KITSAP COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER PROJECT NO. 97003081

DUWE'IQ STORMWATER TREATMENT WETLAND
FORMAL BID 2016-108

FUNDED IN PART BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY

DEPARTMENT OF ECOLOGY
State of Washington

JONATHON L. BRAND
STATE OF WASHINGTON
28997
REGISTERED
PROFESSIONAL ENGINEER
3/2/16

KITSAP COUNTY, WASHINGTON

CONTRACT PROVISIONS

KITSAP COUNTY DEPARTMENT OF PUBLIC WORKS
614 DIVISION STREET MS-26
PORT ORCHARD, WASHINGTON 98366-4699
360.337.5777

JONATHON L. BRAND, P.E.
COUNTY ENGINEER

BACK OF COVER

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D – SWPPP (STORMWATER POLLUTION PREVENTION PLAN)
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INVITATION TO BID

KITSAP COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER PROJECT NO. 97003081

DUWE'IQ STORMWATER TREATMENT WETLAND
2016-108

BID OPENING: DATE: **MARCH 29, 2016** TIME: **10:00 AM**

Sealed bids for the project designated above will be received by Kitsap County Department of Public Works before the time and date indicated above, at which time they will be opened and publicly read aloud. Bids will be received at the Kitsap County Purchasing Office, 4th Floor Administration Building, 619 Division Street, Port Orchard, Washington. The mailing address for the Kitsap County Purchasing Office is 614 Division Street, MS-07, Port Orchard, Washington 98366. Bids will be opened in the Port Madison Conference Room, 4th Floor Administration Building, 619 Division Street, Port Orchard, Washington. Instructions for the delivery of bids are contained in the Special Provisions for this project. Prospective bidders are hereby notified that they are solely responsible for ensuring timely delivery of their bid to the place of bid opening.

All bid proposals shall be accompanied by a bid proposal surety bond made payable to Kitsap County Department of Public Works in an amount equal to five percent (5%) of the amount of such bid proposal. Should the successful Bidder fail to enter into such contract and furnish satisfactory performance and payment bonds within the time stated in the Special Provisions, the bid proposal bond shall be forfeited to Kitsap County Department of Public Works.

Each proposal or bid shall be completely sealed in a separate envelope, properly addressed as stated above, with the name and address of the bidder and the name of the project plainly written on the outside of the envelope. A complete bid proposal shall include the following:

(1) Proposal Form
(2) Bid Bond
(3) Bidder Responsibility Statement
(4) Non-Collusion Declaration
(5) Subcontractor List
(6) M/WBE Subcontractor Form

All of the above items must be complete in all respects, including signatures (notarized where required). Bidder shall acknowledge receipt of all addendums in the spaces provided. The successful bidder will be required to submit a photocopy of their current Washington State Contractor's Registration. Failure to include all items may be cause for the bid to be considered irregular and thereby rejected.

Bids or proposals received after the time set for the opening of bids will not be considered.

Bidders are notified that all bids are likely to be rejected if the lowest responsible bid received exceeds the Engineer's estimate by an unreasonable amount.

Kitsap County reserves the right to award the bid in a manner and on a basis which will best serve the County, taking into consideration the Bidder Responsibility Statement included with the bids and the requirements of the APWA/WSDOT Standard Specifications and the Contract Provisions.

The award of the contract, if made, shall be made to the responsible Bidder submitting the lowest responsive bid, based upon the total sum of the extension of unit prices for the bid items.

It is anticipated that this project will be funded in part by the Washington State Department of Ecology. Neither the State of Washington nor any of its departments or employees are, or shall be, a party to any contract or any subcontract resulting from this solicitation for bids.

The Plans and Contract Provisions for the proposed work may be downloaded from the internet at the Kitsap County Website at http://www.kitsapgov.com/purchasing/bids.htm.

DESCRIPTION OF WORK

This contract provides for the construction of a stormwater treatment wetland, outfall, and stormwater conveyance in Kitsap County. The work includes, but is not limited to, demolition, site preparation, erosion control, traffic safety and control and related work, utility coordination, excavation, grading, pavement repair, installation of storm sewer structures and pipe, log weirs, habitat logs, precast concrete culvert, streambed boulders, streambed aggregate, and planting. All work shall be in accordance with the plans, specifications, special provisions, and other contract documents as administered by the Kitsap County Public Works Department.

Partial funding of this project is being provided by the Washington State Department of Ecology's (Ecology) Stormwater Grant Program. Neither the State Of Washington nor any of its departments or employees are, or shall be, a party to this contract or any subcontract. All parties agree that the State of Washington shall be, and is hereby, named as an express third-party beneficiary of this contract, with full rights as such.

NOTICE TO ALL PLAN HOLDERS

The office of the Kitsap County Public Works Project Manager who will show this project to prospective bidders is located at the Kitsap County Department of Surface and Stormwater Management, 614 Division Street, MS-26A, Port Orchard, Washington. Prospective bidders are requested to call Julie Hamon at 360.307.4310 or email at jhamon@co.kitsap.wa.us in advance to set up an appointment to view the project. To obtain a Bid Proposal Package at no cost or to be added to the Plan Holder List, please call Colby Wattling at 360.337.7036 or email at cwattling@co.kitsap.wa.us

KITSAP COUNTY BOARD OF COMMISSIONERS
KITSAP COUNTY DEPARTMENT OF PUBLIC WORKS

DUWE'IQ STORMWATER TREATMENT WETLAND
STORMWATER PROJECT NO.97003081

PROPOSAL

The Honorable Board of Commissioners
Kitsap County
614 Division Street
Port Orchard, Washington 98366

1. Pursuant to and in compliance with your Advertisement for Bids and the other documents relating thereto, the undersigned Bidder, having familiarized themselves with the terms of the project related to those items herein bid, being aware of the local conditions affecting the performance of a Contract covering the items bid, having knowledge of the cost of the work at the place where the work is to be done, having familiarized themselves with the Contract Documents, hereby proposes and agrees to perform the work and/or to furnish the equipment, and to furnish any and all of the labor, materials, tools, expendable equipment and all utility and transportation services necessary to perform a Contract covering any or all of those items herein bid and to complete in a workmanlike manner all work covered by said Contract in connection with the Owner's Stormwater Treatment Wetland Project, for an amount computed upon the basis of the quantity of work actually performed at the following bid prices:

NOTE: UNIT PRICES FOR ALL ITEMS, ALL EXTENSIONS, AND THE TOTAL AMOUNT OF BID MUST BE SHOWN. All prices shall be in legible figures (not words) written in ink or typed. The proposal shall include: A unit price for each item (omitting digits more than four places to the right of the decimal point); An extension for each unit price (omitting digits more than two places to the right of the decimal point); The total contract price (the sum of all extensions).

DUWE'IQ STORMWATER TREATMENT WETLAND
BID PROPOSAL

NO.	QTY	UNIT	STD ITEM NO.	ITEM (SECTION)	UNIT COST	AMOUNT
1	1	L.S.	0001	MOBILIZATION (SECTION 1-09)		
2	1	L.S.	N.S.	PROJECT SURVEYING (SECTION 1-05.4)		

NO.	QTY	UNIT	STD ITEM NO.	ITEM (SECTION)	UNIT COST	AMOUNT
3	2.4	ACRE	0025	CLEARING AND GRUBBING (SECTION 2-01)		
4	1,182	L.F.	N.S.	SAW CUT ASPHALT CONC. PAVEMENT (SECTION 2-02)		
5	492	S.Y.	0120	REMOVING ASPHALT CONC. PAVEMENT (SECTION 2-02)		
6	50	C.Y.	0350	UNSUITABLE FOUNDATION EXCAVATION INCL. HAUL (SECTION 2-03,SECTION 7-08)		
7	90	TON	N.S.	SPECIAL BORROW INCL. HAUL (SECTION 2-03)		
8	4	EACH	1046	CONCRETE INLET (SECTION 7-05)		
9	34	TON	1086	QUARRY SPALLS (SECTION 8-15)		
10	5	EACH	3090	CATCH BASIN TYPE 1L (SECTION 7-05)		
11	1	EACH	3091	CATCH BASIN TYPE 1 (SECTION 7-05)		
12	3	EACH	3105	CATCH BASIN TYPE 2 48 IN. DIAM. (SECTION 7-05)		
13	386	L.F.	3577	SOLID WALL PVC STORM SEWER PIPE 12 IN. DIAM. (SECTION 7-04)		
14	4	EACH	N.S.	12 IN. PVC CLEANOUT WITH BOX (SECTION 7-04)		
15	4	EACH	N.S.	12 IN. PVC KNIFE VALVE (SECTION 7-04)		
16	97	L.F.	3602	CORRUGATED POLYETHYLENE STORM SEWER PIPE 12 IN. DIAM. (SECTION 7-04)		

NO.	QTY	UNIT	STD ITEM NO.	ITEM (SECTION)	UNIT COST	AMOUNT
17	70	L.F.	3607	CORRUGATED POLYETHYLENE STORM SEWER PIPE 18 IN. DIAM. (SECTION 7-04)		
18	470	L.F.	N.S.	DUCTILE IRON STORM SEWER PIPE 16 IN. DIAM. (SECTION 7-04)		
19	94	L.F.	N.S.	DUCTILE IRON STORM SEWER PIPE 12 IN. DIAM. (SECTION 7-04)		
20	27	L.F.	N.S.	DUCTILE IRON STORM SEWER PIPE 8 IN. DIAM. (SECTION 7-04)		
21	6	EACH	N.S.	DEBRIS BARRIER (SECTION 7-04)		
22	50	C.Y.	4006	STRUCTURE EXCAVATION CLASS A INCL. HAUL (SECTION 2-09)		
23	1	L.S.	4013	SHORING OR EXTRA EXCAVATION CLASS A (SECTION 2-09)		
24	1	L.S.	4345	PRECAST REINFORCED CONCRETE THREE SIDED STRUCTURE (SECTION 7-02)		
25	115	TON	5120	CRUSHED SURFACING TOP COURSE (SECTION 4-04)		
26	1.85	ACRE	N.S.	TOPSOIL TYPE A (SECTION 8-02)		
27	1.85	ACRE	6480	FINE COMPOST (SECTION 8-02)		
28	1.19	ACRE	6579	WOOD CHIP MULCH (SECTION 8-02)		

NO.	QTY	UNIT	STD ITEM NO.	ITEM (SECTION)	UNIT COST	AMOUNT
29	1	L.S.	6971	PROJECT TEMPORARY TRAFFIC CONTROL (SECTION 1-10)		
30	1	L.S.	7003	TYPE B PRGRESS SCHEDULE (Minimum Bid $1,000.00) (SECTION 1-08.3)		
31	5	EACH	7029	PLUGGING EXISTING PIPE (SECTION 7-08)		
32	1	EACH	N.S.	72 IN. DIAM. FLOW SPLITTER (SECTION 7-05)		
33	1	EACH	N.S.	EMERGENCY OVERFLOW STRUCTURE (SECTION 7-05)		
34	4	EACH	9605	CONNECTION TO DRAINAGE STRUCTURE (SECTION 7-05)		
35	1	L.S.	N.S.	REMOVAL OF OIL WATER SEPARATOR (SECTION 2-02)		
36	9,329	C.Y.	N.S.	SPECIAL POND EXCAVATION INCL. HAUL (SECTION 2-03)		
37	516	C.Y.	N.S.	EMBANKMENT COMPACTION FOR POND (SECTION 2-03)		
38	936	TON	N.S.	PROTECTIVE SOIL COVER FOR POND LINER (SECTION 2-03)		
39	18	TON	N.S.	GRAVEL BACKFILL FOR WALL (SECTION 2-09)		
40	1	L.S.	N.S.	SHORING OR EXTRA EXCAVATION CLASS B (SECTION 7-08)		

NO.	QTY	UNIT	STD ITEM NO.	ITEM (SECTION)	UNIT COST	AMOUNT
41	1518	S.Y.	N.S.	POND LINER (SECTION 2-13)		
42	123	TON	5875	COMMERCIAL HMA (SECTION 5-04)		
43	1	L.S.	N.S.	EROSION/WATER POLLUTION CONTROL (SECTION 8-01)		
44	10	M-GAL	7018	WATER (SECTION 2-07)		
45	3	EACH	N.S.	ROCK PILE (SECTION 8-02)		
46	5	EACH	N.S.	BRUSH PILE (SECTION 8-02)		
47	5	EACH	N.S.	SNAG (SECTION 8-02)		
48	90	TON	N.S.	STREAMBED AGGREGATE (SECTION 8-15)		
49	50	TON	N.S.	STREAMBED COBBLES (SECTION 8-15)		
50	7	TON	N.S.	STREAMBED BOULDERS (SECTION 8-15)		
51	2	EACH	N.S.	OUTFALL PROTECTION (SECTION 8-15)		
52	4	EACH	N.S.	TREATMENT CELL DRAIN INLET (SECTION 8-15)		
53	11	EACH	N.S.	HABITAT LOGS (SECTION 8-30)		
54	5	EACH	N.S.	LOG WEIRS (SECTION 8-31)		
55	151	S.F.	N.S.	ROCK WALL (SECTION 8-24)		

NO.	QTY	UNIT	STD ITEM NO.	ITEM (SECTION)	UNIT COST	AMOUNT
56	694	S.F.	N.S.	CRUSHED ROCK PAVING WITH GEOTEXTILE SECTION 8-32)		
57	1	L.S.	N.S.	PROTECTION OF EXISTING UTILITIES INCL. POT HOLING (SECTION 1-07.17)		
58	1,410	L.F.	N.S.	CEDAR SPLIT 3-RAIL FENCE (SECTION 8-12)		
59	2	EACH	N.S.	15-FOOT SECURITY GATE (SECTION 8-12)		
60	20	L.F.	N.S.	METAL SAFETY RAILING (SECTION 8-33)		
61	8	EACH	N.S.	DECOMMISSION MONITORING WELLS AND PIEZOMETERS (SECTION 8-34)		
62	1	L.S.	N.S.	NPDES CONSTRUCTION STORMWATER GENERAL PERMIT (SECTION 8-01)		
63	1	EST.	7725	REIMBURSEMENT FOR THIRD PARTY DAMAGE (SECTION 1-07)	$5.00	$5.00
64	1	CALC	7728	MINOR CHANGE (SECTION 1-04)	$10,000.00	$10,000.00
65	1	L.S.	7736	SPCC PLAN (SECTION 1-07)		
				CONTRACT SUBTOTAL		
				SALES TAX AT 8.7%		
				CONTRACT TOTAL AMOUNT		

2. BIDDER SHALL SHOW SALES TAX IN THE SPACE PROVIDED, in accordance with Section 1-07.2 of Special Provisions.

3. The undersigned Bidder hereby proposes and agrees to commence work under this Contract, if awarded to them, in accordance with Sections 1-08.4 and 1-08.5 of the Special Provisions. They further agree to complete the contract within **90 working days**.

4. The agreed liquidated damage to the Owner shall be in accordance with Liquidated Damages as described in the Standard Specifications, Amendments thereto, and Special Provisions.

5. The Owner reserves the right to delete all or any portions of the work as outlined in the Contract Document.

6. The required bid security in the amount of five percent (5%) of the total bid is hereto attached.

7. It is understood that the Contractor is responsible for obtaining and completing all required government forms.
8. Receipt of the following Addenda to the Contract Document is hereby acknowledged.

ADDENDUM #	DATE OF RECEIPT OF ADDENDUM	SIGNED ACKNOWLEDGMENT
1		
2		
3		
4		
5		

(Note: Failure to acknowledge receipt of the Addenda may be considered an irregularity in the proposal).

9. Notice of Acceptance of this bid or requests for additional information should be addressed to the undersigned at the address stated below and unless otherwise notified in writing, this address shall be used by the successful bidder during the life of the Contract for all official notices.

10. By signing this Proposal, the Bidder certifies that they have read and understand all of the terms and Conditions of the Contract Plans, Standard Specifications, the Amendments there to, and these Special Provisions, and agrees to comply with them.

Date: _____

Proper Name of Bidder (Type or Print): _____

By (Signature): _____

Name and Title (Type or Print Name and Title of Signatory): _____

Street Address: _____

City, State and Zip Code: _____

Telephone Number with Area Code: _____

Fax Number with Area Code: _____

Mailing Address, if different from above: _____

_____

Failure to return this Declaration as part of the bid proposal package will make the bid nonresponsive and ineligible for award.

NON-COLLUSION DECLARATION

I, by signing the proposal, hereby declare, under penalty of perjury under the laws of the United States that the following statements are true and correct:

1. That the undersigned person(s), firm, association or corporation has (have) 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 connection with the project for which this proposal is submitted.
2. **That by signing the signature page of this proposal, I am deemed to have signed and to have agreed to the provisions of this declaration.**

NOTICE TO ALL BIDDERS

To report rigging activities call:

1-800-424-9071

The U.S. Department of Transportation (USDOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m., eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of USDOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the USDOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

DOT Form 272-036H EF
Revised 5/06

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BIDDER RESPONSIBILITY STATEMENT

Each Bidder shall prepare and submit the following information with their bid.

By signing the signature page of the Proposal, the bidder affirms that the following information is true and correct.

Name of Bidder _____

Business Address _____

_____

A) MANDATORY BIDDER RESPONSIBILITY CRITERIA (RCW 39.04.350)

1. Washington State Contractors License Number _____

   Effective date _____

2. State of Washington Unified Business Identifier (UBI) No. _____

3. Do you have industrial insurance (worker's compensation) coverage for your employees working in Washington as required by Title 51 RCW?

   Yes _____ No _____ Not Applicable_____

4. Washington State Employment Security Department number as required by Title 51 RCW.

   Number _____ Not Applicable _____

5. Washington State Department of Revenue state excise tax registration number as required by Title 82 RCW.

   Number _____ Not Applicable _____

6. Have you ever been disqualified from bidding on any public works contracts under RCW 39.06.010 or 39.12.065(3)?

   Yes _____ No _____

(Continued on next page)

B) SUPPLEMENTAL BIDDER RESPONSIBILITY CRITERIA

(Special Provisions Section 1-02.14)

1. Do you owe delinquent taxes to the State of Washington Department of Revenue?

   Yes____ No____

2. Are you currently debarred or suspended from bidding by the Federal government?

   Yes____ No_____

3. Does your standard subcontract form include the subcontract responsibility language required by RCW 39.06.020?

   Yes ____ No_____

4. Do you have an established procedure which your company utilizes to validate the responsibility of each of your subcontractors and any sub-tier contractors?

   Yes_____ No_____

5. Do you have any record of prevailing wage violations in the last 5 years as determined by the Washington State Department of Labor and Industries?

   Yes_____ No_____

6. Have you had any claims against retainage or payment bonds for public works projects in the last three years?

   Yes_____ No_____

7. Has your company or its owners been convicted of a crime involving bidding on a public works contract in the last 5 years?

   Yes_____ No_____

8. Has your company had any public works contract terminated for cause or terminated for default by a government agency in the last 5 years?

   Yes_____ No_____

9. Has your company had any lawsuits with judgments entered against the company in the last 5 years?

   Yes_____ No_____

(Continued on next page)

C) PROJECT SPECIFIC SUPPLEMENTAL BIDDER RESPONSIBILITY CRITERIA

1. Gross Amount of Contracts Now in Hand: $ _____

2. General Type of Work Performed by your Company:

   _____

   _____

3. List more important construction projects completed by your company in the last 5 years. Include project name, year, approximate costs, and name and phone number of project engineer or owner.

   _____

   _____

   _____

   _____

   _____

   _____

4. Bank References: _____

   _____

5. Bonding Company: _____

   _____

Supporting documentation verifying that the bidder meets the supplemental and project specific responsibility criteria stated in Sections B and C above may be requested by the Contracting Agency in accordance with Section 1-02.14 of the Special Provisions.

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Local Agency Name
Local Agency Address

LOCAL AGENCY SUBCONTRACTOR LIST

Prepared in compliance with RCW 39.30.060

To Be Submitted with the Bid Proposal

Project Name _____

Failure to list subcontractors with whom the bidder, if awarded the contract, will directly subcontract for performance of the work of heating, ventilation and air conditioning, plumbing, as described in Chapter 18.106 RCW, and electrical, as described in Chapter 19.28 RCW or naming more than one subcontractor to perform the same work will result in your bid being non-responsive and therefore void.

Subcontractor(s) with whom the bidder will directly subcontract that are proposed to perform the work of heating, ventilation and air conditioning, plumbing, as described in Chapter 18.106 RCW, and electrical as described in Chapter 19.28 RCW **must** be listed below. The work to be performed is to be listed below the subcontractor(s) name.

To the extent the Project includes one or more categories of work referenced in RCW 39.30.060, and no subcontractor is listed below to perform such work, the bidder certifies that the work will either (i) be performed by the bidder itself, or (ii) be performed by a lower tier subcontractor who will not contract directly with the bidder.

Subcontractor Name _____
Work to be Performed _____
_____
_____

Subcontractor Name _____
Work to be Performed _____
_____
_____

Subcontractor Name _____
Work to be Performed _____
_____
_____

Subcontractor Name _____
Work to be Performed _____
_____
_____

Subcontractor Name _____
Work to be Performed _____
_____
_____

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

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DISADVANTAGED BUSINESS ENTERPRISE UTILIZATION CERTIFICATION

To be eligible for award of this contract the bidder must fill out and submit, as part of its bid proposal, the following Disadvantaged Business Enterprise Utilization Certification relating to Disadvantaged Business Enterprise (DBE) requirements. The Contracting Agency shall consider as non-responsive and shall reject any bid proposal that does not contain a DBE Certification which properly demonstrates that the bidder will meet the DBE participation requirements in one of the manners provided for in the proposed contract. The Bidder must submit good faith effort documentation within 48 hours of bid opening ***only in the event*** the bidder's efforts to solicit sufficient DBE participation has been unsuccessful. If submitting a good faith effort bidder needs to check Box 4 agreeing to submit good faith effort within 48 hours. The successful bidder's Disadvantage Business Enterprise Utilization Certification shall be deemed a part of the resulting contract. Information on certified firms is available from OMWBE, online at: http://www.omwbe.wa.gov or Toll Free 1-866-208-1064.

_____ certifies that the Disadvantaged Business Enterprise (DBE) Firms listed below have been contacted regarding participation on this project. If this bidder is successful on this project and is awarded the contract, it shall assure that subcontracts or supply agreements are executed with named DBEs. (If necessary, use additional sheets.)

Column 1 **Name of DBE**	Column 2 * **Project Role** (Subcontractor, Subcontractor (Force Account), Manufacturer, Regular Dealer, Broker)	Column 3 **Description of Work** (Separate Force Account work from other work for Goal Participation percentage purpose; see instructions.)	Column 4 ** **Amount Subcontracted to DBE**	Column 5 *** **Amount to be Applied Towards Goal**

Disadvantaged Business Enterprise Subcontracting Goal: _____ Total DBE Commitment _____****
Box 2 Box 3

☐ Box 4 By checking Box 4 the bidder is stating that their attempts to solicit sufficient DBE participation has been unsuccessful and good faith effort willdbe be submitted within 48 hours of bid opening.

* Regular Dealer status must be approved prior to bid submittal by the Office of Equal Opportunity, Wash. State Dept. of Transportation, on each contract.

** See the section "Crediting DBE Participation" in the Contract Document.

*** Column 5 must show a reduced or equal amount to that shown in Column 4 as appropriate for project role. See the section "Disadvantaged Business Enterprise Utilization Certification Form #272-056" in the Contract documents.

**** The Contracting Agency will utilize this amount to determine whether or not the bidder has met the goal. In the event of an arithmetic difference between this total and the sum of the individual amounts listed above in Column 4, then the sum of the amounts listed shall prevail and the total will be revised accordingly

Instructions for Disadvantaged Business Enterprise Utilization Certification Form

To be eligible for award of the contract, the bidder shall properly complete and submit a Disadvantaged Business Enterprise Utilization Certification form with the bidder's sealed Bid Proposal that demonstrates how the bidder intends to meet the DBE Condition of Award (COA) goal.

Box 1: Name of Bidder (Proposal holder) submitting a bid. Column 1: Name of the Disadvantaged Business Enterprise (DBE). Column 2: The Project Role that the DBE will be performing as follows;

Subcontractor, Subcontractor (Force Account), Manufacturer, Regular Dealer*,Broker

The role is used to determine what portion of the DBE participation may be credited toward the goal. See Crediting DBE Participation toward Meeting the Goal as described in the Disadvantaged Business Enterprise Condition of Award Participation specification.

Column 3: Description A description of the work to be performed by the DBE consistent with the eligible of Work in the OMWBE Directory of Certified DBE firms. If the DBE is to perform a portion of a bid item, then state Partial and what work is included, e.g., "Electrical (Partial) – Trenching". "Mobilization" will not be accepted as a description of work as it is not considered a distinct item of work that a DBE is certified to perform. The bidder may rely upon the descriptors listed in the Directory of Certified DBE Firms. Force Account work must be listed separately, for the purpose of calculating Goal participation percent and to determine the responsiveness at the time of Contract Award. For the purposes of meeting the DBE COA Goal, only 50% of the Proposal amount shall be credited toward the Contractors Commitment to meet the DBE COA Goal.

Column 4: Amount to be subcontracted and this column is used for the purpose of determining the amount to be applied towards goal for Regular Dealer and Force Account work.

Column 5: The dollar amount for each DBE listed in the certification that the prime intends to apply towards meeting the DBE contract goal. It may be that only a portion of the amount paid to the DBE is eligible as COA participation. See *Crediting DBE Participation* in the special provisions; *Disadvantaged Business Enterprise Condition of Award Participation*.

Box 2: The goal stated in the contract in terms of a dollar amount or a percentage as noted under the general special provision; *DBE Condition of Award (COA) Goal*, *Disadvantaged Business Enterprise Condition of Award Participation*. When expressed as a percentage it is a percentage of the sum total of all bid items as submitted in the bidder's proposal.

Box 3: The total for column 5. This value must equal or exceed the goal amount.

Box 4: Check Box 4 if sufficient DBE Participation has been unsuccessful and a good faith effort will be submitted. Refer to the subsection titled, *Selection of Successful Bidder/Good Faith Efforts (GFE)* in the special provision, *DBE Condition of Award (COA) Goal*, *Disadvantaged Business Enterprise Condition of Award Participation*.

* Note: In accordance with 49 CFR 26.55(e)(2)(i), if the materials or supplies are purchased from a DBE Regular Dealer, the amount to be counted towards the DBE will be sixty percent (60%) of the cost of the materials or supplies, e.g., Material cost: $100,000, allowable amount toward DBE goal; $60,000.

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,

as Principal, and _____

as Surety, are hereby held and firmly bound unto _____

_____

as Owner in the penal sum of _____

for payment of which, well and truly to be made, we hereby jointly and severally bind

ourselves, successors and assigns. Signed this _____ day of _____, 2016.

The Condition of the above obligation is such that whereas the Principal has submitted to _____ a certain BID, attached hereto and made a part

hereof to enter a contract in writing, for the _____

_____

_____

NOW, THEREFORE,

(a) If said BID be rejected, or

(b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attachment hereto (properly completed in accordance with said BID) and shall furnish a BOND for faithful performance of said contract, and for the payment of all persons performing labor and furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are Corporations have set their Corporation seals to be hereto

affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____
Principal

_____
Surety

By: _____

AGREEMENT

This agreement, made and entered into this day of _____, 2016, between Kitsap County, through the BOARD OF COUNTY COMMISSIONERS of Kitsap County, State of Washington, hereinafter referred to as County, and, _____ _____, a general Contractor licensed by the State of Washington, for themselves, their heirs, executors, administrators, successors, and assigns, hereinafter called Contractor.

WITNESSETH:

WHEREAS, County desires to improve the Duwe'iq Stormwater Treatment Wetland Facility and

WHEREAS, Contractor has been selected by competitive bid as the "lowest responsive bidder" as that term is defined in RCW 39.04.010:

NOW THEREFORE, County and Contractor mutually agree as follows:

CONTRACT DOCUMENTS:
The Agreement between the parties is expressed in the Contract Documents which includes the Invitation for Bids, the accepted Proposal, the Non-Collusion Affidavit, Statement of Bidders Qualifications, Bid Bond, Project Plans, Standard Specifications, Special Provisions and this Agreement.

(1) DESCRIPTION OF WORK:
This Contract provides for the improvement of the Duwe'iq Stormwater Treatment Wetland in Kitsap County. The work proposed includes, but is not limited to, demolition, site preparation, erosion control, traffic safety and control and related work, utility coordination, excavation, grading, pavement repair, installation of storm sewer structures and pipe, log weirs, habitat logs, precast concrete culvert, streambed boulders, streambed aggregate, planting and other work all in accordance with the Contract Documents.

Contractor agrees to furnish all materials, labor, carriage, tools, equipment, apparatus, facilities and anything else necessary to perform and complete in a workmanlike manner the work called for in the Contract Documents titled: "Duwe'iq Stormwater Treatment Wetland".

(2) BINDING EFFECT:
The covenants and conditions contained in this Agreement shall apply to and bind the parties, heirs, legal representatives, and assigns of the parties.

(3) TIME IS OF THE ESSENCE:
The Contractor agrees to work promptly and fully complete the work within the limits as described in the Contract Documents. Failure to complete within the allowed time limit will subject the Contractor to the payment of liquidated damages, as described in the State of Washington Standard Specifications for Road, Bridge and Municipal Construction, in Section 1-08.9, PROSECUTION AND PROGRESS.

(4) TIME FOR COMPLETION:
The work to be performed under this Agreement shall commence in accordance with Sections 1-08.4 and 1-08.5 of the Special Provisions and shall be physically completed within **90 working days**.

(5) COMPENSATION:
The County agrees to pay the Contractor for the work described and completed according to the Contract Documents the sum of $ _____.
This sum shall include state sales tax.

(6) INDEPENDENT CONTRACTOR:
The Contractor shall perform the services under this agreement as an independent Contractor and not as an agent, employee or servant of the County. The parties agree that the Contractor is not entitled to any benefits or rights enjoyed by employees of the County. Contractor shall comply with all laws regarding workers' compensation.

(7) DISCRIMINATION AND ADA:
The Contractor agrees to comply with all provisions of the Americans with Disabilities Act and all regulations interpreting or enforcing said act. The Contractor agrees to comply with all Federal, State and County laws and regulations in effect pertaining to nondiscrimination. Violation of this section may be treated as a breach of this Agreement.

(8) LIABILITY FOR NEGLIGENCE:
The Contractor shall be liable for any additional expenses incurred by the County as a result of carelessness or negligence on the part of the Contractor, or Contractor's agents, or Contractor's employees. The Contractor agrees that the County may deduct such additional costs on its own behalf from monies due or to become due to the Contractor.

(9) TERMINATION:
This contract may be terminated by the officials or agents of the County authorized to contract for or supervise the execution of such work in accordance with Section 1-08.10 of the Standard Specifications for Road, Bridge, or Municipal Construction.

(10) MODIFICATION
There shall be no modification of this agreement, except in writing, executed with the same formalities as this present instrument.
Change Orders totaling less than 10% of the total contract amount may be executed by The Director of Public Works or his authorized agent. Change Orders that exceed 10%

of the total Contract amount shall be valid provided they are executed by the Chair of the Board of County Commissioners or her authorized agent.

(11) HOLD HARMLESS:
Contractor shall indemnify and hold County and its officers and employees harmless from, and shall process and defend at its own expense, all claims, demands or suits at law or equity arising in whole or in part from Contractor's performance of any of its obligations under this Agreement; provided that nothing herein shall require Contractor to indemnify County against and hold harmless County from claims, demands, or suits based upon the sole negligence of the County, its agents, officers, and employees; and provided further that if claims or suits are caused by or result from the concurrent negligence of (a) Contractor or Contractor's agents or employees, and (b) County or County's agents, officers, or employees, this indemnity provision shall be valid and enforceable only to the extent of Contractor's negligence or the negligence of Contractor's agents or employees.

Contractor expressly assumes potential liability for actions brought by Contractor's own employees against County; and, solely for the purpose of this indemnification and defense, Contractor specifically waives any immunity under the state industrial insurance law, Title 51 RCW. Contractor recognizes that this waiver was specifically entered into pursuant to the provisions of RCW 4.24.115 and was subject of mutual negotiation.

(12) INSURANCE REQUIREMENTS:
Section 1-07.18 of the Special Provisions shall govern this contract.

(13) VENUE AND CHOICE OF LAW:
Any action at law, suit in equity, or other judicial proceeding for the enforcement of this contract or any provisions thereof shall be instituted only in the court of the State of Washington, County of Kitsap. It is mutually understood and agreed that this contract shall be governed by the laws of the State of Washington, both as to interpretation and performance.

(14) INTEGRATION CLAUSE:
This instrument embodies the whole agreement of the parties. There are no promises, terms, conditions or obligations other than those contained herein; and this contract shall supersede all previous communications, representations or agreements, either verbal or written, between parties.

(15) CONTRACT BOND:
Payment and Performance bonds for this project have been issued by _____

Surety Company of _____(Street address) _____

Telephone: _____Contact Person: _____

in the amount of_____

(16) THIRD-PARTY BENEFICIARY:
All parties agree that the State of Washington shall be, and is hereby, named as an express third-party beneficiary of this contract, with full rights as such.

IN WITNESS WHEREOF, the said Contractor has executed this instrument, and the said Board of County Commissioners of aforesaid County pursuant to resolution duly adopted has caused this instrument to be executed by and in the name of said Board by its Chair, duly attested by its Clerk, the day and year first above written, and the seal of said Board to be hereunto affixed on the date this instrument first above written.

CONTRACTOR

_____

BY:_____

TITLE_____

BOARD OF COUNTY COMMISSIONERS
KITSAP COUNTY, WASHINGTON

_____
Edward E. Wolfe, Chair

_____
Charlotte Garrido, Commissioner

_____
Robert Gelder, Commissioner

Foregoing contract approved and ratified:

_____
ATTEST:

_____
DANA DANIELS, Clerk of the Board

Local Agency Performance Bond

PERFORMANCE BOND

to [City of _____ or _____ County], WA

Bond No. _____

The [City of _____ or _____ County], Washington ([City or County]) has awarded to _____ (Principal), a contract for the construction of the project designated as _____ ,Project No. _____ , in [location], Washington (Contract), and said Principal is required to furnish a bond for performance of all obligations under the Contract.

The Principal, and _____ (Surety), a corporation, organized under the laws of the State of _____ and licensed to do business in the State of Washington as surety and named in the current list of "Surety Companies Acceptable in Federal Bonds" as published in the Federal Register by the Audit Staff Bureau of Accounts, U.S. Treasury Dept., are jointly and severally held and firmly bound to the [City or County], in the sum of _____ US Dollars ($ _____) Total Contract Amount, subject to the provisions herein.

This statutory performance bond shall become null and void, if and when the Principal, its heirs, executors, administrators, successors, or assigns shall well and faithfully perform all of the Principal's obligations under the Contract and fulfill all terms and conditions of all duly authorized modifications, additions, and changes to said Contract that may hereafter be made, at the time and in the manner therein specified; and if such performance obligations have not been fulfilled, this bond shall remain in force and effect.

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

This bond may be executed in two (2) original counterparts, and shall be signed by the parties' duly authorized officers. This bond will only be accepted if it is accompanied by a fully executed and original power of attorney for the office executing on behalf of the surety.

PRINCIPAL		SURETY	
Principal Signature	Date	Surety Signature	Date
Printed Name	Date	Printed Name	Date
Title		Title	

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

Approved as to form:

[City or County] Attorney, [City of _____ or _____ County] _____ Date

DOT Form 272-002A EF
08/2012

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Local Agency Payment Bond -
Highway Construction

PUBLIC WORKS PAYMENT BOND
to [City of _____ or _____ County], WA

Bond No. _____

The [City of _____ or _____ County], Washington ([City or County]) has awarded to _____ (Principal), a contract for the construction of the project designated as _____ ,Project No. _____, in [location], Washington (Contract), and said Principal is required under the terms of that Contract to furnish a payment bond in accord with Title 39.08 Revised Code of Washington (RCW) and (where applicable) 60.28 RCW.

The Principal, and _____ (Surety), a corporation organized under the laws of the State of _____ and licensed to do business in the State of Washington as surety and named in the current list of "Surety Companies Acceptable in Federal Bonds" as published in the Federal Register by the Audit Staff Bureau of Accounts, U.S. Treasury Dept., are jointly and severally held and firmly bound to the [City or County], in the sum of _____ US Dollars ($ _____) Total Contract Amount, subject to the provisions herein.

This statutory payment bond shall become null and void, if and when the Principal, its heirs, executors, administrators, successors, or assigns shall pay all persons in accordance with RCW 39.08, 39.12, and 60.28 including all workers, laborers, mechanics, subcontractors, and materialmen, and all person who shall supply such contractor or subcontractor with provisions and supplies for the carrying on of such work, and all taxes incurred on said Contract under Titles 50 and 51 RCW and all taxes imposed on the Principal under Title 82 RCW; and if such payment obligations have not been fulfilled, this bond shall remain in full force and effect.

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

This bond may be executed in two (2) original counterparts, and shall be signed by the parties' duly authorized officers. This bond will only be accepted if it is accompanied by a fully executed and original power of attorney for the office executing on behalf of the surety.

PRINCIPAL		SURETY	
Principal Signature	Date	Surety Signature	Date
Printed Name	Date	Printed Name	Date
Title		Title	

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

Approved as to form:

_____ _____

[City or County] Attorney, [City of _____ or _____ County] Date

DOT Form 272-003A EF
08/2012

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WASHINGTON STATE DEPARTMENT OF ECOLOGY
STORMWATER GRANT PROGRAMS
SPECIFICATIONS INSERT

General

Partial funding of this project is being provided by the Washington State Department of Ecology's (Ecology) Stormwater Grant Program.

Compliance with State and Local Laws

The construction of the project, including the letting of subcontracts in connection therewith, shall conform to the applicable requirements of state and local laws and ordinances.

State Interest Exclusion

It is anticipated that this project will be funded in part by the Washington State Department of Ecology . Neither the State Of Washington nor any of its departments or employees are, or shall be, a party to this contract or any subcontract.

Third Party Beneficiary

Partial funding of this project is being provided through the Washington State Department of Ecology Stormwater Grant Program. All parties agree that the State of Washington shall be, and is hereby, named as an express third-party beneficiary of this contract, with full rights as such.

Access to the construction site and to records

The contractor shall provide for the safe access to the construction site and to the contractor's records by Washington State Department of Ecology personnel.

The Contractor shall maintain accurate records and accounts to facilitate the Owner's audit requirements and shall ensure that all subcontractors maintain auditable records.

These Project records shall be separate and distinct from the Contractor's other records and accounts.

All such records shall be available to the Owner and to Washington State Department of Ecology personnel for examination. All records pertinent to this project shall be retained by the Contractor for a period of three (3) years after the final audit.

Protection of the Environment

No construction related activity shall contribute to the degradation of the environment, allow material to enter surface or ground waters, or allow particulate emissions to the atmosphere, which exceed state or federal standards. Any actions that potentially allow a discharge to state waters must have prior approval of the Washington State Department of Ecology.

Project Signs

The Contractor shall display Ecology's logo in a manner that informs the public that the project received financial assistance from the Washington State Stormwater Grant Program.

Utilization of Minority and Women Business Enterprises

All bidders are encouraged to utilize certified minority-owned and women-owned businesses to the extent possible in the performance of this contract. All prospective bidders or persons submitting qualifications should take the following steps, when possible.

1. Include qualified minority and women's businesses on solicitation lists.
2. Assure that qualified minority and women's businesses are solicited whenever they are potential sources of services or supplies.
3. Divide the total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by qualified minority and women's businesses.
4. Establish delivery schedules, where work requirements permit, which will encourage participation of qualified minority and women's businesses.
5. Use the services and assistance of the State Office of Minority and Women's Business Enterprises (OMWBE) and the Office of Minority Business Enterprises of the U.S. Department of Commerce, as appropriate.

All prospective bidders must provide a list of the MBE/WBE subcontractors they intend to use during the project. This list must be provided with the bid package.

Revised 3/29/12

AMENDMENTS TO THE STANDARD SPECIFICATIONS

INTRODUCTION
The following Amendments and Special Provisions shall be used in conjunction with the 2016 Standard Specifications for Road, Bridge, and Municipal Construction.

AMENDMENTS TO THE STANDARD SPECIFICATIONS

The following Amendments to the Standard Specifications are made a part of this contract and supersede any conflicting provisions of the Standard Specifications. For informational purposes, the date following each Amendment title indicates the implementation date of the Amendment or the latest date of revision.

Each Amendment contains all current revisions to the applicable section of the Standard Specifications and may include references which do not apply to this particular project.

Section 1-06, Control of Material
January 4, 2016
This section is supplemented with the following new section and subsections:

1-06.6 Recycled Materials
The Contractor shall make their best effort to utilize recycled materials in the construction of the project; the use of recycled concrete aggregate as specified in Section 1-06.6(1)A is a requirement of the Contract.

The Contractor shall submit a Recycled Material Utilization Plan as a Type 1 Working Drawing within 30 calendar days after the Contract is executed. The plan shall provide the Contractor's anticipated usage of recycled materials for meeting the requirements of these Specifications. The quantity of recycled materials will be provided in tons and as a percentage of the Plan quantity for each material listed in Section 9-03.21(1)E Table on Maximum Allowable Percent (By Weight) of Recycled Material. When a Contract does not include Work that requires the use of a material that is included in the requirements for using materials the Contractor may state in their plan that no recycled materials are proposed for use.

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

1-06.6(1) Recycling of Aggregate and Concrete Materials

1-06.6(1)A General

The minimum quantity of recycled concrete aggregate shall be 25 percent of the total quantity of aggregate that is incorporated into the Contract for those items listed in Section 9-03.21(1)E Table on Maximum Allowable Percent (By Weight) of Recycled Material that allow the use of recycled concrete aggregate. The percentage of recycled material incorporated into the project for meeting the required percentage will be calculated in tons based on the quantity of recycled concrete used on the entire Contract and not as individual items.

If the Contractor's total cost for Work with recycled concrete aggregate is greater than without the Contractor may choose to not use recycled concrete aggregate. When the Contractor does not meet the minimum requirement of 25 percent recycled concrete aggregate for the Contract due to costs or any other reason the following shall be submitted:

1. A cost estimate for each material listed in Section 9-03.21(1)E that is utilized on the Contract. The cost estimate shall include the following:

    a. The estimated costs for the Work for each material with 25 percent recycled concrete aggregate. The cost estimate shall include for each material a copy of the price quote from the supplier with the lowest total cost for the Work.

    b. The estimated costs for the Work for each material without recycled concrete aggregate.

The Contractor's cost estimates shall be submitted as an attachment to the Recycled Materials Reporting form.

Section 1-07, Legal Relations and Responsibilities to the Public
January 4, 2016

1-07.1 Laws to be Observed
In the second to last sentence of the third paragraph, "WSDOT" is revised to read "Contracting Agency".

Section 1-08, Prosecution and Progress
January 4, 2016

1-08.1(1) Prompt Payment, Subcontract Completion and Return of Retainage Withheld
In item number 5 of the first paragraph, "WSDOT" is revised to read "Contracting Agency".

Section 5-02, Bituminous Surface Treatment
January 4, 2016

5-02.3(2) Preparation of Roadway Surface
This section is supplemented with the following new subsection:

5-02.3(2)E Crack Sealing
Where shown in the Plans, seal cracks and joints in the pavement in accordance with Section 5-04.3(5)C.

Section 5-04, Hot Mix Asphalt
January 4, 2016

5-04.2 Materials
The first paragraph is supplemented with the following new items:

Hot Poured Sealant 9-04.2(1)A
Sand Slurry 9-04.2(1)B

This section is supplemented with the following new paragraph:

The requirements of Section 1-06.6 do not apply to the portland cement and fine aggregate used in sand slurry.

5-04.3(5)C Crack Sealing
This section's content is deleted and replaced with the following new subsections:

5-04.3(5)C1 General
When the Proposal includes a pay item for crack sealing, all cracks and joints ¼ inch in width and greater shall be sealed. Cracks and joints shall be thoroughly clean, dry and free of all loose and foreign material when filled with crack sealant material. Immediately prior to filling a crack or joint with the sealant material a hot air lance shall be used to dry and warm the pavement surfaces within the crack or joint. Pavement shall not be overheated and direct flame dryers shall not be used. Routing cracks and joints is not required.

Where cracks and joints are to be filled with sand slurry thoroughly mix the components and pour the mixture into the cracks and joints until full. Additional CSS-1 emulsified asphalt may be added to the sand slurry as needed for the mixture to be workable to completely fill the crack or joint. Strike off the sand slurry flush with the existing pavement surface and allow the mixture to cure. Cracks or joints that were not completely filled shall be topped off with additional sand slurry. Do not place the HMA overlay until the slurry has fully cured.

Where cracks and joints are to be filled with hot poured sealant the material shall be applied in accordance with these requirements and the manufacturer's recommendations. The manufacturer's recommendations shall be furnished to the Engineer prior to the start of work and shall include recommended heating time

and temperatures, allowable storage time and temperatures after initial heating, allowable reheating criteria, and application temperature range.

Crack sealing with hot poured sealants shall be controlled to confine the material within the crack or joint. Any overflow of sealant shall be cleaned from the pavement surface. If, in the opinion of the Engineer, the Contractor's method of sealing the cracks and joints with hot poured sealant results in an excessive amount of material on the pavement surface, the operation shall be stopped and corrected to eliminate the excess material.

5-04.3(5)C2 Crack Sealing Areas Prior to Paving
In areas where HMA will be placed the cracks and joints shall be filled with sand slurry.

5-04.3(5)C3 Crack Sealing Areas Not to be Paved
In areas where HMA will not be placed the cracks and joints shall be filled as follows:

1. Cracks ¼ inch to 1 inch in width shall be filled with hot poured sealant.

2. Cracks and joints greater than 1 inch in width shall be filled with sand slurry.

5-04.3(5)C4 Crack Sealing Areas Prior to a Bituminous Surface Treatment
In areas where a BST will be placed the cracks and joints shall be filled per Section 5-
04.3(5)C3.

5-04.4 Measurement
The following new paragraph is inserted after the third paragraph:

Crack Sealing-LF will be measured by the linear foot along the line of the crack.

5-04.5 Payment
The Bid item "Crack Sealing" is revised to read "Crack Sealing-FA".

The following is inserted after the paragraph following the Bid item "Crack Sealing-FA", by force account (after the preceding Amendment is applied):

"Crack Sealing-LF", per linear foot.
The unit Contract price per linear foot for "Crack Sealing-LF" shall be full payment for all costs incurred to perform the Work described in Section 5-04.3(5)C.

Section 6-02, Concrete Structures
January 4, 2016

6-02.3(2)A1 Contractor Mix Design for Concrete Class 4000D

The following new sentence is inserted after the second sentence of the last paragraph:

> Mix designs using shrinkage reducing admixture shall state the specific quantity required.

The following new sentence is inserted before the last sentence of the last paragraph:

> Testing samples of mixes using shrinkage reducing admixture shall use the admixture amount specified in the mix design submittal.

6-02.3(26)D2 Test Block Dimensions
The first sentence is revised to read:

> The dimensions of the test block perpendicular to the tendon in each direction shall be the smaller of twice the minimum edge distance or the minimum spacing specified by the special anchorage device manufacturer, with the stipulation that the concrete cover over any confining reinforcing steel or supplementary skin reinforcement shall be appropriate for the project-specific application and circumstances.

Section 6-14, Geosynthetic Retaining Walls
January 4, 2016

6-14.5 Payment
The bid item “Concrete Fascia Panel”, per square foot, and the paragraph following this bid item are revised to read:

> Concrete Fascia Panel For Geosynthetic Wall”, per square foot.
>
> All costs in connection with constructing the concrete fascia panels as specified shall be included in the unit Contract price per square foot for “Concrete Fascia Panel For Geosynthetic Wall”, including all steel reinforcing bars, premolded joint filler, polyethylene bond breaker strip, joint sealant, PVC pipe for weep holes, exterior surface finish, and pigmented sealer (when specified), constructing and placing the concrete footing, edge beam, anchor beam, anchor rod assembly, and backfill.

Section 6-19, Shafts
January 4, 2016

6-19.4 Measurement
The first paragraph is revised to read:

> Soil excavation for shaft, including haul, will be measured by the cubic yards of shaft excavated. The cubic yards will be computed using the shaft diameter, top of shaft elevation and bottom of shaft elevation shown in the Plans, less all rock

excavation measured as specified for rock excavation. Excavation between the existing ground line and the top of shaft elevation is considered incidental to soil excavation for shaft and will not be measured.

The second paragraph is deleted.

6-19.5 Payment
The paragraph following the bid item “Soil Excavation For Shaft Including Haul”, per cubic yard is revised to read:

> The unit Contract price per cubic yard for “Soil Excavation For Shaft Including Haul” shall be full pay for performing the work as specified, including all costs in connection with furnishing, mixing, placing, maintaining, containing, collecting, and disposing of all mineral, synthetic, and water slurry, and disposing of groundwater collected by the shaft excavation, and the incidental excavation of soils between the top of shaft elevation shown in the Plans and the existing ground line.

Section 8-01, Erosion Control and Water Pollution Control
January 4, 2016

8-01.2 Materials
This section is supplemented with the following new paragraph:

> Recycled concrete, in any form, shall not be used for any Work defined in Section 8-01.

Section 8-10, Guide Posts
January 4, 2016

8-10.3 Construction Requirements
The last sentence of the second paragraph is deleted.

Section 8-22, Pavement Marking
January 4, 2016

8-22.4 Measurement
The first two sentences of the fourth paragraph are revised to read:

> The measurement for “Painted Wide Lane Line”, “Plastic Wide Lane Line”, “Profiled Plastic Wide Lane Line”, “Painted Barrier Center Line”, “Plastic Barrier Center Line”, “Painted Stop Line”, “Plastic Stop Line”, “Painted Wide Dotted Entry Line”, or “Plastic Wide Dotted Entry Line” will be based on the total length of each painted, plastic or profiled plastic line installed. No deduction will be made for the

unmarked area when the marking includes a broken line such as, wide broken lane line, drop lane line, wide dotted lane line or wide dotted entry line.

8-22.5 Payment
The following two new Bid items are inserted after the Bid item "Plastic Crosshatch Marking", per linear foot:

"Painted Wide Dotted Entry Line", per linear foot.

"Plastic Wide Dotted Entry Line", per linear foot.

Section 9-03, Aggregates
January 4, 2016

9-03.21(1)B Concrete Rubble
This section, including title, is revised to read:

9-03.21(1)B Recycled Concrete Aggregate
Recycled concrete aggregates are coarse and fine aggregates manufactured from hardened concrete mixtures.

Recycled concrete, in any form, shall not be placed below the ordinary high water mark of any water of the State.

Section 9-04, Joint and Crack Sealing Materials
January 4, 2016

9-04.2(1) Hot Poured Joint Sealants
This section's content is deleted and replaced with the following new subsections:

9-04.2(1)A Hot Poured Sealant
Hot poured sealant shall be sampled in accordance with ASTM D5167 and tested in accordance with ASTM D5329. Hot poured sealant shall have a minimum Cleveland Open Cup Flash Point of 205°C in accordance with AASHTO T 48.

9-04.2(1)A1 Hot Poured Sealant for Cement Concrete Pavement
Hot poured sealant for cement concrete pavement shall meet the requirements of ASTM D6690 Type IV, except for the following:

1. The Cone Penetration at 25°C shall be 130 maximum.

2. The extension for the Bond, non-immersed, shall be 100 percent.

9-04.2(1)A2 Hot Poured Sealant for Bituminous Pavement
Hot poured sealant for bituminous pavement shall meet the requirements of ASTM D6690 Type II.

9-04.2(1)B Sand Slurry for Bituminous Pavement
Sand slurry is mixture consisting of the following components measured by total weight:

1. Twenty percent CSS-1 emulsified asphalt,

2. Two percent Portland cement, and

3. Seventy-eight percent fine aggregate meeting the requirements of 9-03.1(2)B Class 2. Fine aggregate may be damp (no free water).

Section 9-07, Reinforcing Steel
January 4, 2016

9-07.1(1)A Acceptance of Materials
The first sentence of the first paragraph is revised to read:

> Reinforcing steel rebar manufacturers shall comply with the National Transportation Product Evaluation Program (NTPEP) Work Plan for Reinforcing Steel (rebar) Manufacturers.

The first sentence of the second paragraph is revised to read:

Steel reinforcing bar manufacturers use either English or a Metric size designation while stamping rebar.

SPECIAL PROVISIONS

INTRODUCTION TO THE SPECIAL PROVISIONS

(August 14, 2013 APWA GSP)

The work on this project shall be accomplished in accordance with the Standard Specifications for Road, Bridge and Municipal Construction, 2016 edition, as issued by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA), Washington State Chapter (hereafter "Standard Specifications"). The Standard Specifications, as modified or supplemented by the Amendments to the Standard Specifications and these Special Provisions, all of which are made a part of the Contract Documents, shall govern all of the Work.

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

The project-specific Special Provisions are not labeled as such. The GSPs are labeled under the headers of each GSP, with the effective date of the GSP and its source. For example:

(March 8, 2013 APWA GSP)
(April 1, 2013 WSDOT GSP)

Also incorporated into the Contract Documents by reference are:

- *Manual on Uniform Traffic Control Devices for Streets and Highways*, currently adopted edition, with Washington State modifications, if any
- *Standard Plans for Road, Bridge and Municipal Construction*, WSDOT/APWA, current edition

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

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DIVISION 1 GENERAL REQUIREMENTS

Description of Work
This contract provides for the construction of Duwe'iq Stormwater Treatment Wetland in Kitsap County. The work includes, but is not limited to, demolition, site preparation, erosion control, traffic safety and control and related work, utility coordination, excavation, grading, pavement repair, installation of storm sewer structures and pipe, log weirs, habitat logs, precast concrete culvert, streambed boulders, streambed aggregate, and planting. All work shall be in accordance with the attached Contract Plans, these Contract Provisions, and the Standard Specifications.

1-01 Definitions and Terms

1-01.3 Definitions
(January 4, 2016 APWA GSP)
Delete the heading **Completion Dates** and the three paragraphs that follow it, and replace them with the following:

Dates

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

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

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

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

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

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

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

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

Supplement this Section with the following:

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

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

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

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

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

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

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

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

Contract Documents
See definition for "Contract".

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

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

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

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

1-02 Bid Procedures and Conditions

1-02.1 Prequalification of Bidders

Delete this Section and replace it with the following:

1-02.1 Qualifications of Bidder
(January 24, 2011 APWA GSP)
Before award of a public works contract, a bidder must meet at least the minimum qualifications of RCW 39.04.350(1) to be considered a responsible bidder and qualified to be awarded a public works project.

Add the following new section:

1-02.1(1) Supplemental Qualifications Criteria
(January 4, 2016 APWA GSP; requires pre-approval on FHWA funded projects, through WSDOT/Local Programs)

In addition, the Contracting Agency has established Contracting Agency-specific and/or project-specific supplemental criteria, in accordance with RCW 39.04.350(2),

for determining Bidder responsibility, including the basis for evaluation and the deadline for appealing a determination that a Bidder is not responsible. These criteria are contained in Section 1-02.14 Option C of these Special Provisions.

1-02.2 Plans and Specifications
(June 27, 2011 APWA GSP)
Delete this section and replace it with the following:

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

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

To Prime Contractor	No. of Sets	Basis of Distribution
Reduced plans (11" x 17")	5	Furnished automatically upon award.
Contract Provisions	5	Furnished automatically upon award.
Large plans (e.g., 22" x 34")	5	Furnished automatically upon award.

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

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

1-02.4(2) Subsurface Information
Supplement this section with the following:

(March 8, 2013 APWA GSP)
The second sentence in the first paragraph is revised to read:

The Summary of Geotechnical Conditions and the boring logs, <u>if and when included</u> as an appendix to the Special Provisions, shall be considered as part of the Contract.

Supplement the preceding section with the following:

The geotechnical report for this project is attached to these Contract Provisions.

1-02.5 Proposal Forms
(June 27, 2011 APWA GSP)
Delete this section and replace it with the following:

The Proposal Form will identify the project and its location and describe the work. It will also list estimated quantities, units of measurement, the items of work, and the materials to be furnished at the unit bid prices. The bidder shall complete spaces on the proposal form that call for, but are not limited to, unit prices; extensions; summations; the total bid amount; signatures; date; and, where applicable, retail sales taxes and acknowledgment of addenda; the bidder's name, address, telephone number, and signature; the bidder's D/M/WBE commitment, if applicable; a State of Washington Contractor's Registration Number; and a Business License Number, if applicable. Bids shall be completed by typing or shall be printed in ink by hand, preferably in black ink. The required certifications are included as part of the Proposal Form.

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

1-02.6 Preparation of Proposal

(June 27, 2011 APWA GSP)
Supplement the second paragraph with the following:

4. If a minimum bid amount has been established for any item, the unit or lump sum price must equal or exceed the minimum amount stated.
5. Any correction to a bid made by interlineation, alteration, or erasure, shall be initialed by the signer of the bid.

Delete the last paragraph, and replace it with the following:

The Bidder shall make no stipulation on the Bid Form, nor qualify the bid in any manner.

A bid by a corporation shall be executed in the corporate name, by the president or a vice president (or other corporate officer accompanied by evidence of authority to sign).

A bid by a partnership shall be executed in the partnership name, and signed by a partner. A copy of the partnership agreement shall be submitted with the Bid Form if any D/M/WBE requirements are to be satisfied through such an agreement.

A bid by a joint venture shall be executed in the joint venture name and signed by a member of the joint venture. A copy of the joint venture agreement shall be submitted with the Bid Form if any D/W/MBE requirements are to be satisfied through such an agreement.

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

Supplement this section with the following:

Bid bonds shall contain the following:

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

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

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

Supplement the preceding section with the following:

Bidders shall use the Bid Bond form included with these Contract Provisions.

A bid deposit in the form of cash or check will not be accepted.

1-02.9 Delivery of Proposal
(August 15, 2012 APWA GSP, Option A)

Delete this section and replace it with the following:

Each proposal shall be submitted in a sealed envelope, with the Project Name and Project Number as stated in the Call for Bids clearly marked on the outside of the envelope, or as otherwise required in the Bid Documents, to ensure proper handling and delivery.

If the project has FHWA funding and requires DBE Written Confirmation Documents or Good Faith Effort Documentation, then to be considered responsive, the Bidder shall submit with their Bid Proposal, written Confirmation Documentation from each DBE firm listed on the Bidder's completed DBE Utilization Certification, form 272-056A EF, as required by Section 1-02.6.

The Contracting Agency will not open or consider any Bid Proposal that is received after the time specified in the Call for Bids for receipt of Bid Proposals, or received in a location other than that specified in the Call for Bids.

1-02.10 WITHDRAWING, REVISING, OR SUPPLEMENTING PROPOSAL
(July 23, 2015 APWA GSP)
Delete this section, and replace it with the following:

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

1. The Bidder submits a written request signed by an authorized person and physically delivers it to the place designated for receipt of Bid Proposals, and
2. The Contracting Agency receives the request before the time set for receipt of Bid Proposals, and

3. The revised or supplemented Bid Proposal (if any) is received by the Contracting Agency before the time set for receipt of Bid Proposals.

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

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

1-02.12 Public Opening of Proposals
Supplement this section with the following:

Date of Opening Bids
The bid opening date for this project shall be **March 29, 2016**. The bids will be publicly opened and read after **10:00 A.M**. on this date in the Port Madison Conference Room, fourth floor Kitsap County Administration Building located at the address shown below.

Sealed bids shall be received at or before the specified time at:

Kitsap County Purchasing Office
Fourth Floor Administration Building
619 Division Street
Port Orchard, Washington

Bids delivered in person or by private carrier (UPS, Federal Express, etc.) shall be addressed and delivered to the above location. Bids delivered by US Postal Service shall be addressed to:

Kitsap County Purchasing Office
614 Division Street, MS-07
Port Orchard WA 98366

Bidders are advised that bids not delivered in person may be subject to delay or loss. It is the bidder's sole responsibility to ensure timely delivery of their bid to the place of bid opening. Bids not received at the place of bid opening at or before the appointed time will not be considered, and shall be returned unopened to the bidder.

1-02.13 Irregular Proposals
(January 4, 2016 APWA GSP)
Delete this section and replace it with the following:

1. A proposal will be considered irregular and will be rejected if:

   a. The Bidder is not prequalified when so required;
   b. The authorized proposal form furnished by the Contracting Agency is not used or is altered;
   c. The completed proposal form contains any unauthorized additions, deletions, alternate Bids, or conditions;
   d. The Bidder adds provisions reserving the right to reject or accept the award, or enter into the Contract;
   e. A price per unit cannot be determined from the Bid Proposal;
   f. The Proposal form is not properly executed;
   g. The Bidder fails to submit or properly complete a Subcontractor list, if applicable, as required in Section 1-02.6;
   h. The Bidder fails to submit or properly complete a Disadvantaged Business Enterprise Certification, if applicable, as required in Section 1-02.6;
   i. The Bidder fails to submit written confirmation from each DBE firm listed on the Bidder's completed DBE Utilization Certification that they are in agreement with the bidders DBE participation commitment, if applicable, as required in Section 1-02.6, or if the written confirmation that is submitted fails to meet the requirements of the Special Provisions;
   j The Bidder fails to submit DBE Good Faith Effort documentation, if applicable, as required in Section 1-02.6, or if the documentation that is submitted fails to demonstrate that a Good Faith Effort to meet the Condition of Award was made;
   k. The Bid Proposal does not constitute a definite and unqualified offer to meet the material terms of the Bid invitation; or

l. More than one proposal is submitted for the same project from a Bidder under the same or different names.

2. A Proposal may be considered irregular and may be rejected if:

a. The Proposal does not include a unit price for every Bid item;
b. Any of the unit prices are excessively unbalanced (either above or below the amount of a reasonable Bid) to the potential detriment of the Contracting Agency;
c. Receipt of Addenda is not acknowledged;
d. A member of a joint venture or partnership and the joint venture or partnership submit Proposals for the same project (in such an instance, both Bids may be rejected); or
e. If Proposal form entries are not made in ink.

1-02.14 Disqualification of Bidders
Delete this Section and replace it with the following:

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

1. Delinquent State Taxes

A. Criterion: The Bidder shall not owe delinquent taxes to the Washington State Department of Revenue unless they have a payment plan which has been approved by the Washington State Department of Revenue.

B. Documentation: The Bidder shall not be listed as delinquent by the Washington State Department of Revenue or if they are so listed, must submit a written copy of their payment plan approved by the Department of Revenue to the Contracting Agency within 2 business days following the bid opening.

2. Federal Debarment

A. Criterion: The Bidder shall not currently be debarred or suspended by the Federal government.

B. Documentation: The Bidder shall not be listed as having an “active exclusion” on the U.S. government’s “System for Award Management” database (www.sam.gov).

3. Subcontractor Responsibility

A. Criterion: The Bidder's standard subcontract form shall include the subcontractor responsibility language required by RCW 39.06.020, and the Bidder shall have an established procedure which it utilizes to validate the responsibility of each of its subcontractors. The Bidder's subcontract form shall also include a requirement that each of its subcontractors shall have and document a similar procedure to determine whether the sub-tier subcontractors with whom it contracts are also "responsible" subcontractors as defined by RCW 39.06.020.

B. Documentation: The Bidder, if and when required as detailed below, shall submit a copy of its standard subcontract form for review by the Contracting Agency, and a written description of its procedure for validating the responsibility of subcontractors with which it contracts.

4. Prevailing Wages

A. Criterion: The Bidder shall not have a record of prevailing wage violations as determined by WA Labor & Industries in the five years prior to the bid submittal date, that demonstrates a pattern of failing to pay workers prevailing wages, unless there are extenuating circumstances and such circumstances are deemed acceptable to the Contracting Agency.

B. Documentation: The Bidder, if and when required as detailed below, shall submit a list of all prevailing wage violations in the five years prior to the bid submittal date, along with an explanation of each violation and how it was resolved. The Contracting Agency will evaluate these explanations and the resolution of each complaint to determine whether the violation demonstrate a pattern of failing to pay its workers prevailing wages as required.

5. Claims Against Retainage and Bonds

A. Criterion: The Bidder shall not have a record of excessive claims filed against the retainage or payment bonds for public works projects in the three years prior to the bid submittal date, that demonstrate a lack of effective management by the Bidder of making timely and appropriate payments to its subcontractors, suppliers, and workers, unless there are extenuating circumstances and such circumstances are deemed acceptable to the Contracting Agency.

B. Documentation: The Bidder, if and when required as detailed below, shall submit a list of the public works projects completed in the three years prior to the bid submittal date that have had claims against

retainage and bonds and include for each project the following information:

- Name of project
- The owner and contact information for the owner;
- A list of claims filed against the retainage and/or payment bond for any of the projects listed;
- A written explanation of the circumstances surrounding each claim and the ultimate resolution of the claim.

6. Public Bidding Crime

A. Criterion: The Bidder and/or its owners shall not have been convicted of a crime involving bidding on a public works contract in the five years prior to the bid submittal date.

B. Documentation: The Bidder, if and when required as detailed below, shall sign a statement (on a form to be provided by the Contracting Agency) that the Bidder and/or its owners have not been convicted of a crime involving bidding on a public works contract.

7. Termination for Cause / Termination for Default

A. Criterion: The Bidder shall not have had any public works contract terminated for cause or terminated for default by a government agency in the five years prior to the bid submittal date, unless there are extenuating circumstances and such circumstances are deemed acceptable to the Contracting Agency.

B. Documentation: The Bidder, if and when required as detailed below, shall sign a statement (on a form to be provided by the Contracting Agency) that the Bidder has not had any public works contract terminated for cause or terminated for default by a government agency in the five years prior to the bid submittal date; or if Bidder was terminated, describe the circumstances.

8. Lawsuits

A. Criterion: The Bidder shall not have lawsuits with judgments entered against the Bidder in the five years prior to the bid submittal date that demonstrate a pattern of failing to meet the terms of contracts, unless there are extenuating circumstances and such circumstances are deemed acceptable to the Contracting Agency.

B. Documentation: The Bidder, if and when required as detailed below, shall sign a statement (on a form to be provided by the Contracting

Agency) that the Bidder has not had any lawsuits with judgments entered against the Bidder in the five years prior to the bid submittal date that demonstrate a pattern of failing to meet the terms of contracts, or shall submit a list of all lawsuits with judgments entered against the Bidder in the five years prior to the bid submittal date, along with a written explanation of the circumstances surrounding each such lawsuit. The Contracting Agency shall evaluate these explanations to determine whether the lawsuits demonstrate a pattern of failing to meet of terms of construction related contracts.

9. Contracting Agency Specific Criteria

A. Criterion:
Bidders shall supply the following information:

- Dollar amount of contracts currently held by the bidder
- List of more important construction projects completed by your company in the last 5 years.
- Bank References
- Bonding Company

B. Documentation:
The required information shall be included in Section C of the Bidder Responsibility Statement.

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

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

If the Contracting Agency determines the Bidder does not meet the bidder responsibility criteria above and is therefore not a responsible Bidder, the Contracting Agency shall notify the Bidder in writing, with the reasons for its

determination. If the Bidder disagrees with this determination, it may appeal the determination within two (2) business days of the Contracting Agency's determination by presenting its appeal and any additional information to the Contracting Agency. The Contracting Agency will consider the appeal and any additional information before issuing its final determination. If the final determination affirms that the Bidder is not responsible, the Contracting Agency will not execute a contract with any other Bidder until at least two business days after the Bidder determined to be not responsible has received the Contracting Agency's final determination.

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

1-02.15 Pre-Award Information
(August 14, 2013 APWA GSP)

Revise this section to read:

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

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

1-03 Award and Execution of Contract

1-03.1 Consideration of Bids
(January 23, 2006 APWA GSP)

Revise the first paragraph to read:

After opening and reading proposals, the Contracting Agency will check them for correctness of extensions of the prices per unit and the total price. If a discrepancy

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

1-03.3 Execution of Contract
(October 1, 2005 APWA GSP)
Revise this section to read:

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

Within 10 calendar days after the award date, the successful bidder shall return the signed Contracting Agency-prepared contract, an insurance certification as required by Section 1-07.18, and a satisfactory bond as required by law and Section 1-03.4. Before execution of the contract by the Contracting Agency, the successful bidder shall provide any pre-award information the Contracting Agency may require under Section 1-02.15.

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

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

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

Delete the first paragraph and replace it with the following:

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

payment and performance bonds, each shall be for the full contract amount. The bond(s) shall:

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

1-03.7 Judicial Review

(July 23, 2015 APWA GSP)

Revise this section to read:

Any decision made by the Contracting Agency regarding the Award and execution of the Contract or Bid rejection shall be conclusive subject to the scope of judicial review permitted under Washington Law. Such review, if any, shall be timely filed in the Superior Court of the county where the Contracting Agency headquarters is located, provided that where an action is asserted against a county, RCW 36.01.05 shall control venue and jurisdiction.

1-04 Scope of the Work

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

(March 13, 2012 APWA GSP)

Revise the second paragraph to read:

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

1. Addenda,
2. Proposal Form,
3. Special Provisions,
4. Contract Plans,
5. Amendments to the Standard Specifications,
6. Standard Specifications,
7. Contracting Agency's Standard Plans or Details (if any), and
8. WSDOT Standard Plans for Road, Bridge, and Municipal Construction.

1-04.6 Variation in Estimated Quantities

Supplement this Section with the following:

The quantities for Unsuitable Foundation Excavation Incl. Haul and Special Borrow Incl. Haul have been entered into the Proposal only to provide a common proposal for bidders. Actual quantities will be determined in the field as the work progresses, and will be paid at the original bid price, regardless of final quantity. These bid items shall not be subject to the provisions of 1-04.6 of the Standard Specifications.

1-05 Control of Work

1-05.3 Plans and Working Plans

Supplement this section with the following:

The County will provide the contractor with hard copies and electronic (CAD) versions of the engineering Plans to use as a basis for the record Plans. The contractor is responsible for filling out the information on the record Plans.

Record Plans shall show the size and location of stream construction limits and its features. All record drawing information shall be shown in station, offset and elevation. The Plans shall also show the size, type and composition of the features as appropriate.

These plans shall be kept current during the course of construction, kept on-site at the contractor's site office, and be available for review by the engineer at all times. Record Plans shall be updated daily and changes occurring on any day shall be entered on the record Plans by noon on the next working day.

Prior to acceptance of the completed project, the contractor shall furnish the engineer one legible and neatly marked set of full-sized plans. All record Plans and disks shall be delivered to the Engineer in acceptable form prior to final payment.

The production of record Plans shall be considered incidental to and included in the cost for other items in the contract. A pay submittal shall not be considered complete or payable if the record Plans are not current as required by this section.

1-05.4 Conformity With and Deviations From Plans and Stakes
Supplement this section with the following:

Copies of the Contracting Agency provided primary survey control data are shown on the Plans. The Contractor shall provide all surveying required to complete the project. The Contractor shall be responsible for setting, maintaining, and resetting all stakes for the Work. Except for the survey control data to be furnished by the Contracting Agency, calculations, surveying, and measuring required for setting and maintaining the necessary lines and grades shall be the Contractor's responsibility. All setting and resetting of monuments, property corners, and primary control, shall be completed by or under the direct supervision of a Washington State Registered Professional Land Surveyor (PLS).

At the Contractor's request the Contracting Agency will provide the electronic CAD base files. Electronic files are provided for the Contractor's convenience and are not part of the Contract. Calculations shall be made from the Plans. The Contractor is advised to field verify the electronic files prior to their use in staking or other activities. If the signed and stamped Plans and electronic files differ, the signed and stamped Plans control. The Contractor shall not rely on the electronic files and no claim by the Contractor shall be based on the electronic files or any difference between the electronic files and the signed and stamped Plans or site conditions.

The Contractor shall maintain detailed survey records, including a description of the work performed on each shift, the methods utilized, and the control points used. The records shall be adequate to allow the survey to be reproduced. A copy of each day's record shall be provided to the Engineer within three business days of Engineer's request.

The survey work shall include but not be limited to the following:

1. Primary and Secondary Control: Verify and use the primary horizontal and vertical control furnished by the Contracting Agency, and expand into secondary control by adding stakes and hubs as well as additional survey control needed for the project. Provide descriptions of secondary control to the Contracting Agency. The description shall include horizontal coordinates, station, offset and elevations of all secondary control points. Provide the Contracting Agency an electronic copy of the secondary control points. Vertical secondary control shall be established using spirit levels, not a GPS system.

2. The Contractor shall stake Right-of-Way, easements, clearing limits and centerline stationing one week prior to commencement of on-site construction activities. The Contractor shall allow for at least two working days for the Engineer to approve the

layout after staking. The Contractor shall assume full responsibility for detailed dimensions, elevations, and excavation slopes measured from these stakes and marks, regardless of Engineer's review and approval.

3. Clearing Limits: Clearing limits shall be marked at major angle points and at intermediate points at approximately 100 foot intervals. Staking of clearing limits is not required if the limits are defined by existing features (i.e. fence, edge of pavement) shown on the Plans and which will not be removed during construction. The clearing limits shall generally be located 5 feet beyond the toe of the fill and 10 feet beyond the top of the cut unless otherwise shown on the Plans.

4. Protected Areas: Wetland boundaries, easements, and other areas to be protected shall be marked at major angle points and at intermediate points at approximately 50 foot intervals. Staking is not required if the limits are defined by existing features (i.e. fence, edge of pavement) shown on the Plans and which will not be removed during construction.

5. Grading Limits (Slope Stakes): Grading limits shall be staked on the centerline at 50 foot intervals. Contractor shall establish offset reference to all slope stakes.

6. Sanitary Sewer and Storm Sewer Structures: Sanitary sewer manholes and storm sewer manholes and catch basins shall be staked with two offset stakes each. Gravity sanitary sewer and storm pipe shall be staked as follows: one stake at 25-foot and one stake at 100-foot stations, as measured upstream from structures. Service stubs shall be staked with two inline stakes. Establish the radius point of all curb returns before staking drainage structures. Radius point stakes shall be marked with the station, offset, and radius.

7. Culvert Pipes: Culvert pipes shall be staked at each end of the culvert and at horizontal and vertical angle points.

8. Subgrade and Finished Grade: Subgrade and surfacing elevations shall be set at the top of subgrade and at the top of each course of surfacing. Subgrade and surfacing stakes shall be set at horizontal intervals not greater than 50 feet in tangent sections and 25 feet in curve sections with a radius less than 300 feet, and at 10-foot intervals in intersection radii with a radius of less than 10 feet.

9. Concrete Retaining, Rock, and Block Walls. Walls shall be staked with a single offset line to the bottom face of wall; at the beginning and end of the wall, horizontal angle points/curves, points of bottom and top of wall changes in elevations, and at approximately 50-foot intervals. The Contractor shall be responsible for verifying points of bottom and top of wall changes in elevations and coordinating adjustments with the Engineer.

10. Monuments: The Contractor shall establish the locations of monuments shown on the Plans. The Contractors shall be responsible for locating and preserving existing monuments within the right-of-way, which shall include existing property corners in the right-of-way lines. The Contractors shall maintain a complete and accurate reference of all survey markers, monuments, property corners, on this project. The Contractor shall inform the Engineer when monuments are discovered that were not identified in the Plans. All monuments shall be protected throughout the length of the project or be replaced at the Contractor's expense, unless marked on the Plans as to be removed and reset. In the event the Contractor disturbs or destroys any survey marker during the course of construction, not indicated to be removed/replaced on the Plans, the Contractor shall bear all costs of survey, resetting, legal claims, and filing state forms.

11. For all other types of construction included in the Contract (including but not limited to channelization and pavement marking, conduits, junction boxes, control/service cabinets, fences, signing, landscaping, irrigation facilities, and sawcuts) , provide staking and layout as required to adequately locate, construct, and check the specific construction activity.

The Contractor shall establish all surveyed points by placing hubs and tacks with marked stakes in unpaved areas or P.K. nails with painted markings in paved areas. All surveying stakes shall be marked in accordance with WSDOT Standard Plan A-10.10-00.

The Contractor shall ensure a surveying accuracy within the following tolerances:

	Vertical	**Horizontal**
Slope Stakes	±0.1 foot	±0.10 foot
Subgrade Grade Stakes Set 0.04 foot Below Grade	±0.01 foot	±0.5 foot (parallel to alignment) ±0.1 foot (normal to alignment)
Stationing on Roadway	N/A	±0.1 foot
Alignment on Roadway	N/A	±0.04 foot
Surfacing Grade Stakes	±0.01 foot	±0.1 foot (parallel to alignment) ±0.1 foot (normal to alignment)
Roadway Paving Pins for Surfacing or Paving	±0.01 foot	±0.1 foot (parallel to alignment) ±0.05 foot (normal to alignment)
Alignment of sewer and storm manholes and catch basins	±0.01 foot	±0.1 foot

Walls	±0.01 foot	±0.04 foot
Curb and Gutter	±0.01 foot	±0.01 foot

When staking roadway alignment and stationing, the Contractor's PLS shall perform independent checks from different secondary control to ensure that the points staked are within the specified survey accuracy tolerances.

The Contracting Agency may spot-check the Contractor's surveying. These spot-checks shall not change the requirements for accuracy by the Contractor.

If errors are found, or the Engineer determines that the survey Work is insufficient for the project, the Contractor shall correct the errors and/or resolve insufficiencies, which may include removal and replacement of incorrectly installed improvements. All costs incurred to correct or complete the Work shall be at the Contractor's expense, in accordance with Section 1-05.7.

Payment

Payment will be made in accordance with Section 1-04.1 for the following bid item, when included in the proposal:

“Project Surveying”, per Lump Sum.

The unit contract price for “Project Surveying”, by Lump Sum, shall be full pay for all labor, equipment, materials, and supervision utilized to perform the Work specified, including any resurveying, checking, correction of errors, replacement of missing or damaged stakes, and coordination efforts as described above, as shown on the Plans, and herein specified, including resetting markers and/or monuments purposely moved as part of the Work.

1-05.6 inspection of Work and Materials

Supplement this section with the following:

> The Contractor shall provide for the safe access to the construction site and to the Contractor’s records by Washington State Department of Ecology personnel.
>
> The Contractor shall maintain accurate records and accounts to facilitate the Contracting Agency’s audit requirements and shall ensure that all subcontractors maintain auditable records.
>
> These Project records shall be separate and distinct from the Contractor’s other records and accounts.

All such records shall be available to the Contracting Agency and to Washington State Department of Ecology personnel for examination. All records pertinent to this project shall be retained by the Contractor for a period of three (3) years after the final audit.

1-05.7 Removal of Defective and Unauthorized Work
(October 1, 2005 APWA GSP)

Supplement this section with the following:

If the Contractor fails to remedy defective or unauthorized work within the time specified in a written notice from the Engineer, or fails to perform any part of the work required by the Contract Documents, the Engineer may correct and remedy such work as may be identified in the written notice, with Contracting Agency forces or by such other means as the Contracting Agency may deem necessary.

If the Contractor fails to comply with a written order to remedy what the Engineer determines to be an emergency situation, the Engineer may have the defective and unauthorized work corrected immediately, have the rejected work removed and replaced, or have work the Contractor refuses to perform completed by using Contracting Agency or other forces. An emergency situation is any situation when, in the opinion of the Engineer, a delay in its remedy could be potentially unsafe, or might cause serious risk of loss or damage to the public.

Direct or indirect costs incurred by the Contracting Agency attributable to correcting and remedying defective or unauthorized work, or work the Contractor failed or refused to perform, shall be paid by the Contractor. Payment will be deducted by the Engineer from monies due, or to become due, the Contractor. Such direct and indirect costs shall include in particular, but without limitation, compensation for additional professional services required, and costs for repair and replacement of work of others destroyed or damaged by correction, removal, or replacement of the Contractor's unauthorized work.

No adjustment in contract time or compensation will be allowed because of the delay in the performance of the work attributable to the exercise of the Contracting Agency's rights provided by this Section.

The rights exercised under the provisions of this section shall not diminish the Contracting Agency's right to pursue any other avenue for additional remedy or damages with respect to the Contractor's failure to perform the work as required.

1-05.11 Final Inspection
Delete this section and replace it with the following:

1-05.11 Final Inspections and Operational Testing

1-05.11(1) Substantial Completion Date

This project shall be physically completed within **90 working days**.

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

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

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

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

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

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

deficiencies. This process will continue until the Engineer is satisfied the listed deficiencies have been corrected.

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

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

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

1-05.11(3) Operational Testing

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

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

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

1-05.13 Superintendents, Labor, and Equipment of Contractor
(August 14, 2013 APWA GSP)

Delete the sixth and seventh paragraphs of this section.

1-05.14 Cooperation with Other Contractors

Supplement this section with the following:

The Contractor shall be responsible for the coordination of his work with the work of others, including the work in the vicinity of this project by other contractors. The Owner will not be responsible for any damage suffered or extra costs incurred by the Contractor resulting directly or indirectly from any other contract(s) or work.

1-05.15 Method of Serving Notices
(March 25, 2009 APWA GSP)

Revise the second paragraph to read:

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

Add the following new sections:

> **1-05.16 Water and Power**
> (October 1, 2005 APWA GSP)
>
> The Contractor shall make necessary arrangements, and shall bear the costs for power and water necessary for the performance of the work, unless the contract includes power and water as a pay item.
>
> **1-05.17 Oral Agreements**
>
> No oral agreement or conversation with any officer, agent, or employee of the Contracting Agency, either before or after execution of the contract, shall affect or modify any of the terms or obligations contained in any of the documents comprising the contract. Such oral agreement or conversation shall be considered as unofficial information and in no way binding upon the Contracting Agency, unless subsequently put in writing and signed by the Contracting Agency.

1-06 Control of Materials

1-06.6 Recycled Materials

Delete this section in its entirety.

1-07 Legal Regulations and Responsibilities to the Public

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

Supplement this section with the following:

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

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

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

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

1-07.2 State Taxes
Delete this section, including its sub-sections, in its entirety and replace it with the following:

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

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

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

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

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

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

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

WAC 458-20-170, and its related rules, apply to the constructing and repairing of new or existing buildings, or other structures, upon real property. This includes, but is not limited to, the construction of streets, roads, highways, etc., owned by the state of Washington; water mains and their appurtenances; sanitary sewers and sewage disposal systems unless such sewers and disposal systems are within, and a part of, a street or road drainage system; telephone, telegraph, electrical power distribution lines, or other conduits or lines in or above streets or roads, unless such power lines become a part of a street or road lighting system; and installing or attaching of any article of tangible personal property in or to real property, whether or not such personal property becomes a part of the realty by virtue of installation.

For work performed in such cases, the Contractor shall collect from the Contracting Agency, retail sales tax on the full contract price. The Contracting Agency will automatically add this sales tax to each payment to the Contractor. For this reason,

the Contractor shall not include the retail sales tax in the unit bid item prices, or in any other contract amount subject to Rule 170, with the following exception.

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

1-07.2(3) Services

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

1-07.6 Permits And Licenses

Supplement this section with the following:

The Contracting Agency has obtained the below-listed permit(s) for this project. A copy of the permit(s) is attached as an appendix for informational purposes. All contacts with the permitting agency concerning the below-listed permit(s) shall be through the Engineer. The Contractor shall obtain additional permits as necessary, including a Right-of-Way permit from Kitsap County Public Works. All costs to obtain and comply with additional permits shall be included in the applicable bid items for the work involved. Copies of these permits are required to be onsite at all times.

NAME OF DOCUMENT	PERMITTING AGENCY	PERMIT REFERENCE #
Site Dev. Activity Permit	Kitsap Co. DCD	SDAP 15 01250
Hydraulic Project Approval	WDFW	2015-6-531+01
NPDES Permit	Dept. of Ecology	<in process>

1-07.7 Load Limits

Supplement this section with the following:

If the sources of materials provided by the Contractor necessitates hauling over roads other than county roads, the Contractor shall, at the Contractor's expense, make all arrangements for the use of the haul routes.

1-07.9 Wages

1-07.9(1) General

Supplement this section with the following:

This contract is subject to the minimum wage requirements of RCW39.12. The schedule of the prevailing wage rates for this Contract is included in the Appendix

1-07.15 Temporary Water Pollution Prevention
Supplement this section with the following:

Protection of the Environment: No construction related activity shall contribute to the degradation of the environment, allow material to enter surface or ground waters, or allow particulate emissions to the atmosphere, which exceed state or federal standards. Any actions that potentially allow a discharge to state waters must have prior approval of the Washington State Department of Ecology.

1-07.17 Utilities And Similar Facilities
Delete the first paragraph of this section and replace it with the following:

The Contractor shall protect all private and public utilities from damage resulting from the work to be accomplished under this contract and provide the support necessary to keep any facility encountered during construction intact and fully functional. Among others these utilities include: telephone, cable television and power lines; pipelines and water lines; railroad tracks and equipment; road and highway lighting and sign systems and intelligent transportation systems (ITS)

Supplement this section with the following:

Locations and dimensions shown in the Plans for existing facilities are in accordance with available information obtained without uncovering, measuring, or other verification.

Public and private utilities, or their Contractors, will furnish all work necessary to adjust, relocate, replace, or construct their facilities unless otherwise provided for in the Plans or these Special Provisions. Such adjustment, relocation, replacement, or construction will be done during the prosecution of the work for this project. It is anticipated that utility adjustment, relocation, replacement, or construction within the project limits will be completed as follows:

The Silverdale Water District (SWD) water supply facilities will be used for temporary irrigation that is installed by the Contractor as part of this Contract. SWD will inspect and approve the service connection. Contractor to coordinate the relocation of SWD utilities.

CenturyLink-owned underground communications line will be relocated by CenturyLink.

Puget Sound Energy underground power will be relocated by PSE.

Comcast-owned underground communications line will be relocated by Comcast.

Cascade Natural Gas-owned underground gas pipes will be relocated by Cascade Natural Gas.

The Contractor shall be responsible for coordinating with all utility owners to ensure timely and efficient completion of the work.

The Contractor shall attend a mandatory utility preconstruction meeting with the Engineer, all affected Subcontractors, and all utility owners and their Contractors prior to beginning on-site work.

The following addresses and telephone numbers of utility companies or their Contractors that will be adjusting, relocating, replacing, or constructing utilities within the project limits are supplied for the Contractor's use:

Puget Sound Energy
6522 Kitsap Way
Bremerton, WA 98312
Contact: Tom Brobst
Telephone: 360.475.7020

CenturyLink
611 6th Street
Bremerton, WAWA 98337
Contact: Royce Klein
Telephone: 360.478.5930

Comcast
1225 Sylvan Way
Bremerton, WA 98310
Contact: Jim Lecompte
Telephone: 253.896.5688, 360.340.1288

Silverdale Water District
5300 NW Newberry Hill
Silverdale, WA 98383
Contact: Nolan Corpuz
Telephone: 360-447-3500

Cascade Natural Gas
PO Box 539
Bremerton, WA 98312
Contact Rick Coy
Telephone 360-633-6614

Add the following new section:

1-07.17(3) Protection and Support of Existing Utilities

Description
The Contractor shall provide protection of all existing and relocated utility facilities crossing the work area during construction. All Utilities shall remain fully operational throughout the life of this contract unless otherwise stated in these provisions. The Contractor shall be responsible for coordinating with the Engineer and the utility owners for the temporary or permanent relocation of the utilities or the erection of temporary support for them by the Contractor.

The Contractor shall locate, "pot hole," and expose all existing underground utilities shown in the Plans. Excavation immediately adjacent to existing utilities including conduits shall be by hand methods in compliance with Washington State requirements.

Payment
Payment will be made in accordance with Section 1-04.1 for the following bid item included on the proposal:

"Protection of Existing Utilities Incl. Pot Holing", lump sum.

The lump sum contract price for "Protection of Existing Utilities Incl. Pot Holing" shall be full pay for all labor, tools, materials and equipment necessary to complete the work, including potholing, support, and for any costs incurred by the Contractor due to the loss of work efficiency as a result of utility relocation by others or the requirement to work adjacent to the relocated or temporarily supported utilities.

1-07.18 Public Liability and Property Damage Insurance
Delete this section in its entirety, and replace it with the following:

1-07.18 Insurance
(January 4, 2016 APWA GSP)

1-07.18(1) General Requirements

A. The Contractor shall procure and maintain the insurance described in all subsections of section 1-07.18 of these Special Provisions, from insurers with a current A. M. Best rating of not less than A-: VII and licensed to do business in the State of Washington. The Contracting Agency reserves the right to approve or reject the insurance provided, based on the insurer's financial condition.

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

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

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

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

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

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

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

1-07.18(2) Additional Insured

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

- the Contracting Agency and its officers, elected officials, employees, agents, and volunteers

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

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

1-07.18(3) Subcontractors

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

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

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

1-07.18(4) Verification of Coverage

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

Verification of coverage shall include:

1. An ACORD certificate or a form determined by the Contracting Agency to be equivalent.

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

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

1-07.18(5) Coverages and Limits

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

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

1-07.18(5)A Commercial General Liability

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

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

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

Such policy must provide the following minimum limits:

$1,000,000	Each Occurrence
$2,000,000	General Aggregate
$2,000,000	Products & Completed Operations Aggregate
$1,000,000	Personal & Advertising Injury each offence
$1,000,000	Stop Gap / Employers' Liability each accident

1-07.18(5)B Automobile Liability

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

Such policy must provide the following minimum limit:

$1,000,000	Combined single limit each accident

1-07.18(5)C Workers' Compensation

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

1-07.23 Public Convenience and Safety

1-07.23(1) Construction Under Traffic

Supplement this section with the following:

The Contractor shall maintain safe pedestrian passage through the work area at all times.

(January 2, 2012 WSDOT GSP, Option 2)

Work Zone Clear Zone

The Work Zone Clear Zone (WZCZ) applies during working and nonworking hours. The WZCZ applies only to temporary roadside objects introduced by the Contractor's operations and does not apply to preexisting conditions or permanent Work. Those work operations that are actively in progress shall be in accordance with adopted and approved Traffic Control Plans, and other contract requirements.

During nonworking hours equipment or materials shall not be within the WZCZ unless they are protected by permanent guardrail or temporary concrete barrier. The use of temporary concrete barrier shall be permitted only if the Engineer approves the installation and location.

During actual hours of work, unless protected as described above, only materials absolutely necessary to construction shall be within the WZCZ and only construction vehicles absolutely necessary to construction shall be allowed within the WZCZ or allowed to stop or park on the shoulder of the roadway.

The Contractor's nonessential vehicles and employees private vehicles shall not be permitted to park within the WZCZ at any time unless protected as described above.

Deviation from the above requirements shall not occur unless the Contractor has requested the deviation in writing and the Engineer has provided written approval.

Minimum WZCZ distances are measured from the edge of traveled way and will be determined as follows:

Regulatory Posted Speed	Distance From Traveled Way (Feet)
35 mph or less	10 *
40 mph	15
45 to 55 mph	20
60 mph or greater	30

* or 2-feet beyond the outside edge of sidewalk

Minimum Work Zone Clear Zone Distance

1-07.24 Rights of Way
(July 23, 2015 APWA GSP)

Delete this section, and replace it with the following:

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

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

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

Whenever easements or rights of entry have not been acquired prior to advertising, these areas are so noted in the Plans. The Contractor shall not proceed with any portion of the work in areas where right of way, easements or rights of entry have not

been acquired until the Engineer certifies to the Contractor that the right of way or easement is available or that the right of entry has been received. If the Contractor is delayed due to acts of omission on the part of the Contracting Agency in obtaining easements, rights of entry or right of way, the Contractor will be entitled to an extension of time. The Contractor agrees that such delay shall not be a breach of contract.

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

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

Add the following new sections:

1-07.28 Third Party Beneficiary

All parties agree that the State of Washington shall be, and is hereby named as an express third-party beneficiary of this contract, with full rights as such.

1-07.29 State Interest Exclusion Clause

It is anticipated that this project will be funded in part by the Washington State Department of Ecology. Neither the State of Washington nor any of its departments or employees are, or shall be, a party to this contract or any subcontract.

1-08 Prosecution and Progress

Add the following new section:

1-08.0 Preliminary Matters
(May 25, 2006 APWA GSP)

Add the following new section:

1-08.0(1) Preconstruction Conference
(October 10, 2008 APWA GSP)

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

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

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

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

Add the following new section:

1-08.0(2) Hours of Work
(December 8, 2014 APWA GSP)

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

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

If the Contractor wishes to deviate from the established working hours, the Contractor shall submit a written request to the Engineer for consideration. This request shall state what hours are being requested, and why. Requests shall be submitted for review no later than 2 working days prior to the day(s) the Contractor is requesting to change the hours.

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

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

1-08.3 Progress Schedule

1-08.3(2) Progress Schedule Types

1-08.3(2)B Type B Progress Schedule
(March 13, 2012 APWA GSP)
Revise the first paragraph to read:

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

Revise the first sentence of the second paragraph to read:

> The Contractor shall submit one copy in an electronic format of a Type B Progress Schedule depicting the entire project no later than 21-calendar days after the preconstruction conference.

1-08.4 Prosecution of Work

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

1-08.4 Notice to Proceed and Prosecution of Work

(July 23, 2015 APWA GSP)

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

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

1-08.5 Time for Completion

(August 14, 2013 APWA GSP, Option A)

Revise the third and fourth paragraphs to read:

Contract time shall begin on the first working day following <u>the Notice to Proceed Date</u>.

Each working day shall be charged to the contract as it occurs, until the contract work is physically complete. If substantial completion has been granted and all the authorized working days have been used, charging of working days will cease. Each week the Engineer will provide the Contractor a statement that shows the number of working days: (1) charged to the contract the week before; (2) specified for the physical completion of the contract; and (3) remaining for the physical completion of the contract. The statement will also show the nonworking days and any partial or whole day the Engineer declares as unworkable. Within 10 calendar days after the date of each statement, the Contractor shall file a written protest of any alleged discrepancies in it. To be considered by the Engineer, the protest shall be in sufficient detail to enable the Engineer to ascertain the basis and amount of time disputed. By not filing such detailed protest in that period, the Contractor shall be deemed as having accepted the statement as correct. <u>If the Contractor is approved to work 10 hours a day and 4 days a week (a 4-10 schedule) and the fifth day of the week in which a 4-10 shift is worked would ordinarily be charged as a working day then the fifth day of that week will be charged as a working day whether or not the Contractor works on that day</u>.

Revise the sixth paragraph to read:

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

1. The physical work on the project must be complete; and

2. The Contractor must furnish all documentation required by the contract and required by law, to allow the Contracting Agency to process final acceptance of the contract. The following documents must be received by the Project Engineer prior to establishing a completion date:

   a. Certified Payrolls (per Section 1-07.9[5]).
   b. Material Acceptance Certification Documents
   c. Quarterly Reports of Amounts Credited as DBE Participation, as required by the Contract Provisions.
   d. Final Contract Voucher Certification
   e. Copies of the approved "Affidavit of Prevailing Wages Paid" for the Contractor and all Subcontractors
   f. Property owner releases per Section 1-07.24.

(March 13, 1995 WSDOT GSP, Option 7)
Supplement this section with the following:

This project shall be physically completed within *** **90*** working days**.

1-08.9 Liquidated Damages
(August 14, 2013 APWA GSP)

Revise the fourth paragraph to read:

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

1-09 Measurement and Payment

1-09.2(1) General Requirements for Weighing Equipment

(July 23, 2015 APWA GSP, Option 2)

Revise item 4 of the fifth paragraph to read:

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

1-09.6 Force Account

(October 10, 2008 APWA GSP)
Supplement this section with the following:

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

1-09.9 Payment

(March 13, 2012 APWA GSP)
Delete the first four paragraphs and replace them with the following:

The basis of payment will be the actual quantities of Work performed according to the Contract and as specified for payment.

The Contractor shall submit a breakdown of the cost of lump sum bid items at the Preconstruction Conference, to enable the Project Engineer to determine the Work performed on a monthly basis. A breakdown is not required for lump sum items that include a basis for incremental payments as part of the respective Specification. Absent a lump sum breakdown, the Project Engineer will make a determination based on information available. The Project Engineer's determination of the cost of work shall be final.

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

The initial progress estimate will be made not later than 30 days after the Contractor commences the work, and successive progress estimates will be made every month thereafter until the Completion Date. Progress estimates made during progress of the work are tentative, and made only for the purpose of determining progress payments.

The progress estimates are subject to change at any time prior to the calculation of the final payment.

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

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

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

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

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

1-09.13 Claims Resolution

1-09.13(3) Claims $250,000 or Less

1-09.13(3)A Administration of Arbitration
(July 23, 2015 APWA GSP)

Revise the third paragraph to read:

The Contracting Agency and the Contractor mutually agree to be bound by the decision of the arbitrator, and judgment upon the award rendered by the arbitrator may be entered in the Superior Court of <u>the county in which the Contracting Agency's headquarters is located, provided that where claims subject to arbitration are asserted against a county, RCW 36.01.05 shall control venue and jurisdiction of the Superior Court</u>. The decision of the arbitrator and the specific basis for the decision shall be in writing. The arbitrator shall use the Contract as a basis for decisions.

1-10 Temporary Traffic Control

1-10.2 Traffic Control Management

1-10.2(1) General
(December 1, 2008 WSDOT GSP)

Section 1-10.2(1) is supplemented with the following:

Only training with WSDOT TCS card and WSDOT training curriculum is recognized in the State of Washington. The Traffic Control Supervisor shall be certified by one of the following:

The Northwest Laborers-Employers Training Trust
27055 Ohio Ave.
Kingston, WA 98346
(360) 297-3035

Evergreen Safety Council
401 Pontius Ave. N.
Seattle, WA 98109
1-800-521-0778 or
(206) 382-4090

The American Traffic Safety Services Association
15 Riverside Parkway, Suite 100
Fredericksburg, Virginia 22406-1022
Training Dept. Toll Free (877) 642-4637
Phone: (540) 368-1701

1-10.2(2) Traffic Control Plans
Supplement this section with the following:

Development of Traffic Control Plans
Development of a Traffic Control Plan shall be the responsibility of the Contractor. The traffic control plan shall include details on traffic control measures at ingress and egress points to public right of way, as well as traffic control within private parking areas and access roads.

The existing Clear Creek Trail shall be closed for the duration of the construction contract as shown on the Plans. Traffic control shall include all materials and labor necessary to maintain closure of the trail as described in the plans and specifications.

Example Standard Plans have been attached to this document for the Contractors use in developing this Plan. The Contractor shall submit his Traffic Control Plan for the Engineer's review five working days prior to the Preconstruction Meeting.

The Engineer shall review the Plan and at the Preconstruction Meeting give written approval or discuss the revisions required. Subsequent reviews or revisions, if required, shall be accomplished by the Engineer within 5 working days after submittal. No work shall be undertaken until the Contractor has written approval of the Traffic Control Plan.

1-10.4 Measurement

1-10.4(1) Lump Sum Bid for Project (No Unit Items)

(August 2, 2004 WSDOT GSP Option 1)

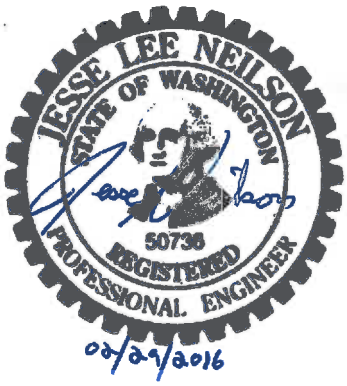
Supplement this section with the following:

The proposal contains the item "Project Temporary Traffic Control," lump sum. The provisions of Section 1-10.4(1) shall apply.

KITSAP COUNTY DEPARTMENT OF PUBLIC WORKS
STORMWATER PROJECT NO. 97003081

DUWE'IQ STORMWATER TREATMENT WETLAND

The Professional Engineer's seal(s) and signature(s) affixed hereon indicates this Engineer's preparation of Divisions 2 through 9 of these Special Provisions.



Prepared by:

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ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

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DIVISION 2 EARTHWORK

2-01 Clearing, Grubbing, and Roadside Cleanup

2-01.1 Description
Supplement this section with the following:

(March 13, 1995 WSDOT GSP Option 1)
Clearing and grubbing on this project shall be performed within the following limits:

As shown in the Plans.

2-01.2 Disposal of Usable Material and Debris
Revise the third paragraph to read as follows:

The Contractor shall use Disposal Method No. 2.

2-01.4 Measurement
Supplement this section with the following:

"Clearing and Grubbing" will be measured by the acre by ground slope measurement.

2-01.5 Payment
Supplement this section with the following:

"Clearing and Grubbing", per acre.

The unit contract price, per acre, for "Clearing and Grubbing" shall be full compensation for all costs incurred for all tools, labor, materials, and equipment necessary to complete the work.

2-02 Removal of Structures and Obstructions

2-02.1 Description
Supplement this section with the following:

"Removal of Oil Water Separator" shall include removal and disposal of the existing Oil/Water Separator and replacement of new pipe materials to connect to existing Oil/Water Separator inlet and outlet pipe. The work shall include excavation, removal, haul and disposal, connection of new storm sewer pipes to existing inlet and outlet pipes, backfill, compaction, and surface restoration.

Saw Cut Asphalt Concrete Pavement
Where shown in the plans or where designated by the Engineer, the Contractor shall saw cut asphalt concrete pavement prior to removal of any pavement.

2-02.3 Construction Requirements

2-02.3(3) Removal of Pavement, Sidewalks, Curbs, and Gutters

Saw Cut Asphalt Concrete Pavement
The equipment and procedures used to make the vertical cut shall be approved by the Contracting Agency.

The Contractor shall make a vertical saw cut to delineate the areas of pavement to be removed from those areas of pavement to remain. The removed pavement shall become the property of the Contractor and shall be promptly removed from the project.

Damage caused to portions of the pavement to remain, due to the Contractor's operations, shall be repaired by the Contractor at no expense to the Contracting Agency.

Pavement Thickness
(September 8, 1997 WSDOT GSP Option 1)
Section 2-02.3(3) is supplemented with the following:

The approximate thickness of the existing asphalt pavement is a condition that has not been observed. It shall be the Bidder's responsibility to observe existing conditions and base their bid accordingly.

Add the following new section:

2-02.4 Measurement

"Removal of Oil Water Separator" will be measured per lump sum.

"Removing Asphalt Conc. Pavement" will be measured by the square yard.

"Saw Cut Asphalt Conc. Pavement" will be measured by the linear foot of saw cut actually completed.

2-02.5 Payment
Supplement this section with the following:

Payment for "Removal of Oil Water Separator" includes removal of oil/water separator, disposal, connection of new pipes to existing pipes, backfill, compaction, and surface restoration. The structure shall be vactored out dry before removal and disposal. New storm sewer pipes shall be measured and paid for by the linear foot of pipe installed and connected to the existing pipes.

"Removing Asphalt Conc. Pavement", per square yard.

The unit contract price, per square yard, shown on the proposal for “Removing Asphalt Conc. Pavement” shall be full compensation for all costs incurred for all tools, labor, materials, and equipment necessary to complete the work regardless of pavement depth or method of removal.

“Saw Cut Asphalt Conc. Pavement”, per linear foot.

The unit contract price, per linear foot, shown on the proposal for “Saw Cut Asphalt Conc. Pavement” shall be full compensation for all costs incurred for all tools, labor, materials, and equipment necessary to complete the work.

2-03 Roadway Excavation and Embankment

2-03.1 Description

Supplement this section with the following:

This work shall include Special Excavation for Pond and placement of protective soil liner cover in accordance details shown in the plans

2-03.2 Vacant

Revise this section including the title to read as follows:

2-03.2 Materials

Special Borrow shall meet the requirements of Section 9-03.14(5) of these Special Provisions.

2-03.3 Construction Requirements

Supplement this section with the following:

Embankments constructed and measured as Embankment Compaction for Pond shall be compacted according to the requirements of Method B.

2-03.3(7) Disposal of Surplus Material

This section is deleted and replaced with the following:

A waste site has not been provided by the Contracting Agency for the disposal of excess materials and construction debris. The Contractor shall be solely responsible for loading, hauling and the disposal of all surplus material and construction debris in a manner complying with all local, state and federal statutes and regulations.

2-03.3(13) Borrow

Supplement this section with the following:

The Contractor must provide the Contracting Agency with written notice at least 24 hours before hauling and placing backfill materials from off-site locations. This notice is essential in scheduling inspection personnel and item quantity ticket takers.

Failure by the Contractor to begin hauling and placing materials at the agreed time may result in a penalty equal to the standby cost incurred by the County. The penalty will be calculated and deducted from the item being hauled.

Add the following new section:

Supplement this section with the following new section:

2-03.3(14)N Special Borrow including Haul

Where shown in the Plans or as directed by the Engineer, the Contractor shall use Special Borrow including Haul meeting the requirements of Section 9-03.14(5) of these provisions to:

1. Build embankments.
2. Backfill excavation of unsuitable foundation materials.
3. Backfill trenches when select backfill material is required in accordance with Section 2-09 or Section 7-08.

Special Borrow shall be compacted according to Section 2-03.3(14)C, Method B, and 2-03.3(14)D.

2-03.3(20) Protective Soil Cover for Pond Liner

Installation of the protective soil cover shall be the responsibility of the Contractor. When installing the cover, the Contractor shall adhere to the following guidelines:

1. Protective Cover Composition: The protective cover shall be composed of well-graded earthen fill material free of organics, trash, clay balls or other deleterious matter. No sharp edged stones, stones larger than 3/4 inch in diameter or hard objects shall be acceptable. The cover shall be track compacted in 12-inch lifts, and installed using low ground pressure equipment until the depth of cover exceeds three feet or to the depth specified.
2. A minimum of 12 inches of cover between low ground pressure equipment and the liner is required at all times. Roadways for entering ponds and for transporting material over pond slopes and floor shall have a minimum depth of 2 feet of cover between low ground pressure equipment and liner.
3. Avoid unnecessary stress on the liner at all times. Cover material must be pushed up side slopes, never down. A worker should walk along side earthmoving equipment and remove all rocks, stones, roots or other debris that could cause damage to the liner. Equipment operators must avoid sharp turns or quick stops that could pinch and tear the liner.
4. If damage does occur, report it to the Engineer immediately.
5. Cover shall be placed and maintained in a uniform thickness, free of ruts and irregularities.
6. Do not work wet cover material that cannot support equipment.
7. Equipment operators and all other personnel must be qualified and must exercise good judgment and common sense at all times.

8. Scrapers or trucks transporting soil must proceed slowly, at speeds under 5 MPH, to prevent displacement of the liner.

2-03.4 Measurement
Supplement this section with the following:

"Special Borrow including Haul" will be measured by the ton. Measurement when used to build embankments and to backfill for unsuitable foundation materials will be to the actual limits ordered by the Engineer. When used in backfill of storm sewer trenches, measurement will be for material placed inside the limits defined in Section 2-09.4.

"Special Pond Excavation Incl. Haul" and "Embankment Compaction for Pond" will be measured by the cubic yard based on displaced/placed quantity.

Computation of Excavation and Embankment Quantities
The determination of the original ground elevation will be based on the site survey for this project. Measurement for "Special Pond Excavation Incl. Haul" and "Embankment Compaction for Pond" will be based on the original ground elevation recorded previous to the award of this contract minus a factor to account for the removal of organic material during clearing and grubbing. It is anticipated that depth of removal of organic material during clearing and grubbing for this project will vary and a factor of minus 6 inches will be used to determine ground elevation after clearing and grubbing. Control stakes will be set during construction to provide the Contractor with all essential information for the construction of excavation and embankments.

If discrepancies are discovered in the ground elevations which will materially affect the quantities of earthwork, the original computations of earthwork quantities will be adjusted accordingly.

Earthwork quantities will be computed by the Engineer, by means of electronic data processing equipment utilizing digital terrain modeling techniques. "Special Pond Excavation Incl. Haul" is the cut volume removed from site. The "Embankment Compaction for Pond Excavation" is the cut volume used for on-site fill.

Copies of the ground cross-section notes will be available for the bidder's inspection, before the opening of bids, at the Project Engineer's office.

Upon award of the contract, copies of the original ground cross-sections will be furnished to the successful bidder on request to the Project Engineer.

"Protective Soil Cover for Pond Liner" shall be measured per ton.

2-03.5 Payment
Supplement this section with the following:

"Special Borrow including Haul", per ton.

The unit contract price per ton for Special Borrow including Haul shall be full compensation for all costs incurred for loading, hauling and placing the material.

"Special Pond Excavation Incl. Haul", per cubic yard.

"Embankment Compaction for Pond", per cubic yard.

All costs involved in the loading, hauling and the disposal of all surplus material and construction debris, including all labor, equipment, and materials, final placement, and compaction and any other activities necessary to accomplish this work shall be included in the bid prices of the items shown on the proposal and no further payment will be made.

"Protective Soil Cover for Pond Liner", per ton.

All costs involved in hauling, material, stockpiling, placement, compaction, and screening are considered incidental to this item.

2-09 Structure Excavation

2-09.3 Construction Requirements

2-09.3(1) General Requirements

Add the following new subsection:

2-09.3(1)C Removal of Unstable Base Material
Revise this section to read:

> When the material at the bottom of an excavation is not stable enough to support the Structure, the Contractor shall excavate below grade and replace the unstable material with special borrow.
>
> Special borrow shall meet the requirements of Section 9-03.14(5) of these Special Provisions. It shall be placed in layers not more than 6 inches thick with each layer compacted to 95 percent of the maximum density determined by the Compaction Control Test, Section 2-03.3(14)D.

2-09.3(1)G Trench Dewatering
All "localized trench dewatering" work associated with maintaining a trench suitable for structure installation and pipeline construction will be incidental and included in bid item "Erosion/Water Pollution Control". "Localized trench dewatering" is defined as dewatering methods occurring in or directly adjacent to the trench, including trash pumps, sump pumps, or other methods in the excavated areas. "Localized trench

dewatering" does not include a dewatering system such as well points, well screens, or deep wells

2-09.3(2) Classification of Structure Excavation
Supplement this section with the following:

Structure Excavation Class A shall include excavation for the pre-cast concrete culvert and precast concrete footings to the neat lines shown in the Plans.

2-09.4 Measurement

Delete paragraphs 1 through 2 of this section and replace them with the following:

No measurement will be made for Structure Excavation Class B or Structure Excavation Class B including Haul. All costs for such excavation shall be included in the unit contract price shown in the proposal for the item to be installed.

Delete the second sentence of the ninth paragraph and replace it with the following:

No unit of measurement shall apply to the lump sum bid item Shoring or Extra Excavation Class B.

Delete the third, fourth and fifth sentences of the ninth paragraph.

Supplement this section with the following:

"Gravel Backfill for Wall" will be measured by the ton.

2-09.5 Payment

In the first paragraph delete all references to "Structure Excavation Class B" and "Structure Excavation Class B including Haul". Insert the following at the end of the paragraph:

All costs for Structure Excavation Class B or Structure Excavation Class B including Haul shall be included in the unit price for the item to be installed and no further payment will be made.

Revise the first sentence of the third paragraph to read:

If the Engineer orders the Contractor to excavate below the elevations shown in the Plans, the excavation will be paid for as Unsuitable Foundation Excavation including Haul per cubic yard in accordance with Section 2-09 of these Special Provisions.

Delete the ninth, tenth and eleventh paragraph and replace them with the following:

All costs for Shoring or Extra Excavation Class B shall be included in the unit price for the item to be installed and no further payment will be made.

Supplement this section with the following:

"Gravel Backfill for Wall", per ton.

Add the following new section and subsections:

2-13 Pond Liner

2-13.1 Description

This work shall include the furnishing and installing a watertight pond liner consisting of PVC Geomembrane. The work includes subgrade preparation, placing geomembrane, anchor trench, field seaming, and patching operations.

2-13.2 Materials

Material for the pond liner shall meet the requirements of Section 9-33.2(4) of these Special Provisions.

2-13.3 Construction Requirements

A. Delivery, Storage, and Handling

1. Wooden pallets shall be free from mechanical obstructions such as nails, screws, or other fasteners that may damage lining. Any lining that is damaged during shipment, storage or installation must be repaired by the Contractor before placement of the protective cover materials or backfill.
2. The PVC lining material shall be stored at the job site in its original unopened packaging to protect the material against damage. PVC liner material shall be stored in dry areas offering protection from direct heat of the sun or freezing temperatures, especially if the storage period is long. Space shall be allowed between each liner pallet for ease of identification and abrasion prevention. Pallets of liner shall never be stacked.

B. Subgrade Preparation

The Contractor shall be responsible for preparing and maintaining the subgrade in a condition suitable for installation of the liner.

1. Surfaces to be lined shall be smooth and free of debris, roots, and angular or sharp rocks larger than three quarter (3/4) inches in diameter to a depth of four (4) inches. All fill shall consist of well graded material free of organics, trash, clayballs, sharp stones or any other deleterious material that may cause damage to the liner. The subgrade shall be compacted in accordance with design specifications but in no event below the minimum required to provide a firm unyielding foundation sufficient to permit the movement of vehicles and welding equipment over the subgrade without causing rutting or other

deleterious effects. The subgrade shall have no sudden, sharp or abrupt changes in grade.

2. The Contractor shall protect the subgrade from desiccation, flooding and freezing. Protection, if required, may consist of a thin plastic protective cover (or other material as approved by the engineer) installed over the completed subgrade until such time as the placement of geomembrane liner begins. Subgrades found to have desiccation cracks greater than 1/2 inch in width or depth, or which exhibit swelling, heaving or other similar conditions shall be replaced or reworked by the earth contractor to remove these defects.
3. Bulldozer cleat marks, blade or loader tire marks exceeding 1/2 inch in depth shall be raked out.
4. Subsequent repairs to the subgrade and the surface (due to water on-site or inclement weather, for example) shall be the responsibility of the Contractor. This may include water removal, re-grading, or any other action needed to provide sub-grade conditions that are suitable for liner installation.
5. Anchor Trench needs to be constructed per plans while maintain minimum distances provided. Anchor area needs to be excavated before installation crews arrive on site.

C. Geomembrane Installation (Note: also refer to manufacturer's recommendations)

1. The Liner panel is marked on the outside covering indicating the panel identification letter or number. The panel markings are also on the material inside the packaging.
2. When ready to unfold the panels, remove the packaging carefully. DO NOT USE A KNIFE AS DAMAGE TO LINER MAY OCCUR. Carefully inspect for protrusions before unfolding panels from the pallet. Remove any protrusions that may cause damage.
3. Positioning the panel and unfolding it from the pallet is best handled with a front-end loader or forklift. Liner panels may weigh as much as 6,000 pounds. The equipment operator should slowly drive backwards while workers on each side of the pallet unfold the liner onto the ground.
4. After the panel is unfolded, it is straightened out to the layout guidelines.
5. The panel is then spread into position. Men are positioned at the edge of the panel as indicated by the Crew Chief. The men are positioned approximately 15 feet apart, depending on the size of the panel and the terrain to be covered. Men are positioned at the uphill end of the panel to keep it from sliding down the slope as it is spread. If the edge to be gripped is subsequently to be bonded, then the panel edge is folded back about 2 or 3 feet, creating a fold. The fold is gripped using the 1 foot x 2 inch grade stake or dowel rather than the edge itself. This is to avoid stretching the edge where it is to be bonded.
6. As the panel is pulled out, it is necessary to maintain air under the liner to reduce friction. This can be accomplished in several ways. One is to simply hold the edge and advance at a rate fast enough to create air under the liner as it is unfolded. Another is to "fan" air under the liner. This is done by raising and lowering the edge of the panel to create a wave-like action across the liner as it is being spread. This fanning action should be directed by the Crew Chief.
7. Caution should be observed when spreading the panel under windy conditions. The panel should always be pulled into the wind to facilitate proper air flotation.

Extreme care must be taken to prevent the liner from getting out of control and blowing away.

8. A slight lateral tension on the leading edge of the panel being spread should be maintained. This lateral tension facilitates the spreading operations.
9. Only unfold the panels that are to be anchored or seamed together in one day.
10. After the panels are initially placed, remove as many wrinkles as practical. If possible, allow the panels to “relax” by warming in the sun. The edges to be bonded need to be smooth and free of wrinkles to ensure good field seams.
11. When panels are in position, commence field seaming operations. See Section D: Field Seaming Procedures Using Solvent Adhesive and Section F: Field Seaming Procedures Using Wedge Welders.
12. All unseamed edges should be anchored with sandbags at the end of each day. If winds are expected, place boards along the edges of the liner panels with sandbags on top. A “wind row” of backfill material placed three-feet back from leading edge can also anchor the liner. Other ballast materials, such as rolls of geotextile may be used at the determination of the installer.
13. Bury the liner edges in the anchor trench after field seaming is completed around the given area. Do not bury the liner edge in the anchor trench within 30 feet of an incomplete field seam. This is to allow the seam area to be re-tensioned to remove wrinkles along the seam.
14. To begin the field seaming, always start in the middle and work toward an open end. This will minimize large wrinkles becoming trapped, which requires cutting and patching.

D. Field Seaming Procedures Using Solvent Adhesive

1. Temperatures for seaming must be as follows:

Minimum ambient temperature:	50° F
Minimum liner temperature:	60° F
Minimum solvent adhesive temperature:	60° F

2. Before adhesive is applied, surfaces to be seamed must be free of dirt and foreign materials. The particles must be totally encapsulated in the adhesive/seam so they do not connect to form a path for a leak.
3. Adhesion of one liner panel to another is accomplished by lapping the edges of panels a minimum of 3 inches (6 inches is more desirable). The contact surfaces of the panels should be wiped clean to remove all dirt, dust or other foreign materials. A clean cloth, foxtail or grout brush may be used. If adverse conditions exist, such as mud, caked mud, or clay, remove by washing with clean water. Dry the liner before attempting to continue with seaming. A plywood seaming board should be placed under the liner portion to be immediately seamed. Adhesive can be applied with squeeze bottles or cans with brushes. Cans and brushes must be used cautiously with a lid slit barely large enough to accept the brush; otherwise the solvent in the adhesive can evaporate prematurely. Always keep the dispensing vessel sealed when not in immediate use. The actual bonded area must be continuous, extend to the exposed edge of the seam be a nominal 2 to 3 inches wide and have a minimum width of 1/2 inch. Using too much PVC bonding solvent in a wide area could result in a poor quality seam. With a typical 2-inch wood or plastic

wallpaper seam roller, burnish the freshly joined areas by rolling perpendicular to the seam squeezing out excess adhesive and air pockets.

4. “Fishmouths” can be folded over and bonded closed or slit, bonded down and patched. Patches over “fishmouths” or other seam flaws shall extend at least 2 inches past the flaw in question. The rule on patching is to patch all areas where water can leak though.

E. Field Seam Testing for Solvent Adhesive Welds

All field seams made to join liner panels or penetration details (such as pipe boots) shall be 100% visually inspected for integrity and 100% air lance tested using a pressure of 40 PSI. Quality control personnel (representatives of Kitsap County) shall inspect all seams and patches and identify all inadequate seams and determine the appropriate measures to correct the condition. Any problematic areas found shall be visibly identified with a bright marker that will not interfere with repair process itself. After repairs are made, every identified area must be re-inspected and approved by a representative of Kitsap County before backfilling operations over the affected area. Non-destructive coupon samples shall be taken at least twice each day for each seaming technician at the beginning and end of field seaming operations. Non-destructive coupon samples shall have minimum measurements of 12 inches x 24 inches (lengthwise being parallel to the seam direction) and shall be identified as to the time of day, adhesive used and the name of the seaming technician. Coupon seams shall be cured for a minimum of 20 hours including at least 6 hours of direct sunlight exposure and the balance being at room temperature. Testing shall be in the shear and peel directions (see materials section for strength requirements).

F. Field Seaming Procedures Using Wedge Welders

PVC liners equal or greater than 30 mils thick can typically be welded with a wedge welder. Thinner PVC liners will experience more burnouts when a wedge welder is used to make the seams. Refer to the instruction manual provided by the wedge welder manufacturer for details on wedge welding PVC. Quality control, sampling, and testing shall be the same as 2-13.3.E above.

G. Patching Instructions for PVC Geomembrane

1. Before making repairs, the contact surfaces of the lining shall be thoroughly cleaned to remove all dirt, dust, moisture and other foreign materials.
2. When making repairs, a hot-air gun or other approved heating device shall be used to warm the lining when the ambient air temperature is below 50° F. No lining repairs shall be made when the ambient air temperature is below 35° F.
3. A solvent adhesive supplied or approved by AccGeo Liner, Inc. shall be used in the repair work.
4. All lining repairs shall be made using patches of parent material (same gauge or thicker PVC) with rounded corners.
5. All patches shall have a minimum of 3 inches overlap outside of the damaged area for bonding.
6. The patch is to be applied with the same adhesive as used for liner seaming and must be rolled and/or burnished to ensure a complete seal.
7. Any area repaired shall be inspected and approved by quality control personnel (representative of Kitsap County) before placement of any cover.

2-13.4 Measurement

“Pond Liner” will be measured per square yard.

2-13.5 Payment

Payment will be made in accordance with Section 1-04.1 for each of the following Bid items when they are included in the proposal:

“Pond Liner” per square yard.

Payment for “Pond Liner” shall include all costs to furnish 30 mil PVC Geomembrane install it in all the locations shown on the plans and in accordance with the manufacturer’s recommendations and section 2-13 of these special provisions. Work involved includes, but is not limited to: Placement and seaming of geomembrane, temporary sandbagging or other restraining of geomembrane, material placed in anchor trenches, sealing around pipe or any other penetrations (including booting), base preparation, and compaction. Geomembrane shall not be considered complete for payment until all quality control and quality assurance data is received and verified by the engineer. The cost associated with excavation of the anchor trenches, backfilling, and compaction shall be included in the unit price.

DIVISION 5 SURFACE TREATMENTS AND PAVEMENTS

5-04 Hot Mix Asphalt

5-04.3 Construction Requirements

5-04.3(7) Preparation of Aggregates

5-04.3(7)A Mix Design

5-04.3(7)A2 Statistical or Nonstatistical Evaluation
(January 16, 2014 APWA GSP)

Delete this section and replace it with the following;

Mix designs for HMA accepted by Nonstatistical or Commercial evaluation shall;

- Be submitted to the Project Engineer on WSDOT Form 350-042
- Have the aggregate structure and asphalt binder content determined in accordance with WSDOT Standard Operating Procedure 732 and meet the requirements of Sections 9-03.8(2) and 9-03.8(6).
- Have anti-strip requirements, if any, for the proposed mix design determined in accordance with WSDOT Test Method T 718 or based on historic anti-strip and aggregate source compatibility from WSDOT lab testing. Anti-strip evaluation of HMA mix designs utilized that include RAP will be completed without the inclusion of the RAP.

At or prior to the preconstruction meeting, the contractor shall provide one of the following mix design verification certifications for Contracting Agency review;

- The proposed mix design indicated on a WSDOT mix design/anti-strip report that is within one year of the approval date
- The proposed HMA mix design submittal (Form 350-042) with the seal and certification (stamp & signature) of a valid licensed Washington State Professional Engineer.
- The proposed mix design by a qualified City or County laboratory mix design report that is within one year of the approval date.

The mix design will be performed by a lab accredited by a national authority such as Laboratory Accreditation Bureau, L-A-B for Construction Materials Testing, The Construction Materials Engineering Council (CMEC's) ISO 17025 or AASHTO Accreditation Program (AAP) and shall supply evidence of participation in the AASHTO Material Reference Laboratory (AMRL) program.

At the discretion of the Engineer, agencies may accept mix designs verified beyond the one year verification period with a certification from the Contractor that the materials and sources are the same as those shown on the original mix design.

5-04.3(8) Mixing

5-04.3(8)A Acceptance Sampling and Testing – HMA Mixture

5-04.3(8)A1 General
(January 16, 2014 APWA GSP)

Delete this section and replace it with the following:

Acceptance of HMA shall be as defined under nonstatistical or commercial evaluation.

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

The mix design will be the initial JMF for the class of HMA. The Contractor may request a change in the JMF. Any adjustments to the JMF will require the approval of the Project Engineer and must be made in accordance with Section 9-03.8(7).

Commercial evaluation may be used for Commercial HMA and for other classes of HMA in the following applications: sidewalks, road approaches, ditches, slopes, paths, trails, gores, prelevel, and pavement repair. Other nonstructural applications of HMA accepted by commercial evaluation shall be as approved by the Project Engineer. Sampling and testing of HMA accepted by commercial evaluation will be at the option of the Project Engineer. Commercial HMA can be accepted by a contractor certificate of compliance letter stating the material meets the HMA requirements defined in the contract.

5-04.3(8)A4 Definition of Sampling Lot and Sublot
(January 16, 2014 APWA GSP)

Section 5-04.3(8)A4 is supplemented with the following:

For HMA in a structural application, sampling and testing for total project quantities less than 400 tons is at the discretion of the engineer. For HMA used in a structural application and with a total project quantity less than 800 tons but more than 400 tons, a minimum of one acceptance test shall be performed:

i. If test results are found to be within specification requirements, additional testing will be at the Engineer's discretion.

ii. If test results are found not to be within specification requirements, additional testing as needed to determine a CPF shall be performed.

5-04.3(8)A5 Test Results
(January 16, 2014 APWA GSP)

The first paragraph of this section is deleted.

5-04.3(8)A6 Test Methods
(January 16, 2014 APWA GSP)

Delete this section and replace it with the following:

Testing of HMA for compliance of Va will be at the option of the Contracting Agency. If tested, compliance of Va will be use WSDOT Standard Operating Procedure SOP 731. Testing for compliance of asphalt binder content will be by WSDOT FOP for AASHTO T 308. Testing for compliance of gradation will be by WAQTC FOP for AASHTO T 27/T 11.

5-04.5(1) Quality Assurance Price Adjustments

5-04.5(1)B Price Adjustments for Quality of HMA Compaction
(January 16, 2014 APWA GSP)

Delete this section and replace it with the following:

The maximum CPF of a compaction lot is 1.00.

For each compaction lot of HMA when the CPF is less than 1.00, a Nonconforming Compaction Factor (NCCF) will be determined. THE NCCF equals the algebraic difference of CPF minus 1.00 multiplied by 40 percent. The Compaction Price Adjustment will be calculated as the product of the NCCF, the quantity of HMA in the lot in tons and the unit contract price per ton of the mix.

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DIVISION 7 DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS

7-02 Culverts

7-02.1 Description

Supplement this section with the following:

This work shall include the design and construction of a precast culvert, precast footings, and precast curb headwall in the position and size as shown on the Plans.

7-02.3 Construction Requirements

Supplement this section with the following:

The precast culvert, precast footings, and precast curb headwall shall be designed by a Structural Engineer licensed in the State of Washington. The footings shall be keyed to receive the 3-sided box culvert. The footings shall be designed for an allowable bearing capacity of 1,500 psf.

The precast culvert, precast footings, and precast curb headwall shall be cast off-site. The Contractor shall embed required lifting eyes or hooks as required for the Contractor's lifting equipment and to prevent damage (including cracking) to the precast segments.

7-02.3(6)C Casting

Section 7-02.3(6)C is supplemented with the following:

Precast Reinforced Concrete Three Sided Structure

The precast reinforced concrete three sided structure fabricator shall notify the Washington State Department of Transportation Materials and Fabrication Inspection Section at least five working days in advance of beginning fabrication of the structures for this project.

7-02.5 Payment

Supplement this section with the following:

"Precast Reinforced Concrete Three Sided Structure", lump sum.

The lump sum contract price for "Precast Reinforced Concrete Three Sided Structure" shall be full pay for equipment, labor, and materials to install the structure, including precast footings, curb, CSTC, concrete cut off walls, other minor items, and concrete weir wall. Any over excavation, or special access requirements are considered incidental to this item.

7-04 Storm Sewers

7-04.1 Description

Supplement this section with the following:

This work shall include the furnishing and installing Ductile Iron storm sewer pipe, debris barriers, and PVC Cleanouts and Valves as shown on Plans.

7-04.2 Materials

Supplement this section with the following:

Materials shall conform to the details shown in the Plans.

"Ductile Iron Storm Sewer Pipe ___ In. Diam." shall meet the requirements of Section 9-05.13.

"Debris Barrier" shall be of the material specified in the Construction Drawings.

7-04.4 Measurement

Supplement this section with the following:

"Ductile Iron Storm Sewer Pipe ___ In. Diam.," will be measured per linear foot.

"Debris Barrier," will be measured per each.

"12 IN. PVC Cleanout with Box," will be measured per each.

"12 IN. PVC Knife Valve," will be measured per each.

7-04.5 Payment

Supplement this section with the following:

"Ductile Iron Storm Sewer Pipe ___ In. Diam.," per linear foot.

"12 IN. PVC Cleanout with Box," per each.

"12 IN. PVC Knife Valve," per each.

The unit Contract price per linear foot for storm sewer pipe of the kind and size specified, cleanouts, and knife valves shall be full pay for all Work to complete the installation of these items, including, excavation, haul, shoring, bedding, laying and jointing pipe and fittings, backfilling, adjusting inverts, utility conflicts, compaction and

all bedding/backfill material excluding imported backfill, which shall be paid per unit Contract price.

"Debris Barrier" per each.

7-05 Manholes, Inlets, Catch Basins, and Drywells

7-05.1 Description

Supplement this section with the following:

This work shall include the furnishing and installing of 72-inch Flow Splitter per the Plans.

This work shall include the furnishing and installing of the Emergency Overflow Structure.

This work shall include furnishing and installing the Kitsap County frames and grates as specified in the Plans.

7-05.2 Materials

Supplement this section with the following:

Catch basin frames and grates and Manhole covers shall be the bolt down type and be in accordance with the Kitsap County Standard Storm Details shown in the Plans.

Materials shall conform to the details shown in the Plans.

Material for the "72 In. Flow Splitter" shall conform to the details in the Plans and shall meet the following specifications in Section 7-05.3.

7-05.3 Construction Requirements

Add the following new sections:

7-05.3(6) 72 In. Flow Splitter

Silicone Sealant: Shall be pure RTV silicone conforming to Federal Specification Number TT S001543A or TT S00230C or Engineer approved.

The adjustable weir shall be constructed of ASTM B209 5052 Aluminum sheet.

The adjustable weir should allow for adjustment of up to exactly 6 inches above or 6 inches below the center weir position.

At project completion, weirs shall be set to specified elevation, leave and sealed at all joints with silicone sealant. Sealant shall be worked into joints from both sides.

7-05.4 Measurement

Revise fourth paragraph to read:

Structure Excavation Class B and Structure Excavation Class B including Haul will be measured in accordance with Section 2-09.4 of these Special Provisions.

Supplement this section with the following:

"72 In. Diam. Flow Splitter," will be measured per each.

"Emergency Overflow Structure," will be measured per each.

7-05.5 Payment

Delete the eighteenth and nineteenth paragraphs and replace them with the following:

Structure Excavation Class B and Structure Excavation Class B including Haul will be paid in accordance with Section 2-09 of these Special Provisions.

Supplement this section with the following:

"72 In. Diam. Flow Splitter", per each.

Payment for "72 In. Diam. Flow Splitter" includes all costs associated with furnishing and installing "72 In. Diam. Flow Splitter" including excavation, haul, bedding and foundation materials, backfill, compaction, and connection to existing storm sewer pipes. Payment includes the Tee orifice assembly with gate valve, all assemblies, lids, and materials as shown on Plans, and concrete weir installed per Plans.

"Emergency Overflow Structure", per each.

Payment for "Emergency Overflow Structure" includes all costs associated with furnishing and installing "Emergency Overflow Structure" and appurtenances as shown in the Plans including excavation, haul, bedding materials, compaction, shear gate valve assembly and handle, exit Tee assembly, and beehive grate as shown on Plans.

Payment for "Connection to Drainage Structure" shall include all costs associated with connection to the existing drainage structure or existing drainage pipe as shown on plans. Payment shall include any additional excavation, plugging of existing or vacated holes in existing structures, grouting, and other materials associated with connecting new storm drainage pipes to structures.

Payment for Kitsap County frames, grates, and covers shall be incidental to the corresponding structure.

Payment for catch basins and concrete inlets no matter the size and type shall include costs for excavation, haul, bedding materials, backfill, compaction, and connection to new or existing storm sewer pipes.

7-08 General Pipe Installation Requirements

7-08.4 Measurement

Delete the third paragraph and replace it with the following:

Structure Excavation Class B and Structure Excavation Class B including Haul will be measured in accordance with Section 2-09.4 of these special provisions.

Revise the last paragraph to read:

Shoring or Extra Excavation Class B will be measured in accordance with Section 2-09.4 of these Special Provisions.

7-08.5 Payment

Delete the seventh and eighth paragraph.

Revise the ninth paragraph to read:

"Shoring or Extra Excavation Class B", lump sum.

Supplement this section with the following:

"Unsuitable Foundation Excavation Including Haul", per cubic yard.

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DIVISION 8 MISCELLANEOUS CONSTRUCTION

8-01 Erosion Control and Water Pollution Control

8-01.1 Description

Supplement this section with the following:

This work also includes dewatering, preparation and implementation of Temporary Erosion and Sediment Control (TESC) and implementation of the Stormwater Pollution Prevention Plan (SWPPP).

Kitsap County is applying for a Washington State Department of Ecology NPDES Construction Stormwater General Permit for this project. The County anticipates the permit to be issued prior to the start of construction. The Contractor shall assume and include in the bid full compliance and administration with the requirements of the General Permit for this Project.

8-01.2 Materials

Supplement this section with the following:

Dry Native Seed

All dry native seed shall be "non-endophyte enhanced". Seed of the following composition and proportion shall be applied at a rate of forty (40) pounds per acre on all areas requiring dry native seeding within the project:

Kind and Variety of Seed in Mixture	% By Weight	% by Seed/Lb
Meadow barley (*Hordeum brachyantherum*)	50	11
Red fescue (*Festuca rubra* var. *commutata* "Chewings")	20	27
Blue wildrye (*Elymus glaucus*)	20	6
Tufted hairgrass (*Dechampsia cespitosa*)	5	33
Canada reed (*Calamagrostis canadensis*)	3	18
White dutch clover (*Trifolium repens*)	2	5
TOTAL	100.00%	100.00%

8-01.3 Construction Requirements

8-01.3(1) General
Supplement this section with the following:

Maintenance of Project Site
The Contractor shall be responsible for controlling dust and mud 24 hours a day within the project limits, and for maintaining in a clean condition all parking lots and streets within and adjacent to the project limits during the performance of this Contract. The Contractor shall be prepared to and shall use watering trucks, power vacuum sweepers, power vacuum units, and other appropriate equipment necessary to remove mud, debris, or other foreign objects of materials from the roadway. The Contractor shall be solely responsible to remedy any damage caused by dust, mud, debris, or foreign object or material resulting from the Contractor's operations.

The Contractor shall protect existing drainage structures and facilities, adjacent water bodies, neighboring properties, and the traveling public from dust and mud within the project limits by the use of silt fences, sediment socks, water trucks, sweepers, and any other material and equipment needed to perform these duties. The Contractor shall be solely responsible to remedy any damage caused by dust, mud, debris, or foreign objects or material resulting from the Contractor's operations.

Watering trucks shall not be used on streets where, in the opinion of the Engineer, insufficient capacity or protections are in place to prevent compromising water quality.

Maintenance of the project site shall include but not be limited to the following:

- The asphalt access roadway shall be kept cleaned throughout the day. All dirt tracked out from traffic driving through the construction shall be cleaned up immediately.
- The Contractor shall provide, at a minimum, a power broom sweeper for continuous cleaning throughout the day's activities as needed and for a power vacuum sweeping of all surfaced roadways affected by the Contractor's operations upon completion of each day's activities.
- The Contractor shall install erosion and sediment control measures shown in the Plans that may include but not be limited to silt fences, high visibility fences, storm drain inlet protection, sediment traps, gravel berms, temporary discharge spillway, construction entrances, seeding, fertilizing, and mulching.
- Dust control shall be maintained at all times. The Contractor shall be available during evenings and weekends if the Engineer determines that adequate measures are not in place to prevent fugitive dust from impacting the neighboring properties and the traveling public.
- The Contractor shall cover all spoils piles and material stockpiles with plastic to prevent dust or mud runoff from these areas.
- The Contractor shall maintain all erosion control facilities as specified in Section 8-01.3(15) Maintenance of the Standard Specifications. Payment for

maintenance shall be included in Erosion/ Water Pollution Control and the other bid items.

- The Contractor shall provide an ESC lead to provide all requirements as specified in Section 8-01.3(1)B of the Standard Specifications.

In the event that dust and mud control is not provided, and roadway conditions resulting from the Contractor's operations are not remedied to the Engineer's satisfaction within 1 hour of notification from the Engineer, then the Engineer may, without further notice to the Contractor or Surety, have the work performed by others and deduct the costs from any payment due or coming due the Contractor.

NPDES Permit

The Contractor shall perform all work in compliance with the NPDES Construction Stormwater General Permit. The County will provide a copy of the finalized permit to the Contractor upon award of the Contract.

The permit shall be transferred to the Contractor prior to issuance of a Notice to Proceed and terminated upon completion of the project per the following:

1. The County will provide the Contractor with a Transfer of Coverage form prior to issuing a Notice to Proceed.
2. The Contractor shall sign and return the Transfer of Coverage form to the County.
3. The County will process the transfer and pay any associated transfer fees to the Department of Ecology.
4. Once the transfer is complete and a Notice to Proceed has been issued, the Contractor is responsible for performing all work in compliance with the permit.

Upon completion of the project, the Contractor shall submit a Notice of Termination to the Department of Ecology and provide the County documentation that the termination is effective.

8-01.3(1)C Water Management

Supplement this section with the following:

The Contractor shall anticipate that groundwater will be encountered in excavation of wetland ponds. Refer to the attached geotechnical information.

Wetland area shall be dewatered by whatever means and methods deemed most effective and efficient by the Contractor to provide a dry, unsaturated condition during excavation, pipe placement, liner placement, compaction, and backfilling activities until ground cover is permanently stabilized. Groundwater shall not be allowed to rise above the bottom of any active excavation area, or be allowed to re-enter and remain within the excavation at any time unless the ground cover is stabilized and segregated from the active excavation areas. Sediment traps may be used as temporary

groundwater storage areas during construction, provided that they do not surface discharge off-site.

The configuration, size, and capacity of dewatering systems and equipment shall maintain active excavations free of water at all times and shall prevent bottom heave, instability of the foundation, collapse of walls, and/or similar detrimental occurrences. The Contractor shall determine the size, capacity, and configuration of all piping and equipment required for dewatering and shall furnish, install, and maintain in operation all such piping and equipment until all construction is completed.

The Contractor shall maintain the dewatering systems in place and in operation for whatever time required to properly dewater excavation areas prior to and during excavation and during backfilling. The Contractor shall make all arrangements for and shall pay all costs of power and maintenance necessary for operation of pumps (if used). The Contractor shall install and maintain temporary drains and drain ditches, as required, to intercept or control and direct surface which may affect the execution or condition of the work.

The ends of pipe shall be sealed and provisions made to prevent floating of the pipe by the Contractor through construction. Trench water or other deleterious materials shall not be allowed to enter a pipe or structure at any time.

All surface or groundwater controlled and/or directed by the Contractor shall be disposed of in accordance with the requirements and regulations imposed by local, state, and federal agencies. Upon approval of the Engineer, water from excavations and trenches may be discharged to the existing upland areas of the site or storm water system in accordance with Section 1-07.15 of the Standard Specifications if the water meets the requirements for surface discharge in project related permits (see appendix), the Construction Stormwater Permit, or as otherwise amended by the Special Provisions. Water shall not be discharged to the sanitary sewer without prior written permission from Kitsap County Public Works Sewer Department.

8-01.4 Measurement

Supplement this section with the following:

No unit of measurement shall apply to the lump sum price, “NPDES Construction Stormwater General Permit”

No unit of measurement shall apply to the lump sum price, “Erosion/Water Pollution Control”

8-01.5 Payment

Supplement this section with the following:

“Erosion/Water Pollution Control”, per lump sum.

The lump sum Contract price for “Erosion/Water Pollution Control” shall include all costs for dewatering, maintenance of project site, temporary erosion and sediment control, storm drain inlet protection, silt fences, and construction entrances. The SWPPP (found in the appendices) shall be implemented and is incidental to this item.

“NPDES Construction Stormwater General Permit”, per Lump Sum.

The lump sum contract price for “NPDES Construction Stormwater General Permit” shall be full pay for all costs, including but not limited to, transferring the permit, sampling, monitoring, reporting, coordinating, inspecting, fees and any other expenses, materials and labor necessary to fully comply with the requirements of the permit and terminate it upon completion of the project.

8-02 Roadside Restoration

8-02.1 Description

Section 8-02.1 shall be supplemented with the following:

This work shall also consist of constructing and installing various habitat structures such as rock pile, brush pile, and snags, as detailed and as shown in the Plans.

8-02.2 Materials

Section 8-02.2 shall be supplemented with the following:

Rock Pile

Rock pile shall be between approximately 7 feet diameter and 4 feet tall. Partially bury piles below ground surface in upland areas. Rock shall be mostly rounded and clean and be an even mix by weight of sizes ranging from 2 inch diameter to 2-man rock. Include some rocks with jagged edges. If large rocks are encountered on site they may be cleaned and incorporated into the piles.

Brush Pile

Brush pile shall consist of woody material, including trees, stumps, branches, brush, and roots of native trees and shrubs. Approximately one third of the woody material shall consist of material with the main trunks and branches varying between 2 and 4 inches in diameter and 3 to 6 feet in length. Approximately one third of the woody material shall consist of material with the main trunks and branches varying between 6 and 8 inches in diameter and 6 to 12 feet in length. For the remaining third of vegetation trunks, roots and branches smaller than 2 inches in diameter are acceptable. No noxious weed or undesirable vegetation as listed in Section 2-01.3 shall be included in brush piles.

Snag

Snag shall be a native coniferous tree trunk with bark intact meeting the requirements shown in the Plans.

8-02.3 Construction Requirements

Section 8-02.3 shall be supplemented with the following:

Rock Pile
The Contractor shall stake location for approval of the Engineer before proceeding with installation. Dig out area so that pile can be partially buried. Randomly pile material and place perch log as shown in plan detail.

Brush Pile
The Contractor shall stake location for approval of the Engineer before proceeding with installation. Randomly pile woody material to provide variable coverage (dense to loose).the area of the brush pile location. The brush pile shall be constructed without incorporation of rock, soil, foreign debris, or non-native material in the pile.

Snag
The trunk shall be installed vertically. The soil shall be firmly compacted along the buried portion of the trunk. Installation shall be by drilling or other approved method. Use of a pile driver will not be allowed. Excess soil shall be removed from the site or placed on site at locations approved by the Engineer.

8-02.4 Measurement
Section 8-02.4 shall be supplemented with the following:

"Rock Pile," "Brush Pile," and "Snag" will be measured per each.

8-02.5 Payment
Section 8-02.5 shall be supplemented with the following:

"Rock Pile", per each.

"Brush Pile", per each.

"Snag", per each.

The unit contract price per each for "Rock Pile", "Brush Pile", and "Snag" shall be full pay for all materials, labor, tools, and equipment necessary to furnish and install these habitat items.

The contract payment for "Topsoil Type A", "Fine Compost", and "Wood Chip Mulch" shall be full pay for all costs necessary to furnish and place these items as shown in the Plans including tilling topsoil into underlying soil.

8-12 Chain Link Fence and Wire Fence

8-12.1 Description

Supplement this section with the following:

This work shall include the furnishing and installing of Cedar Split 3-Rail Fence and Security Gates.

8-12.2 Materials

Supplement this section with the following:

"Cedar Split 3-Rail Fence" and "15-Foot Security Gate" shall be of material as specified in the Construction Drawings.

8-12.4 Measurement

Supplement this section with the following:

"Cedar Split 3-Rail Fence" will be measured by the linear foot.

"15-Foot Security Gate" will be measured per each.

8-12.5 Payment

Supplement this section with the following:

"Cedar Split 3-Rail Fence", per linear foot.

"15-Foot Security Gate", per each.

8-15 Riprap

8-15.1 Description

Supplement this section with the following:

This work shall include the furnishing and installing of Streambed Aggregates, Streambed Boulder Riffle, and Outfall Protection.

8-15.2 Materials
Supplement this section with the following:

Geotextile for Separation	9-33

Streambed Aggregates

Streambed Sediment	9-03.11(1)
Streambed Cobbles	9-03.11(2)
Streambed Boulders	9-03.11(3)

Streambed Aggregate is composed of a mix of streambed sediment, and streambed cobbles and shall conform to the requirements shown in the Plans.

8-15.4 Measurement
Supplement this section with the following:

"Streambed Boulders" will be measured by the ton.

"Streambed Aggregate" will be measured by the ton.

"Streambed Cobbles" will be measured by the ton.

"Outfall Protection" will be measured per each.

"Treatment Cell Drain Inlet" will be measured per each.

8-15.5 Payment

Supplement this section with the following:

"Streambed Boulders", per ton.

"Streambed Aggregate", per ton.

The unit contract price per ton for "Streambed Boulders", "Streambed Aggregate", and Streambed Cobbles shall be full pay for furnishing and installing these items including excavation and haul of native soils and geotextile.

"Outfall Protection", per each.

The unit contract price per each for "Outfall Protection" shall be full pay for furnishing and installing this item including excavation and haul, cobbles, and geotextile.

"Treatment Cell Drain Inlet", per each.

The unit contract price per each for "Treatment Cell Drain Inlet" shall be full pay for furnishing and installing this item including excavation and haul, cobbles, and geotextile.

8-24 Rock and Gravity Block Wall and Gabion Cribbing

8-24.1 Description

Supplement this section with the following:

This work shall include the construction of rock walls.

8-24.3 Construction Requirements

Supplement this section with the following:

Rock Wall shall be constructed in accordance with the detail shown in the Plans.

8-24.4 Measurement

Delete the first paragraph of this section and replace with the following:

"Rock Wall" will be measured by the square foot of vertical face including any base rocks which may be buried or partially buried.

8-24.5 Payment

Delete the second and third paragraphs of this section and replace with the following:

"Rock Wall", per square foot.

Excavation, haul, disposal, geotextile, backfill, and chinking material are considered incidental to the bid item "Rock Wall".

Add the following new sections and subsections:

8-30 Habitat Logs (Anchored)

8-30.1 Description

This work shall consist of furnishing and installing Habitat Logs as detailed and as shown in the Plans. All logs and root wads shall be anchored except for the logs at the wetland outfall spill way.

8-30.2 Materials

Wood specified is a natural material and will naturally vary in size. The Contractor shall select and install the wood members which meet the requirements of the

anchored items. Habitat log shall be of a native coniferous tree species with branches intact. Size and locations shall be as shown in the Plans.

Wood shall meet the following requirements:

1. Wood shall be firm, free of rot and disease and damage.
2. Wood with rot or structural defects such as splits, chunks cut out, or gouges will not be accepted.
3. Wood shall be stored in a manner that will prevent damage to the wood, including roots.

Wood Components:

1. Logs shall be a tree trunk, bark intact and root mass intact where shown on the Plans. Log length shall be measured from the top of the log bole (root mass) to the end of the log.
2. Log diameter shall be measured at the midpoint of the log length.

Earth Anchor
Each earth anchor assembly shall be as shown on the Plan. The Contractor shall assume existing soils have typical blow count values "N" of 3-8 when selecting the earth anchors to be used for the project. All costs in connection with furnishing and installing earth anchors shall be included in the unit contract prices for the anchored logs. Root wads shall be secured with a single anchor. See Section 9-14.8.

Source of Material
The Contractor shall submit the source(s) of materials for anchored habitat logs to the Engineer for approval at least 10 working days prior to use.

8-30.3 Construction Requirements

The Contractor shall install anchored habitat logs at the locations shown in the Plans.

The Contractor shall exercise care when installing anchored logs to ensure that the method of installation minimizes damage to logs, disturbance of waterways, and prevents sediment or pollutant discharge into water.

Placement of the anchored habitat logs shall be according to the following:

- The Contractor shall lay out the individual log locations for review by the Engineer. The linear extent of the logs shall be indicated with stakes and flagging.
- The Contractor shall notify the Engineer 48 hours in advance of review on-site.

Earth Anchor
Earth anchors shall be driven into the ground and locked into position. Anchors shall not be augered, drilled, or dug into place. Anchors shall be placed with adequate cover over anchoring and fastenings so as to be hidden from view.

The Contractor shall test and verify the capacity of each anchor to achieve a holding capacity of 5,000 pounds. The Contractor shall use an anchor “load locker” from the manufacturer. Earth Anchors shall not penetrate an elevation below 21.5 feet.

Anchored Item
Place item in a stable position on the ground surface. Install earth anchors in accordance with manufacturer’s instructions and Earth Anchor specifications herein. Engineer shall approve installation.

8-30.4 Measurement

“Habitat Logs” will be measured per each.

8-30.5 Payment
Payment will be made in accordance with Section 1-04.1 for the following:

“Habitat Logs”, per each

The unit contract price for “Habitat Logs” shall include all costs for all materials, labor, and equipment including logs, earth anchors, chains, cables, and hardware necessary to perform the work. Any excavation required is considered incidental to this item.

8-31 Log Weirs

8-31.1 Description
This work shall consist of furnishing and installing Log Weirs as detailed and as shown in the Plans. Log Weirs include all items shown in detail including seal log, weir log, shims, concrete, rebar, bolts, chains, log preparation, downstream energy dissipation, and geotextile.

8-31.2 Materials
Wood specified is a natural material and will naturally vary in size. The Contractor shall select and install the wood members which meet the requirements of the log weirs.

Wood shall meet the following:
1. Wood shall be Cedar
2. Wood shall be firm, free of rot and disease and damage.
3. Wood with rot or structural defects such as splits, chunks cut out, or gouges will not be accepted.
4. Wood shall be stored in a manner that will prevent damage to the wood, including roots.

Wood Components:
1. Logs shall be a tree trunk, free of branches, with bark removed and root mass removed as shown on the Plans. Logs shall be of sufficient length to meet the requirements shown in the detail.

2. Log diameter shall be measured at the midpoint of the log length.
3. A two inch, flat mating surface shall be cut into the seal log and log weir. Surfaces shall be level and free from irregularities (planed) to provide a leak resistant seal with a maximum opening of 1/4 inch.
4. A weir surface shall be cut into the log weir as shown in the detail. Surface shall be level and free from irregularities.

Concrete Anchor:
Each concrete anchor assembly shall be as shown on the Plan. All costs in connection with furnishing and installing concrete anchors shall be included in the unit contract prices for the anchored weir logs.

Source of Material:
The Contractor shall submit the source(s) of materials for all logs included in the detail to the Engineer for approval at least 10 working days prior to use.

8-31.3 Construction Requirements
The Contractor shall install log weirs at the locations and elevations shown in the Plans.

The Contractor shall exercise care when working around installed log weirs to ensure that weir level is not altered.

Concrete Anchor
Anchors can be brought in as “pre-cast” units or cast-in-place.

Weir/Seal Log
Place log in a stable position on the ground surface. Logs shall set on a level, supporting surface (combination of log, soil, and concrete) in such a manner that it is supported uniformly across the entire span as to not impart uneven strain on the log. Engineer shall approve installation.

8-31.4 Measurement

“Log Weirs” will be measured per weir structure identified on the Plans.

8-31.5 Payment
Payment will be made in accordance with Section 1-04.1 for the following:

“Log Weirs”, per each.

The unit contract price for “Log Weirs” shall include all costs for all materials, labor, and equipment including logs (both anchor and seal) and log preparation, concrete anchors, cables, shims, hardware, upstream and downstream energy dissipation rock, geotextile, leveling, and any other requirements necessary to perform the work as designed. Any excavation, haul, and shoring required is considered incidental to the item.

8-32 Crushed Rock Paving With Geotextile

8-32.1 Description

This work shall consist of furnishing, installing, and compacting Crushed Rock Paving with Geotextile as detailed and as shown on the Plans.

8-32.2 Materials

Crushed Rock Paving shall be 1/4 inch minus Crushed Granite Surfacing supplied by Morrison Gravel of Port Orchard Washington, contact phone number: (360) 876-4701.

Geotextile shall be Geotextile for Separation per Standard Specification 9-33.2(1), Table 3, woven or non-woven.

8-32.3 Construction Requirements

The Contractor shall install Crushed Rock Paving at the locations and by the methods shown in the Plans.

Crushed Rock Paving shall be compacted using Method B per the Standard Specifications.

8-32.4 Measurement

“Crushed Rock Paving with Geotextile” will be measured per square foot.

8-32.5 Payment

Payment will be made in accordance with Section 1-04.1 for the following:

“Crushed Rock Paving with Geotextile” per square foot.

The unit contract price for “Crushed Rock Paving with Geotextile” shall include all costs for all materials including crushed rock, geotextile, labor, and equipment necessary to perform the work.

8-33 Metal Safety Railing

8-33.1 Description

This work shall consist of furnishing and installing metal safety railing on the precast concrete culvert as shown on the Plans.

8-33.2 Materials

Safety railing shall be hot-dipped galvanized steel as specified on the Plans.

8-33.4 Measurement

Metal Safety Railing will be measured by the lineal foot along the line and slope at the base of the completed railing.

8-33.5 Payment

Payment will be made in accordance with Section 1-04.1 for the following:

"Metal Safety Railing" per lineal foot.

The unit contract price for "Metal Safety Railing" shall include all costs to furnish and install this item complete.

8-34 Decommission Monitoring Wells and Piezometers

8-34.1 Description

This work shall consist of decommissioning of existing monitoring wells and piezometers per Chapter 173-160-420 of the Washington Administrative Code (WAC). Well locations and well logs are provided in the geotechnical report provided in Appendix D.

8-34.4 Measurement

"Decommissioning Monitoring Wells and Piezometers" will be measured per each.

8-34.5 Payment

Payment will be made in accordance with Section 1-04.1 for the following:

"Decommissioning Monitoring Wells and Piezometers," per each.

The unit contract price for "Decommissioning Monitoring Wells and Piezometers" shall include all costs to complete the work including providing required documentation to the Department of Ecology.

DIVISION 9 MATERIALS

9-03 Aggregates

9-03.8 Aggregates for Hot Mix Asphalt

9-03.8(2) HMA Test Requirements
Supplement this section with the following:

ESAL's
The number of ESAL's for the design and acceptance of the HMA shall be in the range of more than 300,000 to less than 3 million.

9-14 Erosion Control and Roadside Planting

9-14.1 Soil

9-14.1(1) Topsoil Type A
Supplement this Section with the following:

Topsoil Type A
Topsoil Type A shall be a well blended mixture of two parts coarse compost and three parts Mineral Aggregate for Topsoil Type A by volume.

9-14.1(4) Mineral Aggregate for Topsoil Type A
Mineral Aggregate for Topsoil Type A shall meet the following gradation:

Sieve Size	Percent Passing
1 inch	100
No. 4	60-100
No. 10	40-100
No. 40	15-50
No. 200	2-5

Add the following new sections:

9-14.8 Earth Anchor

Tipping Plate Anchor
Anchor shall be a driven tipping plate anchor system designed for use in corrosive soil environments meeting the following minimum parameters:

Anchor holding power in normal soil 5,000 lbs.

Chain breaking strength	5,000 lbs.
Chain material	1/2 inch stainless steel
Bolts, Anchor Rod, & Eye Nut	3/4 inch stainless steel

Tipping Plate Anchor shall be Manta Ray Model MR-2 or approved equivalent.

9-33 Construction Geosynthetics

9-33.2 Geosynthetic Properties

9-33.2(4) Pond Liner

Material for the pond liner shall be 30 mil PVC Geomembrane meeting the following specifications:

Property	Test Method	Specified Values
Thickness Mils (Nominal =/- 5%)	ASTM-D5199	30
Specific Gravity, min.	ASTM-D792	1.20
Minimum Tensile Properties	ASTM-D882	2300
Breaking Factor (pds, in., Width)	ASTM-D882	73
Elongation at Break (%)	ASTM-D882	360
Modulus (force) at 100% Elongation, Pds, in., Width	ASTM-D882	32.0
(kN/m)		(5.6)
Tear Resistance, lbs., min.	ASTM-D1004	8
(N, min.)		(35)
Low Temperature Degrees C	ASTM-D1790	-29
Dimensional Stability,	ASTM-D1204	3.0
Percent Change, Max (212 Deg F, 15 min)		
Water Extraction, Max % wt loss	ASTM-D3083 0.15	
Volatility, Percentage loss, max	ASTM-D1203 0.70	
Resistance to Soil Burial,	ASTM-D3083	
% change, max in original value		
Braking Factor		-5
Elongation, @ Break		-20
Modulus @ 100% Elongation		+20
Hydrostatic Resistance, psi, min.	ASTM-D751 100	
Factory Seam Requirements:		
Dielectric Fusion Weld		
Bonded Seam Strength	ASTM-D3083 55.2	
(factory seam breaking factor, ppi width)		
Peel Adhesion	ASTM-D413	10
As Modified in NSF 54		

END OF SPECIAL PROVISIONS

STANDARD PLANS
(August 3, 2015 WSDOT GSP)

The State of Washington Standard Plans for Road, Bridge and Municipal Construction M21-01 transmitted under Publications Transmittal No. PT 15-048, effective August 3, 2015 is made a part of this contract.

The Standard Plans are revised as follows:

A-30.15
DELETED

A-50.10
Sheet 2 of 2, Plan, with Single Slope Barrier, reference C-14a is revised to C-70.10

A-50.20
Sheet 2 of 2, Plan, with Anchored Barrier, reference C-14a is revised to C-70.10

A-50.30
Sheet 2 of 2, Plan (top), reference C-14a is revised to C-70.10

B-10.20 and B-10.40
Substitute “step” in lieu of “handhold” on plan

B-15.60
Table, Maximum Knockout Size column, 120” Diam., 42” is revised to read; 96”

B-25.20
Add Note 7. See Standard Specification Section 8-04 for Curb and Gutter requirements

B-55.20
Metal Pipe elevation, title is revised to read; “Metal Pipe and Steel Rib Reinforced Polyethylene Pipe”

B-90.40
Offset & Bend details, add the subtitle, “Plan View” above titles

C-8b
Sheet 2, Anchor Plate detail, callout, was – 1” DIAM. HOLE (TYP.)” IS REVISED TO READ; “1 1/8” (IN) DIAM. HOLE (TYP.)”

C-1
Assembly Detail, Steel Post, (post) callout – was - ”W6 x 9 or W6 x 15” is revised to read; “W6 x 8.5 or W6 x 9 or W6 x 15”

C-10
General Note 1, first sentence, was – “Length of W8 x 35 and W6 x 9 shall be determined by measurement from top of ground to top of grout pad.” Is revised to read; “Length of W8 x 35 and W6 x 8.5 or W6 x 9 shall be determined by measurement from top of ground to top of grout pad.”
Sheet 1, Post Base Plate Detail, callout, was – “W6 x 9” is revised to read; “W6 x 8.5 or W6 x 9”
Sheet 1, Box Culvert Guardrail Steel Post Type 2 detail, callout, was – “W6 x 9 Steel Post” is revised to read;” “W6 x 8.5 or W6 x 9 Steel Post”
Sheet 1, Post Anchor Attachment Detail, callout, was – “W6 x 9 ~ See Note 1” is revised to read; “W6 x 8.5 or W6 x 9 ~ See Note 1”
Sheet 1, Detail A, callout, was – “W6 x 9 Steel Post ~ See Note 1” is revised to read; “W6 x 8.5 or W6 x 9 Steel Post ~ See Note 1”
Sheet 2, Box Culvert Guardrail Steel Post Type 1, callout, was – “W6 x 9 x 27.5” Steel Post” is revised to read; “W6 x 8.5 x 27.5” (IN) or W6 x 9 x 27.5” (IN) Steel Post”
Sheet 2, Detail B, callout, was – “W6 x 9 x 27.5” Steel Post” is revised to read; “W6 x 8.5 x 27.5” (IN) or W6 x 9 x 27.5” (IN) Steel Post”

C-16a
Note 1, reference C-28.40 is revised to C-20.10

C-16b
Note 3, reference C-28.40 is revised to C-20.10

C-22.14
Plan, callout, was – “Location of Post (Without Block) ~ W6 x 9 Steel Post Only” is revised to read; “Location of Post (Without Block) ~ W6 x 8.5 or W6 x 9 Steel Post Only”
Elevation, callout, was – “Location of Post (Without Block) ~ W6 x 9 Steel Post Only” is revised to read; “Location of Post (Without Block) ~ W6 x 8.5 or W6 x 9 Steel Post Only”

F-10.12
Section Title, was – “Depressed Curb Section” is revised to read: “Depressed Curb and Gutter Section”

F-10.40
“EXTRUDED CURB AT CUT SLOPE”, Section detail - Deleted

H-70.20
Sheet 2, Spacing Detail, Mailbox Support Type 1, reference to Standard Plan I-70.10 is revised to H-70.10

J-3
DELETED

J-3b
DELETED

J-3C
DELETED

J-10.22
Key Note 1, was – “Meter base per serving utility requirements~ as a minimum, the meter base shall be safety socket box with factory-installed test bypass facility that meets the requirements of EUSERC drawing 305.” Is revised to read; “Meter base per serving utility requirements~ as a minimum, the meter base shall be safety socket box with factory-installed test bypass facility that meets the requirements of EUSERC drawing 305. When the utility requires meter base to be mounted on the side or back of the service cabinet, the meter base enclosure shall be fabricated from type 304 stainless steel.”
Key Note 4, “Test with (SPDT Snap Action, Positive close 15 Amp – 120/277 volt “T” rated). Is revised to read: “Test Switch (SPDT snap action, positive close 15 amp – 120/277 volt “T” rated).”
Key Note 14, was – “Hinged dead front with ¼ turn fasteners or slide latch.” Is revised to read; “Hinged dead front with ¼ turn fasteners or slide latch. ~ Dead front panel bolts shall not extend into the vertical limits of the breaker array(s).”
Key Note 15, was – “Cabinet Main Bonding Jumper. Buss shall be 4 lug tinned copper. See Cabinet Main bonding Jumper detail, Standard Plan J-3b.“ is revised to read; “Cabinet Main Bonding Jumper Assembly ~ Buss shall be 4 lug tinned copper ~ See Standard Plan J-10.20 for Cabinet Main Bonding Jumper Assembly details.”

J-20.11
Sheet 2, Foundation Detail, Elevation, callout – “Type 1 Signal Pole” is revised to read: “Type PS or Type 1 Signal Pole”
Sheet 2, Foundation Detail, Elevation, add note below Title, “(Type 1 Signal Pole Shown)”

J-20.16
View A, callout, was – LOCK NIPPLE, is revised to read; CHASE NIPPLE

J-21.10
Sheet 1 of 2, Elevation view (Round), add dimension depicting the distance from the top of the foundation to find 2 #4 reinforcing bar shown, to read; 3” CLR.. Delete

“(TYP.)” from the 2 ½” CLR. dimension, depicting the distance from the bottom of the foundation to find 2 # 4 reinf. Bar.
Sheet 1 of 2, Elevation view (Square), add dimension depicting the distance from the top of the foundation to find 1 #4 reinforcing bar shown, to read; 3” CLR. Delete “(TYP.)” from the 2 ½” CLR. dimension, depicting the distance from the bottom of the foundation to find 1 # 4 reinf. Bar.
Sheet 2 of 2, Elevation view (Round), add dimension depicting the distance from the top of the foundation to find 2 #4 reinforcing bar shown, to read; 3” CLR. Delete “(TYP.)” from the 2 ½” CLR. dimension, depicting the distance from the bottom of the foundation to find 2 # 4 reinf. Bar.
Sheet 2 of 2, Elevation view (Square), add dimension depicting the distance from the top of the foundation to find 1 #4 reinforcing bar shown, to read; 3” CLR. Delete “(TYP.)” from the 2 ½” CLR. dimension, depicting the distance from the bottom of the foundation to find 1 # 4 reinf. Bar.

J-21.15
Partial View, callout, was – LOCK NIPPLE ~ 1 ½” DIAM., is revised to read; CHASE NIPPLE ~ 1 ½” (IN) DIAM.

J-21.16
Detail A, callout, was – LOCKNIPPLE, is revised to read; CHASE NIPPLE

J-22.15
Ramp Meter Signal Standard, elevation, dimension 4’ - 6” is revised to read; 6’-0”
(2x) Detail A, callout, was – LOCK NIPPLE ~ 1 ½” DIAM. is revised to read; CHASE NIPPLE ~ 1 ½” (IN) DIAM.

J-28.50
Section D, callout, was – Backup Strip (ref. to key note 3) is revised to read; “Continuous Backup Strip (ref. to key note 3)”
Key Note 3, was – ¼” Thick, or No thinner than pole wall thickness. Tack weld or seal weld to Base plate. Is revised to read; “1/4” Thick, or No thinner than Pole wall thickness. Tack weld in root or continuous seal weld to Base plate or Pole wall.”

J-28.70
Detail C, dimension, 2” MAX. is revised to read: 1” MAX.
Detail D, dimension, 2” MAX. is revised to read: 1” MAX.

J-29.10
Galvanized Welded Wire Mesh detail, callout – “Drill and Tap for ¼” Diam. Cap Screw, 3 Places, @ 9” center, all 4 edges S.S. Screw, ASTM F593 and washer” is revised to read;
“*Drill and Tap ¼” (IN) Diam. x 1” (IN) Cap Screw with washer ~ space approx.. 9” o.c. ~ Liberally coat threads with Anti-seize compound (TYP.)”

Add Boxed note: * Bolts, Nuts, and washers ~ ASTM F593 or A193 Type 304 or Type 316 Stainless Steel (S.S.)

J-29.15
Title, “Camera Pole Standard” is revised to read; “Camera Pole Standard Details”

J-29-16
Title, “Camera Pole Standard Details” is revised to read; “Camera Pole Details”

J-40.10
Sheet 2 of 2, Detail F, callout, “12 – 13 x 1 ½” S.S. PENTA HEAD BOLT AND 12” S. S. FLAT WASHER” is revised to read; “12 – 13 x 1 ½” S.S. PENTA HEAD BOLT AND 1/2” (IN) S. S. FLAT WASHER”

J-60.14
All references to J-16b (6x) are revised to read; J-60.11

J-90.10
Section B, callout, “Hardware Mounting Rack ~ S. S. 1-5/8” Slotted Channel” is revised to read: “Hardware Mounting Rack (Typ.) ~ Type 304 S. S. 1-5/8” Slotted Channel”

J-90.20
Section B, callout, “Hardware Mounting Rack (Typ.) ~ S. S. 1-5/8” Slotted Channel” is revised to read: “Hardware Mounting Rack (Typ.) ~ Type 304 S. S. 1-5/8” Slotted Channel”

K-80.10
Sign Installation (Fill Section), dimension, 6’ TO 12’ MIN. is revised to read: 12’ MIN.
Sign Installation (Sidewalk and Curb Section), dimension, 6’ TO 12’ MIN. is revised to read: 12’ MIN.
Sign Installation (Behind Traffic Barrier Section), Delete dimensions - 6’ TO 12’ MIN. and 6’ MIN.
Sign with Supplemental Plaque Installation (Fill Section), dimension, 6’ TO 12’ MIN. is revised to read: 12’ MIN.
Sign Installation (Ditch Section), dimension, 6’ TO 12’ MIN. is revised to read: 12’ MIN. Delete dimension – 6’ MIN.

K-80.30
In the NARROW BASE, END view, the reference to Std. Plan C-8e is revised to Std. Plan K-80.35

M-11.10
Layout, dimension (from stop bar to “X”), was – 23’ is revised to read; 24’

The following are the Standard Plan numbers applicable at the time this project was advertised. The date shown with each plan number is the publication approval date shown in the lower right-hand corner of that plan. Standard Plans showing different dates shall not be used in this contract.

A-10.10-00.....8/7/07
A-10.20-00.....10/5/07
A-10.30-00.....10/5/07
A-20.10-00.....8/31/07
A-30.10-00..... 11/8/07
A-30.30-01 6/16/11
A-30.35-00..... 10/12/07
A-40.00-00..... 8/11/09
A-40.10-03..... 12/23/14
A-40.15-00..... 8/11/09
A-40.20-03..... 12/23/14
A-40.50-02..... 12/23/14
A-50.10-00..... 11/17/08
A-50.20-01.....9/22/09
A-50.30-00.....11/17/08
A-50.40-00.....11/17/08
A-60.10-03.....12/23/14
A-60.20-03.....12/23/14
A-60.30-00.....11/8/07
A-60.40-00.....8/31/07

B-5.20-01..... 6/16/11
B-5.40-01..... 6/16/11
B-5.60-01..... 6/16/11
B-10.20-01.....2/7/12
B-10.40-00.....6/1/06
B-10.60-00.....6/8/06
B-15.20-01.....2/7/12
B-15.40-01.....2/7/12
B-15.60-01.....2/7/12
B-20.20-02.....3/16/12
B-20.40-03.....3/16/12
B-20.60-03.....3/15/12
B-25.20-01.....3/15/12
B-25.60-00.....6/1/06
B-30.10-01.....4/26/12
B-30.20-02.....4/26/12
B-30.30-01.....4/26/12
B-30.40-01.....4/26/12
B-30.50-01.....4/26/12
B-30.70-03.....4/26/12
B-30.80-00.....6/8/06
B-30.90-01.....9/20/07
B-35.20-00.....6/8/06
B-35.40-00.....6/8/06
B-40.20-00.....6/1/06
B-40.40-01.....6/16/10
B-45.20-00.....6/1/06
B-45.40-00.....6/1/06
B-50.20-00.....6/1/06
B-55.20-00.....6/1/06
B-60.20-00.....6/8/06
B-60.40-00.....6/1/06
B-65.20-01.....4/26/12
B-65.40-00.....6/1/06
B-70.20-00.....6/1/06
B-70.60-00.....6/1/06
B-75.20-01.....6/10/08
B-75.50-01.....6/10/08
B-75.60-00.....6/8/06
B-80.20-00.....6/8/06
B-80.40-00.....6/1/06
B-82.20-00.....6/1/06
B-85.10-01.....6/10/08
B-85.20-00.....6/1/06
B-85.30-00.....6/1/06
B-85.40-00.....6/8/06
B-85.50-01.....6/10/08
B-90.10-00.....6/8/06
B-90.20-00.....6/8/06
B-90.30-00.....6/8/06
B-90.40-00.....6/8/06
B-90.50-00.....6/8/06
B-95.20-01.....2/3/09
B-95.40-00.....6/8/06

C-1..... 6/16/11
C-1a.....7/14/15
C-1b.....7/14/15
C-1c.....5/30/97
C-1d.....10/31/03
C-2.....1/6/00
C-2a.....6/21/06
C-2b.....6/21/06
C-2c.....6/21/06
C-2d.....6/21/06
C-2e.....6/21/06
C-2f.....3/14/97
C-2g.....7/27/01
C-6 ..... 5/30/97
C-6a 10/14/09
C-6c..... 1/6/00
C-6d 5/30/97
C-6f 7/25/97
C-7 .....6/16/11
C-7a 6/16/11
C-8 ..... 2/10/09
C-8a 7/25/97
C-8b 6/27/11
C-8e 2/21/07
C-8f 6/30/04
C-10 ..... 6/3/10
C-23.60-03 ..... 6/11/14
C.24.10-01 ..... 6/11/14
C-25.18-05 .....7/14/15
C-25.20-06 .....7/14/15
C-25.22-05 .....7/14/15
C-25.26-03 .....7/14/15
C-25.80-03 ..... 6/11/14
C-40.14-02 .....7/2/12
C-40.16-02 .....7/2/12
C-40.18-02 .....7/2/12
C-70.10-01 .....6/17/14
C-75.10-01 ..... 6/11/14
C-75.20-01 ..... 6/11/14

C-2h.....3/28/97
C-2i.....3/28/97
C-2j.....6/12/98
C-2k.....7/27/01
C-2n.....7/27/01
C-2o.....7/13/01
C-2p.....10/31/03
C-3.....7/2/12
C-3a.....10/4/05
C-3b..... 6/27/11
C-3c..... 6/27/11
C-4b.....6/8/06
C-4e.....10/23/14
C-4f.....7/2/12

C-16a 6/3/10
C-16b 6/3/10
C-20.10-03 ..... 7/14/15
C-20.14-03 .....6/11/14
C-20.15-02 .....6/11/14
C-20.18-02 .....6/11/14
C-20.19-02 .....6/11/14
C-20.40-05 .....7/14/15
C-20.41-01 .....7/14/15
C-20.42-05 .....7/14/15
C-20.45.01 .....7/2/12
C-22.14-03 .....6/11/14
C-22.16-05 .....7/14/15
C-22.40-04 .....10/23/14
C-22.41-01 .....10/23/14
C-22.45-01 .....10/23/14

C-75.30-01 ..... 6/11/14
C-80.10-01 ..... 6/11/14
C-80.20-01 ..... 6/11/14
C-80.30-01 ..... 6/11/14
C-80.40-01 ..... 6/11/14
C-80.50-00 .....4/8/12
C-85.10-00 .....4/8/12
C-85.11-00 .....4/8/12
C-85.14-01 ..... 6/11/14
C-85.15-01 .....6/30/14
C-85.16-01 .....6/17/14
C-85-18-01 ..... 6/11/14
C-85.20-01 ..... 6/11/14
C-90.10-00 .....7/3/08

D-2.04-00.....11/10/05
D-2.06-01..... 1/6/09
D-2.08-00.....11/10/05
D-2.14-00.....11/10/05
D-2.16-00.....11/10/05
D-2.18-00.....11/10/05
D-2.20-00.....11/10/05
D-2.32-00.....11/10/05
D-2.34-01..... 1/6/09
D-2.36-03.....6/11/14
D-2.42-00.....11/10/05
D-2.44-00.....11/10/05
D-2.60-00.....11/10/05
D-2.62-00.....11/10/05
D-2.46-01.....6/11/14

D-2.48-00 .....11/10/05
D-2.64-01 ..... 1/6/09
D-2.66-00 .....11/10/05
D-2.68-00 .....11/10/05
D-2.80-00 .....11/10/05
D-2.82-00 .....11/10/05
D-2.84-00 .....11/10/05
D-2.86-00 .....11/10/05
D-2.88-00 .....11/10/05
D-2.92-00 .....11/10/05
D-3.09-00 ..... 5/17/12
D-3.10-01 ..... 5/29/13
D-3.11-03 .....6/11/14
D-3.15-02 ..... 6/10/13
D-3.16-02 ..... 5/29/13

D-3.17-01 .....5/17/12
D-4 ..... 12/11/98
D-6 .....6/19/98
D-10.10-01 .....12/2/08
D-10.15-01 .....12/2/08
D-10.20-00 .....7/8/08
D-10.25-00 .....7/8/08
D-10.30-00 .....7/8/08
D-10.35-00 .....7/8/08
D-10.40-01 .....12/2/08
D-10.45-01 .....12/2/08
D-15.10-01 .....12/2/08
D-15.20-02 ..... 6/2/11
D-15.30-01 .....12/02/08

E-1 ..... 2/21/07
E-2 ..... 5/29/98

E-4 .....8/27/03
E-4a 8/27/03

F-10.12-03.....6/11/14
F-10.16-00.... 12/20/06
F-10.18-00.....6/27/11
F-10.40-02..... 6/21/12
F-10.42-00..... 1/23/07

F-10.62-02 ..... 4/22/14
F-10.64-03 ..... 4/22/14
F-30.10-03 .....6/11/14
F-40.12-02 ..... 6/20/13
F-40.14-02 ..... 6/20/13

F-40.15-02.....6/20/13
F-40.16-02.....6/20/13
F-45.10-01.....6/21/12
F-80.10-03..... 6/11/14

G-10.10-00 ..... 9/20/07
G-20.10-02 ..... 6/23/15
G-22.10-03 ..... 7/10/15
G-24.10-00 .....11/8/07
G-24.20-01 ..... 2/7/12

G-24.60-04..... 6/23/15
G-25.10-04..... 6/10/13
G-30.10-04..... 6/23/15
G-50.10-02..... 6/23/15
G-60.10-03..... 6/18/15

G-70.20-02.....6/10/13
G-70.30-02.....6/10/13
G-90.10-01..... 5/11/11
G-90.20-03.....7/10/15
G-90.30-02.....3/22/13

G-24.30-01 ..... 2/7/12
G-24.40-05 ..... 6/23/15
G-24.50-03 ..... 6/17/14

G-60.20-02 ..... 6/18/15
G-60.30-02 ..... 6/18/15
G-70.10-03 ..... 6/18/15

G-90.40-01 ..... 10/14/09
G-95.10-01 ..... 6/2/11
G-95.20-02 ..... 6/2/11
G-95.30-02 ..... 6/2/11

H-10.10-00..... 7/3/08
H-10.15-00..... 7/3/08
H-30.10-00.... 10/12/07

H-32.10-00 ..... 9/20/07
H-60.10-01 ..... 7/3/08
H-60.20-01 ..... 7/3/08

H-70.10-01 ..... 2/7/12
H-70.20-01 ..... 2/16/12
H-70.30-02 ..... 2/7/12

I-10.10-01 .....8/11/09
I-30.10-02 ..... 3/22/13
I-30.15-02 ..... 3/22/13
I-30.16-00 ..... 3/22/13
I-30.17-00 ..... 3/22/13

I-30.20-00..... 9/20/07
I-30.30-01..... 6/10/13
I-30.40-01..... 6/10/13
I-30.60-00..... 5/29/13
I-40.10-00..... 9/20/07

I-40.20-00 ..... 9/20/07
I-50.20-01 ..... 6/10/13
I-60.10-01 ..... 6/10/13
I-60.20-01 ..... 6/10/13
I-80.10-01 .....8/11/09

J-10 ..... 7/18/97
J-10.10-03 ..... 6/3/15
J-10.15-01 .....6/11/14
J-10.16-00 ..... 6/3/15
J-10.17-00 ..... 6/3/15
J-10.18-00 ..... 6/3/15
J-10.20-00 ..... 6/3/15
J-10.21-00 ..... 6/3/15
J-10.22-00 ..... 5/29/13
J-15.10-01 .....6/11/14
J-15.15-02 ..... 7/10/15
J-20.10-03 ..... 6/30/14
J-20.11-02..... 6/30/14
J-20.15-03 ..... 6/30/14
J-20.16-02 ..... 6/30/14
J-20.20-02 ..... 5/20/13
J-20.26-01 ..... 7/12/12
J-21.10-04 ..... 6/30/14
J-21.15-01 ..... 6/10/13
J-21.16-01 ..... 6/10/13
J-21.17-01 ..... 6/10/13
J-21.20-01 ..... 6/10/13
J-22.15-02 ..... 7/10/15
J-22.16-03 ..... 7/10/15
J-26.10-02 ..... 3/15/12

J-26.15-01 ..... 5/17/12
J-26.20-00 .....6/11/14
J-27.10-00 ..... 3/15/12
J-27.15-00 ..... 3/15/12
J-28.10-01 .....5/11/11
J-28.22-00 ..... 8/07/07
J-28.24-01 ..... 6/3/15
J-28.26-01 ..... 12/02/08
J-28.30-03 .....6/11/14
J-28.40-02 .....6/11/14
J-28.42-01 .....6/11/14
J-28.43-00 .....6/11/14
J-28.45-02 .....6/11/14
J-28.50-02 .....6/2/11
J-28.60-01 .....6/2/11
J-28.70-01 .....5/11/11
J-29.10-00 .....6/27/11
J-29.15-00 .....6/27/11
J-29.16-01 ..... 6/20/13
J-30.10-00 ..... 6/18/15
J-40.10-03 ..... 5/20/13
J-40.20-02 .....6/11/14
J-40.30-03 ..... 5/20/13
J-40.35-01 ..... 5/29/13
J-40.36-01 ..... 5/20/13
J-40.37-01 ..... 5/20/13
J-40.38-01 ..... 5/20/13
J-40.39-00 ..... 5/20/13

J-40.40-00 .....5/20/13
J-50.10-00 .....6/3/11
J-50.11-00 .....6/3/11
J-50.12-00 ..... 6/3/11
J-50.15-00 ..... 6/3/11
J-50.16-01 .....3/22/13
J-50.20-00 ..... 6/3/11
J-50.25-00 .....6/3/11
J-50.30-00 .....6/3/11
J-60.05-00 ..... 6/16/11
J-60.11-00 .....5/20/13
J-60.12-00 .....5/20/13
J-60.13-00 .....6/16/10
J-60.14-00 .....6/16/10
J-75.10-02 .....7/10/15
J-75.20-01 .....7/10/15
J-75.30-02 .....7/10/15
J-75.40-01 ..... 6/11/14
J-75.41-00 ..... 6/11/14
J-75.45-01 ..... 6/11/14
J-90.10-01 ..... 6/27/11
J-90.20-01 ..... 6/27/11
J-90.21-00 .....6/30/14

K-70.20-00..... 2/15/07
K-80.10-00..... 2/21/07

K-80.20-00.... 12/20/06
K-80.30-00..... 2/21/07
K-80.35-00..... 2/21/07
K-80.37-00..... 2/21/07

L-10.10-02 ..... 6/21/12
L-20.10-03 ..... 7/14/15
L-30.10-02 .....6/11/14
L-40.10-02..... 6/21/12
L-40.15-01.....6/16/11
L-40.20-02..... 6/21/12
L-70.10-01.....5/21/08
L-70.20-01.....5/21/08

M-1.20-03 ..... 6/24/14
M-1.40-02 .....6/3/11
M-1.60-02 .....6/3/11
M-1.80-03 .....6/3/11
M-2.20-03 ..... 7/10/15
M-2.21-00 ..... 7/10/15
M-3.10-03 .....6/3/11
M-3.20-02 .....6/3/11
M-3.30-03 .....6/3/11
M-3.40-03 .....6/3/11
M-3.50-02 .....6/3/11
M-5.10-02 .....6/3/11
M-7.50-01 ..... 1/30/07
M-9.50-02 ..... 6/24/14
M-9.60-00..... 2/10/09
M-11.10-01..... 1/30/07
M-15.10-01..... 2/6/07
M-17.10-02..... 7/3/08
M-20.10-02.....6/3/11
M-20.20-02..... 4/20/15
M-20.30-03..... 4/20/15
M-20.40-03..... 6/24/14
M-20.50-02.....6/3/11
M-24.20-02..... 4/20/15
M-24.40-02..... 4/20/15
M-24.50-00.....6/16/11
M-24.60-04..... 6/24/14
M-40.10-03.....6/24/14
M-40.20-00.....10/12/07
M-40.30-00.....9/20/07
M-40.40-00.....9/20/07
M-40.50-00.....9/20/07
M-40.60-00.....9/20/07
M-60.10-01..... 6/3/11
M-60.20-02..... 6/27/11
M-65.10-02..... 5/11/11
M-80.10-01..... 6/3/11
M-80.20-00.....6/10/08
M-80.30-00.....6/10/08

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ATTACHMENT A

PREVAILING WAGES

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State of Washington
Department of Labor & Industries

Prevailing Wage Section - Telephone 360-902-5335
PO Box 44540, Olympia, WA 98504-4540

Washington State Prevailing Wage

The PREVAILING WAGES listed here include both the hourly wage rate and the hourly rate of fringe benefits. On public works projects, worker's wage and benefit rates must add to not less than this total. A brief description of overtime calculation requirements are provided on the Benefit Code Key.

Journey Level Prevailing Wage Rates for the Effective Date: 1/25/2016

County	Trade	Job Classification	Wage	Holiday	Overtime	Notes
Kitsap	Asbestos Abatement Workers	Journey Level	$43.95	5D	1H	
Kitsap	Boilermakers	Journey Level	$30.34		1	
Kitsap	Brick Mason	Journey Level	$52.82	5A	1M	
Kitsap	Brick Mason	Pointer-Caulker-Cleaner	$52.82	5A	1M	
Kitsap	Building Service Employees	Janitor	$9.47		1	
Kitsap	Building Service Employees	Shampooer	$9.47		1	
Kitsap	Building Service Employees	Waxer	$9.47		1	
Kitsap	Building Service Employees	Window Cleaner	$13.22		1	
Kitsap	Cabinet Makers (In Shop)	Journey Level	$23.72		1	
Kitsap	Carpenters	Acoustical Worker	$54.02	5D	4C	
Kitsap	Carpenters	Bridge, Dock And Wharf Carpenters	$54.02	5D	4C	
Kitsap	Carpenters	Carpenter	$54.02	5D	4C	
Kitsap	Carpenters	Carpenters on Stationary Tools	$54.15	5D	4C	
Kitsap	Carpenters	Creosoted Material	$54.12	5D	4C	
Kitsap	Carpenters	Floor Finisher	$54.02	5D	4C	
Kitsap	Carpenters	Floor Layer	$54.02	5D	4C	
Kitsap	Carpenters	Scaffold Erector	$54.02	5D	4C	
Kitsap	Cement Masons	Journey Level	$53.95	7A	1M	
Kitsap	Divers & Tenders	Diver	$107.22	5D	4C	8A
Kitsap	Divers & Tenders	Diver On Standby	$64.42	5D	4C	
Kitsap	Divers & Tenders	Diver Tender	$58.33	5D	4C	

Kitsap	Divers & Tenders	Surface Rcv & Rov Operator	$58.33	5D	4C	
Kitsap	Divers & Tenders	Surface Rcv & Rov Operator Tender	$54.27	5A	4C	
Kitsap	Dredge Workers	Assistant Engineer	$56.44	5D	3F	
Kitsap	Dredge Workers	Assistant Mate (Deckhand)	$56.00	5D	3F	
Kitsap	Dredge Workers	Boatmen	$56.44	5D	3F	
Kitsap	Dredge Workers	Engineer Welder	$57.51	5D	3F	
Kitsap	Dredge Workers	Leverman, Hydraulic	$58.67	5D	3F	
Kitsap	Dredge Workers	Mates	$56.44	5D	3F	
Kitsap	Dredge Workers	Oiler	$56.00	5D	3F	
Kitsap	Drywall Applicator	Journey Level	$54.02	5D	1H	
Kitsap	Drywall Tapers	Journey Level	$54.07	5P	1E	
Kitsap	Electrical Fixture Maintenance Workers	Journey Level	$31.74		1	
Kitsap	Electricians - Inside	Journey Level	$51.26		1	
Kitsap	Electricians - Motor Shop	Craftsman	$15.37		1	
Kitsap	Electricians - Motor Shop	Journey Level	$14.69		1	
Kitsap	Electricians - Powerline Construction	Cable Splicer	$69.95	5A	4D	
Kitsap	Electricians - Powerline Construction	Certified Line Welder	$63.97	5A	4D	
Kitsap	Electricians - Powerline Construction	Groundperson	$43.62	5A	4D	
Kitsap	Electricians - Powerline Construction	Heavy Line Equipment Operator	$63.97	5A	4D	
Kitsap	Electricians - Powerline Construction	Journey Level Lineperson	$63.97	5A	4D	
Kitsap	Electricians - Powerline Construction	Line Equipment Operator	$53.81	5A	4D	
Kitsap	Electricians - Powerline Construction	Pole Sprayer	$63.97	5A	4D	
Kitsap	Electricians - Powerline Construction	Powderperson	$47.55	5A	4D	
Kitsap	Electronic Technicians	Journey Level	$44.26	7E	1D	
Kitsap	Elevator Constructors	Mechanic	$82.67	7D	4A	
Kitsap	Elevator Constructors	Mechanic In Charge	$89.40	7D	4A	
Kitsap	Fabricated Precast Concrete Products	Journey Level - In-Factory Work Only	$13.50		1	
Kitsap	Fence Erectors	Fence Erector	$13.80		1	
Kitsap	Fence Erectors	Fence Laborer	$11.60		1	
Kitsap	Flaggers	Journey Level	$37.26	7A	3I	
Kitsap	Glaziers	Journey Level	$56.16	7L	1Y	

Kitsap	Heat & Frost Insulators And Asbestos Workers	Journeyman	$63.18	5J	1S	
Kitsap	Heating Equipment Mechanics	Journey Level	$72.83	7F	1E	
Kitsap	Hod Carriers & Mason Tenders	Journey Level	$45.32	7A	3I	
Kitsap	Industrial Power Vacuum Cleaner	Journey Level	$29.89		1	
Kitsap	Inland Boatmen	Boat Operator	$56.78	5B	1K	
Kitsap	Inland Boatmen	Cook	$53.30	5B	1K	
Kitsap	Inland Boatmen	Deckhand	$53.30	5B	1K	
Kitsap	Inland Boatmen	Deckhand Engineer	$54.32	5B	1K	
Kitsap	Inland Boatmen	Launch Operator	$55.57	5B	1K	
Kitsap	Inland Boatmen	Mate	$55.57	5B	1K	
Kitsap	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Cleaner Operator, Foamer Operator	$9.73		1	
Kitsap	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Grout Truck Operator	$11.48		1	
Kitsap	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Head Operator	$12.78		1	
Kitsap	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Tv Truck Operator	$24.17		1	
Kitsap	Insulation Applicators	Journey Level	$54.02	5D	4C	
Kitsap	Ironworkers	Journeyman	$63.53	7N	1O	
Kitsap	Laborers	Air, Gas Or Electric Vibrating Screed	$43.95	7A	3I	
Kitsap	Laborers	Airtrac Drill Operator	$45.32	7A	3I	
Kitsap	Laborers	Ballast Regular Machine	$43.95	7A	3I	
Kitsap	Laborers	Batch Weighman	$37.26	7A	3I	
Kitsap	Laborers	Brick Pavers	$43.95	7A	3I	
Kitsap	Laborers	Brush Cutter	$43.95	7A	3I	
Kitsap	Laborers	Brush Hog Feeder	$43.95	7A	3I	
Kitsap	Laborers	Burner	$43.95	7A	3I	
Kitsap	Laborers	Caisson Worker	$45.32	7A	3I	
Kitsap	Laborers	Carpenter Tender	$43.95	7A	3I	
Kitsap	Laborers	Caulker	$43.95	7A	3I	

Kitsap	Laborers	Cement Dumper-paving	$44.76	7A	3I	
Kitsap	Laborers	Cement Finisher Tender	$43.95	7A	3I	
Kitsap	Laborers	Change House Or Dry Shack	$43.95	7A	3I	
Kitsap	Laborers	Chipping Gun (under 30 Lbs.)	$43.95	7A	3I	
Kitsap	Laborers	Chipping Gun(30 Lbs. And Over)	$44.76	7A	3I	
Kitsap	Laborers	Choker Setter	$43.95	7A	3I	
Kitsap	Laborers	Chuck Tender	$43.95	7A	3I	
Kitsap	Laborers	Clary Power Spreader	$44.76	7A	3I	
Kitsap	Laborers	Clean-up Laborer	$43.95	7A	3I	
Kitsap	Laborers	Concrete Dumper/chute Operator	$44.76	7A	3I	
Kitsap	Laborers	Concrete Form Stripper	$43.95	7A	3I	
Kitsap	Laborers	Concrete Placement Crew	$44.76	7A	3I	
Kitsap	Laborers	Concrete Saw Operator/core Driller	$44.76	7A	3I	
Kitsap	Laborers	Crusher Feeder	$37.26	7A	3I	
Kitsap	Laborers	Curing Laborer	$43.95	7A	3I	
Kitsap	Laborers	Demolition: Wrecking & Moving (incl. Charred Material)	$43.95	7A	3I	
Kitsap	Laborers	Ditch Digger	$43.95	7A	3I	
Kitsap	Laborers	Diver	$45.32	7A	3I	
Kitsap	Laborers	Drill Operator (hydraulic,diamond)	$44.76	7A	3I	
Kitsap	Laborers	Dry Stack Walls	$43.95	7A	3I	
Kitsap	Laborers	Dump Person	$43.95	7A	3I	
Kitsap	Laborers	Epoxy Technician	$43.95	7A	3I	
Kitsap	Laborers	Erosion Control Worker	$43.95	7A	3I	
Kitsap	Laborers	Faller & Bucker Chain Saw	$44.76	7A	3I	
Kitsap	Laborers	Fine Graders	$43.95	7A	3I	
Kitsap	Laborers	Firewatch	$37.26	7A	3I	
Kitsap	Laborers	Form Setter	$43.95	7A	3I	
Kitsap	Laborers	Gabian Basket Builders	$43.95	7A	3I	

Kitsap	Laborers	General Laborer	$43.95	7A	3I	
Kitsap	Laborers	Grade Checker & Transit Person	$45.32	7A	3I	
Kitsap	Laborers	Grinders	$43.95	7A	3I	
Kitsap	Laborers	Grout Machine Tender	$43.95	7A	3I	
Kitsap	Laborers	Groutmen (pressure)including Post Tension Beams	$44.76	7A	3I	
Kitsap	Laborers	Guardrail Erector	$43.95	7A	3I	
Kitsap	Laborers	Hazardous Waste Worker (level A)	$45.32	7A	3I	
Kitsap	Laborers	Hazardous Waste Worker (level B)	$44.76	7A	3I	
Kitsap	Laborers	Hazardous Waste Worker (level C)	$43.95	7A	3I	
Kitsap	Laborers	High Scaler	$45.32	7A	3I	
Kitsap	Laborers	Jackhammer	$44.76	7A	3I	
Kitsap	Laborers	Laserbeam Operator	$44.76	7A	3I	
Kitsap	Laborers	Maintenance Person	$43.95	7A	3I	
Kitsap	Laborers	Manhole Builder-mudman	$44.76	7A	3I	
Kitsap	Laborers	Material Yard Person	$43.95	7A	3I	
Kitsap	Laborers	Motorman-dinky Locomotive	$44.76	7A	3I	
Kitsap	Laborers	Nozzleman (concrete Pump, Green Cutter When Using Combination Of High Pressure Air & Water On Concrete & Rock, Sandblast, Gunite, Shotcrete, Water Bla	$44.76	7A	3I	
Kitsap	Laborers	Pavement Breaker	$44.76	7A	3I	
Kitsap	Laborers	Pilot Car	$37.26	7A	3I	
Kitsap	Laborers	Pipe Layer Lead	$45.32	7A	3I	
Kitsap	Laborers	Pipe Layer/tailor	$44.76	7A	3I	
Kitsap	Laborers	Pipe Pot Tender	$44.76	7A	3I	
Kitsap	Laborers	Pipe Reliner	$44.76	7A	3I	
Kitsap	Laborers	Pipe Wrapper	$44.76	7A	3I	
Kitsap	Laborers	Pot Tender	$43.95	7A	3I	
Kitsap	Laborers	Powderman	$45.32	7A	3I	
Kitsap	Laborers	Powderman's Helper	$43.95	7A	3I	
Kitsap	Laborers	Power Jacks	$44.76	7A	3I	

Kitsap	Laborers	Railroad Spike Puller - Power	$44.76	7A	3I	
Kitsap	Laborers	Raker - Asphalt	$45.32	7A	3I	
Kitsap	Laborers	Re-timberman	$45.32	7A	3I	
Kitsap	Laborers	Remote Equipment Operator	$44.76	7A	3I	
Kitsap	Laborers	Rigger/signal Person	$44.76	7A	3I	
Kitsap	Laborers	Rip Rap Person	$43.95	7A	3I	
Kitsap	Laborers	Rivet Buster	$44.76	7A	3I	
Kitsap	Laborers	Rodder	$44.76	7A	3I	
Kitsap	Laborers	Scaffold Erector	$43.95	7A	3I	
Kitsap	Laborers	Scale Person	$43.95	7A	3I	
Kitsap	Laborers	Sloper (over 20)"	$44.76	7A	3I	
Kitsap	Laborers	Sloper Sprayer	$43.95	7A	3I	
Kitsap	Laborers	Spreader (concrete)	$44.76	7A	3I	
Kitsap	Laborers	Stake Hopper	$43.95	7A	3I	
Kitsap	Laborers	Stock Piler	$43.95	7A	3I	
Kitsap	Laborers	Tamper & Similar Electric, Air & Gas Operated Tools	$44.76	7A	3I	
Kitsap	Laborers	Tamper (multiple & Self-propelled)	$44.76	7A	3I	
Kitsap	Laborers	Timber Person - Sewer (lagger, Shorer & Cribber)	$44.76	7A	3I	
Kitsap	Laborers	Toolroom Person (at Jobsite)	$43.95	7A	3I	
Kitsap	Laborers	Topper	$43.95	7A	3I	
Kitsap	Laborers	Track Laborer	$43.95	7A	3I	
Kitsap	Laborers	Track Liner (power)	$44.76	7A	3I	
Kitsap	Laborers	Traffic Control Laborer	$39.84	7A	3I	8R
Kitsap	Laborers	Traffic Control Supervisor	$39.84	7A	3I	8R
Kitsap	Laborers	Truck Spotter	$43.95	7A	3I	
Kitsap	Laborers	Tugger Operator	$44.76	7A	3I	
Kitsap	Laborers	Tunnel Work-Compressed Air Worker 0-30 psi	$74.29	7A	3I	8Q
Kitsap	Laborers	Tunnel Work-Compressed Air Worker 30.01-44.00 psi	$79.32	7A	3I	8Q
Kitsap	Laborers	Tunnel Work-Compressed Air	$83.00	7A	3I	8Q

		Worker 44.01-54.00 psi				
Kitsap	Laborers	Tunnel Work-Compressed Air Worker 54.01-60.00 psi	$88.70	7A	3I	8Q
Kitsap	Laborers	Tunnel Work-Compressed Air Worker 60.01-64.00 psi	$90.82	7A	3I	8Q
Kitsap	Laborers	Tunnel Work-Compressed Air Worker 64.01-68.00 psi	$95.92	7A	3I	8Q
Kitsap	Laborers	Tunnel Work-Compressed Air Worker 68.01-70.00 psi	$97.82	7A	3I	8Q
Kitsap	Laborers	Tunnel Work-Compressed Air Worker 70.01-72.00 psi	$99.82	7A	3I	8Q
Kitsap	Laborers	Tunnel Work-Compressed Air Worker 72.01-74.00 psi	$101.82	7A	3I	8Q
Kitsap	Laborers	Tunnel Work-Guage and Lock Tender	$45.42	7A	3I	8Q
Kitsap	Laborers	Tunnel Work-Miner	$45.42	7A	3I	8Q
Kitsap	Laborers	Vibrator	$44.76	7A	3I	
Kitsap	Laborers	Vinyl Seamer	$43.95	7A	3I	
Kitsap	Laborers	Watchman	$33.86	7A	3I	
Kitsap	Laborers	Welder	$44.76	7A	3I	
Kitsap	Laborers	Well Point Laborer	$44.76	7A	3I	
Kitsap	Laborers	Window Washer/cleaner	$33.86	7A	3I	
Kitsap	Laborers - Underground Sewer & Water	General Laborer & Topman	$43.95	7A	3I	
Kitsap	Laborers - Underground Sewer & Water	Pipe Layer	$44.76	7A	3I	
Kitsap	Landscape Construction	Irrigation Or Lawn Sprinkler Installers	$9.47		1	
Kitsap	Landscape Construction	Landscape Equipment Operators Or Truck Drivers	$10.05		1	

Kitsap	Landscape Construction	Landscaping Or Planting Laborers	$12.92		1	
Kitsap	Lathers	JOURNEY LEVEL	$21.00		1	
Kitsap	Marble Setters	Journey Level	$52.82	5A	1M	
Kitsap	Metal Fabrication (In Shop)	Fitter	$26.96		1	
Kitsap	Metal Fabrication (In Shop)	Laborer	$9.47		1	
Kitsap	Metal Fabrication (In Shop)	Machine Operator	$13.83		1	
Kitsap	Metal Fabrication (In Shop)	Welder	$13.83		1	
Kitsap	Millwright	Journey Level	$44.89		1	
Kitsap	Modular Buildings	Cabinet Assembly	$11.56		1	
Kitsap	Modular Buildings	Electrician	$11.56		1	
Kitsap	Modular Buildings	Equipment Maintenance	$11.56		1	
Kitsap	Modular Buildings	Plumber	$11.56		1	
Kitsap	Modular Buildings	Production Worker	$9.47		1	
Kitsap	Modular Buildings	Tool Maintenance	$11.56		1	
Kitsap	Modular Buildings	Utility Person	$11.56		1	
Kitsap	Modular Buildings	Welder	$11.56		1	
Kitsap	Painters	Journey Level	$37.80	6Z	2B	
Kitsap	Pile Driver	Journey Level	$54.27	5D	4C	
Kitsap	Plasterers	Journey Level	$51.68	7Q	1R	
Kitsap	Playground & Park Equipment Installers	Journey Level	$9.47		1	
Kitsap	Plumbers & Pipefitters	Journey Level	$63.57	5A	1G	
Kitsap	Power Equipment Operators	Asphalt Plant Operators	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Assistant Engineer	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Barrier Machine (zipper)	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Batch Plant Operator, Concrete	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Bobcat	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Brokk - Remote Demolition Equipment	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Brooms	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Bump Cutter	$56.44	7A	3C	8P

Kitsap	Power Equipment Operators	Cableways	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Chipper	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Compressor	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Concrete Pump: Truck Mount With Boom Attachment Over 42 M	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Concrete Finish Machine -laser Screed	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Concrete Pump - Mounted Or Trailer High Pressure Line Pump, Pump High Pressure.	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Concrete Pump: Truck Mount With Boom Attachment Up To 42m	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Conveyors	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Cranes Friction: 200 tons and over	$58.67	7A	3C	8P
Kitsap	Power Equipment Operators	Cranes: 20 Tons Through 44 Tons With Attachments	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Cranes: 100 Tons Through 199 Tons, Or 150' Of Boom (Including Jib With Attachments)	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators	Cranes: 200 tons- 299 tons, or 250â€™ of boom including jib with attachments	$58.10	7A	3C	8P
Kitsap	Power Equipment Operators	Cranes: 300 tons and over or 300â€™ of boom including jib with attachments	$58.67	7A	3C	8P
Kitsap	Power Equipment Operators	Cranes: 45 Tons Through 99 Tons, Under 150' Of Boom (including Jib With Attachments)	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Cranes: A-frame - 10 Tons And Under	$53.57	7A	3C	8P

Kitsap	Power Equipment Operators	Cranes: Friction cranes through 199 tons	$58.10	7A	3C	8P
Kitsap	Power Equipment Operators	Cranes: Through 19 Tons With Attachments A-frame Over 10 Tons	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Crusher	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Deck Engineer/deck Winches (power)	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Derricks, On Building Work	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Dozers D-9 & Under	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Drill Oilers: Auger Type, Truck Or Crane Mount	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Drilling Machine	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators	Elevator And Man-lift: Permanent And Shaft Type	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Finishing Machine, Bidwell And Gamaco & Similar Equipment	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Forklift: 3000 Lbs And Over With Attachments	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Forklifts: Under 3000 Lbs. With Attachments	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Grade Engineer: Using Blue Prints, Cut Sheets, Etc	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Gradechecker/stakeman	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Guardrail Punch	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Hard Tail End Dump Articulating Off- Road Equipment 45 Yards. & Over	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Hard Tail End Dump Articulating Off-road Equipment Under 45 Yards	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Horizontal/directional Drill Locator	$56.00	7A	3C	8P

Kitsap	Power Equipment Operators	Horizontal/directional Drill Operator	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Hydralifts/boom Trucks Over 10 Tons	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Hydralifts/boom Trucks, 10 Tons And Under	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Loader, Overhead 8 Yards. & Over	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators	Loader, Overhead, 6 Yards. But Not Including 8 Yards	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Loaders, Overhead Under 6 Yards	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Loaders, Plant Feed	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Loaders: Elevating Type Belt	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Locomotives, All	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Material Transfer Device	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Mechanics, All (leadmen - $0.50 Per Hour Over Mechanic)	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators	Motor Patrol Graders	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Mucking Machine, Mole, Tunnel Drill, Boring, Road Header And/or Shield	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Oil Distributors, Blower Distribution & Mulch Seeding Operator	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Outside Hoists (elevators And Manlifts), Air Tuggers,strato	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Overhead, Bridge Type Crane: 20 Tons Through 44 Tons	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Overhead, Bridge Type: 100 Tons And Over	$57.51	7A	3C	8P

Kitsap	Power Equipment Operators	Overhead, Bridge Type: 45 Tons Through 99 Tons	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Pavement Breaker	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Pile Driver (other Than Crane Mount)	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Plant Oiler - Asphalt, Crusher	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Posthole Digger, Mechanical	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Power Plant	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Pumps - Water	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Quad 9, Hd 41, D10 And Over	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Quick Tower - No Cab, Under 100 Feet In Height Based To Boom	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Remote Control Operator On Rubber Tired Earth Moving Equipment	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Rigger And Bellman	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Rigger/Signal Person, Bellman (Certified)	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Rollagon	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Roller, Other Than Plant Mix	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Roller, Plant Mix Or Multi-lift Materials	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Roto-mill, Roto-grinder	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Saws - Concrete	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Scraper, Self Propelled Under 45 Yards	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Scrapers - Concrete & Carry All	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Scrapers, Self-propelled: 45 Yards And Over	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Service Engineers - Equipment	$56.00	7A	3C	8P

Kitsap	Power Equipment Operators	Shotcrete/gunite Equipment	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Shovel , Excavator, Backhoe, Tractors Under 15 Metric Tons.	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Shovel, Excavator, Backhoe: Over 30 Metric Tons To 50 Metric Tons	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Shovel, Excavator, Backhoes, Tractors: 15 To 30 Metric Tons	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Shovel, Excavator, Backhoes: Over 50 Metric Tons To 90 Metric Tons	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators	Shovel, Excavator, Backhoes: Over 90 Metric Tons	$58.10	7A	3C	8P
Kitsap	Power Equipment Operators	Slipform Pavers	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Spreader, Topsider & Screedman	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Subgrader Trimmer	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Tower Bucket Elevators	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Tower Crane Up To 175' In Height Base To Boom	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators	Tower Crane: over 175â€™ through 250â€™ in height, base to boom	$58.10	7A	3C	8P
Kitsap	Power Equipment Operators	Tower Cranes: over 250â€™ in height from base to boom	$58.67	7A	3C	8P
Kitsap	Power Equipment Operators	Transporters, All Track Or Truck Type	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Trenching Machines	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators	Truck Crane Oiler/driver - 100 Tons And Over	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Truck Crane Oiler/driver Under 100 Tons	$56.00	7A	3C	8P

Kitsap	Power Equipment Operators	Truck Mount Portable Conveyor	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators	Welder	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators	Wheel Tractors, Farmall Type	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators	Yo Yo Pay Dozer	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Asphalt Plant Operators	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Assistant Engineer	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Barrier Machine (zipper)	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Batch Plant Operator, Concrete	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Bobcat	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Brokk - Remote Demolition Equipment	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Brooms	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Bump Cutter	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Cableways	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Chipper	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Compressor	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Concrete Pump: Truck Mount With Boom Attachment Over 42 M	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Concrete Finish Machine -laser Screed	$53.57	7A	3C	8P

Kitsap	Power Equipment Operators- Underground Sewer & Water	Concrete Pump - Mounted Or Trailer High Pressure Line Pump, Pump High Pressure.	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Concrete Pump: Truck Mount With Boom Attachment Up To 42m	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Conveyors	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Cranes Friction: 200 tons and over	$58.67	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Cranes: 20 Tons Through 44 Tons With Attachments	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Cranes: 100 Tons Through 199 Tons, Or 150' Of Boom (Including Jib With Attachments)	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Cranes: 200 tons- 299 tons, or 250â€™ of boom including jib with attachments	$58.10	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Cranes: 300 tons and over or 300â€™ of boom including jib with attachments	$58.67	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Cranes: 45 Tons Through 99 Tons, Under 150' Of Boom (including Jib With Attachments)	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Cranes: A-frame - 10 Tons And Under	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Cranes: Friction cranes through 199 tons	$58.10	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Cranes: Through 19 Tons With Attachments A-frame Over 10 Tons	$56.00	7A	3C	8P

Kitsap	Power Equipment Operators- Underground Sewer & Water	Crusher	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Deck Engineer/deck Winches (power)	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Derricks, On Building Work	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Dozers D-9 & Under	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Drill Oilers: Auger Type, Truck Or Crane Mount	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Drilling Machine	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Elevator And Man-lift: Permanent And Shaft Type	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Finishing Machine, Bidwell And Gamaco & Similar Equipment	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Forklift: 3000 Lbs And Over With Attachments	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Forklifts: Under 3000 Lbs. With Attachments	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Grade Engineer: Using Blue Prints, Cut Sheets, Etc	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Gradechecker/stakeman	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Guardrail Punch	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Hard Tail End Dump Articulating Off- Road Equipment 45 Yards. & Over	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Hard Tail End Dump Articulating Off-road Equipment Under 45 Yards	$56.44	7A	3C	8P

Kitsap	Power Equipment Operators- Underground Sewer & Water	Horizontal/directional Drill Locator	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Horizontal/directional Drill Operator	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Hydralifts/boom Trucks Over 10 Tons	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Hydralifts/boom Trucks, 10 Tons And Under	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Loader, Overhead 8 Yards. & Over	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Loader, Overhead, 6 Yards. But Not Including 8 Yards	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Loaders, Overhead Under 6 Yards	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Loaders, Plant Feed	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Loaders: Elevating Type Belt	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Locomotives, All	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Material Transfer Device	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Mechanics, All (leadmen - $0.50 Per Hour Over Mechanic)	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Motor Patrol Graders	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Mucking Machine, Mole, Tunnel Drill, Boring, Road Header And/or Shield	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Oil Distributors, Blower Distribution & Mulch Seeding Operator	$53.57	7A	3C	8P

Kitsap	Power Equipment Operators- Underground Sewer & Water	Outside Hoists (elevators And Manlifts), Air Tuggers,strato	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Overhead, Bridge Type Crane: 20 Tons Through 44 Tons	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Overhead, Bridge Type: 100 Tons And Over	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Overhead, Bridge Type: 45 Tons Through 99 Tons	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Pavement Breaker	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Pile Driver (other Than Crane Mount)	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Plant Oiler - Asphalt, Crusher	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Posthole Digger, Mechanical	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Power Plant	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Pumps - Water	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Quad 9, Hd 41, D10 And Over	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Quick Tower - No Cab, Under 100 Feet In Height Based To Boom	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Remote Control Operator On Rubber Tired Earth Moving Equipment	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Rigger And Bellman	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Rigger/Signal Person, Bellman (Certified)	$56.00	7A	3C	8P

Kitsap	Power Equipment Operators- Underground Sewer & Water	Rollagon	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Roller, Other Than Plant Mix	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Roller, Plant Mix Or Multi-lift Materials	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Roto-mill, Roto-grinder	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Saws - Concrete	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Scraper, Self Propelled Under 45 Yards	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Scrapers - Concrete & Carry All	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Scrapers, Self-propelled: 45 Yards And Over	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Service Engineers - Equipment	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Shotcrete/gunite Equipment	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Shovel , Excavator, Backhoe, Tractors Under 15 Metric Tons.	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoe: Over 30 Metric Tons To 50 Metric Tons	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoes, Tractors: 15 To 30 Metric Tons	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoes: Over 50 Metric Tons To 90 Metric Tons	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoes: Over 90 Metric Tons	$58.10	7A	3C	8P

Kitsap	Power Equipment Operators- Underground Sewer & Water	Slipform Pavers	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Spreader, Topsider & Screedman	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Subgrader Trimmer	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Tower Bucket Elevators	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Tower Crane Up To 175' In Height Base To Boom	$57.51	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Tower Crane: over 175â€™ through 250â€™ in height, base to boom	$58.10	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Tower Cranes: over 250â€™ in height from base to boom	$58.67	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Transporters, All Track Or Truck Type	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Trenching Machines	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Truck Crane Oiler/driver - 100 Tons And Over	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Truck Crane Oiler/driver Under 100 Tons	$56.00	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Truck Mount Portable Conveyor	$56.44	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Welder	$56.94	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Wheel Tractors, Farmall Type	$53.57	7A	3C	8P
Kitsap	Power Equipment Operators- Underground Sewer & Water	Yo Yo Pay Dozer	$56.44	7A	3C	8P

Kitsap	Power Line Clearance Tree Trimmers	Journey Level In Charge	$45.75	5A	4A	
Kitsap	Power Line Clearance Tree Trimmers	Spray Person	$43.38	5A	4A	
Kitsap	Power Line Clearance Tree Trimmers	Tree Equipment Operator	$45.75	5A	4A	
Kitsap	Power Line Clearance Tree Trimmers	Tree Trimmer	$40.84	5A	4A	
Kitsap	Power Line Clearance Tree Trimmers	Tree Trimmer Groundperson	$30.74	5A	4A	
Kitsap	Refrigeration & Air Conditioning Mechanics	Mechanic	$63.57	5A	1G	
Kitsap	Residential Brick Mason	Journey Level	$17.04		1	
Kitsap	Residential Carpenters	Journey Level	$40.66	5D	4C	
Kitsap	Residential Cement Masons	Journey Level	$30.87		1	
Kitsap	Residential Drywall Applicators	Journey Level	$40.64	5D	4C	
Kitsap	Residential Drywall Tapers	Journey Level	$20.00		1	
Kitsap	Residential Electricians	Journey Level	$27.00		1	
Kitsap	Residential Glaziers	Journey Level	$56.16	7L	1Y	
Kitsap	Residential Insulation Applicators	Journey Level	$13.96		1	
Kitsap	Residential Laborers	Journey Level	$16.89		1	
Kitsap	Residential Marble Setters	Journey Level	$17.04		1	
Kitsap	Residential Painters	Journey Level	$19.52		1	
Kitsap	Residential Plumbers & Pipefitters	Journey Level	$21.11		1	
Kitsap	Residential Refrigeration & Air Conditioning Mechanics	Journey Level	$17.64		1	
Kitsap	Residential Sheet Metal Workers	Journey Level (Field or Shop)	$28.95		1	
Kitsap	Residential Soft Floor Layers	Journey Level	$19.38		1	
Kitsap	Residential Sprinkler Fitters (Fire Protection)	Journey Level	$27.74		1	
Kitsap	Residential Stone Masons	Journey Level	$52.82	5A	1M	
Kitsap	Residential Terrazzo Workers	Journey Level	$9.47		1	
Kitsap	Residential Terrazzo/Tile Finishers	Journey Level	$30.26		1	
Kitsap	Residential Tile Setters	Journey Level	$31.14		1	
Kitsap	Roofers	Journey Level	$45.71	5A	3H	

Kitsap	Roofers	Using Irritable Bituminous Materials	$48.71	5A	3H	
Kitsap	Sheet Metal Workers	Journey Level (Field or Shop)	$72.83	7F	1E	
Kitsap	Shipbuilding & Ship Repair	CARPENTER	$19.29		1	
Kitsap	Shipbuilding & Ship Repair	ELECTRICIAN	$25.53		1	
Kitsap	Shipbuilding & Ship Repair	Heat & Frost Insulator	$63.18	5J	1S	
Kitsap	Shipbuilding & Ship Repair	Laborer	$19.64		1	
Kitsap	Shipbuilding & Ship Repair	MACHINIST	$19.29		1	
Kitsap	Shipbuilding & Ship Repair	OPERATOR	$19.44		1	
Kitsap	Shipbuilding & Ship Repair	Painter	$37.80	6Z	2B	
Kitsap	Shipbuilding & Ship Repair	PIPEFITTER	$19.29		1	
Kitsap	Shipbuilding & Ship Repair	RIGGER	$19.29		1	
Kitsap	Shipbuilding & Ship Repair	Sheet Metal	$22.21		1	
Kitsap	Shipbuilding & Ship Repair	SHIPFITTER	$19.29		1	
Kitsap	Shipbuilding & Ship Repair	WELDER/BURNER	$19.29		1	
Kitsap	Sign Makers & Installers (Electrical)	Journey Level	$20.58		1	
Kitsap	Sign Makers & Installers (Non-Electrical)	Journey Level	$9.47		1	
Kitsap	Soft Floor Layers	Journey Level	$42.88	5A	3D	
Kitsap	Solar Controls For Windows	Journey Level	$10.31		1	
Kitsap	Sprinkler Fitters (Fire Protection)	Journey Level	$69.74	5C	1X	
Kitsap	Stage Rigging Mechanics (Non Structural)	Journey Level	$13.23		1	
Kitsap	Stone Masons	Journey Level	$52.82	5A	1M	
Kitsap	Street And Parking Lot Sweeper Workers	Journey Level	$16.00		1	
Kitsap	Surveyors	Assistant Construction Site Surveyor	$56.00	7A	3C	8P
Kitsap	Surveyors	Chainman	$55.47	7A	3C	8P

Kitsap	Surveyors	Construction Site Surveyor	$56.94	7A	3C	8P
Kitsap	Telecommunication Technicians	Journey Level	$42.07	7E	1E	
Kitsap	Telephone Line Construction - Outside	Cable Splicer	$37.60	5A	2B	
Kitsap	Telephone Line Construction - Outside	Hole Digger/Ground Person	$20.79	5A	2B	
Kitsap	Telephone Line Construction - Outside	Installer (Repairer)	$36.02	5A	2B	
Kitsap	Telephone Line Construction - Outside	Special Aparatus Installer I	$37.60	5A	2B	
Kitsap	Telephone Line Construction - Outside	Special Apparatus Installer II	$36.82	5A	2B	
Kitsap	Telephone Line Construction - Outside	Telephone Equipment Operator (Heavy)	$37.60	5A	2B	
Kitsap	Telephone Line Construction - Outside	Telephone Equipment Operator (Light)	$34.94	5A	2B	
Kitsap	Telephone Line Construction - Outside	Telephone Lineperson	$34.93	5A	2B	
Kitsap	Telephone Line Construction - Outside	Television Groundperson	$19.73	5A	2B	
Kitsap	Telephone Line Construction - Outside	Television Lineperson/Installer	$26.31	5A	2B	
Kitsap	Telephone Line Construction - Outside	Television System Technician	$31.50	5A	2B	
Kitsap	Telephone Line Construction - Outside	Television Technician	$28.23	5A	2B	
Kitsap	Telephone Line Construction - Outside	Tree Trimmer	$34.93	5A	2B	
Kitsap	Terrazzo Workers	Journey Level	$47.46	5A	1M	
Kitsap	Tile Setters	Journey Level	$47.46	5A	1M	
Kitsap	Tile, Marble & Terrazzo Finishers	Journey Level	$12.00		1	
Kitsap	Traffic Control Stripers	Journey Level	$43.73	7A	1K	
Kitsap	Truck Drivers	Asphalt Mix Over 16 Yards (W. WA-Joint Council 28)	$49.85	5D	3A	8L
Kitsap	Truck Drivers	Asphalt Mix To 16 Yards (W. WA-Joint Council 28)	$49.01	5D	3A	8L
Kitsap	Truck Drivers	Dump Truck	$19.60		1	
Kitsap	Truck Drivers	Dump Truck And Trailer	$19.60		1	
Kitsap	Truck Drivers	Other Trucks	$18.37		1	
Kitsap	Truck Drivers	Transit Mixer	$20.79		1	

Kitsap	Well Drillers & Irrigation Pump Installers	Irrigation Pump Installer	$13.17		1	
Kitsap	Well Drillers & Irrigation Pump Installers	Oiler	$14.08		1	
Kitsap	Well Drillers & Irrigation Pump Installers	Well Driller	$14.40		1	

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Overtime Codes

Overtime calculations are based on the hourly rate actually paid to the worker. On public works projects, the hourly rate must be not less than the prevailing rate of wage minus the hourly rate of the cost of fringe benefits actually provided for the worker.

1. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.

B. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

C. The first two (2) hours after eight (8) regular hours Monday through Friday and the first ten (10) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other overtime hours and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

D. The first two (2) hours before or after a five-eight (8) hour workweek day or a four-ten (10) hour workweek day and the first eight (8) hours worked the next day after either workweek shall be paid at one and one-half times the hourly rate of wage. All additional hours worked and all worked on Sundays and holidays shall be paid at double the hourly rate of wage.

E. The first two (2) hours after eight (8) regular hours Monday through Friday and the first eight (8) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

F. The first two (2) hours after eight (8) regular hours Monday through Friday and the first ten (10) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other overtime hours worked, except Labor Day, shall be paid at double the hourly rate of wage. All hours worked on Labor Day shall be paid at three times the hourly rate of wage.

G. The first ten (10) hours worked on Saturdays and the first ten (10) hours worked on a fifth calendar weekday in a four-ten hour schedule, shall be paid at one and one-half times the hourly rate of wage. All hours worked in excess of ten (10) hours per day Monday through Saturday and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

H. All hours worked on Saturdays (except makeup days if work is lost due to inclement weather conditions or equipment breakdown) shall be paid at one and one-half times the hourly rate of wage. All hours worked Monday through Saturday over twelve (12) hours and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

I. All hours worked on Sundays and holidays shall also be paid at double the hourly rate of wage.

J. The first two (2) hours after eight (8) regular hours Monday through Friday and the first ten (10) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked over ten (10) hours Monday through Saturday, Sundays and holidays shall be paid at double the hourly rate of wage.

K. All hours worked on Saturdays and Sundays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at double the hourly rate of wage.

M. All hours worked on Saturdays (except makeup days if work is lost due to inclement weather conditions) shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

N. All hours worked on Saturdays (except makeup days) shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

Overtime Codes Continued

1. O. The first ten (10) hours worked on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays, holidays and after twelve (12) hours, Monday through Friday and after ten (10) hours on Saturday shall be paid at double the hourly rate of wage.

   P. All hours worked on Saturdays (except makeup days if circumstances warrant) and Sundays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at double the hourly rate of wage.

   Q. The first two (2) hours after eight (8) regular hours Monday through Friday and up to ten (10) hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked in excess of ten (10) hours per day Monday through Saturday and all hours worked on Sundays and holidays (except Christmas day) shall be paid at double the hourly rate of wage. All hours worked on Christmas day shall be paid at two and one-half times the hourly rate of wage.

   R. All hours worked on Sundays and holidays shall be paid at two times the hourly rate of wage.

   S. The first two (2) hours after eight (8) regular hours Monday through Friday and the first eight (8) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays and all other overtime hours worked, except Labor Day, shall be paid at double the hourly rate of wage. All hours worked on Labor Day shall be paid at three times the hourly rate of wage.

   U. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays (except Labor Day) shall be paid at two times the hourly rate of wage. All hours worked on Labor Day shall be paid at three times the hourly rate of wage.

   V. All hours worked on Sundays and holidays (except Thanksgiving Day and Christmas day) shall be paid at one and one-half times the hourly rate of wage. All hours worked on Thanksgiving Day and Christmas day shall be paid at double the hourly rate of wage.

   W. All hours worked on Saturdays and Sundays (except make-up days due to conditions beyond the control of the employer)) shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at double the hourly rate of wage.

   X. The first four (4) hours after eight (8) regular hours Monday through Friday and the first twelve (12) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked over twelve (12) hours Monday through Saturday, Sundays and holidays shall be paid at double the hourly rate of wage. When holiday falls on Saturday or Sunday, the day before Saturday, Friday, and the day after Sunday, Monday, shall be considered the holiday and all work performed shall be paid at double the hourly rate of wage.

   Y. All hours worked outside the hours of 5:00 am and 5:00 pm (or such other hours as may be agreed upon by any employer and the employee) and all hours worked in excess of eight (8) hours per day (10 hours per day for a 4 x 10 workweek) and on Saturdays and holidays (except labor day) shall be paid at one and one-half times the hourly rate of wage. (except for employees who are absent from work without prior approval on a scheduled workday during the workweek shall be paid at the straight-time rate until they have worked 8 hours in a day (10 in a 4 x 10 workweek) or 40 hours during that workweek.) All hours worked Monday through Saturday over twelve (12) hours and all hours worked on Sundays and Labor Day shall be paid at double the hourly rate of wage.

   Z. All hours worked on Saturdays and Sundays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid the straight time rate of pay in addition to holiday pay.

2. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.

   B. All hours worked on holidays shall be paid at one and one-half times the hourly rate of wage.

   C. All hours worked on Sundays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at two times the hourly rate of wage.

Overtime Codes Continued

2. F. The first eight (8) hours worked on holidays shall be paid at the straight hourly rate of wage in addition to the holiday pay. All hours worked in excess of eight (8) hours on holidays shall be paid at double the hourly rate of wage.

G. All hours worked on Sunday shall be paid at two times the hourly rate of wage. All hours worked on paid holidays shall be paid at two and one-half times the hourly rate of wage including holiday pay.

H. All hours worked on Sunday shall be paid at two times the hourly rate of wage. All hours worked on holidays shall be paid at one and one-half times the hourly rate of wage.

O. All hours worked on Sundays and holidays shall be paid at one and one-half times the hourly rate of wage.

R. All hours worked on Sundays and holidays and all hours worked over sixty (60) in one week shall be paid at double the hourly rate of wage.

U. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked over 12 hours in a day or on Sundays and holidays shall be paid at double the hourly rate of wage.

W. The first two (2) hours after eight (8) regular hours Monday through Friday and the first eight (8) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage. On a four-day, ten-hour weekly schedule, either Monday thru Thursday or Tuesday thru Friday schedule, all hours worked after ten shall be paid at double the hourly rate of wage. The first eight (8) hours worked on the fifth day shall be paid at one and one-half times the hourly rate of wage. All other hours worked on the fifth, sixth, and seventh days and on holidays shall be paid at double the hourly rate of wage.

3. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.

A. Work performed in excess of eight (8) hours of straight time per day, or ten (10) hours of straight time per day when four ten (10) hour shifts are established, or forty (40) hours of straight time per week, Monday through Friday, or outside the normal shift, and all work on Saturdays shall be paid at time and one-half the straight time rate. Hours worked over twelve hours (12) in a single shift and all work performed after 6:00 pm Saturday to 6:00 am Monday and holidays shall be paid at double the straight time rate of pay. Any shift starting between the hours of 6:00 pm and midnight shall receive an additional one dollar ($1.00) per hour for all hours worked that shift. The employer shall have the sole discretion to assign overtime work to employees. Primary consideration for overtime work shall be given to employees regularly assigned to the work to be performed on overtime situations. After an employee has worked eight (8) hours at an applicable overtime rate, all additional hours shall be at the applicable overtime rate until such time as the employee has had a break of eight (8) hours or more.

C. Work performed in excess of eight (8) hours of straight time per day, or ten (10) hours of straight time per day when four ten (10) hour shifts are established, or forty (40) hours of straight time per week, Monday through Friday, or outside the normal shift, and all work on Saturdays shall be paid at one and one-half times the hourly rate of wage. All work performed after 6:00 pm Saturday to 5:00 am Monday and Holidays shall be paid at double the hourly rate of wage. After an employee has worked eight (8) hours at an applicable overtime rate, all additional hours shall be at the applicable overtime rate until such time as the employee has had a break of eight (8) hours or more.

D. All hours worked between the hours of 6:00 pm and 6:00 am, Monday through Saturday, shall be paid at a premium rate of 15% over the hourly rate of wage. All other hours worked after 6:00 am on Saturdays, shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

E. All hours worked Sundays and holidays shall be paid at double the hourly rate of wage. Each week, once 40 hours of straight time work is achieved, then any hours worked over 10 hours per day Monday through Saturday shall be paid at double the hourly wage rate.

Overtime Codes Continued

3. F. All hours worked on Saturday shall be paid at one and one-half times the hourly rate of wage. All hours worked on Sunday shall be paid at two times the hourly rate of wage. All hours worked on paid holidays shall be paid at two and one-half times the hourly rate of wage including holiday pay.

H. All work performed on Sundays between March 16th and October 14th and all Holidays shall be compensated for at two (2) times the regular rate of pay. Work performed on Sundays between October 15th and March 15th shall be compensated at one and one half (1-1/2) times the regular rate of pay.

I. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. In the event the job is down due to weather conditions during a five day work week (Monday through Friday,) or a four day-ten hour work week (Tuesday through Friday,) then Saturday may be worked as a voluntary make-up day at the straight time rate. However, Saturday shall not be utilized as a make-up day when a holiday falls on Friday. All hours worked Monday through Saturday over twelve (12) hours and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

4. ALL HOURS WORKED IN EXCESS OF EIGHT (8) HOURS PER DAY OR FORTY (40) HOURS PER WEEK SHALL BE PAID AT ONE AND ONE-HALF TIMES THE HOURLY RATE OF WAGE.

A. All hours worked in excess of eight (8) hours per day or forty (40) hours per week shall be paid at double the hourly rate of wage. All hours worked on Saturdays, Sundays and holidays shall be paid at double the hourly rate of wage.

B. All hours worked over twelve (12) hours per day and all hours worked on holidays shall be paid at double the hourly rate of wage.

C. On Monday through Friday, the first four (4) hours of overtime after eight (8) hours of straight time work shall be paid at one and one half (1-1/2) times the straight time rate of pay, unless a four (4) day ten (10) hour workweek has been established. On a four (4) day ten (10) hour workweek scheduled Monday through Thursday, or Tuesday through Friday, the first two (2) hours of overtime after ten (10) hours of straight time work shall be paid at one and one half (1-1/2) times the straight time rate of pay. On Saturday, the first twelve (12) hours of work shall be paid at one and one half (1-1/2) times the straight time rate of pay, except that if the job is down on Monday through Friday due to weather conditions or other conditions outside the control of the employer, the first ten (10) hours on Saturday may be worked at the straight time rate of pay. All hours worked over twelve (12) hours in a day and all hours worked on Sunday and Holidays shall be paid at two (2) times the straight time rate of pay.

D. All hours worked in excess of eight (8) hours per day or forty (40) hours per week shall be paid at double the hourly rate of wage. All hours worked on Saturday, Sundays and holidays shall be paid at double the hourly rate of pay. Rates include all members of the assigned crew.

EXCEPTION:
On all multipole structures and steel transmission lines, switching stations, regulating, capacitor stations, generating plants, industrial plants, associated installations and substations, except those substations whose primary function is to feed a distribution system, will be paid overtime under the following rates:

The first two (2) hours after eight (8) regular hours Monday through Friday of overtime on a regular workday, shall be paid at one and one-half times the hourly rate of wage. All hours in excess of ten (10) hours will be at two (2) times the hourly rate of wage. The first eight (8) hours worked on Saturday will be paid at one and one-half (1-1/2) times the hourly rate of wage. All hours worked in excess of eight (8) hours on Saturday, and all hours worked on Sundays and holidays will be at the double the hourly rate of wage.

All overtime eligible hours performed on the above described work that is energized, shall be paid at the double the hourly rate of wage.

Overtime Codes Continued

4. E. The first two (2) hours after eight (8) regular hours Monday through Friday and the first eight (8) hours on Saturday shall be paid at one and one-half times the hourly rate of wage. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

   On a four-day, ten-hour weekly schedule, either Monday thru Thursday or Tuesday thru Friday schedule, all hours worked after ten shall be paid at double the hourly rate of wage. The Monday or Friday not utilized in the normal four-day, ten hour work week, and Saturday shall be paid at one and one half (1½) times the regular shift rate for the first eight (8) hours. All other hours worked Monday through Saturday, and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

   F. All hours worked between the hours of 6:00 pm and 6:00 am, Monday through Saturday, shall be paid at a premium rate of 20% over the hourly rate of wage. All hours worked on Sundays shall be paid at one and one-half times the hourly rate of wage. All hours worked on holidays shall be paid at double the hourly rate of wage.

   G. All hours worked on Saturdays shall be paid at one and one-half times the hourly rate of wage. All hours worked Monday through Saturday over twelve (12) hours and all hours worked on Sundays and holidays shall be paid at double the hourly rate of wage.

Holiday Codes

5. A. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, and Christmas Day (7).

   B. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, the day before Christmas, and Christmas Day (8).

   C. Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8).

   D. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8).

   H. Holidays: New Year's Day, Memorial Day, Independence Day, Thanksgiving Day, the Day after Thanksgiving Day, And Christmas (6).

   I. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day (6).

   J. Holidays: New Year's Day, Memorial Day, Independence Day, Thanksgiving Day, Friday after Thanksgiving Day, Christmas Eve Day, And Christmas Day (7).

   K. Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday After Thanksgiving Day, The Day Before Christmas, And Christmas Day (9).

   L. Holidays: New Year's Day, Martin Luther King Jr. Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, And Christmas Day (8).

   N. Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, The Friday After Thanksgiving Day, And Christmas Day (9).

   P. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday And Saturday After Thanksgiving Day, The Day Before Christmas, And Christmas Day (9). If A Holiday Falls On Sunday, The Following Monday Shall Be Considered As A Holiday.

Holiday Codes Continued

5. Q. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day (6).

R. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Day After Thanksgiving Day, One-Half Day Before Christmas Day, And Christmas Day. (7 1/2).

S. Paid Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, And Christmas Day (7).

T. Paid Holidays: New Year's Day, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, The Friday After Thanksgiving Day, Christmas Day, And The Day Before Or After Christmas (9).

Z. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8).

Holiday Codes Continued

6. A. Paid Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8).

E. Paid Holidays: New Year's Day, Day Before Or After New Year's Day, Presidents Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and a Half-Day On Christmas Eve Day. (9 1/2).

G. Paid Holidays: New Year's Day, Martin Luther King Jr. Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and Christmas Eve Day (11).

H. Paid Holidays: New Year's Day, New Year's Eve Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday After Thanksgiving Day, Christmas Day, The Day After Christmas, And A Floating Holiday (10).

I. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday After Thanksgiving Day, And Christmas Day (7).

T. Paid Holidays: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, The Friday After Thanksgiving Day, The Last Working Day Before Christmas Day, And Christmas Day (9).

Z. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, And Christmas Day (7). If a holiday falls on Saturday, the preceding Friday shall be considered as the holiday. If a holiday falls on Sunday, the following Monday shall be considered as the holiday.

Holiday Codes Continued

7. A. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8). Any Holiday Which Falls On A Sunday Shall Be Observed As A Holiday On The Following Monday. If any of the listed holidays falls on a Saturday, the preceding Friday shall be a regular work day.

Holiday Codes Continued

7. B. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

C. Holidays: New Year's Day, Martin Luther King Jr. Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

D. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (8). Unpaid Holidays: President's Day. Any paid holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any paid holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

E. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (7). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

F. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the last working day before Christmas day and Christmas day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

G. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day (6). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday.

H. Holidays: New Year's Day, Martin Luther King Jr. Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the Last Working Day before Christmas Day and Christmas Day (9). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

I. Holidays: New Year's Day, President's Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day, The Friday After Thanksgiving Day, The Day Before Christmas Day And Christmas Day (9). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

J. Holidays: New Year's Day, Independence Day, Memorial Day, Labor Day, Thanksgiving Day and Christmas Day (6). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

K. Holidays: New Year's Day, Memorial Day, Independence Day, Thanksgiving Day, the Friday and Saturday after Thanksgiving Day, And Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

L. Holidays: New Year's Day, Memorial Day, Labor Day, Independence Day, Thanksgiving Day, the Last Work Day before Christmas Day, And Christmas Day (7). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

M. Paid Holidays: New Year's Day, The Day after or before New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, And the Day after or before Christmas Day (10). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

Holiday Codes Continued

7. N. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, And Christmas Day (7). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. When Christmas falls on a Saturday, the preceding Friday shall be observed as a holiday.

P. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, And Christmas Day (7). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday.

Q. Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, the Last Working Day before Christmas Day and Christmas Day (8). Any holiday which falls on a Sunday shall be observed as a holiday on the following Monday. If any of the listed holidays falls on a Saturday, the preceding Friday shall be a regular work day.

R. Paid Holidays: New Year's Day, the day after or before New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and the day after or before Christmas Day (10). If any of the listed holidays fall on Saturday, the preceding Friday shall be observed as the holiday. If any of the listed holidays falls on a Sunday, the day observed by the Nation shall be considered a holiday and compensated accordingly.

S. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Friday after Thanksgiving Day, Christmas Day, the Day after Christmas, and A Floating Holiday (9). If any of the listed holidays falls on a Sunday, the day observed by the Nation shall be considered a holiday and compensated accordingly.

T. Paid Holidays: New Year's Day, the Day after or before New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, the Friday after Thanksgiving Day, Christmas Day, and The Day after or before Christmas Day. (10). If any of the listed holidays falls on a Sunday, the day observed by the Nation shall be considered a holiday and compensated accordingly. Any holiday which falls on a Saturday shall be observed as a holiday on the preceding Friday.

Note Codes

8. A. In addition to the hourly wage and fringe benefits, the following depth premiums apply to depths of fifty feet or more:
Over 50' To 100' -$2.00 per Foot for Each Foot Over 50 Feet
Over 100' To 150' -$3.00 per Foot for Each Foot Over 100 Feet
Over 150' To 220' -$4.00 per Foot for Each Foot Over 150 Feet
Over 220' -$5.00 per Foot for Each Foot Over 220 Feet

C. In addition to the hourly wage and fringe benefits, the following depth premiums apply to depths of fifty feet or more:
Over 50' To 100' -$1.00 per Foot for Each Foot Over 50 Feet
Over 100' To 150' -$1.50 per Foot for Each Foot Over 100 Feet
Over 150' To 200' -$2.00 per Foot for Each Foot Over 150 Feet
Over 200' -Divers May Name Their Own Price

D. Workers working with supplied air on hazmat projects receive an additional $1.00 per hour.

L. Workers on hazmat projects receive additional hourly premiums as follows -Level A: $0.75, Level B: $0.50, And Level C: $0.25.

M. Workers on hazmat projects receive additional hourly premiums as follows: Levels A & B: $1.00, Levels C & D: $0.50.

8. N. Workers on hazmat projects receive additional hourly premiums as follows -Level A: $1.00, Level B: $0.75, Level C: $0.50, And Level D: $0.25.

P. Workers on hazmat projects receive additional hourly premiums as follows -Class A Suit: $2.00, Class B Suit: $1.50, Class C Suit: $1.00, And Class D Suit $0.50.

Q. The highest pressure registered on the gauge for an accumulated time of more than fifteen (15) minutes during the shift shall be used in determining the scale paid.

R. Effective August 31, 2012 – A Traffic Control Supervisor shall be present on the project whenever flagging or spotting or other traffic control labor is being utilized. A Traffic Control Laborer performs the setup, maintenance and removal of all temporary traffic control devices and construction signs necessary to control vehicular, bicycle, and pedestrian traffic during construction operations. Flaggers and Spotters shall be posted where shown on approved Traffic Control Plans or where directed by the Engineer. All flaggers and spotters shall possess a current flagging card issued by the State of Washington, Oregon, Montana, or Idaho. These classifications are only effective on or after August 31, 2012.

S. Effective August 31, 2012 – A Traffic Control Supervisor shall be present on the project whenever flagging or spotting or other traffic control labor is being utilized. Flaggers and Spotters shall be posted where shown on approved Traffic Control Plans or where directed by the Engineer. All flaggers and spotters shall possess a current flagging card issued by the State of Washington, Oregon, Montana, or Idaho. This classification is only effective on or after August 31, 2012.

T. Effective August 31, 2012 – A Traffic Control Laborer performs the setup, maintenance and removal of all temporary traffic control devices and construction signs necessary to control vehicular, bicycle, and pedestrian traffic during construction operations. Flaggers and Spotters shall be posted where shown on approved Traffic Control Plans or where directed by the Engineer. All flaggers and spotters shall possess a current flagging card issued by the State of Washington, Oregon, Montana, or Idaho. This classification is only effective on or after August 31, 2012.

U. Workers on hazmat projects receive additional hourly premiums as follows – Class A Suit: $2.00, Class B Suit: $1.50, And Class C Suit: $1.00. Workers performing underground work receive an additional $0.40 per hour for any and all work performed underground, including operating, servicing and repairing of equipment. The premium for underground work shall be paid for the entire shift worked. Workers who work suspended by a rope or cable receive an additional $0.50 per hour. The premium for work suspended shall be paid for the entire shift worked. Workers who do "pioneer" work (break open a cut, build road, etc.) more than one hundred fifty (150) feet above grade elevation receive an additional $0.50 per hour.

Washington State Department of Labor and Industries
Policy Statement
(Regarding the Production of "Standard" or "Non-standard" Items)

Below is the department's (State L&I's) list of criteria to be used in determining whether a prefabricated item is "standard" or "non-standard". For items not appearing on WSDOT's predetermined list, these criteria shall be used by the Contractor (and the Contractor's subcontractors, agents to subcontractors, suppliers, manufacturers, and fabricators) to determine coverage under RCW 39.12. The production, in the State of Washington, of non-standard items is covered by RCW 39.12, and the production of standard items is not. The production of any item outside the State of Washington is not covered by RCW 39.12.

1. Is the item fabricated for a public works project? If not, it is not subject to RCW 39.12. If it is, go to question 2.

2. Is the item fabricated on the public works jobsite? If it is, the work is covered under RCW 39.12. If not, go to question 3.

3. Is the item fabricated in an assembly/fabrication plant set up for, and dedicated primarily to, the public works project? If it is, the work is covered by RCW 39.12. If not, go to question 4.

4. Does the item require any assembly, cutting, modification or other fabrication by the supplier? If not, the work is not covered by RCW 39.12. If yes, go to question 5.

5. Is the prefabricated item intended for the public works project typically an inventory item which could reasonably be sold on the general market? If not, the work is covered by RCW 39.12. If yes, go to question 6.

6. Does the specific prefabricated item, generally defined as standard, have any unusual characteristics such as shape, type of material, strength requirements, finish, etc? If yes, the work is covered under RCW 39.12.

Any firm with questions regarding the policy, WSDOT's Predetermined List, or for determinations of covered and non-covered workers shall be directed to State L&I at (360) 902-5330.

WSDOT's
Predetermined List for
Suppliers - Manufactures - Fabricator

Below is a list of potentially prefabricated items, originally furnished by WSDOT to Washington State Department of Labor and Industries, that may be considered non-standard and therefore covered by the prevailing wage law, RCW 39.12. Items marked with an X in the "YES" column should be considered to be non-standard and therefore covered by RCW 39.12. Items marked with an X in the "NO" column should be considered to be standard and therefore not covered. Of course, exceptions to this general list may occur, and in that case shall be evaluated according to the criteria described in State and L&I's policy statement.

	ITEM DESCRIPTION	YES	NO
1.	Metal rectangular frames, solid metal covers, herringbone grates, and bi-directional vaned grates for Catch Basin Types 1, 1L, 1P, and 2 and Concrete Inlets. See Std. Plans		X
2.	Metal circular frames (rings) and covers, circular grates, and prefabricated ladders for Manhole Types 1, 2, and 3, Drywell Types 1, 2, and 3 and Catch Basin Type 2. See Std. Plans		X
3.	Prefabricated steel grate supports and welded grates, metal frames and dual vaned grates, and Type 1, 2, and 3 structural tubing grates for Drop Inlets. See Std. Plans.		X
4.	Concrete Pipe - Plain Concrete pipe and reinforced concrete pipe Class 2 to 5 sizes smaller than 60 inch diameter.		X
5.	Concrete Pipe - Plain Concrete pipe and reinforced concrete pipe Class 2 to 5 sizes larger than 60 inch diameter.		X
6.	Corrugated Steel Pipe - Steel lock seam corrugated pipe for culverts and storm sewers, sizes 30 inch to 120 inches in diameter. May also be treated, 1 thru 5.		X
7.	Corrugated Aluminum Pipe - Aluminum lock seam corrugated pipe for culverts and storm sewers, sizes 30 inch to 120 inches in diameter. May also be treated, #5.		X

	ITEM DESCRIPTION	YES	NO
8.	Anchor Bolts & Nuts - Anchor Bolts and Nuts, for mounting sign structures, luminaries and other items, shall be made from commercial bolt stock. See Contract Plans and Std. Plans for size and material type.		X
9.	Aluminum Pedestrian Handrail - Pedestrian handrail conforming to the type and material specifications set forth in the contract plans. Welding of aluminum shall be in accordance with Section 9-28.14(3).	X	
10.	Major Structural Steel Fabrication - Fabrication of major steel items such as trusses, beams, girders, etc., for bridges.	X	
11.	Minor Structural Steel Fabrication - Fabrication of minor steel Items such as special hangers, brackets, access doors for structures, access ladders for irrigation boxes, bridge expansion joint systems, etc., involving welding, cutting, punching and/or boring of holes. See Contact Plans for item description and shop drawings.	X	
12.	Aluminum Bridge Railing Type BP - Metal bridge railing conforming to the type and material specifications set forth in the Contract Plans. Welding of aluminum shall be in accordance with Section 9-28.14(3).		X
13.	Concrete Piling--Precast-Prestressed concrete piling for use as 55 and 70 ton concrete piling. Concrete to conform to Section 9-19.1 of Std. Spec..	X	
14.	Precast Manhole Types 1, 2, and 3 with cones, adjustment sections and flat top slabs. See Std. Plans.		X
15.	Precast Drywell Types 1, 2, and with cones and adjustment Sections. See Std. Plans.		X
16.	Precast Catch Basin - Catch Basin type 1, 1L, 1P, and 2 With adjustment sections. See Std. Plans.		X

	ITEM DESCRIPTION	YES	NO
17.	Precast Concrete Inlet - with adjustment sections, See Std. Plans		X
18.	Precast Drop Inlet Type 1 and 2 with metal grate supports. See Std. Plans.		X
19.	Precast Grate Inlet Type 2 with extension and top units. See Std. Plans		X
20.	Metal frames, vaned grates, and hoods for Combination Inlets. See Std. Plans		X
21.	Precast Concrete Utility Vaults - Precast Concrete utility vaults of various sizes. Used for in ground storage of utility facilities and controls. See Contract Plans for size and construction requirements. Shop drawings are to be provided for approval prior to casting		X
22.	Vault Risers - For use with Valve Vaults and Utilities Vaults.		X
23.	Valve Vault - For use with underground utilities. See Contract Plans for details.		X
24.	Precast Concrete Barrier - Precast Concrete Barrier for use as new barrier or may also be used as Temporary Concrete Barrier. Only new state approved barrier may be used as permanent barrier.		X
25.	Reinforced Earth Wall Panels – Reinforced Earth Wall Panels in size and shape as shown in the Plans. Fabrication plant has annual approval for methods and materials to be used. See Shop Drawing. Fabrication at other locations may be approved, after facilities inspection, contact HQ. Lab.	X	
26.	Precast Concrete Walls - Precast Concrete Walls - tilt-up wall panel in size and shape as shown in Plans. Fabrication plant has annual approval for methods and materials to be used	X	

	ITEM DESCRIPTION	YES	NO
27.	Precast Railroad Crossings - Concrete Crossing Structure Slabs.	X	
28.	12, 18 and 26 inch Standard Precast Prestressed Girder – Standard Precast Prestressed Girder for use in structures. Fabricator plant has annual approval of methods and materials to be used. Shop Drawing to be provided for approval prior to casting girders. See Std. Spec. Section 6-02.3(25)A	X	
29.	Prestressed Concrete Girder Series 4-14 - Prestressed Concrete Girders for use in structures. Fabricator plant has annual approval of methods and materials to be used. Shop Drawing to be provided for approval prior to casting girders. See Std. Spec. Section 6-02.3(25)A .	X	
30.	Prestressed Tri-Beam Girder - Prestressed Tri-Beam Girders for use in structures. Fabricator plant has annual approval of methods and materials to be used. Shop Drawing to be provided for approval prior to casting girders. See Std. Spec. Section 6-02.3(25)A	X	
31.	Prestressed Precast Hollow-Core Slab – Precast Prestressed Hollow-core slab for use in structures. Fabricator plant has annual approval of methods and materials to be used. Shop Drawing to be provided for approval prior to casting girders. See Std. Spec. Section 6-02.3(25)A.	X	
32.	Prestressed-Bulb Tee Girder - Bulb Tee Prestressed Girder for use in structures. Fabricator plant has annual approval of methods and materials to be used. Shop Drawing to be provided for approval prior to casting girders. See Std. Spec. Section 6-02.3(25)A	X	
33.	Monument Case and Cover See Std. Plan.		X

	ITEM DESCRIPTION	YES	NO
34.	Cantilever Sign Structure - Cantilever Sign Structure fabricated from steel tubing meeting AASHTO-M-183. See Std. Plans, and Contract Plans for details. The steel structure shall be galvanized after fabrication in accordance with AASHTO-M-111.	X	
35.	Mono-tube Sign Structures - Mono-tube Sign Bridge fabricated to details shown in the Plans. Shop drawings for approval are required prior to fabrication.	X	
36.	Steel Sign Bridges - Steel Sign Bridges fabricated from steel tubing meeting AASHTO-M-138 for Aluminum Alloys. See Std. Plans, and Contract Plans for details. The steel structure shall be galvanized after fabrication in accordance with AASHTO-M-111.	X	
37.	Steel Sign Post - Fabricated Steel Sign Posts as detailed in Std Plans. Shop drawings for approval are to be provided prior to fabrication		X
38.	Light Standard-Prestressed - Spun, prestressed, hollow concrete poles.	X	
39.	Light Standards - Lighting Standards for use on highway illumination systems, poles to be fabricated to conform with methods and materials as specified on Std. Plans. See Specia Provisions for pre-approved drawings.	X	
40.	Traffic Signal Standards - Traffic Signal Standards for use on highway and/or street signal systems. Standards to be fabricated to conform with methods and material as specified on Std. Plans. See Special Provisions for pre-approved drawings	X	
41.	Precast Concrete Sloped Mountable Curb (Single and DualFaced) See Std. Plans.		X

	ITEM DESCRIPTION	YES	NO
42.	Traffic Signs - Prior to approval of a Fabricator of Traffic Signs, the sources of the following materials must be submitted and approved for reflective sheeting, legend material, and aluminum sheeting. **NOTE:** *** Fabrication inspection required. Only signs tagged "Fabrication Approved" by WSDOT Sign Fabrication Inspector to be installed	X	X
		Custom Message	Std Signing Message
43.	Cutting & bending reinforcing steel		X
44.	Guardrail components	X	X
		Custom End Sec	Standard Sec
45.	Aggregates/Concrete mixes	Covered by WAC 296-127-018	
46.	Asphalt	Covered by WAC 296-127-018	
47.	Fiber fabrics		X
48.	Electrical wiring/components		X
49.	treated or untreated timber pile		X
50.	Girder pads (elastomeric bearing)	X	
51.	Standard Dimension lumber		X
52.	Irrigation components		X

ITEM DESCRIPTION	YES	NO
53. Fencing materials		X
54. Guide Posts		X
55. Traffic Buttons		X
56. Epoxy		X
57. Cribbing		X
58. Water distribution materials		X
59. Steel "H" piles		X
60. Steel pipe for concrete pile casings		X
61. Steel pile tips, standard		X
62. Steel pile tips, custom	X	

Prefabricated items specifically produced for public works projects that are prefabricated in a county other than the county wherein the public works project is to be completed, the wage for the offsite prefabrication shall be the applicable prevailing wage for the county in which the actual prefabrication takes place.

It is the manufacturer of the prefabricated product to verify that the correct county wage rates are applied to work they perform.

See RCW 39.12.010
(The definition of "locality" in RCW 39.12.010(2) contains the phrase "wherein the physical work is being performed." The department interprets this phrase to mean the actual work site.

WSDOT's List of State Occupations not applicable to Heavy and Highway Construction Projects

This project is subject to the state hourly minimum rates for wages and fringe benefits in the contract provisions, as provided by the state Department of Labor and Industries.
The following list of occupations, is comprised of those occupations that are not normally used in the construction of heavy and highway projects.
When considering job classifications for use and / or payment when bidding on, or building heavy and highway construction projects for, or administered by WSDOT, these Occupations will be excepted from the included "Washington State Prevailing Wage Rates For Public Work Contracts" documents.

- Building Service Employees
- Electrical Fixture Maintenance Workers
- Electricians - Motor Shop
- Heating Equipment Mechanics
- Industrial Engine and Machine Mechanics
- Industrial Power Vacuum Cleaners
- Inspection, Cleaning, Sealing of Water Systems by Remote Control
- Laborers - Underground Sewer & Water
- Machinists (Hydroelectric Site Work)
- Modular Buildings
- Playground & Park Equipment Installers
- Power Equipment Operators - Underground Sewer & Water
- Residential *** ALL ASSOCIATED RATES ***
- Sign Makers and Installers (Non-Electrical)
- Sign Makers and Installers (Electrical)
- Stage Rigging Mechanics (Non Structural)

The following occupations may be used only as outlined in the preceding text concerning "WSDOT's list for Suppliers - Manufacturers - Fabricators"

- Fabricated Precast Concrete Products
- Metal Fabrication (In Shop)

Definitions for the Scope of Work for prevailing wages may be found at the Washington State Department of Labor and Industries web site and in WAC Chapter 296-127.

WAC 296-127-018 Agency filings affecting this section

Coverage and exemptions of workers involved in the production and delivery of gravel, concrete, asphalt, or similar materials.

(1) The materials covered under this section include but are not limited to: Sand, gravel, crushed rock, concrete, asphalt, or other similar materials.

(2) All workers, regardless of by whom employed, are subject to the provisions of chapter 39.12 RCW when they perform any or all of the following functions:

(a) They deliver or discharge any of the above-listed materials to a public works project site:

(i) At one or more point(s) directly upon the location where the material will be incorporated into the project; or

(ii) At multiple points at the project; or

(iii) Adjacent to the location and coordinated with the incorporation of those materials.

(b) They wait at or near a public works project site to perform any tasks subject to this section of the rule.

(c) They remove any materials from a public works construction site pursuant to contract requirements or specifications (e.g., excavated materials, materials from demolished structures, clean-up materials, etc.).

(d) They work in a materials production facility (e.g., batch plant, borrow pit, rock quarry, etc.,) which is established for a public works project for the specific, but not necessarily exclusive, purpose of supplying materials for the project.

(e) They deliver concrete to a public works site regardless of the method of incorporation.

(f) They assist or participate in the incorporation of any materials into the public works project.

(3) All travel time that relates to the work covered under subsection (2) of this section requires the payment of prevailing wages. Travel time includes time spent waiting to load, loading, transporting, waiting to unload, and delivering materials. Travel time would include all time spent in travel in support of a public works project whether the vehicle is empty or full. For example, travel time spent returning to a supply source to obtain another load of material for use on a public works site or returning to the public works site to obtain another load of excavated material is time spent in travel that is subject to prevailing wage. Travel to a supply source, including travel from a public works site, to obtain materials for use on a private project would not be travel subject to the prevailing wage.

(4) Workers are not subject to the provisions of chapter 39.12 RCW when they deliver materials to a stockpile.

(a) A "stockpile" is defined as materials delivered to a pile located away from the site of incorporation such that the stockpiled materials must be physically moved from the stockpile and transported to another location on the project site in order to be incorporated into the project.

(b) A stockpile does not include any of the functions described in subsection (2)(a) through (f) of this section; nor does a stockpile include materials delivered or distributed to multiple locations upon the project site; nor does a stockpile include materials dumped at the place of incorporation, or adjacent to the location and coordinated with the incorporation.

(5) The applicable prevailing wage rate shall be determined by the locality in which the work is performed. Workers subject to subsection (2)(d) of this section, who produce such materials at an off-site facility shall be paid the applicable prevailing wage rates for the county in which the off-site facility is located. Workers subject to subsection (2) of this section, who deliver such materials to a public works project site shall be paid the applicable prevailing wage rates for the county in which the public works project is located.

[Statutory Authority: Chapter 39.12 RCW, RCW 43.22.051 and 43.22.270. 08-24-101, § 296-127-018, filed 12/2/08, effective 1/2/09. Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270. 92-01-104 and 92-08-101, § 296-127-018, filed 12/18/91 and 4/1/92, effective 8/31/92.]

ATTACHMENT B

PROJECT PERMITS

(ADDITIONAL APPLICABLE PERMITS WILL BE PROVIDED AT THE PRE-CONSTRUCTION MEETING)

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HYDRAULIC PROJECT APPROVAL

Washington Department of
Fish & Wildlife
PO Box 43234
Olympia, WA 98504-3234
(360) 902-2200

Issued Date: August 26, 2015
Project End Date: September 30, 2018

Permit Number: 2015-6-531+01
FPA/Public Notice Number: N/A
Application ID: 3951

PERMITTEE	AUTHORIZED AGENT OR CONTRACTOR
Kitsap County Public Works	Parametrix
ATTENTION: Melinda Fohn	ATTENTION: Phil Struck
614 Division Street, MS 26A	4990 Kitsap Way
Port Orchard, WA 98366	Bremerton, WA 98312-2351

Project Name: Duwe-iq Stormwater Treatment Wetland

Project Description: The Duwe'iq Stormwater Treatment Wetland and Buffer Restoration project is a 2.56 acre project to improve stormwater treatment from an adjacent 16.34-acre commercial area that currently discharges untreated stormwater to Clear Creek. Kitsap County proposes to construct a stormwater treatment wetland to treat this stormwater through natural processes (wetland functions) and restore with native vegetation the remaining site area, which is buffer area to Clear Creek.

PROVISIONS

1. TIMING
1. TIMING LIMITATION: You may begin the project on August 1 and you must complete the project by September 30 of any given year.

2. APPROVED PLANS: You must accomplish the work per plans and specifications submitted with the application and approved by the Washington Department of Fish and Wildlife, entitled DUWE'IQ Stormwater Treatment, dated April 7, 2015, and received on April 30, 2015, except as modified by this Hydraulic Project Approval. You must have a copy of these plans available on site during all phases of the project proposal.

3. INVASIVE SPECIES CONTROL: Thoroughly clean all equipment and gear before arriving and leaving the job site to prevent the transport and introduction of aquatic invasive species. Properly dispose of any water and chemicals used to clean gear and equipment. You can find additional information in the Washington Department of Fish and Wildlife's Invasive Species Management Protocols (November 2012), available online at http://wdfw.wa.gov/publications/01490/wdfw01490.pdf.

NOTIFICATION REQUIREMENTS
4. PRE- AND POST-CONSTRUCTION NOTIFICATION: You, your agent, or contractor must contact the Washington Department of Fish and Wildlife by e-mail at HPAapplications@dfw.wa.gov; mail to Post Office Box 43234, Olympia, Washington 98504-3234; or fax to (360) 902-2946 at least three business days before starting work, and again within seven days after completing the work. The notification must include the permittee's name, project location, starting date for work or date the work was completed, and the permit number. The Washington Department of Fish and Wildlife may conduct inspections during and after construction; however, the Washington Department of Fish and Wildlife will notify you or your agent before conducting the inspection.

5. FISH KILL/ WATER QUALITY PROBLEM NOTIFICATION: If a fish kill occurs or fish are observed in distress at the job site, immediately stop all activities causing harm. Immediately notify the Washington Department of Fish and Wildlife of the problem. If the likely cause of the fish kill or fish distress is related to water quality, also notify the

Washington Military Department Emergency Management Division at 1-800-258-5990. Activities related to the fish kill or fish distress must not resume until the Washington Department of Fish and Wildlife gives approval. The Washington Department of Fish and Wildlife may require additional measures to mitigate impacts.

6. Limit the use of equipment waterward of the ordinary high water line to that necessary to gain position for the work.

7. Check equipment daily for leaks and complete any required repairs in an upland location before using the equipment in or near the water.

8. Use environmentally acceptable lubricants composed of biodegradable base oils such as vegetable oils, synthetic esters, and polyalkylene glycols in equipment operated in or near the water.

9. This Hydraulic Project Approval does not authorize equipment crossings of the stream.

CONSTRUCTION-RELATED SEDIMENT, EROSION AND POLLUTION CONTAINMENT
10. Work in the dry watercourse (when no natural flow is occurring in the channel, or when flow is diverted around the job site).

11. Protect all disturbed areas from erosion. Maintain erosion and sediment control until all work and cleanup of the job site is complete.

12. Straw used for erosion and sediment control, must be certified free of noxious weeds and their seeds.

13. Stop all hydraulic project activities except those needed to control erosion and siltation, if flow conditions arise that will result in erosion or siltation of waters of the state.

14. Prevent project contaminants, such as petroleum products, hydraulic fluid, fresh concrete, sediments, sediment-laden water, chemicals, or any other toxic or harmful materials, from entering or leaching into waters of the state.

15. Route construction water (wastewater) from the project to an upland area above the limits of anticipated floodwater. Remove fine sediment and other contaminants before discharging the construction water to waters of the state.

16. Deposit waste material from the project, such as construction debris, silt, excess dirt, or overburden, in an upland area above the limits of anticipated floodwater unless the material is approved by the Washington Department of Fish and Wildlife for reuse in the project.

17. Deposit all trash from the project at an appropriate upland disposal location.
OUTFALL
18. Locate and construct the outfall per the approved plans and specifications entitled, DUWE'IQ Stormwater Treatment, dated April 7, 2015, and received on April 30, 2015 and submitted to the Washington Department of Fish and Wildlife.

19. To prevent the entry of adult or juvenile fish, construct the outfall structure according to the approved plans and specifications.

20. To prevent scouring, protect the watercourse bank and bed at the point of discharge using biotechnical techniques as described in the plan. No angular rock shall be added to the dissipater.

LOCATION #1:	Site Name: DUWE'IQ STORMWATER TREATMENT WETLAND AND BUFFER RESTORATION

HYDRAULIC PROJECT APPROVAL

Washington Department of
Fish & Wildlife
PO Box 43234
Olympia, WA 98504-3234
(360) 902-2200

Issued Date: August 26, 2015
Project End Date: September 30, 2018

Permit Number: 2015-6-531+01
FPA/Public Notice Number: N/A
Application ID: 3951

	, Silverdale, WA 98383					
WORK START:	June 1, 2016			WORK END:	October 28, 2016	
WRIA		Waterbody:			Tributary to:	
15 - Kitsap		Clear Creek			Clear Creek	
1/4 SEC:	Section:	Township:	Range:	Latitude:	Longitude:	County:
SW 1/4	16	25 N	01 E	47.654446	-122.686374	Kitsap
Location #1 Driving Directions						
SR 3 North (N) or South (S) bound: Take exit 45A (N) or 45 (S) ramp for SR303 South toward E Bremerton/Silverdale. Road name changes to Kitsap Mall Blvd NW. Go through intersection of Silverdale Way NW onto Ridgetop Boulevard. Then East on Ridgetop until Clear Creek trail. North on Clear Creek trail approximately 300 ft to site.						

APPLY TO ALL HYDRAULIC PROJECT APPROVALS

This Hydraulic Project Approval pertains only to those requirements of the Washington State Hydraulic Code, specifically Chapter 77.55 RCW. Additional authorization from other public agencies may be necessary for this project. The person(s) to whom this Hydraulic Project Approval is issued is responsible for applying for and obtaining any additional authorization from other public agencies (local, state and/or federal) that may be necessary for this project.

This Hydraulic Project Approval shall be available on the job site at all times and all its provisions followed by the person (s) to whom this Hydraulic Project Approval is issued and operator(s) performing the work.

This Hydraulic Project Approval does not authorize trespass.

The person(s) to whom this Hydraulic Project Approval is issued and operator(s) performing the work may be held liable for any loss or damage to fish life or fish habitat that results from failure to comply with the provisions of this Hydraulic Project Approval.

Failure to comply with the provisions of this Hydraulic Project Approval could result in a civil penalty of up to one hundred dollars per day and/or a gross misdemeanor charge, possibly punishable by fine and/or imprisonment.

All Hydraulic Project Approvals issued under RCW 77.55.021 are subject to additional restrictions, conditions, or revocation if the Department of Fish and Wildlife determines that changed conditions require such action. The person(s) to whom this Hydraulic Project Approval is issued has the right to appeal those decisions. Procedures for filing appeals are listed below.

HYDRAULIC PROJECT APPROVAL

Issued Date: August 26, 2015
Project End Date: September 30, 2018

Permit Number: 2015-6-531+01
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MINOR MODIFICATIONS TO THIS HPA: You may request approval of minor modifications to the required work timing or to the plans and specifications approved in this HPA. Any approved minor modification will require issuance of a letter documenting the approval. A minor modification to the required work timing means any change to the work start or end dates of the current work season to enable project or work phase completion. Minor modifications will be approved only if spawning or incubating fish are not present within the vicinity of the project. You may request subsequent minor modifications to the required work timing. A minor modification of the plans and specifications means any changes in the materials, characteristics or construction of your project that does not alter the project's impact to fish life or habitat and does not require a change in the provisions of the HPA to mitigate the impacts of the modification. Minor modifications do not require you to pay additional application fees or be issued a new HPA. If you originally applied for your HPA through the online Aquatic Protection Permitting System (APPS), you may request a minor modification through APPS. A link to APPS is at http://wdfw.wa.gov/licensing/hpa/. If you do not use APPS you must submit a written request that clearly indicates you are seeking a minor modification to an existing HPA. Written requests must include the name of the applicant, the name of the authorized agent if one is acting for the applicant, the control number of the HPA, the date issued, the permitting biologist, the requested changes to the HPA, the reason for the requested change, the date of the request, and the requestor's signature. Send by mail to: Washington Department of Fish and Wildlife, PO Box 43234, Olympia, Washington 98504-3234, or by email to HPAapplications@dfw.wa.gov. Do not include payment with your request. You should allow up to 45 days for the department to process your request.

MAJOR MODIFICATIONS TO THIS HPA: You may request approval of major modifications to any aspect of your HPA. Any approved change other than a minor modification to your HPA will require issuance of a new HPA. If you paid an application fee for your original HPA you must pay an additional $150 for the major modification. If you did not pay an application fee for the original HPA, no fee is required for a change to it. If you originally applied for your HPA through the online Aquatic Protection Permitting System (APPS), you may request a major modification through APPS. A link to APPS is at http://wdfw.wa.gov/licensing/hpa/. If you do not use APPS you must submit a written request that clearly indicates you are requesting a major modification to an existing HPA. Written requests must include the name of the applicant, the name of the authorized agent if one is acting for the applicant, the control number of the HPA, the date issued, the permitting biologist, the requested changes to the HPA, the reason for the requested change, the date of the request, payment of the application the original application was subject to an application fee, and the requestor's signature. Send your written request and payment, if applicable, by mail to: Washington Department of Fish and Wildlife, PO Box 43234, Olympia, Washington 98504-3234. You should allow up to 45 days for the department to process your request.

APPEALS INFORMATION

If you wish to appeal the issuance, denial, conditioning, or modification of a Hydraulic Project Approval (HPA), Washington Department of Fish and Wildlife (WDFW) recommends that you first contact the department employee who issued or denied the HPA to discuss your concerns. Such a discussion may resolve your concerns without the need for further appeal action. If you proceed with an appeal, you may request an informal or formal appeal. WDFW encourages you to take advantage of the informal appeal process before initiating a formal appeal. The informal appeal process includes a review by department management of the HPA or denial and often resolves issues faster and with less legal complexity than the formal appeal process. If the informal appeal process does not resolve your concerns, you may advance your appeal to the formal process. You may contact the HPA Appeals Coordinator at (360) 902-2534 for more information.

Washington Department of
Fish & Wildlife
PO Box 43234
Olympia, WA 98504-3234
(360) 902-2200

HYDRAULIC PROJECT APPROVAL

Issued Date: August 26, 2015
Project End Date: September 30, 2018

Permit Number: 2015-6-531+01
FPA/Public Notice Number: N/A
Application ID: 3951

A. INFORMAL APPEALS: WAC 220-660-460 is the rule describing how to request an informal appeal of WDFW actions taken under Chapter 77.55 RCW. Please refer to that rule for complete informal appeal procedures. The following information summarizes that rule.

A person who is aggrieved by the issuance, denial, conditioning, or modification of an HPA may request an informal appeal of that action. You must send your request to WDFW by mail to the HPA Appeals Coordinator, Department of Fish and Wildlife, Habitat Program, 600 Capitol Way North, Olympia, Washington 98501-1091; e-mail to HPAapplications@dfw.wa.gov; fax to (360) 902-2946; or hand-delivery to the Natural Resources Building, 1111 Washington St SE, Habitat Program, Fifth floor. WDFW must receive your request within 30 days from the date you receive notice of the decision. If you agree, and you applied for the HPA, resolution of the appeal may be facilitated through an informal conference with the WDFW employee responsible for the decision and a supervisor. If a resolution is not reached through the informal conference, or you are not the person who applied for the HPA, the HPA Appeals Coordinator or designee will conduct an informal hearing and recommend a decision to the Director or designee. If you are not satisfied with the results of the informal appeal, you may file a request for a formal appeal.

B. FORMAL APPEALS: WAC 220-660-470 is the rule describing how to request a formal appeal of WDFW actions taken under Chapter 77.55 RCW. Please refer to that rule for complete formal appeal procedures. The following information summarizes that rule.

A person who is aggrieved by the issuance, denial, conditioning, or modification of an HPA may request a formal appeal of that action. You must send your request for a formal appeal to the clerk of the Pollution Control Hearings Boards and serve a copy on WDFW within 30 days from the date you receive notice of the decision. You may serve WDFW by mail to the HPA Appeals Coordinator, Department of Fish and Wildlife, Habitat Program, 600 Capitol Way North, Olympia, Washington 98501-1091; e-mail to HPAapplications@dfw.wa.gov; fax to (360) 902-2946; or hand-delivery to the Natural Resources Building, 1111 Washington St SE, Habitat Program, Fifth floor. The time period for requesting a formal appeal is suspended during consideration of a timely informal appeal. If there has been an informal appeal, you may request a formal appeal within 30 days from the date you receive the Director's or designee's written decision in response to the informal appeal.

C. FAILURE TO APPEAL WITHIN THE REQUIRED TIME PERIODS: If there is no timely request for an appeal, the WDFW action shall be final and unappealable.

Habitat Biologist	Michael.Blanton@dfw.wa.gov		for Director
Michael Blanton	360-895-3965		WDFW

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ATTACHMENT C

GEOTECHNICAL INFORMATION

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DUWE'IQ STORMWATER TREATMENT FACILITY GEOTECHNICAL AND HYDROGEOLOGIC ASSESSMENT

Silverdale, Washington

Prepared for: Parametrix, Inc. and Kitsap County

Project No. 140203 • August 18, 2014 Final

Aspect CONSULTING

earth + water

Aspect CONSULTING

DUWE'IQ STORMWATER TREATMENT FACILITY GEOTECHNICAL AND HYDROGEOLOGIC ASSESSMENT

Silverdale, Washington

Prepared for: Parametrix, Inc. and Kitsap County

Project No. 140203 • August 18, 2014 Final

Aspect Consulting, LLC

HENRY H. HASELTON
STATE OF WASHINGTON
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REGISTERED
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8-18-14

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Executive Summary

This report presents the results of the geotechnical and hydrogeologic assessment for the Duwe'iq stormwater treatment facility. The primary objectives for the assessment included characterizing soil and groundwater conditions in the project area and providing geotechnical recommendations regarding excavation, reuse of on-site soils, slopes, wetland liner options, and foundation support for the pedestrian bridges.

Aspect Consulting, LLC drilled and installed two monitoring wells, six piezometers, and conducted test pit explorations across the Site. Soil and groundwater conditions were documented and soil samples were collected for grain size analysis. Water level transducers with dataloggers were installed in the monitoring wells and piezometers for water level monitoring.

The following soil conditions were observed at the Site:

- Mixed fill and/or alluvium soils were encountered in all the explorations at depths that ranged from 1.0 feet in TP-10 to more than 10 feet in TP-13.
- Recessional Outwash: Recessional outwash was encountered in TP-5 at depths of 7 to 9 feet and TP-6 at depths of 5 to 7.5 feet.
- Sub-Glacial Melt-out Till: Melt-out till was encountered beneath alluvium and recessional outwash in most of the explorations. It extended to a depth of 14 feet in MW-2 and greater than 20.75 feet in MW-1.
- Advance outwash: Advance outwash, consisting of fine-medium sand, was encountered in MW-2 underlying the melt-out till.

Shallow seepage was observed in most of the explorations starting at depths of between 1 and 6.5 feet. This perched water may not be present during the dry season (late summer and fall). A confined aquifer was encountered at depths of 12.5 to 14 feet in the two monitoring wells.

Geotechnical recommendations were provided to support the proposed project, including reuse of on-site soils, maximum slopes for the pond side slopes, the need for a liner in the forebay, recommended foundation approach, soil parameters for foundation design, and excavation dewatering recommendations. Key elements of these recommendations are summarized below:

- Due to the presence of a confined aquifer beneath the Site, we recommend a minimum forebay cell excavation Elevation of 23 feet.
- Groundwater inflow estimates for the dry season appear to indicate that carefully planned sumps and pumps will be an appropriate method of construction dewatering.
- A liner is recommended in the forebay and may consist of a low permeability soil barrier (LPSB) or geomembrane liner.

- Pedestrian bridges may be constructed using shallow foundations placed directly on the weathered/unweathered melt-out till or recessional outwash or placed on structural fill that extends to the weathered/unweathered melt-out till or recessional outwash.

1 Introduction

Kitsap County retained Aspect Consulting LLC (Aspect) to conduct a geotechnical and hydrogeologic assessment to support design of the Duwe'iq stormwater treatment facility. The goals of the project are to provide water quality treatment and enhance stream-side wetlands in lower Clear Creek. As shown on Figure 1, the proposed project is located west of Clear Creek in Silverdale, Washington.

Based on design drawings provided by Parametrix, the project will include a constructed wetland built on approximately 1 acre next to Clear Creek. The area included in this assessment (referred to as the "Site") includes the area of constructed wetlands and is shown on Figure 2. The facility will treat runoff from commercial development areas located west and north of the constructed wetlands. The conceptual design includes the following elements:

- The forebay will be located in the northwest corner of the Site and is expected to be approximately 200 feet long and 6 to 10 feet deep with a minimum base Elevation of 23 feet.
- Water will drain from the forebay into a series of constructed wetland cells that wind through the Site in an "S" shaped pattern.
- Excavated material from the forebay and wetlands areas will be used to construct berms in lower portions of the Site. The goal is to have a balance cut and fill across the Site to minimize the costs to haul material off-site or import fill.
- Outflow from the constructed wetland will flow into a control structure and then into an existing outfall in the southeast corner of the Site.
- The project will include new pedestrian trails.
- The project may include new pedestrian bridges supported on spread footings. The bridges are expected to have minimal grade separation and therefore will not have significant approaches or abutments.

1.1 Purpose and Scope of Work

The purpose of our geotechnical engineering services is to characterize soil and groundwater conditions in the project area and provide geotechnical recommendations regarding excavation, reuse of on-site soils, slopes, and foundation support for the pedestrian bridges. The groundwater elevation information will be used to determine the appropriate base elevations of the forebay and main wetland pool.

Our scope of work was detailed in the contract with Kitsap County dated April 15, 2013. Finalizing this report was completed under contract with Parametrix. In general, our scope included:

- Background review of the project and Site conditions;
- Field exploration program consisting of test pits, soil borings, and monitoring wells; and
- Water level monitoring in the monitoring wells for a period of 1 year. Water level monitoring data that has been collected prior to this report is presented herein. One additional round of monitoring data will be reviewed in 2014; and
- Geotechnical analyses for:
  - Site earthwork procedures including qualitative dewatering recommendations;
  - Reuse of on-site soils, including shrinkage/swell factor;
  - Maximum slopes for the pond side slopes;
  - The need for a liner in the forebay;
  - Coordinating with the design team to ensure that the groundwater elevation data is properly integrated with the constructed wetland design;
  - Suitability of on-site soil for use as low permeability liner;
  - Pedestrian bridge foundations; and
  - This report presenting design and construction conclusions and recommendations.

2 Field and Laboratory Investigations

Site visits were conducted on April 15 and 17, 2013 to complete soil borings, install monitoring wells, and to complete backhoe test pits. An additional site visit was conducted on October 8, 2013 to complete vactor explorations. The primary purpose of the investigations was to collect sufficient subsurface information to support design of the stormwater treatment facility. Locations of the investigations are provided on Figure 2 with corresponding geologic cross sections presented on Figures 3 through 5 and detailed investigation methodology and exploration logs are provided in Appendix A. Geotechnical laboratory tests were completed on selected soil samples collected during our investigations with a summary discussion in Section 2.6 and detailed results presented in Appendix B. This section presents methodology and results of our field and laboratory investigations.

2.1 Surface Observations

The Site is characterized by rolling topography with approximately 15 feet of topographic relief. It is vegetated with meadow grass in the southern two-thirds of the Site. The northern portion of the Site is covered with recently downed trees and brush. The west side of the property is bordered by a parking lot for the neighboring commercial development and the east side is bordered by Clear Creek. Outside of the stream channel, no standing water was observed anywhere on the Site.

2.2 Borings and Monitoring Wells

Aspect observed the drilling of two borings and installation of two groundwater monitoring wells on April 15, 2013. A summary of the borings and monitoring well depths is provided in Table 1.

The monitoring wells were installed by Geologic Drill Explorations, Inc. using a track-mounted hollow-stem auger drilling rig. Soil samples were collected using a Standard Penetration Test (SPT) sampler that collects 1.5-inch diameter samples. The number of blows to drive the sampler provides an indication of the soil density. The advancement of the borings and collection of samples was observed and logged by a geologist from Aspect.

As indicated in Table 1, the borings ranged from 20.75 to 24 feet deep. MW-1 encountered 2.5 feet of fill and/or alluvium over melt-out glacial till that extended to the bottom of the boring. The glacial till ranged from silty gravelly sand (SM[1]), to slightly sandy, very silty gravel (GM), to sandy gravel (GP). Water was first encountered in a sandy gravel zone at a depth of 12.5 feet, although the water level rose slowly over the next day to a depth of approximately 6 feet below the ground surface, indicating confined conditions in the sandy gravel zone. Eventually, the water level rose to within 3.5 feet of the ground surface.

MW-2 encountered 3.5 feet of fill and/or alluvium over melt-out glacial till to a depth of 14 feet over advance outwash to the bottom of the boring. The glacial till ranged from silty sandy gravel (GM) to gravelly, very silty sand (SM). The advance outwash consisted of fine to medium sand with trace silt (SP). Perched water was encountered above the glacial till at

[1] Soil classification in accordance with the Unified Soil Classification System using ASTM D-2488.

a depth of 2.5 feet and the first water-bearing zone was the advance outwash at a depth of 14 feet. Once the drill fully penetrated the glacial till, the water level rose quickly to a depth of approximately 2.5 feet below the ground surface, indicating confined conditions in the advance outwash zone.

Monitoring wells[2] were installed in both soil borings to allow monitoring of water levels. The wells consist of 10 feet of 2-inch diameter slotted PVC screen and then solid PVC casing to the ground surface. The wellheads are protected with a surface seal and a flush well cover.

Table 1 – Boring and Monitoring Well Summary (feet)

Well	Elevation GS	Boring Depth	Well Depth	Screened Interval (below GS)	Depth to Water Bearing Zone (below GS)	Elevation of Water Bearing Zone
MW-1	32	20.75	20.75	10-20	12.5	19.5
MW-2	27	24	24	13.5-23.5	14	13

Notes:
Elevations are approximate and referenced to mean sea level (msl) using datum NAD83.
GS - Ground surface

2.3 Test Pit Explorations

Aspect observed and logged test pit explorations within the Site area on April 17, 2013. The test pits were excavated using a track-mounted excavator provided and operated by Kitsap County. A summary of the conditions observed at each exploration is provided in Table 2. Following excavation and sampling, the test pits were backfilled with excavated material.

[2] Monitoring wells were installed by a licensed driller and should be decommissioned in accordance with WAC 173-160-381 after they are no longer needed.

Table 2 – Conditions Encountered in Test Pit Explorations

Test Pit	Total Depth (feet)	Soil Conditions	Seepage (feet)
TP-1	9.5	Fill/alluvium to 1.5 feet, weathered melt-out till to 6 feet, melt-out till to bottom	1-3
TP-2	10	Fill/alluvium to 2.2 feet, weathered melt-out till to 5.2 feet, melt-out till to bottom	1-3
TP-4	10	Alluvium to 2 feet, weathered melt-out till to 6 feet, melt-out till to bottom	2.5
TP-5	10	Alluvium to 7 feet, recessional outwash to 9 feet, melt-out till to bottom	2-3, 5.5-6, 7-9
TP-6	10	Alluvium to 5 feet, weathered melt-out till to 5.2 feet, melt-out till to bottom	2-2.5, 8.5-10
TP-7	4.5	Alluvium to 4 feet, weathered melt-out till to bottom	3.5-4
TP-8	3	Fill/alluvium to bottom	none
TP-10	4.5	Fill/alluvium to 1 feet, weathered melt-out till to 4.5 feet, melt-out till to bottom	none
TP-11	3	Fill/alluvium to bottom	none
TP-12	2	Fill/alluvium to bottom	none
TP-13	10	Fill/alluvium to bottom	6.5

Notes:
Test pit locations 3 and 9 were marked in the field for utility locating purposes but not excavated.

Some of the test pits were benched at depths of 1 to 6.5 feet to facilitate *in situ* soil density measurements. In-place soil density and moisture content were measured by a technician from Krazan & Associates, Inc. using a nuclear densometer. The results of these measurements are provided in Table B-1.

2.4 Vactor Explorations and Piezometer Installation

Aspect also observed the exploration of six vactor explorations on October 8, 2013.

The vactor (vacuum excavation) explorations were conducted by Kitsap County personnel using a county-owned vactor truck and a high-pressure water jet to loosen the soil. Aspect recorded soil and groundwater conditions during excavation and collected soil samples using a hand auger at approximate 2-foot intervals. Explorations V-4, V-5, and V-6 were excavated to depths between 9.4 and 10 feet below the ground surface. The remaining three explorations were terminated at shallower depths (between 3.1 and 4.4 feet deep) due to the difficulty of vactoring through the very dense melt-out till.

Following excavation, the exploration holes were completed as piezometers. The piezometers were constructed with 2-inch diameter schedule-40 PVC casing and hand cut slots in the bottom 2 feet of casing. The annular space outside the slotted section was filled with crushed rock.

Seepage into the exploration holes was observed to range from an elevation of 19.5 feet above mean sea level (amsl) in V-6 to 22.5 feet amsl in V-4. These seepage observations were obtained in early October 2013 and likely reflect typical late summer and fall groundwater level conditions (before the wet season groundwater high). Kitsap County installed pressure transducers in the piezometers to collect water levels into the future and the results to date are reported below.

2.5 Piezometer Flow Testing and Monitoring Well Slug Testing

Piezometer flow testing was conducted in all the piezometers to provide an indication of hydraulic conductivity (K) of the surrounding soil. The piezometer flow tests were conducted by filling the piezometer with water and measuring the change in hydraulic head at 5-minute intervals using a pressure transducer placed in the bottom of the piezometer. Occasional hand measurements of the water level were also obtained using an electric water level meter. Piezometer V-3, V-4, V-5, and V-6 were refilled with water to maintain a relatively high water level throughout the tests and maintain saturation over a larger portion of the piezometer.

The duration of the piezometer flow tests ranged from 145 minutes (V-2) to 350 minutes (V-4). The data collected during piezometer flow tests are provided in Appendix C. The results were analyzed using two different approaches:

- Borehole infiltration methods suitable for piezometers completed above the water table (V-1, V-2, and V-3);
- Slug testing methods suitable for piezometers completed below or across the water table. Although V-1, V-2, and V-3 were complete above the water table, estimates of K were obtained using this approach for comparison with the borehole infiltration approach.

Additional details regarding these approaches are provided in Appendix C and the parameter values used to estimates K are provided in Table B-1. As shown in Table 2, the K estimates for the piezometers ranged from 0.2 to 0.9 feet/day with relatively little variability between piezometers.

In addition, a slug test was conducted in MW-1 to obtain an estimate of K at a greater depth. The K estimate for MW-1 is approximately two orders of magnitude less, suggesting that the melt-out till becomes less permeable with depth.

2.6 Laboratory Testing

Selected soil samples from the explorations were submitted to either Krazan & Associates, Inc. in Poulsbo, Washington or Am Test Inc. in Kirkland, Washington for laboratory testing. The laboratory results are provided in Appendix B. The following analyses were performed:

- Grain size analyses in accordance with ASTM D-422; and
- Moisture Density (Proctor) Analysis in accordance with ASTM-D-1557.

Two Proctor tests were conducted and the results are summarized below:

- P-1 was a composite sample of glacial till soils and included material from TP-5, TP-6, TP-8, and TP-10. The rock corrected results (includes all gravel) provided a maximum density of 142 pound/cubic foot (PCF) at a moisture content of 5%. The uncorrected results (i.e., after removal of material retained on the 0.75 inch sieve) provided a maximum density of 137 PCF at a moisture content of 7%.
- P-2 was a sample of alluvial sand from TP-5. This material did not contain any gravel retained on the 0.75 inch sieve and the maximum density was 116 PCF at a moisture content of 8%.

The results of the grain-size analyses are summarized in Table 3.

Table 3 – Summary of Grain Size Analysis Results

Location	Depth (feet)	% Gravel	% Sand	% Silt	Notes
P-1 (TP-5, 6, 8, 10)	Variable	29	54	17	Well-graded, silty gravelly sand (melt-out till, SM)
P-2 (TP-5)	2-3	0	88	12	Poorly graded, slightly silty sand (alluvium, SP-SM)
MW-1	10-11.5	58	24	18	Gap-graded, silty sandy gravel (melt-out till, GM)
MW-1	15-15.5	26	60	14	Well-graded, silty gravelly sand (melt-out till, SM)
MW-2	5-6.5	15	48	37	Well-graded, gravelly very silty sand (melt-out till, SM)
MW-2	12.5	6	77	17	Well-graded, slightly gravelly silty sand (melt-out till, SM)
TP-5	3-5,6-7	1.2	71	28	Well-graded, silty sand, trace gravel (alluvium, SM)
TP-5	7-9	38	60	2.4	Well-graded, very gravelly sand, trace silt (recessional outwash, SW)
TP-7	3-3.5	11	79	10	Poorly-graded, slightly silty, slightly gravelly sand (alluvium, SP-SM)
TP-13	3-4	22	66	13	Well-graded, gravelly, silty sand (alluvium, SM)

2.7 Groundwater Levels

Transducers have been installed in MW-1 and MW-2 since April 2013 and in the piezometers since they were completed in October 2013. Figure 6 shows depth to groundwater below ground surface, and Figure 7 shows groundwater elevations in the monitoring wells and the piezometers.

As shown on Figure 6, the depth to perched groundwater in the piezometers ranged from a low of 3.5 to 5.5 feet below the ground surface during October and began rising in November. The flat regions of the curves for V-1, V-2, and V-3 indicate that these piezometer were initially dry. Water levels rose significantly during November to a depth of between 0.5 and 4 feet below the ground surface and all the piezometers now have water in the casings.

The depth to groundwater in MW-1 (completed in the melt-out till at a depth of 10 to 20 feet) declined approximately 3 feet over the summer months and began to rebound significantly at the beginning of October. The water level in MW-2 (completed in the advance outwash at a depth of 13.5 to 23.5 feet) followed a similar pattern as MW-1, although the summer decline was only 1.5 feet.

As shown on Figure 7, groundwater elevations in V-1 and V-2 (located in the northwest and west portion of the site) have ranged from less than 27 feet amsl during October to more than 28.5 feet amsl during November. Groundwater elevations in V-3, V-4, and V-5 (in the southern and eastern portion of the site) follow a similar pattern with a low of approximately 23 feet amsl during October to a high of approximately 26 feet amsl in November. The water level in V-6, located at a lower elevation in the northeast portion of the Site, ranged from a low of approximately 21.7 feet amsl in October to a high of more than 23 feet amsl in November.

The groundwater elevations in MW-1 have followed the groundwater elevations in V-2, the nearest piezometer. The groundwater elevations in MW-2 generally tracked the water levels in the nearest piezometers (V-3 and V-4) during October but have not increased nearly as much as the piezometer water levels during November. This pattern suggests a delayed response in the underlying advance outwash aquifer following seasonal changes in groundwater recharge.

3 Geology and Hydrogeology

This section summarizes the hydrogeology for the site based on readily available geologic information, previous studies in the area, and the subsurface explorations conducted for this assessment. Locations of the explorations conducted for this assessment are shown on Figure 2 and the exploration logs are provided in Appendix A.

3.1 Geologic Setting

The surficial geology of the Duwe'iq project area results from long periods of erosion and non-glacial sedimentation in depositional environments similar to those present today, punctuated by multiple glacial advances into the Puget Sound lowland. The most recent glaciation, the Vashon stade of the Fraser glaciation, ended only about 13,000 years ago, and the resulting landform consists of glacially sculpted uplands composed of north to south elongated glacial drumlins and flutes, and waterways of Puget Sound. Clear Creek lies within a north to south trending valley that was glacially carved during these glacial advances.

The geologic units that are present at the surface and in the shallow surface are generally divided into deposits from the Vashon glaciation, and more recently deposited alluvial deposits. The project area is mapped by Yount et al. (1998) as Vashon age recessional outwash over glacial till.

3.2 Site Geology

The explorations conducted for this assessment provide more detail regarding Site geology with some important differences from the general geologic setting discussed above. In particular, although most of the project area was previously mapped as recessional outwash, most of the explorations conducted for this assessment encountered melt-out glacial till. Descriptions of the geologic units encountered at the project area are provided below.

Mixed Fill and Alluvium: Mixed fill and/or alluvium soils were encountered in all the explorations at depths that ranged from 1.0 feet in TP-10 to more than 10 feet in TP-13. These soils were highly variable but generally consist of loose to medium dense sand with variable amounts of silt, gravel, and organics and were generally classified as SM or SP with occasional GW-GM and ML.

The mixed fill and alluvium should be assumed to possess variable compressibility and shear strength characteristics based on the observed variability in the relative consistency and density. It can also be assumed to have moderate to high moisture sensitivity, especially in areas where the soil unit has high fines content. Soils with high moisture sensitivity tend to degrade easily upon exposure to weather and disturbance and are difficult to compact when the moisture content exceeds its optimum value. The fill can be expected to have variable, low to moderate permeability.

Recessional Outwash: Recessional outwash was encountered in TP-5 at depths of 7 to 9 feet and TP-6 at depths of 5 to 7.5 feet. This material may be a well-sorted zone of sub-glacial melt-out till. These soils consist of medium dense to dense, sandy gravel with

cobbles and boulders and is classified as SW. A thin interbed of silty sand (SM) was encountered in TP-6 at a depth of approximately 6.5 feet.

The recessional outwash should be assumed to possess low to moderate compressibility and moderate shear strength characteristics. It can also be assumed to have low to moderate moisture sensitivity (except in zones with silty interbeds that will have higher moisture sensitivity) and moderate permeability.

Sub-Glacial Melt-out Till: These deposits were encountered in the majority of the explorations and were generally deposited in running water beneath the glacier, resulting in some sorting of material. The bottom of the melt-out till was encountered at a depth of 14 feet in MW-2 and was not encountered in MW-1, which extended to a depth of 20.75 feet. In general, the melt-out till consists of medium dense to very dense mixtures of gravel, sand, and silt and was generally classified as GP, GM, or SM. SPT results from MW-1 and MW-2 exceeded 90 blow-counts per foot. The upper few feet of melt-out till was generally identified as weathered based on color (more brown or light gray versus blue gray).

The melt-out till should be assumed to possess low compressibility and moderate to high shear strength characteristics. It can also be assumed to have moderate to high moisture sensitivity due to the presence of silt in the unit. The compact nature of the melt-out till and the moderate to high fines content in the soil matrix yields moderate to low permeability. Melt-out till generally behaves as an aquitard; however, it does contain layers or lenses of cleaner water-worked sediments that can produce minor amounts of water or seepage in open excavations. In particular, the relatively permeable melt-out till encountered below a depth of 13.5 feet in MW-1 is water-bearing and represents a confined aquifer zone that would produce water in an open excavation.

Advance Outwash: Advance outwash was encountered in MW-2 beneath the melt-out till and consist of dense to very dense, fine to medium sand with trace silt and trace gravel in places (SP). SPT results ranged from 27 to 57 blow-counts per foot.

The advance outwash should be assumed to possess low compressibility and moderate shear strength characteristics. It can also be assumed to have low to moderate moisture sensitivity depending on the amount of silt in the unit. The relatively low fines content in the soil matrix yields moderate to high permeability. Advance outwash generally behaves as an aquifer and typically requires significant dewatering to conduct open excavations.

3.3 Site Hydrogeology

As discussed in Section 2, groundwater was observed in a number of the explorations and two monitoring wells and six piezometers were installed to allow measurement of groundwater elevations. Groundwater conditions observed at the Site are summarized below.

Shallow Perched Groundwater: Shallow perched groundwater was observed above the melt-out till at depths of 1 to 6.5 feet below the ground surface. These observations indicate the presence of shallow perched water conditions that peak during winter months.

Confined Aquifer: The two monitoring wells are screened over water-bearing zones in either the melt-out till (MW-1) or the advance outwash (MW-2). The water levels in the wells are higher than the depth where the water bearing zones were encountered (13 to 19.5

feet), indicating the presence of confined aquifer conditions. The water level in MW-1 recovered slowly following removal of water during development, indicating that the water bearing zone is not very permeable. The water level in MW-2 recovered quickly following removal of water during development, indicating that the water bearing zone is quite permeable. During water level monitoring following well installation, the water levels in the wells were observed to decline approximately 12 to 30 inches over the summer months before increasing by the same magnitudes through the winter months. The average water level in MW-1 is approximately 4.0 feet below the ground surface (an approximately elevation of 28 feet amsl) and the average water level in MW-2 is approximately 3 feet below the ground surface (an approximate elevation of 24 feet amsl).

4 Geotechnical Recommendations

This section provides geotechnical recommendations to support design and construction of the proposed stormwater treatment facility.

4.1 General

In our opinion, the proposed project is feasible from a geotechnical perspective. The following sections present the results of our engineering analyses and recommendations. The following recommendations are for earthwork activities, bridge foundation support, construction dewatering, and other pertinent geotechnical design issues.

4.2 Temporary Erosion and Sedimentation Control

In our opinion, erosion hazard can be minimized if the bulk of the earthwork is conducted during the dry season, generally between June and the end of September. Erosion at the Site during construction can also be minimized by prudent grading practices and judicious use of erosion control devices. Kitsap County Best Management Practices (BMPs) should be in-place for Temporary Erosion and Sedimentation Control (TESC) for the duration of the construction activities. The following recommendations are provided for mitigation of the Site erosion hazard during and following construction:

- Silt fences should be placed and maintained around the downslope sides of all proposed excavations.
- Areas stripped of natural vegetation during construction should be replanted as soon as possible or otherwise protected.
- Water should not be allowed to flow across the Site over construction surfaces. All water should be diverted, collected, and tight-lined away from the construction area to an appropriate outlet.
- If precipitation is anticipated, earthwork should be performed in small areas to minimize exposure to wet weather.
- Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean structural fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance.
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water.
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left un-compacted and exposed to moisture. Soils that become too wet for compaction should be removed and replaced with clean granular materials;

Long-term erosion control should be achieved by establishing new vegetation within the disturbed areas. In sloped areas, vegetation with deep penetrating roots is the preferred choice, since the roots tend to maintain the surficial stability of slopes by mechanical effects and contribute to the drying of slopes by evapotranspiration.

4.3 Earthwork

Based on the explorations performed at the Site and our understanding of the proposed project, it is our opinion that planned excavation and grading can generally be completed with standard construction equipment. Although large boulders (larger than 3 feet in diameter) were not encountered in any explorations, they may be encountered in the types of soils found at the Site.

Site preparation should consist of the grubbing and removal of all existing non-structural topsoil, fills, and other deleterious materials, including demolition or construction debris. Exposed bearing surfaces should be evaluated by the Geotechnical Engineer. Any soft areas or area of unsuitable soils should be over-excavated to firm, undisturbed soil and backfilled with structural fill as defined below.

Due to the presence of a confined aquifer beneath the Site we recommend a minimum long-term excavation elevation of 23 feet amsl and temporary minimum excavation of 21.5 feet amsl during the summer months (June to September). The confined aquifer or water-bearing zone was encountered at depths of 12.5 to 14 feet below the ground surface at MW-1 and MW-2 (corresponding to approximate elevations of 19.5 feet amsl at MW-1 and 13 feet amsl at MW-2). The confined aquifer was not encountered in any of the test pits, many of which extended to a depth of 10 feet. It is important to note that these depths and elevations may not represent conditions across the entire Site and additional explorations may be recommended for any excavations that extend deeper than nearby explorations. These explorations should extend at least 3 feet deeper than the depth of the proposed excavation.

4.3.1 Re-use of On-site Soil

Approximately 6-12 inches of sod, topsoil, and woody debris are found at the ground surface across most of the Site. This material contains abundant organics and is not suitable for re-use as structural fill, although it may be suitable for re-use as topsoil.

The soils beneath the topsoil are generally free of organics and are potentially suitable for structural fill if the moisture content can be properly controlled. Due to their high silt content, the mixed alluvial/fill and melt-out till soils are very moisture sensitive. As indicated in Table B-1, the in-place moisture contents are often in excess of 20 percent, compared with an optimum moisture content of 8 percent for the alluvial sand and 5-7 percent for the melt-out till. The moisture content of these soils will need to be lower before the materials can be compacted to a firm non-yielding condition. It is expected that the moisture content of the on-site soils will be lower during summer and early fall, but some amount of moisture conditioning will be required.

It is our understanding that the project will be designed to balance cut and fills and minimize the need to export or import soil. It is likely that the soil density will change once the soil is excavated, placed, and compacted and the grading plan to account for this change in density. Based on the soil density measurements summarized in Table B-1 and our experience, the grading plan should be based on the following approximate in-place compaction levels:

- 0-2.5 feet: 80 percent of maximum density (determined using ASTM:D-1557)
- >2.5 feet: 95 percent of maximum density (determined using ASTM:D-1557)

Shrinkage/swell estimates can be estimated once the design compaction levels for fill placement are determined.

The data suggest significant variability in percent compaction and these compaction estimates should be considered approximate. We recommend that the grading plan provide for some flexibility by including vegetated berms that could be raised or lowered to accommodate inaccuracies in the cut and fill balance.

4.3.2 Structural Fill

The Site soils may be acceptable for re-use as structural fill provided the soils are relatively free of organics and other deleterious material. Ultimately, structural fill soils proposed for use should be approved by the Geotechnical Engineer.

If imported fill is used as structural fill beneath foundation, trails, and utilities, this fill should consist of material meeting the requirements of Select Borrow as described in Section 9-03.14(2) of the WSDOT Standard Specifications. If structural fill will be used in berms that will support ponded water it should be a well graded material containing at least 20 percent fines (passing the #200 sieve) to limit water leakage through the berm.

Structural fill soils should be moisture conditioned to within about 3 percent of optimum moisture content, placed in loose, horizontal lifts less than 8 inches in thickness, and compacted to the appropriate maximum dry density (MDD) listed below, as determined by ASTM D-1557:

- Beneath foundations and pavement and in water-retaining berms: 95 percent of MDD. For structural fill placed underneath foundations, the fill should extend a minimum of 2 feet horizontally beyond the footprint of the foundation element.
- Within 5 feet behind a wall: 90 percent of the MDD.
- Berms or slopes in landscaped areas: 90 percent of the MDD. Structural fill placed in a sloped configuration should be overbuilt a minimum of 2 feet and fine graded back to the final slope configuration to ensure adequate compaction throughout the fill.

The procedure to achieve the specified minimum relative compaction depends on the size and type of compacting equipment, the number of passes, thickness of the layer being compacted, and certain soil properties. When the size of the excavation restricts the use of heavy equipment, smaller equipment can be used, but the soil must be placed in thin enough lifts to achieve the required compaction.

4.3.3 Excavation Bottom Heave Potential

Due to the presence of a pressurized, confined aquifer within the Vashon Advance Outwash (outwash) unit beneath the Site, the potential for excavation bottom heave within the planned forebay excavation has been assessed. Based on the results of the completed explorations, Aspect estimated the pressurized aquifer within the outwash unit underlies the Vashon Sub-Glacial Melt-Out Till (till) at approximately Elevation 13. The maximum recorded piezometric level in the completed monitoring wells is approximately Elevation 30. The unit weight of the confining till is estimated at 135 pounds per cubic foot (pcf). We understand the critical excavation will be for the forebay treatment cell. Therefore, multiple minimum excavation elevations through the forebay were analyzed for excavation bottom heave. The results of the analyzed scenarios are summarized in Table 4 below.

Table 4 – Summary of Forebay Excavation Bottom Heave Analysis Results

Minimum Forebay Cell Excavation Elevation (feet)	Factor of Safety Against Bottom Heave
22	1.14
23	1.27
24	1.40

We recommend a minimum factor of safety against bottom heave excavation of 1.25; therefore, a minimum finished Elevation for the forebay of 23 feet is recommended. The planned base of the secondary treatment cell excavation is equal to or higher in elevation than the forebay cell excavation, making the forebay cell excavation the critical scenario. Provided that temporary excavations necessary for placing topsoil and/or soil liner are completed between June and September, they may extend as deep as Elevation 21.5. This recommendation assumes a groundwater elevation of 28 feet. If excavation occurs outside of the June through September timeframe, then the excavations should not be advanced below Elevation 23.

We anticipate the excavations for the forebay and secondary treatment cells will encounter shallow groundwater seepage within the mixed fill and alluvium soils as well as within the till; however, this anticipated shallow seepage is not a contributing element to the excavation bottom heave. The anticipated shallow seepage will require standard dewatering and handling (e.g., sumps and pumps) during the excavations.

4.3.4 Temporary Excavation Slopes

Maintenance of safe working conditions, including temporary excavation stability, is the responsibility of the Contractor. All temporary cuts in excess of 4 feet in height that are not protected by trench boxes or otherwise shored, should be sloped in accordance with Part N of Washington Administrative Code (WAC) 296-155.

In general, the near surface soils across the Site can be categorized as OSHA Soil Classification Type B and Type C. Temporary excavation side slopes are anticipated to stand as steep as 1H:1V (Horizontal:Vertical) within the compacted fill soils and melt-out till, and 1½H:1V within the un-compacted fill and alluvium soils. The cut slope inclinations estimated above are applicable to excavations without groundwater seepage, or runoff, and assume dewatered conditions.

With time and the presence of seepage and/or precipitation, the stability of temporary unsupported cut slopes can be significantly reduced. Therefore, all temporary slopes should be protected from erosion by installing a surface water diversion ditch or berm at the top of the slope. In addition, the Contractor should monitor the stability of the temporary cut slopes and adjust the construction schedule and slope inclination accordingly. Vibrations created by traffic and construction equipment may cause caving and raveling of the trench walls. In such an event, lateral support for the trench walls should be provided by the Contractor to prevent loss of ground support.

4.3.5 Permanent Slopes

Permanent cut and fill slopes should not exceed a maximum inclination of 2H:1V for slopes that will not be in contact with ponded water and 3H:1V for slopes that will be in contact with ponded water. Contact the geotechnical engineer for approaches that may facilitate steeper permanent slopes, such as using mechanically-reinforced earth techniques to construct the slopes.

4.4 Pipelines and Utility Structures

It is expected that the project will include manhole structures and stormwater conveyance in pipelines north of the proposed wetlands. Excavations for the manhole structures and pipelines are anticipated to be less than 8 feet deep and will typically encounter fill/alluvium and/or melt-out till. Oversized particles such as wood debris, cobbles, and boulders should be expected within the shallow soils and the melt-out till can be very dense or hard due to glacial consolidation. Perched groundwater is also anticipated within the excavations during wet periods of the year.

Trench excavations should be conducted in accordance with the temporary slope recommendations provided in Section 4.3.4. The means and methods of supporting temporary excavations are the responsibility of the Contractor. Trench support systems used for the project should be designed and constructed to support lateral loads exerted by the retained soil mass and any pressures applied during construction, such as heavy equipment and stockpiles next to the excavation. Trench support to protect workers typically consists of passive trench support systems (i.e., trench boxes) that allow the sides of the trenches to slough and still protect the workers. These are also known as Trench Safety Systems. Temporary excavations that are properly dewatered and protected by engineered trench boxes may be cut as steeply as the soil will stand, in some cases near-vertical.

Passive trench support systems are acceptable where settlement sensitive structures and/or utilities are not present within the zone of influence of the trench, if the trenches are less than about 20 feet deep, and if the majority of the trench excavation is anticipated

to be within Vashon melt-out till. The zone of influence is defined as a 1H:1V slope extending from the bottom of the trench.

Precautions should be taken during removal of the trench boxes and other shoring systems to minimize disturbance of the pipe, underlying bedding materials, and native soils.

4.4.1 Pipe Support and Bedding

The following considerations for pipe support and bedding are applicable to open cut methodologies. Fill and native soil encountered in the completed subsurface explorations at the anticipated pipe invert elevations are expected to provide suitable foundation support for the proposed pipes, provided they are not disturbed during construction. Disturbance of trench bottoms can be minimized by excavating with a smooth-bladed bucket wherever possible and limiting foot traffic on the trench bottoms. If very soft, organic rich or otherwise unsuitable soils are encountered at the invert level, we recommend that they be removed and replaced with bedding materials or a geosynthetic fabric may be used to maintain separation between the bedding and poor subgrade soil. The melt-out till soils do contain cobble and boulder-sized particles that if encountered, should be removed from the pipe subgrade and replaced with bedding materials. The appropriate course of action should be determined by the Geotechnical Engineer at the time of construction.

We recommend that pipe bedding meet the requirements of Section 7-08.3(1)C of the WSDOT Standard Specifications. Specific recommendations relative to the bedding of the proposed underground pipelines include:

- Bedding for the proposed pipes should meet the gradation requirements for Gravel Backfill for Pipe Zone Bedding, Section 9-03.312(3) of the WSDOT Standard Specifications.
- Prior to installation of the pipe, the bedding material should be shaped to fit the lower portion of the pipe exterior with reasonable closeness to provide continuous support along the pipe.
- Backfill around the pipe should be placed in layers and tamped around the pipe to obtain complete contact. Pipe bedding material should be used as trench backfill to at least 6 inches above the crown of the pipe, for the full width of the trench. In areas where a trench box is used, the bedding material should be placed before the trench box is advanced.
- Where a trench box is used and restraint of the installed pipe appears to be in question, we recommend that pipe restraint in the form of a cable and winch system be used inside the pipe so that the joints of previously laid pipe are not pulled apart as the trench box is advanced.

4.4.2 Trench Backfill and Compaction Criteria

For general structural fill and compaction considerations, refer to Section 4.3.2 of this report. The following criteria for trench backfill and compaction are provided.

The soils within the Site can be used for trench backfill provided the soils are relatively free of deleterious material or oversized material, and are not overly wet. The soils within the Site typically contain a moderate percentage of fines (particles passing the No. 200 sieve) making them difficult to compact when wet. Soils below the observed perched groundwater level are anticipated to be too wet for compaction at the time of excavation, and will require drying or mixing with other materials prior to use as trench backfill. The soils within the Study Area are typically less permeable than imported select backfill and can provide an advantage over imported material as it can slow/stop water seepage along the new pipeline alignment.

Trench backfill should follow the requirements of Section 7-08.3(3) of the WSDOT Standard Specifications. During placement of the initial lifts, the trench backfill material should not be bulldozed into the trench or dropped directly on the pipe. Furthermore, heavy vibratory equipment should not be permitted to operate over the pipe until at least 2 feet of backfill has been placed. Where it is necessary to minimize settlement of trench backfill, we recommended the trench backfill be placed in 8- to 12-inch, loose lifts and compacted using mechanical equipment to at least 90 percent of the maximum dry density (MDD) as determined by test method ASTM D-1557. In areas beneath pavements, the upper 3 feet of the backfill should be compacted to at least 95 percent MDD to provide an adequate subgrade for the pavement section. In unimproved areas where settlement can be tolerated, we recommend the backfill material be placed in loose lifts not exceeding 18 inches and compacted to a reasonably firm and unyielding condition.

4.4.3 Buoyancy

Below-grade structures such as manhole structures will be subjected to upward buoyancy forces when the groundwater level around the structure is higher than the fluid level inside the structure. Groundwater across the Site should be assumed at the ground surface for the calculation of uplift pressures. The structures should be designed to resist this upward force and to prevent possible heave and cracking of the structure base. The weight of the structure will resist uplift forces. The uplift resistance of a structure can be increased by placing backfill over an extended base of the structure.

4.5 Dewatering

Shallow perched water was encountered in most of the explorations. We recommend conducting earthwork during relatively dry periods of the year (June through October) to minimize the need for temporary dewatering.

Based on the hydrogeologic conditions described in Section 3.3 and based on the assumption that excavations will not extend into the advance outwash encountered in MW-2, we do not anticipate an active dewatering system will be required to dewater the excavation. Unless there is a need for complete dewatering due to proposed construction methods, we recommend the use of sumps and pumps to control water from inside the excavations. The estimated horizontal inflow rates of perched groundwater into the wetland excavation during the months of August and September is approximately 29 gallons per minute (gpm) using the best estimate for the Site hydraulic conductivity value (K). For additional details on the estimated horizontal inflow rates of perched

groundwater, including the variability of flowrate with time or year and K values, refer to the water balance calculations detailed in Aspect's technical memorandum (Aspect, 2014).

We anticipate that the dewatering system will be contractor designed. This information is intended to provide information on the recommended method of dewatering and other information to help assess project constructability and costs.

Pumps and Sumps – Temporary sumps with submersible pumps are often used inside of the excavation to control residual seepage and stormwater. The placement of sumps is usually determined on an as-needed basis by the contractor, and the location and number of sumps are often changed as the excavation is advanced.

Temporary sumps are often constructed by placing a short section of perforated corrugated steel pipe (or surplus 8- to 12-inch well screen) in a small hole excavated to approximately 3 to 5 feet below excavation subgrade. The annular space around the pipe is backfilled with drain rock, with several inches placed inside the casing to help control the pumping of fines. Submersible pumps are then placed inside the casing and connected to a central discharge pipe.

The spacing of the wells and sumps for these methods is determined by the permeability and heterogeneity of the geologic conditions, including the consideration of any significant hydraulic boundaries.

Discharge of dewatering flow should be conducted in accordance with applicable regulations. It is our understanding that discharge to a local sanitary sewer is not an option. Discharge options include on-site infiltration or direct discharge to local surface water bodies. Direct discharge to any surface water body would require authorization from the Washington State Department of Ecology (Ecology) under the Construction Stormwater General Permit. Discharge water quality must meet Ecology's Water Quality Standard for Surface Waters requirements. If there are exceedances of the criteria, water may require treatment prior to discharge.

The discharge authorization will be provisioned for turbidity and pH. Therefore, on-site baffled storage tanks will be required to reduce settable solids prior to final discharge. The permit(s) will include requirements for monitoring, which may include occasional analytical testing for dissolved constituents and routine field measurements of turbidity and pH.

4.6 Pedestrian Bridge Foundations

Technically viable geotechnical options exist to support pedestrian bridges that may be included in the design. In most locations it should be feasible to utilize shallow foundations that are placed directly on the weathered/unweathered melt-out till or recessional outwash or placed on structural fill that extends to the weathered/unweathered melt-out till or recessional outwash. With the exception of TP-13 and V-06, the depth to melt-out till or recessional outwash is less than 7 feet. Alternative foundations recommendations can be provided if shallow foundations are not feasible.

4.6.1 Shallow Foundations

Based on the results of the subsurface explorations and our geotechnical analyses, shallow foundations may be used to support potential pedestrian bridges under two scenarios:

1. The foundations are founded directly on weathered/unweathered melt-out till or recessional outwash.
2. The foundations are founded on structural fill that extends to the weathered/unweathered melt-out till or recessional outwash after removal of the fill and alluvial soils. The structural fill should extend at least 2 feet horizontally beyond the footprint of the foundation.

We recommend a maximum allowable bearing pressure of 2,000 pounds per square foot (psf). The recommended maximum allowable bearing pressures may be increased by 1/3 for short-term transient loading conditions, such as wind or seismic loading.

Assuming construction is accomplished as recommended herein, we estimate total settlement of shallow footings of less than about 1 inch and differential settlement between two adjacent load-bearing components supported on competent soil of less than about ½-inch. We anticipate that the majority of the estimated settlement will occur during construction as the loads are applied. If the anticipated settlements are too large, a reduced bearing capacity should be used. We can provide different design bearing capacities for different settlement criteria as needed.

Wind, earthquakes, and unbalanced earth loads will subject the proposed structures to lateral forces. Lateral forces on a structure will be resisted by a combination of sliding resistance of its base or footing on the underlying soil and passive earth pressure against the buried portions of the structure. For use in design, an allowable coefficient of friction of 0.33 may be assumed along the interface between the base of the footing and subgrade soils. An allowable passive earth pressure value of 260 pounds per cubic foot (pcf) may be assumed in design, provided footings are cast directly against relatively undisturbed native soils or structural fill. The recommended coefficient of friction and passive earth pressure values include a safety factor of about 1.5.

All bearing surfaces should be trimmed neat and the bottom of the excavation should be carefully prepared. All loose or softened soil should be removed from the bearing surface prior to placing reinforcing steel bars. We recommend that all bearing surfaces be observed by the Geotechnical Engineer prior to placing steel and concrete, to verify that an appropriate bearing stratum has been exposed and that the bearing surface has been properly prepared.

Any unsuitable subgrade soils should be overexcavated to a relatively firm and unyielding subgrade and replaced with structural fill. Below-grade structures such as manholes should be underlain by a 12-inch minimum layer meeting the requirements for Class A Gravel Backfill for Foundations Section 9-03.12(1)A of the Standard Specifications, compacted to a firm and unyielding condition.

If bearing surfaces are open during periods of wet weather or prone to wetness due to the relatively shallow groundwater across the Site, temporary dewatering will be necessary

and it may be helpful to provide a layer of crushed rock or gravel to help preserve the subgrade. If gravel is used to protect the bearing surface subgrade, it should meet the gradation requirements for Class A Gravel Backfill for Foundations, as described in Section 9-03.12(1)A of the WSDOT Standard Specifications.

4.6.2 Pin Pile Foundations

For locations where it is not practical to construct pedestrian bridges on shallow foundations, 2-inch diameter pin piles are a possible solution. The 2-inch-diameter driven pin piles are typically driven to refusal using a 90-pound pneumatic hammer. Refusal is defined as less than 1 inch of penetration into the ground during 1 minute of continuous driving with the 90-pound pneumatic hammer.

When driven to refusal, each pin pile can support a maximum allowable vertical load of 4,000 pounds. We recommend a minimum of four pin piles be installed at each bridge end. Vertical pin piles should be utilized for compressive support only.

4.6.3 Scour Protection

The design scour elevation will be determined by the project design team based on a hydraulic analysis utilizing stream flow data and the proposed stream bank characteristics. If shallow foundations are used for the proposed bridges, we recommend the foundations extend a minimum of 2 feet below the design scour elevation or are otherwise protected from scour. We recommend scour protection be incorporated in the project design. Scour protection may include hard or soft armoring of the creek banks, specific stream alignment considerations, or other methods.

4.7 Forebay Liner Recommendations

Before field explorations were conducted it was unknown if a forebay liner would be needed. Although some of the soils in the area are relatively permeable, perched water was identified at depths of 2 to 3 feet below the ground surface in the area of the proposed forebay. Perched groundwater would likely pond in the forebay during much of year, although the level of perched groundwater may decline during dry parts of the year.

Subsequent water balance analyses (Aspect, 2014) indicate the estimated minimum standing water level in the forebay area is slightly below that is required to maintain standing water year-round, as specified by the Washington Department of Ecology. Therefore, we recommend specifying a liner in the forebay to ensure this requirement is met. The specified liner should extend along the bottom of the forebay only and not along the sidewalls where inflow is expected to occur. This recommendation is made based on conservative inflow assumptions in the forebay area. If more favorable inflow conditions are revealed at the time of construction, it could be justifiable to omit a liner for the forebay. The construction contract should reflect this possibility.

We recommend two liner alternatives; a low permeability soil barrier (LPSB) or a membrane high density polyethylene (HDPE)/polyvinyl chloride (PVC) liner. A LPSB will have less complications during maintenance, but will require specialty construction and performance testing. Minor upward groundwater flow and gradient is anticipated from the lower confined aquifer; however, it is insignificant enough that both liner alternatives are viable.

4.7.1 LPSB

The on-site soils may be amended with powdered bentonite to create a LPSB. Amendment of the on-site soils could be done with a pug mill or other equivalent mixing facility. For planning purposes, a 12-inch thick LPSB should be anticipated with a target maximum hydraulic conductivity on the order of $1x10^{-5}$ centimeters per second (cm/sec). The LPSB should be compacted to at least 90 percent of MDD as determined by ASTM D-1557 (Modified Proctor). The base of the excavation should be kept dry during placement of the LPSB to ensure that proper compaction can be achieved. Additional hydraulic conductivity testing would be needed to determine the amount of bentonite amending of the native soils required to meet the above criteria.

4.7.2 Membrane Liner

Membrane liners may consist of a HDPE or PVC product. The membrane liners should be specified and installed in accordance with the appropriate manufacturer's recommendations.

5 Additional Services

We recommend that Aspect be retained to review the 100 percent design drawings to determine if our recommendations are appropriate and sufficient and to verify that the recommendations presented herein have been interpreted and implemented as intended. In addition, Aspect should be retained to provide sufficient geotechnical monitoring, testing and consultation during construction to review the geotechnical aspects of Contractor submittals (dewatering, shoring, fill materials, as applicable), confirm that the conditions encountered are consistent with those indicated by explorations, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated.

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Limitations

Work for this project was performed for Parametrix, Inc. and Kitsap County (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Vicinity Map

Duwe'iq Stormwater Treatment Facility
Silverdale, Washington

Aspect CONSULTING	MAY-2013	BY: JSK / HRL	FIGURE NO.
	PROJECT NO. 140203	REV BY: - - -	1

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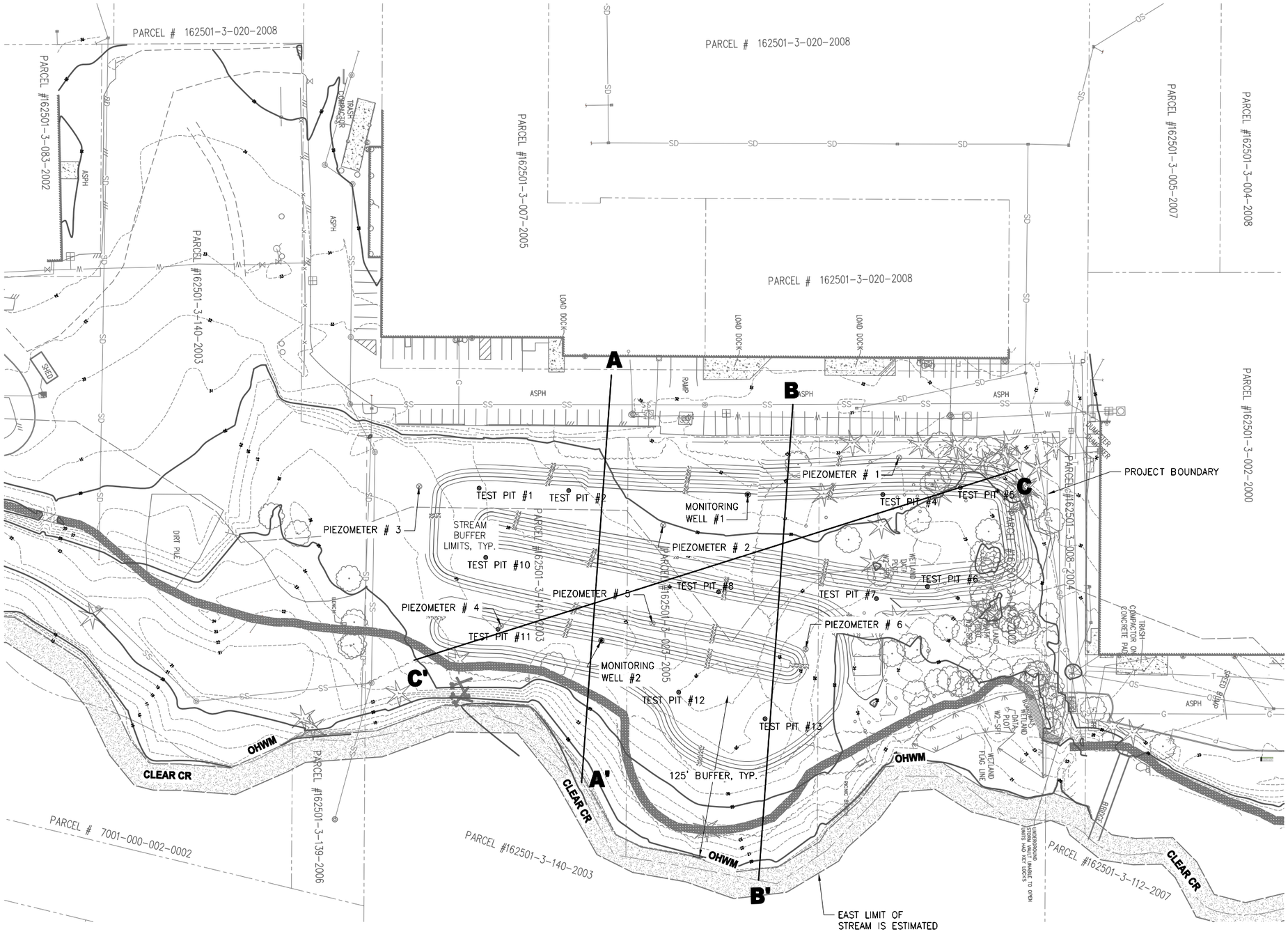


EXPLORATION KEY

MONITORING WELL #1 = MW-1
PIEZOMETER #1 = V-1
TEST PIT #1 = TP-1

EXISTING CONDITIONS PLAN

SCALE IN FEET

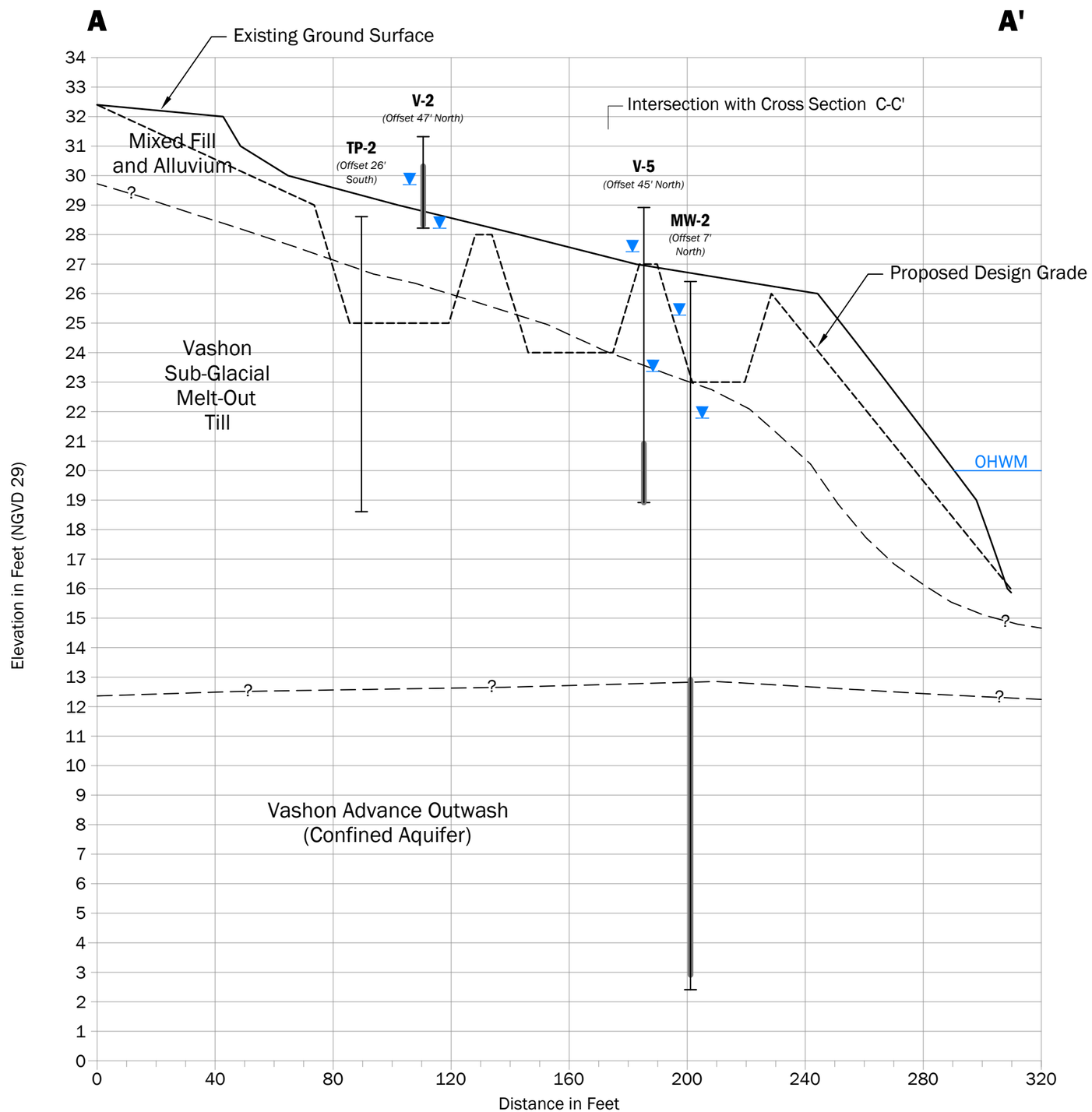
0 40 80

BASE MAP PROVIDED BY PARAMETRIX.

Site and Exploration Map

Duwe'iq Stormwater Treatment Facility
Silverdale, Washington

Aspect CONSULTING	JUN-2014	BY: JB/SCC	FIGURE NO.
	PROJECT NO. 140203	REVISED BY: -	2



Legend

Exploration Location and ID
(Offset Distance and Direction from Section)

Maximum Groundwater/ Piezometric Elevation

Well Screen Interval

Minimum Groundwater/ Piezometric Elevation

See hydrograph figures for water level date range.

Significant Seepage[1] (> 1 gpm)

OHWM Clear Creek Ordinary High Water Mark

[1] See exploration logs for details.

Horizontal Scale: 1" = 40'
Vertical Scale: 1" = 4'
Vertical Exaggeration 10x

0 40 80
Feet

Geologic Cross Section A-A'
Duwe'iq Stormwater Treatment Facility
Silverdale, Washington

Aspect CONSULTING	JUN-2014	BY: JB/SCC	FIGURE NO.
	PROJECT NO. 140203	REVISED BY: SCC	3

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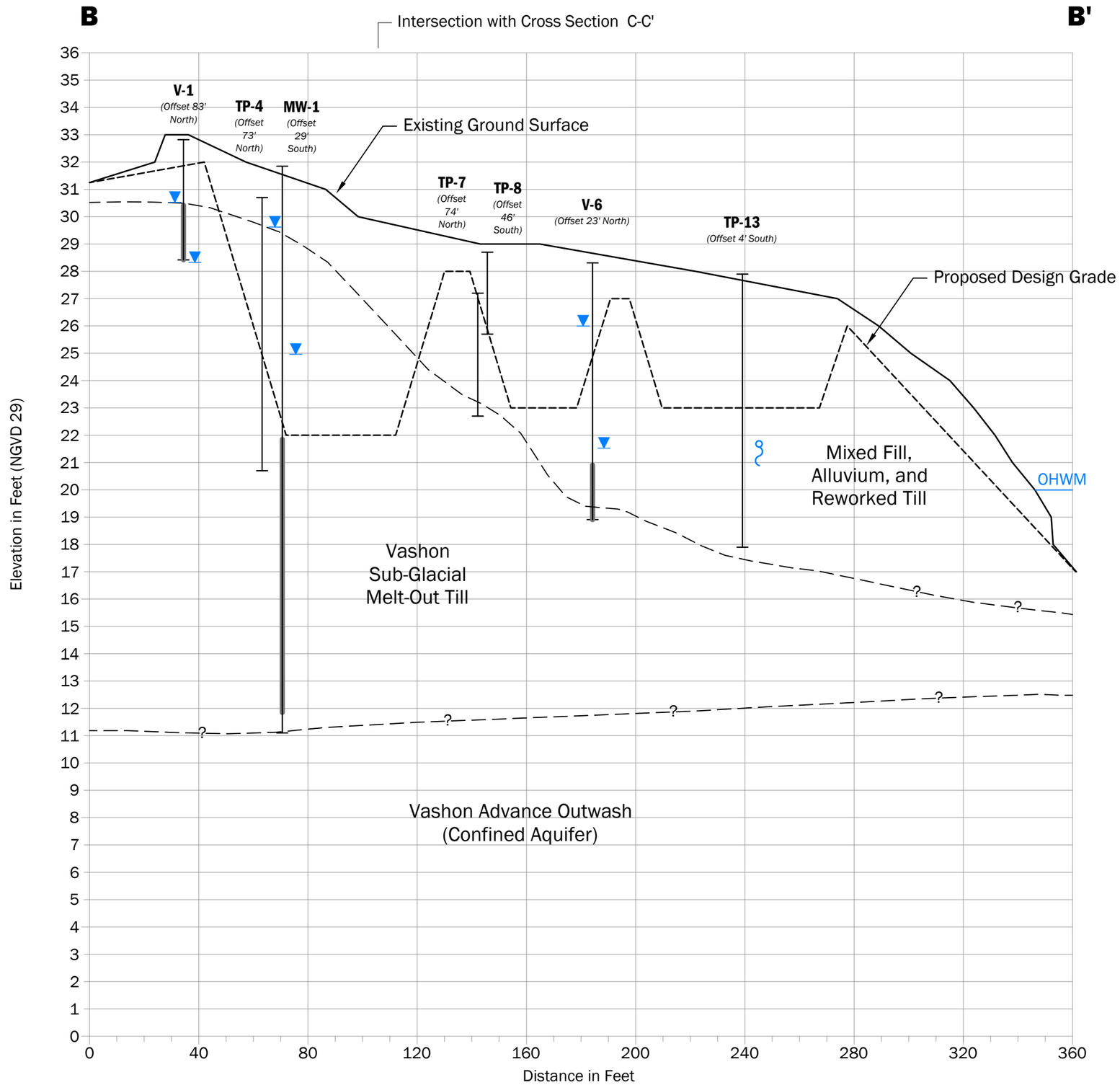

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Exploration Location and ID
(Offset Distance and Direction from Section)

Maximum Groundwater/ Piezometric Elevation

Well Screen Interval

Minimum Groundwater/ Piezometric Elevation

See hydrograph figures for water level date range.

Significant Seepage[1] (> 1 gpm)

OHWM — Clear Creek Ordinary High Water Mark

[1] See exploration logs for details.

Horizontal Scale: 1" = 40'
Vertical Scale: 1" = 4'
Vertical Exaggeration 10x

0 40 80
Feet

Geologic Cross Section B-B'
Duwe'iq Stormwater Treatment Facility
Silverdale, Washington

Aspect CONSULTING	JUN-2014	BY: JB/SCC	FIGURE NO.
	PROJECT NO. 140203	REVISED BY: SCC	4

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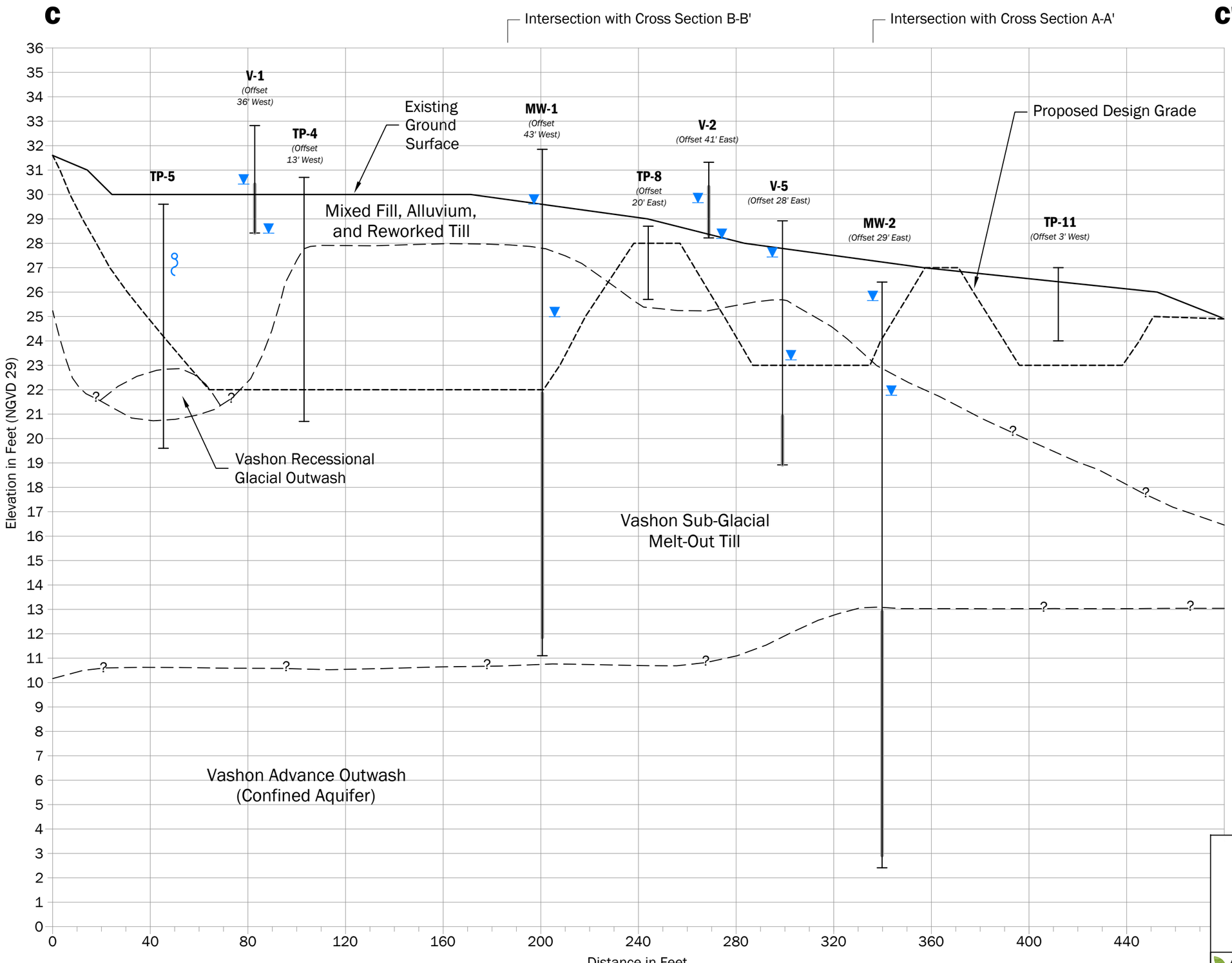

Legend

Exploration Location and ID
(Offset Distance and Direction from Section)

Maximum Groundwater/ Piezometric Elevation

Well Screen Interval

Minimum Groundwater/ Piezometric Elevation

See hydrograph figures for water level date range.

Significant Seepage[1] (> 1 gpm)

[1] See exploration logs for details.

Horizontal Scale: 1" = 40'
Vertical Scale: 1" = 4'
Vertical Exaggeration 10x

0 40 80
Feet

Geologic Cross Section C-C'
Duwe'iq Stormwater Treatment Facility
Silverdale, Washington

Aspect CONSULTING	JUN-2014	BY: JB/SCC	FIGURE NO.
	PROJECT NO. 140203	REVISED BY: SCC	5

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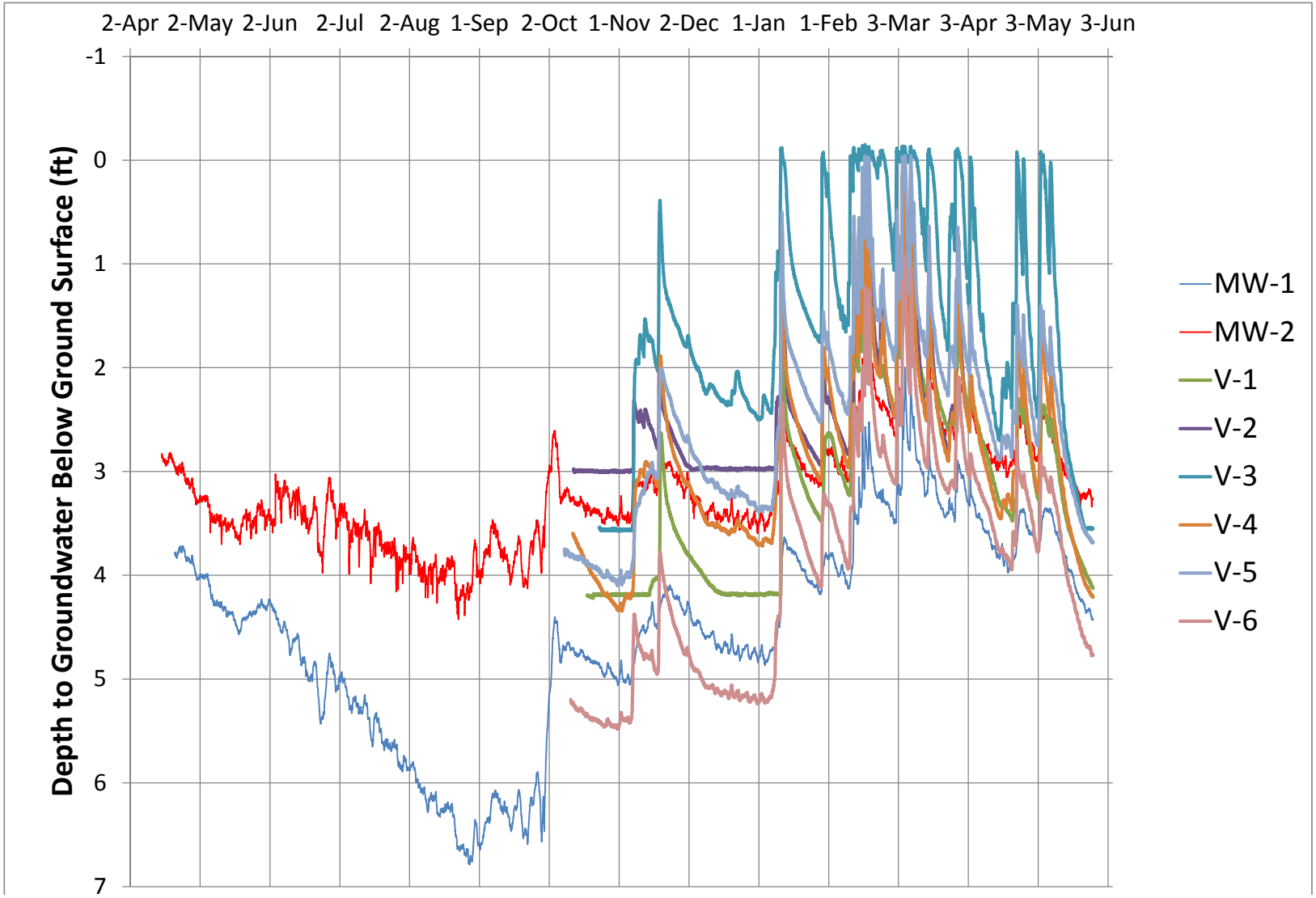
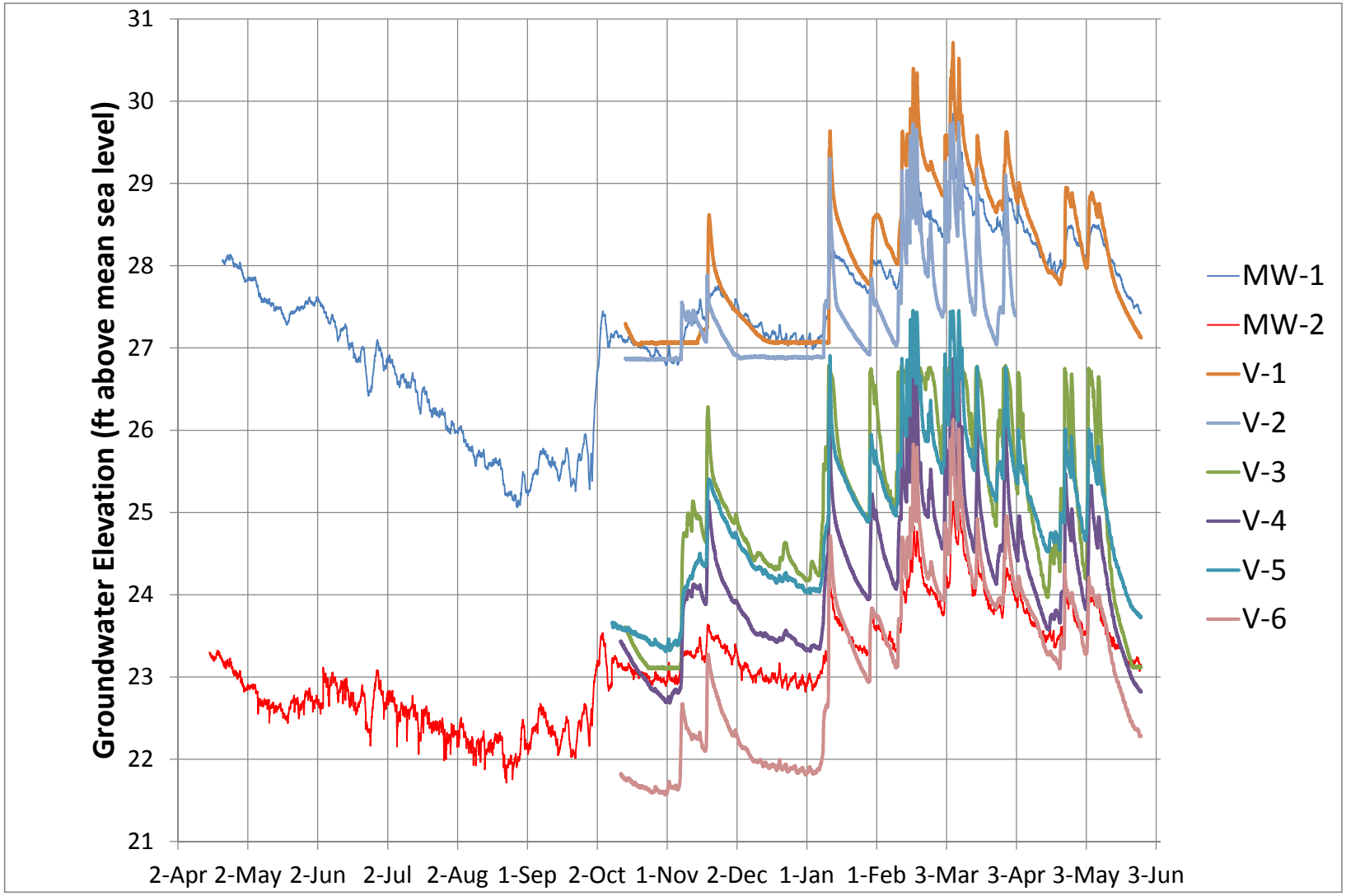


Aspect Consulting
8/18/2014
W:_GEOTECH\140203 Duwe'iq Stormwater\Deliverables\Water Balance Memo\Duwe'iq water level monitoring

Figure 6 - Depth to Groundwater Below Ground Surface
Duwe'iq Stormwater Treatment Facility
Silverdale, Washington



Aspect Consulting
8/18/2014
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Figure 7 - Groundwater Elevations
Duwe'iq Stormwater Treatment Facility
Silverdale, Washinton

APPENDIX A

Field Explorations

A. Field Exploration Program

A.1. Geotechnical Borings

Geotechnical borings MW-1 and MW-2 were drilled using sonic drilling techniques. The wells were installed by Geologic Drill Explorations, Inc. using a track-mounted hollow-stem auger drilling rig. Soil samples were collected using a Standard Penetration Test (SPT) sampler that collects 1.5-inch diameter samples. The number of blows to drive the sampler provides an indication of the soil density. The samples and auger cuttings that emerged at the ground surface were observed and logged by a geologist from Aspect. The locations of the borings are shown on Figure 2. Boring logs of the completed explorations, and a key to the symbols and terms used in the boring logs, are found at the end of this appendix.

In addition to continuous core sampling from the sonic drilling activities, discrete sampling was completed at selected depth intervals using the Standard Penetration Test (SPT) in general accordance with ASTM Method D-1586. This involves driving a 2-inch outside-diameter split-barrel sampler a distance of 18 inches into the soil with a 140-pound hammer free-falling from a distance of 30 inches. The number of blows for each 6-inch interval is recorded and the number of blows required to drive the sampler the final 12 inches is known as the Standard Penetration Resistance (“N”) or blow count. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils.

An Aspect geologist was present throughout the field exploration program to observe the drilling procedure, assist in sampling, and to prepare descriptive logs of the exploration. Soils were classified in general accordance with ASTM D-2488, *Standard Practice for Description and Identification of Soils* (Visual-Manual Procedure). The summary exploration log represents our interpretation of the contents of the field logs. The stratigraphic contacts shown on the individual summary logs represent the approximate boundaries between soil types; actual transitions may be more gradual. The subsurface conditions depicted are only for the specific date and locations reported, and therefore, are not necessarily representative of other locations and times.

A.2. Monitoring Wells

MW-1 and MW-2 were completed as monitoring wells to allow collection of groundwater levels. The wells consist of 10 feet of 2-inch diameter, 20-slot (0.020-inch-wide slots) PVC screen and then solid PVC casing to the ground surface. A sand filter pack consisting of Colorado 10/20 silica sand was placed in the annular space surrounding the well screen and extended at least two feet above the top of the well screen. The annular space above the sand filter pack was filled with bentonite chips to create an annular seal and eliminate the potential for water to travel down the borehole. The chips were hydrated by adding water to the annular space during placement of the

bentonite chips. A concrete surface seal was installed at the ground surface and secured a bolted, watertight, steel, flush-mount surface casing. Details of the monitoring well installations are shown on the summary exploration logs at the end of this Appendix.

The monitoring wells were developed using a bailer to surge the screen and remove water and sediment from the well screen. The objective of well development is to ensure hydraulic communication between the well screen and the surrounding water-bearing formation.

The static groundwater levels in the monitoring wells were determined by making groundwater level measurements before and after well development. Representative groundwater level measurements are shown on the summary logs. Pressure transducers were placed in the wells to record water levels on an hourly frequency over time.

A.3. Geotechnical Test Pits

The test pits were excavated using a track-mounted excavator provided and operated by Kitsap County. An Aspect Consulting representative was present throughout the field exploration program to observe the test pit procedure, assist in sampling, and to prepare descriptive logs of the exploration. Soils were classified in general accordance with ASTM D-2488, *Standard Practice for Description and Identification of Soils* (Visual-Manual Procedure). The summary exploration log represents our interpretation of the contents of the field logs. The stratigraphic contacts shown on the individual summary logs represent the approximate boundaries between soil types; actual transitions may be more gradual. The subsurface conditions depicted are only for the specific date and locations reported, and therefore, are not necessarily representative of other locations and times.

A.4. Vactor Explorations

Vactor explorations were excavated using a vactor truck and crew provided by Kitsap County. The approximate locations of the vactor explorations are shown on Figure 1 in the main body of the report. Boring logs of the completed explorations, and a key to the symbols and terms used in the boring logs, are found in this appendix.

Discrete sampling was completed at 1- to 3-foot depth intervals using a hand auger. An Aspect staff member was present throughout the field exploration program to observe the Vactor excavations, conduct soil sampling, and to prepare descriptive logs of the exploration. Soils were classified in general accordance with ASTM D-2488, *Standard Practice for Description and Identification of Soils* (Visual-Manual Procedure). The summary exploration log represents our interpretation of the contents of the field logs. The stratigraphic contacts shown on the individual summary logs represent the approximate boundaries between soil types; actual transitions may be more gradual. The subsurface conditions depicted are only for the specific date and locations reported, and therefore, are not necessarily representative of other locations and times.

Coarse-Grained Soils - More than 50% Retained on No. 200 Sieve (1)	Gravels - More than 50% of Coarse Fraction (1) Retained on No. 4 Sieve	≤5% Fines (5)	GW	Well-graded gravel and gravel with sand, little to no fines
			GP	Poorly-graded gravel and gravel with sand, little to no fines
		≥15% Fines (5)	GM	Silty gravel and silty gravel with sand
			GC	Clayey gravel and clayey gravel with sand
	Sands - 50% or More of Coarse Fraction (1) Passes No. 4 Sieve	≤5% Fines (5)	SW	Well-graded sand and sand with gravel, little to no fines
			SP	Poorly-graded sand and sand with gravel, little to no fines
		≥15% Fines (5)	SM	Silty sand and silty sand with gravel
			SC	Clayey sand and clayey sand with gravel
Fine-Grained Soils - 50% or More Passes No. 200 Sieve (1)	Silts and Clays Liquid Limit Less than 50		ML	Silt, sandy silt, gravelly silt, silt with sand or gravel
			CL	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay
			OL	Organic clay or silt of low plasticity
	Silts and Clays Liquid Limit 50 or More		MH	Elastic silt, clayey silt, silt with micaceous or diato-maceous fine sand or silt
			CH	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel
			OH	Organic clay or silt of medium to high plasticity
Highly Organic Soils			PT	Peat, muck and other highly organic soils

Terms Describing Relative Density and Consistency

Coarse-Grained Soils

Density	SPT (2) blows/foot
Very Loose	0 to 4
Loose	4 to 10
Medium Dense	10 to 30
Dense	30 to 50
Very Dense	>50

Fine-Grained Soils

Consistency	SPT (2) blows/foot
Very Soft	0 to 2
Soft	2 to 4
Medium Stiff	4 to 8
Stiff	8 to 15
Very Stiff	15 to 30
Hard	>30

Test Symbols

FC = Fines Content
G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Consolidation
DD = Dry Density
K = Permeability
Str = Shear Strength
Env = Environmental
PiD = Photoionization Detector

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

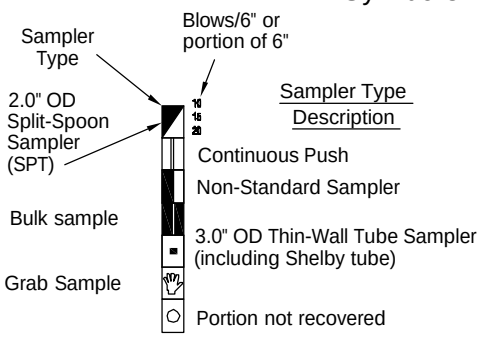
(3) Estimated Percentage

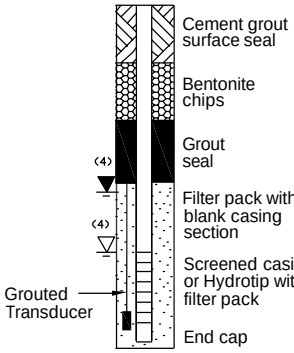
Percentage by Weight	Modifier
<5	Trace
5 to 15	Slightly (sandy, silty, clayey, gravelly)
15 to 30	Sandy, silty, clayey, gravelly)
30 to 49	Very (sandy, silty, clayey, gravelly)

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols





(1) Percentage by dry weight
(2) (SPT) Standard Penetration Test (ASTM D-1586)
(3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)
(4) Depth of groundwater
(5) Combined USCS symbols used for fines between 5% and 15% as estimated in General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)

▽ ATD = At time of drilling
▼ Static water level (date)
BGS = below ground surface

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

Aspect CONSULTING

Exploration Log Key

DATE:
DESIGNED BY:
DRAWN BY:
REVISED BY:

PROJECT NO.

FIGURE NO.
A-1

Q:_ACAD Standards\Standard Details\Exploration Log Key A1.dwg

Boring Log

Aspect CONSULTING

Project Number	Boring Number	Sheet
140203	MW-1	1 of 1

Project Name: Duwe'iq Stormwater
Location: Silverdale, WA
Driller/Equipment: Geologic Drill Explorations, Inc / HSA (9" OD, 4.25" ID)
Drilling Method/Hammer: SPT (2" OD, 1.5" ID) / 140 lb / 30"

Ground Surface Elev (ft): ~32
Depth to Water (ft BGS): 6.2
Start/Finish Date: 4/15/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	Blows/ 6"	Blows/foot ▲ Water Content % ● (0 10 20 30 40 50)	Material Type	Description	Depth (ft)
	Flush monument set in concrete						**>SOD AND TOPSOIL**	
							MIXED FILL AND ALLUVIUM	
	Hydrated bentonite chips	S-1		5 28 50/6"			**WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL** Very dense, very moist, yellow red and brown, sandy GRAVEL (GP); round to subround fine gravel, fine to coarse sand, trace silt	
5		S-2		27 50/5"			Very dense, slightly moist, brown, slightly sandy, very silty GRAVEL (GM); subround fine gravel, predominantly fine sand	5
	4/16/13						**VASHON SUB-GLACIAL MELT-OUT TILL** Very dense, slightly moist, gray blue to light gray, slightly sandy, very silty GRAVEL with cobbles (GM); gray purple fine subround gravel (Drill rig broke shear pins on a cobble at 5' BGS)	
		S-3		34 50/5"			Becomes gray purple to light gray; fine to coarse round to subangular gravel, fine to coarse sand - predominantly fine sand	
	10-20 sand filter pack							
10		S-4	G	22 37 50/6"			Becomes slightly moist to moist	10
	20-slot PVC screen 4/15/13							
		S-5		28 50/5"			Very dense, very moist to wet, gray purple to gray blue, sandy GRAVEL (GP); subround to subangular fine gravel and fine to coarse sand, trace silt	
15		S-6	G	50/6"			Very dense, slighlty moist to moist, gray purple to light gray, silty, gravelly SAND (SM); fine to coarse round to subangular gray blue to gray purple gravel, fine to coarse sand - predominantly fine sand Becomes sandy	15
		S-7		42 50/3"			Trace fine to medium dark brow to red brown gravel with iron oxidation spots	
20	PVC end-cap	S-8		38 50/3"			Very dense, very moist to wet, gray blue to gray purple, sandy GRAVEL (GP); fine subround gray blue gravel, fine to coarse subround sand	20
							Very dense, slighlty moist to moist, gray purple to light gray, sandy, silty GRAVEL (GM); fine to coarse round to subangular gray blue to gray purple gravel, fine to coarse sand - predominantly fine sand	
							Bottom of boring at 20.75' BGS	
25								25

Sampler Type:
- ○ No Recovery
- ◩ Standard Penetration Test (ASTM D1586)

Drilling Method:
HSA: Hollow Stem Auger
MR: Mud Rotary

Logged by: JB
Approved by: HHH
Figure No. A - 2

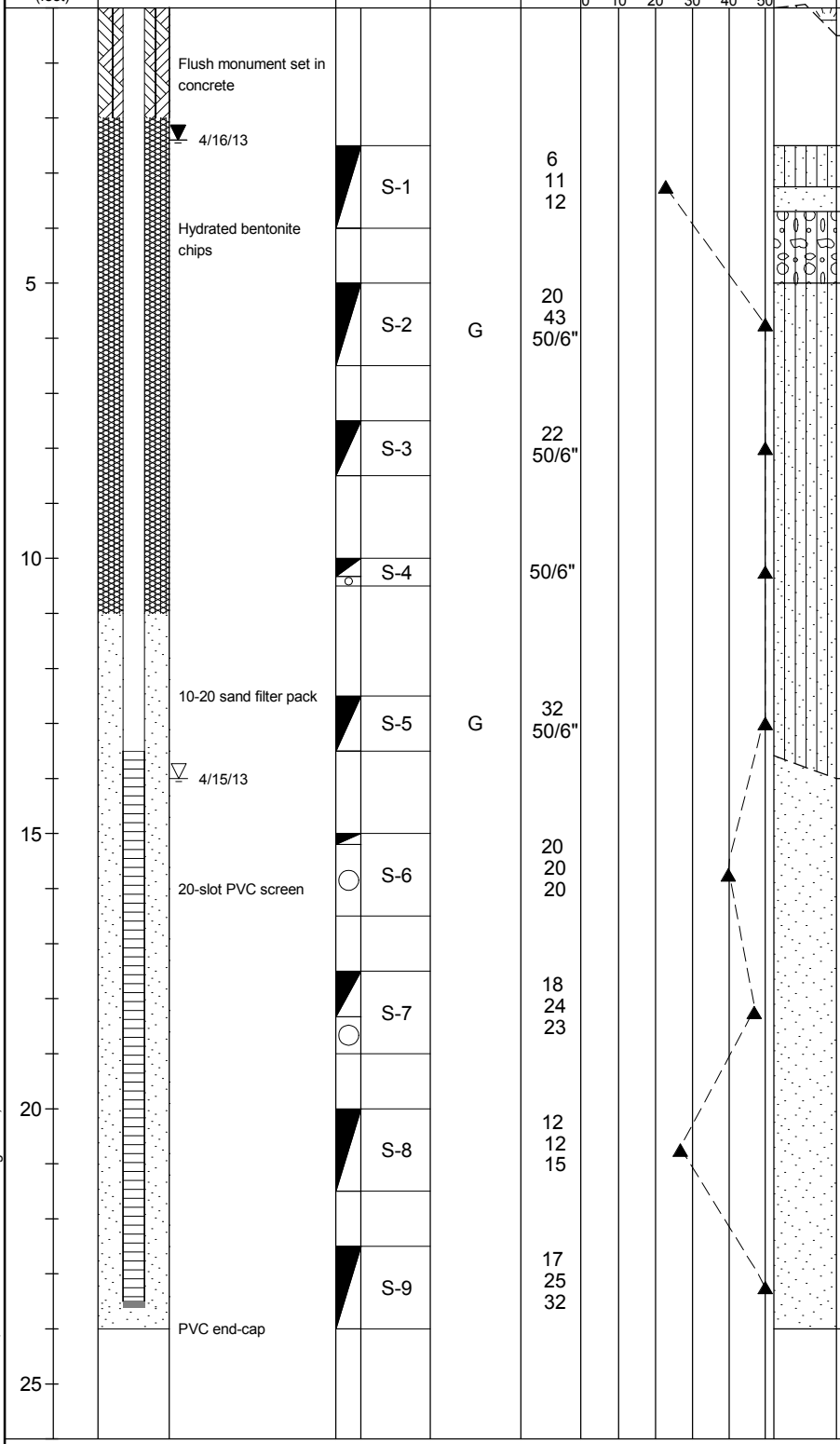
Boring Log

Aspect CONSULTING

Project Number	Boring Number	Sheet
140203	MW-2	1 of 1

Project Name: Duwe'iq Stormwater
Location: Silverdale, WA
Driller/Equipment: Geologic Drill Explorations, Inc / HSA (9" OD, 4.25" ID)
Drilling Method/Hammer: SPT (2" OD, 1.5" ID) / 140 lb / 30"

Ground Surface Elev (ft): ~27
Depth to Water (ft BGS): 2.4
Start/Finish Date: 4/15/2013



Depth / Elevation (feet)	Description	Depth (ft)
	SOD AND TOPSOIL	
	MIXED FILL AND ALLUVIUM	
	Medium dense, wet, yellow red, silty SAND (SM); fine sand, iron oxide staining, trace organics	
	Medium dense, very moist, brown gray, slightly gravelly SAND (SP); fine sand - dark and light grains, fine subround gravel	
	WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL	
	Medium dense, moist, gray blue, silty, sandy GRAVEL (GM); scattered oxidation and mottling	5
	VASHON SUB-GLACIAL MELT-OUT TILL	
	Very dense, slightly moist to moist, gray blue to gray purple, gravelly, very silty SAND (SM); fine to coarse gravel and sand - predominantly subround	
	Becomes gray purple	
	With cobbles	
	Becomes moist; rare wood fragments	10
	VASHON ADVANCE OUTWASH	
	Drill action suggests change at 14' BGS	
	Dense, wet, dark gray SAND (SP), fine to medium subround to subangular sand, trace coarse sand, trace silt,	15
	Becomes gray purple, predominantly fine sand - gray purple and white grains	20
	Becomes fine to medium sand, trace subround to subangular coarse sand and fine gravel	
	Bottom of boring at 24' BGS	25

Sampler Type:
- ○ No Recovery
- ◩ Standard Penetration Test (ASTM D1586)

Drilling Method:
HSA: Hollow Stem Auger
MR: Mud Rotary

Logged by: JB
Approved by: HHH
Figure No. A - 3

GEOTECH BORING LOG DUWEIQ STORMWATER.GPJ August 18, 2014

Exploration/Test Pit

Aspect CONSULTING

Project Number	Exploration Number	Sheet
140203	TP-01	1 of 1

Project Name: Duwe'iq Stormwater
Ground Surface Elev (ft) ~32
Location: Silverdale, WA
Contractor/Method: Kitsap County / Excavator
Depth to Water (ft BGS)
Sampling Method:
Start/Finish Date 4/17/2013

Depth / Elevation (feet)	Sample Type/ID	Tests/Remarks	PID (ppm)	Material Type	Description	Depth (ft)
					SOD AND TOPSOIL	
					MIXED FILL AND ALLUVIUM Medium dense, wet, brown and gray mottled SAND (SP) mixed with silty, gravelly SAND (SM); predominanlty fine to medium sand, scattered subangular sand, numerous fibrous organics (roots) Seepage and slumping 1'-3' BGS (~0.1 gpm/ft^2)	
					WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL Medium dense, wet, mottled gray and brown, silty, sandy GRAVEL (GM) Becomes dense, slightly moist to moist, brown	
5						5
					VASHON SUB-GLACIAL MELT-OUT TILL Very dense, slightly moist to moist, gray blue, silty, sandy GRAVEL (GM)	
10					Bottom of pit at 9.5' BGS Sidewall slumping from 1'-3' BGS; stable near-vertical sidewalls elsewhere	10
15						15

Sampler Type:
No Recovery

PID - Photoionization Detector (Headspace Measurement)
Static Water Level
Water Level (ATD)
Groundwater Seepage (ATD)

Logged by: JB
Approved by: HHH
Figure No. A - 4

Exploration/Test Pit

Aspect CONSULTING

Project Number	Exploration Number	Sheet
140203	TP-02	1 of 1

Project Name: Duwe'iq Stormwater
Location: Silverdale, WA
Contractor/Method: Kitsap County / Excavator
Sampling Method:

Ground Surface Elev (ft) ~32
Depth to Water (ft BGS)
Start/Finish Date 4/17/2013

Depth / Elevation (feet)	Sample Type/ID	Tests/Remarks	PID (ppm)	Material Type	Description	Depth (ft)
					TOPSOIL AND SOD	
					MIXED FILL AND ALLUVIUM Loose, moist, red brown, silty, gravelly SAND (SM); numerous fibrous organics (grass roots), 1.5' diameter boulder at 0.5'-2' BGS	
					Loose, wet, light gray and brown, slightly silty, very sandy GRAVEL (GW-GM); well-graded fine to coarse round to subround gravel, predominantly fine sand, numerous fibrous organics (grass roots) to 2' BGS Seepage and slumping 1'-3' BGS (~0.5-0.1 gpm/ft^2)	
					WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL Dense, slightly moist, light gray, silty, sandy GRAVEL (GM); scattered iron-oxide staining Becomes very dense	
5						5
					VASHON SUB-GLACIAL MELT-OUT TILL Very dense, slighlty moist, gray blue, silty, sandy GRAVEL (GM)	
10					Bottom of pit at 10' BGS Sidewall slumping from 1'-3' BGS; stable near-vertical sidewalls elsewhere	10
15						15

Sampler Type:
No Recovery

PID - Photoionization Detector (Headspace Measurement)
Static Water Level
Water Level (ATD)
Groundwater Seepage (ATD)

Logged by: JB
Approved by: HHH
Figure No. A - 5

Exploration/Test Pit

Aspect CONSULTING

Project Number	Exploration Number	Sheet
140203	TP-04	1 of 1

Project Name: Duwe'iq Stormwater
Location: Silverdale, WA
Contractor/Method: Kitsap County / Excavator
Sampling Method:

Ground Surface Elev (ft) ~32
Depth to Water (ft BGS)
Start/Finish Date 4/17/2013

Depth / Elevation (feet)	Sample Type/ID	Tests/Remarks	PID (ppm)	Material Type	Description	Depth (ft)
					SOD AND TOPSOIL	
					ALLUVIUM Loose, moist, red brown to brown, silty SAND (SM); fine sand, numerous fibrous organics (roots and wood fragments), trace coarse sand and fine gravel; lenses of sandy SILT (ML), trace clay Becomes wet Seepage and slumping on contact at 2.5' BGS (<0.01 gpm/ft^2)	
		Seepage			**WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL** Medium dense, very moist, light gray, silty, sandy GRAVEL with cobbles (GM) Becomes very dense, moist	
5						5
					VASHON SUB-GLACIAL MELT-OUT TILL Grades to very dense, moist to very moist, light gray to blue gray, slightly silty to silty, very sandy GRAVEL (GP-GM); poorly graded gravel, less cohesive than unit above	
10					Bottom of pit at 10' BGS Sidewall slumping at 2.5' BGS; stable near-vertical sidewalls elsewhere	10
15						15

Sampler Type:
No Recovery

PID - Photoionization Detector (Headspace Measurement)
Static Water Level
Water Level (ATD)
Groundwater Seepage (ATD)

Logged by: JB
Approved by: HHH
Figure No. A - 6

Exploration/Test Pit

Aspect CONSULTING

Project Number	Exploration Number	Sheet
140203	TP-05	1 of 1

Project Name: Duwe'iq Stormwater
Location: Silverdale, WA
Contractor/Method: Kitsap County / Excavator
Sampling Method:

Ground Surface Elev (ft) ~32
Depth to Water (ft BGS) 5.5
Start/Finish Date 4/17/2013

Depth / Elevation (feet)	Sample Type/ID	Tests/Remarks	PID (ppm)	Material Type	Description	Depth (ft)
					WOODY DEBRIS AND TOPSOIL	
		G			**ALLUVIUM** Loose, moist, gray and brown mottled, slightly silty SAND (SP-SM); fine sand, trace fibrous organics (roots and wood fragments) Becomes wet, gray and brown Seepage and slight slumping 2-3' BGS (~0.5-1.5 gpm/ft^2)	
		G			Medium dense, very moist, light gray, silty SAND (SM); trace gravel, scattered iron-oxide staining	
5						5
					Medium dense, moist to very moist, light gray to gray slightly gravelly SAND (SP); predominantly fine sand, fine gravel in layers, trace medium to coarse sand Seepage and slumping 5.5'-6' BGS (~0.1 gpm/ft^2)	
		G			Medium dense, very moist, light gray, silty SAND (SM); trace gravel scattered iron-oxide staining	
		G			**VASHON RECESSIONAL GLACIAL OUTWASH** Medium dense to dense, wet, gray, very gravelly SAND (SW); fine to coarse well-graded sand and gravel with cobbles and up to 2' diameter boulders, predominanlty subround gravel and cobbles, subangular to subround sand, trace silt Seepage and major slumping 7'-9' BGS (~0.1 gpm/ft^2)	
					VASHON SUB-GLACIAL MELT-OUT TILL Very dense, moist, gray blue, silty, very sandy GRAVEL (GM)	
10						10
					Bottom of pit at 10' BGS Combined wall seepage into bottom of pit ~2-5 gpm Sidewall slumping from 2'-3', 5.5'-6', and 7'-9' BGS	
15						15

Sampler Type:
No Recovery

PID - Photoionization Detector (Headspace Measurement)
Static Water Level
Water Level (ATD)
Groundwater Seepage (ATD)

Logged by: JB
Approved by: HHH
Figure No. A - 7

Exploration/Test Pit

Aspect CONSULTING

Project Number	Exploration Number	Sheet
140203	TP-06	1 of 1

Project Name: Duwe'iq Stormwater
Location: Silverdale, WA
Contractor/Method: Kitsap County / Excavator
Sampling Method:

Ground Surface Elev (ft) ~30
Depth to Water (ft BGS) 8.5
Start/Finish Date 4/17/2013

Depth / Elevation (feet)	Sample Type/ID	Tests/Remarks	PID (ppm)	Material Type	Description	Depth (ft)
					WOODY DEBRIS AND TOPSOIL	
					ALLUVIUM Loose, moist to very moist, yellow red to red brown, very silty SAND (SM)	
					Loose, wet, gray and brown SAND (SP); fine sand - light and dark grains Seepage and slumping 2'-2.5' BGS over denser soil (~0.2-0.5 gpm/ft^2) Becomes medium dense, moist to very moist	
5					**VASHON RECESSIONAL GLACIAL OUTWASH** Grades to medium dense, very moist to wet, gray and brown SAND (SW); fine to coarse well-graded sand, trace silt and gravel Thin silty SAND (SM) interbed	5
					VASHON SUB-GLACIAL MELT-OUT TILL Grades to medium dense, very moist, blue gray, silty, sandy GRAVEL (GM)	
					Grades to medium dense, wet, dark brown, sandy GRAVEL with cobbles and boulders (GW); round to subround gravel, cobbles, and up to 2' diameter boulders Seepage and major slumping 8.5'-10' BGS (~0.1 gpm/ft^2)	
10					Medium dense, very moist, gray blue, silty, sandy GRAVEL (GM) Bottom of pit at 10' BGS Sidewall slumping from 2'-2.5' and 8.5'-10' BGS; stable near-vertical sidewalls elsewhere	10
15						15

Sampler Type:
No Recovery

PID - Photoionization Detector (Headspace Measurement)
Static Water Level
Water Level (ATD)
Groundwater Seepage (ATD)

Logged by: JB
Approved by: HHH
Figure No. A - 8

Exploration/Test Pit

Aspect CONSULTING

Project Number	Exploration Number	Sheet
140203	TP-07	1 of 1

Project Name: Duwe'iq Stormwater
Location: Silverdale, WA
Contractor/Method: Kitsap County / Excavator
Sampling Method:

Ground Surface Elev (ft) ~30
Depth to Water (ft BGS)
Start/Finish Date 4/17/2013

Depth / Elevation (feet)	Sample Type/ID	Tests/Remarks	PID (ppm)	Material Type	Description	Depth (ft)
					WOODY DEBRIS AND TOPSOIL	
					ALLUVIUM Loose, moist, dark brown, silty SAND (SM); trace to numerous organics (roots)	
					Loose, very moist, gray and brown, slighlty silty SAND (SP-SM); fine sand; grading coarser and less silty with depth	
		G			Loose, very moist, gray and brown SAND (SP); fine to medium sand	
					Loose, wet, gray and brown, slightly silty, slightly gravelly SAND (SP-SM); predominantly coarse sand, poorly graded Seepage and slumping 3.5'-4' BGS (slow seepage because ponded on bottom of pit)	
5					**WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL** Medium dense, moist, brown, silty, sandy GRAVEL (GM)	5
					Bottom of pit at 4.5' BGS Sidewall slumping from 3.5'-4' BGS; stable near-vertical sidewalls elsewhere	
10						10
15						15

Sampler Type:
No Recovery

PID - Photoionization Detector (Headspace Measurement)
Static Water Level
Water Level (ATD)
Groundwater Seepage (ATD)

Logged by: JB
Approved by: HHH
Figure No. A - 9

Exploration/Test Pit

Aspect CONSULTING

Project Number	Exploration Number	Sheet
140203	TP-08	1 of 1

Project Name: Duwe'iq Stormwater
Location: Silverdale, WA
Contractor/Method: Kitsap County / Excavator
Sampling Method:

Ground Surface Elev (ft) ~30
Depth to Water (ft BGS)
Start/Finish Date 4/17/2013

Depth / Elevation (feet)	Sample Type/ID	Tests/Remarks	PID (ppm)	Material Type	Description	Depth (ft)
					SOD AND TOPSOIL	
					MIXED FILL, ALLUVIUM, AND REWORKED TILL	
					2' diameter boulder at 3' BGS	
					Bottom of pit at 3' BGS	
					Stable near-vertical sidewalls	
5						5
10						10
15						15

Sampler Type:
No Recovery

PID - Photoionization Detector (Headspace Measurement)
Static Water Level
Water Level (ATD)
Groundwater Seepage (ATD)

Logged by: JB
Approved by: HHH
Figure No. A - 10

Exploration/Test Pit

Aspect CONSULTING

Project Number	Exploration Number	Sheet
140203	TP-10	1 of 1

Project Name: Duwe'iq Stormwater
Ground Surface Elev (ft) ~30
Location: Silverdale, WA
Contractor/Method: Kitsap County / Excavator
Depth to Water (ft BGS)
Sampling Method:
Start/Finish Date 4/17/2013

Depth / Elevation (feet)	Sample Type/ID	Tests/Remarks	PID (ppm)	Material Type	Description	Depth (ft)
					SOD AND TOPSOIL	
					MIXED FILL AND ALLUVIUM Loose, very moist, dark brown, silty, gravelly SAND (SM); fine to coarse subround gravel, numerous fibrous organics (grass roots)	
					WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL Medium dense, very moist, gray and brown, silty, sandy GRAVEL (GM); grades drier with depth	
5					**VASHON SUB-GLACIAL MELT-OUT TILL** Medium dense to very dense, slightly moist to moist, gray blue, silty, sandy GRAVEL (GM)	5
					Bottom of pit at 4.5' BGS Stable near-vertical sidewalls	
10						10
15						15

Sampler Type:
No Recovery

PID - Photoionization Detector (Headspace Measurement)
Static Water Level
Water Level (ATD)
Groundwater Seepage (ATD)

Logged by: JB
Approved by: HHH
Figure No. A - 11

Exploration/Test Pit

Aspect CONSULTING

Project Number	Exploration Number	Sheet
140203	TP-11	1 of 1

Project Name: Duwe'iq Stormwater
Location: Silverdale, WA
Contractor/Method: Kitsap County / Excavator
Sampling Method:

Ground Surface Elev (ft) ~28
Depth to Water (ft BGS)
Start/Finish Date 4/17/2013

Depth / Elevation (feet)	Sample Type/ID	Tests/Remarks	PID (ppm)	Material Type	Description	Depth (ft)
					SOD AND TOPSOIL	
					MIXED FILL AND ALLUVIUM Loose, moist, red brown, silty SAND (SM) with cobbles; fine sand, numerous fibrous organics (grass roots), trace coarse sand and gravel, less than 5% cobbles, bedding not apparent	
					ALLUVIUM Medium dense to dense, gray and brown SAND (SP); fine to medium sand - 70% light and 30% dark grains	
					Bottom of pit at 3' BGS Stable near-vertical sidewalls	
5						5
10						10
15						15

Sampler Type:
No Recovery

PID - Photoionization Detector (Headspace Measurement)
Static Water Level
Water Level (ATD)
Groundwater Seepage (ATD)

Logged by: JB
Approved by: HHH
Figure No. A - 12

Exploration/Test Pit

Aspect CONSULTING

Project Number	Exploration Number	Sheet
140203	TP-12	1 of 1

Project Name: Duwe'iq Stormwater
Ground Surface Elev (ft) ~27
Location: Silverdale, WA
Contractor/Method: Kitsap County / Excavator
Depth to Water (ft BGS)
Sampling Method:
Start/Finish Date 4/17/2013

Depth / Elevation (feet)	Sample Type/ID	Tests/Remarks	PID (ppm)	Material Type	Description	Depth (ft)
					SOD AND TOPSOIL	
					MIXED FILL, ALLUVIUM, AND REWORKED TILL Loose, moist, dark brown, gravelly, silty SAND (SM)	
					Bottom of pit at 2' BGS Stable near-vertical sidewalls	
5						5
10						10
15						15

Sampler Type:
No Recovery

PID - Photoionization Detector (Headspace Measurement)
Static Water Level
Water Level (ATD)
Groundwater Seepage (ATD)

Logged by: JB
Approved by: HHH
Figure No. A - 13

Exploration/Test Pit

Aspect CONSULTING

Project Number	Exploration Number	Sheet
140203	TP-13	1 of 1

Project Name: Duwe'iq Stormwater
Ground Surface Elev (ft) ~27
Location: Silverdale, WA
Contractor/Method: Kitsap County / Excavator
Depth to Water (ft BGS)
Sampling Method:
Start/Finish Date 4/17/2013

Depth / Elevation (feet)	Sample Type/ID	Tests/Remarks	PID (ppm)	Material Type	Description	Depth (ft)
					SOD AND TOPSOIL	
					FILL, ALLUVIUM, AND REWORKED TILL Loose, moist, dark brown, slightly gravelly, silty SAND (SM); predominantly fine sand, fine to coarse gravel, scattered glass and plastic, numerous fibrous organics (grass roots)	
		G			Metal wire at 3' BGS Becomes medium dense, red brown, gravelly with cobbles	
					Wood debris (3" diameter log or root)	
5					Medium dense, moist, gray brown SAND (SP); fine sand	5
					Medium dense to very dense, wet, light gray to gray, slighlty silty, sandy GRAVEL with cobbles and up to 2' diameter boulders (GW-GM); well-graded fine to coarse gravel, 10-30% cobbles and boulders Seepage and slumping at 6.5' BGS (~2-3 gpm/ft^2 in 2 locations)	
					Loose to medium dense, very moist to wet, gray blue, silty, gravelly SAND (SM) No ponding - all wall seepage draining through bottom of pit	
10					Bottom of pit at 10' BGS Sidewall slumping at 6.5' BGS; stable near-vertical sidewalls elsewhere	10
15						15

Sampler Type:
No Recovery

PID - Photoionization Detector (Headspace Measurement)
Static Water Level
Water Level (ATD)
Groundwater Seepage (ATD)

Logged by: JB
Approved by: HHH
Figure No. A - 14

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
140203	V-01	1 of 1

Project Name:	Duwe'iq Stormwater	Ground Surface Elev.	
Location:	Silverdale, WA	Top of Casing Elev.	
Driller/Method:	Kitsap County / Vactor Truck	Depth to Water (ft BGS)	Not encountered
Sampling Method:		Start/Finish Date	10/8/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
							SOD, BLACKBERRY DEBRIS, AND TOPSOIL	
1	2 inch PVC						**FILL** Loose, moist, red-brown, slightly gravelly, silty SAND (SM); numerous organics to 2 ft	1
2	Crushed rock							2
							Medium dense, moist, light gray with brown mottling, slightly sandy, slightly gravelly SILT (ML); non-plastic	
3							**WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL** Dense, moist, light gray, silty, gravelly SAND (SM) Becomes very dense	3
4								4
							Refusal at 4.4 ft No seepage; no slumping	
5								5
6								6
7								7
8								8
9								9
10								10

Sampler Type:

No Recovery

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: JB

Approved by: HHH

Figure No. A - 15

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
140203	V-02	1 of 1

Project Name:	Duwe'iq Stormwater	Ground Surface Elev.	
Location:	Silverdale, WA	Top of Casing Elev.	
Driller/Method:	Kitsap County / Vactor Truck	Depth to Water (ft BGS)	Not encountered
Sampling Method:		Start/Finish Date	10/8/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
							SOD AND TOPSOIL	
							FILL Medium dense, moist, brown, silty, gravelly SAND (SM); trace organics	
1	2 inch PVC							1
2	Crushed rock							2
3							**WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL** Very dense, gray with brown mottling, silty, gravelly SAND (SM); no organics	3
4							Bottom of boring at 3.1 ft No seepage; no slumping	4
5								5
6								6
7								7
8								8
9								9
10								10

Sampler Type:

No Recovery

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: JB

Approved by: HHH

Figure No. A - 16

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
140203	V-03	1 of 1

Project Name:	Duwe'iq Stormwater	Ground Surface Elev.	
Location:	Silverdale, WA	Top of Casing Elev.	
Driller/Method:	Kitsap County / Vactor Truck	Depth to Water (ft BGS)	Not encountered
Sampling Method:		Start/Finish Date	10/8/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
							SOD AND TOPSOIL	
1	2 inch PVC						**FILL** Medium dense, moist, brown, slightly gravelly, sandy SILT (ML); non-plastic, trace grass roots	1
2	Crushed rock							2
3							**WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL** Dense to very dense, moist, gray, silty, gravelly SAND (SM)	3
4							Bottom of boring at 4 ft No seepage; no slumping	4
5								5
6								6
7								7
8								8
9								9
10								10

Sampler Type:

No Recovery

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: JB

Approved by: HHH

Figure No. A - 17

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
140203	V-04	1 of 1

Project Name:	Duwe'iq Stormwater	Ground Surface Elev.	
Location:	Silverdale, WA	Top of Casing Elev.	
Driller/Method:	Kitsap County / Vactor Truck	Depth to Water (ft BGS)	4.5 ATD
Sampling Method:		Start/Finish Date	10/8/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
							SOD AND TOPSOIL	
							FILL Medium dense, moist, brown, sandy SILT (ML); non-plastic, trace organics	
1	2 inch PVC							1
2	Crushed rock							2
							WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL Very dense, moist, gray, silty, gravelly SAND (SM) with cobbles (15%); scattered pockets of slightly silty SAND (SP-SM)	
3								3
4								4
	▽						~0.1 gpm seepage from 4.5-5 ft; slight slumping	
5							Very dense, moist, gray silty, sandy GRAVEL (GM)	5
6								6
7								7
8								8
9								9
10							Bottom of boring at 10 ft	10

Sampler Type:

○ No Recovery

PID - Photoionization Detector

▼ Static Water Level

▽ Water Level (ATD)

Logged by: JB

Approved by: HHH

Figure No. A - 18

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
140203	V-05	1 of 1

Project Name:	Duwe'iq Stormwater	Ground Surface Elev.	
Location:	Silverdale, WA	Top of Casing Elev.	
Driller/Method:	Kitsap County / Vactor Truck	Depth to Water (ft BGS)	5 and 8.5 ATD
Sampling Method:		Start/Finish Date	10/8/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
							SOD AND TOPSOIL	
							FILL Medium dense, brown, sandy SILT (ML)	
1	2 inch PVC							1
2	Crushed rock							2
3							**WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL** Thin bed slightly silty, gravelly SAND (SP-SM) at 3 ft Very dense, gray-brown, silty, gravelly SAND (SM) with cobbles (10%) and rare boulders	3
4								4
5	▽						Very dense, gray, silty, sandy GRAVEL (GM) with cobbles (10%) and rare boulders ~0.2 gpm seepage from 5-7 ft; no slumping	5
6								6
7								7
8	▽						~0.1 gpm seepage at 8.5 ft; no slumping	8
9								9
10							Bottom of boring at 10 ft	10

Sampler Type:

○ No Recovery

PID - Photoionization Detector

▼ Static Water Level

▽ Water Level (ATD)

Logged by: JB

Approved by: HHH

Figure No. A - 19

Monitoring Well Construction Log

Aspect CONSULTING

Project Number	Well Number	Sheet
140203	V-06	1 of 1

Project Name:	Duwe'iq Stormwater	Ground Surface Elev.	
Location:	Silverdale, WA	Top of Casing Elev.	
Driller/Method:	Kitsap County / Vactor Truck	Depth to Water (ft BGS)	7.5 ATD
Sampling Method:		Start/Finish Date	10/8/2013

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
							SOD, TOPSOIL, AND BLACKBERRY DEBRIS	
							FILL Medium dense, moist, gray, silty, gravelly SAND (SM)	
1	2 inch PVC							1
2	Crushed rock							2
							Becomes brown, trace gravel	
3								3
4								4
							ALLUVIUM Medium dense, moist, light gray SAND (SP); fine sand	
5								5
							Medium dense, moist, gray, slightly silty, gravelly SAND (SP-SM); fine to coarse sand, predominantly fine to medium sand	
6								6
							Medium dense, moist, gray, slightly silty, sandy GRAVEL (GP-GM) with cobbles (15%) ~2 gpm seepage from 7.5-8.5; no slumping	
7								7
8								8
9							**WEATHERED VASHON SUB-GLACIAL MELT-OUT TILL** Very dense, silty, sandy GRAVEL (GM) Refusal at 9.4 ft	9
10								10

Sampler Type:

No Recovery

PID - Photoionization Detector

Static Water Level

Water Level (ATD)

Logged by: JB

Approved by: HHH

Figure No. A - 20

APPENDIX B

Laboratory Testing Results

B. Laboratory Testing Results

Laboratory tests were conducted on selected soil samples to characterize certain engineering (physical) properties of the soils within the Study Area. Laboratory testing included Proctor compaction and grain-size distribution. The laboratory tests were conducted in general accordance with appropriate ASTM test methods. Test procedures are discussed below.

Laboratory Proctor compaction tests were conducted on two soil samples in general accordance with ASTM D-1557 (Modified Proctor) to determine the moisture-density relationship. The grain size distribution of selected samples was analyzed in general accordance with ASTM D-422, *Standard Test Method for Particle-Size Analysis of Soils* without hydrometer determination of fines content.

Table B-1 - In-Place Soil Density Measurements

Testpit	Depth (ft)	Soil Texture	Maximum Dry Density (PCF)	Wet Density (PCF)	Dry Density (PCF)	Moisture Content (%)	Compaction (%)
TP-5	1	Silty fine sand	116	119.9	93.8	27.8	81
TP-5	2	Slightly silty sand	116	134.5	115.2	16.8	99
TP-5	4	Silty sand	116	139.4	120.3	15.9	100[1]
TP-6	2	Fine sand	116	110.1	80.9	36.1	70
TP-6	3	Fine sand	116	129.1	108.9	20.2	94
TP-6	4	Fine sand	116	132.2	111.5	18.5	96
TP-6	6.5	Outwash sand	137	143.7	128.2	12.1	94
TP-7	1	Silty sand	116	96.5	75.1	28.5	65[2]
TP-7	2.5	Slightly silty sand	116	110.1	84.0	31.2	72
TP-7	4	Weathered till	142	136.9	118.4	15.5	83
TP-10	1	Weathered till	142	125.6	101.6	23.6	71
TP-10	2	Weathered till	142	150.2	137.4	9.3	97[3]

(1) High compaction values indicate that Proctor Value is not representative of material and should be discounted.

(2) Low compaction values indicate that Proctor Value is not representative of material and should be discounted.

(3) Material description indicates that native material contains more gravel than the Proctor sample and reported compaction results are likely too high and should be discounted.

Krazan & Associates, Inc.

GEOTECHNICAL ENGINEERING • ENVIRONMENTAL ENGINEERING
CONSTRUCTION TESTING AND INSPECTION

FIELD REPORT NO: 156548

DATE: 17 APRIL 2013
PROJECT #: 106-13060
PROJECT: DUWE'IQ STORMWATER
LOCATION: SILVERDALE
KRAZAN PROJECT MANAGER: JB

CONTRACTOR: ASPECT CONSULTING
JURISDICTION: KITSAP CO
PERMIT #: —
INSPECTOR: PENN SEELY
WEATHER: O'CAST TEMP: 55

RECEIVED FROM CLIENT (2) 5 GAL BUCKETS OF SOIL FOR LABORATORY TESTING. ALSO RECEIVED (4) PINT JARS OF SOIL FOR GRAIN SIZE ANALYSIS.

SAMPLE A: 5 GAL BUCKET LABELED - ASPECT # 130012
✓ ID NO: P31530 P-1-041713
RUN PROCTOR AND SIEVE

SAMPLE B: 5 GAL BUCKET LABELED - ASPECT # 130012
✓ ID NO: P31529 TP-5, P-2-0417
RUN PROCTOR AND SIEVE

SAMPLE C: PINT JAR - MW1, 10-11.5
✓ ID NO: 31552 GRAIN SIZE

SAMPLE D: PINT JAR - MW-1, 15-15.5
✓ ID NO: 31551 GRAIN SIZE

SAMPLE E: PINT JAR - MW2, 5-6.5'
✓ ID NO: 31554 GRAIN SIZE

SAMPLE F: PINT JAR - MW2, @ 11.5
✓ ID NO: 31555 GRAIN SIZE

Equipment/Asset Number(s):

N/A

To the best of my knowledge, the above ~~WAS / WAS NOT~~ performed in accordance with the approved plans, specifications, and regulatory requirements.

Superintendent/Representative: Technician: Penn Seely

This report indicates our inspector's observation and testing results based on the site condition and contractor's activities. This information is subject to review prior to final submittal. By signing this report, our inspector does not accept responsibility for validity of the results. Some information on this report may have been provided by others on site. The information provided on this report is prepared for the exclusive use of the client. This report may not be reproduced in any format without the written permission of the client and Krazan & Assoc.

Krazan & Associates, Inc.

GEOTECHNICAL ENGINEERING • ENVIRONMENTAL ENGINEERING
CONSTRUCTION TESTING AND INSPECTION

FIELD REPORT NO: 156668

DATE: 17 APRIL 2013
PROJECT #: 106 - 13060
PROJECT: DUWELO STORMWATER
LOCATION: SILVERDALE
KRAZAN PROJECT MANAGER: JB

CONTRACTOR: ASPECT
JURISDICTION: KITSAP CO
PERMIT #:
INSPECTOR: PENN SEELY
WEATHER: PARTLY CLOUDY TEMP: 55

ON SITE TO PERFORM IN-PLACE DENSITY TESTS WITH NUCLEAR GAUGE AT VARIOUS LEVELS OF TEST PIT EXCAVATIONS AS DIRECTED BY ASPECT REPRESENTATIVE. THE FOLLOWING IS A SUMMARY OF GAUGE READINGS.

TEST PIT NO.	DEPTH	WET DENSITY P.C.F.	DRY DENSITY P.C.F.	PERCENT MOISTURE
5	1'	119.9	93.8	27.8
5	2'	134.5	115.2	16.8
5	4'	139.4	120.3	15.9
7	1'	96.5	75.1	28.5
7	2.5'	110.1	84.0	31.2
7	4'	136.9	118.4	15.5
10	1'	125.6	101.6	23.6
10	2'	150.2	137.4	9.3
6	2'	110.1	80.9	36.1
6	3'	129.1	108.9	20.2
6	4'	132.2	111.5	18.5
6	6.5'	143.7	128.2	12.1

Equipment/Asset Number(s): TROXLER 3430 SERIAL NO 37080

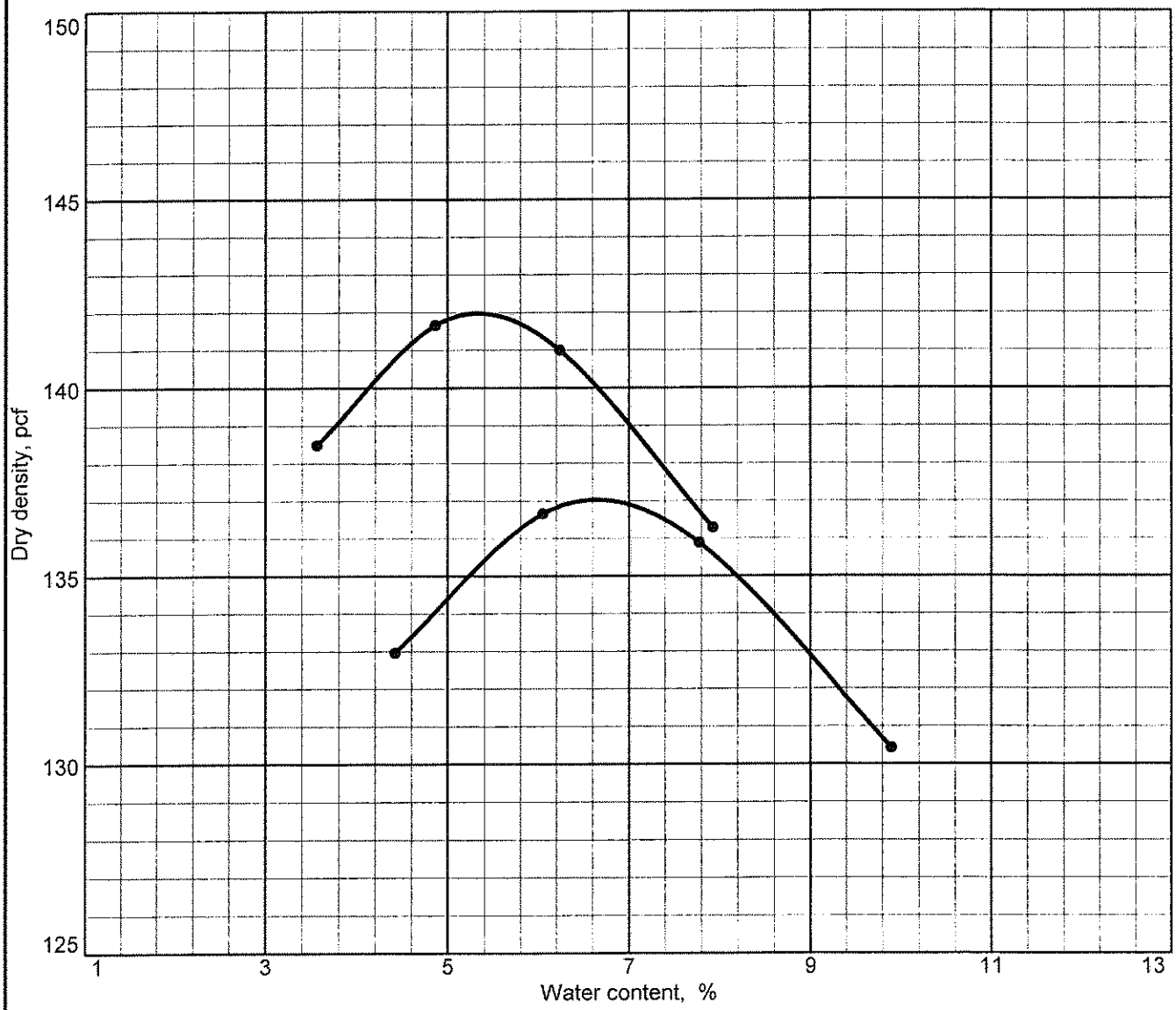
To the best of my knowledge, the above ~~WAS / WAS NOT~~ N/A performed in accordance with the approved plans, specifications, and regulatory requirements.

Superintendent/Representative: _____

Technician: Penn Seely

This report indicates our inspector's observation and testing results based on the site condition and contractor's activities. This information is subject to review prior to final submittal. By signing this report, our inspector does not accept responsibility for validity of the results. Some information on this report may have been provided by others on site. The information provided on this report is prepared for the exclusive use of the client. This report may not be reproduced in any format without the written permission of the client and Krazan & Assoc.

MOISTURE DENSITY ANALYSIS



Test specification: ASTM D 1557-02 Procedure B modified
Oversize correction applied to each point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	SM	A-1-b			NV	NP	20.3	16.8

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 142 pcf	137 pcf	SILTY SAND W/ GRAVEL
Optimum moisture = 5 %	7 %	

Project No. 106-13060 **Client:** ASPECT
Project: SILVERDALE STORM WATER (DUWE'IQ)

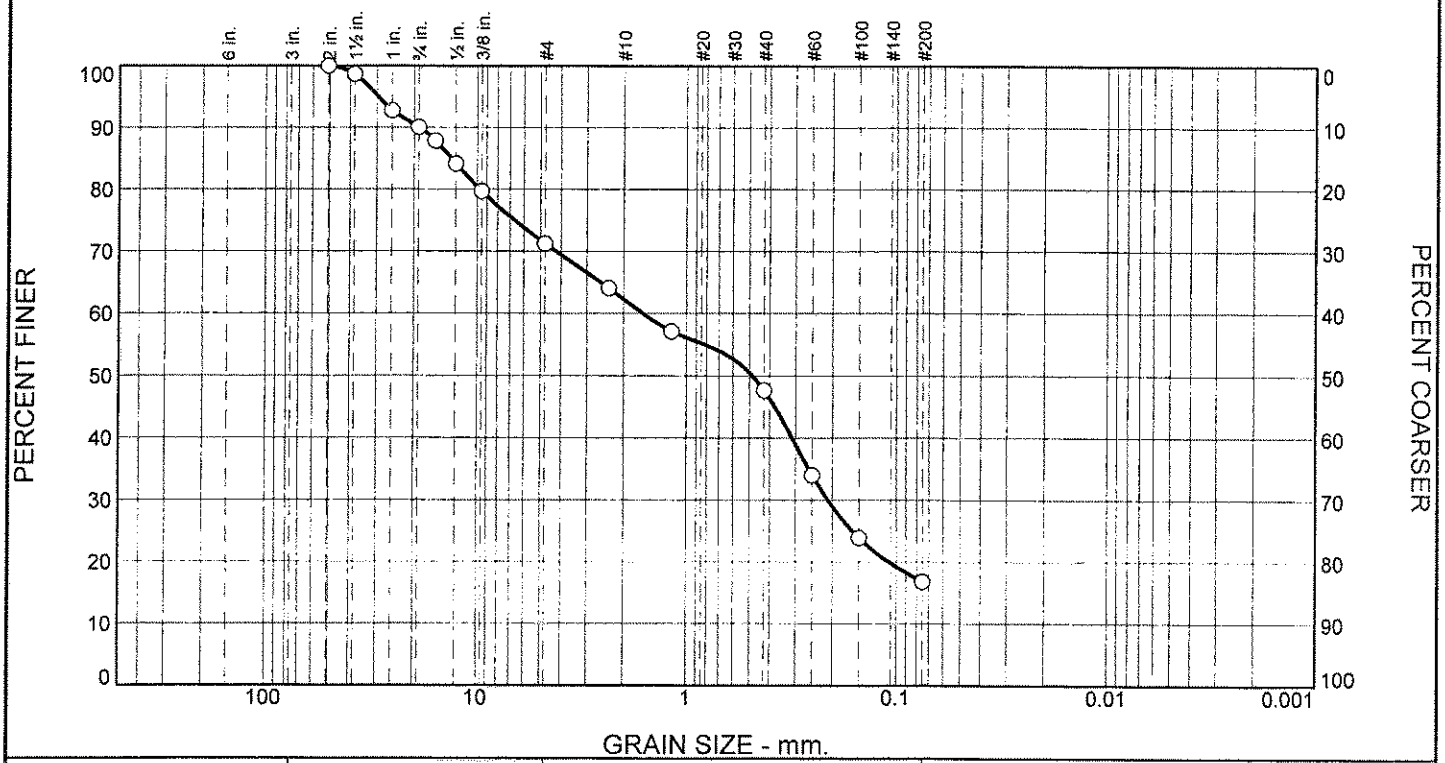
● **Location:** P - 1 041713

Krazan

Remarks:
REPORT:156548; DATE:4-22-13
SAMPLE: P 31530
FIELD DESCRIPTION: NAT TAN SILTY SAND W/ GRAVEL

Figure 4

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.9	18.9	8.9	14.7	30.8	16.8	

Test Results (ASTM C 136 & ASTM C 117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
2	100.0		
1.5	98.7		
1	92.8		
.75	90.1		
.625	87.9		
.5	84.2		
.375	79.7		
#4	71.2		
#8	64.1		
#16	57.1		
#40	47.6		
#60	34.0		
#100	23.9		
#200	16.8		

* (no specification provided)

Material Description

SILTY SAND W/ GRAVEL

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-1-b

Coefficients

D_{90}= 18.8662 D_{85}= 13.3175 D_{60}= 1.6204
D_{50}= 0.4839 D_{30}= 0.2103 D_{15}=
D_{10}= C_u= C_c=

Remarks

REPORT: 156548
FIELD DESCRIPTION; NATIVE TAN SILTY SAND W/ GRAVEL

Date Received: 4-18-13 **Date Tested:** 4-22-13
Tested By: KM
Checked By: AARON CLYDE
Title: LABORATORY MANAGER

Location: P - 1 041713
Sample Number: P 31530
Date Sampled: 4-17-13

Krazan

Client: ASPECT
Project: SILVERDALE STORM WATER (DUWE'IQ)
Project No: 106-13060 **Figure**

MOISTURE DENSITY ANALYSIS

Test specification: ASTM D 1557-02 Procedure B modified
Oversize correction applied to each point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	SP-SM	A-2-4(0)			NV	NP	0	11.7

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 116 pcf	116 pcf	POOLRY GRADED SAND W/ SILT
Optimum moisture = 8 %	8 %	

Project No. 106-13060 **Client:** ASPECT
Project: SILVERDALE STORM WATER (DUWE'IQ)

● **Location:** P - 2 0417

Remarks:
REPORT:156548; DATE: 4-22-13
SAMPLE: P31529
FIELD DESCRIPTION: NAT TAN SILTY SAND

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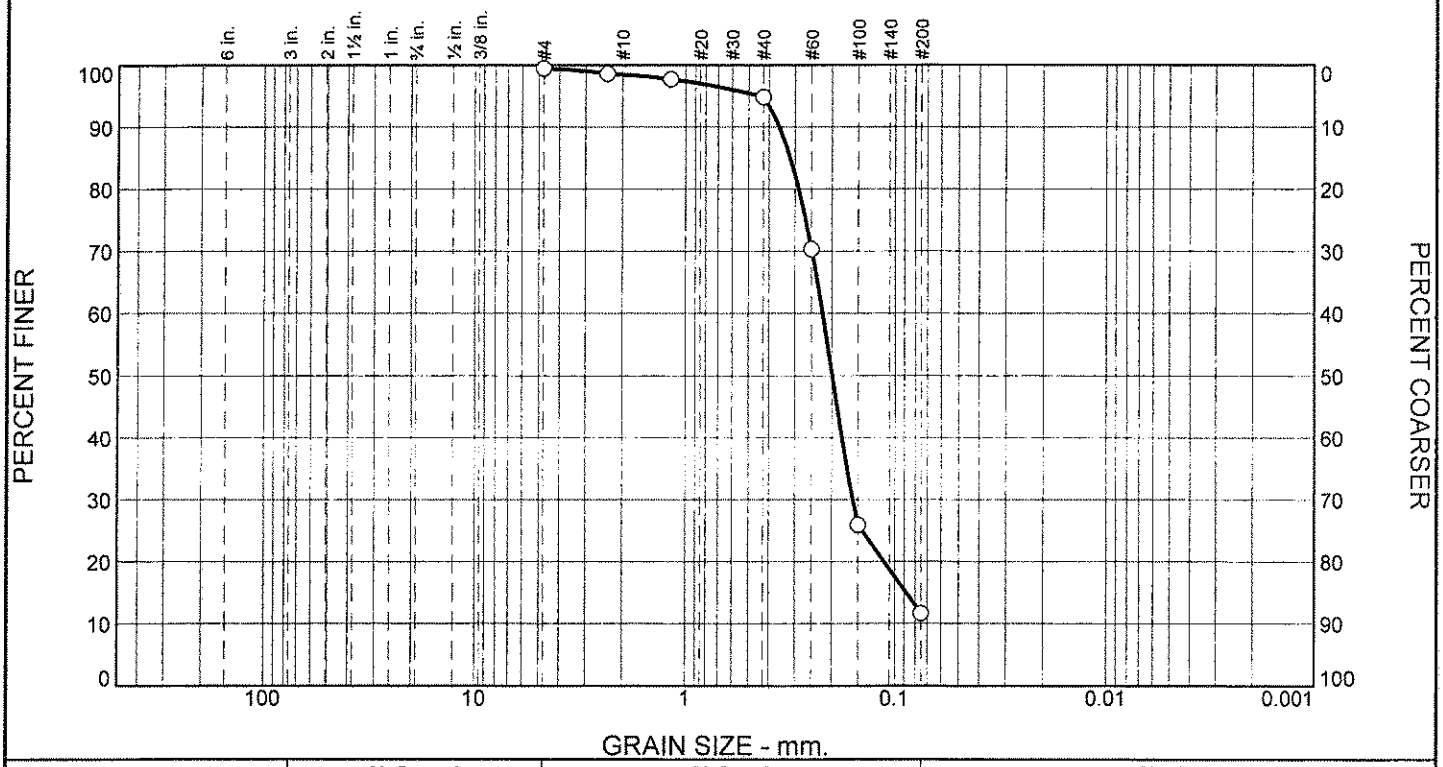
Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
			1.0	3.6	83.2	11.7	

Test Results (ASTM C 136 & ASTM C 117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	99.5		
#8	98.6		
#16	97.7		
#40	94.9		
#60	70.4		
#100	25.9		
#200	11.7		

* (no specification provided)

Material Description

POOLRY GRADED SAND W/ SILT

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= SP-SM AASHTO (M 145)= A-2-4(0)

Coefficients

D_{90}= 0.3572 D_{85}= 0.3163 D_{60}= 0.2215
D_{50}= 0.1991 D_{30}= 0.1588 D_{15}= 0.0882
D_{10}= C_u= C_c=

Remarks

REPORT: 156548
FIELD DESCRIPTION:BRN SILTY SAND W/ GRAVEL

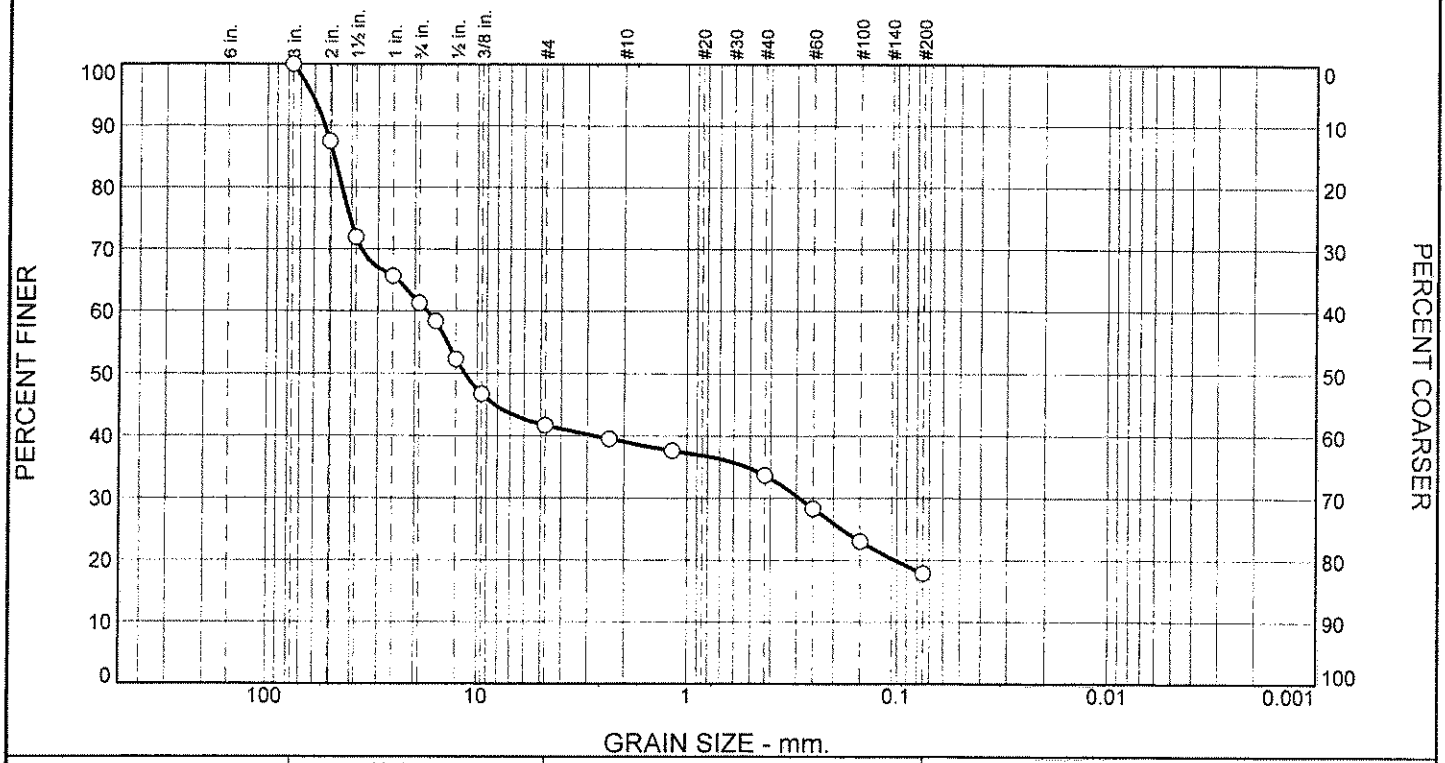
Date Received: 4-18-13 **Date Tested:** 4-22-13
Tested By: KM
Checked By: AARON CLYDE
Title: LABORATORY MANAGER

Location: P - 2 0417
Sample Number: P 31529
Date Sampled: 4-17-13

Krazan

Client: ASPECT
Project: SILVERDALE STORM WATER (DUWE'IQ)
Project No: 106-13060 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	38.7	19.6	2.7	5.3	15.8	17.9	

Test Results (ASTM C 136 & ASTM C 117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0		
2	87.5		
1.5	72.0		
1	65.7		
.75	61.3		
.625	58.4		
.5	52.4		
.375	46.7		
#4	41.7		
#8	39.5		
#16	37.6		
#40	33.7		
#60	28.4		
#100	23.1		
#200	17.9		

* (no specification provided)

Material Description

SILTY GRAVEL W/ SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= GM AASHTO (M 145)= A-1-b

Coefficients

D_{90}= 53.5726 D_{85}= 48.4487 D_{60}= 17.3840
D_{50}= 11.5110 D_{30}= 0.2903 D_{15}=
D_{10}= C_u= C_c=

Remarks

REPORT:156548
FIELD DESCRIPTION:TAN GRAY SAND

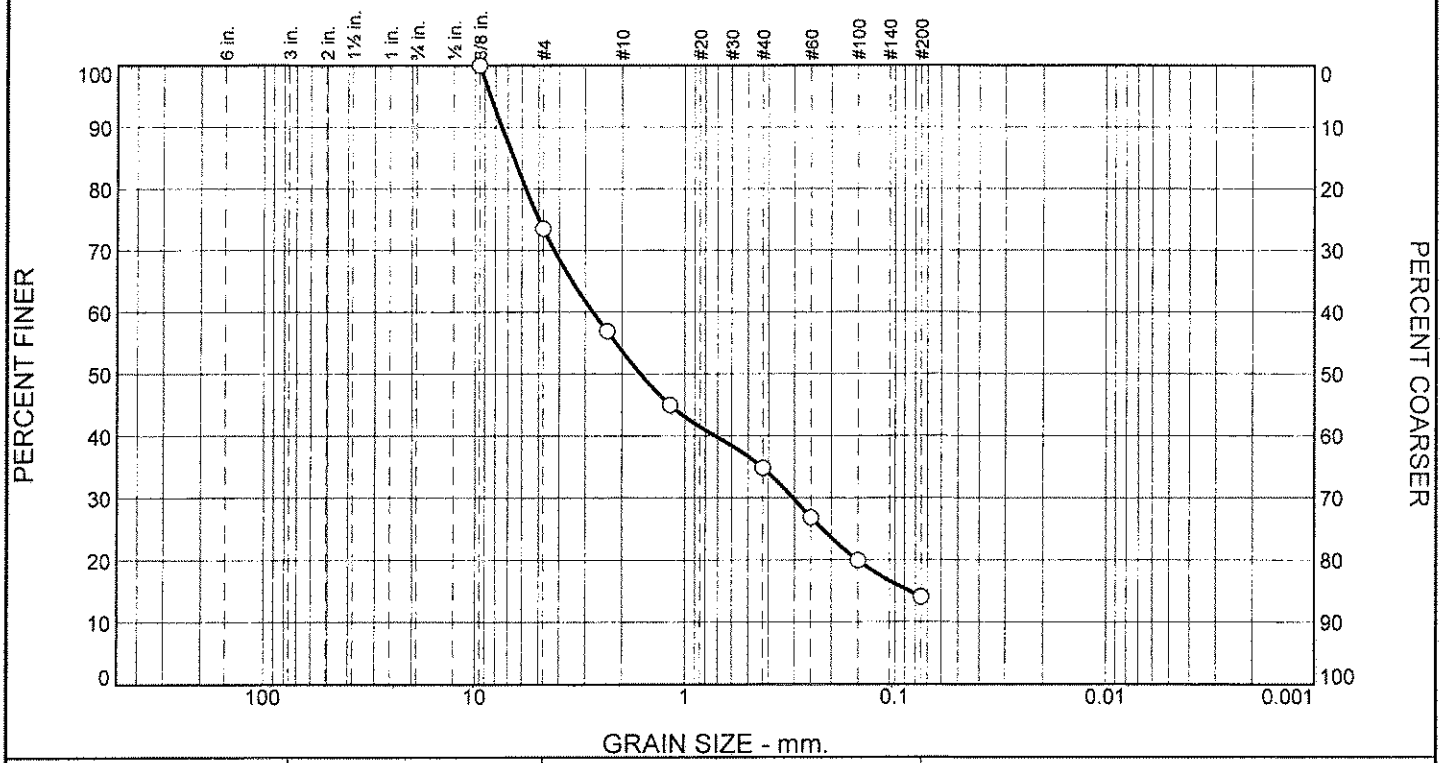
Date Received: 4-17-13 **Date Tested:** 4-18-13
Tested By: KM
Checked By: AARON CLYDE
Title: LABORATORY MANAGER

Location: MW1
Sample Number: P 31552 **Depth:** 10 - 11.5 **Date Sampled:** 4-17-13

Krazan

Client: ASPECT
Project: SILVERDALE STORM WATER (DUWE'IQ)
Project No: 106-13060 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	26.4	19.9	18.9	20.7	14.1	

Test Results (ASTM C 136 & ASTM C 117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.375	100.0		
#4	73.6		
#8	56.9		
#16	45.0		
#40	34.8		
#60	26.8		
#100	19.9		
#200	14.1		

* (no specification provided)

Material Description

SILTY SAND W/ GRAVEL

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-1-b

Coefficients

D_{90}= 7.4656 D_{85}= 6.5762 D_{60}= 2.7520
D_{50}= 1.6359 D_{30}= 0.3054 D_{15}= 0.0854
D_{10}= C_u= C_c=

Remarks

REPORT:156548
FIELD DESCRIPTION:TAN GRAY SAND W/ GRAVEL

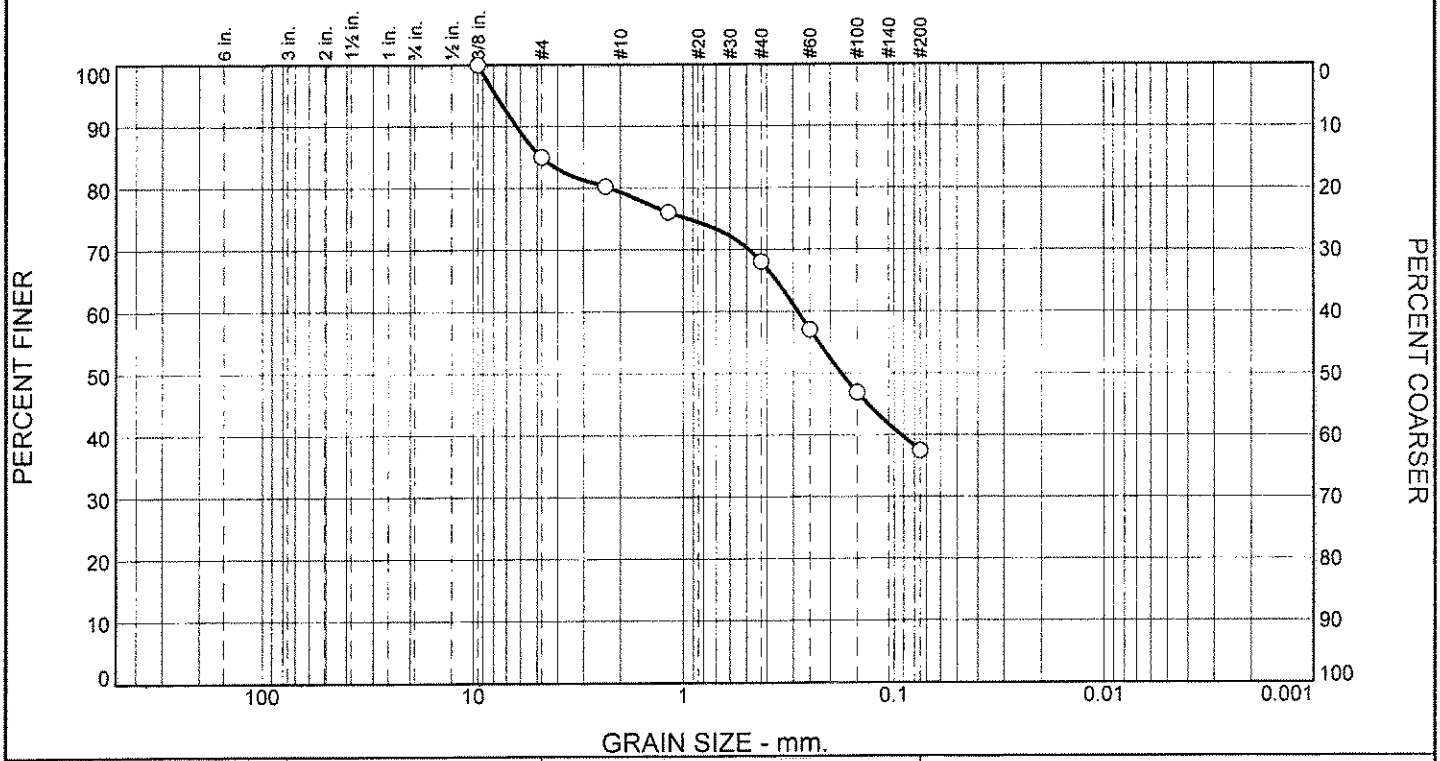
Date Received: 4-18-13 **Date Tested:** 4-18-13
Tested By: KM
Checked By: AARON CLYDE
Title: LABROATORY MANAGER

Location: MW1
Sample Number: P 31551 **Depth:** 15 - 15.5 **Date Sampled:** 4-17-13

Krazan

Client: ASPECT
Project: SILVERDALE STORM WATER (DUWE'IQ)
Project No: 106-13060 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	15.0	5.6	11.4	30.5	37.5	

Test Results (ASTM C 136 & ASTM C 117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.375	100.0		
#4	85.0		
#8	80.3		
#16	76.1		
#40	68.0		
#60	57.1		
#100	46.9		
#200	37.5		

* (no specification provided)

Material Description

SILTY SAND W/GRAVEL

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-4(0)

Coefficients

D_{90}= 6.2794 D_{85}= 4.7336 D_{60}= 0.2851
D_{50}= 0.1781 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

REPORT:156548
FIELD DESCRIPTION: TAN GRAY SILTY SAND

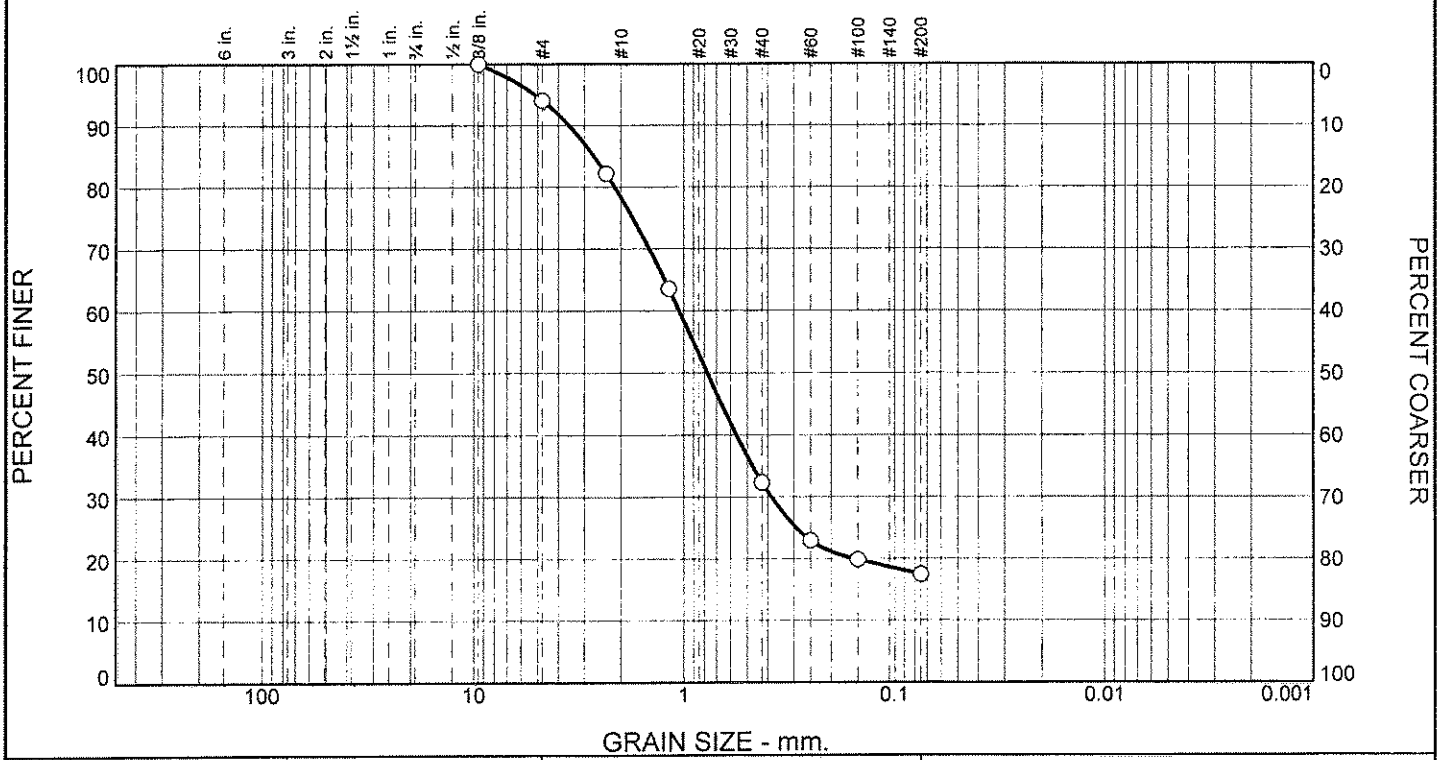
Date Received: 4-18-13 **Date Tested:** 4-18-13
Tested By: KM
Checked By: AARON CLYDE
Title: LABORATORY MANAGER

Location: MW2 **Date Sampled:** 4-17-13
Sample Number: P31554 **Depth:** 5 - 6.5

Krazan

Client: ASPECT
Project: SILVERDALE STORM WATER (DUWE'IQ)
Project No: 106-13060 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.9	15.7	46.0	14.9	17.5	

Test Results (ASTM C 136 & ASTM C 117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.375	100.0		
#4	94.1		
#8	82.2		
#16	63.6		
#40	32.4		
#60	23.0		
#100	19.9		
#200	17.5		

* (no specification provided)

Material Description

SILTY SAND

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-1-b

Coefficients

D_{90}= 3.5442 D_{85}= 2.6903 D_{60}= 1.0530
D_{50}= 0.7741 D_{30}= 0.3835 D_{15}=
D_{10}= C_u= C_c=

Remarks

REPORT: 156548
FIELD DESCRPTION: TAN GRAY SILTY SAND

Date Received: 4-18-13 **Date Tested:** 4-18-13
Tested By: KM
Checked By: AARON CLYDE
Title: LABORATORY MANAGER

Location: MW2
Sample Number: P31555 **Depth:** 11.5
Date Sampled: 4-17-13

Krazan

Client: ASPECT
Project: SILVERDALE STORM WATER (DUWE'IQ)
Project No: 106-13060 **Figure**

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Jun 13 2013
ASPECT CONSULTING
350 MADISON AVE N.
BAINBRIDGE ISLAND, WA 98110
Attention: SCOTT KINDRED

Dear SCOTT KINDRED:

Enclosed please find the analytical data for your DEWE'I Q STORMWATER project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
TP-7/3.5-4'	Soil	13-A006574	Sieve Analysis, CONV
TP-13/3-4'	Soil	13-A006575	Sieve Analysis, CONV
TP-5/7-9'	Soil	13-A006576	Sieve Analysis, CONV
TP-5/3-5+6-7	Soil	13-A006577	Sieve Analysis, CONV

Your samples were received on Friday, May 31, 2013. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Method Detection Limits (MDL's), as opposed to Practical Quantitation Limits (PQL's).

If you should have any questions pertaining to the data package, please feel free to conact me.

Sincerely,

Aaron W. Young
Laboratory Manager

Project #: 130012-1

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

ASPECT CONSULTING
350 MADISON AVE N.
BAINBRIDGE ISLAND, WA 98110
Attention: SCOTT KINDRED
Project Name: DEWE'I Q STORMWATER
Project #: 130012-1
All results reported on a dry weight basis.

Date Received: 05/31/13
Date Reported: 6/13/13

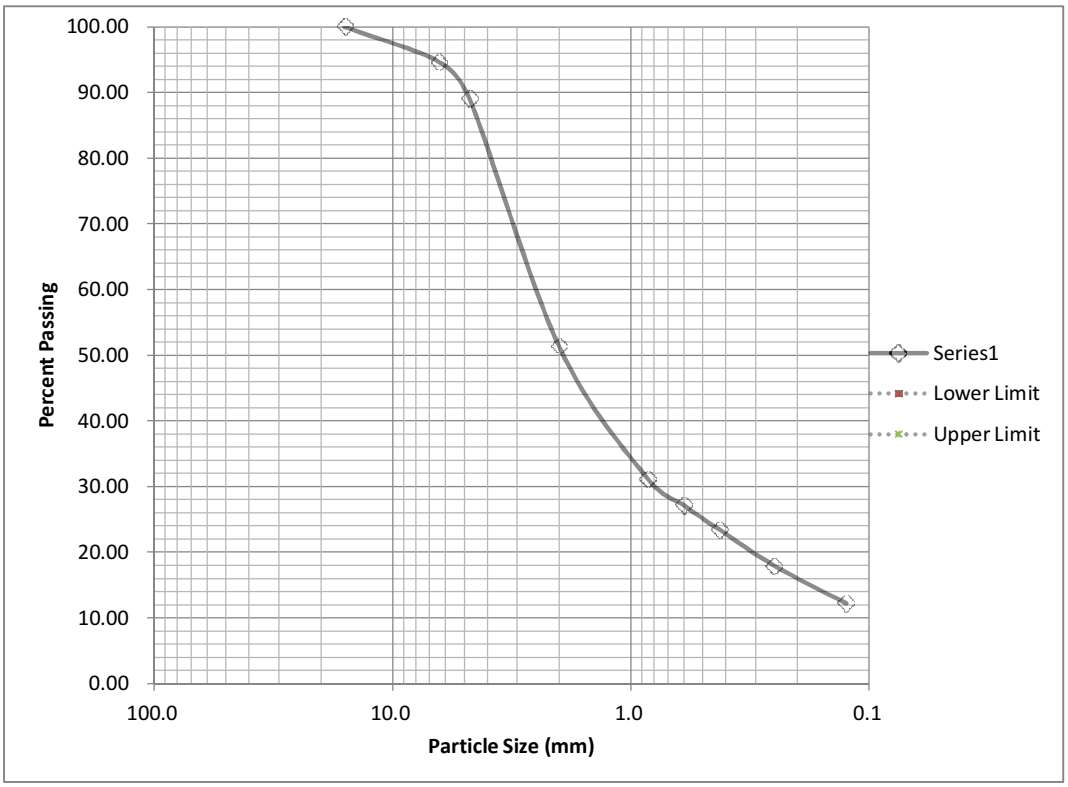
AMTEST Identification Number **13-A006574**
Client Identification **TP-7/3.5-4'**
Sampling Date **04/17/13**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Solids	83.9	%		0.1	SM 2540G	JH	06/06/13

Particle Size by Sieve Only

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
5/8" Sieve	< 0.1	%		0.1	ASTM D422	JH	06/06/13
1/4" Sieve	5.37	%		0.1	ASTM D422	JH	06/06/13
No. 4 (4.75 mm)	5.61	%		0.1	ASTM D422	JH	06/06/13
No. 10 (2 mm)	37.7	%		0.1	ASTM D422	JH	06/06/13
No. 20 (0.84 mm)	20.2	%		0.1	ASTM D422	JH	06/06/13
No. 30 (0.60 mm)	4.06	%		0.1	ASTM D422	JH	06/06/13
No. 40 (0.425 mm)	3.70	%		0.1	ASTM D422	JH	06/06/13
No. 60 (0.25 mm)	5.49	%		0.1	ASTM D422	JH	06/06/13
No. 120 (0.125 mm)	5.73	%		0.1	ASTM D422	JH	06/06/13
No. 200 (0.075 mm)	1.91	%		0.1	ASTM D422	JH	06/06/13
% Passed	10.2	%		0.1	ASTM D422	JH	06/06/13



USCS Classification (mm)						
	% Gravel		% Sand			% Fines
% +3"	Coarse	Fine	Coarse	Medium	Fine	Silt
		11.0	37.7	27.9	13.1	10.2

D10	D30	D60
0.00	0.80	1.60

Effective Particle Size (D10) > 0.3 mm	0.00
Uniformity Coefficient (D60/D10) < 4.0	#DIV/0!

Material Description	
Client ID	TP-7/3.5-4'
AmTest ID	13-A006574
Received	5/31/2013
Analyzed	6/6/2013
Analyst	JH
Reviewed	AY - Lab Manager

Sieve #	% Finer
5/8"	100.0
1/4"	94.6
4.0	89.0
10.0	51.3
20.0	31.1
30.0	27.1
40.0	23.4
60.0	17.9
120.0	12.2
200.0	10.2

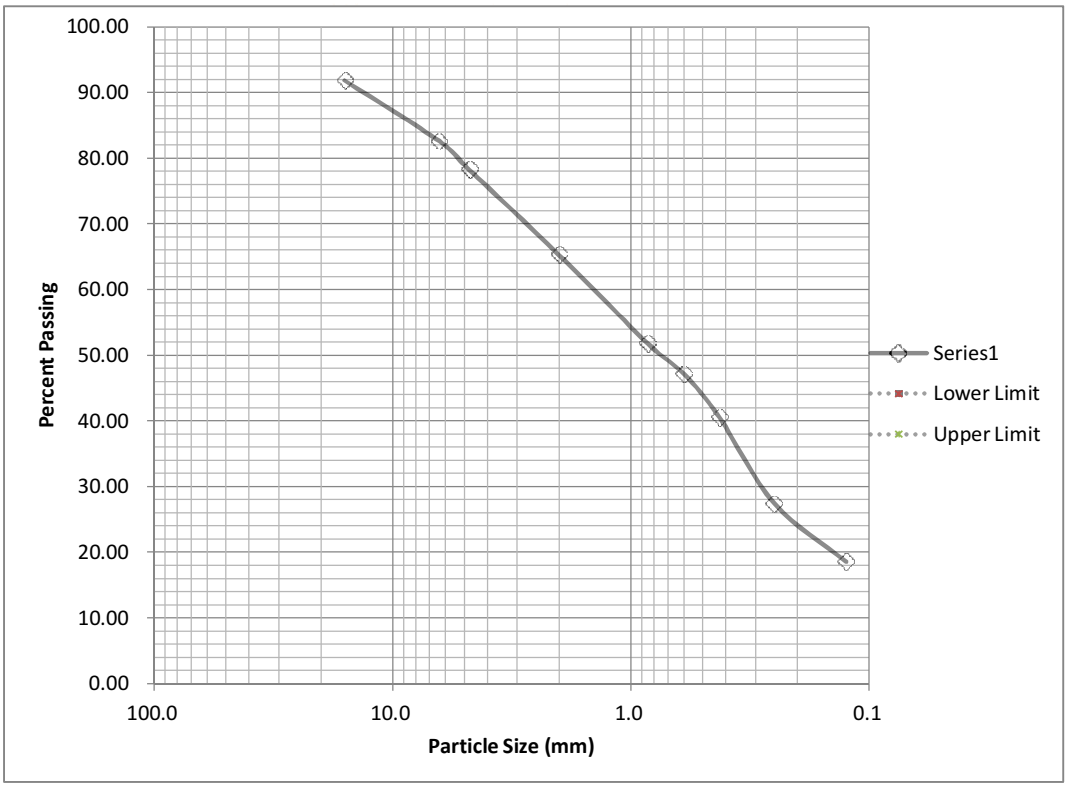
AMTEST Identification Number **13-A006575**
Client Identification **TP-13/3-4'**
Sampling Date **04/17/13**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Solids	78.4	%		0.1	SM 2540G	JH	06/06/13

Particle Size by Sieve Only

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
5/8" Sieve	8.21	%		0.1	ASTM D422	JH	06/06/13
1/4" Sieve	9.24	%		0.1	ASTM D422	JH	06/06/13
No. 4 (4.75 mm)	4.36	%		0.1	ASTM D422	JH	06/06/13
No. 10 (2 mm)	13.0	%		0.1	ASTM D422	JH	06/06/13
No. 20 (0.84 mm)	13.5	%		0.1	ASTM D422	JH	06/06/13
No. 30 (0.60 mm)	4.62	%		0.1	ASTM D422	JH	06/06/13
No. 40 (0.425 mm)	6.67	%		0.1	ASTM D422	JH	06/06/13
No. 60 (0.25 mm)	13.1	%		0.1	ASTM D422	JH	06/06/13
No. 120 (0.125 mm)	8.86	%		0.1	ASTM D422	JH	06/06/13
No. 200 (0.075 mm)	5.90	%		0.1	ASTM D422	JH	06/06/13
% Passed	12.6	%		0.1	ASTM D422	JH	06/06/13



USCS Classification (mm)						
	% Gravel		% Sand			% Fines
% +3"	Coarse	Fine	Coarse	Medium	Fine	Silt
		21.8	13.0	24.8	27.8	12.6

D10	D30	D60
0.00	0.28	1.50

Effective Particle Size (D10) > 0.3 mm	0.00
Uniformity Coefficient (D60/D10) < 4.0	#DIV/0!

Material Description	
Client ID	TP-13/3-4'
AmTest ID	13-A006575
Received	5/31/2013
Analyzed	6/6/2013
Analyst	JH
Reviewed	AY - Lab Manager

Sieve #	% Finer
5/8"	91.8
1/4"	82.5
4.0	78.2
10.0	65.2
20.0	51.7
30.0	47.1
40.0	40.5
60.0	27.4
120.0	18.5
200.0	12.6

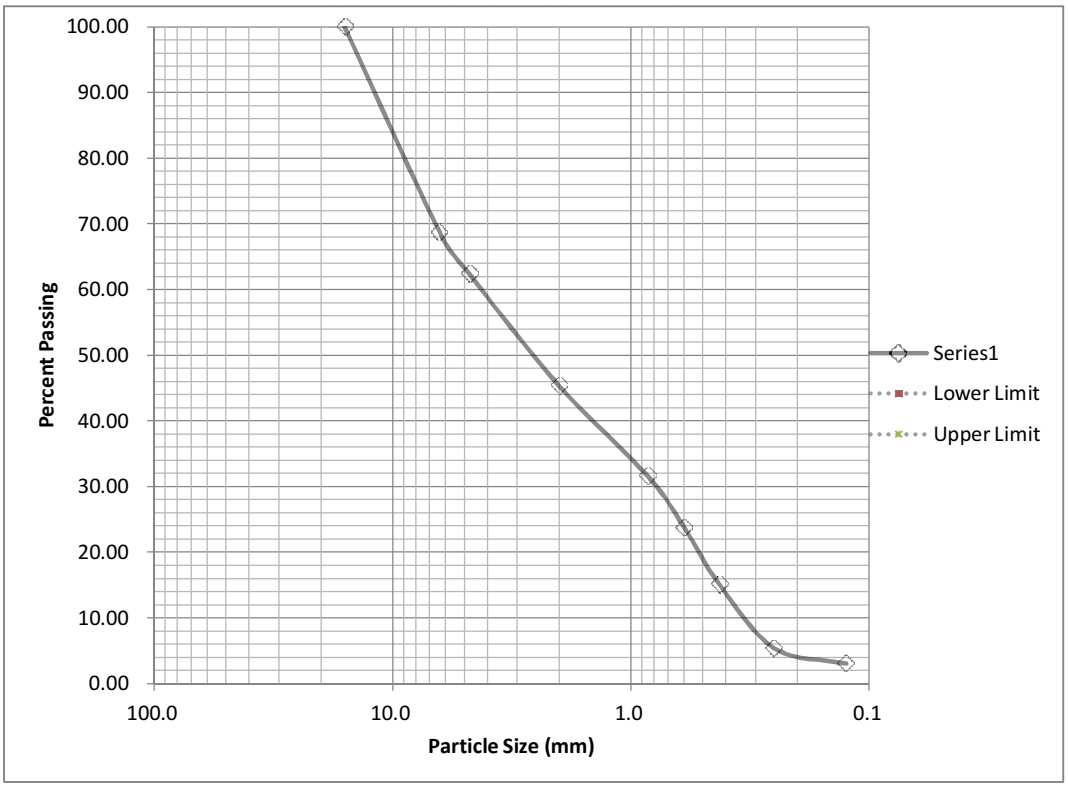
AMTEST Identification Number **13-A006576**
Client Identification **TP-5/7-9'**
Sampling Date **04/17/13**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Solids	86.6	%		0.1	SM 2540G	JH	06/06/13

Particle Size by Sieve Only

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
5/8" Sieve	< 0.1	%		0.1	ASTM D422	JH	06/06/13
1/4" Sieve	31.2	%		0.1	ASTM D422	JH	06/06/13
No. 4 (4.75 mm)	6.47	%		0.1	ASTM D422	JH	06/06/13
No. 10 (2 mm)	17.0	%		0.1	ASTM D422	JH	06/06/13
No. 20 (0.84 mm)	13.8	%		0.1	ASTM D422	JH	06/06/13
No. 30 (0.60 mm)	7.74	%		0.1	ASTM D422	JH	06/06/13
No. 40 (0.425 mm)	8.78	%		0.1	ASTM D422	JH	06/06/13
No. 60 (0.25 mm)	9.70	%		0.1	ASTM D422	JH	06/06/13
No. 120 (0.125 mm)	2.31	%		0.1	ASTM D422	JH	06/06/13
No. 200 (0.075 mm)	0.69	%		0.1	ASTM D422	JH	06/06/13
% Passed	2.39	%		0.1	ASTM D422	JH	06/06/13



USCS Classification (mm)						
	% Gravel		% Sand			% Fines
% +3"	Coarse	Fine	Coarse	Medium	Fine	Silt
		37.7	17.0	30.3	12.7	2.4

D10	D30	D60
0.34	0.78	4.40

Effective Particle Size (D10) > 0.3 mm	0.34
Uniformity Coefficient (D60/D10) < 4.0	12.9

Material Description	
Client ID	TP-5/7-9'
AmTest ID	13-A006576
Received	5/31/2013
Analyzed	6/6/2013
Analyst	JH
Reviewed	AY - Lab Manager

Sieve #	% Finer
5/8"	100.0
1/4"	68.8
4.0	62.3
10.0	45.4
20.0	31.6
30.0	23.9
40.0	15.1
60.0	5.4
120.0	3.1
200.0	2.4

AMTEST Identification Number **13-A006577**
Client Identification **TP-5/3-5+6-7**
Sampling Date **04/17/13**

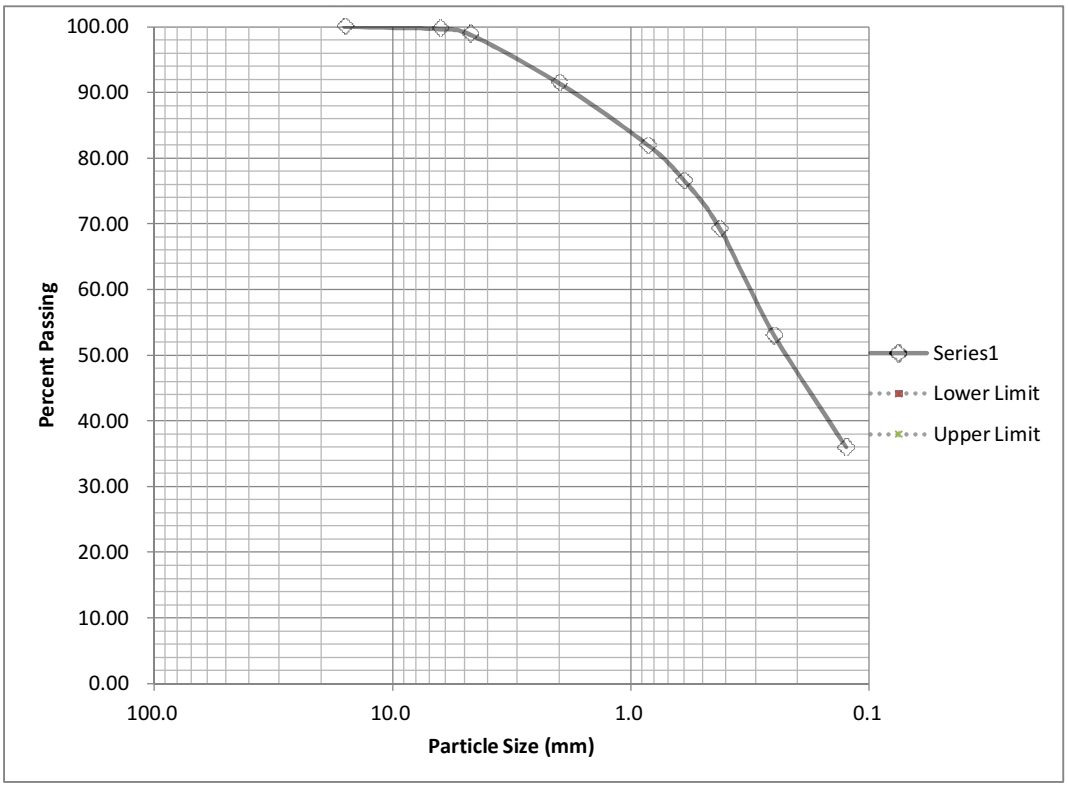
Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Solids	86.0	%		0.1	SM 2540G	JH	06/06/13

Particle Size by Sieve Only

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
5/8" Sieve	< 0.1	%		0.1	ASTM D422	JH	06/06/13
1/4" Sieve	0.35	%		0.1	ASTM D422	JH	06/06/13
No. 4 (4.75 mm)	0.81	%		0.1	ASTM D422	JH	06/06/13
No. 10 (2 mm)	7.43	%		0.1	ASTM D422	JH	06/06/13
No. 20 (0.84 mm)	9.40	%		0.1	ASTM D422	JH	06/06/13
No. 30 (0.60 mm)	5.34	%		0.1	ASTM D422	JH	06/06/13
No. 40 (0.425 mm)	7.31	%		0.1	ASTM D422	JH	06/06/13
No. 60 (0.25 mm)	16.4	%		0.1	ASTM D422	JH	06/06/13
No. 120 (0.125 mm)	17.0	%		0.1	ASTM D422	JH	06/06/13
No. 200 (0.075 mm)	7.78	%		0.1	ASTM D422	JH	06/06/13
% Passed	28.3	%		0.1	ASTM D422	JH	06/06/13

Aaron W. Young
Laboratory Manager



USCS Classification (mm)						
	% Gravel		% Sand			% Fines
% +3"	Coarse	Fine	Coarse	Medium	Fine	Silt
		1.2	7.4	22.1	41.1	28.2

D10	D30	D60
		0.33

Effective Particle Size (D10) > 0.3 mm	
Uniformity Coefficient (D60/D10) < 4.0	#DIV/0!

Material Description	
Client ID	TP-5/3-5+6-7
AmTest ID	13-A006577
Received	5/31/2013
Analyzed	6/6/2013
Analyst	JH
Reviewed	AY - Lab Manager

Sieve #	% Finer
5/8"	100.0
1/4"	99.7
4.0	98.8
10.0	91.4
20.0	82.0
30.0	76.7
40.0	69.3
60.0	53.0
120.0	36.0
200.0	28.2

AMTEST LABORATORIES

AmTest Chain of Custody Record

13600 NE 126th PL, Suite C, Kirkland, WA 98034
Ph (425) 885-1664 Fx (425) 820-0245
www.amtestlab.com

Chain of Custody No. 5000

Client Name & Address: Aspect Consulting	Invoice To: Aspect Consulting 350 Madison ave. N Bainbridge Island 98110
Contact Person: Scott Kindred	Invoice Contact:
Phone No: 206-838-6589	PO Number:
Fax No:	Invoice Ph/Fax:
E-mail: skindred@aspectconsulting.com	Invoice E-mail:
Report Delivery: (Choose all that apply) Mail / Fax / Email / Posted Online	Data posted to online account: YES / NO Web Login ID:
Special Instructions: standard sieve sizes	
Requested TAT: (Rush must be pre-approved by lab) Standard RUSH (5 Day / 3 Day / 48 HR / 24 HR)	Temperature upon Receipt:
Project Name: Dewey Stormwater	
Project Number: 130012-1	

AmTest ID	Client ID (35 characters max)	Date Sampled	Time Sampled	Matrix	No. of containers	Analysis Requested: Grain size								QA/QC
6574	TP-7/3.5-4'	4/17/13		Soil	1	X								
75	TP-13/3-4'	4/17/13		↓	↓	X								
76	TP-5/7-9'	4/17/13		↓	↓	X								
77	TP-5/3-5+6-7	4/17/13		↓	↓	X								

Collected/Relinquished By:	Date	Time	Received By:	Date	Time
			[signature]	5/31/13	1306
Relinquished By:	Date	Time	Received By:	Date	Time
Relinquished By:	Date	Time	Received By:	Date	Time

COMMENTS:

APPENDIX C

Piezometer Testing and Hydraulic Conductivity Analyses

C. Piezometer Testing and Hydraulic Conductivity Analyses

C.1. Borehole Infiltration and Slug Test Methodology

Borehole infiltration testing was conducted in the vactor explorations to estimate hydraulic conductivity (K). The tests were conducted by filling the vactor exploration with water and measuring the change in hydraulic head at 5-minute intervals using a pressure transducer placed in the bottom of the exploration. Occasional hand measurements of the water level were also obtained using a tape measure. Some of the explorations were re-filled during the test to maintain a relatively high water level throughout the test.

The results were analyzed using two different approaches:

- Borehole infiltration methods suitable for piezometers completed above the water table (V-1, V-2, and V-3); and
- Slug testing methods are suitable for piezometers completed below or across the water table. Although V-1, V-2, and V-3 were complete above the water table, estimates of K were obtained using this approach for comparison with the borehole infiltration approach. This method was also used for analyzing MW-1 water level data obtained during development of the well.

C.2. Borehole Infiltration Analysis

Numerous solutions for estimating K from open borehole infiltration tests are available in the literature. As discussed in Stephens et al., (1983), these solutions range from relatively simple analytical approaches that assume steady infiltration into a fully-saturated homogeneous soil to relatively complex numerical approaches that incorporate transient effects and unsaturated flow. Given the high degree of subsurface variability across the Site, the approximate estimates of K provided by the simple analytical approaches are judged to be suitable for this assessment.

The analytical solutions utilized in this analysis include the Glover equation (Glover, 1953) and the Nasburg-Terletskata equation (Terletskata, 1954). These equations assume steady infiltration from an open borehole into a homogeneous isotropic soil and require knowing the following parameters:

- Steady state height of water (H) in the borehole;
- Steady state infiltration rate (Qs) into the borehole; and
- Radius of borehole (r).

Both solutions are based on the concept that the water infiltrating from the borehole flows radially and downward in response to pressure and gravity gradients. The flow region is

assumed to be fully saturated everywhere and is confined within an envelope known as the “free surface”. The soil outside the free surface envelope is not considered part of the flow region. The differences between these solutions are relatively subtle and are related to assumptions regarding the strength of the point source solution along the well bore.

In addition to the assumption of homogenous isotropic soil, these solutions are based on the following assumptions:

- No flow through the bottom of the borehole (this is generally negligible when the length of the borehole is at least 10 times the radius of the borehole);
- No unsaturated flow outside the free surface; and
- The test has reached steady state and there are no unsaturated zones within the free surface.

Although the analytical equations used in this analysis assume a constant head test that has reached a steady-state infiltration rate, a falling head approach was used to facilitate the completion of multiple tests in a short period of time and did not require flow meters and valves to control the flow. The flow rate was approximated based on the rate of falling head and the diameter of the borehole during a period of time when the flow rate was relatively constant (generally at the end of the test). The constant head was estimated to equal the average height of water in the borehole during the same period.

It is clear that some of the assumptions of the methodology were violated (e.g., the length of the borehole was not at least 10 times the borehole radius for each test). Given these violations, the limitations of the methodology, and the high degree of subsurface variability, the results provided by this analysis should be considered a qualitative indication of K and should be used with caution. In addition, these simple analytical solutions tend to provide higher estimates of K than more rigorous solutions that account for transient and unsaturated flow. Therefore the estimates of K provided in this analysis should be used with the knowledge that the actual K may be lower.

C.3. Slug Test Analysis

The Bouwer and Rice (Bouwer and Rice, 1976) method was applied to the water level data in general accordance with the American Society for Testing and Materials (ASTM) Method D 4104-96. This method utilizes the following parameters:

- Saturated aquifer thickness;
- Length of screen/sandpack across the aquifer;
- Screen and borehole radius;
- Initial change in water elevation; and
- Drainable porosity of the sandpack.

To implement this method, the water level data are converted to relative values (by dividing the hydraulic head at each time by the maximum hydraulic head at the beginning of the test) and plotted on the semi-log scale with time on the arithmetic x-axis. A best fit

straight line is drawn through the data points and the change in relative head between two points in time is used in the Bouwer and Rice equation.

The Bouwer and Rice approach is based on the following assumptions:

- The aquifer has unconfined conditions;
- The aquifer is homogeneous and isotropic;
- The aquifer has infinite areal extent;
- The soil and water are incompressible;
- Steady-state conditions;
- The change in water level is instantaneous; and
- Effects of aquifer storage are assumed to be small and are ignored.

A number of these assumptions are clearly not achieved (e.g., the change in water level is not instantaneous) and the resulting estimates of K should be considered approximate.

C.4. Hydraulic Conductivity (K) Results

The data from each test are provided in table included in this appendix and both linear and semi-log graphs are included with the data. For the borehole infiltration tests, the data used to calculate the average head and the average flux are shown with yellow highlighting in the tables and the values for average head and average flux are provided at the top of the table shown in each figure.

The semi-log graphs show the straight-line data used to calculate K using the Bouwer and Rice slug test approach. In tests where the piezometer was refilled, the data collected after refilling was used to calculate K. Note that the data from V-4, V-5, and V-6 did not plot on a single straight line. Instead, the slope decreased with time, which is often observed in these tests. Typically, the initial data reflects filling of the sandpack and the late data is generally considered unreliable due to the very small changes in hydraulic head. The middle portion of the data is generally considered most indicative of K in the native soils, although for V-4, V-5, and V-6 there appears to be a distinct change in slope during this middle portion of the test and two straight-line segments in the data. Because of this change, K was calculated for both straight lines segments and the results are reported as a range.

The semi-log plot for MW-1 indicates a distinct change in slope at an elevation head of 22.25 feet above mean sea level (corresponding to a water depth of 9 feet below the top of casing. This elevation corresponds to the approximate top of the sandpack in the well which changes the effective storage per foot of head rise.

Table C-1 summarizes the calculations used to estimate K for each of the tests.

Table C-1 - Hydraulic Conductivity Estimates from Borehole Infiltration Tests

140203 Duwe'iq Stormwater

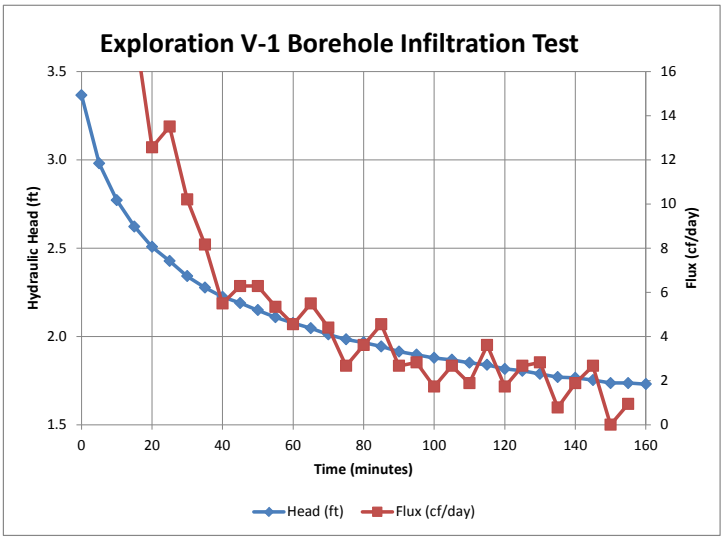
Piezometer	V-1	V-2	V-3	V-4		V-5		V-6		MW-1	
Tested Interval USCS Classification	SM	SM	SM	GM		GM		GP-GM		GP, GM, SM	
Soil Type	melt-out till	fill	melt-out till	melt-out till		melt-out till		melt-out till		melt-out till	
Tested Interval (depth in feet)	2.6 - 4.4	2.3 - 3.1	1.6 - 4.0	4.5 - 10		5.2 - 10		5.7 - 9.4		8 - 21	
Borehole Infiltration Analysis											
Height of Water (H) in Feet	1.8	0.8	2.3	Approach not valid since borehole extends below water table.		Approach not valid since borehole extends below water table.		Approach not valid since borehole extends below water table.		Approach not valid since borehole extends below water table.	
Steady Infiltration Rate (Qs) in cf/day	2.2	0.92	3.0								
Radius of Borehole (r) in Feet	0.75	0.75	0.75								
H/r	2.40	1.05	3.09								
K in ft/day (Glover)	0.07	Not valid	0.08								
K in in./hr (Glover)	0.03	Not valid	0.04								
K in cm/sec (Glover)	2.4E-05	Not valid	2.6E-05								
K in ft/day (Nasburg-Terletskata)	0.20	0.20	0.19								
K in inch/hr (Nasburg-Terletskata)	0.10	0.10	0.09								
K in cm/sec (Nasburg-Terletskata)	7E-05	7E-05	7E-05								
Slug Test Analysis (Bouwer and Rice, 1976; Bouwer, 1989)				Low	High	Low	High	Low	High	Low	High
Piezometer Depth in Feet	4.4	3.1	4.0	10.0		10.0		9.4		20.0	
Screen Length in Feet	2.0	2.0	2.0	2.0		2.0		2.0		10.0	
Depth to Screen in Feet	2.4	1.1	2.0	8.0		8.0		7.4		10.0	
Depth to Aquitard in Feet	4.4	3.1	4.0	10.0		10.0		9.4		20.0	
Depth to Water in Feet	3.0	2.0	2.2	4.7		5.4		6.3		12.5	
Depth to Sandpack in Feet	0.0	0.0	0.0	0.0		0.0		0.0		8.0	
Sandpack Length in Feet	4.4	3.1	4.0	10.0		10.0		9.4		12.0	
Slug Displacement (H_o) in Feet	1.97	0.94	1.57	1.71		1.94		3.90		15.64	
Sandpack Drainable Porosity (n)	0.2	0.2	0.2	0.2		0.2		0.2		0.3	
Radius of Casing (r_c) in Feet	0.083	0.083	0.083	0.083		0.083		0.083		0.083	
Radius of Borehole (r_w) in Feet	0.75	0.75	0.75	0.75		0.75		0.75		0.38	
Effective Casing Radius (r_{ce}) in Feet	0.344	0.344	0.344	0.344		0.344		0.344		0.201	
Saturated Aquifer Thickness (H) in Feet	1.4	1.1	1.8	5.3		4.6		3.1		7.5	
Saturated Well Thickness (L_w) in Feet	1.4	1.1	1.8	5.3		4.6		3.1		7.5	
Effective Radius (r_{eff}) in Feet	0.75	0.75	0.75	0.75		0.75		0.75		0.38	
Effective Screen Length (L_e) in Feet	1.4	1.1	1.8	5.3		4.6		3.1		7.5	
Normalized Head at t_1 (y_1) in Feet	0.42	0.45	0.70	0.20	0.40	0.17	0.40	0.26	0.51	0.67	0.92
Time - t_1 in Seconds	2,400	900	3,900	4,800	1,500	3,300	1,200	2,100	900	3,600	10,800
Normalized Head at t_2 (y_2) in Feet	0.26	0.26	0.35	0.14	0.24	0.14	0.19	0.20	0.26	0.41	0.40
Time - t_2 in Seconds	5,400	3,000	8,700	8,100	3,600	5,100	3,000	3,900	2,100	43,200	93,600
L_e/r_w	1.9	1.5	2.4	7.1	7.1	6.1	6.1	4.1	4.1	20.0	20.0
Coefficient A [a]	1.5	1.5	1.6	1.7	1.7	1.7	1.7	1.6	1.6	2.1	2.1
Coefficient B [a]	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Coefficient C [a]	0.9	0.9	0.9	1.1	1.1	1.0	1.0	1.0	1.0	1.6	1.6
Fully Penetrating Well											
$\ln(R_e/r_w)$ [b]	0.4	0.3	0.6	1.4	1.4	1.3	1.3	1.0	1.0	2.2	2.2
K in ft/day	0.26	0.35	0.25	0.14	0.34	0.18	0.60	0.24	0.91	0.007	0.005
K in inch/hr	0.13	0.17	0.13	0.07	0.17	0.09	0.30	0.12	0.45	0.003	0.003
K in cm/sec	9E-05	1E-04	9E-05	5E-05	1E-04	6E-05	2E-04	8E-05	3E-04	2E-06	2E-06

Hydraulic conductivity estimates from the Bouwer and Rice method (Bouwer and Rice, 1976; Bouwer, 1989).
All depths are below ground surface.
[a] A, B, and C coefficients are calculated using regression equations of Van Rooy (1988).
[b] R_e/r_w is the effective radial distance over which y is dissipated, divided by the radial distance of well development.

Exploration V-1

			Total Flux=	0.89	
		Ave=	1.8	Ave=	2.2
Diver measurements					
date time	**Minutes**	**ft H20**	**Head (ft)**	**Flux (cf)**	**Flux (cf/day)**
10/8/13 13:20		33.831			
10/8/13 13:25		33.806			
10/8/13 13:30	0.0	37.171	3.37		
10/8/13 13:35	5.0	36.786	2.98	0.210	60
10/8/13 13:40	10.0	36.577	2.77	0.114	33
10/8/13 13:45	15.0	36.428	2.62	0.081	23
10/8/13 13:50	20.0	36.313	2.51	0.063	18
10/8/13 13:55	25.0	36.233	2.43	0.044	13
10/8/13 14:00	30.0	36.147	2.34	0.047	14
10/8/13 14:05	35.0	36.082	2.28	0.035	10
10/8/13 14:10	40.0	36.03	2.22	0.028	8.2
10/8/13 14:15	45.0	35.995	2.19	0.019	5.5
10/8/13 14:20	50.0	35.955	2.15	0.022	6.3
10/8/13 14:25	55.0	35.915	2.11	0.022	6.3
10/8/13 14:30	60.0	35.881	2.08	0.019	5.3
10/8/13 14:35	65.0	35.852	2.05	0.016	4.6
10/8/13 14:40	70.0	35.817	2.01	0.019	5.5
10/8/13 14:45	75.0	35.789	1.98	0.015	4.4
10/8/13 14:50	80.0	35.772	1.97	0.009	2.7
10/8/13 14:55	85.0	35.749	1.94	0.013	3.6
10/8/13 15:00	90.0	35.72	1.91	0.016	4.6
10/8/13 15:05	95.0	35.703	1.90	0.009	2.7
10/8/13 15:10	100.0	35.685	1.88	0.010	2.8
10/8/13 15:15	105.0	35.674	1.87	0.006	1.7
10/8/13 15:20	110.0	35.657	1.85	0.009	2.7
10/8/13 15:25	115.0	35.645	1.84	0.007	1.9
10/8/13 15:30	120.0	35.622	1.82	0.013	3.6
10/8/13 15:35	125.0	35.611	1.81	0.006	1.7
10/8/13 15:40	130.0	35.594	1.79	0.009	2.7
10/8/13 15:45	135.0	35.576	1.77	0.010	2.8
10/8/13 15:50	140.0	35.571	1.77	0.003	0.8
10/8/13 15:55	145.0	35.559	1.75	0.007	1.9
10/8/13 16:00	150.0	35.542	1.74	0.009	2.7
10/8/13 16:05	155.0	35.542	1.74	0.000	0.0
10/8/13 16:10	160.0	35.536	1.73	0.003	0.9

Yellow shading indicates values used to estimate average.



Manual measurements

time	DTW (ft)	Comment
13:25	1.99	pz filled with water
13:52	3.34	
16:10	4.1	diver removed

Hole Dimensions

ft bgs	**hole diameter (ft)**
0-4.4	1.5 ft
Porosity =	0.3
Volume/ft	0.55 cf

Casing

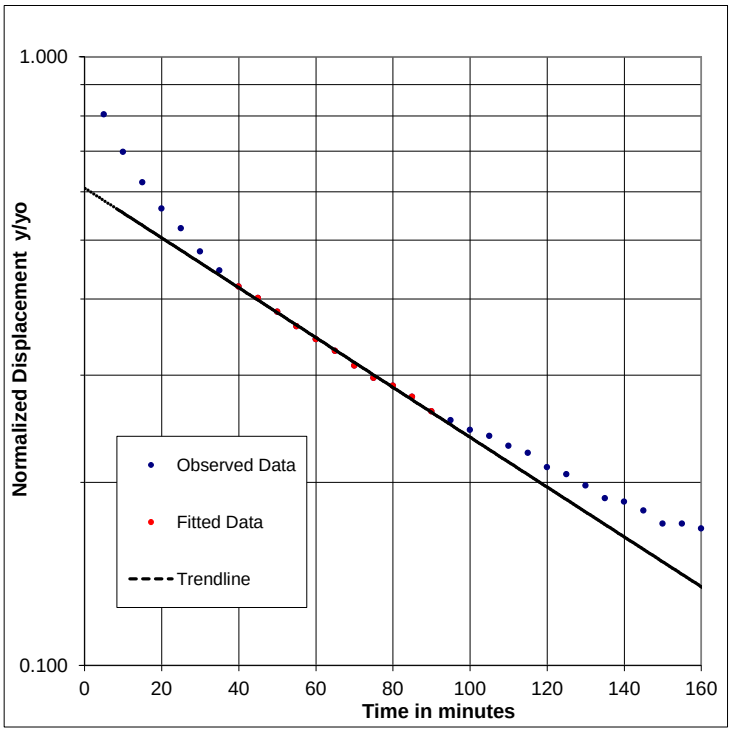
Stickup	1.5 ft
Diameter	0.17 ft

Seepage/Caving Comments

No seepage or caving

Displacement	1.97
H1 (nor. ft)	0.419
T1 (sec)	2400
H2 (nor. ft)	0.262
T2 (sec)	5400

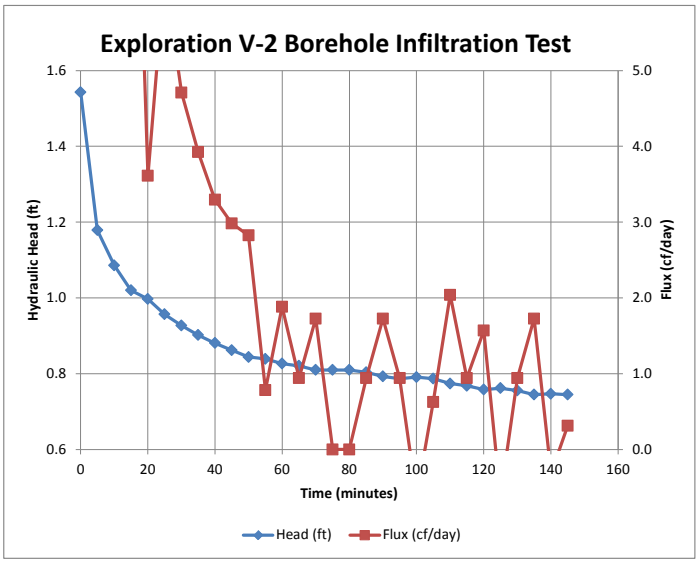
Head (Ft H20)	Elapsed Time (sec)	Elapsed Time (min)	Relative dH	Fitted Data
1.40				
3.37	0	0.0		
2.98	300	5.0	0.804	
2.77	600	10.0	0.698	
2.62	900	15.0	0.622	
2.51	1,200	20.0	0.563	
2.43	1,500	25.0	0.523	
2.34	1,800	30.0	0.479	
2.28	2,100	35.0	0.446	
2.22	2,400	40.0	0.419	0.419
2.19	2,700	45.0	0.402	0.402
2.15	3,000	50.0	0.381	0.381
2.11	3,300	55.0	0.361	0.361
2.08	3,600	60.0	0.344	0.344
2.05	3,900	65.0	0.329	0.329
2.01	4,200	70.0	0.311	0.311
1.98	4,500	75.0	0.297	0.297
1.97	4,800	80.0	0.288	0.288
1.94	5,100	85.0	0.276	0.276
1.91	5,400	90.0	0.262	0.262
1.90	5,700	95.0	0.253	
1.88	6,000	100.0	0.244	
1.87	6,300	105.0	0.238	
1.85	6,600	110.0	0.230	
1.84	6,900	115.0	0.223	
1.82	7,200	120.0	0.212	
1.81	7,500	125.0	0.206	
1.79	7,800	130.0	0.197	
1.77	8,100	135.0	0.188	
1.77	8,400	140.0	0.186	
1.75	8,700	145.0	0.180	
1.74	9,000	150.0	0.171	
1.74	9,300	155.0	0.171	
1.73	9,600	160.0	0.168	



Exploration V-2

			Total Flux=	0.44	
		Ave=	0.79	Ave=	0.9
Diver measurements					
date time	**Minutes**	**ft H20**	**Head (ft)**	**Flux (cf)**	**Flux (cf/day)**
10/8/13 13:29		33.98			
10/8/13 13:34	0.0	35.52	1.54		
10/8/13 13:39	5.0	35.16	1.18	0.198	57.1
10/8/13 13:44	10.0	35.06	1.09	0.051	14.6
10/8/13 13:49	15.0	35.00	1.02	0.036	10.4
10/8/13 13:54	20.0	34.97	1.00	0.013	3.6
10/8/13 13:59	25.0	34.93	0.96	0.022	6.3
10/8/13 14:04	30.0	34.90	0.93	0.016	4.7
10/8/13 14:09	35.0	34.88	0.90	0.014	3.9
10/8/13 14:14	40.0	34.86	0.88	0.011	3.3
10/8/13 14:19	45.0	34.84	0.86	0.010	3.0
10/8/13 14:24	50.0	34.82	0.84	0.010	2.8
10/8/13 14:29	55.0	34.82	0.84	0.003	0.8
10/8/13 14:34	60.0	34.80	0.83	0.007	1.9
10/8/13 14:39	65.0	34.80	0.82	0.003	0.9
10/8/13 14:44	70.0	34.79	0.81	0.006	1.7
10/8/13 14:49	75.0	34.79	0.81	0.000	0.0
10/8/13 14:54	80.0	34.79	0.81	0.000	0.0
10/8/13 14:59	85.0	34.78	0.80	0.003	0.9
10/8/13 15:04	90.0	34.77	0.79	0.006	1.7
10/8/13 15:09	95.0	34.76	0.79	0.003	0.9
10/8/13 15:14	100.0	34.77	0.79	-0.002	-0.6
10/8/13 15:19	105.0	34.76	0.79	0.002	0.6
10/8/13 15:24	110.0	34.75	0.77	0.007	2.0
10/8/13 15:29	115.0	34.74	0.77	0.003	0.9
10/8/13 15:34	120.0	34.73	0.76	0.005	1.6
10/8/13 15:39	125.0	34.74	0.76	-0.002	-0.6
10/8/13 15:44	130.0	34.73	0.76	0.003	0.9
10/8/13 15:49	135.0	34.72	0.74	0.006	1.7
10/8/13 15:54	140.0	34.72	0.75	-0.001	-0.3
10/8/13 15:59	145.0	34.72	0.74	0.001	0.3

Yellow shading indicates values used to estimate average.



Manual measurements

time	DTW (ft)	Comment
13:29		pz filled with water
13:32	1.76	
13:44	3.4	
15:53	3.75	diver out

Hole Dimensions

ft bgs	**hole diameter (ft)**	
0-3.1	1.5	ft
Porosity =	0.3	
Volume/ft	0.55	cf

Casing

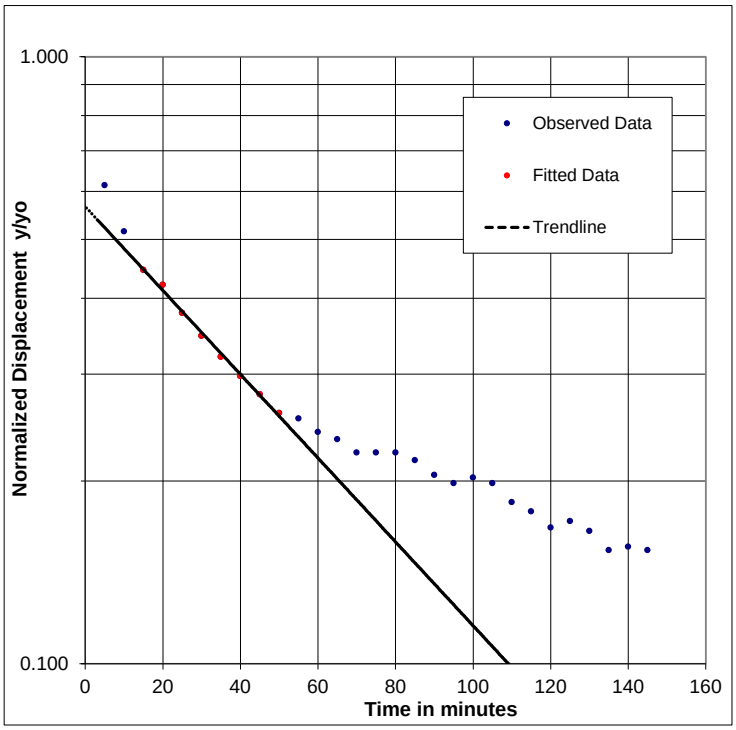
Stickup	1.4	ft
Diameter	0.17	ft

Seepage/Caving Comments

No seepage or caving

Displacement	0.94
H1 (nor. ft)	0.445
T1 (sec)	900
H2 (nor. ft)	0.259
T2 (sec)	3000

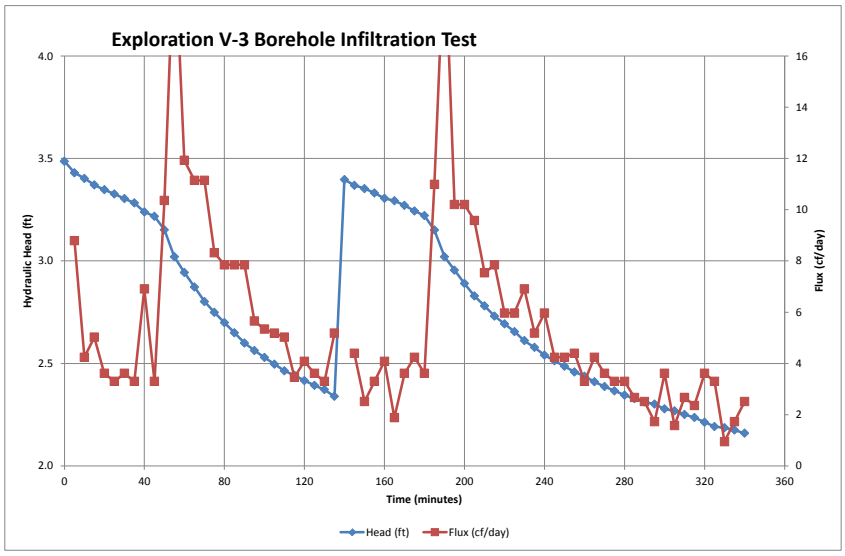
Head (Ft H20)	Elapsed Time (sec)	Elapsed Time (min)	Relative dH	Fitted Data
0.60				
1.54	0	0.0		
1.18	300	5.0	0.614	
1.09	600	10.0	0.515	
1.02	900	15.0	0.445	0.445
1.00	1,200	20.0	0.421	0.421
0.96	1,500	25.0	0.379	0.379
0.93	1,800	30.0	0.347	0.347
0.90	2,100	35.0	0.320	0.320
0.88	2,400	40.0	0.298	0.298
0.86	2,700	45.0	0.278	0.278
0.84	3,000	50.0	0.259	0.259
0.84	3,300	55.0	0.253	
0.83	3,600	60.0	0.241	
0.82	3,900	65.0	0.234	
0.81	4,200	70.0	0.223	
0.81	4,500	75.0	0.223	
0.81	4,800	80.0	0.223	
0.80	5,100	85.0	0.216	
0.79	5,400	90.0	0.205	
0.79	5,700	95.0	0.198	
0.79	6,000	100.0	0.203	
0.79	6,300	105.0	0.198	
0.77	6,600	110.0	0.185	
0.77	6,900	115.0	0.178	
0.76	7,200	120.0	0.168	
0.76	7,500	125.0	0.172	
0.76	7,800	130.0	0.165	
0.74	8,100	135.0	0.154	
0.75	8,400	140.0	0.156	
0.74	8,700	145.0	0.154	



Exploration V-3

			Total Flux=	1.30	
		Ave=	2.3	Ave=	3.0
Diver measurements					
date time	**Minutes**	**ft H20**	**Head (ft)**	**Flux (cf)**	**Flux (cf/day)**
10/8/13 10:06		33.89			
10/8/13 10:11	0.0	37.37	3.49		
10/8/13 10:16	5.0	37.32	3.43	0.031	9
10/8/13 10:21	10.0	37.29	3.40	0.015	4
10/8/13 10:26	15.0	37.26	3.37	0.017	5
10/8/13 10:31	20.0	37.23	3.35	0.013	4
10/8/13 10:36	25.0	37.21	3.33	0.011	3
10/8/13 10:41	30.0	37.19	3.30	0.013	4
10/8/13 10:46	35.0	37.17	3.28	0.011	3
10/8/13 10:51	40.0	37.13	3.24	0.024	7
10/8/13 10:56	45.0	37.10	3.22	0.011	3
10/8/13 11:01	50.0	37.04	3.15	0.036	10
10/8/13 11:06	55.0	36.91	3.02	0.072	21
10/8/13 11:11	60.0	36.83	2.94	0.041	12
10/8/13 11:16	65.0	36.76	2.87	0.039	11
10/8/13 11:21	70.0	36.69	2.80	0.039	11
10/8/13 11:26	75.0	36.64	2.75	0.029	8.3
10/8/13 11:31	80.0	36.59	2.70	0.027	7.8
10/8/13 11:36	85.0	36.54	2.65	0.027	7.9
10/8/13 11:41	90.0	36.49	2.60	0.027	7.8
10/8/13 11:46	95.0	36.45	2.56	0.020	5.7
10/8/13 11:51	100.0	36.42	2.53	0.019	5.3
10/8/13 11:56	105.0	36.38	2.50	0.018	5.2
10/8/13 12:01	110.0	36.35	2.46	0.017	5.0
10/8/13 12:06	115.0	36.33	2.44	0.012	3.5
10/8/13 12:11	120.0	36.30	2.42	0.014	4.1
10/8/13 12:16	125.0	36.28	2.39	0.013	3.6
10/8/13 12:21	130.0	36.26	2.37	0.011	3.3
10/8/13 12:26	135.0	36.23	2.34	0.018	5.2
10/8/13 12:31	140.0	37.28	3.40		
10/8/13 12:36	145.0	37.26	3.37	0.015	4.4
10/8/13 12:41	150.0	37.24	3.35	0.009	2.5
10/8/13 12:46	155.0	37.22	3.33	0.011	3.3
10/8/13 12:51	160.0	37.19	3.31	0.014	4.1
10/8/13 12:56	165.0	37.18	3.29	0.007	1.9
10/8/13 13:01	170.0	37.16	3.27	0.013	3.6
10/8/13 13:06	175.0	37.13	3.24	0.015	4.2
10/8/13 13:11	180.0	37.11	3.22	0.013	3.6
10/8/13 13:16	185.0	37.04	3.15	0.038	11.0
10/8/13 13:21	190.0	36.91	3.02	0.071	20.6
10/8/13 13:26	195.0	36.84	2.96	0.035	10.2
10/8/13 13:31	200.0	36.78	2.89	0.035	10.2
10/8/13 13:36	205.0	36.72	2.83	0.033	9.6
10/8/13 13:41	210.0	36.67	2.78	0.026	7.5
10/8/13 13:46	215.0	36.62	2.73	0.027	7.8
10/8/13 13:51	220.0	36.58	2.69	0.021	6.0
10/8/13 13:56	225.0	36.54	2.65	0.021	6.0
10/8/13 14:01	230.0	36.50	2.61	0.024	6.9
10/8/13 14:06	235.0	36.46	2.58	0.018	5.2
10/8/13 14:11	240.0	36.43	2.54	0.021	6.0
10/8/13 14:16	245.0	36.40	2.51	0.015	4.2
10/8/13 14:21	250.0	36.37	2.49	0.015	4.2
10/8/13 14:26	255.0	36.34	2.46	0.015	4.4
10/8/13 14:31	260.0	36.32	2.44	0.011	3.3
10/8/13 14:36	265.0	36.30	2.41	0.015	4.2
10/8/13 14:41	270.0	36.27	2.39	0.013	3.6
10/8/13 14:46	275.0	36.25	2.37	0.011	3.3
10/8/13 14:51	280.0	36.23	2.35	0.011	3.3
10/8/13 14:56	285.0	36.21	2.33	0.009	2.7
10/8/13 15:01	290.0	36.20	2.31	0.009	2.5
10/8/13 15:06	295.0	36.19	2.30	0.006	1.7
10/8/13 15:11	300.0	36.16	2.28	0.013	3.6
10/8/13 15:16	305.0	36.15	2.27	0.005	1.6
10/8/13 15:21	310.0	36.14	2.25	0.009	2.7
10/8/13 15:26	315.0	36.12	2.24	0.008	2.4
10/8/13 15:31	320.0	36.10	2.21	0.013	3.6
10/8/13 15:36	325.0	36.08	2.19	0.011	3.3
10/8/13 15:41	330.0	36.07	2.19	0.003	0.9
10/8/13 15:46	335.0	36.06	2.18	0.006	1.7
10/8/13 15:51	340.0	36.05	2.16	0.009	2.5

Yellow shading indicates values used to estimate average.



Manual measurements

time	DTW (ft)	Comment
10:08		pz filled with water
10:09	1.65	
10:54	1.93	
12:26	2.82	pz filled with water after measurement
12:28	1.75	
15:51	3	diver out

Hole Dimensions

ft bgs	**hole diameter (ft)**	
0-4	1.5	ft
Porosity =	0.3	
Volume/ft	0.55	cf

Casing

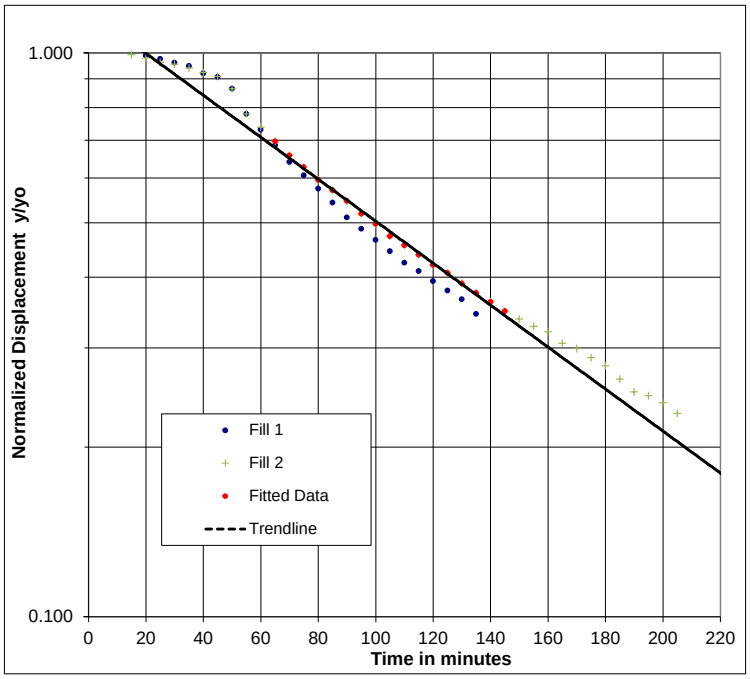
Stickup	1.2	ft
Diameter	0.17	ft

Seepage/Caving Comments

No seepage or caving

Displacement	1.57
H1 (nor. ft)	0.696
T1 (sec)	3900
H2 (nor. ft)	0.348
T2 (sec)	8700

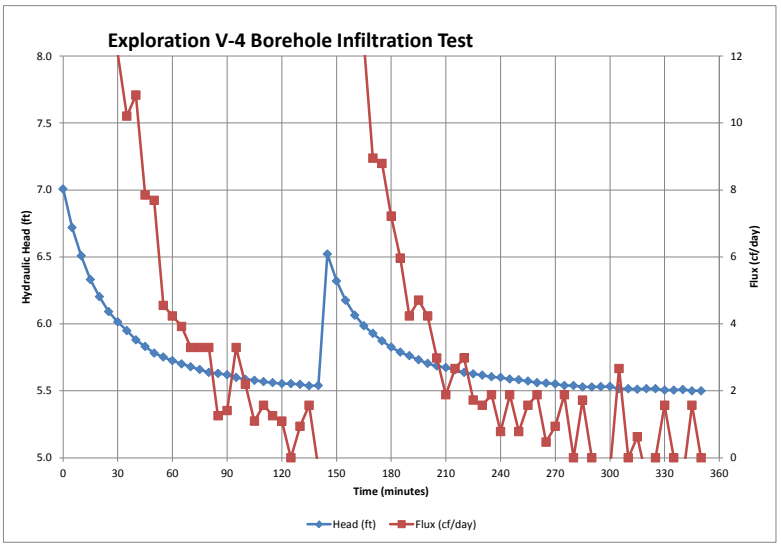
Head (Ft H20)	Elapsed Time (sec)	Elapsed Time (min)	Relative dH	Fitted Data
1.80				
3.37	0	0.0		
3.43	300	5.0	1.042	
3.40	600	10.0	1.024	
3.37	900	15.0	1.004	
3.35	1,200	20.0	0.989	
3.33	1,500	25.0	0.976	
3.30	1,800	30.0	0.961	
3.28	2,100	35.0	0.948	
3.24	2,400	40.0	0.919	
3.22	2,700	45.0	0.906	
3.15	3,000	50.0	0.864	
3.02	3,300	55.0	0.780	
2.94	3,600	60.0	0.731	
2.87	3,900	65.0	0.686	
2.80	4,200	70.0	0.640	
2.75	4,500	75.0	0.606	
2.70	4,800	80.0	0.574	
2.65	5,100	85.0	0.542	
2.60	5,400	90.0	0.511	
2.56	5,700	95.0	0.488	
2.53	6,000	100.0	0.466	
2.50	6,300	105.0	0.445	
2.46	6,600	110.0	0.424	
2.44	6,900	115.0	0.410	
2.42	7,200	120.0	0.394	
2.39	7,500	125.0	0.379	
2.37	7,800	130.0	0.365	
2.34	8,100	135.0	0.344	
3.40	300	5.0	1.020	
3.37	600	10.0	1.003	
3.35	900	15.0	0.992	
3.33	1,200	20.0	0.979	
3.31	1,500	25.0	0.962	
3.29	1,800	30.0	0.955	
3.27	2,100	35.0	0.940	
3.24	2,400	40.0	0.923	
3.22	2,700	45.0	0.908	
3.15	3,000	50.0	0.863	
3.02	3,300	55.0	0.780	
2.96	3,600	60.0	0.738	
2.89	3,900	65.0	0.696	0.696
2.83	4,200	70.0	0.658	0.658
2.78	4,500	75.0	0.627	0.627
2.73	4,800	80.0	0.595	0.595
2.69	5,100	85.0	0.571	0.571
2.65	5,400	90.0	0.546	0.546
2.61	5,700	95.0	0.518	0.518
2.58	6,000	100.0	0.497	0.497
2.54	6,300	105.0	0.473	0.473
2.51	6,600	110.0	0.456	0.456
2.49	6,900	115.0	0.438	0.438
2.46	7,200	120.0	0.420	0.420
2.44	7,500	125.0	0.407	0.407
2.41	7,800	130.0	0.390	0.390
2.39	8,100	135.0	0.375	0.375
2.37	8,400	140.0	0.362	0.362
2.35	8,700	145.0	0.348	0.348
2.33	9,000	150.0	0.337	
2.31	9,300	155.0	0.327	
2.30	9,600	160.0	0.320	
2.28	9,900	165.0	0.305	
2.27	10,200	170.0	0.299	
2.25	10,500	175.0	0.288	
2.24	10,800	180.0	0.279	
2.21	11,100	185.0	0.264	
2.19	11,400	190.0	0.250	
2.19	11,700	195.0	0.247	
2.18	12,000	200.0	0.240	
2.16	12,300	205.0	0.229	



Exploration V-4

			Total Flux=	1.36	
		Ave=	5.5	Ave=	0.8
Diver measurements					
date time	**Minutes**	**ft H20**	**Head (ft)**	**Flux (cf)**	**Flux (cf/day)**
10/8/13 9:55		33.97			
10/8/13 10:00		43.43			
10/8/13 10:05	0.0	40.97	7.01		
10/8/13 10:10	5.0	40.68	6.72	0.158	45.4
10/8/13 10:15	10.0	40.47	6.51	0.114	33.0
10/8/13 10:20	15.0	40.30	6.33	0.097	27.9
10/8/13 10:25	20.0	40.17	6.20	0.070	20.1
10/8/13 10:30	25.0	40.06	6.09	0.061	17.4
10/8/13 10:35	30.0	39.98	6.01	0.042	12.1
10/8/13 10:40	35.0	39.92	5.95	0.035	10.2
10/8/13 10:45	40.0	39.85	5.88	0.038	10.8
10/8/13 10:50	45.0	39.80	5.83	0.027	7.8
10/8/13 10:55	50.0	39.75	5.78	0.027	7.7
10/8/13 11:00	55.0	39.72	5.75	0.016	4.6
10/8/13 11:05	60.0	39.69	5.73	0.015	4.2
10/8/13 11:10	65.0	39.67	5.70	0.014	3.9
10/8/13 11:15	70.0	39.65	5.68	0.011	3.3
10/8/13 11:20	75.0	39.62	5.66	0.011	3.3
10/8/13 11:25	80.0	39.60	5.64	0.011	3.3
10/8/13 11:30	85.0	39.60	5.63	0.004	1.3
10/8/13 11:35	90.0	39.59	5.62	0.005	1.4
10/8/13 11:40	95.0	39.57	5.60	0.011	3.3
10/8/13 11:45	100.0	39.55	5.59	0.008	2.2
10/8/13 11:50	105.0	39.54	5.58	0.004	1.1
10/8/13 11:55	110.0	39.53	5.57	0.005	1.6
10/8/13 12:00	115.0	39.53	5.56	0.004	1.3
10/8/13 12:05	120.0	39.52	5.55	0.004	1.1
10/8/13 12:10	125.0	39.52	5.55	0.000	0.0
10/8/13 12:15	130.0	39.51	5.55	0.003	0.9
10/8/13 12:20	135.0	39.50	5.54	0.005	1.6
10/8/13 12:25	140.0	39.51	5.54	-0.001	-0.3
10/8/13 12:30	145.0	40.49	6.52		
10/8/13 12:35	150.0	40.29	6.32	0.110	31.6
10/8/13 12:40	155.0	40.14	6.18	0.079	22.8
10/8/13 12:45	160.0	40.03	6.07	0.061	17.4
10/8/13 12:50	165.0	39.95	5.99	0.043	12.4
10/8/13 12:55	170.0	39.89	5.93	0.031	8.9
10/8/13 13:00	175.0	39.84	5.87	0.031	8.8
10/8/13 13:05	180.0	39.79	5.83	0.025	7.2
10/8/13 13:10	185.0	39.75	5.79	0.021	6.0
10/8/13 13:15	190.0	39.73	5.76	0.015	4.2
10/8/13 13:20	195.0	39.70	5.73	0.016	4.7
10/8/13 13:25	200.0	39.67	5.71	0.015	4.2
10/8/13 13:30	205.0	39.65	5.69	0.010	3.0
10/8/13 13:35	210.0	39.64	5.67	0.007	1.9
10/8/13 13:40	215.0	39.62	5.66	0.009	2.7
10/8/13 13:45	220.0	39.60	5.64	0.010	3.0
10/8/13 13:50	225.0	39.59	5.63	0.006	1.7
10/8/13 13:55	230.0	39.58	5.62	0.005	1.6
10/8/13 14:00	235.0	39.57	5.61	0.007	1.9
10/8/13 14:05	240.0	39.57	5.60	0.003	0.8
10/8/13 14:10	245.0	39.55	5.59	0.007	1.9
10/8/13 14:15	250.0	39.55	5.58	0.003	0.8
10/8/13 14:20	255.0	39.54	5.57	0.005	1.6
10/8/13 14:25	260.0	39.53	5.56	0.007	1.9
10/8/13 14:30	265.0	39.52	5.56	0.002	0.5
10/8/13 14:35	270.0	39.52	5.55	0.003	0.9
10/8/13 14:40	275.0	39.51	5.54	0.007	1.9
10/8/13 14:45	280.0	39.51	5.54	0.000	0.0
10/8/13 14:50	285.0	39.49	5.53	0.006	1.7
10/8/13 14:55	290.0	39.49	5.53	0.000	0.0
10/8/13 15:00	295.0	39.50	5.53	-0.001	-0.3
10/8/13 15:05	300.0	39.50	5.53	-0.001	-0.3
10/8/13 15:10	305.0	39.48	5.52	0.009	2.7
10/8/13 15:15	310.0	39.48	5.52	0.000	0.0
10/8/13 15:20	315.0	39.48	5.51	0.002	0.6
10/8/13 15:25	320.0	39.48	5.52	-0.002	-0.6
10/8/13 15:30	325.0	39.48	5.52	0.000	0.0
10/8/13 15:35	330.0	39.47	5.51	0.005	1.6
10/8/13 15:40	335.0	39.47	5.51	0.000	0.0
10/8/13 15:45	340.0	39.48	5.51	-0.002	-0.6
10/8/13 15:50	345.0	39.47	5.50	0.005	1.6
10/8/13 15:55	350.0	39.47	5.50	0.000	0.0

Yellow shading indicates values used to estimate average.



Manual measurements

time	DTW (ft)	Comment
9:58		pz filled with water
10:12	3.49	
10:52	4.24	
12:25	4.52	pz filled with water after measurement
15:55	4.55	diver out

Hole Dimensions

ft bgs	**hole diameter (ft)**
0-10	1.5 ft
Porosity =	0.3
Volume/ft	0.55 cf

Casing

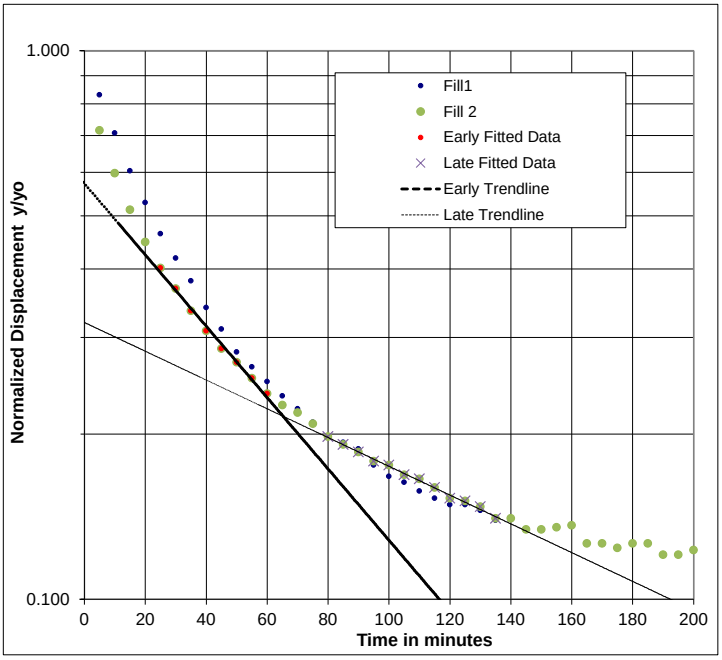
Stickup	1.0 ft
Diameter	0.17 ft

Seepage/Caving Comments

Slight seepage and caving at 4.5-5 ft

Displacement	1.71	
H1 (nor. ft)	0.402	0.198
T1 (sec)	1500	4800
H2 (nor. ft)	0.237	0.141
T2 (sec)	3600	8100

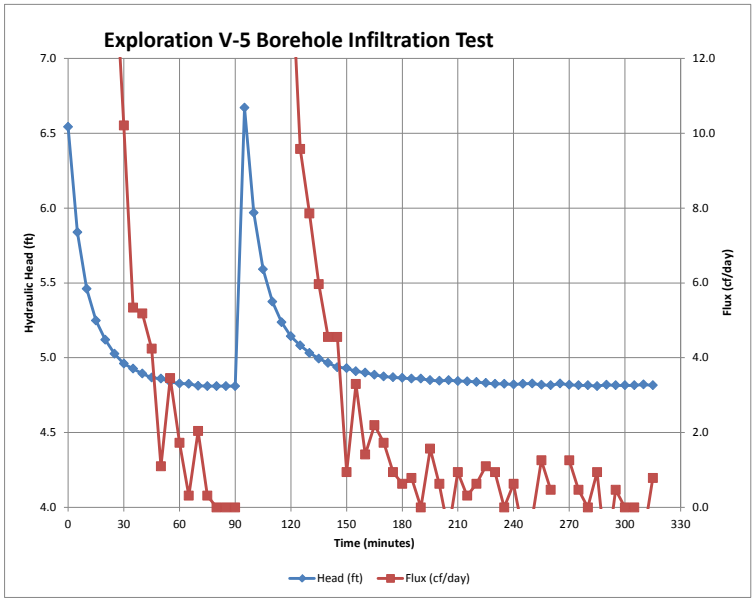
Head (Ft H20)	Elapsed Time (sec)	Elapsed Time (min)	Relative dH	Fitted Data	Fitted Data
5.30					
7.01	0	0.0			
6.72	300	5.0	0.831		
6.51	600	10.0	0.708		
6.33	900	15.0	0.604		
6.20	1,200	20.0	0.529		
6.09	1,500	25.0	0.464		
6.01	1,800	30.0	0.419		
5.95	2,100	35.0	0.381		
5.88	2,400	40.0	0.340		
5.83	2,700	45.0	0.311		
5.78	3,000	50.0	0.282		
5.75	3,300	55.0	0.265		
5.73	3,600	60.0	0.249		
5.70	3,900	65.0	0.235		
5.68	4,200	70.0	0.222		
5.66	4,500	75.0	0.210		
5.64	4,800	80.0	0.198		
5.63	5,100	85.0	0.193		
5.62	5,400	90.0	0.188		
5.60	5,700	95.0	0.176		
5.59	6,000	100.0	0.167		
5.58	6,300	105.0	0.163		
5.57	6,600	110.0	0.157		
5.56	6,900	115.0	0.153		
5.55	7,200	120.0	0.149		
5.55	7,500	125.0	0.149		
5.55	7,800	130.0	0.145		
5.54	8,100	135.0	0.139		
5.54	8,400	140.0	0.141		
6.52	300	5.0	0.715		
6.32	600	10.0	0.598		
6.18	900	15.0	0.513		
6.07	1,200	20.0	0.448		
5.99	1,500	25.0	0.402	0.402	
5.93	1,800	30.0	0.368	0.368	
5.87	2,100	35.0	0.335	0.335	
5.83	2,400	40.0	0.309	0.309	
5.79	2,700	45.0	0.286	0.286	
5.76	3,000	50.0	0.270	0.270	
5.73	3,300	55.0	0.253	0.253	
5.71	3,600	60.0	0.237	0.237	
5.69	3,900	65.0	0.226		
5.67	4,200	70.0	0.219		
5.66	4,500	75.0	0.209		
5.64	4,800	80.0	0.198		0.198
5.63	5,100	85.0	0.191		0.191
5.62	5,400	90.0	0.186		0.186
5.605	5,700	95.0	0.179		0.179
5.6	6,000	100.0	0.176		0.176
5.588	6,300	105.0	0.169		0.169
5.583	6,600	110.0	0.166		0.166
5.573	6,900	115.0	0.160		0.160
5.561	7,200	120.0	0.153		0.153
5.558	7,500	125.0	0.151		0.151
5.552	7,800	130.0	0.148		0.148
5.54	8,100	135.0	0.141		0.141
5.54	8,400	140.0	0.141		
5.529	8,700	145.0	0.134		
5.529	9,000	150.0	0.134		
5.531	9,300	155.0	0.135		
5.533	9,600	160.0	0.136		
5.516	9,900	165.0	0.126		
5.516	10,200	170.0	0.126		
5.512	10,500	175.0	0.124		
5.516	10,800	180.0	0.126		
5.516	11,100	185.0	0.126		
5.506	11,400	190.0	0.121		
5.506	11,700	195.0	0.121		
5.51	12,000	200.0	0.123		
5.5	12,300	205.0	0.117		
5.5	12,600	210.0	0.117		



Exploration V-5

			Total Flux=	1.95	
		Ave=	4.8	Ave=	0.4
Diver measurements					
date time	**Minutes**	**ft H20**	**Head (ft)**	**Flux (cf)**	**Flux (cf/day)**
10/8/13 10:47		34.00			
10/8/13 10:52	0.0	40.54	6.54		
10/8/13 10:57	5.0	39.84	5.84	0.384	110.5
10/8/13 11:02	10.0	39.46	5.46	0.206	59.3
10/8/13 11:07	15.0	39.25	5.25	0.116	33.3
10/8/13 11:12	20.0	39.12	5.12	0.070	20.1
10/8/13 11:17	25.0	39.03	5.03	0.051	14.8
10/8/13 11:22	30.0	38.96	4.96	0.035	10.2
10/8/13 11:27	35.0	38.93	4.93	0.019	5.3
10/8/13 11:32	40.0	38.89	4.89	0.018	5.2
10/8/13 11:37	45.0	38.87	4.87	0.015	4.2
10/8/13 11:42	50.0	38.86	4.86	0.004	1.1
10/8/13 11:47	55.0	38.84	4.84	0.012	3.5
10/8/13 11:52	60.0	38.83	4.83	0.006	1.7
10/8/13 11:57	65.0	38.82	4.83	0.001	0.3
10/8/13 12:02	70.0	38.81	4.81	0.007	2.0
10/8/13 12:07	75.0	38.81	4.81	0.001	0.3
10/8/13 12:12	80.0	38.81	4.81	0.000	0.0
10/8/13 12:17	85.0	38.81	4.81	0.000	0.0
10/8/13 12:22	90.0	38.81	4.81	0.000	0.0
10/8/13 12:27	95.0	40.67	6.67		
10/8/13 12:32	100.0	39.97	5.97	0.383	110.2
10/8/13 12:37	105.0	39.59	5.59	0.206	59.2
10/8/13 12:42	110.0	39.37	5.37	0.118	34.1
10/8/13 12:47	115.0	39.24	5.24	0.075	21.5
10/8/13 12:52	120.0	39.14	5.14	0.051	14.8
10/8/13 12:57	125.0	39.08	5.08	0.033	9.6
10/8/13 13:02	130.0	39.03	5.03	0.027	7.9
10/8/13 13:07	135.0	38.99	4.99	0.021	6.0
10/8/13 13:12	140.0	38.96	4.97	0.016	4.6
10/8/13 13:17	145.0	38.94	4.94	0.016	4.6
10/8/13 13:22	150.0	38.93	4.93	0.003	0.9
10/8/13 13:27	155.0	38.91	4.91	0.011	3.3
10/8/13 13:32	160.0	38.90	4.90	0.005	1.4
10/8/13 13:37	165.0	38.89	4.89	0.008	2.2
10/8/13 13:42	170.0	38.87	4.88	0.006	1.7
10/8/13 13:47	175.0	38.87	4.87	0.003	0.9
10/8/13 13:52	180.0	38.86	4.86	0.002	0.6
10/8/13 13:57	185.0	38.86	4.86	0.003	0.8
10/8/13 14:02	190.0	38.86	4.86	0.000	0.0
10/8/13 14:07	195.0	38.85	4.85	0.005	1.6
10/8/13 14:12	200.0	38.85	4.85	0.002	0.6
10/8/13 14:17	205.0	38.85	4.85	-0.002	-0.6
10/8/13 14:22	210.0	38.84	4.84	0.003	0.9
10/8/13 14:27	215.0	38.84	4.84	0.001	0.3
10/8/13 14:32	220.0	38.84	4.84	0.002	0.6
10/8/13 14:37	225.0	38.83	4.83	0.004	1.1
10/8/13 14:42	230.0	38.82	4.83	0.003	0.9
10/8/13 14:47	235.0	38.82	4.83	0.000	0.0
10/8/13 14:52	240.0	38.82	4.82	0.002	0.6
10/8/13 14:57	245.0	38.82	4.83	-0.002	-0.6
10/8/13 15:02	250.0	38.83	4.83	-0.001	-0.3
10/8/13 15:07	255.0	38.82	4.82	0.004	1.3
10/8/13 15:12	260.0	38.82	4.82	0.002	0.5
10/8/13 15:17	265.0	38.83	4.83	-0.006	
10/8/13 15:22	270.0	38.82	4.82	0.004	1.3
10/8/13 15:27	275.0	38.82	4.82	0.002	0.5
10/8/13 15:32	280.0	38.82	4.82	0.000	0.0
10/8/13 15:37	285.0	38.81	4.81	0.003	0.9
10/8/13 15:42	290.0	38.82	4.82	-0.005	-1.4
10/8/13 15:47	295.0	38.82	4.82	0.002	0.5
10/8/13 15:52	300.0	38.82	4.82	0.000	0.0
10/8/13 15:57	305.0	38.82	4.82	0.000	0.0
10/8/13 16:02	310.0	38.82	4.82	-0.003	-0.8
10/8/13 16:07	315.0	38.82	4.82	0.003	0.8

Yellow shading indicates values used to estimate average.



Manual measurements

time	DTW (ft)	Comment
10:47		pz filled with water
10:48	2.89	
10:56	4.26	
12:22	5.2	pz filled with water after measurement
12:24	3.88	
16:07	5.21	diver out

Hole Dimensions

ft bgs	**hole diameter (ft)**
0-10	1.5 ft
Porosity =	0.3
Volume/ft	0.55 cf

Casing

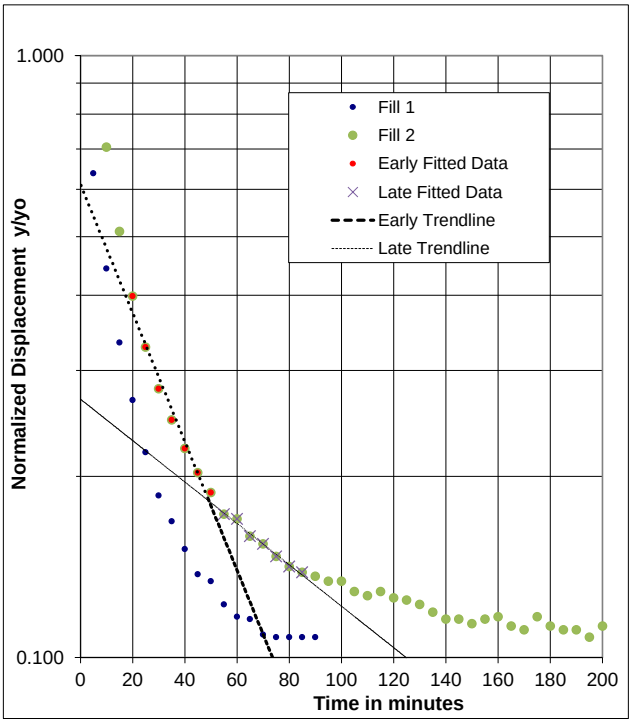
Stickup	1.25 ft
Diameter	0.17 ft

Seepage/Caving Comments

Slight seepage with no slumping from 5-7 ft and at 8.5 ft

Displacement	1.94	
H1 (nor. ft)	0.399	0.173
T1 (sec)	1200	3300
H2 (nor. ft)	0.188	0.139
T2 (sec)	3000	5100

Head (Ft H20)	Elapsed Time (sec)	Elapsed Time (min)	Relative dH	Fitted Data	Fitted Data
4.60					
6.54	0	0.0			
5.84	300	5.0	0.637		
5.46	600	10.0	0.443		
5.25	900	15.0	0.334		
5.12	1,200	20.0	0.268		
5.03	1,500	25.0	0.219		
4.96	1,800	30.0	0.186		
4.93	2,100	35.0	0.168		
4.89	2,400	40.0	0.151		
4.87	2,700	45.0	0.137		
4.86	3,000	50.0	0.134		
4.84	3,300	55.0	0.123		
4.83	3,600	60.0	0.117		
4.83	3,900	65.0	0.116		
4.81	4,200	70.0	0.109		
4.81	4,500	75.0	0.108		
4.81	4,800	80.0	0.108		
4.81	5,100	85.0	0.108		
4.81	5,400	90.0	0.108		
6.67	300	5.0	1.066		
5.97	600	10.0	0.704		
5.59	900	15.0	0.510		
5.37	1,200	20.0	0.399	0.399	
5.24	1,500	25.0	0.328	0.328	
5.14	1,800	30.0	0.280	0.280	
5.08	2,100	35.0	0.248	0.248	
5.03	2,400	40.0	0.222	0.222	
4.99	2,700	45.0	0.203	0.203	
4.97	3,000	50.0	0.188	0.188	
4.94	3,300	55.0	0.173		0.173
4.93	3,600	60.0	0.170		0.170
4.91	3,900	65.0	0.159		0.159
4.90	4,200	70.0	0.154		0.154
4.89	4,500	75.0	0.147		0.147
4.88	4,800	80.0	0.142		0.142
4.87	5,100	85.0	0.139		0.139
4.86	5,400	90.0	0.136		
4.86	5,700	95.0	0.134		
4.86	6,000	100.0	0.134		
4.85	6,300	105.0	0.129		
4.85	6,600	110.0	0.127		
4.85	6,900	115.0	0.129		
4.84	7,200	120.0	0.126		
4.84	7,500	125.0	0.125		
4.84	7,800	130.0	0.123		
4.83	8,100	135.0	0.119		
4.83	8,400	140.0	0.116		
4.825	8,700	145.0	0.116		
4.821	9,000	150.0	0.114		
4.825	9,300	155.0	0.116		
4.827	9,600	160.0	0.117		
4.819	9,900	165.0	0.113		
4.816	10,200	170.0	0.111		
4.827	10,500	175.0	0.117		
4.819	10,800	180.0	0.113		
4.816	11,100	185.0	0.111		
4.816	11,400	190.0	0.111		
4.81	11,700	195.0	0.108		
4.819	12,000	200.0	0.113		
4.816	12,300	205.0	0.111		
4.816	12,600	210.0	0.111		
4.816	12,900	215.0	0.111		
4.821	13,200	220.0	0.114		
4.816	13,500	225.0	0.111		

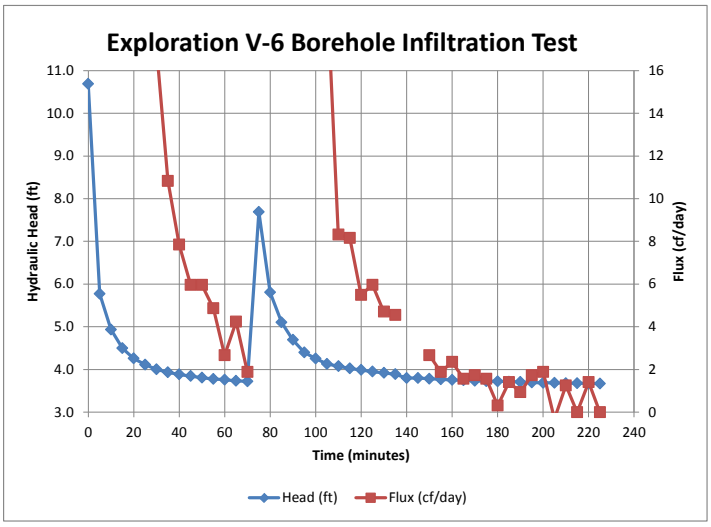


V-5 Semilog Slug Response
140203 Duwe'iq Stormwater

Exploration V-6

			Total Flux=	5.99	
		Ave=	3.7	Ave=	0.9
Diver measurements					
date time	**Minutes**	**ft H20**	**Head (ft)**	**Flux (cf)**	**Flux (cf/day)**
10/8/13 12:15		33.98			
10/8/13 12:20	0.0	44.67	10.69		
10/8/13 12:25	5.0	39.76	5.77	2.68	771
10/8/13 12:30	10.0	38.92	4.94	0.46	132
10/8/13 12:35	15.0	38.48	4.50	0.24	68
10/8/13 12:40	20.0	38.24	4.26	0.13	38
10/8/13 12:45	25.0	38.10	4.12	0.08	23
10/8/13 12:50	30.0	37.99	4.01	0.06	17
10/8/13 12:55	35.0	37.92	3.94	0.038	11
10/8/13 13:00	40.0	37.87	3.89	0.027	7.9
10/8/13 13:05	45.0	37.83	3.85	0.021	6.0
10/8/13 13:10	50.0	37.79	3.81	0.021	6.0
10/8/13 13:15	55.0	37.76	3.78	0.017	4.9
10/8/13 13:20	60.0	37.75	3.76	0.009	2.7
10/8/13 13:25	65.0	37.72	3.74	0.015	4.2
10/8/13 13:30	70.0	37.71	3.72	0.007	1.9
10/8/13 13:35	75.0	41.67	7.69		
10/8/13 13:40	80.0	39.79	5.81	1.02	295
10/8/13 13:45	85.0	39.08	5.10	0.39	111
10/8/13 13:50	90.0	38.68	4.70	0.22	64
10/8/13 13:55	95.0	38.38	4.40	0.16	47
10/8/13 14:00	100.0	38.24	4.26	0.08	22
10/8/13 14:05	105.0	38.11	4.13	0.07	20
10/8/13 14:10	110.0	38.06	4.08	0.029	8.3
10/8/13 14:15	115.0	38.01	4.03	0.028	8.2
10/8/13 14:20	120.0	37.97	3.99	0.019	5.5
10/8/13 14:25	125.0	37.93	3.95	0.021	6.0
10/8/13 14:30	130.0	37.90	3.92	0.016	4.7
10/8/13 14:35	135.0	37.88	3.89	0.016	4.6
10/8/13 14:40	140.0	37.78	3.80	0.050	
10/8/13 14:45	145.0	37.78	3.80	0.000	
10/8/13 14:50	150.0	37.77	3.78	0.009	2.7
10/8/13 14:55	155.0	37.75	3.77	0.007	1.9
10/8/13 15:00	160.0	37.74	3.76	0.008	2.4
10/8/13 15:05	165.0	37.73	3.75	0.005	1.6
10/8/13 15:10	170.0	37.72	3.74	0.006	1.7
10/8/13 15:15	175.0	37.71	3.73	0.005	1.6
10/8/13 15:20	180.0	37.71	3.72	0.001	0.3
10/8/13 15:25	185.0	37.70	3.72	0.005	1.4
10/8/13 15:30	190.0	37.69	3.71	0.003	0.9
10/8/13 15:35	195.0	37.68	3.70	0.006	1.7
10/8/13 15:40	200.0	37.67	3.69	0.007	1.9
10/8/13 15:45	205.0	37.67	3.69	-0.001	-0.3
10/8/13 15:50	210.0	37.66	3.68	0.004	1.3
10/8/13 15:55	215.0	37.66	3.68	0.000	0.0
10/8/13 16:00	220.0	37.65	3.67	0.005	1.4
10/8/13 16:05	225.0	37.65	3.67	0.000	0.0

Yellow shading indicates values used to estimate average.



Manual measurements

time	DTW (ft)	Comment
12:18		pz filled with water
12:19	2.1	water level dropping at ~0.1 ft/s
13:32	6.34	pz filled with water after measurement
13:33	2.31	
13:48	5.43	
16:05	6.38	diver out

Hole Dimensions

ft bgs	**hole diameter (ft)**	
0-9.4	1.5	ft
Porosity =	0.3	
Volume/ft	0.55	cf

Casing

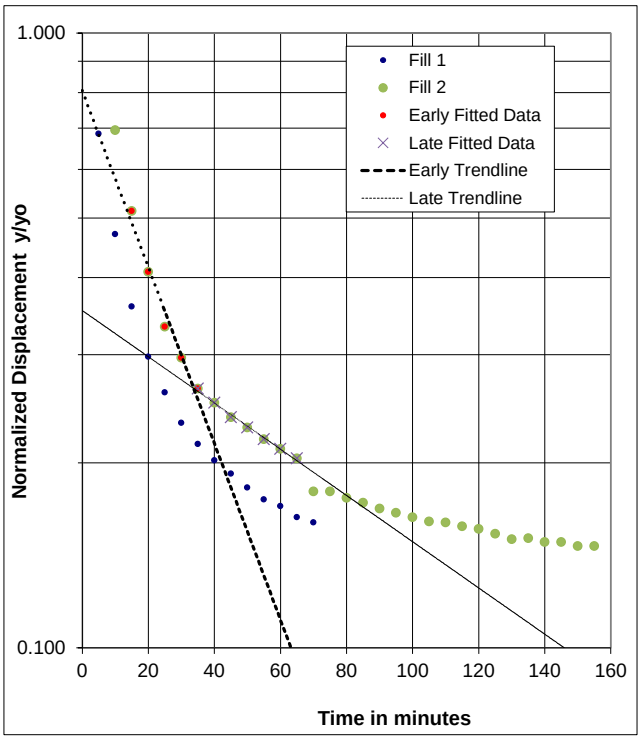
Stickup	1.0	ft
Diameter	0.17	ft

Seepage/Caving Comments

Moderate seepage with no slumping from 7.5 ft to 8.5 ft

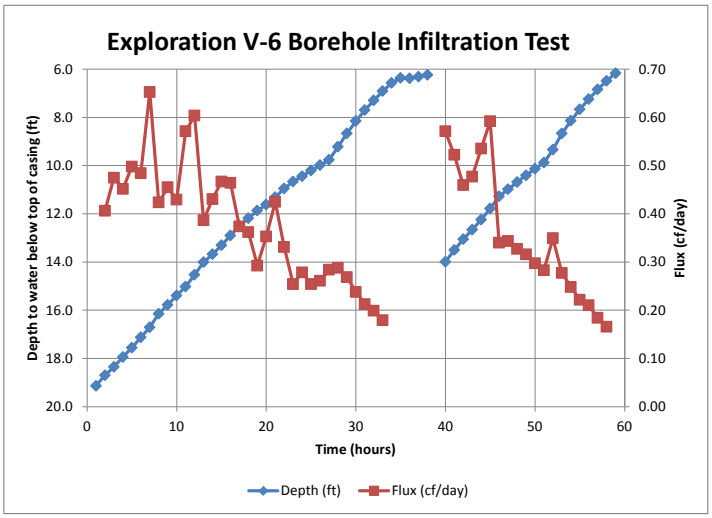
Displacement	3.90	
H1 (nor. ft)	0.513	0.264
T1 (sec)	900	2100
H2 (nor. ft)	0.264	0.203
T2 (sec)	2100	3900

Head (Ft H20)	Elapsed Time (sec)	Elapsed Time (min)	Relative dH	Fitted Data	Fitted Data
3.10					
7.00	0	0.0			
5.77	300	5.0	0.686		
4.94	600	10.0	0.471		
4.50	900	15.0	0.359		
4.26	1,200	20.0	0.297		
4.12	1,500	25.0	0.260		
4.01	1,800	30.0	0.232		
3.94	2,100	35.0	0.215		
3.89	2,400	40.0	0.202		
3.85	2,700	45.0	0.192		
3.81	3,000	50.0	0.182		
3.78	3,300	55.0	0.174		
3.76	3,600	60.0	0.170		
3.74	3,900	65.0	0.163		
3.72	4,200	70.0	0.160		
7.69	300	5.0	1.177		
5.81	600	10.0	0.695		
5.10	900	15.0	0.513	0.513	
4.70	1,200	20.0	0.409	0.409	
4.40	1,500	25.0	0.333	0.333	
4.26	1,800	30.0	0.296	0.296	
4.13	2,100	35.0	0.264	0.264	0.264
4.08	2,400	40.0	0.251		0.251
4.03	2,700	45.0	0.237		0.237
3.99	3,000	50.0	0.228		0.228
3.95	3,300	55.0	0.218		0.218
3.92	3,600	60.0	0.211		0.211
3.89	3,900	65.0	0.203		0.203
3.80	4,200	70.0	0.180		
3.80	4,500	75.0	0.180		
3.78	4,800	80.0	0.175		
3.77	5,100	85.0	0.172		
3.76	5,400	90.0	0.168		
3.75	5,700	95.0	0.166		
3.74	6,000	100.0	0.163		
3.73	6,300	105.0	0.161		
3.72	6,600	110.0	0.160		
3.72	6,900	115.0	0.158		
3.71	7,200	120.0	0.156		
3.70	7,500	125.0	0.153		
3.69	7,800	130.0	0.150		
3.69	8,100	135.0	0.151		
3.68	8,400	140.0	0.149		
3.68	8,700	145.0	0.149		
3.67	9,000	150.0	0.146		
3.67	9,300	155.0	0.146		



Well MW-1

			Total Flux=	-0.81	
		Ave=	12.0	Ave=	0.4
Diver measurements					
date time	**Hours**	**ft H20**	**Depth (ft)**	**Flux (cf)**	**Flux (cf/day)**
4/15/13 19:00			19.14		
4/15/13 20:00	1.0		18.70	-0.02	
4/15/13 21:00	2.0		18.35	-0.02	0.41
4/15/13 22:00	3.0		17.94	-0.02	0.47
4/15/13 23:00	4.0		17.55	-0.02	0.45
4/16/13 0:00	5.0		17.13	-0.02	0.50
4/16/13 1:00	6.0		16.71	-0.02	0.48
4/16/13 2:00	7.0		16.15	-0.03	0.65
4/16/13 3:00	8.0		15.78	-0.02	0.42
4/16/13 4:00	9.0		15.39	-0.02	0.46
4/16/13 5:00	10.0		15.02	-0.02	0.43
4/16/13 6:00	11.0		14.53	-0.02	0.57
4/16/13 7:00	12.0		14.01	-0.03	0.60
4/16/13 8:00	13.0		13.67	-0.02	0.39
4/16/13 9:00	14.0		13.30	-0.02	0.43
4/16/13 10:00	15.0		12.90	-0.02	0.47
4/16/13 11:00	16.0		12.50	-0.02	0.46
4/16/13 12:00	17.0		12.18	-0.02	0.37
4/16/13 13:00	18.0		11.87	-0.02	0.36
4/16/13 14:00	19.0		11.62	-0.01	0.29
4/16/13 15:00	20.0		11.31	-0.01	0.35
4/16/13 16:00	21.0		10.95	-0.02	0.42
4/16/13 17:00	22.0		10.66	-0.01	0.33
4/16/13 18:00	23.0		10.44	-0.01	0.25
4/16/13 19:00	24.0		10.20	-0.01	0.28
4/16/13 20:00	25.0		9.98	-0.01	0.25
4/16/13 21:00	26.0		9.76	-0.01	0.26
4/16/13 22:00	27.0		9.21	-0.01	0.28
4/16/13 23:00	28.0		8.66	-0.01	0.29
4/17/13 0:00	29.0		8.15	-0.01	0.27
4/17/13 1:00	30.0		7.70	-0.01	0.24
4/17/13 2:00	31.0		7.29	-0.01	0.21
4/17/13 3:00	32.0		6.91	-0.01	0.20
4/17/13 4:00	33.0		6.57	-0.01	0.18
4/17/13 5:00	34.0		6.37	0.00	
4/17/13 6:00	35.0		6.37	0.00	
4/17/13 7:00	36.0		6.31	0.00	
4/17/13 8:00	37.0		6.23	0.00	
4/17/13 9:00	38.0				
4/17/13 10:00	39.0		13.99		
4/17/13 11:00	40.0		13.50	-0.02	0.57
4/17/13 12:00	41.0		13.05	-0.02	0.52
4/17/13 13:00	42.0		12.66	-0.02	0.46
4/17/13 14:00	43.0		12.25	-0.02	0.48
4/17/13 15:00	44.0		11.78	-0.02	0.54
4/17/13 16:00	45.0		11.27	-0.02	0.59
4/17/13 17:00	46.0		10.98	-0.01	0.34
4/17/13 18:00	47.0		10.69	-0.01	0.34
4/17/13 19:00	48.0		10.40	-0.01	0.33
4/17/13 20:00	49.0		10.13	-0.01	0.32
4/17/13 21:00	50.0		9.88	-0.01	0.30
4/17/13 22:00	51.0		9.33	-0.01	0.28
4/17/13 23:00	52.0		8.67	-0.01	0.35
4/18/13 0:00	53.0		8.14	-0.01	0.28
4/18/13 1:00	54.0		7.66	-0.01	0.25
4/18/13 2:00	55.0		7.24	-0.01	0.22
4/18/13 3:00	56.0		6.84	-0.01	0.21
4/18/13 4:00	57.0		6.48	-0.01	0.18
4/18/13 5:00	58.0		6.17	-0.01	0.17
4/18/13 6:00	59.0		6.05	0.00	



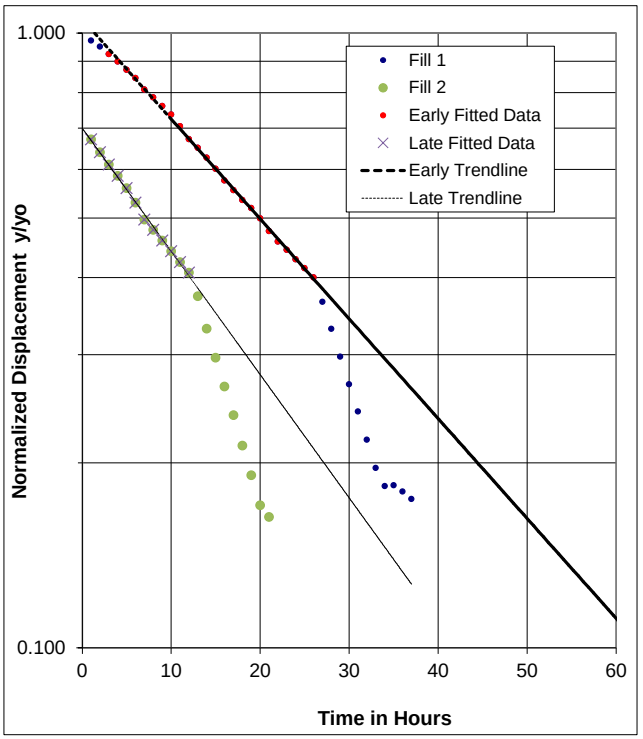
Hole Dimensions

ft bgs	**hole diameter (ft)**
0-20.75	0.375 ft
Porosity =	0.3
Volume/ft	0.048 cf
Casing	
Stickup	0.0 ft
Diameter	0.17 ft
Volume/ft	0.022 cf

Note:
"Depth" is depth to water below top of casing.

Displacement	15.64	
H1 (nor. ft)	0.924	0.671
T1 (sec)	10800	3600
H2 (nor. ft)	0.400	0.408
T2 (sec)	93600	43200

Head (Ft H20)	Elapsed Time (sec)	Elapsed Time (hours)	Relative dH	Fitted Data	Fitted Data
28.50					
12.86	0				
13.30	3,600	1.0	0.972		
13.65	7,200	2.0	0.950		
14.06	10,800	3.0	0.924	0.924	
14.45	14,400	4.0	0.899	0.899	
14.88	18,000	5.0	0.871	0.871	
15.29	21,600	6.0	0.845	0.845	
15.85	25,200	7.0	0.809	0.809	
16.22	28,800	8.0	0.785	0.785	
16.61	32,400	9.0	0.760	0.760	
16.98	36,000	10.0	0.737	0.737	
17.47	39,600	11.0	0.705	0.705	
17.99	43,200	12.0	0.672	0.672	
18.33	46,800	13.0	0.651	0.651	
18.70	50,400	14.0	0.627	0.627	
19.10	54,000	15.0	0.601	0.601	
19.50	57,600	16.0	0.576	0.576	
19.82	61,200	17.0	0.555	0.555	
20.13	64,800	18.0	0.535	0.535	
20.39	68,400	19.0	0.519	0.519	
20.69	72,000	20.0	0.500	0.500	
21.06	75,600	21.0	0.476	0.476	
21.34	79,200	22.0	0.458	0.458	
21.56	82,800	23.0	0.444	0.444	
21.80	86,400	24.0	0.429	0.429	
22.02	90,000	25.0	0.415	0.415	
22.24	93,600	26.0	0.400	0.400	
22.79	97,200	27.0	0.365		
23.34	100,800	28.0	0.330		
23.85	104,400	29.0	0.297		
24.30	108,000	30.0	0.268		
24.71	111,600	31.0	0.242		
25.09	115,200	32.0	0.218		
25.43	118,800	33.0	0.196		
25.64	122,400	34.0	0.183		
25.63	126,000	35.0	0.184		
25.69	129,600	36.0	0.180		
25.77	133,200	37.0	0.175		
12.54	0	0.0	1.021		
18.01	3,600	1.0	0.671		0.671
18.50	7,200	2.0	0.640		0.640
18.95	10,800	3.0	0.611		0.611
19.34	14,400	4.0	0.586		0.586
19.76	18,000	5.0	0.559		0.559
20.22	21,600	6.0	0.530		0.530
20.73	25,200	7.0	0.497		0.497
21.019	28,800	8.0	0.478		0.478
21.315	32,400	9.0	0.459		0.459
21.597	36,000	10.0	0.441		0.441
21.869	39,600	11.0	0.424		0.424
22.125	43,200	12.0	0.408		0.408
22.666	46,800	13.0	0.373		
23.334	50,400	14.0	0.330		
23.864	54,000	15.0	0.296		
24.338	57,600	16.0	0.266		
24.762	61,200	17.0	0.239		
25.164	64,800	18.0	0.213		
25.516	68,400	19.0	0.191		
25.833	72,000	20.0	0.171		
25.948	75,600	21.0	0.163		



Note: Head is shown in elevation above mean sea level.

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Aspect CONSULTING

MEMORANDUM

Project No.: 140203-01

June 27, 2014

To: Phil Struck, Parametrix, Inc.

cc: Mindy Fohn, Kitsap County Public Works

State of Washington Hydrogeologist 1537 Licensed Geologist 6-27-14

Erick William Miller

HENRY H. HASELTON STATE OF WASHINGTON 33194 REGISTERED PROFESSIONAL ENGINEER 6-27-14

From: **Erick W. Miller, LHG**
Senior Associate Hydrogeologist

Henry H. Haselton, PE
Principal Geotechnical Engineer

Jared Bean
Staff Hydrogeologist

Re: **Hydrogeologic Conditions, Excavation Constraints, and Water Balance for the Duwe'iq Stormwater Treatment Facility**

This technical memorandum presents a supplemental hydrogeologic and geotechnical assessment of the proposed Duwe'iq stormwater treatment facility. This information is intended to assist Kitsap County and their consultant, Parametrix, with the response to the Department of Ecology's comments on the 30 percent design. The primary objectives for this assessment include:

- Identify excavation constraints related to possible bottom-heave for the proposed facility excavation depths; and
- Evaluate hydrogeologic conditions and develop a water balance to support wet and dry season estimates of groundwater inflow into the facility.

This information will be used to:

- Support excavation planning;
- Better understand the timing and magnitude of flows through the facility; and
- Provide conceptual liner recommendations, if a liner is deemed necessary.

Background

Initial work at the site included installation of two monitoring wells, water level monitoring, and excavation of test pits (Aspect, 2013a) to characterize soil and groundwater conditions. Subsequent work at the site included installation of six shallow piezometers, piezometer flow testing, and additional long-term water level monitoring (Aspect, 2013b). Preliminary groundwater inflow estimates were provided in a previous draft memorandum (Aspect 2013b). Inflow estimates provided in this memo supersede those that were previously provided.

Stratigraphy

The site layout is illustrated on Figure 1. Cross -sections (A-A', B-B', and C-C') through the proposed stormwater treatment facility are shown on Figures 2 through 4. The locations of the individual sections are shown on Figure 1. The sections include the existing ground surface, a selection of completed explorations, proposed grading for the stormwater treatment facility, underlying geology and stratigraphy, and key groundwater data. The duration of water level data recorded in on-site piezometers for this report are as follows: MW-1 and MW-2: 4/15/13 through 5/27/14, and for the “V” piezometers: 10/8/13 through 5/27/14. Also shown on cross-sections A-A' and B-B' is the western margin of the existing Clear Creek channel and the ordinary high water mark (OHWM). Additional details related to the individual explorations and groundwater data can be found in the draft geotechnical report (Aspect, 2013a) and the draft water level monitoring memorandum (Aspect, 2013b).

The site geology generally consists of a sequence of mixed fill and alluvium overlying subglacial melt-out till. Approximate 2-foot (ft) interbeds of Recessional outwash or well sorted meltout till were noted between the mixed fill/alluvium and the melt-out till in TP-5 and TP-6. Advance outwash was found below the melt-out till in monitoring well MW-2.

Shallow perched groundwater occurs above the melt-out till and goes dry seasonally. On-going monitoring will further define water level fluctuations in the shallow perched zone. Two test pits toward the north end of the forebay had seepage zones extending down to depths of about 9 ft below ground surface within the mixed fill/alluvium and the melt-out till. Of the two monitoring wells, one is screened through melt-out till (MW-1), and the other is screened through advance outwash (MW-2). Water levels in these wells rose above the level at which groundwater was encountered indicating confined conditions.

Note, the proposed grading for the stormwater treatment facility shown Figure 1 and on the cross-sections has been developed to the 30 percent design level and has not been finalized.

Excavation Bottom Heave Potential

Due to the presence of a pressurized, confined aquifer within the Vashon Advance Outwash (outwash) unit beneath the site, the potential for excavation bottom heave has been assessed. Based on the results of the completed explorations, Aspect estimated the pressurized aquifer within the outwash unit underlies the Vashon Sub-Glacial Melt-Out Till (till) at approximately Elevation 13. The maximum recorded piezometric level in the completed monitoring wells is approximately Elevation 30. The unit weight of the confining till is estimated at 135 pounds per cubic foot (pcf). We understand the critical excavation will be for the forebay treatment cell. Therefore, multiple minimum excavation elevations through the forebay were analyzed for excavation bottom heave. The results of the analyzed scenarios are summarized in Table 1 below.

Table 1 – Summary of Forebay Excavation Bottom Heave Analysis Results

Minimum Forebay Cell Excavation Elevation (feet)	Factor of Safety Against Bottom Heave
22	1.14
23	1.27
24	1.40

We recommend a minimum factor of safety against bottom heave excavation of 1.25; therefore, a minimum finished Elevation for the forebay of 23 feet is recommended. The planned base of the secondary treatment cell excavation is equal to or higher in elevation than the forebay cell excavation, making the forebay cell excavation the critical scenario. Provided that temporary excavations necessary for placing topsoil and/or soil liner are completed between June and September, they may extend as deep as Elevation 21.5. This recommendation assumes a groundwater elevation of 28 feet. If excavation occurs outside of the June through September timeframe, then the excavations should not be advanced below Elevation 23.

We anticipate the excavations for the forebay and secondary treatment cells will encounter shallow groundwater seepage within the mixed fill and alluvium soils as well as within the till; however, this anticipated shallow seepage is not a contributing element to the excavation bottom heave. The anticipated shallow seepage will require standard dewatering and handling (e.g., sumps and pumps) during the excavations.

Water Balance

A water balance was developed to evaluate the timing and relative magnitude of inflow components and to address the lining requirements for a constructed wetland. Under Ecology's BMP T10.30: Stormwater Treatment Wetlands, the lining requirements may be waived if it can be demonstrated that:

- the second cell retains water for at least 10 months of the year; and,
- the first cell (forebay) retain at least 3 feet of water year-round.

The BMP further indicates that a complete precipitation record be used when establishing these conditions and evapotranspiration losses shall be taken into account as well as infiltration losses.

A monthly water balance was developed to evaluate these criteria for the proposed wetland and to develop an understanding of the timing of magnitude of flows. The water balance was summarized to a monthly time step using the continuity equation:

Inflows = Outflows +/- Change in Storage

Outflow from the forebay and the 2nd cell will be controlled by a weir and outlet control structure. Therefore, changes in storage were considered negligible in the analysis. Details of the water balance are presented in Appendix A. The water balance was developed for the 10, 50, and 90 percent flow exceedance years to provide flow estimates for a range of climatic conditions. Separate water balances were done for the forebay and the 2nd cell.

A summary of the water balance parameters is presented below:

Wetland Area – The wetland area was divided into the forebay and 2nd cell. Areas were based on the approximate upper contour of the wetland area as shown on Figure 1.

Stormwater Flow and Precipitation – Stormwater flow and incident precipitation onto the water surface of the wetland were output as a single value from the WWHM model and provided by Parametrix as daily values for the period 1948 through 1999. The surface water inflows are flows entering the wetland downstream of the splitter box. The flow splitter is located north of the facility and diverts a portion of the stormwater flow to the wetland. Daily stormwater plus precipitation was summed to annual totals and ranked to determine the approximate 10 percent (1974), 50 percent (1980), 90 percent (1982) exceedance years. These years were carried forward in the analysis.

Inflows

Groundwater inflow was estimated for horizontal and vertical flow components.

Horizontal Groundwater Inflow – Shallow groundwater seepage within the mixed fill and alluvium soils, as well as within the till, is anticipated to enter along the upgradient wetland edges (west and north). Horizontal groundwater flow was estimated by treating the excavation as a well of equivalent radius using equation 6.12 of Powers (1992). The system is represented as a trench of finite length with consideration of end effects. The analysis was run for range of hydraulic conductivity values based on soil texture and previous slug tests. The groundwater head used in the calculation was obtained from monitoring well MW-1 plus 1 foot to capture higher water levels that occur in piezometer V-1. Piezometer V-1 goes dry seasonally, but when wet, has a water level about 1-foot (ft) higher than MW-1. Thus, adding 1 ft to the MW-1 water level was used to estimate the groundwater head throughout the year including times when V-1 is dry. For the inflow analysis, MW-1 (which appears to be completed in a confined unit within the melt out till) was assumed to be in hydraulic continuity with the thicker, saturated alluvium/fill/till identified in pits TP-5 and TP-6 and water levels in this well are assumed to representative of the fill/alluvium/till. An additional piezometer could be installed in the vicinity of TP-5/6 to confirm this assumption. Water level data collected at the site is presented on Figures 5 and 6, by depth and elevation, respectively. Horizontal groundwater inflow results are summarized in Table 2.

Forebay horizontal groundwater inflow values range from a low of 0.008 cubic feet per second (cfs) (3.6 gallons per minute [gpm] for low hydraulic conductivity [K] estimate) for August and September conditions to 0.16 cfs (72 gpm for high K estimate) for March. The K value of 10 ft/day is considered the best estimate for the evaluation of groundwater inflows. Measurement of K based on slug tests ranged from about 0.1 to 0.9 ft/day (Aspect, 2013b). The selected K value of 10 ft/day is about an order of magnitude higher than the slug test values, to account for inflow through more permeable gravelly sand lenses that were observed in test pits TP-5 and TP-6.

Average monthly horizontal groundwater inflow to the **forebay** using the K = 10 ft/day ranges from 0.036 cfs (18 gpm) for August/September to 0.075 cfs (34 gpm) for March. **Second (2nd) cell** groundwater inflow rates range from 0.028 cfs (13 gpm) in August and September to 0.069 cfs (31 gpm) in March. Therefore, **Total** average monthly horizontal groundwater inflow to the wetland ranges from 0.064 cfs (29 gpm) for August/September to 0.14 cfs (63 gpm) for March for the best estimate K value (Table 2).

The groundwater inflow estimates, based on 10 ft/day hydraulic conductivity, were used in the water balance. The computed inflow values are representative of long-term steady state conditions. Initial inflows during excavation will likely be greater than those estimated for the steady state condition. This will be a transient condition that will be experienced during construction. The duration and magnitude of transient inflow expected during construction will be addressed as the design progresses and documented in our final geotechnical report.

Vertical Groundwater Inflow – Seasonal vertical upward seepage into the wetland is predicted to occur through the till from the underlying artesian advance outwash aquifer. Water level data from MW-2 indicates upward seepage will generally occur from January through April and with greatest seepage in March, where it was estimated to be less than 1 gpm.

Outflows

Evapotranspiration was based on the WSU Public Agricultural Weather (PAWs) station located in Poulsbo, Washington assuming evaporation from open water.

Average monthly wetland outflow is presented on Figure 7 for the forebay and 2nd cell. Water balance components are presented in Table 3 and shown graphically on Figure 9. Components are broken out by forebay and 2nd cell. Average monthly outflow is estimated to range from a minimum 0.08 cfs (36 gpm) occurring during August of the 10 percent and 50 percent exceedance years to a maximum of 0.40 cfs (450 gpm) for January of the 10 percent exceedance year. For the 50 percent exceedance year, average monthly flows range from 0.08 cfs to 0.31 cfs (35 to 138 gpm).

Estimated Standing Water

Figure 8 also shows the base of the wetland and the higher of the estimated groundwater elevation for the forebay and 2nd cell. The groundwater elevation was based on water levels observed in MW-1 or V-1, whichever was greater. Water levels in the wetland will come to equilibrium with water levels determined by weir and outlet control structure. Thus, Figure 8 represents the maximum achievable standing water level, if the pond is relying only on groundwater inflows. The standing groundwater level will be less since the hydraulic control is set below the groundwater level.

The minimum groundwater level occurs in September. For a design forebay finished bottom elevation of 23 ft, the predicted standing groundwater level is about 2.6 ft in September, assuming the weir provides hydraulic control to allow groundwater to pool to this depth. The weir elevation will not be set above this level to prevent excessive surcharging of the inlet conveyance system. For the 2nd cell, bottom design elevations slope from 25 to 23 ft, and Figure 8 shows the 25 ft bottom elevation. Table 1 presents an average cell bottom elevation of 24 ft. The 2nd cell is predicted to be wet throughout the year with groundwater elevations above the base of the cell. For the maximum design elevation for the base of the 2nd cell of 25 ft, up to 0.6 ft of groundwater could pool for an appropriately placed weir.

The estimated minimum standing water level in the forebay area is slightly below that required to maintain standing water year-round, as specified by Ecology. Therefore, we recommend specifying a liner in the forebay to ensure this requirement is met. This recommendation is made based on conservative inflow assumptions in the forebay area. If more favorable inflow conditions are revealed at the time of construction, it could be justifiable to omit a liner for the forebay. The construction contract should reflect this possibility.

Similarly, the design for the 2nd cell of the wetland should also include a provision for lining, based on conservative inflow assumptions. Localized downward seepage may also occur along portions of the 2nd cell, particularly in the middle and east wetland segments. Water levels at piezometer V-6 indicate that seasonal water levels will be below the wetland base along these segments (Figure 3, Section B-B'). As with the forebay, if favorable inflow conditions are revealed at the time of construction, it could be justifiable to omit a liner for the forebay. The construction contract should reflect this possibility.

Low Permeability Soil Barrier

A low permeability soil barrier (LPSB) can be incorporated into the design of the forebay to act as a liner. A LPSB is preferred over a membrane liner to minimize complications during maintenance. The LPSB should be designed for the floor of the forebay only, and is not suitable on sidewalls where inflow is expected to occur.

The on-site soils may be amended with powdered bentonite to create a LPSB. Amendment of the on-site soils could be done with a pug mill or other equivalent mixing facility. For planning purposes, a 12-inch thick LPSB should be anticipated with a target maximum hydraulic conductivity on the order of $1x10^{-5}$ centimeters per second (cm/sec). Additional hydraulic conductivity testing would be needed to determine the amount of bentonite amending of the native soils required to meet the above criteria.

References

American Society of Civil Engineers (ASCE), 1996, Hydrology Handbook, Second Edition.

Aspect Consulting, LLC (Aspect), 2013a, Draft Report, Duwe'iq Stormwater Treatment Facility Geotechnical and Hydrogeologic Assessment, Silverdale, Washington, July 11, 2013.

Aspect Consulting, LLC (Aspect), 2013b, Draft Memorandum, Results of Piezometer Installation and Water Level Monitoring, Duwe'iq Stormwater Treatment Facility, December 12, 2013.

Powers, J. P., 1992, Construction Detwatering, New Methods and Applications, Second Edition.

Limitations

Work for this project was performed for Parametrix, Inc. (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Attachments

Table 1 – Summary of Forebay Excavation Bottom Heave Analysis Results (In Text)
Table 2 – Groundwater Inflow Summary
Table 3 – Water Balance Summary
Figure 1 – Site and Exploration Map
Figure 2 – Geologic Cross Section A-A'
Figure 3 – Geologic Cross Section B-B'
Figure 4 – Geologic Cross Section C-C'
Figure 5 – Depth to Groundwater Below Ground Surface
Figure 6 – Groundwater Elevations
Figure 7 – Cell Outflows
Figure 8 – Maximum Cell Groundwater Elevations
Figure 9 – Cell Water Balance Components
Appendix A – Water Balance Methods

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Table 2 - Groundwater Inflow Summary

Duwe'iq Stormwater Treatment Facility
Silverdale, Washington

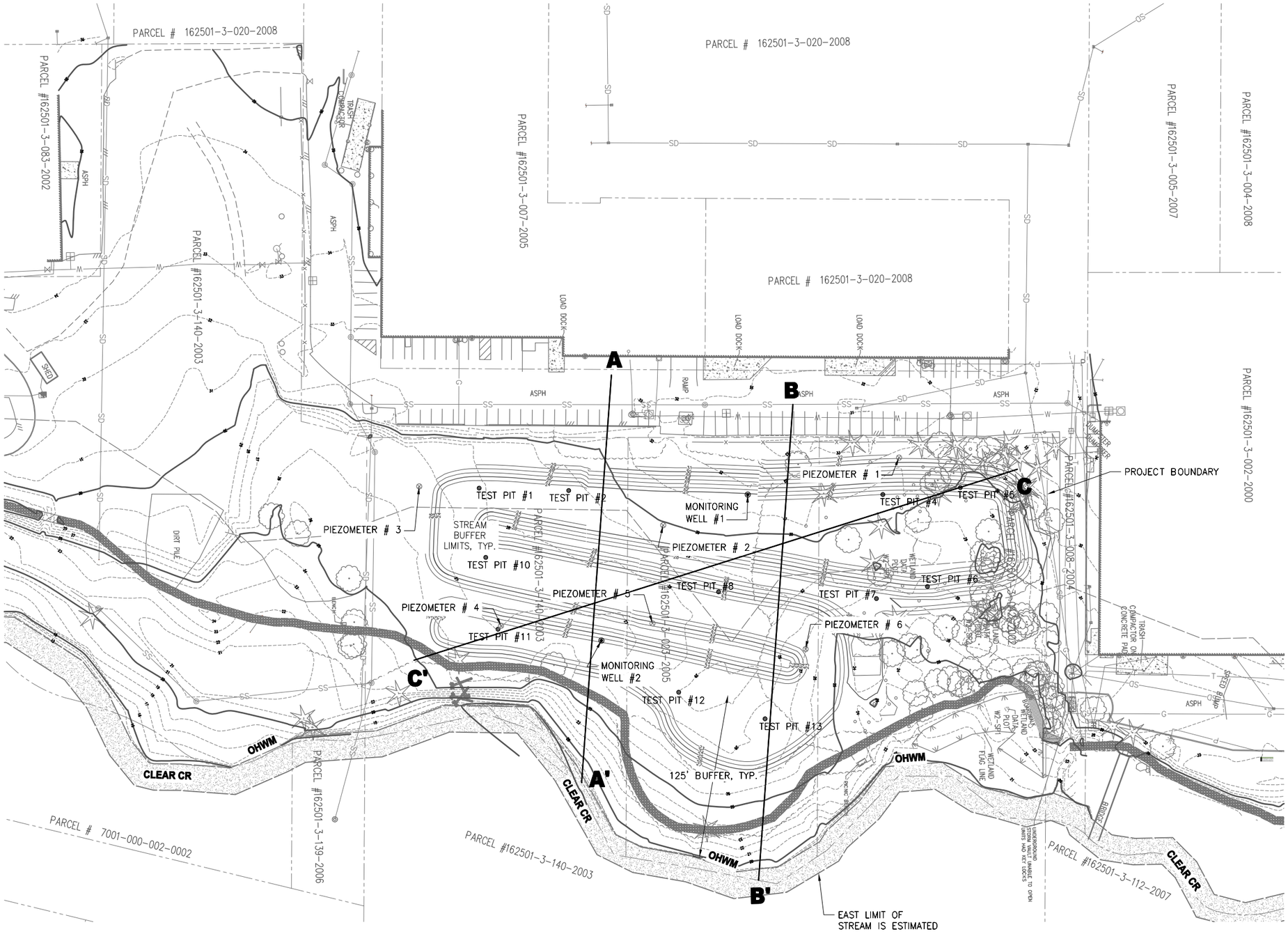
Parameter	Units	Jun-13			Jul-13			Aug-13			Sep-13			Oct-13			Nov-13			Dec-13			Jan-14			Feb-14			Mar-14			Apr-14			May-14		
MW-1 water elev +1 ft	ft	28.1			27.4			26.6			26.6			28.0			28.3			28.2			28.7			29.4			29.8			29.3			29.0		
Hydraulic Conductivity (K)		low K	mid K	high K	low K	mid K	high K	low K	mid K	high K	low K	mid K	high K	low K	mid K	high K	low K	mid K	high K	low K	mid K	high K	low K	mid K	high K	low K	mid K	high K	low K	mid K	high K	low K	mid K	high K	low K	mid K	high K
	ft/d	1	10	30	1	10	30	1	10	30	1	10	30	1	10	30	1	10	30	1	10	30	1	10	30	1	10	30	1	10	30	1	10	30	1	10	30
Forebay Horizontal Groundwater Inflow	cfs	0.012	0.053	0.112	0.010	0.046	0.096	0.008	0.036	0.075	0.008	0.036	0.076	0.012	0.053	0.111	0.013	0.056	0.119	0.012	0.055	0.116	0.014	0.061	0.127	0.016	0.070	0.146	0.017	0.075	0.157	0.015	0.068	0.143	0.015	0.065	0.136
	gpm	5.4	24.0	50.4	4.7	20.5	43.0	3.7	16.1	33.8	3.7	16.1	33.9	5.4	23.7	49.8	5.7	25.4	53.3	5.6	24.7	51.9	6.1	27.2	57.2	7.0	31.2	65.6	7.6	33.6	70.7	6.9	30.6	64.3	6.6	29.0	61.1
2nd Cell Horizontal Groundwater Inflow	cfs	0.010	0.046	0.099	0.008	0.038	0.081	0.006	0.028	0.060	0.006	0.028	0.060	0.010	0.046	0.097	0.011	0.050	0.106	0.010	0.048	0.102	0.012	0.054	0.115	0.014	0.063	0.134	0.015	0.069	0.146	0.013	0.062	0.131	0.013	0.058	0.124
	gpm	4.5	20.8	44.3	3.7	17.2	36.5	2.7	12.6	26.7	2.8	12.6	26.8	4.4	20.5	43.6	4.8	22.3	47.4	4.7	21.6	45.9	5.2	24.2	51.4	6.1	28.4	60.4	6.6	30.9	65.7	6.0	27.7	59.0	5.6	26.1	55.5

Notes:
See Appendix A for calculation methods and assumptions.

Table 3 - Water Balance Summary

Duwe'iq Stormwater Treatment Facility
Silverdale, Washington

FOREBAY															
Input	**Units**	**Jan.**	**Feb.**	**Mar.**	**April**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**		***Annual Avg.***
Groundwater - horizontal	cfs	0.0535	0.0456	0.0359	0.0360	0.0527	0.0565	0.0550	0.0605	0.0695	0.0748	0.0681	0.0647		*0.0561*
Groundwater - vertical	cfs	0.0001	0.0003	0.0004	0.0002	-0.0001	-0.0001	-0.0002	-0.0003	-0.0002	0.0000	0.0001	0.0000		*0.0000*
Stormwater + Precip 10% EP	cfs	0.2880	0.1543	0.2017	0.0414	0.0327	0.0112	0.0332	0.0000	0.0000	0.0081	0.1393	0.1780		*0.0907*
Stormwater + Precip 50% EP	cfs	0.1035	0.1986	0.0399	0.0846	0.0204	0.0545	0.0053	0.0000	0.0081	0.0286	0.1712	0.1333		*0.0707*
Stormwater + Precip 90% EP	cfs	0.1222	0.1669	0.0059	0.0000	0.0045	0.0159	0.0008	0.0059	0.0074	0.1738	0.0000	0.0000		*0.0419*
Output															
Evapotranspiration (ETo)	cfs	0.0002	0.0005	0.0009	0.0015	0.0020	0.0023	0.0028	0.0022	0.0012	0.0007	0.0003	0.0002		*0.0012*
Surface water 10% EP	cfs	0.3413	0.1998	0.2371	0.0761	0.0834	0.0654	0.0853	0.0580	0.0681	0.0823	0.2072	0.2425		*0.1456*
Surface water 50% EP	cfs	0.1569	0.2441	0.0753	0.1193	0.0710	0.1086	0.0574	0.0580	0.0762	0.1027	0.2391	0.1978		*0.1255*
Surface water 90% EP	cfs	0.1755	0.2124	0.0413	0.0347	0.0552	0.0700	0.0529	0.0639	0.0755	0.2479	0.0680	0.0645		*0.0968*
		78.7726	95.3457	18.5413	15.5816	24.7784	31.4105	23.7270	28.6798	33.8852	111.2769	30.5002	28.9450		
2ND CELL															
Input															
Groundwater - horizontal	cfs	0.0539	0.0632	0.0688	0.0618	0.0582	0.0464	0.0383	0.0280	0.0281	0.0457	0.0496	0.0481		*0.0492*
Groundwater - vertical	cfs	0.0004	0.0009	0.0012	0.0007	-0.0003	-0.0002	-0.0005	-0.0008	-0.0006	0.0001	0.0003	0.0000		*0.0001*
Forebay surface water 10% EP	cfs	0.3413	0.1998	0.2371	0.0761	0.0834	0.0654	0.0853	0.0580	0.0681	0.0823	0.2072	0.2425		*0.1456*
Forebay surface water 50% EP	cfs	0.1569	0.2441	0.0753	0.1193	0.0710	0.1086	0.0574	0.0580	0.0762	0.1027	0.2391	0.1978		*0.1255*
Forebay surface water 90% EP	cfs	0.1755	0.2124	0.0413	0.0347	0.0552	0.0700	0.0529	0.0639	0.0755	0.2479	0.0680	0.0645		*0.0968*
Output															
Evapotranspiration (ETo)	cfs	0.0006	0.0013	0.0024	0.0041	0.0054	0.0062	0.0076	0.0060	0.0033	0.0018	0.0007	0.0005		*0.0033*
Surface water 10% EP	cfs	0.3949	0.2626	0.3047	0.1345	0.1359	0.1053	0.1155	0.0792	0.0924	0.1263	0.2564	0.2901		*0.1915*
Surface water 50% EP	cfs	0.2105	0.3069	0.1428	0.1776	0.1235	0.1486	0.0876	0.0792	0.1004	0.1467	0.2883	0.2454		*0.1715*
Surface water 90% EP	cfs	0.2291	0.2753	0.1088	0.0930	0.1077	0.1100	0.0831	0.0851	0.0998	0.2919	0.1171	0.1121		*0.1427*
		102.8297	123.5409	48.8470	41.7493	48.3425	49.3520	37.2836	38.1732	44.7742	131.0062	52.5680	50.3081		
Maximum Standing Water															
Forebay W. side groundwater elev.	ft	27.7	29.0	29.3	28.4	28.0	27.1	26.4	25.6	25.6	27.0	27.3	27.2		*27.4*
Forebay bottom elev.	ft	23	23	23	23	23	23	23	23	23	23	23	23		
Maximum Modeled Standing Water	ft	4.7	6.0	6.3	5.4	5.0	4.1	3.4	2.6	2.6	4.0	4.3	4.2		*4.4*
2nd Cell approx bottom elev.	ft	25	25	25	25	25	25	25	25	25	25	25	25		
Maximum Modeled Standing Water	ft	2.7	4.0	4.3	3.4	3.0	2.1	1.4	0.6	0.6	2.0	2.3	2.2		*2.4*
Maximum Actual Standing Water	ft	2.7	4.0	4.3	3.4	3.0	2.1	1.5	1.5	1.5	2.0	2.3	2.2		*2.5*
Notes:															
Weirs and outlet controls will limit maximum water level in 2nd Cell to 1.5 ft.															
EP = exceedance probability.															
See Appendix A for calculation methods and assumptions.															



EXPLORATION KEY

MONITORING WELL #1 = MW-1
PIEZOMETER #1 = V-1
TEST PIT #1 = TP-1

EXISTING CONDITIONS PLAN

SCALE IN FEET

0 40 80

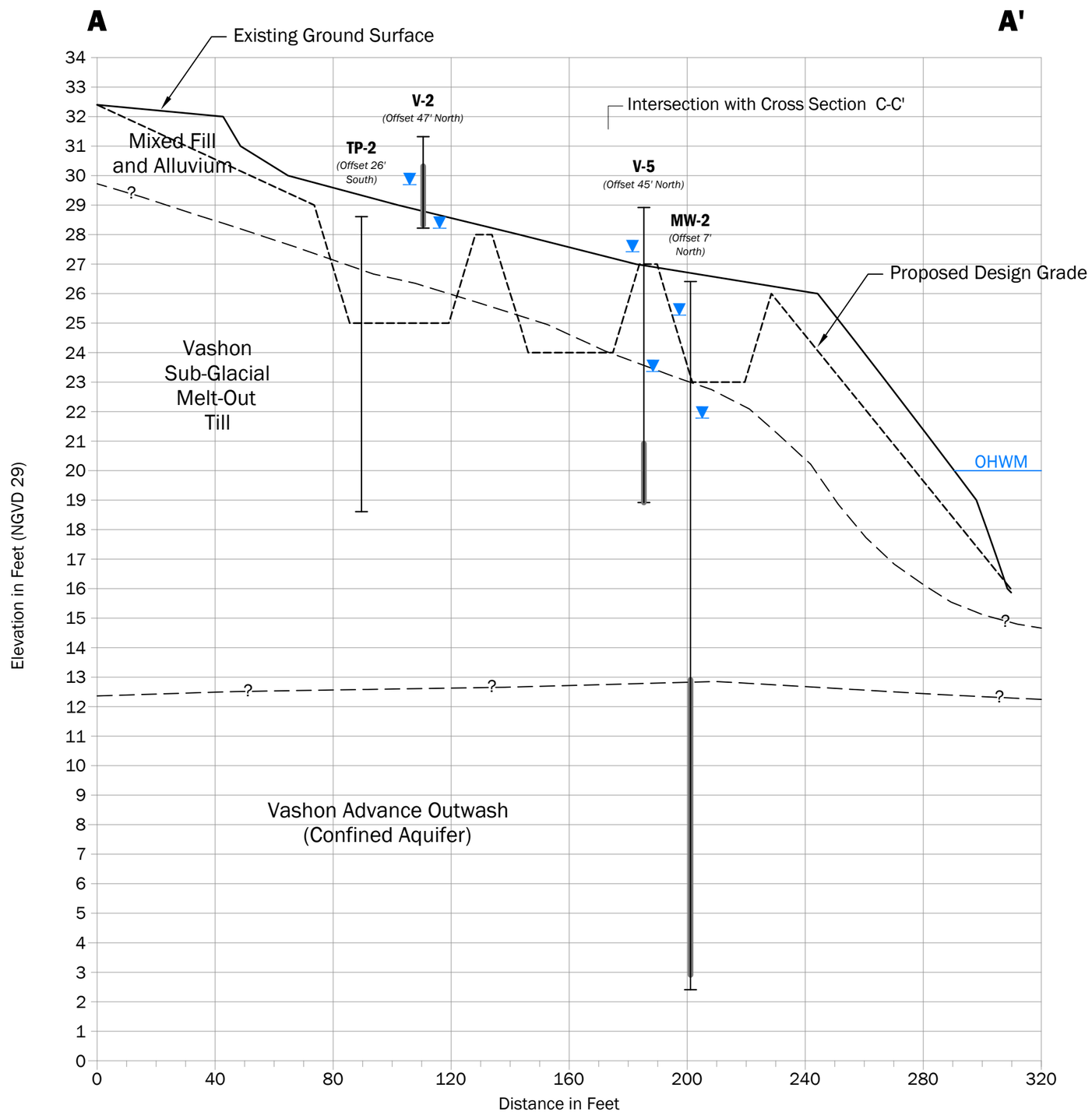
N

BASE MAP PROVIDED BY PARAMETRIX.

Site and Exploration Map

Duwe'iq Stormwater Treatment Facility
Silverdale, Washington

Aspect CONSULTING	JUN-2014	BY: JB/SCC	FIGURE NO.
	PROJECT NO. 130012	REVISED BY: -	1



Legend

Exploration Location and ID
(Offset Distance and Direction from Section)

Maximum Groundwater/ Piezometric Elevation

Well Screen Interval

Minimum Groundwater/ Piezometric Elevation

See hydrograph figures for water level date range.

Significant Seepage[1] (> 1 gpm)

OHWM Clear Creek Ordinary High Water Mark

[1] See exploration logs for details.

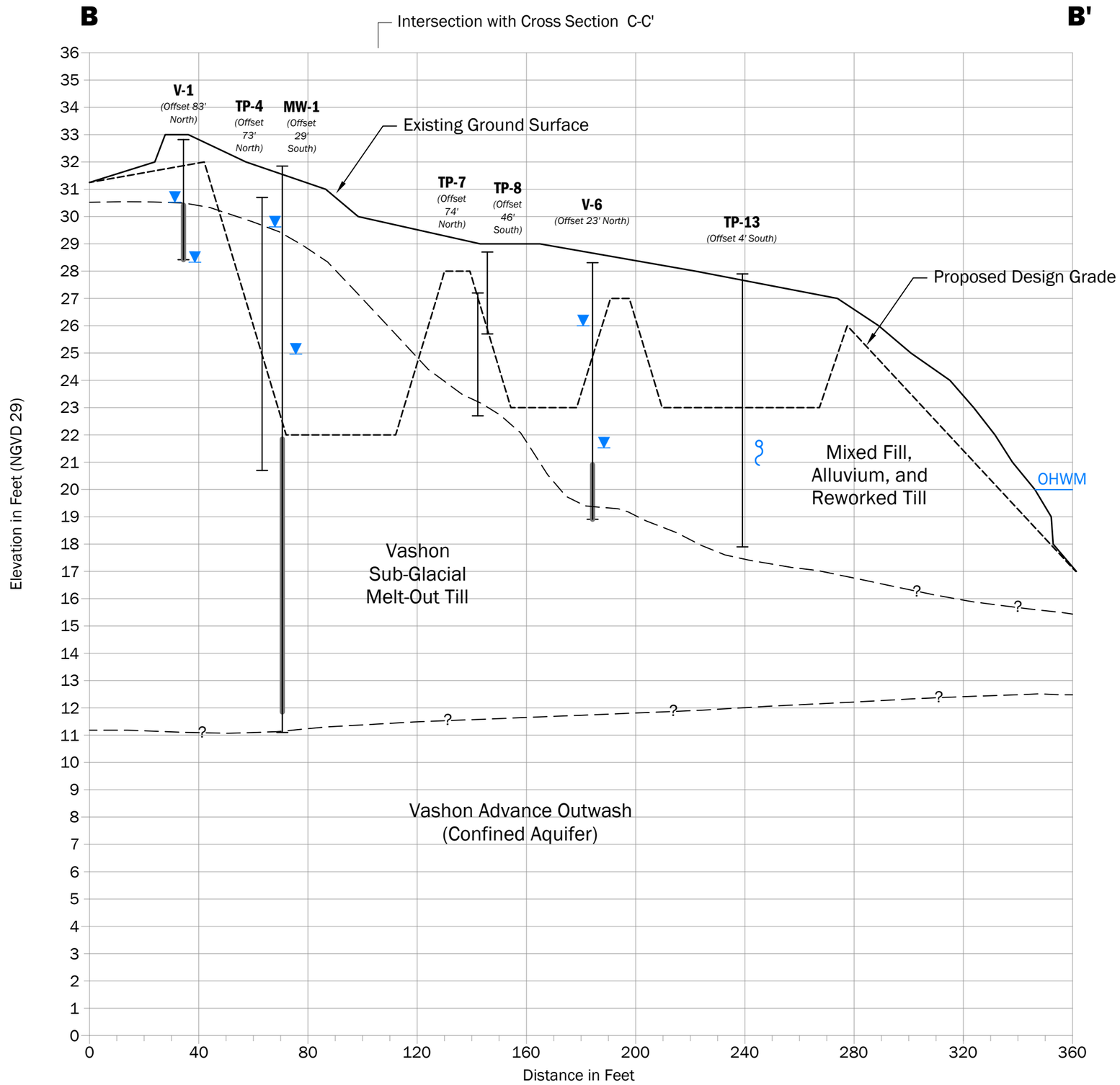
Horizontal Scale: 1" = 40'
Vertical Scale: 1" = 4'
Vertical Exaggeration 10x

0 40 80
Feet

Geologic Cross Section A-A'
Duwe'iq Stormwater Treatment Facility
Silverdale, Washington

Aspect CONSULTING	JUN-2014	BY: JB/SCC	FIGURE NO.
	PROJECT NO. 130012	REVISED BY: -	2

CAD Path: Q:\Kitsap County\130012 Duwe'iq Stormwater Wetland\2014-06 Cross Sections\130012-AA.dwg 11x17 Landscape || Coordinate System: NAD 1983 State Plane Washington North FIPS 4601 Feet || Date Saved: Jun 27, 2014 11:20am || User: scudd



Legend

Exploration Location and ID
(Offset Distance and Direction from Section)

Maximum Groundwater/ Piezometric Elevation

Well Screen Interval

Minimum Groundwater/ Piezometric Elevation

See hydrograph figures for water level date range.

Significant Seepage[1] (> 1 gpm)

OHWM — Clear Creek Ordinary High Water Mark

[1] See exploration logs for details.

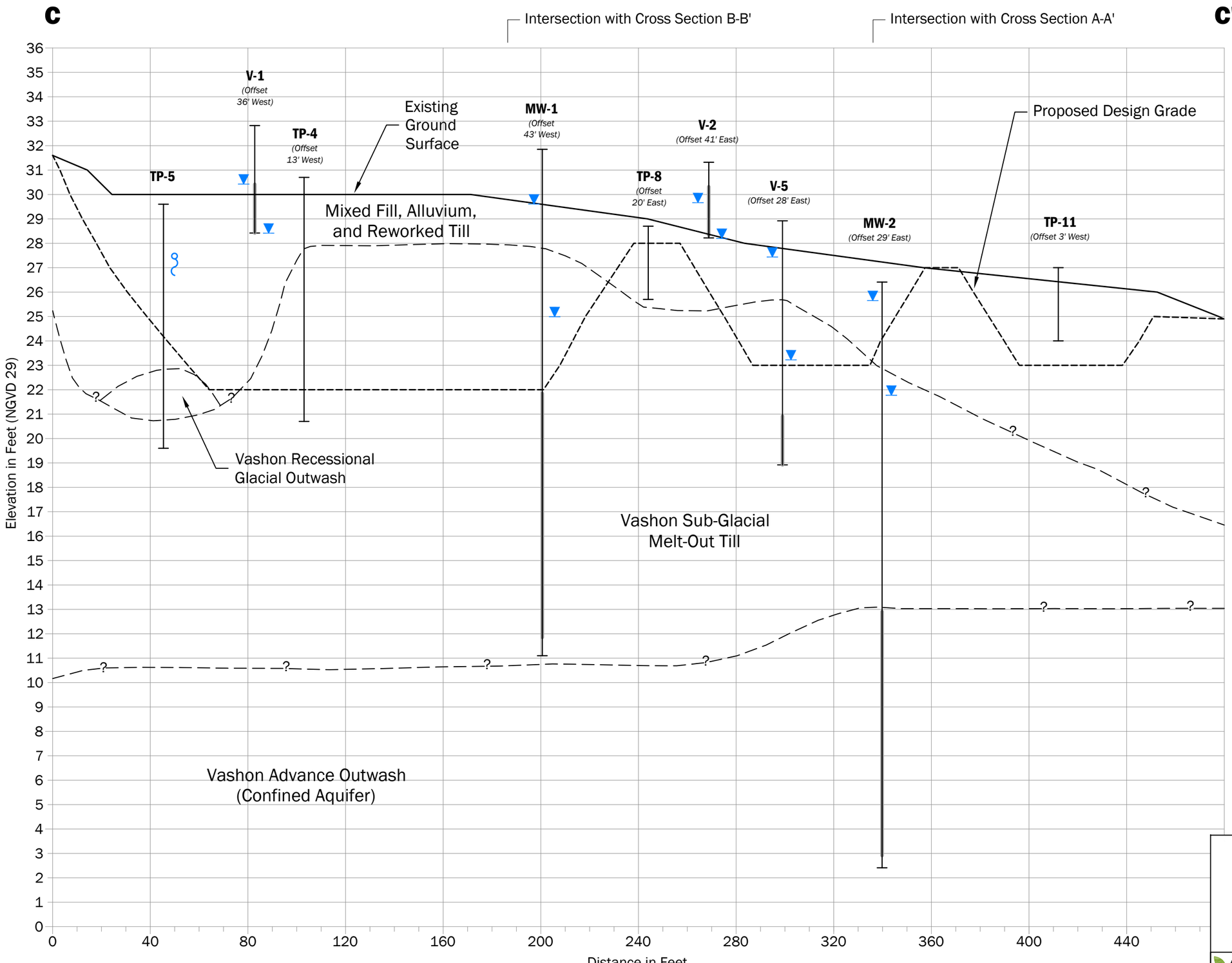
Horizontal Scale: 1" = 40'
Vertical Scale: 1" = 4'
Vertical Exaggeration 10x

0 40 80
Feet

Geologic Cross Section B-B'
Duwe'iq Stormwater Treatment Facility
Silverdale, Washington

Aspect CONSULTING	JUN-2014	BY: JB/SCC	FIGURE NO.
	PROJECT NO. 130012	REVISED BY: -	3

CAD Path: Q:\Kitsap County\130012 Duwe'iq Stormwater Wetland\2014-06 Cross Sections\130012-BB.dwg 11x17 Landscape || Coordinate System: NAD 1983 State Plane Washington North FIPS 4601 Feet || Date Saved: Jun 27, 2014 11:22am || User: scudd



Legend

Exploration Location and ID
(Offset Distance and Direction from Section)

Maximum Groundwater/ Piezometric Elevation

Well Screen Interval

Minimum Groundwater/ Piezometric Elevation

See hydrograph figures for water level date range.

Significant Seepage[1] (> 1 gpm)

[1] See exploration logs for details.

Horizontal Scale: 1" = 40'
Vertical Scale: 1" = 4'
Vertical Exaggeration 10x

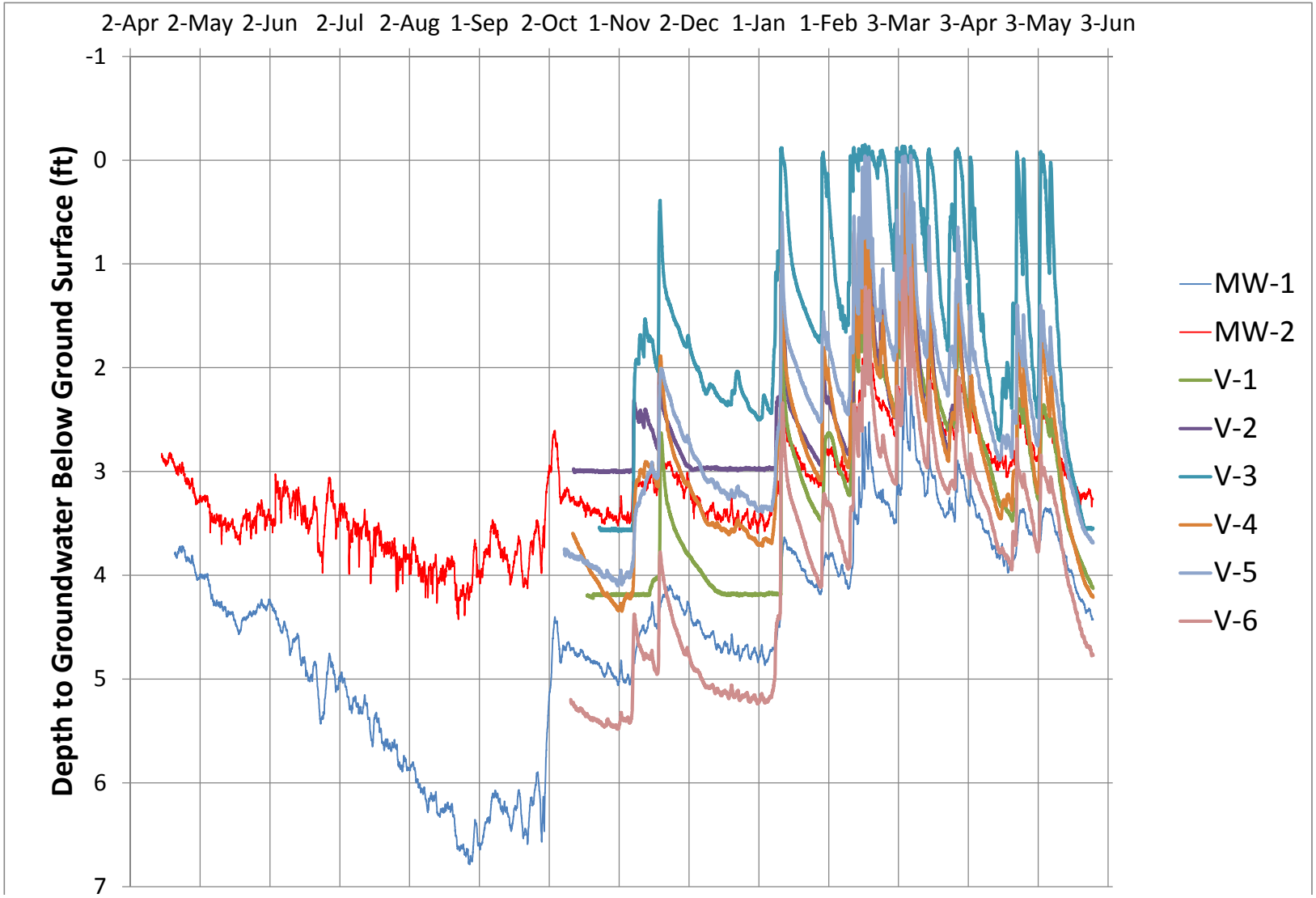
0 40 80
Feet

Geologic Cross Section C-C'

Duwe'iq Stormwater Treatment Facility
Silverdale, Washington

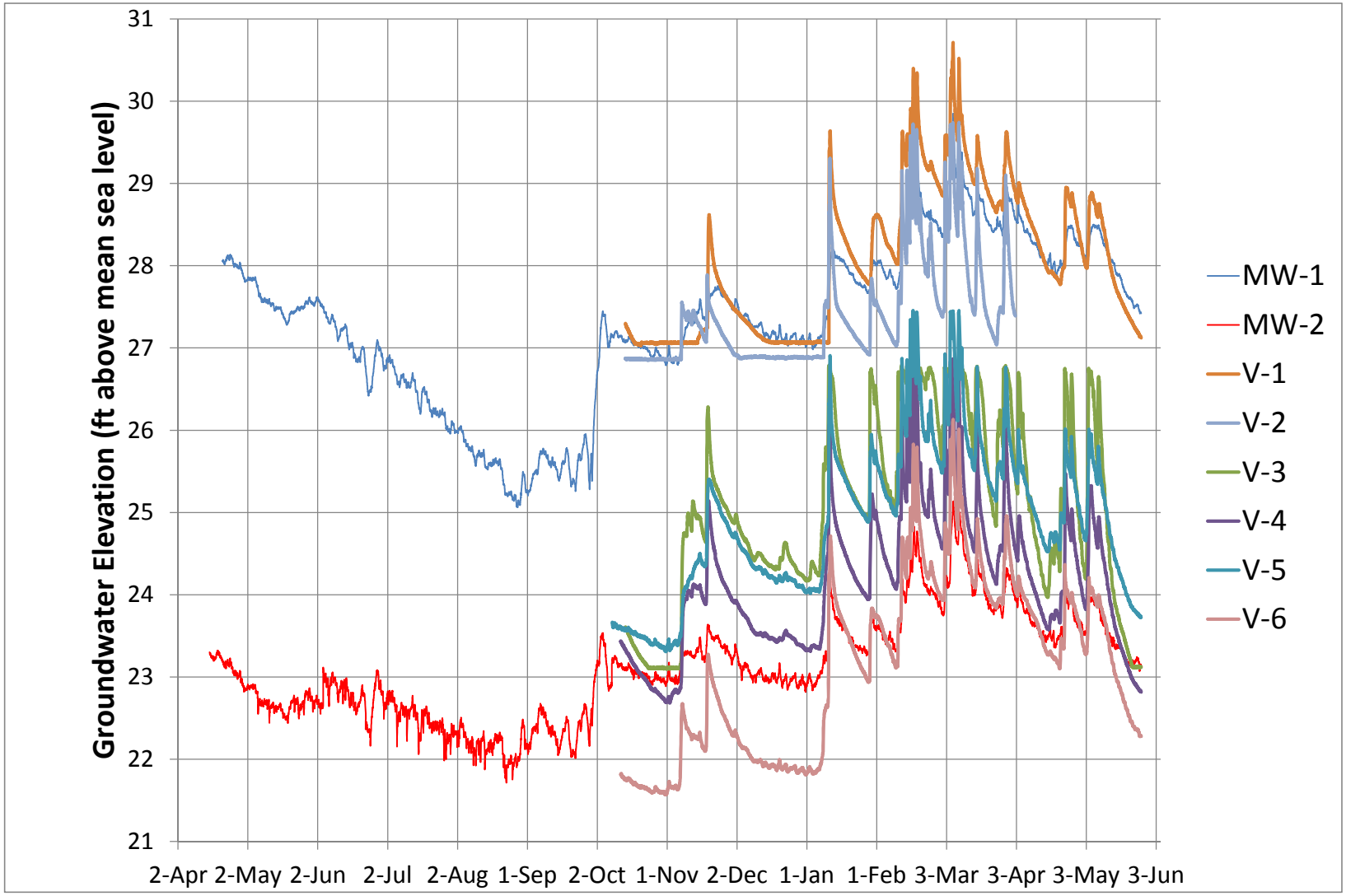
Aspect CONSULTING	JUN-2014	BY: JB/SCC	FIGURE NO.
	PROJECT NO. 130012	REVISED BY: -	4

CAD Path: Q:\Kitsap County\130012 Duwe'iq Stormwater Wetland\2014-06 Cross Sections\130012CC.dwg 11x17 Landscape || Coordinate System: NAD 1983 State Plane Washington North FIPS 4601 Feet || Date Saved: Jun 27, 2014 11:25am || User: scudd



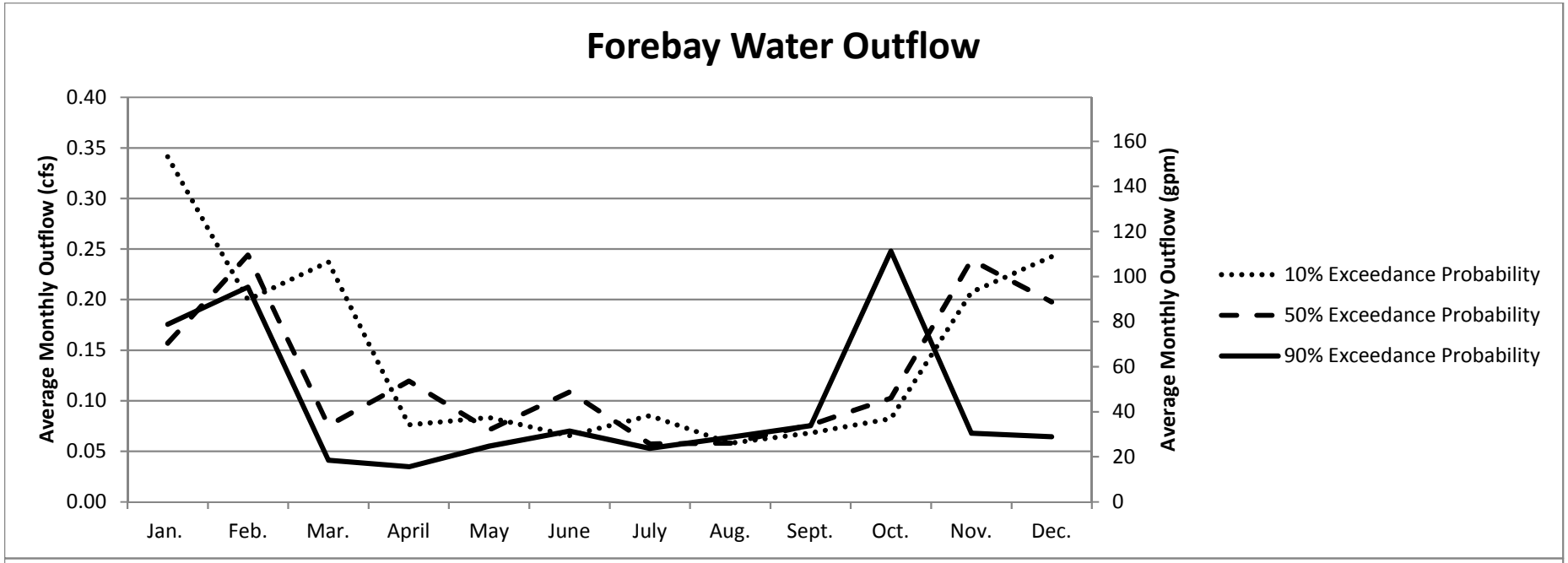
Aspect Consulting
6/27/2014
W:_GEOTECH\140203 Duwe'iq Stormwater\Deliverables\Water Balance Memo\Duwe'iq water level monitoring - Figures 5 and 6

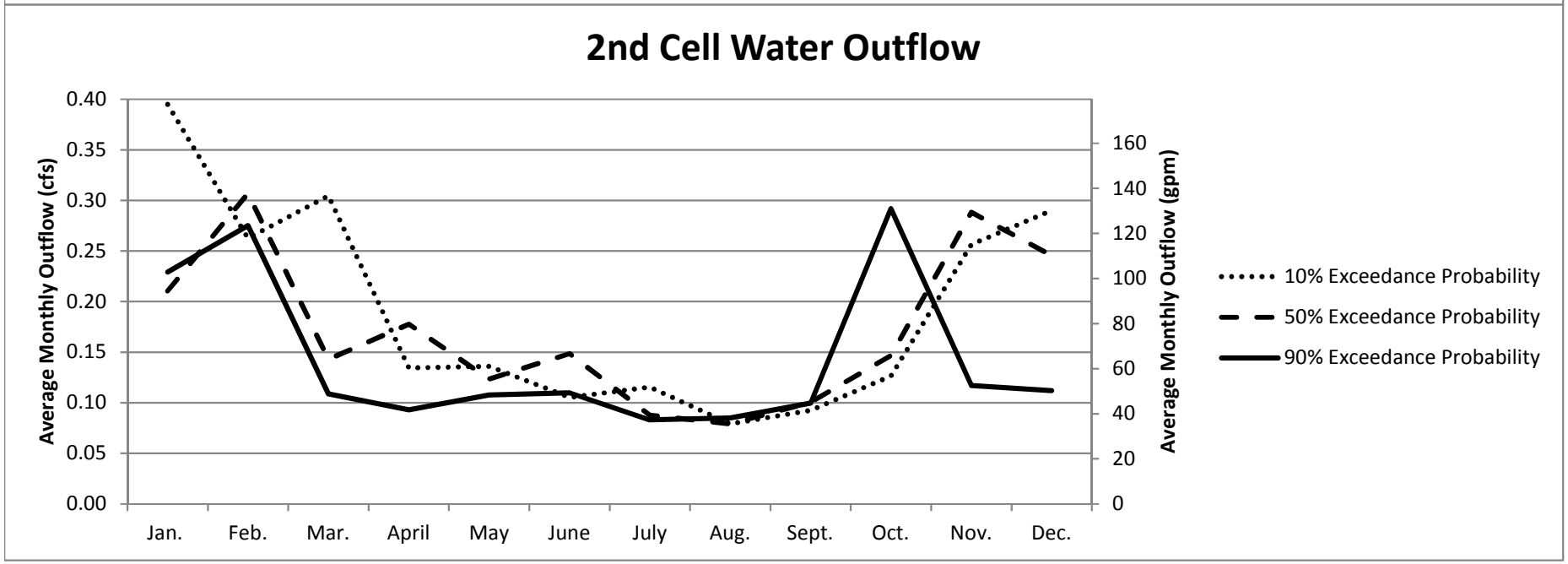
Figure 5 - Depth to Groundwater Below Ground Surface
Duwe'iq Stormwater Treatment Facility
Silverdale, Washington



Aspect Consulting
6/27/2014
W:_GEOTECH\140203 Duwe'iq Stormwater\Deliverables\Water Balance Memo\Duwe'iq water level monitoring - Figures 5 and 6

Figure 6 - Groundwater Elevations
Duwe'iq Stormwater Treatment Facility
Silverdale, Washinton





Aspect Consulting, LLC

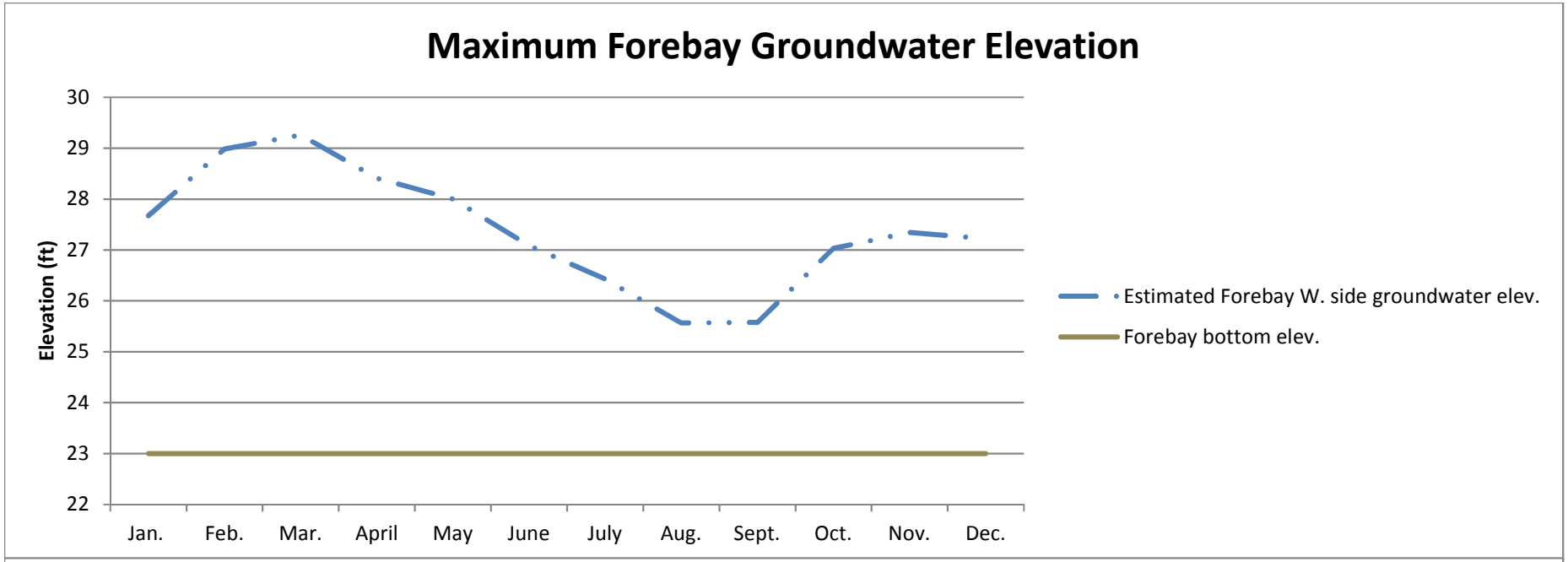
6/27/2014

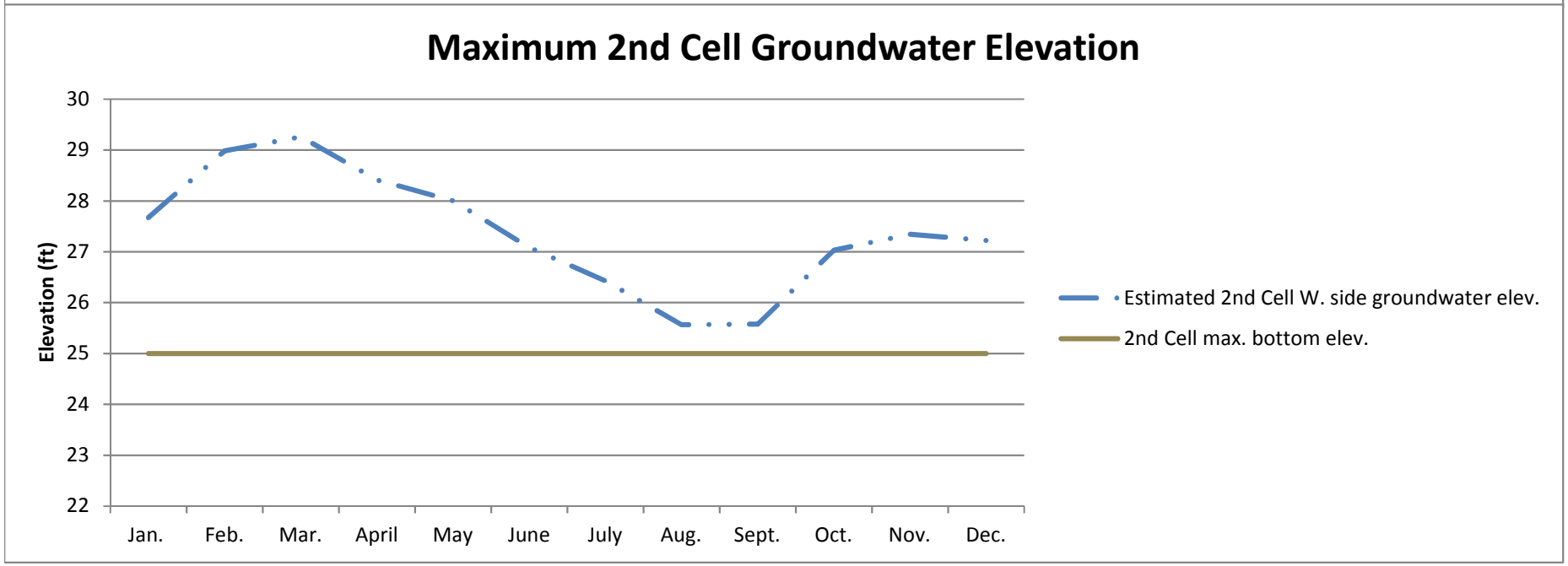
W:_GEOTECH\140203 Duwe'iq Stormwater\Deliverables\Water Balance Memo\[Duwe'iq Water Balance_rev1.xlsx]Summary Wtr. Bal. Table

Figure 7 - Cell Outlows

Duwe'iq Stormwater Treatment Facility

Silverdale, Washington





Aspect Consulting, LLC

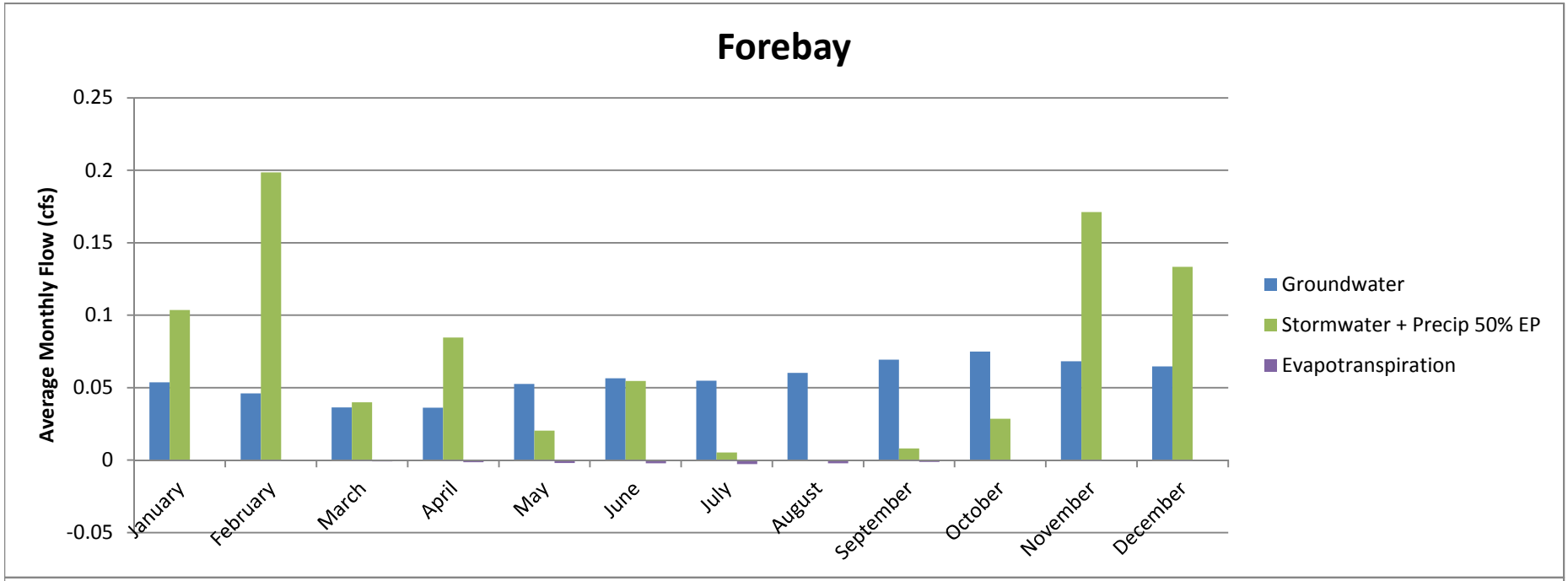
6/27/2014

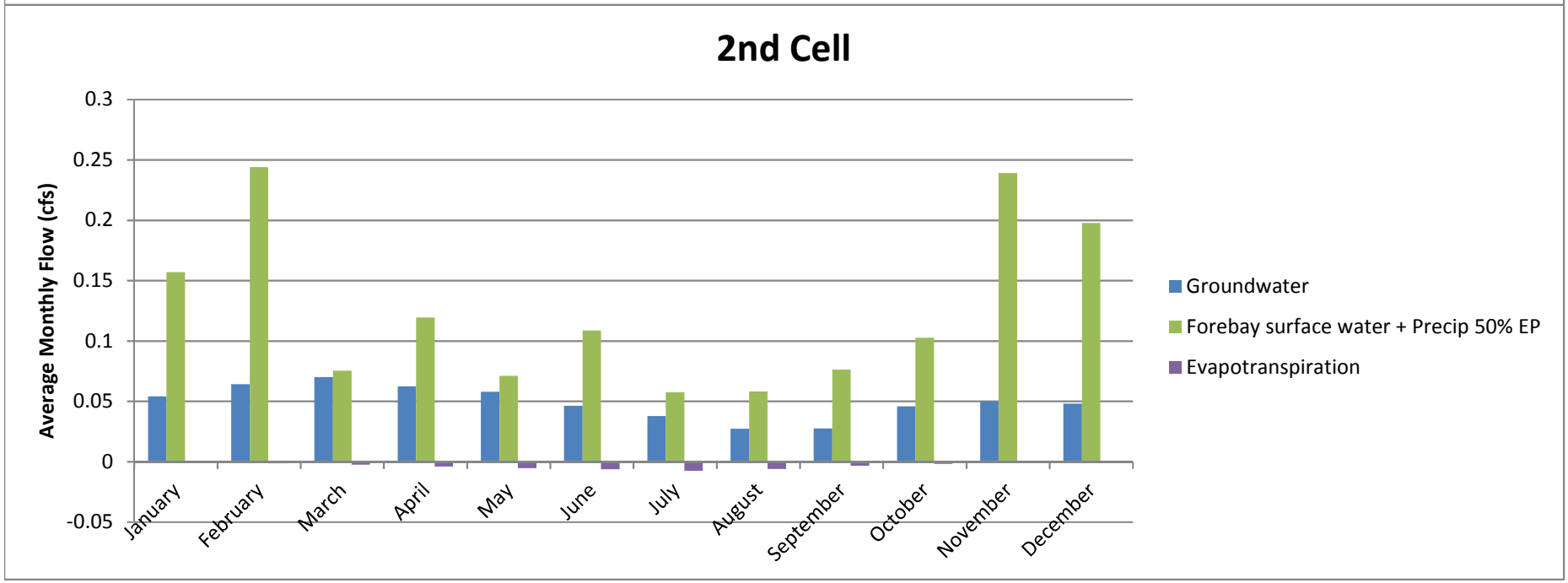
W:_GEOTECH\140203 Duwe'iq Stormwater\Deliverables\Water Balance Memo\[Duwe'iq Water Balance_rev1.xlsx]Summary Wtr. Bal. Table

Figure 8 - Maximum Cell Groundwater Elevations

Duwe'iq Stormwater Treatment Facility

Silverdale, Washington





Aspect Consulting, LLC

6/27/2014

W:_GEOTECH\140203 Duwe'iq Stormwater\Deliverables\Water Balance Memo\[Duwe'iq Water Balance_rev1.xlsx]Summary Wtr. Bal. Table

Figure 9 - Cell Water Balance Components

Duwe'iq Stormwater Treatment Facility

Silverdale, Washington

APPENDIX A

Water Balance Methods

A. Water Balance Methods

The water balance was developed to understand the timing and magnitude of flows through the wetland. The water balance was based on the continuity equation:

Input=Outputs +/- Change in Storage

The water balance was run for the 10, 50, and 90 percent exceedance years based on total wetland inflow (incident precipitation plus stormwater flow) to develop an understanding of flows under a range of climate conditions. The water balance was broken into the forebay and 2nd cell areas as follows:

A.1. Excavation Areas

- Forebay excavation area (approximate excavation footprint): 230 ft X 60 ft = 17,000 ft^2
- 2nd cell area receiving horizontal groundwater inflow: 230 ft X 60 ft = 13,800 ft^2
- 2nd cell excavation area (approximate excavation footprint): 46,400 ft^2

A.2. Inflows

Groundwater inflow was calculated for horizontal flow that will enter the wetland through the excavation sidewalls and vertical upward seepage from the underlying confined advance outwash aquifer.

A.3. Horizontal Groundwater Inflow

Horizontal groundwater inflow was calculated from Powers (1992), Equation 6.12 for flow to a trench that accounts for end effects.

$$\mathrm{Q} = \frac{\pi \mathrm{K}\,(H^2 - h^2)}{\ln R_o/r_s} + 2\left[\frac{x\mathrm{K}\,(H^2 - h^2)}{2L}\right]$$

Powers, 1992, Equation 6.12

Input parameters were determined as follows:

- Groundwater inflow (Q) was taken as half the computed value as flow is expected to enter the trench only from the upgradient, north, and west edges. We understand the bottom of the wetland will be above the creek level and, as such, inflow is not expected to occur from the east or south sides.
- r_s is the equivalent radius of the system computed from Powers (1992) Equation 6.10.
- R_o is the equivalent radius of influence. R_o is most reliably estimated from a pumping test that determines the radius of influence. In lieu of the pump test, R_o was estimated from Powers Equation 6.13. In this equation, R_o is a function of time, transmissivity, and specific yield. A time value of 3 days was developed by calibrating to the distance from the edge of the forebay excavation to the utility trench. Three days was considered a reasonable time

for drainage from an unconfined aquifer to equilibrate. Larger values of R_o will decrease the inflow value. Pump testing could be performed to further evaluate this parameter.

- K_h is the horizontal hydraulic conductivity. A range was developed based on slug testing and evaluation of soil textures. Slug testing indicated K values ranging from 0.1 to 0.9 ft/day (Aspect, 2013b). The K values used in the groundwater inflow estimate included: 1, 10, and 30 ft/day, which are considered representative of the unconfined, perched aquifer materials. The hydraulic conductivity value of 10 ft/day is considered a reasonable estimate based on observed site conditions. The selected value is about an order of magnitude higher than the slug test values, to account for inflow through more permeable gravelly sand lenses that were observed in test pits TP-5 and TP-6. Additional pump testing and/or slug testing would be necessary to improve this estimate.
- The values H (aquifer head above aquifer base) and h (excavation head above aquifer base) define the height of the water table above the aquifer base (till) and the gradient to the trench over a length L. The aquifer base elevation was conservatively assumed at Elevation 17 ft in the till. The height of the water table above the aquifer base (H) was taken from the water level hydrographs for MW-1 with 1 ft added to account for higher elevation interflow documented at upslope piezometer V-1. These values varied monthly based on observed water levels. The water level height above the aquifer base in the wetland (h) was taken as the 6 ft for the forebay (bottom Elevation 23 ft) and 7 ft for the 2nd cell (average bottom Elevation 24 ft). The 23ft Elevation for the forebay is based on our recommended bottom heave safety factor. The length L was taken as ½ R_o based on Powers, 1992 equation 6.15.

Once constructed, groundwater inflow is expected to occur from the upgradient north and west edges. As such, the computed groundwater inflow values were taken as half the value computed by Powers Equation 6.12.

A.4. Vertical Groundwater Flow

Vertical upward seepage from the confined outwash unit into the wetland bottom was computed using Darcy's law as follows:

- Q = KiA (Darcy's Law)
- K_v estimated as 0.00001 cm/s (~0.03 ft/day) or 3 orders of magnitude less than estimated K_h (10 ft/d)
- i = dh/dl
  - Calculated using the MW-2 monthly average water level and screen interval in the confined aquifer (Vashon Advance Outwash) (MW-2 water level data range: June 2013-May 2014).
- Forebay excavation area = 17,000 ft^2
- 2nd Cell excavation area = 46,400 ft^2

A.4.1. Precipitation and Stormwater Runoff

Incident precipitation and stormwater runoff were provided as combined output from the WWHM model provided by Parametrix. The inflows were modeled for Basins E and F, which is anticipated to be the capture area for final design.

A.5. Outputs

A.5.1. Evapotranspiration

Evapotranspiration (ET) was computed assuming an open water surface. Grass reference crop (ET_o) data were obtained from the weather.wsu.edu PAWS network Poulsbo South station (date range: 6/16/13-6/15/14). A crop coefficient of 1 was used for open water less than 1 meter deep (Table 4.12, ASCE Manual No. 28, 1996 [ASCE, 1996]).

Surface Water Inflow to 2nd Cell

- Forebay inputs (groundwater, precipitation, stormwater) minus outputs (ET) (assuming no change in storage).

Surface Water Discharge to Creek

- 2nd cell inputs (groundwater, precipitation, forebay surface water) minus outputs (assuming no change in storage).

ATTACHMENT D

SWPPP (STORMWATER POLLUTION PREVENTION PLAN)

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Stormwater Pollution Prevention Plan for Duwe'iq Stormwater Treatment Wetlands

Prepared for

Kitsap County Department of Public Works

March 2015

Prepared by

Parametrix

Stormwater Pollution Prevention Plan for Duwe'iq Stormwater Treatment Wetlands

Prepared for

Kitsap County Department of Public Works
614 Division Street
Port Orchard, WA 98366

Prepared by

Parametrix
4660 Kitsap Way, Suite A
Bremerton, WA 98312-2357
T. 360.377.0014 F. 1.855.542.6353
www.parametrix.com

March 2015 | 233-1578-135

CITATION

Parametrix. 2015. Stormwater Pollution Prevention Plan
for Duwe'iq Stormwater Treatment Wetlands.
Prepared by Parametrix, Bremerton, Washington.
March 2015.

CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

Prepared by Jesse Neilson, P.E.

Stormwater Pollution Prevention Plan

for

Duwe'iq Stormwater Treatment Wetlands

Owner	Developer	Operator/Contractor
Kitsap County Department of Public Works, MS-26 614 Division St., Port Orchard, WA 98366 360-337-5777	Kitsap County Department of Public Works, MS-26 614 Division St., Port Orchard, WA 98366 360-337-5777	TBD

Project Site Location

The project will be located in Silverdale, WA in Kitsap County at the east end of NW Kitsap Place. The project limits are Clear Creek Trail (east) to NW Kitsap Place (north) to Car Toy's rear parking lot (west) and to the Stingle Plaza Development (south).

Certified Erosion and Sediment Control
Lead TBD – Contractor

SWPPP Prepared By Jesse Neilson, PE – Parametrix

SWPPP Preparation Date

March, 2015

Approximate Project Construction Dates

September 1, 2016 to October 31, 2017

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B Construction BMPs
C Alternative BMPs
D General Permit
E Site Inspection Forms (and Site Log)
F SWPPP and TESC Plan Amendments
G Engineering Calculations

KEY TERMS

BMPs	Best Management Practices
CESCL	Certified Erosion and Sediment Control Lead
SPCCCP	Spill Prevention, Containment, Control and Cleanup Plan
SWMMWW	Stormwater Management Manual for Western Washington
SWPPP	Stormwater Pollution Prevention Plan
TESC	temporary and permanent erosion and sediment control

1. INTRODUCTION

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared as part of the NPDES Stormwater Construction General Permit requirements for the Duwe'iq Stormwater Treatment Wetlands project in Silverdale, Washington. The project site is located in Silverdale, WA just north of Ridgetop Blvd. NW, west of the Clear Creek Trail and east of the Car Toy's building. The project treats runoff from multiple sub-basins totaling 16.34 acres located to the west of the site. The existing 2.56 acre site area will consist of a multiple cell constructed wetland, with overflow into Clear Creek.

Construction activities will include clearing and grading of the project area, stormwater conveyance, landscape, habitat features, three sided box culvert, and outlet channel. The purpose of this SWPPP is to describe the proposed construction activities and temporary and permanent erosion and sediment control (TESC) measures, pollution prevention measures, inspection/monitoring activities, and recordkeeping that will be implemented during the proposed construction 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, ground water quality, or sediment management standards.
3. Prevent, during the construction phase, adverse water quality impacts including impacts on beneficial uses of the receiving water by controlling peak flow rates and volumes of stormwater runoff at the site's outfalls.

This SWPPP was prepared using the Ecology SWPPP Template downloaded from the Ecology website on February 24, 2015. This SWPPP was prepared based on the requirements set forth in the Construction Stormwater General Permit, and Stormwater Management Manual for Western Washington (SWMMWW) 2012 Volume II. The report is divided into seven main sections with several appendices that include stormwater related reference materials. The topics presented in the each of the main sections are:

- Section 1 – INTRODUCTION. This section provides a summary description of the project, and the organization of the SWPPP document.
- Section 2 – SITE DESCRIPTION. This section provides a detailed description of the existing site conditions, proposed construction activities, and calculated stormwater flow rates for existing conditions and post– construction conditions.
- Section 3 – CONSTRUCTION BMPs. This section provides a detailed description of the BMPs to be implemented based on the 13 required elements of the SWPPP (SWMMWW 2012).
- Section 4 – CONSTRUCTION PHASING AND BMP IMPLEMENTATION. This section provides a description of the timing of the BMP implementation in relation to the project schedule.
- Section 5 – POLLUTION PREVENTION TEAM. This section identifies the appropriate contact names (emergency and non-emergency), monitoring personnel, and the onsite temporary erosion and sedimentation control inspector
- Section 6 – INSPECTION AND MONITORING. This section provides a description of the inspection and monitoring requirements such as the parameters of concern to be

monitored, sample locations, sample frequencies, and sampling methods for all stormwater discharge locations from the site.

- Section 7 – REPORTING AND RECORDKEEPING. This section describes the requirements for documentation of the BMP implementation, site inspections, monitoring results, and changes to the implementation of certain BMPs due to site factors experienced during construction.

Supporting documentation and standard forms are provided in the following Appendices:

- Appendix A – Contributing Basin Figure / Site Plan, TESC Plan, TESC Notes
- Appendix B – Construction BMPs
- Appendix C – Alternative Construction BMP List
- Appendix D – General Permit
- Appendix E – Site Log and Inspection Forms
- Appendix F – SWPPP and TESC Plan Amendments
- Appendix G – Engineering Calculations

2. SITE DESCRIPTION

2.1 EXISTING CONDITIONS

The project is located in Kitsap County, Washington, in Section 16, Township 25 North, Range 1 East, Willamette Meridian. The project site is located in Silverdale, WA north of Ridgetop Blvd., west of Clear Creek and east of the commercial area along Silverdale Way NW. The project site has a gradient of 0.7 percent and is located approximately 25 feet to 30 feet above mean sea level. The project area consists of vacant land that is vegetated with grass and sparse trees. The project construction limits are 2.56 acres and do not contain any impervious area.

2.2 PROPOSED CONSTRUCTION ACTIVITIES

The project proposes the construction of a new stormwater treatment wetland. Existing stormwater lines will be intercepted and routed to the treatment wetland. The water will then flow through multiple wetland cells and out of a new energy dissipation channel into Clear Creek. The project also includes landscaping and habitat features around the wetland. Construction machinery that will be used includes typical equipment such as cranes, boom trucks, backhoes, excavators, bulldozers, dump trucks, front loaders, graders, small concrete mixers, compressors, and power hand tools.

Improvements will be constructed in accordance with the 2012 Kitsap County Stormwater Ordinance, and the 2012 SWMMWW. The improvements will export approximately 8,800 yards of soil. There will be no proposed sanitary sewer or potable water system improvements, however, a temporary irrigation connection will be made to the public water system during the plant establishment period. Existing stormwater flows from the contributing basin will be routed around the project area to existing outfalls during construction so flow control will not be required during construction.

Project elements are summarized as follows:

- Total site area: 3.7 acres
- Total construction area: 2.56 acres
- Contributing Area into Stormwater Treatment Wetland 20 acres
- Percent impervious area before construction (Project Site): 0 %
- Percent impervious area after construction (Project Site): 0 %
- Disturbed area during construction: 2.56 acres
- Disturbed area that is characterized as impervious (i.e., access roads, staging, parking): 0 acres
- 2-year stormwater runoff peak flow (existing and during construction): 0.55 cfs

Existing and developed calculations for the construction site are located in Appendix G.

3. CONSTRUCTION STORMWATER BMPS

3.1 13 BMP ELEMENTS

The following 13 BMP Elements meet the requirements of the Construction Stormwater General Permit and Kitsap County Stormwater Ordinance:

3.1.1 Element #1 – Mark Clearing Limits

The clearing and grubbing limits are shown on the construction plans (Appendix A). These limits are set at the minimum needed to allow for the planned improvements and minimize exposed soils. These limits will be staked in the field. A silt fence will be installed after the clearing limits are marked as shown on the plans. The specific BMPs for channel and outlet stabilization that shall be used on this project include:

Minimum Required BMPs:

Preserving Natural Vegetation (BMP C101), Buffer Zones (BMP C102), Silt Fences (BMP C233).

Optional BMPs:

High Visibility Plastic or Metal Fence (BMP C103).

Alternate BMPs for marking clearing limits are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.2 Element #2 – Establish Construction Access

Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads. If necessary, wheel washing, street sweeping, and street cleaning shall be employed to prevent sediment from entering state waters. All wash wastewater shall be controlled on site. The specific BMPs for channel and outlet stabilization that shall be used on this project include:

Minimum Required BMPs:

Stabilized Construction Entrance/Exit (BMP C105)

Optional BMPs:

Wheel Wash (BMP C106), Construction Road/Parking Area Stabilization (BMP C107)

Alternate construction access BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.3 Element #3 – Control Flow Rates

The construction area will collect onsite stormwater and use appropriate BMPs to prevent erosion and collect sediments before leaving the site.

Stormwater treatment facilities and new conveyance pipes will be constructed and brought on line to treat stormwater and convey the water to the proposed wetland as soon as plants are established and stable. Until that time, stormwater from the contributing basins will be diverted around construction areas and exposed soils via the existing conveyance infrastructure. Stormwater will not be conveyed into the stormwater treatment wetland until vegetation has been established and soils stabilized. Sediment traps have been sized using BMP C240 from the 2012 SWMMWW (calculations are found in Appendix G). The specific BMPs for channel and outlet stabilization that shall be used on this project include:

Minimum Required BMPs:

Check Dams (BMP C207), Sediment Trap (BMP C240),

Optional BMPs:

Water Bars (BMP C203), Outlet Protection (BMP C209), Wattles (BMP C235), Temporary Sediment Pond (BMP C241)

Alternate flow control BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.4 Element #4 – Install Sediment Controls

All stormwater runoff from disturbed areas shall pass through an appropriate sediment removal BMP before leaving the construction site.

Sediment controls will be employed to collect and/or control sediment that has become suspended in the surface flows. Silt fences will be installed around the perimeter of the project as shown on TESC Plan to trap sediments from leaving the construction area. Temporary sediment traps will be located at the downstream end of various onsite drainage areas and are sized to remove medium sized silt particles (0.02 mm). Sediment Trap sizing is found in Appendix G. The required surface area is based on the following equation:

$$SA = FS\left(\frac{Q_2}{V_S}\right)$$

Where

Q_2 is the inflow based on the peak discharged from the developed 10-year runoff event (1.12 cubic feet per second).

V_S is the settling velocity of a 0.02 millimeter (medium silt) soil particle with an assumed density of 2.65 grams per cubic centimeter (0.00096 feet per second)

FS is the factor of safety to account for non-ideal settling. A factor of safety of two is used per BMP C240.

The required surface area of the sediment trap was calculated at 2,327 square feet. A total of five sediment traps will be installed and are located to facilitate excavation of the wetland. Four of the five sediment traps are located in series, thus the final sediment trap is oversized to accommodate the increased flow by minimizing velocities through the sediment trap.

Check dams will slow stormwater velocities and allow the release of sediment in stages along the path of the conveyance. The specific BMPs for channel and outlet stabilization that shall be used on this project include:

Minimum Required BMPs:

Silt Fence (BMP C233), Sediment Trap (BMP C240)

Optional BMPs:

Brush Barrier (BMP C231), Gravel Filter Berm (BMP C232), Vegetated Strip (BMP C234), Wattles (BMP C235), Temporary Sediment Pond (BMP C241), Construction Stormwater Chemical Treatment (BMP C250), Construction Stormwater Filtration (BMP C251)

Alternate sediment control BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

In addition, sediment will be removed from paved areas in and adjacent to construction work areas manually or using mechanical sweepers to minimize tracking of sediments on vehicle tires away from the site and to minimize washoff of sediments from adjacent streets in runoff.

For specific areas shown on the plans, treated stormwater shall be discharged into onsite, vegetated areas (BMP C241). Discharge area is shown on the TESC Plan.

The following BMPs will be implemented as needed to meet permitted turbidity limits in the site discharge(s). Prior to the implementation of these BMPs, sediment sources and erosion control and soil stabilization BMP efforts will be maximized to reduce the need for end-of-pipe sedimentation controls.

3.1.5 Element #5 – Stabilize Soils

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. The specific BMPs for soil stabilization that shall be used on this project include:

- All efforts will be made to cover exposed soils during construction. From May 1 to September 30, no soils or erodible materials shall remain exposed and un-worked for more than 7 days.
- From October 1 through April 30 no soils or erodible materials (including stockpiles) shall remain exposed and un-worked for more than 2 days. This applies to all soils on-site, whether at final grade or not. Straw, mulching, jute mats, compost socks and temporary hydroseeding will be employed as needed to ensure reduced erosion. Dust will be controlled by watering when needed.

For emergencies and large storm events the contractor shall have materials stored on-site such as straw bales, plastic sheeting, straw wattles, etc. as necessary to stabilize the site as well as

items listed in BMP C150 in Appendix B. A CESCL will be on call to manage the site and direct additional soil stabilization measures as necessary during a large storm event. The specific BMPs for soil stabilization that shall be used on this project include:

Minimum Required BMPs:

Dust Control (BMP C140), Nets and Blankets (BMP C122)

Optional BMPs:

Temporary and Permanent Seeding (BMP C120), Mulching (BMP C121), Plastic Covering (BMP C123), Sodding (BMP C124), Topsoiling/Composting (BMP C125), Polyacrylamide for Soil Erosion Protection (BMP C126), Surface Roughening (BMP C130), Gradient Terraces (BMP C131)

Alternate soil stabilization BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

In general, cut and fill slopes will be stabilized as soon as possible and soil stockpiles will be temporarily covered with plastic sheeting. All stockpiled soils shall be stabilized from erosion, protected with sediment trapping measures, and will be located away from storm drain inlets, waterways, and drainage channels.

3.1.6 Element #6 – Protect Slopes

All cut and fill slopes will be constructed and immediately stabilized to minimizes erosion.

The site is mostly flat. Large cut or fill slopes are not planned however, small slopes with a minimum slope of 3:1 (horizontal:vertical) and maximum vertical height of nine feet are expected. The specific BMPs for slope protection that shall be used on this project include:

Minimum Required BMPs:

Check Dams (BMP C207)

Optional BMPs:

Temporary and Permanent Seeding (BMP C120), Mulching (BMP C121), Nets and Blankets (BMP C122), Surface Roughening (BMP C130), Gradient Terraces (BMP C131), Interceptor Dike and Swale (BMP C200), Grass-Lined Channels (BMP C201), Water Bars (BMP C203), Pipe Slope Drains (BMP C204), Subsurface Drains (BMP C205), Level Spreader (BMP C206), Triangular Silt Dike (Geotextile-Encased Check Dam) (BMP C208)

Alternate slope protection BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.7 Element #7 – Protect Drain Inlets

All storm drain inlets and culverts within or adjacent to construction shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. However, the first priority is to keep all access roads clean of sediment and keep street wash water separate from entering storm drains until treatment can be provided. Storm Drain Inlet Protection (BMP C220) will be implemented for all drainage inlets and culverts that could potentially be impacted by sediment-laden runoff on and near the project site. The specific BMPs for channel and outlet stabilization that shall be used on this project include:

Minimum Required BMPs:

Storm Drain Inlet Protection (BMP C220)

Optional BMPs:

None

If the BMP options listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D), or if no BMPs are listed above but deemed necessary during construction, the Certified Erosion and Sediment Control Lead shall implement one or more of the alternative BMP inlet protection options listed in Appendix C.

3.1.8 Element #8 – Stabilize Channels and Outlets

All exposed conveyance channels will be lined with erosion matt or gravel. Rockery outlet splash pads will be provided at outlets to reduce stormwater velocities to prevent scouring. Additional materials will be stored on-site to maintain and modify existing and proposed conveyance ditches as necessary.

The conveyance channel in between the sediment pond was sized using the 10-year peak flow at a five minute interval. Per the 2012 SWMMWW, Vol. 2 page 3-19, Element #8, a factor of safety of 1.6 was used to establish a design flow of 1.79 cubic feet per second. Using a Manning's roughness coefficient and channel dimensions as shown in Appendix G, a normal flow depth of 0.85 feet was calculated. The contractor shall maintain minimum slopes and channel dimensions as defined in the plans and calculations.

The specific BMPs for channel and outlet stabilization that shall be used on this project include:

Minimum Required BMPs:

Channel Lining (BMP C202), Outlet Protection (BMP C209), Check Dams (BMP C207)

Optional BMPs:

Grass Lined Channels (BMP C201), Nets and Blankets (BMP C122)

Alternate channel and outlet stabilization BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. Thus, per the 2012 SWMMWW, "all temporary on-site conveyance channels have been designed, and will be

constructed, and stabilized to prevent erosion from the expected peak 10 minute velocity of flow from a Type 1A, 10-year, 24-hour recurrence interval storm for the developed condition. Alternatively, the 10-year, 1-hour peak flow rate indicated by an approved continuous runoff simulation model, increased by a factor of 1.6, shall be used." The conveyance channel shown in the plans was designed for the 10 year, 5 minute velocity. See calculations in Appendix G.

3.1.9 Element #9 – Control Pollutants

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well-organized, and free of debris. The Spill Prevention, Containment, Control and Cleanup Plan (SPCCCP) will be provided by the contractor for activities to be performed by the contractor on-site.

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.
- On-site fueling tanks and petroleum product storage containers shall include secondary containment.
- 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.

Chemical storage:

- Any chemicals stored in the construction areas will conform to the appropriate source control BMPs listed in Volume IV of the Ecology stormwater manual. In Western WA, all chemicals shall have cover, containment, and protection provided on site, per BMP C153 for Material Delivery, Storage and Containment in SMMWW 2012
- Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations for application procedures and rates shall be followed.

Excavation and tunneling spoils dewatering waste:

- Dewatering BMPs and BMPs specific to the excavation and tunneling (including handling of contaminated soils) are discussed under Element 10.

Demolition:

- Storm drain inlets vulnerable to stormwater discharge carrying dust, soil, or debris will be protected using Storm Drain Inlet Protection (BMP C220 as described above for Element 7).

- Process water and slurry resulting from sawcutting and surfacing operations will be prevented from entering the waters of the State by implementing Sawcutting and Surfacing Pollution Prevention measures (BMP C152).

Concrete and grout:

- Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing Concrete Handling measures (BMP C151).

Sanitary wastewater:

- Portable sanitation facilities will be firmly secured, regularly maintained, and emptied when necessary.
- Wheel wash or tire bath wastewater shall be discharged to a separate on- site treatment system or to the sanitary sewer as part of Wheel Wash implementation (BMP C106).

Solid Waste:

- Solid waste will be stored in secure, clearly marked containers.

Other:

- Other BMPs will be administered as necessary to address any additional pollutant sources on site.

3.1.10 Element #10 – Control Dewatering

There will be no discharge from dewatering into the sanitary sewer system during construction for this project without written permission from the owner. The contractor shall capture and bypass dewatering water around trench and excavation activities. Water collected during dewatering will meet the benchmark limits for turbidity before it is discharged into the stormwater conveyance system. Collected water that does not meet the standards will be treated using an approved method prior to discharging.

3.1.11 Element #11 – Maintain BMPs

All temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function. Maintenance and repair shall be conducted in accordance with each particular BMPs specifications. Visual monitoring of the BMPs will be conducted 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 will be reduced to once every month.

All temporary erosion and sediment control BMPs shall be removed within 30 days after the final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be removed or stabilized on site. Disturbed soil resulting from removal of BMPs or vegetation shall be permanently stabilized.

3.1.12 Element #12 – Manage the Project

Erosion and sediment control BMPs for this project have been designed based on the following principles:

- Design the project to fit the existing topography, soils, and drainage patterns.
- Emphasize erosion control rather than sediment control.
- Minimize the extent and duration of the area exposed.

- Keep runoff velocities low.
- Retain sediment on site.
- Thoroughly monitor site and maintain all ESC measures.
- Schedule major earthwork during the dry season.

In addition, project management will incorporate the key components listed below. As this project site is located west of the Cascade Mountain Crest, the project will be managed according to the following key project components:

- Phasing of Construction:
  - The construction project is not being phased and will be completed in approximately 60 days..
- Seasonal Work Limitations:
  - From October 1 through April 30, clearing, grading, and other soil disturbing activities shall only be permitted if silt-laden runoff will be prevented from leaving the site through a combination of the following:
    - Site conditions including existing vegetative coverage, slope, soil type, and proximity to receiving waters; and
    - Limitations on activities and the extent of disturbed areas; and
    - Proposed erosion and sediment control measures.
- Coordination with Utilities and Other Jurisdictions:
  - Care has been taken to coordinate with utilities, other construction projects, and the local jurisdiction in preparing this SWPPP and scheduling the construction work.
- Inspection and Monitoring:
  - All BMPs shall be inspected, maintained, and repaired as needed to assure continued performance of their intended function. Site inspections shall be conducted by a person who is knowledgeable in the principles and practices of erosion and sediment control. This person has the necessary skills to:
    - Assess the site conditions and construction activities that could impact the quality of stormwater, and
    - Assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.
  - A Certified Erosion and Sediment Control Lead shall be on-site or on-call at all times.
  - Whenever inspection and/or monitoring reveals that the BMPs identified in this SWPPP are inadequate, due to the actual discharge of or potential to discharge a significant amount of any pollutant, appropriate BMPs or design changes shall be implemented as soon as possible.
- Maintaining an Updated Construction SWPPP:
  - This SWPPP shall be retained on-site or within reasonable access to the site.

- The SWPPP shall be modified whenever there is a change in the 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 shall be modified if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The SWPPP shall be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP shall be completed within seven (7) days following the inspection.

3.1.13 Element #13 – Protect Low Impact Development BMPs

Low Impact BMPs are not part of this project.

3.2 SITE SPECIFIC BMPS

Site specific BMPs are shown on the TESC Plan Sheets and Details in Appendix A. These site specific plan sheets will be updated if the TESC Plan or SWPPP is modified.

4. CONSTRUCTION PHASING AND BMP IMPLEMENTATION

It is estimated that the project is scheduled to begin in 2016 and conclude by 2017. The BMP implementation schedule will be driven by the construction schedule. Critical milestones are provided below and will be updated prior to bid:

- Estimate of Construction start date: ..... June 2016
- Mobilize equipment on site: ..... June 2016
- Mobilize and store all ESC and soil stabilization
- products (store materials on hand BMP C150): ..... June 2016
- Install ESC measures:..... June 2016
- Install stabilized construction entrance: ..... June 2016
- Begin clearing and grubbing: ..... June 2016
- Begin grading for wetland:..... June 2016
- Complete Grading: .....September 2016
- Complete Conveyance:.....September 2016
- Planting: .....Oct. – Nov. 2016
- Construction Complete:.....November 2016

5. POLLUTION PREVENTION TEAM

The pollution prevention team consists of personnel responsible for implementation of the SWPPP, including the following:

- Certified Erosion and Sediment Control Lead (CESCL) – primary contractor contact, responsible for site inspections (BMPs, visual monitoring, sampling, etc.); to be called upon in case of failure of any ESC measures.
- Resident Engineer – For projects with engineered structures only (sediment ponds/traps, sand filters, etc.): site representative for the owner that is the project's supervising engineer responsible for inspections and issuing instructions and drawings to the contractor's site supervisor or representative
- Emergency Ecology Contact – individual to be contacted at Ecology in case of emergency. Go to the following website to get the name and number for the Ecology contact information: http://www.ecy.wa.gov/org.html
- Emergency Owner Contact – individual that is the site owner or representative of the site owner to be contacted in the case of an emergency.
- Non-Emergency Ecology Contact – individual that is the site owner or representative of the site owner than can be contacted if required.
- Monitoring Personnel – personnel responsible for conducting water quality monitoring; for most sites this person is also the Certified Erosion and Sediment Control Lead.

5.1 TEAM MEMBERS

Names and contact information for those identified as members of the pollution prevention team are provided in the following table:

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	TBD (Contractor)	TBD
Resident Engineer	Chris May, Kitsap County Public Works	360-337-5777
Emergency Ecology Contact	Kevin Fitzpatrick	425-649-7033
Emergency Owner Contact	Chris May, Kitsap County Public Works	360-337-5777
Non-Emergency Ecology Contact	Bellevue Ecology Receptionist	425-649-7000
Monitoring Personnel	TBD (Contractor)	TBD

6. SITE INSPECTIONS AND MONITORING

Monitoring includes visual inspection, monitoring for water quality parameters of concern, and documentation of the inspection and monitoring 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 and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP (Appendix E) include the required information for the site log book. This SWPPP may function as the site log book if desired, or the forms may be separated and included in a separate site log book. However, if separated, the site log book but must be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

6.1 SITE INSPECTION

All BMPs will be inspected, maintained, and repaired as needed to assure continued performance of their intended function. Site inspections will be conducted by a person who is knowledgeable in the principles and practices of erosion and sediment control. The onsite inspector will have the skills to assess the potential for water quality impacts as a result of the type of construction activities occurring on site, and the knowledge of the appropriate and effective ESC measures needed to control the quality of stormwater discharges.

All BMPs will be inspected, maintained, and repaired as needed to assure continued performance of their intended function. The inspector will be a Certified Erosion and Sediment Control Lead (CESCL) per BMP C160. The name and contact information for the CESCL is provided in Section 5 of this SWPPP.

Site inspection will occur in all areas disturbed by construction activities and at all stormwater discharge points. Stormwater will be examined for the presence of suspended sediment, turbidity, discoloration, and oily sheen. The site inspector will evaluate and document the effectiveness of the installed BMPs and determine if it is necessary to repair or replace any of the BMPs to improve the quality of stormwater discharges. All maintenance and repairs will be documented in the site log book or forms provided in this document. All new BMPs or design changes will be documented in the SWPPP as soon as possible.

6.1.1 Site Inspection Frequency

Site inspections will be conducted not less than monthly per the permit.

6.1.2 Site Inspection Documentation

The site inspector will record each site inspection using the site log inspection forms provided in Appendix E. The site inspection log forms may be separated from this SWPPP document, but will be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

6.2 STORMWATER QUALITY MONITORING

6.2.1 Turbidity Sampling

Monitoring requirements for the proposed project will include either turbidity or water transparency sampling to monitor site discharges for water quality compliance with the 2012 Construction Stormwater General Permit (Appendix D). Sampling will be conducted at all discharge points at least once per calendar week.

Turbidity or transparency monitoring will follow the analytical methodologies described in Section S4 of the 2005 Construction Stormwater General Permit (Appendix D). The key benchmark values that require action are 25 NTU for turbidity (equivalent to 32 cm transparency) and 250 NTU for turbidity (equivalent to 6 cm transparency). If the 25 NTU benchmark for turbidity (equivalent to 32 cm transparency) is exceeded, the following steps will be conducted:

1. Ensure all BMPs specified in this SWPPP are installed and functioning as intended.
2. Assess whether additional BMPs should be implemented, and document revisions to the SWPPP as necessary.
3. Sample discharge location daily until the analysis results are less than 25 NTU (turbidity) or greater than 32 cm (transparency).

If the turbidity is greater than 25 NTU (or transparency is less than 32 cm) but less than 250 NTU (transparency greater than 6 cm) for more than 3 days, additional treatment BMPs will be implemented within 24 hours of the third consecutive sample that exceeded the benchmark value. Additional treatment BMPs to be considered will include, but are not limited to, off-site treatment, infiltration, filtration and chemical treatment.

If the 250 NTU benchmark for turbidity (or less than 6 cm transparency) is exceeded at any time, the following steps will be conducted:

1. Notify Ecology by phone within 24 hours of analysis (see Section 5.0 of this SWPPP for contact information).
2. Continue daily sampling until the turbidity is less than 25 NTU (or transparency is greater than 32 cm).
3. Initiate additional treatment BMPs such as off-site treatment, infiltration, filtration and chemical treatment within 24 hours of the first 250 NTU exceedance.
4. Implement additional treatment BMPs as soon as possible, but within 7 days of the first 250 NTU exceedance.
5. Describe inspection results and remedial actions taken in the site log book and in monthly discharge monitoring reports as described in Section 7.0 of this SWPPP.

6.2.2 pH Sampling

Not required.

7. REPORTING AND RECORDKEEPING

7.1 RECORDKEEPING

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; and,
- Stormwater quality monitoring.

7.1.2 Records Retention

Records of all monitoring information (site log book, inspection reports/checklists, etc.), this Stormwater Pollution Prevention Plan, and any other documentation of compliance with permit requirements will be retained during the life of the construction project and for a minimum of three years following the termination of permit coverage in accordance with permit condition S5.C.

7.1.3 Access to Plans and Records

The SWPPP, General Permit, Notice of Authorization letter, and Site Log Book will be retained on site or within reasonable access to the site and will be made immediately available upon request to Ecology or the local jurisdiction. A copy of this SWPPP will be provided to Ecology within 14 days of receipt of a written request for the SWPPP from Ecology. Any other information requested by Ecology will be submitted within a reasonable time. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with permit condition S5.G.

7.1.4 Updating the SWPPP

In accordance with Conditions S3, S4.B, and S9.B.3 of the General Permit, this SWPPP will be modified if the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site or there has been a change in design, construction, operation, or maintenance at the site that has a significant effect on the discharge, or potential for discharge, of pollutants to the waters of the State. The SWPPP will be modified within seven days of determination based on inspection(s) that additional or modified BMPs are necessary to correct problems identified, and an updated timeline for BMP implementation will be prepared. SWPPP amendments and TESC Plan amendments will be kept in Appendix F of this SWPPP.

7.2 REPORTING

7.2.1 Discharge Monitoring Reports

Discharge Monitoring Reports will be submitted online to:
http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html

High Turbidity Reporting

Turbidity reporting of values higher than 250 NTU will need to be reported by phone to Ecology Northwest Region at (425) 649-7000.

7.2.2 Notification of Noncompliance

If any of the terms and conditions of the permit are not met, and it causes a threat to human health or the environment, the following steps will be taken in accordance with permit section S5.F:

1. Ecology will be immediately notified of the failure to comply.
2. Immediate action will be taken to control the noncompliance issue and to correct the problem. 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.

Appendix A

Site Plan and TESC Plans

PLANTINGS TO PROVIDE A VISUAL SCREEN

PROPERTY BOUNDARY

FOREBAY

EXISTING TRAIL

INTERPLANT TREES AND SHRUBS IN THIS AREA

OHWM

WETLAND

EXISTING TRAIL

OHWM

PROPERTY BOUNDARY

INTERPLANT TREES AND SHRUBS IN THIS AREA

PICNIC BENCH

CLEAR CREEK

UNDERGROUND STORM VAULT, UNABLE TO OPEN UNTIL MID FEB. LOCKS

Contributing Basin Map and Stormwater Treatment Flows

Basin	Non PGIS (acres)	PGIS (acres)	Pervious (acres)	WQ Offline (cfs)	91% 24-hr Volume (cf)	91% Volume (ac-ft)
E	4.41	8.49	0.51	1.66	104,108	1.66
F	0.57	0.67	-	0.17	10,890	0.25
G	0.53	1.16	-	0.24	14,810	0.34
Stingle Plaza	0.83	1.51	1.74	0.34	21,780	0.50
Totals	6.34	11.83	2.25	2.41	151,588	2.75

Contributing Basin Map
Duwe'iq Stormwater Treatment Facility
Silverdale, Washington

Parametrix DATE: February 26, 2015 FILE: DUWEIQ_ILLUSTRATIVE

N

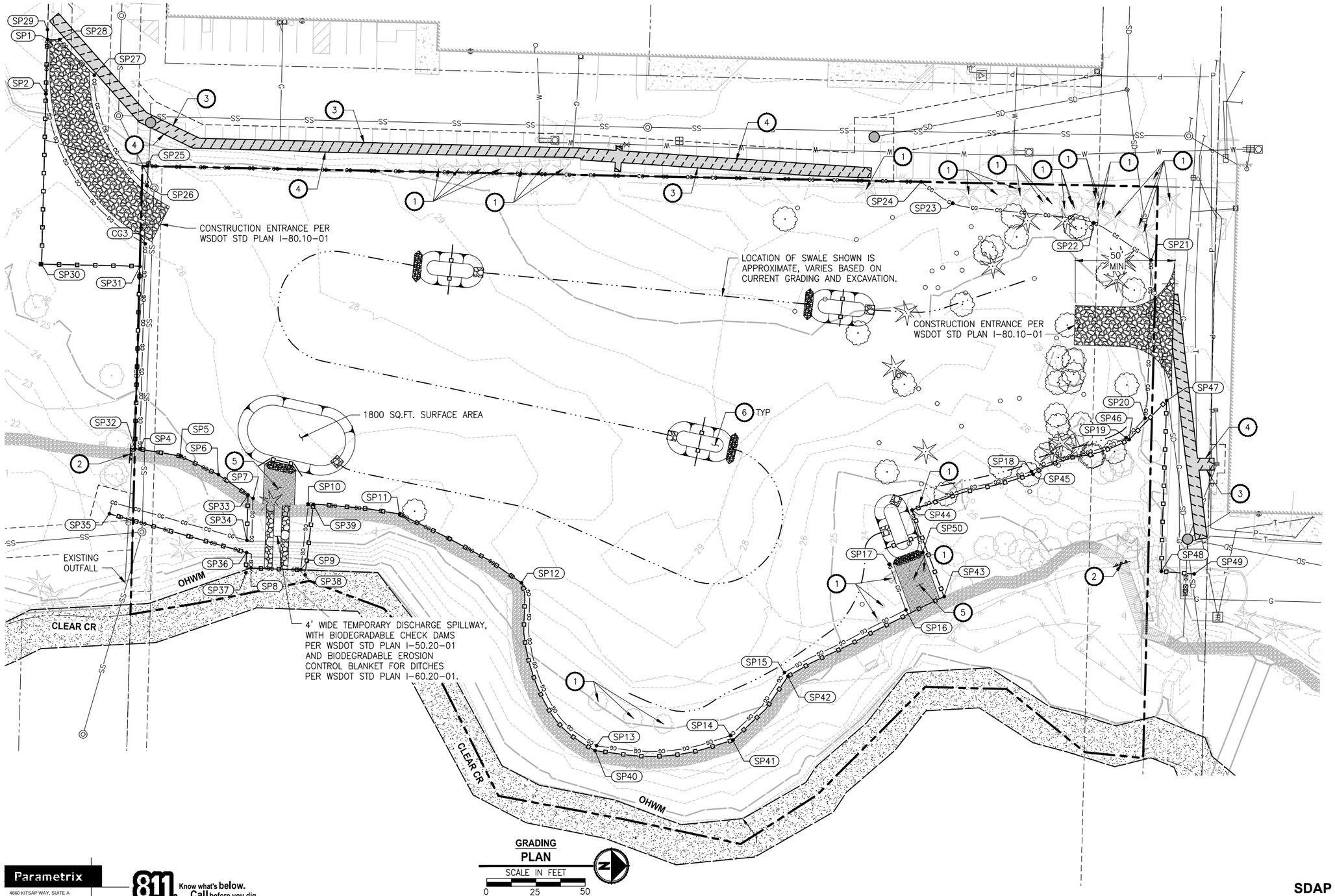
0 40
SCALE IN FEET

LEGEND

- EMERGENT PLANTING MIX
- SHALLOW EMERGENT PLANTING MIX
- LOW NATIVE SHRUB MIX
- NATIVE SHRUB PLANTING MIX
- NATIVE GRASS
- CONTROL WEEDS, MULCH AREA, AND INFILL PLANT TREES AND SHRUBS
- EXISTING TREES
- LIVE STAKE WILLOWS AND RED-TWIG DOGWOOD
- LARGE NATIVE CONIFER TREES
- LARGE NATIVE DECIDUOUS TREES
- SMALL NATIVE CONIFER TREES OR LARGE NATIVE EVERGREEN SHRUBS
- SMALL NATIVE DECIDUOUS TREES
- ROCK PILE
- BRUSH PILE
- SNAG
- ANCHORED LOG

Site Plan

Duwe'iq Treatment Wetland Plan
Silverdale, Washington



GRADING PLAN

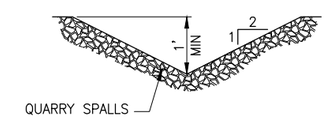
SCALE IN FEET 0 25 50

LEGEND:

- STORM DRAIN INLET PROTECTION (OPEN GRATES ONLY) PER WSDOT STD PLAN I-40.20-00
- 12" THICK RIP RAP PAD, 4" TO 8" QUARRY SPALLS
- GRAVEL BERM PER WSDOT STD PLAN I-80.10-01
- SEDIMENT TRAP PER WASHINGTON DEPARTMENT OF ECY BMP C240
- CLEARING AND GRUBBING LIMITS
- SILT FENCE PER WSDOT STD PLAN I-30.15-02
- INTERCEPTOR SWALE WITH ROCK CHECK DAMS PER WSDOT STD PLAN I-50.20-01, AND SEE DETAIL 1/—
- SAWCUT
- REMOVE ASPHALT CONCRETE PAVEMENT
- (SPXX) SITE PREP CONTROL POINTS, SEE SHEET 7.

KEY NOTES:

1. PROTECT EXISTING TREE/ ROOT STRUCTURE. NATIVE TREES AND SHRUB AREAS SHALL BE PRESERVED AND PROTECTED WITHIN CLEARING AND GRUBBING AREAS. NOTIFY PROJECT REPRESENTATIVE 5 DAYS PRIOR TO START OF CLEARING ACTIVITY FOR ASSISTANCE FLAGGING PLANTS AND AREAS TO PROTECT AND FOR APPROVAL OF CLEARING LIMITS. USE ONLY HAND TOOLS AND METHODS WHEN WORKING INSIDE THE DRIPLINE AREA OF EXISTING TREES AND SHRUBS.
2. HIGH VISIBILITY CONSTRUCTION FENCE, PEDESTRIAN BARRICADE, AND SIGN "TRAIL CLOSED". MAINTAIN SIGNS DURING CONSTRUCTION PERIOD.
3. SAWCUT ASPHALT TO ENSURE CLEAN EDGE.
4. PIPE TRENCHING LIMITS, SEE DETAIL 2/15
5. VEGETATED STRIP PER WASHINGTON DEPARTMENT OF ECY BMP C234. **DO NOT CLEAR & GRUB VEGETATED STRIP.**
6. MIN SEDIMENT TRAP SURFACE AREA IS 500 SQ.FT. MEASURED AT WEIR INVERT. TYPICAL ALL SEDIMENT TRAPS. UNLESS SPECIFIED OTHERWISE. SEE DETAIL 6/15



INTERCEPTOR SWALE DETAIL 1

NO SCALE

SDAP SUBMITTAL
MARCH 20, 2015

Parametrix
4660 KITSAP WAY, SUITE A
BREMERTON, WASHINGTON 98312
T. 360.377.0014 F. 360.479.5961
www.parametrix.com

811 Know what's below. Call before you dig.

CONTROL POINTS

REVISIONS

No.	BY	DATE	DESCRIPTION

SURVEYED: PMX
DESIGNED: JN
DRAWN: JC
CHECKED: DD
CRP No.
DATE: 03/25/15

JESSE L. NEILSON — STATE OF WASHINGTON — 50736 — REGISTERED PROFESSIONAL ENGINEER

KITSAP COUNTY 1857 WASHINGTON

KITSAP COUNTY
DEPT. OF PUBLIC WORKS
614 DIVISION STREET MS-26
PORT ORCHARD, WA 98366
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DUWE'IQ STORMWATER TREATMENT WETLAND

TREATMENT WETLAND SITE PREP & TESC PLAN

KITSAP COUNTY, WASHINGTON
SECTION 16, TOWNSHIP 25 NORTH, RANGE 1 EAST, W.M.

CONSTRUCTION SEQUENCE:

1. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S). INSTALL INLET PROTECTION.
2. CONSTRUCT SILT FENCE BARRIERS.
3. CONSTRUCT DISCHARGE SPILLWAY AND SEDIMENT TRAPS.
4. CONSTRUCT RUNOFF INTERCEPTION AND DIVERSION DITCHES, OR PIPING
5. CLEAR AND GRADE THE MINIMUM SITE AREA REQUIRED FOR CONSTRUCTION OF THE VARIOUS PHASES OF WORK.
6. MAINTAIN ALL EROSION AND SEDIMENTATION CONTROL FACILITIES TO PROVIDE THE REQUIRED PROTECTION OF DOWNSTREAM WATER QUALITY.
7. MODIFY INTERCEPTOR DITCHES AND SEDIMENT TRAPS AS NEEDED DURING EXCAVATION ACTIVITIES.
8. PROVIDE PERMANENT SITE STABILIZATION.
9. EROSION AND SEDIMENTATION CONTROL FACILITIES SHALL NOT BE REMOVED UNTIL CONSTRUCTION IS COMPLETE AND ACCEPTED BY KITSAP COUNTY.

TEMPORARY EROSION AND SEDIMENTATION CONTROL MAINTENANCE REQUIREMENTS:

1. EROSION AND SEDIMENTATION CONTROL FACILITIES SHALL BE INSPECTED AFTER EACH STORM EVENT AND DAILY DURING PROLONGED RAINFALL.
2. NECESSARY REPAIRS OR REPLACEMENT OF FACILITIES SHALL BE ACCOMPLISHED PROMPTLY.
3. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR WHEN THE LEVEL OF DEPOSITION REACHES APPROXIMATELY ONE-HALF THE MAXIMUM POTENTIAL DEPTH.
4. SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE ESC FACILITIES ARE NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.
5. TEMPORARY EROSION AND SEDIMENTATION CONTROL FACILITIES SHALL BE MAINTAINED BY CONTRACTOR.

GENERAL EROSION AND SEDIMENTATION CONTROL NOTES:

1. THE FOLLOWING EROSION AND SEDIMENTATION CONTROL NOTES APPLY TO ALL CONSTRUCTION SITE ACTIVITIES AT ALL TIMES, UNLESS OTHERWISE SPECIFIED ON THESE PLANS:
2. APPROVAL OF THIS EROSION AND SEDIMENTATION CONTROL PLAN DOES NOT CONSTITUTE AN ACCEPTANCE OF THE DRAINAGE DESIGN.
3. THE CONTRACTOR AND HIS/HER RESPRESENTATIVES SHALL BE RESPONSIBLE AT ALL TIMES FOR PREVENTING SILT-LADEN RUNOFF FROM DISCHARGING FROM THE PROJECT SITE. FAILURE BY THE OWNER AND/OR CONTRACTOR CAN RESULT IN A FINE.
4. THE DESIGNATED CONTRACTOR TEMPORARY CONTACT PERSON MUST BE AVAILABLE FOR CONTACT BY TELEPHONE ON A 24 HOUR BASIS THROUGHOUT CONSTRUCTION AND UNTIL THE PROJECT HAS BEEN COMPLETED AND ACCEPTED BY THE COUNTY.
5. THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT AND UPGRADING OF THESE FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR FROM THE BEGINNING OF CONSTRUCTION UNTIL ALL CONSTRUCTION IS COMPLETED AND ACCEPTED BY THE COUNTY AND THE SITE IS STABILIZED.
6. PRIOR TO BEGINNING ANY WORK ON THE PROJECT SITE, A PRECONSTRUCTION CONFERENCE MUST BE HELD, AND SHALL BE ATTENDED BY THE GENERAL CONTRACTOR, THE PROJECT ENGINEER, REPRESENTATIVES FROM AFFECTED UTILITIES, AND A REPRESENTATIVE OF KITSAP COUNTY.
7. THE EROSION AND SEDIMENTATION CONTROL FACILITIES SHOWN ON THIS PLAN ARE TO BE CONSIDERED ADEQUATE BASIC REQUIREMENTS FOR THE ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION, DEVIATIONS FROM THIS PLAN MAY BE NECESSARY IN ORDER TO MAINTAIN WATER QUALITY. MINOR DEPARTURES FROM THIS PLAN ARE PERMITTED SUBJECT TO THE APPROVAL OF THE COUNTY INSPECTOR. HOWEVER, EXCEPT FOR EMERGENCY SITUATIONS, ALL OTHER DEVIATIONS FROM THIS PLAN MUST BE DESIGNED BY THE PROJECT ENGINEER AND APPROVED BY KITSAP COUNTY PRIOR TO INSTALLATION.

GENERAL EROSION & SEDIMENTATION CONTROL NOTES CONT:

8. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED BY THE CONTRACTOR ON A FREQUENT BASIS AND IMMEDIATELY AFTER EACH RAINFALL, AND MAINTAINED AS NECESSARY TO INSURE THEIR CONTINUED FUNCTIONING. ALL SEDIMENT MUST BE REMOVED FROM SILT FENCES, STRAW BALES, SEDIMENT PONDS, ETC. PRIOR TO THE SEDIMENT REACHING 1/3 ITS MAXIMUM POTENTIAL DEPTH.
9. AT NO TIME SHALL CONCRETE, CONCRETE BY-PRODUCTS, VEHICLE FLUIDS, PAINT, CHEMICALS, OR OTHER POLLUTING MATTER BE PERMITTED TO DISCHARGE TO THE TEMPORARY OR PERMANENT DRAINAGE SYSTEM, OR TO DISCHARGE FROM THE PROJECT SITE.
10. PERMANENT DETENTION/RETENTION PONDS, PIPES, TANKS OR VAULTS MAY ONLY BE USED FOR SEDIMENT CONTAINMENT WHEN SPECIFICALLY INDICATED ON THESE PLANS.
11. PROTECTION OF THE ENVIRONMENT: NO CONSTRUCTION RELATED ACTIVITY SHALL CONTRIBUTE TO THE DEGRADATION OF THE ENVIRONMENT, ALLOW MATERIAL TO ENTER SURFACE OR GROUND WATERS, OR ALLOW PARTICULATE EMISSIONS TO THE ATMOSPHERE, WHICH EXCEED STATE OR FEDERAL STANDARDS. ANY ACTIONS THAT POTENTIALLY ALLOW A DISCHARGE TO STATE WATERS MUST HAVE PRIOR APPROVAL OF THE WASHINGTON STATE DEPARTMENT OF ECOLOGY.

MINIMUM EROSION & SEDIMENTATION CONTROL REQUIREMENTS:

1. STABILIZATION AND SEDIMENT TRAPPING. ALL EXPOSED AND UNWORKED SOILS, INCLUDING SOIL STOCKPILES, SHALL BE STABILIZED BY SUITABLE APPLICATION OF BMPS THAT PROTECT SOIL FROM THE EROSIVE FORCES OF RAINDROP IMPACT AND FLOWING WATER. APPLICABLE PRACTICES INCLUDE, BUT ARE NOT LIMITED TO VEGETATIVE ESTABLISHMENT, MULCHING, PLASTIC COVERING, AND THE EARLY APPLICATION OF GRAVEL BASE ON AREAS TO BE PAVED. FROM OCTOBER 1 TO APRIL 30, NO SOILS SHALL REMAIN UNSTABILIZED FOR MORE THAN 2 DAYS. FROM MAY 1 TO SEPTEMBER 30, NO SOILS SHALL REMAIN UNSTABILIZED FOR MORE THAN 7 DAYS.
2. AT ALL TIMES OF THE YEAR, THE CONTRACTOR SHALL HAVE SUFFICIENT MATERIALS, EQUIPMENT AND LABOR ON-SITE TO STABILIZE AND PREVENT EROSION FROM ALL DENUDED AREAS WITHIN 12-HOURS AS SITE AND WEATHER CONDITIONS DICTATE.
3. FROM OCTOBER 1ST TO APRIL 30TH, THE PROJECT ENGINEER SHALL VISIT THE DEVELOPMENT SITE A MINIMUM OF ONCE PER WEEK FOR THE PURPOSE OF INSPECTING THE EROSION AND SEDIMENTATION CONTROL FACILITIES, REVIEWING THE PROGRESS OF CONSTRUCTION, AND VERIFYING THE EFFECTIVENESS OF THE EROSION CONTROL MEASURES BEING UNDERTAKEN. THE PROJECT ENGINEER SHALL IMMEDIATELY INFORM THE COUNTY OF ANY PROBLEMS OR POTENTIAL PROBLEMS OBSERVED DURING SAID SITE VISITS, AS WELL AS OF ANY RECOMMENDED CHANGES IN THE EROSION CONTROL MEASURES TO BE UNDERTAKEN. WHEN REQUESTED BY THE COUNTY, THE PROJECT ENGINEER SHALL PROVIDE THE COUNTY WITH WRITTEN RECORDS OF SAID WEEKLY SITE VISITS, INCLUDING DATES OF VISITS AND NOTED SITE OBSERVATIONS.
4. IN THE EVENT THAT GROUND ON A PROJECT SITE IS LEFT BARE AFTER SEPTEMBER 30TH, THE COUNTY MAY ISSUE A STOP WORK ORDER FOR THE ENTIRE PROJECT UNTIL SATISFACTORY CONTROLS ARE PROVIDED. IN ADDITION, THE OWNER WILL BE SUBJECT TO THE PENALTIES PROVIDED IN SECTION 12.32 OF THE KITSAP COUNTY CODE.
5. IN THE EVENT THAT GROUND ON A PROJECT SITE IS LEFT BARE AFTER SEPTEMBER 30TH, AND THE COUNTY IS UNSUCCESSFUL IN CONTACTING THE DESIGNATED EMERGENCY CONTACT PERSON, THE COUNTY MAY ENTER THE PROJECT SITE AND INSTALL TEMPORARY GROUND COVER MEASURES AND BILL THE CONTRACTOR FOR ALL EXPENSES INCURRED BY THE COUNTY. THESE COSTS WILL BE IN ADDITION TO ANY MONETARY PENALTIES LEVIED AGAINST THE CONTRACTOR.
6. DELINEATION OF CLEARING AND EASEMENT LIMITS. CLEARING LIMITS, SETBACKS, BUFFERS, AND SENSITIVE OR CRITICAL AREAS SUCH AS STEEP SLOPES, WETLANDS AND RIPARIAN CORRIDORS SHALL BE CLEARLY MARKED IN THE FIELD AND INSPECTED BY KITSAP COUNTY DEPARTMENT OF COMMUNITY DEVELOPMENT PRIOR TO COMMENCEMENT OF LAND CLEARING ACTIVITIES. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
7. PROTECTION OF ADJACENT PROPERTIES. ADJACENT PROPERTIES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION BY APPROPRIATE USE OF VEGETATIVE BUFFER STRIPS, SEDIMENT BARRIERS OR FILTERS, DIKES OR MULCHING, OR BY A COMBINATION OF THESE MEASURES AND OTHER APPROPRIATE BMPS.

MINIMUM EROSION AND SEDIMENTATION CONTROL REQUIREMENTS CONT:

8. TIMING AND STABILIZATION OF SEDIMENT TRAPPING MEASURES. SEDIMENT PONDS AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER BMPS INTENDED TO TRAP SEDIMENT ON-SITE SHALL BE CONSTRUCTED AS A FIRST STEP IN GRADING. THESE BMPS SHALL BE FUNCTIONAL BEFORE LAND DISTURBING ACTIVITIES TAKE PLACE. EARTHEN STRUCTURES SUCH AS DAMS, DIKES, AND DIVERSIONS SHALL BE STABILIZED ACCORDING TO THE TIMING INDICATED IN ITEM (1) ABOVE.
9. SLOPE STABILIZATION. CUT AND FILL SLOPES SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. ROUGHENED SOIL SURFACES ARE PREFERRED TO SMOOTH SURFACES. INTERCEPTORS SHOULD BE CONSTRUCTED AT THE TOP OF LONG, STEEP SLOPES WHICH HAVE SIGNIFICANT AREAS ABOVE THAT CONTRIBUTE RUNOFF. CONCENTRATED RUNOFF SHOULD NOT BE ALLOWED TO FLOW DOWN THE FACE OF A CUT OR FILL SLOPE UNLESS CONTAINED WITHIN AN ADEQUATE CHANNEL OR PIPE SLOPE DRAIN. WHEREVER A SLOPE FACE CROSSES A WATER SEEPAGE PLANE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHOULD BE PROVIDED. IN ADDITION, SLOPES SHOULD BE STABILIZED IN ACCORDANCE WITH ITEM (1) ABOVE.
10. CONTROLLING OFF-SITE EROSION. PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM EROSION DUE TO INCREASES IN THE VOLUME, VELOCITY, AND PEAK FLOW RATE OF STORMWATER RUNOFF FROM THE DEVELOPMENT SITE BY THE IMPLEMENTATION OF APPROPRIATE BMPS TO MINIMIZE ADVERSE DOWNSTREAM IMPACTS.
11. STABILIZATION OF TEMPORARY CONVEYANCE CHANNELS AND OUTLETS. ALL TEMPORARY ON-SITE CONVEYANCE CHANNELS SHALL BE DESIGNED, CONSTRUCTED AND STABILIZED TO PREVENT EROSION FROM THE EXPECTED FLOW VELOCITY FROM A 2-YEAR FREQUENCY, 24-HOUR DURATION STORM FOR THE POST-DEVELOPMENT CONDITION. STABILIZATION ADEQUATE TO PREVENT EROSION OF OUTLETS, ADJACENT STREAMBANKS, SLOPES AND DOWNSTREAM REACHES SHALL BE PROVIDED AT THE OUTLETS OF ALL CONVEYANCE SYSTEMS.
12. STORM DRAIN INLET PROTECTION. ALL STORM DRAIN INLETS MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT STORMWATER RUNOFF SHALL NOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT. AFTER PROPER WRITTEN APPLICATION, THE REQUIREMENT FOR INLET PROTECTION MAY BE WAIVED BY THE COUNTY ON A SITE-SPECIFIC BASIS WHEN THE CONVEYANCE SYSTEM DOWNSTREAM OF THE INLET DISCHARGES TO AN APPROPRIATE SEDIMENT CONTAINMENT BMP AND THE CONVEYANCE SYSTEM CAN BE ADEQUATELY CLEANED FOLLOWING SITE STABILIZATION.
13. UNDERGROUND UTILITY CONSTRUCTION. THE CONSTRUCTION OF UNDERGROUND UTILITY LINES SHALL BE LIMITED, WHERE FEASIBLE, TO NO MORE THAN 500 FEET OF OPEN TRENCH AT ANY ONE TIME. WHERE CONSISTENT WITH SAFETY AND SPACE CONSIDERATIONS, EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF THE TRENCH. DEWATERING DEVICES SHALL DISCHARGE TO AN APPROPRIATE SEDIMENT TRAP OR POND, PRECEDED BY ADEQUATE ENERGY DISSIPATION, PRIOR TO RUNOFF LEAVING THE SITE.
14. CONSTRUCTED ACCESS ROUTES. WHEREVER CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED ROADS, PROVISIONS MUST BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT (MUD) ONTO THE PAVED ROAD BY USE OF APPROPRIATE BMPS SUCH AS A STABILIZED CONSTRUCTION ENTRANCE. IF SEDIMENT IS TRANSPORTED ONTO A ROAD SURFACE, THE ROADS SHALL BE CLEANED THOROUGHLY, AS A MINIMUM, AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM ROADS BY SHOVELING OR SWEEPING AND BE TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.
15. REMOVAL OF TEMPORARY BMPS. ALL TEMPORARY EROSION AND SEDIMENT CONTROL BMPS SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPS ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON-SITE. DISTURBED SOIL AREAS RESULTING FROM REMOVAL OF TEMPORARY BMPS SHALL BE PERMANENTLY STABILIZED. THE REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL BMPS MAY NOT BE REQUIRED FOR THOSE PROJECTS, SUCH AS SINGLE FAMILY PLATS, THAT WILL BE FOLLOWED BY ADDITIONAL CONSTRUCTION UNDER A DIFFERENT PERMIT. IN THESE CIRCUMSTANCES, THE NEED FOR REMOVING OR RETAINING THE MEASURES WILL BE EVALUATED ON A SITE-SPECIFIC BASIS.
16. DEWATERING CONSTRUCTION SITES. DEWATERING DEVICES SHALL DISCHARGE INTO AN APPROPRIATE SEDIMENT TRAP OR POND, DESIGNED TO ACCEPT SUCH A DISCHARGE, PRECEDED BY ADEQUATE ENERGY DISSIPATION, PRIOR TO RUNOFF LEAVING THE SITE.
17. CONTROL OF POLLUTANTS OTHER THAN SEDIMENT ON CONSTRUCTION SITES. ALL POLLUTANTS OTHER THAN SEDIMENT THAT OCCUR ON-SITE DURING CONSTRUCTION SHALL BE HANDLED AND LEGALLY DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORM OR SURFACE WATERS. POLLUTANTS OF CONCERN INCLUDE, BUT ARE NOT LIMITED TO, FUELS, LUBRICANTS, SOLVENTS, CONCRETE BI-PRODUCTS AND CONSTRUCTION MATERIALS.
18. MAINTENANCE. ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL BMPS SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL MAINTENANCE AND REPAIR SHALL BE CONDUCTED IN ACCORDANCE WITH THE MANUAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASSURING THAT ANY SUCH FACILITIES DAMAGED DURING FLOODS, STORMS OR OTHER ADVERSE WEATHER CONDITIONS ARE IMMEDIATELY RETURNED TO NORMAL OPERATING CONDITION.

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811 Know what's below. Call before you dig.

SDAP SUBMITTAL
MARCH 20, 2015

CONTROL POINTS

REVISIONS

No.	BY	DATE	DESCRIPTION

SURVEYED:	PMX
DESIGNED:	JN
DRAWN:	JC
CHECKED:	DD
CRP No.	
DATE:	03/25/15

JESSE L. NEILSON — STATE OF WASHINGTON — 50736 — REGISTERED PROFESSIONAL ENGINEER

KITSAP COUNTY — 1857 — WASHINGTON
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DUWE'IQ STORMWATER TREATMENT WETLAND

TESC NOTES

KITSAP COUNTY, WASHINGTON
SECTION 16, TOWNSHIP 25 NORTH, RANGE 1 EAST, W.M.

GRADING POINTS

Point #	Elevation	Northing	Easting	Description
1	31.00	244962.11	1184017.04	AP, TOP
2	31.00	244962.54	1184007.05	AP, TOP
3	31.00	244959.53	1183987.86	PC, TOP
4	31.00	244930.34	1183958.42	PT, TOP
5	31.00	244880.55	1183953.89	FG, TOP
6	31.00	244830.65	1183950.71	FG, TOP
7	32.00	244775.51	1183952.49	PC, TOP
8	32.00	244751.17	1183963.66	MID, TOP
9	32.00	244732.50	1183955.73	PT, TOP
10	32.00	244682.51	1183956.52	FG, TOP
11	29.00	244651.94	1183960.43	PC, TOP
12	29.00	244625.33	1183968.43	MID, TOP
13	29.00	244603.63	1183953.22	PT, TOP
14	29.00	244553.65	1183951.98	FG, TOP
15	28.00	244536.13	1183946.39	PC, TOP
16	28.00	244509.19	1183951.20	FG, TOP
17	28.00	244486.85	1183980.09	PT, TOP
18	28.00	244484.87	1184010.14	FG, TOP
19	27.00	244483.99	1184034.07	MID, TOP
20	27.00	244491.26	1184039.62	PT, TOP
21	27.00	244553.80	1184058.89	FG, TOP
22	27.00	244602.42	1184070.54	FG, TOP
23	27.00	244636.07	1184078.31	PC, TOP
24	27.00	244646.88	1184083.87	MID, TOP
25	27.00	244656.54	1184083.45	PT, TOP
26	27.00	244705.10	1184095.35	FG, TOP
27	27.00	244766.85	1184110.32	PC, TOP
28	27.00	244771.56	1184107.59	MID, TOP
29	27.00	244769.18	1184102.69	PT, TOP
30	27.00	244720.93	1184089.57	FG, TOP

GRADING POINTS

Point #	Elevation	Northing	Easting	Description
31	27.00	244673.62	1184079.33	PC, TOP
32	27.00	244652.17	1184059.20	MID, TOP
33	27.00	244617.47	1184065.83	PC, TOP
34	27.00	244568.82	1184054.31	FG, TOP
35	27.00	244513.93	1184039.26	PC, TOP
36	28.00	244489.53	1184011.34	FG, TOP
37	28.00	244491.82	1183980.64	FG, TOP
38	30.00	244959.85	1184042.03	PC, TOP
39	30.00	244950.47	1184057.38	PT, TOP
40	30.00	244901.48	1184067.37	FG, TOP
41	30.00	244851.48	1184067.56	FG, TOP
42	30.00	244806.14	1184046.48	FG, TOP
43	30.00	244764.35	1184035.97	PC, TOP
44	30.00	244745.14	1184022.76	MID, TOP
45	30.00	244721.83	1184033.68	MID, TOP
46	28.00	244705.81	1184026.75	PT, TOP
47	28.00	244656.70	1184017.33	FG, TOP
48	29.00	244625.75	1184014.21	MID, TOP
49	29.00	244616.03	1183999.14	MID, TOP
50	29.00	244590.29	1184006.19	MID, TOP
51	28.00	244574.85	1184000.80	PT, TOP
52	28.00	244548.75	1183995.34	PC, TOP
53	28.00	244553.39	1184003.65	PT, TOP
54	28.00	244616.53	1184017.19	PT, TOP
55	28.00	244655.09	1184025.50	MID, TOP
56	28.00	244665.30	1184032.56	MID, TOP
57	28.00	244687.77	1184033.47	PT, TOP
58	30.00	244737.42	1184038.89	FG, TOP
59	30.00	244799.92	1184052.75	PC, TOP
60	30.00	244836.45	1184080.67	MID, TOP

GRADING POINTS

Point #	Elevation	Northing	Easting	Description
61	30.00	244857.86	1184077.86	PT, TOP
62	30.00	244907.79	1184075.32	PC, TOP
63	30.00	244964.98	1184057.34	PT, TOP
64	26.00	244815.55	1184078.53	FG, TOP
65	26.00	244824.65	1184103.33	FG, TOP
66	26.00	244811.14	1184151.47	PT, TOP
67	26.00	244771.52	1184181.97	FG, TOP
68	27.00	244737.20	1184200.25	MID, TOP
69	27.00	244689.97	1184183.85	FG, TOP
70	27.00	244662.22	1184142.25	FG, TOP
71	27.00	244647.75	1184124.08	PC, TOP
72	27.00	244640.76	1184118.08	MID, TOP
73	26.00	244626.96	1184116.72	PT, TOP
74	26.00	244605.48	1184111.77	PC, TOP
75	26.00	244579.01	1184101.80	MID, TOP
76	26.00	244562.57	1184101.30	PT, TOP
77	26.00	244532.21	1184098.85	FG, TOP
78	27.00	244661.51	1184158.07	PC, TOP
79	27.00	244696.76	1184193.53	FG, TOP
80	27.00	244732.34	1184205.11	MID, TOP
81	26.00	244745.83	1184199.58	MID, TOP
82	26.00	244798.44	1184168.53	FG, TOP
83	26.00	244829.67	1184125.33	PT, TOP
84	26.00	244830.71	1184112.92	PC, TOP
85	26.00	244838.80	1184095.74	MID, TOP
86	26.00	244477.97	1184033.67	MID, TOP
87	26.00	244474.74	1184056.10	PC, TOP
88	26.00	244485.47	1184078.39	PT, TOP
89	26.00	244514.11	1184096.68	PT, TOP
90	26.00	244514.94	1184093.50	PC, TOP

GRADING POINTS

Point #	Elevation	Northing	Easting	Description
91	26.00	244489.40	1184077.01	PT, TOP
92	26.00	244479.72	1184052.44	PT, TOP
93	26.00	244495.03	1184045.20	PT, TOP
94	27.00	244501.61	1183950.56	PC, TOE
95	27.00	244482.80	1183980.32	PT, TOE
96	26.00	244477.76	1184003.83	FG, TOE
97	29.00	244955.29	1184067.28	PC, TOE
98	28.00	244913.12	1184080.73	FG, TOE
99	26.00	244890.21	1184089.47	FG, TOE
100	25.00	244857.90	1184092.92	PC, TOE
101	24.00	244840.18	1184114.12	PT, TOE
102	25.00	244832.54	1184133.93	MID, TOE
103	24.00	244829.18	1184150.71	MID, TOE
104	24.00	244789.04	1184180.52	MID, TOE
105	25.00	244757.07	1184197.88	PC, TOE
106	25.00	244740.54	1184209.64	PT, TOE
107	26.00	244711.34	1184204.06	FG, TOE
108	26.00	244692.66	1184195.89	PC, TOE
109	26.00	244668.13	1184177.03	PT, TOE
110	23.00	244927.13	1183982.20	PC, TOE
111	23.00	244853.53	1183977.25	MID, TOE
112	23.00	244767.86	1183986.63	MID, TOE
113	23.00	244765.05	1184011.87	MID, TOE
114	23.00	244826.75	1184033.20	PC, TOE
115	23.00	244881.67	1184042.36	PT, TOE
116	23.00	244935.20	1184031.94	MID, TOE
117	23.00	244906.16	1184014.67	AP, TOE
118	23.00	244906.59	1184004.68	AP, TOE
119	25.00	244732.30	1183984.09	MID, TOE
120	25.00	244701.10	1183981.17	MID, TOE

GRADING POINTS

Point #	Elevation	Northing	Easting	Description
121	25.00	244648.66	1183972.34	MID, TOE
122	25.00	244623.34	1183980.26	AP, TOE
123	25.00	244620.91	1183988.18	AP, TOE
124	25.00	244639.09	1184002.60	MID, TOE
125	25.00	244677.81	1184004.69	MID, TOE
126	25.00	244709.05	1184018.14	MID, TOE
127	25.00	244731.21	1184009.60	MID, TOE
128	25.00	244728.46	1183996.86	MID, TOE
129	24.00	244601.48	1183968.12	PT, TOE
130	24.00	244548.98	1183963.84	PC, TOE
131	24.00	244508.07	1184002.65	PT, TOE
132	24.00	244546.62	1184037.47	PC, TOE
133	24.00	244581.18	1184039.98	MID, TOE
134	24.00	244621.51	1184057.42	MID, TOE
135	24.00	244642.19	1184037.20	MID, TOE
136	24.00	244618.87	1184035.31	MID, TOE
137	24.00	244583.33	1184021.98	PC, TOE
138	24.00	244555.23	1184018.13	PT, TOE
139	24.00	244533.86	1183998.18	PC, TOE
140	24.00	244561.62	1183983.05	PT, TOE
141	24.00	244680.14	1184044.32	MID, TOE
142	24.00	244714.74	1184052.95	MID, TOE
143	24.00	244734.35	1184062.77	MID, TOE
144	24.00	244761.41	1184062.62	MID, TOE
145	24.00	244795.05	1184071.36	MID, TOE
146	24.00	244802.14	1184083.13	MID, TOE
147	24.00	244814.18	1184097.52	MID, TOE
148	24.00	244809.11	1184136.82	MID, TOE
149	24.00	244788.10	1184146.86	MID, TOE
150	24.00	244770.27	1184169.70	MID, TOE

GRADING POINTS

Point #	Elevation	Northing	Easting	Description
151	24.00	244737.69	1184163.42	MID, TOE
152	24.00	244692.83	1184167.57	MID, TOE
153	24.00	244678.23	1184128.19	MID, TOE
154	24.00	244651.05	1184114.57	MID, TOE
155	24.00	244653.30	1184092.36	MID, TOE
156	24.00	244686.95	1184100.06	PC, TOE
157	24.00	244765.93	1184129.08	FG, TOE
158	24.00	244783.93	1184111.08	FG, TOE
159	24.00	244772.43	1184094.30	PT, TOE
160	24.00	244731.22	1184082.57	MID, TOE
161	24.00	244699.30	1184069.28	MID, TOE
162	24.00	244674.97	1184068.59	MID, TOE
163	23.00	244635.22	1184090.53	MID, TOE
164	23.00	244556.88	1184073.58	MID, TOE
165	23.00	244524.41	1184069.97	MID, TOE
166	23.00	244498.36	1184062.21	MID, TOE
167	23.00	244526.29	1184086.84	MID, TOE
168	23.00	244553.86	1184089.01	MID, TOE
169	23.00	244581.48	1184090.06	MID, TOE
170	23.00	244612.37	1184102.10	MID, TOE
171	23.00	244634.18	1184106.83	MID, TOE
172	28.00	244749.08	1183992.56	MID, TOP
173	28.00	244742.51	1183996.80	MID, TOP
174	28.00	244747.78	1184002.48	MID, TOP
175	28.00	244754.26	1183998.20	MID, TOP

SITE PREP CONTROL POINTS

Point #	Northing	Easting	Description
SP1	244407.29	1183864.86	AP, C&G
SP2	244406.43	1183892.42	PC, C&G
SP3	244456.92	1183968.67	AP, C&G
SP4	244454.12	1184073.02	AP, C&G, SILT
SP5	244474.71	1184076.44	AP, C&G, SILT
SP6	244494.02	1184085.94	AP, C&G, SILT
SP7	244511.68	1184098.08	AP, C&G, SILT
SP8	244510.65	1184133.42	AP, C&G
SP9	244535.94	1184134.34	AP, C&G
SP10	244539.79	1184100.98	AP, C&G

SITE PREP CONTROL POINTS

Point #	Northing	Easting	Description
SP11	244586.11	1184105.92	AP, C&G, SILT
SP12	244648.04	1184140.93	AP, C&G, SILT
SP13	244686.22	1184223.69	AP, C&G
SP14	244754.24	1184218.60	AP, C&G
SP15	244781.72	1184186.51	AP, C&G
SP16	244843.44	1184154.62	AP, C&G
SP17	244835.08	1184131.64	AP, C&G
SP18	244907.15	1184084.46	AP, C&G
SP19	244955.29	1184067.28	AP, C&G
SP20	244964.98	1184057.34	AP, C&G

SITE PREP CONTROL POINTS

Point #	Northing	Easting	Description
SP21	244968.04	1183976.97	AP, C&G
SP22	244938.99	1183958.08	AP, C&G
SP23	244867.32	1183948.19	AP, C&G
SP24	244851.17	1183937.19	AP, C&G
SP25	244457.97	1183929.19	AP, C&G
SP26	244457.70	1183939.23	AP, C&G
SP27	244430.97	1183883.00	AP, C&G
SP28	244413.40	1183864.88	AP, C&G
SP29	244407.25	1183859.88	AP, SILT
SP30	244404.24	1183979.01	AP, SILT

SITE PREP CONTROL POINTS

Point #	Northing	Easting	Description
SP31	244454.25	1183980.16	AP, SILT
SP32	244451.63	1184072.79	AP, SILT
SP33	244509.15	1184096.34	AP, SILT
SP34	244508.52	1184119.35	AP, SILT
SP35	244438.65	1184105.80	AP, SILT
SP36	244508.36	1184125.54	AP, SILT
SP37	244508.08	1184135.83	AP, SILT
SP38	244538.16	1184136.93	AP, SILT
SP39	244542.30	1184101.05	AP, C&G, SILT
SP40	244685.44	1184226.11	AP, SILT

SITE PREP CONTROL POINTS

Point #	Northing	Easting	Description
SP41	244755.53	1184220.82	AP, SILT
SP42	244783.48	1184188.38	AP, SILT
SP43	244862.83	1184147.91	AP, SILT
SP44	244846.55	1184103.93	AP, C&G, SILT
SP45	244908.00	1184085.78	AP, SILT
SP46	244956.85	1184068.14	AP, SILT
SP47	244975.97	1184048.28	AP, SILT
SP48	244973.23	1184135.06	AP, SILT
SP49	244989.85	1184136.42	AP, SILT
SP50	244852.00	1184125.49	AP, C&G

WEIR POINTS AND ELEVATIONS

Point #	Elevation	Northing	Easting	Description
W1	27.80	244750.83	1183978.17	WEIR
W2	27.80	244749.15	1183992.07	WEIR
W3	27.80	244747.82	1184002.99	WEIR
W4	27.80	244746.14	1184016.88	WEIR
W5	26.20	244623.32	1183977.79	WEIR
W6	26.20	244619.20	1183991.17	WEIR
W7	24.95	244660.71	1184040.95	WEIR
W8	24.95	244654.72	1184053.61	WEIR
W9	24.45	244646.17	1184093.78	WEIR
W10	24.45	244643.57	1184107.54	WEIR

LEGEND:

AP	ANGLE POINT
C&G	CLEAR AND GRUB
FG	FINISHED GRADE
MID	MID-POINT
PC	POINT OF CURVE
PT	POINT OF TANGENCY
SILT	SILT FENCE
TOE	TOE OF SLOPE
TOP	TOP OF SLOPE
WEIR	WEIR CONTROL POINT

U:\PSO\Projects\Clients\1578-KitsapCo\233-1578-135 DuweiqSWTrtmntWetland\99Svcs\CADD\DWG\PSO157813S-C06-07.DWG JASON CERALDE 2:09 PM 3/26/2015

Parametrix
4660 KITSAP WAY, SUITE A
BREMERTON, WASHINGTON 98312
T. 360.377.0014 F. 360.479.5961
www.parametrix.com

811 Know what's below. Call before you dig.

SDAP SUBMITTAL
MARCH 20, 2015

CONTROL POINTS

REVISIONS

No.	BY	DATE	DESCRIPTION

SURVEYED: PMX
DESIGNED: JN
DRAWN: JC
CHECKED: DD
CRP No.
DATE: 03/25/15

JESSE L. NEILSON, STATE OF WASHINGTON, 50736, REGISTERED PROFESSIONAL ENGINEER

KITSAP COUNTY WASHINGTON 1857

KITSAP COUNTY
DEPT. OF PUBLIC WORKS
614 DIVISION STREET MS-26
PORT ORCHARD, WA 98366
TEL:(360) 337-5777 FAX:(360) 337-4867

DUWE'IQ STORMWATER TREATMENT WETLAND

POINT TABLES

KITSAP COUNTY, WASHINGTON
SECTION 16, TOWNSHIP 25 NORTH, RANGE 1 EAST, W.M.

Appendix B

Construction BMPs

Appendix C

Alternative BMPs

Appendix C – Alternative BMPs

The following includes a list of possible alternative BMPs for each of the 13 elements not described in the main SWPPP text. This list can be referenced in the event a BMP for a specific element is not functioning as designed and an alternative BMP needs to be implemented. These BMPs are discussed in Detail in Volume II of the 2012 SMMWW.

BMP C102 – Buffer Zones

BMP C104 – Stake and Wire Fence

BMP C105 – Stabilized Construction Entrance BMP C106 – Wheel Wash

BMP C121 – Mulching

BMP C122 – Nets and Blankets

BMP C126 – Polyacrylamide for Soil Erosion Protection BMP C131 – Gradient Terraces

BMP C151 - Concrete Handling

BMP C203 – Water Bars

BMP C207 – Check Dams

BMP C220 – Storm Drain Inlet Protection BMP C241 – Temporary Sediment Pond BMP C232 – Gravel Filter Berm

BMP C250 – Construction Stormwater Chemical Treatment

BMP C251 – Construction Stormwater Filtration

Other BMPs include:

- Sand Bags – For diversion of surface water away from open trenches or exposed soils.
- Silt Bag – For removal of silts and sediments from pumped or collected silt laden water from trenches or ditches.
- Temporary Diversion Piping – For diverting stormwater around the construction areas. This includes the use of To Be Abandoned/Removed stormwater piping to divert stormwater around the construction areas while new stormwater pipe is installed.

Appendix D

General Permit

(Insert Construction Stormwater Permit)

Appendix E

Site Inspection Forms (and Site Log)

Appendix E – Site Inspection Forms (and Site Log)

The results of each inspection shall be summarized in an inspection report or checklist that is entered into or attached to the site log book. It is suggested that the inspection report or checklist be included in this appendix to keep monitoring and inspection information in one document, but this is optional. However, it is mandatory that this SWPPP and the site inspection forms be kept onsite at all times during construction, and that inspections be performed and documented as outlined below.

a. At a minimum, each inspection report or checklist shall include:
   - Inspection date/times

b. Weather information: general conditions during inspection, approximate amount of precipitation since the last inspection, and approximate amount of precipitation within the last 24 hours.

c. A summary or list of all BMPs that have been implemented, including observations of all erosion/sediment control structures or practices.

d. The following shall be noted:
   - locations of BMPs inspected,
   - locations of BMPs that need maintenance,
   - the reason maintenance is needed,
   - locations of BMPs that failed to operate as designed or intended, and
   - locations where additional or different BMPs are needed, and the reason(s) why

e. A description of stormwater discharged from the site. The presence of suspended sediment, turbid water, discoloration, and/or oil sheen shall be noted, as applicable.

f. A description of any water quality monitoring performed during inspection, and the results of that monitoring.

g. General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.

h. A statement that, in the judgment of the person conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the SWPPP and the NPDES permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance, as well as a schedule of implementation.

i. Name, title, and signature of person conducting the site inspection; and the following statement: "I certify under penalty of law that this report is true, accurate, and complete, to the best of my knowledge and belief".

When the site inspection indicates that the site is not in compliance with any terms and conditions of the NPDES permit, the Permittee shall take immediate action(s) to: stop, contain, and clean up the unauthorized discharges, or otherwise stop the noncompliance; correct the problem(s); implement appropriate Best Management Practices (BMPs), and/or conduct maintenance of existing BMPs; and achieve compliance with all applicable standards and permit conditions. In addition, if the noncompliance causes a threat to human health or the environment, the Permittee shall comply with the Noncompliance Notification requirements in Special Condition S5.F of the permit.

INSTRUCTIONS

Site Inspection Form

General Information Project			
Name:			
Inspector Name:		Title:	
CESCL # :			
Date:		Time:	
Inspection Type:	o After a rain event o Weekly o Turbidity/transparency benchmark exceedance o Other		
Weather			
Precipitation	Since last inspection	In last 24 hours	
Description of General Site Conditions:			

Inspection of BMPs
Element 1: Mark Clearing Limits
BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 2: Establish Construction Access

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 3: Control Flow Rates

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 4: Install Sediment Controls

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP: Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP: Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP: Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP: Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 5: Stabilize Soils

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 6: Protect Slopes

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 7: Protect Drain Inlets

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 8: Stabilize Channels and Outlets

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 9: Control Pollutants

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 10: Control Dewatering

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Stormwater Discharges From the Site			
	Observed?		Problem/Corrective Action
	Y	N	
Location			
Turbidity			
Discoloration			
Sheen			
Location			
Turbidity			
Discoloration			
Sheen			

Water Quality Monitoring	
Was any water quality monitoring conducted?	o Yes o No
If water quality monitoring was conducted, record results here:	
If water quality monitoring indicated turbidity 250 NTU or greater; or transparency 6 cm or less, was Ecology notified by phone within 24 hrs?	o Yes o No
If Ecology was notified, indicate the date, time, contact name and phone number below:	
Date: Time: Contact Name: Phone #:	
General Comments and Notes Include BMP repairs, maintenance, or installations made as a result of the inspection.	
Were Photos Taken?	o Yes o No
If photos taken, describe photos below:	

Appendix F

SWPPP and TESC Plan Amendments

Appendix G

Engineering Calculations

Appendix G – Engineering Calculations

Stormwater flow calculations for the 2.56 acres within the construction limits are listed on the following pages.

Site Existing and Developed Flows in Construction Limits (2.56 ac)

Existing and During Construction (no net increase of impervious surface)

Subbasin Name: Basin 1 — Designate as Bypass for POC:

Flows To :	Surface	Interflow	Groundwater
	Trapezoidal Pond 1	Trapezoidal Pond 1	

Area in Basin — Show Only Selected

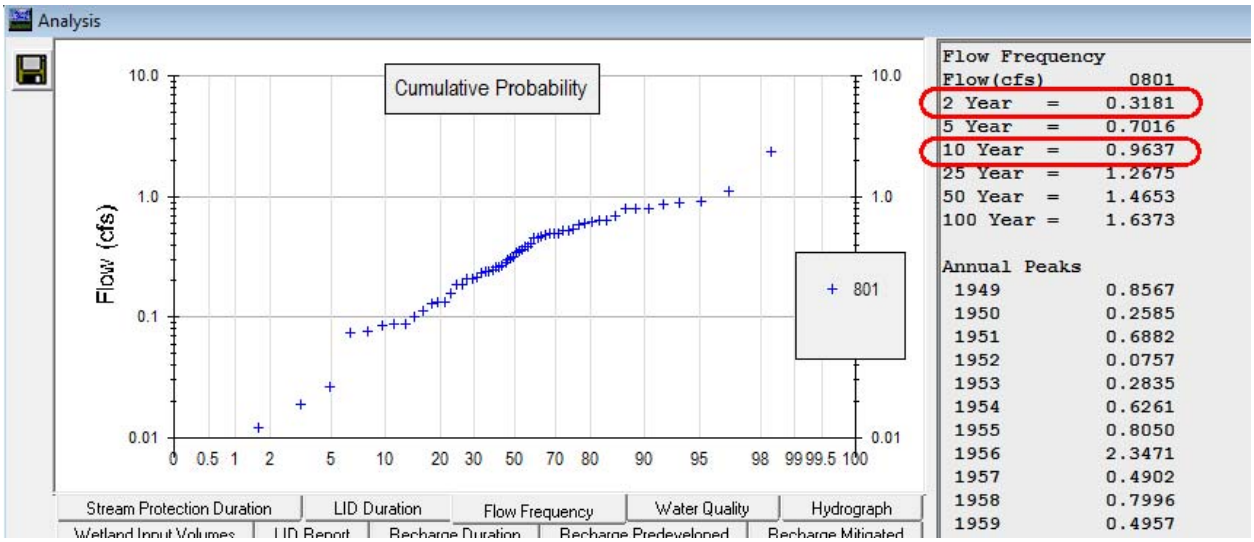
Available Pervious	Acres
A/B, Forest, Flat	0
A/B, Forest, Mod	0
A/B, Forest, Steep	0
A/B, Pasture, Flat	0
A/B, Pasture, Mod	0
A/B, Pasture, Steep	0
☑ A/B, Lawn, Flat	2.56
A/B, Lawn, Mod	0
A/B, Lawn, Steep	0
C, Forest, Flat	0
C, Forest, Mod	0
C, Forest, Steep	0
C, Pasture, Flat	0
C, Pasture, Mod	0
C, Pasture, Steep	0
C, Lawn, Flat	0
C, Lawn, Mod	0
C, Lawn, Steep	0
SAT, Forest, Flat	0

Available Impervious	Acres
ROADS/FLAT	0
ROADS/MOD	0
ROADS/STEEP	0
ROOF TOPS/FLAT	0
DRIVEWAYS/FLAT	0
DRIVEWAYS/MOD	0
DRIVEWAYS/STEEP	0
SIDEWALKS/FLAT	0
SIDEWALKS/MOD	0
SIDEWALKS/STEEP	0
PARKING/FLAT	0
PARKING/MOD	0
PARKING/STEEP	0
POND	0
Porous Pavement	0

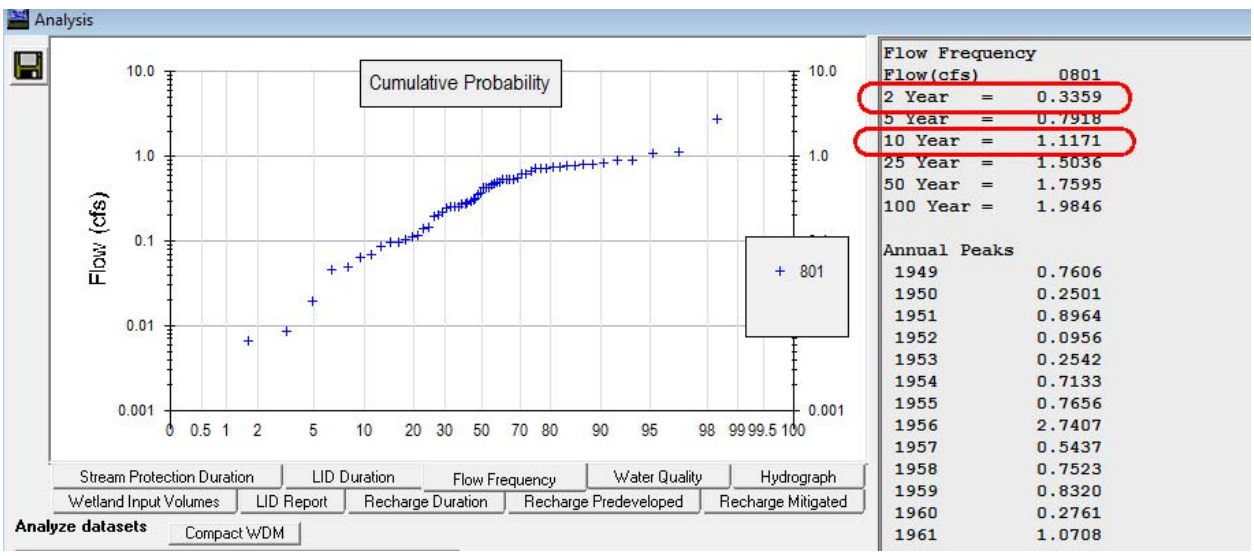
PerviousTotal	2.56	Acres
Impervious Total	0	Acres
Basin Total	2.56	Acres

Deselect Zero — **Select By:** — GO

15-Minute Timestep



5-Minute Timestep



WWHM2012

PROJECT REPORT

Project Name: default[1]
Site Name:
Site Address:
City :
Report Date: 2/26/2015
Gage : Quilcene
Data Start : 1948/10/01 00:00
Data End : 2009/09/30 00:00
Precip Scale: 0.80
Version : 2013/09/27

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

MITIGATED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A B, Lawn, Flat	2.56
Pervious Total	2.56

Impervious Land Use	Acres

Impervious Total **0**

Basin Total **2.56**

Element Flows To:

Surface	**Interflow**	**Groundwater**
Trapezoidal Pond 1	Trapezoidal Pond 1	

Name : Trapezoidal Pond 1

Bottom Length: 5.00 ft.

Bottom Width: 5.00 ft.

Depth: 2 ft.

Volume at riser head: 0.0001 acre-ft.

Side slope 1: 2 To 1

Side slope 2: 2 To 1

Side slope 3: 2 To 1

Side slope 4: 2 To 1

Discharge Structure

Riser Height: 0.1 ft.

Riser Diameter: 48 in.

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Parametrix
4660 Kitsap Way, Suite A, Bremerton, WA 98312
Phone: 360.377.0014

Project No: 233-1578-135
Client: Kitsap County
Prepared By: JN
Checked By:
Date & Time: 3/25/2015 16:53

Description: Sediment Traps, BMP C240

Drainage Area =	2.56 acres	Tributary Area < 3 Acres	OK
2-year Peak Flow Runoff =	0.3359 cfs	5-minute time step	
10-year Peak Flow Runoff =	1.1171 cfs	5-minute time step	
Factor of Safety =	2	per BMP	
Settling Velocity =	0.00096 ft/sec	Φ = 0.02 mm (medium silt) particle, ρ = 2.65 g/cm^3	
Required Surface Area =	2,327 ft^2	(2,080 ft^2 per cfs)	
Number of Sediment Traps =	5	Assumes equivalent contribution area	
Sediment Trap Size =	500 ft^2		
Number of Sediment Traps in Series =	4		
Final Sediment Trap Area =	1,862 ft^2		

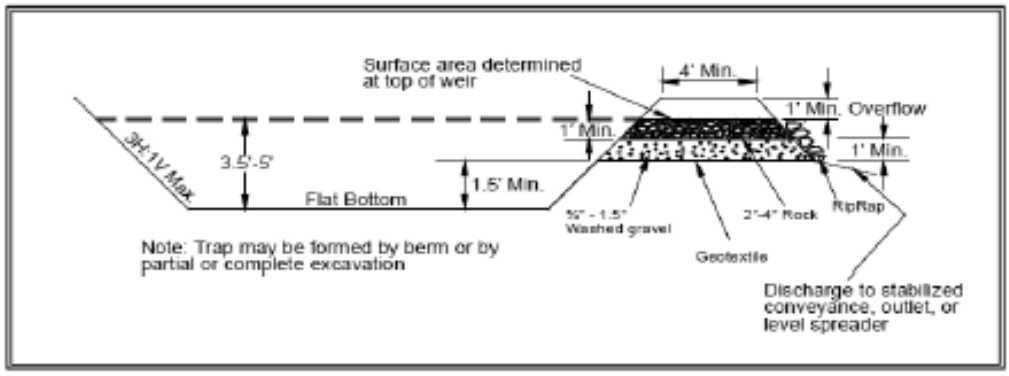


Figure 4.2.16 – Cross Section of Sediment Trap

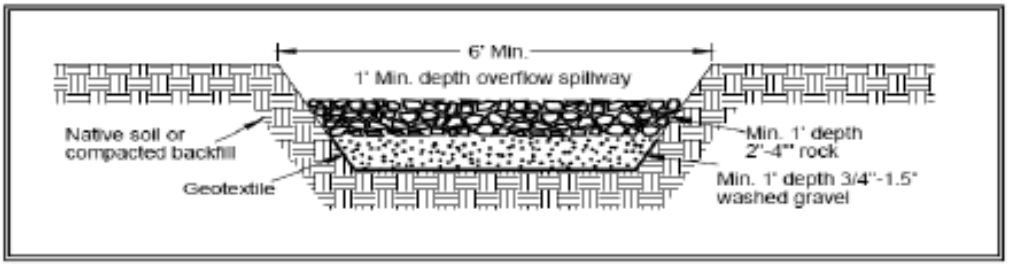


Figure 4.2.17 – Sediment Trap Outlet

Parametrix
4660 Kitsap Way, Suite A, Bremerton, WA 98312
Phone: 360.377.0014

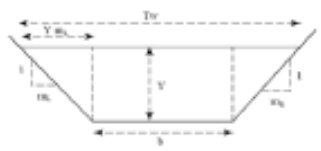
Project No: 233-1578-135
Client: Kitsap County
Prepared By: JN
Checked By:
Date & Time: 3/25/2015 15:47

Description: Sediment Traps, SWPPP Element #8, Stabilize Channels and Outlets

10-year Peak Flow Runoff =	1.1171 cfs	5-minute time step
Factor of Safety =	1.6	per 2012 SWMMWW, Vol. 2 page 3-19, Element #8
Design Flow =	1.78736 cfs	

Channel Geometry =	Traingular
Side Slope, 1 Vert:	2 Horizontal
n =	0.05
c_u =	1.4861
b =	0 ft
m_L =	2 ft
m_R =	2 ft
Ave. S =	0.0025 ft/ft
	0.25%
y_n =	0.85 ft
Flow Area =	1.44 ft^2
Velocity =	1.24 fps

Channel Cross Section and Equations



$$A = (Y \cdot b) + \left(\frac{Y^2}{2} m_L\right) + \left(\frac{Y^2}{2} m_R\right)$$

$$P = b + \left(Y \cdot \sqrt{1 + m_L^2}\right) + \left(Y \cdot \sqrt{1 + m_R^2}\right)$$

$$T_W = b + Y \cdot (m_L + m_R)$$

$$A \cdot h_c = \left(\frac{Y^2 \cdot b}{2}\right) + \left(\frac{Y^3}{6} m_L\right) + \left(\frac{Y^3}{6} m_R\right)$$

$$A = (Y \cdot b) + (Y^2 \cdot m)$$

$$P = b + \left(2 \cdot Y \cdot \sqrt{1 + m^2}\right)$$

$$T_W = b + (2 \cdot Y \cdot m)$$

$$A \cdot h_c = \left(\frac{Y^2 \cdot b}{2}\right) + \left(\frac{Y^3 \cdot m}{3}\right)$$

$$R_h = \frac{A}{P} \qquad E = Y + \frac{Q^2}{2g \cdot A^2} + \Delta z \qquad M = (A \cdot h_c) + \frac{Q^2}{g \cdot A}$$

VBA code for normal Depth Calculation

```
Function newtonYn(Q, cu, b, mr, ml, s, n)
Dim F, Fun, FFun, dFdFun As Double

F = 0.001
Fun = Q - (cu / n * (F * b + F ^ 2 * mr / 2 + F ^ 2 * ml / 2) ^ (5 / 3) / (b + F * Sqr(1 + mr ^ 2) + F * Sqr(1 + ml ^ 2)) ^ (2 / 3) * Sqr(s))
Do While Abs(Fun) > 0.001
  F = F + 1.001
  FFun = Q - (cu / n * (F * b + F ^ 2 * mr / 2 + F ^ 2 * ml / 2) ^ (5 / 3) / (b + F * Sqr(1 + mr ^ 2) + F * Sqr(1 + ml ^ 2)) ^ (2 / 3) * Sqr(s))
  dFdFun = (FFun - Fun) / (F - F / 1.001)
  F = F / 1.001
  F = F - Fun / dFdFun
  Fun = Q - (cu / n * (F * b + F ^ 2 * mr / 2 + F ^ 2 * ml / 2) ^ (5 / 3) / (b + F * Sqr(1 + mr ^ 2) + F * Sqr(1 + ml ^ 2)) ^ (2 / 3) * Sqr(s))
Loop
newtonYn = F
End Function
```

ATTACHMENT E

INADVERTENT DISCOVERY PLAN

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PLAN AND PROCEDURES FOR THE UNANTICIPATED DISCOVERY OF CULTURAL RESOURCES AND HUMAN SKELETAL REMAINS

DUWE'IQ STORMWATER TREATMENT WETLAND, KITSAP COUNTY WASHINGTON

1. INTRODUCTION

KITSAP COUNTY intends to construct the DUWE'IQ CONSTRUCTED WETLAND PROJECT. The purpose of this project is to provide stormwater treatment and improve the water quality of the receiving water (Clear Creek). The following Inadvertent Discovery Plan (IDP) outlines procedures to follow, in accordance with state and federal laws, if archaeological materials or human remains are discovered.

2. RECOGNIZING CULTURAL RESOURCES

A cultural resource discovery could be prehistoric or historic. Examples include:

- An accumulation of shell, burned rocks, or other food related materials,
- Bones or small pieces of bone,
- An area of charcoal or very dark stained soil with artifacts,
- Stone tools or waste flakes (i.e. an arrowhead, or stone chips),
- Clusters of tin cans or bottles, logging or agricultural equipment that appears to be older than 50 years,
- Buried railroad tracks, decking, or other industrial materials.

When in doubt, assume the material is a cultural resource.

3. ON-SITE RESPONSIBILITIES

STEP 1: STOP WORK. If any KITSAP COUNTY employee, contractor or subcontractor believes that he or she has uncovered a cultural resource at any point in the project, all work adjacent to the discovery must stop. The discovery location should be secured at all times.

STEP 2: NOTIFY MONITOR. If there is an archaeological monitor for the project, notify that person. If there is a monitoring plan in place, the monitor will follow its provisions.

STEP 3: NOTIFY KITSAP COUNTY PROJECT MANAGEMENT. Contact the KITSAP COUNTY Project Manager:

Please edit the titles as necessary, and provide contact information for the RECIPIENT'S direct staff or consultants responsible for these roles.

Recipient's Project Manager:
Mindy Fohn
360-337-7066
mfohn@co.kitsap.wa.us

Cultural/Environmental Natural/(CR/ENV/NR) Program Manager:
Same

Assigned Alternates:

Assigned Project Manager Alternate:
Chris May
360-337-7295
cmay@co.kitsap.wa.us

Alternate CR/ENV/NR Alternate:
Same

The Project Manager or the CR/ENV/NR Program will make all other calls and notifications.

If human remains are encountered, treat them with dignity and respect at all times. Cover the remains with a tarp or other materials (not soil or rocks) for temporary protection in place and to shield them from being photographed. **Do not call 911 or speak with the media.**

4. FURTHER CONTACTS AND CONSULTATION

A. Recipient Project Manager's Responsibilities:

- **Protect Find**: The Project Manager is responsible for taking appropriate steps to protect the discovery site. All work will stop in an area adequate to provide for the total security, protection, and integrity of the resource. Vehicles, equipment, and unauthorized personnel will not be permitted to traverse the discovery site. Work in the immediate area will not resume until treatment of the discovery has been completed following provisions for treating archaeological/cultural material as set forth in this document.

- **Direct Construction Elsewhere On-site**: The Project Manager may direct construction away from cultural resources to work in other areas prior to contacting the concerned parties.

- **Contact CR/ENV/NR Manager**: If the CR/ENV/NR Program Manager has not yet been contacted, the Project Manager will do so.

B. Recipient CR/ENV/NR Program Manager's Responsibilities:

- **Identify Find**: The CR/ENV/NR Program Manager (or a CR Specialist if so delegated), will ensure that a qualified professional archaeologist examines the find to determine if it is archaeological.

    - If it is determined not archaeological, work may proceed with no further delay.

    - If it is determined to be archaeological, the CR/ENV/NR Manager or CR Specialist will continue with notification.

    - If the find may be human remains or funerary objects, the CR/ENV/NR Manager or CR Specialist will ensure that a qualified physical anthropologist examines the find. **If it is determined to be human remains, the procedure described in Section 5 will be followed.**

- **Notify DAHP**: The CR/ENV/NR Program Manager (or a CR Specialist if so delegated) will contact the involved federal agencies (if any) and the Department of Archaeology and Historic Preservation (DAHP).

- **Notify Tribes**: If the discovery may relate to Native American interests, the Manager or Specialist will also contact the project's Tribal Liaison, or, if the project is not assigned a Liaison, the Executive Tribal Liaison.

General Contacts

Department of Archaeology and Historic Preservation:

Dr. Allyson Brooks	or
State Historic Preservation Officer	Rob Whitlam, Ph.D.
360-586-3066	Staff Archaeologist
	360-586-3050

Tribal Liaisons:

Project Tribal Liaison	Executive Tribal Liaison
Dennis Lewarch	Leonard Foresman
Suquamish Tribe	Suquamish Tribe
360-598-3311	360-598-3311

The Tribal Liaison, or CR/ENV/NR Program Manager or Specialist, will contact the interested and affected Tribes for a specific project.

Tribes consulted on this project are:

Tribe:
Dennis Lewarch
Suquamish Tribe
360-598-3311

C. Further Activities

- Archaeological discoveries will be documented as described in Section 6.
- Construction in the discovery area may resume as described in Section 7.

5. SPECIAL PROCEDURES FOR THE DISCOVERY OF HUMAN SKELETAL MATERIAL

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect.

If the project occurs on federal lands (e.g., national forest or park, military reservation) the provisions of the Native American Graves Protection and Repatriation Act of 1990 apply, and the responsible federal agency will follow its provisions. Note that state highways that cross federal lands are on an easement and are not owned by the state.

If the project occurs on non-federal lands, KITSAP COUNTY will comply with applicable state and federal laws, and the following procedure:

A. Notify Law Enforcement Agency or Coroner's Office:

In addition to the actions described in Sections 3 and 4, the Project Manager will immediately notify the local law enforcement agency or coroner's office.

The coroner (with assistance of law enforcement personnel) will determine if the remains are human, whether the discovery site constitutes a crime scene, and will notify DAHP.

Kitsap County Coroner
360-337-7077

Per RCW 27.44.055, RCW 68.50, and RCW 68.60, DAHP will have jurisdiction over non-forensic human remains. WSDOT personnel will participate in consultation.

B. Further Activities:

- Documentation of human skeletal remains and funerary objects will be agreed upon through the consultation process described in RCW 27.44.055, RCW 68.50, and RCW 68.60.

- When consultation and documentation activities are complete, construction in the discovery area may resume as described in Section 7.

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6. DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS

Archaeological deposits discovered during construction will be assumed eligible for inclusion in the National Register of Historic Places under Criterion D until a formal Determination of Eligibility is made.

KITSAP COUNTY staff will ensure the proper documentation and assessment of any discovered cultural resources in cooperation with the federal agencies (if any), DAHP, affected tribes, and a contracted consultant (if any).

All prehistoric and historic cultural material discovered during project construction will be recorded by a professional archaeologist on cultural resource site or isolate form using standard techniques. Site overviews, features, and artifacts will be photographed; stratigraphic profiles and soil/sediment descriptions will be prepared for subsurface exposures. Discovery locations will be documented on scaled site plans and site location maps.

Cultural features, horizons and artifacts detected in buried sediments may require further evaluation using hand-dug test units. Units may be dug in controlled fashion to expose features, collect samples from undisturbed contexts, or interpret complex stratigraphy. A test excavation unit or small trench might also be used to determine if an intact occupation surface is present. Test units will be used only when necessary to gather information on the nature, extent, and integrity of subsurface cultural deposits to evaluate the site's significance. Excavations will be conducted using state-of-the-art techniques for controlling provenience.

Spatial information, depth of excavation levels, natural and cultural stratigraphy, presence or absence of cultural material, and depth to sterile soil, regolith, or bedrock will be recorded for each probe on a standard form. Test excavation units will be recorded on unit-level forms, which include plan maps for each excavated level, and material type, number, and vertical provenience (depth below surface and stratum association where applicable) for all artifacts recovered from the level. A stratigraphic profile will be drawn for at least one wall of each test excavation unit.

Sediments excavated for purposes of cultural resources investigation will be screened through 1/8-inch mesh, unless soil conditions warrant ¼-inch mesh.

All prehistoric and historic artifacts collected from the surface and from probes and excavation units will be analyzed, catalogued, and temporarily curated. Ultimate disposition of cultural materials will be determined in consultation with the federal agencies (if any), DAHP, and the affected tribes.

Within 90 days of concluding fieldwork, a technical report describing any and all monitoring and resultant archaeological excavations will be provided to the Project Manager, who will forward the report to the KITSAP COUNTY Cultural/Environmental/Natural Resources Program for review and delivery to the federal agencies (if any), SHPO, and the affected tribe(s).

If assessment activity exposes human remains (burials, isolated teeth, or bones), the process described in Section 5 above will be followed.

7. PROCEEDING WITH CONSTRUCTION

Project construction outside the discovery location may continue while documentation and assessment of the cultural resources proceed. A professional archaeologist must determine the boundaries of the discovery location. In consultation with DAHP and any affected tribes, the Recipient Project Manager and CR/ENV/NR Program staff will determine the appropriate level of documentation and treatment of the resource. If there is a federal nexus, Section 106 consultation and associated federal laws will make the final determinations about treatment and documentation.

Construction may continue at the discovery location only after the process outlined in this plan is followed and KITSAP COUNTY, DAHP, any affected tribes, Ecology (and the federal agencies, if any) determine that compliance with state and federal laws is complete.

8. RECIPIENT RESPONSIBILITY

The RECIPIENT is responsible for developing an IDP. The IDP must be immediately available by request by any party. An IDP must be immediately available and be implemented to address any discovery.