HA-11_1-2_20240422 404381-19	<50	<250	95
HA-12_0-1_20240423 404381-20	<50	<250	96
HA-12_1-2_20240423 404381-21	<50	<250	95
HA-7_0-0.9_20240423 404381-22	<50	<250	93
HA-13_0-1_20240423 404381-23	<50	<250	94

Date of Report: 05/09/24
Date Received: 04/24/24
Project: Harris Shipyard AS210195B, F&BI 404381
Date Extracted: 04/28/24
Date Analyzed: 04/28/24

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
HA-14_0-1_20240423 404381-24	<50	400	91
Method Blank 04-1021 MB	<50	<250	97
Method Blank 04-1024 MB	<50	<250	93

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-1_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-01 1/5
Date Analyzed:	04/29/24	Data File:	042908.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	74	16	137
2-Fluorobiphenyl	80	46	122
2,4,6-Tribromophenol	63 ca	17	154
Terphenyl-d14	76	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.043
Anthracene	<0.01
Fluoranthene	0.085
Pyrene	0.087
Benz(a)anthracene	0.036
Chrysene	0.048
Benzo(a)pyrene	0.040
Benzo(b)fluoranthene	0.058
Benzo(k)fluoranthene	0.022
Indeno(1,2,3-cd)pyrene	0.033
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.038

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-1_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-02 1/5
Date Analyzed:	04/29/24	Data File:	042911.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	71	16	137
2-Fluorobiphenyl	82	46	122
2,4,6-Tribromophenol	85 ca	17	154
Terphenyl-d14	80	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.025
Anthracene	<0.01
Fluoranthene	0.062
Pyrene	0.053
Benz(a)anthracene	0.026
Chrysene	0.031
Benzo(a)pyrene	0.028
Benzo(b)fluoranthene	0.044
Benzo(k)fluoranthene	0.015
Indeno(1,2,3-cd)pyrene	0.019
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.020

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-2_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-03 1/25
Date Analyzed:	04/29/24	Data File:	042919.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	75 d	16	137
2-Fluorobiphenyl	86 d	46	122
2,4,6-Tribromophenol	55 ca d	17	154
Terphenyl-d14	83 d	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	0.070
Fluorene	0.082
Phenanthrene	0.82
Anthracene	0.096
Fluoranthene	1.2
Pyrene	1.1
Benz(a)anthracene	0.55
Chrysene	0.68
Benzo(a)pyrene	0.65
Benzo(b)fluoranthene	0.89
Benzo(k)fluoranthene	0.34
Indeno(1,2,3-cd)pyrene	0.28
Dibenz(a,h)anthracene	0.061
Benzo(g,h,i)perylene	0.28

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-2_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-04 1/25
Date Analyzed:	04/29/24	Data File:	042920.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	72 d	16	137
2-Fluorobiphenyl	91 d	46	122
2,4,6-Tribromophenol	78 ca d	17	154
Terphenyl-d14	76 d	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	0.12
Anthracene	<0.05
Fluoranthene	0.25
Pyrene	0.22
Benz(a)anthracene	0.11
Chrysene	0.16
Benzo(a)pyrene	0.16
Benzo(b)fluoranthene	0.32
Benzo(k)fluoranthene	0.12
Indeno(1,2,3-cd)pyrene	0.11
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	0.12

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-3_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-05 1/25
Date Analyzed:	04/29/24	Data File:	042921.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	80 d	16	137
2-Fluorobiphenyl	94 d	46	122
2,4,6-Tribromophenol	43 ca d	17	154
Terphenyl-d14	84 d	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	0.27
Anthracene	<0.05
Fluoranthene	0.70
Pyrene	0.62
Benz(a)anthracene	0.38
Chrysene	0.43
Benzo(a)pyrene	0.44
Benzo(b)fluoranthene	0.66
Benzo(k)fluoranthene	0.25
Indeno(1,2,3-cd)pyrene	0.20
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	0.18

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-3_1-1.5_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-06 1/5
Date Analyzed:	04/29/24	Data File:	042912.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	72	16	137
2-Fluorobiphenyl	78	46	122
2,4,6-Tribromophenol	71 ca	17	154
Terphenyl-d14	83	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.011
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	0.018
Fluorene	0.020
Phenanthrene	0.24
Anthracene	0.048
Fluoranthene	0.34
Pyrene	0.28
Benz(a)anthracene	0.16
Chrysene	0.16
Benzo(a)pyrene	0.14
Benzo(b)fluoranthene	0.21
Benzo(k)fluoranthene	0.077
Indeno(1,2,3-cd)pyrene	0.085
Dibenz(a,h)anthracene	0.021
Benzo(g,h,i)perylene	0.078

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-4_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-07 1/25
Date Analyzed:	04/29/24	Data File:	042922.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	83 d	16	137
2-Fluorobiphenyl	98 d	46	122
2,4,6-Tribromophenol	50 ca d	17	154
Terphenyl-d14	93 d	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	0.18
Anthracene	<0.05
Fluoranthene	0.48
Pyrene	0.46
Benz(a)anthracene	0.20
Chrysene	0.48
Benzo(a)pyrene	0.27
Benzo(b)fluoranthene	0.70
Benzo(k)fluoranthene	0.24
Indeno(1,2,3-cd)pyrene	0.14
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	0.14

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-4_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-08 1/5
Date Analyzed:	04/29/24	Data File:	042913.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	74	16	137
2-Fluorobiphenyl	80	46	122
2,4,6-Tribromophenol	80 ca	17	154
Terphenyl-d14	79	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	0.011
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.069
Anthracene	<0.01
Fluoranthene	0.19
Pyrene	0.17
Benz(a)anthracene	0.072
Chrysene	0.14
Benzo(a)pyrene	0.095
Benzo(b)fluoranthene	0.21
Benzo(k)fluoranthene	0.068
Indeno(1,2,3-cd)pyrene	0.064
Dibenz(a,h)anthracene	0.013
Benzo(g,h,i)perylene	0.067

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-5_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-09 1/5
Date Analyzed:	04/29/24	Data File:	042914.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	77	16	137
2-Fluorobiphenyl	83	46	122
2,4,6-Tribromophenol	70 ca	17	154
Terphenyl-d14	78	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.044
Anthracene	<0.01
Fluoranthene	0.10
Pyrene	0.092
Benz(a)anthracene	0.048
Chrysene	0.066
Benzo(a)pyrene	0.054
Benzo(b)fluoranthene	0.095
Benzo(k)fluoranthene	0.033
Indeno(1,2,3-cd)pyrene	0.034
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.037

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-6_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-10 1/25
Date Analyzed:	04/29/24	Data File:	042915.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	77 d	10	198
2-Fluorobiphenyl	83 d	45	117
2,4,6-Tribromophenol	85 d	11	158
Terphenyl-d14	100 d	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	0.081
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	0.46
Anthracene	0.097
Fluoranthene	1.1
Pyrene	1.5
Benz(a)anthracene	0.70
Chrysene	0.72
Benzo(a)pyrene	0.86
Benzo(b)fluoranthene	0.95
Benzo(k)fluoranthene	0.26
Indeno(1,2,3-cd)pyrene	0.47
Dibenz(a,h)anthracene	0.11
Benzo(g,h,i)perylene	0.52

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-6_1-1.4_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-11 1/25
Date Analyzed:	04/29/24	Data File:	042916.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	80 d	10	198
2-Fluorobiphenyl	93 d	45	117
2,4,6-Tribromophenol	99 d	11	158
Terphenyl-d14	106 d	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	0.31
Anthracene	0.050
Fluoranthene	0.72
Pyrene	0.85
Benz(a)anthracene	0.40
Chrysene	0.46
Benzo(a)pyrene	0.52
Benzo(b)fluoranthene	0.70
Benzo(k)fluoranthene	0.20
Indeno(1,2,3-cd)pyrene	0.32
Dibenz(a,h)anthracene	0.071
Benzo(g,h,i)perylene	0.35

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-8_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-12 1/25
Date Analyzed:	04/30/24	Data File:	043014.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	66 d	16	137
2-Fluorobiphenyl	84 d	46	122
2,4,6-Tribromophenol	47 d ca	17	154
Terphenyl-d14	95 d	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.10
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	0.20
Anthracene	<0.05
Fluoranthene	0.34
Pyrene	0.28
Benz(a)anthracene	0.073
Chrysene	0.14
Benzo(a)pyrene	0.069
Benzo(b)fluoranthene	0.15
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-8_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-13 1/25
Date Analyzed:	04/29/24	Data File:	042923.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	72 d	16	137
2-Fluorobiphenyl	90 d	46	122
2,4,6-Tribromophenol	40 ca d	17	154
Terphenyl-d14	87 d	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	<0.05
Pyrene	<0.05
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	<0.05
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-9_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-14 1/25
Date Analyzed:	04/29/24	Data File:	042911.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	79 d	10	198
2-Fluorobiphenyl	92 d	45	117
2,4,6-Tribromophenol	100 d	11	158
Terphenyl-d14	101 d	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	0.15
Anthracene	<0.05
Fluoranthene	0.43
Pyrene	0.52
Benz(a)anthracene	0.30
Chrysene	0.43
Benzo(a)pyrene	0.74
Benzo(b)fluoranthene	1.1
Benzo(k)fluoranthene	0.32
Indeno(1,2,3-cd)pyrene	0.52
Dibenz(a,h)anthracene	0.11
Benzo(g,h,i)perylene	0.56

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-9_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-15 1/25
Date Analyzed:	04/29/24	Data File:	042912.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	81 d	10	198
2-Fluorobiphenyl	92 d	45	117
2,4,6-Tribromophenol	105 d	11	158
Terphenyl-d14	101 d	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	0.15
Anthracene	<0.05
Fluoranthene	0.41
Pyrene	0.52
Benz(a)anthracene	0.29
Chrysene	0.43
Benzo(a)pyrene	0.73
Benzo(b)fluoranthene	1.1
Benzo(k)fluoranthene	0.31
Indeno(1,2,3-cd)pyrene	0.57
Dibenz(a,h)anthracene	0.12
Benzo(g,h,i)perylene	0.63

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-10_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-16 1/5
Date Analyzed:	04/29/24	Data File:	042915.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	76	16	137
2-Fluorobiphenyl	84	46	122
2,4,6-Tribromophenol	77 ca	17	154
Terphenyl-d14	79	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.096
Anthracene	0.017
Fluoranthene	0.20
Pyrene	0.16
Benz(a)anthracene	0.071
Chrysene	0.073
Benzo(a)pyrene	0.055
Benzo(b)fluoranthene	0.086
Benzo(k)fluoranthene	0.031
Indeno(1,2,3-cd)pyrene	0.027
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.027

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-10_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-17 1/5
Date Analyzed:	04/29/24	Data File:	042916.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	76	16	137
2-Fluorobiphenyl	83	46	122
2,4,6-Tribromophenol	83 ca	17	154
Terphenyl-d14	79	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.063
Anthracene	<0.01
Fluoranthene	0.14
Pyrene	0.12
Benz(a)anthracene	0.048
Chrysene	0.060
Benzo(a)pyrene	0.057
Benzo(b)fluoranthene	0.090
Benzo(k)fluoranthene	0.033
Indeno(1,2,3-cd)pyrene	0.034
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.038

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-11_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-18 1/5
Date Analyzed:	04/29/24	Data File:	042917.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	72	16	137
2-Fluorobiphenyl	81	46	122
2,4,6-Tribromophenol	75 ca	17	154
Terphenyl-d14	79	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.043
Anthracene	<0.01
Fluoranthene	0.062
Pyrene	0.063
Benz(a)anthracene	0.029
Chrysene	0.041
Benzo(a)pyrene	0.039
Benzo(b)fluoranthene	0.060
Benzo(k)fluoranthene	0.021
Indeno(1,2,3-cd)pyrene	0.021
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.023

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-11_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-19 1/5
Date Analyzed:	04/29/24	Data File:	042918.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	83	16	137
2-Fluorobiphenyl	81	46	122
2,4,6-Tribromophenol	77 ca	17	154
Terphenyl-d14	76	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.017
Anthracene	<0.01
Fluoranthene	0.039
Pyrene	0.045
Benz(a)anthracene	0.025
Chrysene	0.034
Benzo(a)pyrene	0.034
Benzo(b)fluoranthene	0.049
Benzo(k)fluoranthene	0.017
Indeno(1,2,3-cd)pyrene	0.016
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.017

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-12_0-1_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-20 1/5
Date Analyzed:	04/29/24	Data File:	042910.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	72	16	137
2-Fluorobiphenyl	79	46	122
2,4,6-Tribromophenol	82 ca	17	154
Terphenyl-d14	80	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.015
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	0.011
Phenanthrene	0.17
Anthracene	0.020
Fluoranthene	0.27
Pyrene	0.24
Benz(a)anthracene	0.10
Chrysene	0.11
Benzo(a)pyrene	0.11
Benzo(b)fluoranthene	0.15
Benzo(k)fluoranthene	0.057
Indeno(1,2,3-cd)pyrene	0.061
Dibenz(a,h)anthracene	0.014
Benzo(g,h,i)perylene	0.062

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-12_1-2_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-21 1/5
Date Analyzed:	04/29/24	Data File:	042909.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	71	16	137
2-Fluorobiphenyl	82	46	122
2,4,6-Tribromophenol	82 ca	17	154
Terphenyl-d14	81	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.011
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.088
Anthracene	0.011
Fluoranthene	0.12
Pyrene	0.11
Benz(a)anthracene	0.047
Chrysene	0.060
Benzo(a)pyrene	0.059
Benzo(b)fluoranthene	0.073
Benzo(k)fluoranthene	0.026
Indeno(1,2,3-cd)pyrene	0.038
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.041

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-7_0-0.9_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-22 1/25
Date Analyzed:	04/29/24	Data File:	042913.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	67 d	10	198
2-Fluorobiphenyl	77 d	45	117
2,4,6-Tribromophenol	73 d	11	158
Terphenyl-d14	91 d	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	0.19
Anthracene	<0.05
Fluoranthene	0.45
Pyrene	0.41
Benz(a)anthracene	0.23
Chrysene	0.23
Benzo(a)pyrene	0.26
Benzo(b)fluoranthene	0.36
Benzo(k)fluoranthene	0.12
Indeno(1,2,3-cd)pyrene	0.19
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	0.22

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-13_0-1_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-23 1/25
Date Analyzed:	04/29/24	Data File:	042914.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	73 d	10	198
2-Fluorobiphenyl	78 d	45	117
2,4,6-Tribromophenol	92 d	11	158
Terphenyl-d14	100 d	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	0.27
Anthracene	<0.05
Fluoranthene	0.47
Pyrene	0.49
Benz(a)anthracene	0.21
Chrysene	0.26
Benzo(a)pyrene	0.31
Benzo(b)fluoranthene	0.41
Benzo(k)fluoranthene	0.14
Indeno(1,2,3-cd)pyrene	0.25
Dibenz(a,h)anthracene	0.052
Benzo(g,h,i)perylene	0.30

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-14_0-1_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-24 1/25
Date Analyzed:	04/30/24	Data File:	043015.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	73 d	16	137
2-Fluorobiphenyl	91 d	46	122
2,4,6-Tribromophenol	55 d ca	17	154
Terphenyl-d14	108 d	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
2-Methylnaphthalene	<0.05
1-Methylnaphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	<0.05
Pyrene	<0.05
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05 J
Benzo(b)fluoranthene	0.053 J
Benzo(k)fluoranthene	<0.05 J
Indeno(1,2,3-cd)pyrene	<0.05 J
Dibenz(a,h)anthracene	<0.05 J
Benzo(g,h,i)perylene	<0.05 J

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	HA-14_0-1_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	404381-24 1/100
Date Analyzed:	04/29/24	Data File:	042918.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	66 d	10	198
2-Fluorobiphenyl	74 d	45	117
2,4,6-Tribromophenol	85 d	11	158
Terphenyl-d14	84 d	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.2
2-Methylnaphthalene	<0.2
1-Methylnaphthalene	<0.2
Acenaphthylene	<0.2
Acenaphthene	<0.2
Fluorene	<0.2
Phenanthrene	<0.2
Anthracene	<0.2
Fluoranthene	<0.2
Pyrene	<0.2
Benz(a)anthracene	<0.2
Chrysene	<0.2
Benzo(a)pyrene	<0.2
Benzo(b)fluoranthene	<0.2
Benzo(k)fluoranthene	<0.2
Indeno(1,2,3-cd)pyrene	<0.2
Dibenz(a,h)anthracene	<0.2
Benzo(g,h,i)perylene	<0.2

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	04-1017 mb2 1/5
Date Analyzed:	04/29/24	Data File:	042905.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	89	10	198
2-Fluorobiphenyl	87	45	117
2,4,6-Tribromophenol	73	11	158
Terphenyl-d14	101	50	124

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270E

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Harris Shipyard AS210195B
Date Extracted:	04/26/24	Lab ID:	04-1023 mb 1/5
Date Analyzed:	04/29/24	Data File:	042907.D
Matrix:	Soil	Instrument:	GCMS12
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Nitrobenzene-d5	87	16	137
2-Fluorobiphenyl	91	46	122
2,4,6-Tribromophenol	87 ca	17	154
Terphenyl-d14	87	31	167

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
2-Methylnaphthalene	<0.01
1-Methylnaphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-1_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-01
Date Analyzed:	04/25/24	Data File:	404381-01.051
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	5.3
Barium	45
Cadmium	<1
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-1_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-01 x5
Date Analyzed:	04/26/24	Data File:	404381-01 x5.132
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Chromium	68
Lead	110

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-1_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-02
Date Analyzed:	04/25/24	Data File:	404381-02.068
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.4
Barium	27
Cadmium	<1
Chromium	27
Lead	54
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-2_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-03
Date Analyzed:	04/25/24	Data File:	404381-03.075
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	72
Cadmium	1.2
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-2_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-03 x5
Date Analyzed:	04/26/24	Data File:	404381-03 x5.133
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Barium	110
Chromium	49
Lead	180

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-2_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-04
Date Analyzed:	04/25/24	Data File:	404381-04.076
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	18
Cadmium	<1
Chromium	22
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-2_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-04 x5
Date Analyzed:	04/26/24	Data File:	404381-04 x5.134
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Barium	34
Lead	87

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-3_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-05
Date Analyzed:	04/25/24	Data File:	404381-05.079
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Mercury	1.4

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-3_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-05 x2
Date Analyzed:	04/26/24	Data File:	404381-05 x2.136
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	230
Barium	180
Cadmium	2.8
Selenium	<2
Silver	<2

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-3_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-05 x10
Date Analyzed:	04/26/24	Data File:	404381-05 x10.135
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Chromium	43
Lead	470

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-3_1-1.5_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-06
Date Analyzed:	04/25/24	Data File:	404381-06.080
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	64
Cadmium	1.2
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-3_1-1.5_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-06 x5
Date Analyzed:	04/26/24	Data File:	404381-06 x5.137
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Barium	130
Chromium	22
Lead	130

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-4_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-07
Date Analyzed:	04/25/24	Data File:	404381-07.089
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	49
Cadmium	1.3
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-4_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-07 x5
Date Analyzed:	04/26/24	Data File:	404381-07 x5.138
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Barium	120
Chromium	35
Lead	230

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-4_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-08
Date Analyzed:	04/25/24	Data File:	404381-08.090
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	22
Cadmium	<1
Chromium	21
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-4_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-08 x5
Date Analyzed:	04/26/24	Data File:	404381-08 x5.153
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Barium	66
Lead	110

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-5_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-09
Date Analyzed:	04/25/24	Data File:	404381-09.091
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	99
Cadmium	1.4
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-5_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-09 x5
Date Analyzed:	04/26/24	Data File:	404381-09 x5.154
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Barium	190
Chromium	42
Lead	230

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-6_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-10
Date Analyzed:	04/25/24	Data File:	404381-10.092
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	32
Cadmium	<1
Chromium	20
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-6_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-10 x5
Date Analyzed:	04/26/24	Data File:	404381-10 x5.166
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Barium	110
Lead	140

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-6_1-1.4_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-11
Date Analyzed:	04/26/24	Data File:	404381-11.176
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	110
Barium	120
Cadmium	1.5
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-6_1-1.4_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-11
Date Analyzed:	04/29/24	Data File:	404381-11.134
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Mercury	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-6_1-1.4_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-11 x5
Date Analyzed:	04/29/24	Data File:	404381-11 x5.132
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Chromium	35
Lead	180

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-8_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-12
Date Analyzed:	04/26/24	Data File:	404381-12.177
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	14
Barium	48
Cadmium	<1
Chromium	31
Lead	94
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-8_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-13
Date Analyzed:	04/26/24	Data File:	404381-13.178
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.0
Barium	31
Cadmium	<1
Chromium	16
Lead	39
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-9_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-14
Date Analyzed:	04/26/24	Data File:	404381-14.179
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	99
Barium	110
Cadmium	1.2
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-9_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-14 x5
Date Analyzed:	04/29/24	Data File:	404381-14 x5.126
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Chromium	37
Lead	150

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-9_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-15
Date Analyzed:	04/26/24	Data File:	404381-15.188
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	38
Barium	110
Cadmium	<1
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-9_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-15 x5
Date Analyzed:	04/29/24	Data File:	404381-15 x5.127
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Chromium	38
Lead	220

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-10_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-16
Date Analyzed:	04/26/24	Data File:	404381-16.189
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	38
Barium	75
Cadmium	<1
Lead	55
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-10_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-16 x5
Date Analyzed:	04/29/24	Data File:	404381-16 x5.128
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Chromium	26

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-10_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-17
Date Analyzed:	04/26/24	Data File:	404381-17.190
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	21
Barium	72
Cadmium	<1
Lead	52
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-10_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-17 x5
Date Analyzed:	04/29/24	Data File:	404381-17 x5.129
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Chromium	23

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-11_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-18
Date Analyzed:	04/25/24	Data File:	404381-18.061
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	6.0
Barium	46
Cadmium	<1
Chromium	18
Lead	20
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-11_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-19
Date Analyzed:	04/26/24	Data File:	404381-19.191
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	4.5
Barium	35
Cadmium	<1
Chromium	18
Lead	13
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-12_0-1_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-20
Date Analyzed:	04/26/24	Data File:	404381-20.192
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	13
Barium	110
Cadmium	1.1
Chromium	22
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-12_0-1_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-20 x10
Date Analyzed:	04/29/24	Data File:	404381-20 x10.139
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	330

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-12_1-2_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-21
Date Analyzed:	04/27/24	Data File:	404381-21.201
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.6
Barium	96
Cadmium	<1
Chromium	13
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-12_1-2_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-21 x10
Date Analyzed:	04/29/24	Data File:	404381-21 x10.140
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	410

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-7_0-0.9_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-22
Date Analyzed:	04/27/24	Data File:	404381-22.202
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	150
Barium	130
Cadmium	1.8
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-7_0-0.9_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-22 x10
Date Analyzed:	04/29/24	Data File:	404381-22 x10.141
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Chromium	39
Lead	240

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-13_0-1_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-23
Date Analyzed:	04/27/24	Data File:	404381-23.203
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	33
Barium	78
Cadmium	<1
Chromium	22
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-13_0-1_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-23 x10
Date Analyzed:	04/29/24	Data File:	404381-23 x10.144
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	160

Analysis For Total Metals By EPA Method 6020B

Client ID:	HA-14_0-1_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	404381-24
Date Analyzed:	04/27/24	Data File:	404381-24.204
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	8.1
Barium	38
Cadmium	<1
Chromium	14
Lead	16
Mercury	<1 k
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Aspect Consulting
Date Received:	NA	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	I4-331 mb
Date Analyzed:	04/25/24	Data File:	I4-331 mb.039
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Barium	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1
Selenium	<1
Silver	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Aspect Consulting
Date Received:	NA	Project:	Harris Shipyard AS210195B
Date Extracted:	04/25/24	Lab ID:	I4-332 mb
Date Analyzed:	04/25/24	Data File:	I4-332 mb.052
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Barium	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1
Selenium	<1
Silver	<1

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-1_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-01
Date Analyzed:	05/07/24	Data File:	404381-01.054
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Lead	<1	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-2_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-03
Date Analyzed:	05/07/24	Data File:	404381-03.055
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Lead	<1	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-3_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-05
Date Analyzed:	05/07/24	Data File:	404381-05.056
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Lead	<1	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-3_1-1.5_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-06
Date Analyzed:	05/07/24	Data File:	404381-06.064
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Lead	<1	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-4_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-07
Date Analyzed:	05/07/24	Data File:	404381-07.065
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Lead	<1	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-4_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-08
Date Analyzed:	05/07/24	Data File:	404381-08.066
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Lead	4.9	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-5_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-09
Date Analyzed:	05/07/24	Data File:	404381-09.067
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Lead	<1	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-6_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-10
Date Analyzed:	05/07/24	Data File:	404381-10.068
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Lead	<1	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-6_1-1.4_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-11
Date Analyzed:	05/07/24	Data File:	404381-11.156
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Lead	<1	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-9_0-1_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-14
Date Analyzed:	05/07/24	Data File:	404381-14.157
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Lead	<1	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-9_1-2_20240422	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-15
Date Analyzed:	05/07/24	Data File:	404381-15.158
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Lead	<1	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-12_0-1_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-20
Date Analyzed:	05/07/24	Data File:	404381-20.159
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Lead	3.5	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-12_1-2_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-21
Date Analyzed:	05/07/24	Data File:	404381-21.160
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Lead	2.2	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-7_0-0.9_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-22
Date Analyzed:	05/07/24	Data File:	404381-22.161
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Lead	<1	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	HA-13_0-1_20240423	Client:	Aspect Consulting
Date Received:	04/24/24	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	404381-23
Date Analyzed:	05/07/24	Data File:	404381-23.162
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Lead	<1	5.0

Analysis for TCLP Metals By EPA Method 6020B and 1311

Client ID:	Method Blank	Client:	Aspect Consulting
Date Received:	NA	Project:	Harris Shipyard AS210195B
Date Extracted:	05/06/24	Lab ID:	I4-363 mb
Date Analyzed:	05/07/24	Data File:	I4-363 mb.049
Matrix:	Soil/Solid	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)	TCLP Limit
Arsenic	<1	5.0
Lead	<1	5.0

Date of Report: 05/09/24
Date Received: 04/24/24
Project: Harris Shipyard AS210195B, F&BI 404381

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 404410-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	5,000	100	98	63-146	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	100	77-123

Date of Report: 05/09/24
Date Received: 04/24/24
Project: Harris Shipyard AS210195B, F&BI 404381

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 404381-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	94	102	63-146	8

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	100	77-123

Date of Report: 05/09/24
Date Received: 04/24/24
Project: Harris Shipyard AS210195B, F&BI 404381

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: 404382-04 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.83	<0.01	73	71	28-125	3
2-Methylnaphthalene	mg/kg (ppm)	0.83	<0.01	80	80	10-192	0
1-Methylnaphthalene	mg/kg (ppm)	0.83	<0.01	80	81	10-163	1
Acenaphthylene	mg/kg (ppm)	0.83	<0.01	83	84	45-128	1
Acenaphthene	mg/kg (ppm)	0.83	<0.01	80	81	36-125	1
Fluorene	mg/kg (ppm)	0.83	<0.01	85	86	48-121	1
Phenanthrene	mg/kg (ppm)	0.83	<0.01	82	82	46-122	0
Anthracene	mg/kg (ppm)	0.83	<0.01	84	85	30-144	1
Fluoranthene	mg/kg (ppm)	0.83	<0.01	87	88	50-150	1
Pyrene	mg/kg (ppm)	0.83	<0.01	85	88	40-134	3
Benz(a)anthracene	mg/kg (ppm)	0.83	<0.01	86	90	50-150	5
Chrysene	mg/kg (ppm)	0.83	<0.01	84	87	50-150	4
Benzo(a)pyrene	mg/kg (ppm)	0.83	<0.01	91	93	50-150	2
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	<0.01	91	94	50-150	3
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	<0.01	89	90	50-150	1
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	<0.01	86	89	40-140	3
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	<0.01	85	88	41-136	3
Benzo(g,h,i)perylene	mg/kg (ppm)	0.83	<0.01	82	83	29-139	1

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.83	88	57-107
2-Methylnaphthalene	mg/kg (ppm)	0.83	93	63-112
1-Methylnaphthalene	mg/kg (ppm)	0.83	93	63-113
Acenaphthylene	mg/kg (ppm)	0.83	92	70-130
Acenaphthene	mg/kg (ppm)	0.83	91	66-112
Fluorene	mg/kg (ppm)	0.83	93	67-117
Phenanthrene	mg/kg (ppm)	0.83	96	70-130
Anthracene	mg/kg (ppm)	0.83	97	70-130
Fluoranthene	mg/kg (ppm)	0.83	101	70-130
Pyrene	mg/kg (ppm)	0.83	99	70-130
Benz(a)anthracene	mg/kg (ppm)	0.83	100	70-130
Chrysene	mg/kg (ppm)	0.83	97	70-130
Benzo(a)pyrene	mg/kg (ppm)	0.83	106	68-120
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	108	67-128
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	105	70-130
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	100	67-129
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	97	67-128
Benzo(g,h,i)perylene	mg/kg (ppm)	0.83	94	65-130

Date of Report: 05/09/24
Date Received: 04/24/24
Project: Harris Shipyard AS210195B, F&BI 404381

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270E

Laboratory Code: 404381-02 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.83	<0.01	71	73	50-150	3
2-Methylnaphthalene	mg/kg (ppm)	0.83	<0.01	71	75	50-150	5
1-Methylnaphthalene	mg/kg (ppm)	0.83	<0.01	72	76	50-150	5
Acenaphthylene	mg/kg (ppm)	0.83	<0.01	80	80	50-150	0
Acenaphthene	mg/kg (ppm)	0.83	<0.01	82	82	50-150	0
Fluorene	mg/kg (ppm)	0.83	<0.01	80	83	50-150	4
Phenanthrene	mg/kg (ppm)	0.83	0.023	77	79	10-170	3
Anthracene	mg/kg (ppm)	0.83	<0.01	77	79	37-139	3
Fluoranthene	mg/kg (ppm)	0.83	0.057	74	75	10-203	1
Pyrene	mg/kg (ppm)	0.83	0.049	76	74	10-208	3
Benz(a)anthracene	mg/kg (ppm)	0.83	0.024	84	82	37-146	2
Chrysene	mg/kg (ppm)	0.83	0.028	75	71	36-144	5
Benzo(a)pyrene	mg/kg (ppm)	0.83	0.026	77	75	40-150	3
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	0.040	75	74	45-157	1
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	0.014	80	79	50-150	1
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	0.017	77	74	24-145	4
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	<0.01	78	76	31-137	3
Benzo(g,h,i)perylene	mg/kg (ppm)	0.83	<0.03	74	69	14-141	7

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.83	80	59-105
2-Methylnaphthalene	mg/kg (ppm)	0.83	81	62-108
1-Methylnaphthalene	mg/kg (ppm)	0.83	82	62-108
Acenaphthylene	mg/kg (ppm)	0.83	89	61-111
Acenaphthene	mg/kg (ppm)	0.83	91	61-110
Fluorene	mg/kg (ppm)	0.83	90	62-114
Phenanthrene	mg/kg (ppm)	0.83	88	64-112
Anthracene	mg/kg (ppm)	0.83	86	63-111
Fluoranthene	mg/kg (ppm)	0.83	90	66-115
Pyrene	mg/kg (ppm)	0.83	87	65-112
Benz(a)anthracene	mg/kg (ppm)	0.83	98	64-116
Chrysene	mg/kg (ppm)	0.83	93	66-119
Benzo(a)pyrene	mg/kg (ppm)	0.83	98	62-116
Benzo(b)fluoranthene	mg/kg (ppm)	0.83	99	61-118
Benzo(k)fluoranthene	mg/kg (ppm)	0.83	98	65-119
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.83	101	64-130
Dibenz(a,h)anthracene	mg/kg (ppm)	0.83	98	67-131
Benzo(g,h,i)perylene	mg/kg (ppm)	0.83	100	67-126

Date of Report: 05/09/24
Date Received: 04/24/24
Project: Harris Shipyard AS210195B, F&BI 404381

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 404318-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	3.01	91 b	107 b	75-125	16 b
Barium	mg/kg (ppm)	50	42.2	100 b	104 b	75-125	4 b
Cadmium	mg/kg (ppm)	10	<1	101	98	75-125	3
Chromium	mg/kg (ppm)	50	14.7	93 b	90 b	75-125	3 b
Lead	mg/kg (ppm)	50	8.65	89	97	75-125	9
Mercury	mg/kg (ppm	5	<1	105	106	75-125	1
Selenium	mg/kg (ppm)	5	<1	104	102	75-125	2
Silver	mg/kg (ppm)	10	<1	91	90	75-125	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	98	80-120
Barium	mg/kg (ppm)	50	102	80-120
Cadmium	mg/kg (ppm)	10	101	80-120
Chromium	mg/kg (ppm)	50	104	80-120
Lead	mg/kg (ppm)	50	103	80-120
Mercury	mg/kg (ppm)	5	116	80-120
Selenium	mg/kg (ppm)	5	105	80-120
Silver	mg/kg (ppm)	10	94	80-120

Date of Report: 05/09/24
Date Received: 04/24/24
Project: Harris Shipyard AS210195B, F&BI 404381

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 404381-18 x5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	5.27	87 b	90 b	75-125	3 b
Barium	mg/kg (ppm)	50	41.2	109 b	115 b	75-125	5 b
Cadmium	mg/kg (ppm)	10	<5	93	93	75-125	0
Chromium	mg/kg (ppm)	50	19.6	100 b	106 b	75-125	6 b
Lead	mg/kg (ppm)	50	19.8	98 b	104 b	75-125	6 b
Mercury	mg/kg (ppm	5	<5	104	101	75-125	3
Selenium	mg/kg (ppm)	5	<5	94	94	75-125	0
Silver	mg/kg (ppm)	10	<5	69 vo	71 vo	75-125	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	94	80-120
Barium	mg/kg (ppm)	50	102	80-120
Cadmium	mg/kg (ppm)	10	99	80-120
Chromium	mg/kg (ppm)	50	99	80-120
Lead	mg/kg (ppm)	50	98	80-120
Mercury	mg/kg (ppm)	5	112	80-120
Selenium	mg/kg (ppm)	5	108	80-120
Silver	mg/kg (ppm)	10	90	80-120

Date of Report: 05/09/24
Date Received: 04/24/24
Project: Harris Shipyard AS210195B, F&BI 404381

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL/SOLID SAMPLES FOR TCLP METALS USING EPA METHODS 6020B AND 1311

Laboratory Code: 405070-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/L (ppm)	1.0	<1	91	89	75-125	2
Lead	mg/L (ppm)	1.0	<1	96	96	75-125	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/L (ppm)	1.0	87	80-120
Lead	mg/L (ppm)	1.0	95	80-120

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

404381

SAMPLE CHAIN OF CUSTODY 04/24/24 MH

Page # 1 of 3

Report To Eric Markofer
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-838-6582 Email Eric.Markofer@aspectconsulting.com

SAMPLERS (signature)

PROJECT NAME: Harris Shipyard
PO #: AS210195B
REMARKS: Project specific RLs? - Yes / No
INVOICE TO: Eric Markofer

TURNAROUND TIME
- ◆ Standard turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Archive samples
- ☐ Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	RCRA 8 Metals	TCLP Pb	TCLP As		Notes
						ANALYSES REQUESTED											⊗ per EM
HA-1_0-1_20240422	01	4/22/24	1400	SO	1	X					X		X	⊗			5/2/24 EMB
HA-1_1-2_20240422	02	4/22/24	1405	↓	↓	↓					↓		↓				
HA-2_0-1_20240422	03	↓	1240	↓	↓	↓					↓		↓	⊗			
HA-2_1-2_20240422	04	↓	1305	↓	↓	↓					↓		↓				
HA-3_0-1_20240422	05	↓	1530	↓	↓	↓					↓		↓	⊗	⊗		
HA-3_~~1-1.5~~ 1-1.5_20240422	06	↓	1545	↓	↓	↓					↓		↓	⊗			
HA-4_0-1_20240422	07	↓	1500	↓	↓	↓					↓		↓	⊗			
HA-4_1-2_20240422	08	↓	1510	↓	↓	↓					↓		↓	⊗			
HA-5_0-1_20240422	09	↓	1120	↓	↓	↓					↓		↓	⊗			
HA-6_0-1_20240422	10	↓	1130	↓	↓	↓					↓		↓	⊗			

4/23/24 NF

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	MATTHEW VONDERAHE	Aspect	4/24/24	15:50
Received by:	VINH	FBI	4-24-24	1515
Relinquished by:		Samples received at 0 °C		
Received by:				

Friedman & Bruya, Inc.
Ph. (206) 285-8282

404381

SAMPLE CHAIN OF CUSTODY 04/24/24 M4

Report To Eric Marhofer
Company Aspect Consultants
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone 206-838-6582 Email Eric.Marhofer@aspectconsulting.com

SAMPLERS (signature)

PROJECT NAME: Harris Shipyard
PO #: AS210195B
REMARKS: Project specific RLs? - Yes / No
INVOICE TO: Eric Marhofer

TURNAROUND TIME
■ Standard turnaround
□ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
□ Archive samples
□ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	RCRA 8 Metals	TCLP Pb	TCLP As		Notes
						ANALYSES REQUESTED											⊗ Run per EM 5/2/24 EMB
HA-6_1-1.5_20240422	11	4/22/24	1155	SO	1	X					X		X	⊗	⊗		
HA-8_0-1_20240422	12	↓	1420	↓	↓	↓					↓		↓				
HA-8_1-2_20240422	13		1440														
HA-9_0-1_20240422	14		1020											⊗			
HA-9_1-2_20240422	15		1040											⊗			
HA-10_0-1_20240422	16		0930														
HA-10_1-2_20240422	17		1000														
HA-11_0-1_20240422	18		0850														
HA-11_1-2_20240422	19	↓	0855														
HA-12_0-1_20240423	20	4/23/24	0950	↓	↓	↓					↓		↓	⊗			

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Matthew Vondracek	Aspect	4/24/24	15:50
Received by:	VINA	FBI	4-24-24	1550
Relinquished by:		Samples received at 0 °C		
Received by:				

Friedman & Bruya, Inc.
Ph. (206) 285-8282

404381

SAMPLE CHAIN OF CUSTODY

04/24/24 MH

Page # 3 of 3

Report To Eric Marhofer

Company Aspect Consulting

Address 710 2nd Ave. Suite 550

City, State, ZIP Seattle WA 98104

Phone 206-838-6582 Email Eric.Marhofer@aspectconsulting.com

SAMPLERS (*signature*)

PROJECT NAME: Harris Shipyard

PO #: AS210195B

REMARKS

Project specific RLs? - Yes / No

INVOICE TO: Eric Marhofer

TURNAROUND TIME
- ■ Standard turnaround
- □ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- □ Archive samples
- □ Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	RCRA 8 Metals	TCLP Pb	TCLP As		Notes
						ANALYSES REQUESTED											
HA-12_1-7_20240423	21	4/23/24	1000	SO	1	X					X		X	⊗			⊗ Run per EM 5/2/24
HA-7_0-0.5_20240423	22	↓	1040	↓	1	↓					↓		↓	⊗	⊗		
HA-13_0-1_20240423	23A-B	↓	1055	↓	2	↓					↓		↓	⊗			
~~HA-13_~~ (NB) 4/23/24																	
HA-14_01_20240423	24A-B	4/23/24	1115	SO	2	X					X		X				

4/23/24 (NB)

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Matthew Vondrasek	Aspect	4/24/24	15:50
Received by:	VIN H	FBI	4-24-24	1550
Relinquished by:		Samples received at 0 °C		
Received by:				

Friedman & Bruya, Inc.
Ph. (206) 285-8282

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 404381 CLIENT ASP INITIALS/ DATE: AP 04/24/24

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 0 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
- ☐ Over the Counter
- ☑ Picked up by F&BI
- ☐ FedEx/UPS/GSO

Number of days samples have been sitting prior to receipt at laboratory 1-2 days

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO
*or other representative documents, letters, and/or shipping memos

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Is the following information provided on the COC* ? (explain "no" answer below)

Sample ID's	☑ Yes	☐ No	# of Containers	☑ Yes	☐ No
Date Sampled	☑ Yes	☐ No	Relinquished	☑ Yes	☐ No
Time Sampled	☑ Yes	☐ No	Requested analysis	☑ Yes	☐ No

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

If Yes:
Number of unused TO15 canisters _____ Number of unused TO17 tubes _____

Explain "no" items from above (use the back if needed)

APPENDIX C

Example AO and Draft SWPPP

EXAMPLE ADMINISTRATIVE ORDER

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF AN ADMINISTRATIVE ORDER AGAINST Port of Bellingham Brian Gouran	)))))	ADMINISTRATIVE ORDER DOCKET # 21254

To: Brian Gouran
Port of Bellingham
1801 Roeder Avenue
Bellingham, WA 98225

Order Docket #	21254
Site Location	Lignin Operable Unit 298 W. Laurel St. Bellingham WA 98225 – Parcel 380330008066 (Corner of Cornwall Avenue and West Laurel Street)

The Department of Ecology (Ecology) has issued this Administrative Order (Order) requiring Port of Bellingham to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) - State of Washington Water Pollution Control Act.
- Chapter 173-201A Washington Administrative Code (WAC) - Water Quality Standards for Surface Waters of the State of Washington.
- Construction Stormwater General Permit WAR311551: National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity.

This is an Administrative Order in accordance with General Condition G12 (Additional Monitoring) as set forth in the Construction Stormwater General Permit. Chapter 90.48.120(2) RCW authorizes Ecology to issue Administrative Orders to accomplish the purposes of Chapter 90.48 RCW.

ORDER TO COMPLY

The permittee is subject to coverage under NPDES Construction Stormwater General Permit (CSGP) WAR311551 for construction activities associated with the construction site known as Lignin Operable Unit (298 W. Laurel St. Bellingham WA 98225; Parcel 380330008066; Corner of Cornwall Avenue and West Laurel Street). The project consists of approximately 4 acres. The Lignin Parcel is part of the former Georgia-Pacific mill property, which is now the Georgia-Pacific West (GP West) cleanup site (Site) which requires remediation under the Model Toxics Control Act (MTCA) prior to redevelopment. The Port has been conducting environmental investigations and remediation at the Site since 2009. The project will remove cPAH - contaminated soils areas beneath the warehouse foundation and along the rail spur as well as removing zinc-contaminated soils in the southwest portion of the site. The cleanup will also

include the Port's removal of an estimated 8,400 tons of remnant structures (e.g., concrete foundation elements including the large floor slab of the former Lignin Warehouse B, asphalt pavement, and railroad spurs). The remnant structures are located on top of and adjacent to contaminated soils being removed, and an estimated 10,400 tons of metals-impacted soils. Excavated areas will be backfilled with clean fill. The receiving waterbody following treatment is Bellingham Bay. Ecology was notified of the presence of onsite groundwater and/or soil contamination, which has the potential to discharge in stormwater and dewatering water due to the proposed construction activity. The Construction Stormwater General Permit does not have water quality sampling nor benchmarks for the known contaminants of concern, listed in Table 1, below. However, the permit requires compliance with the Water Quality Standards for Surface Waters of the State of Washington (Water Quality Standards – 173-201A WAC) and prohibits any discharges of pollutants.

The Order establishes Indicator Levels for the Lignin Operable Unit project. Indicator Levels express a pollutant concentration used as a threshold, below which a pollutant is considered unlikely to cause a water quality violation, and above which it may. Indicator Levels in this Administrative Order were derived from WAC 173-201A and the analytical method's minimum quantitation level.

For these reasons and in accordance with RCW 90.48.120(2) it is ordered that the Permittee take the following actions. These actions are required at the location known as Lignin Operable Unit, located at the corner of Cornwall Avenue and West Laurel Street (Parcel 380330008066). In the event of a permit transfer to another Permittee, compliance with this Administrative Order and the actions listed below is required.

The Permittee must take the following actions to remain in compliance with NPDES Permit WAR311551:

- Install all pre-treatment and treatment systems prior to any discharge of dewatering water or contaminated construction stormwater to the receiving waterbody.
- Capture, contain, and treat all contaminated dewatering water or contaminated construction stormwater prior to discharge to the receiving waterbody.
- Use an Ecology-approved treatment system and media filtration to treat any contaminated dewatering water or contaminated construction stormwater. Ecology must be notified in advance if any changes in the treatment are made, with the exception of routine maintenance.
- All captured sediment from the treatment of the dewatering water or contaminated construction stormwater must be transported to an approved disposal facility based on the level of contamination.

The treatment system must have enough capacity to hold treated dewatering water or contaminated construction stormwater until it has been tested to determine if any of the Indicator Levels listed in Table 1 have been met. No dewatering water or contaminated construction stormwater may be discharged before it has been tested for the parameters listed in Table 1. If any of the Indicator Levels listed in Table 1 are exceeded, the treated dewatering water or contaminated construction stormwater must not be discharged to the receiving waterbody until it has been retested to determine that all parameters are equal to or below the Indicator Levels in Table 1. If any of the Indicator Levels are exceeded after being retested, the Permittee must modify the existing treatment to increase effectiveness, install an additional Ecology-approved treatment system, or truck the contaminated

construction stormwater or groundwater off-site for disposal in an approved manner. The permittee may also discharge to sanitary sewer with the approval of the proper sewer authority.

Once the effectiveness of the treatment system has been determined, the Permittee may revert to a flow-through treatment system after a minimum of two sampling and testing events and upon written approval from Ecology. The flow-through treatment system design and batch sampling results must be submitted to Ecology for review prior to use.

- If a flow-through treatment system is adopted, all dewatering water or contaminated construction stormwater must be sampled weekly while discharging, and tested for the parameters listed in Table 1.
- When using a flow-through treatment system, if any of the Indicator Levels listed in Table 1 are exceeded, the Permittee must stop the discharge of treated dewatering water or contaminated construction stormwater to the receiving waterbody until it has been retested to determine that all parameters are equal to or below the Indicator Levels in Table 1. If any of the Indicator Levels are exceeded after being retested, the Permittee must modify the existing flow-through treatment system to increase its effectiveness, install an additional Ecology-approved treatment system, or truck the contaminated construction stormwater or dewatering water off-site for disposal in an approved manner. The Permittee may also discharge the treated water to sanitary sewer in accordance with the conditions of the discharge authorization from the proper sewer authority.
- Sampling for the contaminants listed in Table 1 must be reported on the required Discharge Monitoring Report (DMR) according to Permit Conditions (S5.B Discharge Monitoring Reports).
- If sampling is conducted more frequently than required by this Order, the results of this monitoring must be included in the calculation and reporting of the data that is submitted in the DMR.
- Any discharge to Waters of the State in exceedance of the contaminant Indicator Levels in Table 1 must be reported to the Department of Ecology according to Permit Condition S5.F, Noncompliance Notification as follows:
    - Immediately notify Ecology of noncompliance by calling the regional 24-hour Environmental Report Tracking System (ERTS) phone number (206) 594-0000 (note that this is a new phone number as of 5/17/2021).
    - Cease the discharge until Indicator Levels can be met.
    - Submit a detailed, written report to Ecology within five (5) days, unless requested earlier by Ecology. See Permit condition S5.F.3 for the full written report requirements.
    - For exceedances of the numeric benchmark for pH, refer to Special Condition S4.D.4 of the CSGP.
- All monitoring data must be prepared by a laboratory registered or accredited under the provisions of Accreditation of Environmental Laboratories, Chapter 137-50 WAC.
- All sampling data must be reported monthly on DMRs electronically using Ecology's secure online system WQWebDMR, in accordance to permit condition S5.B. If the measured

concentration is below the detection level then the Permittee must report single analytical values below detection as "less than the detection level (DL)" by entering "<" followed by the numeric value of the detection level (e.g. "<0.1"). All other values above DL must be reported as the numeric value.

- Contaminated soils excavated during construction will be immediately hauled offsite without stock piling to an approved disposal facility based on the level of contamination. When it is not feasible to immediately haul soils offsite, the soils must be placed in a covered area to minimize contact with stormwater.
- Noncompliance with permit requirements or the provisions of this Order (such as exceedances of indicator levels) must be immediately reported to the Northwest Regional Office of the Department of Ecology in accordance with Permit Condition S5.F, Noncompliance Notification.
- The Stormwater Pollution Prevention Plan (SWPPP) prepared for Lignin Operable Unit must be fully implemented and amended as needed for the duration of the project.
- If a modification of the Order is desired, a written request must be submitted to Ecology and if approved, Ecology will issue an amendment to this Order.

Ecology retains the right to make modifications to this Order through supplemental Order, or amendment to this Order, it if appears necessary to further protect the public interest.

This Order does not exempt the Permittee from any Construction Stormwater General Permit requirement. This Order automatically terminates when NPDES Construction Stormwater General Permit WAR311551 is terminated.

Table 1. Marine Water Parameters

The Permittee must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for monitoring unless the method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136. If the Permittee uses an alternative method, not specified in the order and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report.

Table 1. Marine & Brackish Water Parameters

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) AND CARCINOGENIC PAH'S						
Acenaphthene (83-32-9)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
Acenapthylene (208-96-8)	Batch/Weekly	Grab	10.5 [a]	625.1	3.5	10.5
Anthracene (120-12-7)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
Benzo(a)anthracene (56-55-3)	Batch/Weekly	Grab	23.4 [a]	625.1	7.8	23.4
Benzo(a)pyrene (50-32-8)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Benzo(b)fluoranthene (205-99-2)	Batch/Weekly	Grab	14.4 [a]	610/625.1	4.8	14.4
Benzo(g,h,i)perylene (191-24-2)	Batch/Weekly	Grab	12.3 [a]	610/625.1	4.1	12.3
Benzo(j)fluoranthene (205-82-3)	Batch/Weekly	Grab	1.0 [a]	625	0.5	1.0
Benzo(k)fluoranthene (207-08-9)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Chrysene (218-01-9)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Dibenzo(a-h)anthracene (53-70-3)	Batch/Weekly	Grab	7.5 [a]	625.1	2.5	7.5
Dibenzofuran (132-64-9)	Batch/Weekly	Grab	0.01 [a]	8270	0.01	0.01
Dimethyl Phthalate (131-11-3)	Batch/Weekly	Grab	4.8 [a]	625.1	1.6	4.8
Fluoranthene (206-44-0)	Batch/Weekly	Grab	6.6 [a]	625.1	2.2	6.6

Fluorene (86-73-7)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
Indeno(1,2,3-cd)pyrene (193-39-5)	Batch/Weekly	Grab	11.1 [a]	610/625.1	3.7	11.1
1-Methylnapthalene (90-12-0)	Batch/Weekly	Grab	0.01 [a]	8270	0.01	0.01
2-Methylnapthalene (91-57-6)	Batch/Weekly	Grab	0.01 [a]	8270	0.01	0.01
Naphthalene (91-20-3)	Batch/Weekly	Grab	4.8 [a]	625.1	1.6	4.8
Phenanthrene (85-01-8)	Batch/Weekly	Grab	16.2 [a]	625.1	5.4	16.2
Pyrene (129-00-0)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
METALS						
Arsenic, Total (7440-38-2)	Batch/Weekly	Grab	69 [c]	200.8	0.1	0.5
Cadmium, Total (7440-43-9)	Batch/Weekly	Grab	42.25 [c]	200.8	0.05	0.25
Chromium, Total (7440-47-3)	Batch/Weekly	Grab	1100 [d]	200.8	0.2	1.0
Copper, Total (7440-50-8)	Batch/Weekly	Grab	5.78 [c]	200.8	0.4	2.0
Lead, Total (7439-92-1)	Batch/Weekly	Grab	220.82 [c]	200.8	0.1	0.5
Manganese, Total (7439-96-5)	Batch/Weekly	Grab	0.5 [a]	200.8	0.1	0.5
Mercury, Total (7439-97-6)	Batch/Weekly	Grab	2120 ng/L [c]	1631E	0.2 ng/L	0.5 ng/L
Nickel, Total (7440-02-0)	Batch/Weekly	Grab	74.75 [c]	200.8	0.1	0.5
Zinc, Total (7440-66-6)	Batch/Weekly	Grab	95.14 [c]	200.8	0.5	2.5
PETROLEUM HYDROCARBONS						
Diesel and Oil-Range Hydrocarbons (NWTPH-Dx) [e]	Batch/Weekly	Grab	250 [a]	NWTPH-Dx	250	250
Gasoline-Range Hydrocarbons (NWTPH-Gx) [j]	Batch/Weekly	Grab	250 [a]	NWTPH-Gx	250	250
VOLATILE ORGANIC COMPOUNDS (VOCs), SEMI VOCs AND HALOGENATED VOCs						
4-methylphenol (106-44-5)	Batch/Weekly	Grab	10 [a]	8270	10	10
bis(2-ethylhexyl)phthalate (117-81-7)	Batch/Weekly	Grab	7.5 [a]	625.1	2.5	7.5
Benzoic Acid (65-85-0)	Batch/Weekly	Grab	50 [a]	8270	10	50

Carbazole (86-74-8)	Batch/Weekly	Grab	0.01 [a]	8270	0.01	0.01
Formaldehyde (50-00-0)	Batch/Weekly	Grab	0.2 mg/L [a]	NCASI 98.01	0.04 mg/L	0.2 mg/L
Phenol (108-95-2)	Batch/Weekly	Grab	4.5 [a]	625.1	1.5	4.5
Construction Stormwater General Permit Benchmarks						
Parameter	**Sampling Frequency***	**Sample Type**	**Benchmark**		**Analytical Method**	
Turbidity	Batch/Weekly	Grab	25 NTU		SM2130 [g]	
pH	Batch/Weekly	Grab	6.5 - 8.5 SU		SM4500-H^+ B	

NOTES	
[a]	No applicable surface water criterion; value is laboratory quantitation level.
[c]	Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240) calculated using conversion factors per Table 240.
[g]	Or equivalent.
*	If permission is granted for flow through, sampling will then be weekly.

FAILURE TO COMPLY WITH THIS ORDER

Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

YOUR RIGHT TO APPEAL

You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. 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).

To appeal you must do both of the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Your appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 **Pollution Control Hearings Board** 1111 Israel Road SW STE 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

CONTACT INFORMATION

Please direct all questions about this Order to:

Elizabeth Fint
Department of Ecology
913 Squalicum Way #101
Bellingham, WA 98225

Phone: (360) 296-0274
Email: efin461@ECY.WA.GOV

MORE INFORMATION

- Pollution Control Hearings Board Website
  http://www.eluho.wa.gov/Board/PCHB
- Chapter 43.21B RCW - Environmental and Land Use Hearings Office – Pollution Control Hearings Board
  http://app.leg.wa.gov/RCW/default.aspx?cite=43.21B
- Chapter 371-08 WAC – Practice And Procedure
  http://app.leg.wa.gov/WAC/default.aspx?cite=371-08
- Chapter 34.05 RCW – Administrative Procedure Act
  http://app.leg.wa.gov/RCW/default.aspx?cite=34.05
- Ecology's Laws, rules, & rulemaking website
  https://ecology.wa.gov/About-us/How-we-operate/Laws-rules-rulemaking

SIGNATURE

Douglas R. Allen
Manager
Bellingham Field Office

Date 8/19/2022

Stormwater Pollution Prevention Plan (SWPPP)

for

Upland Cleanup Action
Harris Avenue Shipyard Site

Prepared for:
Port of Bellingham
1801 Roeder Avenue
Bellingham, WA 98225

Owner	Site Operator	Contractor
Port of Bellingham	Port of Bellingham	TBD

Project Site Location:
298 W Laurel Street
Bellingham, WA 98225

Certified Erosion and Sediment Control Lead (CESCL)

Name	Organization	Contact Phone Number
TBD	TBD	TBD

CSWPP Plan Prepared By

Name	Organization	Contact Phone Number
Will Guyton, CESCL	Aspect Consulting	(509) 960-7470

Preparation Date:
April 12, 2024

Approximate Construction Dates:
Begin Construction: <Month> 2025
End Construction: <Month> 2025

Note: This SWPPP will be finalized, including potential modifications, once the Contractor is selected and the Project schedule is known.

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List of Acronyms and Abbreviations

Acronym / Abbrev.	Explanation
303(d)	Section of the Clean Water Act pertaining to Impaired Waterbodies
BFO	Bellingham Field Office of the Department of Ecology
BMP(s)	Best Management Practice(s)
CESCL	Certified Erosion and Sediment Control Lead
CO_2	Carbon Dioxide
CRO	Central Regional Office of the Department of Ecology
CSWGP	Construction Stormwater General Permit
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
ERTS	Environmental Report Tracking System
ESC	Erosion and Sediment Control
GULD	General Use Level Designation
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
NWRO	Northwest Regional Office of the Department of Ecology
pH	Power of Hydrogen
RCW	Revised Code of Washington
SPCC	Spill Prevention, Control, and Countermeasure
su	Standard Units
SWMMWW	Stormwater Management Manual for Western Washington
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
TMDL	Total Maximum Daily Load
WAC	Washington Administrative Code
WSDOT	Washington Department of Transportation
WWHM	Western Washington Hydrology Model

1 Introduction

This Surface Water Pollution Prevention Plan (SWPPP) and associated documents have been prepared for the Upland Cleanup Action project at the Harris Avenue Shipyard Site (site). The site address is 201 Harris Avenue, Bellingham, Washington. The construction activities will include the removal of contaminated soils, demolition and removal of associated structural obstructions, and installation of a new stormwater conveyance and treatment system and compacted gravel surface cap.

The purpose of this SWPPP is to describe the proposed construction activities and temporary erosion and sediment control (TESC) measures, pollution prevention measures, inspection/monitoring activities, and record keeping that will be implemented during construction of the project. The objectives of the SWPPP are to:

1. Implement Best Management Practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate, or prevent stormwater contamination and water pollution from construction activity.
2. Prevent violations of surface water quality, groundwater quality, or sediment management standards. In order to prevent violations, the construction Contractor will have spill kits on site, the on-site Contractor employees will be trained in their proper use, and equipment will be maintained as appropriate to minimize spill risks.

This SWPPP was prepared using the Washington State Department of Ecology (Ecology) SWPPP template, downloaded from the Ecology website March 26, 2024. This SWPPP generally follows the requirements outlined in the *Construction Stormwater General Permit and Stormwater Management Manual for Western Washington* (SWMMWW).

2 Project Information

Project/Site Name: Harris Avenue Shipyard

Street/Location: 201 Harris Avenue

City: Bellingham **State:** WA **Zip code:** 98225

Subdivision: N/A

Receiving Waterbody: Bellingham Bay

2.1 Existing Conditions

Total acreage (including support activities such as off-site equipment staging yards, material storage areas, borrow areas).

Total acreage: approximately 5 Acres

Disturbed acreage: approximately 3 Acres

Existing structures: Existing and historical structures (pavements, concrete foundation elements, etc.) are located on top of and adjacent to contaminated soils being removed. The structural elements include but are not limited to asphalt and concrete surfacing, building foundations and floor slabs, concrete tank pads and ancillary structures, wooden pilings supporting concrete foundations, and pipes of various sizes and materials.

Landscape topography: Portions of the site have been used historically and recently for industrial purposes, primarily as a shipyard. The current tenant, Fairhaven Industrial Marine Repair Facility (FIMRF), began occupying the upland portion of the Site in early 2021 and has plans to use the Site for vessel moorage, repair, dry docking, and other industrial uses. The site is bordered on the north and west by Bellingham Bay and on the south by the City of Bellingham's (City) Marine Park and the BNSF Railway rail lines. Industrial properties owned by the Port of Bellingham (Port) are present to the east and southeast of the Site. Properties to the east of the Site and their current uses include the former Arrowac Fisheries, Inc. warehouse on the uplands and a parking lot. Farther to the east is the Bellingham Cruise Terminal, operated by the Port as the southern terminus for the Alaska State Ferry. Access is on the east end of the site off of Harris Avenue.

Drainage patterns: Under existing conditions, the uplands portion of the site is generally flat with stormwater runoff generally sheet flowing towards Bellingham Bay (northward and westward). There are three distinct stormwater drainage systems that collect runoff from portions of the site into existing on-site catch basins. Two of the drainage systems convey runoff to two separate on-site outfalls, one on the west and one on the north. The third drainage system conveys runoff to the east into an existing Port stormwater drainage system.

Existing Vegetation: The site is a fully developed area of the Port of Bellingham (Port), primarily consisting of impervious surfaces.

Critical Areas: Bellingham Bay (not within the construction limits).

List of known impairments for 303(d) listed or Total Maximum Daily Load (TMDL) for the receiving waterbody: Based on review of Ecology's 303(d) list, Bellingham Bay in the vicinity of the project site currently has no Category 5 listings. However, there are multiple Category 4b listings in the vicinity.

Summary of Site Pollutant Constituents: Contaminants present in site soils at concentrations exceeding MTCA soil cleanup levels include copper and zinc. There are also residual concentrations of polycyclic aromatic hydrocarbons (PAHs) exceeding groundwater cleanup levels.

2.2 Proposed Construction Activities

The Port of Bellingham is completing remedial cleanup activities at the upland portion of the Harris Avenue Shipyard site.

The cleanup action will involve excavation and proper off-site disposal of contaminated soil, with concurrent dewatering as needed to facilitate soil removal and handling, along with demolition and removal of structural obstructions (asphalt pavement, concrete foundations, etc.) that interfere with removal of the contaminated soil. As such, the activities will involve permanent removal of contaminated soil across most of the site.

Work performed by the Contractor shall consist of providing all labor, supervision, material, and equipment necessary for all excavation, dewatering, demolition, materials handling including temporary stockpiling, transportation for off-site disposal of contaminated soils/debris and recycling of inert debris, installation of new stormwater conveyance and treatment system infrastructure, and excavation backfill activities as specified by the Contract. The Work includes preventing any off-site runoff of stormwater or sediment (including vehicle track out), and capturing, treating as needed, and discharging to designated locations any groundwater produced by excavation dewatering, any onsite stormwater, including stormwater accumulating within stockpile areas.

It is the Contractor's responsibility to furnish, install, protect, and maintain construction stormwater and erosion controls, soil protection, and pollutant prevention and countermeasures. These controls will prevent erosion and prevent conveyance of pollutants and sediment into surface waters, drainage systems, and environmentally critical areas. All work performed by the Contractor and subcontractors shall be performed per Contract Specifications.

At conclusion of the cleanup project, the remediated site surface will primarily consist of a compacted aggregate surface that will direct on-site stormwater into a revised stormwater conveyance system with a new stormwater treatment BMP, before discharging through an existing outfall. Final stabilization will consist of excavation areas backfilled with compacted aggregate to the designed finish grades.

3 Construction Stormwater BMPs

The SWPPP is a living document reflecting current conditions and changes throughout the life of the project. These changes may be informal (i.e. hand-written notes and deletions). Update the SWPPP when the CESCL has noted a deficiency in BMPs or deviation from original design.

3.1 The 13 Elements

3.1.1 Element 1: Preserve Vegetation / Mark Clearing Limits

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction are primarily bordered by existing fencing or will be marked with Silt Fence (BMP C233) before land disturbing activities begin, in accordance with the Contract Specifications.

Alternate BMPs for marking clearing limits may be recommended by the CESCL in the event the BMP(s) listed above are deemed ineffective or inappropriate. To avoid potential erosion and sediment control issues, the Contractor will promptly initiate the implementation of one or more alternative BMPs after the first sign that existing BMPs are ineffective.

List and describe BMPs:

BMP C233 – Silt Fence

Compost Sock

Installation Schedules: Prior to beginning land disturbing activities, including clearing and grading, clearly mark all clearing limits within the construction area.

Inspection and Maintenance plan: BMPs and site conditions shall be inspected weekly. Maintenance should occur as soon as a deficiency is observed.

Responsible Staff: The Contractor for each phase of work will be responsible to establish BMPs. The CESCL will be responsible for ensuring BMPs are constructed per plan. If revisions are needed, the CESCL will provide recommendations to the Contractor to relocate or add additional facilities. If changes are made, this SWPPP will be updated by the CESCL.

3.1.2 Element 2: Establish Construction Access

Vehicles tracking sediment off-site will be minimized by limiting vehicle access through one route, installation of a Stabilized Construction Entrance (see Site Map located in Attachment A), and regular sweeping and cleaning.

The Contractor is responsible for cleanup of any track-out from the site including sediment, debris, water, and dust. Brooms, Sweepers, and Street Washing are techniques that should be considered. Street wash wastewater shall be controlled by pumping back on-site or otherwise be prevented from discharging into systems tributary to state surface waters. Street sweeping on public roads will be employed. No sediment track-out is allowed on City streets.

List and describe BMPs:

BMP C105 – Stabilized Construction Entrance

BMP C140 – Dust Control

Installation Schedules: Development of access points and mobilization of equipment to remove track-out and provide dust abatement should be on-site prior to construction and should remain on-site throughout the duration of the phase.

Inspection and Maintenance plan: Sediment accumulation should be checked daily and maintained weekly. Dust abatement should occur anytime there is a dust generating activity.

Responsible Staff: The Contractor for each phase of work will be responsible to establish BMPs. The CESCL will be responsible for ensuring BMPs are constructed per plan. If revisions are needed, the CESCL will provide recommendations to the Contractor to relocate or add additional facilities. If changes are made, this SWPPP will be updated by the CESCL.

3.1.3 Element 3: Control Flow Rates

Flow control measures are intended to protect properties and waterways downstream of the construction site from erosion due to increases in volume, velocity, and peak flow rate of stormwater runoff from the project site.

In order to protect the properties and waterways downstream of the project Site, all stormwater in excavation areas will be contained and collected for treatment as described in Element 10. There is no expected increase in construction stormwater compared to the existing pre-construction conditions.

Will you construct stormwater retention and/or detention facilities?
☐ Yes ☒ No

Will you use permanent infiltration ponds or other low impact development (example: rain gardens, bio-retention, porous pavement) to control flow during construction?
☐ Yes ☒ No

List and describe BMPs: N/A

Installation Schedules: N/A

Inspection and Maintenance plan: BMPs and site conditions shall be inspected weekly. Maintenance should occur as soon as a deficiency is observed.

Responsible Staff: The Contractor for each phase of work will be responsible to establish BMPs. The CESCL will be responsible for ensuring BMPs are constructed per plan. If revisions are needed, the CESCL will provide recommendations to the Contractor to relocate or add additional facilities. If changes are made, this SWPPP will be updated by the CESCL.

3.1.4 Element 4: Install Sediment Controls

Silt Fence (BMP C233) and Compost Sock will be installed and maintained as shown on the Site Map in Attachment A and as directed by the CESCL, to further prevent sediment from leaving the site. Sediment-laden water from within the work zone will be contained within an excavation area and collected for treatment following Elements 3 and 10.

In addition, sediment will be removed from paved areas in and adjacent to construction work areas manually or using mechanical sweepers, as needed, to minimize tracking of sediments on vehicle tires out of the site and to minimize wash-off of sediments from adjacent streets in runoff. Any sediment track out from the site onto surrounding roads will be immediately removed in accordance with the Construction Specifications.

List and describe BMPs:

BMP C233 – Silt Fence

Compost Sock

Installation Schedules: The BMPs noted above should be installed prior to any soil disturbing activities.

Inspection and Maintenance plan: BMPs and site conditions shall be inspected weekly. Maintenance should occur as soon as a deficiency is observed.

Responsible Staff: The Contractor for each phase of work will be responsible to establish BMPs. The CESCL will be responsible for ensuring BMPs are constructed per plan. If revisions are needed, the CESCL will provide recommendations to the Contractor to relocate or add additional facilities. If changes are made, this SWPPP will be updated by the CESCL.

3.1.5 Element 5: Stabilize Soils

As needed, site management personnel will assess weather and site conditions on a daily basis to determine if water needs to be applied for dust control, or if specific areas require additional BMP implementation to protect soil erosion from rain, wind, or off-site water sources.

The specific BMPs to be used for stabilizing soils or stockpiles on this project include: Temporary and Permanent Seeding (BMP C120), Mulching (BMP C121), Plastic Covering (BMP C123), Dust Control (BMP C140), and Wattles (BMP C235).

If Contractor chooses to temporarily stockpile removed materials prior to off-site transport, the Contractor will construct a bermed and lined stockpile area(s) for contaminated soil and debris pending transportation for off-site landfill disposal and a separate stockpile area for inert debris pending transportation for off-site recycling. Stockpile areas will be in Engineer-approved locations away from storm inlets, in accordance with Contract Specifications. Material will be transported in a way so as to prevent spillage of material.

Each stockpile will be underlain by a polyethylene, scrim-reinforced geomembrane with a minimum thickness of 10 mils and a minimum weight of 40 pounds per 1,000 square feet, with adjacent sheeting sections continuously overlapped by a minimum of 3 feet. The ground surface on which the sheeting will be placed will be free of objects that could damage the sheeting. Alternatively, a layer of geotextile or plywood may be placed beneath the sheeting to protect it. A layer of geotextile or plywood will also be placed upon the liner to protect it. Berms shall be constructed around each stockpile area to a minimum height of 12 inches and shall contain sufficient area to allow for ponding and control of stormwater. Base liners of stockpiles shall be bathtub construction to collect excess water, unless an alternative method is approved by Engineer. Liquid accumulating in stockpiles shall be collected and disposed of in accordance with the Contract Specifications.

Each soil stockpile will be covered by a polyethylene geomembrane of minimum 10-mil thickness to prevent precipitation from entering the stockpiled soil. Each stockpile cover will be anchored (e.g., using sand bags) sufficiently to prevent it from being removed by wind. Soil stockpiles will be covered when not in use and as needed during periods of rain and wind to prevent transport of soil. The stockpile management measures will be inspected regularly and maintained as needed as long as the stockpile remains at the Site.

Alternate BMPs for stabilizing soil may be recommended by the CESCL in the event the BMP(s) listed above are deemed ineffective or inappropriate. To avoid potential erosion and sediment control issues, the Contractor will promptly initiate the implementation of one or more alternative BMPs after the first sign that existing BMPs are ineffective.

List and describe BMPs:

BMP C120 – Temporary and Permanent Seeding

BMP C121 – Mulching

BMP C123 – Plastic Covering

BMP C140 – Dust Control

BMP C235 – Wattles

Installation Schedules: Disturbed areas or bare soils should be temporarily stabilized to prevent transport of sediment, rutting, dust, and over saturation. When cleanup activities cease, then the area of disturbance should be permanently stabilized.

Inspection and Maintenance plan: BMPs and site conditions shall be inspected weekly. Maintenance should occur as soon as a deficiency is observed.

If dust is generated, then the dust generating activity should either cease or water should be supplied to the exposed soil.

Responsible Staff: The Contractor for each phase of work will be responsible to establish BMPs. The CESCL will be responsible for ensuring that BMPs are constructed per plan. If revisions are needed, the CESCL will provide recommendations to the Contractor to relocate or add additional facilities. If changes are made, this SWPPP will be updated by the CESCL.

3.1.6 Element 6: Protect Slopes

Will steep slopes be present at the site during construction?
☐ Yes ☒ No

The ground surfaces that will be disturbed are generally flat and pervious (following removal of impervious surfaces during the cleanup), all excavations will be internally draining, and no increase in runoff is expected due to construction activities. Slope protection is not applicable to the site.

3.1.7 Element 7: Protect Drain Inlets

Select storm drain inlets within the active site will be demolished and removed, and their discharge piping plugged at edge of the excavation. All storm drain inlets shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. Storm Drain Inlet Protection (BMP C220) will be implemented for all drainage inlets that could potentially be impacted by sediment-laden runoff from the project site. In addition, all access roads must be kept clean of sediment.

List and describe BMPs:

BMP C220 – Storm Drain Inlet Protection

Installation Schedules: Storm drain inlet protection should be installed as soon as an improvement starts.

Inspection and Maintenance plan: BMPs and site conditions shall be inspected weekly. Maintenance should occur as soon as a deficiency is observed.

Responsible Staff: The Contractor for each phase of work will be responsible to establish BMPs. The CESCL will be responsible for ensuring that BMPs are constructed per plan. If revisions are needed, the CESCL will provide recommendations to the

Contractor to relocate or add additional facilities. If changes are made, this SWPPP will be updated by the CESCL.

3.1.8 Element 8: Stabilize Channels and Outlets

This element is not applicable. There are no on-site conveyance channels or outlets, existing or proposed, to stabilize. If site conditions should warrant construction of a channel, the CESCL shall notify the Owner prior to undertaking any such work.

3.1.9 Element 9: Control Pollutants

The following pollutants are anticipated to be present on-site:

Table 1 – Pollutants

Pollutant (and source, if applicable)
Potential contaminants present in site soils include metals (copper, zinc). Potential contaminants in site groundwater include polycyclic aromatic hydrocarbons (PAHs).
Waste Material and Demolition Debris generated from Contractor operations

By removing contaminated soils, the project will prevent, reduce, or eliminate the discharge of pollutants to the stormwater system or waters of the state. The project will also minimize impacts from storage of hazardous materials on-site, storage of materials in designated areas, and delivery of materials to and from the site. Temporary storage areas will be located away from vehicular traffic, near the construction entrance(s), and away from storm drains. Material Safety Data Sheets (MSDS) will be supplied for all materials stored. Chemicals will be kept in their original labeled containers. Hazardous material storage on-Site will be minimized and handled as infrequently as possible.

The project will utilize BMP C153 Material Delivery, Storage, and Containment. Good housekeeping and preventative measures will be taken to ensure that the project location will be kept clean, well-organized, and free of debris.

If required, BMPs to be implemented to control specific sources of pollutants are as follows:

Vehicles, construction equipment, and/or petroleum product storage/dispensing:

- All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
- Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.
- In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.

- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

Excavation dewatering water:

- Dewatering BMPs and BMPs specific to the excavation (including handling of contaminated soils) are discussed under Element 10.

Sanitary wastewater:

- Portable sanitation facilities will be firmly secured, regularly maintained, and emptied, when necessary.
- If a wheel wash is used, its wastewater shall be discharged to a separate on-Site treatment system as part of Wheel Wash implementation (BMP C106).

Solid Waste:

- Solid waste other than soil and inert debris generated during excavation will be stored in secure, clearly marked containers.

Other:

- Other BMPs will be administered, as necessary, to address any additional pollutant sources on-site.

All pollutants, including waste materials and inert demolition debris, that occur on-site shall be handled and disposed of in a manner that does not cause contamination of ground or surface waters. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well-organized, and free of debris. Fueling, maintenance, and repair of construction equipment and vehicles will be conducted to prevent spills or other environmental damage in accordance with the Contract Specifications.

List and describe BMPs:

BMP C140 – Dust Control

BMP C153 – Material Delivery, Storage, and Containment

Installation Schedules: BMPs to control pollutants shall be installed and implemented prior to the start of construction and throughout construction activities.

Inspection and Maintenance plan: BMPs and site conditions shall be inspected weekly. Maintenance should occur as soon as a deficiency is observed.

Responsible Staff: The Contractor for each phase of work will be responsible to establish BMPs. The CESCL will be responsible for ensuring BMPs are constructed per plan. If revisions are needed, the CESCL will provide recommendations to the Contractor to relocate or add additional facilities. If changes are made, this SWPPP will be updated by the CESCL.

Will maintenance, fueling, and/or repair of heavy equipment and vehicles occur on-site?

☐ Yes ☒ No

Will wheel wash or tire bath system BMPs be used during construction?

☐ Yes ☒ No

Will pH-modifying sources be present on-site?

☒ Yes ☐ No

Table 2 – pH-Modifying Sources

☐	None
☒	Bulk cement (removal)
☐	Cement kiln dust
☐	Fly ash
☐	Other cementitious materials
☐	New concrete washing or curing waters
☐	Waste streams generated from concrete grinding and sawing
☐	Exposed aggregate processes
☐	Dewatering concrete vaults
☐	Concrete pumping and mixer washout waters
☐	Recycled concrete
☐	Other (i.e., calcium lignosulfate) [please describe:]

3.1.10 Element 10: Control Dewatering

All water collected from excavation dewatering activities, and any stormwater that cannot be infiltrated or that accumulates within the stockpile areas, will be collected and pretreated on-site to meet Contract Specifications and all permit requirements for discharge using a temporary treatment system appropriately sized by the Contractor to accommodate required water flow rates, meet any flow or water quality restrictions, and include redundancy. Treated water not in compliance with permitted discharge limits will be rerun through the treatment system, with treatment adjustments, as needed, until passing discharge limits or it will be containerized, characterized, and sent for off-Site disposal to an approved facility. No untreated dewatering water or other sediment-laden water will be allowed to discharge from the site or enter surface waters.

The Contractor will discharge the treated water via the City of Bellingham storm drain in accordance with the Construction Stormwater General Permit and project-specific Administrative Order issued by Ecology (CSWGP). The Contractor will be required and responsible to comply with all of the CSWGP's provisions including but not limited to initial treatment batch testing to demonstrate achievement of permit indicator levels prior to any discharge, obtaining Ecology approval for flow-through operation and discharge based

on the batch testing results, and conducting monitoring and reporting to Ecology throughout the duration of treatment and discharge.

Table 3 – Dewatering BMPs

	Infiltration
X	Transport off-site in a vehicle
X	Ecology-approved on-site chemical treatment or other suitable treatment technologies
	Sanitary or combined sewer discharge with local sewer district approval (last resort)
	Use of sedimentation bag with discharge to ditch or swale (small volumes of localized dewatering)

3.1.11 Element 11: Maintain BMPs

All Temporary Erosion and Sediment Control (TESC) BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with each particular BMP specification (see *Volume II of Ecology's current Stormwater Manual for Western Washington*).

Visual monitoring of all BMPs installed at the site will be conducted by CESCL at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the site. If the site becomes inactive and is temporarily stabilized, the inspection frequency may be reduced to once every calendar month.

All TESC BMPs shall be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed, unless otherwise directed by Owner

Trapped sediment shall be removed from the site as contaminated soil. Disturbed soil resulting from removal of either BMPs or vegetation shall be permanently stabilized.

Additionally, protection must be provided for all BMPs installed for the permanent control of stormwater from sediment and compaction. BMPs that are to remain in place following completion of construction shall be examined and restored to full operating condition. If sediment enters these BMPs during construction, the sediment shall be removed and the facility shall be returned to conditions specified in the construction documents.

3.1.12 Element 12: Manage the Project

The project will be managed based on the following principles:

- Projects will be phased to the maximum extent practicable and seasonal work limitations will be taken into account.
- Inspection and monitoring:
    - Inspection, maintenance and repair of all BMPs will occur as needed to ensure performance of their intended function.

- Maintain an updated SWPPP.
    - The SWPPP shall be updated, maintained, and implemented throughout the duration of construction.

As site work progresses, the SWPPP will be modified routinely to reflect changing site conditions. The SWPPP will be reviewed monthly to ensure the content is current. The following management BMPs apply to this site:

Table 4 – Management

X	Design the project to fit the existing topography, soils, and drainage patterns
	Emphasize erosion control rather than sediment control
X	Minimize the extent and duration of the area exposed
	Keep runoff velocities low
X	Retain sediment on-site
X	Thoroughly monitor site and maintain all TESC measures
X	Schedule major earthwork during the dry season
	Other (please describe)

3.1.13 Element 13: Protect Low Impact Development (LID) BMPs

This element does not apply. No LID BMPs will be impacted or constructed.

4 Pollution Prevention Team

Table 5 – Team Information

Title	Name(s)	Agency / Firm	Phone
CESCL	TBD		
Resident Engineer	Jane Gregg	Aspect Consulting	(906) 231-1500
Emergency Ecology Contact	John Rapp	Department of Ecology	(206) 247-3242
Emergency Owner Contact	Larry Scholten	Port of Bellingham	(360) 715-7378
Emergency Contractor Contact	TBD		
Non-Emergency Contractor Contact	TBD		
Monitoring Personnel	TBD		
Ecology Regional Office	Ecology Northwest Regional Office		206-594-0000

5 Monitoring and Sampling Requirements

Monitoring includes visual inspection, sampling for water quality parameters of concern, and documentation of the inspection and sampling findings in a site log book. A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections
- Stormwater sampling data

For convenience, a Site Inspection Form is included as Attachment B.

The site log book must be maintained, remain on-site, and be made available upon request to Ecology or the local jurisdiction.

Numeric effluent limits may be required for certain discharges to 303(d) listed waterbodies. See CSWGP Special Condition S8 and Section 6 of this SWPPP.

5.1 Site Inspection

Site inspections will be conducted at least once every calendar week and within 24 hours following any discharge from the site. For sites that are temporarily stabilized and inactive, the required frequency is reduced to once per calendar month.

The discharge point(s) are indicated on the Site Map (see Attachment A) and in accordance with the applicable requirements of the CSWGP.

5.2 Water Quality Sampling

All collected and treated stormwater and dewatering water to be discharged from the site to surface water will be sampled in accordance with the project-specific Administrative Order for the CSWGP. Refer to the Administrative Order for water quality sampling and analysis requirements for discharge to surface water.

6 Discharges to 303(d) or Total Maximum Daily Load (TMDL) Waterbodies

6.1 303(d) Listed Waterbodies

Is the receiving water 303(d) (Category 5) listed for turbidity, fine sediment, phosphorus, or pH?

Yes No **X**

List the impairment(s):

Based on review of Ecology's 303(d) list, Bellingham Bay near the project site currently has no Category 5 listings.

6.2 TMDL Waterbodies

Waste Load Allocation for CWSGP discharges:

Based on review of Ecology's TMDL list, Bellingham Bay near the project site currently has TMDLs listed for Arsenic, Copper, Lead, Mercury, Phenol, PCBs, Zinc, 2-Methylnaphthalene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(g,h,i)perylene, Benzofluoranthenes (Total, b+k+j), Bis(2-ethylhexyl)phthalate, Cadmium, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-c,d)pyrene, Naphthalene, Phenanthrene, and Pyrene.

In order to prevent sediment-laden waters from entering Bellingham Bay, appropriate sediment control BMPs shall be implemented prior to commencement of construction and shall be maintained throughout the life of the project.

List and describe BMPs:

- Silt Fence (BMP C233)
- Compost Sock
- Temporary Sediment Ponds (BMP C241)
- Materials on Hand (BMP C150)

Discharges to TMDL receiving waterbodies will meet the indicator level concentrations listed in the project-specific Administrative Order at the point of discharge.

7 Reporting and Record Keeping

7.1 Record Keeping

7.1.1 Site Log Book

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections
- Sample logs

7.1.2 Records Retention

Records will be retained during the life of the project and for a minimum of three (3) years following the termination of permit coverage in accordance with Special Condition S5.C of the CSWGP.

Permit documentation to be retained on-site:

- CSWGP
- Permit Coverage Letter
- SWPPP
- Site Log Book

Permit documentation will be provided within 14 days of receipt of a written request from Ecology. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with Special Condition S5.G.2.b of the CSWGP.

All reporting and record keeping requirements of the project-specific Administrative Order must also be complied with if any discharges to surface water occur during the project.

7.1.3 Updating the SWPPP

The SWPPP will be modified if:

- Found ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site.

- There is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

The SWPPP will be modified within seven (7) days if inspection(s) or investigation(s) determine additional or modified BMPs are necessary for compliance.

7.2 Reporting

7.2.1 Discharge Monitoring Reports

Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period the DMR will be submitted as required, reporting "No Discharge". The DMR due date is fifteen (15) days following the end of each calendar month. DMRs will be reported online through Ecology's WQWebDMR System in accordance with the requirements of the project-specific Discharge authorization.

https://www.ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance

7.2.2 Notification of Noncompliance

If any of the terms and conditions of the CSGWP with Administrative Order, is not met, including any exceedance of indicator levels, the following actions will be taken:

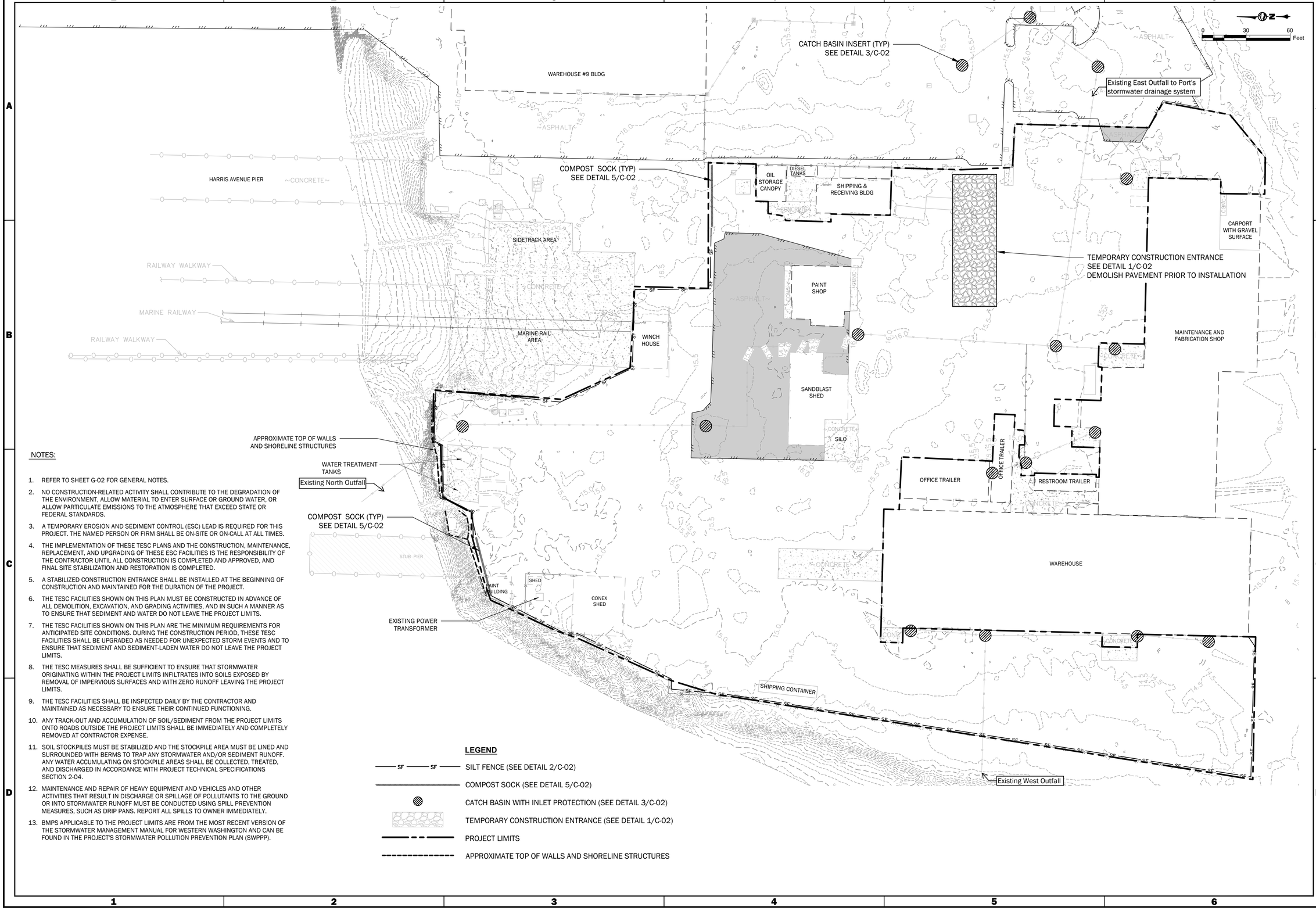
1. Ecology will be notified within 24-hours of the failure to comply by calling the Northwest Regional Office ERTS phone number (425-649-7000).
2. Immediate action will be taken to prevent the discharge/pollution or otherwise stop or correct the noncompliance. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Include the following information:

1. Your name and / Phone number
2. Permit number
3. City / County of project
4. Sample results
5. Date / Time of call
6. Date / Time of sample
7. Project name

ATTACHMENT A

Site Map



NOTES:

1. REFER TO SHEET G-02 FOR GENERAL NOTES.
2. NO CONSTRUCTION-RELATED ACTIVITY SHALL CONTRIBUTE TO THE DEGRADATION OF THE ENVIRONMENT, ALLOW MATERIAL TO ENTER SURFACE OR GROUND WATER, OR ALLOW PARTICULATE EMISSIONS TO THE ATMOSPHERE THAT EXCEED STATE OR FEDERAL STANDARDS.
3. A TEMPORARY EROSION AND SEDIMENT CONTROL (ESC) LEAD IS REQUIRED FOR THIS PROJECT. THE NAMED PERSON OR FIRM SHALL BE ON-SITE OR ON-CALL AT ALL TIMES.
4. THE IMPLEMENTATION OF THESE TESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED, AND FINAL SITE STABILIZATION AND RESTORATION IS COMPLETED.
5. A STABILIZED CONSTRUCTION ENTRANCE SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT.
6. THE TESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN ADVANCE OF ALL DEMOLITION, EXCAVATION, AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND WATER DO NOT LEAVE THE PROJECT LIMITS.
7. THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE TESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE PROJECT LIMITS.
8. THE TESC MEASURES SHALL BE SUFFICIENT TO ENSURE THAT STORMWATER ORIGINATING WITHIN THE PROJECT LIMITS INFILTRATES INTO SOILS EXPOSED BY REMOVAL OF IMPERVIOUS SURFACES AND WITH ZERO RUNOFF LEAVING THE PROJECT LIMITS.
9. THE TESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
10. ANY TRACK-OUT AND ACCUMULATION OF SOIL/SEDIMENT FROM THE PROJECT LIMITS ONTO ROADS OUTSIDE THE PROJECT LIMITS SHALL BE IMMEDIATELY AND COMPLETELY REMOVED AT CONTRACTOR EXPENSE.
11. SOIL STOCKPILES MUST BE STABILIZED AND THE STOCKPILE AREA MUST BE LINED AND SURROUNDED WITH BERMS TO TRAP ANY STORMWATER AND/OR SEDIMENT RUNOFF. ANY WATER ACCUMULATING ON STOCKPILE AREAS SHALL BE COLLECTED, TREATED, AND DISCHARGED IN ACCORDANCE WITH PROJECT TECHNICAL SPECIFICATIONS SECTION 2-04.
12. MAINTENANCE AND REPAIR OF HEAVY EQUIPMENT AND VEHICLES AND OTHER ACTIVITIES THAT 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. REPORT ALL SPILLS TO OWNER IMMEDIATELY.
13. BMPS APPLICABLE TO THE PROJECT LIMITS ARE FROM THE MOST RECENT VERSION OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON AND CAN BE FOUND IN THE PROJECT'S STORMWATER POLLUTION PREVENTION PLAN (SWPPP).

LEGEND

- SF — SF — SILT FENCE (SEE DETAIL 2/C-02)
- COMPOST SOCK (SEE DETAIL 5/C-02)
- CATCH BASIN WITH INLET PROTECTION (SEE DETAIL 3/C-02)
- TEMPORARY CONSTRUCTION ENTRANCE (SEE DETAIL 1/C-02)
- PROJECT LIMITS
- APPROXIMATE TOP OF WALLS AND SHORELINE STRUCTURES

100% DESIGN DRAFT NOT FOR CONSTRUCTION

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM Washington State

DRAWN BY: CMV
DESIGNED BY: EBP/JRG
REVISED BY: -

Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE:

TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

C-01

SHEET **4** *OF* **37**

CAD Path: \\ASP-BEA01\Drafting\Port of Bellingham\210195 Harris\Shop\2023-01 Revised Plans_Regrade 3\100_Design_210195 PreSet_.SPK_1-4.dwg Layout: C-01 | | Date Saved: 9/10/2024 11:37:06 AM | | User: caroline.vanslyke

ATTACHMENT B

Site Inspection Form

Construction Stormwater Site Inspection Form

Project Name _____ Permit # _____ Inspection Date _____ Time _____

Name of Certified Erosion Sediment Control Lead (CESCL) or qualified inspector if *less than one acre*
Print Name: _____

Approximate rainfall amount since the last inspection (in inches): _____

Approximate rainfall amount in the last 24 hours (in inches): _____

Current Weather Clear ☐ Cloudy ☐ Mist ☐ Rain ☐ Wind ☐ Fog ☐

A. Type of inspection: Weekly ☐ | Post Storm Event ☐ Other ☐

B. Phase of Active Construction (*check all that apply*):

Pre Construction/installation of erosion/sediment controls	☐	Clearing/Demo/Grading	☐	Infrastructure/storm/roads	☐
Concrete pours	☐	Vertical Construction/buildings	☐	Utilities	☐
Offsite improvements	☐	Site temporary stabilized	☐	Final stabilization	☐

C. Questions:

1. Were all areas of construction and discharge points inspected? Yes ___ No ___
2. Did you observe the presence of suspended sediment, turbidity, discoloration, or oil sheen Yes ___ No ___
3. Was a water quality sample taken during inspection? (*refer to permit conditions S4 & S5*) Yes ___ No ___
4. Was there a turbid discharge 250 NTU or greater, or Transparency 6 cm or less?* Yes ___ No ___
5. If yes to #4 was it reported to Ecology? Yes ___ No ___
6. Is pH sampling required? pH range required is 6.5 to 8.5. Yes ___ No ___

If answering yes to a discharge, describe the event. Include when, where, and why it happened; what action was taken, and when.

_____

_____

_____

_____

*If answering yes to # 4 record NTU/Transparency with continual sampling daily until turbidity is 25 NTU or less/ transparency is 33 cm or greater.

Sampling Results: Date: _____

Parameter	Method (circle one)	Result			Other/Note
		NTU	cm	pH	
Turbidity	tube, meter, laboratory				
pH	Paper, kit, meter				

Construction Stormwater Site Inspection Form

D. Check the observed status of all items. Provide "Action Required "details and dates.

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
1 Clearing Limits	Before beginning land disturbing activities are all clearing limits, natural resource areas (streams, wetlands, buffers, trees) protected with barriers or similar BMPs? (high visibility recommended)						
2 Construction Access	Construction access is stabilized with quarry spalls or equivalent BMP to prevent sediment from being tracked onto roads?						
	Sediment tracked onto the road way was cleaned thoroughly at the end of the day or more frequent as necessary.						
3 Control Flow Rates	Are flow control measures installed to control stormwater volumes and velocity during construction and do they protect downstream properties and waterways from erosion?						
	If permanent infiltration ponds are used for flow control during construction, are they protected from siltation?						
4 Sediment Controls	All perimeter sediment controls (e.g. silt fence, wattles, compost socks, berms, etc.) installed, and maintained in accordance with the Stormwater Pollution Prevention Plan (SWPPP).						
	Sediment control BMPs (sediment ponds, traps, filters etc.) have been constructed and functional as the first step of grading.						
	Stormwater runoff from disturbed areas is directed to sediment removal BMP.						
5 Stabilize Soils	Have exposed un-worked soils been stabilized with effective BMP to prevent erosion and sediment deposition?						

Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
5 Stabilize Soils Cont.	Are stockpiles stabilized from erosion, protected with sediment trapping measures and located away from drain inlet, waterways, and drainage channels?						
	Have soils been stabilized at the end of the shift, before a holiday or weekend if needed based on the weather forecast?						
6 Protect Slopes	Has stormwater and ground water been diverted away from slopes and disturbed areas with interceptor dikes, pipes and or swales?						
	Is off-site storm water managed separately from stormwater generated on the site?						
	Is excavated material placed on uphill side of trenches consistent with safety and space considerations?						
	Have check dams been placed at regular intervals within constructed channels that are cut down a slope?						
7 Drain Inlets	Storm drain inlets made operable during construction are protected.						
	Are existing storm drains within the influence of the project protected?						
8 Stabilize Channel and Outlets	Have all on-site conveyance channels been designed, constructed and stabilized to prevent erosion from expected peak flows?						
	Is stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes and downstream conveyance systems?						
9 Control Pollutants	Are waste materials and demolition debris handled and disposed of to prevent contamination of stormwater?						
	Has cover been provided for all chemicals, liquid products, petroleum products, and other material?						
	Has secondary containment been provided capable of containing 110% of the volume?						
	Were contaminated surfaces cleaned immediately after a spill incident?						
	Were BMPs used to prevent contamination of stormwater by a pH modifying sources?						

Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
9 Cont.	Wheel wash wastewater is handled and disposed of properly.						
10 Control Dewatering	Concrete washout in designated areas. No washout or excess concrete on the ground.						
	Dewatering has been done to an approved source and in compliance with the SWPPP.						
	Were there any clean non turbid dewatering discharges?						
11 Maintain BMP	Are all temporary and permanent erosion and sediment control BMPs maintained to perform as intended?						
12 Manage the Project	Has the project been phased to the maximum degree practicable?						
	Has regular inspection, monitoring and maintenance been performed as required by the permit?						
	Has the SWPPP been updated, implemented and records maintained?						
13 Protect LID	Is all Bioretention and Rain Garden Facilities protected from sedimentation with appropriate BMPs?						
	Is the Bioretention and Rain Garden protected against over compaction of construction equipment and foot traffic to retain its infiltration capabilities?						
	Permeable pavements are clean and free of sediment and sediment laden-water runoff. Muddy construction equipment has not been on the base material or pavement.						
	Have soiled permeable pavements been cleaned of sediments and pass infiltration test as required by stormwater manual methodology?						
	Heavy equipment has been kept off existing soils under LID facilities to retain infiltration rate.						

E. Check all areas that have been inspected. ✔

All in place BMPs ☐ All disturbed soils ☐ All concrete wash out area ☐ All material storage areas ☐
All discharge locations ☐ All equipment storage areas ☐ All construction entrances/exits ☐

F. Elements checked "Action Required" (section D) describe corrective action to be taken. List the element number; be specific on location and work needed. Document, initial, and date when the corrective action has been completed and inspected.

Element #	Description and Location	Action Required	Completion Date	Initials

Attach additional page if needed

Sign the following certification:

"I certify that this report is true, accurate, and complete, to the best of my knowledge and belief"

Inspected by: (print) _____ (Signature) _____ Date: _____

Title/Qualification of Inspector: _____

APPENDIX D

Regulated Building Materials Report

LIMITED HAZARDOUS BUILDING MATERIALS SURVEY

Demolition of Harrison Avenue Shipyard Buildings
Port of Bellingham
Bellingham, Washington

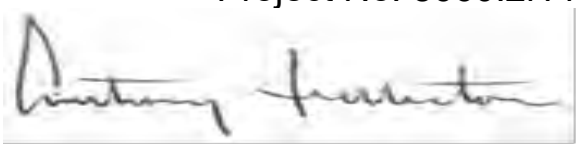
Submitted To:

Aspect Consulting, LLC.
103 East Holly Street, Suite 320
Bellingham, Washington 98225

Prepared by:

Med-Tox Northwest
Post Office Box 1446
Auburn, Washington 98071-1446
Telephone: 253-351-0677

Project No. 8660.2rv1



Anthony Fullerton
AHERA BI #190507 Exp. 08/22/2024
September 2023

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Acronyms

AAS	atomic absorption spectroscopy
ACM	asbestos-containing materials
AHERA	Asbestos Hazard Emergency Response Act
ASHARA	Asbestos Schools Hazard Abatement Reauthorization Act
ASTM	American Society of Testing and Materials
CFR	Code of Federal Regulation
DEHP	Di (2-ethylhexyl) phthalate
ECD	electron capture detectors
EPA	U.S. Environmental Protection Agency
GC	gas chromatography
GWB	gypsum wallboard
HBM	hazardous building materials
HID	high intensity discharge
HM	homogeneous material
LBP	lead-based paint
mg/cm^2	milligrams per square centimeter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MTNW	Med-Tox Northwest
NIST	National Institute of Standards and Technology
NVLAP	National Voluntary Laboratory Accreditation Program
NWCAA	Northwest Clean Air Agency
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PLM	polarized light microscopy
ppm	parts per million
SAT	Seattle Asbestos Test, LLC.
SF	square feet
TCLP	toxicity characteristic leaching procedure
TSI	thermal system insulation
WAC	Washington Administration Code
WDOC	State of Washington Department of Commerce
WISHA	Washington Industrial Safety and Health Administration
WRD	WISHA Regional Directive
XRF	X-ray fluorescence
% wt	percent by weight

Survey Summary

On August 30, 2023 Anthony Fullerton of Med-Tox Northwest (MTNW) conducted a hazardous building materials (HBM) survey of various buildings at the Harris Avenue Shipyard in Bellingham, Washington. The site is located at 201 Harris Avenue in Bellingham, Washington. This work was conducted under contract to Aspect Consulting, LLC. The client supplied a site drawing that showed the buildings that are going to be impacted by the upcoming project. The buildings surveyed included the Paint Shop building, Sandblast building, Winch building, Water Treatment building, tank farm, Paint building, and the Conex building. There were no other structures or piers included in the survey activities.

A building inspector certified under the Asbestos Hazard Emergency Response Act (AHERA) and employed by MTNW conducted the building material survey in accordance with federal, state, and local regulations to provide for an assessment of asbestos-containing materials (ACM) of the pier and associated structures. The applicable regulations require the building owner to identify and dispose of the identified ACM prior to or during demolition work.

This report identifies building materials that contain asbestos, estimates the quantity of ACM present and documents building materials that potentially contain lead-based paint (LBP), polychlorinated biphenyls (PCBs) and other hazardous materials.

Copies of the inspectors' AHERA building inspector certificate and State of Washington Department of Commerce (WDOC) Risk Assessor certificates are included in **Appendix A**.

Building Information

Photographic documentation of the structure and the major systems described herein are provided in **Appendix B**.

Harris Avenue Shipyard Buildings

The following buildings/tanks were included in the survey activities:

- Paint Shop – Construction date unknown. Single story shop building +/- 1,400 square feet (SF). This wood framed building is finished with corrugated metal siding and roofing. The floor is finished concrete. The interior of the building is finished with gypsum wallboard (GWB) system over fiberglass batt insulation. Rooms in the building include a furnace room, compressor room, and outside covered storage space. Building improvements include a gas-fired furnace for heating and electricity. There were no other improvements observed.
- Sandblast Shed – Construction date unknown. Single story shed building +/- 2,011 SF. This wood framed building is finished with corrugated metal siding and

roofing. The floor is finished concrete. The interior of the building is finished with wood sheeting affixed to the wood framing. At one time the ceiling also had an additional finish (paper-like material attached to the wood framing). At the time of the MTNW survey, there were only remnant pieces of the material left. Rooms in the building include two storage areas located on the east and west sides of the building. The center section appears to have been where sandblasting activities previously took place. At the time of the survey, the area was being used for storage. The building is wired for electricity; there were no other improvements observed.

- Winch House Building – Construction date unknown. Single story building +/- 813 SF. This wood framed building is finished with corrugated metal siding and roofing. The floor is finished concrete. Rooms in the building include a storage room, electrical room, and main winch motor room. The building is wired for electricity; there were no other improvements observed.
- Water Treatment Building – Construction date unknown. Single story building +/- 437 SF. This wood framed building is finished with corrugated metal siding and roofing. The floor is finished concrete. Inside the building are several storage tanks and pipe systems. The building is wired for electricity and plumbing for the water treatment process. Heat is provided by several wall mounted electric space heaters.
- Tank Farm – the tank farm is comprised of eight above ground storage tanks that range in size and construction. Most of the tanks are situated around the exterior of the Water Treatment building. The following tanks were surveyed as part of the tank farm:
    1. Tank #1- steel tank that is 40,000 gallons,
    2. Tank #2- fiberglass tank that is 31,000 gallons,
    3. Tank #3- fiberglass tank that is 20,343 gallons,
    4. Tank #4- fiberglass tank that is 24,000 gallons,
    5. Tank #5- steel tank that is 24,000 gallons,
    6. Tank #6- fiberglass tank inside water treatment building
    7. Tank #7- steel tank that is 8,722 gallons,
    8. Tank #8- steel tank that is 6,392 gallons.
- Paint Building – Construction date unknown. Single story building +/- 325 SF. This small wood-frame structure is finished with corrugated sheet metal siding and roofing. The floor is finished concrete. Interior finishes include fiberglass batt insulation.
- Conex Building – Construction date unknown. Single story building +/- 1,656 SF. This structure consists of two repurposed metal freight containers (one all steel

shipping container and one old refrigerator unit) that are approximately 288 SF each. The containers are spaced apart and there is a metal framed roof structure affixed over the open area to create additional room for covered storage. The storage space is approximately 1,080 SF in size. The north container (refrigerator unit) has several interior finishes and there has been a wall constructed to divide the space. Interior finishes include untextured GWB system and fibrous corrugated wall panels along with caulking on the interior walls and ceiling seams. The roof of the north container has sealant applied to the metal panels. The containers have been wired for electricity, there were no other improvements observed.

Asbestos Survey

The AHERA regulation, 40 Code of Federal Regulations (CFR) 763, is the primary governing regulation when performing asbestos surveys. This regulation was originally enacted for school buildings but has since been applied to public and commercial buildings by the Asbestos School Hazard Abatement Reauthorization Act (ASHARA) in 1994 and by the Occupational Safety and Health Administration's (OSHA) worker protection regulations in 1995, specifically 29 CFR 1926.1101(k).

Northwest Clean Air Agency (NWCAA) also requires compliance with AHERA's survey and sampling requirements. This applies to any renovation or demolition activities where suspected ACM may be disturbed. NWCAA is a local agency that receives statutory authority from the U.S. Environmental Protection Agency (EPA) to enforce environmental regulations.

AHERA divides suspect ACM into three categories: "surfacing materials" (i.e., sprayed fireproofing, popcorn ceiling texture, etc.), "thermal system insulation" (TSI) (i.e., pipe or building insulation, etc.), and "miscellaneous materials" (i.e., flooring material, roofing, construction mastics, etc.). The following sections summarize the potential ACMs identified for each of these three categories. For a complete listing of suspect materials sampled, see **Appendix C**.

Table 1 summarizes ACM identified on the pier and associated sheds surveyed by Med-Tox Northwest. Friability was determined by conditions observed during the survey and by how the material behaves during mechanical demolition.

Table 1. Summary of Asbestos Containing Materials

Material	Location	Friable	Quantity*
Conex Building			
Roof sealant	North container roof	No	288 SF
Paint Shop Building			
There were no asbestos containing materials identified in this building.			
Sandblast Building			

Material	Location	Friable	Quantity*
There were no asbestos containing materials identified in this building.			
Winch Building			
There were no asbestos containing materials identified in this building.			
Water Treatment Building			
There were no asbestos containing materials identified in this building.			
Tank Farm			
There were no asbestos containing materials identified with the associated tanks or piping systems.			
Paint Building			
There were no asbestos containing materials identified in this building.			

SF=square feet. *Quantities are approximate. Note: This table is not to be used without the complete survey document including appendices for additional information.

Homogeneous material (HM) descriptions in the following text are provided to help correlate material descriptions provided in Appendix C.

Surfacing Materials

There was one surfacing material identified in the Conex Building as defined in 40 CFR 763.

- Silver paint on GWB (HM-25). This material was found on the interior demising wall (finished with GWB) of the north container. Three samples were collected of this material based on total square footage observed. This material is negative for asbestos.

The were no surfacing materials observed in the other buildings included in the survey.

Thermal System Insulation

There were five TSI materials identified in the buildings as defined in 40 CFR 763.

Paint Shop Building

- White plastic with mastic and fiberglass batt insulation (HM-01). This material was found on lining the walls and ceiling of the building. Three samples were collected of this material based on total square footage observed. This material is negative for asbestos.

Water Treatment Building

- White plastic with mastic and fiberglass batt insulation (HM-15). This material was found on lining the walls and ceiling of the building. Three samples were collected of this material based on total square footage observed. This material is negative for asbestos.

Tank Farm

- Canvas pipe wrap and white sealant over fiberglass and foam insulation (HM-19). This pipe insulation was observed on the outside of Tank #4. Three samples were collected of this material based on total square footage observed. This material is negative for asbestos.
- Canvas pipe wrap and white sealant over fiberglass and foam insulation (HM-20). This pipe insulation was observed on the outside of Tank #5. Three samples were collected of this material based on total square footage observed. This material is negative for asbestos.

Paint Building

- White plastic with mastic and fiberglass batt insulation (HM-22). This material was found on lining the walls and ceiling of the building. Three samples were collected of this material based on total square footage observed. This material is negative for asbestos.

There were no TSI materials observed in the Sandblast Building, Winch Building, or the Conex Building.

Miscellaneous Materials

Paint Shop Building

- Un-textured gypsum wallboard system (HM-02). This material was observed on the interior walls. Three samples were collected of this material; this material is negative for asbestos.
- Paint coating on floor (HM-03). This material was observed on the concrete floor. Two samples were collected of this material; this material is negative for asbestos.
- Screw gasket (HM-04). This material was observed under the exterior siding screws. Two samples were collected of this material; this material is negative for asbestos.
- Black tar sealant (HM-05). This material was observed on the exterior of the south wall by the main entrance door on the bottom of the wall. Two samples were collected of this material; this material is negative for asbestos.

Sandblast Building

- Remnant ceiling paper (HM-06). This material was observed on the ceiling. Three samples were collected and analyzed for asbestos content; this material was determined to be negative for asbestos.
- Remnant wall mastic (HM-07). This material was observed on the east side of the building on the wood wall panel. Two samples were collected and analyzed for asbestos content; this material was determined to be negative for asbestos.

- Door in-fill caulk (HM-08). This material was observed in the east storage area. Two samples were collected and analyzed for asbestos content; this material was determined to be negative for asbestos.
- Flashing sealant (HM-09). This material was observed on the east side exterior siding. Two samples were collected and analyzed for asbestos content; this material was determined to be negative for asbestos.
- Window frame caulk (HM-10). This material was observed around the exterior window frames. Two samples were collected and analyzed for asbestos content; this material was determined to be negative for asbestos.
- Corrugated metal siding sealant (HM-11). This material was observed on the exterior corrugated metal siding. Two samples were collected and analyzed for asbestos content; this material was determined to be negative for asbestos.
- Screw gasket (HM-12). This material was observed under the exterior siding screws. Two samples were collected of this material; this material is negative for asbestos.

Winch Building

- Blue sheet flooring (HM-13). This material was observed on the floor in the electrical room. Two samples were collected of this material; this material is negative for asbestos.
- Screw gasket (HM-14). This material was observed under the exterior siding and roof screws. Two samples were collected of this material; this material is negative for asbestos.

Water Treatment Building

- Screw gasket (HM-16). This material was observed under the exterior siding screws. Two samples were collected of this material; this material is negative for asbestos.

Tank Farm

- Remnant caulk (HM-17). This material was observed on the side of Tank #1. Two samples were collected and analyzed for asbestos content; this material was determined to be negative for asbestos.
- Black flange gasket (HM-18). This material was observed on the flanges of Tanks #2 and #3. Two samples were collected and analyzed for asbestos content; this material was determined to be negative for asbestos.
- Black flange gasket (HM-21). This material was observed on Tank #5. Two samples were collected and analyzed for asbestos content; this material was determined to be negative for asbestos.

Paint Building

- Green flange gasket (HM-23). This material was observed on the pipes inside the building. Two samples were collected and analyzed for asbestos content; this material was determined to be negative for asbestos.
- Siding caulk (HM-24). This material was observed on the exterior siding and window frame. Two samples were collected of this material; this material is negative for asbestos.

Conex Building

- Fibrous corrugated wall (HM-26). This material was observed on the walls in the north Conex container. Two samples were collected of this material; this material is negative for asbestos.
- Un-textured GWB system (HM-27). This material was observed on the demising wall in the north Conex container. Two samples were collected of this material; this material is negative for asbestos.
- Caulk on interior walls and ceiling seams (HM-28). This material was observed on the walls and ceiling in the north Conex container. Two samples were collected of this material; this material is negative for asbestos.
- **Roof sealant (HM-29).** This material was observed on the roof of the north Conex. Two samples were collected and analyzed for asbestos content; this material was **determined to contain 3% Chrysotile asbestos**.

Table 2 lists all suspect materials sampled that have been determined to be non-asbestos containing.

Table 2. Summary of Suspect Materials Determined Non-Asbestos Containing

Material Location	Material Description
Paint Shop Building	
White plastic with mastic and fiberglass batt insulation (HM-01)	Un-textured GWB system (HM-02)
Paint coating on floor (HM-03)	Screw gasket (HM-04)
Black tar sealant (HM-05)	
Sandblast Building	
Remnant ceiling paper (HM-06)	Remnant wall mastic (HM-07)
Door in-fill caulk (HM-08)	Flashing sealant (HM-09)
Window frame caulk (HM-10)	Corrugated metal siding sealant (HM-11)
Screw gasket (HM-12)	
Winch Building	
Blue sheet flooring (HM-13)	Screw gasket (HM-14)
Water Treatment Building	
White plastic with mastic and fiberglass batt	Screw gasket (HM-16)

Material Location	Material Description
insulation (HM-15)	
Tank Farm	
Remnant caulk (HM-17)	Black flange gasket (HM's 18 and 21)
Canvas wrap and white sealant over fiberglass and foam insulation (HM's 19 and 20)	
Paint Building	
White plastic with mastic and fiberglass batt insulation (HM-22)	Green pipe flange gasket (HM-23)
Siding caulk (HM-24)	
Conex Building	
Silver paint on GWB wall (HM-25)	Fibrous corrugated wall (HM-26)
Un-textured GWB system (HM-27)	Caulk on interior walls and ceiling seams (HM-28)

Note: This table is not to be used without the complete survey document including appendices for additional information.

Lead-Based Paint Summary

Lead was commonly used in most paint products until 1978, when it was banned from residential paints at concentrations greater than 600 parts per million (ppm); however, commercial applications with lead were still utilized and are still available. Lead is poisonous to the human body and presents a potential health hazard during any kind of disturbance (such as maintenance, including grinding, welding, and cutting) and if improperly disposed, where lead can enter drinking water supplies.

EPA defines lead-based paint as a concentration of 1.0 milligram per centimeter squared (mg/cm^2) or greater by x-ray fluorescence (XRF) or 0.5 percent by weight or greater by total lead analysis (equivalent to 5,000 milligram per kilogram [mg/kg]). This EPA action level triggers requirements for protection of the environment, maintenance workers, and building occupants in child occupied facilities. It also triggers training and certification requirements for inspectors, project designers, contractors, supervisors, and workers. Although these requirements only apply to certain residential and/or child occupied structures at this time, they could apply to this type of property sometime in the future.

Washington Industrial Safety and Health Administration (WISHA) worker protection regulations has not defined a minimum concentration for regulating lead and has clarified that lead at any detectable concentration shall be considered regulated (Washington Administrative Code [WAC] 296-155-176, Lead).

Lead in Painted Surfaces

Interior and exterior painted surfaces were tested for LBP using bulk sample collection and chemical analysis. A total of seven (7) paint chip samples were collected. Analytical results are provided in **Table 3**.

Table 3. Summary of Bulk Paint Chip Sample Results.

Sample Number	Location	Component	Substrate	Color	Result (ppm)
Paint Shop Building					
8066.2-AF-01PB	Interior	Wall	GWB	Multi-color	<80
8066.2-AF-02PB	Interior	Wall	GWB	White	<80
8066.2-AF-03PB	Interior slab	Floor	Concrete	Multi-color	<80
Tank Farm					
8066.2-AF-04PB	Tank #1	Exterior	Steel	Beige	<230
8066.2-AF-05PB	Tank #5	Exterior	Steel	Beige/yellow	**140,000**
8066.2-AF-06PB	Tank #8	Exterior	Steel	Black	**630**
Conex Building					
8066.2-AF-07PB	North Conex interior	Wall	GWB	Multi-color	<80

gwb = gypsum wallboard, ppm = parts per million. **Bolded values** – bulk paint chip samples with lead detected above the laboratory reporting limit have been bolded/. The WISHA worker protection regulations have stated that lead at any detectable concentration shall be considered regulated WAC 296-155-176, Lead.

Other Hazardous Building Materials

Chlorofluorocarbons

Med-Tox Northwest inspected the buildings at the site for cooling systems with potential CFCs. None of the buildings had cooling units and no portable air conditioners were observed.

PCB Light Ballasts and Fluorescent Light Tubes

Older fluorescent light ballasts have small capacitors that may contain high concentrations of PCB. Nearly all ballasts manufactured before 1979 contain PCBs. All ballasts manufactured after July 1, 1978 that do not contain PCBs are required to be clearly marked "No PCBs". Unmarked ballasts or ballasts without a date code should be assumed to be PCB ballasts. PCBs are toxic chemicals according to the EPA. While there is only a small amount, about one ounce, of PCBs in each light ballast capacitor, there are a large number of ballasts in the United States. About half of the one billion ballasts, estimated as currently installed, were manufactured before 1979 and usually contain PCBs. Ballasts manufactured after 1978 may contain a PCB replacement called Di (2-ethylhexyl) phthalate (DEHP), a probable human carcinogen. In any case, ballasts should not be disassembled for disposal but collected and sent to a certified recycling/disposal facility.

Fluorescent light fixtures were observed throughout the building. These fixtures were not inspected for the presence of PCB light ballasts due to being in use and the likelyhood that many have been replaced since 1971. Determining how many fluorescent lights actually contain PCB ballasts can only be verified during demolition. Therefore, all light fixtures are assumed to contain PCB light ballasts; light tubes are assumed to contain mercury. Additionally, exit lights, high intensity discharge (HID) lamps, smoke and heat detectors, and fire extinguishers may be regulated as universal or hazardous waste and will require dismantling and special handling. **Table 4** provides a summary of these items in the building:

Table 4. Summary of Light Fixtures.

Location/floor	HID lights	8-foot, 2-bulb	4-foot, 3-bulb	4-foot, 2-bulb	Smoke/ heat detectors	Exit lights
Site wide	16	10	0	13	0	0
Total	**16**	**10**	**0**	**13**	**0**	**0**

Typically, there is one ballast for every two light tubes in a fluorescent light fixture; accordingly, there are approximately 39 ballasts in the light fixtures requiring recycling or PCB hazardous waste disposal. There are also 46 light tubes that will need to be recycled during renovation/ demolition.

PCB in Caulking and Paint

PCBs were used in paint and caulk formulations as drying oils (resins) and plasticizers or softening agents (liquids). Wood, concrete, gypsum wallboard and metal may have painted surfaces containing PCBs.

PCBs were tested in representative paints from the interior and exteriors of the buildings located on the Harris Avenue Shipyard. **Table 5** below provides a summary of PCB sample results.

Table 5. Summary of Bulk PCB Sample Results.

Sample Number	Location	Material	Result (mg/kg*)
Paint Shop Building			
8660.2-AF-01PCB	Interior walls	Paint coating on GWB walls	ND
8660.2-AF-02PCB	Interior floor	Paint coating on concrete floor	ND
Sandblast Building			
8660.2-AF-03PCB	East storage area	Door infill caulk	ND
8660.2-AF-04PCB	Exterior	Siding caulk	ND
Tank Farm			

Sample Number	Location	Material	Result (mg/kg*)
8660.2-AF-05PCB	Tank #1	Remnant caulk on tank exterior	ND
8660.2-AF-06PCB	Tank #1	Paint coating on tank exterior	ND
8660.2-AF-07PCB	Tank #5	Paint coating on tank exterior	ND
8660.2-AF-08PCB	Tank #8	Paint coating on tank exterior	0.65 Aroclor 1254
Paint Building			
8660.2-AF-09PCB	Exterior	Siding and window frame caulk	ND
Conex Building			
8660.2-AF-10PCB	North Conex interior	Caulk on wall and ceiling seams	ND
8660.2-AF-11PCB	North Conex interior	Paint on center GWB wall	ND

gwb = gypsum wallboard, mg/kg= milligrams per kilogram, ND = none detected. Note: Do not use this table without the complete survey document.

Mercury Containing Switches

Heating system thermostats were investigated for mercury containing systems; none were observed.

Laboratory Analytical Methods

Asbestos-Containing Materials

Bulk samples were analyzed by Polarized Light Microscopy (PLM) dispersion staining EPA Method 600/R-93/116 by Seattle Asbestos Test, LLC (SAT). SAT is accredited through the National Voluntary Laboratory Accreditation Program (NVLAP) administered by the National Institute of Standards and Technology (NIST), a division of the U.S. Department of Commerce. This accreditation does not constitute endorsement, but rather a finding of laboratory competence. The NVLAP participant number for SAT is 200876-0 (certification copy is located in **Appendix D**). Analytical results are in **Appendix E**.

Lead-Based Paint

Bulk paint chip samples were submitted to EMSL Analytical, Inc., for analysis. Paint chip samples were analyzed for lead using atomic absorption spectroscopy (AAS) to determine the presence and percentage of lead. Procedures for analyzing metals are found in the American Society of Testing and Materials (ASTM) D-3335-78 and EPA Method Manual SW-846, Method 6010. (EMSL Analytical Inc. used SW 846 3050B*/7000B).

Analytical results for paint chips are provided in **Appendix F**. EMSL Analytical, Inc.'s laboratory certification is attached in **Appendix G**.

PCBs

Bulk PCB samples were submitted to On-Site Environmental, Inc., for analysis using gas chromatography (GC) equipped with electron capture detectors (ECD). Samples were analyzed using EPA Method SW-846 8082A. Analytical results are provided in **Appendix H**. On-Site Environmental, Inc. laboratory certification is attached in **Appendix I**.

A sample location drawing is provided in **Appendix J**.

Comments and Recommendations

Asbestos-Containing Materials

Med-Tox Northwest recommends, and state law requires, that all asbestos materials be removed prior to impact from renovation and/or demolition with few exceptions.

Additional destructive investigation and sampling will be required prior to and during demolition activities including the following:

1. None of the doors in the buildings appeared to be of the type with asbestos fire rating protection; however, prior to demolition and disposal, inspect each door and door frame to verify no suspect fire protection material (potential ACM) is located inside.
2. Prior to demolition activities, inspect all wiring systems for potential ACM.

Med-Tox Northwest recommends that this survey report be placed on-site during renovation and/or demolition and copies provided to the contractor(s) bidding and performing work. WISHA and NWCAA require that the report be on-site and available for review during the entire project duration.

WISHA requires ACM be removed by trained and licensed contractors using certified asbestos abatement workers and supervisors (except for deregulated roofing sealants, mastics, and coatings). A 10-day prior notification is also required before abatement can begin. In addition, NWCAA requires notification and fees prior to beginning asbestos removal, their prior notification requirement is 10 working days.

Med-Tox Northwest recommends third party oversight of asbestos and demolition activities by an AHERA accredited building inspector to ensure regulatory compliance and completion of the additional destructive methods recommended herein. Additionally, Med-Tox Northwest recommends requesting unit pricing from abatement contractors during the bidding process to adjust pricing depending on actual quantities verified in the field.

Lead-Based Paint

With respect to painted surfaces and demolition, OSHA regulates lead at any measurable level and therefore, any paint disturbing activity is subject to compliance with 29 CFR 1926.62. Based on the survey results, the paint on tanks #5 and #8 contain high levels of lead in the paint. It is required that any work with the painted tanks be done in compliance with 29 CFR 1926.62. This requirement will apply to all construction trades, unless painted surfaces are removed during demolition activities, which is typically cost prohibitive. The above-stated regulations pertain specifically to

employee exposure during any maintenance, renovation, demolition, decorating, or new construction project where lead is present.

The leachable lead concentration in the waste stream was not tested at the time of the survey. Based on the results of the lead samples collected, the limited number of painted materials and that most of the buildings/ tanks are constructed of metal (which is recyclable) the waste stream for the demolition debris from the site will most likely be less than 5.0 mg/l.

PCB

There was one (1) paint that was determined to contain PCB's less than 50 ppm. PCB-containing waste in demolition debris cannot be recycled. It may go to a subtitle D landfill. Profiling and special transport requirements (i.e., lined containers) apply.

Work procedures for proper removal and protection of workers should be provided to contractors in accordance with WAC 296-155 and WAC 296-841. This includes Hazardous Communications training as it pertains to PCB's considered a remediation waste.

During demolition, the asbestos abatement contractor should be tasked with dismantling light fixtures, collecting all lighting ballasts for proper disposal, and recycling the light tubes. Ballasts without "No-PCB" labels are considered PCB-containing and must be disposed of as hazardous waste. "No-PCB" ballasts may designate as Washington Dangerous Waste and should be sent to an EPA licensed facility for proper disposal. Light tubes can be recycled as a universal waste for minimal cost or must be disposed of as a hazardous waste.

Other Hazardous Building Materials

Fluorescent light tubes contain mercury and can be recycled as a universal waste for minimal cost. HID lights should be collected and recycled/disposed of appropriately.

Limitations

A good faith effort has been made to identify ACM, LBP and other HBM in preparation for building demolition at Harrison Avenue Shipyard. This survey was performed for complete demolition of the buildings. Additional destructive investigation and sampling will be required depending on inaccessible building systems including mechanical spaces and/or mechanical/electrical system routing.

Sampling was performed consistent with the level of care and skill ordinarily exercised by professionals currently practicing under similar conditions in the area. No other warranty, expressed or implied, is made.

This report has been prepared for the exclusive use of Aspect Consulting, LLC and its' designates for this project only. The analyses, conclusions, and recommendations presented in this report are based on conditions encountered at the time of our survey and our experience and judgment. MTNW cannot be held responsible for interpretation by others of the data contained in this report; any use of this report shall include the entire document. This survey is not intended for use as abatement plans and/or specifications which MTNW recommends for regulatory compliance.

This report reflects Med-Tox Northwest's observations of the condition of the property during the time of field activities and does not cover conditions that may be found at some later time on the property that were not visible during these field activities.

Appendix A
AHERA Building Inspector and WDOC Risk Assessor Certificates

STATE OF WASHINGTON

Department of Commerce

Lead-Based Paint Abatement Program

Anthony L Fullerton

Has fulfilled the certification requirements of
WAC 365-230
and has been certified to conduct lead-based paint activities as a
Risk Assessor

Certification #	Issuance Date	Expiration Date
0242	08/13/2020	04/03/2023

Certificate of Completion

This is to certify that

Anthony L. Fullerton

has satisfactorily completed
4 hours of online refresher training as an

AHERA Building Inspector

to comply with the training requirements of
TSCA Title II, 40 CFR 763 (AHERA)

EPA Provider # 1085

186102
Certificate Number

ARGUS PACIFIC
TRAINING • CONSULTING
A Terracon COMPANY

Aug 25, 2022 Expires in 1 year.
Date(s) of Training

Exam Score: N/A
(if applicable)

Instructor: David Welch

ARGUS PACIFIC, INC / 21905 64th AVE W, SUITE 100 / MOUNTLAKE TERRACE, WASHINGTON 98043 / 206.285.3373 / ARGUSPACIFIC.COM

Appendix B
Building and Building System Photographic Documentation



Photo 1: Paint Shop Building facing southwest.



Photo 2: Interior of the Paint Shop Building.



Photo 3: Exterior of the Sandblast Shed Building facing northwest.



Photo 4: Typical finishes observed inside the Sandblast Shed Building.



Photo 5: Winch House Building facing south.



Photo 6: Typical finishes observed in the Winch Building.



Photo 7: Water Treatment Building facing southwest.

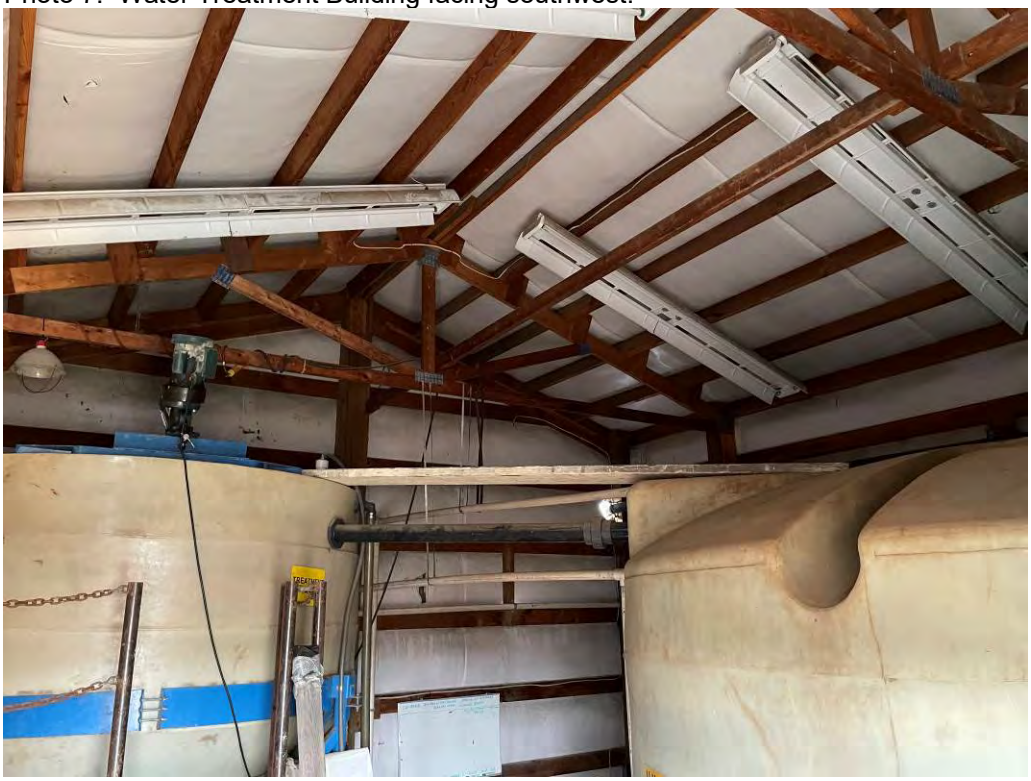


Photo 8: Typical finishes observed inside the Water Treatment Building.



Photo 9: Tank farm tanks #4 and #5 facing north.



Photo 10: Tank #8 with low levels of PCB's in the black paint.



Photo 11: Paint Building facing northwest.



Photo 12: Typical finishes observed inside the Paint Building.



Photo 13: Conex building facing southwest.



Photo 14: ACM roof sealant on north container roof.

Appendix C
Summary of Materials Sampled for Asbestos

Table C-1. Summary of Materials Sampled for Asbestos

Sample	Material	Location	AHERA Type	HM	Result
Paint Shop Building					
8660.2-AF-001	White plastic with mastic and fiberglass batt insulation	Ceiling	TSI	01	ND
8660.2-AF-002	White plastic with mastic and fiberglass batt insulation	Ceiling	TSI	01	ND
8660.2-AF-003	White plastic with mastic and fiberglass batt insulation	Ceiling	TSI	01	ND
8660.2-AF-004	Un-textured GWB system	Interior walls	Misc.	02	ND
8660.2-AF-005	Un-textured GWB system	Interior walls	Misc.	02	ND
8660.2-AF-006	Un-textured GWB system	Interior walls	Misc.	02	ND
8660.2-AF-007	Paint coating on floor	Interior slab	Misc.	03	ND
8660.2-AF-008	Paint coating on floor	Interior slab	Misc.	03	ND
8660.2-AF-009	Screw gasket	Exterior siding and roof	Misc.	04	ND
8660.2-AF-010	Screw gasket	Exterior siding and roof	Misc.	04	ND
8660.2-AF-011	Black tar sealant (10LF)	Exterior- south wall by main entrance door	Misc.	05	ND
8660.2-AF-012	Black tar sealant (10LF)	Exterior- south wall by main entrance door	Misc.	05	ND
Sandblast Building					
8660.2-AF-013	Remnant ceiling paper	Interior at ceiling	Misc.	06	ND
8660.2-AF-014	Remnant ceiling paper	Interior at ceiling	Misc.	06	ND
8660.2-AF-015	Remnant wall mastic	Interior – east wall on wood	Misc.	07	ND
8660.2-AF-016	Remnant wall mastic	Interior – east wall on wood	Misc.	07	ND
8660.2-AF-017	Door infill caulk	Interior	Misc.	08	ND
8660.2-AF-018	Door infill caulk	Interior	Misc.	08	ND
8660.2-AF-019	Flashing sealant	Exterior siding	Misc.	09	ND
8660.2-AF-020	Flashing sealant	Exterior siding	Misc.	09	ND
8660.2-AF-021	Window frame caulk	Exterior windows	Misc.	10	ND
8660.2-AF-022	Window frame caulk	Exterior windows	Misc.	10	ND
8660.2-AF-023	Corrugated metal siding sealant	Exterior siding	Misc.	11	ND
8660.2-AF-024	Corrugated metal siding sealant	Exterior siding	Misc.	11	ND
8660.2-AF-025	Screw gasket	Exterior siding and roof	Misc.	12	ND
8660.2-AF-026	Screw gasket	Exterior siding and roof	Misc.	12	ND
Winch Building					ND
8660.2-AF-027	Blue sheet flooring	Electrical room	Misc.	13	ND

Sample	Material	Location	AHERA Type	HM	Result
8660.2-AF-028	Blue sheet flooring	Electrical room	Misc.	13	ND
8660.2-AF-029	Screw gasket	Exterior siding and roof	Misc.	14	ND
8660.2-AF-030	Screw gasket	Exterior siding and roof	Misc.	14	ND
Water Treatment Building					
8660.2-AF-031	White plastic with mastic and fiberglass batt insulation	Walls and Ceiling	TSI	15	ND
8660.2-AF-032	White plastic with mastic and fiberglass batt insulation	Walls and Ceiling	TSI	15	ND
8660.2-AF-033	White plastic with mastic and fiberglass batt insulation	Walls and Ceiling	TSI	15	ND
8660.2-AF-034	Screw gasket	Exterior siding and roof	Misc.	16	ND
8660.2-AF-035	Screw gasket	Exterior siding and roof	Misc.	16	ND
Tank Farm					
8660.2-AF-036	Remnant caulk	Tank #1	Misc.	17	ND
8660.2-AF-037	Remnant caulk	Tank #1	Misc.	17	ND
8660.2-AF-038	Black flange gasket	Tank #2	Misc.	18	ND
8660.2-AF-039	Black flange gasket	Tank #3	Misc.	18	ND
8660.2-AF-040	Canvas pipe wrap and white sealant over fiberglass and foam insulation	Tank #4	TSI	19	ND
8660.2-AF-041	Canvas pipe wrap and white sealant over fiberglass and foam insulation	Tank #4	TSI	19	ND
8660.2-AF-042	Canvas pipe wrap and white sealant over fiberglass and foam insulation	Tank #4	TSI	19	ND
8660.2-AF-043	Canvas pipe wrap and white sealant over fiberglass and foam insulation	Tank #5	TSI	20	ND
8660.2-AF-044	Canvas pipe wrap and white sealant over fiberglass and foam insulation	Tank #5	TSI	20	ND
8660.2-AF-045	Canvas pipe wrap and white sealant over fiberglass and foam insulation	Tank #5	TSI	20	ND
8660.2-AF-046	Black flange gasket	Tank #5	Misc.	21	ND
8660.2-AF-047	Black flange gasket	Tank #5	Misc.	21	ND
Paint Building					
8660.2-AF-048	White plastic with mastic and fiberglass batt insulation	Walls and Ceiling	TSI	22	ND

Sample	Material	Location	AHERA Type	HM	Result
8660.2-AF-049	White plastic with mastic and fiberglass batt insulation	Walls and Ceiling	TSI	22	ND
8660.2-AF-050	White plastic with mastic and fiberglass batt insulation	Walls and Ceiling	TSI	22	ND
8660.2-AF-051	Green pipe flange gasket	Interior piping (north wall)	Misc.	23	ND
8660.2-AF-052	Green pipe flange gasket	Interior piping (north wall)	Misc.	23	ND
8660.2-AF-053	Siding caulk	Exterior siding and window frame	Misc.	24	ND
8660.2-AF-054	Siding caulk	Exterior siding and window frame	Misc.	24	ND
Conex Building					
8660.2-AF-055	Silver paint on GWB wall	Interior wall- north Conex	Surfacing	25	ND
8660.2-AF-056	Silver paint on GWB wall	Interior wall- north Conex	Surfacing	25	ND
8660.2-AF-057	Silver paint on GWB wall	Interior wall- north Conex	Surfacing	25	ND
8660.2-AF-058	Fibrous corrugated wall	Interior walls- north Conex	Misc.	26	ND
8660.2-AF-059	Fibrous corrugated wall	Interior walls- north Conex	Misc.	26	ND
8660.2-AF-060	Un-textured GWB system	Interior wall- north Conex	Misc.	27	ND
8660.2-AF-061	Un-textured GWB system	Interior wall- north Conex	Misc.	27	ND
8660.2-AF-062	Caulk on interior walls and ceiling seams	Interior- north Conex	Misc.	28	ND
8660.2-AF-063	Caulk on interior walls and ceiling seams	Interior- north Conex	Misc.	28	ND
8660.2-AF-064	**Roof sealant**	**North Conex**	**Misc.**	**29**	**3% CHR**
8660.2-AF-065	**Roof sealant**	**North Conex**	**Misc.**	**29**	**3% CHR**

Appendix D
National Voluntary Laboratory Accreditation Program Certificates

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 200768-0

Seattle Asbestos Test, LLC

Lynnwood, WA

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2022-10-01 through 2023-09-30

Effective Dates

For the National Voluntary Laboratory Accreditation Program

Appendix E
Analytical Reports- Asbestos

SEATTLE ASBESTOS TEST, LLC

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.9850, Fax: 425.673.9810, NVLAP Lab Code: 200768-0

www.seattleasbestostest.com, admin@seattleasbestostest.com

Project Manager:	Anthony Fullerton	Date Analyzed:	9/5/2023
Client:	Med-Tox, Northwest	Client Job#:	8660.2
Address:	PO Box 1446, Auburn, WA 98071-1446	Project Location:	Harrison Ave Shipyard Bellingham, WA
Tel:	253.351.0677	Laboratory batch#:	202213008
Date Report Issued:	9/5/2023	Samples Received:	65

Enclosed please find the test results for the bulk samples submitted to our laboratory for asbestos analysis. Analysis was performed using polarized light microscopy (PLM) in accordance with Test Method US EPA - 40 CFR Appendix E of Part 763, Interim Method of Determination of Asbestos in Bulk Insulation Samples and Test Method US EPA/600/R-93/116.

Percentages for this report are done by visual estimate and relate to the suggested acceptable error ranges by the method. Since variation in data increases as the quantity of asbestos decreases toward the limit of detection, the EPA recommends point counting for samples containing between <1% and 10% asbestos (NESHAP, 40 CFR Part 61). Statistically, point counting is a more accurate method. If you feel a point count might be beneficial, please feel free to call and request one.

The test results refer only to the samples or items submitted and tested. The accuracy with which these samples represent the actual materials is totally dependent on the acuity of the person who took the samples. This report must not be used by the client to claim product certification, approval, or endorsement by Seattle Asbestos Test, LLC, NVLAP, NIST, or any agency of the Federal government. The test report or calibration certificate shall not be reproduced except in full, without written approval of the laboratory. If the sample is inhomogeneous the sub-samples of the components are analyzed separately as layers.This report in its entirety consists of this cover leter, the customer sampling COC or data sheet, and the analytical report which is page numbered.

This report is highly confidential and will not be released without your consent. Samples are archived for 30 days after the analysis, and disposed of as hazardous waste thereafter.

Thank you for using our service and let us know if we can further assist you.

Sincerely

SZhang

Steve (Fanyao) Zhang
Approved Signatory

202213008

SEATTLE ASBESTOS TEST, LLC

Analyzing Quality

Lynnwood Lab: 19711 Scriber Lake Road, Suite D, WA 98036, Tel:425.673.9850, Fax:425.673.9810
Bellevue Lab: 12727 Northup Way, Suite 1, Bellevue, WA 98005, Tel:425.861.1111, Fax:425.861.1118
Email: admin@seattleasbestostest.com, Website: www.seattleasbestostest.com

CHAIN OF CUSTODY

☒ Bulk Asbestos ☐ Point Count 400 ☐ Point Count 1000 ☐ Point Count Gravimetric ☐ Other (Specify) _____
☐ 1 Hour ☐ 2 Hours ☐ Same day (4 to 6 Hrs.) ☐ 1 Day ☒ 5 Days

Med-Tox, Northwest

PO Box 1446, Auburn, WA 98071-1446 Tel: 253.351.0677 Fax: 253.351.0688

Number of Samples 65 PO# 8660.2 Project Location Harrison Ave Shipyard Bellingham, WA

Project Manager (Check one or more):

☒	Anthony Fullerton	206.356.8927	fullertona@medtoxnw.com	☐	evansc@medtoxnw.com
☐	Ginnie Kindler		kindlerg@medtoxnw.com	☐ Jon Havelock	havelockj@medtoxnw.com
☐				☐ Teresa Choate	choatet@medtoxnw.com

SEQ#	CLIENT SAMPLE #	SAMPLE DESCRIPTION	LOCATION	NOTES
1	8660.2-AF-001			
2				
3				
4				
5				
6				
7				
8				
9				
10				
11		See Table		
12				
13				
14				
15				
16				
17				
18				
19				
20	8660.2-AF-065			

	Print Name	Signature	Company	Date	Time
Sampled:	A Fullerton		Med-Tox, Northwest	8/30/23	
Relinquished:	A Fullerton		Med-Tox, Northwest	9/1/23	
Delivered:			Med-Tox, Northwest		
Received:	Kingpong Lin		Seattle Asbestos Test	9/4/23	13:55
Analyzed:	Kingpong Lin		Seattle Asbestos Test	9/12/23	11:00
Reported:			Seattle Asbestos Test		

Seattle Asbestos Test warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted and disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. Seattle Asbestos Test accepts no legal responsibility for the purpose for which the client uses the test results. By signing on this form, the clients agree to relieve Seattle Asbestos Test of any liability that may arise from the test results. It is the client's responsibility to make sure the samples are appropriately taken according to federal and local regulations. Invoices paid late may be charged of interest, and invoices go to collection may be charged 17% to 25% of collection fee. NSF checks will be charged of $50.

Results reporting method: ☐ Phone ☐ Fax ☐ Email ☐ Pick-up

☐ Composite all wallboard samples ☐ Text result to phone ☐ Point count ..... % or less asbestos

Page ( ) of ( )

Table C-1. Summary of Materials Sampled for Asbestos

Sample	Material	Location	AHERA Type	HM	Result
Paint Shop Building					
8660.2-AF-001	White plastic with mastic and fiberglass batt insulation	Ceiling	TSI	01	
8660.2-AF-002	White plastic with mastic and fiberglass batt insulation	Ceiling	TSI	01	
8660.2-AF-003	White plastic with mastic and fiberglass batt insulation	Ceiling	TSI	01	
8660.2-AF-004	Un-textured GWB system	Interior walls	Misc.	02	
8660.2-AF-005	Un-textured GWB system	Interior walls	Misc.	02	
8660.2-AF-006	Un-textured GWB system	Interior walls	Misc.	02	
8660.2-AF-007	Paint coating on floor	Interior slab	Misc.	03	
8660.2-AF-008	Paint coating on floor	Interior slab	Misc.	03	
8660.2-AF-009	Screw gasket	Exterior siding and roof	Misc.	04	
8660.2-AF-010	Screw gasket	Exterior siding and roof	Misc.	04	
8660.2-AF-011	Black tar sealant (10LF)	Exterior- south wall by main entrance door	Misc.	05	
8660.2-AF-012	Black tar sealant (10LF)	Exterior- south wall by main entrance door	Misc.	05	
Sandblast Building					
8660.2-AF-013	Remnant ceiling paper	Interior at ceiling	Misc.	06	
8660.2-AF-014	Remnant ceiling paper	Interior at ceiling	Misc.	06	
8660.2-AF-015	Remnant wall mastic	Interior – east wall on wood	Misc.	07	
8660.2-AF-016	Remnant wall mastic	Interior – east wall on wood	Misc.	07	
8660.2-AF-017	Door infill caulk	Interior	Misc.	08	
8660.2-AF-018	Door infill caulk	Interior	Misc.	08	
8660.2-AF-019	Flashing sealant	Exterior siding	Misc.	09	
8660.2-AF-020	Flashing sealant	Exterior siding	Misc.	09	
8660.2-AF-021	Window frame caulk	Exterior windows	Misc.	10	
8660.2-AF-022	Window frame caulk	Exterior windows	Misc.	10	
8660.2-AF-023	Corrugated metal siding sealant	Exterior siding	Misc.	11	
8660.2-AF-024	Corrugated metal siding sealant	Exterior siding	Misc.	11	
8660.2-AF-025	Screw gasket	Exterior siding and roof	Misc.	12	

Sample	Material	Location	AHERA Type	HM	Result
8660.2-AF-026	Screw gasket	Exterior siding and roof	Misc.	12	
Winch Building					
8660.2-AF-027	Blue sheet flooring	Electrical room	Misc.	13	
8660.2-AF-028	Blue sheet flooring	Electrical room	Misc.	13	
8660.2-AF-029	Screw gasket	Exterior siding and roof	Misc.	14	
8660.2-AF-030	Screw gasket	Exterior siding and roof	Misc.	14	
Water Treatment Building					
8660.2-AF-031	White plastic with mastic and fiberglass batt insulation	Walls and Ceiling	TSI	15	
8660.2-AF-032	White plastic with mastic and fiberglass batt insulation	Walls and Ceiling	TSI	15	
8660.2-AF-033	White plastic with mastic and fiberglass batt insulation	Walls and Ceiling	TSI	15	
8660.2-AF-034	Screw gasket	Exterior siding and roof	Misc.	16	
8660.2-AF-035	Screw gasket	Exterior siding and roof	Misc.	16	
Tank farm					
8660.2-AF-036	Remnant caulk	Tank #1	Misc.	17	
8660.2-AF-037	Remnant caulk	Tank #1	Misc.	17	
8660.2-AF-038	Black flange gasket	Tank #2	Misc.	18	
8660.2-AF-039	Black flange gasket	Tank #3	Misc.	18	
8660.2-AF-040	Canvas pipe wrap and white sealant over fiberglass and foam insulation	Tank #4	TSI	19	
8660.2-AF-041	Canvas pipe wrap and white sealant over fiberglass and foam insulation	Tank #4	TSI	19	
8660.2-AF-042	Canvas pipe wrap and white sealant over fiberglass and foam insulation	Tank #4	TSI	19	
8660.2-AF-043	Canvas pipe wrap and white sealant over fiberglass and foam insulation	Tank #5	TSI	20	
8660.2-AF-044	Canvas pipe wrap and white sealant over fiberglass and foam insulation	Tank #5	TSI	20	

Sample	Material	Location	AHERA Type	HM	Result
8660.2-AF-045	Canvas pipe wrap and white sealant over fiberglass and foam insulation	Tank #5	TSI	20	
8660.2-AF-046	Black flange gasket	Tank #5	Misc.	21	
8660.2-AF-047	Black flange gasket	Tank #5	Misc.	21	
Paint Building					
8660.2-AF-048	White plastic with mastic and fiberglass batt insulation	Walls and Ceiling	TSI	22	
8660.2-AF-049	White plastic with mastic and fiberglass batt insulation	Walls and Ceiling	TSI	22	
8660.2-AF-050	White plastic with mastic and fiberglass batt insulation	Walls and Ceiling	TSI	22	
8660.2-AF-051	Green pipe flange gasket	Interior piping (north wall)	Misc.	23	
8660.2-AF-052	Green pipe flange gasket	Interior piping (north wall)	Misc.	23	
8660.2-AF-053	Siding caulk	Exterior siding and window frame	Misc.	24	
8660.2-AF-054	Siding caulk	Exterior siding and window frame	Misc.	24	
Conex Building					
8660.2-AF-055	Silver paint on GWB wall	Interior wall- north conex	Surfacing	25	
8660.2-AF-056	Silver paint on GWB wall	Interior wall- north conex	Surfacing	25	
8660.2-AF-057	Silver paint on GWB wall	Interior wall- north conex	Surfacing	25	
8660.2-AF-058	Fibrous corrugated wall	Interior walls- north conex	Misc.	26	
8660.2-AF-059	Fibrous corrugated wall	Interior walls- north conex	Misc.	26	
8660.2-AF-060	Un-textured GWB system	Interior wall- north conex	Misc.	27	
8660.2-AF-061	Un-textured GWB system	Interior wall- north conex	Misc.	27	
8660.2-AF-062	Caulk on interior walls and ceiling seams	Interior- north conex	Misc.	28	
8660.2-AF-063	Caulk on interior walls and ceiling seams	Interior- north conex	Misc.	28	
8660.2-AF-064	Roof sealant	North conex	Misc.	29	
8660.2-AF-065	Roof sealant	North conex	Misc.	29	

SEATTLE ASBESTOS TEST

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.9850, Fax: 425.673.9810, NVLAP Lab Code: 200768-0

Disclaimer: This report must not be used by the client to claim product certification, approval, or endorsement by Seattle Asbestos Test, LLC, NVLAP, NIST, or any agency of the Federal government.

ANALYTICAL LABORATORY REPORT

[PLM] EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples; [PLM] EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Attn.: Anthony Fullerton
Client: Med-Tox, Northwest
Address: PO Box 1446, Auburn, WA 98071-1446
Job#: 8660.2
Batch#: 202213008
Date Received: 9/1/2023
Samples Rec'd: 65
Date Analyzed: 9/5/2023
Samples Analyzed: 65
Project Loc.: Harrison Ave Shipyard, Bellingham, WA

Analyzed by: Xingping Lin/ CiCi Xu

Approved Signatory: Steve (Fanyao) Zhang, President

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-fibrous Components	%	Non-asbestos Fibers
1	8660.2-AF-001	1	White plastic		None detected	Plastic		None detected
		2	Clear mastic		None detected	Mastic/binder	4	Cellulose
		3	Yellow fibrous material		None detected	Filler	90	Glass fibers
2	8660.2-AF-002	1	White plastic		None detected	Plastic		None detected
		2	Clear mastic		None detected	Mastic/binder	3	Cellulose
		3	Yellow fibrous material		None detected	Filler	89	Glass fibers
3	8660.2-AF-003	1	White plastic		None detected	Plastic		None detected
		2	Clear mastic		None detected	Mastic/binder	4	Cellulose
		3	Yellow fibrous material		None detected	Filler	91	Glass fibers
4	8660.2-AF-004	1	Trace white powdery material with paint		None detected	Binder/filler, Paint	5	Cellulose
		2	White chalky material with paper		None detected	Binder/filler, Gypsum/binder	25	Cellulose
5	8660.2-AF-005	1	Trace white powdery material with paint		None detected	Binder/filler, Paint	5	Cellulose
		2	White chalky material with paper		None detected	Binder/filler, Gypsum/binder	26	Cellulose
6	8660.2-AF-006	1	Trace white powdery material with paint		None detected	Binder/filler, Paint	5	Cellulose
		2	White chalky material with paper		None detected	Binder/filler, Gypsum/binder	24	Cellulose
7	8660.2-AF-007	1	Gray sandy/brittle material with paint		None detected	Sand, Filler, Binder, Paint	4	Cellulose
8	8660.2-AF-008	1	Gray sandy/brittle material with paint		None detected	Sand, Filler, Binder, Paint	3	Cellulose
9	8660.2-AF-009	1	Black soft/elastic material		None detected	Binder, Filler	4	Cellulose
10	8660.2-AF-010	1	Black soft/elastic material		None detected	Binder, Filler	3	Cellulose
11	8660.2-AF-011	1	Black asphaltic material		None detected	Asphalt/binder	3	Cellulose
12	8660.2-AF-012	1	Black asphaltic material		None detected	Asphalt/binder	4	Cellulose

SEATTLE ASBESTOS TEST

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.9850, Fax: 425.673.9810, NVLAP Lab Code: 200768-0

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ANALYTICAL LABORATORY REPORT

[PLM] EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples; [PLM] EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Attn.: Anthony Fullerton | Client: Med-Tox, Northwest | Address: PO Box 1446, Auburn, WA 98071-1446

Job#: 8660.2 | Batch#: 202213008 | Date Received: 9/1/2023

Samples Rec'd: 65 | Date Analyzed: 9/5/2023 | Samples Analyzed: 65

Project Loc.: Harrison Ave Shipyard, Bellingham, WA

Analyzed by: Xingping Lin/ CiCi Xu | Approved Signatory: Steve (Fanyao) Zhang, President

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-fibrous Components	%	Non-asbestos Fibers
13	8660.2-AF-013	1	Tan fibrous material with paint		None detected	Filler, Paint	90	Cellulose
14	8660.2-AF-014	1	Tan fibrous material with paint		None detected	Filler, Paint	89	Cellulose
15	8660.2-AF-015	1	Clear/gray mastic		None detected	Mastic/binder	4	Cellulose
16	8660.2-AF-016	1	Clear/gray mastic		None detected	Mastic/binder	3	Cellulose
17	8660.2-AF-017	1	White soft/elastic material		None detected	Binder, Filler	4	Cellulose
18	8660.2-AF-018	1	White soft/elastic material		None detected	Binder, Filler	5	Cellulose
19	8660.2-AF-019	1	White soft/elastic material		None detected	Binder, Filler	4	Cellulose
20	8660.2-AF-020	1	White soft/elastic material		None detected	Binder, Filler	3	Cellulose
21	8660.2-AF-021	1	Yellow/clear brittle material		None detected	Filler, Binder	2	Cellulose
22	8660.2-AF-022	1	Yellow/clear brittle material		None detected	Filler, Binder	3	Cellulose
23	8660.2-AF-023	1	Gray/clear soft/elastic material		None detected	Binder, Filler	4	Cellulose
24	8660.2-AF-024	1	Gray/clear soft/elastic material		None detected	Binder, Filler	3	Cellulose
25	8660.2-AF-025	1	Trace silver paint		None detected	Paint, Filler	4	Cellulose
		2	Black soft/elastic material		None detected	Binder, Filler	3	Cellulose
26	8660.2-AF-026	1	Trace silver paint		None detected	Paint, Filler	4	Cellulose
		2	Black soft/elastic material		None detected	Binder, Filler	5	Cellulose
27	8660.2-AF-027	1	Blue sheet vinyl		None detected	Vinyl/binder		None detected
		2	Tan woven fibrous material with mastic		None detected	Filler, Binder	20	Cellulose, Glass fibers
28	8660.2-AF-028	1	Blue sheet vinyl		None detected	Vinyl/binder		None detected
		2	Tan woven fibrous material with mastic		None detected	Filler, Binder	20	Cellulose, Glass fibers
29	8660.2-AF-029	1	Black soft/elastic material		None detected	Binder, Filler	5	Cellulose

SEATTLE ASBESTOS TEST

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.9850, Fax: 425.673.9810, NVLAP Lab Code: 200768-0

Disclaimer: This report must not be used by the client to claim product certification, approval, or endorsement by Seattle Asbestos Test, LLC, NVLAP, NIST, or any agency of the Federal government.

ANALYTICAL LABORATORY REPORT

[PLM] EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples; [PLM] EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Attn.: Anthony Fullerton | Client: Med-Tox, Northwest | Address: PO Box 1446, Auburn, WA 98071-1446

Job#: 8660.2 | Batch#: 202213008 | Date Received: 9/1/2023

Samples Rec'd: 65 | Date Analyzed: 9/5/2023 | Samples Analyzed: 65

Project Loc.: Harrison Ave Shipyard, Bellingham, WA

Analyzed by: Xingping Lin/ CiCi Xu

Approved Signatory: Steve (Fanyao) Zhang, President

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-fibrous Components	%	Non-asbestos Fibers
30	8660.2-AF-030	1	Black soft/elastic material		None detected	Binder, Filler	4	Cellulose
31	8660.2-AF-031	1	White plastic		None detected	Plastic		None detected
		2	Clear mastic		None detected	Mastic/binder	4	Cellulose
		3	Yellow fibrous material		None detected	Filler	90	Glass fibers
32	8660.2-AF-032	1	White plastic		None detected	Plastic		None detected
		2	Clear mastic		None detected	Mastic/binder	3	Cellulose
		3	Yellow fibrous material		None detected	Filler	88	Glass fibers
33	8660.2-AF-033	1	White plastic		None detected	Plastic		None detected
		2	Clear mastic		None detected	Mastic/binder	3	Cellulose
		3	Yellow fibrous material		None detected	Filler	88	Glass fibers
34	8660.2-AF-034	1	Black soft/elastic material		None detected	Binder, Filler	4	Cellulose
35	8660.2-AF-035	1	Black soft/elastic material		None detected	Binder, Filler	3	Cellulose
36	8660.2-AF-036	1	White soft/elastic material		None detected	Binder, Filler	4	Cellulose
		2	Brown wood block		None detected	Wood aggregates	3	Cellulose
37	8660.2-AF-037	1	White soft/elastic material		None detected	Binder, Filler	4	Cellulose
		2	Brown wood block		None detected	Wood aggregates	3	Cellulose
38	8660.2-AF-038	1	Black soft/elastic material		None detected	Binder, Filler	5	Cellulose
		2	Clear soft/elastic material		None detected	Binder, Filler	3	Cellulose
39	8660.2-AF-039	1	Black soft/elastic material		None detected	Binder, Filler	4	Cellulose
		2	Clear soft/elastic material		None detected	Binder, Filler	2	Cellulose
40	8660.2-AF-040	1	Off-white soft/elastic material with debris		None detected	Binder, Filler	5	Cellulose
		2	White woven fibrous material		None detected	Filler, Binder	68	Cellulose, Glass fibers

SEATTLE ASBESTOS TEST

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.9850, Fax: 425.673.9810, NVLAP Lab Code: 200768-0

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ANALYTICAL LABORATORY REPORT

[PLM] EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples; [PLM] EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Attn.: Anthony Fullerton | Client: Med-Tox, Northwest | Address: PO Box 1446, Auburn, WA 98071-1446

Job#: 8660.2 | Batch#: 202213008 | Date Received: 9/1/2023

Samples Rec'd: 65 | Date Analyzed: 9/5/2023 | Samples Analyzed: 65

Project Loc.: Harrison Ave Shipyard Bellingham, WA

Analyzed by: Xingping Lin/ CiCi Xu

Approved Signatory: Steve (Fanyao) Zhang, President

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-fibrous Components	%	Non-asbestos Fibers
40	8660.2-AF-040	3	White soft/elastic material		None detected	Binder, Filler	4	Cellulose
		4	Black foamy material		None detected	Synthetic foam		None detected
41	8660.2-AF-041	1	Off-white soft/elastic material with debris		None detected	Binder, Filler	5	Cellulose
		2	White woven fibrous material		None detected	Filler, Binder	67	Cellulose, Glass fibers
		3	White soft/elastic material		None detected	Binder, Filler	4	Cellulose
		4	Black foamy material		None detected	Synthetic foam		None detected
42	8660.2-AF-042	1	Off-white soft/elastic material with debris		None detected	Binder, Filler	4	Cellulose
		2	White woven fibrous material		None detected	Filler, Binder	65	Cellulose, Glass fibers
		3	White soft/elastic material		None detected	Binder, Filler	3	Cellulose
		4	Black foamy material		None detected	Synthetic foam		None detected
43	8660.2-AF-043	1	Off-white soft/elastic material with debris		None detected	Binder, Filler	4	Cellulose
		2	White woven fibrous material		None detected	Filler, Binder	67	Cellulose, Glass fibers
		3	White soft/elastic material		None detected	Binder, Filler	3	Cellulose
		4	Black foamy material		None detected	Synthetic foam		None detected
44	8660.2-AF-044	1	Beige/gray brittle material		None detected	Filler, Binder	2	Cellulose
		2	White woven fibrous material		None detected	Filler, Binder	64	Cellulose, Glass fibers
		3	White soft/elastic material		None detected	Binder, Filler	3	Cellulose
		4	Green foamy material		None detected	Synthetic foam		None detected
45	8660.2-AF-045	1	Beige/gray brittle material		None detected	Filler, Binder	2	Cellulose
		2	White woven fibrous material		None detected	Filler, Binder	65	Cellulose, Glass fibers

SEATTLE ASBESTOS TEST

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.9850, Fax: 425.673.9810, NVLAP Lab Code: 200768-0

Disclaimer: This report must not be used by the client to claim product certification, approval, or endorsement by Seattle Asbestos Test, LLC, NVLAP, NIST, or any agency of the Federal government.

ANALYTICAL LABORATORY REPORT

[PLM] EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples; [PLM] EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Attn.: Anthony Fulierton | Client: Med-Tox, Northwest | Address: PO Box 1446, Auburn, WA 98071-1446

Job#: 8660.2 | Batch#: 202213008 | Date Received: 9/1/2023

Samples Rec'd: 65 | Date Analyzed: 9/5/2023 | Samples Analyzed: 65

Project Loc.: Harrison Ave Shipyard, Bellingham, WA

Analyzed by: Xingping Lin/ CiCi Xu

Approved Signatory: Steve (Fanyao) Zhang, President

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-fibrous Components	%	Non-asbestos Fibers
45	8660.2-AF-045	3	White soft/elastic material		None detected	Binder, Filler	3	Cellulose
		4	Green foamy material		None detected	Synthetic foam		None detected
46	8660.2-AF-046	1	Black soft/elastic material		None detected	Binder, Filler	4	Cellulose
47	8660.2-AF-047	1	Black soft/elastic material		None detected	Binder, Filler	3	Cellulose
48	8660.2-AF-048	1	White plastic		None detected	Plastic		None detected
		2	Clear mastic		None detected	Mastic/binder	4	Cellulose
		3	Yellow fibrous material		None detected	Filler	85	Glass fibers
49	8660.2-AF-049	1	White plastic		None detected	Plastic		None detected
		2	Clear mastic		None detected	Mastic/binder	4	Cellulose
		3	Yellow fibrous material		None detected	Filler	86	Glass fibers
50	8660.2-AF-050	1	White plastic		None detected	Plastic		None detected
		2	Clear mastic		None detected	Mastic/binder	3	Cellulose
		3	Yellow fibrous material		None detected	Filler	84	Glass fibers
51	8660.2-AF-051	1	Green brittle material with fibrous material		None detected	Filler, Binder	7	Cellulose
52	8660.2-AF-052	1	Green brittle material with fibrous material		None detected	Filler, Binder	7	Cellulose
53	8660.2-AF-053	1	White soft/elastic material		None detected	Binder, Filler	4	Cellulose
54	8660.2-AF-054	1	White soft/elastic material		None detected	Binder, Filler	5	Cellulose
55	8660.2-AF-055	1	Silver paint		None detected	Paint, Filler	4	Cellulose
		2	Black brittle material with paint		None detected	Filler, Binder, Paint	2	Cellulose
		3	Trace white powdery material with paint		None detected	Binder/filler, Paint	5	Cellulose
		4	White chalky material with paper		None detected	Binder/filler, Gypsum/binder	25	Cellulose

SEATTLE ASBESTOS TEST

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.9850, Fax: 425.673.9810, NVLAP Lab Code: 200768-0

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ANALYTICAL LABORATORY REPORT

[PLM] EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples; [PLM] EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Attn.: Anthony Fullerton | Client: Med-Tox, Northwest | Address: PO Box 1446, Auburn, WA 98071-1446

Job#: 8660.2 | Batch#: 202213008 | Date Received: 9/1/2023

Samples Rec'd: 65 | Date Analyzed: 9/5/2023 | Samples Analyzed: 65

Project Loc.: Harrison Ave Shipyard, Bellingham, WA

Analyzed by: Xingping Lin/ CiCi Xu | Approved Signatory: Steve (Fanyao) Zhang, President

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-fibrous Components	%	Non-asbestos Fibers
56	8660.2-AF-056	1	Silver paint		None detected	Paint, Filler	4	Cellulose
		2	Trace brown brittle material with paint		None detected	Filler, Binder, Paint	2	Cellulose
		3	Trace white powdery material with paint and paper		None detected	Binder/filler, Paint	35	Cellulose
		4	Gray soft/elastic material		None detected	Binder, Filler	4	Cellulose
57	8660.2-AF-057	1	Silver paint		None detected	Paint, Filler	4	Cellulose
		2	Trace brown brittle material with paint		None detected	Filler, Binder, Paint	2	Cellulose
		3	Trace white powdery material with paint		None detected	Binder/filler, Paint	5	Cellulose
		4	White chalky material with paper		None detected	Binder/filler, Gypsum/binder	27	Cellulose
58	8660.2-AF-058	1	White brittle/rigid material with woven fibrous material and paint		None detected	Filler, Binder, Fine particles	65	Cellulose, Glass fibers
		2	Brown mastic		None detected	Mastic/binder	4	Cellulose
59	8660.2-AF-059	1	White brittle/rigid material with woven fibrous material and paint		None detected	Filler, Binder, Fine particles	67	Cellulose, Glass fibers
		2	Brown mastic		None detected	Mastic/binder	3	Cellulose
60	8660.2-AF-060	1	Blue brittle material with paint		None detected	Filler, Binder, Paint	2	Cellulose
		2	Trace brown brittle material with paint		None detected	Filler, Binder, Paint	2	Cellulose
		3	White chalky material with paper		None detected	Binder/filler, Gypsum/binder	26	Cellulose
61	8660.2-AF-061	1	Brown brittle material with paint		None detected	Filler, Binder, Paint	2	Cellulose
		2	Trace silver paint		None detected	Paint, Filler	4	Cellulose
		3	Gray brittle material with paint		None detected	Filler, Binder, Paint	2	Cellulose
		4	White chalky material with paper		None detected	Binder/filler, Gypsum/binder	24	Cellulose

SEATTLE ASBESTOS TEST

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.9850, Fax: 425.673.9810, NVLAP Lab Code: 200768-0

Disclaimer: This report must not be used by the client to claim product certification, approval, or endorsement by Seattle Asbestos Test, LLC, NVLAP, NIST, or any agency of the Federal government.

ANALYTICAL LABORATORY REPORT

[PLM] EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples; [PLM] EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Attn.: Anthony Fullerton **Client:** Med-Tox, Northwest **Address:** PO Box 1446, Auburn, WA 98071-1446

Job#: 8660.2 **Batch#:** 202213008 **Date Received:** 9/1/2023

Samples Rec'd: 65 **Date Analyzed:** 9/5/2023 **Samples Analyzed:** 65

Project Loc.: Harrison Ave Shipyard Bellingham, WA

Analyzed by: Xingping Lin/ CiCi Xu

Approved Signatory: Steve (Fanyao) Zhang, President

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-fibrous Components	%	Non-asbestos Fibers
62	8660.2-AF-062	1	White soft/elastic material with paint		**None detected**	Binder, Filler, Paint	4	Cellulose
		2	Clear mastic		**None detected**	Mastic/binder	5	Cellulose
63	8660.2-AF-063	1	White soft/elastic material with paint		**None detected**	Binder, Filler, Paint	3	Cellulose
		2	Clear mastic		**None detected**	Mastic/binder	5	Cellulose
64	8660.2-AF-064	1	Gray soft/elastic material	3	**Chrysotile**	Filler, Binder	3	Cellulose
65	8660.2-AF-065	1	Gray soft/elastic material	3	**Chrysotile**	Filler, Binder	4	Cellulose

Appendix F
Analytical Reports- Lead

EMSL Analytical, Inc.
6340 CastlePlace Dr., Indianapolis, IN 46250
Phone/Fax: (317) 803-2997 / (317) 803-3047
http://www.EMSL.com indianapolislab@emsl.com

EMSL Order: 162320295
CustomerID: MEDT50
CustomerPO:
ProjectID:

Attn: **Anthony Fullerton**
Med-Tox Northwest
PO Box 1446
Auburn, WA 98071

Phone: (253) 351-0677
Fax: (253) 351-0688
Received: 9/5/2023 09:47 AM
Collected: 8/30/2023

Project: **8660.2**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client SampleDescription	*Collected*	*Analyzed*	*Weight*	*RDL*	*Lead Concentration*
8066.2-AF-01PB *162320295-0001*	8/30/2023 Site: INTERIOR Desc: WALL, GWB, MULTI-COLOR	9/8/2023	0.2512 g	80 ppm	<80 ppm
8066.2-AF-02PB *162320295-0002*	8/30/2023 Site: INTERIOR Desc: WALL, GWB, WHITE	9/8/2023	0.2524 g	80 ppm	<80 ppm
8066.2-AF-03PB *162320295-0003*	8/30/2023 Site: INTERIOR SLAB Desc: FLOOR, CONCRETE, MULTI-COLOR	9/8/2023	0.2582 g	80 ppm	<80 ppm
8066.2-AF-04PB *162320295-0004*	8/30/2023 Site: TANK #1 Desc: EXTERIOR, STEEL, BEIGE	9/8/2023	0.0857 g	230 ppm	<230 ppm
8066.2-AF-05PB *162320295-0005*	8/30/2023 Site: TANK #5 Desc: EXTERIOR, STEEL, BEIGE/YELLOW	9/8/2023	0.1924 g	2600 ppm	140000 ppm
8066.2-AF-06PB *162320295-0006*	8/30/2023 Site: TANK #8 Desc: EXTERIOR, STEEL, BLACK	9/8/2023	0.2517 g	80 ppm	630 ppm
8066.2-AF-07PB *162320295-0007*	8/30/2023 Site: NORTH CONEX INTERIOR Desc: WALL, GWB, MULTI-COLOR	9/8/2023	0.2541 g	80 ppm	<80 ppm

Aleksandrea Kuchenbrod

Aleksandrea Kuchenbrod, Inorganic Chemistry Lab Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted.
* Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008% wt based on the minimum sample weight per our SOP. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc. Indianapolis, IN AIHA LAP, LLC-ELLAP Accredited #157245, OH E10040

Initial report from 09/12/2023 07:38:17

OrderID: 162320295

Lead (Pb) Chain of Custody

EMSL Order ID *(Lab Use Only)*:

162320295

PHONE:
FAX:

Company: Med-Tox NW		**EMSL-Bill to:** ☐ Different ☐ Same If Bill to is Different note instructions in Comments** *Third Party Billing requires written authorization from third party*	
Street: P.O.BOX 1446			
City: Auburn	**State/Province:** WA	**Zip/Postal Code:** 98071	**Country:** USA
Report To (Name): Anthony Fullerton		**Telephone #:** 253.351.0677	
Email Address: fullertona@medtoxnw.com		**Fax #:**	**Purchase Order:**
Project Name/Number: 86602		**Please Provide Results:** ☐ FAX ☐ E-mail ☐ Mail	
U.S. State Samples Taken: WA		**CT Samples:** ☐ Commercial/Taxable ☐ Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour | ☐ 6 Hour | ☐ 24 Hour | ☐ 48 Hour | ☐ 72 Hour | ☐ 96 Hour | ☒ 1 Week | ☐ 2 Week

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide*

Matrix	Method	Instrument	Reporting Limit	Check
Chips ☐ % by wt. ☐ mg/cm² ☒ ppm	SW846-7000B	Flame Atomic Absorption	0.01%	☒
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	☐
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	☐
	NIOSH 7300 modified	ICP-AES/ICP-MS	0.5 µg/filter	☐
Wipe* ASTM ☐ non ASTM ☐ *if no box is checked, non-ASTM Wipe is assumed	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	☐
	SW846-6010B or C	ICP-AES	1.0 µg/wipe	☐
	SW846-7000B/7010	Graphite Furnace AA	0.075 µg/wipe	☐
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	SW846-1131/SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)	☐
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	☐
	SW846-7010	Graphite Furnace AA	0.3 mg/kg (ppm)	☐
	SW846-6010B or C	ICP-AES	2 mg/kg (ppm)	☐
Wastewater Unpreserved ☐ Preserved with HNO_3 pH < 2 ☐	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐
	EPA 200.7	ICP-AES	0.020 mg/L (ppm)	☐
Drinking Water Unpreserved ☐ Preserved with HNO_3 pH < 2 ☐	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐
	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	☐
TSP/SPM Filter	40 CFR Part 50	ICP-AES	12 µg/filter	☐
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	☐
Other:				☐

Name of Sampler: A Fullerton **Signature of Sampler:**

Sample #	Location	Volume/Area	Date/Time Sampled
86602-1	AF- 01Pb		8/30/23
	02Pb		
	03Pb	See Table	
	04Pb		
	05Pb		
	06Pb		
86602-2	AF- 07Pb		8/30/23

Client Sample #'s **Total # of Samples:** 7

Relinquished (Client):	**Date:**	9/1/23	**Time:**	1115
Received (Lab):	**Date:**	9/5/23	**Time:**	9:47

Comments:

Page 1 of 1 pages

Table 3. Summary of Bulk Paint Chip Sample Results.

Sample Number	Location	Component	Substrate	Color	Result (%wt*)
Paint Shop Building					
8066.2-AF-01PB	Interior	Wall	GWB	Multi-color	
8066.2-AF-02PB	Interior	Wall	GWB	White	
8066.2-AF-03PB	Interior slab	Floor	Concrete	Multi-color	
Tank Farm					
8066.2-AF-04PB	Tank #1	Exterior	Steel	Beige	
8066.2-AF-05PB	Tank #5	Exterior	Steel	Beige/yellow	
8066.2-AF-06PB	Tank #8	Exterior	Steel	Black	
Conex Building					
8066.2-AF-07PB	North Conex interior	Wall	GWB	Multi-color	

%wt= percent in weight

Appendix G
EMSL Analytical Inc. Laboratory Certification

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

EMSL Analytical, Inc.

6340 Castleplace Drive Indianapolis, IN 46250

Laboratory ID: LAP-157245

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA LAP), LLC accreditation to the ISO/IEC 17025:2017 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

LABORATORY ACCREDITATION PROGRAMS

☑	**INDUSTRIAL HYGIENE**	Accreditation Expires: June 01, 2025
☑	**ENVIRONMENTAL LEAD**	Accreditation Expires: June 01, 2025
☑	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: June 01, 2025
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2017 and AIHA LAP, LLC requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Cheryl O. Morton

Cheryl O Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision21: 05/15/2023

Date Issued: 06/01/2023

AIHA Laboratory Accreditation Programs, LLC

SCOPE OF ACCREDITATION

EMSL Analytical, Inc.
6340 Castleplace Drive Indianapolis, IN 46250

Laboratory ID: LAP-157245
Issue Date: 06/01/2023

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

The EPA recognizes the AIHA LAP, LLC ELLAP program as meeting the requirements of the National Lead Laboratory Accreditation Program (NLLAP) established under Title X of the Residential Lead-Based Paint Hazard Reduction Act of 1992 and includes paint, soil and dust wipe analysis. Air and composited wipes analyses are not included as part of the NLLAP.

Environmental Lead Laboratory Accreditation Program (ELLAP)

Initial Accreditation Date: 09/01/2002

Component, parameter or characteristic tested	Technology sub-type/Detector	Method	Method Description *(for internal methods only)*
Airborne Dust	AA	NIOSH 7082	N/A
Paint	AA	EPA SW-846 3050B	N/A
		EPA SW-846 3051A	N/A
		EPA SW-846 7000B	N/A
	ICP	EPA SW-846 3050B	N/A
		EPA SW-846 3051A	N/A
		EPA SW-846 6010D	N/A
Settled Dust by Wipe	AA	EPA SW-846 3050B	N/A
		EPA SW-846 3051A	N/A
		EPA SW-846 7000B	N/A
	ICP	EPA SW-846 3050B	N/A
		EPA SW-846 3051A	N/A
		EPA SW-846 6010D	N/A
Soil	AA	EPA SW-846 3050B	N/A
		EPA SW-846 3051A	N/A
		EPA SW-846 7000B	N/A

Component, parameter or characteristic tested	Technology sub-type/Detector	Method	Method Description *(for internal methods only)*
	ICP	EPA SW-846 3050B	N/A
		EPA SW-846 3051A	N/A
		EPA SW-846 6010D	N/A

A complete listing of currently accredited ELLAP laboratories is available on the AIHA LAP, LLC website at:
http://www.aihaaccreditedlabs.org

Appendix H
PCB Results

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

September 18, 2023

Anthony Fullerton
MED-TOX Northwest
P.O. Box 1146
Auburn, WA 98071

Re: Analytical Data for Project 8660.2
Laboratory Reference No. 2309-017

Dear Anthony:

Enclosed are the analytical results and associated quality control data for samples submitted on September 5, 2023.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: September 18, 2023
Samples Submitted: September 5, 2023
Laboratory Reference: 2309-017
Project: 8660.2

Case Narrative

Samples were collected on August 30, 2023 and received by the laboratory on September 5, 2023. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: September 18, 2023
Samples Submitted: September 5, 2023
Laboratory Reference: 2309-017
Project: 8660.2

PCBs EPA 8082A

Matrix: Solid
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**8660.2-AF-01PCB**					
Laboratory ID:	09-017-01					
Aroclor 1016	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1221	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1232	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1242	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1248	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1254	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1260	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1262	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1268	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*63*	*50-127*				
Client ID:	**8660.2-AF-02PCB**					
Laboratory ID:	09-017-02					
Aroclor 1016	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1221	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1232	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1242	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1248	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1254	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1260	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1262	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1268	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*83*	*50-127*				
Client ID:	**8660.2-AF-03PCB**					
Laboratory ID:	09-017-03					
Aroclor 1016	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1221	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1232	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1242	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1248	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1254	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1260	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1262	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1268	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*73*	*50-127*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: September 18, 2023
Samples Submitted: September 5, 2023
Laboratory Reference: 2309-017
Project: 8660.2

PCBs EPA 8082A

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**8660.2-AF-04PCB**					
Laboratory ID:	09-017-04					
Aroclor 1016	**ND**	0.51	EPA 8082A	9-7-23	9-7-23	
Aroclor 1221	**ND**	0.51	EPA 8082A	9-7-23	9-7-23	
Aroclor 1232	**ND**	0.51	EPA 8082A	9-7-23	9-7-23	
Aroclor 1242	**ND**	0.51	EPA 8082A	9-7-23	9-7-23	
Aroclor 1248	**ND**	0.51	EPA 8082A	9-7-23	9-7-23	
Aroclor 1254	**ND**	0.51	EPA 8082A	9-7-23	9-7-23	
Aroclor 1260	**ND**	0.51	EPA 8082A	9-7-23	9-7-23	
Aroclor 1262	**ND**	0.51	EPA 8082A	9-7-23	9-7-23	
Aroclor 1268	**ND**	0.51	EPA 8082A	9-7-23	9-7-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*66*	*50-127*				
Client ID:	**8660.2-AF-05PCB**					
Laboratory ID:	09-017-05					
Aroclor 1016	**ND**	0.43	EPA 8082A	9-7-23	9-7-23	
Aroclor 1221	**ND**	0.43	EPA 8082A	9-7-23	9-7-23	
Aroclor 1232	**ND**	0.43	EPA 8082A	9-7-23	9-7-23	
Aroclor 1242	**ND**	0.43	EPA 8082A	9-7-23	9-7-23	
Aroclor 1248	**ND**	0.43	EPA 8082A	9-7-23	9-7-23	
Aroclor 1254	**ND**	0.43	EPA 8082A	9-7-23	9-7-23	
Aroclor 1260	**ND**	0.43	EPA 8082A	9-7-23	9-7-23	
Aroclor 1262	**ND**	0.43	EPA 8082A	9-7-23	9-7-23	
Aroclor 1268	**ND**	0.43	EPA 8082A	9-7-23	9-7-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*91*	*50-127*				
Client ID:	**8660.2-AF-06PCB**					
Laboratory ID:	09-017-06					
Aroclor 1016	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1221	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1232	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1242	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1248	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1254	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1260	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1262	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Aroclor 1268	**ND**	0.74	EPA 8082A	9-7-23	9-7-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*87*	*50-127*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: September 18, 2023
Samples Submitted: September 5, 2023
Laboratory Reference: 2309-017
Project: 8660.2

PCBs EPA 8082A

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**8660.2-AF-07PCB**					
Laboratory ID:	09-017-07					
Aroclor 1016	**ND**	0.83	EPA 8082A	9-7-23	9-7-23	
Aroclor 1221	**ND**	0.83	EPA 8082A	9-7-23	9-7-23	
Aroclor 1232	**ND**	0.83	EPA 8082A	9-7-23	9-7-23	
Aroclor 1242	**ND**	0.83	EPA 8082A	9-7-23	9-7-23	
Aroclor 1248	**ND**	0.83	EPA 8082A	9-7-23	9-7-23	
Aroclor 1254	**ND**	0.83	EPA 8082A	9-7-23	9-7-23	
Aroclor 1260	**ND**	0.83	EPA 8082A	9-7-23	9-7-23	
Aroclor 1262	**ND**	0.83	EPA 8082A	9-7-23	9-7-23	
Aroclor 1268	**ND**	0.83	EPA 8082A	9-7-23	9-7-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*91*	*50-127*				
Client ID:	**8660.2-AF-08PCB**					
Laboratory ID:	09-017-08					
Aroclor 1016	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1221	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1232	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1242	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1248	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1254	**0.65**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1260	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1262	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Aroclor 1268	**ND**	0.54	EPA 8082A	9-7-23	9-7-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*78*	*50-127*				
Client ID:	**8660.2-AF-09PCB**					
Laboratory ID:	09-017-09					
Aroclor 1016	**ND**	0.53	EPA 8082A	9-7-23	9-7-23	
Aroclor 1221	**ND**	0.53	EPA 8082A	9-7-23	9-7-23	
Aroclor 1232	**ND**	0.53	EPA 8082A	9-7-23	9-7-23	
Aroclor 1242	**ND**	0.53	EPA 8082A	9-7-23	9-7-23	
Aroclor 1248	**ND**	0.53	EPA 8082A	9-7-23	9-7-23	
Aroclor 1254	**ND**	0.53	EPA 8082A	9-7-23	9-7-23	
Aroclor 1260	**ND**	0.53	EPA 8082A	9-7-23	9-7-23	
Aroclor 1262	**ND**	0.53	EPA 8082A	9-7-23	9-7-23	
Aroclor 1268	**ND**	0.53	EPA 8082A	9-7-23	9-7-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*82*	*50-127*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: September 18, 2023
Samples Submitted: September 5, 2023
Laboratory Reference: 2309-017
Project: 8660.2

PCBs EPA 8082A

Matrix: Soil
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**8660.2-AF-10PCB**					
Laboratory ID:	09-017-10					
Aroclor 1016	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1221	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1232	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1242	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1248	**ND**	0.56	EPA 8082A	9-7-23	9-7-23	
Aroclor 1254	**ND**	1.4	EPA 8082A	9-7-23	9-7-23	U1
Aroclor 1260	**ND**	1.4	EPA 8082A	9-7-23	9-7-23	U1
Aroclor 1262	**ND**	1.4	EPA 8082A	9-7-23	9-7-23	U1
Aroclor 1268	**ND**	1.4	EPA 8082A	9-7-23	9-7-23	U1
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*83*	*50-127*				
Client ID:	**8660.2-AF-11PCB**					
Laboratory ID:	09-017-11					
Aroclor 1016	**ND**	0.59	EPA 8082A	9-7-23	9-7-23	
Aroclor 1221	**ND**	0.59	EPA 8082A	9-7-23	9-7-23	
Aroclor 1232	**ND**	0.59	EPA 8082A	9-7-23	9-7-23	
Aroclor 1242	**ND**	0.59	EPA 8082A	9-7-23	9-7-23	
Aroclor 1248	**ND**	0.59	EPA 8082A	9-7-23	9-7-23	
Aroclor 1254	**ND**	0.59	EPA 8082A	9-7-23	9-7-23	
Aroclor 1260	**ND**	0.59	EPA 8082A	9-7-23	9-7-23	
Aroclor 1262	**ND**	0.59	EPA 8082A	9-7-23	9-7-23	
Aroclor 1268	**ND**	0.59	EPA 8082A	9-7-23	9-7-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*78*	*50-127*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: September 18, 2023
Samples Submitted: September 5, 2023
Laboratory Reference: 2309-017
Project: 8660.2

PCBs EPA 8082A
QUALITY CONTROL

Matrix: Solid
Units: mg/Kg (ppm)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0907S1					
Aroclor 1016	**ND**	0.050	EPA 8082A	9-7-23	9-7-23	
Aroclor 1221	**ND**	0.050	EPA 8082A	9-7-23	9-7-23	
Aroclor 1232	**ND**	0.050	EPA 8082A	9-7-23	9-7-23	
Aroclor 1242	**ND**	0.050	EPA 8082A	9-7-23	9-7-23	
Aroclor 1248	**ND**	0.050	EPA 8082A	9-7-23	9-7-23	
Aroclor 1254	**ND**	0.050	EPA 8082A	9-7-23	9-7-23	
Aroclor 1260	**ND**	0.050	EPA 8082A	9-7-23	9-7-23	
Aroclor 1262	**ND**	0.050	EPA 8082A	9-7-23	9-7-23	
Aroclor 1268	**ND**	0.050	EPA 8082A	9-7-23	9-7-23	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*74*	*50-127*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	08-333-01										
	MS	MSD	MS	MSD		MS	MSD				
Aroclor 1260	**0.413**	**0.384**	0.500	0.500	ND	**83**	**77**	41-121	7	28	
Surrogate:											
DCB						*79*	*73*	*50-127*			

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

X2 - Sample extract treated with a silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Chain of Custody

Page 1 of 2

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

npany: MTNW
ject Number: 8660.2
ject Name: Harrison Ave Shipyard
ject Manager: A. Fullerton
mpled by:

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

Laboratory Number: 09-017

ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx	Volatiles 8260C	Halogenated Volatiles 8260C	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A	% Moisture
1	8660.2-AF-01PCB	8/30/23		Soil	1									X								
2	02PCB				1									X								
3	03PCB				1									X								
4	04PCB				1									X								
5	05PCB				1									X								
6	06PCB				1									X								
7	07PCB				1									X								
8	08PCB				1									X								
9	09PCB				1									X								
10	8660.2-AF-10PCB	8/30/23		Solid	1									X								

	Signature	Company	Date	Time
elinquished		MTNW	9/1/23	1100
eceived		SE	9/5/23	1500
elinquished				
eceived				
elinquished				
eceived				

Comments/Special Instructions

eviewed/Date | Reviewed/Date | Chromatograms with final report ☐

Data Package: Standard ☐ Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

Chain of Custody

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: MTNW
Project Number: 8660.2
Project Name: Harrison Ave Shipyard
Project Manager: A. Fillerton
Sampled by: A. Fillerton

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☑ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

Laboratory Number: 09-017

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx	Volatiles 8260C	Halogenated Volatiles 8260C	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	TCLP Metals	HEM (oil and grease) 1664A
11	8660.2-AS-11 PCB	8/30/23		Solid	1									X							

	Signature	Company	Date	Time	Comments/Special Instructions
Relinquished		MTNW	9/1/23	1100	
Received		OSE	9/5/23	1500	
Relinquished					
Received					
Relinquished					
Received					
Reviewed/Date		Reviewed/Date			Chromatograms with final report ☐

Data Package: Standard ☐ Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

Appendix I
On-Site Analytical Accreditation

The State of Washington Department of Ecology

OnSite Environmental, Inc.

Redmond, WA

has complied with provisions set forth in Chapter 173-50 WAC and is hereby recognized by the Department of Ecology as an ACCREDITED LABORATORY for the analytical parameters listed on the accompanying Scope of Accreditation.

This certificate is effective July 27, 2023 and shall expire July 26, 2024.

Witnessed under my hand on August 11, 2023.

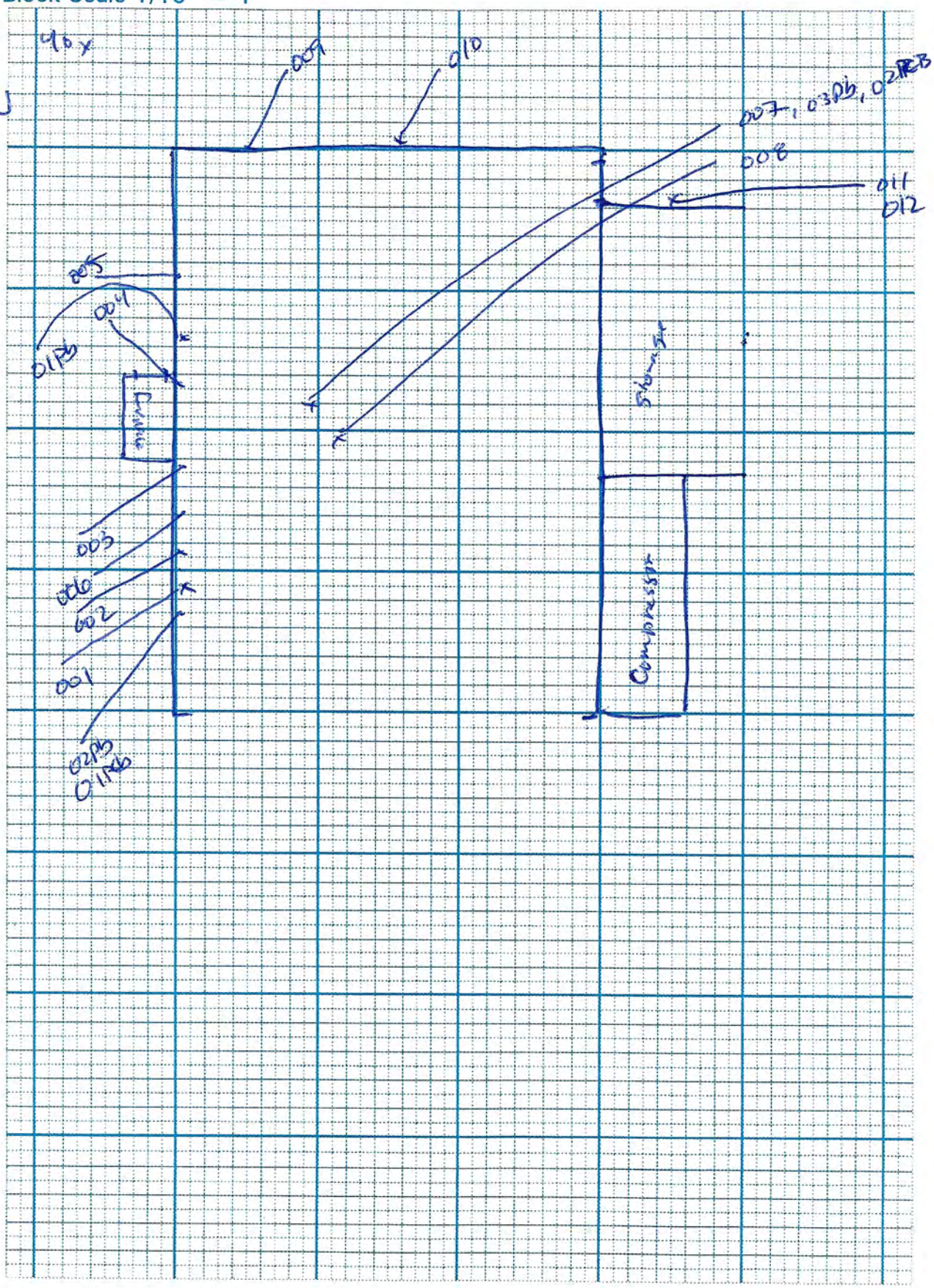
Rebecca Wood
Lab Accreditation Unit Supervisor

Laboratory ID
C591

Appendix J
Sample Location Drawings

MED-TOX NORTHWEST Occupational and Environmental Health	Client Aspect Consulting		Project No. 8666D.2
	Project Harris Ave Shipyard		
	Dwg. Name Paint Shop		
e-mail medtoxnw@msn.com	Date 8/30/23	Dwg. No.	Sheet 1 of 6

Block Scale 1/10" = 1'

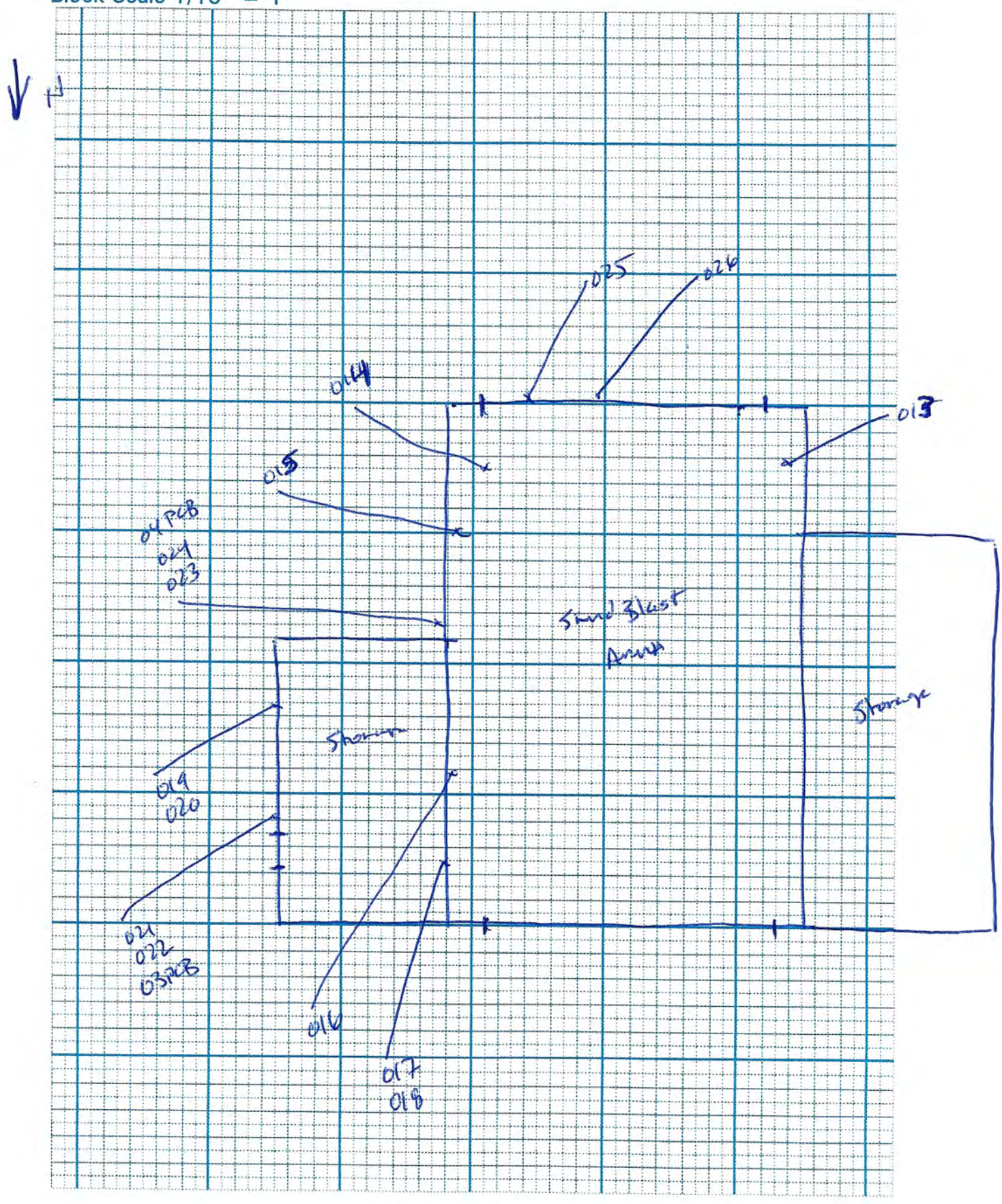


MED-TOX NORTHWEST
Occupational and Environmental Health

e-mail medtoxnw@msn.com

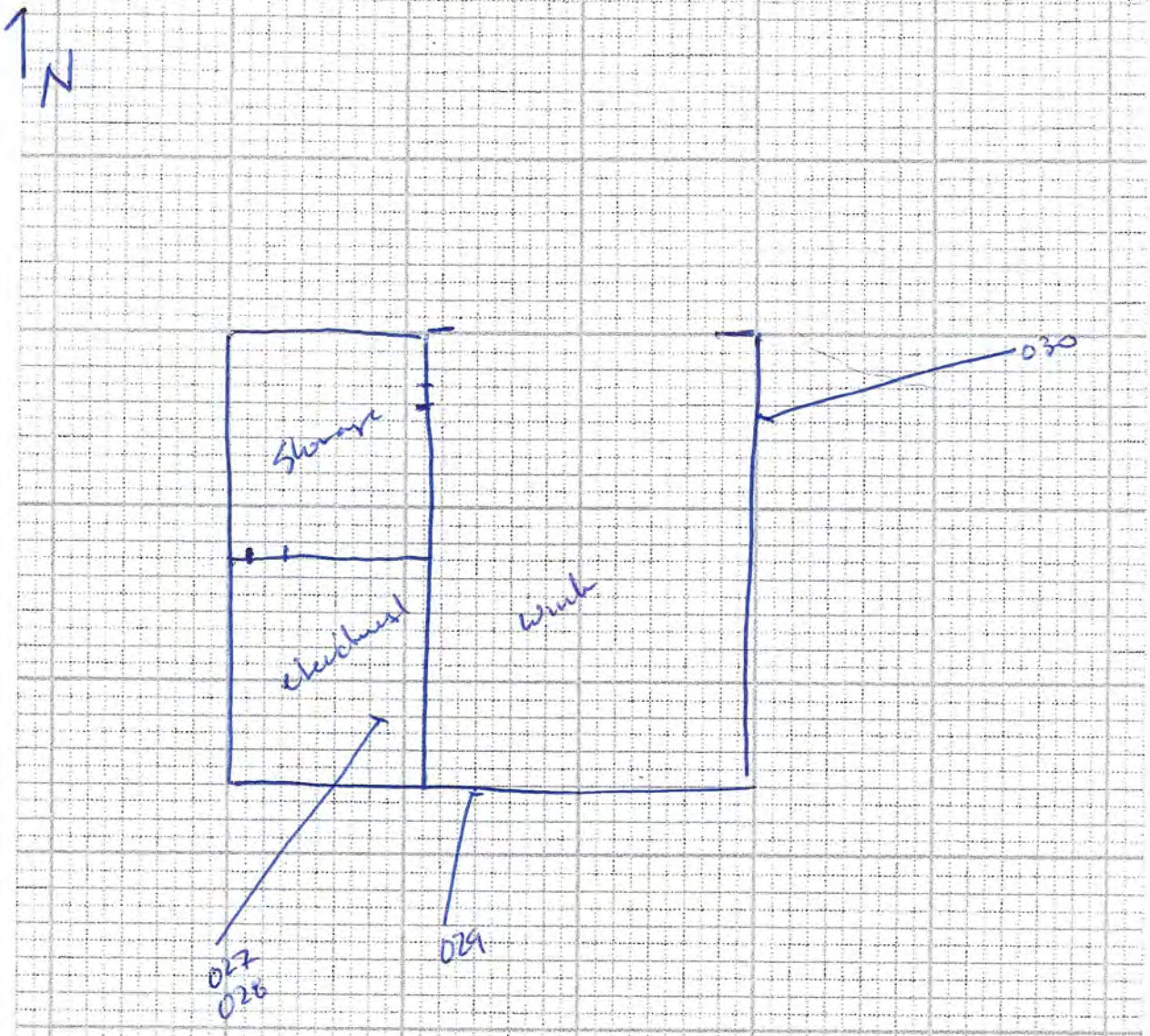
Client Aspect Consulting		Project No. 866602
Project Harris Ave Shipyard		
Dwg. Name Sand Blast Shed		
Date 8/30/23	Dwg. No.	Sheet 2 of 6

Block Scale 1/10" = 1'



MED-TOX NORTHWEST Occupational and Environmental Health e-mail medtoxnw@msn.com	Client Aspect Consulting	Project No. 8660.2
	Project Harris Ave Shipyard	
	Dwg. Name Winch House	
	Date 6/30/23	Dwg. No.
		Sheet 3 of 6

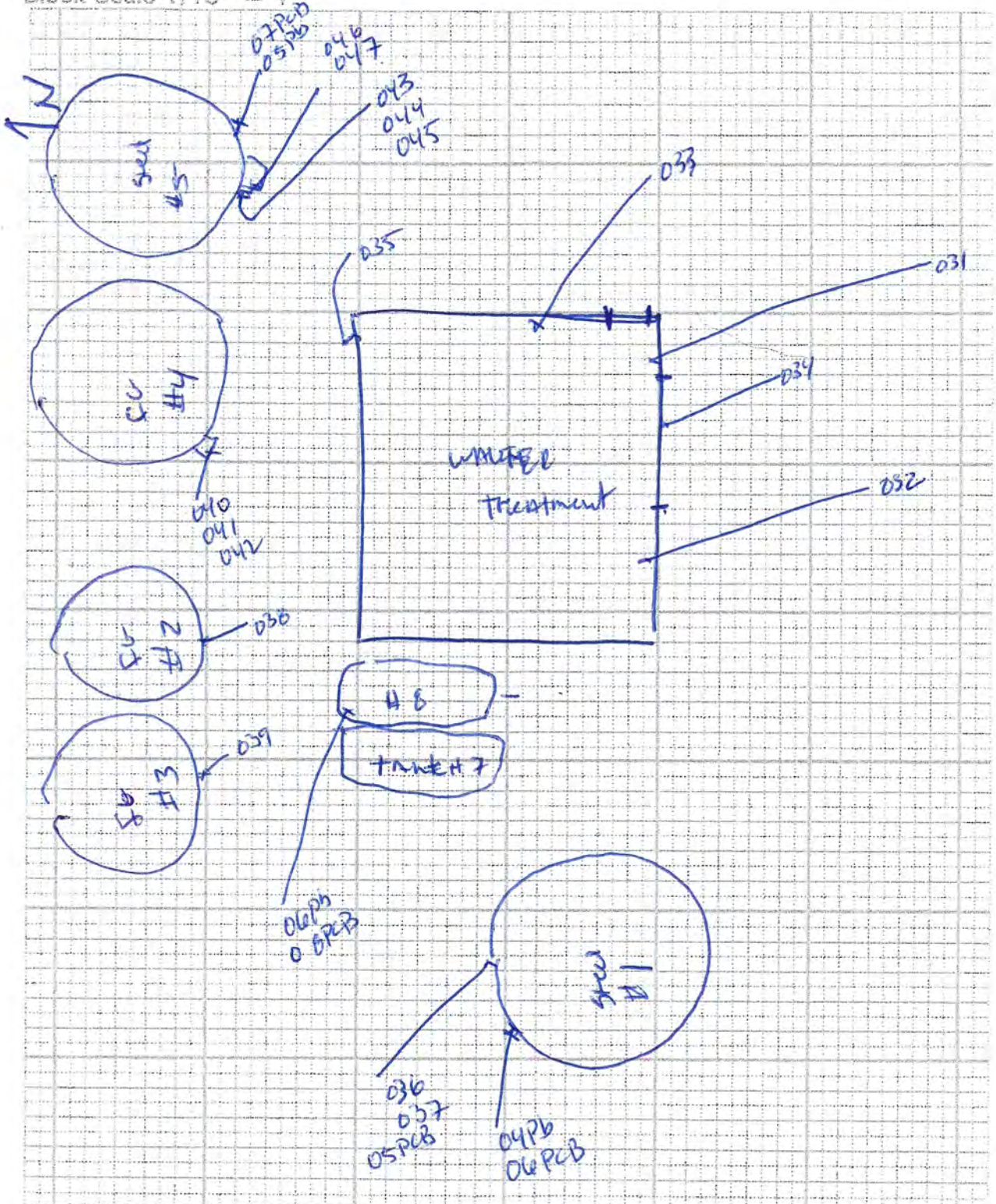
Block Scale 1/10" = 1'



MED-TOX NORTHWEST
Occupational and Environmental Health
e-mail medtoxnw@msn.com

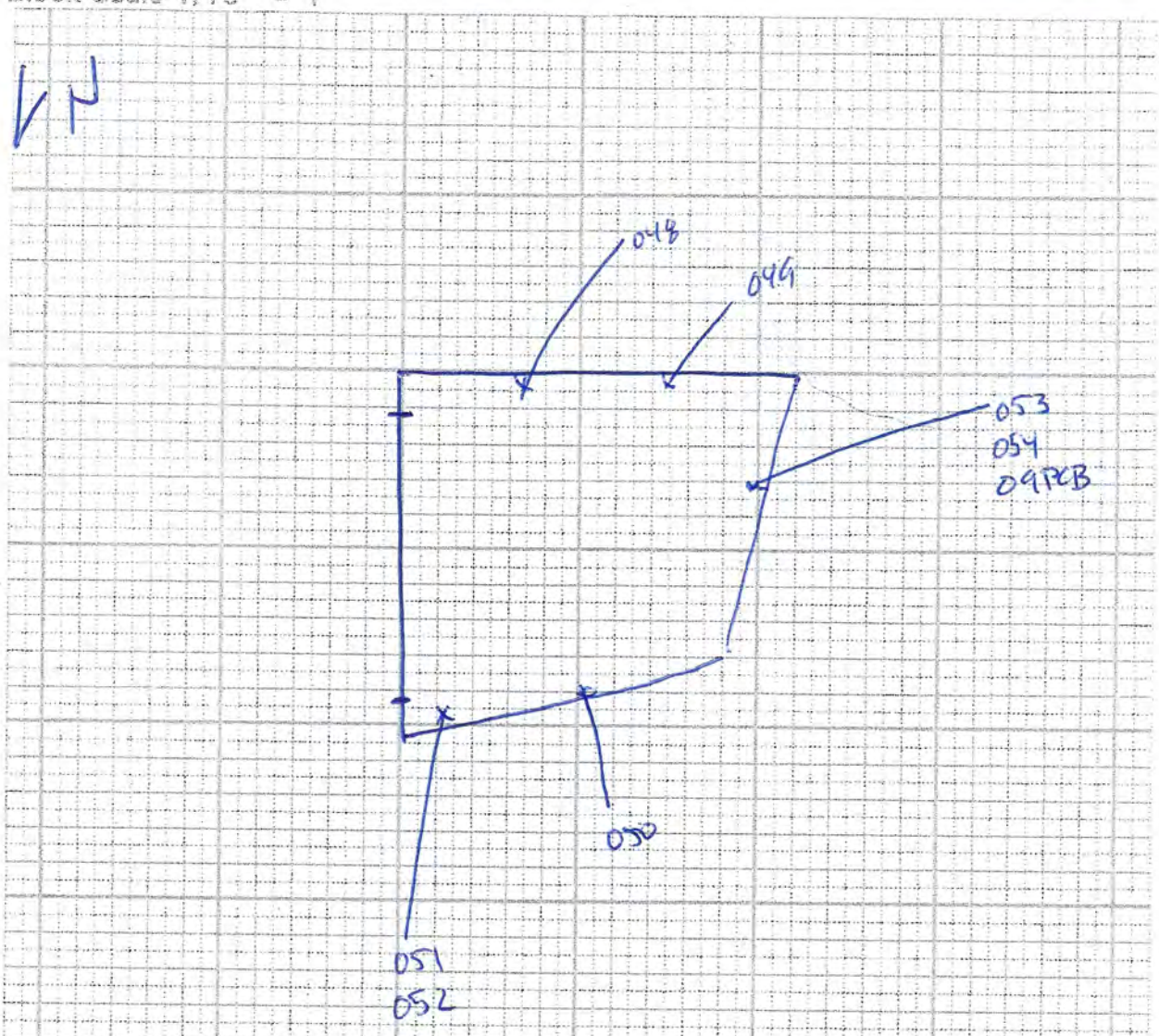
Client Aspect Consulting		Project No. 8660.2
Project HARRIS Ave Shipyard		
Dwg. Name Tank Farm & WATER TREATMENT Bldg		
Date 8/30/23	Dwg. No.	Sheet 4 of 6

Block Scale 1/10" = 1'



MED-TOX NORTHWEST Occupational and Environmental Health e-mail medtoxnw@msn.com	Client Aspect Consulting	Project No. 8660.2
	Project Harris Ave Shipyard	
	Dwg. Name Paint Building	
	Date 8/30/23	Dwg. No.
		Sheet 5 of 6

Block Scale 1/10" = 1'

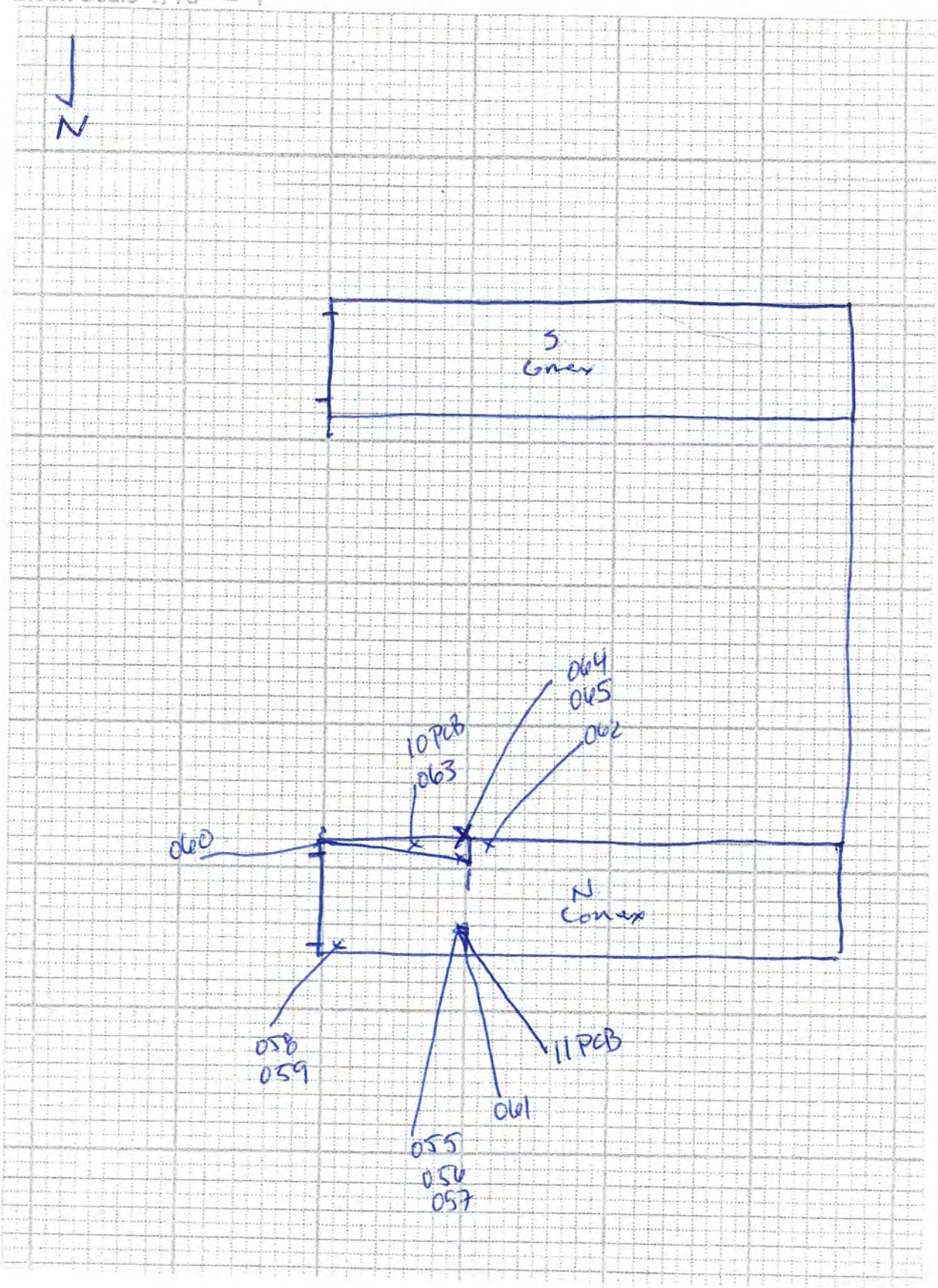


MED-TOX NORTHWEST
Occupational and Environmental Health

e-mail medtoxnw@msn.com

Client Aspect Consulting		Project No. 8660.2
Project Harris Ave Shipyard		
Dwg. Name Conex Building		
Date 8/30/23	Dwg. No.	Sheet 6 of 6

Block Scale 1/10" = 1'



APPENDIX E

City of Bellingham Public Facilities Construction Permit Plan Set

SECTION 02, TOWNSHIP 37 NORTH, RANGE 02 EAST, WILLAMETTE MERIDIAN, CITY OF BELLINGHAM, WHATCOM COUNTY, WASHINGTON

PORT OF BELLINGHAM

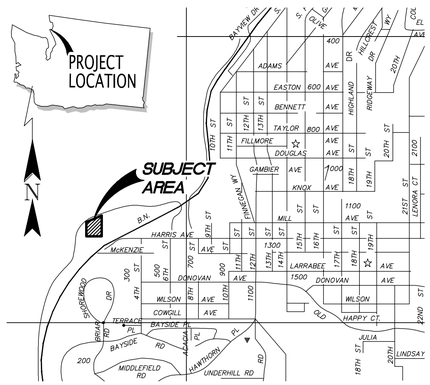
UPLAND CLEANUP ACTION

BELLINGHAM, WA 98225

PFC2025-0007

VICINITY MAP

NTS

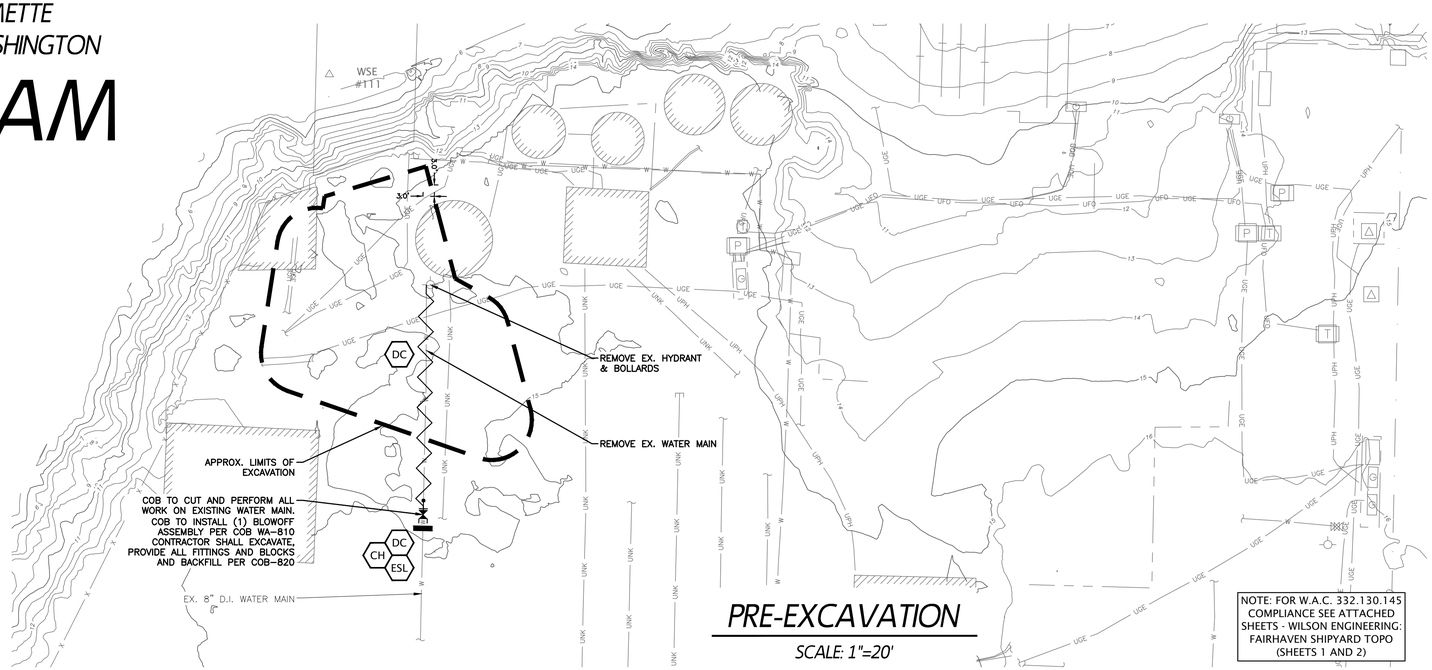


EROSION CONTROL LEGEND

DC	WSDOE BMP C140 DUST CONTROL
CH	WSDOE BMP C151 CONCRETE HANDLING
ESL	WSDOE BMP C160 CERTIFIED EROSION AND SEDIMENT CONTROL LEAD

SHEET INDEX

01	SITE PLAN
02	DETAILS
03	WILSON ENGINEERING 1 – W.A.C. 332.130.145 WAC COMPLIANCE (SEE REFERENCED SHEET 01)
04	WILSON ENGINEERING 2 – W.A.C. 332.130.145 WAC COMPLIANCE (SEE REFERENCED SHEET 02)



PRE-EXCAVATION

SCALE: 1"=20'

NOTE: FOR W.A.C. 332.130.145 COMPLIANCE SEE ATTACHED SHEETS - WILSON ENGINEERING; FAIRHAVEN SHIPYARD TOPO (SHEETS 1 AND 2)

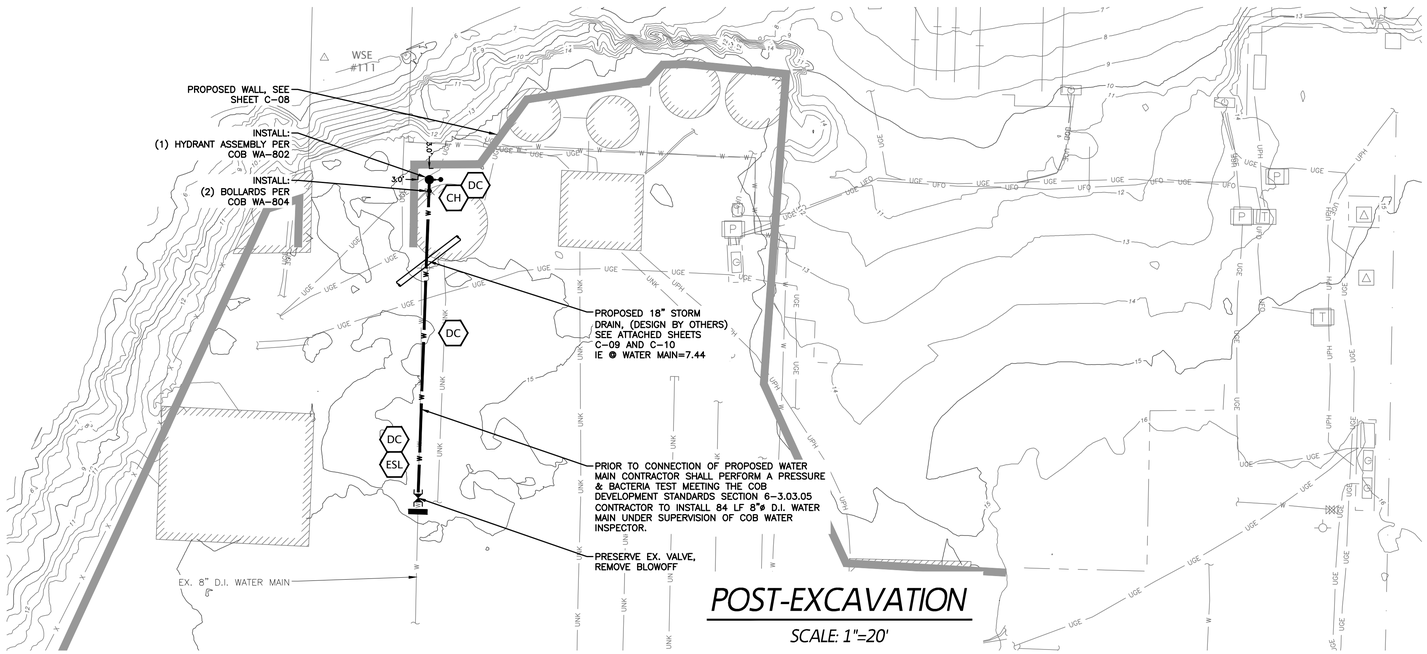
PSE

GRAPHIC SCALE (US SURVEY FEET)

0 20

20 10 40

1 inch = 20 feet



POST-EXCAVATION

SCALE: 1"=20'

DEPARTMENT OF PUBLIC WORKS
BELLINGHAM, WASHINGTON
APPROVED
Public Improvements on this plan have been reviewed and found to be in conformance with Department standards. Subject to field inspections.
Jeremy Thompson DATE 06/03/2025

CALL BEFORE YOU DIG 1-800-424-5555

REVISION	DATE	DESCRIPTION	ISSUE	DATE	DESCRIPTION
1	04/08/2025	PFC R1 COMMENT RESPONSE			
2	05/28/2025	PFC R2 COMMENT RESPONSE			

PORT OF BELLINGHAM
PO BOX 1677
BELLINGHAM, WA 98227
(360) 676-2500

UPLAND CLEANUP ACTION

HARRIS AVENUE SHIPYARD, BELLINGHAM, WA

PFC2025-0007

SITE PLAN

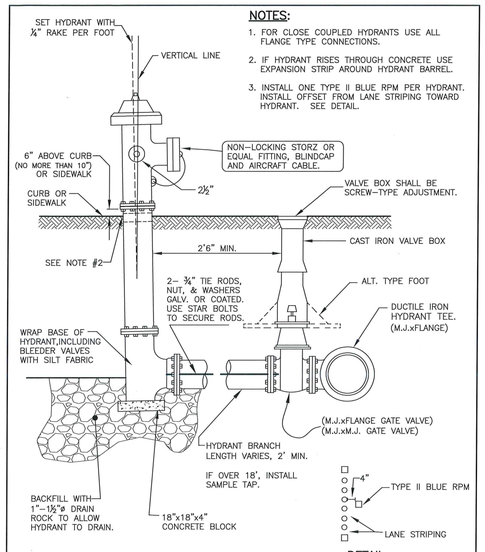
PACIFIC SURVEYING & ENGINEERING, INC.
909 Squalicum Way, Suite 111 | BELLINGHAM, WA 98225
T: 360.671.7387 | F: 360.671.4685
WWW.PSESURVEY.COM | INFO@PSESURVEY.COM

DATA	DRAWN BY	CHECKED BY	FIELD BOOKS
BASE	XXX	XXX	DESIGN: XXX
DESIGN	XXX	XXX	STAKING: XXX
XREF:	XXX		ASBUILT: XXX
JOB#:	2025049		DATUM
HORIZ. SCALE:	SHOWN		HORIZ.: XXX
VERT. SCALE:	SHWON		VERT.: XXX
DWG: P:\Pse Project\2025049\DWGs_SHEET\2025049_ecP_SP.dwg			

SHEET 01 OF 04

STEVEN A. VANDERWOUDE, STATE OF WASHINGTON, 37432, REGISTERED PROFESSIONAL ENGINEER

05-28-2025

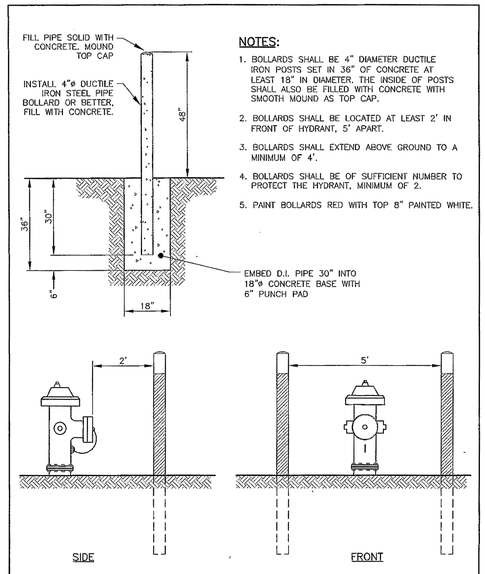


NOTES:

1. FOR CLOSE COUPLED HYDRANTS USE ALL FLANGE TYPE CONNECTIONS.
2. IF HYDRANT RISES THROUGH CONCRETE USE EXPANSION STRIP AROUND HYDRANT BARREL.
3. INSTALL ONE TYPE II BLUE RPM PER HYDRANT. INSTALL OFFSET FROM LANE STRIPING TOWARD HYDRANT. SEE DETAIL.

DETAIL

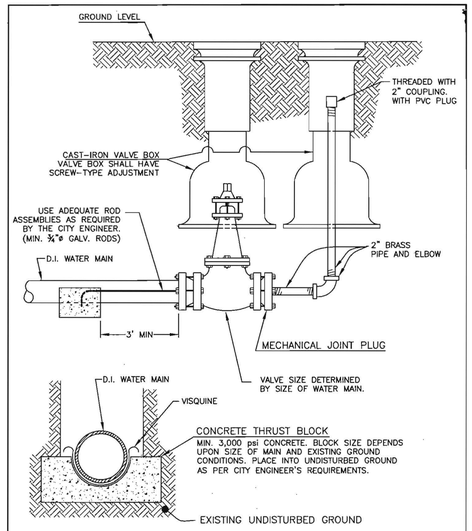
APPROVED		CITY OF BELLINGHAM	DRAWING
City Engineer	24 OCT 2018 Date	HYDRANT INSTALLATION	WA-802



NOTES:

1. BOLLARDS SHALL BE 4" DIAMETER DUCTILE IRON POSTS SET IN 36" OF CONCRETE AT LEAST 18" IN DIAMETER. THE INSIDE OF POSTS SHALL ALSO BE FILLED WITH CONCRETE WITH SMOOTH MOUND AS TOP CAP.
2. BOLLARDS SHALL BE LOCATED AT LEAST 2' IN FRONT OF HYDRANT, 5' APART.
3. BOLLARDS SHALL EXTEND ABOVE GROUND TO A MINIMUM OF 4'.
4. BOLLARDS SHALL BE OF SUFFICIENT NUMBER TO PROTECT THE HYDRANT, MINIMUM OF 2.
5. PAINT BOLLARDS RED WITH TOP 8" PAINTED WHITE.

APPROVED		CITY OF BELLINGHAM	DRAWING
City Engineer	12-28-04 Date	FIRE HYDRANT PROTECTION BOLLARD DETAIL	WA-804



FULL SIZE VALVE TO BE USED WHERE THE MAIN WILL BE EXTENDED IN THE FUTURE.

APPROVED		CITY OF BELLINGHAM	DRAWING
City Engineer	2/3/10 Date	BLOW OFF FOR FUTURE WATER MAIN EXTENSIONS	WA-810

BEDDING SPECIFICATIONS FOR DUCTILE IRON PIPE

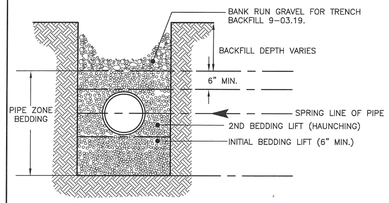
THE FOLLOWING SUPPLEMENTAL SPECIFICATIONS ARE TO BE USED IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, CURRENT EDITION:

BEDDING FOR WATERMAINS FOR DUCTILE IRON PIPE–

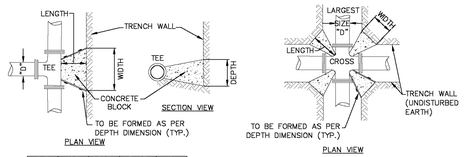
BEDDING MATERIAL FOR DUCTILE IRON PIPE SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS.

PIPE ZONE BEDDING – BEDDING SHALL BE A CLEAN GRANULAR MATERIAL FREE FROM ORGANIC MATTER AND CONFORMING TO THE STANDARD SPECIFICATION: 9-03.12(3), GRAVEL BACKFILL FOR PIPE ZONE BEDDING.

BACKFILL – WHEREVER A TRENCH IS EXCAVATED IN THE EXISTING OR PROPOSED ROADWAY, SIDEWALK OR OTHER AREAS WHERE SETTLEMENT WOULD BE DETRIMENTAL, THE ENTIRE TRENCH SHALL BE BACKFILLED WITH IMPORTED GRAVEL AND COMPACTED TO 95% OF MAXIMUM DENSITY.



APPROVED		CITY OF BELLINGHAM	DRAWING
City Engineer	12 SEPT 2016 Date	WATER PIPE BEDDING DETAILS	WA-820

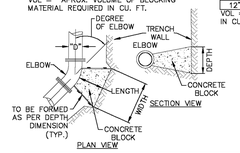


"D"	WIDTH	DEPTH	LENGTH	VOL.
6"	1'-6"	1'-6"	12"	3.0
8"	2'-0"	2'-0"	12"	4.5
10"	2'-6"	2'-6"	12"	7.0
12"	3'-0"	3'-0"	18"	14.0

VOL = APROX. VOLUME OF BLOCKING MATERIAL REQUIRED IN CU. FT.

"D"	WIDTH	DEPTH	LENGTH	VOL.	X4 BLOCKS/JOINTS
6"	1'-0"	1'-0"	12"	0.63	2.50 CU FT
8"	1'-3"	1'-3"	12"	1.00	4.01 CU FT
10"	1'-6"	1'-6"	12"	1.63	6.50 CU FT
12"	1'-0"	1'-9"	18"	3.05	12.19 CU FT

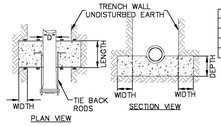
VOL = APROX. VOLUME OF BLOCKING MATERIAL REQUIRED IN CU. FT.



NOTE:
JOINT RESTRAINTS MAY BE USED IN PLACE OF THRUST BLOCKS, IF DESIGNED BY A LICENSED ENGINEER.

	11 1/4°			22 1/2°			45°			90°		
"D"	LENGTH	WIDTH	DEPTH	VOL.	WIDTH	DEPTH	VOL.	WIDTH	DEPTH	VOL.	WIDTH	DEPTH	VOL.
6"	12"	1'-0"	1'-0"	0.63	1'-0"	1'-0"	0.63	1'-6"	1'-6"	1.25	2'-3"	1'-6"	1.88
8"	18"	1'-3"	1'-3"	1.00	1'-3"	1'-3"	1.00	1'-9"	1'-9"	1.75	3'-0"	2'-0"	3.33
10"	24"	1'-9"	1'-6"	1.72	1'-9"	1'-6"	1.72	2'-3"	2'-3"	2.88	3'-6"	2'-6"	4.86
12"	24"	2'-0"	1'-9"	3.48	2'-0"	1'-9"	3.48	2'-9"	2'-6"	5.98	4'-0"	3'-0"	10.00

VOL = APROX. VOLUME OF BLOCKING MATERIAL REQUIRED IN CU. FT.



"D"	WIDTH	DEPTH	LENGTH	VOL.	# OF RODS	ROD DIA.
6"	1'-6"	1'-6"	12"	7.5	2	1/2"
8"	2'-0"	2'-0"	18"	20.0	2	5/8"
10"	2'-6"	2'-6"	24"	37.5	2	3/4"
12"	2'-9"	2'-9"	24"	44.0	4	3/4"

VOL = APROX. VOLUME OF BLOCKING MATERIAL REQUIRED IN CU. FT.
RODS: GALVANIZED A36 STEEL MINIMUM

TYPICAL THRUST BLOCKING DETAILS
NTS

SOIL BEARING CAPACITY 1500 PSF
MINIMUM 100 P.S.I. OPERATING PRESSURE

NOTE:
WATER MAIN OPERATING PRESSURE IS APPROXIMATELY 200 PSI. THRUST BLOCK & TIE BACK RODS SHALL BE SIZED ACCORDINGLY.

DEPARTMENT OF PUBLIC WORKS
BELLINGHAM, WASHINGTON **APPROVED**
Public Improvements on this plan have been reviewed and found to be in conformance with Department standards. Subject to field inspections.
Jeremy Thompson DATE 06/03/2025

CALL BEFORE YOU DIG 1-800-424-5555

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2	05/28/2025	PFC R2 COMMENT RESPONSE			

PORT OF BELLINGHAM
PO BOX 1677
BELLINGHAM, WA 98227
(360) 676-2500

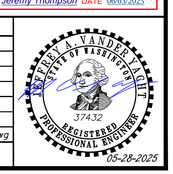
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD, BELLINGHAM, WA
PFC2025-0007

DETAILS

PACIFIC SURVEYING & ENGINEERING, INC.
909 Squalicum Way, Suite 111 | BELLINGHAM, WA 98225
T: 360.671.7387 | F: 360.671.4685
WWW.PSESURVEY.COM | INFO@PSESURVEY.COM

DATA	DRAWN BY	CHECKED BY	FIELD BOOKS
BASE	XXX	XXX	DESIGN: XXX
DESIGN	XXX	XXX	STAKING: XXX
XREF:	XXX		ASBUILT: XXX
JOB#:	2025049		DATUM
HORIZ. SCALE:	SHOWN		HORIZ.: XXX
VERT. SCALE:	SHWON		VERT.: XXX
DWG: P:\Pse Project\2025049\DWGs_SHEET\2025049_ecP_SP.dwg			

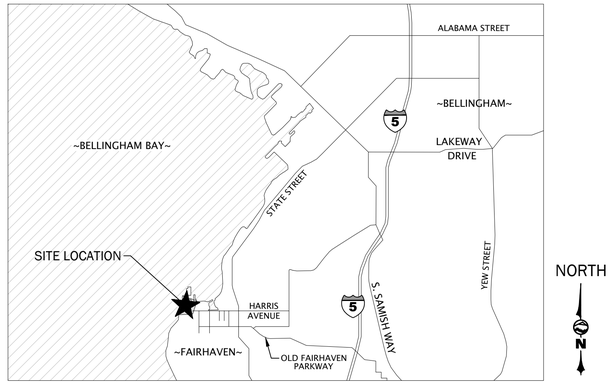
SHEET 02 OF 04



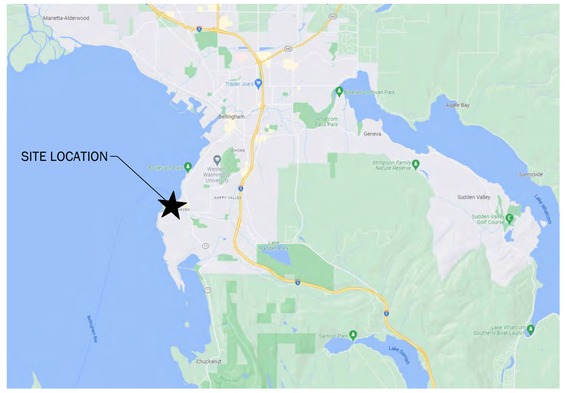
DRAWINGS

100% DESIGN PLANS

HARRIS AVENUE SHIPYARD UPLAND CLEANUP ACTION
BELLINGHAM, WASHINGTON



VICINITY MAP (NOT TO SCALE)



LOCATION MAP (NOT TO SCALE)



BASIS OF SURVEY
SURVEY COMPLETED BY: WILSON ENGINEERING, BELLINGHAM, WASHINGTON, MAY, 2022.

HORIZONTAL DATUM:
WASHINGTON STATE PLANE NAD83(1998) GROUND-LEVEL US-FOOT VALUES, PER THE CITY OF BELLINGHAM 2005 HORIZONTAL CONTROL NETWORK, ACCORDING TO THE RECORD OF SURVEY OF SAME RECORDED UNDER WHATCOM COUNTY AUDITOR'S FILE NO. 2071002449.

BASIS OF COORDINATES: COORDINATION AND MENSURATION ARE LOCAL GROUND VALUES, BASED UPON HOLDING THE PUBLISHED NAD83(1998) POSITION FOR THE BRASS-DISK SURFACE CITY OF BELLINGHAM MONUMENT 800, LOCATED IAT THE CENTERLINE INTERSECTION OF 6TH STREET AND HARRIS AVENUE. SAID MONUMENT HAS THE FOLLOWING PUBLISHED POSITION:

NORTHING = 631,880.321 USFT
EASTING = 1,235,889.653 USFT
SCALE FACTOR : 0.99999754
CONV. ANGLE : -01° 14' 53"

BASIS OF BEARINGS: BEARINGS ARE WASHINGTON STATE PLANE NAD83(1998) GRID, BASED UPON HOLDING THE PUBLISHED POSITIONS MONUMENTED BY CITY OF BELLINGHAM CADASTRAL CONTROL POINTS #800 AND #388, SAID CONTROL POINT #388 BEING A BRONZE-DISK MONUMENT AT THE INTERSECTION OF 10TH STREET AND DOUGLAS AVENUE.

THE DERIVED INVERSE BETWEEN SAID MONUMENTS #800 AND #388 IS:
NORTH 39° 51' 50" EAST, AT A DISTANCE OF 1792.96 USFT. THE PUBLISHED POSITION FOR THE CITY OF BELLINGHAM CADASTRAL SURVEY MONUMENT # 797 IS:

NORTHING = 633,256.544 USFT
EASTING = 1,237,038.879 USFT
SCALE FACTOR: 0.99999825
CONV. ANGLE: -1° 14' 38"

VERTICAL DATUM:
NAVD88, PER THE CITY OF BELLINGHAM ELEVATION DATUM AND CONTROL BENCHMARK DATABASE.

BASIS OF ELEVATIONS: ELEVATIONS ARE NAVD88 VALUES, BASED UPON HOLDING THE PUBLISHED ELEVATION FOR CITY OF BELLINGHAM REFERENCE BENCHMARK #4268, BEING A BRONZE-DISK MONUMENT IN THE PARAPET OF THE BOX CULVERT FOR PADDEN CREEK ON THE SOUTH SIDE OF HARRIS AVENUE. SAID MONUMENT HAD THE FOLLOWING PUBLISHED NAVD88 ELEVATION AT THE TIME OF SURVEY:
ELEVATION = 14.96 FEET

ENGINEER:
ASPECT CONSULTING
710 2ND AVENUE, SUITE 550, SEATTLE, WA 98104
ATTN: ERIC J. MARHOFER, P.E.
PHONE: 206-838-6582

PROPERTY, OWNER, AND LEGAL DESCRIPTION

ADDRESS: 201 HARRIS AVE, BELLINGHAM, WA 98225
OWNER: PORT OF BELLINGHAM, WASHINGTON
SEC–TWN–RNG–QTR: SEC 30, TWP 38N, RNG 2E

LEGAL DESCRIPTION: LOTS 2 AND 3 PORT OF BELLINGHAM FAIRHAVEN TERMINAL LLA AS & FAIRHAVEN TIDELANDS IMPROVEMENTS ONLY

WHATCOM COUNTY PROPERTY IDs: 17743, 17744, 17746
LOT AREA SQUARE FOOTAGE: 2.5 ACRES (17743),
0.0 ACRES (17744), 0.82 ACRES (17746)
PRIMARY STRUCTURE SQUARE FOOTAGE: 37,551 SQFT

CALL 2 WORKING DAYS
BEFORE YOU DIG: 811
(UNDERGROUND UTILITY
LOCATIONS ARE APPROX.)



SHEET NO.	DESCRIPTION	SHEET
G-01	COVER SHEET, LOCATION MAP, AND DRAWING INDEX	1
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G-03	EXISTING CONDITIONS PLAN	3
C-01	TEMPORARY EROSION AND SEDIMENT CONTROL PLAN	4
C-02	TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS	5
C-03	PAVEMENT AND STORMWATER DEMOLITION PLAN	6
C-04	CLEANUP AREA 1 EXCAVATION PLAN	7
C-05	CLEANUP AREA 1 CROSS SECTIONS	8
C-06	CLEANUP AREA 2 EXCAVATION PLAN	9
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D-03	SANDBLAST SHED PHOTOS	18
D-04	WINCH HOUSE AREA	19
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D-07	CONEX SHED AND PAINT BUILDING PHOTOS	22
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D-10	HISTORICAL WATER TREATMENT PHOTOS - SHEET 2	25
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ERIC JAMES MARHOFER
STATE OF WASHINGTON
44162
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-			

PORT OF BELLINGHAM
Washington State

DESIGNED BY: EBP/JRG
DRAWN BY: CMV
REVISED BY: -

Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE:

COVER SHEET, LOCATION MAP AND DRAWING INDEX

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:
G-01
SHEET **1** *OF* **37**

CAD Path: Q:\Port of Bellingham\210195 Harris\Shipyard\2023\01 Revised Plans_Regrade 3\100_Design\210195 ReDist_3N_1-4.dwg | Layout: G-01 | | Date Saved: 10/24/2024 5:15:17 PM | | User: caroline.vanslyke

GENERAL NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE MOST CURRENT STANDARD BUILDING CODES AS ADOPTED BY THE CITY OF BELLINGHAM AND WITH THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, LATEST EDITION, AS ISSUED BY THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION AND THE AMERICAN PUBLIC WORKS ASSOCIATION.
2. A PRECONSTRUCTION CONFERENCE AND 48 HOURS NOTICE TO OWNER AND ENGINEER (ASPECT CONSULTING) ARE REQUIRED PRIOR TO CONSTRUCTION.
3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE A COPY OF THE CONSTRUCTION PLANS AND SPECIFICATIONS ON SITE AT ALL TIMES.
4. THE REQUIREMENTS OF THIS PLAN SET ARE THE MINIMUM REQUIREMENTS. THEY DO NOT REPLACE, REPEAL, ABROGATE, SUPERSEDE, OR AFFECT ANY OTHER MORE STRINGENT REQUIREMENTS, RULES, REGULATIONS, STANDARDS OR RESTRICTIONS.
5. THE CONTRACTOR SHALL IMPLEMENT THE WORK ACCORDING TO THIS PLAN SET, TECHNICAL SPECIFICATIONS, STANDARD SPECIFICATIONS, AND SPECIAL PROVISIONS. ANY CHANGES TO THE DESIGN SHALL FIRST BE REVIEWED AND APPROVED BY THE ENGINEER.
6. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES THAT ARE INDICATED AS TO BE PROTECTED. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION BY CALLING 811, THE UNDERGROUND LOCATE LINE, A MINIMUM OF 48 HOURS (TWO WORKING DAYS) PRIOR TO ANY EXCAVATION. IT IS THE RESPONSIBILITY OF THE REQUESTER TO MAINTAIN THE MARKINGS AFTER THE INITIAL LOCATE IN ACCORDANCE WITH RCW 19.122.
7. UNLESS NOTED OTHERWISE, UTILITIES SHOWN ON THE PLAN ARE EXISTING, AND ARE LOCATED TO THE BEST INFORMATION AVAILABLE AT THE TIME OF PRINTING. THE CONTRACTOR SHALL VERIFY PRIOR TO CONSTRUCTION AND TAKE EXTRAORDINARY CARE WHEN EXCAVATING NEAR OR AROUND UTILITY CROSSINGS INCLUDING "HAND" EXCAVATION AND POT HOLING. IN THE EVENT OF A CONFLICT, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER AND THE PRIVATE OR PUBLIC UTILITY TO RAISE, RELOCATE, OR LOWER THE CONFLICTING APPURTENANCES.
8. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXTENT OF AND HAZARD CREATED BY OVERHEAD POWER AND OTHER UTILITIES. THE CONTRACTOR SHALL MEET WITH UTILITY OWNER PRIOR TO CONSTRUCTION AND TAKE WHATEVER PRECAUTIONS ARE REQUIRED BY LAW AND REGULATIONS, UTILITY OWNERS, SAFE CONSTRUCTION PRACTICES, OR AS DIRECTED BY THE ENGINEER.
9. THE CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE EXISTING UTILITIES, STRUCTURES, SIDEWALKS, PAVEMENTS, AND FACILITIES OUTSIDE OF THE PROJECT LIMITS. ALL DAMAGE OR UNDERMINING SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO IMMEDIATELY REPAIR TO CITY STANDARDS AT THE CONTRACTOR'S EXPENSE.
10. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION, THE COORDINATION OF ALL WORK, SAFETY OF ALL PERSONS AT THE PROJECT LIMITS, AND SHALL COMPLY WITH ALL JOB-RELATED SAFETY STANDARDS. EXCAVATION SLOPES SHALL BE SAFE AND NOT GREATER THAN THE LIMITS SPECIFIED BY LOCAL, STATE AND NATIONAL SAFETY REGULATIONS INCLUDING, BUT NOT LIMITED TO, APPLICABLE OSHA AND WISHA TRENCHING AND EXCAVATION REGULATIONS.
11. ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION/APWA STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, LATEST EDITION, UNLESS OTHERWISE NOTED.
12. THE CONTRACTOR SHALL MEET THE CONDITIONS OF ALL PROJECT PERMITS AND LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS.
13. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AT THE CONSTRUCTION ENTRANCE TO AVOID CONFLICT WITH VEHICULAR, PEDESTRIAN, AND BICYCLE TRAFFIC ON LAUREL STREET IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
14. THE CONTRACTOR SHALL KEEP AFFECTED OFFSITE STREETS CLEAN AT ALL TIMES.
15. THE CONTRACTOR IS RESPONSIBLE FOR SURVEY OF WORK PRIOR TO, DURING, AND AT COMPLETION OF THE WORK IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
16. CONTRACTOR SHALL FIELD VERIFY SITE CONDITIONS PRIOR TO STARTING AND SHALL NOTIFY ENGINEER IF THERE ARE DISCREPANCIES WITH THE PLANS.

ENVIRONMENTAL NOTES

1. THE WORK INCLUDES EXCAVATION AND OFF-SITE DISPOSAL OF SOIL CONTAINING HEAVY METALS AND CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS. THE WORK ALSO INCLUDES REMOVAL OF STRUCTURES AND OBSTRUCTIONS, WATER MANAGEMENT, AND BACKFILLING OF THE EXCAVATIONS.
2. THE FINAL DEPTH AND EXTENT OF THE CA2 EXCAVATION MAY BE MORE THAN OR LESS THAN THE APPROXIMATE EXTENTS SHOWN ON THE PLANS AND WILL BE BASED ON VERIFICATION SOIL SAMPLING PERFORMED BY THE ENGINEER.
3. THE WORK PRESENTED IN THESE PLANS SHALL BE PERFORMED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS AND ALL APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS FOR ENVIRONMENTAL CLEANUP CONSTRUCTION SITES.

EXCAVATION NOTES

1. CONTRACTOR TO REFERENCE THE TECHNICAL SPECIFICATIONS FOR AVAILABLE INFORMATION ON SOILS AND GROUNDWATER CONDITIONS.
2. CONTRACTOR SHALL PROVIDE AN EXCAVATION SEQUENCING PLAN AND SCHEDULE TO THE OWNER AND ENGINEER FOR APPROVAL PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL PROVIDE DAILY UPDATES TO THE OWNER AND ENGINEER AND PROVIDE AT LEAST 24 HOURS NOTICE OF ANY CHANGES TO THE EXCAVATION SEQUENCING PLAN AND SCHEDULE.
3. FOR EXCAVATIONS EXCEEDING DEPTHS GREATER THAN 4 FEET BELOW SURROUNDING GRADE, THE MAXIMUM CUT/FILL SLOPE SHALL NOT EXCEED 1.5 FOOT HORIZONTAL TO 1 FOOT VERTICAL (1.5H:1V) WITHOUT STRUCTURAL SUPPORTS.
4. ALL GRADING SHALL BE LIMITED TO THE AREAS IDENTIFIED ON THE PLANS AND SHALL NOT INFRINGE ADJACENT OWNERSHIPS.
5. EXCAVATION, BACKFILL, AND COMPACTION WILL BE COMPLETED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
6. GRADING LIMITS ARE SHOWN AS EXCAVATION EXTENTS. HOWEVER, FINAL EXCAVATION EXTENTS MAY BE WIDER OR DEEPER THAN THE EXTENTS SHOWN AS DETERMINED BY THE ENGINEER. THE CONTRACTOR WILL PROVIDE THE ENGINEER SAFE ACCESS AND TIME ACCOMMODATION TO RETRIEVE THE VERIFICATION SOIL SAMPLES OR SURVEYS.
7. THE EXCAVATION BOTTOM WILL BE KEPT DRY DURING EXCAVATION, VERIFICATION SOIL SAMPLING, AND BACKFILL.
8. ANY OVER-EXCAVATION PERFORMED BY THE CONTRACTOR WITHOUT THE DIRECTION OF THE ENGINEER SHALL BE AT THE CONTRACTOR'S EXPENSE.

MINIMUM HANDLING AND DISPOSAL REQUIREMENTS FOR CONTAMINATED MATERIALS

1. ALL CONTRACTOR REQUIREMENTS FOR HANDLING AND DISPOSAL OF CONTAMINATED SOIL AND WATER ARE PRESENTED IN THE TECHNICAL SPECIFICATIONS.
2. EXCAVATED SOIL WILL BE MANAGED AS SUBTITLE D SOIL AS DIRECTED BY THE ENGINEER.
3. PIECES OF CONCRETE, ASPHALT, OR METAL WITH ANY DIMENSION GREATER THAN 1 FOOT WILL BE SEGREGATED FROM EXCAVATED SOILS AND MANAGED AS INERT DEBRIS FOR OFF-SITE RECYCLING, UNLESS OTHERWISE DIRECTED BY ENGINEER. ALL WOODEN RAILROAD TIES AND TIMBER PILES, AND OTHER CONTAMINATED DEBRIS AS DESIGNATED BY ENGINEER, WILL BE MANAGED AS SUBTITLE D MATERIAL FOR OFF-SITE DISPOSAL.
4. IF TEMPORARY STOCKPILING WILL BE DONE WITHIN THE DESIGNATED STOCKPILE AREA - ONE FOR EACH CONTAMINATED SOIL WASTE STREAM, ONE FOR INERT DEBRIS - AS APPROVED BY THE ENGINEER. CONTAMINATED DEBRIS MAY BE STOCKPILED WITH SUBTITLE D SOIL. EACH STOCKPILE AREA WILL BE UNDERLAIN BY PLASTIC SHEETING THAT IS OVERLAIN AND PROTECTED BY PLYWOOD OR GEOTEXTILE, COVERED BY PLASTIC SHEETING WHEN NOT IN USE, AND WILL BE BERMED TO PREVENT STORMWATER RUN-ON INTO IT AND RUNOFF FROM IT.
5. ALL CONTAMINATED SOIL AND CONTAMINATED DEBRIS WILL BE LOADED AND TRANSPORTED OFF-SITE TO A PERMITTED DISPOSAL FACILITY AS SPECIFIED.
6. TRUCKS HAULING CONTAMINATED SOIL OR DEBRIS MUST BE COVERED DURING TRANSPORT FROM THE TIME OF LEAVING THE PROJECT SITE UNTIL OFF-LOADING AT THE DISPOSAL FACILITY.

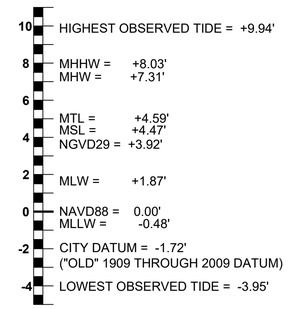
CONSTRUCTION NOTES AND PROPOSED SEQUENCE

1. ACCESS TO HARRIS AVENUE PIER AND STUB PIER SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT.
2. LOCATE ALL EXISTING UTILITIES VIA PUBLIC AND PRIVATE LOCATES.
3. PROVIDE CONSTRUCTION FENCING, SIGNAGE, AND BARRIERS AS NEEDED TO PREVENT UNAUTHORIZED ACCESS TO THE PROJECT SITE. COORDINATE WITH THE OWNER OR ENGINEER TO FIELD ADJUST FENCE AS REQUIRED FOR SPECIFIC SITE CONDITIONS.
4. INSTALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.
5. DEMOLISH STRUCTURES AND OBSTRUCTIONS SHOWN ON DRAWING SHEETS D-1 THROUGH D-12 PRIOR TO EXCAVATION AND EARTHWORK TO FACILITATE STAGING AND AVAILABILITY OF SPACE FOR CONTRACTOR AND TENANT EQUIPMENT.
6. STORMWATER INFRASTRUCTURE SHOWN ON SHEET C-09 SHALL BE INSTALLED PRIOR TO RESTORING THE SITE TO FINAL GRADES (CAPPING).
7. ECOLOGY BLOCK WALL LAYOUT AND CONSTRUCTION
   - 7.1 MARK OR STAKE PROPOSED ECOLOGY BLOCK WALL LAYOUT IN THE FIELD FOR ON SITE REVIEW WITH ENGINEER AND OWNER. ADJUST LAYOUT AS INDICATED BY ENGINEER AND OWNER
   - 7.2 CONSTRUCT ECOLOGY BLOCK WALL AS INDICATED ON THE PLANS AND TECHNICAL SPECIFICATIONS
8. GENERAL EXCAVATION SEQUENCE:
   - 8.1. COORDINATE EXCAVATION AND BACKFILL PHASING WITH OWNER AND ENGINEER TO MINIMIZE DISTURBANCE OF TENANT ACTIVITIES AND ALLOW THE TENANT TO ACCESS THE SITE.
   - 8.2. MARK LIMITS OF AREAS TO BE EXCAVATED.
   - 8.3. EXCAVATE SOIL TO SPECIFIED DEPTH OR ELEVATION AND LOAD INTO TRUCKS FOR OFF-SITE DISPOSAL. IF NEEDED, SOIL CAN BE TEMPORARILY STOCKPILED WITHIN THE ENGINEER APPROVED STOCKPILE AREA.
   - 8.4. REMOVE ALL INACTIVE UTILITIES OR UNDERGROUND OBSTRUCTIONS THAT INTERFERE WITH EXCAVATION OR AS SPECIFIED BY ENGINEER. CUT AND PLUG UTILITY AT EDGE OF EXCAVATION AS NEEDED.
9. BACKFILL AND FINISHED GRADING:
   - 9.1. INSTALL NON-WOVEN GEOTEXTILE (MIRAFI HP270 OR EQUIVALENT) ON SUBGRADES WHERE INDICATED.
   - 9.2. BACKFILL EXCAVATIONS AND COMPACT BACKFILL IN ACCORDANCE WITH AND THE TECHNICAL SPECIFICATIONS.
10. INSPECT AND MAINTAIN TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES THROUGHOUT PROJECT.
11. PERFORM FINAL SITE WALK WITH ENGINEER AND OWNER PRIOR TO DE-MOBILZING FROM SITE.

ABBREVIATIONS

BGS	BELOW EXISTING GROUND SURFACE
CA 1	CLEANUP AREA 1
CA 2	CLEANUP AREA 2
CB	CATCH BASIN
DI	DUCTILE IRON
DIA	DIAMETER
FDC	FIRE DEPARTMENT CONNECTION
IE	INVERT ELEVATION
MH	MANHOLE
MHHW	MEAN HIGHER HIGH WATER
MHW	MEAN HIGH WATER
MLLW	MEAN LOWER LOW WATER
MLW	MEAN LOW WATER
MSL	MEAN SEA LEVEL
MTL	MEAN TIDE LEVEL
MW	MONITORING WELL
NAD83	NORTH AMERICAN DATUM OF 1983
NAVD88	NORTH AMERICAN VERTICAL DATUM OF 1988
NGVD29	NATIONAL GEODETIC VERTICAL DATUM OF 1929
NOAA	NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
PSSP	POLYETHYLENE STORM SEWER PIPE
RCW	REVISED CODE OF WASHINGTON
SD	STORM DRAIN

DATUM CONVERSION SCALE
(PER NOAA STATION DATA SHEET #9449211)



ERIC JAMES MARHOFER
STATE OF WASHINGTON
44162
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-			

PORT OF BELLINGHAM
Washington State

DESIGNED BY: EBP/JRG
DRAWN BY: CMV
REVISED BY: -

Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE:

GENERAL NOTES

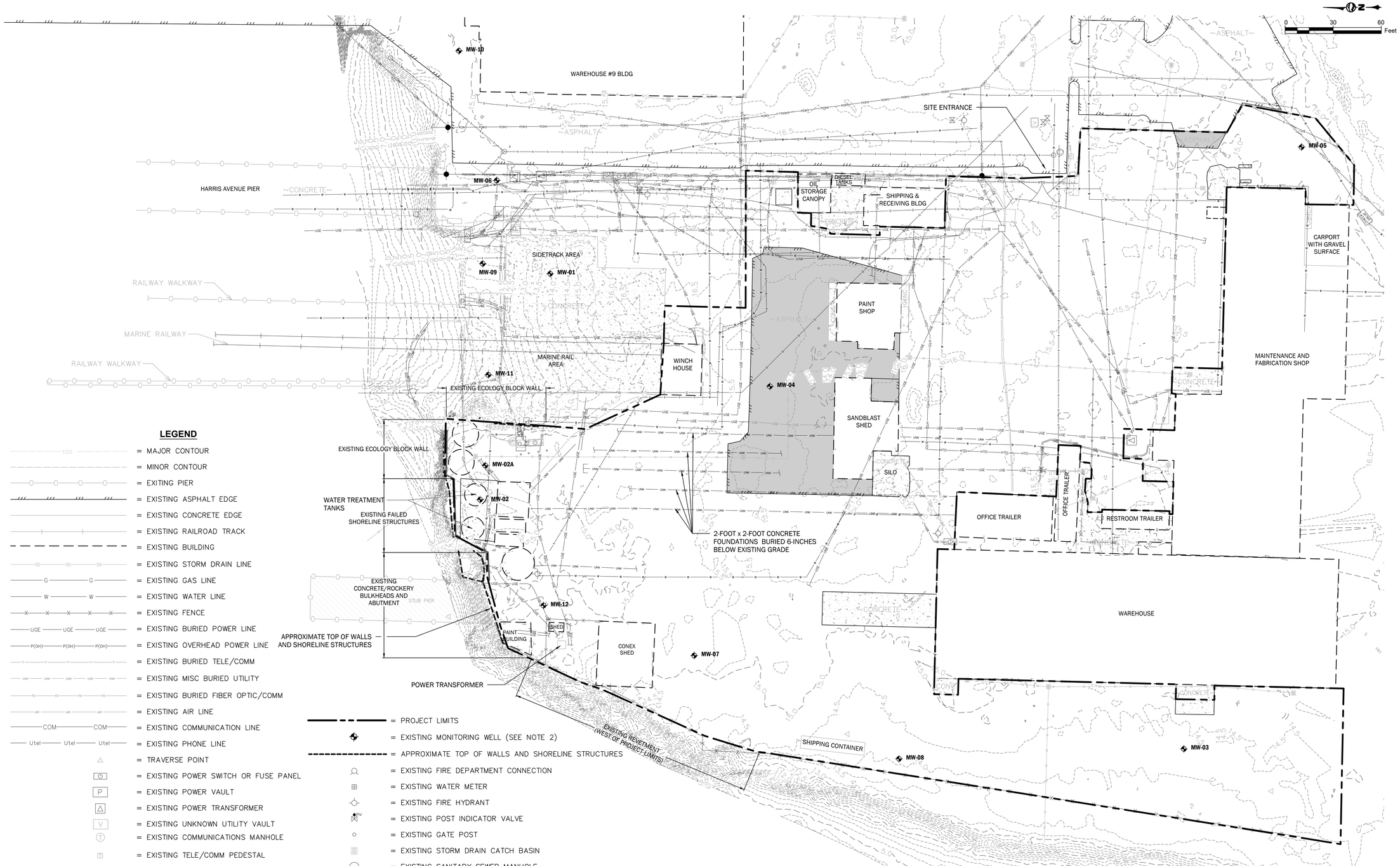
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

G-02

SHEET **2** *OF* **37**

CAD Path: ...\ASP SEA-01\Drafting\Port of Bellingham\210195 Harris\Design\20231011 Revised Plans_Regrade 3 UDC_Design\210195 Plan Set _Dec_1-4.dwg Layout: G-02 | | Date Saved: 6/24/2023 3:55:51 PM | | User: caroline.sandyke



LEGEND

- = MAJOR CONTOUR
- = MINOR CONTOUR
- = EXITING PIER
- = EXISTING ASPHALT EDGE
- = EXISTING CONCRETE EDGE
- = EXISTING RAILROAD TRACK
- = EXISTING BUILDING
- = EXISTING STORM DRAIN LINE
- = EXISTING GAS LINE
- = EXISTING WATER LINE
- = EXISTING FENCE
- = EXISTING BURIED POWER LINE
- = EXISTING OVERHEAD POWER LINE
- = EXISTING BURIED TELE/COMM
- = EXISTING MISC BURIED UTILITY
- = EXISTING BURIED FIBER OPTIC/COMM
- = EXISTING AIR LINE
- = EXISTING COMMUNICATION LINE
- = EXISTING PHONE LINE
- = TRAVERSE POINT
- = EXISTING POWER SWITCH OR FUSE PANEL
- = EXISTING POWER VAULT
- = EXISTING POWER TRANSFORMER
- = EXISTING UNKNOWN UTILITY VAULT
- = EXISTING COMMUNICATIONS MANHOLE
- = EXISTING TELE/COMM PEDESTAL
- = EXISTING POWER POLE
- = EXISTING POWER GUY
- = EXISTING CAPPED OR END OF LINE UTILITY
- = EXISTING WATER VALVE
- = PROJECT LIMITS
- = EXISTING MONITORING WELL (SEE NOTE 2)
- = APPROXIMATE TOP OF WALLS AND SHORELINE STRUCTURES
- = EXISTING FIRE DEPARTMENT CONNECTION
- = EXISTING WATER METER
- = EXISTING FIRE HYDRANT
- = EXISTING POST INDICATOR VALVE
- = EXISTING GATE POST
- = EXISTING STORM DRAIN CATCH BASIN
- = EXISTING SANITARY SEWER MANHOLE
- = SURVEY CONTROL POINT
- = EXISTING CONCRETE
- = EXISTING ASPHALT

NOTES:

1. ALL SURFACES NOT IDENTIFIED AS CONCRETE OR ASPHALT ARE GRAVEL.
2. MONITORING WELLS WITHIN THE PROJECT LIMITS SHALL BE DECOMMISSIONED BY THE ENGINEER PRIOR TO CONSTRUCTION.

ERIC JAMES MARHOFER
STATE OF WASHINGTON
44162
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM
Washington State

DESIGNED BY: EBP/JRG
DRAWN BY: CMV
REVISED BY: -

Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE:

EXISTING CONDITIONS PLAN

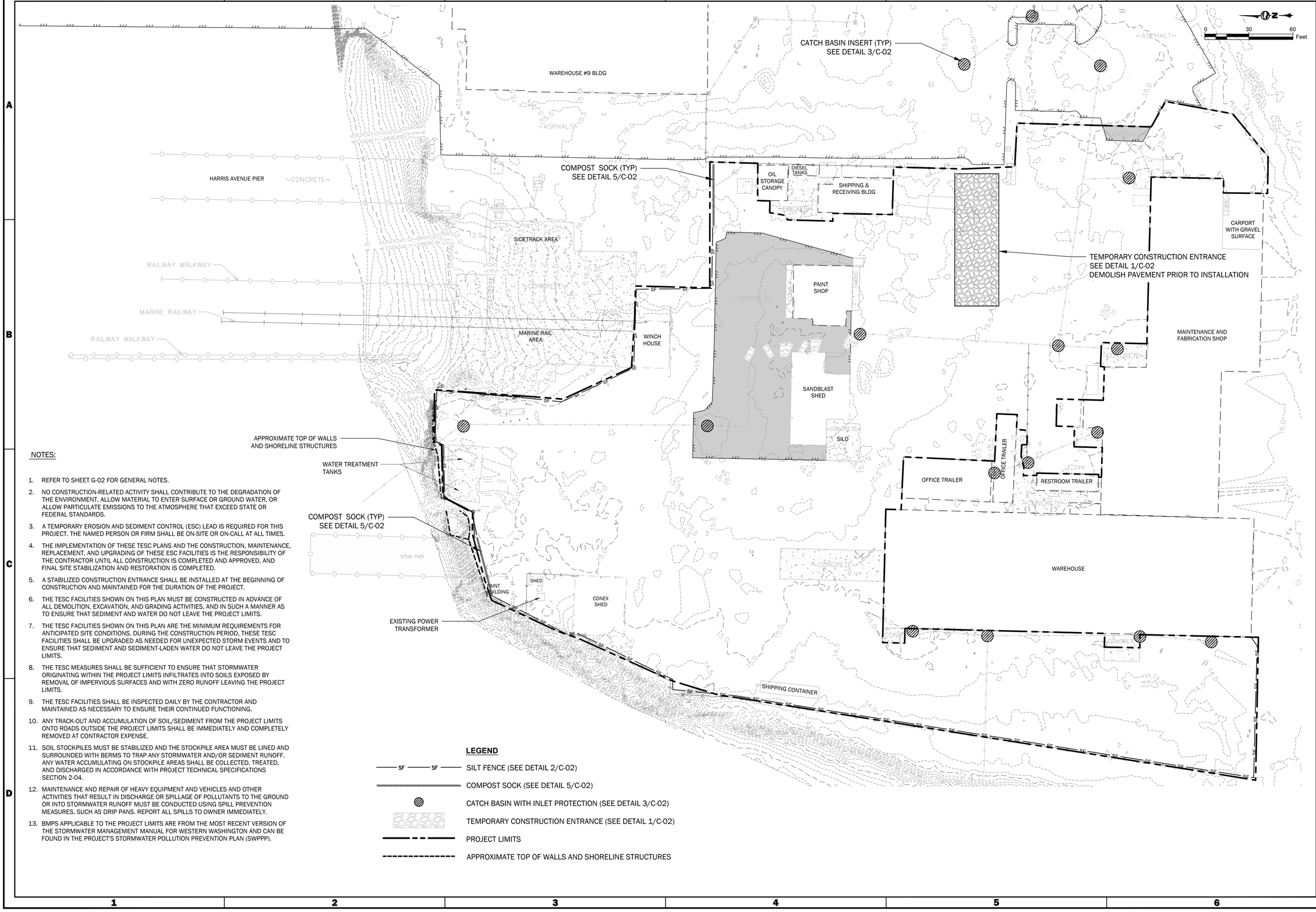
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

G-03

SHEET **3** *OF* **37**

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NOTES:

1. REFER TO SHEET G-02 FOR GENERAL NOTES.
2. NO CONSTRUCTION-RELATED ACTIVITY SHALL CONTRIBUTE TO THE DEGRADATION OF THE ENVIRONMENT, ALLOW MATERIAL TO ENTER SURFACE OR GROUND WATER, OR ALLOW PARTICULATE EMISSIONS TO THE ATMOSPHERE THAT EXCEED STATE OR FEDERAL STANDARDS.
3. A TEMPORARY EROSION AND SEDIMENT CONTROL (ESC) LEAD IS REQUIRED FOR THIS PROJECT. THE NAMED PERSON OR FIRM SHALL BE ON-SITE OR ON-CALL AT ALL TIMES.
4. THE IMPLEMENTATION OF THESE TESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED, AND FINAL SITE STABILIZATION AND RESTORATION IS COMPLETED.
5. A STABILIZED CONSTRUCTION ENTRANCE SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT.
6. THE TESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN ADVANCE OF ALL DEMOLITION, EXCAVATION, AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND WATER DO NOT LEAVE THE PROJECT LIMITS.
7. THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE TESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE PROJECT LIMITS.
8. THE TESC MEASURES SHALL BE SUFFICIENT TO ENSURE THAT STORMWATER ORIGINATING WITHIN THE PROJECT LIMITS INFILTRATES INTO SOILS EXPOSED BY REMOVAL OF IMPERVIOUS SURFACES AND WITH ZERO RUNOFF LEAVING THE PROJECT LIMITS.
9. THE TESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
10. ANY TRACK-OUT AND ACCUMULATION OF SOIL/SEDIMENT FROM THE PROJECT LIMITS ONTO ROADS OUTSIDE THE PROJECT LIMITS SHALL BE IMMEDIATELY AND COMPLETELY REMOVED AT CONTRACTOR EXPENSE.
11. SOIL STOCKPILES MUST BE STABILIZED AND THE STOCKPILE AREA MUST BE LINED AND SURROUNDED WITH BERMS TO TRAP ANY STORMWATER AND/OR SEDIMENT RUNOFF. ANY WATER ACCUMULATING ON STOCKPILE AREAS SHALL BE COLLECTED, TREATED, AND DISCHARGED IN ACCORDANCE WITH PROJECT TECHNICAL SPECIFICATIONS SECTION 2-04.
12. MAINTENANCE AND REPAIR OF HEAVY EQUIPMENT AND VEHICLES AND OTHER ACTIVITIES THAT 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. REPORT ALL SPILLS TO OWNER IMMEDIATELY.
13. BMPS APPLICABLE TO THE PROJECT LIMITS ARE FROM THE MOST RECENT VERSION OF THE STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON AND CAN BE FOUND IN THE PROJECT'S STORMWATER POLLUTION PREVENTION PLAN (SWPPP).

LEGEND

- SF — SF — SILT FENCE (SEE DETAIL 2/C-02)
- COMPOST SOCK (SEE DETAIL 5/C-02)
- CATCH BASIN WITH INLET PROTECTION (SEE DETAIL 3/C-02)
- TEMPORARY CONSTRUCTION ENTRANCE (SEE DETAIL 1/C-02)
- PROJECT LIMITS
- APPROXIMATE TOP OF WALLS AND SHORELINE STRUCTURES

ERIK BRIAN PRUNEDA
STATE OF WASHINGTON
48220
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-			

PORT OF BELLINGHAM
Washington State

DESIGNED BY: EBP/JRG
DRAWN BY: CMV
REVISED BY: -

Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE:

TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

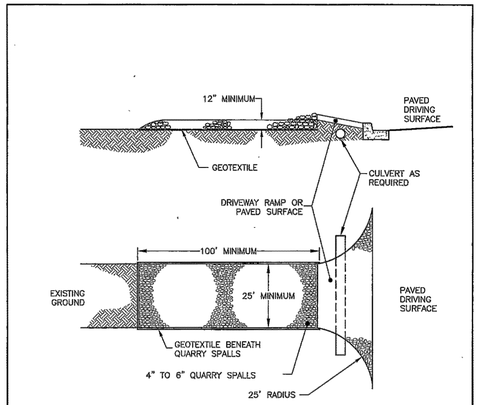
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

C-01

SHEET **4** *OF* **37**

CAD Path: \\ASP-BS-01\Drafting\Port of Bellingham\210195 Harris\Shpyd\2023-01 Revised Plans_Regrade 3\100_Design\210195 PreDes_SPU_1-4.dwg Layout: C-01 | | Date Saved: 10/24/2024 5:13:17 PM | | User: caroline.wampler



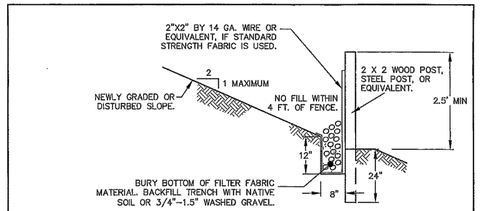
PLAN
NTS

NOTES:

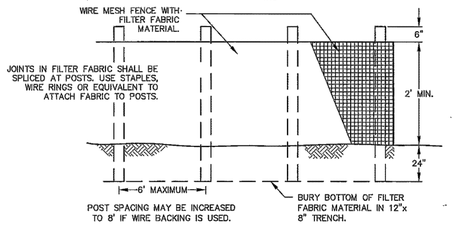
1. PAD SHALL BE REMOVED AND REPLACED WHEN SOIL IS EVIDENT ON THE SURFACE OF THE PAD OR AS DIRECTED BY THE CITY.
2. PAD SHALL BE INSTALLED IN PLANTING STRIP AS APPROPRIATE.
3. PAD THICKNESS SHALL BE INCREASED IF SOIL CONDITIONS DICTATE OR PER THE DIRECTION OF THE CITY.
4. MINIMUM DIMENSIONS MAY BE MODIFIED AS REQUIRED BY SITE CONDITIONS UPON APPROVAL OF THE CITY.

APPROVED		CITY OF BELLINGHAM	DRAWING
City Engineer	Date	TEMPORARY CONSTRUCTION EXIT~PLAT/COMMERCIAL	EC-600

TEMPORARY CONSTRUCTION ENTRANCE (1 / C-02)
SCALE: NTS



TYPICAL CROSS SECTION
NTS



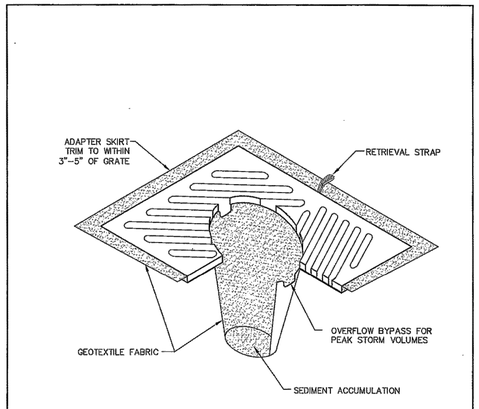
ELEVATION
NTS

NOTES:

1. FENCE SHALL NOT BE INSTALLED ON SLOPES STEEPER THAN 2:1.
2. JOINTS IN FILTER FABRIC SHALL BE OVERLAPPED 6 INCHES AT POST.
3. USE STAPLES, WIRE RINGS, OR EQUIVALENT TO ATTACH FABRIC TO WIRE FENCE.
4. REMOVE SEDIMENT WHEN IT REACHES 1/3 FENCE HEIGHT.

APPROVED		CITY OF BELLINGHAM	DRAWING
City Engineer	Date	REINFORCED SILT FENCE	EC-615

REINFORCED SILT FENCE (2 / C-02)
SCALE: NTS

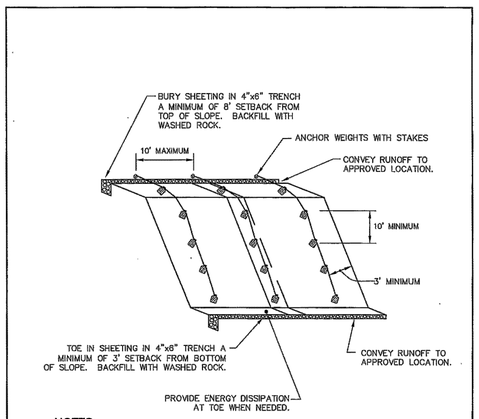


NOTES:

1. INSERT SHALL BE INSTALLED PRIOR TO CLEARING AND GRADING ACTIVITY, OR UPON PLACEMENT OF A NEW CATCH BASIN.
2. SEDIMENT SHALL BE REMOVED FROM THE UNIT WHEN IT BECOMES HALF FULL.
3. SEDIMENT REMOVAL SHALL BE ACCOMPLISHED BY REMOVING THE INSERT, EMPTYING, AND RE-INSERTING IT INTO THE CATCH BASIN.

APPROVED		CITY OF BELLINGHAM	DRAWING
City Engineer	Date	CATCH BASIN INSERT	EC-620

CATCH BASIN INSERT (3 / C-02)
SCALE: NTS

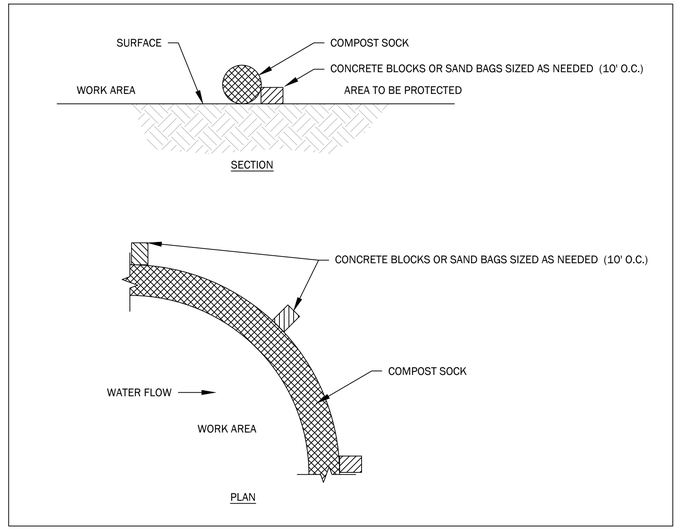


NOTES:

1. TIRES, SANDBAGS, OR EQUIVALENT MAY BE USED TO WEIGH DOWN PLASTIC SHEETING.
2. SEAMS BETWEEN SHEETS MUST OVERLAP A MINIMUM OF 12" AND BE WEIGHTED OR TAPED.
3. PLASTIC SHEETING SHALL HAVE A MINIMUM THICKNESS OF 6 MIL.
4. DUE TO RAPID RUNOFF CAUSED BY PLASTIC SHEETING, THIS METHOD SHALL NOT BE USED UPSLOPE OF AREAS THAT MIGHT BE ADVERSELY IMPACTED BY CONCENTRATED RUNOFF.
5. CONSTRUCT BERM OR SWALE AT TOP OF SLOPE AS DIRECTED BY THE CLEARING AND GRADING INSPECTOR.
6. CONSTRUCT DITCH AT BASE OF SLOPE AS REQUIRED BY CITY, AND DISCHARGE TO APPROVED LOCATION.

APPROVED		CITY OF BELLINGHAM	DRAWING
City Engineer	Date	PLASTIC COVERING FOR SLOPES AND STOCKPILES	EC-650

PLASTIC COVERING FOR STOCK PILE (4 / C-02)
SCALE: NTS



COMPOST SOCK DETAIL (5 / C-02)
SCALE: NTS

ERIK BRIAN PRUNEDA
STATE OF WASHINGTON
48220
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM
Washington State

REVISED BY: -
DRAWN BY: CMV
DESIGNED BY: EBP/JRG

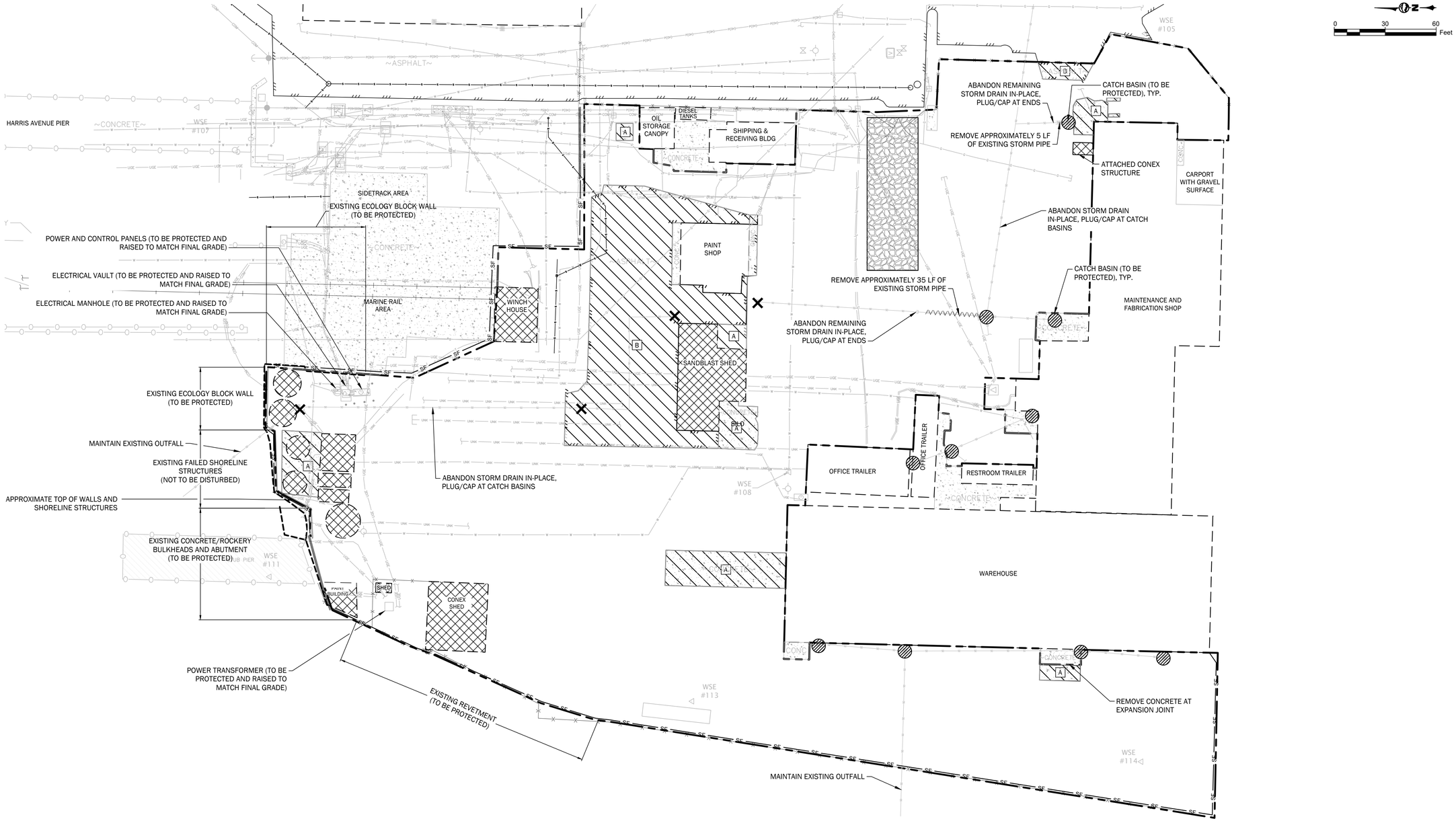
Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE:

TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:
C-02
SHEET **5** *OF* **37**



PAVEMENT DEMOLITION SCHEDULE		
NO.	DESCRIPTION	FOOTPRINT (SQUARE FEET)
A	MISCELLANEOUS CONCRETE PADS	3788
B	MISC. ASPHALT PAVEMENT AREAS	10083

NOTES:

1. REFER TO SHEETS G-02 AND G-03 FOR GENERAL NOTES AND LEGEND, RESPECTIVELY.
2. ALL STRUCTURES AND PAVEMENTS NOT INDICATED AS TO BE DEMOLISHED OR ABANDONED SHALL BE PROTECTED UNLESS OTHERWISE DIRECTED BY THE OWNER. DAMAGE TO PROTECTED STRUCTURES, PAVEMENTS, AND UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
3. REFER TO SHEETS C-04 AND C-06 FOR UTILITY DEMOLITION.

LEGEND

- PROJECT LIMITS
- SF — SF — SILT FENCE
- COMPOST SOCK
- PIPE TO BE REMOVED
- EXISTING PAVEMENT TO BE DEMOLISHED
- EXISTING STRUCTURE TO BE DEMOLISHED (SEE SHEETS D-01 TO D-10)
- EXISTING CATCH BASIN TO BE DEMOLISHED
- PROTECT EXISTING CATCH BASIN
- APPROXIMATE TOP OF WALLS AND SHORELINE STRUCTURES

ERIK BRIAN PRUNEDA
STATE OF WASHINGTON
48220
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-			

PORT OF BELLINGHAM
Washington State

DESIGNED BY: EBP/JRG
DRAWN BY: CMV
REVISED BY: -

Aspect CONSULTING

PROJECT NUMBER: 210195A
REVISION: -
DATE:

PAVEMENT AND STORMWATER DEMOLITION PLAN

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

C-03

SHEET **6** *OF* **37**

CAD Path: \\AM-BEAS1-Drafting\Port of Bellingham\210195 Harris\Shipyard\2023-01 Revised Plans_Regrade 3-200_Design\210195 FileSet_SH_6-9.dwg Layout: C-03 | | Date Saved: 10/31/2024 3:25:35 PM | | User: caroline.vanslyke

HARRIS AVENUE PIER

~CONCRETE~

~ASPHALT~

OIL STORAGE CANOPY

DIESEL TANKS

SHIPPING & RECEIVING BLDG

CARPORT WITH GRAVEL SURFACE

SIDETRACK AREA

A-A C-05

RAILWAY WALKWAY

EXISTING ECOLOGY BLOCK WALL (TO BE PROTECTED)

POWER AND CONTROL PANELS (TO BE PROTECTED AND RAISED TO MATCH FINAL GRADE)

MARINE RAILWAY

ELECTRICAL VAULT (TO BE PROTECTED AND RAISED TO MATCH FINAL GRADE)

MARINE RAIL AREA

PAINT SHOP

CONTRACTOR IS RESPONSIBLE FOR CA1 EXCAVATION BELOW CONSTRUCTION ENTRANCE

MAINTENANCE AND FABRICATION SHOP

RAILWAY WALKWAY

ELECTRICAL MANHOLE (TO BE PROTECTED AND RAISED TO MATCH FINAL GRADE)

EXISTING ECOLOGY BLOCK WALL (TO BE PROTECTED)

SEE SHEETS C-06 AND C-07 FOR CA2 EXCAVATION DETAILS

EXISTING FAILED SHORELINE STRUCTURES (NOT TO BE DISTURBED)

SILO

OFFICE TRAILER

OFFICE TRAILER

RESTROOM TRAILER

2-FOOT x 2-FOOT CONCRETE FOUNDATIONS BURIED 6-INCHES BELOW EXISTING GRADE: DEMOLISH AND REMOVE DURING EXCAVATION

EXISTING WATER MAIN (TO BE PROTECTED)

HYDRANT AND TRANSFORMER (TO BE PROTECTED)

EXISTING CONCRETE/ROCKERY BULKHEADS AND ABUTMENT (TO BE PROTECTED)

STUB PIER

B-B' C-05

SHED

WAREHOUSE

POWER TRANSFORMER (TO BE PROTECTED AND RAISED TO MATCH FINAL GRADE)

EXISTING REVETMENT (TO BE PROTECTED)

OUTFALL (TO BE PROTECTED)

N

0 15 30 Feet

NOTES:

1. REFER TO SHEETS G-02 AND G-03 FOR GENERAL NOTES AND LEGEND, RESPECTIVELY.
2. CA 1 EXCAVATION INCLUDES ALL AREAS WITHIN THE PROJECT LIMITS EXCEPT THOSE INDICATED AS TO BE PROTECTED. CA 1 SUBGRADES EXTEND 2 FEET BELOW FINAL GRADES TO ALLOW INSTALLATION OF A 2-FOOT THICK CAP.
3. CONTRACTOR SHALL MAINTAIN HORIZONTAL EXCAVATION OFFSETS FROM THE TOP OF EXISTING WALLS AND SHORELINE STRUCTURES EQUAL TO 2 TIMES THE EXCAVATION DEPTH, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. EXCAVATIONS ADJACENT THE STUB PIER ABUTMENT SHALL BE IN ACCORDANCE WITH SHEET C-06 AND C-07.
4. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL LOCATION OF ALL UTILITIES. ADDITIONAL UNKNOWN UTILITIES MAY BE PRESENT AT THE SITE THAT ARE NOT SHOWN HEREIN. NOT ALL UTILITIES SHOWN HEREIN WILL BE ENCOUNTERED AT THE SITE DUE TO INACCURATE OR OUTDATED MAPPING DATA.
5. PROTECTION OF ACTIVE UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR. WATER, POWER, AND SEWER SERVICING THE OFFICE BUILDINGS, WAREHOUSE, AND MAINTENANCE AND FABRICATION SHOP SHALL REMAIN ACTIVE DURING EXCAVATION AND BACKFILL OR BE TEMPORARILY RELOCATED TO MINIMIZE DISRUPTION TO THE TENANT.
6. WATER, POWER, AND GAS SERVICING THE NORTHWEST AND NORTHEAST CORNERS OF THE SITE (TOWARDS THE STUB PIER AND HARRIS AVE PIER) SHALL BE SHUT OFF DURING CONSTRUCTION, THEN PROTECTED DURING EXCAVATION OR REMOVED AND REPLACED.
7. ALL ENCOUNTERED UTILITIES MUST BE REVIEWED BY THE OWNER AND ENGINEER AND APPROVED FOR DEMOLITION OR ABANDONMENT, IF APPROPRIATE.

AREAS:

CLEAN UP AREA 1 (123,365 SQFT)

CLEAN UP AREA 2 (3,190 SQFT)

LEGEND

- 13.0 — EXISTING GRADE ELEVATION
- x x — CONSTRUCTION FENCE
- SF SF — SILT FENCE
- 13.0 — CA 1 SUBGRADE CONTOURS (SEE NOTE 2)
- PROJECT LIMITS
- 13 — CA 1 EXCAVATION AREA (SEE NOTE 2)
- CA 2 EXCAVATION AREAS (SEE SHEET C-06)
- APPROXIMATE TOP OF WALLS AND SHORELINE STRUCTURES

HENRY NATHANIEL HASELTON
STATE OF WASHINGTON
21036425
REGISTERED
PROFESSIONAL ENGINEER

11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM
Washington State

REVISED BY: -
DRAWN BY: CMV
DESIGNED BY: EBP/JRG

Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE:

CLEANUP AREA 1 EXCAVATION PLAN

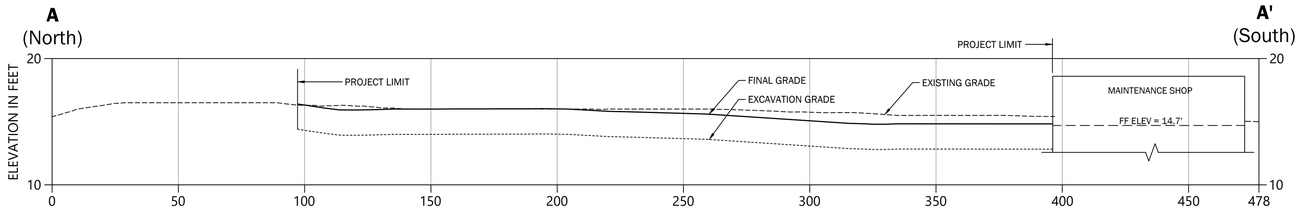
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

C-04

SHEET **7** *OF* **37**

CAD Path: \\ASP-SEA10\Drafting\Port of Bellingham\210195 Harris\Styles\2023-01 Revised Plans_Regrade 3-100_Design\210195 ReDet_BN_6-9.dwg | Layout: C-04 | | Date Saved: 10/31/2024 2:29:55 PM | | User: cemoreno-vanslyke

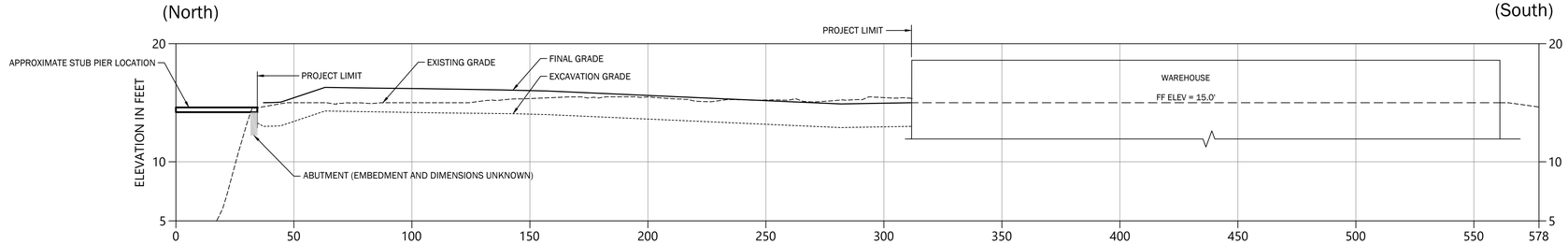


HORIZONTAL DISTANCE IN FEET
5X VERTICAL EXAGGERATION

CROSS SECTION A-A'

SCALE: NOTED

A / C-04

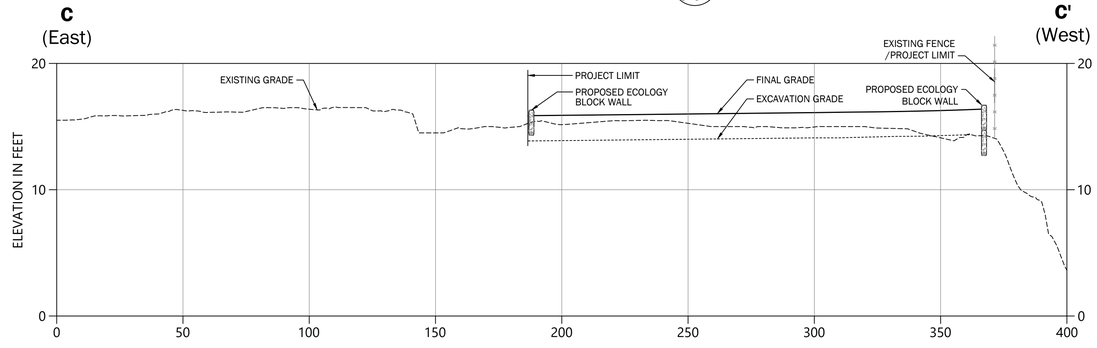


HORIZONTAL DISTANCE IN FEET
5X VERTICAL EXAGGERATION

CROSS SECTION B-B'

SCALE: NOTED

B / C-04

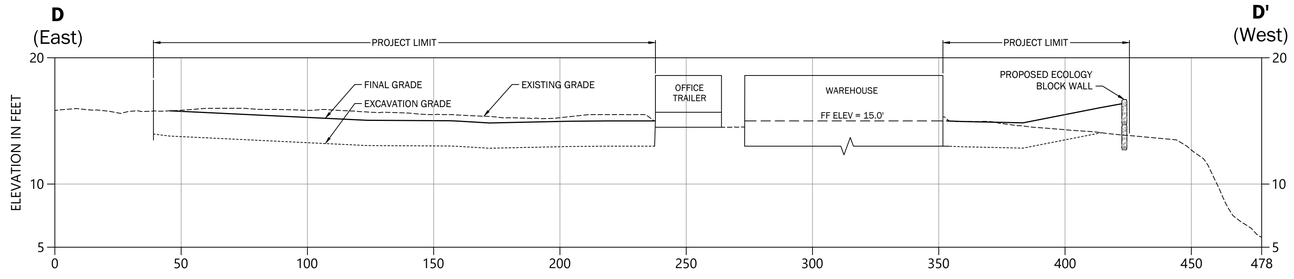


HORIZONTAL DISTANCE IN FEET
5X VERTICAL EXAGGERATION

CROSS SECTION C-C'

SCALE: NOTED

C / C-04



HORIZONTAL DISTANCE IN FEET
5X VERTICAL EXAGGERATION

CROSS SECTION D-D'

SCALE: NOTED

D / C-04

0 15 30 Feet

Horizontal Scale: 1" = 30'

0 6 12 Feet

Vertical Scale: 1" = 6'
Vertical Exaggeration5x

HENRY NATHANIEL HASELTON
STATE OF WASHINGTON
21836435
REGISTERED
PROFESSIONAL ENGINEER

11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM
Washington State

DESIGNED BY: EBP/JRG
DRAWN BY: CMV
REVISED BY: -

Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE:

CLEANUP AREA 1
CROSS SECTIONS

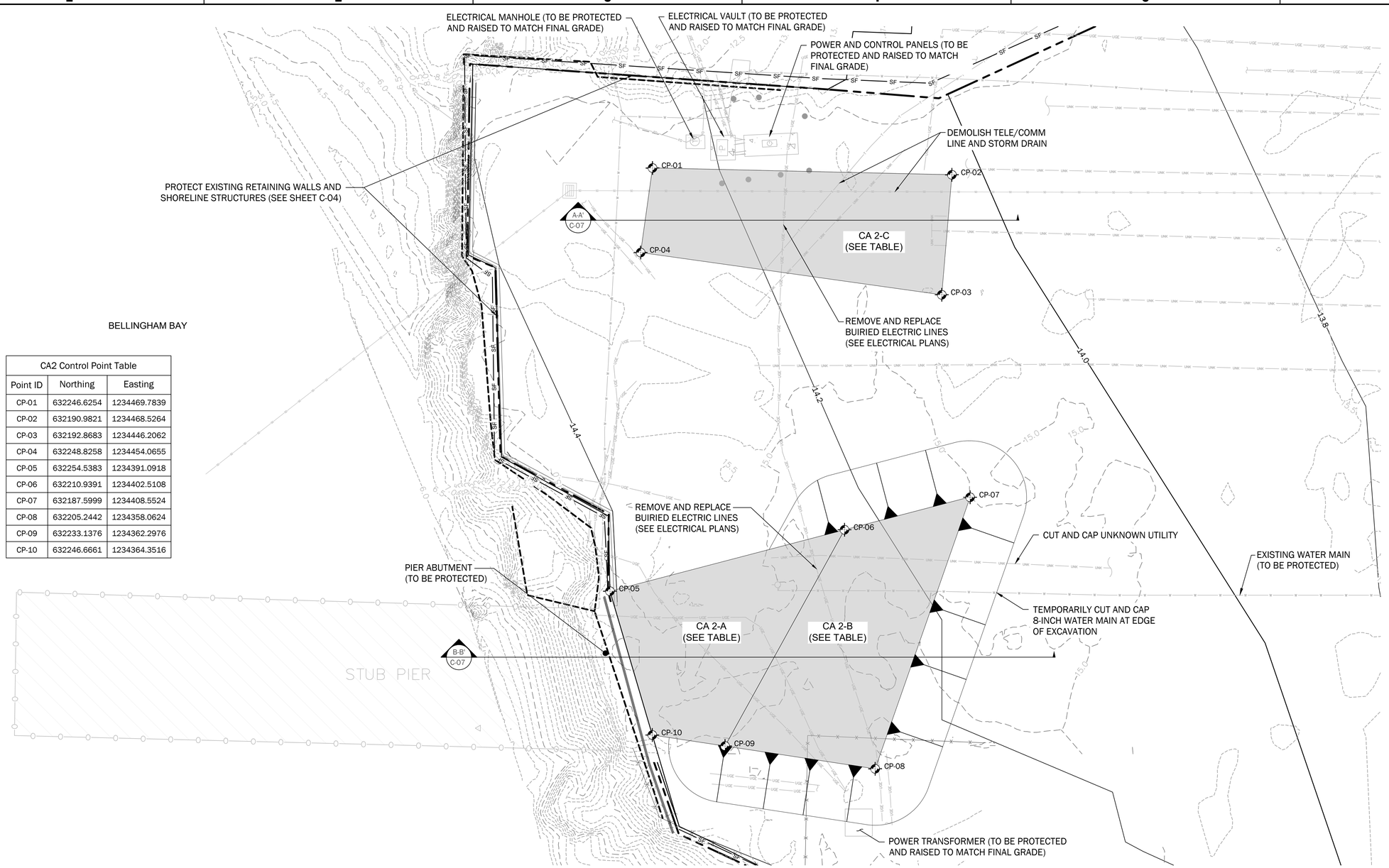
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

C-05

SHEET **8** *OF* **37**

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CA2 Control Point Table		
Point ID	Northing	Easting
CP-01	632246.6254	1234469.7839
CP-02	632190.9821	1234468.5264
CP-03	632192.8683	1234446.2062
CP-04	632248.8258	1234454.0655
CP-05	632254.5383	1234391.0918
CP-06	632210.9391	1234402.5108
CP-07	632187.5999	1234408.5524
CP-08	632205.2442	1234358.0624
CP-09	632233.1376	1234362.2976
CP-10	632246.6661	1234364.3516

CLEAN-UP AREA 2 (CA 2) EXCAVATION SCHEDULE			
EXCAVATION I.D.	EXCAVATION DEPTH[1] (FT)	SUBGRADE EL. (FT NAVD88)	AREA[2] (SF)
CA 2-A	3.5	11.5	973
CA 2-B	9.0	6.0	1145
CA 2-C	5.5	9.5	1071

1. BELOW EXISTING GRADES

2. AREA EXCLUDES SIDE SLOPES.

NOTES:

1. REFER TO SHEETS G-02 AND G-03 FOR GENERAL NOTES AND LEGEND, RESPECTIVELY.
2. THE ENGINEER WILL COLLECT EXCAVATION PERFORMANCE MONITORING SAMPLES IN PRE-DEFINED EXCAVATION GRID CELLS, INITIATED WHEN THE DEFINED CA 2 EXCAVATION EXTENTS ARE REACHED.
3. CONTRACTOR SHALL ALLOW UP TO 3 BUSINESS DAYS FOLLOWING COLLECTION OF PERFORMANCE MONITORING SAMPLES FOR THE ENGINEER TO RECEIVE LABORATORY RESULTS AND THEN PROVIDE A DECISION REGARDING WHETHER OVER-EXCAVATION IS REQUIRED FOR EACH LOCATION SAMPLED. WORK MAY PROCEED IN OTHER AREAS OF THE SITE DURING THIS TIME AS DIRECTED BY THE ENGINEER.
4. THE FINAL EXCAVATION EXTENTS MAY BE WIDER OR DEEPER THAN EXTENTS SHOWN AS DETERMINED BY THE ENGINEER. THE CONTRACTOR WILL PROVIDE THE ENGINEER SAFE ACCESS AND TIME ACCOMMODATION TO RETRIEVE THE PERFORMANCE MONITORING SAMPLES.
5. EXCAVATIONS DEEPER THAN 4 FEET IN HEIGHT SHALL BE SLOPED OR SHORED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. THE CONTRACTOR SHALL SUBMIT PROPOSED EXCAVATION PLAN FOR ENGINEER REVIEW AND APPROVAL PRIOR TO ANY EXCAVATION WORK.

LEGEND

- CONSTRUCTION FENCE
- CA 1 SUBGRADE CONTOURS
- CA 1 EXCAVATION AREA (SEE SHEET C-04)
- CA 2 EXCAVATION AREAS
- CA 2 CONTROL POINT
- PROJECT LIMITS
- CUT SLOPE INDICATOR
- APPROXIMATE TOP OF WALLS AND SHORELINE STRUCTURES

HENRY NATHANIEL HASELTON
STATE OF WASHINGTON
21805435
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM
Washington State

DESIGNED BY: EBP/JRG
DRAWN BY: CMV
REVISED BY: -

Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE: -

CLEANUP AREA 2 EXCAVATION PLAN

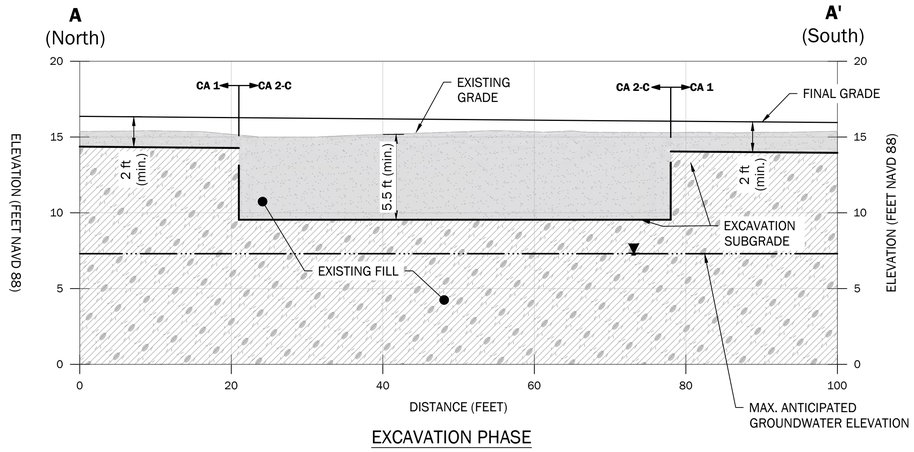
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

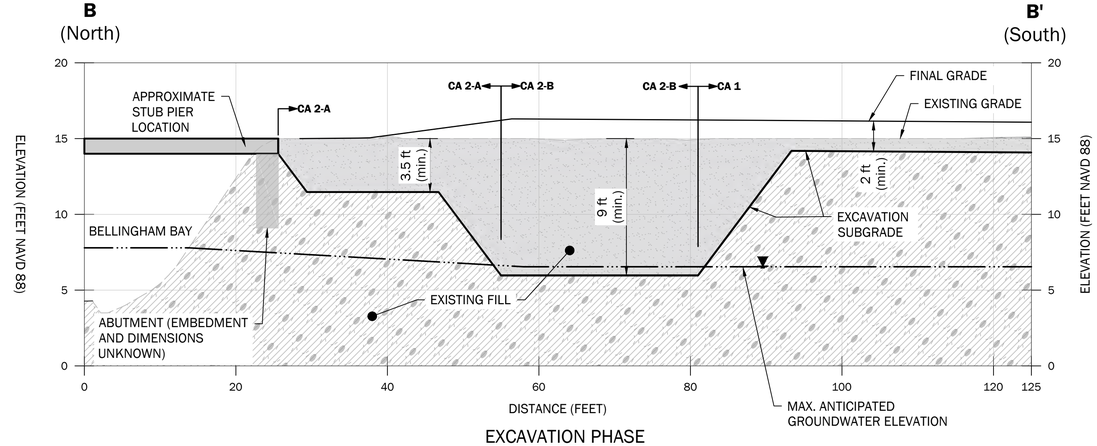
C-06

SHEET **9** *OF* **37**

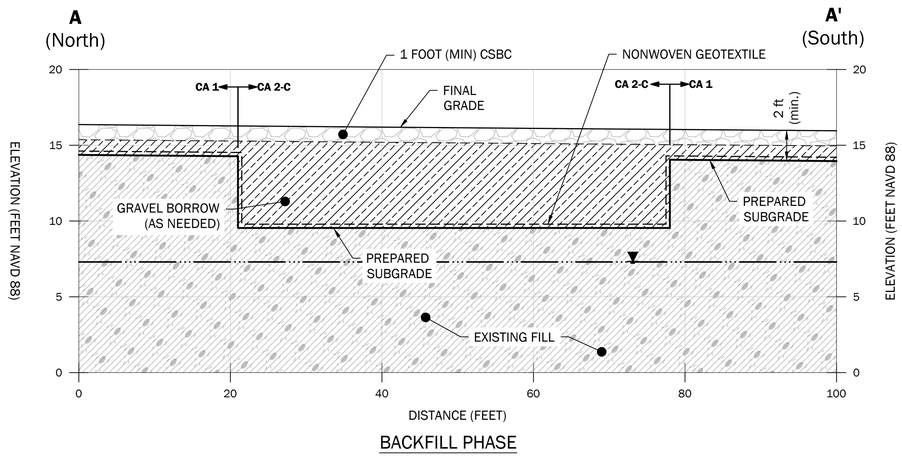
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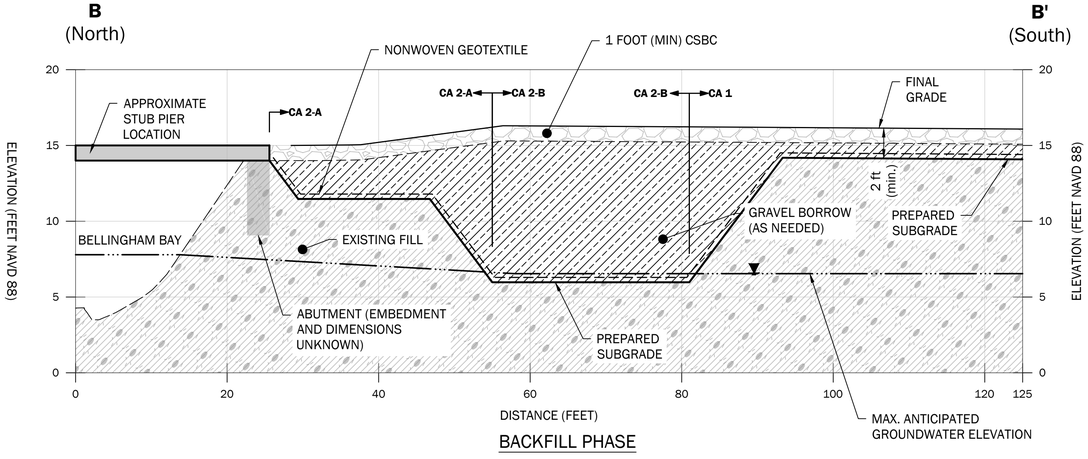
EXCAVATION PHASE



EXCAVATION PHASE



BACKFILL PHASE



BACKFILL PHASE

CA 2-C CROSS SECTION A-A'

SCALE: NOTED

1 / C-07

CA 2-A AND CA 2-B CROSS SECTION B-B'

SCALE: NOTED

2 / C-07

0 10 20 Feet — Horizontal Scale: 1" = 10'

0 5 10 Feet — Vertical Scale: 1" = 5'
Vertical Exaggeration 2x

NOTES:

1. CONTRACTOR SHALL BEGIN BACKFILLING AFTER ENGINEER APPROVAL OF SUBGRADES IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
2. THE BACKFILL MATERIAL WILL BE PLACED ON A RELATIVELY FIRM AND UNYIELDING SUBGRADE, FREE FROM SOFT OR DISTURBED MATERIAL, STANDING WATER OR ORGANIC MATERIAL. THE EXPOSED SUBGRADE SOILS WILL BE COMPACTED (IN PLACE) TO A DENSE CONDITION PRIOR TO BACKFILL PLACEMENT. THE SUBGRADE PREPARATION WILL BE OBSERVED AND ACCEPTED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF STRUCTURAL BACKFILLS.
3. NONWOVEN SEPARATION GEOTEXTILE SHALL MEET THE REQUIREMENTS OF WSDOT STANDARD SPECIFICATION SECTION 9-33.2(1), TABLE 3, FOR MODERATE SURVIVABILITY.
4. CRUSHED SURFACING BASE COURSE (CSBC) SHALL MEET THE REQUIREMENTS OF WSDOT STANDARD SPECIFICATION SECTION 9-03.9(3).
5. GRAVEL BORROW SHALL MEET THE REQUIREMENTS OF WSDOT STANDARD SPECIFICATION 9-03.14(1).
6. THE SUBSURFACE CONDITIONS PRESENTED IN THIS GEOLOGIC CROSS SECTION ARE CONCEPTUAL. VARIATIONS MAY EXIST BETWEEN THE SOIL AND GROUNDWATER CONDITIONS DEPICTED ON THIS FIGURE AND THOSE ACTUALLY UNDERLYING THE SITE. REFER TO AVAILABLE BORING LOGS FOR FURTHER CONTEXT.
7. CONTRACTOR SHALL DESIGN AND PROVIDE A DEWATERING SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS. GROUNDWATER AND DEWATERING RATES ARE TIDALLY INFLUENCED AND WILL VARY BY THE RISE AND FALL OF THE TIDE. CONSTRUCTION TIMING SHALL CONSIDER TIDAL INFLUENCE ON ABILITY TO PERFORM WORK

HENRY NATHANIEL HASELTON
STATE OF WASHINGTON
21836435
REGISTERED
PROFESSIONAL ENGINEER

11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM
Washington State

Aspect CONSULTING

REVISED BY:	-
DRAWN BY:	CMV
DESIGNED BY:	EBP/JRG
PROJECT NUMBER:	210195-A
REVISION:	-
DATE:	

CLEANUP AREA 2 CROSS SECTIONS

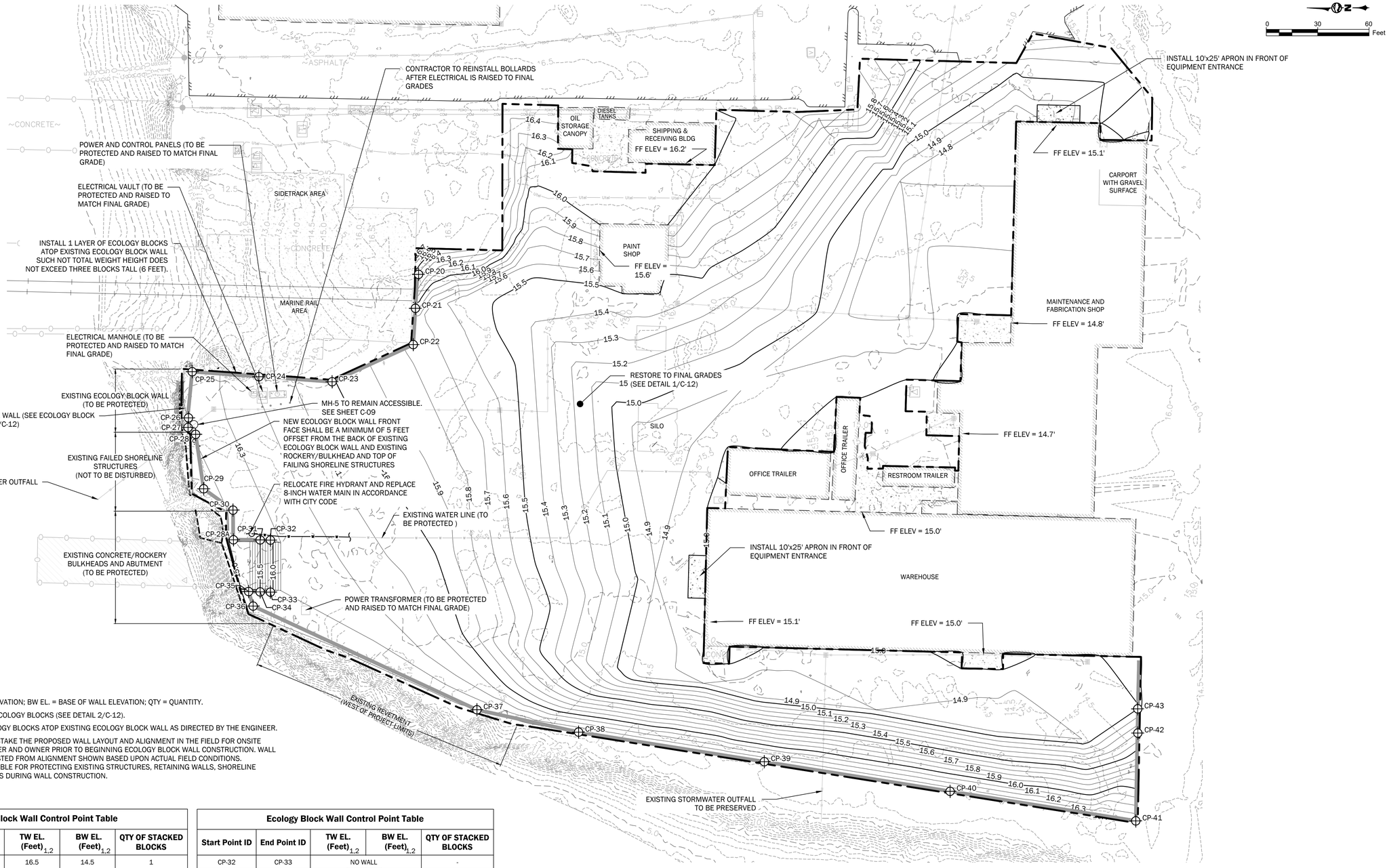
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

C-07

SHEET **10** *OF* **37**

CAD Path: \\ASP-GEA01\Drafting\Port of Bellingham\210195 Harris\Report\2023-01 Revised Plans_Reg\exb 3-100_Design\210195 Plan Set_30-Proj Layout C-07 || Date Saved: 9-13-2024 1:12:42:34 PM || User: caroline.vanslyke



ECOLOGY BLOCK WALL NOTES:

1. TW EL. = TOP OF WALL ELEVATION; BW EL. = BASE OF WALL ELEVATION; QTY = QUANTITY.
2. ASSUMING 2-FOOT HIGH ECOLOGY BLOCKS (SEE DETAIL 2/C-12).
3. INSTALL 1 LAYER OF ECOLOGY BLOCKS ATOP EXISTING ECOLOGY BLOCK WALL AS DIRECTED BY THE ENGINEER.
4. THE CONTRACTOR SHALL STAKE THE PROPOSED WALL LAYOUT AND ALIGNMENT IN THE FIELD FOR ONSITE REVIEW WITH THE ENGINEER AND OWNER PRIOR TO BEGINNING ECOLOGY BLOCK WALL CONSTRUCTION. WALL ALIGNMENT MAY BE ADJUSTED FROM ALIGNMENT SHOWN BASED UPON ACTUAL FIELD CONDITIONS. CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXISTING STRUCTURES, RETAINING WALLS, SHORELINE STRUCTURES AND UTILITIES DURING WALL CONSTRUCTION.

Ecology Block Wall Control Point Table

Start Point ID	End Point ID	TW EL. (Feet)$_{1,2}$	BW EL. (Feet)$_{1,2}$	QTY OF STACKED BLOCKS
CP-20	CP-21	16.5	14.5	1
CP-21	CP-22	16.0	14.0	1
CP-22	CP-23	16.0	14.0	1
CP-23	CP-24	16.5	12.5	2
CP-24	CP-25	SEE NOTE 3		1
CP-25	CP-26	16.5	12.5	2
CP-26	CP-27	16.5	12.5	2
CP-27	CP-28	16.5	12.5	2
CP-28	CP-29	16.5	12.5	2
CP-29	CP-30	16.5	12.5	2
CP-30	CP-31	16.5	12.5	2
CP-31	CP-32	16.5	14.5	2

Ecology Block Wall Control Point Table

Start Point ID	End Point ID	TW EL. (Feet)$_{1,2}$	BW EL. (Feet)$_{1,2}$	QTY OF STACKED BLOCKS
CP-32	CP-33	NO WALL		-
CP-33	CP-34	16.5	14.5	2
CP-34	CP-35	16.5	12.5	2
CP-35	CP-36	16.5	12.5	2
CP-36	CP-37	16.5	12.5	2
CP-37	CP-38	16.5	12.5	2
CP-38	CP-39	16.5	12.5	2
CP-39	CP-40	16.5	12.5	2
CP-40	CP-41	16.5	12.5	2
CP-41	CP-42	16.5	12.5	2
CP-42	CP-43	15.5	13.5	2
CP-43	CP-44	15.5	13.5	2

GENERAL NOTES:

1. REFER TO SHEETS G-02 AND G-03 FOR GENERAL NOTES AND LEGEND, RESPECTIVELY.

LEGEND

- PROJECT LIMITS
- 15.0 / 14.9 — PROPOSED GRADING CONTOURS (0.1' INTERVALS)
- PROPOSED CONCRETE PAD
- PROPOSED ECOLOGY BLOCK WALL
- CP-20 — ECOLOGY BLOCK WALL CONTROL POINT

HENRY NATHANIEL HASELTON — STATE OF WASHINGTON — 21036425 — REGISTERED PROFESSIONAL ENGINEER

11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM Washington State

DESIGNED BY: EBP/JRG
DRAWN BY: CMV
REVISED BY: -

Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE:

GRADING AND RESTORATION PLAN

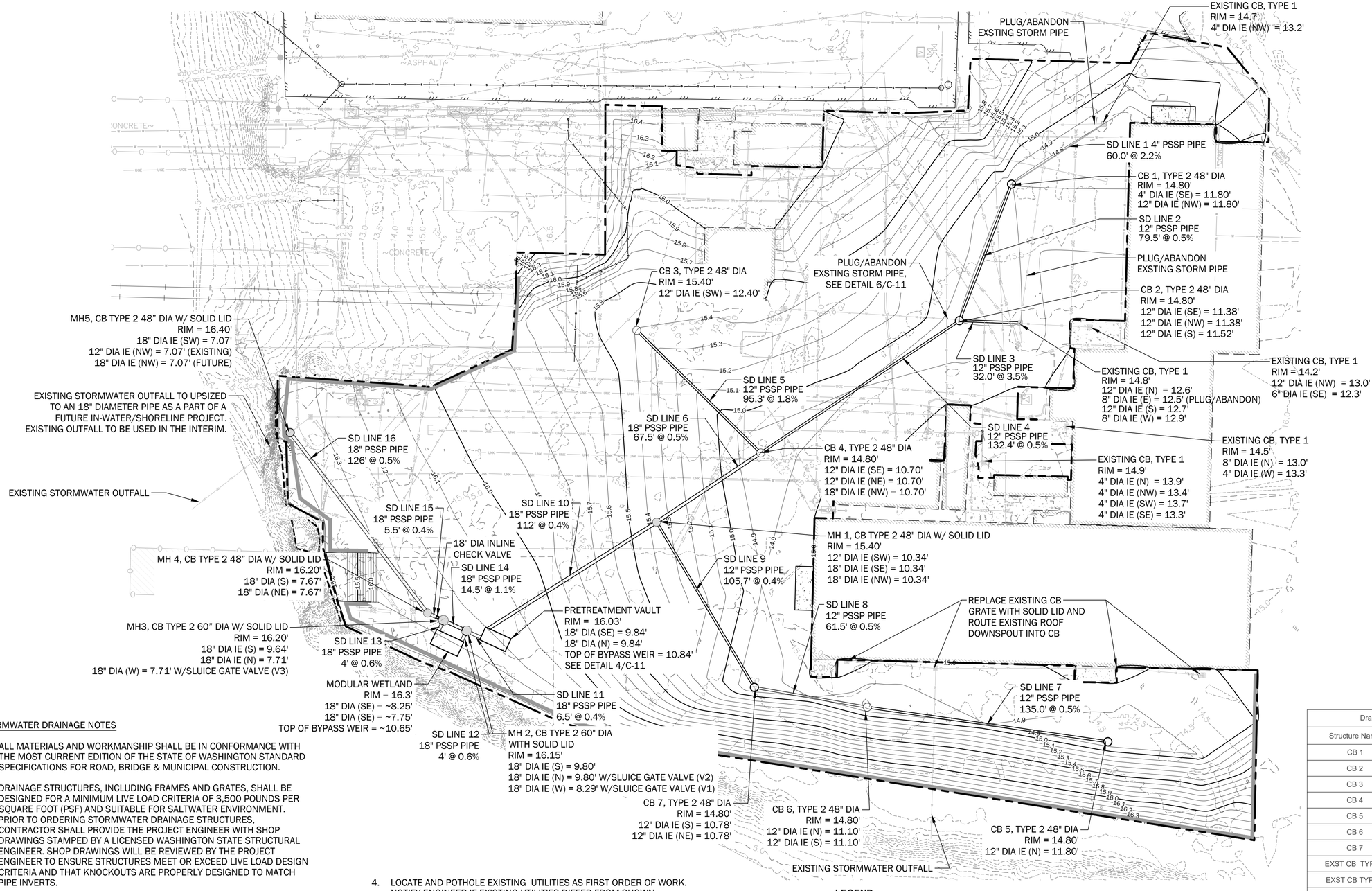
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

C-08

SHEET **11** *OF* **37**

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STORMWATER DRAINAGE NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN CONFORMANCE WITH THE MOST CURRENT EDITION OF THE STATE OF WASHINGTON STANDARD SPECIFICATIONS FOR ROAD, BRIDGE & MUNICIPAL CONSTRUCTION.
2. DRAINAGE STRUCTURES, INCLUDING FRAMES AND GRATES, SHALL BE DESIGNED FOR A MINIMUM LIVE LOAD CRITERIA OF 3,500 POUNDS PER SQUARE FOOT (PSF) AND SUITABLE FOR SALTWATER ENVIRONMENT. PRIOR TO ORDERING STORMWATER DRAINAGE STRUCTURES, CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER WITH SHOP DRAWINGS STAMPED BY A LICENSED WASHINGTON STATE STRUCTURAL ENGINEER. SHOP DRAWINGS WILL BE REVIEWED BY THE PROJECT ENGINEER TO ENSURE STRUCTURES MEET OR EXCEED LIVE LOAD DESIGN CRITERIA AND THAT KNOCKOUTS ARE PROPERLY DESIGNED TO MATCH PIPE INVERTS.
3. THE TYPES, LOCATIONS, SIZES AND/OR DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE IMPROVEMENT PLANS WERE OBTAINED FROM SOURCES OF VARYING RELIABILITY AND ARE FROM THE BEST AVAILABLE RECORDS. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE TYPES, EXTENT, SIZES, LOCATIONS, AND DEPTHS OF SUCH UNDERGROUND UTILITIES. A REASONABLE EFFORT HAS BEEN MADE TO LOCATE AND DELINEATE ALL KNOWN UTILITIES. HOWEVER, THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS OR ACCURACY OF THE DELINEATION OF SUCH UNDERGROUND UTILITIES NOR FOR THE EXISTENCE OF OTHER BURIED OBJECTS OR UTILITIES WHICH MAY BE ENCOUNTERED BUT WHICH ARE NOT SHOWN ON THESE DRAWINGS.
4. LOCATE AND POTHOLE EXISTING UTILITIES AS FIRST ORDER OF WORK. NOTIFY ENGINEER IF EXISTING UTILITIES DIFFER FROM SHOWN.
5. CONTRACTOR TO LAYOUT ALL UTILITIES AND ASSOCIATED STRUCTURES PRIOR TO COMMENCING EXCAVATION AND NOTIFY ENGINEER OF ANY CONFLICTS.
6. CONTRACTOR SHALL DESIGN AND PROVIDE A DEWATERING SYSTEM IN ACCORDANCE WITH THE SPECIFICATIONS. GROUNDWATER AND DEWATERING RATES ARE TIDALLY INFLUENCED AND WILL VARY BY THE RISE AND FALL OF THE TIDE. CONSTRUCTION TIMING SHALL CONSIDER TIDAL INFLUENCE ON ABILITY TO PERFORM WORK.
7. REFER TO SHEETS G-02 FOR ADDITIONAL NOTES AND LEGEND.

LEGEND

- PROJECT LIMITS
- PROPOSED STORM CATCH BASIN
- PROPOSED MANHOLE
- PROPOSED STORM DRAIN PIPE (PSSP)
- PROPOSED ECOLOGY BLOCK WALL
- EXISTING STORM DRAIN STRUCTURE
- EXISTING STORM DRAIN PIPE
- PSSP — POLYETHYLENE STORM SEWER PIPE

Drainage Structure Table		
Structure Name	Northing	Easting
CB 1	631861.12	1234598.61
CB 2	631890.94	1234520.63
CB 3	632075.38	1234515.05
CB 4	632004.53	1234445.05
CB 5	631806.10	1234280.01
CB 6	631943.68	1234299.75
CB 7	632008.15	1234311.05
EXST CB TYPE 1	631856.10	1234519.33
EXST CB TYPE 1	631808.26	1234633.07
MH 1	632064.01	1234405.47
MH 2	632172.73	1234343.29
MH 3	632185.90	1234349.36
MH 4	632194.98	1234353.55
MH 5	632273.57	1234456.63
MODULAR WETLAND	632183.85	1234336.49
PRETREATMENT VAULT	632156.20	1234338.54

*NORTHING AND EASTING DENOTE CENTER OF STRUCTURE

ERIK BRIAN PRUNEDA — STATE OF WASHINGTON — 48220 — REGISTERED PROFESSIONAL ENGINEER
11/5/2024

APPR.	DATE	DESCRIPTION	REV.

PORT OF BELLINGHAM Washington State

REVISED BY: -
DRAWN BY: CMV
DESIGNED BY: EBP/JRG

Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE:

STORMWATER DRAINAGE PLAN

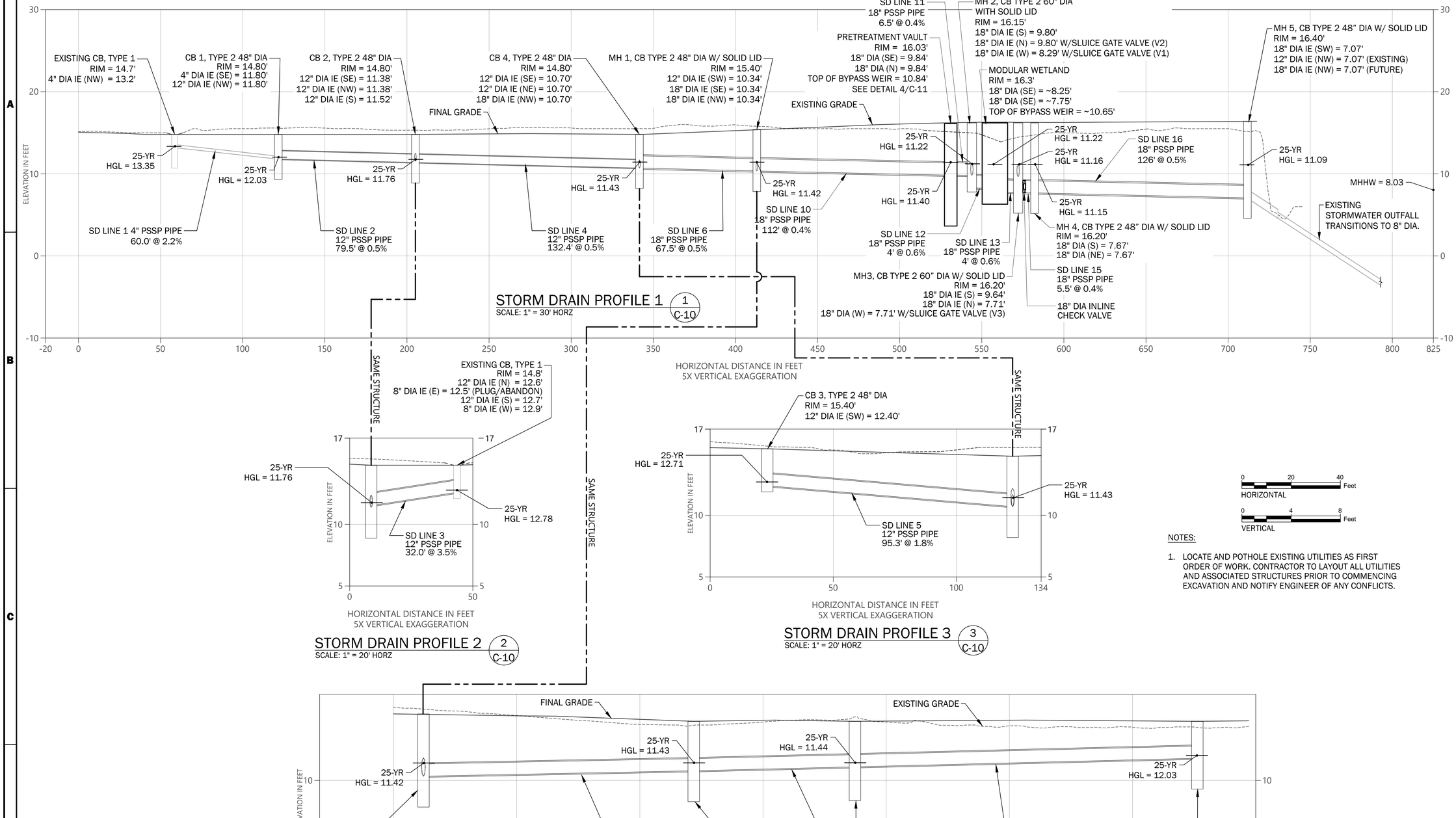
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

C-09

SHEET **12** *OF* **37**

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STORM DRAIN PROFILE 1

SCALE: 1" = 30' HORZ

1 / C-10

STORM DRAIN PROFILE 2

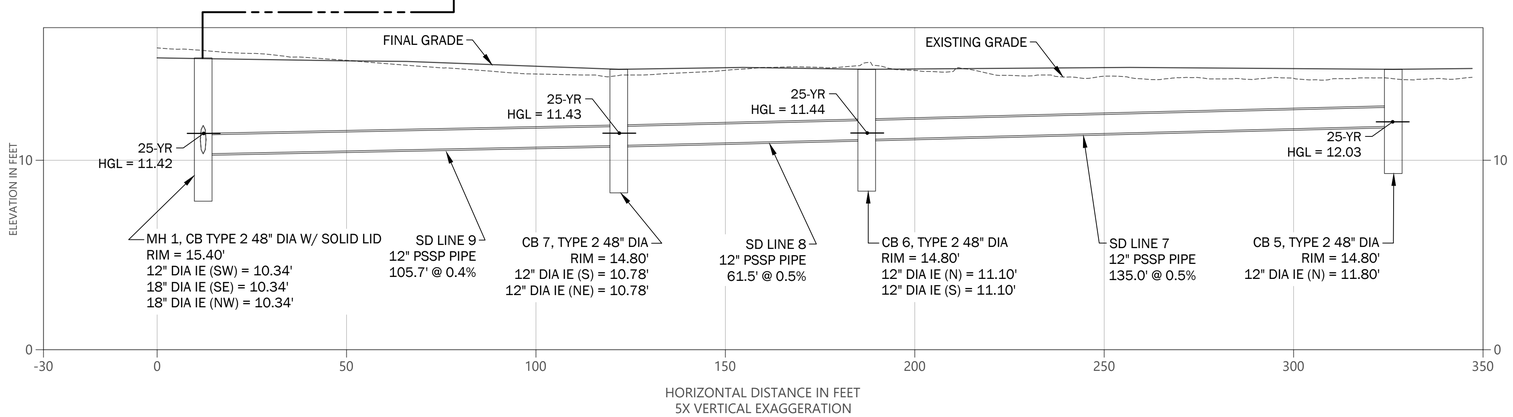
SCALE: 1" = 20' HORZ

2 / C-10

STORM DRAIN PROFILE 3

SCALE: 1" = 20' HORZ

3 / C-10



STORM DRAIN PROFILE 4

SCALE: 1" = 20' HORZ

4 / C-10

0 20 40 Feet
HORIZONTAL

0 4 8 Feet
VERTICAL

NOTES:

1. LOCATE AND POTHOLE EXISTING UTILITIES AS FIRST ORDER OF WORK. CONTRACTOR TO LAYOUT ALL UTILITIES AND ASSOCIATED STRUCTURES PRIOR TO COMMENCING EXCAVATION AND NOTIFY ENGINEER OF ANY CONFLICTS.

ERIK BRIAN PRUNEDA
STATE OF WASHINGTON
48220
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM
Washington State

DRAWN BY: CMV
DESIGNED BY: EBP/JRG
REVISED BY: -

Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE: -

STORMWATER PROFILES

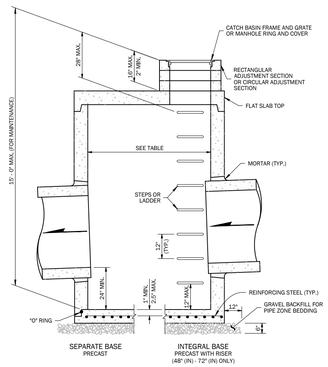
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

C-10

SHEET **13** *OF* **37**

CAD Path: \\ASP-BEA01\Drafting\Port of Bellingham\210195 Harris\Shop\2023-01 Revised Plans_Regrade 3\100_Design\210195 FinalDes_Sht_C3-15.dwg Layout: C-10 || Date Saved: 11/1/2024 12:56:53 PM || User: caroline.vanskike



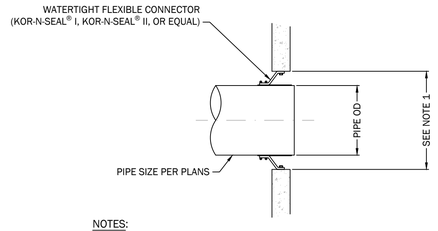
CATCH BASIN DIMENSIONS				
CATCH BASIN DIAMETER	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS
48"	4"	6"	36"	8"
54"	4.5"	8"	42"	8"
60"	5"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	96"	12"
144"	12"	12"	108"	12"

PIPE ALLOWANCES					
CATCH BASIN DIAMETER	PIPE MATERIAL WITH MAXIMUM INSIDE DIAMETER				
	CONCRETE	ALL METAL	CPSSP ① PP ④	SOLID WALL PVC ②	PROFILE WALL PVC ③
48"	24"	30"	24"	30"	30"
54"	30"	36"	30"	36"	36"
60"	36"	42"	36"	42"	42"
72"	42"	54"	42"	48"	48"
84"	54"	60"	54"	48"	48"
96"	60"	72"	60"	48"	48"
120"	66"	84"	60"	48"	48"
144"	78"	96"	60"	48"	48"

NOTES
1. No steps are required when height is 4' or less
2. The bottom of the precast catch basin may be sloped to facilitate cleaning.
3. The frame and grate shall be integrally cast into the adjustment section with flange up.
4. Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with Standard Specification Section 9-04.3.

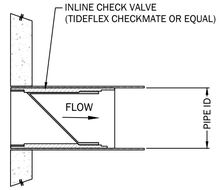
① Corrugated Polyethylene Storm Sewer Pipe (See **Standard Specification Section 9-05.20**)
② (See **Standard Specification Section 9-05.12(1)**
③ (See **Standard Specification Section 9-05.12(2)**
④ Polypropylene Pipe (See **Standard Specification Section 9-05.24**)

WSDOT CATCH BASIN, TYPE 2 DETAIL 1 C-11
SCALE: NTS



NOTES:
1. CONTRACTOR SHALL VERIFY MANHOLE CORE DIMENSION WITH MANUFACTURER.

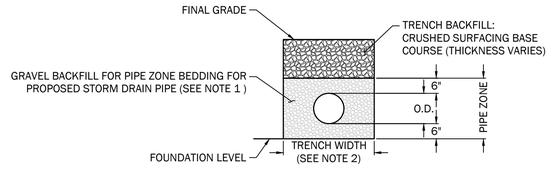
PIPE TO CONCRETE STRUCTURE CONNECTION DETAIL 2 C-11
SCALE: NTS



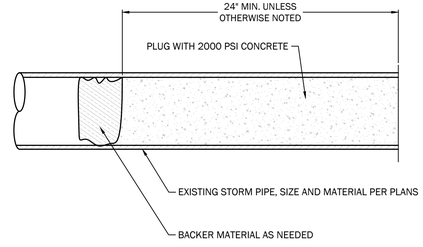
NOTES:
1. VALVE MUST BE FULLY INSIDE PIPE BEFORE INSTALLATION.
2. REPORT EXACT PIPE ID TO MANUFACTURER BEFORE THE VALVE IS ORDERED.

INLINE CHECK VALVE DETAIL 3 C-11
SCALE: NTS

NOTES
1. SEE STANDARD SPECIFICATIONS SECTION 9-03.12(3) FOR GRAVEL BACKFILL FOR PIPE ZONE BEDDING.
2. SEE STANDARD SPECIFICATIONS SECTION 2-09.4 FOR MEASUREMENT OF TRENCH WIDTH.
3. ALL BEDDING AND BACKFILL SHALL BE COMPACTED PER STANDARD SPECIFICATION SECTION 7-08.

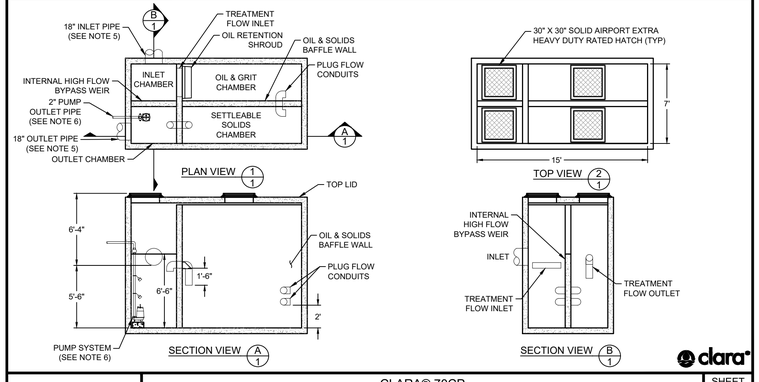


PIPE ZONE AND BEDDING BACKFILL DETAIL 5 C-11
SCALE: NTS



PIPE PLUG/CAP DETAIL 6 C-11
SCALE: NTS

GENERAL NOTES
1. CLARA® BY STORMWATERX - PORTLAND, OREGON - 800-680-3543
2. CLARA70CP SHALL HAVE TREATMENT FLOW CAPACITY OF 200 GPM, A SEDIMENT STORAGE CAPACITY OF 5 CY AND AN OIL/FLOATBLE STORAGE CAPACITY OF 510 US GAL.
3. INTERNAL STRUCTURE DIMENSIONS ARE REFERENCE DIMENSIONS, FINAL EXTERIOR DIMENSIONS WILL DEPEND ON STRUCTURAL REQUIREMENTS AND SHOWN ON SHOP DRAWING. OPTIONAL LEFT OR RIGHT INLET (LEFT SHOWN.)
4. PRECAST VAULT TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C857 AND C858. STRUCTURE AND ACCESS COVERS TO MEET AASHTO AIRPORT EXTRA HEAVY DUTY LOAD RATING.
5. INLET AND OUTLET PIPING PER EXISTING PIPE OR TO BE SPECIFIED BY STORMWATERX AND PROVIDED BY OWNER\CONTRACTOR. OWNER/CONTRACTOR IS RESPONSIBLE FOR CORING OPENINGS
6. FUTURE PUMP ESTIMATED 2HP (460V/3PH/6A). PUMP SYSTEM INCLUDES PUMP, TWO FLOAT SWITCHES, CHECK VALVE AND FLOW CONTROL VALVE.



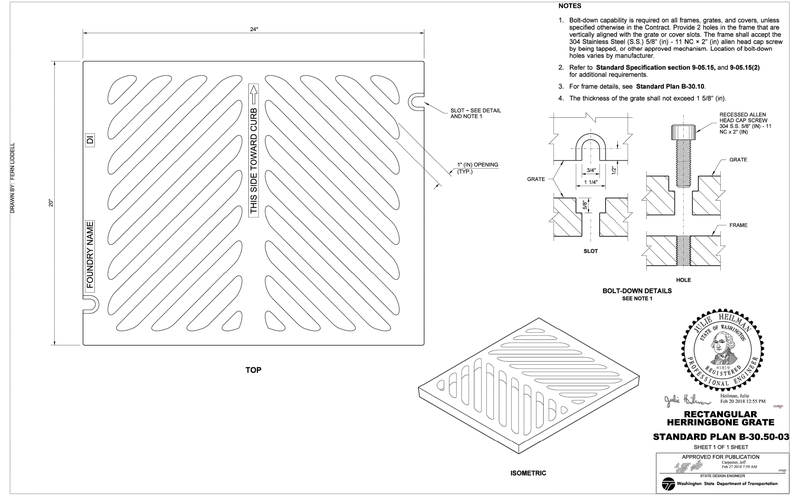
stormwaterRx a newterra company
800.680.3543 | stormwaterx.com

CLARA® 70CP
BASIC SEPARATOR
HARRIS AVE DETAIL R3

SHEET 1 OF 1

DATE:	SCALE:	FILE NAME:	DRAWN:	CHECKED:
11/5/2024	NONE	210195 PLANSET_SHT_12-15	SW	TL

PRETREATMENT VAULT DETAIL 4 C-11
SCALE: NTS



HERRINGBONE GRATE DETAIL 7 C-11
SCALE: NTS

ERIK BRIAN PRUNEDA
STATE OF WASHINGTON
48220
REGISTERED PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM Washington State

REVISED BY: -
DRAWN BY: CMV
DESIGNED BY: EBP/JRG
PROJECT NUMBER: 210195-A
REVISION: -
DATE: -

Aspect CONSULTING

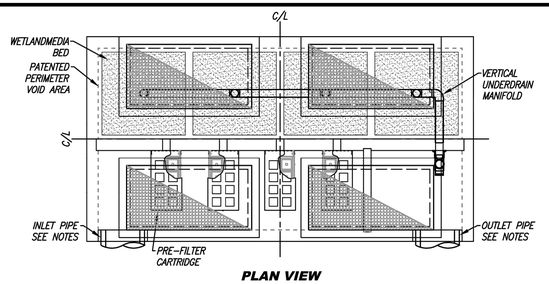
STORMWATER DETAILS

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

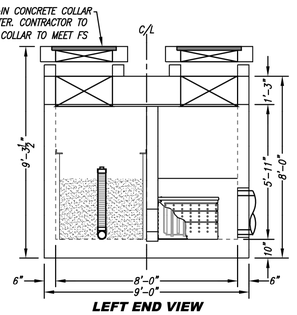
SHEET REFERENCE NUMBER:
C-11
SHEET **14** *OF* **37**

CAD Path: \\ASP-SEA01\Drafting\Port of Bellingham\210195 Harris\Report\2023-01 Revised Plans_Regrade 3\100_Design\210195 PlanSet_Shr_12-15.dwg Layout: C-11 || Date Saved: 11/1/2024 12:56:00 PM || User: caroline.urquhart

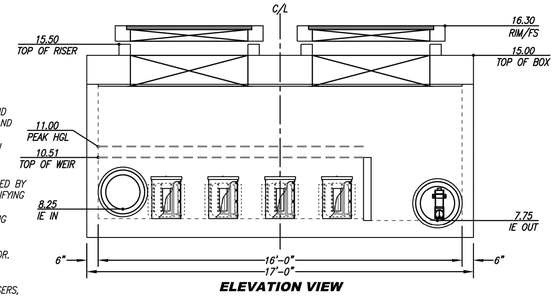
SITE SPECIFIC DATA			
PROJECT NUMBER		----	
PROJECT NAME		PORT OF BELLINGHAM HARRIS AVE. SHIPYARD	
PROJECT LOCATION		BELLINGHAM, WA	
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
N/A		0.35	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			4.1
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE	8.25	HDPE	18"
OUTLET PIPE	7.75	HDPE	18"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	16.30	16.30	16.30
SURFACE LOAD	AIRCRAFT LOADING, SEE NOTES BELOW.		
FRAME & COVER	2EA 30" X 62"	2EA 30" X 62"	N/A
WETLANDMEDIA VOLUME (CY)			4.07
ORIFICE SIZE (DIA. INCHES)			ø2.88"
NOTES: 75,000 LBS WITH 250 PSI TIRE PRESSURE, ENGINEER TO VERIFY LOADING.			



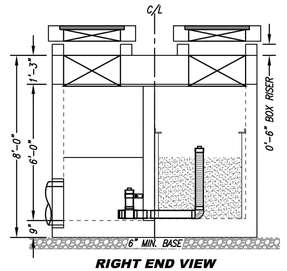
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO USE GROUT AND/OR BRICKS TO MATCH COVERS WITH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT CONTECH.

INTERNAL BYPASS DISCLOSURE:

THE DESIGN AND CAPACITY OF THE PEAK CONVEYANCE METHOD TO BE REVIEWED AND APPROVED BY THE ENGINEER OF RECORD. HGL(S) AT PEAK FLOW SHALL BE ASSESSED TO ENSURE NO UPSTREAM FLOODING. PEAK HGL AND BYPASS CAPACITY SHOWN ON DRAWING ARE USED FOR GUIDANCE ONLY.

TREATMENT FLOW (CFS)	0.36
OPERATING HEAD (FT)	2.6
PRETREATMENT LOADING RATE (GPM/SF)	1.6
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

MODULAR WETLANDS — FOR PATENT INFORMATION, GO TO www.ContechES.com/IP

PROPRIETARY AND CONFIDENTIAL:
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CONTECH ENGINEERED SOLUTIONS LLC — www.ContechES.com

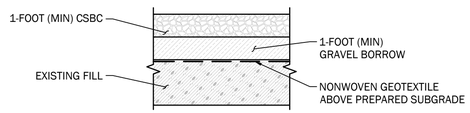
MWS-L-8-16-5'-11"-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

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MODULAR WETLAND DETAIL

SCALE: NTS

(1 / C-12)



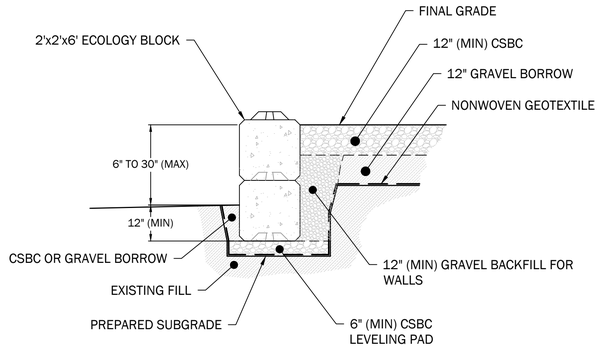
NOTES

1. FOR CA-2, INSTALL GRAVEL BORROW AS NEEDED TO ESTABLISH GRADES FOR THE CSBC LAYER.
2. SEE SHEET C-07 FOR RESTORATION MATERIAL REQUIREMENTS.

TYPICAL RESTORATION SECTION FOR CA-1

SCALE: NTS

(2 / C-12)



TYPICAL ECOLOGY BLOCK WALL

SCALE: NTS

(3 / C-12)

ERIK BRIAN PRUNEDA — STATE OF WASHINGTON — 48220 — REGISTERED PROFESSIONAL ENGINEER

11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM — Washington State

DESIGNED BY: EBP/JRG
DRAWN BY: CMV
REVISED BY: -

Aspect CONSULTING

PROJECT NUMBER: 210195-A
REVISION: -
DATE:

MISCELLANEOUS DETAILS

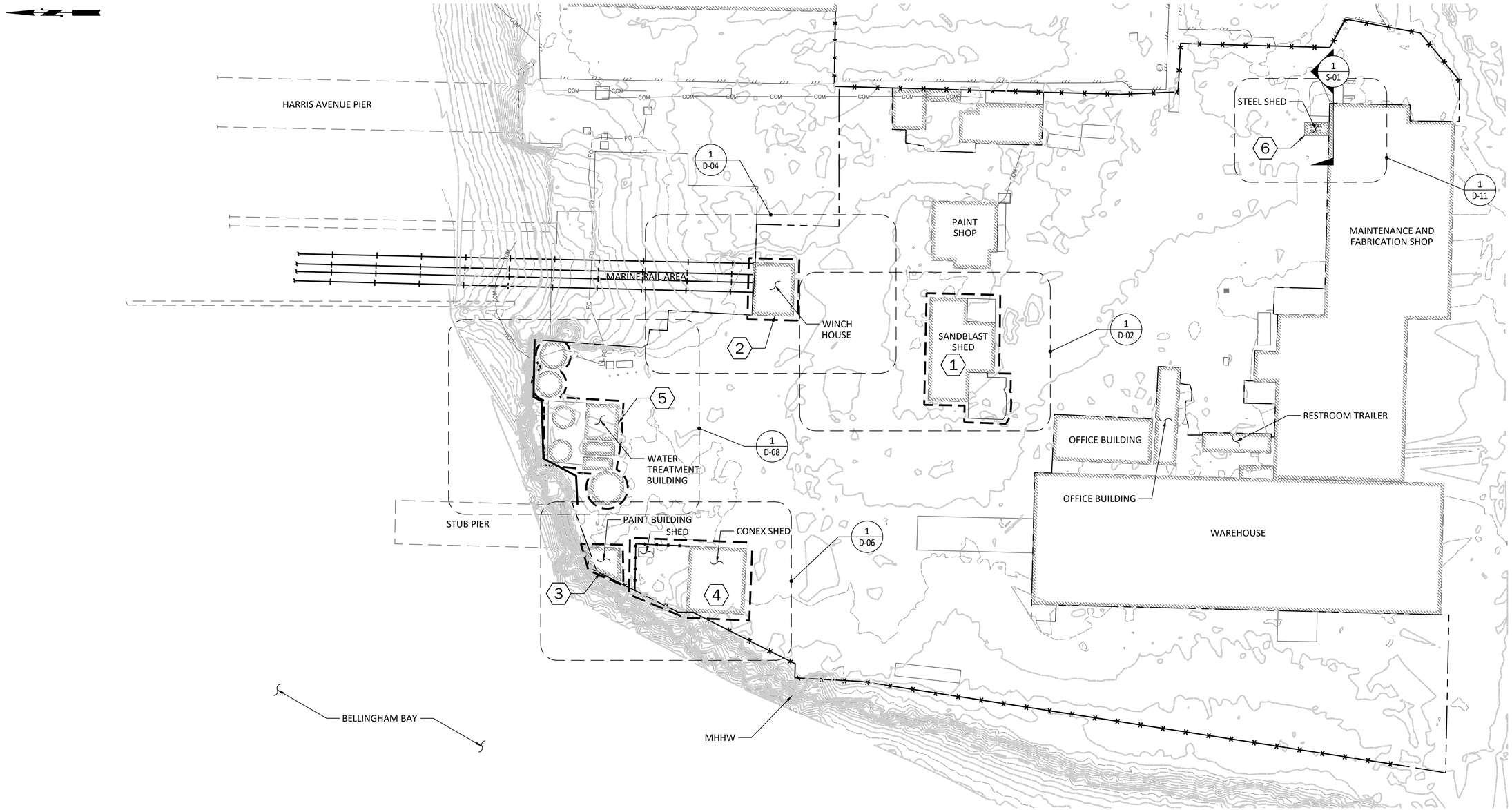
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

C-12

SHEET **15** *OF* **37**

CAD Path: Q:\Port of Bellingham\210195 HarrisShipyd\2203101 Revised Plans_Regrade 3-1\00_Design\210195 PlanSet_SPA_13-15.dwg Layout: C-12 | | Date Saved: 11/1/2024 12:58:50 PM | | User: jacqueline.reinhart



1 DEMOLITION SITE PLAN

STRUCTURE DEMOLITION SCHEDULE				
NO.	DESCRIPTION	FOOTPRINT (SQUARE FEET)	ESTIMATED FOUNDATION THICKNESS (FEET)	ESTIMATED FOUNDATION CONCRETE VOLUME (BANK CUBIC YARDS)
1	SANDBLAST SHED	2200	0.50	41
2	WINCH HOUSE	860	1.00	32
3	PAINT BUILDING	370	0.50	7
4	CONEX SHED	1400	0.00	0
5	WATER TREATMENT BUILDING FOUNDATION	550	0.67	14
6	STEEL SHED	120	0.50	2

NOTES:

.. REFER TO SHEETS G-02 AND C-03 FOR ADDITIONAL NOTES AND LEGEND.

.. INFRASTRUCTURE NOT SCHEDULED FOR DEMOLITION SHALL BE PROTECTED.

3. EXISTING UTILITIES NOT SHOWN.

4. ALL MISCELLANEOUS EQUIPMENT AND MATERIAL IN AND IMMEDIATELY ADJACENT TO THE BUILDINGS SHALL BE DISPOSED OF AS PART OF THE BUILDING DEMOLITION, UNLESS NOTED OTHERWISE.

LEGEND:

- DEMOLITION LIMITS
- EXISTING FENCE
- PROJECT LIMITS

JOSEPH R. GALLOWAY
STATE OF WASHINGTON
53686
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM
Washington State

DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:

PROJECT NUMBER: 309015G0
REVISION:
DATE: 9/11/24

STRUCTURAL DEMOLITION SITE PLAN
PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

SHEET REFERENCE NUMBER:
D-01

SHEET 16 of 37

LEGEND

N — PHOTO LOCATION INDICATOR

GENERAL NOTES:

1. DEMOLISH ALL UTILITY CONNECTIONS TO BUILDING 5 FEET FROM BUILDING FACE. CAP, ABANDON AND/OR DECOMMISSION REMAINING UTILITY CONNECTIONS IN PLACE UNLESS NOTED OTHERWISE ON CIVIL OR ELECTRICAL DRAWINGS.
2. PROTECT AND RETAIN ALL EXISTING VEGETATION AND UTILITIES/SURFACE FEATURES OUTSIDE OF WORKING/CLEARING LIMITS.
3. PROVIDE INLET PROTECTION TO ALL CATCH BASINS RECEIVING SILT LADEN RUN-OFF FROM CONSTRUCTION SITE.

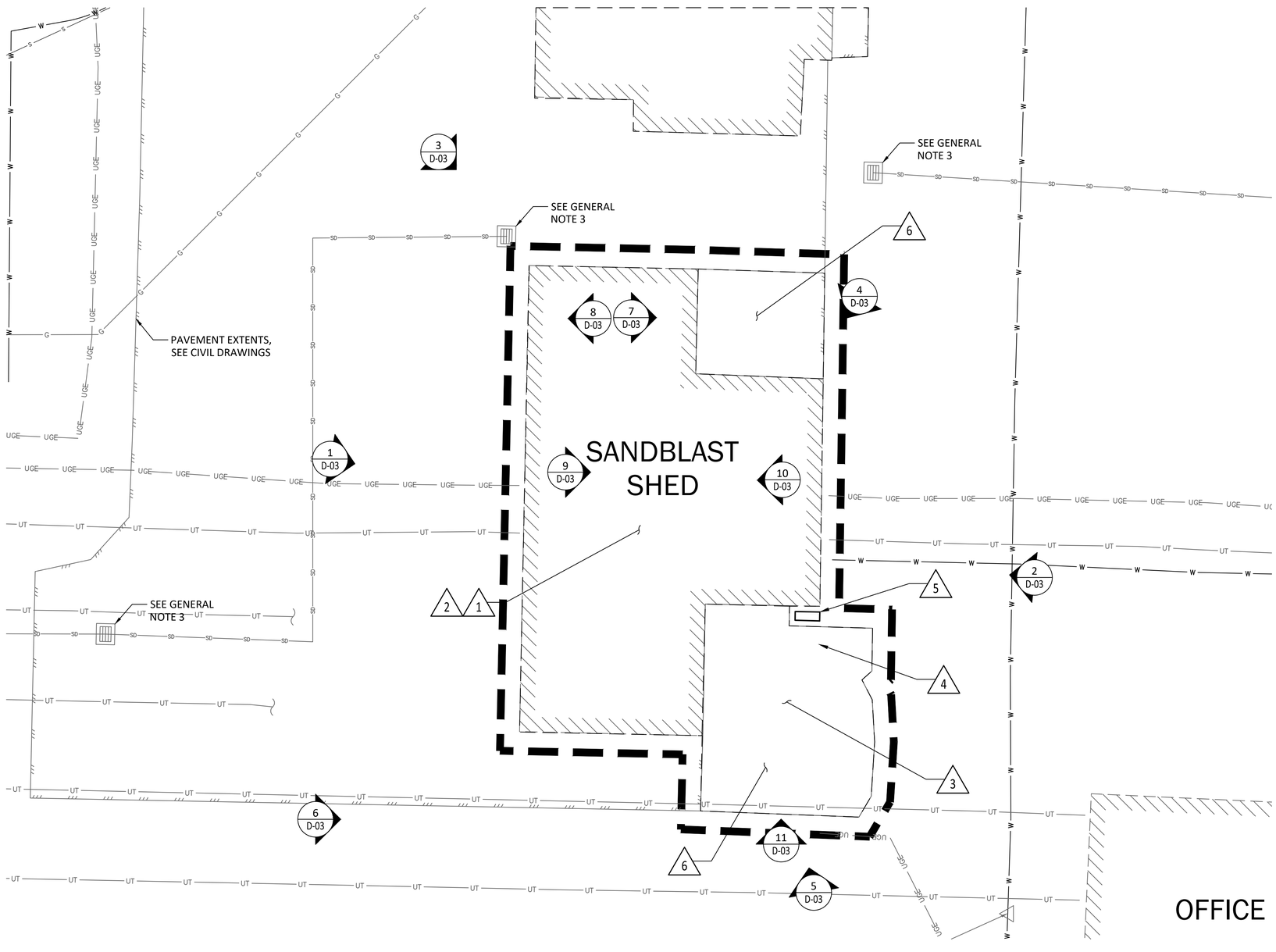
LEGEND:

DEMOLITION LIMITS

BUILDING PERIMETER

DEMOLITION KEY NOTES:

1. DEMOLISH BUILDING IN ITS ENTIRETY. DISPOSE OF BUILDING MATERIAL AT AN APPROVED DISPOSAL LOCATION. COORDINATE APPROVED DISPOSAL LOCATION AND HAUL ROUTE WITH PORT PRIOR TO BEGINNING WORK.
2. DEMOLISH BUILDING CONCRETE FOUNDATION IN ITS ENTIRETY. FOUNDATION IS ASSUMED TO BE A CONCRETE STRIP FOOTING AROUND THE BUILDING PERIMETER
3. DEMOLISH STEEL SILO AND ABOVE-GROUND STORAGE TANKS.
4. DEMOLISH CHAIN-LINK FENCE AND ALL ASSOCIATED FOUNDATIONS.
5. EXISTING ABOVE GRADE GUTTER. TRACE UNDERGROUND WIRES (4 CONDUITS WITH WIRE THAT HAVE BEEN CUT IN THE GUTTER) AND REMOVE CABLES BACK TO ORIGIN. CUTOFF CONDUITS DOWN TO 1FT BELOW GRADE, CAP AND ABANDON IN PLACE.
6. EXISTING PAVEMENT, SEE CIVIL DRAWINGS.



1 ENLARGED SITE PLAN - SANDBLAST SHED AND SILO
SCALE: 1" = 8'

1" = 8' scale 8 0 8 16 feet

JOSEPH R. GALLOWAY — STATE OF WASHINGTON — 53005 — REGISTERED PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM Washington State

DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:

PROJECT NUMBER: 3090156O
REVISION:
DATE: 9/11/24

SANDBLAST SHED AREA

PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

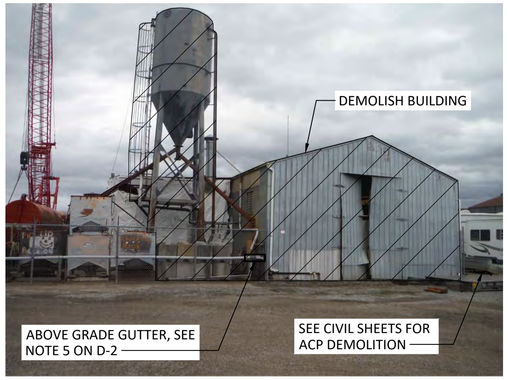
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D-02

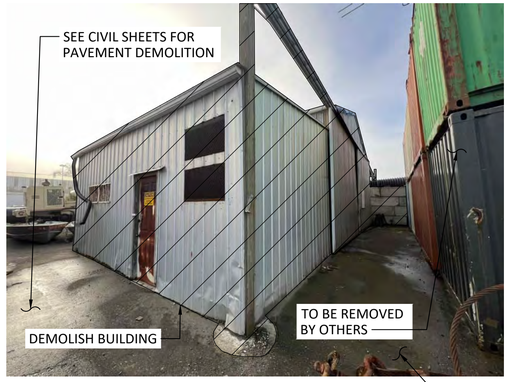
SHEET 17 OF 37



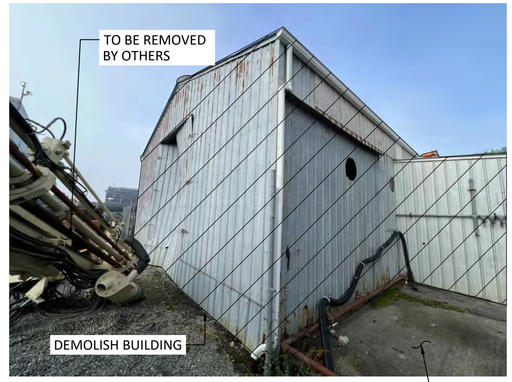
1 D-02 **SITE PHOTO**
SCALE: NTS



2 D-02 **SITE PHOTO**
SCALE: NTS



3 D-02 **SITE PHOTO**
SCALE: NTS



4 D-02 **SITE PHOTO**
SCALE: NTS



5 D-02 **SITE PHOTO**
SCALE: NTS



6 D-02 **SITE PHOTO**
SCALE: NTS



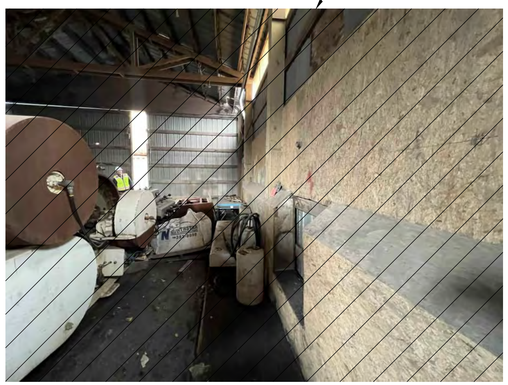
7 D-02 **SITE PHOTO**
SCALE: NTS



8 D-02 **SITE PHOTO**
SCALE: NTS



9 D-02 **SITE PHOTO**
SCALE: NTS



10 D-02 **SITE PHOTO**
SCALE: NTS



11 D-02 **SITE PHOTO**
SCALE: NTS

JOSEPH R. GALLOWAY
STATE OF WASHINGTON
23005
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM
Washington State

DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:

PROJECT NUMBER: 309015
REVISION:
DATE: 9/11/24

SANDBLAST SHED PHOTOS

PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

SHEET REFERENCE NUMBER:
D-03

SHEET 18 OF 37

LEGEND

N — PHOTO LOCATION INDICATOR

GENERAL NOTES:

1. DEMOLISH ALL UTILITY CONNECTIONS TO BUILDING 5 FEET FROM BUILDING FACE. CAP, ABANDON AND/OR DECOMMISSION REMAINING UTILITY CONNECTIONS IN PLACE UNLESS NOTED OTHERWISE ON CIVIL OR ELECTRICAL DRAWINGS.
2. PROTECT AND RETAIN ALL EXISTING VEGETATION AND UTILITIES/SURFACE FEATURES OUTSIDE OF WORKING/CLEARING LIMITS.
3. PROVIDE INLET PROTECTION TO ALL CATCH BASINS RECEIVING SILT LADEN RUN-OFF FROM CONSTRUCTION SITE.

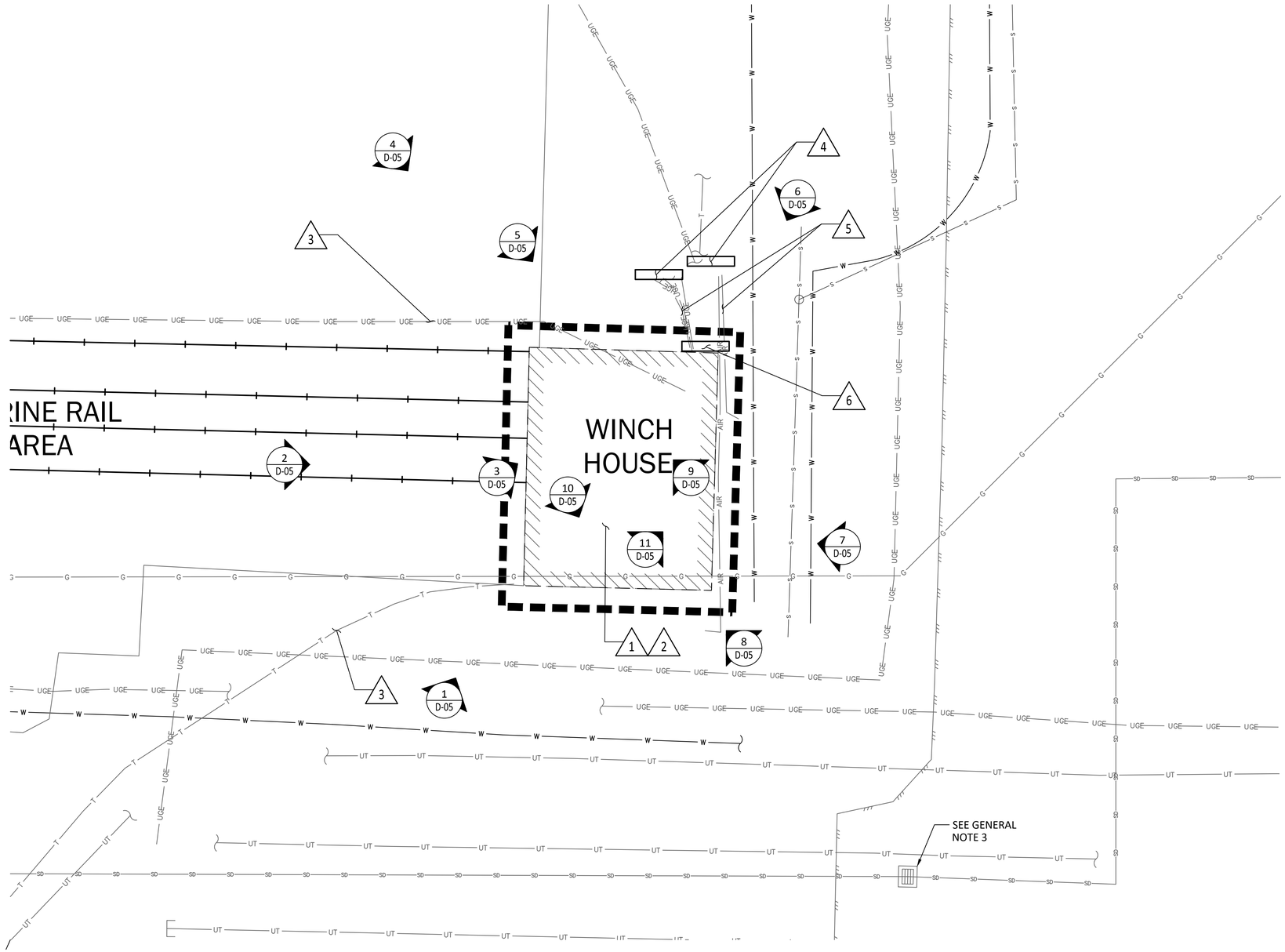
LEGEND:

DEMOLITION LIMITS

BUILDING PERIMETER

DEMOLITION KEY NOTES:

1. DEMOLISH BUILDING IN ITS ENTIRETY. DISPOSE OF BUILDING MATERIAL AT AN APPROVED DISPOSAL LOCATION. COORDINATE APPROVED DISPOSAL LOCATION AND HAUL ROUTE WITH PORT PRIOR TO BEGINNING WORK.
2. DEMOLISH BUILDING CONCRETE FOUNDATION IN ITS ENTIRETY. CONTRACTOR SHOULD ANTICIPATE AN APPROXIMATELY 1-FOOT THICK CONCRETE SLAB SUPPORTED BY TIMBER PILES. IF PILES ARE ENCOUNTERED, DEMOLISH PILES BY CUTTING OFF BELOW BOTTOM OF EXCAVATION.
3. REMOVE COMMUNICATION WIRES BACK TO ORIGIN AND ABANDON CONDUIT IN PLACE.
4. EXISTING ELECTRICAL RACKS TO BE RE-ESTABLISHED, SEE ELECTRICAL DRAWINGS.
5. REMOVE ALL CABLES BETWEEN ELECTRICAL RACKS AND BUILDING.
6. EXISTING CONDUIT STUB UPS, PROTECT IN PLACE. REMOVE CONDUIT AND WIRE EXITING THE TOP OF THE BUILDING. REMOVE WIRE BACK TO ELECTRICAL RACKS AND CAP CONDUITS.



1 ENLARGED SITE PLAN - WINCH HOUSE
SCALE: 1" = 8'

1" = 8' scale 8 0 8 16 feet

JOSEPH R. GALLOWAY — STATE OF WASHINGTON — 53606 — REGISTERED PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM Washington State

DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:
PROJECT NUMBER: 3090156O
REVISION:
DATE: 9/11/24

WINCH HOUSE AREA

PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

SHEET REFERENCE NUMBER:
D-04

SHEET 19 OF 37



1 D-04 SITE PHOTO
SCALE: NTS



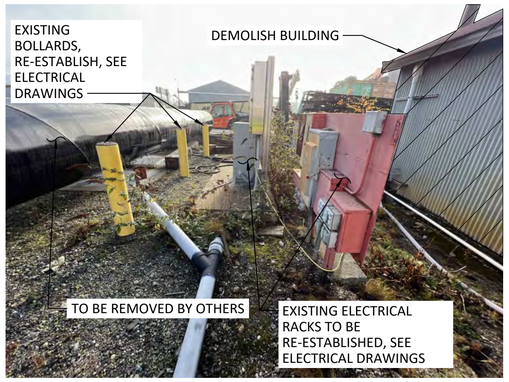
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SCALE: NTS



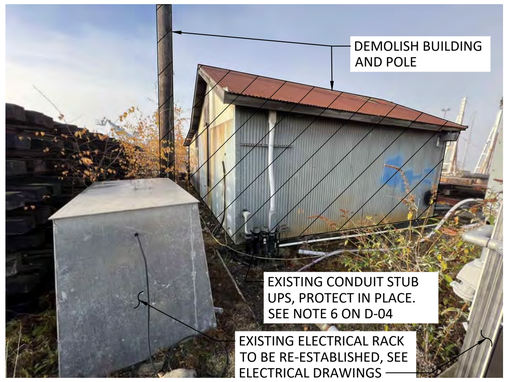
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SCALE: NTS



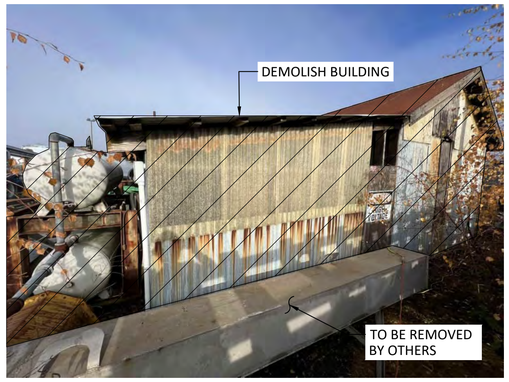
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SCALE: NTS



5 D-04 SITE PHOTO
SCALE: NTS



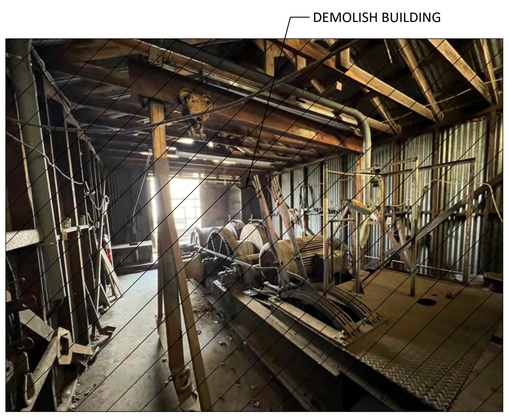
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SCALE: NTS



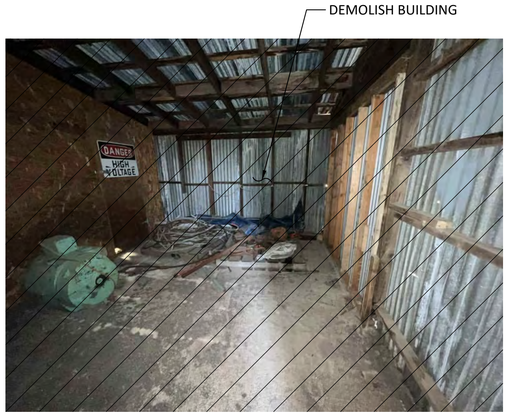
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SCALE: NTS



8 D-04 SITE PHOTO
SCALE: NTS



9 D-04 SITE PHOTO
SCALE: NTS



10 D-04 SITE PHOTO
SCALE: NTS



11 D-04 SITE PHOTO
SCALE: NTS

JOSEPH R. GALLOWAY
STATE OF WASHINGTON
23005
REGISTERED
PROFESSIONAL ENGINEER

11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM
Washington State

DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:

PROJECT NUMBER: 30901560
REVISION:
DATE: 9/11/24

WINCH HOUSE PHOTOS

PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

SHEET REFERENCE NUMBER:

D-05

SHEET 20 OF 37

LEGEND

N — PHOTO LOCATION INDICATOR

GENERAL NOTES:

1. DEMOLISH ALL UTILITY CONNECTIONS TO BUILDING 5 FEET FROM BUILDING FACE. CAP, ABANDON AND/OR DECOMMISSION REMAINING UTILITY CONNECTIONS IN PLACE UNLESS NOTED OTHERWISE ON CIVIL OR ELECTRICAL DRAWINGS.
2. PROTECT AND RETAIN ALL EXISTING VEGETATION AND UTILITIES/SURFACE FEATURES OUTSIDE OF WORKING/CLEARING LIMITS.
3. PROVIDE INLET PROTECTION TO ALL CATCH BASINS RECEIVING SILT LADEN RUN-OFF FROM CONSTRUCTION SITE.

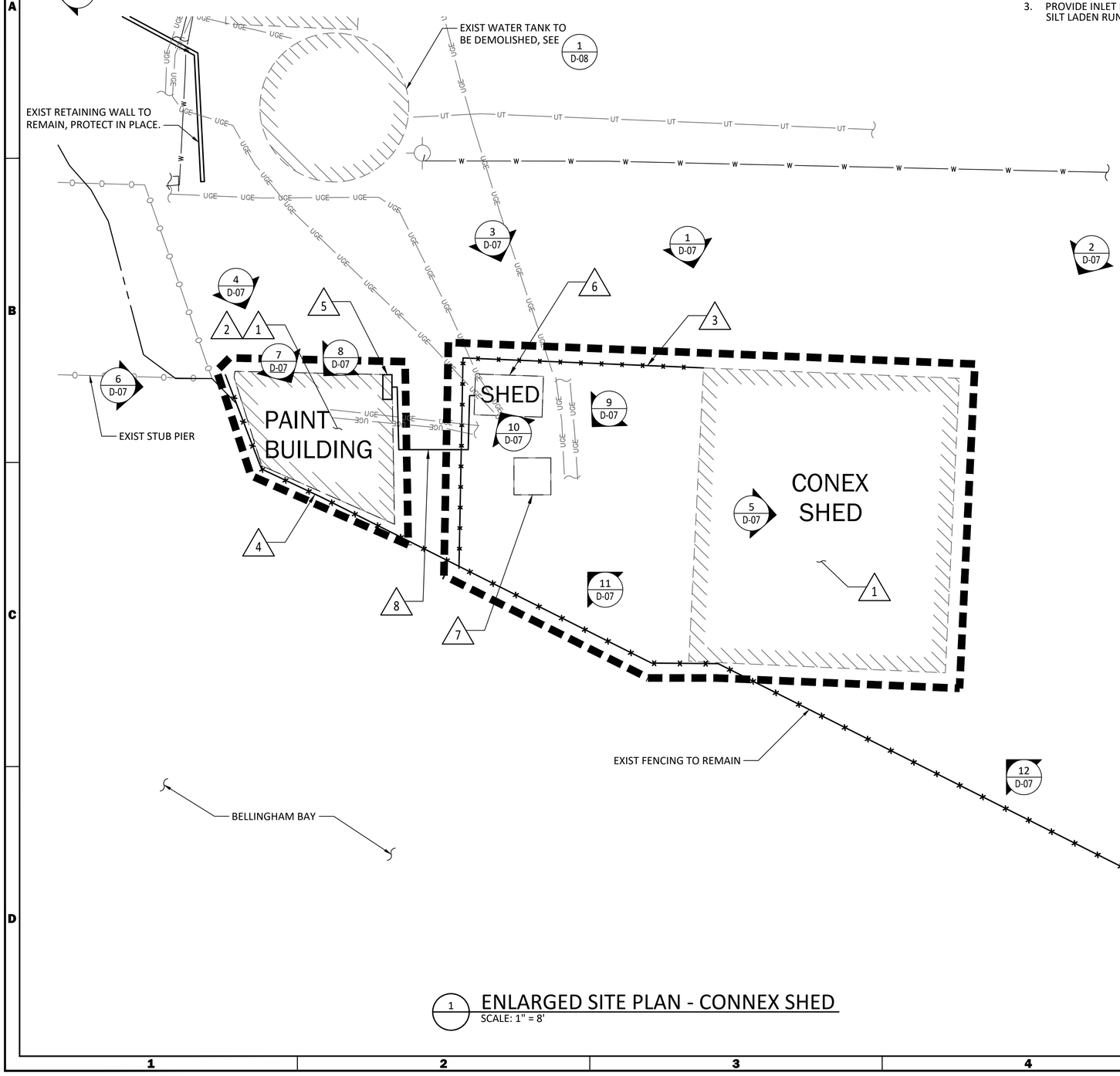
LEGEND:

DEMOLITION LIMITS

BUILDING PERIMETER

DEMOLITION KEY NOTES:

1. DEMOLISH BUILDING IN ITS ENTIRETY. DISPOSE OF BUILDING MATERIAL AT AN APPROVED DISPOSAL LOCATION. COORDINATE APPROVED DISPOSAL LOCATION AND HAUL ROUTE WITH PORT PRIOR TO BEGINNING WORK.
2. DEMOLISH BUILDING CONCRETE FOUNDATION IN ITS ENTIRETY. FOUNDATION IS ASSUMED TO BE A CONCRETE STRIP FOOTING.
3. DEMOLISH CHAIN-LINK FENCE AND ALL ASSOCIATED FOUNDATIONS.
4. DEMOLISH MISCELLANEOUS UTILITY PIPES BETWEEN FENCE AND BUILDING.
5. EXISTING ELECTRICAL PANEL, DISCONNECT, REMOVE SUPPLY CONDUIT & CABLE BACK TO ELECTRICAL SHED, AND REMOVE WITH BUILDING.
6. DEMOLISH EXISTING ELECTRICAL SHED, SEE ELECTRICAL DRAWINGS.
7. EXISTING 12,470V TRANSFORMER, PROTECT FOR REUSE, SEE ELECTRICAL DRAWINGS.
8. REMOVE EXISTING CONDUIT AND CABLE RUN ON FENCE BETWEEN EXISTING PANEL AND EXISTING ELECTRICAL SHED. SEE D-07 FOR ADDITIONAL CONDUITS & CABLES IN THIS AREA.



1 ENLARGED SITE PLAN - CONNEX SHED
SCALE: 1" = 8'

1" = 8' scale 8 0 8 16 feet

Joseph R. Galloway — State of Washington — 23806 — Registered Professional Engineer
11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM Washington State

DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:
PROJECT NUMBER: 30901560
REVISION:
DATE: 9/11/24

CONEX SHED AND PAINT BUILDING AREA
PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

SHEET REFERENCE NUMBER:
D-06

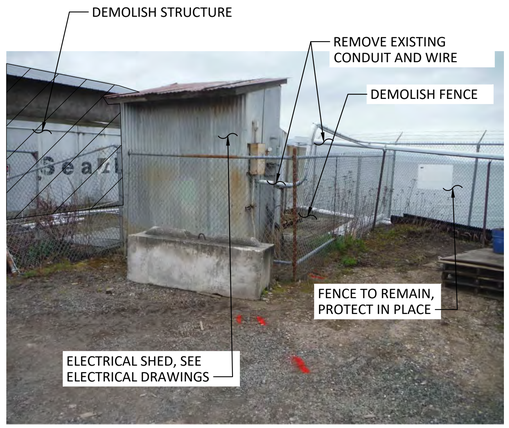
SHEET 21 OF 37



1 D-06 SITE PHOTO
SCALE: NTS



2 D-06 SITE PHOTO
SCALE: NTS



3 D-06 SITE PHOTO
SCALE: NTS



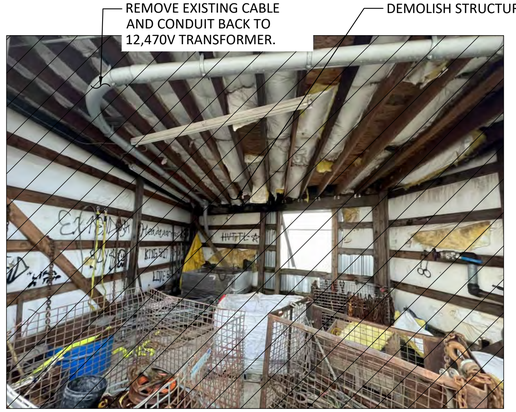
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SCALE: NTS



5 D-06 SITE PHOTO
SCALE: NTS



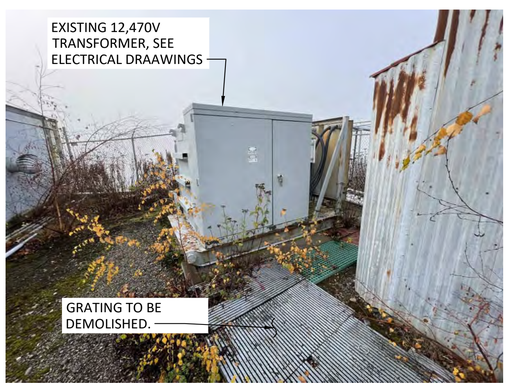
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SCALE: NTS



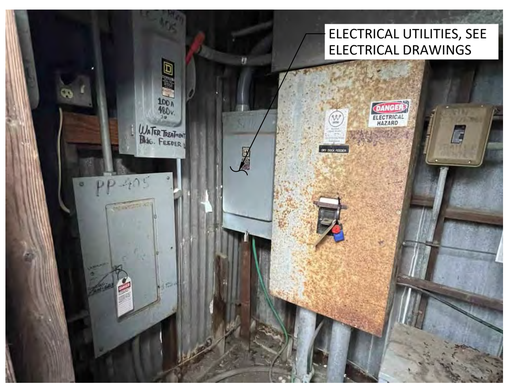
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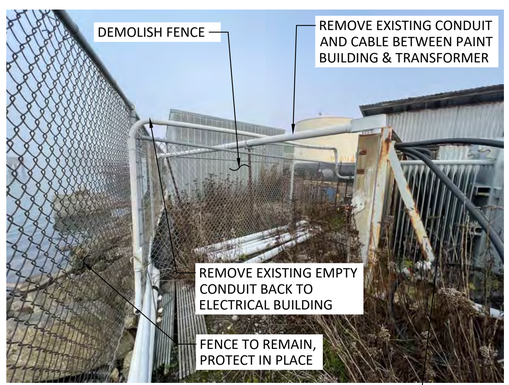
8 D-06 SITE PHOTO
SCALE: NTS



9 D-06 SITE PHOTO
SCALE: NTS



10 D-06 SITE PHOTO
SCALE: NTS



11 D-06 SITE PHOTO
SCALE: NTS



12 D-06 SITE PHOTO
SCALE: NTS

JOSEPH R. GALLOWAY
STATE OF WASHINGTON
23005
REGISTERED
PROFESSIONAL ENGINEER

11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM
Washington State

DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:

PROJECT NUMBER: 3090156

REVISION:

DATE: 9/11/24

CONEX SHED AND PAINT BUILDING PHOTOS
PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

SHEET REFERENCE NUMBER:
D-07

SHEET 22 OF 37

LEGEND

N — PHOTO LOCATION INDICATOR

GENERAL NOTES:

1. DEMOLISH ALL UTILITY CONNECTIONS TO BUILDING 5 FEET FROM BUILDING FACE. CAP, ABANDON AND/OR DECOMMISSION REMAINING UTILITY CONNECTIONS IN PLACE UNLESS NOTED OTHERWISE ON CIVIL DRAWINGS.
2. PROTECT AND RETAIN ALL EXISTING VEGETATION AND UTILITIES/SURFACE FEATURES OUTSIDE OF WORKING/CLEARING LIMITS.
3. PROVIDE INLET PROTECTION TO ALL CATCH BASINS RECEIVING SILT LADEN RUN-OFF FROM CONSTRUCTION SITE.

LEGEND:

DEMOLITION LIMITS

BUILDING AND TANK PERIMETER

DEMOLITION KEY NOTES:

1. DEMOLISH WATER TREATMENT BUILDING AND CONCRETE FOUNDATION IN ITS ENTIRETY. FOUNDATION IS ASSUMED TO BE A CONCRETE STRIP FOOTING ALONG THE BUILDING PERIMETER.
2. DEMOLISH STEEL TANK IN ITS ENTIRETY INCLUDING ALL ASSOCIATED PIPING. SEE CIVIL DRAWINGS FOR PAVEMENT DEMOLITION EXTENTS.
3. DEMOLISH WATER TREATMENT TANK IN ITS ENTIRETY INCLUDING ALL ASSOCIATED PIPING.
4. ECOLOGY BLOCK RETAINING WALL TO REMAIN.
5. REMOVE EXISTING PUMP CIRCUIT BREAKER AND JUNCTION BOX. REMOVE CABLES BACK TO EXISTING WATER TREATMENT BUILDING. CUT CONDUITS FLUSH WITH GRADE AND CAP.
6. REMOVE HEAT RACE OUTLETS. REMOVE CABLES BACK TO EXISTING WATER TREATMENT BUILDING. CUT CONDUITS FLUSH WITH GRADE AND CAP.
7. REMOVE CABLES BACK TO EXISTING ELECTRICAL SHED AS SHOWN ON D-06.
8. EXISTING BUILDING MAIN DISCONNECT. DISCONNECT AND REMOVE CABLES BACK TO EXISTING ELECTRICAL SHED AS SHOWN ON D-06.
9. REMOVE EXISTING COMMUNICATIONS CABLE BACK TO ORIGIN. CUT CONDUIT FLUSH WITH GRADE AND CAP.
10. RE-ESTABLISH EXISTING ELECTRICAL RACK AND BOLLARDS, SEE ELECTRICAL DRAWINGS.

EXIST RETAINING WALL

SEE GENERAL NOTE 3

EXIST STUB PIER

1 ENLARGED SITE PLAN - WATER TREATMENT STRUCTURES
SCALE: 1" = 8'

1" = 8' scale 8 0 8 16 feet

JOSEPH R. GALLOWAY — STATE OF WASHINGTON — 53005 — REGISTERED PROFESSIONAL ENGINEER

11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM Washington State

DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:

PROJECT NUMBER: 30901560
REVISION:
DATE: 9/11/24

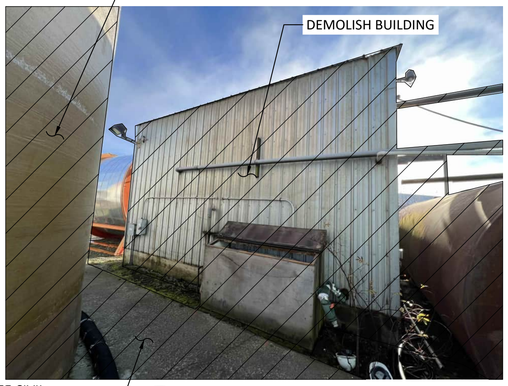
HISTORICAL WATER TREATMENT AREA
PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

SHEET REFERENCE NUMBER:
D-08

SHEET 23 OF 37



1 D-08 **SITE PHOTO** SCALE: NTS



2 D-08 **SITE PHOTO** SCALE: NTS



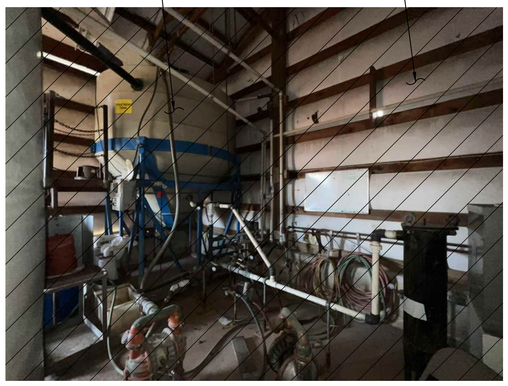
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4 D-08 **SITE PHOTO** SCALE: NTS



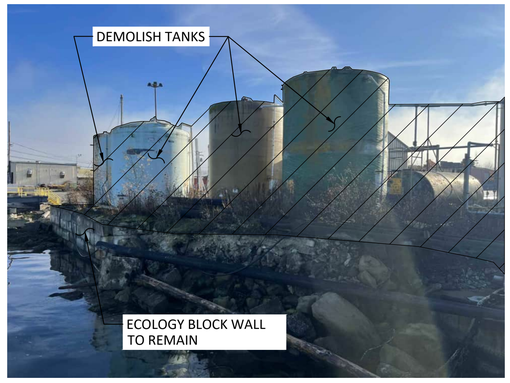
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6 D-08 **SITE PHOTO** SCALE: NTS



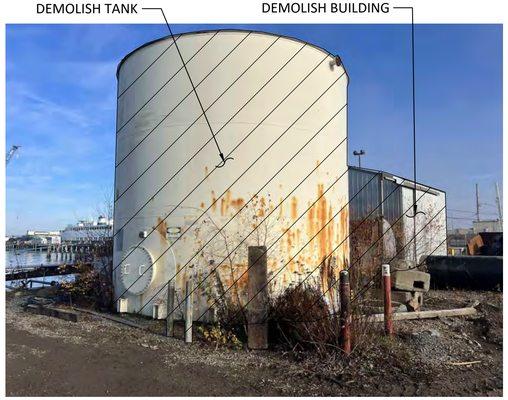
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8 D-08 **SITE PHOTO** SCALE: NTS



9 D-08 **SITE PHOTO** SCALE: NTS



10 D-08 **SITE PHOTO** SCALE: NTS



11 D-08 **SITE PHOTO** SCALE: NTS



12 D-08 **SITE PHOTO** SCALE: NTS

JOSEPH R. GALLOWAY
STATE OF WASHINGTON
23805
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM
Washington State

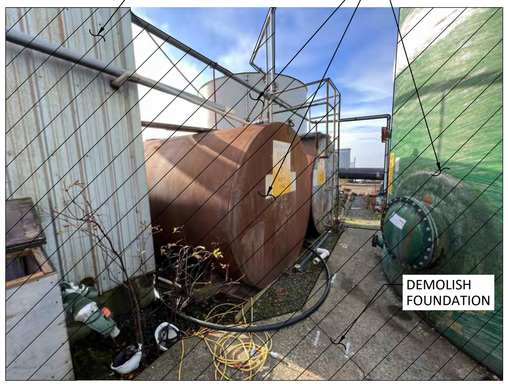
DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:
PROJECT NUMBER: 30901560
REVISION:
DATE: 9/11/24

HISTORICAL WATER TREATMENT PHOTOS - SHEET 1
PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

SHEET REFERENCE NUMBER:
D-09



1 D-08 SITE PHOTO
SCALE: NTS



2 D-08 SITE PHOTO
SCALE: NTS



3 D-08 SITE PHOTO
SCALE: NTS



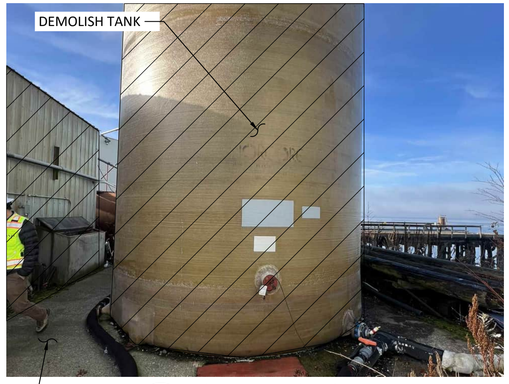
4 D-08 SITE PHOTO
SCALE: NTS



5 D-08 SITE PHOTO
SCALE: NTS



6 D-08 SITE PHOTO
SCALE: NTS



7 D-08 SITE PHOTO
SCALE: NTS



8 D-08 SITE PHOTO
SCALE: NTS

SEE CIVIL DRAWINGS FOR PAVEMENT DEMOLITION EXTENTS



9 D-08 SITE PHOTO
SCALE: NTS

DEMOLISH TANK

SEE CIVIL DRAWINGS FOR PAVEMENT DEMOLITION EXTENTS



10 D-08 SITE PHOTO
SCALE: NTS

SEE CIVIL DRAWINGS FOR PAVEMENT DEMOLITION EXTENTS



11 D-08 SITE PHOTO
SCALE: NTS

SEE CIVIL DRAWINGS FOR PAVEMENT DEMOLITION EXTENTS



12 D-08 SITE PHOTO
SCALE: NTS

EXISTING BOLLARD, TYP, RE-ESTABLISH, SEE ELECTRICAL DRAWINGS

REMOVE EXISTING PUMP CIRCUIT BREAKER AND JUNCTION BOX. REMOVE CABLES BACK TO EXISTING WATER TREATMENT BUILDING. CUT CONDUIT FLUSH WITH GRADE AND CAP.

JOSEPH R. GALLOWAY
STATE OF WASHINGTON
23005
REGISTERED
PROFESSIONAL ENGINEER

11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM
Washington State

DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:

PROJECT NUMBER: 30901560
REVISION:
DATE: 9/11/24

HISTORICAL WATER TREATMENT PHOTOS - SHEET 2
PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

SHEET REFERENCE NUMBER:
D-10

SHEET 25 OF 37

LEGEND

N — PHOTO LOCATION INDICATOR

GENERAL NOTES:

1. DEMOLISH ALL UTILITY CONNECTIONS TO BUILDING 5 FEET FROM BUILDING FACE. CAP, ABANDON AND/OR DECOMMISSION REMAINING UTILITY CONNECTIONS IN PLACE UNLESS NOTED OTHERWISE ON CIVIL OR ELECTRICAL DRAWINGS.
2. PROTECT AND RETAIN ALL EXISTING VEGETATION AND UTILITIES/SURFACE FEATURES OUTSIDE OF WORKING/CLEARING LIMITS.
3. PROVIDE INLET PROTECTION TO ALL CATCH BASINS RECEIVING SILT LADEN RUN-OFF FROM CONSTRUCTION SITE.

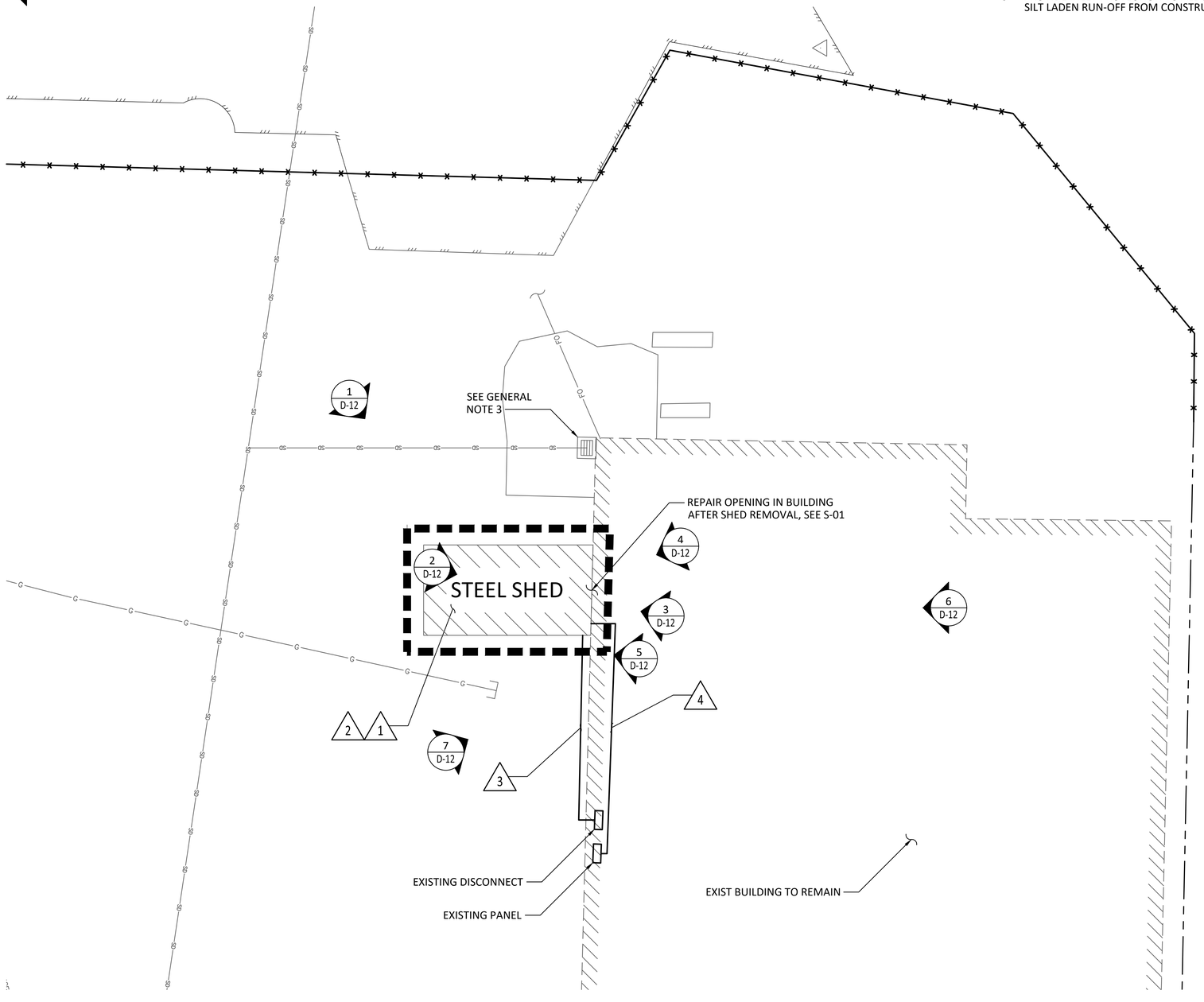
LEGEND:

DEMOLITION LIMITS

BUILDING PERIMETER

DEMOLITION KEY NOTES:

1. DEMOLISH SHED IN ITS ENTIRETY. DISPOSE OF BUILDING MATERIAL AT AN APPROVED DISPOSAL LOCATION. COORDINATE APPROVED DISPOSAL LOCATION AND HAUL ROUTE WITH PORT PRIOR TO BEGINNING WORK.
2. FOUNDATION IS UNKNOWN. IF A FOUNDATION IS ENCOUNTERED, DEMOLISH FOUNDATION IN ITS ENTIRETY. ANY CONNECTION TO THE ADJACENT WAREHOUSE MUST BE SAWCUT.
3. REMOVE EXISTING 3/4" EMT & CABLES BACK TO EXISTING DISCONNECT. SEAL ALL HOLES IN SIDE OF BUILDING WATERTIGHT.
4. REMOVE EXISTING 1/2" EMT & CABLES BACK TO EXISTING PANEL



1 ENLARGED SITE PLAN - STEEL SHED
SCALE: 1" = 8'

1" = 8' scale: 8 0 8 16 feet

JOSEPH R. GALLOWAY — STATE OF WASHINGTON — 23806 — REGISTERED PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM Washington State

DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:

PROJECT NUMBER: 30901560
REVISION:
DATE: 9/11/24

STEEL SHED AREA

PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

SHEET REFERENCE NUMBER:
D-11

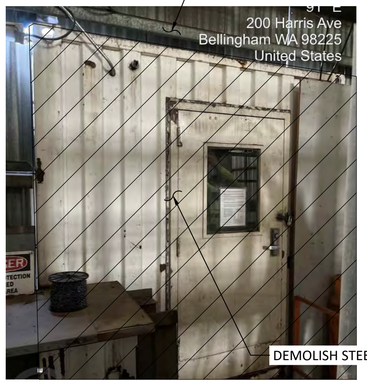
SHEET 26 OF 37



1 D-10 **SITE PHOTO**
SCALE: NTS



2 D-10 **SITE PHOTO**
SCALE: NTS



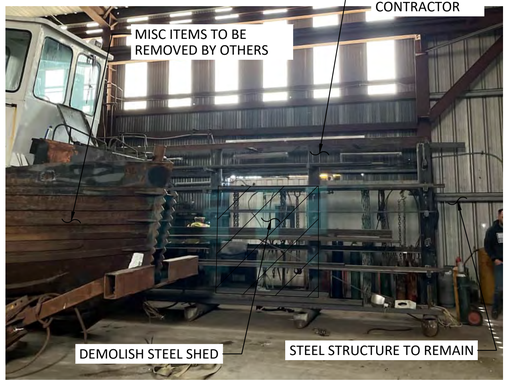
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SCALE: NTS



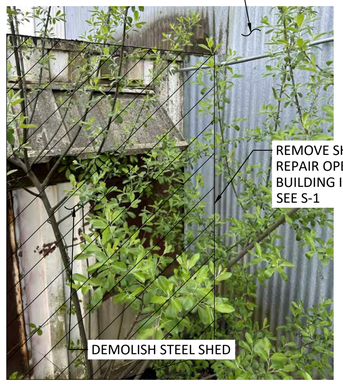
4 D-10 **SITE PHOTO**
SCALE: NTS



5 D-10 **SITE PHOTO**
SCALE: NTS



6 D-10 **SITE PHOTO**
SCALE: NTS



7 D-10 **SITE PHOTO**
SCALE: NTS

JOSEPH R. GALLOWAY
STATE OF WASHINGTON
23005
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM
Washington State

DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:

PROJECT NUMBER: 30901560
REVISION:
DATE: 9/11/24

STEEL SHED PHOTOS

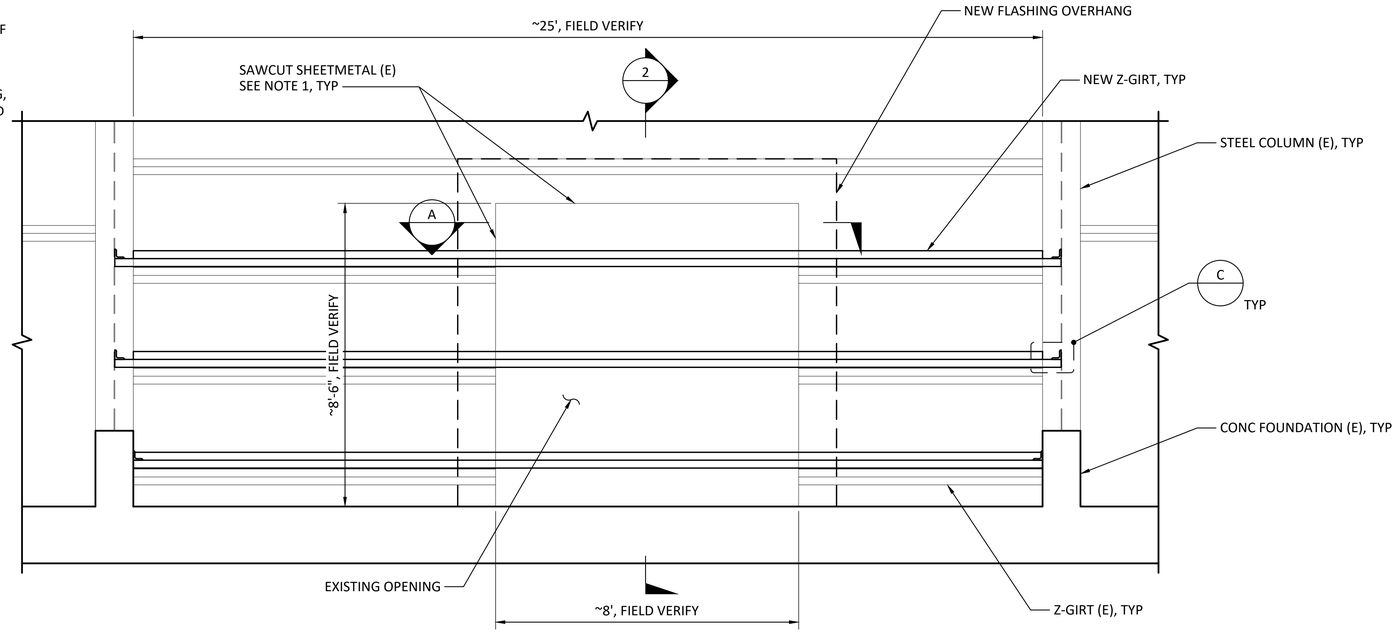
PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

SHEET REFERENCE NUMBER:
D-12

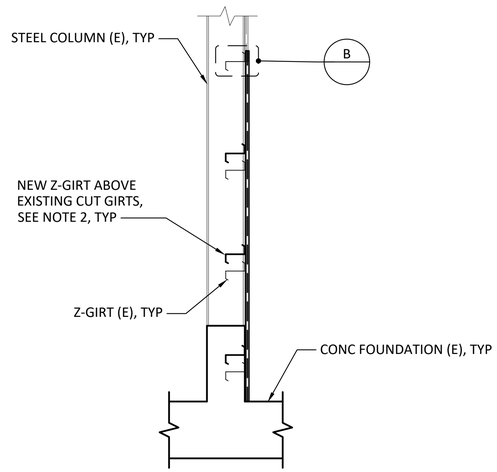
SHEET 27 OF 37

NOTES:

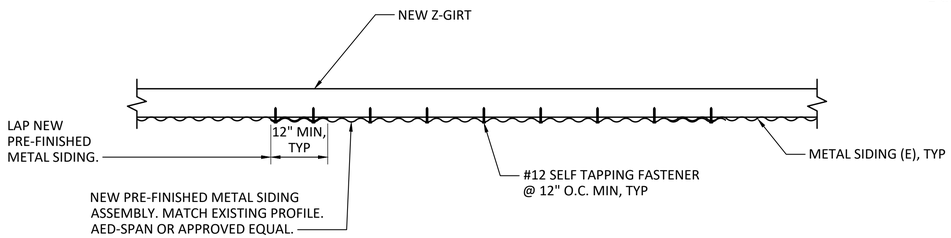
1. PROVIDE CLEAN CUT TO EDGE OF EXISTING CUT METAL SIDING.
2. MATCH SIZE, GAUGE, AND FINISH OF EXISTING GIRTS. (ASSUMED G60 GALVANIZED)
3. IF Z-GIRT ENDS AT A CONC FOOTING, USE HILTI KB-TZ2 1/2" X 5 1/2" STUD ANCHOR ASSEMBLY OR APPROVED EQUIVALENT.



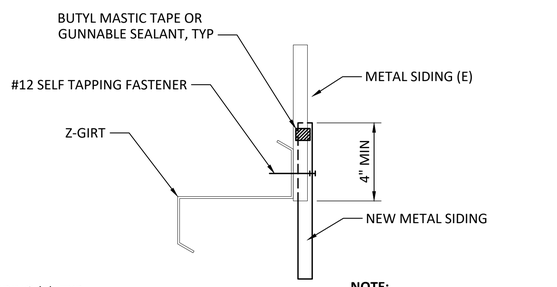
1 ELEVATION - WALL REPAIR
SCALE: NTS



2 SECTION - WALL REPAIR
SCALE: NTS

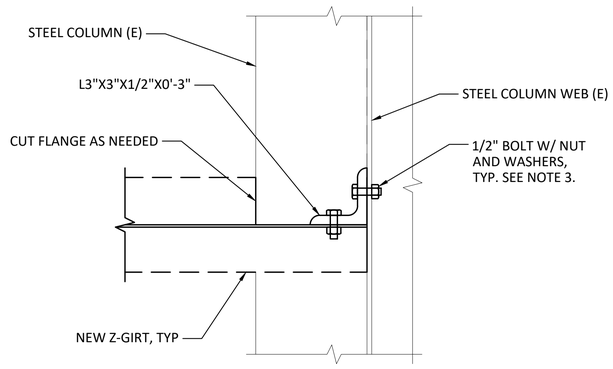


A SECTION - WALL REPAIR
SCALE: NTS



NOTE:
GALVANIZE ALL HARDWARE AND MISCELLANEOUS STEEL.

B DETAIL - PANEL LAP
SCALE: NTS



C DETAIL - COLUMN CONNECTION
SCALE: NTS

JOSEPH R. GALLOWAY
STATE OF WASHINGTON
23806
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM
Washington State

DESIGNED BY: BAH
DRAWN BY: BAH
REVISED BY:

PROJECT NUMBER: 30901560
REVISION:
DATE: 9/11/24

WAREHOUSE REPAIRS

PORT OF BELLINGHAM
UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
Bellingham, Washington

SHEET REFERENCE NUMBER:

S-01

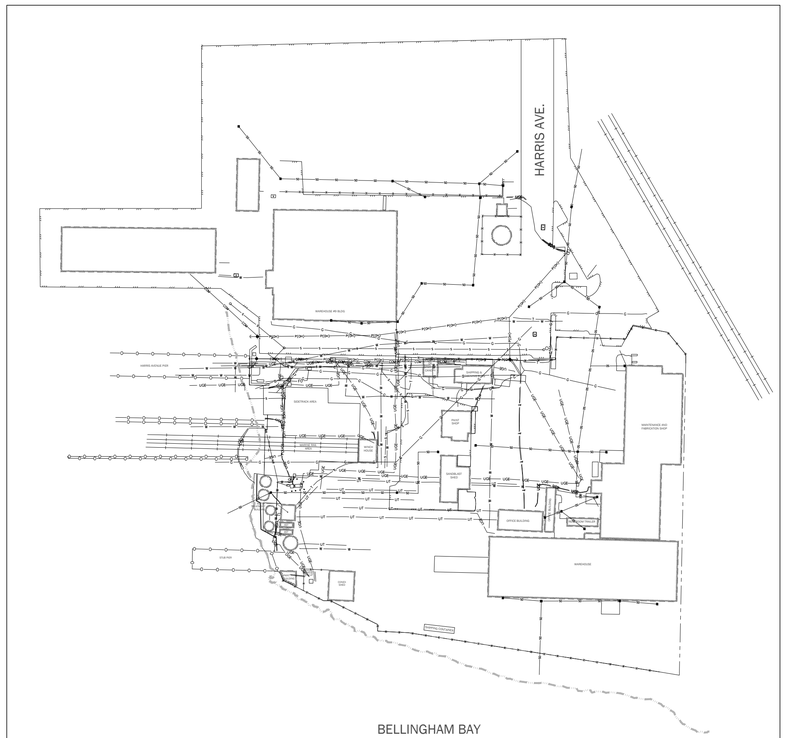
SHEET 28 OF 37

NOTES (APPLICABLE TO ALL ELECTRICAL DRAWINGS):

1. ALL SYSTEMS, EQUIPMENT, DEVICES, RACEWAYS, CABLES, ETC. INDICATED ARE NEW UNLESS SPECIFICALLY NOTED AS EXISTING.
2. ALL ELECTRICAL MATERIALS SHALL BE "UL" (UNDERWRITER'S LABORATORIES, INC.) LISTED, LABELED AND APPROVED FOR THE SERVICE INTENDED WHERE UL STANDARDS HAVE BEEN ESTABLISHED.
3. UNLESS NOTED OTHERWISE, PROTECT IN-PLACE ALL FEATURES/ELEMENTS PRESENT.
4. PROVIDE ALL SUPERVISION, LABOR, SERVICES, TOOLS, MATERIALS & EQUIPMENT FOR A COMPLETE, SAFE & RELIABLE INSTALLATION; ADJUSTED, TESTED & READY FOR OPERATION.
5. PROVIDE ALL COORDINATION WITH UTILITIES AND PUGET SOUND ENERGY.
6. THE COMPLETED INSTALLATION SHALL BE DONE IN A NEAT & WORKMANLIKE MANNER, SHALL BE SUITABLE FOR THE LOCATION, AND SHALL BE IN ACCORDANCE ALL LAWS, RULES & REGULATIONS IN EFFECT AT THE SITE (INCLUDING THE LATEST EDITIONS OF THE NATIONAL ELECTRICAL CODE, THE WASHINGTON STATE RULES & REGULATIONS FOR INSTALLING ELECTRIC WIRES & EQUIPMENT.
7. ALL OPERATIONS SHALL BE CONDUCTED IN A MANNER TO AVOID THE RISK OF HARM TO PERSONS OR DAMAGE TO PROPERTY. DAMAGE SHALL IMMEDIATELY BE REPAIRED. CONSTRUCTION EQUIPMENT & TOOLS SHALL BE IN GOOD OPERATING CONDITION, AND BE DESIGNED FOR THE WORK REQUIRED.
8. THE CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES, PROTECT EXISTING UTILITIES AS REQUIRED, AND REPAIR ANY DAMAGE TO EXISTING UTILITIES (KNOWN OR UNKNOWN, LOCATED OR NOT LOCATED) RESULTING FROM CONTRACTORS OPERATIONS WITHOUT INCREASE IN CONTRACT SUM. DAMAGED ELECTRICAL AND TELECOMMUNICATIONS (TELEPHONE, COMPUTER/DATA, TELEVISION, FIBER, COPPER, ETC.) CABLES SHALL BE REPLACED IN THEIR ENTIRETY. SPLICING WILL NOT BE ALLOWED.
9. VERIFY ALL TRENCH, EQUIPMENT, DEVICES, ETC. LOCATIONS WITH OWNER & ENGINEER PRIOR TO BEGINNING EXCAVATION, TRENCHING & ROUGH-IN.
10. CHANGES IN LOCATION UP TO 10' (E.G. EQUIPMENT AND DEVICES, TRENCH AND CONDUIT ROUTING, ETC.) MADE BEFORE INSTALLATION AND DEVIATIONS TO AVOID INTERFERENCES SHALL BE MADE WITHOUT INCREASE IN CONTRACT SUM.
11. POWER INTERRUPTIONS (WHETHER TO THE ENTIRE SYSTEM OR TO INDIVIDUAL BUILDINGS, PANELS, EQUIPMENT, DEVICES, ETC.) SHALL BE KEPT TO AN ABSOLUTE MINIMUM, AND SHALL NOT BE DONE WITHOUT PRIOR APPROVAL, 2 WEEKS ADVANCED SCHEDULING & COORDINATION MEETING WITH THE OWNER. SECONDARY VERIFICATION THAT POWER INTERUPTION WILL OCCUR IS ALSO REQUIRED 48 HOURS PRIOR TO THE DATE OF OCCURANCE.
12. BELOW GRADE CONDUIT SHALL BE SCHEDULE 40 PVC (EXCEPT PSE CONDUIT SHALL BE DB120), DIRECT BURIED A MINIMUM OF 24 INCHES BELOW GRADE OR AS INDICATED. WARNING TAPE SHALL BE BURIED ABOVE ALL CONDUITS.
13. BELOW GRADE CONDUITS CONTAINING BENDS SHALL BE DONE WITH FIBERGLASS OR GALVANIZED RIGID STEEL (GRS). THE MINIMUM CHANGE OF DIRECTION IN ANY PLANE BETWEEN SECTIONS OF STRAIGHT PVC CONDUIT WITHOUT THE USE OF GRS OR FIBERGLASS BENDS SHALL BE LIMITED TO 10 DEGREES.
14. PLAN DRAWINGS DO NOT ATTEMPT TO SHOW COMPLETE DETAILS OR LIST EVERY ITEM OF THE ELECTRICAL SYSTEM, EQUIPMENT, OR BUILDING CONSTRUCTION; HOWEVER, THE ROUTING OF RACEWAYS AND CIRCUITS, THE LOCATIONS OF EQUIPMENT, DEVICES AND FIXTURES REPRESENT THE DESIRED FINISHED ARRANGEMENT.
15. DETAIL DRAWINGS SHALL BE CONSIDERED APPLICABLE TO ALL PLAN DRAWINGS AND SIMILAR CONDITIONS EVEN IF THE DETAILS ARE NOT SPECIFICALLY REFERENCED.
16. EXPOSED RACEWAYS SHALL BE RUN AS NEATLY & UNOBTRUSIVELY AS POSSIBLE, SUPPORTED AS REQUIRED, PARALLEL OR AT RIGHT ANGLES TO CEILINGS, WALLS & STRUCTURAL MEMBERS.
17. RACEWAYS SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
    - A. INTERIOR - ELECTRICAL METALLIC TUBING (EMT) WITH FLEXIBLE METAL CONDUIT (FLEX) FOR FINAL CONNECTIONS TO VIBRATING EQUIPMENT.
    - B. EXTERIOR ABOVE GRADE - GALVANIZED RIGID STEEL CONDUIT (GRS).
    - C. EXTERIOR BELOW GRADE - POLYVINYL CHLORIDE CONDUIT (PVC), EXCEPT CONDUIT ELBOWS FOR SIZE 2 INCH AND LARGER SHALL BE TYPE RTRC (FIBERGLASS).
    - D. METAL CLAD (MC) CABLE SHALL NOT BE PERMITTED.
18. RACEWAYS SHALL BE SIZED SO THAT THE CABLE FILL DOES NOT EXCEED 40%, EXCEPT, MINIMUM CONDUIT SIZES SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
    - A. 3/4" - BRANCH CIRCUITS AND SYSTEM RACEWAYS, EXCEPT AS NOTED BELOW.
    - B. 1" - POWER & LIGHTING HOMERUNS.
    - C. 1" - UNDERGROUND CONDUITS.
19. TELECOMMUNICATIONS CONDUITS SHALL BE PROVIDED WITH PULL ROPES BELOW GRADE AND PULL STRINGS ABOVE GRADE.
20. BELOW GRADE SERVICE & FEEDER CABLE SHALL BE 1/C COPPER (UNLESS SPECIFICALLY NOTED OTHERWISE) WITH 600V TYPE XHHW INSULATION, EXCEPT TYPE THWN MAY BE USED FOR BELOW GRADE FEEDER CABLES WHERE THE CABLE IS ROUTED BELOW THE BUILDING FLOOR SLAB FOR ITS ENTIRE LENGTH.
21. BRANCH CIRCUIT CABLES, EQUIPMENT GROUND CABLES AND ABOVE GRADE FEEDER CABLES SHALL BE 1/C COPPER, #12 AWG UNLESS NOTED OTHERWISE, WITH 600V TYPE XHHW OR THHN/THWN INSULATION.
22. IN ADDITION TO THE CIRCUIT CONDUCTORS INDICATED, CONTRACTOR SHALL PROVIDE AN EQUIPMENT GROUND CABLE (SIZED THE SAME AS THE LARGEST CIRCUIT CONDUCTOR UNLESS SPECIFICALLY NOTED OTHERWISE) WITHIN EACH RACEWAY WITH THE CIRCUIT CONDUCTORS.
23. ALL WIRING SHALL BE ENCLOSED WITHIN THE RACEWAY SYSTEM.
24. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE FIRE RESISTIVE RATINGS OF WALLS, PARTITIONS AND OTHER BUILDING STRUCTURES. INSTALLATION OF SYSTEM COMPONENTS AND RACEWAYS MUST MAINTAIN THE EXISTING FIRE RESISTIVE RATING OF THE BUILDING.
25. LABELING & NAMEPLATES:
    - A. OUTLETS SHALL BE LABELED WITH THE PANEL AND CIRCUIT NUMBER FROM WHICH ITS FED. LABELS SHALL BE HEAVY DUTY ADHESIVE TYPE, CLEAR TAPE WITH BLACK LETTERING, MADE WITH A LABEL PRINTING DEVICE.
    - B. JUNCTION BOXES SHALL BE LABELED WITH THE PANEL AND CIRCUIT NUMBER CONTAINED WITHIN. MARKING SHALL BE LEGIBLY HAND-WRITTEN WITH BLACK INDELIBLE MARKER.
    - C. REFER TO SPECIFICATIONS FOR PANELS, DISCONNECT SWITCHES, STARTERS, ETC. NAMEPLATES AND LABELING.

DEMOLITION NOTES (APPLICABLE TO ALL ELECTRICAL DRAWINGS):

1. CONTRACTOR SHALL REMOVE ALL EXISTING EQUIPMENT, DEVICES, ETC. WHERE INDICATED. EXISTING DEVICES NOT DESCRIBED TO BE REMOVED OR NOT SHOWN ON THE DRAWINGS SHALL REMAIN. ALL ASSOCIATED CONDUIT, BOXES, CABLES, ETC. SHALL BE REMOVED TO THEIR POINT OF ORIGIN &/OR DESTINATION, EXCEPT, CONDUITS MAY BE RE-USED IF IN GOOD CONDITION & SUITABLE FOR THE NEW INSTALLATION, &/OR CONCEALED CONDUITS MAY BE LABELED & ABANDONED IN PLACE. EXISTING CABLES SHALL BE REMOVED OR REPLACED. EXISTING FLUSH BOXES SHALL BE PROVIDED WITH SUITABLE COVERS OR WALLPLATES.
2. EXISTING EQUIPMENT, FIXTURES, DEVICES, ETC. TO REMAIN SHALL BE PROTECTED AS REQUIRED DURING DEMOLITION AND CONSTRUCTION.
3. EXISTING CIRCUITS, CONDUITS, CABLES, ETC. INTERRUPTED DUE TO THE PROJECT SHALL BE RE-CONNECTED AS REQUIRED TO MAINTAIN THE CIRCUIT.
4. ALL SURPLUS MATERIAL REMOVED DURING THE DEMOLITION SHALL BE INSPECTED BY THE OWNER, AND THOSE ITEMS SELECTED SHALL REMAIN THE PROPERTY OF THE OWNER. ALL REMAINING SURPLUS MATERIALS SHALL BE REMOVED FROM THE SITE & DISPOSED OF BY THE CONTRACTOR.



NORTH

ELECTRICAL - OVERALL SITE MAP

SCALE: 1" = 30'-0"

ELECTRICAL LEGEND

	STREET LIGHTING POLE MTD. LUMINAIRE (COBRA HEAD)
A	STREET LIGHTING POLE MTD. LUMINAIRE (SHOE BOX) (A = FIXTURE TYPE)
	BELOW GRADE CONDUIT, NEW OR NEW CABLE
	BELOW GRADE CONDUIT, EXISTING
	BRANCH CIRCUIT, ABOVE GRADE, EXPOSED (SLASHES = NO. OF CIRCUIT CONDUCTORS)
	HOMERUN TO LOCATION INDICATED, (TYPICAL)
	GROUND CABLE
	OVERHEAD CABLE
	DUPLEX OUTLET
	SPECIAL PURPOSE OUTLET
J	JUNCTION BOX
H	HAND HOLE
T	TELEPHONE PEDESTAL
F	FIRE ALARM PULL STATION
EX	EXISTING
REX	REPLACE EXISTING WITH NEW
POB	PORT OF BELLINGHAM
PSE	PUGET SOUND ENERGY
CL	CENTURY LINK
WAVE	WAVE BROADBAND
NIC	NOT IN CONTRACT

DEMOLITION

(DASHED LINES INDICATE EXISTING TO BE REMOVED)

	BRANCH CIRCUIT CONDUIT, SURFACE MTD.
	WALL MOUNTED FIXTURE
	PANELBOARD
	DISCONNECT SWITCH
J	JUNCTION BOX

30 0 30 60
SCALE HORIZONTAL SCALE FEET

STEVEN B. TEVEN — STATE OF WASHINGTON — 41903 — REGISTERED PROFESSIONAL ENGINEER — 11/5/2024

APPR.	DATE	DESCRIPTION	REV.

PORT OF BELLINGHAM Washington State

REVISED BY: -
DRAWN BY: KL
DESIGNED BY: STV
PROJECT NUMBER: 2370
REVISION:
DATE: 11/5/2024

K ENGINEERS INC.
208 Third Street
Lynden, WA. 98264
Bus.: (360) 354-4757
FAX (360) 354-6794

ELECTRICAL - OVERALL SITE MAP, LEGEND & NOTES

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:
E-01
SHEET 29 OF 37

WAREHOUSE #9 BLDG

EXISTING MAIN SWITCHBOARD (DISCONNECT VFD/150 HP WINCH MOTOR POWER CIRCUIT PRIOR TO BUILDING DEMOLITION)

EXISTING PSE POWER POLE

EXISTING PRIMARY POWER METER BASE

HARRIS AVENUE PIER

OIL STORAGE CANOPY

DIESEL TANKS

SHIPPING & RECEIVING BLDG

SIDETRACK AREA

EXISTING 4" PVC (REMOVE 4 #4/0 AWG + 1 #4 AWG GND) VFD/150 HP WINCH MOTOR POWER IN WINCH HOUSE.

PAINT SHOP

MAINTENANCE AND FABRICATION SHOP

EXISTING 4" PVC (3 #2 AWG, 15 KV WITH CONCENTRIC GND)

MARINE RAIL AREA

WINCH HOUSE

SEE DETAILS ON DRAWING E-05 & E-06.

EXISTING 4" PVC (REMOVE 3 #2 AWG, 15 KV WITH OUTER CONCENTRIC GND & PROVIDE NEW 3 #2 AWG, 15 KV + 1 #2 AWG 600V GND)

SANDBLAST SHED

EXISTING POB PRIMARY SPLICE VAULT (CONTAINS 15 KV JUNCTIONS & 15 KV ELBOWS. PROVIDE NEW 15 KV ELBOWS ON NEW CABLES)

EXISTING POB PADMOUNT TRANSFORMER

INTERCEPT EXISTING & EXTEND WITH NEW

WATER TREATMENT BUILDING

REMOVE EXISTING 4" PVC (3 #2 AWG, 15 KV WITH OUTER CONCENTRIC GND)

4" PVC (3 #2 AWG, 15 KV + 1 #2 AWG 600V GND)

AST

AST

OFFICE BUILDING

OFFICE BUILDING

RESTROOM TRAILER

STUB PIER

REMOVE EXISTING 1" PVC (ABANDONED CABLES)

REMOVE EXISTING 1½" PVC (4 #2 AWG + 1 #8 AWG GND)

WAREHOUSE

SHED

PAINT BUILDING

CONEX SHED

SEE DETAILS ON DRAWING E-03 & E-04.

EXISTING 2-3" PVC (EACH WITH 3 #500 KCMIL + 1 #1/0 AWG GND)

EXISTING PIER PANEL P & SUPPORT RACK (LIGHTLY SAND, PRIME RUSTY SPOTS & REPAINT PANEL GRAY & SUPPORT RACK YELLOW)

SHIPPING CONTAINER

SEE DRAWING D-01 & PERFORM ELECT. WORK

NORTH

ELECTRICAL - SITE PLAN

SCALE: 1" = 30'-0"

30 0 30 60

SCALE HORIZONTAL SCALE FEET

STEVEN B. TEPPEN — STATE OF WASHINGTON — 41903 — REGISTERED PROFESSIONAL ENGINEER — 11/5/2024

REV.	DESCRIPTION	DATE	APPR.

PORT OF BELLINGHAM — Washington State

K ENGINEERS INC.
208 Third Street
Lynden, WA. 98264
Bus. (360) 354-4757
FAX (360) 354-6794

DESIGNED BY: STV
DRAWN BY: KL
REVISED BY: -
PROJECT NUMBER: 2370
REVISION:
DATE: 11/5/2024

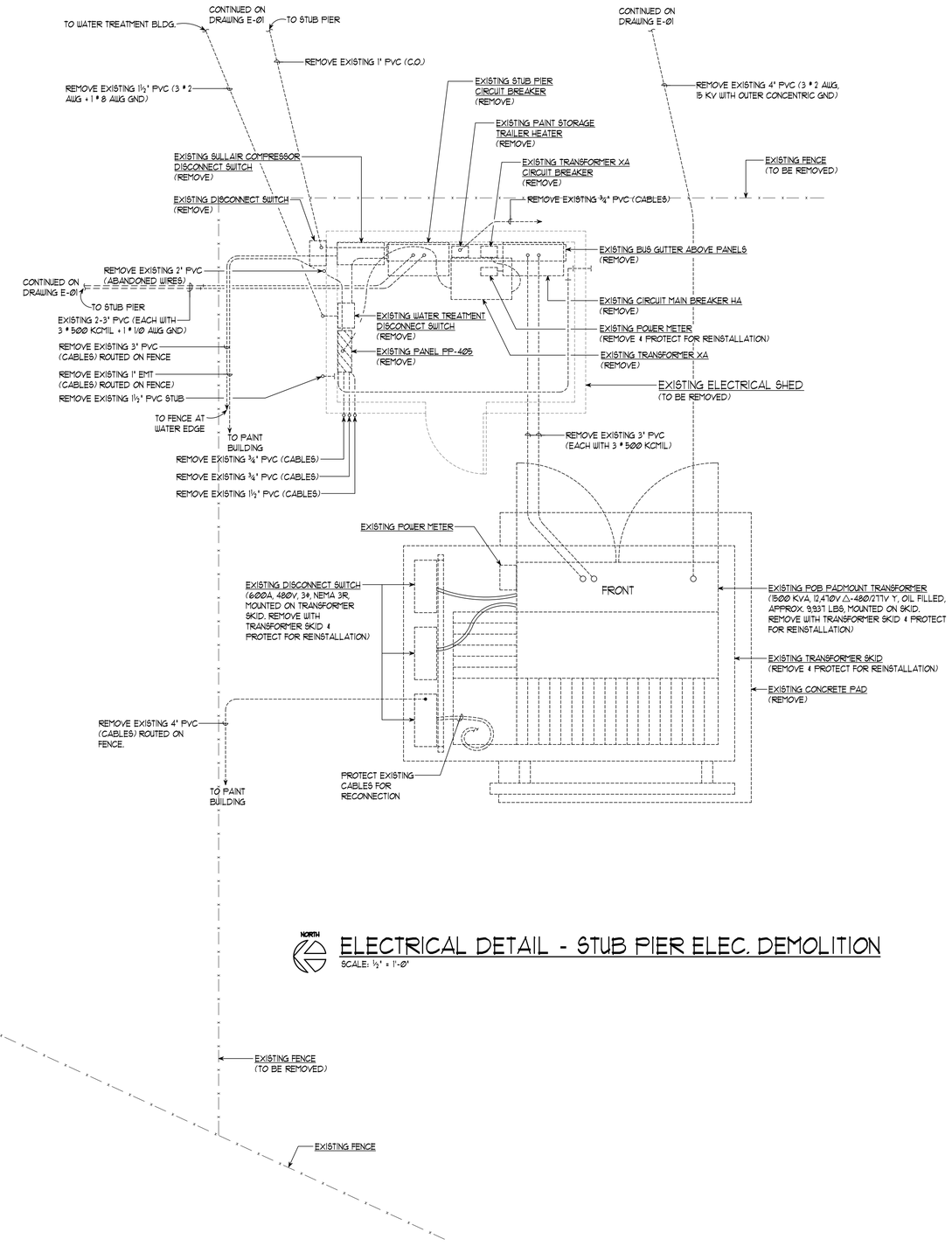
ELECTRICAL - SITE PLAN

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

E-02

SHEET **30** OF **37**



ELECTRICAL DETAIL - STUB PIER ELEC. DEMOLITION

SCALE: ½" = 1'-0"

SCALE 2 0 2 4 FEET
HORIZONTAL SCALE

STEVEN B. TEPLEY — STATE OF WASHINGTON — 41903 — REGISTERED PROFESSIONAL ENGINEER — 11/5/2024

APPR.	DATE	DESCRIPTION	REV.

PORT OF BELLINGHAM — Washington State

DRAWN BY: KL
REVISED BY: -
DESIGNED BY: STV

K ENGINEERS INC.
208 Third Street
Lynden, WA 98264
Bus. (360) 354-4757
FAX (360) 354-6794

PROJECT NUMBER: 2370
REVISION:
DATE: 11/5/2024

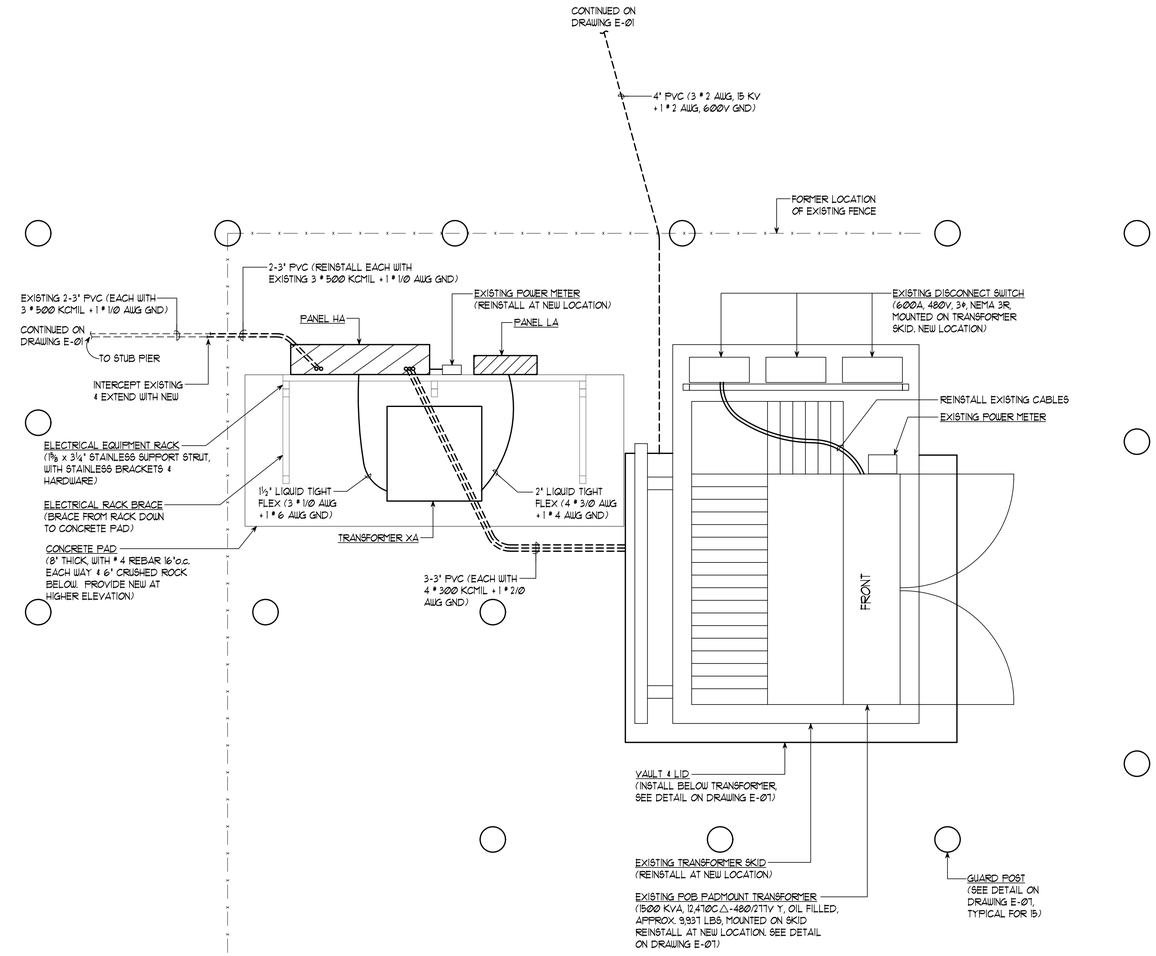
ELECTRICAL - STUB PIER
ELEC., DEMOLITION DETAIL

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

E-03

SHEET **31** OF **37**



NORTH

ELECTRICAL DETAIL - STUB PIER ELEC. RACK, NEW

SCALE: ½" = 1'-0"

SCALE 2 0 2 4 FEET
HORIZONTAL SCALE

STEVEN B. TEPLEY — STATE OF WASHINGTON — 41903 — REGISTERED PROFESSIONAL ENGINEER — 11/5/2024

APPR.	DATE	DESCRIPTION	REV.

PORT OF BELLINGHAM — Washington State

DESIGNED BY: STV
DRAWN BY: KL
REVISED BY: -

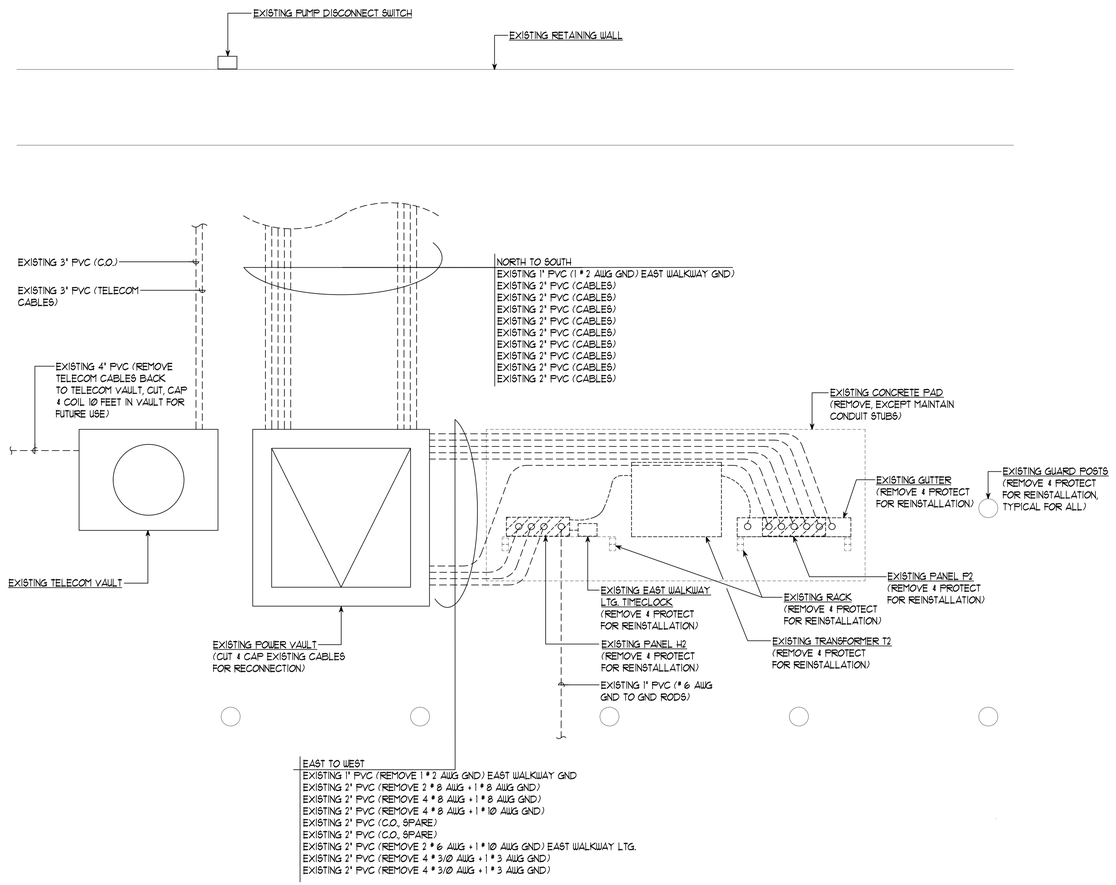
K ENGINEERS INC.
208 Third Street
Lynden, WA. 98264
Bus: (360) 354-4757
FAX (360) 354-6794

PROJECT NUMBER: 2370
REVISION:
DATE: 11/5/2024

ELECTRICAL - STUB PIER
ELEC. RACK, NEW DETAIL

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:
E-04
SHEET 32 OF 37



NORTH

ELECTRICAL DETAIL - MARINE RAIL ELEC. RACK, DEMOLITION

SCALE: ½" = 1'-0"

2 0 2 4
SCALE HORIZONTAL SCALE FEET

STEVEN B. TEPLEY
STATE OF WASHINGTON
41903
REGISTERED PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM
Washington State

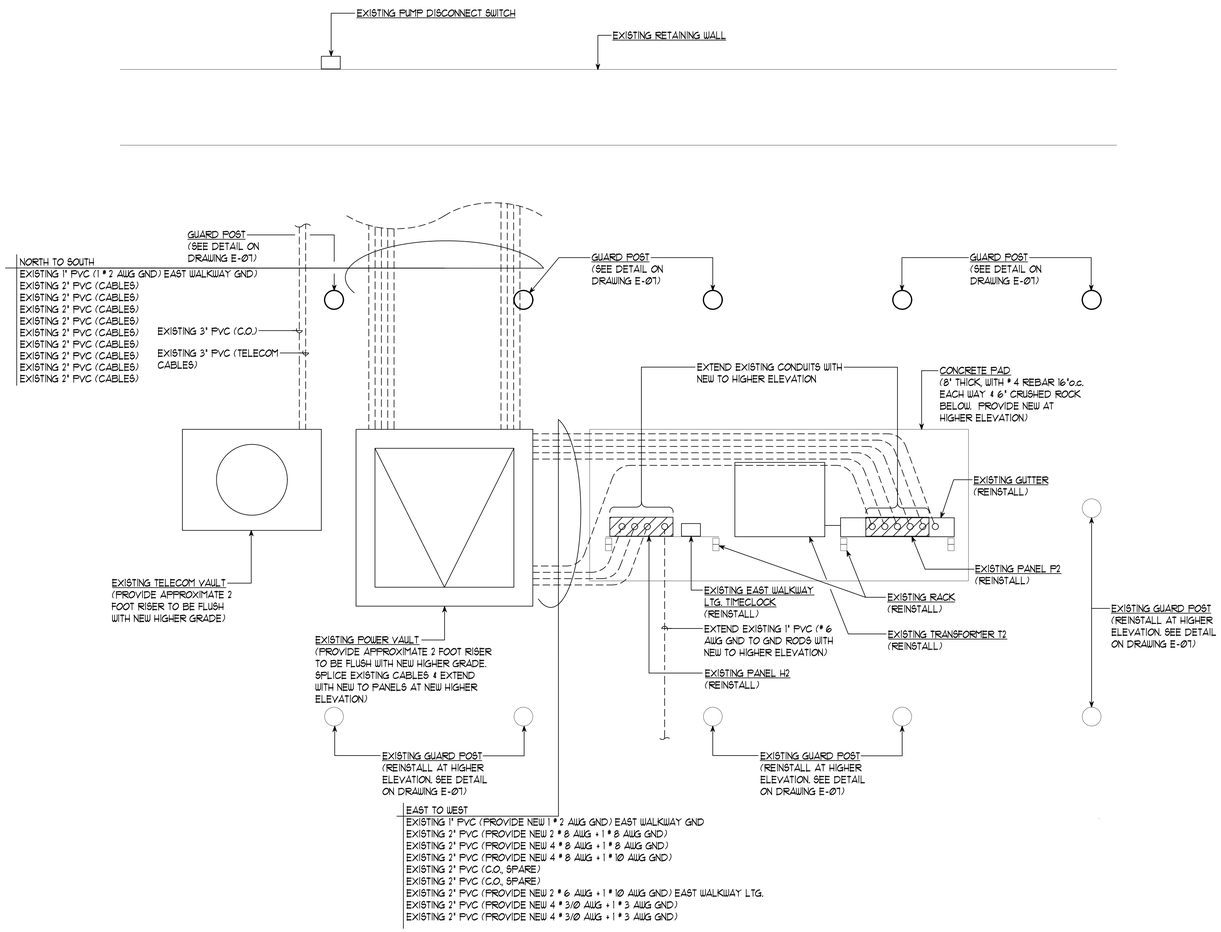
K ENGINEERS INC.
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DATE: 11/5/2024
REVISION:
PROJECT NUMBER: 2370
DESIGNED BY: STV
DRAWN BY: KL
REVISED BY: -

ELECTRICAL - MARINE RAIL
ELEC. RACK, DEMOLITION DETAIL

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:
E-05
SHEET 33 OF 37



NORTH

ELECTRICAL DETAIL - MARINE RAIL ELEC. RACK, NEW

SCALE: ½" = 1'-0"

SCALE 2 0 2 4 FEET
HORIZONTAL SCALE

STEVEN B. TEVEBAUGH
STATE OF WASHINGTON
41903
REGISTERED 11/5/2024
PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM
Washington State

K ENGINEERS INC.
208 Third Street
Lynden, WA. 98264
Bus.: (360) 354-4757
FAX (360) 354-6794

DATE: 11/5/2024
REVISION:
PROJECT NUMBER: 2370
DESIGNED BY: STV
DRAWN BY: KL
REVISED BY: -

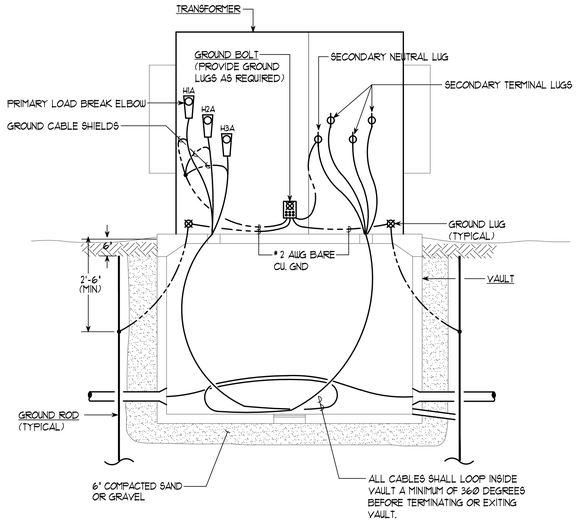
ELECTRICAL - MARINE RAIL
ELEC. RACK NEW DETAIL

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

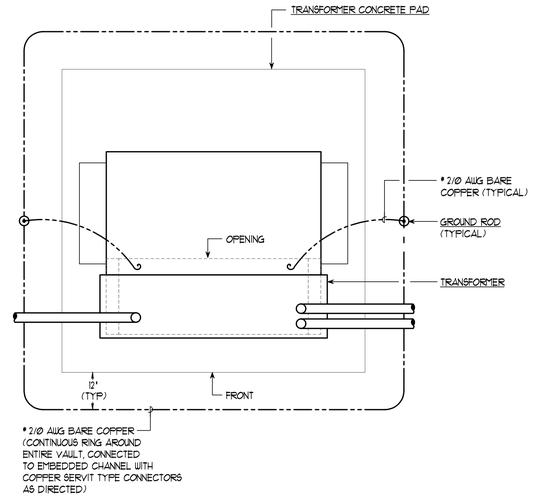
SHEET REFERENCE NUMBER:

E-06

SHEET 34 OF 37



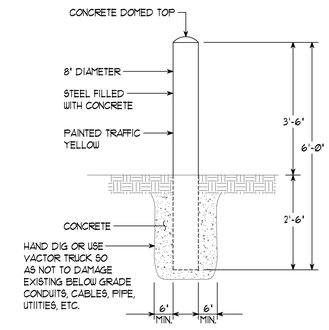
SECTION



PLAN

DETAIL - TYPICAL PRIMARY 3 PHASE PADMOUNTED TRANSFORMER

NO SCALE



DETAIL # 1- GUARD POST

½" = 1'-Ø"

STEVEN B. TEPLEY
STATE OF WASHINGTON
41903
REGISTERED
PROFESSIONAL ENGINEER
11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM
Washington State

DESIGNED BY: STV
DRAWN BY: KL
REVISED BY: -

K ENGINEERS INC.
208 Third Street
Lynden, WA. 98264
Bus: (360) 354-4757
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PROJECT NUMBER: 2370
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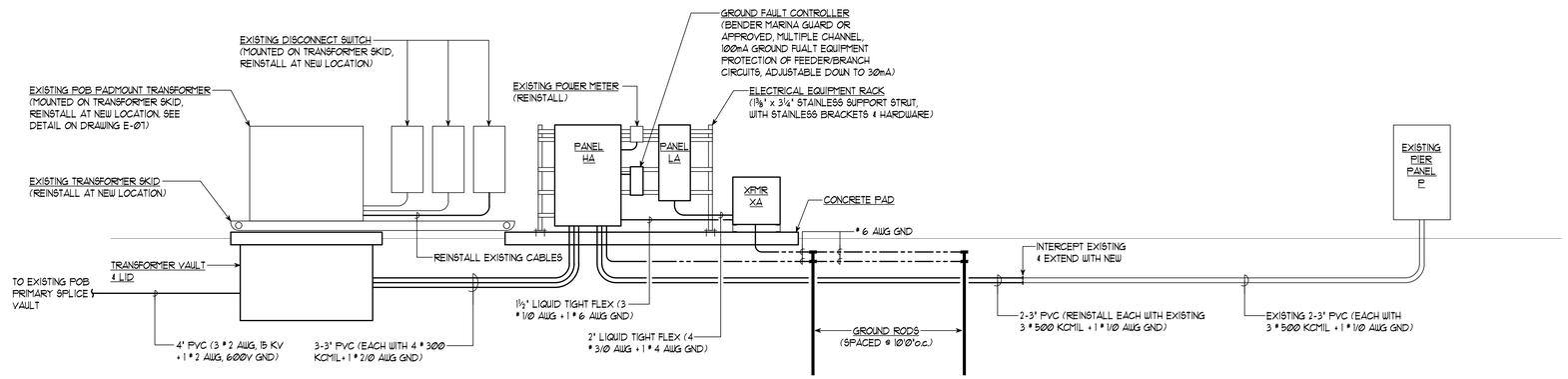
ELECTRICAL - SHED DEMOLITION
& POWER PLAN

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

E-07

SHEET 35 OF 37



ELECTRICAL - STUB PIER POWER RISER DIAGRAM

SCALE: NONE

EXISTING PSE POLE MOUNTED OVERHEAD METERING — HARRIS AVENUE

VOLTAGE: 12,470V, 3 PH, 4 W
ENCLOSURE: NEMA 3R
MOUNTING: SURFACE
CONTINUOUS RATING: 400 A
PER PUGET SOUND ENERGY REQUIREMENTS
SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT

ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA) EXIST.	CONN. LOAD (VA) NEW	CONN. LOAD (VA) TOTAL	DEMAND FACTOR	DEMAND LOAD (VA)
Lighting		0.0	0.0	1.25	0.0
Gen. Purpose Outlets (First 10 KVA)		0.0	0.0	1.00	0.0
Gen. Purpose Outlets (Remainder)		0.0	0.0	0.50	0.0
Special Purpose Outlets		0.0	0.0	1.00	0.0
Mechanical Equipment		0.0	0.0	1.00	0.0
Kitchen Equipment & Appliances		0.0	0.0	1.00	0.0
Miscellaneous		0.0	0.0	1.00	0.0
25% Largest Motor					0.0
Existing PSE Peak Demand Load: (See Note 1 Below)	1759722.2		1759722.2	1.25	2199652.8
TOTAL LOAD	1759722.2	0.0	1759722.2		2199652.8
TOTAL AMPS	81.5	0.0	81.5		101.8

NOTES:
(1) PEAK VA LOAD AS RECORDED BY PSE DEMAND METER FROM SEPTEMBER, 2013 THROUGH APRIL 2014.
METER RECORDS 15 MINUTE AVERAGE DEMAND. PEAK DEMAND OCCURRED IN FEBRUARY 2014.

EXISTING POB PADMOUNTED TRANSFORMER (OWNED BY POB, RECONNECT) — NEAR STUB PIER

KVA: 1500 PHASE: 3
PRIMARY: 12,470V DELTA 95 KV BIL
SECONDARY: 480Y/277V 30 KV BIL
TAPS: 2 @ 2.5% FCAN
2 @ 2.5% FCBN
COOLING: OA
TEMP. RISE: 65C (30C AMBIENT)
TYPE: PADMOUNTED
ENCLOSURE: OUTDOOR, NEMA 3R TAMPER-PROOF
WINDINGS: MANUFACT. STANDARD
HIGH VOLTAGE TERMINATIONS: RADIAL FEED
PRIMARY DISCONNECT: AIR SWITCH, FUSIBLE, 200 AMP
PRIMARY FUSING: CURRENT LIMITING, SIZE AS RECOMMENDED FOR XFMR
MAXIMUM PHYSICAL DIMENSIONS:

ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA) EXIST.	CONN. LOAD (VA) NEW	CONN. LOAD (VA) TOTAL	DEMAND FACTOR	DEMAND LOAD (VA)
Lighting		0.0	0.0	1.25	0.0
Gen. Purpose Outlets (First 10 KVA)		0.0	0.0	1.00	0.0
Gen. Purpose Outlets (Remainder)		0.0	0.0	0.50	0.0
Special Purpose Outlets		0.0	0.0	1.00	0.0
Mechanical Equipment		0.0	0.0	1.00	0.0
Kitchen Equipment & Appliances		0.0	0.0	1.00	0.0
Miscellaneous		0.0	0.0	1.00	0.0
25% Largest Motor					0.0
		0.0	0.0	1.25	0.0
TOTAL LOAD	0.0	0.0	0.0		0.0
TOTAL AMPS (PRIMARY)	0.0	0.0	0.0		0.0
TOTAL AMPS (SECONDARY)	0.0	0.0	0.0		0.0

NEW PANEL HA — ELECTRICAL RACK NEW STUB PIER

VOLTAGE: 480Y/277V, 3 PH, 4 W
TYPE: PANELBOARD
ENCLOSURE: NEMA 3R, STAINLESS
MOUNTING: SURFACE
BUSSING: MANUFACTURER'S STANDARD
CONTINUOUS RATING: 800 A
FULL AIC RATING: 65,000 A
SERIES AIC RATING: NONE
MAIN: CIRCUIT BREAKER
CONTINUOUS RATING: 800 A
FULL AIC RATING: 65,000 A
SERIES AIC RATING: NONE
LOCATION: TOP
FEEDER/BRANCH CIRCUIT DEVICES: BOLT-ON CIRCUIT BREAKERS
FULL AIC RATING: 14,000 A
SERIES AIC RATING: 65,000 A
SPECIAL PROVISIONS:
MASTER NAMEPLATE
GROUND BAR
SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT

ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA) EXIST	CONN. LOAD (VA) NEW	CONN. LOAD (VA) TOTAL	DEMAND FACTOR	DEMAND LOAD (VA)
Lighting	0.0	0.0	0.0	1.25	0.0
Gen. Purpose Outlets (First 10 KVA)	0.0	0.0	0.0	1.00	0.0
Gen. Purpose Outlets (Remainder)	0.0	0.0	0.0	0.50	0.0
Special Purpose Outlets	0.0	0.0	0.0	1.00	0.0
Mechanical Equipment	0.0	0.0	0.0	1.00	0.0
Kitchen Equipment & Appliances	0.0	0.0	0.0	1.00	0.0
Miscellaneous	0.0	0.0	0.0	1.00	0.0
25% Largest Motor					0.0
TOTAL LOAD	0.0	0.0	0.0		0.0
TOTAL AMPS	0.0	0.0	0.0		0.0

CONN. LOAD (VA)	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	BKR AMP/P	CKT NO	BUS (PHASE)	CKT NO	BKR AMP/P	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	CONN. LOAD (VA)
	MAIN CIRCUIT BREAKER									
0.0	SPARE		60/3	1	A	2	SPACE			0.0
0.0			SHUNT	3	B	4	|			0.0
0.0			TRIP	5	C	6	|			0.0
0.0	SPARE		70/3	7	A	8	SPACE			0.0
0.0			SHUNT	9	B	10	|			0.0
0.0			TRIP	11	C	12	|			0.0
0.0	SPARE		100/3	13	A	14	200/3	SPARE		0.0
0.0			SHUNT	15	B	16	SHUNT			0.0
0.0			TRIP	17	C	18	TRIP			0.0
0.0	SPARE		600/3	19	A	20	400/3	SPARE	(1)	0.0
0.0			SHUNT	21	B	22	SHUNT			0.0
0.0			TRIP	23	C	24	TRIP			0.0
0.0	PANEL LA - ELECTRICAL RACK NEAR STUB PIER (VIA TRANSFORMER XA)		125/3	25	A	26	800/3	PANEL P - STUB PIER	(1)	0.0
0.0			|	27	B	28	SHUNT			0.0
0.0			|	29	C	30	TRIP			0.0

NOTES:
(1) SHUNT TRIP BREAKER CONTROLLED BY GROUND FAULT CONTROLLER WITH 100mA GROUND FAULT PROTECTION.

NEW TRANSFORMER XA — ELECTRICAL RACK NEW STUB PIER

KVA: 45 PHASE: 3
PRIMARY: 480 DELTA
SECONDARY: 208Y/120
TAPS: 2 @ 2.5% FCAN
4 @ 2.5% FCBN
COOLING: OA
INSULATION : CLASS 220
TEMP. RISE: 150C (40C AMBIENT)
TYPE: DRY
ENCLOSURE: NEMA 3R, FLOOR MOUNTED
WINDINGS: MANUFACTURER'S STANDARD
SPECIAL PROVISIONS:
MASTER NAMEPLATE
DEPT. OF ENERGY COMPLIANT

ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA) EXIST.	CONN. LOAD (VA) NEW	CONN. LOAD (VA) TOTAL	DEMAND FACTOR	DEMAND LOAD (VA)
Lighting	0.0	0.0	0.0	1.25	0.0
Gen. Purpose Outlets (First 10 KVA)	0.0	0.0	0.0	1.00	0.0
Gen. Purpose Outlets (Remainder)	0.0	0.0	0.0	0.50	0.0
Special Purpose Outlets	0.0	0.0	0.0	1.00	0.0
Mechanical Equipment	0.0	0.0	0.0	1.00	0.0
Kitchen Equipment & Appliances	0.0	0.0	0.0	1.00	0.0
Miscellaneous	0.0	0.0	0.0	1.00	0.0
25% Largest Motor					0.0
TOTAL LOAD	0.0	0.0	0.0		0.0
TOTAL AMPS (PRIMARY)	0.0	0.0	0.0		0.0
TOTAL AMPS (SECONDARY)	0.0	0.0	0.0		0.0

NEW PANEL LA — ELECTRICAL RACK NEW STUB PIER

VOLTAGE: 208Y/120V, 3 PH, 4 W
TYPE: PANELBOARD
ENCLOSURE: NEMA 3R, STAINLESS
MOUNTING: SURFACE
BUSSING: MANUFACTURER'S STANDARD
CONTINUOUS RATING: 225 A
FULL AIC RATING: 10,000 A
SERIES AIC RATING: NONE
MAIN: CIRCUIT BREAKER
CONTINUOUS RATING: 200 A
FULL AIC RATING: 10,000 A
SERIES AIC RATING: NONE
LOCATION: BOTTOM
FEEDER/BRANCH CIRCUIT DEVICES: BOLT-ON CIRCUIT BREAKERS
FULL AIC RATING: 10,000 A
SERIES AIC RATING: NONE
SPECIAL PROVISIONS:
MASTER NAMEPLATE
GROUND BAR
SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT

ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA) EXIST.	CONN. LOAD (VA) NEW	CONN. LOAD (VA) TOTAL	DEMAND FACTOR	DEMAND LOAD (VA)
Lighting	0.0	0.0	0.0	1.25	0.0
Gen. Purpose Outlets (First 10 KVA)	0.0	0.0	0.0	1.00	0.0
Gen. Purpose Outlets (Remainder)	0.0	0.0	0.0	0.50	0.0
Special Purpose Outlets	0.0	0.0	0.0	1.00	0.0
Mechanical Equipment	0.0	0.0	0.0	1.00	0.0
Kitchen Equipment & Appliances	0.0	0.0	0.0	1.00	0.0
Miscellaneous	0.0	0.0	0.0	1.00	0.0
25% Largest Motor					0.0
TOTAL LOAD	0.0	0.0	0.0		0.0
TOTAL AMPS	0.0	0.0	0.0		0.0

CONN. LOAD (VA)	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	BKR AMP/P	CKT NO	BUS (PHASE)	CKT NO	BKR AMP/P	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	CONN. LOAD (VA)
0.0			20/1	1	A	2	20/1			0.0
0.0			20/1	3	B	4	20/1			0.0
0.0			20/1	5	C	6	20/1			0.0
0.0			20/1	7	A	8	20/1			0.0
0.0			20/1	9	B	10	20/1			0.0
0.0			20/1	11	C	12	20/1			0.0
0.0			20/1	13	A	14	20/1			0.0
0.0			20/1	15	B	16	20/1			0.0
0.0			20/1	17	C	18	20/1			0.0
0.0			20/1	19	A	20	20/1			0.0
0.0			20/1	21	B	22	20/1			0.0
0.0			20/1	23	C	24	20/1			0.0
0.0			20/1	25	A	26	20/1			0.0
0.0			20/1	27	B	28	20/1			0.0
0.0			20/1	29	C	30	20/1			0.0
0.0				31	A	32				0.0
0.0			20/2	33	B	34	50/2			0.0
0.0			|	35	C	36	|			0.0
0.0			100/3	37	A	38	30/3			0.0
0.0			|	39	B	40	|			0.0
0.0			|	41	C	42	|			0.0
	MAIN CIRCUIT BREAKER									

EXISTING PANEL P (RECONNECT) — STUB PIER

VOLTAGE: 480Y/277V, 3 PH, 4 W
TYPE: PANELBOARD
SIEMENS, S4
ENCLOSURE: NEMA 3R
MOUNTING: SURFACE
BUSSING: MANUFACTURER'S STANDARD
CONTINUOUS RATING: 800 A
FULL AIC RATING: 65,000 A
SERIES AIC RATING: NONE
MAIN: LUGS ONLY
LOCATION: BOTTOM
FEEDER/BRANCH CIRCUIT DEVICES: BOLT-ON CIRCUIT BREAKERS
FULL AIC RATING: 14,000 A
SERIES AIC RATING: 65,000 A
SPECIAL PROVISIONS:
MASTER NAMEPLATE
GROUND BAR
SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT

ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA) EXIST.	CONN. LOAD (VA) NEW	CONN. LOAD (VA) TOTAL	DEMAND FACTOR	DEMAND LOAD (VA)
Lighting	0.0	0.0	0.0	1.25	0.0
Gen. Purpose Outlets (First 10 KVA)	0.0	0.0	0.0	1.00	0.0
Gen. Purpose Outlets (Remainder)	0.0	0.0	0.0	0.50	0.0
Special Purpose Outlets	0.0	0.0	0.0	1.00	0.0
Mechanical Equipment	0.0	0.0	0.0	1.00	0.0
Kitchen Equipment & Appliances	0.0	0.0	0.0	1.00	0.0
Miscellaneous	0.0	0.0	0.0	1.00	0.0
25% Largest Motor					0.0
TOTAL LOAD	0.0	0.0	0.0		0.0
TOTAL AMPS	0.0	0.0	0.0		0.0

CONN. LOAD (VA)	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	BKR AMP/P	CKT NO	BUS (PHASE)	CKT NO	BKR AMP/P	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	CONN. LOAD (VA)
	MAIN CIRCUIT BREAKER									
0.0	SPARE		300/3	1	A	2		BREAKER ON LEFT EXTENDS INTO THIS SPACE		0.0
0.0			|	3	B	4	|			0.0
0.0			|	5	C	6	|			0.0
0.0	SPARE		300/3	7	A	8		BREAKER ON LEFT EXTENDS INTO THIS SPACE		0.0
0.0			|	9	B	10	|			0.0
0.0			|	11	C	12	|			0.0
0.0	SPARE		300/3	13	A	14		BREAKER ON LEFT EXTENDS INTO THIS SPACE		0.0
0.0			|	15	B	16	|			0.0
0.0			|	17	C	18	|			0.0

K ENGINEERS INC.
208 Third Street
Lynden, WA. 98264
Bus. (360) 354-4757
FAX (360) 354-6794

STEVEN B. TEVEN — STATE OF WASHINGTON — 41903 — REGISTERED PROFESSIONAL ENGINEER — 11/5/2024

REV.	DESCRIPTION	DATE	APPR.
-	-	-	-

PORT OF BELLINGHAM — Washington State

DESIGNED BY: STV
DRAWN BY: KL
REVISED BY: -
PROJECT NUMBER: 2370
REVISION:
DATE: 11/5/2024

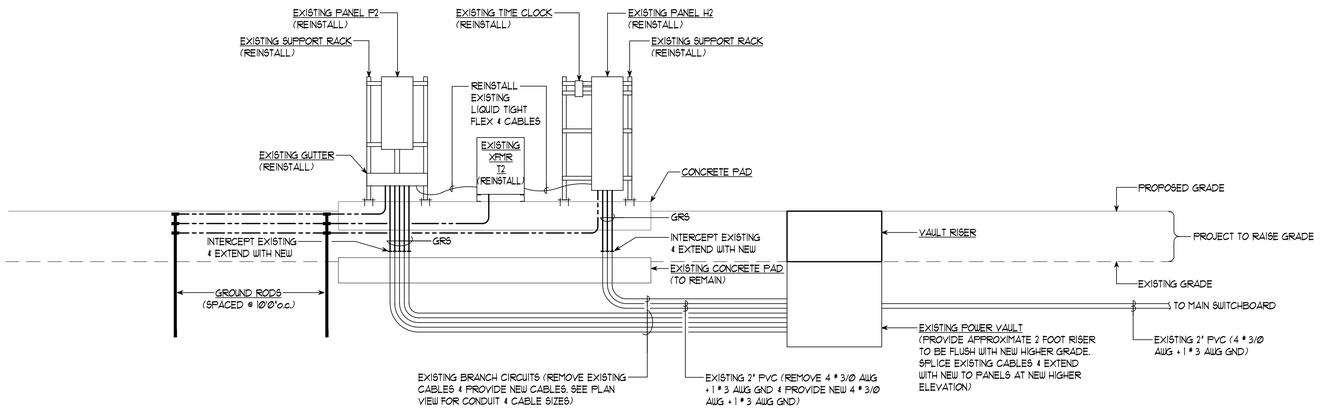
ELECTRICAL - STUB PIER RISER DIAGRAM & PANEL SCHEDULES

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

E-08

SHEET 36 OF 37



ELECTRICAL - MARINE RAIL POWER RISER DIAGRAM

SCALE: NONE

EXISTING PSE PADMOUNTED METER CABINET — NEAR MCI PIER

VOLTAGE: 12,470Y/7200V, 3 PH, 4 W
ENCLOSURE: NEMA 3R
MOUNTING: PADMOUNTED
CONTINUOUS RATING: 600 A
PER PUGET SOUND ENERGY REQUIREMENTS

METER # 203 826 896

ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA) EXIST.	NEW	TOTAL	DEMAND FACTOR	DEMAND LOAD (VA)
Lighting		0.0	0.0	1.25	0.0
Gen. Purpose Outlets (First 10 KVA)		0.0	0.0	1.00	0.0
Gen. Purpose Outlets (Remainder)		0.0	0.0	0.50	0.0
Special Purpose Outlets		0.0	0.0	1.00	0.0
Mechanical Equipment		0.0	0.0	1.00	0.0
Kitchen Equipment & Appliances		0.0	0.0	1.00	0.0
Miscellaneous		0.0	0.0	1.00	0.0
25% Largest Motor					0.0
Existing Load per PSE Billing, May 2013 History = X KW @ 0.9 P.F.	0.0		0.0	1.25	0.0
TOTAL LOAD	0.0	0.0	0.0		0.0
TOTAL AMPS	0.0	0.0	0.0		0.0

NOTES:
(1) PEAK VA LOAD AS RECORDED BY PSE DEMAND METER FROM SEPTEMBER, 2013 THROUGH APRIL 2014. METER RECORDS 15 MINUTE AVERAGE DEMAND. PEAK DEMAND OCCURRED IN FEBRUARY 2014.

EXISTING PADMOUNTED TRANSFORMER (OWNED BY POB) — NEAR MCI PIER

KVA: 1500 PHASE: 3
PRIMARY: 12,470V DELTA 95 KV BIL
SECONDARY: 480Y/277V 30 KV BIL
TAPS: 2 @ 2.5% FCAN, 2 @ 2.5% FCBN
COOLING: OA
TEMP. RISE: 65C (30C AMBIENT)
TYPE: PADMOUNTED
ENCLOSURE: OUTDOOR, NEMA 3R TAMPER-PROOF
WINDINGS: MANUFACT. STANDARD

HIGH VOLTAGE TERMINATIONS: RADIAL FEED
PRIMARY DISCONNECT: AIR SWITCH, FUSIBLE, 200 AMP
PRIMARY FUSING: CURRENT LIMITING, SIZE AS RECOMMENDED FOR XFMR
MAXIMUM PHYSICAL DIMENSIONS:

ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA) EXIST.	NEW	TOTAL	DEMAND FACTOR	DEMAND LOAD (VA)
Lighting		0.0	0.0	1.25	0.0
Gen. Purpose Outlets (First 10 KVA)		0.0	0.0	1.00	0.0
Gen. Purpose Outlets (Remainder)		0.0	0.0	0.50	0.0
Special Purpose Outlets		0.0	0.0	1.00	0.0
Mechanical Equipment		0.0	0.0	1.00	0.0
Kitchen Equipment & Appliances		0.0	0.0	1.00	0.0
Miscellaneous		0.0	0.0	1.00	0.0
25% Largest Motor					0.0
		0.0	0.0	1.25	0.0
TOTAL LOAD	0.0	0.0	0.0		0.0
TOTAL AMPS (PRIMARY)	0.0	0.0	0.0		0.0
TOTAL AMPS (SECONDARY)	0.0	0.0	0.0		0.0

EXISTING MAIN SWITCHBOARD MDP — UPLAND, NEAR MCI PIER

VOLTAGE: 480Y/277V, 3 PH, 4 W
TYPE: SWITCHBOARD
ENCLOSURE: NEMA 3R
MOUNTING: SURFACE/FLOOR
BUSSING: MANUFACTURER'S STANDARD, CONTINUOUS RATING: 1800 A, FULL AIC RATING: 65,000 A, SERIES AIC RATING: NONE
MAIN: CIRCUIT BREAKER, CONTINUOUS RATING: 1800 A, FULL AIC RATING: 65,000 A, GROUND FAULT PROTECTION

FEEDER/BRANCH CIRCUIT DEVICES: BOLT-ON CIRCUIT BREAKERS, FULL AIC RATING: 65,000 A, SERIES AIC RATING: NONE
SPECIAL PROVISIONS: MASTER NAMEPLATE, GROUND BAR, SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT

ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA) EXIST.	NEW	TOTAL	DEMAND FACTOR	DEMAND LOAD (VA)
Lighting	0.0	0.0	0.0	1.25	0.0
Gen. Purpose Outlets (First 10 KVA)	0.0	0.0	0.0	1.00	0.0
Gen. Purpose Outlets (Remainder)	0.0	0.0	0.0	0.50	0.0
Special Purpose Outlets	0.0	0.0	0.0	1.00	0.0
Mechanical Equipment	0.0	0.0	0.0	1.00	0.0
Kitchen Equipment & Appliances	0.0	0.0	0.0	0.65	0.0
Miscellaneous	0.0	0.0	0.0	1.00	0.0
25% Largest Motor					0.0
TOTAL LOAD	0.0	0.0	0.0		0.0
TOTAL AMPS	0.0	0.0	0.0		0.0

MAIN CIRCUIT BREAKER (LEFT SECTION)

DISTRIBUTION SECTION (RIGHT SECTION)

CONN. LOAD (VA)	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	BKR AMP/P	CKT NO	BUS (PHASE)	CKT NO	BKR AMP/P	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	CONN. LOAD (VA)
0.0	SURGE ARRESTOR		60/3	1	A	2	200/3	PANEL H1		0.0
0.0			|	|	B	|	|			0.0
0.0			|	|	C	|	|			0.0
0.0	SHORE POWER STATION 1		225/3	3	A	4	70/3	PANEL P1 (VIA XFMR T1)		0.0
0.0			|	|	B	|	|			0.0
0.0			|	|	C	|	|			0.0
0.0	SHORE POWER STATION 2		225/3	5	A	6	400/3	PANEL H2		0.0
0.0			|	|	B	|	|			0.0
0.0			|	|	C	|	|			0.0
0.0	SHORE POWER STATION 3		225/3	7	A	8	400/3	PANEL H3		0.0
0.0			|	|	B	|	|			0.0
0.0			|	|	C	|	|			0.0
0.0	SHORE POWER STATION 4		225/3	9	A	10	225/3	TO VFD/150HP MOTOR IN WINCH BUILDING	(1)	0.0
0.0			|	|	B	|	|			0.0
0.0			|	|	C	|	|			0.0
0.0	SHORE POWER STATION 5		225/3	11	A	12	SPACE			0.0
0.0			|	|	B	|				0.0
0.0			|	|	C	|				0.0
0.0	SHORE POWER STATION 6		225/3	13	A	14	SPACE			0.0
0.0			|	|	B	|				0.0
0.0			|	|	C	|				0.0
0.0	SHORE POWER STATION 7		225/3	15	A	16	SPACE			0.0
0.0			|	|	B	|				0.0
0.0			|	|	C	|				0.0
0.0	SHORE POWER STATION 8		225/3	17	A	18	SPACE			0.0
0.0			|	|	B	|				0.0
0.0			|	|	C	|				0.0

NOTES:
(1) REMOVE EXISTING CIRCUIT AND MAKE CIRCUIT BREAKER SPARE.

EXISTING PANEL H2 (REMOVE & REINSTALL) — EQUIPMENT RACK NEAR MARINE RAIL

VOLTAGE: 480Y/277V, 3 PH, 4 W
TYPE: PANELBOARD, SIEMENS, P1
ENCLOSURE: NEMA 3R
MOUNTING: SURFACE
BUSSING: MANUFACTURER'S STANDARD, CONTINUOUS RATING: 400 A, FULL AIC RATING: 65,000 A, SERIES AIC RATING: NONE
MAIN: CIRCUIT BREAKER, CONTINUOUS RATING: 400 A, FULL AIC RATING: 65,000 A, SERIES AIC RATING: NONE, LOCATION: BOTTOM

FEEDER/BRANCH CIRCUIT DEVICES: BOLT-ON CIRCUIT BREAKERS, FULL AIC RATING: 65,000 A, SERIES AIC RATING:
SPECIAL PROVISIONS: MASTER NAMEPLATE, GROUND BAR

ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA) EXIST.	NEW	TOTAL	DEMAND FACTOR	DEMAND LOAD (VA)
Lighting	0.0	0.0	0.0	1.25	0.0
Gen. Purpose Outlets (First 10 KVA)	0.0	0.0	0.0	1.00	0.0
Gen. Purpose Outlets (Remainder)	0.0	0.0	0.0	0.50	0.0
Special Purpose Outlets	0.0	0.0	0.0	1.00	0.0
Mechanical Equipment	0.0	0.0	0.0	1.00	0.0
Kitchen Equipment & Appliances	0.0	0.0	0.0	1.00	0.0
Miscellaneous	0.0	0.0	0.0	1.00	0.0
25% Largest Motor					0.0
TOTAL LOAD	0.0	0.0	0.0		0.0
TOTAL AMPS	0.0	0.0	0.0		0.0

CONN. LOAD (VA)	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	BKR AMP/P	CKT NO	BUS (PHASE)	CKT NO	BKR AMP/P	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	CONN. LOAD (VA)
0.0	LTG - WALKWAY		20/1	1	A	2	20/1	SPARE		0.0
0.0	LCP #2		20/1	3	B	4	20/1	SPARE		0.0
0.0			SPACE	5	C	6	20/1	SPARE		0.0
0.0			SPACE	7	A	8	20/1	SPARE		0.0
0.0			SPACE	9	B	10	20/1	SPARE		0.0
0.0			SPACE	11	C	12	20/1	SPARE		0.0
0.0			SPACE	13	A	14	20/1	SPARE		0.0
0.0			SPACE	15	B	16	SPACE			0.0
0.0			SPACE	17	C	18	SPACE			0.0
0.0			SPACE	19	A	20	SPACE			0.0
0.0			SPACE	21	B	22	SPACE			0.0
0.0			SPACE	23	C	24	SPACE			0.0
0.0			SPACE	25	A	26	70/3	PANEL P2 - ELECTRICAL RACK (VIA TRANSFORMER X2)		0.0
0.0			SPACE	27	B	28	|			0.0
0.0			SPACE	29	C	30	|			0.0

MAIN CIRCUIT BREAKER

EXISTING TRANSFORMER X2 (REMOVE & REINSTALL) — EQUIPMENT RACK NEAR MARINE RAIL

KVA: 45 PHASE: 3
PRIMARY: 480 DELTA
SECONDARY: 208Y/120
TAPS: 2 @ 2.5% FCAN, 4 @ 2.5% FCBN
COOLING: OA
INSULATION: CLASS 220
TEMP. RISE: 150C (40C AMBIENT)
TYPE: DRY
ENCLOSURE: NEMA 3R
MOUNTING: FLOOR
WINDINGS: MANUFACTURER'S STANDARD
SPECIAL PROVISIONS: MASTER NAMEPLATE

ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA) EXIST.	NEW	TOTAL	DEMAND FACTOR	DEMAND LOAD (VA)
Lighting	0.0	0.0	0.0	1.25	0.0
Gen. Purpose Outlets (First 10 KVA)	0.0	0.0	0.0	1.00	0.0
Gen. Purpose Outlets (Remainder)	0.0	0.0	0.0	0.50	0.0
Special Purpose Outlets	0.0	0.0	0.0	1.00	0.0
Mechanical Equipment	0.0	0.0	0.0	1.00	0.0
Kitchen Equipment & Appliances	0.0	0.0	0.0	1.00	0.0
Miscellaneous	0.0	0.0	0.0	1.00	0.0
25% Largest Motor					0.0
TOTAL LOAD	0.0	0.0	0.0		0.0
TOTAL AMPS (PRIMARY)	0.0	0.0	0.0		0.0
TOTAL AMPS (SECONDARY)	0.0	0.0	0.0		0.0

EXISTING PANEL P2 (REMOVE & REINSTALL) — EQUIPMENT RACK NEAR MARINE RAIL

VOLTAGE: 208Y/120V, 3 PH, 4 W
TYPE: PANELBOARD, SIEMENS, P2
ENCLOSURE: NEMA 3R
MOUNTING: SURFACE
BUSSING: MANUFACTURER'S STANDARD
MAIN: LUGS ONLY, LOCATION: BOTTOM

FEEDER/BRANCH CIRCUIT DEVICES: BOLT-ON CIRCUIT BREAKERS, FULL AIC RATING: 10,000 A, SERIES AIC RATING: NONE
SPECIAL PROVISIONS: MASTER NAMEPLATE, GROUND BAR, SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT

ELECTRICAL LOAD CALCULATION	CONN. LOAD (VA) EXIST.	NEW	TOTAL	DEMAND FACTOR	DEMAND LOAD (VA)
Lighting	0.0	0.0	0.0	1.25	0.0
Gen. Purpose Outlets (First 10 KVA)	0.0	0.0	0.0	1.00	0.0
Gen. Purpose Outlets (Remainder)	0.0	0.0	0.0	0.50	0.0
Special Purpose Outlets	0.0	0.0	0.0	1.00	0.0
Mechanical Equipment	0.0	0.0	0.0	1.00	0.0
Kitchen Equipment & Appliances	0.0	0.0	0.0	1.00	0.0
Miscellaneous	0.0	0.0	0.0	1.00	0.0
25% Largest Motor					0.0
TOTAL LOAD	0.0	0.0	0.0		0.0
TOTAL AMPS	0.0	0.0	0.0		0.0

CONN. LOAD (VA)	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	BKR AMP/P	CKT NO	BUS (PHASE)	CKT NO	BKR AMP/P	FEEDER/BRANCH CIRCUIT DESCRIPTION	NOTE	CONN. LOAD (VA)
0.0	OUTLETS - EAST WALKWAY		20/1	1	A	2	SPACE			0.0
0.0	OUTLETS - EAST WALKWAY		20/1	3	B	4	SPACE			0.0
0.0	OUTLETS - WEST WALKWAY		20/1	5	C	6	SPACE			0.0
0.0	OUTLETS - YARD DUMP		30/2	7	A	8	SPACE			0.0
0.0			|	9	B	10	SPACE			0.0
0.0			SPACE	11	C	12	SPACE			0.0
0.0			SPACE	13	A	14	SPACE			0.0
0.0			SPACE	15	B	16	SPACE			0.0
0.0			SPACE	17	C	18	SPACE			0.0
0.0			SPACE	19	A	20	20/1	SPARE		0.0
0.0			SPACE	21	B	22	20/1	SPARE		0.0
0.0			SPACE	23	C	24	20/1	SPARE		0.0
0.0			SPACE	25	A	26	20/1	SPARE		0.0
0.0			SPACE	27	B	28	20/1	SPARE		0.0
0.0			SPACE	29	C	30	20/1	SPARE		0.0

MAIN LUGS

STEVEN B. TEVEN — STATE OF WASHINGTON — 41903 — REGISTERED PROFESSIONAL ENGINEER — 11/5/2024

APPR.	DATE	DESCRIPTION	REV.

PORT OF BELLINGHAM — Washington State

REVISED BY: -
DRAWN BY: KL
DESIGNED BY: STV

K ENGINEERS INC.
208 Third Street
Lynden, WA. 98264
Bus.: (360) 354-4757
FAX (360) 354-6794

PROJECT NUMBER: 2370
REVISION:
DATE: 11/5/2024

ELECTRICAL - MARINE RAIL RISER DIAGRAM & PANEL SCHEDULES

UPLAND CLEANUP ACTION
HARRIS AVENUE SHIPYARD
BELLINGHAM, WASHINGTON

SHEET REFERENCE NUMBER:

E-09

SHEET 37 OF 37

EXHIBIT A

“Contract” (form of)

PROJECT: **DATE OF BID OPENING:**

CONTRACT

THIS CONTRACT, made and entered into this _____, by and between the **PORT OF BELLINGHAM**, of P.O. Box 1677, Bellingham, Washington, 98227-1677, a municipal corporation, hereinafter referred to as **Owner**, and XXXXXXXXXXXXXXXXXXXXXX of XXXXXXXXXXXXXX, hereinafter called the **Contractor**.

W I T N E S S E T H:

1. **Contractor** shall furnish all of the material and perform all of the work and labor for the above named project in accordance with the Contract as defined in the Bid Solicitation and Division 1 of the M 41-10 Standard Specifications for Road, Bridge, and Municipal Construction (the "WSDOT Specifications"). The Bid Solicitation and WSDOT Specifications are fully incorporated herein by reference.

2. **Owner** shall pay **Contractor** per the following schedule:

   2.1 **Contractor** shall complete the work heretofore called for as depicted in the Contract, and **Owner**, pursuant to law, reserves the right to hold retainage in accordance with RCW 60.28.

3. **Contractor** agrees to the following anticipated construction schedule.

4. **Contractor** agrees to keep the property free from liens of any kind whatsoever and to defend and hold **Owner** harmless from any claims of third parties for damages suffered by third parties as a result of Contractor's activities in connection with the performance of this Contract.

5. **Prevailing Wage Law**. Before any payment is made of any sum or sums due, **Contractor** and any or all **subcontractors** must file and receive an approved Intent form from the Industrial Statistician, certifying the rate of hourly wage paid each classification of laborer or workman employed by them on such work and further certifying that no laborer or workman employed by them for this work has been paid less than the prevailing wage rate in Whatcom County, which certificate and statement to be so filed will be verified by the oath of the **Contractor** or **subcontractor,** as the case may be, that they have read such statement and certificate subscribed by them, knows the contents thereof, and that the same is true as they verily believe.

   In case a dispute arises as to the prevailing wage rates for work of a similar nature and such dispute cannot be adjusted by the parties involved, the matter shall be referred to the Director of the Department of Labor and Industries of the State of Washington for arbitration, and their decision shall be final and conclusive and binding upon all parties involved in the dispute.

   Contractor acknowledges their familiarity with R.C.W. 39.12 as the same pertains to payment of prevailing wages and agrees to comply therewith. The Contractor shall be responsible for the compliance with the requirements of Prevailing Wage Law by all firms (including subcontractors, lower tier subcontractors, suppliers, manufacturers and

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fabricators) engaged in any part of the work necessary to complete this Contract.

6. **Contractor** agrees to furnish **Owner** all bonds required in the Specifications heretofore mentioned within the timeframe specified in the bid documents and the Notice of Award. To the extent that this provision conflicts with WSDOT Section 1-03.3, this section controls.

7. The **Contractor** shall receive no compensation for delays or hindrances to the work, except when direct and unavoidable extra cost to the **Contractor** is caused by the failure of the **Owner** to provide information or material, if any, which is to be furnished by the **Owner**. When such extra compensation is claimed, a written statement thereof providing specific detail of the basis for the claim shall be presented by the **Contractor** to the Engineer and if found correct by them shall be approved and referred by them to the Port Commission for final approval or disapproval; and the action thereon by the Port Commission shall be final and binding.

8. **Certification of Non-Segregated Facilities** (*for Federally assisted projects*). The Contractor agrees by signature herein below that he is deemed to have signed and agreed to the provisions of certification of non-segregated facilities which is included as an Exhibit to the Bid Solicitation package and made part hereof.

9. **Equal Employment Opportunity Responsibilities.** The Contractor shall fully comply with all applicable state and federal employment and discrimination laws and regulations. Contractor shall assure, by signing this Contract, to fully comply with all equal employment opportunity as required by Executive Order 11246 and 11375, including all regulations promulgated thereto.

10. **Conflict of Interest**

Contractor covenants that it presently has no interest and shall not acquire an interest, directly or indirectly, which would conflict in any manner or degree with its performance under this Contract. Contractor further covenants that in the performance of this Contract, no person having such interest shall be employed by it or any of its sub-contractors.

11. **Indemnification.** To the fullest extent permitted by law and to the extent claims, damages or losses or expenses are not covered by insurance purchased by Contractor, the Contractor shall defend and indemnify the Owner and Owner's employees and Commissioners from any claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of, or resulting from the performance of, the Work, but only to the extent caused by the acts or omissions of the Contractor, a subcontractor or supplier, or anyone directly or indirectly employed by them or anyone for whose acts they may be liable.

11.1 This indemnification obligation shall include, but is not limited to, all claims against the Owner by an employee or former employee of the Contractor or any subcontractor or supplier. For this purpose, the Contractor expressly waives, as respects the Owner only, all immunity and limitation on liability under any industrial insurance Act, including Title 51 RCW, or other workers compensation act, disability act, or other employees benefits of any act of any jurisdiction which would otherwise be applicable in the case of such a claim. **BY INITIALING BELOW THE OWNER AND CONTRACTOR CERTIFY THE WAIVER OF IMMUNITY SPECIFIED BY THIS PROVISION WAS MUTUALLY NEGOTIATED.**

_____ _____

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12. **Obligation to Report Employees Who Used Early Retirement Factors; Liability for Failure to Report.** The Port is an employer of one or more members of the Washington State Department of Retirement Systems (DRS). As a DRS covered employer, the Port is required to advise DRS of any retiree performing services for the Port who has used the 2008 Early Retirements Factors (ERFs) to retire early and is under age 65. Workers meeting these factors cannot perform services in any capacity for a DRS-covered employer and continue to receive a pension benefit (WAC 415-02-325).

    Concurrently with the execution of this Contract and prior to commencing work, Contractor shall verify if any person who will be performing work on this project retired from a DRS employer using ERFs. Contractor must report any such persons to the Port by: (1) completing the DRS Contractor or Third-Party Worker Retirement Status Verification form that can be downloaded by following this link (https://www.portofbellingham.com/DocumentCenter/View/9921/DRS_StatusForm) and (2) emailing it to payroll@portofbellingham.com or mailing it to Port of Bellingham Payroll at 1801 Roeder Ave, Suite 146 – Bellingham, WA 98225.

    If Contractor fails to timely report any employee who used ERFs to the Port in accordance with this section, Contractor shall be liable for all assessments issued to the Port by DRS and all legal fees and costs incurred by the Port in connection with such assessment. Contractor agrees that the Port may deduct such amounts from any amounts that may be owed to Contractor. Any additional amounts owed will be paid to the Port within fifteen (15) days of receiving an invoice from the Port.

13. **Successors and Assigns.** This Contract shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns. The representations and warranties contained herein shall survive the termination of this Contract. No other promises, representations or warranties shall be valid and binding unless they are reduced to writing and signed by the parties hereto. No amendment to this Contract shall be valid unless reduced to writing and signed by the parties hereto.

    IN WITNESS WHEREOF, the parties hereto have executed this CONTRACT in duplicate the day and year first above written.

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XXXXXXXXXXXXXXXXXXXXX

By: _____

_____
Print name and Title

Date signed: _____

PORT OF BELLINGHAM By:

_____

Tiffany Desimone, Interim Exec Director
Print Name and Title

Date signed: _____

EXHIBIT B

“PAYMENT AND PERFORMANCE BOND”

Form S.F. 352 (3.94)	Port of Bellingham PAYMENT AND PERFORMANCE BOND	Date Bond Executed

See Instructions to Bidders

NOTE: Type or Print in Ink

Principal (Legal Name and Business Address)	Type of Organization (Check One) ☐ Individual ☐ Partnership ☐ Joint Venture ☐ Corporation
Surety(ies) (Name(s) and Business Address(es))	Contract Date / Contract Number
	Sum Amount of bond (Including State Sales Tax) Dollars
	($)

We, the Principal and Surety(ies), in accordance with the Revised Code of Washington, are firmly bound and obligated to the Port of Bellingham in the above sum amount on conditions set forth below, for the payment of which we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH, that the Principal entered into the contract identified above.

THE ABOVE OBLIGATION shall be void and of no effect if the Principal performs and fulfills all the provisions of such contract and any extensions or modifications thereof that may be made by the Port of Bellingham, and faithfully pays all laborers, mechanics and subcontractors and materialmen, and all persons who shall supply such person or persons, or subcontractors, with materials and supplies for the carrying on of such work and shall indemnify the Port of Bellingham against any loss or damage directly due to the failure of the Principal to faithfully perform the contract identified above.

IN WITNESS WHEREOF, the Principal and Surety(ies) have executed this payment and performance bond and have affixed their signatures and seals on the date set forth above.

1. Name of Principal and Title	Phone No.	Signature	L.S. *(Corporate Seal)*
2.			

Surety A	Name and Address		Liability Limit	L.S. *(Corporate Seal)*
	1. Name and Title (Attorney in Fact)	Phone No.	Signature	
	2. Name and Title (Resident Agent	Phone No.	Signature	
Surety B	Name and Address		Liability Limit	L.S. *(Corporate Seal)*
	1. Name and Title (Attorney in Fact)	Phone No.	Signature	
	2. Name and Title (Resident Agent	Phone No.	Signature	

EXHIBIT C

WAGE LAWS COMPLIANCE CERTIFICATION

(RCW 39.04.350)

I,_____,
[PRINT NAME AND TITLE OF PERSON SIGNING THIS FORM]

do certify and declare that the bidder is in compliance with RCW 39.04.350(1)(g) and that within the three (3) year period immediately preceding the date of this bid, the bidder has not been determined by a final and binding citation and notice of assessment issued by the department of labor and industries or through a civil judgement entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of chapter 49.46, chapter 49.48, or chapter 49.52 RCW.

Executed under penalty of perjury under the laws of the State of Washington at

_____ on _____
[PRINT CITY AND STATE WHERE SIGNED] *[PRINT DATE SIGNED]*

_____
[PRINT NAME OF PROJECT]

_____
[PRINT FULL NAME OF COMPANY SUBMITTING BID]

_____
[SIGNATURE]

EXHIBIT D

PREVAILING WAGE RATES

The rate of wages to be paid to all workmen, laborers or mechanics employed in the performance of any part of this contract shall be in accordance with the provisions of CHAPTER 39.12 R.C.W., as amended, and the rules and regulations of the Department of Labor and Industries.

The project site is located in **Whatcom County**.

The effective date for prevailing wages on this project will be the prime contractor's **Quote Due Date** with these exceptions:

- If the project is not awarded within six (6) months of the quote due date, the award date is the effective date.
- If the project is not awarded pursuant to quotes, the award date (the date the contract is executed) is the effective date.
- Janitorial contracts follow WAC 296-127-023.

Except for janitorial contracts, the rates in effect on the quote due date shall apply for the duration of the contract (unless otherwise noted in the solicitation).

Look up the prevailing rates of pay, benefit, and overtime codes from this link:
https://secure.lni.wa.gov/wagelookup/

For prevailing wage questions, contact the Dept. of Labor and Industries at PW1@Lni.wa.gov or 360-902-5335.

A copy of the Prevailing Wage Rates are available for viewing at the Port of Bellingham's Administrative Offices at 1801 Roeder Ave – Bellingham WA, 98225. Please contact the Port's Contracts Administrator for additional information or to obtain a hard copy by mail.

Each contractor performing work on the project shall keep accurate Certified Payroll records for three (3) years from the date of acceptance of the public works project in complete compliance with WAC 296-127-320. It is the responsibility of the Contractor to collect and maintain Certified Payroll records from Sub-Contractors and provide upon request.

EXHIBIT E

"STATEMENT OF SUBCONTRACTORS"

Each Bidder must designate in its bid, or within one (1) hour after the published bid submittal time, the names of the Subcontractors with whom the Bidder, if awarded the Contract, will subcontract for performance of the work for (i) HVAC (heating, ventilation, and air conditioning), (ii) plumbing as described in chapter 18.106 RCW, and (iii) electrical as described in chapter 19.28 RCW, **or name itself for such work**.

Additionally, each Bidder must designate in its bid, or within forty-eight (48) hours after the published bid submittal time, the names of the Subcontractors with whom the Bidder, if awarded the Contract, will subcontract for performance of the work for (1) structural steel installation and (ii) rebar installation, **or name itself for such work**. The bidder shall not list more than one (1) subcontractor for each category of work identified, unless subcontractors vary with bid alternates, in which case the Bidder must indicate which Subcontractor will be used for which alternate.

Failure to name such Subcontractors (or to name itself to perform such work) or the naming of two or more Subcontractors to perform the same work shall render the Bidder's bid non-responsive and cause it to be rejected.

HVAC	**Name and Address of Subcontractor**
	_____
	_____
	_____

Plumbing	**Name and Address of Subcontractor**
	_____
	_____
	_____

Electrical	**Name and Address of Subcontractor**
	_____
	_____
	_____

Structural Steel Installation	**Name and Address of Subcontractor**
	_____
	_____
	_____

Rebar Installation	**Name and Address of Subcontractor**
	_____
	_____
	_____

_____
Bidder

_____
By

_____
Title

_____
Date

In addition to the requirements of RCW 39.30.060, further reporting of subcontractors will be required of the successful responsible bidder submitting the lowest responsive bid.

APPRENTICE UTILIZATION

Intent: *As a material part of this Contract, this exhibit includes the requirements, process, and procedures associated with the utilization of apprentices on this Contract. These requirements are in addition to the requirements that may be found elsewhere in the Contract.*

1. APPRENTICE UTILIZATION REQUIREMENT

The Contractor must ensure that **15 percent** of the total Contract Labor Hours used on the project are performed by apprentices registered in a state-approved training program. This requirement must be included in any subcontract at any tier on the Project.

Total Contract labor hours include additional hours worked because of Change Orders, and exclude hours worked by foremen, superintendents, supervisors, owners, and workers who are not subject to prevailing wage requirements.

However, it may be determined that they are subject to prevailing wage requirements under the following criteria of WAC 296-127-015: supervisors (e.g. foreman, general foreman, superintendents) are entitled to receive at least the journey level prevailing rate of wage for performing manual or physical labor:

1. For each hour spent in the performance of manual or physical labor if it is for more than 20 percent but less than 50 percent of their hours worked on a public works project during any given week.

2. For all hours worked in any given week if they perform manual or physical labor for 50 percent or more of their hours worked on a public works project during such week. The Contractor must include the apprentice utilization requirements of this Section in all subcontracts executed for the Project and ensure that all Subcontractors working on the project are notified of the apprentice utilization requirements. The Contractor is responsible for meeting the apprentice utilization requirements of the Contract, including overall compliance on all Contract labor hours worked by Subcontractors.

The Contractor must ensure compliance with RCW 49.04, WAC 296-05, and the apprenticeship training standards for each trade/craft classification used on the Project, as set forth by L&I.

2. APPRENTICE UTILIZATION PLAN

The Contractor must submit a comprehensive plan listing the subcontractors and apprentices/programs to be used on the Project and how the apprentice utilization requirements will be met on the total Contract labor hours.

The plan must be submitted within five (5) business days on the attached form.

An approved Plan is required prior to issuance of Notice to Proceed. An updated Plan is required when any new subcontractor is approved to the project and when any Change Order Proposal is submitted.

3. GOOD FAITH EFFORTS AND ADJUSTMENTS TO THE APPRENTICE UTILIZATION REQUIREMENT

If the Contractor determines that the Project will be unable to achieve the apprentice utilization percentage, the Contractor may make a written request to the Port of Bellingham to adjust the required apprentice utilization percentage as allowed under RCW 39.04.320(2).

The request must include documentation of the Contractor's and subcontractor's ***good faith efforts*** to hire registered apprentices.

Acceptable good faith efforts must include one, or more of the following:

1. Not enough registered apprentices in the geographic/county area as verified by WSATC;
2. An inadequate number of apprentices are available to comply with the required apprentice utilization percentage as verified by appropriate state programs;
3. There are not enough hours on the project to afford the appropriate ratio of journey level to apprentice oversight as verified by the appropriate state programs and documented through the Project schedule;
4. There is a disproportionately high ratio of material costs to labor hours, which does not make the required minimum levels of apprentice participation possible for this Contract as verified by the schedule of values/bid item breakdown and/or backup invoicing from suppliers or similar;
5. Apprentice utilization and involvement in Work of the Project would void warranty as verified by an original equipment manufacturer and/or surety;
6. Other documented and verifiable impracticality that could not have been foreseen or avoided.

The Owner will evaluate the request and, if appropriate, prepare a Change Order reducing the required utilization percentage. If the Owner determines that a reduction in the required utilization percentage is not justified, the Owner will communicate the decision in writing to the Contractor and a monetary disincentive may be assessed.

4. PREVAILING WAGES FOR APPRENTICES

An apprentice is defined as a laborer, worker, or mechanic employed to perform the Work for whom an apprentice agreement is established through a Training Program that is registered and approved by the Washington State Apprenticeship and Training Council (WSATC).

Per RCW 39.12.021 and RCW 49.04, apprentices must be paid the applicable prevailing hourly rate for an apprentice of that trade. An apprentice wage schedule has been added to the Journey Level rates. Intents, Affidavits, and certified payrolls must contain the relevant apprentice information and be recorded in L&I's Prevailing Wage Intents and Affidavits system.

5. APPRENTICE UTILIZATION REPORTING

The Contractor and every Subcontractor must report all apprentices and the wages paid as required by L&I.

The Contractor must submit other information as requested by the Owner to verify compliance with the apprentice utilization requirements of the Contract. The Owner may add, delete, or change the information required by the Contractor, as necessary.

6. MONITORING APPRENTICE UTILIZATION

The Owner will monitor the Contractor's and subcontractor's progress in apprentice utilization by reviewing and approving Apprentice Utilization Plan(s), Intents and Affidavits filed and Certified Payroll as part of the monthly Progress Payment reviews. The Owner reserves the right to withhold payment until appropriate documentation is loaded into PWIA.

7. MEETING APPRENTICE UTILIZATION REQUIREMENTS: MONETARY INCENTIVE

Should the Contractor, and/or subcontractors, achieve 15% apprentice utilization *without any good faith efforts*, a monetary assessment of $1,000.00 will be paid to the Contractor for proportional distribution to all employers of apprentices on the Project.

8. FAILURE TO COMPLY WITH APPRENTICE UTILIZATION REQUIREMENTS: DISINCENTIVE ASSESSMENT

Failure to comply with requirements for apprentice utilization, without a good faith effort, is a material breach of the Contract for which the Contractor, or its subcontractors, are subject to damages. If the Owner determines that the Contractor, or any of its subcontractors, are non-compliant, a monetary disincentive assessment of $500.00 will be subtracted from monies otherwise owed to the Contractor. If no additional monies are owed, an invoice will be sent for remittance prior to the filing the Notice of Completion with the state. *In no event, will the disincentive assessment exceed 5% of the Total Contract Cost*.

PORT OF BELLINGHAM
Washington State

PROJECT APPRENTICE UTILIZATION PLAN

Project Name		AUR	**15%**
Prime Contractor Name			
Initial Date Submitted		Revision No.	
Submitted By		Revision Date	

** Include labor hours and count for all trades, including those performed by Subcontractors.* ***Mark all revisions in RED.***

Part A

	Program/Trade	No.	Name	Estimated Journey Level Hours	Estimated Apprentice Hours
Prime					
	Total Estimated Hours Part A				

Part B

Subcontractor business name	Estimated Start Date	Program/Trade	Name	No.	Estimated Journey Level Hours	Estimated Apprentice Hours
Total Estimated Hours Part B						
Total Estimated Hours Part A (from above)						
Total apprentice utilization **percentage** based on planned values						

Reviewed by: _____ Date: _____

Good faith efforts needed?* ☐*yes* ☐*no*

If the estimated total apprentice utilization percentage is under 15%,* ***good faith efforts* *must be made.*

Use separate form to document. A revised Apprentice Utilization Plan is to be attached to every good faith effort AUR adjustment request.

- The owner reserves the right to request additional documentation or information to verify subcontractors, scope, trade, and/or hours of work.
- Those projects that do not meet the apprentice utilization goal (approved goal adjustments meet the goal) shall be assessed a penalty per the contract documents.

APPRENTICE UTILIZATION PLAN INSTRUCTIONS

PORT OF BELLINGHAM

REQUIREMENTS FOR PROJECT APPRENTICESHIP UTILIZATION PLAN

- An initial apprentice utilization plan must be submitted within 5 business days on the form provided by the owner.
- The initial Apprentice Utilization Plan provides an estimate of all labor hours anticipated to be performed and plan for utilization of state-registered apprentices by the prime contractor and an/all subcontractors performing trade scopes on the project; and as known at the time of bid.
- Estimated subcontractors, scopes, hours, and listed percentages need to be reasonable within the scope and duration of project.
- The plan demonstrates that you, and the subcontractors, intend to meet the requirement or use **good faith efforts** to comply.
- The plan shall be revised as more information becomes available or changes are experienced in such things as scopes, subcontracting, apprentice availability, or the project schedule.
- Non-signatory contractors/subcontractors are subject to the requirement.

INSTRUCTIONS:

- Include a listing of all subcontractors and their trades, regardless of if they will be using apprentices.
- Include an estimate from each subcontractor of how many hours they will perform on the project and how many of those hours will be performed by apprentices, as anticipated.
- List all state approved programs under which apprentices are enrolled or are going to enroll.
- Update the plan as the schedule changes, change orders are issued and/or new subcontractors are subcontracted, to verify that you can still meet the requirement through utilization.
- **Upload certified payroll** for every contractor, subcontractor, and hourly employee **weekly** into L&I's prevailing wage intents and affidavits portal.
- If, or as discovered, the prime or any subcontractor believes they cannot meet the apprenticeship utilization requirement a **good faith efforts approval process** must be started (see form attached)

Questions? Please contact:

Procurement at Procurement@portofbellingham.com

PORT OF BELLINGHAM
Washington State

Apprentice Utilization Good Faith Efforts Documentation

Project: _____ Date: _____

Prime: _____

Prepared By (print name and title): _____

Requested apprentice utilization percentage (goal adjustment): _____

Contractor Statement

An adjustment to the apprentice utilization requirements for the above-named project is hereby requested. All contractors and subcontractors on the project understand the requirements, have performed the following documented good faith efforts, and have confirmed that the required apprentice utilization hours will not be able to be achieved for the ***following rationale.*** _____ (initial)

Rationale. Check all that apply.

- ☐ Demonstrated lack of availability of apprentices (regionally or by trade). [list trades]
- ☐ Disproportionately high ratio of material/product/equipment cost to labor.
- ☐ Not enough hours available on the job to accommodate the ratio, supervision, or work process required.
- ☐ State approved apprentice programs unavailable for the specific work type.
- ☐ Warranty or specialty work requirements unable to accommodate apprentices.
- ☐ Funding requires federal, native American, or other employee training program that conflicts with Washington State apprentice utilization requirements.
- ☐ Other: _____ (fill in)

Documentation must be attached to substantiate the request. Check all that apply and attach.

- ☐ Emails, letters, or similar **communication with appropriate state apprenticeship program** confirming the assessment or denying apprentices or similar. Include, dates, time, responses, names, titles, and similar information.
- ☐ **Manufacturer letter** or email statement of equipment, material, or product that substantiates the cost and/or the specialty nature or the item and the requirement for certified/specific installers or similar.
- ☐ **Specification section**, funding requirement, or similar precluding or hindering state apprentice utilization requirements.
- ☐ Other: _____ (fill in)

Attach a revised Apprentice Utilization Plan showing where adjustments are requested.