Set No. \_\_\_\_\_

Specifications, Proposal, and Contract Documents for:

Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1 CIP No. SDC0900000

Job No. 19-23-PW



City of Kirkland Department of Public Works 123 Fifth Avenue Kirkland, Washington 98033

### CITY OF KIRKLAND DEPARTMENT OF PUBLIC WORKS

Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1

> CIP NO. SDC090000 JOB NO. 19-23-PW

#### Certificate of Engineer:

The Special Provisions and drawings contained herein have been prepared by or under the direction of the undersigned, whose seal as a Professional Engineer licensed to practice in the State of Washington, is affixed below.



Matthew J. Hough, P.E. Project Manager, Principal

Approved for Construction:

Rod Steitzer, P.E. Capital Projects Manager



# CITY OF KIRKLAND DOCUMENT TABLE OF CONTENTS

- **Invitation to Bid**
- **General Information, Proposal & Contract**
- **Special Provisions**
- **Prevailing Wage Rates**
- Appendices
- **Appendix A: Plans**
- **Appendix B: Pre-Approved Plans**
- Appendix C: Northshore Utility District Engineering Specifications and Special Provisions
- **Appendix D: Permits**
- **Appendix E: Geotechnical Reports**
- Appendix F: Stormwater Pollution Prevention Plan (SWPPP)
- **Appendix G: Critical Areas Report**
- **Appendix H: Structural Calculations**
- **Appendix I: Cultural Resource Report**
- **Appendix J: Pothole Data**

# INVITATION TO BID

#### **INVITATION TO BID**

Notice is hereby given that the City of Kirkland will receive sealed bids in the office of the Purchasing Agent, City Hall, 123 Fifth Avenue, Kirkland, Washington, at 2:00 P.M., local time on January 31, 2024, for the project hereinafter referred to as:

#### Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1

#### CIP No. SDC0900000

#### PROJECT JOB NO. 19-23-PW

At said time all bids will be opened and publicly read aloud. Each bid shall be accompanied by a bid proposal deposit in the form of a cashier's check or a bond issued on a form acceptable to your surety made payable to the City of Kirkland for a sum of not less than five percent (5%) of the total bid amount. No bid shall be considered unless accompanied by such bid proposal deposit. Incomplete proposals and proposals received after the time stated above will not be considered. Faxed or emailed responses are not acceptable.

The work to be performed under these specifications consists of furnishing all labor, tools, materials, and equipment necessary for construction of the *Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1*.

Specific work includes, but is not limited to the removal, replacement, and improvement of existing public storm drainage collection, conveyance, and outfall systems; removal and replacement of HMA pavement and subgrade materials; installation of retaining walls; removal, replacement, and/or relocation of existing franchise utilities (i.e., Northshore Utility District water and sanitary sewer facilities, Puget Sound Energy natural gas and electrical systems, communication purveyors, etc.); and landscaping related to shoulder and critical area buffer restoration. The probable cost for this project is estimated to range between \$1,900,000 to \$2,200,000.

<u>The City will not sell bid packages</u>. Plans, specifications, and addenda may be viewed and obtained online at *www.bxwa.com*. Click on: "Posted Projects"; "Public Works", "City of Kirkland". The Bidders List is maintained by the Builder's Exchange of Washington, Inc. Registration for the bidder's list may be made online, by phoning (425) 258-1303, or at Builder's Exchange of Washington located at 2607 Wetmore Ave, Everett, WA.

The City of Kirkland in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 USC 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-Assisted Programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises as defined at 49 CFR Part 26 will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

Questions regarding this project shall be submitted in writing to **James Waihenya**, **PE**, **PMP** via fax (425) 587-3821. Questions via phone or email will not be accepted. Bidders shall submit questions no later than 10:00 A.M. on January 24, 2024.

The City reserves the right to reject any and all bids, and to waive any informalities in the bidding, and to make the award to the lowest, responsive, responsible bidder as best serves the interests of the City.

No bids may be withdrawn within forty-five (45) after the actual date of the bid opening.

Published: Daily Journal of Commerce - January 12, 2024; January 19, 2024

# GENERAL INFORMATION, PROPOSAL, AND CONTRACT



# CITY OF KIRKLAND

TABLE OF CONTENTS – PROPOSAL

Information for Bidders	2
Bid Proposal	5
Bid Schedule	8
Bid Deposit and Bid Bond	11
Non-collusion Affidavit	13
Statement of Bidder's Qualifications	14
Subcontractor Identification	15
Bidder's Checklist	17

# CITY OF KIRKLAND INFORMATION FOR BIDDERS

Bidders must bid on all items contained in the proposal. The omission or deletion of any bid item will be considered non-responsive and shall be cause for rejection of the bid.

Submit your proposal on the Bid Proposal and other forms which are enclosed, or make a copy of the required forms and submit these documents.

#### The following forms must be executed in full <u>with</u> submittal of the bid:

- 1. BIDDER RESPONSIBILITY CRITERIA CHECKLIST
- 2. <u>SUBCONTRACTOR RESPONSIBILITY CRITERIA CHECKLIST</u>
- 3. <u>PROPOSAL</u>

The lump sum or unit prices must be shown in the spaces provided on the bid schedule.

Show total bid price in both words and figures on the Proposal.

The Proposal form must be completed in full, signed and dated.

4. <u>BID BOND</u>

A surety issued bid bond must be executed by the bidder and its surety company. The amount of the bid bond shall be not less than five percent (5%) of the total amount bid and may be shown in dollars or on a percentage basis. (A cashier's check payable to the City of Kirkland and issued for an amount not less than 5% of the total bid may be submitted in lieu of a bid bond.)

- 5. NONCOLLUSION AFFIDAVIT Notarized
- 6. <u>STATEMENT OF BIDDER'S QUALIFICATIONS</u>

This form must be filled in and signed. The owner reserves the right to check all statements and to judge the adequacy of the bidder's qualifications.

7. SUBCONTRACTOR IDENTIFICATION LIST

This form must be completed for HVAC, plumbing, and electrical subcontractors if the estimate exceeds \$1,000,000.

#### The following forms are to be executed <u>after</u> the contract is awarded:

1. <u>CONTRACT</u>

This agreement is to be executed by the successful bidder.

2. <u>PERFORMANCE AND PAYMENT BOND</u>

To be executed by the successful bidder and its surety company.

3. <u>CONTRACTOR'S DECLARATION OF OPTION FOR MANAGEMENT OF STATUTORY</u> <u>RETAINED PERCENTAGE; RETAINED PERCENTAGE ESCROW AGREEMENT</u>

To be executed by the successful bidder based on bidder's selection of option.

4. <u>CERTIFICATES OF INSURANCE</u>

To be executed by the successful bidder and by an acceptable insurance company. The City of Kirkland must be named as an additional insured.

5. <u>STATEMENT(S) OF INTENT TO PAY PREVAILING WAGES</u>

Affidavit certifying all employees of Contractor and Subcontractor shall be paid no less than the Prevailing Wage Rate(s) as determined by the Industrial Statistician of the Washington State Department of Labor and Industries.

# SPECIAL NOTE: Prior to commencing work, the contractor and all subcontractors must have applied and paid for a City of Kirkland business license

# CITY OF KIRKLAND BIDDER RESPONSIBILITY CRITERIA

It is the intent of City to award a contract to the low responsible bidder. Before award, the bidder must meet the following bidder responsibility criteria to be considered a responsible bidder. The bidder may be required by the City to submit documentation demonstrating compliance with the criteria. The bidder must:

- 1. Have a current certificate of registration as a contractor in compliance with chapter 18.27 RCW, which must have been in effect at the time of bid submittal;
- 2. Have a current Washington Unified Business Identifier (UBI) number;
- **3**. Have:
  - a. Industrial Insurance (workers' compensation) coverage for the bidder's employees working in Washington, as required in Title 51 RCW;
  - b. A Washington Employment Security Department number, as required in Title 50 RCW;
  - c. A Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW;
- 4. Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065(3). **Meet responsibility criteria in RCW 39.04.350**
- 5. Until December 31, 2017, not have violated more than one time the off-site, prefabricated, non-standard, project specific items reporting requirements of RCW 39.04.370.
- 6. For public works projects subject to the apprenticeship utilization requirements of RCW 39.04.320, not have been found out of compliance by the Washington state apprenticeship and training council for working apprentices out of ratio, without appropriate supervision, or outside their approved work processes as outlined in their standards of apprenticeship under chapter 49.04 RCW for the one-year period immediately preceding the first date of advertising for the project.

# CITY OF KIRKLAND SUBCONTRACTOR RESPONSIBILITY CRITERIA

- A. The Contractor shall include the language of this section in each of its first tier subcontracts, and shall require each of its subcontractors to include the same language of this section in each of their subcontracts, adjusting only as necessary the terms used for the contracting parties. Upon request of the Owner, the Contractor shall promptly provide documentation to the Owner demonstrating that the subcontractor meets the subcontractor responsibility criteria below. The requirements of this section apply to all subcontractors regardless of tier.
- B. At the time of subcontract execution, the Contractor shall verify that each of its first tier subcontractors meets the following bidder responsibility criteria:
  - □ 1. Have a current certificate of registration in compliance with chapter 18.27 RCW, which must have been in effect at the time of subcontract bid submittal;
  - 2. Have a current Washington Unified Business Identifier (UBI) number;
  - □ 3. Have:
    - a) Industrial Insurance (workers' compensation) coverage for the subcontractor's employees working in Washington, as required in Title 51 RC
    - b) A Washington Employment Security Department number, as required in Title 50 RCW;
    - c) A Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW;
    - d) An electrical contractor license, if required by Chapter 19.28 RCW;
    - e) An elevator contractor license, if required by Chapter 70.87 RCW.
  - ☐ 4. Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065 (3). **Meet responsibility criteria in RCW 39.04.350**
  - □ 5. Until December 31, 2017, not have violated more than one time the off-site, prefabricated, non-standard, project specific items reporting requirements of RCW 39.04.370.
  - □ 6. For public works projects subject to the apprenticeship utilization requirements of RCW 39.04.320, not have been found out of compliance by the Washington state apprenticeship and training council for working apprentices out of ratio, without appropriate supervision, or outside their approved work processes as outlined in their standards of apprenticeship under chapter 49.04 RCW for the one-year period immediately preceding the first date of advertising for the project.



**GOAT HILL DRAINAGE DITCH AND CHANNEL STABILIZATION, PHASE 1** 

CIP NO. SDC0900000 JOB NO. 19-23-PW

To: Director of Finance City of Kirkland 123 Fifth Avenue Kirkland, Washington 98033

The undersigned, hereinafter called the Bidder, declares that the only persons or parties interested in this proposal are those named herein; that this proposal is in all respects fair and without fraud; that it is made without collusion with any official or employee of the City of Kirkland, hereinafter called the Owner; and that the proposal is made without any connection or collusion with any person making another proposal on this contract.

The bidder further declares that it has carefully examined the contract documents for the construction of the project; that it has personally inspected the site; that it has satisfied itself as to the quantities involved, including materials and equipment and conditions of work involved, including the fact that the description of the quantities of work materials, as included herein, is brief and is intended only to indicate the general nature of the work and to identify the said quantities with the detailed requirements of the contract documents; and that this proposal is made according to the provisions and under the terms of the contract documents, which documents are hereby made a part of this proposal.

The bidder further agrees that it has exercised its own judgment regarding the interpretation of subsurface information and has utilized all data which it believes pertinent from the engineer-architect, owner, and other sources in arriving at its conclusions.

The bidder agrees to hold its bid proposal open for 45 days after the actual date of bid opening and to accept the provisions of the Instructions to Bidders regarding disposition of bid bond.

The bidder agrees that if this proposal is accepted, it will, within ten (10) calendar days after notification of acceptance, execute the contract with the Owner in the form of contract included in the contract documents, and will, at the time of execution of the contract, deliver to the Owner the Performance and Payment Bond and all Certificates of Insurance required therein, and will, to the extent of its proposals, furnish all machinery, tools, apparatus, and other means of construction and do the work in the manner, in the time, and according to the methods as specified in the contract documents and required by the engineer or other project manager designated thereunder.

The bidder further agrees, if awarded the contract, to begin work within ten (10) calendar days after the date of the execution of the contract and to complete the construction within the time specified in Section 1-08.5 of the Special Provisions.

In the event the bidder is awarded the contract and shall fail to complete the work within the time limit or extended time limit agreed upon as more particularly set forth in the contract documents, liquidated damages shall be paid to the Owner per the specifications contained in the contract documents.

The bidder further proposes to accept as full payment for the work proposed herein, the amounts computed under the provisions of the contract documents and based upon the lump sum and unit price amounts entered by the bidder for the various bid items included in the Bid Schedule. The bidder further agrees the lump sum and unit prices entered for the various bid items included in the Bid Schedule include all use taxes, overhead, profit, bond premiums, insurance premiums and all other miscellaneous and incidental expenses as well as all costs of materials, labor, tools and equipment required to perform and complete the work.

Within the three-year period immediately preceding the date of the bid solicitation for this Project, bidder has not been determined by a final and binding citation and notice of assessment issued by the department of labor and industries or through a civil judgment entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of chapter 49.46, 49.48, or 49.52 RCW.

The undersigned bids and agrees to complete all construction of the **Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1 project; JOB NO. 19-23-PW** for the following:

Total Computed Price (in figures):	\$
Washington State Sales Tax <b>10.2%</b> (in a	figures): <u>\$</u>
Total Bid <i>(in figures)</i> : <u>\$</u>	
Total Bid <i>(in words)</i> :	
Receipt of Addenda No(s).	_ is hereby acknowledged.
I certify (or declare) under penalty of perj that the foregoing is true and correct:	ury under the laws of the State of Washington
CONTRACTOR (Firm Name)	Location or Place Executed: (City, State)
Ву	Name and title of person signing
(Indicate whether Contractor is Partnership, Corporation, or Sole Proprietorship)	Date

Employment Security Identification Number

Uniform Business Identification (UBI) Number

Contractor's Address:

Telephone Number

Fax Number

EMAIL

\*\* Bid proposal to be submitted in a sealed envelope marked "Bid Enclosed" for the Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1 project, JOB NO. 19-23-PW.

# CITY OF KIRKLAND BID SCHEDULE

## Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1 CIP No. SDC0900000, Project No. 19-23-PW

Note: Unit prices for all items, all extensions, and the total amount of the bid must be shown. All entries must be typed or entered in ink.

ltem No.	Spec. Section	ITEM	QTY.	UNIT	UNIT PRICE	EXTENDED
Schedul	e A - Storm I	Drainage, Roadway, Site				
A1	1-04.4(1)	Minor Change	15,000	CALC		
A2	SP 1-05.4	Roadway Surveying	1	LS		
	SP					
A3	1-05.18	Record Drawings (Minimum Bid \$1,000)	1	LS		
A4	1-07.15	SPCC Plan	1	LS		
A5	1-09.7	Mobilization	1	LS		
A6	SP 1-10	Project Temporary Traffic Control	1	LS		
A7	SP 2-01	Clearing and Grubbing	1	LS		
		Removing Cement Concrete				
A8	SP 2-02	Sidewalk/Pavement	3	SY		
A9	SP 2-02	Removing Cement Conc. Curb and Gutter	28	LF		
A10	SP 2-02	Remove Existing Catch Basin	21	EA		
A11	SP 2-02	Remove Existing Storm Sewer Pipe	1,202	LF		
A12	2-03	Roadway Excavation Incl. Haul	931	СҮ		
A13	2-03	Unsuitable Foundation Excavation Incl. Haul	836	СҮ		
A14	2-03	Gravel Borrow Incl. haul	836	СҮ		
A15	2-09	Structure Excavation Class A Incl. Haul	127	СҮ		
A16	2-09	Structure Excavation Class B Incl. Haul	1,196	СҮ		
		Concrete Paver Removal and				
A17	5-06	Reinstallation	169	SF		
A18	4-04	Crushed Surfacing Base Course	970	TON		
A19	4-04	Crushed Surfacing Top Course	405	TON		
A20	SP 4-06	Asphalt Treated Base, PG64-22	1,455	TON		

ltem No.	Spec. Section	ITEM QTY. UNIT		UNIT PRICE	EXTENDED	
Schedule	Schedule A - Storm Drainage, Roadway, Site					
A21	SP 5-04	HMA Cl. 1/2 in. PG 58H-22	876	TON		
A22	SP 5-04	Asphalt Cost Price Adjustment	8,500	CALC		
A23	SP 6-12	Modular Block Retaining Wall	520	SF		
A24	8-24	Gravity Block Wall	1,710	SF		
A25	SP 8-24	Rockery Wall	730	SF		
A26	7-01	PVC Drain Pipe 12 In. Diam.	2,430	LF		
A27	7-04	C900 PVC Storm Sewer Pipe 12 In. Diam.	166	LF		
A28	7-04	Testing Storm Sewer Pipe	2,596	LF		
A29	7-04	Abandon Existing Storm Main	59	LF		
A30	SP 7-04	Connect Existing Storm Drain	Connect Existing Storm Drain 9 EA			
A31	7-05	Catch Basin Type 1	Catch Basin Type 1 49			
A32	7-05	Catch Basin Type 1 w/ Circular Locking Lid	3	EA		
A33	7-05	Connect Existing Drainage Structure	8	EA		
A34	SP 7-05	Adjust Catch Basin to Grade	14	EA		
A35	7-08.3(4)	Plugging Existing Pipe	2	EA		
A36	8-01	Erosion Control and Water Pollution Prevention	2	LS		
A37	8-01	Inlet Protection	75	EA		
A38	SP 8-02	Property Restoration	20,000	FA		
A39	8-04	Cement Conc. Traffic Curb and Gutter	65	LF		
A40	SP 8-14	Cement Conc. Sidewalk	183	SY		
A41	8-12	Chain Link Fence, Black Vinyl Coated 201 LF		LF		
	Subtotal - Schedule A					
Tax per 1-07.2(2), WAC 458-20-170:				20-170:	10.2%	
Total - Schedule A				edule A		

ltem No.	Spec. Section	ITEM	QTY.	UNIT	UNIT PRICE	EXTENDED
Schedul	e B – Water,	Sanitary Sewer Improvements				
B1	1-04.4(1)	Minor Change	12,000	CALC		
B2	SP 1-05.18	Record Drawings (Minimum Bid \$1,000)	1	LS		
B3	NUD Sec. 4	2" Air & Vacuum Relief Valve	1	EA		
B4	NUD Sec. 4	1" Water Service and Reconnection	36	EA		
B5	NUD Sec. 4	1" Private PRV	17	EA		
B6	NUD Sec. 4	Remove and Replace Valve Box	15	EA		
В7	NUD Sec. 4	Remove and Replace Manhole Frame and Cover 10 EA		EA		
B8	NUD Sec. 4	Additional Potholing, if Required		EA		
В9	NUD Sec. 4	Trench Safety System 1 LS		LS		
Subtotal – Schedule B						
Tax per 1-07.2(2), WAC 458-20-170:				20-170:	10.2%	
Total - Schedule B						

Subtotal - All Schedules		
Tax per 1-07.2(2), WAC 458-20-170:	10.2%	
Total - All Schedules		



# **BID DEPOSIT**

Herewith find deposit in the form of a cashier's check or certified check in the amount of \$\_\_\_\_\_\_which amount is not less than five percent (5%) of the total bid.
SIGN HERE\_\_\_\_\_

# **BID BOND**

KNOW ALL PERSONS BY THESE PRESENTS:

That we,,	as
Principal, and	
	<u>,</u> as
Surety, are held and firmly bound unto the City of Kirkland, as Obligee, in the penal sum	of
dc	llars, for
the payment of which the Principal and the Surety bind themselves, their heirs, executor	S,
administrators, successors and assigns, jointly and severally, by these presents.	
The condition of this obligation is such that if the Obligee shall make any award to the Pl	rincipal
for	

Project Name

Job Number

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

SIGNED, SEALED AND DATED THIS	DAY OF	,
20		
PRINCIPAL:	SURETY:	

Note: If a Bid Bond is provided, it must be accompanied by a power of attorney which appoints the Surety's true and lawful attorney-in-fact to make, execute, seal and deliver this Bid Bond.

# CITY OF KIRKLAND NON-COLLUSION AFFIDAVIT

GOAT HILL DRAINAGE DITCH CONVEYANCE AND CHANNEL STABILIZATION, PHASE 1 CIP NO. SDC0900000 JOB NO. 19-23-PW

STATE OF WASHINGTON	) ) SS
COUNTY OF KING	)

The undersigned, being duly sworn, on oath deposes and says that the person(s), firm, association, partnership or corporation herein named has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the project for which this proposal is submitted.

Firm Name	Authorized Signature			
	Type Name			
Sworn to before me, this day of	Title 20			
	Notary Public in and for the State of Washington			

My Commission Expires

#### NOTICE TO ALL BIDDERS

To report bid 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., ET. 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.

# CITY OF KIRKLAND STATEMENT OF BIDDER'S QUALIFICATIONS

Contractor Name:	Contact:
Business Address:	
Business phone:	Fax:
Number of years the Cont firm name:	ractor has been engaged in the construction business under the present

Describe the general character of work performed by your company:

List five projects of a similar nature which Contractor has completed within the last 10 years. Include contract amount and contact information for references:

Project Name	Amount	Owner/Agency	Contact	Phone	Year Completed

List major equipment anticipated to be used on this project; indicate whether Contractor-owned or to be leased from others:

Bank reference(s):

Washington State Contractor Registration No.: \_\_\_\_\_

Uniform Business Identification No.:

I certify that other contracts now in progress or hereafter obtained will not interfere with timely performance of the City of Kirkland project should I become the successful bidder.

Authorized Signature:

:
Э

#### CITY OF KIRKLAND SUBCONTRACTOR IDENTIFICATION FOR CONTRACTS ESTIMATED TO BE IN EXCESS OF ONE MILLION DOLLARS (\$1,000,000.00)

RCW 39.30.060 requires the following:

"(1) Every invitation to bid on a prime contract that is expected to cost one million dollars or more for the construction, alteration, or repair of any public building or public work of the state or a state agency or municipality as defined under RCW 39.04.010 ... shall require each prime contract bidder to submit:

(a) Within one hour after the published bid submittal time, the names of the subcontractors with whom the bidder, if awarded the contract, will subcontract for performance of the work of: HVAC (heating, ventilation, and air conditioning); plumbing as described in chapter 18.106 RCW; and electrical as described in chapter 19.28 RCW, or to name itself for the work; or

(b) Within forty-eight hours after the published bid submittal time, the names of the subcontractors with whom the bidder, if awarded the contract, will subcontract for performance of the work of structural steel installation and rebar installation.

The prime contract bidder shall not list more than one subcontractor for each category of work identified, unless subcontractors vary with bid alternates, in which case the prime contract bidder must indicate which subcontractor will be used for which alternate. Failure of the prime contract bidder to submit as part of the bid the names of such subcontractors or to name itself to perform such work or the naming of two or more subcontractors to perform the same work shall render the prime contract bidder's bid non-responsive and, therefore, void."

Each bidder shall submit a list of:

- 1. HVAC, plumbing, electrical, structural steel installation, and rebar installation subcontractors; and
- 2. The specific items of work those subcontractors will perform on the contract; and
- 3. The specific items of work that will be performed by the bidder on the contract relating to work described in RCW 39.30.060.

# CITY OF KIRKLAND SUBCONTRACTOR IDENTIFICATION LIST

\*REQUIRED IF ESTIMATE AMOUNT EXCEEDS \$1,000,000 (Reference RCW 39.30.060 RCW)

#### Proposed Subcontractors and items of work to be performed:

Subcontractor Name: _			
Item Numbers:			
Subcontractor Name: _			
Item Numbers:			
Subcontractor Name:			
Item Numbers:			
Subcontractor Name:			
Item Numbers:			

- make additional pages if necessary -

#### Work to be performed by Prime Contractor:

Item Numbers:

# CITY OF KIRKLAND BIDDER'S CHECKLIST

- 1. Have you reviewed the Bidder Responsibility and Subcontractor Responsibility Criteria?
- 2. Have you enclosed a bid bond or certified check with your bid? (Must be at least 5% of the total amount bid)
- 3. Have you entered a bid amount for all items and all schedules?
- 4. Do the written amounts of the proposal agree with the amounts shown in the figures?
- 5. Have you acknowledged receipt of addenda?
- 6. Has the proposal been properly completed and signed?
- 7. Have you completed the Statement of Bidder's Qualifications?
- 8. Have you completed the City of Kirkland Non-collusion Affidavit?
- 9. Have you completed the Subcontractor Identification List? (This is to be completed for HVAC, plumbing, and electrical subcontractors if the estimate amount exceeds \$1,000,000.)
- 10. Bid proposal to be submitted in a sealed envelope marked "Bid Enclosed" for:

# Contract

# INFORMATION ONLY

The following forms must be executed and submitted by the successful bidder within ten (10) calendar days following Notice of Award.



# CITY OF KIRKLAND TABLE OF CONTENTS – CONTRACT DOCUMENTS

Agreement	1
Performance and Payment Bond	4
Labor and Material Payment Bond	5
Contractor's Declaration of Option for Management of Statutory Retained Percentage	7
Retainage Bond	8
Retained Percentage Escrow Agreement	9
Retainage Release Requirements	12

#### Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1

#### JOB NO. 19-23-PW

This agreement is made and entered into this \_\_\_\_\_day of \_\_\_\_\_, 2024, by and between **CONTRACTOR NAME**, hereinafter called the "Contractor" and the City of Kirkland, hereinafter called the "City."

#### WITNESSETH:

Whereas, pursuant to the invitation of the City extended through an officially published "Invitation to Bid," the Contractor did, in accordance therewith, file with the City a proposal containing an offer which was invited by said notice, and

Whereas, the City has heretofore determined that said offer was the lowest responsible bid submitted; now, therefore, it is agreed:

<u>Section 1</u>. That Contractor shall comply in every way with the requirements of those certain specifications entitled: "Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1, Job No. 19-23-PW"

The further terms, conditions and covenants of the contract are set forth in the following contract documents which are hereby made a part of this agreement by actual attachment or by this reference thereto as follows:

- A. Invitation to Bid, as published by the City.
- B. Specifications prepared for this project by the City and named above by title.
- C. Detailed Plans listed and described in said Specifications, together with those which may be issued as supplements thereof.
- D. The bid proposals submitted by the Contractor as to those items and/or alternatives accepted by the City.
- E. Any written change orders, additions or deletions, if any, issued by the City, pursuant to this agreement.
- F. Indemnification and insurance provisions included in the project documents shall apply to this agreement.

<u>Section 2</u>. In consideration of faithful compliance with the terms and conditions of this agreement, whether set forth herein or incorporated by reference, the Owner shall pay to the Contractor, at the times and in the manner provided in said specifications, the total sum of dollars (\$\_\_\_\_\_) which sum is subject, however, to increase or decrease in such proportion as the quantities named in said proposal are so changed, all as in said specifications and proposal provided.

In witness whereof, said Contractor and said City have caused this agreement to be executed on the day and year first written above.

CONTRACTOR (Firm Name)	
Signature of authorized officer	Name and title of officer (print or type)
WA Contractor's Registration Number	Industrial Insurance Account Number
Uniform Business Identification (UBI) Number	Phone Number
(For corporations, LLC's	and other legal entities)
STATE OF WASHINGTON )	
) SS COUNTY OF KING )	
On this day before me, the undersigned, a Notar commissioned and sworn, personally appeared known to be the of executed the foregoing instrument, and acknow voluntary act and deed of said legal entity, for t oath stated that he/she was authorized to sign sa	y Public in and for the State of Washington, duly , to me , the legal entity that vledged the said instrument to be the free and he uses and purposes therein set forth, and on aid instrument.
Given under my hand and official seal this	day of, 2
(For individua	Print Name: NOTARY PUBLIC in and for the State of Washington, residing Commission expires: Is and d/b/a's)

STATE OF WASHINGTON ) ) SS

COUNTY OF KING

On this day before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared \_\_\_\_ and

to me known to be the individual(s) described herein and who executed the foregoing instrument, and acknowledged that he/she/they signed the same as his/her/their free and voluntary act and deed, for the uses and purposes therein mentioned.

Given under my hand and official seal this \_\_\_\_\_ day of \_\_\_\_\_, 2\_\_\_\_.

Print Name: NOTARY PUBLIC in and for the State of Washington, residing \_\_\_\_\_ Commission expires:

**CITY OF KIRKLAND** 

BY: \_\_\_\_\_\_ Tracey Dunlap, Deputy City Manager



#### PERFORMANCE BOND

Surety to have an A.M. Best rating of A-:VII or better.

Bond No.

KNOW ALL PERSONS BY THESE PRESENTS, that **CONTRACTOR NAME**, as Principal, and \_\_\_\_\_\_\_, (insert name of surety), as Surety, a corporation duly organized under the laws of the State of \_\_\_\_\_\_\_, (insert Surety's state of incorporation), and authorized to do business as a surety in the State of Washington, are held and firmly bound unto the City of Kirkland (City) in the sum of \_\_\_\_\_\_\_ dollars (\$\_\_\_\_\_\_), lawful money of the United States of America, plus the total amount of extra orders issued by the City to the Principal pursuant to the terms of the Contract referred to in the next succeeding paragraph hereof, for the payment whereof Principal and Surety bind ourselves, and our heirs, executors, administrators, representatives, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has been awarded, and is about to enter into, a written Contract with the City for the **Goat Hill Drainage Ditch Conveyance and Channel Stabilization project, Job No. 19-23-PW**, which is hereby made a part of this bond as if fully set forth herein;

NOW, THEREFORE, the condition of this bond is such that:

- 1. If the Principal shall completely and faithfully perform all of its obligations under the Contract, including any warranties required thereunder, and all modifications, amendments, additions, and alterations thereto, including modifications which increase the contract price or time for completion, with or without notice to the surety; and
- 2. If the Principal shall indemnify and hold the City harmless from any and all losses, liability, damages, claims, judgments, liens, costs, and fees of any type that the City may be subject to because of the failure or default of the Principal in the performance of any of the terms, conditions, or obligations of the Contract, including all modifications, amendments, additions, and alterations thereto, and any warranties required thereunder;

THEN THIS obligation shall be null and void; otherwise to remain in full force and effect. If the City shall declare Principal to be in default of the Contract, and shall so notify Surety, Surety shall, within a reasonable time which shall not exceed 14 days, except for good cause shown, notify the City in writing of the manner in which surety will satisfy its obligations under this Bond.

Nonpayment of the Bond premium will not invalidate this Bond nor shall the City be obligated for the payment thereof. The Surety hereby waives notice of any modification of the Contract or extension of time made by the City.

Signed this _	day of	, 2024.		
Principal:		Surety:		
By:		By: _		
Title:		Title:		
Address:		Address:		
City/Zip:		City/Zip:		
Telephone:	( )	Telephone:	( )	

Note: A power of attorney must be provided which appoints the Surety's true and lawful attorney-in-fact to make, execute, seal and deliver this performance bond.



# LABOR, MATERIAL and taxes PAYMENT BOND Surety to have an A.M. Best rating of A-:VII or better.

Bond No.

KNOW ALL PERSONS BY THESE PRESENTS, that, CONTRACTOR NAME, as Principal, and \_\_\_\_\_\_\_, (insert name of surety), as Surety, a corporation duly organized under the laws of the State of \_\_\_\_\_\_ (insert Surety's state of incorporation), and authorized to do business as a surety in the State of Washington, are held and firmly bound unto the City of Kirkland (City) for the use and benefit of claimants as hereinafter defined, in the sum of \_\_\_\_\_\_\_ Dollars (\$\_\_\_\_\_\_), lawful money of the United States of America, plus the total amount of any extra orders issued by the City, for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, representatives, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has been awarded, and is about to enter into, a Contract with City of Kirkland for **Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1 project, Job No. 19-23-PW**, which contract is by this reference made a part hereof;

WHEREAS, the contract is a public works contract, subject to the provisions of RCW Titles 39 and 60;

NOW, THEREFORE, the conditions of this obligation are such that, if the Principal shall promptly make payment to all claimants as hereinafter defined, for (a) all labor and material used or reasonably required for use in the performance of the contract and (b) all taxes, increases, and penalties incurred on the above-referenced contract under Titles 50, 51, and 82 RCW which may be due, then this obligation shall be void; otherwise, it shall remain in full force and effect, subject, however, to the following conditions: A claimant is defined as and includes (a) a person claiming to have supplied labor or materials for the prosecution of the work provided for in the contract, including any person having direct contractual relationship with the contractor furnishing the bond or direct contractual relationship with any subcontractor, or an assignee of such person, (b) the state with respect to taxes incurred on the above-referenced contract under Titles 50, 51, and 82 RCW which may be due and (c) any other person or entity as allowed or required by law.

3. The Principal and Surety hereby jointly and severally agree with the City that every claimant as herein defined, who has not been paid in full prior to Final Acceptance of the project, or materials were furnished by such claimant, has an action on this bond for such sum or sums as may be justly due claimant, and may have execution thereon. The City shall not be liable for the payment of any costs or expenses of any such suit or action.

(Form continues on next page)

4. No suit or action shall be commenced hereunder by any claimant (except the state with respect to taxes, increases, and penalties incurred on the above-referenced contract under Titles 50, 51, and 82 RCW which may be due) unless the claimant has sent the written notice required under RCW Title 39 to the Principal and to the City's Purchasing Agent by registered or certified mail, or by hand delivery, no later than 30 days after Final Acceptance of the Project.

The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against the improvement, whether or not claim for the amount of such lien be presented under and against this bond.

The Surety hereby waives notice of any modification of the contract or extension of time made by the City.

Signed this	_ day of	, 2024
Principal:	Surety:	
Ву:	By:	
Title:	Title:	
Address:	Address:	
City/Zip:	City/Zip:	
Telephone: ( )	Telephone:	( )

Note: A power of attorney must be provided which appoints the Surety's true and lawful attorney-in-fact to make, execute, seal and deliver this performance bond.

### END OF LABOR, MATERIAL AND TAXES PAYMENT BOND FORM

## CITY OF KIRKLAND CONTRACTOR'S DECLARATION OF OPTION FOR MANAGEMENT OF STATUTORY RETAINED PERCENTAGE

# GOAT HILL DRAINAGE DITCH CONVEYANCE AND CHANNEL STABILIZATION, PHASE 1 JOB NO. 19-23-PW

Monies reserved under provisions of Chapter 60.28 RCW, at the option of the Contractor, shall be:

#### Select

One

- [] (1) Retained in a fund by the City. No interest will be earned on the retained percentage amount under this election.
- [] (2) Retainage Bond
- [] (3) Placed in escrow with a bank or trust company by the City. When the monies reserved are to be placed in escrow, the City will issue a check representing the sum of the monies reserved payable to the bank or trust company and the Contractor jointly. Such check shall be converted into bonds and securities chosen by the Contractor and approved by the City and the bonds and securities held in escrow. (For the convenience of those Contractors choosing option (3) a City approved Form of Escrow Agreement is included on the next page and should be completed and submitted with the executed contract.)

The Contractor in choosing option (3) agrees to assume full responsibility to pay all costs which may accrue from escrow services, brokerage charges or both, and further agrees to assume all risks in connection with the investment of the retained percentages in securities.

 (4) Deposited by the City in an interest-bearing account at the FDIC insured bank currently providing contracted banking services to the City of Kirkland. Interest on such account shall be paid to the contractor. Any fees incurred shall be the responsibility of the contractor.

CONTRACTOR:	
Signature:	
Print or Type Name:	
Title:	
Date:	

#### <u>RETAINAGE BOND</u> <u>RETURN THIS FORM IF RETAINAGE BOND OPTION IS SELECTED</u>

Contract Title	
Contract Number	
Contractor Name	

The Undersigned, \_\_\_\_\_\_, existing under and by virtue of the laws of the State of Washington and authorized to do business in the State of Washington as Principal, and organized and existing under the laws of the State of and

authorized to transact business in the State of Washington as Surety, are jointly and severally held and bound unto\_\_\_\_\_\_\_, hereinafter called Obligee, and are similarly held and bound unto the beneficiaries of the trust fund created by RCW 60.28, in the penal sum of

(\$\_\_\_\_\_), Which is <u>5%</u> of the principal's price on Contract ID\_\_\_\_\_.

WHEREAS, on the \_\_\_\_\_ day of \_\_\_\_\_, 2024, the said principal herein executed a contract with the Obligee, for the Contract specified above, Contract ID Number\_\_\_\_\_.

WHEREAS, said contract and RCW 60.28 require the Obligee to withhold from the Principal the sum of \_\_\_\_% from monies earned on estimates during the progress of the construction, herein after referred to as earned retained funds.

NOW WHEREAS, Principal has requested that the Obligee not retain any earned retained funds as allowed under RCW 60.28.

NOW THEREFORE, the condition of the obligation is such that the Principal and Surety are held and bound unto the beneficiaries of the trust fund created by RCW 60.28 in the penal sum of \_\_\_\_\_\_ percent (\_\_\_%) of the final contract cost which shall include any increases due to change orders, increases in quantities of work or the addition of any new item of work. If the Principal shall use the earned retained funds, which will not be retained, for the trust fund purposes of RCW 60.28, then this obligation shall be null and void; otherwise, it shall remain in full force and effect until release is authorized in writing by the Obligee. This bond and any proceeds therefrom shall be made subject to all claims and liens and in the same manner and priority as set forth for retained percentages in RCW 60.28.

PROVIDED HOWEVER, that:

- 1. The liability of the surety under this bond shall not exceed <u>5% or 50%</u> of the total amount earned by the Principal if no monies are retained by the Obligee on estimates during the progress of construction.
- 2. Any suit under this bond must be instituted within the time provided by applicable law.

Witness our hands this	_day of	, 2			
<u>SURETY</u>			PRINICPAL		
By:		By:			
Name/ little		Name/1itle			
OF:		OF:			
Surety Name and Local Office of A	gent:				
Surety Address and Phone of Local Office and Agent:					
	-				

# CITY OF KIRKLAND RETAINED PERCENTAGE ESCROW AGREEMENT

GOAT HILL DRAINAGE DITCH CONVEYANCE AND CHANNEL STABILIZATION, PHASE 1 JOB NO. 19-23-PW

Escrow No.

City of Kirkland 123 Fifth Avenue Kirkland, Washington 98033

Contractor: \_\_\_\_\_

Address:

Project Description: \_\_\_\_\_

TO: Escrow Bank or Trust Company:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Attention: \_\_\_\_\_

The undersigned, \_\_\_\_\_\_, herein referred to as the Contractor, has directed the City of Kirkland to deliver to you its warrants, which shall be payable to you and the Contractor jointly. Such warrants are to be held and disposed of by you in accordance with the following instructions and upon the terms and conditions hereinafter set forth.

#### **INSTRUCTIONS**

- 1. Warrants or checks made payable to you and the Contractor jointly upon delivery to you shall be endorsed by you and forwarded for collection. The moneys will then be used by you to purchase, as directed by the Contractor, bonds or other securities chosen by the Contractor and approved by the City of Kirkland. Attached is a list of such bonds, or other securities approved by the City of Kirkland. Other bonds or securities, except stocks, may be selected by the Contractor, subject to the express written approval of the City of Kirkland. Purchase of such bonds or other securities shall be in a form which shall allow you alone to reconvert such bonds or other securities into money if you are required to do so at the direction of the City of Kirkland and Contractor.
- 2. When and as interest on the securities held by you pursuant to this agreement accrues

and is paid, you shall collect such interest and forward it to the Contractor at its address designated below unless otherwise directed by the Contractor.

- 3. You are not authorized to deliver to the Contractor all or any part of the securities held by you pursuant to this agreement (or any moneys derived from the sale of such securities, or the negotiation of the City of Kirkland's warrants) <u>except</u> in accordance with written instructions from the City of Kirkland. Compliance with such instructions shall relieve you of any further liability related thereto. The estimated completion date on the contract underlying this Escrow Agreement is
- 4. The Contractor agrees to pay you as compensation for your services hereunder as follows:

Payment of all fees shall be the sole responsibility of the Contractor and shall not be deducted from any property placed with you pursuant to this agreement until and unless the City of Kirkland directs the release to the Contractor of the securities and moneys held hereunder whereupon you shall be granted a first lien upon such property released and shall be entitled to reimburse yourself from such property for the entire amount of your fees as provided for hereinabove. In the event that you are made a party to any litigation with respect to the property held by you hereunder, or in the event that the conditions of this escrow are not promptly fulfilled or that you are required to render any service not provided for in these instructions, or that there is any assignment of the interests of this escrow or any modification hereof, you shall be entitled to reasonable compensation for such extraordinary services from the Contractor and reimbursement from the Contractor for all costs and expenses, including attorneys fees occasioned by such default, delay, controversy, or litigation.

- 5. This agreement shall not be binding until executed by the Contractor and the City of Kirkland and accepted by you.
- 6. This instrument contains the entire agreement between you, the Contractor and the City of Kirkland, with respect to this escrow and you are not a part nor bound by any instrument or agreement other than this; you shall not be required to take notice of any default or any other matter nor be bound by nor required to give notice or demand, nor required to take any action whatever, except as herein expressly provided; you shall not be liable for any loss or damage not caused by your own negligence or willful misconduct.
- 7. The foregoing provisions shall be binding upon the assigns, successors, personal representatives, and heirs of the parties hereto.
- 8. The Contractor's Federal Income Tax Identification number is
- \*\* Please note: Written release will be issued by the Director of Finance & Administration. For further information, contact the Purchasing Agent at (425) 587-3123.

The undersigned have read and hereby approve the instructions as given above governing the administration of this escrow and do hereby execute this agreement on this \_\_\_\_\_ day of \_\_\_\_\_, 2024.

CONTRACTOR:				CITY	OF KIRKLA	ND:				
By:	Signatur	e			By:	Signature				
	Print or	r Type Name		nt or Type Name		Print or Type Name				
	Title					Title				
Addr	ess:	ess: 123 Fifth Avenue Kirkland, Washington 98033								
The	above	escrow	instructions , 2024.	received	and	accepted	this		day	of
ESC	ROW BAI	NK OR TR	UST CO:							
By:	Authoriz	ed Signatu	re							
	Print or Type Name									
	Title									
Secu	irities Autl	horized by	City of Kirklan	d (select o	ne):					
1. 2. 3. 4. 5.	Bills, certificates, notes or bonds of the United States; Other obligations of the United States or its agencies; Obligations of any corporation wholly-owned by the government of the United States; Indebtedness of the Federal National Mortgage Association; and Time deposits in commercial banks.									

#### **RETURN THIS SIGNED AGREEMENT TO:**

City of Kirkland Attn: Purchasing Agent 123 Fifth Avenue Kirkland, Washington 98033
# CITY OF KIRKLAND RETAINAGE RELEASE REQUIREMENTS

# DOCUMENTS REQUIRED TO BE ON FILE PRIOR TO RELEASE OF RETAINAGE

1. Intent to Pay Prevailing Wage (Contractor must generation including for subcontractors)

Department of Labor/Industries Employment Standards Division General Administration Building Olympia, Washington 98504 (360) 956-5335

2. Notice of Completion of Public Works Contract (City generates)

Department of Revenue Excise Tax Division Olympia, Washington 98504

3. Affidavit of Wages Paid (Contractor must generate including for subcontractors)

Department of Labor/Industries

4. Certificate of Release - State Excise Tax by Public Works Contractor (Letter from State to City)

Department of Revenue Department of Labor and Industries Employment Security Department

5. Receipt for Payment in full or Release of Lien signed by Lien Claimant and filed with City (Responsibility of Contractor to obtain)

Claims against retainage or Payment Bond filed with City by any such subcontractor, workman, or material supplier.

- 6. Current insurance certificate through retainage release (Contractor generates)
- 7. Produce final invoice for retainage if bond is not selected (Contractor generates)

# GENERAL SPECIAL PROVISIONS

# **SPECIAL PROVISIONS**

Supplement to

# 2023

WSDOT Standard Specifications





# CITY OF KIRKLAND TABLE OF CONTENTS – SPECIAL PROVISIONS

Division 1 – General Requirements	SP-1
Division 2 Earthwork	SP-67
Division 3 – Aggregate Production and Acceptance	SP-70
Division 4 Bases	SP-72
Division 5 – Surface Treatments and Pavements	SP-78
Division 6 – Structures	SP-109
Division 7 – Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits	SP-112
Division 8 – Miscellaneous Construction	SP-118
Division 9 – Materials	SP-121



# Division 1 - GENERAL REQUIREMENTS

DESC	CRIPTI	ON OF WORK	SP-1
1-01	-01 DEFINITIONS AND TERMS		SP-1
1-02		BID PROCEDURES AND CONDITIONS	SP-3
1-0	1-02.1 Prequalification of Bidders		SP-3
1-0	02.1	Qualifications of Bidder	SP-3
1-0	02.2	Plans and Specifications	SP-4
1-0	02.4(2)	Subsurface Information	SP-5
1-0	02.5	Proposal Forms	SP-5
1-0	02.6	Preparation of Proposal	SP-5
1-0	02.7	Bid Deposit	SP-6
1-0	02.8	Noncollusion Declaration and Lobbying Certification	SP-7
1-0	02.9	Delivery of Proposal	SP-7
1-0	02.10	Withdrawing, Revising, or Supplementing Proposal	SP-8
1-02.13 Irregular Proposals		SP-9	
1-0	02.14	Disqualification of Bidders	SP-10
1-0	02.15	Pre Award Information	SP-13
1-03	AWA	RD AND EXECUTION OF CONTRACT	SP-13
1-0	03.1	Consideration of Bids	SP-13
1-0	03.3	Execution of Contract	SP-14
1-0	03.4	Contract Bond	SP-14
1-0	03.7	Judicial Review	SP-14
1-0	03.8	Escrow Bid Document Preservation	SP-14
1-04	SCO	PE OF THE WORK	SP-18
1-0	04.1	Intent of the Contract	SP-18
1-0	04.2	Coordination of Contract Documents, Plans, Special Provisions, Specifications, and Addenda	SP-18
1-0	04.4(1)	Minor Changes	SP-18
1-0	04.6	Variation in Estimated Quantities	SP-19
1-0	04.11	Final Cleanup	SP-19
1-0	04.12	Water, Electrical Power, Telecommunications, and Sanitary Sewer Requirements	SP-20

1-05 CON	ITROL OF WORK	SP-20
1-05.1	Authority of the Engineer	SP-20
1-05.4	Conformity with and Deviations from Plans and Stakes	SP-20
1-05.4	(1)Roadway and Utility Surveys	SP-21
1-05.4	(2)Bridge and Structure Surveys	SP-22
1-05.7	Removal of Defective and Unauthorized Work	SP-23
1-05.9	Equipment	SP-23
1-05.10	Guarantees	SP-23
1-05.11	Final Inspection	SP-24
1-05.11	Final Inspections and Operational Testing	SP-24
1-05.1	1(1)Substantial Completion Date	SP-24
1-05.1	1(2)Final Inspection and Physical Completion Date	SP-24
1-05.1	1(3)Operational Testing	SP-25
1-05.12	Final Acceptance	SP-25
1-05.1	2(1) One-Year Guarantee Period	SP-25
1-05.13	Superintendents, Labor and Equipment of Contractor	SP-26
1-05.15	Method of Serving Notices	SP-26
1-05.18	Record Drawings	SP-26
1-05.19	Daily Construction Report	SP-26
1-06 CON	ITROL OF MATERIAL	SP-29
1-06.1	Approval of Materials Prior to Use	SP-29
1-06.1	(2) Request for Approval of Materials (RAM)	SP-30
1-06.6	Recycled Materials	SP-29
1-07 LEG	AL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC	SP-30
1-07.1 I	_aws to Be Observed	SP-30
1-07.2	State Taxes	SP-32
1-07.2	State Sales Tax	SP-32
1-07.2	(1) State Sales Tax — Rule 171	SP-32
1-07.2	(2) State Sales Tax — Rule 170	SP-33
1-07.2	(3) Services	SP-33
1-07.5(2)	State Department of Fish and Wildlife	SP-33
1-07.5(3)	State Department of Ecology	SP-34
1-07.5(6)	U.S. Fish and Wildlife Services and National Marine Fisheries Service	SP-34
1-07.6 I	Permits and Licenses	SP-35
1-07.6(1)	Permits for Sanitary Sewer Discharge for Construction Dewatering	SP-35
1-07.6(2)	Permits for Off-site Staging and Storage Areas	SP-36

1-07.9(5)	Required Documents	SP-36
1-07.11 Requirements for Nondiscrimination		
1-07.14	Responsibility for Damage	SP-39
1-07.15	Temporary Water Pollution/Erosion Control	SP-39
1-07.15(1	1) Spill Prevention, Control, and Countermeasures Plan	SP-39
1-07.16	Protection and Restoration of Property	SP-40
1-07.1	6(3)Fences, Mailboxes, Incidentals	SP-40
1-07.17	Utilities and Similar Facilities	SP-40
1-07.17(2	2) Utility Construction, Removal or Relocation by Others	SP-42
1-07.18	Public Liability and Property Damage Insurance	SP-43
1-07.18	Insurance	SP-43
1-07.18(1	) General Requirements	SP-43
1-07.18(2	2) Additional Insured	SP-44
1-07.18(3	B) Subcontractors	SP-44
1-07.18(4	<ul> <li>Verification of Coverage</li> </ul>	SP-44
1-07.18(5	5) Coverages and Limits	SP-45
1-07.18(5	5)A Commercial General Liability	SP-45
1-07.18(5	5)B Automobile Liability	SP-45
1-07.18(5	5)C Workers Compensation	SP-45
1-07.18(5	5)D Excess or Umbrella Liability	SP-46
1-07.18(5	5)E LHWCA Insurance	SP-46
1-07.18(5	5)H Marine Pollution	SP-46
1-07.18(5	5)K Professional Liability	SP-46
1-07.23	Public Convenience and Safety	SP-47
1-07.24	Rights-of-way	SP-48
1-08 PRO	SECUTION AND PROGRESS	SP-51
1-08.0	Preliminary Matters	SP-51
1-08.0	(1) Preconstruction Conference	SP-51
1-08.0	(2) Hours of Work	SP-51
1-08.1	Subcontracting	SP-54
1-08.3	Progress Schedule	SP-54
1-08	3.3(2)A Type A Progress Schedule	SP-54
1-08.4	Prosecution of Work	SP-55
1-08.4	Notice to Proceed and Prosecution of Work	SP-55
1-08.5	Time for Completion	SP-55
1-08.9	Liquidated Damages	SP-56

1-09 MEASUREMENT AND PAYMENT	SP-57
1-09.2 Weighing Equipment	SP-57
1-09.2(1) General Requirements for Weighing Equipment	SP-57
1-09.2(5) Measurement	SP-57
1-09.6 Force Account	SP-58
1-09.7 Mobilization	SP-58
1-09.9 Payments	SP-58
1-09.11(3) Time Limitation and Jurisdiction	SP-60
1-09.13 Claims Resolution	SP-61
1-09.13(3) Claims \$250,000 or Less	SP-61
1-09.13(3)A Administration of Arbitration	SP-61
1-09.13(4) Venue for Litigation	SP-61
1-10 TEMPORARY TRAFFIC CONTROL	SP-61
1-10.2 Traffic Control Management	SP-63
1-10.2(2)Traffic Control Plans	SP-63
1-10.3 Traffic Control Labor, Procedures, and Devices	SP-63
1-10.3(3)C Portable Changeable Message Sign	SP-63
1-10.5 Payment	SP-64
1-10.5(3) Item Bids with Lump Sum for Incidentals	SP-64
Division 2 - Earthwork	
2-01 Clearing, Grubbing, and Roadside Cleanup	SP-66
2-02 Removal of Structures and Obstructions	SP-66
Division 3 - Aggregate Production and Acceptance	
Division 4 - Bases	
4-04 Ballast and Crushed Surfacing	SP-71
4-06 Asphalt Treated Base (ATB)	SP-72
Division 5 - Surface Treatments and Pavement	
5-04 Hot Mix Asphalt	SP-77
5-06 Concrete Paver Restoration	SP-106
Division 6 - Structures	
6-13 Modular Block Retaining Wall	SP-109
Division 7 - Drainage Structures, Storm Sewers, Sanitary Sewers, Water Mains, and Conduits	
7-04 Storm Sewers	SP-111
7-05 Manholes, Inlets, Catch Basins, and Drywells	SP-114
7-09 Water Mains	SP-115

7-12	Valves for Water Mains	SP-115
7-14	Hydrants	SP-115
7-15	Service Connections	SP-115
7-17	Sanitary Sewers	SP-115
7-18	Side Sewers	SP-115
7-19	Sewer Cleanouts	SP-115
Divisio	n 8 - Miscellaneous Construction	
8-02	Roadside Restoration	SP-117
8-14	Cement Concrete Sidewalk	SP-118
Divisio	on 9 - Materials	
9-03	Aggregates	SP-120

# **City of Kirkland Special Provisions**

# INTRODUCTION

The work on this project shall be accomplished in accordance with the Standard Specifications for Road, Bridge and Municipal Construction, 2024 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 and all Amendments thereto, as modified or supplemented by these Special Provisions, all of which are made a part of the Contract Documents, shall govern all of the Work.

These Special Provisions supersede any conflicting provisions of the Standard Specifications.

The accompanying Plans and these Specifications and any Addenda thereto, show and describe the location and type of work to be performed under the Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1, Job No. 19-23-PW contract documents.

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 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 titles of headings of the Sections and subsections herein are intended for convenience or reference and shall not be considered as having any bearing on their interpretation.

Several types of Special Provisions are included in this contract and are differentiated as follows:

**General Special Provisions (GSPs)** are similar to Standard Specifications in that they typically apply to many public works projects. These can include:

- Local Agency/APWA Approved GSPs are modifications to the Standard Specifications prepared by the APWA Division 1 subcommittee, which is comprised of representatives of local agencies throughout the State of Washington. These GSPs are generally used throughout the state. APWA GSPs replace what was formerly referred to as "Division 1-99 APWA Supplement" in previous editions of the Standard Specifications for Road, Bridge and Municipal Construction. Denoted as: (date APWA GSP)
- **City of Kirkland GSPs** are modifications to the Standard Specifications prepared by the City of Kirkland Public Works Department, and commonly applicable to City of Kirkland projects. Denoted as: (*date COK GSP*)

**Project-Specific Special Provisions** normally appear only in the contract for which they were developed. Denoted as: (\*\*\*\*\*)

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
- City of Kirkland Public Works Department Pre-Approved Plans and Policies, current year edition.
- Northshore Utility District Engineering Specifications and Special Provisions

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

# DIVISION 1

# **DIVISION 1 - GENERAL REQUIREMENTS**

#### **DESCRIPTION OF WORK**

This contract provides for the removal, replacement, and improvement of existing public storm drainage collection, conveyance, and outfall systems; removal and replacement of HMA pavement and subgrade materials; installation of retaining walls; removal, replacement, and/or relocation of existing franchise utilities (i.e., Northshore Utility District water and sanitary sewer facilities, Puget Sound Energy natural gas and electrical systems, communication purveyors, etc.); and landscaping related to shoulder and critical area buffer restoration and all related Work, all in accordance with the Contract Plans, these Contract Special Provisions, and the Standard Specifications.

# 1-01 DEFINITIONS AND TERMS

#### (January 4, 2016 APWA GSP)

#### 1-01.3 Definitions

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 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" in Standard Specifications.

#### **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

# (January 24, 2011 APWA GSP)

# 1-02.1 Prequalification of Bidders

Delete this Section and replace it with the following:

# 1-02.1 Qualifications of Bidder

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.

# (January 1, 2016 COK GSP)

Bidders shall complete and sign the Statement of Bidder's Qualification contained in the Proposal. Said form must be submitted with the bid proposal.

After bids are opened, Contracting Agency may request that a bidder or all bidders provide supplemental information concerning responsibility in accordance with RCW 39.04.350(2). Such supplemental information shall be provided to Contracting Agency in writing within two (2) business days of the request. Whether bidder supplies this supplemental information within the time and manner specified or not, in addition to consideration of this additional information, Contracting Agency may also base its determination of responsibility on any available information related to the supplemental criteria.

If Contracting Agency determines that a bidder is not responsible, Contracting Agency will provide, in writing, the reasons for such determination at which point the contractor will be deemed disqualified in accordance with WSDOT Standard Specification 1-02.14(10) and the proposal rejected. The bidder may appeal the determination within two (2) business days after receipt of the determination by presenting additional information to Contracting Agency. Contracting Agency will consider the additional information before issuing its final decision. If Contracting Agency's final decision affirms that the bidder until two (2) business days after the bidder determined to be not responsible has received Contracting Agency's final determination. The failure or omission of a bidder to receive or examine any form, instrument, addendum or other document shall in no way relieve any bidder from obligations with respect to the bid or to the contract.

Any bidder may, within five (5) business days before the bid submittal deadline, request that Contracting Agency modify the supplemental criteria. Contracting Agency will evaluate the information submitted by the bidder and respond before the submittal deadline. If the evaluation results in a change of the criteria, the Contracting Agency will issue an Addendum to the bidding documents identifying the new criteria.

<u>Supplemental Criteria</u>. Contracting Agency acknowledges that Change Orders (changes, extra work, requests for equitable adjustment and claims (defined as including demands for money or time in excess of the contract amount or contract time)) are ubiquitous on public works construction projects. The expeditious resolution of Change Orders is critical to the on budget and on time successful completion of a public works project. Thus, the City has

established the following relevant supplemental bidder responsibility criteria applicable for the project:

- Criterion. The bidder must demonstrate a record of successful and timely resolution of Change Orders including compliance with public contract Change Order resolution procedures (e.g. timely notice of event giving rise to the Change Order, timely submission of a statement of the cost and/or impact of the Change Order unless the bidder is able to show extenuating circumstances that explain bidder's failure to timely provide such information to the satisfaction of Contracting Agency.
- 2. Documentation. As evidence that the bidder meets the supplemental responsibility criteria, after bids are opened and within two (2) business days of the public notice of Contracting Agency's tabulation of bids, the lowest responsive bidder must submit the following documentation of public works projects completed within the previous three (3) years and include for each project the following:
  - a. The Owner and contact information for the Owner;
  - b. A listing of Change Orders and a signed statement from the bidder that the project timelines concerning resolution of Change Orders was complied with, and if not, provide a written explanation of what the bidder believes to be the extenuating circumstances excusing compliance with the Contract Change Order notice and claim provisions.

Contracting Agency may contact owners listed by the bidders to validate the information provided by a bidder.

# (June 27, 2011 APWA GSP)

# 1-02.2 Plans and Specifications

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 Invitation to Bid 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")	4	Furnished automatically upon award.
Contract Special		Furnished automatically upon
Provisions	2	award.
Large plans (e.g., 22" x 34")	2	Furnished only upon request.

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

# (December 30, 2022 APWA GSP Option A)

# 1-02.4(1) General

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

Prospective Bidders desiring an explanation or interpretation of the Bid Documents, shall request the explanation or interpretation in writing by close of business two (2) business days preceding the bid opening to allow a written reply to reach all prospective Bidders before the submission of their Bids.

# (March 8, 2013 APWA GSP)

# 1-02.4(2) Subsurface Information

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

The geotechnical information included in Appendix D, Geotechnical Reports of the Special Provisions, including but not limited to the boring logs contained therein shall be considered a part of the Contract.

# (July 31, 2017 APWA GSP)

#### 1-02.5 Proposal Forms

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 UDBE/DBE/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.

# (December 10, 2020 APWA GSP Option B)

#### 1-02.6 Preparation of Proposal

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 two paragraphs, and replace them with the following:

The Bidder shall submit with their Bid a completed Contractor Certification Wage Law Compliance form, provided by the Contracting Agency. Failure to return this certification as part of the Bid Proposal package will make this Bid Nonresponsive and ineligible for Award. A Contractor Certification of Wage Law Compliance form is included in the Proposal Forms.

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 UDBE 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 UDBE requirements are to be satisfied through such an agreement.

# (March 8, 2013 APWA GSP)

#### 1-02.7 Bid Deposit

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.

# (January 1, 2016 COK GSP)

# 1-02.8 Noncollusion Declaration and Lobbying Certification

The following new paragraph is inserted at the end of Section 1-02.8:

# **Conflict of Interest**

The bidder affirms that it presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of its services hereunder. The Contractor further covenants that in the performance of this contract, no person having any conflicting interest shall be employed. Any interest on the part of the Contractor or its employees must be disclosed forthwith to the City of Kirkland. If this contract is within the scope of a Federal Housing and Community Development Block Grant program, the Contractor further covenants that no person who presently exercises any functions or responsibilities in connection with the block grant program has any personal financial interest, direct or indirect, in this contract.

# (January 19, 2022 APWA GSP, Option B)

# 1-02.9 Delivery of Proposal

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.

To be considered responsive on a FHWA-funded project, the Bidder may be required to submit the following items, as required by Section 1-02.6:

- DBE Utilization Certification (WSDOT 272-056)
- DBE Written Confirmation Document (WSDOT 422-031) from each DBE firm listed on the Bidder's completed DBE Utilization Certification
- Good Faith Effort (GFE) Documentation
- DBE Bid Item Breakdown (WSDOT 272-054)
- DBE Trucking Credit Form (WSDOT 272-058)

# DBE Utilization Certification

The DBE Utilization Certification shall be received at the same location and no later than the time required for delivery of the Proposal. The Contracting Agency will not open or consider any Proposal when the DBE Utilization Certification is received after the time specified for receipt of Proposals or received in a location other than that specified for receipt of Proposals. The DBE Utilization Certification may be submitted in the same envelope as the Bid deposit.

# DBE Written Confirmation and/or GFE Documentation

The DBE Written Confirmation Documents and/or GFE Documents are not required to be submitted with the Proposal. The DBE Written Confirmation Document(s) and/or GFE (if any) shall be received either with the Bid Proposal or as a Supplement to the Bid. The documents shall be received no later than 48 hours (not including Saturdays, Sundays and Holidays) after the time for delivery of the Proposal. To be considered responsive, Bidders shall submit Written Confirmation Documentation from each DBE firm listed on the Bidder's completed DBE Utilization Certification and/or the GFE as required by Section 1-02.6.

# DBE Bid Item Breakdown and DBE Trucking Credit Form

The DBE Bid Item Breakdown and the DBE Trucking Credit Forms (if applicable) shall be received either with the Bid Proposal or as a Supplement to the Bid. The documents shall be received no later than 48 hours (not including Saturdays, Sundays and Holidays) after the time for delivery of the Proposal. To be considered responsive, Bidders shall submit a completed DBE Bid Item Breakdown and a DBE Trucking Credit Form for each DBE Trucking firm listed on the DBE Utilization Certification, however, minor errors and corrections to DBE Bid Item Breakdown or DBE Trucking Credit Forms will be returned for correction for a period up to five calendar days (not including Saturdays, Sundays, Sundays and Holidays) after the time for delivery of the Proposal. A DBE Bid Item Breakdown or DBE Trucking Credit Forms that are still incorrect after the correction period will be determined to be non-responsive.

Supplemental bid information submitted after the proposal submittal but within 48 hours of the time and date the proposal is due, shall be submitted as follows:

- 1. In a sealed envelope labeled the same as for the Proposal, with "Supplemental Information" added, or
- 2. By facsimile to the following FAX number: (425) 587-3844, or
- 3. By e-mail to the following e-mail address: jwaihenya@kirklandwa.gov

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

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

# (July 23, 2015 APWA GSP)

# 1-02.10 Withdrawing, Revising, or Supplementing Proposal

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.

# (December 30, 2022 APWA GSP)

# 1-02.13 Irregular Proposals

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 (WSDOT Form 271-015), if applicable, as required in Section 1-02.6;
  - h. The Bidder fails to submit or properly complete a Disadvantaged Business Enterprise Certification (WSDOT Form 272-056), if applicable, as required in Section 1-02.6;
  - i. The Bidder fails to submit Written Confirmations (WSDOT Form 422-031) from each DBE firm listed on the Bidder's completed DBE Utilization Certification that they are in agreement with the bidder's DBE participation commitment, if applicable, as required in Section 1-02.6, or if the written confirmation that is submitted fails to meet the requirements of the Special Provisions;
  - 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 Bidder fails to submit a DBE Bid Item Breakdown (WSDOT Form 272-054), if applicable, as required in Section 1-02.6, or if the documentation that is submitted fails to meet the requirements of the Special Provisions;
  - I. The Bidder fails to submit DBE Trucking Credit Forms (WSDOT Form 272-058), if applicable, as required in Section 1-02.6, or if the documentation that is submitted fails to meet the requirements of the Special Provisions;
  - m. The Bid Proposal does not constitute a definite and unqualified offer to meet the material terms of the Bid invitation; or
  - n. 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.

# (May 17, 2018 APWA GSP, Option B)

# 1-02.14 Disqualification of Bidders

Delete this section and replace it with the following:

A Bidder will be deemed not responsible if the Bidder does not meet the mandatory bidder responsibility criteria in RCW 39.04.350(1), as amended; or does not meet Supplemental Criteria 1-7 listed in this Section.

The Contracting Agency will verify that the Bidder meets the mandatory bidder responsibility criteria in RCW 39.04.350(1), and Supplemental Criteria 1-2. Evidence that the Bidder meets Supplemental Criteria 3-7 shall be provided by the Bidder as stated later in this Section.

# 1. Delinquent State Taxes

- A <u>Criterion</u>: The Bidder shall not owe delinquent taxes to the Washington State Department of Revenue without a payment plan approved by the Department of Revenue.
- B. <u>Documentation</u>: 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 does not owe delinquent taxes to the Washington State Department of Revenue, or if delinquent taxes are owed to the Washington State Department of Revenue, the Bidder must submit a written payment plan approved by the Department of Revenue, to the Contracting Agency by the deadline listed below.

# 2. Federal Debarment

- A <u>Criterion</u>: The Bidder shall not currently be debarred or suspended by the Federal government.
- B. <u>Documentation</u>: 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 <u>Criterion</u>: 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. <u>Documentation</u>: 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. Claims Against Retainage and Bonds

- A <u>Criterion</u>: 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. <u>Documentation</u>: 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.

# 5. Public Bidding Crime

- A <u>Criterion</u>: 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. <u>Documentation</u>: 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.

# 6. <u>Termination for Cause / Termination for Default</u>

A <u>Criterion</u>: 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. <u>Documentation</u>: 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.

# 7. Lawsuits

- A <u>Criterion</u>: 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. <u>Documentation</u>: 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 enterms 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.

As evidence that the Bidder meets the Supplemental Criteria stated above, the apparent low Bidder must submit to the Contracting Agency by 12:00 P.M. (noon) of the second business day following the bid submittal deadline, a written statement verifying that the Bidder meets the supplemental criteria together with supporting documentation (sufficient in the sole judgment of the Contracting Agency) demonstrating compliance with the Supplemental Criteria. The Contracting Agency reserves the right to request further documentation as needed from the low Bidder and documentation from other Bidders as well to assess Bidder responsibility and compliance with all bidder responsibility criteria. 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 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.

# (December 30, 2022 APWA GSP)

# 1-02.15 Pre-Award Information

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</u> where the work is located.
- 7. Any other information or action taken that is deemed necessary to ensure that the bidder is the lowest responsible bidder.

# 1-03 AWARD AND EXECUTION OF CONTRACT

# (December 30, 2022 APWA GSP)

# 1-03.1 Consideration of Bids

Revise this section to read:

After opening Bids, if two or more lowest responsive Bid totals are exactly equal, then the tie-breaker will be the Bidder with an equal lowest bid, that proposed to use the highest percentage of recycled materials in the Project, per the form submitted with the Bid Proposal. If those percentages are also exactly equal, then the tie-breaker will be determined by drawing as follows: Two or more slips of paper will be marked as follows: one marked "Winner" and the other(s) marked "unsuccessful". The slips will be folded to make

the marking unseen. The slips will be placed inside a box. One authorized representative of each Bidder shall draw a slip from the box. Bidders shall draw in alphabetic order by the name of the firm as registered with the Washington State Department of Licensing. The slips shall be unfolded and the firm with the slip marked "Winner" will be determined to be the successful Bidder and eligible for Award of the Contract. Only those Bidders who submitted a Bid total that is exactly equal to the lowest responsive Bid, and with a proposed recycled materials percentage that is exactly equal to the highest proposed recycled materials amount, are eligible to draw.

# (October 1, 2005 APWA GSP)

# 1-03.3 Execution of Contract

Revise this section to read:

<u>Copies of the Contract Provisions, including the unsigned Form of Contract, will be available</u> 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 ten (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 Agencyfurnished 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  $\underline{10}$  calendar days after the award date stated above, the Contracting Agency may grant up to a maximum of  $\underline{10}$  additional calendar days for return of the documents, provided the Contracting Agency deems the circumstances warrant it.

# (January 1, 2016 COK GSP)

# 1-03.4 Contract Bond

Revise the first paragraph to read:

The successful bidder shall provide executed payment and performance bond(s) for the full contract amount. Separate payment and performance bonds are required and 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, and
  - c. Have an A.M. best rating of A:VII or better.
- 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).

# (December 30, 2022 APWA GSP)

#### 1-03.7 Judicial Review

Revise this section to read:

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

# (April 25, 2019 COK GSP; may not be used on FHWA-funded projects; note optional/conditional nature of use for other City projects)

Add new Section 1-03.8.

# 1-03.8 Escrow Bid Document Preservation

#### Scope and Purpose

The purpose of this specification is to preserve the Contractor's Bid documents for use by the Contracting Agency in any litigation between the Contracting Agency and Contractor arising out of this Contract.

The Contractor shall submit a legible copy of all documentation used to prepare the Bid for this Contract to a banking institution designated by the Contracting Agency. Such documentation shall be placed in escrow with the banking institution and preserved by that institution as specified in the following sections of this specification.

# **Definition: Bid Documentation**

The term "Bid documentation" as used in this specification means any writings, working papers, computer printouts, charts, and any other data compilations which contain or reflect all information, data, and calculations used by the Contractor to determine the Bid in bidding for

this project. The term "Bid documentation" includes but is not limited to Contractor equipment rates, Contractor overhead rates, labor rates, efficiency or productivity factors, arithmetic extensions, and quotations from Subcontractors and materialmen to the extent that such rates and quotations were used by the Contractor in formulating and determining the amount of the Bid. The term "Bid documentation" also includes any manuals which are standard to the industry used by the Contractor in determining the Bid for this project. Such manuals may be included in the Bid documentation by reference. The term does not include Bid documents provided by the Contracting Agency for use by the Contractor in bidding on this project.

# Submittal of Bid Documentation

The Contractor shall submit the Bid documentation, as defined in this section, to the banking institution. The Bid documentation shall be submitted to the banking institution within seven calendar days after the Contract for this project has been executed by the Contracting Agency. The Bid documentation shall be submitted in a sealed container. The container shall be clearly marked "Bid Documentation" and shall also show on the face of the container the Contractor's name, the date of submittal, the project title, and the Contract number.

# Affidavit

The sealed container shall contain, in addition to the Bid documentation, an affidavit signed under oath by an individual authorized by the Contractor to execute bidding Proposals. The affidavit shall list each Bid document with sufficient specificity so a comparison can be made between the list and the Bid documentation to ensure that all of the Bid documentation listed in the affidavit has been enclosed in the sealed container. The affidavit shall show that the affiant has personally examined the Bid documentation and that the affidavit lists all of the documents used by the Contractor to determine the Bid for this project and that all such Bid documentation has been enclosed in the sealed container.

#### Verification

The banking institution upon receipt of the sealed container shall place the container in a safety deposit box, vault, or other secure place, and immediately notify the Contracting Agency in writing that the container has been received. Upon receipt of such notice, the Contracting Agency will promptly notify the Contractor in writing that the Contracting Agency will open the sealed container to verify that the affidavit has been enclosed and to compare the Bid documents listed in the affidavit with the Bid documents enclosed in the container to ensure that all of the Bid documentation has been submitted and that the copies are legible. The notification will advise the Contractor of the date and time the container will be opened and the name of the Contracting Agency employee who will verify the contents of the container.

The employee verifying the contents of the escrow container will not be involved or connected with the review, evaluation, or resolution of any claim by the Contractor made to the Contracting Agency in connection with the Contract for which the verification was made. The Contractor may have representatives present at the opening.

#### Supplementation

Documents listed in the affidavit but not enclosed in the sealed container through error or oversight shall be submitted in a sealed container within five calendar days after the opening of the original container. Also, any Bid documentation that is illegible shall be replaced with legible copies and furnished within five calendar days after the opening of the original container. The face of the container shall show the same information as the original container except the container shall be marked "Supplemental Bid Documentation". The same procedure used in

verifying the contents of the original container shall be used in verifying the contents of the supplemental submittal.

#### **Duration and Use**

The Bid documentation and affidavit shall remain in escrow during the life of the Contract and will be returned to the Contractor by the banking institution, provided that the Contractor has signed the final Contract voucher certification and has not reserved any claims on the final Contract voucher certification against the Contracting Agency arising out of the Contract. In the event that claims against the Contracting Agency are reserved on the final Contract voucher certification and affidavit shall remain in escrow.

If the claims are not resolved and litigation ensues, the Contracting Agency may serve a request upon the Contractor to authorize the banking institution, in writing, to release the Bid documentation and affidavit in escrow to the Contracting Agency. The Contractor shall respond to the request within 20 days after service of the request. If the Contractor objects or does not respond to the request within 20 days after service of the request, the Contracting Agency may file a motion under the Civil Rules requesting the court to enter an order directing the banking institution to deliver the Bid documentation and affidavit in escrow to the Contractor objects.

The Contractor shall respond to the request within the time required by the then applicable Civil Court Rules for the Superior Court of the Contracting Agency of Washington. If the Contractor objects or does not respond to the request within the time required by the then applicable Civil Rules, the Contracting Agency may file a motion pursuant to such rules requesting the court to enter an order directing the banking institution to deliver the Bid documentation and affidavit in escrow to the Contracting Agency.

The banking institution shall release the Bid documentation and affidavit as follows:

- 1. To the Contracting Agency upon receipt of a letter from the Contractor authorizing the release;
- 2. To the Contracting Agency upon receipt of a certified copy of a court order directing the release of the documents;
- 3. To the court for an in camera examination pursuant to a certified copy of a court order;
- 4. The Bid documentation and affidavit shall be returned to the Contractor if litigation is not commenced within the time period prescribed by law.

The Contractor agrees that the sealed container placed in escrow and any supplemental sealed container placed in escrow contain all of the Bid documentation used to determine the Bid and that no other Bid documentation shall be utilized by the Contractor in litigation over claims brought by the Contractor arising out of this Contract unless otherwise ordered by the court.

#### Remedies for Refusal or Failure to Provide Bid Documentation

Failure or refusal to provide Bid documentation shall be deemed a material breach of this Contract. The Contracting Agency may at its option refuse to make payment for progress estimates under Section 1-09.9 until the Contractor has submitted the Bid documentation required by this specification. The Contracting Agency may at its option terminate the Contract for default under Section 1-08.10. These remedies are not exclusive and the Contracting Agency may take such other action as is available to it under the law.

# Confidentiality of Bid Documentation

The Bid documentation and affidavit in escrow are and will remain the property of the Contractor. The Contracting Agency has no interest in or right to the Bid documentation and

affidavit other than to verify the contents and legibility of the Bid documentation unless litigation ensues between the Contracting Agency and Contractor over claims brought by the Contractor arising out of this Contract. In the event of such litigation, the Bid documentation and affidavit may become the property of the Contracting Agency for use in the litigation as may be appropriate subject to the provisions of any court order limiting or restricting the use or dissemination of the Bid documentation and affidavit as provided in the preceding section entitled Duration and Use.

# **Cost and Escrow Instructions**

The cost of the escrow will be borne by the Contracting Agency. The Contracting Agency will provide escrow instructions to the banking institution consistent with this specification.

# 1-04 SCOPE OF THE WORK

# (January 1, 2016 COK GSP)

# 1-04.1 Intent of the Contract

Section 1-04.1 is supplemented with the following:

All materials, tools, labor, and guarantees thereof of required to complete the work shall be furnished and supplied in accordance with the Plans, these Special Provisions, the Standard Specifications, and City of Kirkland Pre-Approved (Standard) Plans and Policies. The Contractor shall include all costs of doing this work within the contract bid item prices.

# (December 30, 2022 APWA GSP)

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

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. Standard Specifications,
- 6. Contracting Agency's Standard Plans or Details (if any), and
- 7. WSDOT Standard Plans for Road, Bridge, and Municipal Construction.

# (May 30, 2019 APWA GSP)

# 1-04.4(1) Minor Changes

Delete the first paragraph and replace it with the following:

Payments or credits for changes amounting to **\$1,700.00** or less may be made under the Bid item "Minor Change". At the discretion of the Contracting Agency, this procedure for Minor Changes may be used in lieu of the more formal procedure as outlined in Section 1-04.4,

Changes. All "Minor Change" work will be within the scope of the Contract Work and will not change Contract Time

# (July 23, 2015 APWA GSP, Option B; may not be used on FHWA-funded projects)

# 1-04.6 Variation in Estimated Quantities

Revise the first paragraph to read:

Payment to the Contractor will be made only for the actual quantities of Work performed and accepted in conformance with the Contract. When the accepted quantity of Work performed under a unit item varies from the original Proposal quantity, payment will be at the unit Contract price for all Work unless the total accepted quantity of the Contract item, adjusted to exclude added or deleted amounts included in change orders accepted by both parties, increases or decreases by more than 25 percent from the original Proposal quantity, and if the total extended bid price for that item at time of award is equal to or greater than 10 percent of the total contract price at time of award. In that case, payment for contract work may be adjusted as described herein:

# (January 1, 2016 COK GSP)

# 1-04.11 Final Cleanup

Section 1-04.11 is deleted in its entirety and replaced with the following:

The Contractor shall perform final cleanup as provided in this Section. The Engineer will not establish the Physical Completion Date until this is done. All public and private property the Contractor occupied to do the Work, including but not limited to the street rights-of-way, material sites, borrow and waste sites, and construction staging area shall be left neat and presentable. Immediately after completion of the Work, the Contractor shall cleanup and remove all refuse and unused materials of any kind resulting from the Work. Failure to do the final cleanup may result in the final cleanup being done by the Owner and the cost thereof charged to the Contractor and deducted from the Contractor's final progress estimate.

The Contractor shall:

- 1. Remove all rubbish, surplus materials, discarded materials, falsework, piling, camp buildings, temporary structures, equipment, and debris;
- 2. Remove from the Project, all unneeded, oversized rock left from grading, surfacing, or paving unless the Contract specifies otherwise or the Engineer approves otherwise;
- 3. On all concrete and asphalt pavement work, flush the pavement clean and remove the wash water and debris;
- 4. Sweep and flush structure decks and remove wash water and debris;
- 5. Clean out from all open culverts and drains, inlets, catch basins, manholes and water main valve chambers, within the limits of the Project Site, all dirt and debris of any kind that is the result of the Contractor's operations;
- 6. Level and fine grade all excavated material not used for backfill where the Contract requires;
- 7. Fine grade all slopes;

8. Upon completion of grading and cleanup operations at any privately-owned site for which a written agreement between the Contractor and property owner is required, the Contractor shall obtain and furnish to the Engineer a written release from all damages, duly executed by the property owner, stating that the restoration of the property has been satisfactorily accomplished.;

All costs associated with cleanup shall be incidental to the Work and shall be included in the various Bid items in the Bid, and shall be at no additional cost to the Owner.

# (January 27, 2021 COK GSP)

Add new Section 1-04.12.

#### 1-04.12 Water, Electrical Power, Telecommunications, and Sanitary Sewer Requirements

Except where specifically indicated otherwise in the Contract Documents, the Contractor shall make all necessary arrangements and bear all costs as incidental to the Contract for permits, temporary hook-ups, usage fees, and decommissioning of temporary services for all water, electrical power, telecommunications, and/or sanitary sewer services necessary for performance of the Work.

#### 1-05 CONTROL OF WORK

# (January 27, 2021 COK GSP)

#### 1-05.1 Authority of the Engineer

Section 1-05.1 is supplemented with the following:

When directed by the Engineer for purposes such as (but not limited to) maintaining unrestricted public access and use outside the Work area, maintaining an appropriate construction site appearance, and/or allowing full access to the Work by the Engineer or other City personnel, the Contractor shall cleanup and remove debris, refuse, and discarded materials of any kind resulting from the Work to meet those purposes. These activities shall be incidental to the bid items associated with the Work that generated the debris, refuse, and discarded materials. Failure to do so may result in cleanup done by the Owner and the cost thereof charged to the Contractor by either deducting from the next Progress Payment to the Contractor or direct billing from the City.

#### (January 1, 2020 COK GSP)

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

Section 1-05.4 is supplemented with the following:

Unless otherwise identified on Plans or in the Special Provisions, Unit Bid prices shall cover all costs for all surveying labor, equipment, materials, and supervision required to perform the Work. This shall include any resurveying, checking, correction of errors, replacement of missing or damaged stakes, and coordination efforts.

# (January 1, 2016 COK GSP)

Add new Section 1-05.4(1).

# 1-05.4(1) Roadway and Utility Surveys

The Contractor shall be responsible for setting, maintaining, and resetting all alignment stakes, slope stakes, and grades necessary for the construction of the improvements under this contract. Except for the survey control data furnished by the Owner, calculations, surveying, and measuring required for setting and maintaining the necessary lines and grades shall be the Contractor's responsibility.

The Owner may, at their discretion, spot-check the Contractor's surveying. These spotchecks will not change the requirements for or relieve the Contractor from their obligations for survey or property installation means and methods.

To facilitate the establishment of lines and elevations, the Owner will provide the Contractor with primary survey control information consisting of descriptions of two primary control points used for the horizontal and vertical control. Primary control points will be described and shown on the right-of-way Plans. The Contractor shall check all control points for horizontal and vertical locations prior to use and report any discrepancy to the Engineer. Errors resulting from using control points which have not been verified, shall be the Contractors responsibility.

At a minimum the Contractor shall provide following survey staking shall be required:

- 1. Construction centerline or an offset to construction centerline shall be staked at all angle points and 100-foot intervals on tangents.
- 2. Offset stakes of JUT Centerline at all angle points and at 50-foot intervals on tangents
  - a. Cut/fill shall reference the elevations of the lowest conduit.
  - b. Offset shall reference the location of the center of trench and list the width of the trench section.
- 3. Offset stakes of all structure control/location points shown on the undergrounding Plans.
  - a. Each vault, handhold, and junction box shall have a sets of off-set points provided each location point shown in the location tables Cut/Fill shall reference elevations of the finish grade of the top lid of the structure.
  - b. Each pole riser and stub up, shall have at least one set of off-set hubs provided with cut/fills to finish ground elevations.
  - c. Finish grade elevations of all structures shall be determined by the Contractor based on the typical sections and details provide on the Contract Drawings.
- 4. Offset stakes at face or walls.
- 5. Offset staking of all drainage structures and drainage pipes at 50-foot intervals.
- 6. Location of all right-of-way and easements adjacent to the work area as shown on the right-of-way Plans.
- 7. Offset of all permanent concrete sidewalks, curb ramps, and driveways.

Each stake shall have the following information: Hub elevation, offset distance to items being staked, cut/fill to proposed elevations, design elevation of items being staked.

The above information shall also be shown on a written Cut Sheet and provided to the City inspector 48-hours prior to installation of the items being staked.

The Contractor shall establish all secondary survey controls, both horizontal and vertical, as necessary to assure proper placement of all project elements based on the primary control points provided by the Engineer. Survey work shall be within the following tolerances:

Stationing	+.01 foot
Alignment	+.01 foot (between successive points)
Superstructure Elevations	+.01 foot (from plan elevations)
Substructure Elevations	+.05 foot (from plan elevations)
Sidewalk and Curb Ramp Elevations	+.01 foot (from plan elevations)

During the progress of the work, the Contractor shall make available to the Engineer all field books including survey information, footing elevations, cross sections and quantities.

The Contractor shall be fully responsible for the close coordination of field locations and measurements with appropriate dimensions of structural members being fabricated.

# (July 23, 2015 APWA GSP)

Add new Section 1-05.4(2).

# 1-05.4(2) Bridge and Structure Surveys

For all structural work such as bridges and retaining walls, the Contractor shall retain as a part of Contractor's organization an experienced team of surveyors.

The Contractor shall provide all surveys required to complete the structure, except the following primary survey control which will be provided by the Engineer:

- 1. Centerline or offsets to centerline of the structure.
- 2. Stations of abutments and pier centerlines.
- 3. A sufficient number of bench marks for levels to enable the Contractor to set grades at reasonably short distances.
- 4. Monuments and control points as shown in the Plans.

The Contractor shall establish all secondary survey controls, both horizontal and vertical, as necessary to assure proper placement of all project elements based on the primary control points provided by the Engineer. Survey work shall be within the following tolerances:

Stationing	± 0.01 foot
Alignment	± 0.01 foot (between successive points)
Superstructure Elevations	± 0.01 foot (from plan elevations)
Substructure Elevations	± 0.05 foot (from plan elevations)

During the progress of the work, the Contractor shall make available to the Engineer all field books including survey information, footing elevations, cross sections and quantities.

The Contractor shall be fully responsible for the close coordination of field locations and measurements with appropriate dimensions of structural members being fabricated.

# (October 1, 2005 APWA GSP)

# 1-05.7 Removal of Defective and Unauthorized Work

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.

# (January 1, 2016 COK GSP)

#### 1-05.9 Equipment

The following new paragraph is inserted between the second and third paragraphs:

Use of equipment with metal tracks will not be permitted on concrete or asphalt surfaces unless otherwise authorized by the Engineer.

# (January 1, 2016 COK GSP)

#### 1-05.10 Guarantees

Section 1-05.10 is supplemented as follows:

Guarantees and maintenance bonds shall be in accordance with City of Kirkland, State of Washington, Public Works Performance and Payment Bond forms and requirements. The performance bond shall be in the full amount of contract. The Contractor guarantees all

items of material, equipment, and workmanship against mechanical, structural, or other defects for which the Contractor is responsible that may develop or become evident within a period of one year from and after acceptance of the work by the Owner. This guarantee shall be understood to require prompt remedy of defects upon written notification to the Contractor. If the Owner determines the defect requires immediate repair, the Owner may, without further notice to the Contractor, make the necessary corrections, the cost of which shall be borne by the Contractor. To support the above guarantee, the Contractor's performance bond shall remain in full force and effect for one year following the acceptance of the project by the Owner.

# (October 1, 2005 APWA GSP)

# 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

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.

# (March 8, 2013 APWA GSP)

## 1-05.12 Final Acceptance

Add new Section 1-05.12(1).

# 1-05.12(1) One-Year Guarantee Period

The Contractor shall return to the project and repair or replace all defects in workmanship and material discovered within one year after Final Acceptance of the Work. The Contractor shall start work to remedy any such defects within 7 calendar days of receiving Contracting Agency's written notice of a defect, and shall complete such work within the time stated in the Contracting Agency's notice. In case of an emergency, where damage may result from delay or where loss of services may result,

such corrections may be made by the Contracting Agency's own forces or another contractor, in which case the cost of corrections shall be paid by the Contractor. In the event the Contractor does not accomplish corrections within the time specified, the work will be otherwise accomplished and the cost of same shall be paid by the Contractor.

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

This guarantee is supplemental to and does not limit or affect the requirements that the Contractor's work comply with the requirements of the Contract or any other legal rights or remedies of the Contracting Agency.

# (August 14, 2013 APWA GSP)

# **1-05.13** Superintendents, Labor and Equipment of Contractor

Delete the sixth and seventh paragraph of this section.

## (December 30, 2022 APWA GSP)

## 1-05.15 Method of Serving Notices

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.

## (March 8, 2013 APWA GSP)

Add new Section 1-05.18.

#### 1-05.18 Record Drawings

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

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

The preparation and upkeep of the Record Drawings is to be the assigned responsibility of a single, experienced, and qualified individual. The quality of the Record Drawings, in terms of accuracy, clarity, and completeness, is to be adequate to allow the Contracting Agency to modify the computer-aided drafting (CAD) Contract Drawings to produce a complete set

of Record Drawings for the Contracting Agency without further investigative effort by the Contracting Agency.

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

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

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

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

	Vertical	Horizontal
As-built sanitary & storm invert and grate elevations	± 0.01 foot	± 0.01 foot
As-built monumentation	± 0.001 foot	± 0.001 foot
As-built waterlines, inverts, valves, hydrants	± 0.10 foot	± 0.10 foot
As-built ponds/swales/water features	± 0.10 foot	± 0.10 foot
As-built buildings (fin. Floor elev.)	± 0.01 foot	± 0.10 foot
As-built gas lines, power, TV, Tel, Com	± 0.10 foot	± 0.10 foot
As-built signs, signals, etc.	N/A	± 0.10 foot

Making Entries on the Record Drawings:

- Use erasable colored pencil (not ink) for all markings on the Record Drawings, conforming to the following color code:
- Additions Red
- Deletions Green
- Comments Blue
- Dimensions- Graphite
- Provide the applicable reference for all entries, such as the change order number, the request for information (RFI) number, or the approved shop drawing number.
- Date all entries.
- Clearly identify all items in the entry with notes similar to those in the Contract Drawings (such as pipe symbols, centerline elevations, materials, pipe joint abbreviations, etc.).

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

Payment will be made for the following bid item:

Record Drawings (Minimum Bid <b>\$ 1,000.00</b> )	Lump Sum
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Payment for this item will be made on a prorated monthly basis for work completed in accordance with this section up to 75% of the lump sum bid. The final 25% of the lump sum item will be paid upon submittal and approval of the completed Record Drawings set prepared in conformance with these Special Provisions.

A minimum bid amount has been entered in the Bid Proposal for this item. The Contractor must bid at least that amount.

# (November 19, 2019 COK GSP; may not be used on FHWA-funded projects; note optional/conditional nature of use for other City projects)

Add new Section 1-05.19.

## 1-05.19 Daily Construction Report

The Contractor and Subcontractors shall maintain daily, a Daily Construction Report of the Work. The Diary must be kept and maintained by Contractor's designated project superintendent(s). Entries must be made on a daily basis and must accurately represent all of the project activities on each day. Contractor shall provide signed copies of diary sheets from the previous week to Engineer at each Weekly Coordination Meeting.

Every single diary sheet/page must have:

- Project name & number;
- Consecutive numbering of pages, and
- Typed or printed name, signature, and date of the person making the entry.

At a minimum the diary shall, for each day, have a separate entry detailing each of the following:

- 1. Day and date.
- 2. Weather conditions, including changes throughout the day.
- 3. Complete description of work accomplished during the day, with adequate references to the Plans and Contract Provisions so the reader can easily and accurately identify said work on the Plans. Identify location/description of photographs or videos taken that day.

- 4. Each and every changed condition, dispute or potential dispute, incident, accident, or occurrence of any nature whatsoever which might affect Contractor, Contracting Agency, or any third party in any manner. This shall be provided on a separate page for other information.
- 5. List all materials received and stored on- or off-site by Contractor that day for future installation, including the manner of storage and protection of the same.
- 6. List materials installed that day.
- 7. List all Subcontractors working on-site that day.
- 8. List the number of Contractor's employees working during each day, by category of employment.
- 9. List Contractor's equipment on the site that day; showing which were in use, and which idle.
- 10. Notations to explain inspections, testing, stake-out, and all other services furnished by Contracting Agency or other party during the day.
- 11. Verify the daily (including non-work days) inspection and maintenance of traffic control devices and condition of the traveled roadway surfaces.
- 12. Any other information that serves to give an accurate and complete record of the nature, quantity, and quality of Contractor's progress on each day.
- 13. Add; Officials and visitors onsite
- 14. Change Orders
- 15. Occurrence of testing, staking or special inspections

It is expressly agreed between Contractor and Contracting Agency that the Daily Diary maintained by Contractor shall be the "Contractor's Book of Original Entry" for the documentation of any potential claims or disputes that might arise during this Contract. Failure of Contractor to maintain this Diary in the manner described above will constitute a waiver of any such claims or disputes by Contractor.

Preparation of the Daily Diary by the contractor shall be incidental to the unit prices for applicable bid items. No separate payment shall be made for preparation and maintaining the Daily Diary.

Engineer or the Engineer's representative on the job site will also complete a Daily Construction Report.

## 1-06 CONTROL OF MATERIAL

#### (January 1, 2016 COK GSP)

#### 1-06.1 Approval of Materials Prior to Use

Section 1-06.1 is supplemented as follows:

Approval of a Material source shall not mean acceptance of the Material. The Material shall meet the requirements of the Contract.

## (February 17, 2022 COK GSP)

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

Revise the first paragraph to read:

The RAM shall be used for all submittals unless directed otherwise by the Engineer. The RAM shall be prepared by the Contractor in accordance with the instructions on Form 350-071 and submitted to the Engineer for approval before the material is incorporated into the Work.

# (January 4, 2016 APWA GSP)

## 1-06.6 Recycled Materials

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

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

Prior to Physical Completion the Contractor shall report the quantity of recycled materials that were utilized in the construction of the project for each of the items listed in Table 9-03.21(1)E in Section 9-03.21. The report shall include hot mix asphalt, recycled concrete aggregate, recycled glass, steel furnace slag and other recycled materials (e.g. utilization of on-site material and aggregates from concrete returned to the supplier). The Contractor's report shall be provided on DOT form 350-075 Recycled Materials Reporting.

# 1-07 LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC

## (January 1, 2021 COK GSP)

## 1-07.1 Laws to Be Observed

Section 1-07.1 is supplemented with the following:

The Contractor shall at all times eliminate noise to the maximum practicable extent. Air compressing plants shall be equipped with silencers, and the exhaust of all gasoline motors or other power equipment shall be provided with mufflers. Special care shall be used to avoid noise or other nuisances, and the Contractor shall strictly observe all federal, state, and local regulations concerning noise.

The Contractor shall make an effort to reduce carbon emissions by turning off engines on construction equipment not in active use, and on trucks that are idling while waiting to load or unload material for five minutes or more.

#### Compliance with Laws

The Contractor shall comply with the requirements of all other City ordinances, state statutes, laws, and regulations, whether or not stated herein, which are specifically applicable to the public improvements and work to be performed.

The Contractor shall be subject to City of Kirkland Code enforcement, as required by Kirkland Municipal Code (KMC) Chapter 1.12. The Contractor shall fully comply with and

satisfy all fines and costs assessed by code enforcement(s) prior to the Completion Date, unless otherwise authorized by the City of Kirkland in writing.

# (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.

# (January 1, 2016 COK GSP)

Supplement this section with the following:

## **Contractor's Safety Responsibilities**

These construction documents and the joint and several phases of construction hereby contemplated are to be governed at all times by applicable provisions of the federal law(s), including but not limited to the latest amendments of the following:

Williams-Steiger Occupational Safety and Health Act of 1980, Public Law 91-596.

Part 1910 - Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations.

This project, the Contractor and its subcontractors, shall, at all times, be governed by Chapter XIII of Title 29, Code of Federal Regulations, Part 1518 - Safety and Health Regulations for Construction (35 CFR 75), as amended to date.

To implement the program, and to provide safe and healthful working conditions for all persons, the construction superintendent or his/her designated safety officer shall conduct general project safety meetings at the site at least once each month during the course of construction.

The Contractor and all subcontractors shall immediately report all accidents, injuries, and health hazards to the Owner, in writing. This shall not obviate any mandatory reporting under the provisions of the Occupational Safety and Health Act of 1970. This program shall become a part of the contract documents and the contract between the Owner and the Contractor, and all subcontractors, as though fully written therein.

Where the location of the work is in proximity to overhead wires and power lines, the Contractor shall coordinate all work with the utility and shall provide for such measures as may be necessary for the protection of the workers.

## (June 27, 2011 APWA GSP)

## 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

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).

## (January 1, 2021 COK GSP)

## 1-07.5(2) State Department of Fish and Wildlife

Supplement this section with the following:

New Zealand mud snails are an aquatic invasive species of concern for the Puget Sound region, as they have already invaded waterways near the City of Kirkland. Contractors working in-water (e.g. natural stream, small ponds and lakes, wetlands, etc.), including all construction equipment and vehicles used in-water, shall follow the Level 1 decontamination protocols and implement all Special Protocols for personnel and equipment as described in the "Invasive Species Management Protocols" published by the Washington State Department of Fish and Wildlife (WDFW) (Draft Version 3, February 2016). This document can be found on the WDFW website.

For Work that will be performed in-water in the City of Kirkland, all Contractor vehicles and/or heavy equipment previously used for in-water work outside the City of Kirkland shall be cleaned by the Contractor as indicated for "Boats and other Large Aquatic Conveyances Transported Overland", as described in the "Invasive Species Management Protocols" published by the Washington State Department of Fish and Wildlife (WDFW) (Draft Version 3, February 2016). The Contractor is only required to follow Level 2 Decontamination Protocols in the Work area when indicated in the Contract documents.

All labor and materials required for completing decontamination and cleaning protocols shall be incidental to the Contract bid items, unless otherwise indicated in the Contract Documents.

# (January 1, 2021 COK GSP)

# 1-07.5(3) State Department of Ecology

Supplement this section with the following:

Contractor shall comply with all requirements of the Construction Stormwater General Permit (CSWGP), if this permit has been issued for this Work. Additionally, Contractor shall comply with all applicable requirement of Kirkland Municipal Code KMC 15.52, as this local code has been adopted to meet Washington State Department of Ecology requirements for city stormwater management.

CSWGP Permit Number (if issued): WAR313114

CSWGP coverage is typically only issued by the State Department of Ecology in the event the disturbed area for the Work is greater than one (1) acre. In the event CSWGP coverage has been issued for this Work, Contractor shall coordinate the Transfer of the permit from the Contracting Agency to the Contractor prior to any ground disturbance commencing in the Work area.

Unless identified otherwise in the Contract Documents, compliance with all requirements of this Section, the CSWGP, and the Kirkland Municipal Code KMC 15.52 shall be incidental to Contract pay items.

Revise the paragraph 6 to read:

6. When a violation of the Construction Stormwater General Permit (CSWGP) and/or Kirkland Municipal Code KMC 15.52 occurs, Contractor shall immediately notify the City of Kirkland Spill Hotline (425) 587-3900. Contractor shall also report to the Engineer and other agencies as identified in the Contractor's Spill Prevention, Control, and Countermeasures (SPCC) Plan (prepared in accordance with Section 1-07.15(1)).

Revise the paragraph 8 to read:

8. If directed by the Contracting Agency and instead of or in partial conjunction with a Notice of Completion, transfer the CSWGP coverage to the Contracting Agency when Physical Completion has been given and the Engineer has determined that the project site is not destabilized from erosion.

# (January 1, 2021 COK GSP)

## 1-07.5(6) U.S. Fish and Wildlife Service and National Marine Fisheries Service

Delete this section and replace it with the following:

The Contractor shall provide all required fish exclusion and handling services required by the Work, unless otherwise indicated in the Contract Documents. If the Contractor discovers any fish stranded by the project, they shall immediately transfer and release the fish alive into a flowing stream or open water outside the Work area.

# (January 1, 2021 COK GSP)

# 1-07.6 Permits and Licenses

Replace item 6 of the second paragraph of this section with the following:

6. The permit costs the Contracting Agency nothing. This shall include, but not be limited to, application and initial review fees, costs associated with fulfillment of all permit requirements, additional operational fees assessed during the life of the permit.

Supplement second paragraph of this section with the following:

7. When a violation of the Construction Stormwater General Permit (CSWGP) and/or Kirkland Municipal Code KMC 15.52 occurs, Contractor shall immediately notify the <u>City of Kirkland Spill Hotline (425) 587-3900</u>. Contractor shall also report to the Engineer and other agencies as identified in the Contractor's Spill Prevention, Control, and Countermeasures (SPCC) Plan (prepared in accordance with Section 1-07.15(1) ).

# (January 1, 2021 COK GSP)

# 1-07.6(1) Permits for Sanitary Sewer Discharge for Construction Dewatering

Add new Section 1-07.6(1)

The Contracting Agency has not obtained a King County Authorization for Construction Dewatering or local sanitary sewer operating permits for this Work. Contractor proposals for this method of construction stormwater disposal will be supported by the Contracting Agency only if, as determined by the Engineer, the proposal meets all the requirements indicated in Section 1-07.6 and this Section.

Contractors proposing to use sanitary sewer methods for construction dewatering and discharge are directed to the King County web page for "Construction Dewatering" for applications and information on the application process.

In addition to the requirements of Section 1-07.6, Contractor shall provide to the Engineer the written permission obtained by the Contractor from the local sanitary sewer operating agency for use of the sanitary sewer for construction dewatering discharge in advance of the Contractor applying for either general or individual King County Authorization for Construction Dewatering.

Unless otherwise indicated in the Contract Documents or by the Engineer in writing, no claims for equitable adjustment of Contract Time will be approved in order to obtain King County Authorizations and/or local sanitary sewer operating permits.

# (January 1, 2021 COK GSP)

# 1-07.6(2) Permits for Off-site Staging and Storage Areas

Add new Section 1-07.6(2)

The Contracting Agency has not obtained any City of Kirkland Temporary Use Permits for temporary use(s) of off-site areas or properties in the City of Kirkland for the purposes of staging, materials storage, and/or any other Contractor-desired temporary uses during the Work. A City of Kirkland Temporary Use Permit must be obtained by the Contractor for temporary use for the Work of any off-site areas or properties not located in a City of Kirkland right-of-way (ROW). This requirement is in addition to any permissions and/or agreements reached between the Contractor and the property owner(s) as required in Section 1-07.24.

"Off-site" will be taken to mean any area not designated as part of the Work in the Plans or other Contract Documents.

A City of Kirkland Temporary Use Permit is not required for additional use of areas located in a City of Kirkland right-of-way (ROW) and not indicated in the Plans or other Contract Documents. However, the Contractor shall not occupy additional City of Kirkland ROW not shown as part of the Work without advance written approval by the Engineer. Contractor shall photograph and/or video document the existing conditions of ROW used. Any damage or degradation of the existing conditions in these areas shall be repaired and/or replaced by the Contractor at no additional cost to the City of Kirkland.

Contractor shall apply for a City of Kirkland Temporary Use Permit from the City of Kirkland Planning and Building Department through <u>http://mybuildingpermit.com</u>. Contractor shall also notify the Engineer when the Temporary Use Permit application has been submitted.

Unless otherwise indicated in the Contract Documents or by the Engineer in writing, no claims for equitable adjustment of Contract Time will be allowed requesting additional time required for the Contractor to obtain a City of Kirkland Temporary Use Permit for temporary use of any off-site area or property not designated as part of the Work area in the Plans.

# (January 3, 2020 APWA GSP)

# 1-07.9(5) Required Documents

Delete this section and replace it with the following:

## General

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

## Intents and Affidavits

On forms provided by the Industrial Statistician of State L&I, the Contractor shall submit to the Engineer the following for themselves and for each firm covered under RCW 39.12 that will or has provided Work and materials for the Contract:

- 1. The approved "Statement of Intent to Pay Prevailing Wages" State L&I's form number F700-029-000. The Contracting Agency will make no payment under this Contract until this statement has been approved by State L&I and reviewed by the Engineer.
- 2. The approved "Affidavit of Prevailing Wages Paid", State L&I's form number F700-007-000. The Contracting Agency will not grant Completion until all approved Affidavit of Wages paid for the Contractor and all Subcontractors have been received by the Engineer. The Contracting Agency will not release to the Contractor any funds retained under RCW 60.28.011 until "Affidavit of Prevailing Wages Paid" forms have been approved by State L&I and all of the approved forms have been submitted to the Engineer for every firm that worked on the Contract.

The Contractor is responsible for requesting these forms from State L&I and for paying any fees required by State L&I.

# **Certified Payrolls**

Certified payrolls are required to be submitted by the Contractor for themselves, all Subcontractors and all lower tier subcontractors. The payrolls shall be submitted weekly on all Federal-aid projects and no less than monthly on State funded projects.

# Penalties for Noncompliance

The Contractor is advised, if these payrolls are not supplied within the prescribed deadlines, any or all payments may be withheld until compliance is achieved. In addition, failure to provide these payrolls may result in other sanctions as provided by State laws (RCW 39.12.050) and/or Federal regulations (29 CFR 5.12).

# (July 18, 2016 APWA GSP, Option C)

## **1-07.11** Requirements for Nondiscrimination

Supplement this section with the following:

# Voluntary Minority, Small, Veteran and Women's Business Enterprise (MSVWBE) Participation

## **General Statement**

Voluntary goals for minority, small, veteran and women business enterprises are included in this Contract. The Contractor is encouraged to utilize MSVWBEs in accordance with these Specifications, RCW 39.19 and Executive Order 13-01 (issued by the Governor of Washington on May 10, 2013).

No preference will be included in the evaluation of the Contractor's Proposal or Bid; no minimum level of MSVWBE participation is required as a condition of award or completion of the Contract; and a Proposal or Bid will not be rejected or considered non-responsive on that basis.

The goals are voluntary and outreach efforts to provide MSVWBEs maximum practicable opportunities are encouraged.

#### **Non-Discrimination**

Contractors shall not create barriers to open and fair opportunities for all businesses, including MSVWBEs, to participate in the Work on this Contract. This includes the opportunity to compete for subcontracts as sources of supplies, equipment, construction or services.

The Contractor shall make Voluntary MSVWBE Participation a part of all subcontracts and agreements entered into as a result of this Contract.

#### **Voluntary MSVWBE Participation Goals**

Goals for voluntary MSVWBE participation have been established as a percentage of Contractor's total Bid amount.

The Contracting Agency has established the following voluntary goals:

Minority	10%
Small	5%
Veteran	5%
Women	6%

Amounts paid to an MSVWBE will be credited to every voluntary goal in which they are eligible. In other words participation may be credited for participation in more than one category. If the Contractor is a MSVWBE their Work will be credited to the voluntary goals in which they are eligible.

#### Definitions

**Minority Business Enterprise (MBE)** – A minority owned business meeting the requirements of RCW 39.19 and WAC 326-20 and certified by the Washington State Office of Minority & Women's Business Enterprises.

**Small Business** – A business meeting the Washington State requirements for a "Small business", "Minibusiness" or "Microbusiness as defined in RCW 39.26.010 and included on the WSDOT Office of Equal Opportunity list of Small Businesses at http://www.wsdot.wa.gov/equalopportunity/bddirectory.htm

**Veteran Business** – A veteran owned business meeting the requirements of RCW 43.60A.010 and included on the WSDOT Office of Equal Opportunity list of Veteran Businesses at http://www.wsdot.wa.gov/equalopportunity/bddirectory.htm

**Women Business Enterprise (WBE)** – A women owned business meeting the requirements of RCW 39.19 and WAC 326-20 and certified by the Washington State Office of Minority & Women's Business Enterprises.

#### **MSVWBE** Inclusion Plan

A MSVWBE Inclusion Plan shall be submitted to the Engineer prior to the start of Work on the project. The plan is submitted for the Contracting Agency's information. Approval of the plan is not required; an incomplete plan will be returned for correction and resubmittal. The plan shall include the information identified in the guidelines at http://www.wsdot.wa.gov/EqualOpportunity/MSVWBE.htm.

# **MSVWBE** Reporting

An end of project Report of Amounts Paid to MSVWBEs shall be submitted to the Engineer after Physical Completion of the Contract. The end of project report is due 20 calendar days after the physical completion of the project has been issued.

The end of project report shall include payments to all eligible businesses regardless of their listing on the MSVWBE Inclusion Plan. If the Contractor is a MSVWBE the amounts paid by the Contracting Agency for Work performed by the Contractor shall also be reported.

# **MSVWBE** Payment

All costs for implementation of the requirements for Voluntary MSVWBE Participation shall be included in the associated items of Contract Work.

# (January 1, 2016 COK GSP)

# 1-07.14 Responsibility for Damage

Section 1-07.14 is supplemented with the following:

The Contractor further agrees that it is waiving immunity under Industrial Insurance Law Title 51 RCW for any claims brought against the City by its employees. In the event Contractor fails, after receipt of timely notice from the City, to appear, defend, or pay as required by the first paragraph of this section, then in that event and in that event only, the City may in its sole discretion, deduct from the progress payments to the Contractor and pay any amount sufficient to pay any claim, of which the City may have knowledge and regardless of the informalities of notice of such claim, arising out of the performance of this contract, provided the City has theretofore given notice of receipt of such claim to the Contractor and the Contractor has failed to act thereon.

# 1-07.15 Temporary Water Pollution/Erosion Control

# (January 10, 2019 COK GSP)

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

Add the following paragraph under the second paragraph of this section:

In the event the Contractor uses an SPCC Plan template that either follows the WSDOT SPCC Plan Template or contains the same or similar content and/or format, the following changes shall be required:

- 1. Replace all references to "WSDOT" as either the Contracting Agency or project owner with "City of Kirkland", except where indicated in this Section.
- Add into all Spill Reporting and related section(s): "The City of Kirkland Spill Response Hotline at (425) 587-3900 shall be the first point of contact in the event of a spill. Notification to the City of Kirkland Spill Response Hotline shall precede the spill notifications to federal and state agencies."
- 3. Delete all references to the "WSDOT Environmental Compliance Assurance Procedure" (ECAP) in the SPCC.

Supplement the following referenced SPCC Plan Element Requirements in this Section as follows:

For SPCC Plan Element Requirement Number 2, add the following: "The City of Kirkland Spill Response Hotline at (425) 587-3900 shall be the first point of contact in the event of a spill."

For SPCC Plan Element Requirement Number 8, add the following: "As part of Contractor spill response procedure, the Contractor shall contact the City of Kirkland Spill Response Hotline at (425) 587-3900 to report the spill regardless of whether or not the Contractor has fully contained, controlled, and/or cleaned up the spill."

# 1-07.16 Protection and Restoration of Property

(January 1, 2016 COK GSP)

#### 1-07.16(3) Fences, Mailboxes, Incidentals

Section 1-07.16(3) is supplemented with the following:

**U.S. Postal Service Collection Boxes, Mail Receptacles, and other Structures:** U.S. Postal Service collection box and other Structures requiring temporary relocation to accommodate construction, the Contractor shall contact the Kirkland Postmaster at least 5 Working Days in advance for coordination. Only the U.S. Post Office will move Postal Service-owned property.

## (January 1, 2020 COK GSP)

## 1-07.17 Utilities and Similar Facilities

Section 1-07.17 is supplemented 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.

The Contractor is alerted to the existence of Chapter 19.122 RCW, a law relating to underground utilities. Any cost to the Contractor incurred as a result of this law shall be at the Contractor's expense.

No excavation shall begin until all known facilities in the vicinity of the excavation area have been located and marked.

The Contractor shall give advance notice to all utility companies involved where work is to take place and in all other respects comply with the provisions of Chapter 19.122 RCW. Notice shall include, but not be limited to, the following utility companies:

- 4. Water, sewer, storm, streets minimum two working days in advance
- 5. Power (Electric and Natural Gas) minimum 48 hours in advance
- 6. Telephone minimum 30 days in advance
- 7. Natural Gas minimum 48 hours in advance
- 8. Cable Television minimum 48 hours in advance

# 9. Transit – minimum 21 days in advance

The following is a list of some utilities serving the Kirkland area. This is not intended or represented to be a complete list and is provided for the Contractor's convenience.

Utility	Agency/Company	Address	Contact	Phone
Water/Sewer	City of Kirkland	123 Fifth Avenue Kirkland, WA 98033	Josh Pantzke	(425) 587-3900
Storm Drainage	City of Kirkland	123 Fifth Avenue Kirkland, WA 98033	Josh Pantzke	(425) 587-3900
Water / Sewer (North area of Kirkland)	Northshore Utility District	6380 NE 185th St Kenmore, WA 98028	George Matote Kelly Nesbitt	(425) 398-4400 (425) 521-3750
Street	City of Kirkland	123 Fifth Avenue Kirkland, WA 98033	Glenn Akramoff	(425) 587-3900
Natural Gas	Puget Sound Energy	P.O. Box 97034 EST-11W Bellevue, WA 98009-9734	Patty Miller	(206) 305-7950
Electric	Puget Sound Energy	35131 SE Center St Snoqualmie, WA 98065	Fremont Aguinaldo	(425) 223-0936
Telephone/ FIOS	Ziply Fiber	P.O. Box 1127 Everett, WA 98206	Cheryl Schneider	(425) 949-0230
FIOS	Zayo	22651 83 <sup>rd</sup> Ave. S. Kent, WA 98032	Jason Accuradi	(971) 344-0530
Cable Television	Comcast	1525 - 75th St SW, Suite 200 Everett, WA 98203	Joe Fordon	(425) 263-5348
Network	Verizon/MCI	11311 NE 120 <sup>th</sup> St Kirkland, WA 98034	Brad Landis Scott Christenson	(425) 201-0901 (425) 471-1079
School District Transportatio n	Lake Washington School District	15212 NE 95th St Redmond, WA 98052	Jeff Miles	(425) 936-1120
Transit	King County METRO	MS SVQ-TR-0100 1270 6th Ave S Seattle, WA 98134	David Freeman	(206) 477-1140 (206) 477-0438
Water (Northeast area of Kirkland)	Woodinville Water District	17238 NE Woodinville Duvall Road, Woodinville, WA 98072	Christian Hoffman	(425) 487-4142
Olympic Pipeline	BP		Kenneth Metcalf Joseph Stone	(425) 981-2575 (425) 981-2506

Note that most utility companies may be contacted for locations through the "One Call" system, 1-800-424-5555. In the event of a gas emergency, <u>call 911</u> and then the PSE hotline at 1-888-225-5773 (1-888-CALL-PSE).

The Contractor shall coordinate the work with these utilities and shall notify the Engineer in advance of any conflicts affecting the work schedule. The utility companies shall witness or perform all shutdowns, connections or disconnections.

Wherever in the course of the construction operation it becomes necessary to cause an outage of utilities, it shall be the Contractor's responsibility to notify the affected users not less than twenty-four (24) hours in advance of the creation of such outage. The Contractor shall make reasonable effort to minimize the duration of outages.

The Contractor shall be responsible for any breakage of utilities or services resulting from its operations and shall hold the City and its agents harmless from any claims resulting from disruption of, or damage to, same.

# **Other Notifications**

<u>Service Area Turn Off</u>: All service area turn off notices must be distributed to affected parties two working days in advance of any scheduled shut off. City to provide door hangers and affected service area map. The contractor shall fill in all required information prior to hanging door hanger.

<u>Entry onto Private Property</u>: Each property owner shall be given two working days advance Written Notice prior to entry by the Contractor.

<u>Loop Detection Systems</u>: Where an excavation is to take place through a signal loop detector system, the Contractor shall provide at least five (5) Working Days advance notice to the City Signal Shop at (425) 587-3920 to coordinate temporary signal wire disconnect and installation of temporary signal detection equipment.

<u>Survey Monuments</u>: When proposed pavement removal is close to existing survey monumentation, or proposed pavement removal includes existing survey monumentation, the Contractor shall provide a minimum 4 Working Days advance notice to the Engineer to allow survey crews to tie the monument out and reset the monument after pavement installation.

# (January 1, 2016 COK GSP)

## 1-07.17(2) Utility Construction, Removal or Relocation by Others

Section 1-07.17(2) is supplemented with the following:

Under no circumstances will discrepancies in location or incompleteness in description of existing utilities or improvements, whether they are visible from the surface, buried, or otherwise obscured, be considered as a basis for additional compensation to the Contractor.

## (December 30,2022 APWA GSP)

# 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

(December 30, 2022 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-insurance, or self-insurance, or self-insurance policies and shall be excess of the Contractor's insurance and shall not contribute with it.
- E. The Contractor shall provide the Contracting Agency and all additional insureds with written notice of any policy cancellation, within two business days of their receipt of such notice.
- F. The Contractor shall not begin work under the Contract until the required insurance has been obtained and approved by the Contracting Agency
- G. Failure on the part of the Contractor to maintain the insurance as required shall constitute a material breach of contract, upon which the Contracting Agency may, after giving five business days' notice to the Contractor to correct the breach, immediately terminate the Contract or, at its discretion, procure or renew such insurance and pay any and all premiums in connection therewith, with any sums so expended to be repaid to the Contracting Agency on demand, or at the sole discretion of the Contracting Agency, offset against funds due the Contractor from the Contracting Agency.
- H. All costs for insurance shall be incidental to and included in the unit or lump sum prices of the Contract and no additional payment will be made.

# 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.
- 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 <u>not</u> 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.

## (January 4, 2016 APWA GSP) 1-07.18(5)D Excess or Umbrella Liability

The Contractor shall provide Excess or Umbrella Liability insurance with limits of not less than **\$3,000,000** each occurrence and annual aggregate. This excess or umbrella liability coverage shall be excess over and as least as broad in coverage as the Contractor's Commercial General and Auto Liability insurance

All entities listed under 1-07.18(2) of these Special Provisions shall be named as additional insureds on the Contractor's Excess or Umbrella Liability insurance policy.

This requirement may be satisfied instead through the Contractor's primary Commercial General and Automobile Liability coverages, or any combination thereof that achieves the overall required limits of insurance.

# (January 4, 2016 APWA GSP) 1-07.18(5)E LHWCA Insurance

If this Contract involves work on or adjacent to Navigable Waters of the United States, the Contractor shall procure and maintain insurance coverage in compliance with the statutory requirements of the U.S. Longshore and Harbor Workers' Compensation Act (LHWCA).

Such policy must provide the following minimum limits:

\$1,000,000	Bodily Injury by Accident – each accident
\$1,000,000	Bodily Injury by Disease – each employee
\$1,000,000	Bodily Injury by Disease – policy limits.

## (January 4, 2016 APWA GSP) 1-07.18(5)H Marine Pollution

The Contractor shall procure and maintain Pollution Liability (OPA, CERCLA) insurance to satisfy U.S. Coast Guard requirements as respects the Federal Oil Pollution Act of 1990 and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended.

Such policy must provide the following minimum limits, or statutory limits of liability as applicable, whichever is higher:

\$1,000,000 per Occurrence

## (December 30, 2022 APWA GSP) 1-07.18(5)K Professional Liability

The Contractor and/or its subcontractor(s) and/or its design consultant providing construction management, value engineering, or any other design-related non-construction professional services shall provide evidence of Professional Liability insurance covering professional errors and omissions.

Such policy shall provide the following minimum limits:

\$1,000,000 per claim and annual aggregate

If the scope of such design-related professional services includes work related to pollution conditions, the Professional Liability insurance shall include coverage for Environmental Professional Liability.

If insurance is 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.

# (January 1, 2016 COK GSP)

# 1-07.23 Public Convenience and Safety

Section 1-07.23 is supplemented with the following:

No road or street shall be closed to the public except as permitted in these plans and specifications or with the approval of the Engineer and proper governmental authority. Fire hydrants on or adjacent to the work shall be kept accessible to fire fighting equipment at all times. Provision shall be made by the Contractor to ensure the proper functioning of all gutters, sewer inlets, drainage ditches and culverts, irrigation ditches and natural water courses, and storm sewer facilities throughout the project. Temporary interruption of service will be allowed only with the permission of the Engineer.

The Kirkland Police Department and Kirkland Fire Department shall be notified at least four (4) hours in advance of any actions by the Contractor that may affect the functions of either the Police Department or Fire Department.

The Contractor shall conduct its work and take preventative measures so that dust or other particulate matter in the project area shall not become objectionable to the adjacent property owners or general public. Should the Owner determine the Contractor is not fulfilling its obligation in this regard; the Owner reserves the right to take such action as may be necessary to remedy the objectionable condition and to charge the Contractor with any cost that may be incurred in such remedial action. All work shall be carried on with due regard for the safety of the public. No driveway, whether public, commercial, or private, may be closed without prior approval of the Owner, project supervisor, or Engineer unless written authority has been given by the affected property owner. The Contractor shall be responsible for notifying the affected property owners 24 hours in advance of scheduled interruptions to access.

# (January 1, 2016 COK GSP)

Section 1-07.23 is supplemented with the following:

When the work area encroaches upon a sidewalk, walkway or crosswalk area, special consideration must be given to pedestrian safety. Maximum effort must be made to separate pedestrians from the work area. Protective barricades, fencing, and bridges, together with warning and guidance devices and signs, shall be utilized so that the passageway for pedestrians is safe and well defined. Whenever pedestrian walkways are provided across excavations, they shall be provided with suitable handrails. Footbridges shall be safe, strong, free of bounce and sway, have a slip resistant coating, and be free of cracks, holes, and irregularities that could cause tripping. Ramps shall be provided at the entrance and exit of all raised footbridges, again to prevent tripping. Adequate illumination and reflectorization shall be provided during hours of darkness. All walkways shall be maintained with at least 4 feet clear width.

Where walks are closed by construction, an alternate walkway shall be provided, preferably within the planting strip.

Where it is necessary to divert pedestrians into the roadway, barricading or channeling devices shall be provided to separate the pedestrian walkway from the adjacent vehicular traffic lane. At no time shall pedestrians be diverted into a portion of a street used concurrently by moving vehicular traffic.

At locations where adjacent alternate walkways cannot be provided, appropriate signs shall be posted at the limits of construction and in advance of the closure at the nearest crosswalk or intersection to divert pedestrians across the street.

Physical barricades shall be installed to prevent visually impaired people from inadvertently entering a closed area. Pedestrian walkways shall be wheelchair accessible at all times. Pedestrian access shall be maintained to all properties adjacent to the construction site.

# (\*\*\*\*\*)

# 1-07.23 Public Convenience and Safety

Section 1-07.23 is supplemented with the following:

The public rights-of-way within the project work areas and the surrounding neighborhoods where construction will either access through, stage in, or actively occur have highly irregular and narrow, non-standard pavement widths; reduced or no shoulder areas; and limited or no sight lines/distance due to substandard horizontal and vertical geometries dictated by existing steep hillside topography. These unique site constraints require project-specific considerations by the Contractor in the sequencing and staging of construction activities, equipment, and materials; planning, preparation, and implementation of traffic control plans and measures; and other means and methods of construction.

Unless otherwise approved by the Engineer and supported by project-specific traffic control plan(s), the contractor shall maintain safe pedestrian and vehicular travel routes and access points for all local traffic and occupants of the individual private residences served by the public rights-of-way within the project work areas at all times. The Contractor shall keep open and clear all public sidewalks, paths, crosswalks, and detectable warning surfaces currently serving the project work areas. Temporary road closures, regardless of extent or duration, shall only be permitted with prior approval of the Engineer based on compliant traffic control plan that includes clear and complete detour provisions. Temporary road closures will only be permitted for limited durations during allowable working hours and all public rights-of-way shall be open with appropriate temporary surfacing and edge safety provisions in-place during non-working hours.

## (\*\*\*\*\*)

# 1-07.24 Rights-of-way

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.

The Contracting Agency will obtain all rights-of-way and easements, both permanent and temporary, as necessary for carrying out the work. Whenever any of the work is accomplished on or through property other than public rights-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 will be made available to the Contractor as soon as practical after they have been obtained by the Engineer.

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.

# (January 1, 2021 COK GSP)

# 1-07.24 Rights-of-way

The appended Section 1-07.24 shall be supplemented by adding the following:

In addition to all agreements and releases between the Contractor and private property owner(s) described in this Section and as required in Section 1-07.6(2), the Contractor shall apply for a City of Kirkland Temporary Use Permit from the City of Kirkland Planning and Building Department for any temporary uses of real property (including both private property and City-owned real property) for temporary construction facilities, storage of materials, or other Contractor needs.

The Contractor shall file with the Engineer signed property release forms (in the format as detailed below) for all properties disturbed or damaged by the Contractor's operations.

	PROPERTY RELEAS	E
	(Contractor's name and add	dress)
DATE:		owner of
·,	. hereby release	Owner of
<u>(Contractor's name)</u> from any property damage property located at	or personal injury resulting fro	m construction on or adjacent to my
during construction of the is my acknowledgment and a satisfactory condition.	d acceptance that my property,	My signature below as identified above, was returned to
	Signed: Name: Address:	
	Phone:	

## (\*\*\*\*\*)

# 1-07.24 Rights-of-way

The appended Section 1-07.24 shall be supplemented by adding the following:

The public rights-of-way within the project work areas and the surrounding neighborhoods where construction will either access through, stage in, or actively occur have highly irregular and narrow, non-standard pavement widths; reduced or no shoulder areas; and limited or no sight lines/distance due to substandard horizontal and vertical geometries dictated by existing steep hillside topography. These unique site constraints require project-specific considerations by the Contractor in the sequencing and staging of construction activities, equipment, and materials; planning, preparation, and implementation of traffic control plans and measures; haul routes, and other means and methods of construction. Any efforts or costs directly or indirectly associated with accommodation of these site-specific conditions, constraints, and limitations are considered incidental to and included in the Bid price of other items of work.

No construction equipment or materials shall be stored or staged within public rights-ofway during non-working hours and all equipment and materials shall be removed/relocated out of the work area rights-of-way at the end of each workday unless otherwise approved by Engineer. Traffic control plans (TCPs) shall include proposed temporary material and equipment staging and laydown areas for review and approval by Engineer. Any efforts or costs directly or indirectly associated with the limited use of existing rights-of-way areas are considered incidental to and included in the Bid price of other items of work.

# 1-08 PROSECUTION AND PROGRESS

Add the following new section:

# (May 25, 2006 APWA GSP)

## 1-08.0 Preliminary Matters

Add the following new section:

# (October 10, 2008 APWA GSP)

#### 1-08.0(1) Preconstruction Conference

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.

## (January 1, 2021 COK GSP; may not be used on FHWA-funded projects)

Add new Section 1-08.0(2).

## 1-08.0(2) Hours of Work

Except in the case of emergency, unless otherwise indicated in the Contract Documents, or unless otherwise approved by the Contracting Agency in advance, the allowable working hours for this Contract Work shall be any consecutive 8-hour period between 7:00 a.m. and 6:00 p.m. of a working day. A maximum 1-hour lunch break is allowable between 7:00 a.m. and 6:00 p.m. and does not count for purposes of the 8-hour working period. The Contract assumes a 5-day work week, exclusive of weekends and holidays observed by the City of Kirkland and identified in Section 1-08.5.

The normal straight time 8-hour working period for the contract shall be established at the preconstruction conference or prior to the Contractor commencing the Work.

Except in the event of an emergency, unless otherwise indicated in the Contract Documents, or unless otherwise approved in advance by the Contracting Agency (including the Contractor obtaining approval for all applicable City of Kirkland permits as required by the City of Kirkland Zoning Code), no Work shall be allowed between the hours of 6:00 p.m. and 7:00 a.m., during weekends (except driveway construction), or during holidays observed by the City of Kirkland and identified in Section 1-08.5.

The Contracting Agency may consider specific and limited requests by the Contractor to allow Work during one or more periods in which Work is not allowed by this Section, but approval of these requests is solely at the discretion of the Contracting Agency as a benefit to the general public. Contractor shall submit a request in writing to the Engineer, including a full and accurate explanation of the type(s) of work to be performed, the period or periods of time outside normal Work hours, and the explanation(s) for why this work cannot be performed during the allowable Work hours.

The Engineer will consider requests and determine conditions and limitations as the Engineer deems necessary, in conformance with the conditions of support for local permitting described in Section 1-07.6. These conditions and limitations are additional to any conditions or limitations that may be required by Contracting Agency permits and/or variances. These conditions may include, but are not limited to:

- 1. Require the Engineer or such assistants as the Engineer may deem necessary to be present during the Work, including (but not limited to):
  - a. Survey crews
  - b. Personnel from the Contracting Agency's material testing laboratory
  - c. Inspectors
  - d. City operations and maintenance staff
  - e. Police, fire, or other public safety officials
  - f. Any other Contracting Agency employees who, in the opinion of the Engineer, are a necessary presence for the Work outside of the allowable working hours;
- 2. Require the Contractor to reimburse the Contracting Agency for all additional costs and expenses in excess of straight-time costs incurred for Contracting Agency employees and expenses during such times;
- 3. Measure Work performed on nights, weekend days, and holidays as working days with regards to the Contract Time; and/or,
- 4. Consider multiple work shifts (such as a sequential 8-hour day period followed by an 8-hour night period) as multiple working days with respect to Contract Time, even if those multiple shifts occur in a single 24-hour period.

If the Engineer approves the Contractor's written request and all conditions and/or restrictions the Engineer applies to that approval are acceptable by the Contractor, the Contractor shall be responsible for obtaining work hours and noise variances as required by Section 1-07.6. The Contractor shall apply to the City of Kirkland Planning and Building Department using <a href="http://mybuildingpermit.com">http://mybuildingpermit.com</a>. The Engineer can provide supporting

documentation, as deemed appropriate by the Engineer, to the Contractor for submission with this application.

Unless otherwise indicated in the Contract Documents or indicated by the Engineer in writing, no claims for equitable adjustments of Contract will be allowed for review and approval time frames for the Contractor to obtain approval for requests to Work outside the approved working hours in this Section. No claims for equitable adjustments of the Contract will be allowed for requirements, including limitations, in approvals to work outside of the allowed working hours in this Section.

Approved Work outside the allowable working hours in this Section is subject to additional noise control requirements. Approval to continue work during these hours may be revoked at any time the Contractor exceeds the Contracting Agency's noise control regulations or complaints are received from the public or adjoining property owners regarding the noise from the Contractor's operations. The Contractor shall have no claim for damages or delays should such permission be revoked for these reasons.

## **Arterial Streets**

<u>No work will be performed on arterial streets during the peak traffic hours</u> of 7:00 a.m. – 9:00 a.m. and 3:00 p.m. – 6:00 p.m., except for emergency work to restore services or unless a City-approved traffic control plan allows work during these peak hours. The following streets are classified as arterials:

STREET	FROM	ТО
Central Way/NE 85th St	Market St	132nd Ave NE
Juanita Dr NE /NE Juanita Dr	NE 143 <sup>rd</sup> St (City Limits)	98th Ave NE
Juanita Woodinville Way	100 <sup>th</sup> Ave NE	NE 145 <sup>th</sup> St (City Limits)
Lake St/Lake Washington Blvd/Northup Wy	Central Way	Northup Way (City Limits)
Kirkland Ave/Kirkland Way	Lake St	NE 85 <sup>th</sup> St
Lakeview Dr /NE 68th St/NE 70th St	Lake Washington Blvd	132nd Ave NE
Market St/98th Ave NE/100th Ave NE	Central Way	NE 145 <sup>th</sup> St (City Limits)
NE 116th St	98th Ave NE	Slater Ave NE
NE 120th St/132nd Ave NE	Slater Ave NE	NE 60th St (City Limits)
NE 124th St	100th Ave NE	East City Limits
NE 128th St	116 <sup>th</sup> Ave NE/116 <sup>th</sup> Way NE	120 <sup>th</sup> Ave NE
Simonds Rd NE	92 <sup>nd</sup> Ave NE (City Limits)	100 <sup>th</sup> Ave NE
Slater Ave NE	NE 116 <sup>th</sup> St	NE 124 <sup>th</sup> St
Totem Lake Blvd	NE 132nd St	124th Ave NE
3 <sup>rd</sup> Street/State Street	Central Way	NE 68 <sup>th</sup> Street/Lakeview Dr.
6 <sup>th</sup> St/6 <sup>th</sup> St S/108 <sup>th</sup> Ave NE	Central Way/NE 85th St	South City Limits

90 <sup>th</sup> Ave NE/NE 131st Way/NE 132nd St	NE 134 <sup>th</sup> St	132nd Ave NE
120 <sup>th</sup> Ave NE/116 <sup>th</sup> Ave NE/116 <sup>th</sup> Way NE	NE 112 <sup>th</sup> St	NE 132 <sup>nd</sup> St
124th Ave NE	NE 85th St	NE 124th St
124th Ave NE	NE 132 <sup>nd</sup> St	NE 145 <sup>th</sup> PI (City Limits)

# (January 1, 2016 COK GSP)

#### 1-08.1 Subcontracting

Section 1-08.1 is supplemented with the following:

A Subcontractor or an Agent to the Subcontractor will not be permitted to perform any work under the contract until the following documents have been completed and submitted to the Engineer for approval:

- 1. Request to Sublet Work (form 421-012).
- 2. Statement of Intent to Pay Prevailing Wages (Form 700-029-000).

The Contractor's records pertaining to the requirements of this Special Provision shall be open to inspection or audit by representatives of the Department during the life of the contract and for a period of not less than three years after the date of acceptance of the contract. The Contractor shall retain these records for that period. The Contractor shall also guarantee that these records of all Subcontractors and Agents shall be open to similar inspection or audit for the same period.

## (January 1, 2016 COK GSP)

#### 1-08.3 Progress Schedule

The order of work will be at the Contractor's option, in keeping with good construction practice and the terms of the contract. All work shall be carried out in accordance with the requirements of the City of Kirkland in compliance with the plans and specifications. However, the Contractor shall so schedule the work within the time constraints noted in the various contract documents, including any permits. The Contractor is cautioned to review said documents and permits and schedule the work appropriately as no additional compensation will be made to the Contractor due to the time constraints imposed by such documents.

## (December 30, 2022 APWA GSP)

## 1-08.3(2)A Type A Progress Schedule

Revise this section to read:

The Contractor shall submit four (4) copies of a Type A Progress Schedule no later than two (2) days prior to the preconstruction conference, or some other mutually agreed upon submittal time. The schedule may be a critical path method (CPM) schedule, bar chart, or other standard schedule format. Regardless of which format used, the schedule shall identify the critical path. The Engineer will evaluate the Type A Progress Schedule and

approve or return the schedule for corrections within 15 calendar days of receiving the submittal.

# (July 23, 2015 APWA GSP)

## 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

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.

# (June 28, 2007 APWA GSP, Option A)

# **1-08.5** Time for Completion

Revise the third and fourth paragraphs to read:

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

Each working day shall be charged to the contract as it occurs, until the contract work is physically complete. If substantial completion has been granted and all the authorized working days have been used, charging of working days will cease. Each week the Engineer will provide the Contractor a statement that shows the number of working days: (1) charged to the contract the week before; (2) specified for the physical completion of the contract; and (3) remaining for the physical completion of the contract. The statement will also show the nonworking days and any partial or whole day the Engineer declares as unworkable. 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. If the Contractor elects to work 10 hours a day and 4 days a week (a 4-10 schedule) and the fifth day of the week in which a 4-10 shift is worked would

ordinarily be charged as a working day then the fifth day of that week will be charged as a working day whether or not the Contractor works on that day.

Revise the sixth paragraph to read:

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

- 1. The physical work on the project must be complete; and
- 2. The Contractor must furnish all documentation required by the contract and required by law, to allow the Contracting Agency to process final acceptance of the contract. The following documents must be received by the Project Engineer prior to establishing a completion date:
  - a. Certified Payrolls (Federal-aid Projects)
  - b. Material Acceptance Certification Documents
  - c. Annual Report of Amounts Paid as MBE/WBE Participants or Quarterly Report of Amounts Credited as DBE Participation, as required by the Contract Provisions.
  - e. Final Contract Voucher Certification
  - f. Property owner releases per Section 1-07.24

# (January 1, 2016 COK GSP)

Section 1-08.5 is supplemented with the following:

This project shall be substantially completed in its entirety within **120** working days.

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

## 1-08.9 Liquidated Damages

Revise the second and third paragraphs to read:

Accordingly, the Contractor agrees:

- 1. To pay (according to the following formula) liquidated damages for each working day beyond the number of working days established for Physical Completion, and
- 2. To authorize the Engineer to deduct these liquidated damages from any money due or coming due to the Contractor.

## Liquidated Damages Formula:

LD=0.15C/T

Where:

LD = liquidated damages per working day (rounded to the nearest dollar)

C = original Contract amount

T = original time for Physical Completion

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

# 1-09 MEASUREMENT AND PAYMENT

# 1-09.2 Weighing Equipment

# (January 1, 2016 COK GSP)

## 1-09.2(1) General Requirements for Weighing Equipment

The second to last paragraph of Section 1-09.2(1) is supplemented with the following:

## Trucks and E-Tickets

All tickets shall, at a minimum, contain the following information:

- 7. Ticket serial number
- 8. Date and hour of weighing
- 9. Weigher's identification

Duplicate tally tickets shall be prepared to accompany each truckload of materials delivered to the project.

It is the responsibility of the Contractor to see that tickets are given to the Inspector on the project for each truckload of material delivered. Pay quantities will be prepared on the basis of said tally tickets, delivered to the Inspector at time of delivery of materials. Tickets not collected at the time of delivery will not be honored for payment.

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

Revise the first paragraph to read:

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

# (December 30, 2022 APWA GSP)

## 1-09.6 Force Account

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 the Engineer.

## (December 30, 2022 APWA GSP)

#### 1-09.7 Mobilization

Delete this Section and replace it with the following:

Mobilization consists of preconstruction expenses and the costs of preparatory Work and operations performed by the Contractor typically occurring before 10 percent of the total original amount of an individual Bid Schedule is earned from other Contract items on that Bid Schedule. Items which are not to be included in the item of Mobilization include but are not limited to:

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

Based on the lump sum Contract price for "Mobilization", partial payments will be made as follows:

- 1. When 5 percent of the total original Bid Schedule amount is earned from other Contract items on that original Bid Schedule, excluding amounts paid for materials on hand, 50 percent of the Bid Item for mobilization on that original Bid Schedule, 5 percent of the total of that original Bid Schedule, or 5 percent of the total original Contract amount, whichever is the least, will be paid.
- When 10 percent of the total original Bid Schedule amount is earned from other Contract items on that original Bid Schedule, excluding amounts paid for materials on hand, 100 percent of the Bid Item for mobilization on that original Bid Schedule, 10 percent of the total of that original Bid Schedule, or 10 percent of the total original Contract amount, whichever is the least, will be paid.
- 3. When the Substantial Completion Date has been established for the project, payment of any remaining amount Bid for mobilization will be paid.

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

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

#### 1-09.9 Payments

Section 1-09.9 is revised to read:

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.

Failure to perform obligations under the Contract by the Contractor may be decreed by the Contracting Agency to be adequate reason for withholding any payments until compliance is achieved.

Upon completion of all Work and after final inspection (Section 1-05.11), the amount due the Contractor under the Contract will be paid based upon the final estimate made by the Engineer and presentation of a Final Contract Voucher Certification to be signed by the Contractor. The Contractor's signature on such voucher shall be deemed a release of all claims of the Contractor unless a Certified Claim is filed in accordance with the requirements of Section 1-09.11 and is expressly excepted from the Contractor's certification on the Final Contract Voucher Certification. The date the Contracting Agency signs the Final Contract Voucher Certification constitutes the final acceptance date (Section 1-05.12).

If the Contractor fails, refuses, or is unable to sign and return the Final Contract Voucher Certification or any other documentation required for completion and final acceptance of the Contract, the Contracting Agency reserves the right to establish a Completion Date (for the purpose of meeting the requirements of RCW 60.28) and unilaterally accept the Contract. Unilateral final acceptance will occur only after the Contractor has been provided the opportunity, by written request from the Engineer, to voluntarily submit such documents. If voluntary compliance is not achieved, formal notification of the impending establishment of a Completion Date and unilateral final acceptance will be provided by email with delivery confirmation from the Contracting Agency to the Contractor, which will provide 30 calendar days for the Contractor to submit the necessary documents. The 30 calendar day period will begin on the date the email with delivery confirmation is received by the Contractor. The date the Contracting Agency unilaterally signs the Final Contract Voucher Certification shall constitute the Completion Date and the final acceptance date (Section 1-05.12). The reservation by the Contracting Agency to unilaterally accept the Contract will apply to Contracts that are Physically Completed in accordance with Section 1-08.5, or for Contracts that are terminated in accordance with Section 1-08.10. Unilateral final acceptance of the Contract by the Contracting Agency does not in any way relieve the Contractor of their responsibility to comply with all Federal, State, tribal, or local laws, ordinances, and regulations that affect the Work under the Contract.

Payment to the Contractor of partial estimates, final estimates, and retained percentages shall be subject to controlling laws.

# (January 1, 2016 COK GSP)

Unless otherwise agreed to by both parties, the work period shall coincide with the calendar month. A check will be mailed or made available to the Contractor no later than thirty (30) days following the last day of the work period.

# (December 30, 2022 APWA GSP)

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

Revise this section to read:

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

# 1-09.13 Claims Resolution

# (February 1, 2021 COK GSP) Option B

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

Delete this Section and replace it with the following:

The Contractor and the Contracting Agency mutually agree that those claims that total \$250,000 or less, submitted in accordance with Section 1-09.11 and not resolved by nonbinding Alternative Dispute Resolution (ADR) processes, **provided Contracting Agency agreed to engage such ADR processes**, shall be resolved through litigation unless the parties mutually agree in writing to resolve the claim through binding arbitration.

# (November 30, 2018 APWA GSP) 1-09.13(3)A Administration of Arbitration

Revise the third paragraph to read:

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

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

Revise this section to read:

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

# 1-10 TEMPORARY TRAFFIC CONTROL

(\*\*\*\*\*)

# 1-10.1 General

Section 1-10.1 shall be deleted in its entirety and replaced with the following:

Temporary traffic control refers to managing and maintaining safe ingress/egress for all vehicular, bicycle, and pedestrian traffic (including pedestrians with disabilities). The Contractor, utilizing contractor labor and contractor-provided equipment and materials, shall plan, manage, supervise, equip, and perform all temporary traffic control activities needed to support the Work of the Contract. This includes maintenance of safe ingress/egress to all individual private residences within the project area during both working and non-working hours.

# (\*\*\*\*\*)

# 1-10.1(2) Description

Section 1-10.1(2) shall be appended by replacing the first paragraph in its entirety with the following:

The public rights-of-way within the project work areas and the surrounding neighborhoods where construction will either access through, stage in, or actively occur have highly irregular and narrow, non-standard pavement widths; reduced or no shoulder areas; and limited or no sight lines/distance due to substandard horizontal and vertical geometries dictated by existing steep hillside topography. These unique site constraints require specific considerations by the Contractor in the selection of equipment, development and implementation of traffic control plans and measures, and the means and methods of construction for the project. Unless otherwise approved by the Engineer and supported by project-specific traffic control plan(s), the contractor shall maintain safe pedestrian and vehicular travel routes and access points for all local traffic and occupants of the individual private residences served by the public rights-of-way within the project work areas.

The Contractor shall keep open and clear all public sidewalks, paths, crosswalks, and detectable warning surfaces currently serving the project work areas. Temporary road closures, regardless of extent or duration, shall only be permitted with prior approval of the Engineer based on compliant traffic control plan that includes clear and complete detour provisions. Temporary road closures will only be permitted for limited durations during allowable working hours and all public rights-of-way shall be open with appropriate temporary surfacing and edge safety provisions in-place during non-working hours.

(\*\*\*\*\*)

# 1-10.2 Traffic Control Management

# 1-10.2(2) Traffic Control Plans

The first paragraph of Section 1-10.2(2) shall be deleted and replaced in its entirety with the following:

The Contractor shall submit a traffic control plan or plans showing methods of safely regulating vehicular, bicycle, and pedestrian traffic through all active or interim construction areas for all anticipated work conditions and activities. Contractor's traffic control plans shall be titled and include a brief description to clearly understand the construction condition/activity for which they are applicable to and shall include sufficient details and specifications regarding the equipment, signage, sequence and duration, and any other information necessary to maintain safe vehicular and pedestrian traffic for the residents during all phases of construction. All construction signs, flaggers, spotters and other traffic control devices shall be shown on the traffic control plan(s) except for emergency situations.

Any temporary road closure that is proposed by the Contractor to facilitate safe and efficient work shall be described by the traffic control plan(s) reviewed and approved by the Engineer prior to construction. Any such temporary road closure shall only be permitted for limited durations during allowable working hours and all public rights-of-way shall be open with appropriate temporary surfacing and edge safety provisions in-place during non-working hours.

# (May 16, 2006 COK GSP)

## 1-10.3 Traffic Control Labor, Procedures, and Devices

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# 1-10.3(3)C Portable Changeable Message Sign

Supplement this section with the following:

Two (2) Portable Changeable Message Signs (PCMS) shall be provided for the duration of the project. The proposed locations and display message(s) for each sign shall be shown on the Traffic Control Plan(s) received and approved by the Engineer prior to placement. Contractor is responsible for programming of the approved message into the PCMS('s), set-up, placement, and removal upon project completion.

## 1-10.5 Payment

(\*\*\*\*\*)

## 1-10.5(3) Reinstating Unit Items with Lump Sum Traffic Control

"Project Temporary Traffic Control", lump sum.

The Contract lump sum price Bid for "Project Temporary Traffic Control" shall constitute full compensation for all labor, tools, equipment, methods, and materials necessary to provide traffic control for the project, including but not limited to all direct, indirect, or incidental costs for planning, layout, installation, operation and maintenance, removal, and transport of traffic control devices and measures. One (1) Traffic Control Supervisor and a minimum of two (2) flaggers shall be included in the lump sum price Bid for "Project Temporary Traffic Control".

Procurement, installation, operating, and maintaining two (2) Portable Changeable Message Signs from seven (7) calendar days prior to the start of construction and throughout the project duration shall be included in the lump sum Bid item "Project Temporary Traffic Control". No separate measurement or payment shall be made for Portable Changeable Message Signs.

All labor, methods, and materials necessary to complete the required Traffic Control Plans (TCPs) for the project shall be considered incidental to the Bid item "Project Temporary Traffic Control". No separate measurement or payment will be made for preparation of TCPs. Costs associated with the preparation, revisions or updates, and implementation of Traffic Control Plans shall be included in the lump sum amount for "Project Temporary Traffic Control".

No separate payment will be made for materials used to maintain temporary traffic control elements, features, or facilities that are not incorporated into the final improvements. Such materials shall be included in and considered incidental to "Project Temporary Traffic Control".

All costs for minimizing drop-offs and maintaining access to and use of existing streets and driveways including, but not limited to, steel sheeting, temporary driving surface as required by Section 1-07.23(1), channelization devices and controls as required throughout the project duration in compliance with the MUTCD including, but not limited to, reflective signage, barricades, lights, traffic cones, and temporary pavement markings shall be included in the lump sum Bid price for "Project Temporary Traffic Control". No additional or separate compensation will be allowed.

The Lump Sum bid item for "Project Temporary Traffic Control" shall cover the cost to provide temporary traffic control for each working day and non-working day (the entire contract duration) allowed as defined in Section 1-08.5 of these Special Provisions. The total allowable working days defined for this contract includes sufficient time to complete all work associated with items paid as "Minor Change" and/or as other Force Account items. Should the Contractor complete the work in fewer working days than allowed the Contract Lump Sum item will be paid in full and shall be consider an incentive to the Contractor for early completion.

For additional working days approved via a change order for work that is not identified to be paid by force account, the daily cost for Project Temporary Traffic Control shall be determined by dividing the lump sum Contract price for "Project Temporary Traffic Control" by the original allowed contract working days as defined in Section 1-08.5 of these Special Provisions.

# END OF DIVISION 1

# DIVISION 2

# **DIVISION 2 – EARTHWORK**

# 2-01 Clearing, Grubbing, and Roadside Cleanup

# (February 17, 2022 COK GSP)

# 2-01.3(1) Clearing

This Section is supplemented with the following:

8. Tree removal shall be performed in a manner that does not damage overhead utilities. The Contractor shall coordinate tree removal activities with the affected utility companies, including meeting all applicable requirements.

## (January 1, 2020 COK GSP)

## 2-01.3(2) Grubbing

This Section is supplemented with the following:

3. Remove stumps of removed trees by grinding. Contractor shall grind stumps to a minimum of 6 inches below either the existing or final ground surface elevation, whichever is lower. The Contractor shall coordinate stump removal activities with the affected utility companies, including meeting all applicable requirements.

## 2-02 Removal of Structures and Obstructions

(\*\*\*\*\*)

## 2-02.1 Description

This Section is supplemented with the following:

The work to excavate, haul, and dispose of existing asphalt pavement sections identified in the plans to be removed and replaced with new pavement sections shall be per Section 2-03. Roadway Excavation and Embankment.

(\*\*\*\*\*)

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

This section shall be supplemented with the following:

The work to excavate, haul, and dispose of existing asphalt pavement materials identified to be removed and replaced with new pavement sections shall be incidental to and included in the unit bid price for Roadway Excavation, Including Haul per the provisions of Section 2-03.

#### (\*\*\*\*\*)

## 2-02.4 Vacant

This section shall be re-titled and revised as follows:

## 2-02.4 Measurement

The item "Removing Cement Concrete Sidewalk/Pavement" shall be measured per square yard of pavement surface area to be removed in accordance with section 2-02.3(3). Measurement and payment for "Removing Cement Concrete Sidewalk/Pavement" shall

include all labor; equipment, materials, means and methods, and incidentals to complete the work which includes haul and disposal of waste materials.

The item "Removing Cement Conc. Curb and Gutter" shall be measured per lineal feet of concrete curb and gutter to be removed in accordance with section 2-02.3(3). Measurement and payment for "Removing Cement Conc. Curb and Gutter" shall include all labor; equipment, materials, means and methods, and incidentals to complete the work which includes haul and disposal of waste materials.

The item "Removing Existing Catch Basin" shall be measured per each for each existing catch basin structure removed and shall include all labor, equipment, materials, means and methods, and incidentals necessary to excavate and remove the existing catch basin and backfill the excavation in accordance with Contract requirements.

The item "Removing Existing Storm Sewer Pipe" shall be measured per lineal fee of pipe removed and shall include all labor, equipment, materials, means and methods, and incidentals necessary to excavate and remove the existing pipe and backfill the excavation in accordance with Contract requirements.

The work to excavate, haul, and dispose of existing asphalt pavement materials identified to be removed and replaced with new pavement sections shall be incidental to and included in the unit bid price for Roadway Excavation, Including Haul per the provisions of Section 2-03.

(\*\*\*\*\*)

## 2-02.5 Payment

This section shall be supplemented with the following:

"Removing Cement Concrete Sidewalk/Pavement, per square yard

"Removing Cement Conc. Curb and Gutter", per lineal feet

"Removing Existing Catch Basin", per each

"Removing Existing Storm Sewer Pipe", per lineal feet

## **END OF DIVISION 2**

# DIVISION 3

# **DIVISION 3 – AGGREGATE PRODUCTION AND ACCEPTANCE**

**END OF DIVISION 3** 

# DIVISION 4

General Special Provisions Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1 CIP No. SDC0900000

# **DIVISION 4 – BASES**

# 4-04 Ballast and Crushed Surfacing

(March 9, 2016 APWA GSP) 4-04.2 Gravel Base

Supplement this section with the following:

#### Permeable Ballast

Permeable ballast shall meet the requirements of Section 9-03.9(1) for ballast except for the following special requirements.

Grading No. 1		Grading No. 2 (AASHTO No. 3)	
Sieve Size	Percent Passing	Sieve Size	Percent Passing
2-1/2"	99-100	2-1/2"	100
2"	65-100	2"	90-100
3/4"	40-80	1-1/2"	35-70
No. 4	0-5	1"	0-15
No. 100	0-2	1/2"	0-5
% Fracture	95	No. 100	0-3
All percentages are by weight.		% Fracture	95

The grading and quality requirements are:

The sand equivalent value and dust ratio requirements do not apply.

Los Angeles Wear, 500 Rev. 30% maximum Degradation Factor 30 minimum

The fracture requirement shall be at least two (2) fractured faces and will apply to the combined aggregate retained on the No. 4 sieve in accordance with WSDOT FOP for AASHTO T 335.

The minimum void ratio of the aggregate shall be 30 percent as determined by AASHTO T 19.

Permeable ballast material may be conditionally approved based on Contractor submitted sampled materials prior to delivery to the site. Final Acceptance will be based on conformance testing completed on material that has been delivered, installed, and compacted on site. The exact point of acceptance will be determined by the Engineer. Material out of conformance with the project specifications will be removed and replaced at the Contractor's expense.

# (March 9, 2016 APWA GSP)

# 4-04.3(5) Shaping and Compaction

Supplement this section with the following:

Immediately following spreading and final shaping each layer of surfacing shall be lightly compacted in one lift until no visible movement of aggregate is observed resulting in a firm and unyielding condition, as determined by the Engineer.

# (May 5, 2015 APWA GSP)

Add the new Section 4-06:

# 4-06 ASPHALT TREATED BASE (ATB)

#### 4-06.1 Description

Asphalt treated base (ATB) consists of a compacted course of base material which has been weatherproofed and stabilized by treatment with an asphalt binder.

The Work shall consist of one or more courses of asphalt treated base placed on the Subgrade in accordance with these Specifications and in conformity with the lines, grades, thicknesses, and typical cross-sections shown in the Plans or as staked.

## 4-06.2 Materials

Materials shall meet the requirements of the following sections:

Asphalt	9-02.1
Anti-Stripping Additive	9-02.4
Aggregates	9-03.6

The grade of paving asphalt shall be as required in the Contract.

## 4-06.3 Construction Requirements

#### 4-06.3(1) Asphalt Mixing Plant

Asphalt mixing plants for asphalt treated base shall meet the following requirements:

## Heating

The plant shall be capable of heating the aggregates to the required temperature.

## Proportioning

The mixing plant shall be capable of proportioning: the aggregates to meet the Specifications, and the asphalt binder will be introduced at the rate specified in the approved mix design. If the aggregates are supplied in two or more sizes, means shall be provided for proportioning or blending the different sizes of aggregates to produce material meeting the Specification requirements.

Recycled asphalt pavement (RAP) may be used in the production of ATB. If utilized, the amount of RAP shall not exceed 30 percent of the total weight of the ATB. The final gradation and asphalt binder content will conform to the approved Job Mix Formula (JMF).

ATB will be evaluated under Commercial Evaluation as shown in section 9-03.8(7). Va limts under 9-03.8(7) are excluded from ATB evaluation criteria.

# Mixing

The mixer shall be capable of producing a uniform mixture of uniformly coated aggregates meeting the requirements of these Specifications.

# 4-06.3(2) Preparation of Aggregates

Aggregates for asphalt treated base shall be stockpiled before use in accordance with the requirements of Section 3-02.

The aggregates shall be heated as required by the Engineer.

## 4-06.3(2)A Mix Design

The mix design requirements for asphalt treated base shall be as described in Section 9-03.6(3). N<sub>design</sub> will be 100 gyrations for all ATB design applications. The asphalt binder shall be PG 64-22 unless specifically altered in the project specifications. The proposed mix design will be submitted for review on WSDOT Form 350-042 with included notes applicable to the ATB design evaluation.

# 4-06.3(3) Vacant

## 4-06.3(4) Mixing

The asphalt treated base shall be mixed in accordance with the requirements of Section 5-04.3(8).

## 4-06.3(5) Hauling Equipment

Hauling equipment for asphalt treated base shall conform to the requirements of Section 5-04.3(2).

## 4-06.3(6) Spreading and Finishing

Asphalt treated base shall be spread with a spreading machine equipped with a stationary, vibratory, or oscillating screed or cut-off device, subject to the approval of the Engineer. Approval of the equipment shall be based on a job demonstration that the finished product will meet all requirements of the Specifications. Automatic controls will not be required. Unless otherwise directed by the Engineer, the nominal compacted depth of any ATB layer shall not exceed 0.40 feet. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the paving may be done with other equipment or by hand.

The internal temperature of the ATB mixture at the time compaction is achieved shall be a minimum of 185°F. Rollers shall only be operated in the static mode when the internal temperature of the mix is less than 175°F.

## 4-06.3(6)A Subgrade Protection Course

Unless otherwise specified by the Engineer, the Contractor shall place the asphalt treated base as a protection for the prepared Subgrade on all sections of individual Roadways

which are to receive asphalt treated base as soon as 10,000 square yards of Subgrade is completed. This requirement shall not be limited to contiguous areas on the project.

The surface of the Subgrade protection layer when constructed on a grading project shall conform to grade and smoothness requirements that apply to the Subgrade upon which it is placed.

# 4-06.3(6)B Finish Course

The final surface course of the asphalt treated base, excluding Shoulders, shall not deviate at any point more than  $\frac{3}{6}$  inch from the bottom of a 10-foot straightedge laid in any direction on the surface on either side of the Roadway crown. Failure to meet this requirement shall necessitate sufficient surface correction to achieve the required tolerance, as approved by the Engineer, at no expense to the Contracting Agency.

When portland cement concrete pavement is placed on an asphalt base, the surface tolerance of the asphalt base shall be such that no elevation lies more than 0.05 feet below nor 0.00 feet above the plan grade minus the specified plan depth of portland cement concrete pavement. Prior to placing the portland cement concrete pavement, any such irregularities shall be brought to the required tolerance by grinding or other means approved by the Engineer, at no expense to the Contracting Agency.

# 4-06.3(7) Density

The asphalt treated base shall be compacted to a density of not less than 80% percent of the maximum theoretical density established for the mix by WSDOT FOP for AASHTO T 209. The density of the base shall be determined by means of tests on cores taken from the Roadway or with the nuclear gauge in accordance with Section 5-04.3(10)B. The frequency of these tests shall be at the discretion of the Engineer, but in no case shall it be less than one control lot for each normal day's production. The use of equipment which results in damage to the materials or produces substandard workmanship will not be permitted.

# 4-06.3(8) Anti-Stripping Additive

An anti-stripping additive shall be added to the asphalt binder material in accordance with Section 9-02.4 in the amount designated in a WSDOT mix design/anti-strip evaluation report for a dense graded hot mix asphalt design from the same gravel source within the last 24 months or as evaluated separately by an accredited lab using current WSDOT test methods (AASHTO T324 – Hamburg or WSDOT TM T718 – Modified Lottman). Alternately, the ATB may be evaluated for anti-strip additive using ASTM D3625 (Standard Practice for Effect of Water on Bituminous-Coated Aggregate Using Boiling Water) by an accredited lab. The anti-stripping additive required will be the minimum amount necessary to achieve a passing evaluation.

## 4-06.4 Measurement

Asphalt treated base including paving asphalt will be measured by the ton.

## 4-06.5 Payment

Payment will be made in accordance with Section 1-04.1, for each of the following Bid items that are included in the Proposal:

"Asphalt Treated Base, PG XX-XX", per ton.

"Anti-Stripping Additive", if required by one of the evaluation methods allowed in 4-06.3(8), shall be added and included in the unit contract price for Asphalt Treated Base, PG XX-XX, per ton. There will be no separate additional payment for the required anti-strip additive.

# **END OF DIVISION 4**

# DIVISION 5

# **DIVISION 5 – SURFACE TREATMENTS AND PAVEMENTS**

# (July 18, 2018 APWA GSP)

Delete Section 5-04 and all amendments and replace it with the following Section 5-04:

# 5-04 Hot Mix Asphalt

# 5-04.1 Description

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

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

# 5-04.2 Materials

Materials shall meet the requirements of the following sections:

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

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

The Contractor may choose to utilize recycled asphalt pavement (RAP) in the production of HMA. The RAP may be from pavements removed under the Contract, if any, or pavement material from an existing stockpile.

The Contractor may use up to 20 percent RAP by total weight of HMA with no additional sampling or testing of the RAP. The RAP shall be sampled and tested at a frequency of one sample for every 1,000 tons produced and not less than ten samples per project. The asphalt content and gradation test data shall be reported to the Contracting Agency when submitting the mix design for approval on the QPL. The Contractor shall include the RAP as part of the mix design as defined in these Specifications.

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

The Contractor may only use warm mix asphalt (WMA) processes in the production of HMA with 20 percent or less RAP by total weight of HMA. The Contractor shall submit to the Engineer for approval the process that is proposed and how it will be used in the manufacture of HMA.

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

# 5-04.2(1) How to Get an HMA Mix Design on the QPL

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

# 5-04.2(1)A Vacant

## 5-04.2(2) Mix Design – Obtaining Project Approval

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

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

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

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

• The WSDOT Mix Design Evaluation Report from the current WSDOT QPL, or one of the mix design verification certifications listed below.

- The proposed HMA mix design on WSDOT Form 350-042 with the seal and certification (stamp & sig-nature) of a valid licensed Washington State Professional Engineer.
- The Mix Design Report for the proposed HMA mix design developed by a qualified City or County laboratory that is within one year of the approval date.\*\*

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

Mix designs for HMA accepted by Nonstatistical evaluation shall:

- Have the aggregate structure and asphalt binder content determined in accordance with WSDOT Standard Operating Procedure 732 and meet the requirements of Sections 9-03.8(2), except that Hamburg testing for ruts and stripping are at the discretion of the Engineer, and 9-03.8(6).
- Have anti-strip requirements, if any, for the proposed mix design determined in accordance with AASHTO T 283 or T 324, or based on historic anti-strip and aggregate source compatibility from previous WSDOT lab testing.

At the discretion of the Engineer, agencies may accept verified mix designs older than 12 months from the original verification date with a certification from the Contractor that the materials and sources are the same as those shown on the original mix design.

Commercial Evaluation Approval of a mix design for "Commercial Evaluation" will be based on a review of the Contractor's submittal of WSDOT Form 350-042 (For commercial mixes, AASHTO T 324 evaluation is not required) or a Mix Design from the current WSDOT QPL or from one of the processes allowed by this section. Testing of the HMA by the Contracting Agency for mix design approval is not required.

For the Bid Item Commercial HMA, the Contractor shall select a class of HMA and design level of Equivalent Single Axle Loads (ESAL's) appropriate for the required use.

## 5-04.2(2)B Using Warm Mix Asphalt Processes

The Contractor may elect to use additives that reduce the optimum mixing temperature or serve as a compaction aid for producing HMA. Additives include organic additives, chemical additives and foaming processes. The use of Additives is subject to the following:

- Do not use additives that reduce the mixing temperature more than allowed in Section 5-04.3(6) in the production of mixtures.
- Before using additives, obtain the Engineer's approval using WSDOT Form 350-076 to describe the proposed additive and process.

# 5-04.3 Construction Requirements

#### 5-04.3(1) Weather Limitations

Do not place HMA for wearing course on any Traveled Way beginning October 1st through March 31st of the following year without written concurrence from the Engineer.

Do not place HMA on any wet surface, or when the average surface temperatures are less than those specified below, or when weather conditions otherwise prevent the proper handling or finishing of the HMA.

Compacted Thickness (Feet)	Wearing Course	Other Courses	
Less than 0.10	55∘F	45∘F	
0.10 to .20	45∘F	35∘F	
More than 0.20	35∘F	35∘F	

Minimum Surface Temperature for Paving

## 5-04.3(2) Paving Under Traffic

When the Roadway being paved is open to traffic, the requirements of this Section shall apply.

The Contractor shall keep intersections open to traffic at all times except when paving the intersection or paving across the intersection. During such time, and provided that there has been an advance warning to the public, the intersection may be closed for the minimum time required to place and compact the mixture. In hot weather, the Engineer may require the application of water to the pavement to accelerate the finish rolling of the pavement and to shorten the time required before reopening to traffic.

Before closing an intersection, advance warning signs shall be placed and signs shall also be placed marking the detour or alternate route.

During paving operations, temporary pavement markings shall be maintained throughout the project. Temporary pavement markings shall be installed on the Roadway prior to opening to traffic. Temporary pavement markings shall be in accordance with Section 8-23.

All costs in connection with performing the Work in accordance with these requirements, except the cost of temporary pavement markings, shall be included in the unit Contract prices for the various Bid items involved in the Contract.

## 5-04.3(3) Equipment

## 5-04.3(3)A Mixing Plant

Plants used for the preparation of HMA shall conform to the following requirements:

- Equipment for Preparation of Asphalt Binder Tanks for the storage of asphalt binder shall be equipped to heat and hold the material at the required temperatures. The heating shall be accomplished by steam coils, electricity, or other approved means so that no flame shall be in contact with the storage tank. The circulating system for the asphalt binder shall be designed to ensure proper and continuous circulation during the operating period. A valve for the purpose of sampling the asphalt binder shall be placed in either the storage tank or in the supply line to the mixer.
- 2. Thermometric Equipment An armored thermometer, capable of detecting temperature ranges expected in the HMA mix, shall be fixed in the asphalt binder feed line at a location near the charging valve at the mixer unit. The thermometer location shall be convenient and safe for access by Inspectors. The plant shall also be equipped with an approved dial-scale thermometer, a mercury actuated thermometer, an electric pyrometer, or another approved thermometric instrument placed at the discharge chute of the drier to automatically register or indicate the temperature of the heated aggregates. This device shall be in full view of the plant operator.
- 3. Heating of Asphalt Binder The temperature of the asphalt binder shall not exceed the maximum recommended by the asphalt binder manufacturer nor shall it be below the minimum temperature required to maintain the asphalt binder in a homogeneous state. The asphalt binder shall be heated in a manner that will avoid local variations in heating. The heating method shall provide a continuous supply of asphalt binder to the mixer at a uniform average temperature with no individual variations exceeding 25°F. Also, when a WMA additive is included in the asphalt binder, the temperature of the asphalt binder shall not exceed the maximum recommended by the manufacturer of the WMA additive.
- 4. **Sampling and Testing of Mineral Materials** The HMA plant shall be equipped with a mechanical sampler for the sampling of the mineral materials. The mechanical sampler shall meet the requirements of Section 1-05.6 for the crushing and screening operation. The Contractor shall provide for the setup and operation of the field testing facilities of the Contracting Agency as provided for in Section 3-01.2(2).
- 5. **Sampling HMA** The HMA plant shall provide for sampling HMA by one of the following methods:
  - a. A mechanical sampling device attached to the HMA plant.
  - b. Platforms or devices to enable sampling from the hauling vehicle without entering the hauling vehicle.

# 5-04.3(3)B Hauling Equipment

Trucks used for hauling HMA shall have tight, clean, smooth metal beds and shall have a cover of canvas or other suitable material of sufficient size to protect the mixture from adverse weather. Whenever the weather conditions during the work shift include, or are forecast to include, precipitation or an air temperature less than 45°F or when time from loading to unloading exceeds 30 minutes, the cover shall be securely attached to protect the HMA.

The contractor shall provide an environmentally benign means to prevent the HMA mixture from adhering to the hauling equipment. Excess release agent shall be drained prior to filling

hauling equipment with HMA. Petroleum derivatives or other coating material that contaminate or alter the characteristics of the HMA shall not be used. For live bed trucks, the conveyer shall be in operation during the process of applying the release agent.

# 5-04.3(3)C Pavers

HMA pavers shall be self-contained, power-propelled units, provided with an internally heated vibratory screed and shall be capable of spreading and finishing courses of HMA plant mix material in lane widths required by the paving section shown in the Plans.

The HMA paver shall be in good condition and shall have the most current equipment available from the manufacturer for the prevention of segregation of the HMA mixture installed, in good condition, and in working order. The equipment certification shall list the make, model, and year of the paver and any equipment that has been retrofitted.

The screed shall be operated in accordance with the manufacturer's recommendations and shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, segregating, or gouging the mixture. A copy of the manufacturer's recommendations shall be provided upon request by the Contracting Agency. Extensions will be allowed provided they produce the same results, including ride, density, and surface texture as obtained by the primary screed. Extensions without augers and an internally heated vibratory screed shall not be used in the Traveled Way.

When specified in the Contract, reference lines for vertical control will be required. Lines shall be placed on both outer edges of the Traveled Way of each Roadway. Horizontal control utilizing the reference line will be permitted. The grade and slope for intermediate lanes shall be controlled automatically from reference lines or by means of a mat referencing device and a slope control device. When the finish of the grade prepared for paving is superior to the established tolerances and when, in the opinion of the Engineer, further improvement to the line, grade, cross-section, and smoothness can best be achieved without the use of the reference line, a mat referencing device may be substituted for the reference line. Substitution of the device will be subject to the continued approval of the Engineer. The reference line may be removed after the completion of the first course of HMA when approved by the Engineer. Whenever the Engineer determines that any of these methods are failing to provide the necessary vertical control, the reference lines will be reinstalled by the Contractor.

The Contractor shall furnish and install all pins, brackets, tensioning devices, wire, and accessories necessary for satisfactory operation of the automatic control equipment.

If the paving machine in use is not providing the required finish, the Engineer may suspend Work as allowed by Section 1-08.6. Any cleaning or solvent type liquids spilled on the pavement shall be thoroughly removed before paving proceeds.

## 5-04.3(3)D Material Transfer Device or Material Transfer Vehicle

A Material Transfer Device/Vehicle (MTD/V) shall only be used with the Engineer's approval, unless other-wise required by the contract.

Where an MTD/V is required by the contract, the Engineer may approve paving without an MTD/V, at the request of the Contractor. The Engineer will determine if an equitable adjustment in cost or time is due.

When used, the MTD/V shall mix the HMA after delivery by the hauling equipment and prior to laydown by the paving machine. Mixing of the HMA shall be sufficient to obtain a uniform temperature throughout the mixture. If a windrow elevator is used, the length of the windrow may be limited in urban areas or through intersections, at the discretion of the Engineer.

To be approved for use, an MTV:

- 1. Shall be self-propelled vehicle, separate from the hauling vehicle or paver.
- 2. Shall not be connected to the hauling vehicle or paver.
- 3. May accept HMA directly from the haul vehicle or pick up HMA from a windrow.
- 4. Shall mix the HMA after delivery by the hauling equipment and prior to placement into the paving machine.
- 5. Shall mix the HMA sufficiently to obtain a uniform temperature throughout the mixture.

To be approved for use, an MTD:

- 1. Shall be positively connected to the paver.
- 2. May accept HMA directly from the haul vehicle or pick up HMA from a windrow.
- 3. Shall mix the HMA after delivery by the hauling equipment and prior to placement into the paving machine.
- 4. Shall mix the HMA sufficiently to obtain a uniform temperature throughout the mixture.

## 5-04.3(3)E Rollers

Rollers shall be of the steel wheel, vibratory, oscillatory, or pneumatic tire type, in good condition and capable of reversing without backlash. Operation of the roller shall be in accordance with the manufacturer's recommendations. When ordered by the Engineer for any roller planned for use on the project, the Contractor shall provide a copy of the manufacturer's recommendation for the use of that roller for compaction of HMA. The number and weight of rollers shall be sufficient to compact the mixture in compliance with the requirements of Section 5-04.3(10). The use of equipment that results in crushing of the aggregate will not be permitted. Rollers producing pickup, washboard, uneven compaction of the surface, displacement of the mixture or other undesirable results shall not be used.

## 5-04.3(4) Preparation of Existing Paved Surfaces

When the surface of the existing pavement or old base is irregular, the Contractor shall bring it to a uniform grade and cross-section as shown on the Plans or approved by the Engineer.

Pre-leveling of uneven or broken surfaces over which HMA is to be placed may be accomplished by using an asphalt paver, a motor patrol grader, or by hand raking, as approved by the Engineer.

Compaction of pre-leveling HMA shall be to the satisfaction of the Engineer and may require the use of small steel wheel rollers, plate compactors, or pneumatic rollers to avoid bridging across pre-leveled areas by the compaction equipment. Equipment used for the compaction of pre-leveling HMA shall be approved by the Engineer.

Before construction of HMA on an existing paved surface, the entire surface of the pavement shall be clean. All fatty asphalt patches, grease drippings, and other objectionable matter shall be entirely removed from the existing pavement. All pavements or bituminous surfaces shall be thoroughly cleaned of dust, soil, pavement grindings, and other foreign matter. All holes and small depressions shall be filled with an appropriate class of HMA. The surface of the patched area shall be leveled and compacted thoroughly. Prior to the application of tack coat, or paving, the condition of the surface shall be approved by the Engineer.

A tack coat of asphalt shall be applied to all paved surfaces on which any course of HMA is to be placed or abutted; except that tack coat may be omitted from clean, newly paved surfaces at the discretion of the Engineer. Tack coat shall be uniformly applied to cover the existing pavement with a thin film of residual asphalt free of streaks and bare spots at a rate between 0.02 and 0.10 gallons per square yard of retained asphalt. The rate of application shall be approved by the Engineer. A heavy application of tack coat shall be applied to all joints. For Roadways open to traffic, the application of tack coat shall be limited to surfaces that will be paved during the same working shift. The spreading equipment shall be equipped with a thermometer to indicate the temperature of the tack coat material.

Equipment shall not operate on tacked surfaces until the tack has broken and cured. If the Contractor's operation damages the tack coat it shall be repaired prior to placement of the HMA.

The tack coat shall be CSS-1, or CSS-1h emulsified asphalt. The CSS-1 and CSS-1h emulsified asphalt may be diluted once with water at a rate not to exceed one part water to one part emulsified asphalt. The tack coat shall have sufficient temperature such that it may be applied uniformly at the specified rate of application and shall not exceed the maximum temperature recommended by the emulsified asphalt manufacturer.

## 5-04.3(4)A Crack Sealing

## 5-04.3(4)A1 General

When the Proposal includes a pay item for crack sealing, seal all cracks  $\frac{1}{4}$  inch in width and greater.

**Cleaning**: Ensure that cracks are thoroughly clean, dry and free of all loose and foreign material when filling with crack sealant material. Use a hot compressed air lance to dry and

warm the pavement surfaces within the crack immediately prior to filling a crack with the sealant material. Do not overheat pavement. Do not use direct flame dryers. Routing cracks is not required.

**Sand Slurry**: For cracks that are to be filled with sand slurry, thoroughly mix the components and pour the mixture into the cracks until full. Add additional CSS-1 cationic emulsified asphalt to the sand slurry as needed for workability to ensure the mixture will completely fill the cracks. Strike off the sand slurry flush with the existing pavement surface and allow the mixture to cure. Top off cracks that were not completely filled with additional sand slurry. Do not place the HMA overlay until the slurry has fully cured.

The sand slurry shall consist of approximately 20 percent CSS-1 emulsified asphalt, approximately 2 percent portland cement, water (if required), and the remainder clean Class 1 or 2 fine aggregate per section 9-03.1(2). The components shall be thoroughly mixed and then poured into the cracks and joints until full. The following day, any cracks or joints that are not completely filled shall be topped off with additional sand slurry. After the sand slurry is placed, the filler shall be struck off flush with the existing pavement surface and allowed to cure. The HMA overlay shall not be placed until the slurry has fully cured. The requirements of Section 1-06 will not apply to the portland cement and sand used in the sand slurry.

In areas where HMA will be placed, use sand slurry to fill the cracks.

In areas where HMA will not be placed, fill the cracks as follows:

- 1. Cracks <sup>1</sup>/<sub>4</sub> inch to 1 inch in width fill with hot poured sealant.
- 2. Cracks greater than 1 inch in width fill with sand slurry.

**Hot Poured Sealant**: For cracks that are to be filled with hot poured sealant, apply the material in accordance with these requirements and the manufacturer's recommendations. Furnish a Type 1 Working Drawing of the manufacturer's product information and recommendations to the Engineer prior to the start of work, including the manufacturer's recommended heating time and temperatures, allowable storage time and temperatures after initial heating, allowable reheating criteria, and application temperature range. Confine hot poured sealant material within the crack. Clean any overflow of sealant from the pavement surface. If, in the opinion of the Engineer, the Contractor's method of sealing the cracks with hot poured sealant results in an excessive amount of material on the pavement surface, stop and correct the operation to eliminate the excess material.

# 5-04.3(4)A2 Crack Sealing Areas Prior to Paving

In areas where HMA will be placed, use sand slurry to fill the cracks.

# 5-04.3(4)A3 Crack Sealing Areas Not to be Paved

In areas where HMA will not be placed, fill the cracks as follows:

- A. Cracks <sup>1</sup>/<sub>4</sub> inch to 1 inch in width fill with hot poured sealant.
- B. Cracks greater than 1 inch in width fill with sand slurry.

# 5-04.3(4)B Vacant

#### 5-04.3(4)C Pavement Repair

The Contractor shall excavate pavement repair areas and shall backfill these with HMA in accordance with the details shown in the Plans and as marked in the field. The Contractor shall conduct the excavation operations in a manner that will protect the pavement that is to remain. Pavement not designated to be removed that is damaged as a result of the Contractor's operations shall be repaired by the Contractor to the satisfaction of the Engineer at no cost to the Contracting Agency. The Contractor shall excavate only within one lane at a time unless approved otherwise by the Engineer. The Contractor shall not excavate more area than can be completely finished during the same shift, unless approved by the Engineer.

Unless otherwise shown in the Plans or determined by the Engineer, excavate to a depth of 1.0 feet. The Engineer will make the final determination of the excavation depth required. The minimum width of any pavement repair area shall be 40 inches unless shown otherwise in the Plans. Before any excavation, the existing pavement shall be sawcut or shall be removed by a pavement grinder. Excavated materials will become the property of the Contractor and shall be disposed of in a Contractor-provided site off the right-of-way or used in accordance with Sections 2-02.3(3) or 9-03.21.

Asphalt for tack coat shall be required as specified in Section 5-04.3(4). A heavy application of tack coat shall be applied to all surfaces of existing pavement in the pavement repair area.

Placement of the HMA backfill shall be accomplished in lifts not to exceed 0.35-foot compacted depth. Lifts that exceed 0.35-foot of compacted depth may be accomplished with the approval of the Engineer. Each lift shall be thoroughly compacted by a mechanical tamper or a roller.

## 5-04.3(5) Producing/Stockpiling Aggregates and RAP

Aggregates and RAP shall be stockpiled according to the requirements of Section 3-02. Sufficient storage space shall be provided for each size of aggregate and RAP. Materials shall be removed from stockpile(s) in a manner to ensure minimal segregation when being moved to the HMA plant for processing into the final mixture. Different aggregate sizes shall be kept separated until they have been delivered to the HMA plant.

## 5-04.3(5)A Vacant

#### 5-04.3(6) Mixing

After the required amount of mineral materials, asphalt binder, recycling agent and antistripping additives have been introduced into the mixer the HMA shall be mixed until complete and uniform coating of the particles and thorough distribution of the asphalt binder throughout the mineral materials is ensured. When discharged, the temperature of the HMA shall not exceed the optimum mixing temperature by more than 25°F as shown on the reference mix design report or as approved by the Engineer. Also, when a WMA additive is included in the manufacture of HMA, the discharge temperature of the HMA shall not exceed the maximum recommended by the manufacturer of the WMA additive. A maximum water content of 2 percent in the mix, at discharge, will be allowed providing the water causes no problems with handling, stripping, or flushing. If the water in the HMA causes any of these problems, the moisture content shall be reduced as directed by the Engineer.

Storing or holding of the HMA in approved storage facilities will be permitted with approval of the Engineer, but in no event shall the HMA be held for more than 24 hours. HMA held for more than 24 hours after mixing shall be rejected. Rejected HMA shall be disposed of by the Contractor at no expense to the Contracting Agency. The storage facility shall have an accessible device located at the top of the cone or about the third point. The device shall indicate the amount of material in storage. No HMA shall be accepted from the storage facility, except as the storage facility is being emptied at the end of the working shift.

Recycled asphalt pavement (RAP) utilized in the production of HMA shall be sized prior to entering the mixer so that a uniform and thoroughly mixed HMA is produced. If there is evidence of the recycled asphalt pavement not breaking down during the heating and mixing of the HMA, the Contractor shall immediately suspend the use of the RAP until changes have been approved by the Engineer. After the required amount of mineral materials, RAP, new asphalt binder and asphalt rejuvenator have been introduced into the mixer the HMA shall be mixed until complete and uniform coating of the particles and thorough distribution of the asphalt binder throughout the mineral materials, and RAP is ensured.

# 5-04.3(7) Spreading and Finishing

The mixture shall be laid upon an approved surface, spread, and struck off to the grade and elevation established. HMA pavers complying with Section 5-04.3(3) shall be used to distribute the mixture. Unless otherwise directed by the Engineer, the nominal compacted depth of any layer of any course shall not exceed the following:

HMA Class 1"	0.35 feet
HMA Class $\frac{3}{4}$ " and HMA Class $\frac{1}{2}$ "	
wearing course	0.30 feet
other courses	0.35 feet
HMA Class ¾"	0.15 feet

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the paving may be done with other equipment or by hand.

When more than one JMF is being utilized to produce HMA, the material produced for each JMF shall be placed by separate spreading and compacting equipment. The intermingling of

HMA produced from more than one JMF is prohibited. Each strip of HMA placed during a work shift shall conform to a single JMF established for the class of HMA specified unless there is a need to make an adjustment in the JMF.

# 5-04.3(8) Aggregate Acceptance Prior to Incorporation in HMA

For HMA accepted by nonstatistical evaluation the aggregate properties of sand equivalent, uncompacted void content and fracture will be evaluated in accordance with Section 3-04. Sampling and testing of aggregates for HMA accepted by commercial evaluation will be at the option of the Engineer.

# 5-04.3(9) HMA Mixture Acceptance

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

Nonstatistical evaluation will be used for the acceptance of HMA unless Commercial Evaluation is specified.

Commercial evaluation will be used for Commercial HMA and for other classes of HMA in the following applications: sidewalks, road approaches, ditches, slopes, paths, trails, gores, prelevel, temporary pavement, and pavement repair. Other nonstructural applications of HMA accepted by commercial evaluation shall be as approved by the Engineer. Sampling and testing of HMA accepted by commercial evaluation will be at the option of the Engineer.

The mix design will be the initial JMF for the class of HMA. The Contractor may request a change in the JMF. Any adjustments to the JMF will require the approval of the Engineer and may be made in accordance with this section.

## **HMA** Tolerances and Adjustments

 Job Mix Formula Tolerances – The constituents of the mixture at the time of acceptance shall be within tolerance. The tolerance limits will be established as follows:

For Asphalt Binder and Air Voids (Va), the acceptance limits are determined by adding the tolerances below to the approved JMF values. These values will also be the Upper Specification Limit (USL) and Lower Specification Limit (LSL) required in Section 1-06.2(2)D2

Property	Non-Statistical	Commercial
	Evaluation	Evaluation
Asphalt	+/- 0.5%	+/- 0.7%
Binder		
Air Voids, Va	2.5% min. and 5.5%	N/A
	max	

For Aggregates in the mixture:

a. First, determine preliminary upper and lower acceptance limits by applying the following tolerances to the approved JMF.

Aggregate Percent	Non-	Commercial
Passing	Statistical	Evaluation
_	Evaluation	
1", ¾", ½", and 3/8"	+/- 6%	+/- 8%
sieves		
No. 4 sieve	+/-6%	+/- 8%
No. 8 Sieve	+/- 6%	+/-8%
No. 200 sieve	+/- 2.0%	+/- 3.0%

- b. Second, adjust the preliminary upper and lower acceptance limits determined from step (a) the minimum amount necessary so that none of the aggregate properties are outside the control points in Section 9-03.8(6). The resulting values will be the upper and lower acceptance limits for aggregates, as well as the USL and LSL required in Section 1-06.2(2)D2.
- Job Mix Formula Adjustments An adjustment to the aggregate gradation or asphalt binder content of the JMF requires approval of the Engineer. Adjustments to the JMF will only be considered if the change produces material of equal or better quality and may require the development of a new mix design if the adjustment exceeds the amounts listed below.
  - a. **Aggregates** –2 percent for the aggregate passing the 1½", 1", ¾", ½", ¾", and the No. 4 sieves, 1 percent for aggregate passing the No. 8 sieve, and 0.5 percent for the aggregate passing the No. 200 sieve. The adjusted JMF shall be within the range of the control points in Section 9-03.8(6).
  - b. Asphalt Binder Content The Engineer may order or approve changes to asphalt binder content. The maximum adjustment from the approved mix design for the asphalt binder content shall be 0.3 percent

# 5-04.3(9)A Vacant

## 5-04.3(9)B Vacant

## 5-04.3(9)C Mixture Acceptance – Nonstatistical Evaluation

HMA mixture which is accepted by Nonstatistical Evaluation will be evaluated by the Contracting Agency by dividing the HMA tonnage into lots.

## 5-04.3(9)C1 Mixture Nonstatistical Evaluation – Lots and Sublots

A lot is represented by randomly selected samples of the same mix design that will be tested for acceptance. A lot is defined as the total quantity of material or work produced for each Job Mix Formula placed. Only one lot per JMF is expected. A sublot shall be equal to one day's production or 800 tons, whichever is less except that the final sublot will be a minimum of 400 tons and may be increased to 1200 tons.

All of the test results obtained from the acceptance samples from a given lot shall be evaluated collectively. If the Contractor requests a change to the JMF that is approved, the material produced after the change will be evaluated on the basis of the new JMF for the remaining sublots in the current lot and for acceptance of subsequent lots. For a lot in progress with a CPF less than 0.75, a new lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced.

Sampling and testing for evaluation shall be performed on the frequency of one sample per sublot.

## 5-04.3(9)C2 Mixture Nonstatistical Evaluation Sampling

Samples for acceptance testing shall be obtained by the Contractor when ordered by the Engineer. The Contractor shall sample the HMA mixture in the presence of the Engineer and in accordance with AASH-TO T 168. A minimum of three samples should be taken for each class of HMA placed on a project. If used in a structural application, at least one of the three samples shall to be tested.

Sampling and testing HMA in a Structural application where quantities are less than 400 tons is at the discretion of the Engineer.

For HMA used in a structural application and with a total project quantity less than 800 tons but more than 400 tons, a minimum of one acceptance test shall be performed. In all cases, a minimum of 3 samples will be obtained at the point of acceptance, a minimum of one of the three samples will be tested for conformance to the JMF:

- If the test results are found to be within specification requirements, additional testing will be at the Engineer's discretion.
- If test results are found not to be within specification requirements, additional testing of the remaining samples to determine a Composite Pay Factor (CPF) shall be performed.

## 5-04.3(9)C3 Mixture Nonstatistical Evaluation – Acceptance Testing

Testing of HMA for compliance of  $V_a$  will at the option of the Contracting Agency. If tested, compliance of  $V_a$  will use WSDOT SOP 731.

Testing for compliance of asphalt binder content will be by WSDOT FOP for AASHTO T 308.

Testing for compliance of gradation will be by FOP for WAQTC T 27/T 11.

## 5-04.3(9)C4 Mixture Nonstatistical Evaluation – Pay Factors

For each lot of material falling outside the tolerance limits in 5-04.3(9), the Contracting Agency will determine a Composite Pay Factor (CPF) using the following price adjustment factors:

Table of Price Adjustment Factors	
Constituent	Facto r "f"

All aggregate passing: $1\frac{1}{2}$ , $1$ , $\frac{3}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $\frac{1}{2}$ , $\frac{3}{8}$ " and No.4 sieves	2
All aggregate passing No. 8 sieve	15
All aggregate passing No. 200 sieve	20
Asphalt binder	40
Air Voids (Va) (where applicable)	20

Each lot of HMA produced under Nonstatistical Evaluation and having all constituents falling within the tolerance limits of the job mix formula shall be accepted at the unit Contract price with no further evaluation. When one or more constituents fall outside the nonstatistical tolerance limits in the Job Mix Formula shown in Table of Price Adjustment Factors, the lot shall be evaluated in accordance with Section 1-06.2 to determine the appropriate CPF. The nonstatistical tolerance limits will be used in the calculation of the CPF and the maximum CPF shall be 1.00. When less than three sublots exist, backup samples of the existing sublots or samples from the Roadway shall be tested to provide a minimum of three sets of results for evaluation.

# 5-04.3(9)C5 Vacant

## 5-04.3(9)C6 Mixture Nonstatistical Evaluation – Price Adjustments

For each lot of HMA mix produced under Nonstatistical Evaluation when the calculated CPF is less than 1.00, a Nonconforming Mix Factor (NCMF) will be determined. The NCMF equals the algebraic difference of CPF minus 1.00 multiplied by 60 percent. The total job mix compliance price adjustment will be calculated as the product of the NCMF, the quantity of HMA in the lot in tons, and the unit Contract price per ton of mix.

If a constituent is not measured in accordance with these Specifications, its individual pay factor will be considered 1.00 in calculating the Composite Pay Factor (CPF).

## 5-04.3(9)C7 Mixture Nonstatistical Evaluation - Retests

The Contractor may request a sublot be retested. To request a retest, the Contractor shall submit a written request within 7 calendar days after the specific test results have been received. A split of the original acceptance sample will be retested. The split of the sample will not be tested with the same tester that ran the original acceptance test. The sample will be tested for a complete gradation analysis, asphalt binder content, and, at the option of the agency, V<sub>a</sub>. The results of the retest will be used for the acceptance of the HMA in place of the original sublot sample test results. The cost of testing will be deducted from any monies due or that may come due the Contractor under the Contract at the rate of \$500 per sample.

## 5-04.3 (9)D Mixture Acceptance – Commercial Evaluation

If sampled and tested, HMA produced under Commercial Evaluation and having all constituents falling within the tolerance limits of the job mix formula shall be accepted at the unit Contract price with no further evaluation. When one or more constituents fall outside the commercial tolerance limits in the Job Mix Formula shown in 5-04.3(9), the lot shall be

evaluated in accordance with Section 1-06.2 to determine the appropriate CPF. The commercial tolerance limits will be used in the calculation of the CPF and the maximum CPF shall be 1.00. When less than three sublots exist, backup samples of the existing sublots or samples from the street shall be tested to provide a minimum of three sets of results for evaluation.

For each lot of HMA mix produced and tested under Commercial Evaluation when the calculated CPF is less than 1.00, a Nonconforming Mix Factor (NCMF) will be determined. The NCMF equals the algebraic difference of CPF minus 1.00 multiplied by 60 percent. The Job Mix Compliance Price Adjustment will be calculated as the product of the NCMF, the quantity of HMA in the lot in tons, and the unit Contract price per ton of mix.

If a constituent is not measured in accordance with these Specifications, its individual pay factor will be considered 1.00 in calculating the Composite Pay Factor (CPF).

# 5-04.3(10) HMA Compaction Acceptance

HMA mixture accepted by nonstatistical evaluation that is used in traffic lanes, including lanes for intersections, ramps, truck climbing, weaving, and speed change, and having a specified compacted course thickness greater than 0.10-foot, shall be compacted to a specified level of relative density. The specified level of relative density shall be a Composite Pay Factor (CPF) of not less than 0.75 when evaluated in accordance with Section 1-06.2, using a LSL of 92.0 (minimum of 92 percent of the maximum density). The maximum density shall be determined by WSDOT FOP for AASHTO T 729. The specified level of density attained will be determined by the evaluation of the density of the pavement. The density of the pavement shall be determined in accordance with WSDOT FOP for WAQTC TM 8, except that gauge correlation will be at the discretion of the Engineer, when using the nuclear density gauge and WSDOT SOP 736 when using cores to determine density.

Tests for the determination of the pavement density will be taken in accordance with the required procedures for measurement by a nuclear density gauge or roadway cores after completion of the finish rolling.

If the Contracting Agency uses a nuclear density gauge to determine density the test procedures FOP for WAQTC TM 8 and WSDOT SOP T 729 will be used on the day the mix is placed and prior to opening to traffic.

Roadway cores for density may be obtained by either the Contracting Agency or the Contractor in accordance with WSDOT SOP 734. The core diameter shall be 4-inches minimum, unless otherwise approved by the Engineer. Roadway cores will be tested by the Contracting Agency in accordance with WSDOT FOP for AASHTO T 166.

If the Contract includes the Bid item "Roadway Core" the cores shall be obtained by the Contractor in the presence of the Engineer on the same day the mix is placed and at locations designated by the Engineer. If the Contract does not include the Bid item "Roadway Core" the Contracting Agency will obtain the cores.

For a lot in progress with a CPF less than 0.75, a new lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced.

HMA mixture accepted by commercial evaluation and HMA constructed under conditions other than those listed above shall be compacted on the basis of a test point evaluation of the compaction train. The test point evaluation shall be performed in accordance with instructions from the Engineer. The number of passes with an approved compaction train, required to attain the maximum test point density, shall be used on all subsequent paving.

HMA for preleveling shall be thoroughly compacted. HMA that is used for preleveling wheel rutting shall be compacted with a pneumatic tire roller unless otherwise approved by the Engineer.

# **Test Results**

For a sublot that has been tested with a nuclear density gauge that did not meet the minimum of 92 percent of the reference maximum density in a compaction lot with a CPF below 1.00 and thus subject to a price reduction or rejection, the Contractor may request that a core be used for determination of the relative density of the sublot. The relative density of the core will replace the relative density determined by the nuclear density gauge for the sublot and will be used for calculation of the CPF and acceptance of HMA compaction lot.

When cores are taken by the Contracting Agency at the request of the Contractor, they shall be requested by noon of the next workday after the test results for the sublot have been provided or made available to the Contractor. Core locations shall be outside of wheel paths and as determined by the Engineer. Traffic control shall be provided by the Contractor as requested by the Engineer. Failure by the Contractor to provide the requested traffic control will result in forfeiture of the request for cores. When the CPF for the lot based on the results of the HMA cores is less than 1.00, the cost for the contract at the rate of \$200 per core and the Contractor shall pay for the cost of the traffic control.

# 5-04.3(10)A HMA Compaction – General Compaction Requirements

Compaction shall take place when the mixture is in the proper condition so that no undue displacement, cracking, or shoving occurs. Areas inaccessible to large compaction equipment shall be compacted by other mechanical means. Any HMA that becomes loose, broken, contaminated, shows an excess or deficiency of asphalt, or is in any way defective, shall be removed and replaced with new hot mix that shall be immediately compacted to conform to the surrounding area.

The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option, provided the specified densities are attained. Unless the Engineer has approved otherwise, rollers shall only be operated in the static mode when the internal temperature of the mix is less than 175°F. Regardless of mix temperature, a roller shall not be operated in a mode that results in checking or cracking of the mat. Rollers shall only be operated in static mode on bridge decks.

# 5-04.3(10)B HMA Compaction – Cyclic Density

Low cyclic density areas are defined as spots or streaks in the pavement that are less than 90 percent of the theoretical maximum density. At the Engineer's discretion, the Engineer may evaluate the HMA pavement for low cyclic density, and when doing so will follow WSDOT SOP 733. A \$500 Cyclic Density Price Adjustment will be assessed for any 500-foot section with two or more density readings below 90 percent of the theoretical maximum density.

# 5-04.3(10)C Vacant

# 5-04.3(10)D HMA Nonstatistical Compaction

## 5-04.3(10)D1 HMA Nonstatistical Compaction – Lots and Sublots

HMA compaction which is accepted by nonstatistical evaluation will be based on acceptance testing performed by the Contracting Agency dividing the project into compaction lots.

A lot is represented by randomly selected samples of the same mix design that will be tested for acceptance. A lot is defined as the total quantity of material or work produced for each Job Mix Formula placed. Only one lot per JMF is expected. A sublot shall be equal to one day's production or 400 tons, whichever is less except that the final sublot will be a minimum of 200 tons and may be increased to 800 tons. Testing for compaction will be at the rate of 5 tests per sublot per WSDOT T 738.

The sublot locations within each density lot will be determined by the Engineer. For a lot in progress with a CPF less than 0.75, a new lot will begin at the Contractor's request after the Engineer is satisfied that material conforming to the Specifications can be produced.

HMA mixture accepted by commercial evaluation and HMA constructed under conditions other than those listed above shall be compacted on the basis of a test point evaluation of the compaction train. The test point evaluation shall be performed in accordance with instructions from the Engineer. The number of passes with an approved compaction train, required to attain the maximum test point density, shall be used on all subsequent paving.

HMA for preleveling shall be thoroughly compacted. HMA that is used to prelevel wheel ruts shall be compacted with a pneumatic tire roller unless otherwise approved by the Engineer.

## 5-04.3(10)D2 HMA Compaction Nonstatistical Evaluation – Acceptance Testing

The location of the HMA compaction acceptance tests will be randomly selected by the Engineer from within each sublot, with one test per sublot.

## 5-04.3(10)D3 HMA Nonstatistical Compaction – Price Adjustments

For each compaction lot with one or two sublots, having all sublots attain a relative density that is 92 percent of the reference maximum density the HMA shall be accepted at the unit

Contract price with no further evaluation. When a sublot does not attain a relative density that is 92 percent of the reference maximum density, the lot shall be evaluated in accordance with Section 1-06.2 to determine the appropriate CPF. The maximum CPF shall be 1.00, however, lots with a calculated CPF in excess of 1.00 will be used to offset lots with CPF values below 1.00 but greater than 0.90. Lots with CPF lower than 0.90 will be evaluated for compliance per 5-04.3(11). Additional testing by either a nuclear moisture-density gauge or cores will be completed as required to provide a minimum of three tests for evaluation.

For compaction below the required 92% a Non-Conforming Compaction Factor (NCCF) will be determined. The NCCF equals the algebraic difference of CPF minus 1.00 multiplied by 40 percent. The Compaction Price Adjustment will be calculated as the product of CPF, the quantity of HMA in the compaction control lot in tons, and the unit Contract price per ton of mix.

# 5-04.3(11) Reject Work

# 5-04.3(11)A Reject Work General

Work that is defective or does not conform to Contract requirements shall be rejected. The Contractor may propose, in writing, alternatives to removal and replacement of rejected material. Acceptability of such alternative proposals will be determined at the sole discretion of the Engineer. HMA that has been rejected is subject to the requirements in Section 1-06.2(2) and this specification, and the Contractor shall submit a corrective action proposal to the Engineer for approval.

## 5-04.3(11)B Rejection by Contractor

The Contractor may, prior to sampling, elect to remove any defective material and replace it with new material. Any such new material will be sampled, tested, and evaluated for acceptance.

## 5-04.3(11)C Rejection Without Testing (Mixture or Compaction)

The Engineer may, without sampling, reject any batch, load, or section of Roadway that appears defective. Material rejected before placement shall not be incorporated into the pavement. Any rejected section of Roadway shall be removed.

No payment will be made for the rejected materials or the removal of the materials unless the Contractor requests that the rejected material be tested. If the Contractor elects to have the rejected material tested, a minimum of three representative samples will be obtained and tested. Acceptance of rejected material will be based on conformance with the nonstatistical acceptance Specification. If the CPF for the rejected material is less than 0.75, no payment will be made for the rejected material; in addition, the cost of sampling and testing shall be borne by the Contractor. If the CPF is greater than or equal to 0.75, the cost of sampling and testing will be borne by the Contracting Agency. If the material is rejected before placement and the CPF is greater than or equal to 0.75, compensation for the rejected material will be at a CPF of 0.75. If rejection occurs after placement and the CPF is greater than or equal to 0.75, compensation for the rejected material will be at the calculated

CPF with an addition of 25 percent of the unit Contract price added for the cost of removal and disposal.

# 5-04.3(11)D Rejection - A Partial Sublot

In addition to the random acceptance sampling and testing, the Engineer may also isolate from a normal sublot any material that is suspected of being defective in relative density, gradation or asphalt binder content. Such isolated material will not include an original sample location. A minimum of three random samples of the suspect material will be obtained and tested. The material will then be statistically evaluated as an independent lot in accordance with Section 1-06.2(2).

# 5-04.3(11)E Rejection - An Entire Sublot

An entire sublot that is suspected of being defective may be rejected. When a sublot is rejected a minimum of two additional random samples from this sublot will be obtained. These additional samples and the original sublot will be evaluated as an independent lot in accordance with Section 1-06.2(2).

# 5-04.3(11)F Rejection - A Lot in Progress

The Contractor shall shut down operations and shall not resume HMA placement until such time as the Engineer is satisfied that material conforming to the Specifications can be produced:

- 1. When the Composite Pay Factor (CPF) of a lot in progress drops below 1.00 and the Contractor is taking no corrective action, or
- 2. When the Pay Factor (PF) for any constituent of a lot in progress drops below 0.95 and the Contractor is taking no corrective action, or
- 3. When either the PFi for any constituent or the CPF of a lot in progress is less than 0.75.

## 5-04.3(11)G Rejection - An Entire Lot (Mixture or Compaction)

An entire lot with a CPF of less than 0.75 will be rejected.

5-04.3(12) Joints

## 5-04.3(12)A HMA Joints

## 5-04.3(12)A1 Transverse Joints

The Contractor shall conduct operations such that the placing of the top or wearing course is a continuous operation or as close to continuous as possible. Unscheduled transverse joints will be allowed and the roller may pass over the unprotected end of the freshly laid mixture only when the placement of the course must be discontinued for such a length of time that the mixture will cool below compaction temperature. When the Work is resumed, the previously compacted mixture shall be cut back to produce a slightly beveled edge for the full thickness of the course.
A temporary wedge of HMA constructed on a 20H:1V shall be constructed where a transverse joint as a result of paving or planing is open to traffic. The HMA in the temporary wedge shall be separated from the permanent HMA by strips of heavy wrapping paper or other methods approved by the Engineer. The wrapping paper shall be removed and the joint trimmed to a slightly beveled edge for the full thickness of the course prior to resumption of paving.

The material that is cut away shall be wasted and new mix shall be laid against the cut. Rollers or tamping irons shall be used to seal the joint.

# 5-04.3(12)A2 Longitudinal Joints

The longitudinal joint in any one course shall be offset from the course immediately below by not more than 6 inches nor less than 2 inches. All longitudinal joints constructed in the wearing course shall be located at a lane line or an edge line of the Traveled Way. A notched wedge joint shall be constructed along all longitudinal joints in the wearing surface of new HMA unless otherwise approved by the Engineer. The notched wedge joint shall have a vertical edge of not less than the maximum aggregate size or more than ½ of the compacted lift thickness and then taper down on a slope not steeper than 4H:1V. The sloped portion of the HMA notched wedge joint shall be uniformly compacted.

# 5-04.3(12)B Bridge Paving Joint Seals

# 5-04.3(12)B1 HMA Sawcut and Seal

Prior to placing HMA on the bridge deck, establish sawcut alignment points at both ends of the bridge paving joint seals to be placed at the bridge ends, and at interior joints within the bridge deck when and where shown in the Plans. Establish the sawcut alignment points in a manner that they remain functional for use in aligning the sawcut after placing the overlay.

Submit a Type 1 Working Drawing consisting of the sealant manufacturer's application procedure.

Construct the bridge paving joint seal as specified ion the Plans and in accordance with the detail shown in the Standard Plans. Construct the sawcut in accordance with the detail shown in the Standard Plan. Construct the sawcut in accordance with Section 5-05.3(8)B and the manufacturer's application procedure.

# 5-04.3(12)B2 Paved Panel Joint Seal

Construct the paved panel joint seal in accordance with the requirements specified in section 5-04.3(12)B1 and the following requirement:

1. Clean and seal the existing joint between concrete panels in accordance with Section 5-01.3(8) and the details shown in the Standard Plans.

# 5-04.3(13) Surface Smoothness

The completed surface of all courses shall be of uniform texture, smooth, uniform as to crown and grade, and free from defects of all kinds. The completed surface of the wearing course shall not vary more than  $\frac{1}{6}$  inch from the lower edge of a 10-foot straightedge placed on the surface parallel to the centerline. The transverse slope of the completed surface of the wearing course shall vary not more than  $\frac{1}{4}$  inch in 10 feet from the rate of transverse slope shown in the Plans.

When deviations in excess of the above tolerances are found that result from a high place in the HMA, the pavement surface shall be corrected by one of the following methods:

- 1. Removal of material from high places by grinding with an approved grinding machine, or
- 2. Removal and replacement of the wearing course of HMA, or
- 3. By other method approved by the Engineer.

Correction of defects shall be carried out until there are no deviations anywhere greater than the allowable tolerances.

Deviations in excess of the above tolerances that result from a low place in the HMA and deviations resulting from a high place where corrective action, in the opinion of the Engineer, will not produce satisfactory results will be accepted with a price adjustment. The Engineer shall deduct from monies due or that may become due to the Contractor the sum of \$500.00 for each and every section of single traffic lane 100 feet in length in which any excessive deviations described above are found.

When utility appurtenances such as manhole covers and valve boxes are located in the traveled way, the utility appurtenances shall be adjusted to the finished grade prior to paving. This requirement may be waived when requested by the Contractor, at the discretion of the Engineer or when the adjustment details provided in the project plan or specifications call for utility appurtenance adjustments after the completion of paving.

Utility appurtenance adjustment discussions will be included in the Pre-Paving planning (5-04.3(14)B3). Submit a written request to waive this requirement to the Engineer prior to the start of paving.

# 5-04.3(14) Planing (Milling) Bituminous Pavement

The planning plan must be approved by the Engineer and a pre planning meeting must be held prior to the start of any planing. See Section 5-04.3(14)B2 for information on planing submittals.

Locations of existing surfacing to be planed are as shown in the Drawings.

Where planing an existing pavement is specified in the Contract, the Contractor must remove existing surfacing material and to reshape the surface to remove irregularities. The finished product must be a prepared surface acceptable for receiving an HMA overlay.

Use the cold milling method for planing unless otherwise specified in the Contract. Do not use the planer on the final wearing course of new HMA.

Conduct planing operations in a manner that does not tear, break, burn, or otherwise damage the surface which is to remain. The finished planed surface must be slightly grooved or roughened and must be free from gouges, deep grooves, ridges, or other imperfections. The Contractor must repair any damage to the surface by the Contractor's planing equipment, using an Engineer approved method.

Repair or replace any metal castings and other surface improvements damaged by planing, as determined by the Engineer.

A tapered wedge cut must be planed longitudinally along curb lines sufficient to provide a minimum of 4 inches of curb reveal after placement and compaction of the final wearing course. The dimensions of the wedge must be as shown on the Drawings or as specified by the Engineer.

A tapered wedge cut must also be made at transitions to adjoining pavement surfaces (meet lines) where butt joints are shown on the Drawings. Cut butt joints in a straight line with vertical faces 2 inches or more in height, producing a smooth transition to the existing adjoining pavement.

After planing is complete, planed surfaces must be swept, cleaned, and if required by the Contract, patched and preleveled.

The Engineer may direct additional depth planing. Before performing this additional depth planing, the Contractor must conduct a hidden metal in pavement detection survey as specified in Section 5-04.3(14)A.

# 5-04.3(14)A Pre-Planing Metal Detection Check

Before starting planing of pavements, and before any additional depth planing required by the Engineer, the Contractor must conduct a physical survey of existing pavement to be planed with equipment that can identify hidden metal objects.

Should such metal be identified, promptly notify the Engineer.

See Section 1-07.16(1) regarding the protection of survey monumentation that may be hidden in pavement.

The Contractor is solely responsible for any damage to equipment resulting from the Contractor's failure to conduct a pre-planing metal detection survey, or from the Contractor's failure to notify the Engineer of any hidden metal that is detected.

# 5-04.3(14)B Paving and Planing Under Traffic

# 5-04.3(14)B1 General

In addition the requirements of Section 1-07.23 and the traffic controls required in Section 1-10, unless otherwise specified by the Contract Documents or approved by the Engineer in writing, the Contractor shall comply with the following:

1. Intersections:

a. Keep intersections open to traffic at all times, except when paving or planing operations through an intersection requires closure. Such closure must be kept to the minimum time required to place and compact the HMA mixture, or plane as appropriate. For paving, schedule such closure to individual lanes or portions thereof that allows the traffic volumes and schedule of traffic volumes required in the approved traffic control plan. Schedule work so that adjacent intersections are not impacted at the same time and comply with the traffic control restrictions required by the Traffic Engineer. Each individual intersection closure or partial closure, must be addressed in the traffic control plan, which must be submitted to and accepted by the Engineer, see Section 1-10.2(2).

b. When planing or paving and related construction must occur in an intersection, consider scheduling and sequencing such work into quarters of the intersection, or half or more of an intersection with side street detours. Be prepared to sequence the work to individual lanes or portions thereof.

c. Should closure of the intersection in its entirety be necessary, and no trolley service is impacted, keep such closure to the minimum time required to place and compact the HMA mixture, plane, remove asphalt, tack coat, and as needed.

d. Any work in an intersection requires advance warning in both signage and a number of Working Days advance notice as determined by the Engineer, to alert traffic and emergency services of the intersection closure or partial closure.

e. Allow new compacted HMA asphalt to cool to ambient temperature before any traffic is allowed on it. Traffic is not allowed on newly placed asphalt until approval has been obtained from the Engineer.

- Temporary centerline marking, post-paving temporary marking, temporary stop bars, and maintaining temporary pavement marking must comply with Section 8-23.
- 3. Permanent pavement marking must comply with Section 8-22.

# 5-04.3(14)B2 Submittals – Planing Plan and HMA Paving Plan

The Contractor must submit a separate planing plan and a separate paving plan to the Engineer at least 5 Working Days in advance of each operation's activity start date. These plans must show how the moving operation and traffic control are coordinated, as they will be discussed at the pre-planing briefing and pre-paving briefing. When requested by the Engineer, the Contractor must provide each operation's traffic control plan on  $24 \times 36$  inch or larger size Shop Drawings with a scale showing both the area of operation and sufficient detail of traffic beyond the area of operation where detour traffic may be required. The scale on the Shop Drawings is 1 inch = 20 feet, which may be changed if the Engineer agrees sufficient detail is shown.

The planing operation and the paving operation include, but are not limited to, metal detection, removal of asphalt and temporary asphalt of any kind, tack coat and drying, staging of supply trucks, paving trains, rolling, scheduling, and as may be discussed at the briefing.

When intersections will be partially or totally blocked, provide adequately sized and noticeable signage alerting traffic of closures to come, a minimum 2 Working Days in advance. The traffic control plan must show where police officers will be stationed when signalization is or may be, countermanded, and show areas where flaggers are proposed.

At a minimum, the planing and the paving plan must include:

- 1. A copy of the accepted traffic control plan, see Section 1-10.2(2), detailing each day's traffic control as it relates to the specific requirements of that day's planing and paving. Briefly describe the sequencing of traffic control consistent with the proposed planing and paving sequence, and scheduling of placement of temporary pavement markings and channelizing devices after each day's planing, and paving.
- 2. A copy of each intersection's traffic control plan.
- 3. Haul routes from Supplier facilities, and locations of temporary parking and staging areas, including return routes. Describe the complete round trip as it relates to the sequencing of paving operations.
- 4. Names and locations of HMA Supplier facilities to be used.
- 5. List of all equipment to be used for paving.
- 6. List of personnel and associated job classification assigned to each piece of paving equipment.
- 7. Description (geometric or narrative) of the scheduled sequence of planing and of paving, and intended area of planing and of paving for each day's work, must include the directions of proposed planing and of proposed paving, sequence of adjacent lane paving, sequence of skipped lane paving, intersection planing and paving scheduling and sequencing, and proposed notifications and coordinations to be timely made. The plan must show HMA joints relative to the final pavement marking lane lines.
- 8. Names, job titles, and contact information for field, office, and plant supervisory personnel.
- 9. A copy of the approved Mix Designs.
- 10. Tonnage of HMA to be placed each day.
- 11. Approximate times and days for starting and ending daily operations.

# 5-04.3(14)B3 Pre-Paving and Pre-Planing Briefing

At least 2 Working Days before the first paving operation and the first planing operation, or as scheduled by the Engineer for future paving and planing operations to ensure the Contractor has adequately prepared for notifying and coordinating as required in the Contract, the Contractor must be prepared to discuss that day's operations as they relate to other entities and to public safety and convenience, including driveway and business access, garbage truck operations, Metro transit operations and working around energized overhead wires, school and nursing home and hospital and other accesses, other contractors who may be operating in the area, pedestrian and bicycle traffic, and emergency services. The Contractor, and Subcontractors that may be part of that day's operations, must meet with the Engineer and discuss the proposed operation as it relates to the submitted planing plan and paving plan, approved traffic control plan, and public convenience and safety. Such discussion includes, but is not limited to:

- 1. General for both Paving Plan and for Planing Plan:
  - a. The actual times of starting and ending daily operations.
  - b. In intersections, how to break up the intersection, and address traffic control and signalization for that operation, including use of peace officers.
  - c. The sequencing and scheduling of paving operations and of planing operations, as applicable, as it relates to traffic control, to public convenience and safety, and to other con-tractors who may operate in the Project Site.
  - d. Notifications required of Contractor activities, and coordinating with other entities and the public as necessary.
  - e. Description of the sequencing of installation and types of temporary pavement markings as it relates to planning and to paving.
  - f. Description of the sequencing of installation of, and the removal of, temporary pavement patch material around exposed castings and as may be needed
  - g. Description of procedures and equipment to identify hidden metal in the pavement, such as survey monumentation, monitoring wells, street car rail, and castings, before planning, see Section 5-04.3(14)B2.
  - h. Description of how flaggers will be coordinated with the planing, paving, and related operations.
  - i. Description of sequencing of traffic controls for the process of rigid pavement base repairs.
  - j. Other items the Engineer deems necessary to address.
- 2. Paving additional topics:
  - a. When to start applying tack and coordinating with paving.
  - b. Types of equipment and numbers of each type equipment to be used. If more pieces of equipment than personnel are proposed, describe the sequencing of the personnel operating the types of equipment. Discuss the continuance of operator personnel for each type equipment as it relates to meeting Specification requirements.
  - c. Number of JMFs to be placed, and if more than one JMF how the Contractor will ensure different JMFs are distinguished, how pavers and MTVs are distinguished if more than one JMF is being placed at the time, and how pavers and MTVs are cleaned so that one JMF does not adversely influence the other JMF.
  - d. Description of contingency plans for that day's operations such as equipment breakdown, rain out, and Supplier shutdown of operations.
  - e. Number of sublots to be placed, sequencing of density testing, and other sampling and testing.

# 5-04.3(15) Sealing Pavement Surfaces

Apply a fog seal where shown in the plans. Construct the fog seal in accordance with Section 5-02.3. Unless otherwise approved by the Engineer, apply the fog seal prior to opening to traffic.

# 5-04.3(16) HMA Road Approaches

HMA approaches shall be constructed at the locations shown in the Plans or where staked by the Engineer. The Work shall be performed in accordance with Section 5-04.

# 5-04.4 Measurement

HMA CI. \_\_\_\_ PG \_\_\_\_, HMA for \_\_\_\_ CI. \_\_\_ PG \_\_\_\_, and Commercial HMA will be measured by the ton in accordance with Section 1-09.2, with no deduction being made for the weight of asphalt binder, mineral filler, or any other component of the mixture. If the Contractor elects to remove and replace mix as allowed by Section 5-04.3(11), the material removed will not be measured.

Roadway cores will be measured per each for the number of cores taken.

Preparation of untreated roadway will be measured by the mile once along the centerline of the main line Roadway. No additional measurement will be made for ramps, Auxiliary Lanes, service roads, Frontage Roads, or Shoulders. Measurement will be to the nearest 0.01 mile.

Soil residual herbicide will be measured by the mile for the stated width to the nearest 0.01 mile or by the square yard, whichever is designated in the Proposal.

Pavement repair excavation will be measured by the square yard of surface marked prior to excavation.

Asphalt for prime coat will be measured by the ton in accordance with Section 1-09.2.

Prime coat aggregate will be measured by the cubic yard, truck measure, or by the ton, whichever is designated in the Proposal.

Asphalt for fog seal will be measured by the ton, as provided in Section 5-02.4.

Longitudinal joint seals between the HMA and cement concrete pavement will be measured by the linear foot along the line and slope of the completed joint seal.

Planing bituminous pavement will be measured by the square yard.

Temporary pavement marking will be measured by the linear foot as provided in Section 8-23.4.

Water will be measured by the M gallon as provided in Section 2-07.4.

#### 5-04.5 Payment

Payment will be made for each of the following Bid items that are included in the Proposal:

"HMA CI. \_\_\_\_ PG \_\_\_\_", per ton.

"HMA for Approach Cl. \_\_\_\_ PG \_\_\_\_", per ton.

"HMA for Preleveling CI. \_\_\_\_ PG \_\_\_\_", per ton.

"HMA for Pavement Repair Cl. \_\_\_\_ PG \_\_\_\_", per ton.

"Commercial HMA", per ton.

The unit Contract price per ton for "HMA CI. \_\_\_\_PG \_\_\_\_", "HMA for Approach CI. \_\_\_\_PG \_\_\_\_", "HMA for Preleveling CI. \_\_\_\_PG \_\_\_\_", "HMA for Pavement Repair CI. \_\_\_\_PG \_\_\_\_", and "Commercial HMA" shall be full compensation for all costs, including anti-stripping additive, incurred to carry out the requirements of Section 5-04 except for those costs included in other items which are included in this Subsection and which are included in the Proposal.

"Preparation of Untreated Roadway", per mile.

The unit Contract price per mile for "Preparation of Untreated Roadway" shall be full pay for all Work described under 5-04.3(4) , with the exception, however, that all costs involved in patching the Roadway prior to placement of HMA shall be included in the unit Contract price per ton for "HMA CI. \_\_\_\_ PG \_\_\_\_" which was used for patching. If the Proposal does not include a Bid item for "Preparation of Untreated Roadway", the Roadway shall be prepared as specified, but the Work shall be included in the Contract prices of the other items of Work.

"Preparation of Existing Paved Surfaces", per mile.

The unit Contract Price for "Preparation of Existing Paved Surfaces" shall be full pay for all Work described under Section 5-04.3(4) with the exception, however, that all costs involved in patching the Roadway prior to placement of HMA shall be included in the unit Contract price per ton for "HMA CI. \_\_\_\_ PG \_\_\_\_" which was used for patching. If the Proposal does not include a Bid item for "Preparation of Untreated Roadway", the Roadway shall be prepared as specified, but the Work shall be included in the Contract prices of the other items of Work.

"Crack Sealing", by force account.

"Crack Sealing" will be paid for by force account as specified in Section 1-09.6. For the purpose of providing a common Proposal for all Bidders, the Contracting Agency has entered an amount in the Proposal to become a part of the total Bid by the Contractor.

"Pavement Repair Excavation Incl. Haul", per square yard.

The unit Contract price per square yard for "Pavement Repair Excavation Incl. Haul" shall be full payment for all costs incurred to perform the Work described in Section 5-04.3(4) with the exception, however, that all costs involved in the placement of HMA shall be included in the unit Contract price per ton for "HMA for Pavement Repair Cl. \_\_\_\_ PG \_\_\_\_", per ton.

"Asphalt for Prime Coat", per ton.

The unit Contract price per ton for "Asphalt for Prime Coat" shall be full payment for all costs incurred to obtain, provide and install the material in accordance with Section 5-04.3(4).

"Prime Coat Agg.", per cubic yard, or per ton.

The unit Contract price per cubic yard or per ton for "Prime Coat Agg." shall be full pay for furnishing, loading, and hauling aggregate to the place of deposit and spreading the aggregate in the quantities required by the Engineer.

"Asphalt for Fog Seal", per ton.

Payment for "Asphalt for Fog Seal" is described in Section 5-02.5.

"Longitudinal Joint Seal", per linear foot.

The unit Contract price per linear foot for "Longitudinal Joint Seal" shall be full payment for all costs incurred to perform the Work described in Section 5-04.3(12).

"Planing Bituminous Pavement", per square yard.

The unit Contract price per square yard for "Planing Bituminous Pavement" shall be full payment for all costs incurred to perform the Work described in Section 5-04.3(14).

"Temporary Pavement Marking", per linear foot.

Payment for "Temporary Pavement Marking" is described in Section 8-23.5.

"Water", per M gallon.

Payment for "Water" is described in Section 2-07.5.

"Job Mix Compliance Price Adjustment", by calculation.

"Job Mix Compliance Price Adjustment" will be calculated and paid for as described in Section 5-04.3(9)C6.

"Compaction Price Adjustment", by calculation.

"Compaction Price Adjustment" will be calculated and paid for as described in Section 5-04..3(10)D3.

"Roadway Core", per each.

The Contractor's costs for all other Work associated with the coring (e.g., traffic control) shall be incidental and included within the unit Bid price per each and no additional payments will be made.

"Cyclic Density Price Adjustment", by calculation.

"Cyclic Density Price Adjustment" will be calculated and paid for as described in Section 5-04.3(10)B.

(\*\*\*\*\*)

Add the following new section:

# 5-06 CONCRETE PAVER RESTORATION

# 5-06.1 Description

This Work consists of the removal, salvage, and re-installation of existing concrete pavers to accommodate roadway pavement widening at the locations shown on Plans.

# 5-06.2 Materials

Concrete pavers shall be salvaged for reuse from the existing driveway as shown on Plans. Subgrade and joint filler materials shall be recycled where practical or replaced in-kind and in accordance with accepted industry standards for pervious paver installation.

# 5-06.3 Construction Requirements

Existing concrete pavers shall be removed and re-installed in-kind using labor, materials, equipment, means, and methods as necessary and per accepted standards of permeable and concrete paver manufacturers and industry practices.

# 5-06.3(1) Removal of Existing Concrete Pavers

The Contractor shall carefully remove existing concrete pavers and stockpile in close proximity to the area of removal and re-installation. The extent of removal shall be the minimum required to facilitate the proper installation of the adjacent HMA pavement widening.

# 5-06.3(2) Subgrade Preparation

The Contractor shall ensure suitable subgrade condition exists and that it is properly graded and compacted to receive salvaged pavers. Subgrade shall be finished to a grade that results in a uniform and reasonable slope between the edge of HMA pavement and remaining in-place concrete pavers. The finished surface of the re-installed pavers shall match that of the in-place pavers. Contractor shall provide suitable import materials to complete subgrade preparation if in-situ materials do not conform to standard or are otherwise deemed unsuitable by Engineer.

# 5-06.3(3) Reinstallation of Concrete Pavers

Salvaged concrete pavers shall be installed on suitable subgrade. Pavers shall be installed to maintain the pattern of the existing pavers that remain undisturbed. Reinstalled pavers shall be installed flush at the surface and contact edges with the undisturbed, in-place pavers and HMA pavement edge. Contractor shall cut pavers to a clean straight edge as required to achieve proper installation in accordance with standard practices.

# 5-06.3(4) Disposal of Excess Materials

The Contractor shall haul and dispose of excess concrete pavers, subgrade, and other materials incidental to the removal, salvaging, and reinstallation to an approved offsite location.

#### 5-06.4 Measurement

"Concrete Paver Removal and Reinstallation" shall be measured per square foot of reinstalled concrete paver surface.

# 5-06.5 Payment

"Concrete Paver Removal and Reinstallation", per square foot.

The unit Contract price per square foot of "Concrete Paver Removal and Reinstallation" shall be full payment for all labor, equipment, materials, means and method incidental to the Work including, but not limited to removal and salvage of existing concrete pavers; protection of existing pavers; subgrade preparation; cutting/trimming pavers; and installation of joint filler.

# **END OF DIVISION 5**

# DIVISION 6

# **DIVISION 6 – STRUCTURES**

# 6-13 MODULAR BLOCK RETAINING WALL

(\*\*\*\*\*)

#### 6-13.1 Description

The following shall be added to this section:

Work shall also consist of furnishing and constructing modular block retaining wall(s) in accordance with the Plans, these Specifications, or as designated by the Engineer.

#### 6-13.2 Materials

The following shall be added at the end of this section:

Modular concrete units shall be "Keystone Compac Rockface" or approved equal. Color shall be standard manufacturer's color "gray".

#### 6-13.3 Construction Requirements

The following shall be added at the end of this section:

Installation, including but not limited to excavation, subgrade preparation, drainage, base leveling pad, block placement, shear pins, wall top steps, and caps, shall be in accordance with manufacturer guidelines.

#### 6-13.4 Measurement

The following shall be added at the end of this section:

Modular block wall shall be measured per square foot of modular block wall in place measured from the bottom of the individual wall units to the top of the cap.

# 6-13.5 Payment

This section shall be supplemented with the following:

Payment will be made for the following bid item(s):

"Modular Block Wall", per square foot.

The unit bid price for "Modular Block Wall" shall be full compensation for all labor, material, tools and equipment necessary to satisfactorily complete the Work defined herein, including but not limited to: excavation including haul, providing and installing underdrain, providing and installing backfill material, preparation of soil, installing leveling pad, constructing wall and cap, and mudding the back of all visible parts of the wall.

# END OF DIVISION 6

# DIVISION 7

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

# COK GSP (From 12/20/2018 file)

#### 7-04 STORM SEWERS

#### 7-04.2 Materials

The materials list in Section 7-04.2 is modified as follows:

Acceptable pipe materials within City of Kirkland right of way are:

Solid Wall PVC Storm Sewer Pipe	9-05.12(1)
C900 PVC Pipe	9-30.1(5)Å
Ductile Iron Pipe	9-30.1(1)

# 7-04.3 Construction Requirements

(\*\*\*\*\*)

Section 7-04.3(1) is supplemented with the following:

# 7-04.3(1) Cleaning and Testing

Cleaning and testing of the sanitary sewer system is required prior to placing the new section into service and shall be incidental to the sanitary sewer pipe and structures, unless otherwise specified under bid items herewith. Such tests shall be conducted in accordance with the reference material specification for the material being used. Tests on the completed installation shall be made as specified below.

# **Cleaning and Flushing**

All gravity sewer pipes shall be cleaned and flushed after side sewer installation and after backfilling and compaction. The pipe shall be cleaned and flushed by passing an inflatable rubber ball through the completed section or using a flush truck. Any obstruction, such as cemented grout or debris found in the completed section, shall be removed.

# Alignment and Grade

Alignment and grade will be inspected by lamping each completed section. Any section which appears to exceed the allowance for variance in line or grade shall be further inspected by an approved video monitoring system (TV inspection). If this inspection confirms that the section does not meet the specified requirements for the line and grade, the sections or portion not in compliance shall be re-excavated and re-laid at Contractor's expense.

All costs incurred for TV inspection shall be considered incidental to and included in various related bid item included in the proposal.

# **Deflection Test for Gravity Sewer Pipe**

All gravity sewer pipes shall be tested for deflection at least 30 days after completion of trench backfill and compaction in accordance with requirements of Section 7-17.3(2)G of the Standard Specifications.

# Leakage Tests

All gravity sewers, including all connected side sewers, shall be tested for water tightness in accordance with the provisions of Section 7-17.3(2)F (Low Pressure Air Test) of the Standard Specifications.

Acceptable water tightness testing criteria is revised as follows: Air testing will require a minimum pressure of 4 psi for 15 minutes with no pressure drop. No other test procedures will be allowed except by written approval of the Project Engineer. Whenever ground water is encountered in the sewer construction, an approved water level monitoring device shall be installed at each manhole. The device shall be used in the conduct of the sewer testing to determine the water pressure above the sewer being tested.

# (\*\*\*\*\*)

Add the following new Sub-Sections:

# 7-04.3(2) Existing Utilities

Existing utilities of record are shown on the Plans. These are shown for convenience only, and the Engineer assumes no responsibility for improper locations or failure to show utility locations on the Plans. When utility services occupy the same space as the new storm sewer main, the Contractor shall complete necessary excavation to fully expose such services. The Contractor shall protect said services, and work around them during excavating and pipe laying operations. Any damages to services resulting from the Contractor's operation shall be reported to the appropriate utility. Such damage shall be repaired at the Contractor's expense.

The Contractor shall anticipate the potential for crossing over or under an occasional shallow existing side sewers and roof drains that are not part of the one-call utility locate. If such a side sewer or drain is encountered, the Contractor shall immediately notify the Owner's on-site representative and then take the necessary steps to determine whether or not the side sewer is active. If a side sewer is damaged by construction activity, the Contractor is responsible for repairing the side sewer. All costs associated with determining the viability and repair of the existing side sewer shall be considered incidental to the cost of the storm sewer pipe and no additional payment will be made.

# 7-04.3(2)A Potholing

The Contractor shall pothole to determine the exact horizontal and vertical location of existing utilities and determine if a conflict exists. If a conflict should exist, the Engineer shall be notified prior to any change in storm sewer line grade. All costs associated with adjustments in depth to avoid conflicts with existing utilities shall be considered incidental to the cost of the storm sewer pipe and no additional payment will be made.

The Engineer shall approve potholing prior to the Contractor performing the potholing. Potholing done without prior to approval from the Engineer will not be paid. See Section 8-05 herein for potholing measurement and payment.

# 7-04.4 Measurement

Section 7-04.4 is supplemented with the following:

All Storm Sewer Pipe, regardless of size and material shall be measured per lineal feet of installed pipe.

# 7-04.5 Payment

Section 7-04.5 is supplemented with the following:

"C900 PVC Storm Sewer Pipe 12 In. Diam.", per lineal foot

The unit contract prices for Storm Sewer Pipe, regardless of size and material, shall be full compensation for all labor, material, tools and equipment necessary for and incidental to furnish and install the storm sewer as shown on the plans and as specified herein, including the following:

- 1. Removal, loading, hauling, and disposal of existing asphalt concrete pavement as necessary for trench excavations in paved areas. This shall include removal of existing pavement beyond the trench as necessary and as indicated on the drawings prior to final pavement patch.
- 2. All required potholing to verify locations of existing utilities.
- 3. Trench excavation and dewatering, furnishing and installation of pipe on line and grade, wyes, tees, special fittings, manhole adapters.
- 4. Removal, loading, hauling, and disposal of native excavation material.
- 5. Pipe bedding material and compaction.
- 6. Typical Trench Seepage Barrier where indicated on Plans.
- 7. Extra depth, including excavation, backfill and compaction, required to clear existing buried utilities or other obstacles.
- 8. Extra depth, including excavation, backfill and compaction, required to clear existing buried utilities or other obstacles.
- 9. Steel sheeting for covering excavations as necessary.
- 10. Maintenance, restoration and/or relocation, if required, of existing culverts, storm drainage pipe, other utilities and structures affected by construction that are to remain.
- 11. Cleaning and testing of all storm sewers and catch basins including CCTV inspection of the mains.
- 12. Crushed Surfacing Top Course and compaction for roadway base.
- 13. Placing and maintaining temporary cold mix asphalt concrete patching consisting of a minimum 3-inches of cold asphalt mix over compacted backfill within existing paved areas, and removal of the temporary cold mix asphalt mix prior to placement of trench patch (paid for under "HMA Class 1/2-inch, PG 64-22").

# (\*\*\*\*\*)

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

# 7-05.3(1) Adjusting Manholes and Catch Basins to Grade

Section 7-05.3(1) is supplemented with the following:

The item "Adjust Catch Basin to Grade" shall be measured per each existing catch basin structure to remain within new or replaced pavement areas. The unit price bid per each shall include all labor, materials, means, and methods to completely remove and replace a new metal frame and grate to finished road grade.

Existing catch basin structure shall be brought to finished grades per Section 7-05 and City of Kirkland Pre-Approved Plans. Steel risers are not allowed. Patch adjacent pavement with Class G asphalt concrete pavement. Seal joint with AR4000W and dry sand after patching.

Any damage to existing catch basins resulting from the Contractor's operations shall be repaired at the Contractor's expense.

Contractor shall install agency supplied storm drain markers and adhesive on any new or altered catch basins that have a vaned grate and/or inlet. To install, follow the "Storm Drain Marking" instruction sheet supplied with the storm drain markers. Any work associated with installation of storm drain markers is incidental to other bid items.

# 7-05.5 Payment

Payment will be made for the following bid item(s):

"Catch Basin Type I", per each
"Catch Basin Type 1-L", per each
"Catch Basin Type 2 – 48"", per each
"Connect Existing Strom Drain", per each
"Connect Existing Drainage Structure", per each
"Adjust Catch Basin to Finish Grade", per each

The contract bid prices above, shall be full compensation for all labor, material, tools, equipment, and incidentals necessary to complete the work as defined in the Standard Specifications and these Special Provisions.

Precast adjusting rings/risers, bricks, grout, Class G asphalt concrete, and AR4000W asphalt shall be considered incidental and included in the unit contract price for the items in this section.

# 7-09 Water Mains

# (\*\*\*\*\*)

Sections 7-09.1 through 7-09.5 are deleted and replaced in their entirety by the applicable provisions of Northshore Utility District Engineering Specifications and Special Provisions in Appendix C of these contract documents.

# 7-12 Valves for Water Mains

# (\*\*\*\*\*)

Sections 7-12.1 through 7-12.5 are deleted and replaced in their entirety by the applicable provisions of Northshore Utility District Engineering Specifications and Special Provisions in Appendix C of these contract documents.

# 7-14 Hydrants

# (\*\*\*\*\*)

Sections 7-14.1 through 7-14.5 are deleted and replaced in their entirety by the applicable provisions of Northshore Utility District Engineering Specifications and Special Provisions in Appendix C of these contract documents.

# 7-15 Service Connections

# (\*\*\*\*\*)

Sections 7-15.1 through 7-15.5 are deleted and replaced in their entirety by the applicable provisions of Northshore Utility District Engineering Specifications and Special Provisions in Appendix C of these contract documents.

# 7-17 Sanitary Sewers

# (\*\*\*\*\*)

Sections 7-17.1 through 7-17.5 are deleted and replaced in their entirety by the applicable provisions of Northshore Utility District Engineering Specifications and Special Provisions in Appendix C of these contract documents.

# 7-18 Side Sewers

# (\*\*\*\*\*)

Sections 7-18.1 through 7-18.5 are deleted and replaced in their entirety by the applicable provisions of Northshore Utility District Engineering Specifications and Special Provisions in Appendix C of these contract documents.

# 7-19 Sewer Cleanouts

# (\*\*\*\*\*)

Sections 7-19.1 through 7-19.5 are deleted and replaced in their entirety by the applicable provisions of Northshore Utility District Engineering Specifications and Special Provisions in Appendix C of these contract documents.

# **END OF DIVISION 7**

# DIVISION 8

# **DIVISION 8 – MISCELLANEOUS CONSTRUCTION**

# 8-02 ROADSIDE RESTORATION

(\*\*\*\*\*)

# 8-02.1 Description

Replace the first sentence of the first paragraph of Section 8-02.1 with the following:

This Work consists of preserving, maintaining, establishing, augmenting, and restoring vegetation in the shoulder and other right-of-way areas disturbed by the construction of the project improvements outside of new and existing pavement surfaces.

# (\*\*\*\*\*)

Section 8-02.1 is supplemented with the addition of the following at the end of the section:

Work for Roadside Restoration shall include placement of topsoil, seed, bark mulch, slope restoration and other permanent stabilization surface treatments for areas disturbed outside of all new pavement areas by other Work items. All disturbed areas shall be restored in-kind or as otherwise approved by Engineer to provide a stabilized finished vegetated surface equal to or better than pre-construction.

# (\*\*\*\*\*)

# 8-02.4 Measurement

Section 8-02.4 is supplemented with the following:

The item of "Roadside Restoration" shall be measured on a force account basis per the provisions of Section 1-09.6 for the authorized Work items described by Section 8-02 of the Standard Specifications as supplemented or amended by these Special Provisions.

# (\*\*\*\*\*)

# 8-02.5 Payment

Section 8-02.5 is supplemented with the following:

"Property Restoration", per force account.

The force account payment(s) for "Property Restoration" shall be full payment for qualified Work in accordance with Sections 1-09.6 and 8-02.

# 8-14 CEMENT CONCRETE SIDEWALK

(December 28, 2006 COK GSP)

# 8-14.3 Construction Requirements

# 8-14.3(3) Placing and Finishing Concrete

The fourth paragraph of Section 8-14.3(3) shall be replaced with the following:

Sidewalk ramps shall be of the type specified in the Plans. The detectable warning pattern shall have the truncated dome shape shown in the Standard Plans and shall be installed by adding a manufactured material before the concrete has cured. Acceptable manufacturers' products are shown on the Qualified Products List.

Section 8-14.3(5) is replaced with the following:

# 8-14.3(5) ADA Sidewalk Ramps

Construction of ADA sidewalk ramps shall conform to Washington State Dept of Transportation (WSDOT) Standards included herein. Pre-approved manufactured products include: Detectable Warning Systems, Inc or approved equivalent.

All costs associated with the installation of ramps shall be considered included in the unit contract price for "Cement Concrete Sidewalk."

#### 8-14.3(4) Measurement

Section 8-14.3(4) is replaced with the following:

Cement concrete sidewalks will be measured by the square yard of finished surface and will include the surface area of the sidewalk ramps. Included in the unit contract price shall be all labor, tools, equipment, materials, and incidental items of work including, but not limited to, providing expansion joints, joint filler, finishing the surface, thickened edges in curb returns, raised edge for back of walk, materials and labor for ADA sidewalk ramps and providing white polyethylene sheeting for curing.

The unit contract price listed above shall be full compensation for all labor, tools, materials, and equipment necessary to complete the work as specified herein.

Ramp detectible warning retrofit will be measured by the square foot of truncated dome material installed on the existing ramp.

# END OF DIVISION 8

# DIVISION 9

# **DIVISION 9 – MATERIALS**

#### 9-03 AGGREGATES

#### 9-03.6 Vacant

Delete this Section and replace it with the following:

#### 9-03.6 Aggregates for Asphalt Treated Base (ATB)

(May 5, 2015 APWA GSP)

#### 9-03.6(1) General Requirements

Aggregates for asphalt treated base shall be manufactured from ledge rock, talus, or gravel, in accordance with the provisions of Section 3-01 that meet the following test requirements:

Los Angeles Wear, 500 Rev. 30% max. Degradation Factor 15 min.

#### 9-03.6(2) Grading

Aggregates for asphalt treated base shall meet the following requirements for grading:

Sieve Size	Percent Passing
2"	100
1/2"	56-100
No. 4	32-72
No. 10	22-57
No. 40	8-32
No. 200	2.0-9.0

All percentages are by weight.

#### 9-03.6(3) Test Requirements

When the aggregates are combined within the limits set forth in Section 9-03.6(2) and mixed in the laboratory with the designated grade of asphalt, the mixture shall be capable of meeting the following test values:

% of Theoretical Maximum Specific Gravity (GMM) (approximate) 93 @ AASHTO T324, WSDOT TM T718 or ASTM D3625 Pass (Acceptable anti-strip evaluation tests)

93 @ 100 gyrations Pass

The sand equivalent value of the mineral aggregate for asphalt treated base (ATB) shall not be less than 35.

# **END OF DIVISION 9**

# PREVAILING WAGES

# 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.

# Prevailing wage rates which have been published On: 8/1/2023 and will be effective from: 8/31/2023

<u>County</u>	<u>Trade</u>	Job Classification	<u>Wage</u>	Holiday	Overtime	Note
King	Asbestos Abatement Workers	Journey Level	\$59.07	<u>5D</u>	<u>1H</u>	
King	<u>Boilermakers</u>	Journey Level	\$74.29	<u>5N</u>	<u>1C</u>	
King	Brick Mason	Journey Level	\$69.07	<u>7E</u>	<u>1N</u>	
King	Brick Mason	Pointer-Caulker-Cleaner	\$69.07	<u>7E</u>	<u>1N</u>	
King	Building Service Employees	Janitor	\$29.33	<u>55</u>	<u>2F</u>	
King	Building Service Employees	Traveling Waxer/Shampooer	\$29.78	<u>55</u>	<u>2F</u>	
King	Building Service Employees	Window Cleaner (Non-Scaffold)	\$32.93	<u>55</u>	<u>2F</u>	
King	Building Service Employees	Window Cleaner (Scaffold)	\$33.93	<u>55</u>	<u>2F</u>	
King	<u>Cabinet Makers (In Shop)</u>	Journey Level	\$22.74		<u>1</u>	
King	<u>Carpenters</u>	Acoustical Worker	\$74.96	<u>15J</u>	<u>4C</u>	
King	<u>Carpenters</u>	Bridge, Dock And Wharf Carpenters	\$74.96	<u>15J</u>	<u>4C</u>	
King	<u>Carpenters</u>	Floor Layer & Floor Finisher	\$74.96	<u>15J</u>	<u>4C</u>	
King	<u>Carpenters</u>	Journey Level	\$74.96	<u>15J</u>	<u>4C</u>	
King	<u>Carpenters</u>	Scaffold Erector	\$74.96	<u>15J</u>	<u>4C</u>	
King	<u>Cement Masons</u>	Application of all Composition Mastic	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Application of all Epoxy Material	\$72.37	<u>15J</u>	<u>4U</u>	
King	<u>Cement Masons</u>	Application of all Plastic Material	\$72.87	<u>15J</u>	<u>4U</u>	
King	<u>Cement Masons</u>	Application of Sealing Compound	\$72.37	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Application of Underlayment	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Building General	\$72.37	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Composition or Kalman Floors	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Concrete Paving	\$72.37	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Curb & Gutter Machine	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Curb & Gutter, Sidewalks	\$72.37	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Curing Concrete	\$72.37	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Finish Colored Concrete	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Floor Grinding	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Floor Grinding/Polisher	\$72.37	<u>15J</u>	<u>4U</u>	
King	<u>Cement Masons</u>	Green Concrete Saw, self- powered	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Grouting of all Plates	\$72.37	<u>15J</u>	<u>4U</u>	

King	Cement Masons	Grouting of all Tilt-up Panels	\$72.37	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Gunite Nozzleman	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Hand Powered Grinder	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Journey Level	\$72.37	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Patching Concrete	\$72.37	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Pneumatic Power Tools	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Power Chipping & Brushing	\$72.87	<u>15J</u>	<u>4U</u>	
King	<u>Cement Masons</u>	Sand Blasting Architectural Finish	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Screed & Rodding Machine	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Spackling or Skim Coat Concrete	\$72.37	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Troweling Machine Operator	\$72.87	<u>15J</u>	<u>4U</u>	
King	<u>Cement Masons</u>	Troweling Machine Operator on Colored Slabs	\$72.87	<u>15J</u>	<u>4U</u>	
King	Cement Masons	Tunnel Workers	\$72.87	<u>15J</u>	<u>4U</u>	
King	Divers & Tenders	Bell/Vehicle or Submersible Operator (Not Under Pressure)	\$129.71	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Dive Supervisor/Master	\$93.94	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Diver	\$129.71	<u>15J</u>	<u>4C</u>	<u>8V</u>
King	Divers & Tenders	Diver On Standby	\$88.94	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Diver Tender	\$80.82	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 0-30.00 PSI	\$93.26	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 30.01 - 44.00 PSI	\$98.26	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 44.01 - 54.00 PSI	\$102.26	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 54.01 - 60.00 PSI	\$107.26	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 60.01 - 64.00 PSI	\$109.76	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 64.01 - 68.00 PSI	\$114.76	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 68.01 - 70.00 PSI	\$116.76	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 70.01 - 72.00 PSI	\$118.76	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Hyperbaric Worker - Compressed Air Worker 72.01 - 74.00 PSI	\$120.76	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Manifold Operator	\$80.82	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Manifold Operator Mixed Gas	\$85.82	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Remote Operated Vehicle Operator/Technician	\$80.82	<u>15J</u>	<u>4C</u>	
King	Divers & Tenders	Remote Operated Vehicle Tender	\$75.41	<u>15J</u>	<u>4C</u>	
King	Dredge Workers	Assistant Engineer	\$79.62	<u>5D</u>	<u>3F</u>	

King	Dredge Workers	Assistant Mate (Deckhand)	\$79.01	<u>5D</u>	<u>3F</u>	
King	Dredge Workers	Boatmen	\$79.62	<u>5D</u>	<u>3F</u>	
King	Dredge Workers	Engineer Welder	\$81.15	<u>5D</u>	<u>3F</u>	
King	Dredge Workers	Leverman, Hydraulic	\$82.77	<u>5D</u>	<u>3F</u>	
King	Dredge Workers	Mates	\$79.62	<u>5D</u>	<u>3F</u>	
King	Dredge Workers	Oiler	\$79.01	<u>5D</u>	<u>3F</u>	
King	Drywall Applicator	Journey Level	\$74.96	<u>15J</u>	<u>4C</u>	
King	Drywall Tapers	Journey Level	\$74.50	<u>5P</u>	<u>1E</u>	
King	<u>Electrical Fixture Maintenance</u> <u>Workers</u>	Journey Level	\$37.19	<u>5L</u>	<u>1E</u>	
King	<u>Electricians - Inside</u>	Cable Splicer	\$105.59	<u>7C</u>	<u>4E</u>	
King	<u>Electricians - Inside</u>	Cable Splicer (tunnel)	\$113.52	<u>7C</u>	<u>4E</u>	
King	<u>Electricians - Inside</u>	Certified Welder	\$101.98	<u>7C</u>	<u>4E</u>	
King	<u>Electricians - Inside</u>	Certified Welder (tunnel)	\$109.56	<u>7C</u>	<u>4E</u>	
King	<u>Electricians - Inside</u>	Construction Stock Person	\$49.28	<u>7C</u>	<u>4E</u>	
King	<u>Electricians - Inside</u>	Journey Level	\$98.38	<u>7C</u>	<u>4E</u>	
King	<u>Electricians - Inside</u>	Journey Level (tunnel)	\$105.59	<u>7C</u>	<u>4E</u>	
King	Electricians - Motor Shop	Journey Level	\$48.68	<u>5A</u>	<u>1B</u>	
King	<u>Electricians - Powerline</u> <u>Construction</u>	Cable Splicer	\$93.00	<u>5A</u>	<u>4D</u>	
King	<u>Electricians - Powerline</u> <u>Construction</u>	Certified Line Welder	\$85.42	<u>5A</u>	<u>4D</u>	
King	Electricians - Powerline Construction	Groundperson	\$55.27	<u>5A</u>	<u>4D</u>	
King	<u>Electricians - Powerline</u> <u>Construction</u>	Heavy Line Equipment Operator	\$85.42	<u>5A</u>	<u>4D</u>	
King	Electricians - Powerline Construction	Journey Level Lineperson	\$85.42	<u>5A</u>	<u>4D</u>	
King	Electricians - Powerline Construction	Line Equipment Operator	\$73.35	<u>5A</u>	<u>4D</u>	
King	<u>Electricians - Powerline</u> <u>Construction</u>	Meter Installer	\$55.27	<u>5A</u>	<u>4D</u>	<u>8W</u>
King	Electricians - Powerline Construction	Pole Sprayer	\$85.42	<u>5A</u>	<u>4D</u>	
King	<u>Electricians - Powerline</u> <u>Construction</u>	Powderperson	\$63.50	<u>5A</u>	<u>4D</u>	
King	Electronic Technicians	Journey Level	\$63.38	<u>7E</u>	<u>1E</u>	
King	Elevator Constructors	Mechanic	\$107.49	<u>7D</u>	<u>4A</u>	
King	Elevator Constructors	Mechanic In Charge	\$116.13	<u>7D</u>	<u>4A</u>	
King	Fabricated Precast Concrete Products	All Classifications - In-Factory Work Only	\$21.34	<u>5B</u>	<u>1R</u>	
King	Fence Erectors	Fence Erector	\$50.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Fence Erectors	Fence Laborer	\$50.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Flaggers</u>	Journey Level	\$50.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Glaziers</u>	Journey Level	\$79.16	<u>7L</u>	<u>1Y</u>	
King	<u>Heat &amp; Frost Insulators And</u> <u>Asbestos Workers</u>	Journey Level	\$87.15	<u>15H</u>	<u>11C</u>	
King	Heating Equipment Mechanics	Journey Level	\$96.42	<u>7F</u>	<u>1E</u>	
King	Hod Carriers & Mason Tenders	Journey Level	\$62.49	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Industrial Power Vacuum <u>Cleaner</u>	Journey Level	\$15.74		1	
King	Inland Boatmen	Boat Operator	\$61.41	<u>5B</u>	<u>1K</u>	
King	Inland Boatmen	Cook	\$56.48	<u>5B</u>	<u>1K</u>	

King	Inland Boatmen	Deckhand	\$57.48	<u>5B</u>	<u>1K</u>	
King	Inland Boatmen	Deckhand Engineer	\$58.81	<u>5B</u>	<u>1K</u>	
King	Inland Boatmen	Launch Operator	\$58.89	<u>5B</u>	<u>1K</u>	
King	Inland Boatmen	Mate	\$57.31	<u>5B</u>	<u>1K</u>	
King	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Cleaner Operator	\$49.48	<u>15M</u>	<u>110</u>	
King	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Foamer Operator	\$49.48	<u>15M</u>	<u>110</u>	
King	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Grout Truck Operator	\$49.48	<u>15M</u>	<u>110</u>	
King	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Head Operator	\$47.41	<u>15M</u>	<u>110</u>	
King	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	Technician	\$41.20	<u>15M</u>	<u>110</u>	
King	Inspection/Cleaning/Sealing Of Sewer & Water Systems By Remote Control	TV Truck Operator	\$44.31	<u>15M</u>	<u>110</u>	
King	Insulation Applicators	Journey Level	\$74.96	<u>15J</u>	<u>4C</u>	
King	<u>Ironworkers</u>	Journeyman	\$85.80	<u>15K</u>	<u>11N</u>	
King	Laborers	Air, Gas Or Electric Vibrating Screed	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Airtrac Drill Operator	\$60.90	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Ballast Regular Machine	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Batch Weighman	\$50.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Brick Pavers	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Brush Cutter	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Brush Hog Feeder	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Burner	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Caisson Worker	\$60.90	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Carpenter Tender	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Cement Dumper-paving	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Cement Finisher Tender	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Change House Or Dry Shack	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Chipping Gun (30 Lbs. And Over)	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Chipping Gun (Under 30 Lbs.)	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Choker Setter	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Chuck lender	\$59.07	<u>15J</u>	<u>4V</u>	<u>81</u>
King	Laborers	Clary Power Spreader	\$60.15 ¢50.07	<u>10</u>	<u>4v</u>	<u>81</u>
King	Laborers	Clean-up Laborer	\$39.07	<u>10</u>	<u>4v</u>	<u>81</u>
King	Laborers	Operator	\$60.15	<u>15J</u>	<u>4v</u>	<u>81</u>
King	<u>Laborers</u>	Concrete Form Stripper	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Concrete Placement Crew	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Concrete Saw Operator/Core Driller	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Crusher Feeder	\$50.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Curing Laborer	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Demolition: Wrecking & Moving (Incl. Charred Material)	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>

King	Laborers	Ditch Digger	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Diver	\$60.90	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Drill Operator (Hydraulic, Diamond)	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Dry Stack Walls	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Dump Person	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Epoxy Technician	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Erosion Control Worker	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Faller & Bucker Chain Saw	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Fine Graders	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Firewatch	\$50.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Form Setter	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Gabian Basket Builders	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	General Laborer	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Grade Checker & Transit Person	\$62.49	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Grinders	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Grout Machine Tender	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Groutmen (Pressure) Including Post Tension Beams	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Guardrail Erector	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Hazardous Waste Worker (Level A)	\$60.90	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Hazardous Waste Worker (Level B)	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Hazardous Waste Worker (Level C)	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	High Scaler	\$60.90	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Jackhammer	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Laserbeam Operator	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Maintenance Person	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Manhole Builder-Mudman	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Material Yard Person	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Mold Abatement Worker	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Motorman-Dinky Locomotive	\$62.59	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	nozzleman (concrete pump, green cutter when using combination of high pressure air & water on concrete & rock, sandblast, gunite, shotcrete, water blaster, vacuum blaster)	\$62.49	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Pavement Breaker	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Pilot Car	\$50.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Pipe Layer (Lead)	\$62.49	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Pipe Layer/Tailor	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Pipe Pot Tender	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Pipe Reliner	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Pipe Wrapper	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Pot Tender	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Powderman	\$60.90	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Powderman's Helper	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Power Jacks	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Railroad Spike Puller - Power	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>

King	Laborers	Raker - Asphalt	\$62.49	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Re-timberman	\$60.90	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Remote Equipment Operator	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Rigger/Signal Person	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Rip Rap Person	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Rivet Buster	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Rodder	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Scaffold Erector	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Scale Person	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Sloper (Over 20")	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Sloper Sprayer	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Spreader (Concrete)	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Stake Hopper	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Stock Piler	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Swinging Stage/Boatswain Chair	\$50.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Tamper & Similar Electric, Air & Gas Operated Tools	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Tamper (Multiple & Self- propelled)	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Timber Person - Sewer (Lagger, Shorer & Cribber)	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Toolroom Person (at Jobsite)	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Topper	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Track Laborer	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Track Liner (Power)	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Traffic Control Laborer	\$53.54	<u>15J</u>	<u>4V</u>	<u>9C</u>
King	<u>Laborers</u>	Traffic Control Supervisor	\$56.73	<u>15J</u>	<u>4V</u>	<u>9C</u>
King	<u>Laborers</u>	Truck Spotter	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Tugger Operator	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Tunnel Work-Compressed Air Worker 0-30 psi	\$175.79	<u>15J</u>	<u>4V</u>	<u>9B</u>
King	<u>Laborers</u>	Tunnel Work-Compressed Air Worker 30.01-44.00 psi	\$180.82	<u>15J</u>	<u>4V</u>	<u>9B</u>
King	<u>Laborers</u>	Tunnel Work-Compressed Air Worker 44.01-54.00 psi	\$184.50	<u>15J</u>	<u>4V</u>	<u>9B</u>
King	<u>Laborers</u>	Tunnel Work-Compressed Air Worker 54.01-60.00 psi	\$190.20	<u>15J</u>	<u>4V</u>	<u>9B</u>
King	<u>Laborers</u>	Tunnel Work-Compressed Air Worker 60.01-64.00 psi	\$192.32	<u>15J</u>	<u>4V</u>	<u>9B</u>
King	<u>Laborers</u>	Tunnel Work-Compressed Air Worker 64.01-68.00 psi	\$197.42	<u>15J</u>	<u>4V</u>	<u>9B</u>
King	<u>Laborers</u>	Tunnel Work-Compressed Air Worker 68.01-70.00 psi	\$199.32	<u>15J</u>	<u>4V</u>	<u>9B</u>
King	<u>Laborers</u>	Tunnel Work-Compressed Air Worker 70.01-72.00 psi	\$201.32	<u>15J</u>	<u>4V</u>	<u>9B</u>
King	<u>Laborers</u>	Tunnel Work-Compressed Air Worker 72.01-74.00 psi	\$203.32	<u>15J</u>	<u>4V</u>	<u>9B</u>
King	Laborers	Tunnel Work-Guage and Lock Tender	\$62.59	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Tunnel Work-Miner	\$62.59	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Vibrator	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	<u>Laborers</u>	Vinyl Seamer	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Watchman	\$45.51	<u>15J</u>	<u>4V</u>	<u>8Y</u>

King	Laborers	Welder	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Well Point Laborer	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers	Window Washer/Cleaner	\$45.51	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers - Underground Sewer & Water	General Laborer & Topman	\$59.07	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Laborers - Underground Sewer <u>&amp; Water</u>	Pipe Layer	\$60.15	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Landscape Construction	Landscape Construction/Landscaping Or Planting Laborers	\$45.51	<u>15J</u>	<u>4V</u>	<u>8Y</u>
King	Landscape Construction	Landscape Operator	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Landscape Maintenance	Groundskeeper	\$17.87		<u>1</u>	
King	Lathers	Journey Level	\$74.96	<u>15J</u>	<u>4C</u>	
King	Marble Setters	Journey Level	\$69.07	<u>7E</u>	<u>1N</u>	
King	Metal Fabrication (In Shop)	Fitter/Certified Welder	\$42.17	<u>151</u>	<u>11E</u>	
King	Metal Fabrication (In Shop)	General Laborer	\$30.07	<u>151</u>	<u>11E</u>	
King	Metal Fabrication (In Shop)	Mechanic	\$43.63	<u>151</u>	<u>11E</u>	
King	Metal Fabrication (In Shop)	Welder/Burner	\$39.28	<u>151</u>	<u>11E</u>	
King	<u>Millwright</u>	Journey Level	\$76.51	<u>15J</u>	<u>4C</u>	
King	<u>Modular Buildings</u>	Cabinet Assembly	\$15.74		<u>1</u>	
King	<u>Modular Buildings</u>	Electrician	\$15.74		<u>1</u>	
King	Modular Buildings	Equipment Maintenance	\$15.74		<u>1</u>	
King	Modular Buildings	Plumber	\$15.74		<u>1</u>	
King	Modular Buildings	Production Worker	\$15.74		<u>1</u>	
King	Modular Buildings	Tool Maintenance	\$15.74		<u>1</u>	
King	Modular Buildings	Utility Person	\$15.74		<u>1</u>	
King	Modular Buildings	Welder	\$15.74		<u>1</u>	
King	Painters	Journey Level	\$51.71	<u>6Z</u>	<u>11J</u>	
King	<u>Pile Driver</u>	Crew Tender	\$80.82	<u>15J</u>	<u>4C</u>	
King	<u>Pile Driver</u>	Journey Level	\$75.41	<u>15J</u>	<u>4C</u>	
King	<u>Plasterers</u>	Journey Level	\$70.91	<u>7Q</u>	<u>1R</u>	
King	<u>Plasterers</u>	Nozzleman	\$74.91	<u>7Q</u>	<u>1R</u>	
King	Playground & Park Equipment Installers	Journey Level	\$15.74		<u>1</u>	
King	Plumbers & Pipefitters	Journey Level	\$100.69	<u>6Z</u>	<u>1G</u>	
King	Power Equipment Operators	Asphalt Plant Operators	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Assistant Engineer	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Barrier Machine (zipper)	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Batch Plant Operator: concrete	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Boat Operator	\$83.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Bobcat	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Brokk - Remote Demolition Equipment	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Brooms	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Bump Cutter	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Cableways	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Chipper	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Compressor	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Concrete Finish Machine - Laser Screed	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Concrete Pump - Mounted Or Trailer High Pressure Line Pump,	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>

		Pump High Pressure				
King	Power Equipment Operators	Concrete Pump: Truck Mount With Boom Attachment Over 42 M	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Concrete Pump: Truck Mount With Boom Attachment Up To 42m	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Conveyors	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Cranes Friction: 200 tons and over	\$86.48	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Cranes, A-frame: 10 tons and under	\$78.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Cranes: 100 tons through 199 tons, or 150' of boom (including jib with attachments)	\$84.77	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Cranes: 20 tons through 44 tons with attachments	\$83.20	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Cranes: 200 tons- 299 tons, or 250' of boom including jib with attachments	\$85.66	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Cranes: 300 tons and over or 300' of boom including jib with attachments	\$86.48	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Cranes: 45 tons through 99 tons, under 150' of boom(including jib with attachments)	\$83.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Cranes: Friction cranes through 199 tons	\$85.66	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Cranes: through 19 tons with attachments, a-frame over 10 tons	\$82.56	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Crusher	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Deck Engineer/Deck Winches (power)	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Derricks, On Building Work	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Dozers D-9 & Under	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Drill Oilers: Auger Type, Truck Or Crane Mount	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Drilling Machine	\$84.46	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Elevator and man-lift: permanent and shaft type	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Finishing Machine, Bidwell And Gamaco & Similar Equipment	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Forklift: 3000 lbs and over with attachments	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Forklifts: under 3000 lbs. with attachments	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Grade Engineer: Using Blue Prints, Cut Sheets, Etc	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Gradechecker/Stakeman	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Guardrail Punch	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Hard Tail End Dump Articulating Off- Road Equipment 45 Yards. & Over	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Hard Tail End Dump Articulating Off-road Equipment Under 45 Yards	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>

King	Power Equipment Operators	Horizontal/Directional Drill Locator	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Horizontal/Directional Drill Operator	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Hydralifts/Boom Trucks Over 10 Tons	\$82.56	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Hydralifts/boom trucks: 10 tons and under	\$78.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Leverman	\$85.33	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Loader, Overhead, 6 Yards. But Not Including 8 Yards	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Loaders, Overhead Under 6 Yards	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Loaders, Plant Feed	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Loaders: Elevating Type Belt	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Locomotives, All	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Material Transfer Device	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Mechanics: All (Leadmen - \$0.50 per hour over mechanic)	\$84.46	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Motor Patrol Graders	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Mucking Machine, Mole, Tunnel Drill, Boring, Road Header And/or Shield	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Oil Distributors, Blower Distribution & Mulch Seeding Operator	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Outside Hoists (Elevators and Manlifts), Air Tuggers, Strato	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Overhead, bridge type Crane: 20 tons through 44 tons	\$83.20	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Overhead, bridge type: 100 tons and over	\$84.77	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Overhead, bridge type: 45 tons through 99 tons	\$83.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Pavement Breaker	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Pile Driver (other Than Crane Mount)	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Plant Oiler - Asphalt, Crusher	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Posthole Digger, Mechanical	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Power Plant	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Pumps - Water	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Quad 9, Hd 41, D10 And Over	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Quick Tower: no cab, under 100 feet in height base to boom	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Remote Control Operator On Rubber Tired Earth Moving Equipment	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Rigger and Bellman	\$78.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Rigger/Signal Person, Bellman(Certified)	\$82.56	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Rollagon	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Roller, Other Than Plant Mix	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Roller, Plant Mix Or Multi-lift Materials	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Roto-mill, Roto-grinder	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>

King	Power Equipment Operators	Saws - Concrete	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Scraper, Self Propelled Under 45 Yards	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Scrapers - Concrete & Carry All	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Scrapers, Self-propelled: 45 Yards And Over	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Service Engineers: Equipment	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Shotcrete/Gunite Equipment	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Shovel, Excavator, Backhoe, Tractors Under 15 Metric Tons	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Shovel, Excavator, Backhoe: Over 30 Metric Tons To 50 Metric Tons	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Shovel, Excavator, Backhoes, Tractors: 15 To 30 Metric Tons	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Shovel, Excavator, Backhoes: Over 50 Metric Tons To 90 Metric Tons	\$84.46	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Shovel, Excavator, Backhoes: Over 90 Metric Tons	\$85.33	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Slipform Pavers	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Spreader, Topsider & Screedman	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Subgrader Trimmer	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Tower Bucket Elevators	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Tower Crane: over 175' through 250' in height, base to boom	\$85.66	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Tower crane: up to 175' in height base to boom	\$84.77	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Tower Cranes: over 250' in height from base to boom	\$86.48	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Transporters, All Track Or Truck Type	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Trenching Machines	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Truck Crane Oiler/Driver: 100 tons and over	\$83.20	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Truck crane oiler/driver: under 100 tons	\$82.56	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators	Truck Mount Portable Conveyor	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Vac Truck (Vactor Guzzler, Hydro Excavator)	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Welder	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Wheel Tractors, Farmall Type	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators	Yo Yo Pay Dozer	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Asphalt Plant Operators	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Assistant Engineer	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Barrier Machine (zipper)	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Batch Plant Operator, Concrete	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Boat Operator	\$83.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Bobcat	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>

King	Power Equipment Operators- Underground Sewer & Water	Brokk - Remote Demolition Equipment	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Brooms	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Bump Cutter	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Cableways	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Chipper	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Compressor	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Concrete Finish Machine - Laser Screed	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Concrete Pump - Mounted Or Trailer High Pressure Line Pump, Pump High Pressure	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Concrete Pump: Truck Mount With Boom Attachment Over 42 M	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Concrete Pump: Truck Mount With Boom Attachment Up To 42m	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Conveyors	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Cranes Friction: 200 tons and over	\$86.48	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Cranes, A-frame: 10 tons and under	\$78.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Cranes: 100 tons through 199 tons, or 150' of boom (including jib with attachments)	\$84.77	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Cranes: 20 tons through 44 tons with attachments	\$83.20	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Cranes: 20 tons through 44 tons with attachments	\$83.20	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Cranes: 200 tons- 299 tons, or 250' of boom including jib with attachments	\$85.66	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Cranes: 300 tons and over or 300' of boom including jib with attachments	\$86.48	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Cranes: 45 tons through 99 tons, under 150' of boom(including jib with attachments)	\$83.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Cranes: Friction cranes through 199 tons	\$85.66	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Cranes: through 19 tons with attachments, a-frame over 10 tons	\$82.56	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Crusher	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Deck Engineer/Deck Winches (power)	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Derricks, On Building Work	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Dozers D-9 & Under	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Drill Oilers: Auger Type, Truck Or Crane Mount	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
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King	Power Equipment Operators- Underground Sewer & Water	Drilling Machine	\$84.46	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Elevator and man-lift: permanent and shaft type	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Finishing Machine, Bidwell And Gamaco & Similar Equipment	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Forklift: 3000 lbs and over with attachments	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Forklifts: under 3000 lbs. with attachments	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Grade Engineer: Using Blue Prints, Cut Sheets, Etc	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Gradechecker/Stakeman	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Guardrail Punch	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Hard Tail End Dump Articulating Off- Road Equipment 45 Yards. & Over	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Hard Tail End Dump Articulating Off-road Equipment Under 45 Yards	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Horizontal/Directional Drill Locator	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Horizontal/Directional Drill Operator	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Hydralifts/boom trucks: 10 tons and under	\$78.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Hydralifts/boom trucks: over 10 tons	\$82.56	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Leverman	\$85.33	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Loader, Overhead, 6 Yards. But Not Including 8 Yards	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Loaders, Overhead Under 6 Yards	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Loaders, Plant Feed	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Loaders: Elevating Type Belt	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Locomotives, All	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Material Transfer Device	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Mechanics: All (Leadmen - \$0.50 per hour over mechanic)	\$84.46	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Motor Patrol Graders	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Mucking Machine, Mole, Tunnel Drill, Boring, Road Header And/or Shield	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Oil Distributors, Blower Distribution & Mulch Seeding Operator	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>

King	Power Equipment Operators- Underground Sewer & Water	Outside Hoists (Elevators and Manlifts), Air Tuggers, Strato	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Overhead, bridge type Crane: 20 tons through 44 tons	\$83.20	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Overhead, bridge type: 100 tons and over	\$84.77	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Overhead, bridge type: 45 tons through 99 tons	\$83.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Pavement Breaker	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Pile Driver (other Than Crane Mount)	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Plant Oiler - Asphalt, Crusher	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Posthole Digger, Mechanical	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Power Plant	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Pumps - Water	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Quad 9, Hd 41, D10 And Over	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Quick Tower: no cab, under 100 feet in height base to boom	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Remote Control Operator On Rubber Tired Earth Moving Equipment	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Rigger and Bellman	\$78.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Rigger/Signal Person, Bellman(Certified)	\$82.56	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Rollagon	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Roller, Other Than Plant Mix	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Roller, Plant Mix Or Multi-lift Materials	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Roto-mill, Roto-grinder	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Saws - Concrete	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Scraper, Self Propelled Under 45 Yards	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Scrapers - Concrete & Carry All	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Scrapers, Self-propelled: 45 Yards And Over	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Shotcrete/Gunite Equipment	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoe, Tractors Under 15 Metric Tons	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoe: Over 30 Metric Tons To 50 Metric Tons	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoes, Tractors: 15 To 30 Metric Tons	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>

King	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoes: Over 50 Metric Tons To 90 Metric Tons	\$84.46	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Shovel, Excavator, Backhoes: Over 90 Metric Tons	\$85.33	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Slipform Pavers	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Spreader, Topsider & Screedman	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Subgrader Trimmer	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Tower Bucket Elevators	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Tower Crane: over 175' through 250' in height, base to boom	\$85.66	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Tower crane: up to 175' in height base to boom	\$84.77	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Tower Cranes: over 250' in height from base to boom	\$86.48	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Transporters, All Track Or Truck Type	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Trenching Machines	\$82.25	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Truck Crane Oiler/Driver: 100 tons and over	\$83.20	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Truck Crane Oiler/Driver: 100 tons and over	\$83.20	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Truck crane oiler/driver: under 100 tons	\$82.56	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Truck Mount Portable Conveyor	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Vac Truck (Vactor Guzzler, Hydro Excavator)	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Welder	\$83.62	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	<u>Power Equipment Operators-</u> <u>Underground Sewer &amp; Water</u>	Wheel Tractors, Farmall Type	\$78.65	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	Power Equipment Operators- Underground Sewer & Water	Yo Yo Pay Dozer	\$82.88	<u>15J</u>	<u>11G</u>	<u>8X</u>
King	<u>Power Line Clearance Tree</u> <u>Trimmers</u>	Journey Level In Charge	\$57.22	<u>5A</u>	<u>4A</u>	
King	<u>Power Line Clearance Tree</u> <u>Trimmers</u>	Spray Person	\$54.32	<u>5A</u>	<u>4A</u>	
King	<u>Power Line Clearance Tree</u> <u>Trimmers</u>	Tree Equipment Operator	\$57.22	<u>5A</u>	<u>4A</u>	
King	Power Line Clearance Tree Trimmers	Tree Trimmer	\$51.18	<u>5A</u>	<u>4A</u>	
King	<u>Power Line Clearance Tree</u> <u>Trimmers</u>	Tree Trimmer Groundperson	\$38.99	<u>5A</u>	<u>4A</u>	
King	Refrigeration & Air Conditioning Mechanics	Journey Level	\$93.51	<u>67</u>	<u>1G</u>	
King	Residential Brick Mason	Journey Level	\$69.07	<u>7E</u>	<u>1N</u>	
King	Residential Carpenters	Journey Level	\$36.44		<u>1</u>	
King	Residential Cement Masons	Journey Level	\$46.64		<u>1</u>	
King	Residential Drywall Applicators	Journey Level	\$74.96	<u>15J</u>	<u>4C</u>	
King	Residential Drywall Tapers	Journey Level	\$36.36		<u>1</u>	

King	Residential Electricians	Journey Level	\$48.80		<u>1</u>	
King	Residential Glaziers	Journey Level	\$28.93		<u>1</u>	
King	Residential Insulation Applicators	Journey Level	\$28.18		<u>1</u>	
King	Residential Laborers	Journey Level	\$29.73		1	
King	Residential Marble Setters	Journey Level	\$27.38		<u>1</u>	
King	Residential Painters	Journey Level	\$23.47		<u>1</u>	
King	<u>Residential Plumbers &amp;</u> <u>Pipefitters</u>	Journey Level	\$100.69	<u>67</u>	<u>1G</u>	
King	Residential Refrigeration & Air Conditioning Mechanics	Journey Level	\$93.51	<u>67</u>	<u>1G</u>	
King	Residential Sheet Metal Workers	Journey Level	\$96.42	<u>7F</u>	<u>1E</u>	
King	Residential Soft Floor Layers	Journey Level	\$57.11	<u>5A</u>	<u>3J</u>	
King	<u>Residential Sprinkler Fitters</u> ( <u>Fire Protection)</u>	Journey Level	\$58.26	<u>5C</u>	<u>2R</u>	
King	Residential Stone Masons	Journey Level	\$69.07	<u>7E</u>	<u>1N</u>	
King	Residential Terrazzo Workers	Journey Level	\$62.36	<u>7E</u>	<u>1N</u>	
King	<u>Residential Terrazzo/Tile</u> <u>Finishers</u>	Journey Level	\$24.39		<u>1</u>	
King	Residential Tile Setters	Journey Level	\$21.04		<u>1</u>	
King	Roofers	Journey Level	\$61.95	<u>5A</u>	<u>3H</u>	
King	<u>Roofers</u>	Using Irritable Bituminous Materials	\$64.95	<u>5A</u>	<u>3H</u>	
King	Sheet Metal Workers	Journey Level (Field or Shop)	\$96.42	<u>7F</u>	<u>1E</u>	
King	Shipbuilding & Ship Repair	New Construction Boilermaker	\$50.35	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	New Construction Carpenter	\$50.95	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	New Construction Crane Operator	\$41.83	<u>7V</u>	<u>1</u>	
King	Shipbuilding & Ship Repair	New Construction Electrician	\$50.42	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	New Construction Heat & Frost Insulator	\$87.15	<u>15H</u>	<u>11C</u>	
King	Shipbuilding & Ship Repair	New Construction Laborer	\$50.95	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	New Construction Machinist	\$50.95	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	New Construction Operating Engineer	\$41.83	<u>7V</u>	<u>1</u>	
King	Shipbuilding & Ship Repair	New Construction Painter	\$50.95	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	New Construction Pipefitter	\$50.95	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	New Construction Rigger	\$50.35	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	New Construction Sheet Metal	\$50.35	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	New Construction Shipwright	\$50.95	<u>7X</u>	<u>4J</u>	
King	<u>Shipbuilding &amp; Ship Repair</u>	New Construction Warehouse/Teamster	\$41.83	<u>7V</u>	<u>1</u>	
King	Shipbuilding & Ship Repair	New Construction Welder / Burner	\$50.35	<u>7X</u>	<u>4J</u>	
King	<u>Shipbuilding &amp; Ship Repair</u>	Ship Repair Boilermaker	\$50.35	<u>7X</u>	<u>4J</u>	
King	<u>Shipbuilding &amp; Ship Repair</u>	Ship Repair Carpenter	\$50.95	<u>7X</u>	<u>4J</u>	
King	<u>Shipbuilding &amp; Ship Repair</u>	Ship Repair Crane Operator	\$45.06	<u>7Y</u>	<u>4K</u>	
King	Shipbuilding & Ship Repair	Ship Repair Electrician	\$50.42	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	Ship Repair Heat & Frost Insulator	\$87.15	<u>15H</u>	<u>11C</u>	
King	<u>Shipbuilding &amp; Ship Repair</u>	Ship Repair Laborer	\$50.95	<u>7X</u>	<u>4J</u>	
King	<u>Shipbuilding &amp; Ship Repair</u>	Ship Repair Machinist	\$50.95	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	Ship Repair Operating Engineer	\$45.06	<u>7Y</u>	<u>4K</u>	

King	<u>Shipbuilding &amp; Ship Repair</u>	Ship Repair Painter	\$50.95	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	Ship Repair Pipefitter	\$50.95	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	Ship Repair Rigger	\$50.35	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	Ship Repair Sheet Metal	\$50.35	<u>7X</u>	<u>4J</u>	
King	<u>Shipbuilding &amp; Ship Repair</u>	Ship Repair Shipwright	\$50.95	<u>7X</u>	<u>4J</u>	
King	Shipbuilding & Ship Repair	Ship Repair Warehouse / Teamster	\$45.06	<u>7Y</u>	<u>4K</u>	
King	<u>Sign Makers &amp; Installers</u> ( <u>Electrical)</u>	Journey Level	\$58.04	<u>0</u>	1	
King	<u>Sign Makers &amp; Installers (Non- Electrical)</u>	Journey Level	\$37.08	<u>0</u>	<u>1</u>	
King	Soft Floor Layers	Journey Level	\$66.32	<u>15J</u>	<u>4C</u>	
King	Solar Controls For Windows	Journey Level	\$15.74		<u>1</u>	
King	<u>Sprinkler Fitters (Fire</u> <u>Protection)</u>	Journey Level	\$93.99	<u>5C</u>	<u>1X</u>	
King	<u>Stage Rigging Mechanics (Non</u> <u>Structural)</u>	Journey Level	\$15.74		1	
King	Stone Masons	Journey Level	\$69.07	<u>7E</u>	<u>1N</u>	
King	<u>Street And Parking Lot Sweeper</u> <u>Workers</u>	Journey Level	\$19.09		<u>1</u>	
King	<u>Surveyors</u>	Assistant Construction Site Surveyor	\$82.56	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	<u>Surveyors</u>	Chainman	\$78.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	<u>Surveyors</u>	Construction Site Surveyor	\$83.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	<u>Surveyors</u>	Drone Operator (when used in conjunction with survey work only)	\$78.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	<u>Surveyors</u>	Ground Penetrating Radar Operator	\$78.95	<u>7A</u>	<u>11H</u>	<u>8X</u>
King	Telecommunication Technicians	Journey Level	\$63.38	<u>7E</u>	<u>1E</u>	
King	<u>Telephone Line Construction -</u> <u>Outside</u>	Cable Splicer	\$40.11	<u>5A</u>	<u>2B</u>	
King	<u>Telephone Line Construction -</u> <u>Outside</u>	Hole Digger/Ground Person	\$26.67	<u>5A</u>	<u>2B</u>	
King	<u>Telephone Line Construction -</u> <u>Outside</u>	Telephone Equipment Operator (Light)	\$33.49	<u>5A</u>	<u>2B</u>	
King	<u>Telephone Line Construction -</u> <u>Outside</u>	Telephone Lineperson	\$37.90	<u>5A</u>	<u>2B</u>	
King	<u>Terrazzo Workers</u>	Journey Level	\$62.36	<u>7E</u>	<u>1N</u>	
King	<u>Tile Setters</u>	Journey Level	\$62.36	<u>7E</u>	<u>1N</u>	
King	<u>Tile, Marble &amp; Terrazzo</u> <u>Finishers</u>	Finisher	\$53.19	<u>7E</u>	<u>1N</u>	
King	Traffic Control Stripers	Journey Level	\$89.54	<u>15L</u>	<u>1K</u>	
King	Truck Drivers	Asphalt Mix Over 16 Yards	\$74.95	<u>15J</u>	<u>11M</u>	<u>8L</u>
King	Truck Drivers	Asphalt Mix To 16 Yards	\$74.02	<u>15J</u>	<u>11M</u>	<u>8L</u>
King	Truck Drivers	Dump Truck	\$74.02	<u>15J</u>	<u>11M</u>	<u>8L</u>
King	Truck Drivers	Dump Truck & Trailer	\$74.95	<u>15J</u>	<u>11M</u>	<u>8L</u>
King	Truck Drivers	Other Trucks	\$74.95	<u>15J</u>	<u>11M</u>	<u>8L</u>
King	Truck Drivers - Ready Mix	Transit Mix	\$74.95	<u>15J</u>	<u>11M</u>	<u>8L</u>
King	<u>Well Drillers &amp; Irrigation Pump</u> Installers	Irrigation Pump Installer	\$17.71		1	
King	Well Drillers & Irrigation Pump Installers	Oiler	\$15.74		1	

King	Well Drillers & Irrigation Pump	Well Driller	\$18.00	<u>1</u>	
	<u>Installers</u>				

# Appendix A: Plans

100% Plans provided under separate cover concurrent with this review package.

# APPENDIX B: Pre-approved Plans





### LAST REVISED: 01/2023

- CONCRETE INLET TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
- 2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
- ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS
- PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
- KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CURB INLET WALL THICKNESS.
- ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES WITH MAX. DIAM.
- THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
- THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND RISER SECTION SHALL NOT EXCEED 1/2" PER FOOT.
- CONCRETE INLET FRAME AND GRATES SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
- 10. FRAME AND GRATE SHALL BE INSTALLED WITH FLANGE DOWN.
- 11. APPROVAL BY THE CITY OF KIRKLAND REOUIRED.
- 12. CURB INLET MUST DRAIN TO CATCH BASIN WITH SUMP.
- 13. ALL NEW PVC PIPES SHALL BE INSTALLED WITH SAND COLLARS AND A NON-SHRINK GROUT. JETSET OR SPEED CRETE RED LINE GROUT NOT ALLOWED.
- 14. 1", 2", AND 4" RISERS ACCEPTED AS NEEDED.
- 15. MINIMUM 10' FROM ADJACENT TREES, UNLESS OTHERWISE APPROVED.







### NOTES:

- CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M 199) & C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE STANDARD SPECIFICATIONS.
- 2. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497 (AASHTO M 221). WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
- 3. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000.
- 4. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
- 5 KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS.
- ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES, WITH MAX, DIAM, OF 6 20". KNOCKOUTS MAY BE EITHER ROUND OR "D" SHAPE.
- 7. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
- THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION AND 8. RISER SECTION SHALL NOT EXCEED 1/2" PER FOOT.
- 9. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
- 10. FRAME AND GRATE SHALL BE INSTALLED WITH FLANGE DOWN.
- 11. EDGE OF RISER OR BRICK SHALL NOT BE MORE THAN 2" FROM VERTICAL EDGE OF CATCH BASIN WALL.
- 12. ACCEPTABLE PIPE SIZES ARE 8", 12" OR 15". 6" PIPE IS ONLY ACCEPTABLE ON PRIVATE SYSTEMS.
- 13. ROUND SOLID LIDS REQUIRED WHENEVER CATCH BASIN DOES NOT COLLECT SURFACE WATER. SEE CK-D.18 AND CK-D.18A FOR REFERENCE.
- 14. ROUND CONCRETE RISERS ARE REQUIRED FOR ROUND SOLID LOCKING LIDS.
- 15. ALL NEW PVC PIPES SHALL BE INSTALLED WITH SAND COLLARS AND A NON-SHRINK GROUT. JETSET OR SPEED CRETE RED LINE GROUT NOT ALLOWED.
- 16. 1", 2", AND 4" RISERS ACCEPTED AS NEEDED.
- 17. MINIMUM 10' FROM ADJACENT TREES, UNLESS OTHERWISE APPROVED.
- 18. CLEAN SURFACE AND BOTTOM AREA. PROVIDE UNIFORM CONTACT. THE SURFACE AREA OF THE BASE SECTION MUST BE MORTARED TO THE BOTTOM AREA OF THE RISER SECTION.





NOTES:

- 1. GROUT SHALL BE APPLIED BETWEEN ALL MATING SURFACES TO ENSURE A WATER TIGHT SEAL AND STRONG BOND.
- 2. COMMERCIALLY AVAILABLE CONVERTER FROM RECTANGULAR STRUCTURE TO CIRCULAR RISER MAY BE USED IF APPROVED BY PUBLIC WORKS DEPARTMENT.
- 3. 1", 2", AND 4" RISERS ACCEPTED AS NEEDED.



CIRCULAR RISER AND TRANSITION FOR TYPE 1 AND 1-L CB















NOTES:

- 1. GROUT SHALL BE APPLIED BETWEEN ALL MATING SURFACES TO ENSURE A WATER TIGHT SEAL AND STRONG BOND.
- 2. COMMERCIALLY AVAILABLE CONVERTER FROM RECTANGULAR STRUCTURE TO CIRCULAR RISER MAY BE USED IF APPROVED BY PUBLIC WORKS DEPARTMENT.
- 3. 1", 2", AND 4" RISERS ACCEPTED AS NEEDED.



CIRCULAR RISER AND TRANSITION FOR TYPE 1 AND 1-L CB































### APPENDIX C: NORTHSHORE UTILITY DISTRICT Engineering Specifications and Special Provisions (FOR WATER AND SANITARY SEWER WORK)




# TABLE OF CONTENTS

# **SECTION 3**

# **DETAIL SPECIFICATIONS**

3.0	GENERAL	.1
3.1	EXISTING FACILITIES	.1
3.2	TRAFFIC MAINTENANCE AND PROTECTION	.2
3.3	TRENCH BACKFILL	.2
3.4	DEWATERING PLAN	.2
3.5	ABANDON EXISTING WATER SERVICE	.3
3.8	INSTALL NEW WATER SERVICE	.3
3.14	GENERAL RESTORATION	.4
3.15	RESTORATION SCHEDULING	.5
3.16	WORKING WITH ASBESTOS CEMENT PIPE	.5

# **Section 3 – Detail Specifications**

#### 3.0 GENERAL

This specification covers the furnishing of all labor, materials, tools and equipment necessary and incidental for the installation of water and sewer improvements together with all appurtenances and all restoration.

Facilities shall be constructed as shown on the Construction Plans and in accordance with these specifications and pertinent sections of the "Engineering Specifications" except as amended or changed in the Detail Specifications. Manufacturer's equipment shall be installed in compliance with the specifications of the manufacturer, except where a higher quality of workmanship is required by the Contract Plans and Specifications. All material and work shall be in strict accordance with any applicable regulations of State and local authorities. The Contractor shall arrange for such inspection by these agencies as may be required and shall submit evidence of their approval, if requested by the Engineer.

The Contractor shall cut existing asphalt to a neat line prior to excavation. No debris will be piled or dumped in the proximity of the project. Surface waters shall be confined to the site so that dirt and debris is not washed into existing storm drains, ditches or creeks.

All existing utilities disturbed shall be re-routed, reconnected and kept in service at all times. The Contractor shall request location marking of all utilities prior to start of excavation.

After the new utilities have been installed, the Contractor shall restore the existing surface, paved or pervious, to an existing or better condition, as shown on the Plans and per the requirements of the permitting agency right-of-way permits.

#### 3.1 EXISTING FACILITIES

There now exist along the construction route, and within the boundaries thereof, above-ground and underground improvements. A portion of these, where known, is shown on the Plans. However, whether they are shown on the Plans or later marked in the field, responsibility for damage and repair shall be determined in accordance with RCW Chapter 19.122, Underground Utilities.

The Contractor shall inform each property owner in ample time so that the property owner and the Contractor may take any precautions necessary to facilitate construction in the vicinity and thereby protect existing property and any underground water lines, drain lines, and/or power lines or other utility lines.

Wherever existing drainage channels, culverts or structures are disturbed, the Contractor shall provide suitable means for diverting and maintaining all flows during construction in that area at his expense. After the construction has been



completed, all channels, culverts, or structures shall be returned to a condition that is equal to or better than existed prior to construction.

The Contractor shall adequately protect and preserve from damage, destruction, and interference with the use of all property or its appurtenances on or in the vicinity of the work, which is not ordered or provided for removal or destruction under this contract. This applies to all items occupying the right-of-way, trees, monuments, pipes, conduits, water mains and blocking, underground structures, culverts, bridges, fences, rockeries, docks, bulkheads, and property of all descriptions. Wherever such property is damaged, destroyed or the use thereof is interfered with due to the operation of the Contractor, it shall be immediately restored to its former condition by the Contractor, at the Contractor's expense.

No separate payment will be made for the protection and/or repairing of existing facilities and any cost and expense incurred in protection and/or repairing these facilities shall be included in the price bid for the several items as indicated in the proposal.

### 3.2 TRAFFIC MAINTENANCE AND PROTECTION

The work for Traffic Control to perform water and sewer system work shall be covered in the Contract documents for the Goat Hill Drainage Ditch Conveyance and Channel Stabilization, Phase 1 project and meet Manual of Uniform Traffic Control Devices (MUTCD) Standards and the permitting agency's requirements. All traffic control work for the project will be included under the Lump Sum bid item "Project Temporary Traffic Control" in Schedule A of the bid proposal.

# 3.3 TRENCH BACKFILL

All trenches shall be backfilled with Crushed Surfacing Top Course (CSTS), full depth, per Sections 9.8 (a) of the Materials of Construction and 10.27 (b) of the Methods of Construction.

# 3.4 DEWATERING PLAN

The Contractor shall review the actual field conditions and any other available resources to determine the extent and volume of groundwater to be expected. The Contractor shall submit a dewatering plan to the District for review prior to dewatering activities related to work on or around water or sanitary sewer infrastructure. The dewatering plan shall show specific locations, in plan and section, where dewatering is expected as well as general discussion of methods should water be encountered in other locations. The plan should also indicate the location and methods for removing groundwater, proper sediment removal and disposal of groundwater.



Review by the District of the design, materials, method, installation, and operation and maintenance details submitted by the Contractor shall not in any way relieve the Contractor from responsibility for errors/omissions therein or from the entire responsibility for complete and adequate design, materials, inspection, operation, maintenance and performance of the dewatering system. The Contractor shall bear sole responsibility for proper design, installation, operation, maintenance, and any failure of any component of the dewatering system for the duration of this Contract.

# 3.5 ABANDON EXISTING WATER SERVICE

The Contractor shall abandon the existing water services that are replaced, as identified in the drawings. The Contractor shall locate and cap the existing water service line watertight near the existing meter disconnection location and locate and close the corporation stop on the existing main. The removal and disposal of these appurtenances must be completed as soon as the new water service is live.

# 3.8 INSTALL NEW WATER SERVICE

Contractor shall notify customer seven (7) calendar days in advance of water service disruption.

Prior to disrupting water service, Contractor shall pothole each service on the customer side of the meter pit to determine the exact location, size and type of fittings and materials that will be required to reconnect.

Prior to abandoning the existing water service, the Contractor shall coordinate with Northshore Utility District.

Any water service may have an individual PRV which may be within a meter box, buried, or within the customer's building. No records are available regarding existing individual PRV installation locations. The contractor shall provide a calibrated pressure gauge and confirm house water pressure at the hose bib prior to disconnecting existing water service. After the water service is transferred to the new line (installation of the new water service, transfer of water meter to the new setter, and the private water service is reconnected), the contractor shall use a calibrated pressure gauge and re-confirm house pressure at the hose bib. If the pressure differs by more than 5 psi, provide an individual PRV behind the new water meter on the private service line. The contractor shall maintain a log book with measured pressures for each customer, and shall provide to the Owner for review upon request.

• On existing water mains that are live and connected to the existing system, contractor shall furnish and install all parts of the water service and



reconnection as outlined herein, except the tap. Contractor shall coordinate with Northshore Utility District Maintenance & Operations Department to have them perform the tap on the water main. The District will provide all parts necessary to perform the tap (including but not limited to the corporation stop and saddle) and the Contractor shall repair the polyethylene encasement material per manufacturer's recommendations and per the District's Standard Detail.

• On new water mains installed as part of this contract and not yet connected to the existing system, the contractor shall provide all parts and equipment necessary to tap the new main and repair the polyethylene encasement material per manufacturer's recommendations and per the District's Standard Detail.

The Contractor shall then provide a complete, new water service as identified on the Plans and in accordance with the Engineering Specifications and the Standard Water Details excluding the water main direct tap performed by NUD.

The existing water meter is to be salvaged to the District and shall be reset by the Contractor in the new meter setter installed by the Contractor. The existing meter box, U-Branch, angle stops and miscellaneous pipe and fittings, including a re-setter, if a re-setter exists, shall be removed and properly disposed of by the Contractor.

Upon completion of the new water service and reconnection to the existing private service line, the Contractor shall backfill and restore all disturbed areas to existing or better condition with crushed rock, sod, or other restoration to match existing conditions. Water services installed in areas where road reconstruction is shown on the plans require temporary asphalt trench patches.

#### 3.14 GENERAL RESTORATION

Restoration of affected areas not paid for under other items shall be considered general restoration. This restoration includes rockery, fences, lawn areas, planter areas, maintenance of existing trees and shrubs and replanting or replacement of trees and shrubs as allowed under the contract. Grassy areas, including road prism areas in the right-of-way, shall be restored with sod as directed by the District. The Contractor shall specifically note that where an area has a distinctive surface treatment (grass, bark, sand or such), that surface treatment must be replaced in kind unless other restorative treatment is allowed in writing by the property owner.

All pavement markings such as stop bars, crosswalk, lane line reflectors, lane stripes, or such, shall be restored in kind following final paving.



Areas damaged by the Contractor which are not specifically allowed for under the Contract shall be repaired or replaced by the Contractor at the Contractor's expense. Contractor shall provide the District a written release from the owner for any private property damaged by the Contractor.

# 3.15 RESTORATION SCHEDULING

In order to avoid having large areas awaiting restoration and, in an effort to finish the work in a timely manner, all restoration shall immediately follow pipeline installation and testing. Once started, restoration shall be vigorously pursued until completed. All work pertaining to individual schedules of work, including restoration, must be completed to the satisfaction of the District before commencing work on the next schedule of work.

### 3.16 WORKING WITH ASBESTOS CEMENT PIPE

When working with asbestos cement pipe, the Contractor is required to maintain workers' exposure to asbestos material at or below the exposure limit to asbestos material as prescribed in WAC 296-62-07705 State/Federal Guidelines and Certification. All requirements regarding asbestos cement pipe handling by OSHA, WISHA and PSAPCO must be followed. Power tools shall not be used in the cutting of any asbestos cement pipe.





# TABLE OF CONTENTS

# **SECTION 4**

# MEASUREMENT AND PAYMENT

BID ITEM INTRODUCTION	1
TRENCH SAFETY SYSTEM	1
AIR & VACUUM RELIEF VALVE – 2"	2
1" WATER SERVICE AND RECONNECTION	3
1" PRIVATE PRV (IF REQUIRED)	6
REMOVE AND REPLACE VALVE BOX	8
REMOVE AND REPLACE MANHOLE FRAME AND COVER	9
Additional Potholing, If Required	10



# Section 4 - Measurement and Payment

#### **Bid Item Introduction**

It is the intent of these Specifications that the performance of all work under the bid items shall result in the complete construction, in proper operating condition, of the facilities described. It is understood that any additional material or work required to place the facilities in operating condition shall be provided by the Contractor as work covered by the listed bid items and shall be considered incidental thereto.

Submittals, shop drawings, calculations, start-up, testing, training, warranties, and operation and maintenance manuals as required shall be considered incidental to the various items of work and no additional compensation will be allowed.

No separate measurement or payment shall be made for furnishing and installing import foundation gravel (if required), import backfill gravel, and/or crushed rock materials as may be required to complete the water or sanitary sewer work described for this project. All labor, materials, tools, and equipment necessary to furnish gravel foundation, backfill, or crushed rock shall be considered incidental to other bid items for the project.

#### Trench Safety System

The lump sum price bid for trench excavation protection shall constitute full compensation for all labor, materials, tools and equipment necessary and incidental to providing a safe trench excavation. This item shall include, but not be limited to, the following:

- 1. Design, installation, proper use and removal of all sheeting, shoring, cribbing, boxes or other trench protection methods.
- 2. Excavation, backfill, compaction and other work required if extra excavation is used in lieu of trench box, shoring, cribbing or other trench protection. If imported backfill gravel is required for backfilling within the limits of the sewer or water line excavation, it shall also be required as backfill material for the extra excavation and shall be provided at the Contractor's expense.
- 3. All barricades, warning lights, signs, flaggers or other devices needed to warn and protect the public.

The Contractor shall be solely responsible for the safety of his crew and public, and the District assumes no responsibility. The District will not be responsible for



determining the adequacy of any system used by the Contractor and payment for protection systems will not imply District's approval of adequacy.

### Air & Vacuum Relief Valve – 2"

The unit price bid per each for Air & Vacuum Relief Valve Assembly (AVRVA) shall constitute full compensation for all labor, materials, tools and equipment necessary and incidental to furnishing and placing the assembly into operation in accordance with the specifications and Standard Water Details. This item shall include, but not be limited to, the following:

- 1. Clearing, grubbing and disposal of cleared materials, where required, including trees, stumps, and large rocks.
- 2. Potholing existing utilities and recording the depths of all underground existing utilities that will cross the proposed utility. The potholing shall occur prior to commencing any installation of the proposed utility. Potholing includes, but is not limited to, sawcutting, excavation, measuring and recording the depths of the existing utility, backfilling and temporary hot-mix asphalt patching. If the existing utility is not found within the standard locating limits (2' on either side of locate mark) or if additional potholing is directed by the District to locate the existing utility, payment for additional potholing will be made under the bid item for Additional Potholing, If Required.
- 3. Excavation of all materials of whatever nature encountered, including solid rock.
- 4. Excavation and grading to reshape finished grade where shown on the plans and as required by field conditions.
- 5. Dewatering and proper disposal of water as required.
- 6. Hauling away and disposing of any excess material, including securing approved disposal site.
- 7. Furnishing, handling, hauling, placing and mechanical compaction of foundation gravel, trench backfill, pipe bedding material and all other crushed rock or gravel material, native or imported.
- 8. Furnishing and installing all fixtures and pipe bedding material as indicated in the Standard Water Details, necessary to install the Air & Vacuum Relief Valve Assembly.



- 9. Polyethylene encasing and 14 gauge solid copper locating wire.
- 10. Concrete blocking, washed gravel, visqueen and other miscellaneous items and hardware required for proper installation and operation.
- 11. Maintenance and restoration of construction area and of other utilities affected by construction in accordance with the Plans and Specifications, including locating the existing water main, or other utilities, by potholing or by the use of other approved methods, prior to constructing the proposed water main improvements and appurtenances.
- 12. Temporary cold mix patch, asphalt treated base, or trench patch as required, placed immediately after trench backfill and subsequent removal.
- 13. Mortarless, Interlocking stone wall, Rockery, or Hillside Barrier, if required by field conditions or as directed by the District.
- 14. Sawcut, removal, and proper disposal of asphalt or cement concrete pavement up to, and including, 6" in thickness. In the event the Contractor encounters pavement exceeding 6" in thickness, the Contractor will be compensated for the saw cutting, removal and disposal of the excess pavement according to the schedule as outlined in the Proposal section.
- 15. No separate measurement or payment shall be made for furnishing and installing import foundation gravel, import backfill gravel, and/or crushed rock materials as may be required to complete this work item. All labor, materials, tools and equipment necessary to furnish gravel foundation, backfill, or crushed rock shall be considered incidental.

Payment for removal of existing AVRVA shall be considered incidental to other bid items and no separate payment shall be made. The existing AVRVA(ies) must be removed as soon as the existing water main is decommissioned and the new water main is in service. Payment will be made based on actual number of approved AVRVA(ies) installed.

# **<u>1" Water Service and Reconnection</u>**

The unit price bid per each Water Service and Reconnection shall constitute full compensation for all labor, material, tools and equipment necessary and incidental to replacing the existing water service with a new service at the location shown on the Plans in accordance with the Standard Water Detail and typical detail shown on the Plans. This item includes, but is not limited to, the following:



- 1. Clearing, grubbing and disposal of cleared materials, where required, including trees, stumps, and large rocks.
- 2. Potholing existing utilities and recording the depths of all underground existing utilities that will cross the proposed utility. The potholing shall occur prior to commencing any installation of the proposed utility. Potholing includes, but is not limited to, sawcutting, excavation, measuring and recording the depths of the existing utility, backfilling and temporary hot-mix asphalt patching. If the existing utility is not found within the standard locating limits (2' on either side of locate mark) or if additional potholing is directed by the District to locate the existing utility, payment for additional potholing will be made under the bid item for Additional Potholing, If Required.
- 3. Excavation of all materials of whatever nature encountered, including solid rock.
- 4. Boring of service lines in lieu of trenching, including bore pits and any ancillary work to accommodate boring installation method.
- 5. Excavation and grading to reshape finished grade where shown on the plans and as required by field conditions.
- 6. Dewatering and proper disposal of water as required.
- 7. Hauling away and disposing of any excess material, including securing approved disposal site.
- 8. Furnishing, handling, hauling, placing and mechanical compaction of foundation gravel, trench backfill, pipe bedding material and all other crushed rock or gravel material, native or imported.
- 9. Tapping the water main:
  - On existing water mains that are live and connected to the existing system, contractor shall furnish and install all parts of the water service and reconnection as outlined herein, except the tap. Contractor shall coordinate with Northshore Utility District Maintenance & Operations Department to have them perform the tap on the water main. The District will provide all parts necessary to perform the tap (including but not limited to the corporation stop and saddle) and the Contractor shall repair the polyethylene encasement material per manufacturer's recommendations and per the District's Standard Detail.



- On new water mains installed as part of this contract and not yet connected to the existing system, the contractor shall provide all parts and equipment necessary to tap the new main and repair the polyethylene encasement material per manufacturer's recommendations and per the District's Standard Detail.
- 10. New PEXa service pipe, length as required from the main to the new meter box, including pipe bedding material and pressure and purity testing.
- 11. New water meter box, cover and lid, copper setter and fittings per the Standard Water Detail and typical detail. Salvage the existing meter to be re-installed by the Contractor in coordination with the District.
- 12. Locate private water service at the point of connection.
- 13. New private service pipe, fittings and bedding as required to connect the existing private service to the backside of the new copper setter.
- 14. Abandoning existing water service, including removal and disposal of existing meter setter, removal of meter box and miscellaneous fittings and pipe, and capping the existing service line watertight near the existing meter. For water services abandoned on a water main that will remain live, abandonment of the water service will additionally include locating and closing the corporation stop on the existing water main. The removal and disposal of these appurtenances must be completed as soon as the existing water main is decommissioned, and the new water main is in service.
- 15. Adjustment and reconnection of irrigation control and backflow prevention devices and boxes, including backflow assembly testing and recertification, as required.
- 16. Mortarless, Interlocking stone wall, Rockery, or Hillside Barrier, if required by field conditions or as directed by the District.
- 17. Sawcut, removal, and proper disposal of asphalt or cement concrete pavement up to, and including, 6" in thickness. In the event the Contractor encounters pavement exceeding 6" in thickness, the Contractor will be compensated for the saw cutting, removal and disposal of the excess pavement according to the schedule as outlined in the Proposal section.
- 18. Maintenance and restoration of construction area and of other utilities affected by construction in accordance with the Plans and Specifications, including locating the existing water main, or other



utilities, by potholing or by the use of other approved methods, prior to constructing the proposed water main improvements and appurtenances.

- 19. Temporary cold mix patch, or asphalt treated base as required, placed immediately after trench backfill and subsequent removal.
- 20. Adjusting or altering the connection or meter box location as necessary in order to avoid existing utilities or structures and obstructions, such as telephone or electrical junction boxes or pedestals.
- 21. Furnishing and installing 14 gauge solid copper locating wire, continuous from the main line locating wire to the meter setter.
- 22. Permanent hot mixed asphalt (HMA) trench patch for areas outside of the road reconstruction shown on the plans.
- 23. No separate measurement or payment shall be made for furnishing and installing import foundation gravel, import backfill gravel, and/or crushed rock materials as may be required to complete this work item. All labor, materials, tools and equipment necessary to furnish gravel foundation, backfill, or crushed rock shall be considered incidental.

# <u>1" Private PRV (if required)</u>

The unit price bid per each Private PRV (if required) shall constitute full compensation for all labor, material, tools and equipment necessary and incidental to installing a private PRV on the customer service line where required or as directed by the District in accordance with the Standard Water Detail and typical detail shown on the Plans. This item includes, but is not limited to, the following:

- 1. Clearing, grubbing and disposal of cleared materials, where required, including trees, stumps, and large rocks.
- 2. Potholing existing utilities and recording the depths of all underground existing utilities that will cross the proposed utility. The potholing shall occur prior to commencing any installation of the proposed utility. Potholing includes, but is not limited to, sawcutting, excavation, measuring and recording the depths of the existing utility, backfilling and temporary hot-mix asphalt patching. If the existing utility is not found within the standard locating limits (2' on either side of locate mark) or if additional potholing is directed by the District to locate the existing utility, payment for additional potholing will be made under the bid item for Additional Potholing, If Required.



- 3. Excavation of all materials of whatever nature encountered, including solid rock.
- 4. Boring of service lines in lieu of trenching, including bore pits and any ancillary work to accommodate boring installation method.
- 5. Excavation and grading to reshape finished grade where shown on the plans and as required by field conditions.
- 6. Dewatering and proper disposal of water as required.
- 7. Hauling away and disposing of any excess material, including securing approved disposal site.
- 8. Furnishing, handling, hauling, placing and mechanical compaction of foundation gravel, trench backfill, pipe bedding material and all other crushed rock or gravel material, native or imported.
- 9. New PEXa service pipe, length as required from the meter box to the private PRV, including pipe bedding material.
- 10. New box and cover, private PRV device and fittings per the typical detail.
- 11. Locate private water service at the point of connection.
- 12. Check existing line pressure at the building with a pressure gauge prior to and after the completion of work to ensure consistent readings. If pressure readings differ by more than 5 psi, the Contractor shall locate and correct the issue at no additional cost to the District.
- 13. Removal and disposal of private PRV devices and boxes, if found.
- 14. New private service pipe, fittings and bedding as required to connect the existing private service to the backside of the new private PRV.
- 15. Adjustment and reconnection of irrigation control and backflow prevention devices and boxes, including backflow assembly testing and recertification, as required.
- 16. Mortarless, Interlocking stone wall, Rockery, or Hillside Barrier, if required by field conditions or as directed by the District.
- 17. Sawcut, removal, and proper disposal of asphalt or cement concrete pavement up to, and including, 6" in thickness. In the event the



Contractor encounters pavement exceeding 6" in thickness, the Contractor will be compensated for the saw cutting, removal and disposal of the excess pavement according to the schedule as outlined in the Proposal section.

- 18. Maintenance and restoration of construction area and of other utilities affected by construction in accordance with the Plans and Specifications, including locating the existing water main, or other utilities, by potholing or by the use of other approved methods, prior to constructing the proposed water main improvements and appurtenances.
- 19. Temporary cold mix patch, or asphalt treated base as required, placed immediately after trench backfill and subsequent removal.
- 20. Adjusting or altering the connection or box location as necessary in order to avoid existing utilities or structures and obstructions, such as telephone or electrical junction boxes or pedestals.
- 21. Furnishing and installing 14 gauge solid copper locating wire, continuous from the main line locating wire to the private PRV.
- 22. No separate measurement or payment shall be made for furnishing and installing import foundation gravel, import backfill gravel, and/or crushed rock materials as may be required to complete this work item. All labor, materials, tools and equipment necessary to furnish gravel foundation, backfill, or crushed rock shall be considered incidental.

# Remove and Replace Valve Box

The unit price bid per each valve box that is removed and replaced with a new valve box shall constitute full compensation for all labor, materials, tools and equipment necessary and incidental to furnishing, installing, testing, and placing the valve box in proper operating condition. This item shall include, but not be limited to, the following:

- 1. Clearing, grubbing and disposal of cleared materials, where required, including trees, stumps, and large rocks. This applies to areas not covered under clearing and grubbing as shown on the Plans.
- 2. Excavation of all materials of whatever nature encountered, including solid rock.
- 3. Excavation and grading to reshape finished grade where shown on the plans and as required by field conditions.



- 4. Dewatering and proper disposal of water as required.
- 5. Hauling away and disposing of any excess material, including securing approved disposal site.
- 6. Furnishing, handling, hauling, placing and mechanical compaction of foundation gravel, trench backfill and all other crushed rock or gravel material, native or imported.
- 7. Maintenance and restoration of construction area and of other utilities affected by construction in accordance with the Plans and Specifications, including locating the existing water main, or other utilities, by potholing or by the use of other approved methods, prior to constructing the proposed water main improvements and appurtenances.
- 8. Furnishing and installing the valve box and all hardware for proper jointing and operation including testing and disinfecting.
- 9. Sawcut, removal, and proper disposal of asphalt or cement concrete pavement up to, and including, 6" in thickness. In the event the Contractor encounters pavement exceeding 6" in thickness, the Contractor will be compensated for this excess saw cutting, removal and disposal of the excess pavement by actual invoices paid for under the minor change bit item.
- 10. No separate measurement or payment shall be made for furnishing and installing import foundation gravel, import backfill gravel, and/or crushed rock materials as may be required to complete this work item. All labor, materials, tools and equipment necessary to furnish gravel foundation, backfill, or crushed rock shall be considered incidental.

Payment shall be made based on actual number of valve boxes replaced.

#### Remove and Replace Manhole Frame and Cover

The unit price bid per each for Remove and Replace Manhole Frame and Cover shall constitute full compensation for all labor, materials, tools and equipment necessary and incidental to remove the existing manhole frame and cover and adjustment materials, such as bricks or concrete rings, down to the top of the precast concrete structure and to install new concrete adjustment rings and new frame and cover and adjust to final grade in accordance with NUD standards. Included in this bid item shall be the disposal of all removed materials and furnishing, handling, hauling, placing and mechanical compaction of foundation gravel, trench backfill and all other crushed rock or gravel material, native or imported. This bid item applies to existing manholes that are not modified under other bid items.



#### Additional Potholing, If Required

Potholing is incidental to all other bid items. However, when located utilities are not found within the standard locating limits (2' on either side of the locate mark) or there are other utilities located that are not shown on the contract plans, the additional potholing shall be paid for under this bid item. The unit price bid for each Additional Potholing, If Required, shall constitute full compensation for all labor, materials, tools and equipment necessary and incidental to pothole and record depths of the underground existing utilities in these circumstances, and the subsequent furnishing, handling, hauling, placing and mechanical compaction of foundation gravel, trench backfill and all other crushed rock or gravel material, native or imported.





# TABLE OF CONTENTS

# **SECTION 9**

# ENGINEERING SPECIFICATIONS Materials of Construction

9.1	GENERAL	1
9.2	SEWER PIPE AND FITTINGS	1
9.3	MANHOLES	3
9.4	MANHOLE AND CLEANOUT FRAME AND COVERS	8
9.5	WATER MAIN PIPE AND APPURTENANCES	9
9.6	STEEL CASING1	3
9.7	FOUNDATION, BEDDING AND BACKFILL MATERIALS FOR TRENCHES	3 4
9.8	REPLACING ROAD SURFACE1	5
9.9	GRASS SEEDING AND SOD1	6



# Section 9 – Engineering Specifications Materials of Construction

# 9.1 GENERAL

The type and class of materials to be used shall be as shown on the project plans. Where no specific reference is shown, the following specifications shall govern the materials used. All materials shall be new and undamaged of a known brand, with replacement parts readily available from the general Seattle area.

Prior to the installation of any of the facilities required on the project, all materials shall be approved by the District.

All reference specifications herein shall be of the latest revision.

# 9.2 SEWER PIPE AND FITTINGS

Sewer pipe material shall be of the following type unless otherwise specified or as indicated on the Plans:

Locations with less than four (4) feet or more than eighteen (18) feet of cover from finished grade	Class 52 Ductile Iron Pipe
Locations with between four (4) feet and eighteen (18) feet of cover from finished grade	PVC Pipe, ASTM 3034, SDR 35
As indicated on the Plans	High Density Polyethylene (HDPE) Pipe

# (a) DUCTILE IRON SEWER PIPE AND FITTINGS

- 1. Ductile iron pipe shall be new, Class 52, cement-lined, conforming to AWWA C151.
- 2. Ductile iron pipe shall be push-on joint. Pipe shall be furnished with a single rubber ring gasket lubricated to effect the seal.
- 3. Restrained joint pipe shall be U.S. Pipe "TR Flex" or push-on joint pipe restrained with U.S. Pipe "Field Lok" gaskets, or equal. Each length of pipe shall be clearly marked with the manufacturer's identification, year, thickness, class of pipe and weight.
- 4. The Contractor shall furnish certification from the manufacturer of the pipe and gasket being supplied that the inspection and all of the



specified tests have been made and the results thereof comply with the requirements of this standard.

5. Ductile iron fittings shall be short body with a 350-psi pressure rating for mechanical joint fittings and 250-psi for flanged fittings. All fittings shall be cement lined and shall be in conformance with AWWA C153. All fittings shall be domestic and made in the United States of America.

# (b) PVC SEWER PIPE AND FITTINGS (ASTM D3034)

All PVC pipe and fittings shall be integral wall bell and spigot, rubber gasket joint, unplasticized polyvinyl chloride (PVC) pipe in conformance with ASTM D3034 and shall have a maximum SDR of 35. PVC pipe shall have a minimum "pipe stiffness" of 46 psi at 5 percent deflection when tested in accordance with ASTM Designation D2412 and a minimum impact strength of 210 foot-pounds based upon ASTM D3034.

All pipes shall be clearly marked with the manufacturer's identification, year, and class of pipe.

All fittings and accessories shall be manufactured and furnished by the pipe supplier, or shall be District approved equal.

Pipe joints shall use flexible elastomeric gaskets conforming to ASTM D3212.

Connections for side sewer stubs shall be 6 inches inside diameter tee fittings. Wye branches shall be used where the sewer line size is less than 8-inch inside diameter.

# (c) HIGH DENSITY POLYETHYLENE (HDPE) SEWER PIPE

High Density Polyethylene (HDPE) sewer pipe shall be PE 4710 high density conforming to ASTM D3350 cell classification PE445474C or higher, with a DR of 11 unless otherwise specified.

The workmanship shall be of the highest level compatible with current commercial practice. The PE pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, or other injurious defects. It shall be uniform in color, opacity, density, and other physical properties.

Butt fusion of pipes and fittings shall be performed in accordance with the pipe manufacturer's recommendations as to equipment and technique. The pipe shall be fused by a certified installer who has a demonstrated ability to fuse polyethylene pipe in the manner recommended by the pipe supplier and/or the fusion manufacturer.

The pipe shall be Phillips 66 Driscopipe 8700 or District approved equal.



# (d) FLEXIBLE COUPLING ADAPTERS

Flexible coupling adapters shall meet the specifications set forth in the AWWA Standard C219 coupling specification and be rated for working pressures up to 250 psi. Flexible coupling adapters shall be Romac XR501, or District approved equal.

#### (e) POLYETHYLENE PIPE ENCASEMENT

Ductile iron pipe shall be encased with polyethylene encasement (8 mil thickness). Material and installation shall be in accordance with AWWA C105. Installation shall be in accordance with AWWA C105, Method A or Method C.

In Method A, polyethylene encasement tubes are used and in Method C, polyethylene sheets are used. In Method A, one length of polyethylene encasement tube is used for each length of pipe. In Method C, every section of pipe is completely wrapped with a flat sheet of polyethylene encasement. In both Methods, the polyethylene is overlapped at the joints and taped.

During the sewer main installation and/or side sewer installation, repair all rips, tears, or other damage to the polyethylene encasement with adhesive tape (i.e. Christy's Pipe Wrap Tape), per the manufacturer's recommendation.

#### 9.3 MANHOLES

Manholes shall be of the offset type, shall be precast concrete sections with a precast base, and shall be made from 3,000 psi structural concrete. All manhole joints shall be watertight and shall be confined O-ring type. They shall be constructed in full compliance with the Standard Details and as further specified herein.

Manhole materials and manufacturing shall be in accordance with ASTM C478.

Minimum standard manhole depth is eight (8) feet and maximum depth is eighteen (18) feet. Depths other than within this range shall require special design and approval by the District.

The base sections and risers of the manholes shall be arranged so no pipes pass through the manhole joints.

#### (a) Manhole Sections

Manhole sections shall be placed and aligned so as to provide plumb vertical sides and vertical alignment of the ladder steps. The completed manhole shall be rigid, true to dimension and be watertight. The ladder shall be rigidly attached to the side of the manhole.



Manhole grade rings shall be reinforced 3,000 psi structural concrete, 24 inches in diameter and 4 inches high. Grade rings shall be set in a full-width bed of cement grout. Provide grout between rings and between upper ring and casting. Inside rings shall be troweled smooth with 1/2-inch (minimum) of grout in order to provide a watertight surface.

In addition to the O-ring rubber gaskets, all new manhole joints shall be sealed with a flexible butyl joint sealant conforming to ASTM C990-96 and Federal Specification SS-S-210. The flexible butyl joint sealant shall be "Kent Seal #2" as manufactured by Hamilton-Kent Company or "Ram-Nek" as manufactured by K.T. Snyder Company.

Steel lifting loops or hooks for precast manhole components shall be removed to a minimum depth of one (1) inch below the surface and the remaining hole packed with grout. Precast sections with damaged joint surfaces or with cracks or other damage that may permit infiltration will not be allowed.

Reinforcement for precast manholes shall be in accordance with ASTM C 478-97.

# (b) BASE LINERS

All new manholes shall be installed with a prefabricated manhole base liner made of polypropylene (PP) and/or fiberglass reinforced plastic (FRP). The base liner shall be integrally cast and adequately anchored inside new precast concrete manhole base sections during the concrete casting process at the manhole suppliers manufacturing facility. The base liner shall be cast integral with the precast concrete manhole base section in accordance with the liner manufacturer's specifications. The liner must be fully supported during the casting process and lifting devices shall not penetrate the base liner.

The manhole base liner shall be prefabricated from a one piece homogeneous composite and/or thermoplastic with a minimum thickness of 0.12-inch (3 mm) and shall be in lengths and nominal inside diameters corresponding to the precast concrete base section and be a non loadbearing component, which is resistant to the chemical environment normally found in wastewater collection systems. The outer surface of the liner shall be coated with aggregate and/or PP pellets bonded to the outer surface and have perforated PP I-beam "bonding bridge" anchors bonded to the outer surface in order to insure adequate anchoring to concrete base sections to pass vacuum testing with 10-inch of negative pressure.

The inside liner surfaces shall be free of bulges, dents and other defects that result in a variation of inside diameter of more than ¼-inch (7 mm) for base liner flow channel and pipe connections. The precast concrete pipe penetration joint surfaces shall be free of excess concrete at external and



internal surfaces to insure a proper seal between the pipe connection and the liner.

The manhole base liner shall include full flow channels with sidewalls to the crown of the pipe. The inner surface of the bench shall be provided with an anti-skid pattern. Watertight gasketed pipe bell connections to suit specific pipe types, grade, and alignment, shall be monolithically attached to the base liners.

If PP base liner is utilized, a minimum slope of 0.06 foot is acceptable across the invert channel. The FRP base liner shall require the District standard minimum slope of 0.1 foot across the invert channel.

Base liner properties shall be in accordance with the following:

MATERIALS	
Polypropylene (PP):	100% Copolymer
Minimum thickness:	3mm
Hardness:	75 Shore D
Density:	56.8 lb/ft <sup>3</sup> (0.91 g/cm <sup>3</sup> )
Color:	Dull mustard/goldenrod
Fiberglass Reinforced Plastic (FRP):	Polyurethane Hybrid Composite
Glass fiber:	inch (16mm), 10 - 12% content
	by weight
Inert filler:	10 - 13% content by weight
Minimum thickness:	3mm
Hardness:	85 Shore D
Density:	73.0 lb/ft <sup>3</sup> (1.17 g/cm <sup>3</sup> )
Color:	Dull mustard/goldenrod
Aggregate bonding medium:	Processed sand containing crushed & uncrushed dry and cleaned semi-round particles in the 0.08 - 0.12-inch (2 - 3mm) size range
Gaskets:	Polyisoprene, EPDM, or as
Hardness:	50 - 55 Shore A
PHYSICAL PROPERTIES	
Percolation Test:	Water absorption of top surface - 0.032%
Thermal shock (CSA-B45-M93):	100 thermal cycles - no sign of surface defects



Chemical Resistance (ASTM D1308):

Reagent	Result			
	No surface Degradation - Surface			
Nitric Acid 69%	Staining			
Hydrochloric Acid 60%	No surface Degradation			
Ammonia 28%	No surface Degradation			
Sodium Hydroxide 5.25%	No surface Degradation			
Sulfuric Acid 50%	No surface Degradation			
Sulfuric Acid 70%	No surface Degradation			
Sulfuric Acid 80%	No surface Degradation			
Acetone	No surface Degradation			
Unleaded Gasoline	No surface Degradation			
Turpentine	No surface Degradation			
Acetone Immersion (ASTM				
D2152)	No Attack			

#### Selected Reagents

Base liners shall be manufactured and supplied by Geneva Pipe and Precast, a Northwest Pipe Company, of Orem, UT.

#### (c) MANHOLE STEPS

Manhole steps shall be made of 1/2-inch Grade 60 Steel reinforcing bars coated with copolymer polypropylene, equal to Lane International Manhole Step #P-14938.

The steps shall be installed at the manhole manufacturer's yard in conformance with the step manufacturer requirements. At a minimum, the step ends shall be coated with non-shrink epoxy grout and driven into predrilled holes with dimensions of 1-inch diameter and 3-1/2-inch depth. The pre-drilled holes shall not penetrate the exterior manhole wall.

#### (d) GRADE ADJUSTMENT

The depth of the 24-inch diameter manhole neck from the top of the frame to the top of the cone shall be from between 14-inch and 26-inch.

#### (e) CHANNELS

All new manholes shall be provided with fiberglass reinforced plastic base liners per Subsection 9.3.b of these specifications, unless otherwise indicated on the plans or approved by the District. Manholes approved for cement concrete channels shall conform to this subsection of the specifications.



Channels shall be made to conform accurately to the sewer grade and shall be brought together smoothly with well-rounded junctions, subject to approval by the District.

Channels shall consist of commercial grade concrete, minimum Class 3000 in accordance with Section 6-02 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation.

The channels shall be field poured after the inlet and outlet pipes have been laid and firmly grouted into place at the proper elevation. Allowances shall be made for a minimum of one-tenth foot (0.1 foot) drop in elevation across the manhole in the direction of flow. The maximum allowable drop in inlet elevation across the manhole in the direction of flow shall be 0.5 foot. Channel sides shall be carried up vertically from the invert to three-quarters of the diameter of the various pipes. The concrete bench shall be warped evenly and sloped two percent (2%) to drain. Rough, uneven surfaces will not be permitted. Channels shall be constructed to allow the installation and use of a mechanical plug of the appropriate size.

# (f) PIPE CONNECTIONS

All pipe entering or leaving the manhole shall be placed on firmly compacted bedding. Special care shall be taken to see that the openings through which pipes enter the structure are completely and firmly filled with mortar from the outside to insure water tightness. All PVC pipe connections to manholes shall be made with GPK PVC Manhole Adapters (also known as "sand collars") with an external abrasive silica layer or Kor-N-Seal Connector manufactured by NPC. Inc.

All stubbed out sewer pipes placed through manhole walls for future connections shall be suitably plugged and blocked in a manner acceptable to the District.

# (g) SHELF REPAIRS

Shelf repairs at connections to the existing manholes shall be class 3000 commercial grade cement in accordance with the Engineering Specifications.

# (h) GROUT

Grout for all uses including, but not limited to, shelves, pick-holes, and adjusting rings, shall be cement based, nonshrink, noncorrrosive, and nonmetallic grout conforming to ASTM C 1107. Grout shall be Dayton Superior 1107 Advantage Grout, Basalite Non-Shrink Grout - Fast Set, SpecChem SC Multipurpose Grout, or Quikrete Commercial Grade FastSet Non-Shrink Grout. The District may sample and test grout to determine conformance with the specifications.



### (i) DROP MANHOLES

Drop manholes shall, in all respects, be constructed as a standard manhole with the exception of the drop connection as shown on the Standard Detail.

# (j) LIFT HOLES

All lift holes shall be completely filled smooth with grout both inside and out in order to insure water-tightness.

# (k) MANHOLE CERTIFICATION

The Contractor shall provide written certification from the manhole manufacturer that the manholes provided meet or exceed the specifications and that the materials used in the construction of the manhole are in accordance with the specifications. A Manufacturer's Certificate of Compliance shall be provided for each manhole delivered to the project and shall include the manufacturer's name and address, the District's manhole number, reference to the applicable project specifications being used, the design mix and 28-day strength of the cement concrete used, drawings indicating reinforcing steel details, such as size and location, results of materials testing conducted by the manufacturer and the signature of a responsible corporate official of the manufacturer.

The District may test manholes and materials used at any time, including after installation, and any manhole not conforming to the specifications shall be rejected by the District and replaced with a conforming manhole provided and installed by the Contractor.

# 9.4 MANHOLE AND CLEANOUT FRAME AND COVERS

Frames and covers shall be cast iron and conform to the Standard Details and these specifications. Castings shall conform to the requirements of ASTM A-48, Class 30 and shall be free of porosity, shrink cavities, cold shuts or cracks, or any surface defects that would impair serviceability. Repair of defects by welding, or by the use of smooth-on or similar material, will not be permitted. Frames and covers shall be machine-finished or ground on seating surfaces so as to assure non-rocking fit in any position and interchangeability of covers.

All manhole frames and covers will be locking type. Manhole frame and cover shall be East Jordan Ergo Assembly, Part No. 001040105L01.

Cleanout frame and cover shall be locking type equal to Armorcast Polymer Concrete Box Assembly with Pentahead locking bolt style and "CO" imprinted on cover, part number A6001423TA (see NUD Standard Sewer Detail #9).



#### 5 WATER MAIN PIPE AND APPURTENANCES

### (a) DUCTILE IRON WATER PIPE

Ductile iron pipe shall be new, restrained joint, Class 52, cement-lined, conforming to AWWA C151.

Ductile iron pipe shall be U.S. Pipe "TR Flex" or push-on joint pipe restrained with U.S. Pipe "Field Lok" gaskets, or equal. Each length of pipe shall include temporary transportation pipe plugs and shall be clearly marked with the manufacturer's identification, year, thickness, class of pipe and weight.

The Contractor shall furnish certification from the manufacturer of the pipe and gasket being supplied that the inspection and all of the specified tests have been made and the results thereof comply with the requirements of this standard.

### (b) GALVANIZED IRON WATER PIPE AND FITTINGS

Galvanized iron pipe where specified for use shall be Schedule 40 hot dipped, zinc-coated (galvanized) welded and seamless steel pipe for ordinary uses (ASTM A-120). Fittings shall be screwed malleable iron galvanized per USA Standard B16.3.

#### (c) CROSS-LINKED POLYETHYLENE (PEXa 3306) SERVICE PIPE

Service pipe shall be MUNICIPEX® from REHAU Construction, LLC. Pipe shall be crosslinked polyethylene (PEXa 3306), using the high-pressure peroxide extrusion method. The pipe shall meet or exceed the requirements of ASTM F876, CSA B137.5 and PPI TR-3, and is certified to NSF Standards 14 and 61, and AWWA C904. No substitutions will be allowed.

#### (d) POLYETHYLENE PIPE ENCASEMENT

Ductile iron pipe shall be encased with polyethylene encasement (8 mil thickness). Material and installation shall be in accordance with AWWA C105. Installation shall be in accordance with AWWA C105, Method A or Method C.

In Method A, polyethylene encasement tubes are used and in Method C, polyethylene sheets are used. In Method A, one length of polyethylene encasement tube is used for each length of pipe. In Method C, every section of pipe is completely wrapped with a flat sheet of polyethylene encasement. In both Methods, the polyethylene is overlapped at the joints and taped.

During the water main installation and/or water service installation, repair all rips, tears, or other damage to the polyethylene encasement with adhesive tape (i.e. Christy's Pipe Wrap Tape), per the manufacturer's recommendation.



### (e) DUCTILE IRON FITTINGS

Ductile iron fittings shall be short body with a 350-psi pressure rating for mechanical joint fittings and 250-psi for flanged fittings. All fittings shall be cement lined and shall be in conformance with AWWA C153 for mechanical joint fittings and AWWA C110 for flanged fittings.

All mechanical joint fittings shall be restrained with EBAA Iron, Inc. "Mega-Lug" mechanical joint restraints, or equal.

Megalug fittings are prohibited for use on cast iron pipe. Restrained joint connections to existing cast iron water main shall be made with Romac Alpha Couplings and fittings only.

All deactivated water mains shall be capped with Romac EC501 End Cap Coupling or equal.

# (f) FIRE HYDRANTS

Fire hydrants shall conform to AWWA Standard Specification C502 and be one of the following types:

- Mueller Super Centurion
- American Darling B-62-B
- Clow Medallion
- M&H 129 or 129S
- East Jordan Iron Works WaterMaster 5CD250

They shall be a rising stem compression-type which opens counterclockwise and closes with the pressure. The minimum main valve opening diameter shall be 5-1/4-inch unless otherwise specified. The hydrant seat and hydrant seat retaining ring shall be bronze. All external bolts, nuts and studs shall be cadmium plated in accordance with ASTM A165 Type HS or rust proofed by some other process approved by the District. Gaskets shall be of rubber composition.

Fire hydrants shall be equipped with one 4-inch pumper nozzle connection (Seattle Standard Thread) with Storz Adapter (integral or non-integral) as required by those jurisdictions shown on the Standard Details. The hydrant shall include two 2-1/2-inch NST hose ports. Pentagon nuts or caps and operating stem shall measure 1-1/4-inch point to flat and shall open by turning to the left. Nozzle shall be fitted with renewable bronze nipples locked in place.

Fire hydrants shall be set plumb and ports shall be oriented as directed by the Fire Protection District having jurisdiction over said area.



Fire hydrant piping from the main line valve to the hydrant base shall be restrained joint pipe or shall be restrained with stainless steel shackle rods and nuts.

The hydrants shall be coated with enamel paint in accordance with the Standard Details.

See the Standard Detail for additional requirements.

# (g) GATE VALVES

Gate valves shall be ductile iron body valves with resilient wedge conforming to the latest revision of AWWA Standard C515 and shall be NSF 61 approved. Valves shall have epoxy coating fusion bonded to all internal and external surfaces of the valve body and bonnet in compliance with AWWA C550. The wedge shall be fully encapsulated in rubber. The valves shall be non-rising stem, open to the left, equipped with standard 2-inch square operating nuts and O-ring seals at all joints. Resilient wedge gate valves shall be American Flow Control Series 2500, Clow model 2638, Mueller 2360 series, Kennedy 7000 series, East Jordan FlowMaster or M&H Style 7000.

# (h) BUTTERFLY VALVES

Butterfly valves shall be ductile iron body of the tight closing rubber seat type with rubber seat either bonded to the body or mechanically retained in the body with no fasteners or retaining hardware in the flow stream. The valves shall be epoxy coated inside and outside. The valves shall meet the full requirements of AWWA C504, class 150 B, except the valves shall be able to withstand 200 psi differential pressure without leakage. The valves shall be equal to Pratt "Groundhog" or Mueller Lineseal III.

Butterfly valves to be installed underground shall have sealed mechanical operators and 2-inch standard square operating nuts. Complete manufacturer's Specifications for the valves proposed for use shall be submitted to the District for approval.

# (i) VALVE BOXES

Valve boxes shall be two-piece, cast iron, East Jordan Iron Works:

- Valve box cover, 06800209
- Valve box top, 85557016U
- Valve box bottom, 85556036U



# (j) FIRE HYDRANT GUARD POSTS

Concrete fire hydrant guard posts, if required as directed by the District, shall be made of precast reinforced concrete, nine (9) inches in diameter, six (6) feet long, or 8-inch x 6-inch x 6 feet long. The guard posts shall be coated white with enamel paint in accordance with the Fire Hydrant Assembly Standard Detail.

# (k) METER BOXES

The meter boxes shall be according to the Standard Details.

### (I) SERVICE SADDLES

For ductile iron and cast iron water mains larger than 4-inch diameter, direct tapping of 1-inch standard corporation stop threaded tap will be required. Saddles will not be allowed on ductile iron and cast-iron pipe larger than 4-inch diameter for 1-inch water services.

Service taps for all other water main sizes and materials shall be as follows:

- Service saddles for 1-inch, 1-1/2-inch, and 2-inch standard corporation stop threaded tap, shall be single strap and shall be equal to Mueller Company DR1S, Ford Meter Box Company FC101, or Romac Industries, Inc. 101NS.
- 2. Saddles for PVC pipe shall be stainless steel, double strap type and shall be equal to Mueller Company DR2S, Ford Meter Box Company FCD202, or Romac Industries, Inc. 202NS.

On existing water mains that are live and connected to the existing system; the Contractor shall furnish and install all parts of the water service and reconnection as required, except the tap. The District will provide all parts necessary to perform the tap (including but not limited to the corporation stop and saddle) and the Contractor shall repair the polyethylene encasement material per manufacturer's recommendations and per the District's Standard Detail.

On new water mains installed and not yet connected to the existing system; the Contractor shall provide all parts and equipment necessary to tap the new main and repair the polyethylene encasement material per manufacturer's recommendations and per the District's Standard Detail.

#### (m) SERVICE MATERIALS

Service materials including valves, pipe and fittings be as specified on the Standard Details. All brass appurtenances shall be "lead free" and conform to NSF/ANSI 372 and NSF/ANSI 61 standards. 2-inch ball valves shall be



furnished with a slotted operator, and with an adapting 2-inch-square operating nut (Ford Cat. QT-67) secured with a cotter pin.

### (n) RESIDENTIAL DOMESTIC AND FIRE SPRINKLER SERVICES

Combination service for residential domestic and fire sprinkler systems shall be according to the Standard Detail.

### (o) BLOW-OFFS AND AIR & VACUUM RELIEF VALVES

2-inch Blow-offs and 2-inch Air & Vacuum Relief Valves shall be installed for 12-inch diameter pipe and smaller in accordance with the standard detail. Blow-offs for pipe larger than 12-inch in diameter shall be as directed by the District.

# (p) STAINLESS STEEL TAPPING SLEEVE

Tapping sleeve shall be constructed of stainless steel with ductile or carbon steel flange and removable, replaceable bolts and coated nuts to prevent galling. Gaskets shall provide a full circumferential seal. Tapping sleeve shall be Romac SST, JCM 462, or Ford FAST stainless steel tapping sleeve.

### 9.6 STEEL CASING

Steel casing pipe shall meet ASTM A-53, having a minimum tensile strength of 60,000 psi and a minimum yield strength of 35,000 psi. Wall thickness shall be sufficient to withstand jacking forces without deformation, with minimum wall thickness of 0.375-inches for casing pipe diameters up to 22-inches. For casing pipe diameters larger than 22-inches, please see the table at the end of this subsection. All joints shall be welded. All field-welded joints shall comply with AWS Code for procedures of manual shielded metal arc welding.

The carrier pipe shall be installed with casing spacers. Spacers shall be placed in accordance with the Methods of Construction and shall be at least 12-inches wide. Spacers shall be designed to provide a maximum space of 1-inch between the upper runners and the inside of the steel casing. The spacers shall prevent the pipe bells from touching the inside of the casing. Metal components of casing spacers shall be Type 304 (18-8) 14-gauge (minimum) stainless steel. The liner shall be neoprene rubber or PVC, and the runners shall be polyethylene with a low friction factor. Casing spacers shall be designed for center restraint. Casing spacers shall be Model CCS by Cascade Waterworks manufacturing, or District approved equal.

Where casing spacers must be custom designed to account for a specific grade of the carrier pipe inside the casing, submittals must be provided which include drawings and dimensions for each of the casing spacers and the respective location of each of the spacers relative to the casing and carrier pipe.



Casing end seals shall be 1/8-inch thick synthetic rubber with two stainless steel bands and clamps. The end seal shall be Model S by Pipeline Seal and Insulator, or APS Model AC, or approved equal.

Steel Casing Pipe Wall Thickness Table		
Diameter of Casing Pipe	Minimum Thickness	
22 or Less	0.3750"	
Over 22" – 28"	0.4375"	
Over 28" – 34"	0.5000"	
Over 34" – 42"	0.5625"	
Over 42" – 48"	0.6250"	
Over 48"	Review Required	

# 9.7 FOUNDATION, BEDDING AND BACKFILL MATERIALS FOR TRENCHES

Recycled concrete will not be allowed as foundation gravel, pipe bedding, or trench backfill material for any Ductile Iron (DI water or sewer main installation).

### (a) FOUNDATION MATERIALS

Foundation gravel shall consist of clean, granular material free from objectionable materials such as organic matter or other deleterious substances with at least 90 percent coarse material ranging from 1-inch in diameter to 3-inch in diameter and 100 percent 3-inch in diameter or less, unless otherwise specified or approved by the District.

# (b) BEDDING MATERIALS

#### Water Main Pipe:

Bedding material shall consist of crushed surfacing top course, or controlled density fill as indicated on the plans or as directed by the District.

# Water Service Pipe:

Bedding material shall consist of 100% clean sand. Native material will not be allowed by the District.

#### Sewer Main and Lateral Pipe:

Bedding material shall consist of clean, granular, manufactured pea gravel conforming to the following gradation:


U. S. Standard Sieve Size	% Passing by Weight
1/2-inch	100
3/8-inch	85 – 95
No. 4	5 – 15
No. 8	0 – 2

#### (c) TRENCH BACKFILL

Native material may be used for trench backfill if the material meets the requirements of Section 9-03.14(2) of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation for Select Borrow. Native material shall be free from wood waste, organic waste, coal, charcoal, and other extraneous or objectionable materials and shall have no material larger than 2-inch in diameter. The material shall be non-plastic and shall not contain more than 3 percent organic material by weight.

Imported gravel backfill shall be a granular material conforming to Section 9-03.14(1) of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation.

Where designated on the Contract Drawings, as required by the roadway permitting agency or as directed by the District, the trench backfill shall be controlled density fill (CDF), as manufactured by Cadman Inc., product #PFLO5, "Pro-Flow 5 Hour", or District approved equal. Fly ash admixture will not be allowed in the CDF.

#### 9.8 REPLACING ROAD SURFACE

#### (a) CRUSHED SURFACING

Crushed surfacing material shall be 1-1/4-inch base course and 3/4-inch minus top course crushed gravel and shall be manufactured from ledge rock, talus or gravel in accordance with the provisions of Section 9-03.9(3) of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation.

#### (b) GRAVEL BASE

All gravel base shall conform to the requirements of Section 9-03.10 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation.



## (c) HOT MIX ASPHALT SURFACING

Hot mix asphalt surfacing or repair shall be as required by the roadway permitting agency, and shall conform to Section 5-04 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation and the Standard Specification Drawing for Typical Trench Section.

## (d) CEMENT CONCRETE PAVEMENT

Cement concrete pavement shall be in accordance with Section 5-05 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation and shall be furnished only by manufacturers who are members of the Portland Cement Association. All reinforcing steel shall conform with and be placed in accordance with Section 5-05 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation and shall conform to the requirements of ASTM Designation A-15 and A-305, latest revisions.

## (e) RIGID-TYPE PAVEMENTS RESURFACED WITH HOT MIX ASPHALT

Hot mix asphalt surface mat to be placed over Portland cement concrete base shall be as required by the roadway permitting agency; both the base and the surface mat shall be carefully prepared, placed and cured in full compliance with Section 5-04.3 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation.

## 9.9 GRASS SEEDING AND SOD

#### (a) TOPSOIL

Topsoil shall be Type B or C in accordance with Section 9-14.2(2) or 9-14.2(3) of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation. The Contractor shall provide a topsoil material submittal to the District for review and approval prior to construction.

## (b) SEED

Seed material, storage and certification shall conform to Section 9-14.3 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation. Seed shall be "Certified" grade seed or better. The Contractor shall provide a seed



mix material submittal to the District for review and approval prior to construction.

#### (c) FERTILIZER

Fertilizer shall be commercial grade in conformance with Section 9-14.4 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation. The Contractor shall provide a fertilizer material submittal to the District for review and approval prior to construction.

## (d) MULCH AND AMENDMENTS

Mulch shall be approved by the District and shall be certified grass hay or straw or wood cellulose fiber for hydroseeding. Wood cellulose fiber shall be in accordance with Section 9-14.5(2) of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation.

#### (e) SOD

The Contractor shall provide grass mixtures to the District for review and approval prior to construction.

Sod shall be field grown one year or older, have a well-developed root structure and be free of all weeds, disease, and insect damage.

Prior to cutting, the sod shall be green, in an active and vigorous state of growth and mowed to a height not exceeding 1-inch.

The sod shall be cut with a minimum of 1-inch of soil adhering.





## TABLE OF CONTENTS

# **SECTION 10**

## ENGINEERING SPECIFICATIONS Methods of Construction

10.1	GENERAL	1
10.2	CLEARING AND GRUBBING	1
10.3	DEWATERING AND CONTROL OF WATER	2
10.4	TEMPORARY EROSION & SEDIMENTATION CONTROL (TESC)	3
10.5	SEWER PIPE INSTALLATION	5
10.6	SIDE SEWER STUBS	7
10.7	TESTING GRAVITY SEWERS	8
10.8	TESTING SANITARY SEWER FORCE MAINS	11
10.9	MANHOLE VACUUM TESTING	13
10.10	LAYING DUCTILE IRON WATER MAIN	13
10.11	GALVANIZED IRON PIPE	14
10.12	CONCRETE BLOCKING	14
10.13	FIRE HYDRANT INSTALLATION	14
10.14	GUARD POST INSTALLATION	15
10.15	GATE VALVE AND BUTTERFLY VALVE INSTALLATION	15
10.16	VALVE BOX INSTALLATION	15
10.17	AIR AND VACUUM RELIEF VALVE INSTALLATION	15
10.18	2-INCH BLOW-OFF INSTALLATION	16
10.19	TRACER WIRE	16
10.20	WATER SERVICE INSTALLATION	16
10.21	HYDROSTATIC TESTS	17
10.22	STERILIZATION AND FLUSHING OF WATER MAIN	18
10.23	CONNECTION TO EXISTING WATER MAIN	22
10.24	WATER SERVICE TRANSFERS ON PARALLEL LIVE MAINS	22
10.25	STEEL CASING	23
10.26	EXCAVATION AND BACKFILL FOR UTILITY CONSTRUCTION	23
10.27	COMPACTION OF TRENCH BACKFILL	26



10.28	REPLACING ROAD SURFACE	.27
10.29 GRADE	ADJUSTMENT OF NEW AND EXISTING UTILITY STRUCTURES TO	29
10.30	HAZARD OF ASBESTOS CEMENT PIPE REMOVAL	.30
10.31	RIGHT-OF-WAY MONUMENTS AND LOT MARKERS	.30
10.32	RE-DESIGN OF LINES	.31
10.33	GRASS SEEDING AND SOD	.31
10.34	FINISHING AND CLEANUP	.33



## Section 10 – Engineering Specifications Methods of Construction

#### 10.1 GENERAL

A pre-construction conference will be held at the District office prior to the start of construction.

The Contractor shall notify the District a minimum of 5 days in advance of contemplated construction to allow for review of materials to be used on the job.

For construction staking on District Capital Improvement Program (CIP) Projects, the District will provide one set of construction stakes. Stakes removed or destroyed will be replaced by the District at the Contractor's request and expense. The Contractor shall coordinate with the District a minimum of 10 days in advance of the need for staking for any CIP project.

For Developer Extension (DE) Projects, the Contractor shall provide their own construction staking per the lines and grades shown on the approved DE Plans. Cutsheets for the staking shall be provided to the District for review prior to the start of any construction on the DE project.

Except as otherwise noted herein, all work shall be accomplished with adopted standards and specifications of Northshore Utility District and according to the recommendations of the manufacturer of the material or equipment used. The Contractor shall have a copy of the plans and specifications on the jobsite at all times.

## 10.2 CLEARING AND GRUBBING

Clearing and grubbing shall consist of the removal of all trees, stumps, brush, and debris and shall be confined within the limits of the easements obtained for the construction of this project and/or existing public rights-of-way. Removal of clearing and grubbing debris shall be subject to the approval of the District and shall, in no way, constitute a hazard to the continuous operation of any existing utilities. Any damage to the existing utilities shall be repaired by the respective utility company, at the expense of the Contractor.

Within the limits described, all growth and organic matter such as trees, shrubs, brush, logs, fences, upturned stumps and roots of down trees and other similar items, shall be removed and disposed. All trees shall be felled within the area to be cleared. Where the tree limb structure interferes with utility wires or where the trees to be felled are in close proximity to utility wires, the tree shall be taken down in sections to eliminate the possibility of damage to the utility. Any damage that does occur shall be the responsibility of the Contractor.



All fences adjoining any excavation or embankment that may be damaged or buried shall be carefully removed and temporarily erected on the adjoining property or stored for reinstallation as directed by the District.

No debris of any kind shall be deposited in any stream or body of water or in any street or alley.

Trees, shrubbery, and flower beds designated by the District shall be left in place and care shall be taken by the Contractor not to damage or injure such trees, shrubbery, or flower beds by any of its operations.

The refuse resulting from the clearing operation shall be hauled to an approved waste site secured by the Contractor and shall be disposed of in such a manner as to meet all requirements of State, County and municipal regulations regarding health, safety and public welfare.

## NO burning is allowed.

In no case, shall any material be left on the project, shoved onto abutting private properties, or be buried in embankments or sewer trenches on the project.

Where trees exist in planting areas and are not to be removed, it shall be the Contractor's responsibility to trim low limbs which will interfere with the normal operation of its equipment and paint or seal pruned areas with an approved pruning tar or paint. The trimming shall be performed in a professional manner by competent personnel prior to its machine operations and in such a manner as the District and/or the property owner may direct.

The Contractor shall be responsible for all damages to existing improvements resulting from its operations.

## 10.3 DEWATERING AND CONTROL OF WATER

Groundwater in underground utility construction is a widely known, and not unusual, condition. The Contractor shall review the actual field conditions and any other available resources to determine the extent and volume of groundwater to be expected. The Contractor shall submit a dewatering plan to the District for review prior to dewatering activities. The dewatering plan shall show specific locations, in plan and section, where dewatering is expected as well as general discussion of methods should water be encountered in other locations. The plan should also indicate the location and methods for removing groundwater, proper sediment removal and disposal of groundwater.

Review by the District of the design, materials, method, installation, and operation and maintenance details submitted by the Contractor shall not in any way relieve the Contractor from responsibility for errors/omissions therein or from the entire responsibility for complete and adequate design, materials, inspection, operation, maintenance and performance of the dewatering system. The



Contractor shall bear sole responsibility for proper design, installation, operation, maintenance, and any failure of any component of the dewatering system.

The Contractor shall dewater and dispose of the water so as not to cause injury to public or private property or to cause a nuisance or a menace to the public and shall meet all regulatory agency requirements.

The control of groundwater shall be such that softening of the bottom of excavations or formation of "quick" conditions or "boils" shall be prevented. Dewatering systems shall be designed and operated so as to prevent the removal of the natural soils.

During excavating, installing, placing of trench backfill and the placing and setting of concrete, excavations shall be kept free of water. The static water level shall be drawn down below the bottom of the excavation so as to maintain the undisturbed state of the natural soils and allow the placement of backfill to the required density. The dewatering system shall be installed and operated so that the ground water level outside the excavation is not reduced to the extent that would damage or endanger adjacent structures or property.

The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of structures and pipelines.

In carrying out the work within the limits of streams or an area that will drain into a stream, the Contractor is required to comply with the regulations of the appropriate local, State and Federal agencies.

The Contractor shall contact the above referenced departments and secure such permits as may be necessary to cover its proposed method of operation within the areas described above. If no permit is necessary and, if requested by the District, the Contractor shall provide written approval from the appropriate agency.

## 10.4 TEMPORARY EROSION & SEDIMENTATION CONTROL (TESC)

The Contractor shall comply with all applicable permit conditions and recommendations of the geotechnical report, if available.

The detrimental effects of erosion and sedimentation are to be minimized in conformance with the following general principles:

- Leaving soil exposed for the shortest possible time.
- Reducing the velocity and controlling the flow of runoff.
- Detaining runoff in an approved on-site temporary sedimentation control facility to trap sediment.
- Releasing runoff safely to downstream areas.



- Installing temporary filter fabric fence.
- Protecting existing catch basins.

In applying these principles, the Contractor shall provide for erosion control by conducting work in workable units; minimizing the disturbance to cover crop material, providing mulch and/or temporary cover crops, sedimentation basins, and/or diversions in critical areas during construction; properly controlling and conveying runoff; and establishing permanent vegetation and installing erosion control structures as soon as possible.

#### (a) TEMPORARY EROSION & SEDIMENTATION CONTROL (TESC)

The Contractor shall provide, install, and maintain TESC facilities to protect the existing surface waters, drainage systems and adjacent properties.

The TESC facilities must be constructed prior to the start of construction to ensure that the transport of sediment to surface waters, drainage systems and adjacent properties is minimized.

The TESC facilities shown on the plan are the minimum requirements for anticipated site conditions. During the construction periods, these TESC facilities shall be upgraded as needed for unexpected storm events and modified to account for changing site conditions (e.g., additional sump pumps, relocation of ditches and silt fences, etc.).

The TESC facilities shall be inspected daily by the contractor/TESC supervisor and maintained to ensure proper functioning. Written records shall be kept of weekly reviews of the TESC facilities during the wet season (Oct. 1 to March 31) and of monthly reviews during the dry season (April 1 to Sept. 30).

Any areas of exposed soils, including roadway embankments, that will not be disturbed for two days during the wet season or seven days during the dry season shall be immediately stabilized with the approved TESC methods (e.g., seeding, mulching, plastic covering, etc.).

The TESC facilities shall be inspected and maintained within 24 hours following a storm event.

At no time shall more than one (1) foot of sediment be allowed to accumulate within a catch basin. All catch basins and conveyance lines shall be cleaned prior to paving. The cleaning operation shall not flush sediment-laden water into the downstream system.



## (b) TRENCH MULCHING

Where, in the opinion of the District, there is danger of backfill material being washed away due to steepness of the slope along the direction of the trench, material shall be held in place by covering the disturbed area with straw and holding it in place with a covering of jute matting or wire mesh anchored down with wooden stakes, or as directed by the District.

## (c) COVER CROP SEEDING

A cover crop shall be in place in all areas excavated or disturbed during construction that were not paved, landscaped, and/or covered prior to construction. Areas landscaped prior to construction shall be restored to their prior condition. The Contractor shall be responsible for protecting all areas from erosion until the cover in place affords such protection.

Cover-crop seeding shall follow backfilling operations.

The Contractor shall be responsible for protecting all areas from erosion until the cover crop affords such protection. The cover crop shall be reseeded, if required, and additional measures taken to provide protection from erosion until the cover crop is capable of providing protection.

During winter months, the Contractor may postpone seeding at the direction of the District, if conditions are such that the seed will not germinate and grow. The Contractor will not, however, be relieved of the responsibility of protecting all areas until the cover crop has been sown and affords protection from erosion.

Submittals shall be provided for cover crop seed, mulch and fertilizer as specified herein.

## 10.5 SEWER PIPE INSTALLATION

Unless specified otherwise, a 10-foot horizontal separation and an 18-inch vertical separation must be maintained between all sanitary sewer mains and water mains in accordance with the Department of Ecology criteria. Maximum distance between manholes shall not exceed 400', or as approved by District

Where it is necessary to cross an existing asbestos-cement water line, the District may require that the asbestos-cement pipe be removed and replaced with ductile iron pipe in accordance with the Standard Detail on a case-by-case basis. All other non-metallic water main crossings shall be backfilled with CDF per NUD Standard Sewer Details.



## (a) CONNECT TO EXISTING SYSTEM

Connections to existing manholes shall be made by core-drilling. Invert of manhole shall be rechannelized as necessary to accommodate flow directions and provide a minimum of 0.10 foot drop from the inlet to the outlet. Connections shall be watertight. If connection is made to an existing manhole with a fiberglass reinforced plastic baseliner, the disturbed channel must be re-glassed by a District approved contractor.

## (b) PLUG(S) FOR EXISTING SYSTEM

The Contractor shall furnish and install a plug at the time the project is connected to the District's sewer system. The plug(s) must remain in position to prevent debris and water from entering the existing sewer system until such time as the sewer system within the project has been accepted by the District for maintenance and operation. A \$2,000.00 fine will be levied against the Contractor when a sewer mainline plug is removed at any time during the work. The Contractor will also be accountable for all expenses incurred to clean and flush sanitary sewer mainlines as a result of said plug removal.

## (c) PIPE LAYING

The sewer pipe, unless otherwise approved by the District, shall be installed upgrade from point of connection on the existing sewer or from a designated starting point to line and grade per approved plans. The sewer pipe shall be installed with the bell end forward or upgrade. When pipe laying is not in progress, the forward end of the pipe shall be kept tightly closed with an approved temporary plug.

3-inch wide, green metallic sewer detector tape shall be laid 24-inch above the pipe bedding, for the entire length of the sewer main between manholes. Identification on the tape shall include the words "Sanitary Sewer".

## (d) PIPE JOINTING

All extensions, additions, and revisions to the sewer system, unless otherwise indicated, shall be made with sewer pipe joined by means of a flexible gasket which shall be fabricated and installed in accordance with these specifications.

All joints shall be made up in strict compliance with the manufacturer's directions and all sewer pipe manufacturing and handling shall meet or exceed the current revisions of the ASTM recommended specifications.

Pipe handling after the gasket has been affixed shall be carefully controlled to avoid disturbing the gasket and knocking it out of position or loading it with dirt or other foreign material. Any gaskets so disturbed shall be removed,



cleaned, re-lubricated, if required, and replaced before the re-joining is attempted.

Care shall be taken to properly align the pipe before joints are entirely forced home. During insertion of the tongue or spigot, the pipe shall be partially supported by hand, sling, or crane to minimize unequal lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned.

Sufficient pressure shall be applied in making the joint to assure that it is home, as described in the installation instructions provided by the pipe manufacturer.

## 10.6 SIDE SEWER STUBS

A side sewer stub is considered to be that portion of a sewer line that will be constructed between a main sewer line and a property line or easement limit.

All applicable specifications given herein for sewer construction shall be held to apply to side sewer stubs.

3-inch wide, green metallic side sewer detector tape shall be laid 24-inch above the pipe bedding, for the entire length of the side sewer which is 8 feet deep or less continuing up the side sewer 2-inch x 4-inch marker post. Identification on the tape shall include the words "Sanitary Sewer".

Side sewers shall be single and installed according to the Standard Details. In no case may the specified side sewers be changed without the approval of the District.

Side sewers shall be connected to the tee provided in the sewer main where such is available utilizing approved fittings or adapters. The side sewer slope shall be a maximum of 100 percent  $(45^\circ)$  and a minimum of 2 percent.

The maximum bend permissible at any one fitting shall not exceed 45°. Bends exceeding 45° with any combination of two fittings shall have a straight pipe of not less than two (2) feet in length installed between such adjacent fittings, unless one of such fittings be a wye branch with a cleanout provided on the straight leg. The maximum length of 6-inch sewer stub shall be 100 feet; minimum length shall be 5 feet unless otherwise approved by the District.

Where there are no basements, the minimum side sewer depth shall be six (6) feet below final grade at the property line. The Contractor shall provide for each 6-inch stub a 2-inch x 4-inch wooden post that extends from the invert of the 6-inch stub to a point 18 inches (minimum) and 2 feet (maximum) above the existing ground. The exposed area of this post shall be painted white and shall have marked thereon the letters S/S. The elevations of the side sewer



connections shall be of sufficient depth to serve all existing and possible future structures.

Where no tee is provided or available at the sewer main, connection shall be made by machine-made tap and suitable saddle, or otherwise as approved by the District Engineer.

## 10.7 TESTING GRAVITY SEWERS

Before sewer lines are accepted and/or connected to the existing system for use, all lines shall be inspected for line and grade, air tightness, deflection, and television inspection. Any corrections required shall be made at the expense of the Contractor.

The first section of pipe not less than 300 feet in length installed by each crew shall be tested, in order to qualify the crew and/or the material. A successful installation of this first section shall be a prerequisite to further pipe installation by the crew. At the Contractor's option, crew and/or material qualification testing may be performed at any time during the construction process after at least three feet of backfill has been placed over the pipe.

## (a) PREPARATION FOR TESTING

Prior to testing the Contractor shall clean and flush all sewer lines.

The Contractor shall conduct preliminary tests to confirm that the section to be tested is in an acceptable condition before requesting the District to witness the test. The manner and time of testing shall be subject to approval of the District.

## (b) LINE AND GRADE

Variance from established line and grade shall not be greater than one thirtysecond (1/32) of an inch per inch of pipe diameter and not to exceed one-half (1/2) inch, provided that such variation does not result in a level or reverse sloping invert; provided, also, that variation in the invert elevation between adjoining ends of pipe, due to non-concentricity of joining surface and pipe interior surfaces, does not exceed one sixty-fourth (1/64) of an inch per inch of pipe diameter, or one-half (1/2) inch maximum.

## (c) LOW PRESSURE AIR TEST

Gravity sewers shall be tested with low pressure air, by the pressure drop method in accordance with Section 7-17.3(2)F, *Low Pressure Air Test for Sanitary Sewers Constructed of Non Air-Permeable Materials*, of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation. The Contractor shall furnish all facilities and personnel for conducting the air test



under the supervision of the District. The Contractor may desire to make an air test prior to backfilling for its own purposes. However, the acceptance air test shall be made after backfilling has been completed and compacted.

All wyes, tees or the end of the side sewer stubs shall be plugged with flexible joint caps, or acceptable alternative, securely fastened to withstand the internal test pressures. Such plugs or caps shall be readily removable and their removal shall provide a socket suitable for making a flexible, jointed lateral connection or extension. No double plugs shall be allowed.

Immediately following the pipe cleaning, the pipe installation shall be tested with low pressure air. A maximum reach to be tested shall be the reach between two consecutive manholes. Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reaches 4.0 pounds per square inch greater than the average back pressure of any groundwater above the center of the pipe being tested. At least two minutes shall be allowed for temperature stabilization before proceeding further.

The requirements of this specification shall be considered satisfied if the time required in seconds for the pressure to decrease from 3.5 to 2.5 lbs. per square inch greater than the average back pressure of any groundwater that may submerge the pipe is not less than the listed values shown in the following table:

Diameter	Minin	Minimum Test Times for Length of Main (seconds)									
(inches)	50'	100'	150'	200'	250'	300'	350'	400'			
8	144	286	428	570	712	854	908	908			
10	222	444	666	888	1110	1134	1134	1134			
12	320	640	960	1280	1360	1360	1360	1462			
15	500	1000	1500	1700	1700	1714	1998	2284			
18	720	1440	2040	2040	2056	2468	2878	3290			
24	1280	2558	2720	2924	3654	4386	5116	5846			

## Allowable Time for Pressure Drop Method

According to the following:

T = 4\*K, for C < 1  $T = 4*(K/C), \text{ for } 1 \le C < 1.75$  $T = 4*(K/1.75), \text{ for } C \ge 1.75$ 

Where: C = 0.0003918\*d\*L

$$K = 0.0111 * d^2 * L$$



- *d* = *Pipe diameter (inches)*
- L = Pipe length (feet)
- *T* = *Minimum* test time (seconds)

Note: All test times in the above table are rounded up to the nearest even number.

The use of air pressure for testing sewer lines creates hazards that must be recognized. The Contractor shall be certain that all plugs are securely blocked to prevent blowouts. The air testing apparatus shall be equipped with a pressure release device such as a rupture disc or a pressure relief valve designed to relieve pressure in the pipe under test at greater than 6 lbs. per square inch.

Precautions shall be taken to prevent any damage caused by testing. Any damage resulting shall be repaired by the Contractor at its own expense.

All visible leaks showing flowing water in pipelines or manholes shall be stopped even if the test results fall within the allowable leakage.

#### (d) DEFLECTION TESTING

If required by the District, all PVC sewer pipes shall be tested for deflection not less than 30 days after the trench has been backfilled and compaction has been completed. The testing shall be conducted by pulling a properly sized mandrel through the pipe in accordance with Section 7-17.3(2)G of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation.

#### (e) TELEVISION INSPECTION

All sanitary sewers shall be inspected by the use of a Closed-Circuit Television (CCTV) camera. The CCTV footage and corresponding inspection file database (media, mdf, ldf files) shall be exported and provided to the District on a USB flash storage device (thumb drive) or uploaded to a OneDrive folder provided to the Contractor by the District. CCTV files shall be provided to the District before final acceptance of the project. No VHS tapes or DVD-R Discs will be accepted. All inspections shall be conducted in accordance with NASSCO PACP methods, done in Granite Net Version 2.7.2.24 or older, and coded in CUES Basic format with uploadable capability to the District's Granite Net database.

At the beginning of each sewer main inspection, the following information shall be electronically generated and displayed on the CCTV footage:

- 1. Date of inspection
- 2. Contractor Company Name



- 3. Operator Name
- 4. Upstream Manhole number to downstream manhole number
- 5. Direction of inspection (upstream or downstream)
- 6. Pipe material and size

During inspections, the following information shall be electronically generated, automatically updated, and displayed on the CCTV footage:

- 1. Inspection location in the sewer line in feet from adjusted zero
- 2. Manhole number to manhole number (with direction of travel US/DS)
- 3. Date of inspection
- 4. Elapsed time of inspection

Each individual sewer main inspection, from manhole-to-manhole, shall be recorded on one digital file. If a pipe reach cannot be recorded to a single digital file due to extreme pipe length or obstructions in the pipe, multiple digital files for a single pipe are acceptable. On the other hand, multiple sewer main inspections recorded on a single digital file shall not be accepted.

For all projects (District or private development), CCTV inspections shall be furnished by the Contractor. Contractor shall utilize 1-inch target or ball and sewer inspection dye during CCTV recording. Contractor shall use the pipe ID number as shown on the Plans when conducting post-construction CCTV as referenced in the requirements above.

This CCTV inspection will be performed prior to final restoration of the street or easement. The Contractor shall inform the District ahead of time when and which lines are ready to be inspected.

The Contractor shall bear all costs incurred in correcting any deficiencies found during the CCTV inspection including the cost of any additional CCTV inspection that may be required by the District to verify the correction of said deficiency.

The project will not be accepted by the District until the CCTV inspection has been performed.

#### **10.8 TESTING SANITARY SEWER FORCE MAINS**

#### (a) TEST SPECIFICATIONS

Before sewer forcemains are accepted and/or connected to the existing system for use, all lines shall be inspected for line and grade and air tightness. Any corrections required shall be made at the expense of the Contractor.

The pressure tests shall be performed in the following manner:



Water shall be pumped into the main, bringing the pressure in the main equal to, or greater than, 1.5 times the design operating pressure. After a period of thirty minutes, water shall again be pumped into the main to bring the pressure up to the required test pressure and the quantity of water used during the test shall be accurately measured through a standard water service meter with a sweep unit hand that registers one gallon per revolution. The meter shall be approved by the District prior to testing. The allowable water consumption shall not exceed the quantities given by the following formula:

$$L = \frac{N \times D \times P}{1,850}$$

L

Where:

- = allowable leakage in gallons per hour = number of pipe joints Ν
- = pipe diameter in inches D
- Ρ = test pressure in pounds per square inch

A positive displacement type pump shall be furnished by the Contractor for the testing. Feed for the pump shall be from a container wherein the actual amount of "make-up" water can be measured.

Any leakage caused by defective workmanship or materials shall be repaired and the line shall again be tested to full compliance at the Contractor's expense. Concrete thrust blocking for fittings shall be in place and the concrete strength is sufficiently to withstand the test pressure before starting the test. Where permanent blocking is not required, the Contractor shall furnish and install temporary blocking and remove it after testing. The test pressure shall be applied at the low end of the section of pipe being tested. Air in the pipe shall be vented at all high points.

All field equipment for testing as above described shall be furnished and operated by the Contractor, subject to approval by the District.

The Contractor shall conduct preliminary tests and assure itself that the section to be tested is in an acceptable condition before requesting the District Engineer to witness the test.

#### (b) FORCE MAIN THRUST BLOCKS

All fittings, such as bends, shall be blocked with concrete in order to prevent movement and separation of pipe joints in accordance with the Water Standard Details for concrete thrust blocking. Sufficient time shall be allowed for the concrete to attain sufficient strength before commencement of pressure tests.



## 10.9 MANHOLE VACUUM TESTING

Before sewer manholes are accepted and/or connected to the existing system for use, all manholes shall be inspected for air tightness. Any corrections required shall be made at the expense of the Contractor.

All manholes shall be vacuum tested in accordance with ASTM C1244-05 to verify water tightness. All manhole penetrations shall be blocked or sealed and braced prior to the testing in order to prevent pipes, boots, gaskets, or any other materials from being drawn into the manhole. A vacuum of ten (10) inches of Hg shall be drawn on the manhole and the vacuum pump shut off. The time for the vacuum on the manhole to drop from ten (10) inches of Hg to nine (9) shall be measured and the manhole shall have passed the vacuum test if the time measured is greater than shown in the following table:

MH Diameter (inches)				D	epth (f	feet)				
	8 or less	10	12	14	16	18	20	22	24	26
	Time (seconds)									
48	20	25	30	35	40	45	50	55	59	64
54	23	29	35	41	46	52	53	64	64	75

#### **Minimum Test Times for MH Vacuum Testing**

If the time required for the pressure to drop from 10 inches of Hg to 9 inches of Hg is less than the value indicated in the table, the manhole shall be rejected by the District and shall be repaired or replaced and re-tested by the Contractor.

## 10.10 LAYING DUCTILE IRON WATER MAIN

All pipes shall be installed in accordance with these specifications and the instructions of the manufacturer subject to the approval of the District.

Unless otherwise indicated on the plans, minimum cover shall be 3 feet for 8-inch diameter pipe and smaller, and 4 feet for pipe that is larger than 8-inch in diameter.

Potholing for all existing utilities crossing proposed alignment shall be performed a minimum of 200 feet in advance of water main installation. Additional cost in association with any adjustments to alignment and depth of cover due to insufficient potholing will be performed at the expense of the Contractor.

All pipe ends shall be square with the longitudinal axis of the pipe and any damage to the ends shall be cut off before installation, if approved by the District. Where necessary to cut the pipe, the pipe shall be cut with approved cutting tools.



The pipe shall be laid in a straight grade through localized breaks in grade, the excavation shall be deepened gradually at changes in the street grades so that there are no abrupt changes in pipeline grade. To maintain the required alignment, use short lengths and deflect the joints or use necessary bends.

Each pipe section shall be carefully lowered into place in the ditch after inspecting it for defects and removing any gravel or dirt, etc., from the interior of the pipe.

Where it is necessary to cross sanitary sewer or storm sewer trenches, all trench backfill shall be removed and replaced with mechanically compacted pit run material or CDF in order to provide a uniform support for the full length of the pipe.

A 10-foot horizontal separation must be maintained between all sanitary sewer lines and water lines, unless otherwise approved. A 3-foot minimum horizontal separation shall be maintained between other underground utilities, unless otherwise approved.

All pipe shall be kept free of gravel, dirt, and other contaminants. Temporary pipe plugs must be installed at all exposed pipe ends at the end of each working day. The pipe plug must be a watertight, mechanical device, and shall be cleaned thoroughly prior to installation.

## 10.11 GALVANIZED IRON PIPE

Galvanized iron pipe and fittings shall be threaded. Joints shall be made up in accordance with good plumbing practice. All threads shall be coated with pipe thread sealer before connecting.

## **10.12 CONCRETE BLOCKING**

Concrete blocking shall be 2500 psi minimum strength, cast in place and have a minimum of 1/2 square foot bearing against the fitting. Blocking shall bear against fittings only and shall be clear of joints so as to permit taking up or dismantling joint. The Contractor shall install blocking which is adequate to withstand full test pressure as well as to continuously stand operating pressures under all conditions of service. For concrete blocking based upon a 250-psi test pressure, see the Standard Details.

## **10.13 FIRE HYDRANT INSTALLATION**

Correct bury depth shall be determined by contractor, fire hydrant shall be set as shown in the Standard Detail. Fire hydrant extensions will not be allowed on new fire hydrant installations. Mega-lugs or stainless-steel tie rods shall be used to restrain the ductile iron pipe between the hydrant foot and the 6-inch hydrant valve.



The location of the fire hydrant shall be shown on the plans to determine length of hydrant run required. The hydrant shall be set on a solid concrete block 4-inch x 8-inch x16-inch and a minimum of 6 cubic feet of 1-1/2" washed rock shall be placed around the base of the hydrant for a drain pocket.

Fire hydrants shall be set plumb and with the ports oriented as directed by the Fire Protection District having jurisdiction over said area.

In some instances, it may be necessary to make a cut or provide a fill to set a hydrant. Where this occurs, the area for at least a three (3) foot radius around the hydrant shall be graded and leveled, and the cut slopes or fill slopes shall be neatly graded by hand, unless otherwise approved by the District and the Fire Chief.

No tool other than an approved hydrant-operating wrench shall be used when operating hydrants.

Fire hydrants shall be prime-coated and finish coated in accordance with the Standard Detail.

## 10.14 GUARD POST INSTALLATION

Fire hydrant guard posts shall be installed if indicated on the plans or specified by the District. Guard posts shall be set with the top of the guard posts level with the bonnet flange of the fire hydrant. They shall be plumb, and where two posts are used at a hydrant; they shall be set with their tops at the same elevation. The posts shall be coated in the same manner and with the same color as the fire hydrants.

## 10.15 GATE VALVE AND BUTTERFLY VALVE INSTALLATION

Gate and butterfly valves shall be set in the ground vertically and shall be opened and shut under pressure to check operation and, at the same time, show no leakage. Valves 8-inches and larger that are not flanged to other fittings shall be blocked in accordance with the Standard Blocking Details.

#### **10.16 VALVE BOX INSTALLATION**

Valve boxes shall be set flush to the adjacent finished grade.

For valves located outside of paved areas, a cement or asphalt pad for the valve box shall be constructed according to the Standard Detail. The cement or asphalt pad shall be provided for all valves, unless otherwise directed.

## 10.17 AIR AND VACUUM RELIEF VALVE INSTALLATION

Air and vacuum relief valve assembly shall be installed as shown on the Standard Detail.



Location of the air release valves shall be at the high points of the line. Water line must be constructed so that the air release valve may be installed in a convenient location.

#### 10.18 2-INCH BLOW-OFF INSTALLATION

2-inch Blow-offs shall be installed for 12-inch diameter pipe and smaller in accordance with the Standard Detail.

#### **10.19 TRACER WIRE**

All water mains and water services installed shall have blue 14-gauge solid copper wire with polyethylene insulation. Wire shall be placed in the trench on top of the water main and the ends brought into the valve boxes, per the Standard Detail. Tracer wire shall also be wrapped around the water service line and brought up into the meter box. All connections or splicing shall be made with District approved split-bolt wire connectors.

#### **10.20 WATER SERVICE INSTALLATION**

All service installations shall be according to the Standard Details.

For ductile iron and cast iron water mains larger than 4-inch diameter, direct tapping of 1-inch standard corporation stop threaded tap will be required, saddles will not be allowed on ductile iron and cast iron pipe larger than 4-inch diameter for 1-inch water services.

Where an existing water service is being replaced with a new water service, the Contractor shall pothole the private, customer side of the existing meter box prior to any water service disruption in order to determine the fittings required for the reconnection and to determine the final location of the new meter box.

If an existing pressure reducing valve (PRV) is found on a water service to be replaced, contractor shall install PRV on the private property side of the meter box as shown on NUD Standard Water Detail #21.

On existing water mains that are live and connected to the existing system, the contractor shall furnish and install all parts of the water service and reconnection required, except the tap. The Contractor shall coordinate with Northshore Utility District Maintenance & Operations Department to have them perform the tap on the water main. The District will provide all parts necessary to perform the tap and the Contractor shall repair the polyethylene encasement material per manufacturer's recommendations and per the District's Standard Detail.

On new water mains installed and not yet connected to the existing system, the Contractor shall provide all parts and equipment necessary to tap the new main and repair the polyethylene encasement material per manufacturer's recommendations and per the District's Standard Detail.



On new ductile iron water mains, multiple, adjacent direct taps shall be installed with a minimum 18" horizontal separation between services. Direct taps shall be made a minumum of 18" from pipe ends (bell or spigot).

Hand drills with hole saws, or other tools or methods, for the installation of service saddles will be allowed for all other water main sizes and materials. Additionally, for larger diameter water services (1-1/2-inch and 2-inch), saddles will be required regardless of water main size or type. See the Standard Details and Material Specifications for additional information.

## **10.21 HYDROSTATIC TESTS**

After backfilling the water main with sufficient material to prevent movement of the pipeline and allowing sufficient time for the concrete blocking to set, the water main shall be pressure tested in convenient lengths as directed by the District. In general, large sections of untested main will not be permitted to accumulate. Sections to be tested are limited to approximatley 1,500 feet or less, or as approved by the District. Testing against a closed valve is not permitted.

The Contractor shall make arrangements with the District for the necessary filling of the newly installed water main and appurtenances, a minimum of 48 hours notice to the District will be required. The pipeline shall be filled by the District with water slowly and air expelled from the pipeline prior to starting the test. All pipelines shall be tested at a hydrostatic pressure of 250 psi at high point. All necessary pump, valves, meter gauges, piping, 2-inch blow-offs, hose and labor required shall be furnished by the Contractor.

The pressure tests shall be performed in the following manner:

Water shall be pumped into the main, bringing the pressure in the main up to the required test pressure. The 250 psi test pressure must be held for 15 minutes with no drop in pressure in order for a passing hydrostatic test.

All visible leakage shall be corrected, and all new valves installed under these specifications shall be tight. Whenever repairs or corrections are necessary, the pressure test shall be repeated to provide acceptability.

Procedures for testing firelines shall be as described above for hydrostatic tests and per Section 10.22 for bacteriological tests. The testing limits of the portion of the fireline owned and maintained by the District, shall end at a temporary blowoff installed on the fireline, inside the Double Check Detector Assembly (DCDA) vault.

Testing of the private fire line between the DCDA vault and the building shall be per the Fire Marshall's requirements.



## 10.22 STERILIZATION AND FLUSHING OF WATER MAIN

Upon successful completion of the hydrostatic test, all new water mains, and repaired portions of, or extension to, mains shall be flushed and sampled for purity per AWWA C651-14. The District will collect two consecutive samples for testing taken 24 hours apart and will forward the bacteriological test results to the Contractor. Upon receipt of two satisfactory bacteriological reports, the contractor shall have two weeks to make final connections to the existing main. If the connections are not completed within the two week timeframe, a repeat of the bacteriological testing will be required.

Water supply for filling, testing, and flushing of the new mains will be available from the existing distribution system. The Contractor shall make arrangements with the District for the necessary flushing of the pipeline. The water main shall be flushed a minimum of 24 hours or a maximum of 48 hours from the initial time of the pipeline fill. Opening of valves and use of water from the District's system will be done by the District and water for flushing will be provided by the District.

Taps required by the Contractor for temporary or permanent release of air, chlorination or flushing purposes shall be provided by the Contractor as a part of the construction of water mains. See NUD Standard Water Detail #17 for more information.

#### (a) DECHLORINATION AND DISPOSAL OF TREATED WATER

Unless otherwise specified, for District Capital Improvement Program (CIP) Projects, the District shall be responsible for disposal of treated water flushed from mains and shall neutralize the wastewater for protection of aquatic life in the receiving water before disposal into any natural drainage channel.

For Developer Extension (DE) Projects, the Contractor shall develop a plan for the disposal of the treated water and submit it to the District for review. The plan shall show specific locations where, or methods by which, the treated water can be discharged. If the plan designates discharge to sanitary sewer, storm sewer or surface water facilities, the Contractor shall contact the jurisdiction(s) having authority and secure such permits as may be necessary to cover the proposed method of disposal. If no permit is necessary and, if requested by the District, the Contractor shall provide written approval from the appropriate agency.

The actual flushing and disposal of the treated water will be performed by the District.

## (b) REQUIREMENT OF CHLORINE

Before being placed into service, all new mains and repaired portions of, or extensions to, existing mains shall be chlorinated by the Contractor so that a



chlorine residual of not less than 10 ppm remains in the water after standing 24 hours in the pipe.

The initial chlorine content of the water shall be not less than 50 ppm (note that ppm = mg/L).

#### (c) FORM AND METHOD OF APPLIED CHLORINE

Chlorine shall be applied by one of the following methods, to give a dosage of not less than 50 ppm of available chlorine:

#### 1. DRY CALCIUM HYPOCHLORITE

As each length of pipe is laid, sufficient high test calcium hypochlorite (65-70% chlorine) shall be placed in the pipe to yield a dosage of not less than 50 ppm available chlorine, calculated on the volume of the water which the pipe and appurtenances will contain.

The number of ounces of 65% test calcium hypochlorite required for a 20-foot length of pipe equals  $0.008431D^2$ , in which "D" is the diameter in inches.

#### 2. LIQUID CHLORINE

A chlorine gas-water mixture shall be applied by means of a solutionfeed chlorinating device, or the dry gas may be fed directly through proper devices for regulating the rate of flow and providing effective diffusion of the gas into the water within the pipe being treated. Chlorinating devices for feeding solution of the chlorine gas, or the gas itself, must provide means for preventing the backflow of water into the chlorine.

#### 3. CHLORINE-BEARING COMPOUNDS IN WATER

A mixture of water and high-test calcium hypochlorite (65-70% Cl) may be substituted for the chlorine gas-water mixture. The dry powder shall first be mixed as a paste and then thinned to a 1 per cent chlorine solution by adding water to give a total quantity of 7.5 gallons of water per pound of dry powder. This solution shall be injected in one end of the section of main to be disinfected while filling the main with water (continuous-feed method, see below).

#### 4. SODIUM HYPOCHLORITE

Sodium hypochlorite, commercial grade (15% Cl) or in the form of liquid household bleach (5% Cl) may be substituted for the chlorine gas-water mixture.



This liquid chlorine compound may be used full strength or diluted with water and injected into the main in correct proportion to the fill water so that dosage applied to the water will be at least 50 ppm.

The following methods and tables as outlined in AWWA C651-14 are included for reference. Note that ppm = mg/L.

• The continuous-feed method consists of completely filling the main with potable water, removing air pockets, then flushing the main at a minimum of 3.0 ft/sec to remove particulates, and refilling the main with potable water that has been chlorinated to 25 ppm. After a 24-hr holding period in the main there shall be a free chlorine residual of not less than 10 ppm. Please see the table below and AWWA C651-14 for more information.

Pipe D	iameter	100% 0	Chlorine	1% Chlorine Solution		
in.	(mm)	(mm) lb		gal	(L)	
4	(100)	0.013	(5.9)	0.16	(0.6)	
6	(150)	0.030	(13.6)	0.36	(1.4)	
8	(200)	0.054	(24.5)	0.65	(2.5)	
10	(250)	0.085	(38.6)	1.02	(3.9)	
12	(300)	0.120	(54.4)	1.44	(5.4)	
16	(400)	0.217	(98.4)	2.60	(9.8)	

Table 4 Chlorine required to produce an initial 25-mg/L concentration in 100 ft (30.5 m) of pipe by diameter

• The slug method consists of completely filling the main to eliminate air pockets, flushing the main at a minimum of 3.0 ft/sec to remove particulates, then slowly flowing a slug of water dosed with chlorine to a concentration of 100 ppm through the main. The slow rate of flow ensures that all parts of the main and its appurtenances will be exposed to the highly chlorinated water for a period of not less than 3 hours. Please see AWWA C651-14 for more information.

The table below from Appendix B of AWWA C651-14 provides the amount of chemical required to produce a chlorine concentration of 200 ppm. In order to obtain the 100 ppm as outlined in the slug method, divide the amount of chemical required in the table (gallons or pounds) in half.



		T			Calcium Hypochlorite Required						
Vo of V	olume C Water R		orine uired	5% Av Chl	vailable orine	e 10% Available 15% Chlorine C		15% A Chl	vailable orine	65% A Chl	Available lorine
gal	L	lb	(g)	gal	(L)	gal	(L)	gal	(L)	lb	(g)
10	(37.9)	0.02	(9.1)	0.04	(0.15)	0.02	(0.08)	0.02	(0.08)	0.03	(13.6)
50	(189.3)	0.10	(45.4)	0.20	(0.76)	0.10	(0.38)	0.07	(0.26)	0.15	(68.0)
100	(378.5)	0.20	(90.7)	0.40	(1.51)	0.20	(0.76)	0.15	(0.57)	0.30	(136.1)
200	(757.1)	0.40	(181.4)	0.80	(3.03)	0.40	(1.51)	0.30	(1.14)	0.60	(272.2)

Table B.2 Amounts of chemicals required to produce chlorine concentration of 200 mg/L in various volumes of water\*

\*Amounts of sodium hypochlorite are based on concentrations of available chlorine by volume. For either sodium hypochlorite or calcium hypochlorite, extended or improper storage of chemicals may have caused a loss of available chlorine.

#### (d) PREVENTING REVERSE FLOW

During flushing, filling, and testing, the District shall make the connections to the existing distribution system and the new water pipelines and shall utilize a backflow prevention device approved by the State Department of Health.

#### (e) RETENTION PERIOD

Treated water shall be retained in the pipe for a minimum of 24 hours and a maximum of 48 hours. After this period, the chlorine residual at pipe extremities and at other representative points shall be at least 10 parts per million.

#### (f) CHLORINATING VALVES AND HYDRANTS

In the process of chlorinating newly-laid pipe, all hydrant valves and other appurtenances shall be opened while the pipeline is filled with the chlorinating agent and under normal operating pressure.

#### (g) CHLORINATING FINAL CONNECTIONS TO EXISTING WATER MAINS AND SERVICE CONNECTIONS

The chlorinating procedure to be followed shall be as specified by AWWA. All closure fittings shall be swabbed with a 50-ppm minimum chlorine solution.

#### (h) FINAL FLUSHING AND TESTING

Before placing the lines into service, two (2) consecutive satisfactory bacteriological test reports shall be received.

#### (i) REPETITION OF FLUSHING AND TESTING

If the initial round of bacteriological testing, two consecutive tests as outlined in 10.22 (h) above, result in an unsatisfactory outcome, any repeat flushing and testing that is completed by the District shall be paid for by the contractor.



If the second round of bacteriological tests result in an unsatisfactory outcome, rechlorination of the installed water main will be required either by the continuous-feed method or slug method as outlined in AWWA C651-14 and Section 10.22 (c). The costs for subsequent redisinfection and testing shall also be the responsibility of the Contractor.

#### **10.23 CONNECTION TO EXISTING WATER MAIN**

The Contractor shall not operate any gate valves on the water system. Connections to the existing main shall not occur until satisfactory purity tests have been obtained and without approval of the District.

The Contractor shall make the necessary arrangements with the District for the connection to the existing water main.

Pre-digging and steel plating the connection location(s) shall be performed a minimum of one day prior to the date of connection. Pre-digging shall include potholing the existing water main at the point of connection, excavating between the temporary blow-off and the existing main to provide adequate access to each pipe, and verifying the necessary pipe and fittings to perform connection.

Water service outages shall be limited to the hours of 8:00 AM to 3:30 PM in order to minimize inconvenience to water users and maintain fire protection for the area. Once work is started on a connection, it shall proceed continuously without interruption and as rapidly as possible until completed. The Contractor shall provide a minimum of 72 hours notice to the District prior to the required shutdown. The District will alert affected property owners of the proposed service interruptions.

Existing mains shall be kept in operation until the new main has been constructed, satisfactorily tested and disinfected and is ready for operation. Connections to the existing system shall then be made.

The total length of pipe including fittings, and valve(s) required for the connection shall be in accordance with ANSI/AWWA C651-14, Sec. 4.10 and in no case shall exceed 20 feet.

All material used for the connection shall be thoroughly sterilized by swabbing the interior with a chlorine solution of 50 ppm.

## 10.24 WATER SERVICE TRANSFERS ON PARALLEL LIVE MAINS

After the new water main is connected to the existing water system, creating parallel live mains, the Contractor shall proceed immediately with all water service and meter transfers from the existing system to the new water main. The Contractor shall also proceed with all other work necessary to permanently abandon the existing water system; including but not limited to, removal and



disposal of valve boxes, meter boxes and setters, miscellaneous fittings and pipe, and appurtenances.

Service transfers and the abandonment of the existing water system shall take place prior to the contractor proceeding with the installation of additional water main pipe per the Contract.

#### 10.25 STEEL CASING

Steel casing shall be in accordance with the Materials of Construction and the Standard Details.

Sizing and wall thickness of casing shall be approved by the District.

Jacking and boring of casing pipe shall be accomplished in such a manner that there will be no damage to the existing improvements. Boring shall be accomplished by mechanical augering or drilling of the soil. The casing shall be jacked close enough behind the boring operation so there is no caving of soil from above. Removal of the material from the bored hole by washing or sluicing will not be permitted.

If excess voids are created around the casing, holes shall be drilled through the casing and the voids shall be pumped full of cement grout. All excess excavated material shall be disposed of in a manner acceptable to the District and permitting agencies.

The carrier pipe shall be supported on casing spacers at 10 foot maximum spacing and shall be installed with restrained joints. See the Engineering Specifications, Materials of Construction, and the Standard Detail for additional information.

#### 10.26 EXCAVATION AND BACKFILL FOR UTILITY CONSTRUCTION

#### (a) TEMPORARY TRAFFIC CONTROL

The Contractor shall make suitable, safe, and adequate provision for necessary traffic around, over, or across the work in progress and shall schedule pavement patching to follow after backfill is completed as directed by regulatory agency.

The contractor shall submit a traffic control plan for review and approval by the District and the permitting agency prior to beginning work. Traffic control shall conform to Section 1-10 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation.



## (b) EXCAVATING IN PAVED AREAS

Prior to excavating in paved areas, the existing road surface shall be cut a minimum of 1 foot back from the outer edge of the excavation with approved cutting equipment. The cuts are to be made in clean, straight lines to insure a minimum of damage to the existing pavements. All cuts in existing concrete pavement are to be made with a concrete saw, except that where the concrete has been overlaid with asphalt, the pavement may be drilled on three (3) inch centers 1 foot (minimum) from the outer edge of the excavation on each side of the trench section. If the Contractor fails to adequately protect the cut edges during construction, it will be required, at its own expense, to re-cut the edges a minimum of 1 foot back from the edge of excavation prior to repairing the pavement.

## (c) TRENCH SAFETY AND EXCAVATION

Contractor shall provide and install trench safety systems such as shoring or trench boxes or shall employ construction techniques such back sloping that meet the applicable State and Federal safety regulations.

Use and removal of trench safety systems shall be accomplished in such a manner that there will be no damage to the work or to the other properties.

Maximum and minimum trench widths shall be in accordance with the dimensions shown on the Standard Details.

In all cases, trenches must be of sufficient width to permit proper joining of the pipe and backfilling of material along the sides of the pipe. Trench width at the surface of the ground shall be kept to the minimum amount necessary for proper installation of the work in a safe manner.

Trenches wider than the maximum specified may result in a greater load on the pipe and, consequently, if the maximum trench width is exceeded by the Contractor, the Contractor shall, at its own expense, provide pipe of higher strength classification or provide a higher class of bedding where necessary to assure that the pipe will not be overloaded.

The maximum length of open trench permissible on any line, in advance of pipe laying, will be 100 feet for sewer pipe and 250 feet for water mains, except at the end of each day's operations, there shall be no trench in which pipe laying, embedment and backfill have not been completed.

Upon completion of work each day, all open trenches shall be completely backfilled, leveled and temporarily patched, graveled, fenced, or sheeted as required by the regulatory agency and the District.



Excavation for manholes, valves, structures, and other appurtenances shall be sufficient to provide enough room for compaction equipment between the outside surfaces and the sides of the excavation.

All material excavated from trenches and stored adjacent to trench or in a roadway or public thoroughfare shall be maintained in such manner that will cause a minimum of inconvenience to public travel. Provision shall be made for traffic where such is necessary. Free access shall be provided to all fire hydrants, water valves, and meters and clearance shall be left to enable the free flow of storm water in all gutters, conduits, and natural water courses. Where the trench bottom is a material which is unsuitable for providing an adequate foundation or material which will make it difficult to obtain uniform bearing for the pipe such material shall be removed and replaced with "foundation gravel", as previously defined.

## (d) PIPE BEDDING AND TRENCH BACKFILL

#### Recycled concrete will not be allowed as foundation gravel, pipe bedding, or trench backfill material for any Ductile Iron (DI water or sewer main installation).

The placement and compaction of the pipe bedding and trench backfill shall be in accordance with the requirements of the various applicable sections of these specifications and as shown on Standard Details.

Where excavated material is not approved for backfill or bedding, imported backfill gravel conforming to the Materials of Construction shall be provided

Where governmental agencies other than the District have jurisdiction over roadways, the backfill shall be in accordance with the agency's requirements.

Bedding material shall be carefully placed and firmly compacted to provide a firm, uniform cradle for the pipe. The minimum thickness of the layer of bedding material required shall be 4-inches under the bell for all pipe sizes of 27 inches diameter and smaller, 6-inches for all pipe sizes 30 inches diameter and larger and 6-inches under the bell of the pipe for all diameter pipes where rock is excavated. The Contractor shall provide firm, continuous support for the pipe.

After the pipe laying operation, additional bedding material shall be placed and compacted by hand tools for the full width of the trench to a height of 6" above the top of the pipe.

In backfilling the trench, the Contractor shall take all necessary precautions to protect the pipe and protective coating from any damage or shifting of the pipe.



No timber bracing, lagging, sheathing or other lumber shall be left in any excavation.

At all roadway and driveway crossings and within existing paved rights-of-way and in such additional locations as may be directed by the District, the trench shall be immediately backfilled after the pipe is installed and inspected and shall be immediately provided with a temporarily graveled surface and continually maintained on a daily basis until replaced with permanent repair as required.

The Contractor shall be responsible for restoring to a condition equal to the prior condition of any and all existing utilities, culverts, ditches, drains, landscaping, or other facilities which are damaged as a result of the Contractor's operation.

#### **10.27 COMPACTION OF TRENCH BACKFILL**

#### Recycled concrete will not be allowed as foundation gravel, pipe bedding, or trench backfill material for any Ductile Iron (DI water or sewer main installation).

The moisture content of all soils used shall be within 2% of optimum. All densities shall be determined by the ASTM D-1557 (Modified Proctor) test procedure. The District will conduct on-site materials sampling and in-place density testing for all District projects. For private development projects, all testing is to be provided and paid for by the developer; compaction reports shall be provided to the District. The Contractor shall coordinate the testing with the District and shall provide convenient and safe access to the site and the trench for sampling and testing.

## (a) TRENCHING PARALLEL TO ROAD ALIGNMENT

All trench backfill under roadway shall be mechanically compacted to 95% of maximum dry density.

In any trench in which 95% density cannot be achieved with existing backfill, the existing backfill shall be replaced with imported gravel backfill as specified in the Engineering Specifications. The imported gravel backfill shall be mechanically compacted to 95% of maximum dry density for the full depth of the trench.

All backfill material shall be compacted in 24-inch maximum lifts using heavy machinery or 12-inch maximum lifts using hand equipment.

## (b) TRENCHING TRANSVERSE TO ROAD ALIGNMENT

For transverse trenching locations, such as side sewers and intersections, the entire trench shall be backfilled with 1-1/4-inch minus crushed rock per



the Engineering Specifications and placed in the maximum lifts listed above in Section 10.26 (a) and compacted to 95% of maximum dry density.

#### **10.28 REPLACING ROAD SURFACE**

The Contractor shall restore all roadway and driveway surfaces and features excavated or disturbed to a condition acceptable to the District and the governmental agency having control of the road.

All work in County right-of-way shall be subject to the approval of the King County. All work in the City street right-of-way shall be subject to approval of the City.

Paving restoration consists of two steps. The first step is installation of a temporary cold mix patch to be maintained until all work and other restoration is complete or up to 30 days. The second step is installation and sealing of the permanent pavement trench patch.

This work shall consist of the preparation, placing and compaction of subgrade and the patching of various types of pavement cuts to the complete resurfacing of roadways, the performance of which shall be in accordance with the requirements outlined herein. Roadway surface restoration and patching shall be in accordance with the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation, unless specifically directed otherwise by the District.

Before patching material is placed, all pavement cuts shall be trued so that marginal lines of the patch will form a rectangle with straight edges and vertical faces a minimum of one (1) foot back from the maximum trench width.

The Contractor shall maintain proper signs, barricades, lights, and other warning devices in accordance with the traffic control plan.

## (a) GRAVEL BASE

Gravel base for road restoration shall conform to the Materials of Construction specifications and shall be placed and compacted in conformance with Sections 2 and 9 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation. Gravel base shall be placed and compacted before succeeding course material is placed.

Gravel base shall be used as shown on the plans or as directed by the District.



## (b) HOT MIX ASPHALT SURFACING

Hot mix asphalt surfacing or repair shall conform to the Materials of Construction and shall be placed in accordance with Section 5-04 the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation and the Standard Specification Drawing for Typical Trench Section . All lifts shall be free from ridges, ruts, humps, depressions, objectionable marks, and irregularities and shall conform to the line, grade, and cross-section shown in the plans. Each lift shall be subject to compaction testing. All edges and joints of hot mix asphalt pavement repair shall be sealed with asphalt cement. After pavement is in place, all joints shall be sealed with CSS-1, or equal.

## (c) CEMENT CONCRETE PAVEMENT

Concrete shall be as specified in the Materials of Construction and shall be placed in accordance with Section 5-05 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation. Concrete cylinder samples will be taken by the District for the purpose of testing the compressive strength of the concrete to meet the standards as defined by the regulatory agency. Subgrades shall be prepared as shown on the plans and in compliance with the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation.

All reinforcing steel shall conform with and be placed in accordance with Section 5-05 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation and shall conform to the requirements of ASTM Designation A-15 and A-305, latest revisions.

## (d) RIGID-TYPE PAVEMENTS RESURFACED WITH ASPHALT

Those areas that now have a Portland cement concrete base and are surfaced with the hot mix asphalt mat shall be replaced in kind. The surface of the cement concrete portion of the patch shall be left low enough to accommodate the asphalt portion of the patch. Brush finishing will not be required. Joints shall be placed as directed by the District. The hot mix asphalt surface mat and the Portland cement concrete base shall be as specified in the Materials of Construction. Both the base and the surface mat shall be carefully prepared, placed and cured in full compliance with Section 5-04.3 of the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation.

Hot mix asphalt or bituminous plant mix shall not be placed until the day after the cement concrete has been placed unless otherwise permitted by the



District. The edges of the existing asphalt pavements and castings shall be painted with hot asphalt cement or asphalt emulsion immediately before placing the asphalt patching material. The hot mix asphalt pavement shall then be placed, leveled, and compacted to conform to the adjacent paved surface. Immediately thereafter, all joints between the new and original asphalt pavement shall be painted with hot asphalt or asphalt emulsion and be covered with dry paving sand before the asphalt solidifies.

## (e) SHOULDER, GRAVEL SURFACES

Shoulders, gravel driveways, and all other gravel surfaced areas disturbed by construction shall be repaired with a minimum 2-inch lift of 3/4-inch minus crushed rock (top course crushed surfacing). Immediately prior to placement of the gravel, the drainage ditch, shoulders and/or driveways shall be graded to the original smooth contours existing prior to construction. The gravel shall then be placed and compacted in accordance with the applicable Washington State Department of Transportation Specifications.

Crushed surfacing shall be in accordance with Materials of Construction.

Final crushed surfacing shall be placed within 30 days after construction disturbance unless otherwise specified or directed by the District.

#### 10.29 ADJUSTMENT OF NEW AND EXISTING UTILITY STRUCTURES TO GRADE

This work consists of constructing and/or adjusting all new and existing utility structures encountered on the project to finished grade.

For asphalt overlay areas called for to be planed, all existing utility covers shall be lowered below the proposed planing depth prior to planing.

The castings shall not be adjusted to final grade until the pavement is completed, at which time the center of each casting shall be relocated from references previously established by the Contractor. The pavement shall be cut as further described and base material removed to permit removal of the casting. The casting shall then be brought to proper grade.

Prior to commencing manhole adjustments, a plywood and visqueen cover, as approved by the District, shall be placed over the manhole base and channel to protect them from debris.

The hot mix asphalt pavement shall be cut and removed to a neat circle, the diameter of which shall not exceed 6-inch from the outside diameter of the casting frame. The casting frame shall be brought up to desired grade, which shall conform to surrounding road surface. For manholes, adjustment to desired grade shall be made with the use of concrete adjustment rings or bricks. No iron adjustment rings will be allowed. An approved class of mortar (one-part cement


to two-parts of plaster sand) shall be placed between adjustment rings or bricks and casting frame to completely fill all voids and to provide a watertight seal. No rough or uneven surfaces will be permitted inside or out. Adjustment rings or brick shall be placed and aligned so as to provide vertical sides and vertical alignment of ladder steps (if steps are necessary).

Check manhole specifications and the Standard Details for minimum and maximum manhole adjustment and step requirements. Special care shall be exercised in all operations in order not to damage the manhole, frames and lids or other existing facilities.

The annular space between the casting and the pavement shall be filled with crushed rock and compacted with hand tamper to within 6-inch of the top of the frame. Asphalt concrete patching shall not be carried out during wet ground conditions or when air temperature is below 50° F. Hot mix asphalt must be at the temperature as specified by the regulatory agency when placed. Before making the hot mix asphalt repair, the edges of the existing hot mix asphalt pavement and the outer edge of the casting shall be tack coated with hot asphalt cement. The remaining 6-inch shall then be filled with Hot Mix Asphalt Class 1/2-inch and compacted with hand tampers and a patching roller.

The completed patch shall match the existing paved surface for texture, density, and uniformity of grade. The joint between the patch and the existing pavement shall then be carefully painted with hot asphalt cement or asphalt emulsion and shall be immediately covered with dry paving sand before asphalt cement solidifies. Before acceptance of a job, castings shall be cleaned of all debris and foreign material. All ladders must be cleaned free of grout. Any damage occurring to the existing facilities due to the Contractor's operations shall be repaired at its own expense.

# 10.30 HAZARD OF ASBESTOS CEMENT PIPE REMOVAL

To remove existing asbestos cement pipe from the trench, permitting as determined by regulatory agencies is required.

# 10.31 RIGHT-OF-WAY MONUMENTS AND LOT MARKERS

# Capital Improvement Program (CIP) Projects

For monuments identified to be removed or destroyed as shown on the CIP Plans, the District will schedule a Professional Land Surveyor (PLS) to file the required permit forms with the Department of Natural Resources (DNR), as required by RCW 58.09.130 and WAC 332-120. The District's PLS will set tieout reference points for the monument(s) identified on the CIP Plans to be removed or destroyed. The contractor shall protect these reference points until the monument(s) have been reset. No construction work affecting monumentation shall commence until DNR has approved the permit. Upon completion of work affecting monumentation, the form "Completion Report for



Monument Removal or Destruction" shall be signed by the District's PLS and submitted to DNR.

During construction, the Contractor shall take all necessary precautions to locate and protect existing markers, property corners, monuments and other reference points not identified on the CIP Plans to be removed or destroyed. Under no circumstances shall work be performed which would remove, adjust, or destroy any such markers without the DNR permit, as required by RCW 58.09.130 and WAC 332-120. In the event that the Contractor disturbs or destroys any existing marker, property corner, monument or other reference point not identified to be removed or destroyed on the CIP Plans, the Contractor shall bear any and all costs for permitting, survey, resetting, legal claims and filing of State forms as required by RCW 58.09.130 and WAC 332-120.

# **Developer Extension Projects**

Under no circumstances shall work be performed which would remove, adjust, destroy, or otherwise make a survey point or monument no longer visible or readily accessible without the DNR survey monument permit. The Developer's Contractor shall not remove or destruct any monument until the monument has been tied out and the Developer has provided the District with a copy the Department of Natural Resources (DNR) permit authorizing the removal or destruction of the monument in accordance with WAC 332-120.

The Developer's Contractor shall protect all monument tie-out reference points and witness monuments until the monument has been reset and the Developer has completed the DNRs report form, provided the District a copy, and forwarded it to the DNR in accordance with WAC 332-120.

# **10.32 RE-DESIGN OF LINES**

Should interferences or obstructions create construction difficulties that the District determines shall require redesign or relocation of the lines, the District will require the necessary revised drawings.

# 10.33 GRASS SEEDING AND SOD

Areas of existing grass and all areas disturbed by construction which do not receive a specific type of restoration, such as paving, rock, or bark, shall be reseeded, or restored with sod as specified.

The Contractor shall be responsible for providing a finished grass area, which meets the approval of the property owner and the District.

The Contractor shall maintain the grass, including furnishing water and mowing, until project approval, unless otherwise specified.



# (a) TOPSOIL

All areas to be seeded, reseeded, or sodded shall be provided with 4-inch minimum depth of topsoil. Topsoil used shall be imported and shall be subject to approval by the District. Prior to providing topsoil, all areas shall be raked smooth and all debris removed and disposed. The topsoil shall be tilled to a depth sufficient to key into the subsoil, raked to a smooth and even grade without low areas to trap water and compacted.

The Contractor shall notify the engineer not less than 24 hours in advance of any seeding or sodding operation and shall not begin seeding or sodding until areas prepared or designated have been approved by the District.

# (b) SEEDING AND FERTILIZING

Prior to beginning seeding operations, the contractor shall submit seed mix and rate of application to the District for approval.

Seeding shall not be done during windy weather or when the ground is frozen, excessively wet, or otherwise untillable.

Seed and fertilizer may be sown by one of the following methods:

- 1. An approved hydroseeder in accordance with the latest published Standard Specifications for Road, Bridge and Municipal Construction of the Washington State Department of Transportation.
- Hand methods where allowed by the District in areas that are impossible to hydroseed. Seed shall be applied after the fertilizer and shall be raked into the top one (1) inch of the fertilized topsoil. Immediately following the raking of the seed into the soil, the total area shall be covered with District approved mulch and shall be rolled with a water-filled roller.

The seed shall have a tracer added to visibly aid uniform application. The tracer shall not be harmful to plant and animal life. If wood cellulose fiber is used as a tracer the application rate shall not exceed 250 lbs. per acre.

Fertilizer shall be provided and applied in accordance with the manufacturer's recommendations. The Contractor shall submit for approval a guaranteed fertilizer analysis label for the specified product.

Unless otherwise specified, seeding, fertilizing, and mulching shall be completed between April 15 to June 1 and August 15 to October 15.



# (c) GRASS SOD

Sod shall be provided at all locations of established lawn disturbed by construction activities and at other locations as indicated on the plans.

Sod strips shall be placed within 48 hours of being cut. Placement shall be without voids and the end joints shall be staggered. The sod shall be rolled with a smooth roller following placement.

# 10.34 FINISHING AND CLEANUP

Before acceptance of the project, all pipes, manholes, catch basins, and other appurtenances shall be cleaned of all debris and foreign material. After all other work on the project is completed and before final acceptance, the entire roadway, including the roadbed, planting, sidewalk areas, shoulders, driveways, alley and side street approaches, slopes, ditches, utility trenches, and construction areas shall be neatly finished to the lines, grades and cross-sections shown on the plans and as hereinafter specified.

In undeveloped areas, the entire area which has been disturbed by the construction shall be shaped so that, upon completion, the area will present a uniform appearance, blending into the contour of the adjacent properties. All other requirements outlined previously shall be met. Slopes, sidewalk areas, planting areas and roadway shall be smoothed and finished to the required cross-section and grade.

Upon completion of the cleaning and dressing, the project shall appear uniform in all respects. All graded areas shall be true to line and grade as shown on the typical sections and as required by the District.

All rocks in excess of one (1) inch diameter shall be removed from the entire construction area and shall be disposed of the same as required for other waste material. In no instance, shall the rock be thrown onto private property. Overhang on slopes shall be removed and slopes dressed neatly so as to present a uniform, well sloped surface.

All excavated material at the outer lateral limits of the project shall be removed entirely. All debris resulting from clearing and grubbing or grading operations shall be removed and disposed.

Drainage facilities, such as inlets, catch basins, culverts, and open ditches, shall be cleaned of all debris resulting from the Contractor's operations.

All pavements and oil mat surfaces, whether new or old, shall be thoroughly cleaned. Existing improvements, such as Portland cement concrete curbs, curb and gutters, walls, sidewalks, and other facilities which have been sprayed by the asphalt cement shall be cleaned to the satisfaction of the District.



Castings for manholes, monuments, water valves, lamp poles, vaults, and other similar installations which have been covered with the asphalt material shall be cleaned to the satisfaction of the District.

# **APPENDIX D: PERMITS**

- D.1 SEPA Decision
- D.2 LSM Permit
- D.3 Ecology CSWGP
- D.4 Critical Areas Determination

# APPENDIX D.1: SEPA Decision



Planning & Building Department Kirkland, WA 9 123 5th Avenue, Kirkland, WA 98033 425.587.3600 ~ www.kirklandwa.gov

### MEMORANDUM

To: Adam Weinstein, AICP, SEPA Responsible Official

From: David Aldridge III, Planner

October 13, 2023 Date:

File: SEP23-00526

STATE ENVIRONMENTAL POLICY ACT (SEPA) DETERMINATION Subject: GOAT HILL DRAINAGE DITCH CONVEYANCE AND CHANNEL STABILIZATION -PHASE 1

#### GENERAL

This applicant, Matthew Hough with CPH Consultants, proposes to remove, replace, and install new storm drainage facilities in three specific work areas of the Goat Hill neighborhood of Kirkland (see Attachment 1). The three work areas are described as follows:

Work Area A – This project area includes approximately 700 lineal feet (LF) of NE 117<sup>th</sup> PL and 330 LF of 90<sup>th</sup> Avenue NE, with a total approximate area of 42,630 ft<sup>2</sup>.

Work Area B – This project area includes approximately 750 LF of NE117<sup>th</sup> Place, 1,065 LF of NE 116<sup>th</sup> PL, and 160 LF of NE 118<sup>th</sup> PL, with a total approximate area of 99,000 ft<sup>2</sup>.

Work Area C – This project area includes approximately 40 LF of 91<sup>st</sup> Lane NE, with a total approximate area of 3,200 ft<sup>2</sup>.

### ANALYSIS

The SEPA "threshold determination" is the formal decision as to whether the proposal is likely to cause a significant adverse environmental impact for which mitigation cannot be identified. If it is determined that a proposal may have a significant adverse impact that cannot be mitigated, an Environmental Impact Statement (EIS) would be required.

Many environmental impacts are mitigated by City codes and development regulations. For example, the Kirkland Zoning Code has regulations that protect sensitive areas, limit noise, provide setbacks, establish height limits, etc. Where City regulations have been adopted to address an environmental impact, it is presumed that such regulations are adequate to achieve sufficient mitigation [WAC 197-11-660(1)(e) and (g)].

I have had an opportunity to visit the subject property and review the following documents:

- Environmental Checklist dated July 11, 2023 (see Attachment 2)
- Critical Area Report dated May 10, 2023 (see Attachment 3) •
- Critical Area Report dated July 25, 2023 (see Attachment 4)

Below is an analysis of key SEPA elements identified by staff:

#### Transportation

Construction will occur during normal work hours. While the primary purpose of this work is to improve stormwater runoff collection and conveyance, the proposal includes street widening and a sidewalk extension that will improve pedestrian and vehicular safety.

### CONCLUSION

Based on my review of all available information and adopted policies of the City, I have not identified any significant adverse environmental impacts. Therefore, I recommend that a Determination of Non-Significance be issued for this proposed action.

## ATTACHMENTS

- 1. Project Plans
- 2. Environmental Checklist dated July 11, 2023
- 3. Critical Area Report dated May 10, 2023
- 4. Critical Area Report dated July 25, 2023

I concur I do not concur

Comments:

October 13, 2023

for Adam Weinstein, Planning & Building Director Date

cc: Matthew Hough, CPH Consultants George Minassian, City of Kirkland, CIP Team



CITY OF KIRKLAND Planning and Building Department 123 5th Avenue, Kirkland, WA 98033 www.kirklandwa.gov ~ 425.587.3600

# DETERMINATION OF NON-SIGNIFICANCE (DNS)

DATE ISSUED: October 13, 2023

File No.: SEP23-00526

City Planner: David Aldridge III Phone: (425) 587-3256

Project Name: GOAT HILL DRAINAGE DITCH Email: <u>DAldridge@kirklandwa.gov</u> CONVEYANCE AND CHANNEL STABILIZATION – PHASE 1

Project Location/Address: 90<sup>th</sup> Avenue NE, NE 116<sup>th</sup> PL, NE 117th Place, NE 118th Place, and 91<sup>st</sup> Lane NE

Proponent: Matthew Hough with CPH Consultants on behalf of the City of Kirkland CIP Team

Project Description: Remove, replace, and install new storm drainage facilities in the Goat Hill neighborhood of Kirkland.

Lead agency is the City of Kirkland

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public upon request.

## Comment Period Information:

This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date issued. Comments must be submitted to David Aldridge III, project planner at DAldridge@kirklandwa.gov by 5:00 PM on October 27, 2023. Please reference file number SEP23-00526.

Responsible Official:

October 13, 2023

For Adam Weinstein, AICP, Planning & Building Director Date City of Kirkland Planning & Building Department 123 Fifth Avenue, Kirkland, WA 98033 – 425.587.3600

Appeal Information:

There is no administrative appeal period for this DNS (KMC 24.02.230(a)).

Publish in The Seattle Times on: October 17, 2023

Distribute this notice with a copy of the Environmental Checklist to:

## **GENERAL NOTICING**

- Department of Ecology Environmental Review
- Muckleshoot Tribal Council Environmental Division, Tribal Archeologist
- Muckleshoot Tribal Council Environmental Division, Fisheries Division Habitat

- Cascade Water Alliance Director of Planning
- Finn Hill Neighborhood Association
- Juanita Neighborhood Association
- Lake Washington School District No. 414: Budget Manager and Director of Support Services
- Washington State Dept. of Archaeology & Historic Preservation
- King County Dept. of Transportation Employer Transportation Representative
- Seattle & King County Public Health SEPA Coordinator
  - City of Bellevue Director, Planning Dept.
  - City of Kenmore Director, Planning Dept.
  - City of Bothell Manager, Planning Dept.
  - City of Woodinville Director, Planning Dept.
  - City of Redmond Manager, Planning Dept.

# AGENCIES WITH JURISDICTION, AFFECTED AGENCIES, AND/OR INTERESTED PARTIES

- Department of Ecology Environmental Review Department of Fish and Wildlife Olympia
- Eastside Audubon Society
- Parties of Record
- Interested Citizens
- cc: Applicant

Distributed by:

Planning Department File, Case No. SEP23-00526

Bylel

October 13, 2023

Bryan Cole, Program Specialist)

Date



CITY OF KIRKLAND Planning and Building Department 123 5th Avenue, Kirkland, WA 98033 www.kirklandwa.gov ~ 425.587.3600

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425-587-3831 联络 Title VI 协调员。

# **Russian:**

Чтобы запросить перевод этого документа на по-русски, свяжитесь с координатором по вопросам

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# Portuguese:

Para solicitar informações deste documento em português, entre em contato com o Coordenador do

Título VI em titlevicoordinator@kirklandwa.gov ou 425-587-3831.

# Korean:

해당 (언어)로 이 서류의 정보를 요청하려면, 타이틀 VI 코디네이터 타이틀 VI 코디네이터.

에게titlevicoordinator@kirklandwa.gov 또는 425-587-3831로 연락하십시오.

# Vietnamese:

Để yêu cầu thông tin từ tài liệu này bằng Tiếng Việt, vui lòng liên hệ với Điều Phối Viên Tiêu Đề VI theo

địa chỉ titlevicoordinator@kirklandwa.gov hoặc theo số 425-587-3831.

Alternate Formats:

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# APPENDIX D.2: LSM Permit



# Land Surface Modification Permit Po

Clty of Kirkland 123 5th Avenue Kirkland WA 98033 425-587-3600

Permit Number:	LSM23-07936
Гуре:	Land Surface Modification
Nork Class:	Site Development

Permit Infor	mation		
Job Addres	s: ROW 90th AVE NE	Application Date:	10/09/2023
Project:	Goat Hill Drainage Ditch Conveyance and Ch	Issue Date:	01/02/2024
Parcel:		Expiration Date:	01/02/2027

#### Scope of Work

COK Project - Goat Hill Phase 1: (SDC090000) Goat Hill Drainage Ditch Conveyance and Channel Stabilization - Phase 1; storm drainage, grading, and pavement improvements at various road/right-of-way over portions of 90th Ave NE, NE 116th Place, NE 117th Place, NE 118th Place, and 91st Lane NE in the Goat Hill neighborhood.

Contacts			
<b>Type</b> Applicant	<b>Contact Name</b> Matt Hough CPH Consultants	<b>Address</b> 11321 NE 120TH ST KIRKLAND, WA 98034	<b>Phone</b> 4252852390
Owner	City of Kirkland	123 5TH AVE KIRKLAND, WA 98033	4055070000
Secondary Contact	Cody Antos City of Kirkland		4255873823
Water and Sewer	Districts	Permit Type of Wo	ork
Water: Northshore	Utility District: 425-398-4400	Water	X Storm Drainage
Sewer: Northshore	Utility District: 425-398-4400	Sewer	X ROW
Conditions			
The City approved p inspection personne Kirkland tax locatior knowledge and the	olans, permit, conditions, and insp el. Any sales tax reported to the n code 1716. I certify that the info applicable City of Kirkland require	pection record must remain on the job State in association with this project s rmation furnished by me is true and co ements will be met.	site for use by City hould be coded to the City of prrect to the best of my
Owner or	Agent		DATE:
(Check o	ne)	(Print Name)	
		(Signature)	_

# APPENDIX D.3: Ecology CSWGP



STATE OF WASHINGTON

# **DEPARTMENT OF ECOLOGY**

PO Box 47600, Olympia, WA 98504-7600 • 360-407-6000

January 2, 2024

Cody Antos City of Kirkland 123 5<sup>th</sup> Ave Kirkland, WA 98033

RE: Coverage under the Construction Stormwater General Permit

Permit number:WAR313114Site Name:Goat HillLocation:three work areas in the Goat Hill neighborhood- Section 30,Township 26 North, Range 5East Section 31, Township 26 North, Range 5 East.<br/>KirklandDisturbed Acres:1.57

Dear Cody Antos:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Construction Stormwater General Permit (CSWGP). This is your permit coverage letter. Your permit coverage is effective January 2, 2024.

Retain this letter as an official record of permit coverage for your site. You may keep your records in electronic format if you can easily access them from your construction site. You can get the CSWGP, permit forms, and other information at Ecology's <u>CSWGP eCoverage Packet</u> <u>webpage</u><sup>1</sup>. Contact your Permit Administrator, listed below, if you want a copy of the CSWGP mailed to you. Please read the permit and contact Ecology if you have any questions.

## **Electronic Discharge Monitoring Reports (WQWebDMR)**

This permit requires you to submit monthly discharge monitoring reports (DMRs) for the full duration of permit coverage (from the first full month of coverage to termination). Your first sampling and reporting period will be for the month of **February 2024** and your first DMR must be submitted by **March 15, 2024**.

You must submit your DMRs electronically using Ecology's secure online system, WQWebDMR.

<sup>&</sup>lt;sup>1</sup> http://www.ecology.wa.gov/eCoverage-packet

To sign up for WQWebDMR go to Ecology's <u>WQWebPortal guidance webpage</u><sup>2</sup>. If you have Cody Antos January 2, 2024 Page 2

questions, contact the portal staff at (360) 407-7097 (Olympia area), or (800) 633-6193/Option 3, or email <u>WQWebPortal@ecy.wa.gov</u>.

# **Appeal Process**

You have a right to appeal coverage under the general permit to the Pollution Control Hearing Board (PCHB). Appeals must be filed within 30 days of the date of receipt of this letter. Any appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2). For more information regarding your right to appeal, please reference Ecology's Focus Sheet: <u>Appeal of General Permit Coverage</u><sup>3</sup>.

## **Annual Permit Fees**

RCW 90.48.465 requires Ecology to recover the costs of managing the permit program. Permit fees are invoiced annually until the permit is terminated. Termination conditions are described in the permit. For permit fee related questions, please contact the Water Quality Fee Unit at wqfeeunit@ecy.wa.gov or (800) 633-6193/Option 2. You can also visit Water Quality Permit Fees Webpage<sup>4</sup> for more information.

## **Ecology Field Inspector Assistance**

If you have questions regarding stormwater management at your construction site, please contact your Regional Inspector, Luis Buen Abad of Ecology's Northwest Regional Office in Shoreline at luis.buenabad@ecy.wa.gov, or (425) 256-0891.

## **Questions or Additional Information**

Ecology is here to help. Please review our <u>Construction Stormwater General Permit webpage</u><sup>5</sup> for more information. If you have questions about the Construction Stormwater General Permit, please contact your Permit Administrator, Stacey Britton at stacey.britton@ecy.wa.gov or (360) 764-3727.

Sincerely,

1 to Killelen

Jeff Killelea, Manager Permit and Technical Services Section Water Quality Program

<sup>&</sup>lt;sup>2</sup> https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance

<sup>&</sup>lt;sup>3</sup> https://apps.ecology.wa.gov/publications/summarypages/1710007.html

<sup>&</sup>lt;sup>4</sup> https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Fees

<sup>&</sup>lt;sup>5</sup> www.ecology.wa.gov/constructionstormwaterpermit

# APPENDIX D.4: Critical Areas Determination



CITY OF KIRKLAND Planning and Building Department 123 5th Avenue, Kirkland, WA 98033 425.587.3600 - <u>www.kirklandwa.gov</u>

# City of Kirkland Notice of Decision

Project Name:	GOAT STABI	HILL DRAINAGE DITCH CONVEYANCE AND CHANNEL LIZATION
File No.:	SAR23	3-00505
Location:	Public PL, NE Attach	right-of-way in the Goat Hill area of Finn Hill, including NE 118 <sup>th</sup> E 117 <sup>th</sup> PL, 90 <sup>th</sup> AVE NE, NE 116 <sup>th</sup> PL, and 91 <sup>st</sup> LN NE (see ments 1 and 2)
Applicant:	Matt H Works	ough of CPH Consultants, on behalf of City of Kirkland Public Department – Capital Improvements Projects Division
Request:	The C reques critical improv improv	ity of Kirkland Capital Improvement Projects (CIP) Division is sting a Public Agency Exception for improvements proposed within area buffers. The Public Agency Exception applies to rements in Phase 1 of a storm drainage, grading, and pavement rement project. Phase 1 work areas include (see Attachment 2):
	(1)	Work Area A – This project area includes approximately 700 lineal feet (LF) of NE 117th PL and 330 LF of 90th Avenue NE.
	(2)	Work Area B $-$ This project area includes approximately 750 LF of NE117th Place, 1,065 LF of NE 116th PL, and 160 LF of NE 118th PL.
	(3)	Work Area C – This project area includes approximately 40 LF of 91st Lane NE, with a total approximate area of 3,200 ft2.
	The re and B roadwa Wetlar	equested Public Agency Exception would apply to Work Areas A for storm drainage work and the widening of portions of the public ay within the critical area buffers of Stream A, Wetland C, and ad B.
<b>Review Process:</b>	Plannii	ng Director Decision
Project Planner:	Peter N	Milliken, Associate Planner
SEPA Determination:	Determ	nination of Nonsignificance (see Section V)
Decision:	Appro	val with Conditions

ada War

Adam Weinstein, Director of Planning and Building Department

# I. CONDITIONS OF APPROVAL

- A. This application is subject to the applicable requirements contained in the Kirkland Municipal Code, Zoning Code, and Building and Fire Code. It is the responsibility of the applicant to ensure compliance with the various provisions contained in these ordinances. Attachment 3, Development Standards, is provided in this report to familiarize the applicant with some of the additional development regulations. This attachment does not include all of the additional regulations. When a condition of approval conflicts with a development regulation in Attachment 3, the condition of approval shall be followed. See Conclusion IV.B.
- B. As part of the application for a Land Surface Modification Permit or Building Permit, the applicant shall submit a plan set, stating that any impacts to critical areas or their buffers as a result of exempted work pursuant to KZC 90.35 shall be restored, rehabilitated, or replaced to prior condition or better. See Conclusion III.B.2.a.
- C. Prior to issuance of a Land Surface Modification Permit or Building Permit, the applicant shall demonstrate procurement of advance mitigation program (AMP) credits. See Conclusion III.D.2.c.

# II. SITE DESCRIPTION

- A. <u>Facts</u>:
  - The applicant has proposed development activities within the 91<sup>st</sup> LN NE, NE 116<sup>th</sup> PL, NE 117<sup>th</sup> PL, and NE 118<sup>th</sup> PL rights-of-way (see Attachment 2). Currently, the rights-of-way are improved with asphalt driving surfaces and stormwater and sewer utilities located at and below the improved surface. The activities include grading, repaving, right-of-way widening, and utilities improvements. Portions of these rights-of-way are encumbered by wetlands, streams, and their associated buffers. The work is broken into six (6) areas, referred to as Work Areas A, B, C, D, E, and F. Work Areas A, B, and C are Phase 1 while Work Areas D, E, and F are Phase 2.
  - 2. On May 12, 2023, the City determined that six (6) streams (Streams A-F) and seven (7) wetlands (Wetlands A-G) exist within the project area on Goat Hill (see Attachment 4). The determination was based on reports by Meryl Kamowski of Wetland Resources Inc. (WRI), dated March 3, 2023 and May 10, 2023 (both included in Attachment 4) and peer-reviewed by the City's consultant, DCG/Watershed. Wetlands A, C, D, E, and F were determined to be Category III wetlands with 60-foot standard buffers. Wetland B was rated Category II with a 75-foot standard buffer. Wetland G was rated Category IV with a 40-foot standard buffer. Streams A, B, and E were type Np for perennial, non-fish-bearing streams. Streams C and D were type Ns for seasonal, non-fish-bearing streams. Stream F was type F for fish-bearing. All the streams were assigned a 50-foot stream buffer; this includes Stream F, which would've been a 100-foot stream buffer but received a limited buffer waiver per KZC 90.120.2 under the original critical area determination (see Attachment 4).
  - 3. These critical areas intersect with multiple work areas, particularly Wetlands B, C, D, and E within Work Areas A, B, and C.
- B. <u>Conclusions</u>:
  - 1. The applicant has proposed work entirely within the right-of-way, so the size and zoning of the work areas are not constraining factors.
  - 2. The streams, wetlands, and their buffers are constraining factors on the

Goat Hill Drainage Public Agency Exception File No. SAR23-00505 Page 3

proposed development.

# III. CRITICAL AREA REGULATIONS (KZC 90)

Kirkland Zoning Code (KZC) sections 90.15 – Applicability and 90.25 – Regulated Activities establish that the regulations within Chapter 90 apply to development activities within lands of the City of Kirkland that include wetlands, streams, and their associated buffers. The sections of KZC 90 applicable to this proposal are:

- KZC 90.120 Limited Buffer Waivers (see Section III.A)
- KZC 90.35 Exemptions (see Section III.B)
- KZC 90.40 Permitted Activities, Improvements or Uses Subject to Development Standards (see Section III.C)
- KZC 90.45 Public Agency Exceptions (see Section III.D)
- A. LIMITED BUFFER WAIVERS
  - 1. <u>Facts:</u>
    - a. KZC 90.120.1 allows the Planning Official to waive a required critical area buffer in that portion of the buffer isolated from the critical area where an existing legally established and improved public right-of-way or improved easement road interrupts a portion of the critical area buffer from the portion of the buffer adjacent to the critical area.
    - b. In their critical area report dated September 26, 2023, Wetland Resources, Inc (WRI) addresses the criteria in KZC 90.120.1.d and concludes that the critical area buffers are functionally interrupted and should terminate along the edge of improvements within rights-of-way (see Attachment 5).
    - c. Within Work Area A, the buffers of Wetland B and C are interrupted by the NE 117<sup>th</sup> PI right-of-way, nullifying the wetland buffers on the south side of NE 117<sup>th</sup> PL.
  - 2. <u>Conclusions:</u>
    - a. Pursuant to KZC 90.120.1, the buffers from Wetland B and Wetland C should be considered interrupted by improved rights-of-way (NE 117<sup>th</sup> PL).
    - a. Work on the southern edge of the NE 117<sup>th</sup> PL right-of-way, opposite Wetlands B and C, should be considered outside the buffer of said critical areas.
- B. EXEMPTIONS
  - 1. <u>Facts</u>:
    - a. KZC 90.35 establishes activities, improvements and uses that have little or no environmental impact; are temporary in nature; or are an emergency and are therefore exempt from the provisions of KZC 90.40 through 90.225.
    - b. KZC 90.35 also states that an exemption does not give permission to degrade a critical area or ignore risk from natural hazards. All exempted activities shall use reasonable methods to avoid impacts to critical areas or their buffers. Any temporary damage to, or alteration of, a critical area or buffer shall be restored, rehabilitated, or replaced to prior condition or

better at the responsible party's expense.

- c. KZC 90.35.2 provides an exemption for repair, maintenance, reconstruction, and minor expansion of existing public streets.
- d. KZC 90.35.3 provides an exemption for repair and maintenance of utility structures and conveyance systems and their associated facilities, as well as replacement, installation, or construction of new utility structures and conveyance systems so long as the activities do not involve expansion of impervious surfaces within the existing improved rights-of-way.
- e. Within Work Area A, utility and paving work will occur in the 90<sup>th</sup> Ave NE right-of-way within the buffers of Wetland B and Stream A. The impervious surface area will not increase in the critical area buffers (see Attachment 2).
- f. Also within Work Area A, utility and paving work will occur in the NE 117<sup>th</sup> PI right-of-way within the buffers of Wetland B and Stream A. This work includes an increase in impervious area within critical area buffers and is therefore not exempt.
- g. Within Work Area B, paving work will occur within the buffer of Wetland E at the intersection of NE 117<sup>th</sup> PI and NE 116<sup>th</sup> PI rights-of-way and within the buffer of Wetland B at the intersection of NE 117<sup>th</sup> PI and NE 118<sup>th</sup> PI rights-of-way. The impervious surface area will not increase in these critical area buffers (see Attachment 2).
- 2. <u>Conclusions</u>:
  - a. Construction drawings should specify that any temporary critical area and buffer impacts shall be restored to their pre-project condition or better, including soil stabilization and revegetation.
  - b. Pursuant to KZC 90.35.2 and 90.35.3, the paving and utility work in Work Areas A and B that does not increase the impervious surface within critical area buffers qualifies for an exemption to the provisions of KZC 90.40 through 90.225 and may proceed without additional review.
  - c. The paving and utility work in Work Area A that increases impervious surface within a critical area buffer is not exempt under KZC 90.35 and requires further review and permitting pursuant to KZC 90. See Sections III.C and III.D below.
- C. PERMITTED ACTIVITIES, IMPROVEMENTS OR USES SUBJECT TO DEVELOPMENT STANDARDS
  - 1. <u>Facts:</u>
    - KZC 90.40 allows for certain activities and improvements within critical area buffers, subject to specific standards therein. More specifically, KZC 90.40.6.h allows for widening of public streets in critical areas, provided, in part, the street is located only in the outer 25 percent of the buffer area.
    - The proposed paving in Work Area A that widens NE 117<sup>th</sup> PI does not meet the standards for permitting the improvements under KZC 90.40.6.h as noted above.

# 2. <u>Conclusion</u>:

The paving and utility work in Work Area A that increases impervious surface inside the outer 25 percent of the critical area buffer is not permissible under KZC 90.40 and requires further review and permitting pursuant to KZC 90. See Section III.D below.

# D. PUBLIC AGENCY AND PUBLIC UTILITY EXCEPTIONS

- 1. <u>Facts</u>:
  - a. KZC 90.45 allows a public agency to apply for an exception when strict application of KZC 90 would prohibit a proposal.
  - b. The City of Kirkland CIP Division, a public agency, is prohibited from installing the proposed improvements under the applicable sections of KZC 90.35 and 90.40 (see Section III.B and III.C above) and requests an exception pursuant to KZC 90.45 due to the proposal not meeting the applicable standards within those sections.
  - c. Pursuant to KZC 90.45.1, prior to seeking approval of a Public Agency Exception, the applicant must first demonstrate that:
    - (1) The project scope cannot be approved under KZC 90.60 for wetland modifications and KZC 90.70 for stream modifications; and
    - (2) The project cannot meet the requirements under KZC 90.130 for vegetative buffer standards and KZC 90.140 for structure setbacks from critical area buffers; or any other provisions of this chapter.
  - d. The proposed scope of work cannot be achieved as a wetland buffer modification under KZC 90.60.3 because it does not meet any of the scenarios identified therein:
    - (1) a wetland modification (*the project does not involve modifying a wetland as all work is located outside of the wetland*);
    - (2) a buffer averaging proposal (the project cannot achieve an averaged buffer based on standards in KZC 90.115 and the inability for the City to increase buffer area on surrounding private property); and
    - (3) an interrupted buffer waiver (*waivers are already applied to the extent possible for certain portions of the work areas per Section III.A above*).
  - e. The proposed scope of work is not subject to KZC 90.130 for vegetative buffer standards and KZC 90.140 for structure setbacks from critical area buffers.
  - f. Pursuant to KZC 90.45.3, the Planning and Building Director shall make a decision on the exception based on all of the following criteria:
    - (1) There is no other practical alternative to the proposed project with less impact on the critical areas or buffer.

Staff Analysis: The improvements are all public infrastructure facilities that must be located in the existing right-of-way and cannot be installed in an alternative

location due to constraints of fixed right-of-way boundaries and surrounding private property.

(2) Strict application of this chapter would unreasonably restrict or prohibit the ability to provide public utilities or public agency services to the public.

Staff Analysis: The City is tasked with providing safe roadways and related infrastructure in the right-of-way, as well as sufficiently managing stormwater. Without this exception, the proposed work would be prohibited and the City would not be fulfilling its obligation to the public of providing functioning stormwater infrastructure and safe roads.

(3) The proposal minimizes impacts to the critical area or buffer through mitigation sequencing, and through type and location of mitigation, pursuant to KZC 90.145 and 90.150, if applicable, including such installation measures as locating facilities in previously disturbed areas, boring rather than trenching, and using pervious or other low impact materials; and

> Staff Analysis: The applicant's critical area study addresses mitigation opportunities and challenges. Challenges exist due to the buffers and critical areas extending into both public and private property, as well as limited unimproved area within open rights-of-way that are available for mitigation. The study points to using the City's advance mitigation program (AMP) credits to satisfy the mitigation requirements of KZC 90.145 and 90.150. Use of AMP credits fulfills locational preference of KZC 90.145.3. See Attachment 5.

(4) The proposal protects and/or enhances critical area and buffer functions and values, consistent with the best available science and with the objective of no net loss of critical area functions and values.

Staff Analysis: The applicant's critical area study addresses wetland and stream function and values under existing conditions, as well as post-development. The study concludes that stream and wetland function will not suffer any direct impacts and that the improved drainage will reduce water flow velocity and erosion issues, which will improve water quality and hydrological functions in the area – a net improvement in critical area functions and values. See Attachment 5.

- g. The proposed improvements will result in 455 square feet of permanent impact to the critical area buffers of Stream A and Wetland C (see Attachments 2 and 5), which must be mitigated.
- h. Pursuant to KZC 90.145 and 90.150 the permanent impacts to stream and wetland buffers must be mitigated at a 1:1 ratio.
- i. For use of advance mitigation programs, KZC 90.145.5.b.1.c requires the applicant submit documentation of completion of the advance mitigation prior to issuance of a land surface modification or building

permit.

- 2. <u>Conclusions</u>:
  - a. The proposed work is unable to comply with the standards of KZC 90, under strict application, and is therefore eligible for a Public Agency Exception pursuant to KZC 90.45.
  - b. The proposal meets the decisional criteria established in KZC 90.45.3 as supported by the submitted critical areas report.
  - c. As part of the Land Surface Modification permit, the applicant should submit documentation of use of the advance mitigation program pursuant to KZC 90.145.5.b.1.c.

# **IV. DEVELOPMENT STANDARDS**

- A. <u>Fact</u>: Additional comments and requirements placed on the project are found on the Development Standards, Attachment 3.
- B. <u>Conclusion</u>: The applicant should follow the requirements set forth in Attachment 3.

# V. STATE ENVIRONMENTAL POLICY ACT (SEPA)

- A. <u>Facts</u>: A Determination of Nonsignificance (DNS) was issued on October 13, 2023. The Environmental Checklist, Determination, and additional environmental information are included as Attachment 6.
- B. <u>Conclusion</u>: The City has satisfied all procedural requirements for SEPA.

## VI. APPEALS

Pursuant to KZC 90.220, the decision by the Planning and Building Director may be appealed using the applicable appeal provisions of Chapter 145 KZC.

## VII. LAPSE OF APPROVAL

Pursuant to KZC 90.225, the decision made by the Planning and Building Director shall be subject to the lapse of approval provisions of KZC 145.115

Under KZC 145.115:

The applicant must begin construction or submit to the City a complete building permit application for the development activity, use of land or other actions approved herein within five (5) years after the final approval of the City of Kirkland on the matter, or the decision becomes void; provided, however, that in the event judicial review is initiated per KZC 145.110, the running of the five (5) years is tolled for any period of time during which a court order in said judicial review proceeding prohibits the required development activity, use of land, or other actions.

The applicant must substantially complete construction for the development activity, use of land, or other actions approved herein and complete the applicable conditions within seven (7) years after the final approval on the matter, or the decision becomes void.

# **VIII. APPENDICES**

Attachments 1 through 7 are attached.

- 1. Vicinity Map
- 2. Plans
- 3. Development Standards
- 4. Critical Areas Determination, dated May 12, 2023, City of Kirkland
- 5. Critical Area Study and Buffer Mitigation Plan, dated September 26, 2023, Wetland Resources Inc.

6. State Environmental Policy Act (SEPA) Memo, dated October 13, 2023, City of Kirkland

# IX. PARTIES OF RECORD

Applicant Planning and Building Department







LEGEND		GENERAL PROJECT NOTES	ABBREVIATIONS
ROADWAY CENTERLINE PROJECT BOLINDARY LINE PROFERT BOLINDARY LINE ROAT-OF-WAY LINE ROAT-OF-WAY LINE	CITYTING (2000)	1 ALL MORNANCIPSE METHODS AND WATERIALS OF THIS PROJECT SMALL CONSTRUCTION AS THE EXTRONO OF THE STANDARD STACKDG-THINE FOR ROLD, GROUP, AND WATERIALS OVERSTRUCTION AS TRECOLLED OF TROOT AND THE WASHINGTON STATUS CLAFFER OF THE APPRIL AND MALE OFF OF MANUAL CONTROL STATUS CLAFFER AND AND AND AND AND AND AND AND THE STANDARDS. CONTROL STATUS AND	AC ASPAN, PLONGETE PANDADY, LOPE LINED DORBINATED POLYEDINER PRE AP ANALE POWY D' LINEL (FEF) ATE ASPAN, TRANSD BASE LT LEFT, DS INSPECTOR AVE ANNUE AND RETORN UN LAND DS INSPECTOR BOOC - BOOK DF CHRIS WORT WALKE DAVALEMENT FRUMEW TAW
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2 CONTROL LINE		VERTY THE LOCATIONS OF ALL UTLITIES AND RELATED SHARE FLATINGS WORKIN HE PROJECT AREA. AND NOTIFY THE ENGINEER OF ANY DISCREPANDESS WITH THE PLAN INFORMATION PRIOR TO CONSTRUCTION. THE CONTRACTOR	CMP CORNEGATED METAL FIPE NIG NOT IN CONTRACT CONC. CONCRETE 0.C. ON GENTER
SANITARY SEWER MAN		SHALL AT MANANA, CONTACT THE UNDERGROUND UTUTIES LOCATE CENTER (1-800-424-5555) TO HAVE UTUTIES MEMBEL DA THE GROUND PRICE TO CONSTRUCTION.	CONN. CONNECTION PC. POINT OF CURRATORE CONT. CONTINUOUS PE PLAIN END
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FIRE SUPPLY		I THE CHARGENERY ENDERN AND SCHWART CONTROL CONTROL OF SCHWART AND SCHWART AND THE PLANT SCHWART AND	ISHD CRUSHED SIMPACING BASE COURSE PU POINT OF VERTICAL WITERSECTION
BAS LINE		AND SEDWENTATION CONTROL MEASURES SHALL BE IN-FLACE FRIGH TO ANY DEMOLITON OF CONSTRUCTION ACTIVITIES	DAL DIAMETER ACTION FOR COURSE RECO. RECARED
FENCE LINE		4 ALL NEW PAVEMENT, SIDEWALKS, AND CURB AND GUTGER INSTALLED BY THIS PROJECT SHALL BEAR ON SUITABLE	DW DRIVEWAY BT MEDIT
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TELEPHONE LINE		<ol> <li>ALL PAVEMENT MARKINGS SHALL DOMFORM TO THE INSDOT STANDARD PLANS AND SPECIFICATIONS AS AMENDED OF SUPPLEMENTED BY THE PROJECT PLANS, DETAILS, AND SPECIFICATIONS AS INCOMED IN THE CONTRACT DOCUMENTS.</li> </ol>	ESD ENTERING SIGHT DISTANCE STA STATION ESN'T EASEMENT DISTANCE TESC TEMPORARY EROSION AND SEDMENT CONTROL
SUMED PELEPHINE LINE		A 1/1 PURPALE ALL WAR ANIMOUS MILTER LEADER AND AN AN ANE PARENT STATES BUT I AN ANAMAN C. ALL AND AN AN-	EVA EMERTENCY VEHICLE ACCESS TOC TOP OF CLARE EMIST ENISTING TYPE TYPECAL
SHT FENCE	<u>-x-x-x-xx</u>	In all crowing un-site domestic works relias analysis server before server and the property and analysis of a lighted contractor, contractor to provide size work and works and worken vertication of adamposite server of provident to the lighted was servered to contract the server and worken vertication of adamposite server of	PL FLOW ONE IBM TOP BACK OF WALK
SONSTRUCTION PENGING	-11-11-11-11-	ACCORDANCE WITH APPLICABLE ADENCY RETAIN ATOMS	HONE WE CAME UNC UNLESS MULED WHEN THE HONE HONE TO THE HONE TO TH
SLEARING LIMIT SAMITARY SEWER CLEAN OUT		7. THE WATERIALS AND METHODS OF INSTALLATION FOR ALL PUBLIC DOMESTIC POTABLE AND FIRE WATER SUPPLY	WILLING COUNTRY POSICI WAS INVOLUDED. UP IN ANSTRAGA TOP
SANYTARY SEWER MANHOLE		SYSTEMS STULL BE IN ACCORDANCE WITH AMPLICABLE STANDARDS OF	ACHS KING COUNTY HOAD STANDARDS WE WATER SERVICE
STORM DRAIN CATCH BASIN - 1995 I	1.20	6. THE MATERIAL'S AND METHICOS OF INSTALLATION FOR ALL FUELIC SANITARY SEVER SYSTEMS SHALL BE IN	
STORM DRAIN EATCH BASIN - FYPE I	8	Annual milling at the more and the second	
STORM BRAIN EULYCRT		# AT LEAST TWO COPPES OF THESE PLANS GHALL BE ON THE JOB SITE WHEN CONSTRUCTION IS W PROGRESS. THE CONTRACTOR SHALL ALSO HAVE COPPES OF THE APPLICABLE REDULATORY ADDRESS SHADARDS AVAILABLE AT THE JOB	
WATER CAP/PLUG	1	SHE DURING HE RELATED CONSTRUCTION SPERATIONS ALL APPRICABLE FERMITS SHALL BE OBTAINED FROM TO ANY CONSTRUCTION ACTIVITY, ONE COMPLET, SET OF PROJECT PLANS WITH RECERDS OF AS-BULT NFORMATION SHALL BE	
WATER COMPLING		PROVIDED TO THE PROJECT ENGINEER AT THE LAND OF THE WRITEEL.	
REDUCER		B. THE CONTRACTOR SHALL COUNDINATE ACTIVITIES OF ALL LITUTY FURNETCRS UNPACTED BY MURK FOR THIS MIDLELT AND SHALL CONTACT THEM PRIOR TO CONSTRUCTION TO SCHEDULE MORK FOR PROUSIONS FOR AND BE RESPONSIBLE.	
THRUST BLOCK		TO SUMMONT, MADITAN, ON DUMUNUSE MADIECT AND KEEP IN SERVICE ALL EXISTING UTILITIES MARTHEIR SHOWN ON NOT SHOWN ON THESE PLANS DURING CONSTRUCTION	
water weter	5 ····	IN UNITED TO ATTOCTORE BOOTING OF UTUALS THAT TO ADDRESS IN GLASS COLL. BE BEINDER BY THE	
2 NOZZLE FIRE HIDRANT 3 NOZZLE FIRE HIDRANT		INTERFECTION OF THE EXTENT RECESSARY TO COMPLETE THE PROPOSED WORK, THE CONTRACTOR SHALL PLUS THE CONTRACTOR TO THE EXTENT RECESSARY TO COMPLETE THE PROPOSED WORK, THE CONTRACTOR SHALL PLUS THE BELLANDING CONTRACTOR SHALL PLUS	
HANGE /HEAND PL JEWI		CONSIDERED INCIDENTAL TO OTHER WORK PERFORMED	
MECHANICAL JOHN		11. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DASING THAT ALL PROMISIONS OF THE SOLS REPORT FOR	
FUSH-DW/MUB-JON I TOTAL ACANT	1	THE BITE BE DESERVED AND COMPLED WITH DURING ALL PHASES OF SITE PREFARATION, GRADING OPERATIONS, FOUNDATION, SLAB WID FAVING DURSTRUCTION, THE CONTRACTOR SHALL HOTEY THE PROJECT ENGINEER IMMEDIATELY	
AN RELIEF VALUE		OF WAY IMPOUNDED OF THE SOL REPART MORE CONFLICT WITH TO CRMAITEN SHOWN LESE MARKE ON THESE EXAMINES. OR WHICH REQUIRES FURTHER CLAREFICATION.	
BLOW OFF VALVE		12. THE CONTRACTOR OF DIMER DHALL OBTAIN THE SERVICES OF A DUALIFED SOLS ENGINEER AND/OR TESTING WORNDY	
ENTTERFLY VALVE		TO PERFORM SUBJEACE/BHONFILL DENSITY TESTS OF TO DIRECT THE REMOVAL AND REFLACEMENT OF ANY UNSUITABLE MATERIALS DURING CONSTRUCTION: A REPRESENTATIVE OF THE SOULS ENGINEER AND/OR TESTING ADDITA	
GATE/GENERAL VALVE	H	SHOLL BE AVAILABLE TO DESERVE AND TO WERE'S FELD CONVOLDAS AS WORK PROCEEDS, THE SOLS DESMER SHALL SUBMIT RELD REFORTS AS REQUIRED TO DERTRY THE WETHINGS AND WATERIALS ARE IN ACCORDANCE WITH FRO.ECT	
FLUG VALVE		SPECIFICATIONS. THE CONTRACTOR SHALL COORDWATE THE APPROPRIATE SOLS INSPECTIONS AND ITESTING.	
GAS METER		13 THE CONTRACTOR SHALL BE RESPONSELE FOR PROVIDING ADEDUATE TRAFFIC DONTROL DURING CONSTRUCTION ADJACENT TO OR WITHIN ALL PROVID READINGTY TRAFFIC POLICY LEADINGS SHALL BE IN A LIFE DRIVE OF ANY ADJACENT TO OR WITHIN ALL PROVID READINGTY TRAFFIC ONTROL DURING CONSTRUCTION	
PAD MOUNTED TRANSFORMER		CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL MANYAM ACCESS TO ALL PRIVATE PROPERTY DRIVEWAYS DURING	
FOWER VALLT			
TRANSMISSION TOWER (SCALEABLE)	10	14 ALL WORK PERTAINING TO THIS PROJECT SHALL BE SUBJECT TO INSPECTION BY THE WERECTOR OF HIS DESIGNATED REPRESENTATIVE. THICH TO ANY STE WORK, THE CONTRACTOR SHALL CONTACT AT	
POWER POLE	•	10 SCHEDULE A PRE-CONSTRUCTION CONTERLACE	
DIREFT POLL AND NW	e e		
TELEPHONE RIVER	(1)		
BUS STOP			
MAR BOX	-		
RIP RAP	1/2		
SHRUR			
STHERAL SON			
REGULATORY SION	-		
THEE (COMVER)	71		
VARD LIGHT			
BRIDGE /TUNNEL			
ASPWALT PAVEMENT	P. and P.		
CONCRETE.			
ENGR. REVIEW SCA	ALE DATE		
MUH MUH	7/14/2023	DIT STATES SKIPA	GOAT HILL DRAINAGE DITCH CONVEYANCE
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	Know share below.	Constance of the Consta	LEGEND NOTES AND ARBREVIATIONS

#### CITY OF KIRKLAND STANDARD PLAN NOTES

#### EROSION/SEDIMENTATION CONTROL

- ). THE APPROVED CONSTRUCTION SEQUENCE SHALL BE AS FOLLOWS: a COMPLICT PRE-DOMSTRUCTION MEETING.
- IL FLAG OR FENCE DLEARING LIMITS.
- POST SIGN WITH NAME AND PHONE NUMBER OF TESC SUPERVISOR.
- d INSTALL CATCH BASIN PROTECTION DOWNSTREAM AND AS DETERMINED BY THE CITY INSPECTOR
- . DRADE AND INSTALL CONSTRUCTION ENTRANOR(3).
- J. INSTALL PERMETER PROTECTION (BLT FENSE, DRUSH BARKER, ETC.)
- & CONSTRUCT SEDIMENT PONDS AND THAPS
- A. GRADE AND STABLIZE CONSTRUCTION ROADS.
- I CONSTRUCT SURFACE WATER CONTROLS (WIEROCPTOR DIKES, PRFE SLOPE DRAWS, ETC.). SUM TANEDISLY WITH CLEARING AND GRADING FOR DRULECT DEVELOPMENT.
- I MANTAN ERSON CONTROL NEASURE IN ACCORDANCE WITH DTV OF MANALISMUT STANDARS AND MANALISMEST RECOMMENDATIONS & RELOCATE EROSION CONTROL NEASURES OF NETALL NEW MEASURES 20 THAT AS STE
- COMPTIONS DIAMAE. THE EROSAN AND SERVICIAT DONTING IS ALWAYS IN ACCORDANCE. WITH THE CITY TESE WANNUM REQUIREMENTS
- I COVER ALL AREAS WITHIN THE SPECIFIED TWE FRAME WITH STRAM, WOOD FIRER MULCH COMPOST, PLASTIC SHEETING, ORUSHED FOOX OF EQUIVILENT
- IN STABUJE ALL AREAS THAT REACH TINAL GRADE WITHIN 7 DAYS
- IN SEED OR SOD ANY AREAS TO REMAIN UNWORKED FOR MORE THAN 30 DAYS.
- 9 UPON COMPLETION OF THE PROJECT, ALL O'STURBED AREAS MUST BE STABLIZED AND BEST MANAGEMENT PRACTICES REMOVED F APPROPRIATE.

- CLUAR-LP AND FAMILIES ME FAID TO THE OT OF RIFERANCE OLIGHTIDISTING CAMERIDAN DISTORTING STATUS MET MET MET DUALTI COLUMNS DISTORTING CONTRACTOR DISTORTING DISTORTING DISTORTING DISTORTING DISTORTING DISTORTING DISTORTING DISTORTING DI DISTORTING CONTRACTOR DISTORTING DISTOR
- (242-243-3000) AN ADMINISTRATION TO THE FURLE MEMOR CONSTRUCTION INSERTION. ALL NOW AN INTERNAL STULL BE IN ACCOUNCE WITH CITY OF INSERVING ATTACHNOL MOD DESCRIPTION. ADD DESCRIPTION DE THE ELEMING UNITY SHOWN BY THE FLAN SHALL BE CIT BY BURKY WAS COLLEND F. ALLOW IN THE RED AT A LIARING CONSTRUCTION FORM TO CONSTRUCTION. (ANNO THE CONSTRUCTION PORIDA. NO DESTRUMENCE OF REAVILY. CONSTRUCTION. (ANNO THE CARACTERIZATION PORIDA. VICE THE AND THE FIRST TO CONSTRUCTION. (ANNO THE CARACTERIZATION PORIDA. INTERNAL THE FIRST TO CONSTRUCTION. (ANNO THE CARACTERIZATION PORIDA. INTERNAL DE FIRSTITIO. THE PLANSING COSTO RETING THE PRIMITIZE/CONTRIBUTION FOR THE DURATION FOR CONSTRUCTION.

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- Античник, ит те влижари АИО ПЕ СИТ ОГ АВАЦАЙО АКРЕСТОК. П. НЕ СВС САБИТЕК ЗБАНИ, И ПЕ КОТ ОГ АВАЦАЙО АКРЕСТОК. ВИСКАТИ В ИНФИЛИТ БЕ АКОЛИЧИК УМИНИК, ИСПОЛНИКИТЬ СТИГАСИ ПРО-МИЦИ, В ИНФИЛИТ БЕ, АКОЛИЧИК УМИНИК, ИСПОЛНИКИ В ОТОРЕК УМИК ВИ ВИСКАТИ В ИНФИЛИТ БЕ, АКОЛИЧИК УМИНИК, ИСПОЛНИКИ В ОТОРЕК УМИК ВИСКАТИ В ИНФИЛИТ БЕ, АКОЛИЧИК УМИНИК, ИСПОЛНИКАТИ ВО ОТОРИИСТИК ВИСКАТИ В ИНФИЛИТ БЕ, АКОЛИЧИК УМИНИК, ИСПОЛНИКАТИ ВИСКАТИ В ИНФИЛИТ БЕ, АКОЛИЧИК УМИНИК, ИСПОЛНИКАТИ ВИСКАТИ В ИНФИЛИТ БЕ, АКОЛИЧИК УМИНИКАТИРИ ВОЛИЧИКА ВИСКАТИРАТИРИ ВО ОТОРИКАТИРИ ВО ОТОРИКАТИРИ ВИСКАТИРИ ВО ОТОРИСТИКАТИРИ ВО ОТОРИСТИКАТИРИ СОМИНАТИРИ ПО ДАВИЕ ЗКИ ИМИ ВО ОТОРИСТИКАТИРИ АКОЛИЧИСКА КОЛИТИКА, КАКОЛИЧИКАТИРИ МИТ ТЕ ИСТЕСЛО
- MAY BE REZIGIO. HE ESS FAULTOS SMALL BE REPECTED BY THE POMINTE/CONTRACTOR TANY DORMET MORIARMALL PERDOS LEREY HAR (LARCENT) DUME A SAMFALL SEXT AND AT HE BU OF EVEN ANNELL, AND MANTALED AS MESSAWI TO ESSINE THE CONTRACTOR DO OF EVEN ANNELL, AND MANTALED AS MESSAWI TO ESSINE THERE CONTRACTOR DO OF EVEN ANNELL, AND MANTALED AS MESSAWI TO ESSINE THERE CONTRACTOR CONTRACTS SHALL BE MANTANED IN A SATERACTORY CONTROL WITH SACH HE HAT CONTRACTS OFFICIATION OF A SATERACTORY CONTROL WITH SACH HER HAT CONTRACTS OFFICIATION OF THE SATERACTORY CONTROL WITH SACH HER HAT CONTRACTS OFFICIATION OF THE SATERACTORY CONTROL WITH SACH FEED AND DEVENTION OF THE SATERACTORY CONTROL WITH FEEDROSS SHALL B ASEY DOCUMENTION THE REVIEW OF THE ESS FACURES

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1"=20"

84% PHASE T REVIEW SUBMITIAL PCE MUH 7/14/23 REVISION BY TREVIEW DATE

7/14/2023

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Know what's below. Call before you dig.

- 15. ALL DENUDED SOLS MUST BE STABULED WITH AN APPROVED TESC METHOD (E.G. SEEDING WILLOWIG, FLASTIC CINERING, DRUGED RODK) WITHIN THE FOLLOWING THREASES WAY'T 10 SEPTEMBER 30 SOLS MIST BE STRAILIZE WITHIN 7 DAYS OF STADUNG. · DETORER I TO APRIL 30 - SOUS MUST BE STABURDED WITHIN 2 DAYS OF GRADING
- STABILIZE SZRUS AT THE END OF THE WORKWAY HOUCH IT A RELEVAN HOUCHT, OF PREDICTED RAIN EVENT.

- STARULE 2015 AT THE CHO OF THE REPORTAL FIRST 17 A REARING. HOUGHT OF PRENDER RAW SERVE.
   MARNE SELLING THE THERMANY FORSION CONTROL IS RECURSE, TAST CRAIMIN, MIC BASIES SELING THE THERMANY FORSION CONTROL IS RECURSE, TAST CRAIMIN, MIC BASIES SELING THE REPORTANY FORSION CONTROL IS RECURSE. ANALL OF EXPENDING ALL LOTS ADDRESS OF THE REPORTANY FORSION CONTROL IN THE CONTROL IT SELIL, RE APPLIED AT A MONINAL METADOMIC SELECTION (THE CONTROL IS RECURSE).
   MALL LOTS ADDRESS OF THE REPORTANCE SECTION CONTROL IS RECURSED, TO MICH SELILIS ADDRESS OF THE REPORT CONTROL ON THE CONTROL IS ADDRESS TO MICH SELILIS ADDRESS OF THE REPORT CONTROL ON THE CONTROL AND MICH WITH CONTROL IS ADDRESS OF THE REPORT CONTROL ON THE CONTROL AND MICH WITH CONTROL IS ADDRESS OF THE REPORT CONTROL CONTROL IS ADDRESS TO MICH SELILIS ADDRESS OF THE REPORT CONTROL ON THE CONTROL ADDRESS OF THE REAVER AN ANALY AND THE RESTART AND THE CONTROL ON CASE OFFICE SELILIS ADDRESS OF THE REAVER AND SHALL BE RESTARTED HIM A CONTROL CONTROL ON THE CONTROL EXAMINE ADDRESS OF THE REAVER AND SHALL BE RESTARTED HIM A CONTROL CONTROL ON THE CONTROL EXAMINE CONTROL ON THE ADDRESS OF THE ADDRESS OF THE ADDRESS OF THE ADDRESS OF THE REAVER AND SHALL BE RESTARTED HIM A CONTROL CONTROL CONTROL FORCE THE ADDRESS OF THE MICH SHALL BE RESTARTED HIM AND THE ADDRESS OF THE ADDRESS OF THE MICH SHALL BE RESTARTED ADDRESS OF THE ADDRESS OF THE ADDRESS OF SHALL ADDRESS OF THE MICH SHALL BE RESTARTED ADDRESS OF THE ADDRESS

- ZA ALL PROPERTIES ADJACENT TO THE PROJECT SHE SHALL BE PROJECTED FROM SEDMENT DEPOSITION AND REALIFE
- ALTY OT THE SHALL HORE THAN I' OF SEDWENT BE ALLONED TO ACCUMALATE MITAN A CATO I DASH. ALL CATO! DASHS AND CONFENDE LINES SHALL BE CLEMED UMEDIATE! FALLING REMOVAL OF ERSON CONTROL ANDS. THE CLEMED UPERATION SHALL NOT FLUID! SEDMEDIT-LADD! WATER OTO THE DUMESTREM STREM.
- AND FORMATING TARGET AND A THE AND THE COMPONENT STELLY AND A STELLY AS A STELLY AND A STELLY AND A STELLY AS A STELLY AS A STELLY AND A STELLY AS A S
- Mail, T. G. SCHEN, MILLER JAMES INVESTIGATION AND A PARKET SALE OF MAIL INVESTIGATION AND A PARKETATION CONTROL FOR ANY A PARKET SALE OF MAIL TO THE PARKETATION INVESTIGATION AND A PARKETATION CONTROL FOR ANY A PARKET SALE OF MAIL TO THE PARKETATION INVESTIGATION AND A PARKETATION CONTROL FOR ANY A PARKET SALE OF MAIL TO CONTROL AND A PARKETATION CONTROL AND A PARKET SALE AND A PARKET SALE AND A PARKETATION AND A PARKETATION CONTROL AND A PARKET SALE AND A PARKET SALE AND A PARKETATION AND A PARKETATION AND A PARKET SALE AND A PARKET SALE AND A PARKETATION AND A PARKETATION AND A PARKET SALE AND A PARKET SALE AND A PARKETATION AND A PARKETATION AND A PARKET SALE AND A PARKET SALE AND A PARKETATION AND A PARKETATION AND A PARKET SALE AND A PARKET SALE AND A PARKETATION AND A PARKETATION AND A PARKET SALE AND A PARKET SALE AND A PARKETATION AND A PARKETATION AND A PARKET SALE AND A PARKET AND A PARKET AND A PARKETATION AND A PARKETATION AND A PARKET AND A PARKET AND A PARKET AND A PARKET AND A PARKETATION AND A PARKETATION AND A PARKET AND A PARKET AND A PARKET AND A PARKETATION AND A PARKETATION AND A PARKET AND A PARKET AND A PARKET AND A PARKETATION AND A PARKETATION AND A PARKET AND A PARKET AND A PARKET AND A PARKET AND A PARKETATION AND A

- 12 V A SEIMENT FORU IS NOT PROTOSED, A MAKER TANK OF OTHER TEMPORARY GROUND
- A SCHMON FORD TO HOT PROFOSEL, A MARCE TANG TO HORE TEMPORATE DISANG MUTOR SUMMAR ON REFIRE TO THAT ANY MAY BE ADMIRED LUMING EXEMPTION DESTIMANT ON REFIRE TO ADMINISTIC TANK MAY BE ADMIRED LUMING EXEMPTION TO DO NOT FLUED COMBET TO ADMINISTIC TO ADMINISTIC DO NOT FLUED COMBET TO ADMINISTIC TO ADMINISTIC DO NOT FLUED TO ADMINISTICATION STOCEMENT TO ADMINISTIC TO ADMINISTIC TO ADMINISTICATION STOCEMENT FOR ADMINISTIC TO ADMINISTIC TO ADMINISTICATION STOCEMENT FOR ADMINISTIC TO ADMINISTIC ADMINISTICATION STOCEMENT FOR ADMINISTIC TO ADMINISTIC ADMINISTICATION STOCEMENT FOR ADMINISTICATION ADMINISTICATION OF ADMINISTICATION STOCEMENT FOR ADMINISTICATION ADMINISTICATION OF ADMINISTICATION STOCEMENT FOR ADMINISTICATION OF ADMINISTICATION OF ADMINISTICATION STOCEMENT FOR ADMINISTICATION OF ADMINISTICATION OF ADMINISTICATION STOCEMENT FOR ADMINISTICATION OF ADMINISTICATION OF ADMINISTRATICATION STOCEMENT FOR ADMINISTICATION ADMINISTRATICATION OF ADMINISTRATICATION ADMINISTRATION ADMINISTRATION ADMINISTRATION ADMINISTRATICATION OF ADMINISTRATION ADMINISTRATICATION OF ADMINISTRATICATION OF ADMINISTRATICATION ADMINISTRATICATIONAL ADMINISTRATICATIONAL ADMINISTRATICATIONAL ADMINISTRATICATIONAL ADMINISTRATICATIONE ADMINISTRATICATIONAL ADMINISTICATIONAL ADMIN
- SIGNATURE 34 RECYCLED DONORETE STIALL NOT BE STOCKPILED ON SITE, UNLESS FULLY COVERED WITH NO POTENTIAL FOR ADLEASE OF RUMOT

#### STORM DRAINAGE

- A RE-CONSTRUCTION CONFERENCE SHALL BE HELD PRICE TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR IECONOMIC ALL NECESSARY ROUNTS NEED TO CONSTRUCTION.
- ADDWITS FRUID TO: JOINSTRUCTOR. 2. BETREE WAR DWISTRUCTOR WAY OCCUP. THE CONTRACTOR SHALL HAVE FRANS WHICH HAVE BEEN SIDNED AND APPROVED BY THE OTY OF ARRELIND FUELIC WORKS DEPARTMENT, BETAINED ALL OTY, COUNTY, STATE, FEDERAL AND DHEER REQUIRED PERMITS, AND HAVE POSTER ALL REQUIRED BOTIOS
- 1 ALL STORIE ORANAGE MARCHENEYTS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST EXPLOYOF THE CITY OF MARLAND PUBLIC MINKS

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CONSULTANTS

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REC-ARRIVED PLANS AND POLITES AND THE STANDARD SPECIFICATENS FER ROAD BRODE AND WANDARD DONSTRUCTION, PREPARED BY ASOT AND THE AMERIDAN PLEUE ROARS ASSECTION (ARMA), AND DEVADOR FOW THE APPROVED PLANS WAL REDURE MRITTEN ARPHOVAL, ALL LIANDAS SAN IN SE SUBATION TO THE CITY.

- 5 A COPY OF THE APPROVED STORM WATER PLANS MUST BE ON THE JOB STRE WHENEVER CONSTRUCTION IS IN PROCHESS.

- Distributions of an information of the construction of the construction of the information of the construction of
- LINE LADOL ASSNE TAP SERVICE (1) AN ADDRESS OF ALL MELLAND AND ADDRESS OF A PROMENTED DISCHARGE (PER KINC 15.52.050), TEMPORARY DISCHARGES TO SANITARY SEMER RELAIPE PRISH AUTHORIZATION AND PERMIT FROM KING COUNTY INDUSTRIAL WAST.
- PROTECTAL (206-263-3000) AND NOTIFICATION TO THE PUBLIC WORKS CONSTY WOUST NETFECTAL (206-263-3000) AND NOTIFICATION TO THE PUBLIC WORKS CONSTRUCT NETFECTAL INVESTIGATION IS SOLUCIO DI A DIALDING OF LANO SUBFACE VIDEPICATION FORMET D'UTRE D'UTRE REGULARE DES NOT RELITARE THE OBJECTIONE SUBFACE SUBFACE DES NOT ACCEPT ANY ORDER D'UTRE D'UTRE DES NOTATIONS AND OP MONOTENINGES NOT ACCEPT ANY ORDER D'UTRE D'UTRE D'UTRE D'UTRE D'UTRE MANTENANCE DE THE STETERE UNREIS OF FOLDERING EDERTUDEDEN EXCEPT AS OUTLANDU IN THE OTTO KIRELLAND PUBLIC WERRES STANLARES.
- IN THE OTH OF KIRKLAND PARLY WARKS STANDARDS.
  IS ALL RESKY BACKEL SHALL BE COMPARIZED TO SE PARCENT LENGTH WI MARKING, DISDAWY SHOLLDER, ROLOWS Y RESUL AND DIMENSING, AND ES FERCINAL DIMENSION, DISDAWY SHOLLDER, ROLOWS Y RESUL AND DIMENSION, SHA 25 FERCINAL DIMENSION, INGRAVED AND ALL SER RESPONSIBLE TO PROVIDED ACCULAR SMATCH SUB-TOP (STATUS) AND ALL SER RESPONSIBLE TO PROVIDED ACCULAR SMATCH SUB-DIMENSION AND ALL SER RESPONSIBLE TO PROVIDED ACCULAR SMATCH THE RESULT AND THE AND ALL SER RESPONSIBLE TO PROVIDED ACCULAR SMATCH DIMENSION ACCUMENT OF MORE THAN THE DIMENSION ACCULAR SMATCH SHATCH THE RESULT AND ARCONS OF MORE THAN THE DIMENSION ACCULAR SMATCH SHATCH DIMENSION ACCUMENT OF MORE THAN THE DIMENSION ACCULAR SMATCH SHATCH STATE THE RESULT AND ARCONS OF MORE THAN THE DIMENSION ACCULAR SMATCH SHATCH STATE THE RESULT AND ARCONS OF MORE THAN THE DIMENSION ACCULAR SMATCH SHATCH STATE AND THE MARKED AND ARCONS OF THE RESULT AND ARCONS OF THE RESULTANCE AND THE ANALY AND A THE DIMENSION ACCULARIES AND ATTACKED AND ALL AND ALL AND ARCONS OF THE RESULT AND ARCONS OF THE ACCUMENT OF THE ARCONS AND ALL OF THE RESULT ACCURATE OWNER OF THE AND THE ANALY OF THANKED ACCURATE CONTROL OF THE ATTACKED AND ALL AND A REPORT AND THE ANALY OF THANKED ACCURATE CONTROL OF THE ARCONS OF THE ARCONS OF THE ACCURATE OWNER OWNER AND THE ANALY OF THANKED ACCURATE ACTUMENT OF THE ACCURATE OWNER OWNER AND THE ANALY OF THE ACCURATE CONTROL OF THE RESULT AND A RESPONDED TO THE AND A RESPONDED TO THE AND THE ANALY OF THE ACCURATE OWNER OW
- AND THE MANUAL OF LANFORM TRAFFIC CONTROL DEVICES (NUTCO) SHALL APPLY 12 NO FINAL CUT OF FLL SLOPE SHALL EXCEED SLOPES OF TWO (2) HOHIZONTAL TO ONE (1) VERTICAL WITHOUT STABULZATION BY ROCKERY OF BY A STRUCTURAL RETAINING WALL

- TO DRIVE UNIT, INVESTIGATEST PHORE TO TAME, PANIS AND DATE, DATA, DATA,
- 34. ALL ONLARGE NUMBER TO FUBLIC AND/OR PRIVATE PROPERTY BY THE CONTRACTOR UNING THE CONTRACT TO FUBLIC AND/OR PRIVATE PROMPTLY REFAMILIT TO THE SATISFICTION OF THE OTY CONSTRUCTION WORFCITTR BEFORE PROJECT APPROVAL AND/OR THE RELEASE OF THE PROJECT'S REFORMANCE BOND.

CITY OF KIRKLAND

PUBLIC WORKS DEPARTMENT

123 FIFTH AVENUE KIRKLAND, WA KIRKLAND, WA 98033-6189 (206)878-1243 (206)578-1243

OF KIRK

PEHINGS

- 25 DEDUT ALL SEARS AND GRENNIGS IN ALL WHETS, CATCH BASINS, AND MANADLES STREET DEDUT IS NOT ALLONED.
- 20 WHEN MORNING MA ENTITING REALEWAY WHETHE AN ENTITING TYPE I CATCH GASW MUL RELIANN WI THE TRAVEL LANE THE EXISTING REALE AND CONFR SHALL BE REPLACED WITH A ROUND LOCKING TRAVE AND COVER.
- A ADVIDU COMMONITANE AND CONTAINS, ALL EXPOSED ON REACULY EXPOSED INDOOF STORM DRAINER PHYLOPALLINGING DALL BE LACELED WITH THE NONDER STORM DRAIN" WITH MONAUL 2-WOR HIGH LETTERS. 28. RECIFICLED CONSECTE SHALL NOT BE USED ARXING STORMMNERF FACULTES.
- 25 ALL FASTENERS (BOLTS NUTS, WASHERS ETC.) ON MANHOLE AND CATCH HASIN LUIS TO BE STANDARD SIZE. NO METRIC FASTENERS ALLONED

#### READWAY

- Α PRE-CONSTRUCTION CONSTRUCTS SHALL BE RESOLVED TO THE SLAFT OF CONSTRUCTION. THE CONTEXTING SHALL BE RESOLVEDED FOR RECEIRING ALL INCESSARY PERMIS PROVIDED TO CONSTRUCTS. SHALL BE IN ACCOSENCE WITH SHE CURRING APPRI-AND OTTO FOR MILLING SHARES IND. SECONDATIONS.
- 3. ALL FUBLIC ROADWARDS SHALL BE CONSTRUCTED FF 2" CLASS "B" AC PAINING ON 4" ASSMALT-TREATED BASE (ATB). UNLESS OTHERWISE ADDROVED BY THE FUBLIC WORKS DEVANTATION!.
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GOAT HILL DRAINAGE DITCH CONVEYANCE

AND CHANNEL STABILIZATION - PHASE 1

CITY OF KIRKLAND

STANDARD PLAN NOTES














































































City of Kirkland Planning and Building Department 123 5th Avenue, Kirkland, WA 98033 425-587-3600 - www.kirklandwa.gov

This application must comply with all applicable standards. The listing below outlines those standards in a typical development sequence. KMC refers to Kirkland Municipal Code, KZC refers to Kirkland Zoning Code This is not intended to be an exhaustive list of applicable development standards.

#### LAND SURFACE MODIFICATION AND/OR BUILDING PERMIT REQUIREMENTS

**KZC 90.55** <u>Wetlands and Wetland Buffers</u>. No land surface modification may take place and no improvement may be located in a wetland or within the environmentally sensitive area buffers for a wetland, except as specifically provided.

**KZC 90.65** <u>Streams and Stream Buffers</u>. No land surface modification may take place and no improvements may be located in a stream or within the environmentally sensitive area buffers for a stream except as specifically provided.

**KZC 90.190** <u>Critical Area Markers, Fencing and Signage.</u> Construction fencing must be installed prior to commencement of any grading or other development activities.

**KZC 110.60.5** <u>Street Trees</u>. All trees planted in the right-of-way must be approved as to species by the City. All trees must be two inches in diameter at the time of planting as measured using the standards of the American Association of Nurserymen with a canopy that starts at least six feet above finished grade and does not obstruct any adjoining sidewalks or driving lanes.

**KZC 95.52** <u>Prohibited Vegetation.</u> Plants listed as prohibited in the Kirkland Plant List shall not be planted in the City. These plants include Himalayan and Evergreen Blackberry, English Holly, Fragrant water lily; Bindweed or Morning Glory, Bird Cherry, English and Atlantic Ivy; Herb Robert; Bohemian, Giant, Himalayan, and Japanese Knotweed; Old man's beard, Poison hemlock, Reed canary grass, Scotch broom, Spurge laurel, Yellow archangel, and Yellow flag iris. Other plants, while not prohibited, are discouraged, including Butterfly bush, Black Locust, European Mountain Ash, Tree-of-Heaven, Common Hawthorn, and English laurel.

**KZC 115.25** <u>Work Hours</u>. It is a violation of this Code to engage in any development activity or to operate any heavy equipment before 7:00 AM or after 8:00 PM Monday through Friday, or before 9:00 AM or after 6:00 PM Saturday. No development activity or use of heavy equipment may occur on Sundays or on the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas Day. The applicant will be required to comply with these regulations and any violation of this section will result in enforcement action, unless written permission is obtained from the Planning Official.

**KZC 115.75.2** <u>Fill Material</u>. All materials used as fill must be non-dissolving and non-decomposing. Fill material must not contain organic or inorganic material that would be detrimental to the water quality, or existing habitat, or create any other significant adverse impacts to the environment.

**KZC 115.95** <u>Noise Standards</u>. The City of Kirkland adopts by reference the Maximum Environmental Noise Levels established pursuant to the Noise Control Act of 1974, RCW 70.107. See Chapter 173-60 WAC. Any noise, which injures, endangers the comfort, repose, health or safety of persons, or in any way renders persons insecure in life, or in the use of property is a violation of this Code.

May 12<sup>th</sup>, 2023

James Waihenya City of Kirkland, Capital Improvement Program 123 5<sup>th</sup> Ave Kirkland, WA 98033 jwaihenya@kirklandwa.gov

#### RE: Goat Hill Storm Drainage CIP Phase 3 - Critical Areas Determination SAR23-00191

Hi Ms. Waihenya,

The City of Kirkland, with the assistance from our consulting biologist (The Watershed Company) has completed the determination of off-site critical areas near the proposed Goat Hill Storm Drainage project. Work for the Goat Hill Storm Drainage project will primarily occur in the right-of-way. See the Wetland and Stream Review Area Memo for an overview of the study area. Wetlands within 300' of the project and streams within 125' of the project were included in the study area.

Based on the available information, the applicable codes, and the data gathered from the field, the City of Kirkland has determined the presence of four wetlands and five streams within the study area.

	Rating Category	Habitat Score	Buffer
Wetland A	III	5	60'
Wetland B	II	4	75'
Wetland C	III	5	60'
Wetland D	III	4	60'
Wetland E	III	5	60'
Wetland F	III	5	60'
Wetland G	IV	6	40'

Table 1: Wetlands

#### Table 2: Streams

	Туре	Buffer
Stream A	Np	50'
Stream B	Np	50'
Stream C	Ns	50'
Stream D	Ns	50'
Stream E	Np	50'
Stream F	F	50'*

\*Type F Stream Limited Buffer Waiver, per KZC 90.120.2

The locations of the wetlands, streams, associated buffers and buffer setbacks will need to be incorporated into any future development plans.

This determination is valid for five (5) years from the date of the decision pursuant to KZC 90.105.4. The Planning Official's final determination regarding the existence of a stream or wetland and the proper classification of that stream or wetland may be appealed pursuant to the provisions of KZC 90.220.

CHMENT 4

Please let me know if you have any questions.

Sincerely,

Kelly Wilkinson

Kelly Wilkinson Planner 425.587.3264 kwilkinson@kirklandwa.gov

Enclosures:

- 1. Wetland and Stream Review Area Memo prepared by Wetland Resources Inc, dated March 3<sup>rd</sup>, 2023.
- 2. Critical Areas Report prepared by Wetland Resources Inc, dated May 10<sup>th</sup>, 2023.





March 3, 2023

CPH Consultants Attn. Matt Hough 11321-B NE 120th St. Kirkland, WA 98034

### Re: Goat Hill SD CIP 3 - Wetland and Stream Review Area

Wetland Resources, Inc. (WRI) prepared a Critical Area Study for Goat Hill SD CIP Phase 3, dated December 21, 2022. This report provided information on wetlands and streams within the vicinity of the City of Kirkland's proposed stormwater management project in the Goat Hill neighborhood. Figure 1 in the report shows the "investigation area" that depicts the limits of the area covered in the field review. To clarify, this investigation area figure shows the general area that was included in the field delineation.

Enclosed with this letter is an additional figure that shows the full extent of the area that was delineated as well as the area evaluated for "off-site" wetlands and streams. For the purposes of this project, the project "site" or "subject property" was defined as the work area where stormwater management infrastructure will be installed or replaced. As required in Kirkland Zoning Code 90.110.4.d, off-site areas within 300 feet of a wetland and 125 feet of a stream were assessed as part of the overall review of the wetlands and streams in the vicinity of the project area. Please note that the review area shown in the enclosed figure is based on the project information available at this time. When a Critical Area Study discussing the proposed project is prepared, the overall review area may need to be adjusted should the project area change as the project design progresses. Should a shift in the project area require assessment beyond the current review area, additional information will be provided at that time.

If you have any further questions, please feel free to contact me at (425) 337-3174.

Wetland Resources, Inc.

Meryl Kamowski, PWS Senior Ecologist

Enclosure: Review Area for Wetlands and Streams





# **CRITICAL AREA STUDY**

# FOR

# **GOAT HILL SD CIP 3**

Wetland Resources, Inc. Project #22264

Prepared By Wetland Resources, Inc. 9505 19th Avenue SE, Suite 106 Everett, WA 98208 (425) 337-3174

### Prepared For

CPH Consultants Attn. Matt Hough 11321-B NE 120th St. Kirkland, WA 98034

December 21, 2022 Revision #1: May 10, 2023

# TABLE OF CONTENTS

1.0 INTRODUCTION	1 1
2.0 Review of Existing Information	2
3.0 WETLAND AND STREAM DETERMINATION	2
3.1 Methodology	2
3.2 WETLAND BOUNDARY DETERMINATION FINDINGS	3
3.3 STREAM BOUNDARY DETERMINATION FINDINGS	6
4.0 WILDLIFE	7
5.0 Use of this Report	8
6.0 References	9

## LIST OF APPENDICIES

APPENDIX A: CORPS OF ENGINEERS WETLAND DETERMINATION DATA FORMS APPENDIX B: DEPARTMENT OF ECOLOGY 2014 RATING FORMS AND FIGURES APPENDIX C: CRITICAL AREA STUDY MAPS

# **1.0 INTRODUCTION**

Wetland Resources, Inc. (WRI) conducted site investigations on October 10 and November 21, 2022, to locate and evaluate jurisdictional wetlands and streams on and in the vicinity of the Goat Hill Storm Drainage CIP Phase 3 project area. The project area is the City of Kirkland, WA, and located within Section 30, Township 26, Range 5, W.M. The area reviewed for wetlands and streams is shown in the figure below.



Figure 1 - Aerial of the Study Area

# **1.1 PROJECT AREA DESCRIPTION**

The project area and surrounding land use include single- and multi-family residential development. Topography of the investigation area generally slopes to the south, with level areas around existing residences. Six streams and seven wetlands were identified within the study area for Goat Hill SD CIP 3. The project area is within the Juanita Creek drainage basin, which is in Watershed Resources Inventory Area (WRIA) 8.

# 2.0 REVIEW OF EXISTING INFORMATION

Prior to conducting the site investigation, public resource information was reviewed to gather background information on the subject property and the surrounding area in regard to wetlands, streams, and other critical areas. These sources included the USFWS National Wetlands Inventory (NWI), USDA-NRCS Web Soil Survey, City of Kirkland interactive mapping tool, WDFW SalmonScape mapping tool, and WDFW Priority Habitat and Species (PHS) Interactive Map.

- The National Wetlands Inventory maps a linear wetland near the intersection of NE 116th Place and NE 117th Place.
- NRCS identifies Alderwood gravelly sandy loam and Kitsap silt loam within the investigation area.
- King County identifies critical areas in the project area, including several parcels with sensitive area notices on their titles and erosion hazard mapped across the majority of the project area. No wetlands or streams are shown within the project area. Juanita Creek is shown to the east/southeast.
- The City of Kirkland interactive map displays various landslide hazard designations across the project area. Five streams and one wetland area shown within the investigation area.
- WDFW SalmonScape displays an intermittent stream near the intersection of NE 116th Place and NE 117th Place. This stream is not documented as habitat for any salmonid species.
- WDFW PHS does not display any wetlands, streams, or priority habitat areas within the investigation area.

# 3.0 WETLAND AND STREAM DETERMINATION

# **3.1 METHODOLOGY**

The ordinary high water mark (OHWM) of streams were determined using the methodology described in the Washington Department of Ecology's publication, *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson, et al. 2016).

Wetland conditions were evaluated and delineated using routine methodology described in the *Corps of Engineers Wetlands Delineation Manual (Final Report;* January 1987), except where superseded by the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0, referred to as 2010 Regional Supplement). Our findings are consistent with these manuals. The following criteria descriptions were used in the boundary determination:

- 1.) Examination of the site for hydrophytic vegetation (species present and percent cover);
- 2.) Examination of the site for hydric soils;
- 3.) Determining the presence of wetland hydrology

### 3.2 WETLAND BOUNDARY DETERMINATION FINDINGS

As required by the Kirkland Zoning Code (KZC) 90.55, the wetlands were classified using the Washington State Department of Ecology Wetland Rating System for Western Washington: 2014 Update. Wetlands were also classified according to the U.S. Fish and Wildlife Service (USFWS) Classifications of Wetlands and Deepwater Habitats of the United States, also known as the Cowardin Classification System. Please note that the wetland classifications provided here are preliminary and may change upon receipt of surveyed locations.

### Wetland A

**HGM Class:** Depressional

**Cowardin Classification:** Palustrine, Scrub-shrub Wetland, Broad-leaved Deciduous, Occasionally Flooded/Saturated **Rating Category/Habitat Score:** Category III/5 points

Kirkland Buffer Requirement: 60 feet

Wetland A is a small depressional wetland located east of 90th Avenue NE. The wetland and surrounding area appear to be disturbed from previous clearing and grading. A soil berm is immediately downslope of Wetland A. Riprap is present at the edge of the wetland and continues downslope to 90th Avenue NE.

Vegetation within this wetland includes black cottonwood (*Populus balsamifera*; FAC), salmonberry (*Rubus spectabilis*; FAC), willow (*Salix* spp.), Himalayan blackberry (*Rubus armeniacus*; FAC) and hardhack (*Spiraea Douglasii*; FACW). Dominant vegetation within the wetland is rated as facultative (FAC) or wetter and therefore constitutes a hydrophytic plant community.

Soils are generally very dark brown (10YR 2/2) sandy loam with redoximorphic features of dark yellowish brown (10YR 4/6). Soils within Wetland A were dry at the time of the November 2022 investigation. This soil profile meets the criteria for the hydric soil indicator Redox Dark Surface (F6).

# Wetland B

**HGM Class:** Slope + Riverine

**Cowardin Classification:** Palustrine, Scrub-shrub Wetland, Broad-leaved Deciduous, Seasonally Flooded

**Rating Category/Habitat Score:** Category II/4 points **Kirkland Buffer Requirement:** 75 feet

Wetland B is a small slope wetland within the boundary of Stream B, near the intersection of NE 117th Place and 90th Avenue NE. Vegetation in the wetland includes Himalayan blackberry (*Rubus armeniacus*; FAC), creeping buttercup (*Ranunculus repens*; FAC), and bittersweet nightshade (*Solanum dulcamara*; FAC). Vegetation within the wetland is rated as facultative (FAC) or wetter and therefore constitutes a hydrophytic plant community.
Soils in this wetland are very dark brown (10YR 3/2) sandy loam with 5 percent dark yellowish brown (10YR 3/6) redoximorphic features. Soils in this wetland were saturated to the surface during the investigation, with standing water observed at 10 inches below the surface. These conditions meet the criteria for the hydric soil indicator Redox Dark Surface (F6) and wetland hydrology indicators High Water Table (A2), and Saturation (A3).

# Wetland C

HGM Class: Slope

Cowardin Classification: Palustrine, Scrub-shrub Wetland, Broad-leaved Deciduous, Saturated

#### **Rating Category/Habitat Score:** Category III/5 points **Kirkland Buffer Requirement:** 60 feet

Wetland C is a small slope wetland adjacent to Stream A and NE 117th Place. The vegetation in this wetland is primarily small-fruited bulrush (*Scirpus microcarpus*, OBL) with Himalayan blackberry (*Rubus armeniacus*; FAC), and red alder (*Alnus rubra*; FAC) along the perimeter. Vegetation within the wetland is rated as facultative (FAC) or wetter and therefore constitutes a hydrophytic plant community.

Soils within this wetland are typically black  $(10YR\ 2/1)$  sandy clay loam. Soils in this wetland were saturated to the surface during the November 2022 investigation. These conditions meet the criteria for the wetland hydrology indicator Saturation (A3).

#### Wetland D HGM Class: Slope Cowardin Classification: Palustrine, Scrub-shrub Wetland, Broad-leaved Deciduous, Saturated Rating Category/Habitat Score: Category III/4 points Kirkland Buffer Requirement: 60 feet

Wetland D is a slope wetland along Stream E, south of NE 116th Place. Vegetation observed within Wetland D includes red-twig dogwood (*Cornus sericea*; FACW) and creeping buttercup (*Ranunculus repens*; FAC). Vegetation within the wetland is rated as facultative (FAC) or wetter and therefore constitutes a hydrophytic plant community.

Soils within Wetland D are typically very dark brown (10YR 2/2) sandy loam in upper layer with dark grayish brown (10YR 4/2) sandy loam below. Dark yellowish brown (10YR 4/6) redoximorphic concentrations were observed throughout the soil profile. These conditions meet the criteria for the hydric soil indicator Depleted Matrix (F3). Soils in Wetland D were saturated at a depth of two inches below the surface during the November 2022 site investigation. This condition meets the criteria for the wetland hydrology indicator Saturation (A3).

Wetland E HGM Class: Riverine Cowardin Classification: Palustrine, Forested Wetland, Broad-leaved Deciduous, Saturated Rating Category/Habitat Score: Category III/5 points Kirkland Buffer Requirement: 60 feet

Wetland E is a riverine wetland along Stream E, north of NE 116th Place. This wetland was previously identified and rated by The Watershed Company. Their findings are presented in the 8802 NE 117th Place Report.

Wetland F HGM Class: Riverine Cowardin Classification: Palustrine, Scrub-shrub Wetland, Broad-leaved Deciduous, Saturated Rating Category/Habitat Score: Category III/5 points Kirkland Buffer Requirement: 60 feet

Wetland F is a riverine wetland along Stream E, north of NE 116th Place. This wetland was previously identified and rated by The Watershed Company. Their findings are presented in the 8802 NE 117th Place Report.

#### Wetland G HGM Class: Slope Cowardin Classification: Palustrine, Scrub-shrub Wetland, Broad-leaved Deciduous, Saturated Rating Category/Habitat Score: Category IV/6 points Kirkland Buffer Requirement: 40 feet

Wetland G is a slope wetland located northwest of the intersection of NE 120th Street and NE 117th Place. This wetland was previously identified and rated by The Watershed Company. Their findings are presented in the Zheng Report.

### **Non-Wetland Areas**

Vegetation within the areas mapped as non-wetlands includes big leaf maple (Acer macrophyllum; FACU), red alder (Alnus rubra; FAC), beaked hazelnut (Corylus cornuta; FACU), Himalayan blackberry (Rubus armeniacus; FACU), Indian plum (Oemleria cerasiformis; FACU), sword fern (Polystichum munitum; FACU), and English ivy (Hedera helix; FACU).

Soils in these areas were dry and had Munsell colors ranging from very dark grayish brown (10 YR 3/2) to dark drown (10 YR 3/3) to dark yellowish brown (10 YR 4/4), with no redoximorphic features observed. No wetland hydrology indicators were observed during the November 2022 investigation.

#### 3.3 STREAM BOUNDARY DETERMINATION FINDINGS

Streams were classified in accordance with WAC 222-16-030, as required by KZC 90.65.

#### Stream A

**Classification:** Type Np **Kirkland Buffer Requirement:** 50 feet

Streams A flows out of a culvert on the east side of 90th Avenue NE, through two undeveloped parcels in an open channel, then enters a culvert passing under NE 117th Place. The stream exits the culvert on the east side of 117th Place, flows down a steep slope, continues to the east in a riprap lined channel, and then enters a catch basin.

#### <u>Stream B</u> Classification: Type Np Kirkland Buffer Requirement: 50 feet

Stream B flows out of an existing culvert north of 117<sup>th</sup> Place, west of 90<sup>th</sup> Avenue NE. It flows southeast, is piped under NE 117<sup>th</sup> Place and exits a culvert south of NE 117<sup>th</sup> Place. It continues flowing southeast toward NE 116<sup>th</sup> Place until it reaches a catch basin. From the catch basin it is piped to NE 116<sup>th</sup> Place and then east along NE 116<sup>th</sup> Place for a short segment. Another section of above ground stream channel is located at the intersection of 91<sup>st</sup> Place NE and NE 116<sup>th</sup> Place. Stream B flows north from NE 116<sup>th</sup> Place along 91<sup>st</sup> Place NE, enters a culvert, and then is piped east along NE 116<sup>th</sup> Place, then north along 91<sup>st</sup> Lane NE and under 91<sup>st</sup> Lane NE where it emerges into an open channel for a short distance again. It then enters stormwater infrastructure and is routed toward Lake Washington.

#### <u>Stream C</u> Classification: Type Ns Kirkland Buffer Requirement: 50 feet

Stream C originates along NE 117<sup>th</sup> Place, flows northeast a short distance and then merges with Stream B. It is a seasonal, non-fish bearing stream.

#### <u>Stream D</u> Classification: Type Ns Kirkland Buffer Requirement: 50 feet

Stream D originates east of 90th Avenue NE and west of NE 117th Place. This stream flows in an open channel down a hill, entering a catch basin on NE 117th Place. Water was not actively flowing through this channel during the October 2022 investigation; therefore, this is a seasonal stream.

#### <u>Stream E</u> Classification: Type Np Kirkland Buffer Requirement: 50 feet

Stream E originates north of an access driveway west of the intersection of NE 116th Place and NE 117th Place. To the north of the access driveway the stream is in a wood and rock lined channel and enters a culvert, crossing under the access drive, and continues flowing south. Stream E is a perennial stream.

#### <u>Stream F</u> Classification: Type F Kirkland Buffer Requirement: 50 feet

Stream F is a ditch-like channel that originates north of the downstream section of Stream B, flows south, and enters stormwater infrastructure in the same location as Stream B. Water was not actively flowing through this channel during the October 2022 investigation; therefore, this is a seasonally flowing stream. The physical parameters of Stream F meet the definition for a fishbearing (Type F) stream. However, given the extensive stormwater infrastructure and arterial between Stream F and Lake Washington, Stream F does not contain fish. Per City of Kirkland staff, the required buffer width for a Type Ns stream will apply to Stream F.

# 4.0 WILDLIFE

Species of birds that may use the project area include house sparrow (*Passer domesticus*), American robin (*Turdus migratorius*), black-capped chickadee (*Poecile atricapillus*), common crow (*Corvus brachyrhynchos*), Steller's jay (*Cyanocitta stellari*), rufous-sided towhee (*Pipilo erythrophthalmus*), dark eyed junco (*Junco hyemalis*), and house finch (*Carpodacus mexicanus*).

Mammalian species that may utilize this site include: eastern cottontail rabbits (Sylvilagus floridanus), mountain beavers (Aplodontia rufa), shrews (Sorex spp.), moles (Scapanus spp.), bats (Myotis spp.), raccoons (Procyon lotor), skunks (Mephitis spp.), squirrels (Sciuris carolinensis, Tamiasciurus douglasii), deer mice (Peromyscus maniculatus), coyote (Canis latrans), black-tailed deer (Odocoileus hemionus columbianus), and Virginia opossums (Didelphis virginiana).

This list is not meant to be all-inclusive and may not include all species currently utilizing the site or that may utilize the site in the future.

### **5.0 Use of this Report**

This Critical Area Study is supplied to CPH Consultants as a means of describing jurisdictional wetlands and streams, as required by the City of Kirkland during the permitting process. This report is based largely on readily observable conditions and to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions. Reports may be adversely affected due to the physical condition of the site and the difficulty of access, which may lead to observation or probing difficulties.

The laws applicable to wetlands are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report, and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.

Meryl Kamowski, PWS Senior Ecologist

## **6.0 REFERENCES**

- Brinson, M.M. 1993. <u>A Hydrogeomorphic Classification for Wetlands.</u> Technical Report WRPDE-4. US Army Engineers Waterways Experiment Station, Vicksburg, MS.
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- Forest Practices Application Mapping Tool. Maintained by the Washington State Department of Natural Resources. <u>https://fortress.wa.gov/dnr/protectiongis/fpamt/index.html</u>.
- Hruby, T. 2014. <u>Washington State Wetland Rating System for Western Washington- 2014</u> <u>Update</u>. WA State Department of Ecology. Publication #14-06-029.
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- Natural Resources Conservation Service (NRCS). 2022. <u>Web Soil Survey</u>. United States Department of Agriculture. <u>http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx</u>.
- US Army Corps of Engineers. 2010. <u>Regional Supplement to the Corps of Engineers Wetland</u> <u>Delineation Manual: Western Mountains, Valleys, and Coast Region</u> (Version 2.0). Vicksburg, MS
- USFWS. 2022. National Wetlands Inventory (NWI) Online Mapper. http://www.fws.gov/wetlands/Data/Mapper.html.
- WDFW. 2022a. Priority Habitat and Species (PHS) Interactive Map. <u>http://apps.wdfw.wa.gov/phsontheweb/</u>
- WDFW. 2022b. SalmonScape Online Mapping Application. http://apps.wdfw.wa.gov/salmonscape/map.html.

APPENDIX A: Corps of Engineers Wetland Determination Data Forms

Project/Site: #22264 Goat Hill		City/County	City of Ki	rkland	Sampling Date: 11/21/22	
Applicant/Owner: CPG Consultants	State: WA Sampling Point:				_ Sampling Point: S1	
Investigator(s): _MK, AW			Section, To	ownship, Range: <u>Sec 30,</u>	Twp 26N, Rge 05E, W.M.	
Landform (hillslope, terrace, etc.): Depression		Local relie	f (concave	, convex, none): <u>None</u>	Slope (%): _^	~2%
Subregion (LRR): LRR A	Lat: 47.7	0772		Long: <u>-122.22142</u>	Datum: NAD	83
Soil Map Unit Name: Alderwood gravelly sandy loam, 15 to	30 percent sl	opes		NWI classific	ation: N/A	
Are climatic / hydrologic conditions on the site typical for thi	s time of yea	ar? Yes	No 🗸 (I	lf no, explain in Remarks.	)	
Are Vegetation 🖌 . Soil 🖌 . or Hydrology 🗍 signi	ficantlv distu	rbed?	Are "Nor	mal Circumstances" prese	ent? Yes No	
Are Vegetation Soil Or Hydrology On natur	, ally problem;	atic?	(If needed	d explain any answers in	Remarks )	
SUMMARY OF FINDINGS – Attach site map	showing	samplin	a point l	ocations. transects	. important features.	. etc.
	1		51	,	<u>,                                     </u>	
Hydric Soil Present? Yes V No	1	Is th	e Sampled	l Area		
Wetland Hydrology Present? Yes V	j	with	n a Wetlai	nd? Yes 🖌		
Remarks:						
Data taken in Wetland A at terminus of 90th Av	/e NE. Soi	il appears	to be fil	I or excavated, vege	atation under 5 years in	n
age. It was determined using an AgACIS WET	Stable ar	nalysis tha	at the thr	ee months leading u	ip to the November 20	)22
VEGETATION – Use scientific names of plar	its.					
	Absolute	Dominant	Indicator	Dominance Test work	(sheet:	
Tree Stratum (Plot size: 500'2	% Cover	Species?	Status	Number of Dominant S	pecies	
		·		That Are OBL, FACW,	or FAC: <u>3</u> ( <i>i</i>	(A)
2		·		Total Number of Domir	iant	-
1				Species Across All Stra	ata: <u>4</u> (E	3)
<del>۹</del>	0	= Total C		Percent of Dominant S	pecies	
Sapling/Shrub Stratum (Plot size: 3m^2		- 10101 00	5001	That Are OBL, FACW,	or FAC: <u>75</u> (A	4/B)
1. Rubus armeniacus	60	Y	FAC	Prevalence Index wor	·ksheet:	
2. Spirea douglasii	30	Y	FACW	Total % Cover of:	Multiply by:	
3. Populus balsamifera	20	N	FAC	OBL species	x 1 = <u>0</u>	
4. Salix lasiandra & Salix hookeriana	10 & 10	<u>N</u>	FACW	FACW species	x 2 = 0	
5. Rubus spectabilis	4	N	FAC	FAC species	x 3 = 0	
Herb Stratum (Plot size: 1m^2	134	= Total Co	over	FACU species	x 4 = 0	
1 Epilobium ciliatum	20	Y	FACW		x 5 = 0	
2 Taraxacum officinale	5	Y	FACU	Column Totals: 0	(A)	(B)
3.				Prevalence Index	c = B/A =	
4.				Hydrophytic Vegetati	on Indicators:	
5.				Rapid Test for Hyd	rophytic Vegetation	
6.				Dominance Test is	>50%	
7				Prevalence Index is	s ≤3.0 <sup>1</sup>	
8				Morphological Ada	ptations <sup>1</sup> (Provide supportin	ıg
9				data in Remark	s or on a separate sheet)	
10					ular Plants	<b>`</b>
11				<sup>1</sup> Indicators of hudring	il and watland budralage	) Not
	25	= Total Co	over	be present, unless dist	urbed or problematic.	JSC
Woody Vine Stratum (Plot size: 3M/2					· · ·	
				Hydrophytic		
2	0			Vegetation Present?		
% Bare Ground in Herb Stratum <sup>75</sup>	U	= I otal C	over			
Remarks:				L		
Plants appear to be under 5 years old						

Sampling Point: S1

inches)	Color (moist)	%	Color (moist)	%	Type'	Loc <sup>2</sup>	Texture	Remarks
-6	10YR 2/2	85	10 4/6	5	С	М	Loamy sand	
	5Y 6/1	10			D	Μ		
pe: C=Cc	oncentration, D=De	pletion, RM	//=Reduced Matrix, (	 CS=Covere	ed or Coat	ed Sand G	rains. <sup>2</sup> Loc	
dric Soil I	ndicators: (Appli	cable to a	II LRRs, unless oth	erwise no	ted.)		Indicato	rs for Problematic Hydric Soils <sup>3</sup> :
Histosol (	(A1)		Sandy Redox	(S5)			2 cm	Muck (A10)
Histic Epi	ipedon (A2)		Stripped Matri	x (S6)			Red	Parent Material (TF2)
Black His	stic (A3)		Loamy Mucky	Mineral (F	1) ( <b>excep</b>	t MLRA 1)		Shallow Dark Surface (TF12)
Depleted	Below Dark Surfac	e (A11)		i viatrix (F2 ix (F3)	∠)			ri (⊏xpiain in remarks)
Thick Dar	rk Surface (A12)	~ (~ 1 )	Redox Dark S	urface (F6	)		<sup>3</sup> Indicato	rs of hydrophytic vegetation and
Sandy Mu	ucky Mineral (S1)		Depleted Dark	Surface (	, F7)		wetla	nd hydrology must be present,
Sandy Gl	leyed Matrix (S4)		Redox Depres	sions (F8)			unles	s disturbed or problematic.
strictive L	_ayer (if present):							
Type: grav	/ei							
Type: <u>grav</u> Depth (inc marks:	ches): <u>6</u>						Hydric Soil	Present? Yes 🖌 No
Type: grav Depth (inc marks:	ches): <u>6</u>						Hydric Soil	Present? Yes 🖌 No
Type: grav Depth (inc marks: DROLO( etland Hyd	ches): <u>6</u> GY drology Indicators	:					Hydric Soil	Present? Yes 🖌 No
Type: grav Depth (inc marks: DROLOG stland Hyd mary Indic	GY GY (minimum of	: one require	ed; check all that ap	ply)			Hydric Soil	Present? Yes 🖌 No
Type: grav Depth (inc marks: DROLO( tland Hyd mary Indic Surface V	GY GY Grology Indicators ators (minimum of Water (A1)	: one requir	ed; check all that ap	ply) ained Leav	/es (B9) ( <b>e</b>	xcept MLF	Hydric Soil	Present? Yes V No ndary Indicators (2 or more required) ater-Stained Leaves (B9) (MLRA 1, 2
Type: grav Depth (inc marks: DROLO( tland Hyd Mary Indic Surface V High Wat	GY GY Grology Indicators eators (minimum of Water (A1) ter Table (A2)	: one require	ed; check all that ap	ply) ained Leav	/es (B9) (¢ 3)	xcept MLF	Hydric Soil	Present? Yes V No ndary Indicators (2 or more required) ater-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B)
Type: grav Depth (inc marks: DROLOO tland Hyd mary Indic Surface V High Wat Saturation	GY GY drology Indicators cators (minimum of Water (A1) ter Table (A2) n (A3)	: one requir	ed; check all that ap	<u>ply)</u> ained Leav <b>4A, and 4</b>	ves (B9) ( <b>e</b> 3)	xcept MLF	Hydric Soil	Present? Yes V No hdary Indicators (2 or more required) ater-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) rainage Patterns (B10)
Type: grav Depth (inc marks: DROLO( tland Hyd mary Indic Surface V High Wat Saturation Water Ma	GY drology Indicators cators (minimum of Water (A1) ter Table (A2) n (A3) arks (B1) (A2)	: one requir	ed; check all that ap	ply) ained Leav <b>4A, and 4E</b> st (B11) nvertebrate	/es (B9) ( <b>e</b> <b>3)</b> es (B13)	xcept MLF	Hydric Soil	Present? Yes No ndary Indicators (2 or more required) ater-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) rainage Patterns (B10) y-Season Water Table (C2)
Type: grav Depth (incom marks: DROLOO tland Hyc Surface V High Wat Saturation Water Ma Sediment	GY GY drology Indicators cators (minimum of Water (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) costo (P2)	: one requir	ed; check all that ap Water-St 1, 2, 4 Salt Crus Aquatic li Hydroger	ply) ained Leav <b>4A, and 4E</b> st (B11) nvertebrate n Sulfide C	/es (B9) ( <b>e</b> 3) es (B13) idor (C1)	xcept MLF	Hydric Soil	Present? Yes No ndary Indicators (2 or more required) ater-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) rainage Patterns (B10) y-Season Water Table (C2) aturation Visible on Aerial Imagery (C pagmorphic Pacifics (D2)
Type: grav Depth (inc marks: DROLOO tland Hyd Mary Indic Surface V High Wat Saturation Water Ma Sediment Drift Depo	GY GY drology Indicators cators (minimum of Water (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4)	: one requir	ed; check all that ap  display="block" by the second secon	ply) ained Leav <b>4A, and 4E</b> t (B11) nvertebrate n Sulfide C Rhizosphe	ves (B9) ( <b>e</b> <b>3)</b> es (B13) edor (C1) eres along	xcept MLF	Hydric Soil Hydric Soil Secor RA V Dr Dr Dr Sa ots (C3) Ga	Present? Yes No No No No No No No No No No
Type: grav Depth (inc marks: DROLOO tland Hyo mary Indic Surface V High Wat Saturation Water Ma Sediment Drift Depo Algal Mat Iron Depo	GY drology Indicators cators (minimum of Nater (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) posits (B5)	: one requir	ed; check all that ap Water-St 1, 2, 4 Salt Crus Aquatic li Hydroger Oxidized Presence	ply) ained Leav <b>4A, and 4E</b> st (B11) nvertebrate n Sulfide O Rhizosphe e of Reduct	ves (B9) ( <b>e</b> <b>3)</b> es (B13) edor (C1) eres along ed Iron (C4 ion in Tille	xcept MLF	Hydric Soil Hydric Soil Secor RA Dr Dr Dr Sa ots (C3) I Ga St St St St St St St S	Present? Yes No ndary Indicators (2 or more required) ater-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) rainage Patterns (B10) y-Season Water Table (C2) aturation Visible on Aerial Imagery (C eomorphic Position (D2) nallow Aquitard (D3) AC-Neutral Test (D5)
Type: grav Depth (inc marks: DROLOO tland Hyc mary Indic Surface V High Wat Saturation Water Ma Sediment Drift Depo Algal Mat Iron Depo Surface S	GY GY drology Indicators cators (minimum of Water (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6)	: one requir	ed; check all that ap Water-St 1, 2, 4 Salt Crus Aquatic li Hydroger Oxidized Presence Recent Ir	ply) ained Leav <b>4A, and 4E</b> tt (B11) nvertebrate on Sulfide C Rhizosphe of Reduct ron Reduct or Stressed	ves (B9) ( <b>e</b> <b>3)</b> es (B13) edor (C1) eres along ed Iron (C- ion in Tille d Plants (D	xcept MLF Living Roc 4) d Soils (C6 1) (LRR A	Hydric Soil Hydric Soil Secor Secor Dr Dr Dr Dr Dr Sr Sr S	Present? Yes ✓ No ndary Indicators (2 or more required) ater-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) rainage Patterns (B10) y-Season Water Table (C2) aturation Visible on Aerial Imagery (C eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A)
Type: grav Depth (incomarks: marks: DROLOO tland Hyd Surface V High Wat Saturation Water Ma Sediment Drift Depo Algal Mat Iron Depo Surface S Inundatio	GY GY drology Indicators cators (minimum of Water (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) on Visible on Aerial	: one requir	ed; check all that ap  display="block" by the second secon	ply) ained Leav <b>4A, and 4E</b> of (B11) nvertebrate of Reduce of Reduce on Reduct or Stressed xplain in Reduct	ves (B9) ( <b>e</b> es (B13) edor (C1) eres along ed Iron (C- ion in Tille d Plants (D emarks)	xcept MLF Living Roc 4) d Soils (C6 1) (LRR A	Hydric Soil Hydric Soil Secor Secor Dr Dr Dr Sa Si Si F/ Hydric Soil Secor Con Secor Con Secor Seco	Present? Yes ✓ No maary Indicators (2 or more required) ater-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) rainage Patterns (B10) y-Season Water Table (C2) aturation Visible on Aerial Imagery (C eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) ost-Heave Hummocks (D7)
Type: grav Depth (inc marks: DROLOO tland Hyd mary Indic Surface V High Wat Saturation Water Ma Sediment Drift Depo Algal Mat Iron Depo Surface S Inundatio Sparsely	GY GY drology Indicators cators (minimum of Water (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) on Visible on Aerial Vegetated Concav	: one require Imagery (E e Surface	ed; check all that ap Water-St 1, 2, 4 Salt Crus Aquatic li Hydroger Oxidized Presence Recent lr Stunted c 37) Other (E)	ply) ained Leav <b>4A, and 4E</b> at (B11) nvertebrate n Sulfide O Rhizosphe e of Reduct on Reduct on Reduct or Stressed xplain in Re	ves (B9) ( <b>e</b> <b>3)</b> es (B13) edor (C1) eres along ed Iron (C- ion in Tille d Plants (D emarks)	Living Roc 4) d Soils (C6 1) (LRR A	Hydric Soil           Secor           RA         ₩           Image: Dr         Dr           Image: Dr <tr< td=""><td>Present? Yes No ndary Indicators (2 or more required) ater-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) rainage Patterns (B10) y-Season Water Table (C2) aturation Visible on Aerial Imagery (C eomorphic Position (D2) nallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) ost-Heave Hummocks (D7)</td></tr<>	Present? Yes No ndary Indicators (2 or more required) ater-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) rainage Patterns (B10) y-Season Water Table (C2) aturation Visible on Aerial Imagery (C eomorphic Position (D2) nallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) ost-Heave Hummocks (D7)
Type: grav Depth (inc marks: DROLOO tland Hyd mary Indic Surface V High Wat Saturation Water Ma Sediment Drift Depo Algal Mat Iron Depo Surface S Inundatio Sparsely	GY GY drology Indicators eators (minimum of Nater (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) on Visible on Aerial Vegetated Concav vations:	: one require one one one one one one one one one one	ed; check all that ap Water-St 1, 2, 4 Salt Crus Aquatic li Hydroger Oxidized Presence Recent lr Stunted o 37) Other (Ex	ply) ained Leav <b>4A, and 4E</b> at (B11) nvertebrate on Sulfide C Rhizosphe of Reduct or Reduct or Reduct or Stressec xplain in Re	ves (B9) ( <b>e</b> <b>3)</b> es (B13) edor (C1) eres along ed Iron (C- ion in Tille d Plants (D emarks)	Living Roc 4) d Soils (C6 1) (LRR A	Hydric Soil  Hydric Soil  Secor  RA  U  Dr  Dr  Sa  Sis  FA  Fr  Fr  Hydric Soil  H	Present? Yes No ndary Indicators (2 or more required) ater-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) rainage Patterns (B10) y-Season Water Table (C2) aturation Visible on Aerial Imagery (C eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) ost-Heave Hummocks (D7)
Type: grav Depth (inc marks: DROLO( tiland Hyd mary Indic Surface V High Wat Saturation Water Ma Sediment Drift Depo Algal Mat Iron Depo Surface S Inundatio Sparsely Id Observ fface Wate	GY GY drology Indicators eators (minimum of Water (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) on Visible on Aerial Vegetated Concav vations: er Present?	: one require Imagery (E e Surface Yes \N	ed; check all that ap Water-St 1, 2, 4 Salt Crus Aquatic li Hydroger Oxidized Presence Recent lr Stunted c 37) Other (E) (B8)	ply) ained Leav <b>4A, and 4E</b> at (B11) nvertebrate n Sulfide C Rhizosphe of Reduct on Reduct or Reduct or Stressed xplain in Re es):	ves (B9) ( <b>e</b> <b>3)</b> es (B13) edor (C1) eres along ed Iron (C4 ion in Tille d Plants (D emarks)	xcept MLF Living Roc 4) d Soils (C6 1) (LRR A	Hydric Soil         Hydric Soil         Second         Ra       W         Image: Dr       Dr         Dr       Dr         Dr       Dr         Image: Dr       Dr         Image: Dr       Dr         Dr       Dr         Image: Dr       Dr	Present? Yes ✓ No mater-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) rainage Patterns (B10) y-Season Water Table (C2) aturation Visible on Aerial Imagery (C ecomorphic Position (D2) nallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) ost-Heave Hummocks (D7)
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Type: grav Depth (inc marks: DROLOO Marks: DROLOO Marks: DROLOO Marks Surface V High Wat Saturation Water Ma Sediment Drift Depo Algal Mat Iron Depo Surface S Inundatio Sparsely Id Observ face Wate ter Table I uration Pr Judes cap scribe Rec	GY GY Grology Indicators cators (minimum of Water (A1) ter Table (A2) n (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) Soil Cracks (B6) on Visible on Aerial Vegetated Concav vations: er Present? Present? resent? corded Data (strear	Imagery (E e Surface Yes N Yes N Yes N n gauge, n	ed; check all that ap Water-St 1, 2, 4 Salt Crus Aquatic II Hydroger Oxidized Presence Recent Ir Stunted of Stunted of Stunted of B8) Io P Depth (inche Io Pepth (inche Io Pepth (inche	ply) ained Leav 4A, and 4E 4A, and 4E a of Reduct on Reduct or Reduct or Stressed xplain in Re es): es): es): al photos, p	ves (B9) (e 3) es (B13) edor (C1) eres along ed Iron (C- ion in Tille d Plants (D emarks)	xcept MLF Living Roc 4) d Soils (C6 1) (LRR A (LRR A) (URR A)	Hydric Soil Hydric Soil	Present? Yes ✓ No maary Indicators (2 or more required) ater-Stained Leaves (B9) (MLRA 1, 2 4A, and 4B) rainage Patterns (B10) y-Season Water Table (C2) aturation Visible on Aerial Imagery (C eomorphic Position (D2) hallow Aquitard (D3) AC-Neutral Test (D5) aised Ant Mounds (D6) (LRR A) ost-Heave Hummocks (D7) y Present? Yes ✓ No

Project/Site: #22264 Goat Hill	City/County: City of Kirkland				_ Sampling Date: 11/21/22	
Applicant/Owner: CPG Consultants	State: WA				_ Sampling Point: <u>S2</u>	
Investigator(s): <u>MK</u> , AW			Section, To	ownship, Range: <u>Sec 30,</u> 1	Гwp 26N, Rge 05E, W.M.	
Landform (hillslope, terrace, etc.): Hillslope		Local reli	ef (concave	, convex, none): <u>None</u>	Slope (%): <u>4%</u>	
Subregion (LRR): LRR A	Lat: <u>47.7</u>	0773		_ Long: <u>-122.22144</u>	Datum: NAD83	
Soil Map Unit Name: Alderwood gravelly sandy loam, 15 to	30 percent sl	opes		NWI classifica	ation: N/A	
Are climatic / hydrologic conditions on the site typical for th	is time of yea	ar? Yes	_ No <b>✔</b> (I	f no, explain in Remarks.)	)	
Are Vegetation 🔽 , Soil 🔽 , or Hydrology 📃 signi	ficantly distu	rbed?	Are "Nor	mal Circumstances" prese	ent? Yes No	
SUMMARY OF FINDINGS – Attach site map	showing	samplin	(It needed	o, explain any answers in locations, transects	, important features, etc.	
Hydrophytic Vegetation Present? Yes V No Hydric Soil Present? Yes No Wetland Hydrology Present? Yes No	]	Is the with	ne Sampled	I Area nd? Yes 🗸 N	10	
Data taken out of Wetland A at terminus of 90t age. It was determined using an AgACIS WE	ιh Ave NE. ΓStable ar	. Soil app nalysis th	pears to b at the thr	e fill or excavated, v ee months leading u	egetation under 5 years in p to the November 2022	
VEGETATION – Use scientific names of plar	its.			<u> </u>		
	Absolute	Dominant	t Indicator	Dominance Test work	sheet:	
Tree Stratum (Plot size: 5m^2 1. None	<u>% Cover</u>	Species?	<u>Status</u>	Number of Dominant Sp That Are OBL, FACW, o	pecies or FAC: 2 (A)	
23				Total Number of Domin Species Across All Stra	ant <sub>ita: 2</sub> (B)	
4 Sapling/Shrub Stratum (Plot size: 3m^2	0	= Total C	Cover	Percent of Dominant Sp That Are OBL, FACW, o	becies or FAC: <u>100</u> (A/B)	
1. Rubus armeniacus	60	Y	FAC	Prevalence Index wor	ksheet:	
2. Populus balsamifera	30	Y	FAC	Total % Cover of:	Multiply by:	
3. Alnus rubra	10	Ν	FAC	OBL species	x 1 =	
4. Buddleja davidii	5	Ν	FACU	FACW species	x 2 =	
5				FAC species	x 3 = <u>0</u>	
Horp Stratum (Plataiza: 1m^2	105	= Total C	Cover	FACU species	x 4 = 0	
1 None				UPL species	x 5 = 0	
2				Column Totals: 0	(A) (B)	
3				Prevalence Index	= B/A =	
4.				Hydrophytic Vegetatio	on Indicators:	
5.				Rapid Test for Hydr	ophytic Vegetation	
6.				Dominance Test is	>50%	
7.				Prevalence Index is	; ≤3.0 <sup>1</sup>	
8.				Morphological Adap	otations <sup>1</sup> (Provide supporting	
9.				data in Remarks	s or on a separate sheet)	
10.				Wetland Non-Vascu	ılar Plants'	
11.				Problematic Hydrop	hytic Vegetation' (Explain)	
Woody Vine Stratum (Plot size: 3m^2	0	= Total C	Cover	'Indicators of hydric soi be present, unless distu	l and wetland hydrology must urbed or problematic.	
1. None				Hydrophytic		
2				Vegetation		
% Bare Ground in Herb Stratum <u>100</u>	0	= Total C	Cover	Present? Yes	s[/ No	
Remarks:						
Plants appear to be under 5 years old						

Sampling	Point:	S2
Camping	i onit.	

Profile Desc	ription: (Describe	to the dep	th needed to docun	nent the	indicator	or confirm	the absence	of indicators.)
Depth	Matrix		Redox	k Feature	es			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-6	10YR 4/2	95	10YR 3/4	5	С	М	Sandy loam	
6-14	10YR 4/3	98	10YR 3/4	2	С	Μ	Sandy loam	
		·						
		·						
		·						
		. <u> </u>						
<sup>1</sup> Type: C=C	oncentration, D=Dep	oletion, RM	Reduced Matrix, CS	=Covere	ed or Coat	ed Sand Gr	ains. <sup>2</sup> Loo	ation: PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (Applic	able to all	LRRs, unless other	wise no	oted.)			rs for Problematic Hydric Soils":
	(A1) inadan (A2)		Sandy Redox (S	5) SG)				Muck (A10) Derent Meterial (TE2)
	stic (A3)			ineral (F	1) (excen	t MI RA 1)		Shallow Dark Surface (TE12)
	n Sulfide (A4)		Loamy Gleyed M	1atrix (F2	2)		Othe	r (Explain in Remarks)
Depleted	Below Dark Surface	e (A11)	Depleted Matrix	(F3)				
Thick Da	rk Surface (A12)		Redox Dark Sur	ace (F6	)		<sup>3</sup> Indicato	rs of hydrophytic vegetation and
Sandy M	ucky Mineral (S1)		Depleted Dark S     Deprosei	urface (l	F7)		wetla	nd hydrology must be present, s disturbed or problematic
Restrictive	Laver (if present):			5115 (FO)			unies	
Type: n/a	, o: (.: p: coo).							
Depth (in	ches):						Hvdric Soil	Present? Yes No
Remarks:							,	
	GV							
	drology Indicators:	1						
	ators (minimum of c		d: aback all that annu	0			Saaa	adary Indiantors (2 or more required)
	Votor (A1)	one required		/ <u>)</u>	(00 (P0) (	voont MI B		eter Steined Leeves (P0) (MLPA 1.2
	ter Table ( $\Delta 2$ )			and 4F	7es (D9) (e 3)	Cept MLR		$4\Delta$ and $4B$
	(A3)		Salt Crust (	B11)	_)			rainage Patterns (B10)
Water Ma	arks (B1)		Aquatic Inv	ertebrate	es (B13)			y-Season Water Table (C2)
Sedimen	t Deposits (B2)		Hydrogen S	Sulfide O	dor (C1)		🔲 Sa	aturation Visible on Aerial Imagery (C9)
Drift Dep	osits (B3)		Oxidized R	hizosphe	eres along	Living Root	ts (C3) 🔲 G	eomorphic Position (D2)
🗌 Algal Ma	t or Crust (B4)		Presence o	f Reduce	ed Iron (C	4)	🔲 Sł	nallow Aquitard (D3)
Iron Dep	osits (B5)		Recent Iror	Reduct	ion in Tille	d Soils (C6)	) LF	AC-Neutral Test (D5)
Surface S	Soil Cracks (B6)		Stunted or	Stressec	d Plants (D	1) ( <b>LRR A</b> )		aised Ant Mounds (D6) (LRR A)
	on Visible on Aerial I	magery (B7	') U Other (Expl	ain in Re	emarks)		L Fr	ost-Heave Hummocks (D7)
Eield Obser	vegetated Concave	e Surface (E	38)					
Surface Wat	valions:			۱.				
Water Table	Drecent?		Depth (inches	). 				
Saturation D	rocont?		Depth (inches	). \.		Woth	and Hydrolog	Prosent? Vos Nord
(includes cap	pillary fringe)		Deptil (inches	)		wella		
Describe Re	corded Data (stream	n gauge, mo	onitoring well, aerial p	hotos, p	previous in	spections),	if available:	
Remarks:				-				
Data taken	at low point dov	wnslope (	of Wetland A and	l soils	were stil	l dry.		

Project/Site: #22264 Goat Hill	(	City/County	: City of Ki	rkland	_ Sampling Date: 11/21/22
Applicant/Owner: CPG Consultants				State: WA	_ Sampling Point: <u>S3</u>
Investigator(s): MK, AW			Section, To	ownship, Range: <u>Sec 30,</u>	Twp 26N, Rge 05E, W.M.
Landform (hillslope, terrace, etc.): Hillslope		Local relie	f (concave	e, convex, none): <u>None</u>	Slope (%): <u>4%</u>
Subregion (LRR): LRR A	_ Lat: <u>47.7</u>	0591		_ Long: <u>122.22163</u>	Datum: NAD83
Soil Map Unit Name: <u>Alderwood gravelly sandy loam, 15 to 3</u>	0 percent slo	opes		NWI classific	ation: N/A
Are climatic / hydrologic conditions on the site typical for this Are Vegetation, Soil, or Hydrology signifi Are Vegetation, Soil, or Hydrology natura SUMMARY OF FINDINGS – Attach site map	i time of yea cantly distur illy problema <b>showing</b>	ar? Yes rbed? atic? samplin	No ( Are "Nor (If needed g point I	If no, explain in Remarks. mal Circumstances" prese d, explain any answers in <b>locations, transects</b>	) ent? Yes V No Remarks.) 5, important features, etc.
Hydrophytic Vegetation Present?Yes VHydric Soil Present?Yes VWetland Hydrology Present?Yes VRemarks:Yes V		ls th with	e Sampleo in a Wetla	d Area nd? Yes 🗸 1	No
Data taken in Wetland B (within channel of Stree three months leading up to the November 2022	eam B). It <u>2 inspecti</u>	was dete on were s	rmined significar	using an AgACIS WE ntly drier than the 30	ETStable analysis that the -year average.
VEGETATION – Use scientific names of plant	ts.				
Tree Stratum (Plot size: 5m^2 1. None	Absolute <u>% Cover</u>	Dominant Species?	Indicator <u>Status</u>	Dominance Test work Number of Dominant S That Are OBL, FACW,	rsheet: pecies or FAC: <u>3</u> (A)
2				Total Number of Domir	nant
3				Species Across All Stra	ata: <u>3</u> (B)
4 Sapling/Shrub Stratum (Plot size: 3m^2	0	= Total C	over	Percent of Dominant S That Are OBL, FACW,	pecies or FAC: <u>100</u> (A/B)
1. Rubus armeniacus	85	Y	FAC	Prevalence Index wor	rksheet:
2				Total % Cover of:	Multiply by:
3				OBL species	x 1 = <u>0</u>
4				FACW species	x 2 = 0
5				FAC species	x 3 = 0
Harb Stratum (Dlat size: 1m^2	85	= Total Co	over	FACU species	x 4 = 0
1 Ranunculus repens	70	Y	FAC	UPL species	x 5 = 0 (D)
2 Solanum dulcamara	35	Y	FAC	Column Totals:	(A) (B)
3				Prevalence Index	<pre>&lt; = B/A =</pre>
4.				Hydrophytic Vegetati	on Indicators:
5.				Rapid Test for Hyd	rophytic Vegetation
6.				Dominance Test is	>50%
7.				Prevalence Index is	s ≤3.0 <sup>1</sup>
8				Morphological Ada	ptations <sup>1</sup> (Provide supporting
9				data in Remark	s or on a separate sheet)
10				Wetland Non-vasc	ular Plants
11		·			phytic vegetation (Explain)
Woody Vine Stratum (Plot size: 3m^2	95	= Total Co	over	be present, unless dist	Il and wetiand nydrology musi urbed or problematic.
1. None				Hydrophytic	
2	0	= Total C	over	Vegetation Present? Ye	⊧s 🖌 No 🗌
Remarks:					

Sampling Point: S3

Project/Site: #22264 Goat Hill		City/Count	y: City of Ki	rkland	_ Sampling Date: <u>11/21/22</u>	
Applicant/Owner: CPG Consultants				State: WA	Sampling Point: <u>S4</u>	
Investigator(s): _MK, AW			Section, To	ownship, Range: <u>Sec 30, <sup>-</sup></u>	Twp 26N, Rge 05E, W.M.	
Landform (hillslope, terrace, etc.): Hillslope		_Local relie	ef (concave	, convex, none): <u>None</u>	Slope (%): <u>4%</u>	
Subregion (LRR): LRR A	Lat: 47.7	70589		Long: <u>122.22163</u>	Datum: NAD83	
Soil Map Unit Name: <u>Alderwood</u> gravelly sandy loam,	15 to 30 percent sl	opes		NWI classifica	ation: N/A	
Are climatic / hydrologic conditions on the site typical	for this time of yea	ar? Yes	No 🖌 (	lf no, explain in Remarks.)	)	
Are Vegetation, Soil, or Hydrology	significantly distu	rbed?	Are "Nor	mal Circumstances" prese	ent? Yes 🖌 No	
Are Vegetation, Soil, or Hydrology	naturally problem	atic?	(If needeo	d, explain any answers in	Remarks.)	
SUMMARY OF FINDINGS – Attach site	map showing	samplin	ig point l	ocations, transects	, important features, etc.	
Hydrophytic Vegetation Present? Yes	No	ls th	ne Sampleo	Area		
Hydric Soil Present?     Yes     I       Wetland Hydrology Present?     Yes     I		with	nin a Wetla	nd? Yes N	No 🖌	
Remarks:						
Data taken out of WL B. It was determined	d using an AgA	ACIS WE	TStable	analysis that the thre	e months leading up to	
the November 2022 Inspection were sign	ificantly drier ti	nan the 3	su-year av	verage.		
VEGETATION – Use scientific names of	plants.				· ·	
Tree Stratum (Plot size: 5m^2	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test work	sheet:	
1. Acer macrophyllum	60	Y	FACU	That Are OBL, FACW,	pecies or FAC: <sup>2</sup> (A)	
2. Alnus rubra	25	Y	FAC	Total Number of Domin	( )	
3				Species Across All Stra	ita: <u>5</u> (B)	
4				Porcent of Dominant St		
0 1: (0) 1 0: (0) (0) 2m^2	85	= Total C	Cover	That Are OBL, FACW,	or FAC: <u>100</u> (A/B)	
Sapling/Shrub Stratum (Plot size: 507 2	50	Y	FAC	Provalence Index wor	kshoot:	
2 Oemleria cerasiformis	20	Y	FACU	Total % Cover of	Multiply by:	
3 Corylus cornuta	15	N	FACU	OBL species	x 1 = 0	
4.		·		FACW species	x = 0	
5.				FAC species 80	x 3 = 240	
	85	= Total C	Cover	FACU species 165	x 4 = <u>660</u>	
Herb Stratum (Plot size: 1m^2				UPL species	x 5 = _0	
1. Polystichum munitum	70	Y	FACU	Column Totals: 245	(A) <u>900</u> (B)	
2. Equisetum teimetia	5	N	FAC	Drovalance Index	- P/A - 37	
3		·		Hydronhytic Vegetatio	n Indicators:	
4		·		Rapid Test for Hydr	ophytic Vegetation	
5		·		Dominance Test is	>50%	
7.		·		Prevalence Index is	s ≤3.0 <sup>1</sup>	
8.		·		Morphological Ada	otations <sup>1</sup> (Provide supporting	
9.		·		data in Remark	s or on a separate sheet)	
10		·		Wetland Non-Vascu	ular Plants'	
11				Problematic Hydrop	ohytic Vegetation' (Explain)	
	75	= Total C	over	Indicators of hydric soi	I and wetland hydrology must urbed or problematic.	
Woody Vine Stratum (Plot size: 3m^2	40	V	FAOL		,	
	10	Y	FACU	Hydrophytic		
2	10			Vegetation Present?		
% Bare Ground in Herb Stratum <sup>15</sup>	10	= I otal C	over	Fresent: 10		
Remarks:				<u>I</u>		

Sampling Point:	S4
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Profile Desc	ription: (Describe	to the dep	th needed to docur	nent the i	ndicator	or confirm	the absence of	indicators.)
Depth	Matrix		Redo	x Features	<u>s</u>			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-5	10YR 3/3	100					Sandy Loam	
5-16	5Y 6/1	100					Sandy loam	
					·			
<sup>1</sup> Type: C=Co	oncentration, D=Dep	letion, RM=	Reduced Matrix, CS	S=Covered	d or Coate	ed Sand Gra	ains. <sup>2</sup> Locat	ion: PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators: (Applic	able to all	LRRs, unless other	wise note	∋d.)		Indicators	for Problematic Hydric Soils <sup>3</sup> :
Histosol	(A1)		Sandy Redox (S	5)			2 cm M	luck (A10)
Histic Ep	ipedon (A2)		Stripped Matrix	(S6)			Red Pa	arent Material (TF2)
Black His	stic (A3)		Loamy Mucky M	lineral (F1	) (except	MLRA 1)	Very Sl	hallow Dark Surface (TF12)
	n Sulfide (A4) Bolow Dark Surface	(11)	Loamy Gleyed N	/latrix (F2)				Explain in Remarks)
	rk Surface (A12)	e (ATT)	Redox Dark Sur	(F3) face (F6)			<sup>3</sup> Indicators	of hydrophytic vegetation and
Sandy M	uckv Mineral (S1)		Depleted Dark S	Surface (F	7)		wetland	hvdrology must be present.
Sandy G	eyed Matrix (S4)		Redox Depressi	ons (F8)	,		unless o	disturbed or problematic.
Restrictive I	ayer (if present):							
Type:_ <sup>n/a</sup>								
Depth (ind	ches):						Hydric Soil Pr	resent? Yes No 🖌
Remarks:								
HYDROLO	GY							
Wetland Hyd	drology Indicators:							
Primary Indic	ators (minimum of c	ne required	I: check all that appl	v)			Seconda	arv Indicators (2 or more required)
	Vater (A1)		Water-Stai	ned Leave	es (B9) ( <b>e</b> :	cept MLR	A 🗌 Wate	er-Stained Leaves (B9) ( <b>MLRA 1. 2.</b>
High Wat	er Table (A2)		1, 2, 44	, and 4B)	( -) (-		4	IA, and 4B)
Saturatio	n (A3)		Salt Crust	(B11)			🗌 Drair	nage Patterns (B10)
Water Ma	arks (B1)		Aquatic Inv	ertebrates	s (B13)		Dry-	Season Water Table (C2)
Sedimen	t Deposits (B2)		Hydrogen S	Sulfide Od	or (C1)		Satu	ration Visible on Aerial Imagery (C9)
Drift Dep	osits (B3)		Oxidized R	hizospher	es along	Living Root	s (C3) 🔲 Geor	morphic Position (D2)
Algal Ma	t or Crust (B4)		Presence of	of Reduced	d Iron (C4	·)	Shal	low Aquitard (D3)
Iron Dep	osits (B5)		Recent Iror	n Reductio	on in Tilleo	l Soils (C6)	FAC	-Neutral Test (D5)
Surface S	Soil Cracks (B6)		Stunted or	Stressed I	Plants (D	1) ( <b>LRR A</b> )	Rais	ed Ant Mounds (D6) ( <b>LRR A</b> )
Inundatio	n Visible on Aerial I	magery (B7	) Other (Exp	lain in Rer	narks)		Fros	t-Heave Hummocks (D7)
Sparsely	Vegetated Concave	Surface (E	88)					
Field Observ	vations:	_	<b>—</b> _					
Surface Wate	er Present? Y	es No	Depth (inches	):				
Water Table	Present? Y	es No	Depth (inches	):				
Saturation Pr	resent? Y	es No	Depth (inches	):		Wetla	and Hydrology F	Present? Yes No ✔
Describe Red	corded Data (stream	gauge. mo	nitoring well, aerial u	photos. pre	evious ins	pections) i	if available:	
		J J,e				, , -		
Remarks:								
. tomanto.								

Project/Site: #22264 Goat Hill		City/County	: City of Ki	rkland	_ Sampling Date: 11/21/22
Applicant/Owner: CPG Consultants				State: WA	_ Sampling Point: <u>S5</u>
Investigator(s): _MK, AW			Section, To	ownship, Range: <u>Sec 30,</u> <sup>-</sup>	Twp 26N, Rge 05E, W.M.
Landform (hillslope, terrace, etc.): Hillslope		Local relie	ef (concave	, convex, none): <u>None</u>	Slope (%): <u>4%</u>
Subregion (LRR): LRR A	Lat: 47.7	0591		Long: <u>122.22163</u>	Datum: NAD83
Soil Map Unit Name: Alderwood gravelly sandy loam, 15 to	o 30 percent sl	opes		NWI classifica	ation: N/A
Are climatic / hydrologic conditions on the site typical for t	his time of yea	ar? Yes	No 🗸 (	If no, explain in Remarks.)	)
Are Vegetation , Soil , or Hydrology sig	nificantly distu	rbed?	Are "Nor	mal Circumstances" prese	ent? Yes 🖌 No
Are Vegetation . Soil . or Hydrology . natu	rally problem	atic?	(If needeo	d. explain any answers in	Remarks.)
SUMMARY OF FINDINGS – Attach site ma	p showing	samplin	g point l	ocations, transects	, important features, etc.
	7				
Hydric Soil Present? Yes V		Is th	e Sampleo	I Area	
Wetland Hydrology Present? Yes 🖌 No		with	in a Wetla	nd? Yes	10
Remarks:					
Data taken in Wetland C. It was determined u	using an Ag	ACIS WI	ETStable	analysis that the thr	ee months leading up to
the November 2022 inspection were signification	ntly drier th	han the 3	0-year av	verage.	
VEGETATION – Use scientific names of pla	ints.				
Tree Stratum (Plot size: 5m^2	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test work	sheet:
1 Alnus rubra	<u>15</u>	Y	FAC	Number of Dominant Sp That Are OBL_EACW	pecies or FAC: 4 (A)
2.		·			(//)
3.				Total Number of Domin Species Across All Stra	ant ta <sup>.</sup> 4 (B)
4.					
	15	= Total C	over	Percent of Dominant Sp That Are OBL, FACW,	or FAC: 100 (A/B)
Sapling/Shrub Stratum (Plot size: 3m^2	00	V	540		
1. Rubus armeniacus	20	Y	FAC	Prevalence Index work	ksheet:
2		·		ODL anacias	
3		·			$x^{2} = 0$
4				FAC species	$x_3 = 0$
J	20	= Total C	over	FACU species	x = 0
Herb Stratum (Plot size: 1m^2		- Total O	0,001	UPL species	x 5 = 0
1. Scirpus microcarpus	85	Y	OBL	Column Totals: 0	(A) 0 (B)
2. Ranunculus repens	40	Y	FAC		
3		·		Prevalence Index	= B/A =
4				Hydrophytic Vegetatio	on Indicators:
5		·			
6		·		Dominance Test is	>50%
/		·			$\rightarrow \rightarrow 0.0$
8		·		data in Remarks	s or on a separate sheet)
9		·		Wetland Non-Vascu	ular Plants <sup>1</sup>
10				Problematic Hydrop	ohytic Vegetation <sup>1</sup> (Explain)
	95	= Total C	over	<sup>1</sup> Indicators of hydric soi	I and wetland hydrology must
Woody Vine Stratum (Plot size: 3m^2			0,001	be present, unless distu	urbed or problematic.
1. None					
2		·		Vegetation	
	0	= Total C	over	Present? Yes	s 🗸 No
% Bare Ground in Herb Stratum 100				<u> </u>	
NGHIQINS.					

Sampling Point:	S5

Profile Desc	ription: (Describe	to the dep	oth needed to docu	ment the	indicator	or confirm	n the absend	ce of indicators.)
Depth	Matrix		Redo	ox Feature	s			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-17	10YR 2/1	95	10YR 3/6	5	С	М	Sandy Clay Loan	n
						·		
		·						
1 <del></del>		- <u> </u>					. 2.	
Type: C=Co	ncentration, D=Dep	pietion, Rivi	Reduced Matrix, C	S=Covere	d or Coate	ed Sand G	rains. L	ocation: PL=Pore Lining, M=Matrix.
					eu.)			m Muck (A10)
	AI) nedon (A2)		Sandy Redox (	55) (S6)				cm Muck (A10) ad Parent Material (TE2)
	tic (A3)			(50) /lineral (E1	I) (except	MI RA 1)		erv Shallow Dark Surface (TE12)
	Sulfide (A4)		Loamy Gleved	Matrix (F2	) )		⊡ ot	her (Explain in Remarks)
Depleted	Below Dark Surface	e (A11)	Depleted Matrix	(F3)	,			
Thick Da	k Surface (A12)		Redox Dark Su	rface (F6)			<sup>3</sup> Indica	ators of hydrophytic vegetation and
Sandy M	ucky Mineral (S1)		Depleted Dark	Surface (F	7)		we	tland hydrology must be present,
Sandy GI	eyed Matrix (S4)		Redox Depress	ions (F8)			unl	ess disturbed or problematic.
Restrictive L	ayer (if present):							
Type:	h							
Depth (Inc	nes):						Hydric So	oil Present? Yes 🖌 No
Remarks:								
No redoxim	orphic concent	rations c	or depleted soils,	howeve	er black	(1 chom	a) soils th	roughout the entire profile are
indicative of	of frequent inund	dation of	water during the	growing	g seaso	n		
	GY							
Wotland Live								
	atoro (minimum of		d, aboat all that ann	<b>L</b> -)			Sec	ander: (Indiactors (2 or more required)
	ators (minimum or o	one require		I <u>Y)</u>				condary indicators (2 or more required)
	Vater (A1)		Water-Sta	ined Leave	es (B9) ( <b>e</b> : \	Cept MLF		Water-Stained Leaves (B9) (MLRA 1, 2,
High Wat	er Table (AZ)			A, and 4B	)			4A, and 4B)
	(A3)			(DII)	a (D12)		H	Drainage Patterns (BT0)
	(D)				S(D13)		H	Seturation Visible on Aerial Imagon (CO)
	Deposits (D2)			Sulliue Ot		Living Roo		Geomorphic Position (D2)
	or Crust (B4)				$d \operatorname{Iron} (C)$			Shallow Aquitard (D3)
	or ordst (D4)			n Reducti	on in Tiller	') 1 Sails (CA		EAC-Neutral Test (D5)
	Soil Cracks (B6)			Stressed	Plants (D	1) (I RR A	<i>"</i> П	Raised Ant Mounds (D6) (I RR A)
	n Visible on Aerial I	magery (B	7) Other (Exr	olain in Re	marks)			Frost-Heave Hummocks (D7)
	Vegetated Concave	e Surface (	B8)		mantoj			
Field Observ	vations:	(	/					
Surface Wate	er Present?	∕es∏ N	Depth (inches	s):				
Water Table	Present?	∕es⊟ N	Depth (inche	s).				
Saturation Pr	esent?			s). surface		Wot	and Hydrold	nav Present? Ves V
(includes cap	illary fringe)						and Hydroid	
Describe Rec	orded Data (stream	n gaug <mark>e, m</mark>	onitoring well, aerial	photos, pr	evious ins	spections),	if available:	
Remarks:								

Project/Site: #22264 Goat Hill		City/County	: City of Ki	rkland Sampling Date: 11/21/22	;
Applicant/Owner: CPG Consultants				State: WA Sampling Point: <u>S6</u>	
Investigator(s): MK, AW			Section, To	ownship, Range: <u>Sec 30, Twp 26N, Rge 05E, W.M.</u>	
Landform (hillslope, terrace, etc.): Hillslope		Local relie	ef (concave	, convex, none): <u>None</u> Slope (%): <u>4</u>	1%
Subregion (LRR): LRR A	Lat: 47.7	0589		_ Long: <u>122.22163</u> Datum: <u>NAD</u>	83
Soil Map Unit Name: <u>Alderwood</u> gravelly sandy loam, 15 to 3	30 percent sl	opes		NWI classification: N/A	
Are climatic / hydrologic conditions on the site typical for this Are Vegetation, Soil, or Hydrology signif Are Vegetation, Soil, or Hydrology natura SUMMARY OF FINDINGS – Attach site map	s time of yea ficantly distu ally problema <b>showing</b>	ar? Yes rbed? atic? samplin	No ( Are "Nor (If needed g point I	If no, explain in Remarks.) mal Circumstances" present? Yes ✔ No d, explain any answers in Remarks.) Iocations, transects, important features,	, etc.
Hydrophytic Vegetation Present?YesNoHydric Soil Present?YesNoWetland Hydrology Present?YesNoRemarks:YesYes		ls th with	e Sampleo in a Wetla	d Area nd? Yes No♥	
Data taken out of Wetland C. It was determined	d using a	n AgACIS	S WETSt	able analysis that the three months leading	g up
to the November 2022 inspection were signific	antly drie	r than the	e 30-yeai	r average.	]
VEGETATION – Use scientific names of plan	its.				
Tree Stratum (Plot size: 5m^2 1. Acer macrophyllum	Absolute <u>% Cover</u> 25	Dominant <u>Species?</u> Y	Indicator <u>Status</u> FACU	Dominance Test worksheet:         Number of Dominant Species         That Are OBL, FACW, or FAC:       2         (A)	A)
2 3		·		Total Number of Dominant         Species Across All Strata:       4         (E	3)
4 Sanling/Shrub Stratum (Plot size: 3m^2	25	= Total C	over	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A	\/B)
1. Rubus armeniacus	100	Y	FAC	Prevalence Index worksheet:	
2.				Total % Cover of: Multiply by:	
3				OBL species x 1 = _0	
4				FACW species x 2 = _0	
5	. <u> </u>	·		FAC species <u>120</u> x 3 = <u>360</u>	
Light Charter (Distring) 1mA2	100	= Total C	over	FACU species $\frac{70}{x 4} = \frac{280}{x}$	
1 Helix hedera	40	Y	FACU	UPL species $x = 0$	(=)
2 Solanum dulcamara	20	Y	FAC	Column Totals: <u>190</u> (A) <u>640</u>	(B)
3. Polystichum munitum	5	N	FACU	Prevalence Index = $B/A = \frac{3.4}{2}$	
4.				Hydrophytic Vegetation Indicators:	
5.				Rapid Test for Hydrophytic Vegetation	
6.				Dominance Test is >50%	
7				Prevalence Index is ≤3.0 <sup>1</sup>	
8				Morphological Adaptations <sup>1</sup> (Provide supportin	g
9				data in Remarks or on a separate sheet)	
10				Wetland Non-Vascular Plants      Dreblemetic Lludrenbutic Vegetation <sup>1</sup> (Eveloin)	
11	65	= Total C	over	<sup>1</sup> Indicators of hydric soil and wetland hydrology mu be present, unless disturbed or problematic.	ust
<u>Woody Vine Stratum</u> (Plot size: 3m^2 1. None				Hydrophytic	
2	0	= Total C	over	Vegetation Present? Yes No	
Remarks:					

Sampling Po	oint: S6	
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Profile Des	cription: (Describe	to the depth	needed to docu	nent the ir	ndicator	or confirm	the absence of	indicators.)
Denth	Matrix		Redo	x Features		•••••		
(inches)	Color (moist)	% Co	olor (moist)	<u>%</u>	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-6	10YR 2/2	100					Sandy Loam	
6-16	10 YR 3/2	100					Sandy Loam	
0.10	10 11(0/2	100						
		<u> </u>						
<sup>1</sup> Type: C=C	oncentration, D=Dep	letion, RM=R	educed Matrix, C	S=Covered	or Coate	ed Sand Gra	ains. <sup>2</sup> Locati	ion: PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (Applic	able to all LR	Rs, unless othe	rwise note	d.)		Indicators	for Problematic Hydric Soils':
Histosol	(A1)		Sandy Redox (S	S5)			2 cm M	luck (A10)
	pipedon (A2)		Stripped Matrix	(S6)				arent Material (TF2)
	stic (A3)		Loamy Mucky N	(Ineral (F1)	(except	MLRA 1)	Very Sr	hallow Dark Surface (TF12)
	h Sulliue (A4) 1 Below Dark Surface		Depleted Matrix	(F3)				
	ark Surface (A12)		Redox Dark Su	face (F6)			<sup>3</sup> Indicators	of hydrophytic vegetation and
Sandy M	lucky Mineral (S1)		Depleted Dark S	Surface (F7	')		wetland	hydrology must be present,
Sandy G	Gleyed Matrix (S4)		Redox Depress	ions (F8)	,		unless d	listurbed or problematic.
Restrictive	Layer (if present):							
Type:_ <sup>n/a</sup>	l							
Depth (in	ches):						Hydric Soil Pr	resent? Yes No
Remarks:								
Wetland Hy	drology Indicators:							
Primary Indi	cators (minimum of c	ne required; o	heck all that appl	y)			<u>Seconda</u>	ary Indicators (2 or more required)
Surface	Water (A1)		Water-Stai	ned Leave	s (B9) ( <b>e</b> )	cept MLR	A 🗌 Wate	er-Stained Leaves (B9) ( <b>MLRA 1, 2,</b>
High Wa	iter Table (A2)		1, 2, 4/	A, and 4B)			4	A, and 4B)
Saturatio	on (A3)		Salt Crust	(B11)			Drair	nage Patterns (B10)
Water M	larks (B1)		Aquatic Inv	/ertebrates	(B13)			Season Water Table (C2)
Sedimer	nt Deposits (B2)			Sulfide Odo	or (C1)		Satu	ration Visible on Aerial Imagery (C9)
	bosits (B3)			nizosphere	es along l	Living Roots	s (C3) 🔲 Geor	morphic Position (D2)
	at or Crust (B4)			of Reduced	I Iron (C4			low Aquitard (D3)
	oosits (B5)			n Reductio	n in Tilleo			-Neutral Test (D5)
	Soil Cracks (B6)	(DZ)		Stressed F	Plants (D'	1) ( <b>LRR A</b> )		ed Ant Mounds (D6) (LRR A)
	on visible on Aerial I	magery (B7)		lain in Ren	narks)			t-Heave Hummocks (D7)
		Surface (Bo)						
	valions.		Denth (inches					
	Discussion of the second of th			5)				
	Present? Y			s):				
Saturation P	resent? Y	es No	Depth (inches	s):		Wetla	ind Hydrology P	resent? Yes No
Describe Re	corded Data (stream	gauge, monit	oring well, aerial	photos, pre	vious ins	pections), i	f available:	
				-		-		
Remarks:								

Project/Site: #22264 Goat Hill		City/Count	ty: City of Ki	rkland	Sampling Date: 11/21/22
Applicant/Owner: CPG Consultants				State: WA	_ Sampling Point: <u>S7</u>
Investigator(s): _MK, AW			Section, To	ownship, Range: <u>Sec 30,</u>	Twp 26N, Rge 05E, W.M.
Landform (hillslope, terrace, etc.): <u>Hillslope</u>		Local reli	ef (concave	, convex, none): <u>None</u>	Slope (%): <u>10%</u>
Subregion (LRR): LRR A	Lat: 47.7	0417		Long: <u>122.224425</u>	Datum: NAD83
Soil Map Unit Name: Alderwood gravelly sandy loam, 15 to	30 percent sl	opes		NWI classific	ation: N/A
Are climatic / hydrologic conditions on the site typical for th	is time of yea	ar? Yes	No 🗸 (	If no, explain in Remarks.	)
Are Vegetation, Soil, or Hydrology signi	ficantly distu	rbed?	Are "Nor	mal Circumstances" prese	, ent? Yes ✔ No
Are Vegetation 🔲 , Soil 🔲 , or Hydrology 🗍 natur	ally problem	atic?	(If needeo	d, explain any answers in	Remarks.)
SUMMARY OF FINDINGS – Attach site map	showing	samplir	ng point l	ocations, transects	, important features, etc.
Hydronhytic Vegetation Present? Yes V	7				
Hydric Soil Present? Yes V No		Is t	he Sampled	l Area	
Wetland Hydrology Present? Yes 🖌 No	]	WIT	nin a wetia	na? Yes ♥ I	
Remarks:		•			
Data taken in Wetland D. It was determined us	sing an Ag	ACIS W	'ETStable	analysis that the the	ee months leading up to
the November 2022 inspection were significar	ntly drier th	han the 3	30-year av	verage.	
VEGETATION – Use scientific names of plar	nts.				
Tree Stratum (Plot size: 5m^2	Absolute % Cover	Dominan Species?	t Indicator Status	Dominance Test work	(sheet:
1. None		000000		Number of Dominant S That Are OBL, FACW.	pecies or FAC: <sup>2</sup> (A)
2.					
3.				Total Number of Domin	iant ata: 2 (B)
4.					
010	0	= Total 0	Cover	That Are OBL, FACW,	or FAC: 100 (A/B)
Sapling/Shrub Stratum (Plot size: 3m <sup>2</sup>	FF	V		Drevelan en la deu voer	、 ,
	00		FACW	Tetal % Cover of	KSNeet:
2		·			
3		·		FACW species	$x^{2} = 0$
4				FAC species	$x_3 = 0$
J	55	= Total (	Cover	FACU species	x 4 = 0
Herb Stratum (Plot size: 1m^2		i otar t		UPL species	x 5 = 0
1. Ranunculus repens	60	Y	FAC	Column Totals: 0	(A) <u>0</u> (B)
2		·			
3				Prevalence Index	. = B/A =
4		·		Hydrophytic Vegetati	on Indicators:
5				Rapid Test for Hyd	
6				Dominance Test is	>50%
<i>1</i>					3 = 0.0
8				data in Remark	s or on a separate sheet)
9				Wetland Non-Vasc	ular Plants <sup>1</sup>
11		·		Problematic Hydro	phytic Vegetation <sup>1</sup> (Explain)
····	60	= Total (	Cover	<sup>1</sup> Indicators of hydric so	il and wetland hydrology must
Woody Vine Stratum (Plot size: 3m^2			-	be present, unless dist	
1. None				Hydrophytic	
2				Vegetation	
% Bare Ground in Herb Stratum 100	0	= Total C	Cover	Present? Ye	s 🖌 No
Remarks:					

Sampling Point:	S7
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Profile Desc	ription: (Describe	to the dep	oth needed to docum	nent the i	ndicator	or confirm	the absence o	of indicators.)
Depth	Matrix		Redo	x Features	<u>s</u>	2		
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-8	10YR 2/2	95	10YR 4/6	5	С	Μ	Sandy Loam	
8-16	10YR 4/2	70	10YR 4/6	5	С	Μ	Sandy Loam	
		25	5Y 6/1				Sandy Loam	
		. <u></u>				·		
<sup>1</sup> Type: C=Co	oncentration, D=Dep	letion, RM	=Reduced Matrix, CS	S=Covered	l or Coate	ed Sand Gr	ains. <sup>2</sup> Loca	ation: PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators: (Applic	able to all	LRRs, unless other	wise note	ed.)			s for Problematic Hydric Soils":
	(A1) ipedon (A2)		Sandy Redox (S	(S6)				Muck (A10) Parent Material (TE2)
	stic (A3)		Loamv Muckv M	lineral (F1	) (except	MLRA 1)		Shallow Dark Surface (TF12)
	n Sulfide (A4)		Loamy Gleyed N	лаtrix (F2)	) (0.000		Other	(Explain in Remarks)
Depleted	Below Dark Surface	e (A11)	Depleted Matrix	(F3)				· · · /
Thick Da	rk Surface (A12)		Redox Dark Sur	face (F6)			<sup>3</sup> Indicators	s of hydrophytic vegetation and
Sandy M	ucky Mineral (S1)		Depleted Dark S	Surface (F	7)		wetlan	d hydrology must be present,
Sandy G	leyed Matrix (S4)		Redox Depressi	ons (F8)			unless	disturbed or problematic.
Type: n/a	_ayer (if present):							
Denth (in	ches): -							
							Hydric Soli F	
Remarks:								
HYDROLO	GY							
Wetland Hy	drology Indicators:							
Primary India	ators (minimum of o	ne require	d; check all that apply	y)			<u>Second</u>	dary Indicators (2 or more required)
Surface V	Nater (A1)		Water-Stair	ned Leave	s (B9) ( <b>e</b>	xcept MLR	A 🗌 Wa	ter-Stained Leaves (B9) (MLRA 1, 2,
High Wa	ter Table (A2)		1, 2, 4A	A, and 4B)			_	4A, and 4B)
✓ Saturatio	n (A3)		Salt Crust (	(B11)				ainage Patterns (B10)
Water Mater Mater Mater	arks (B1)		Aquatic Inv	ertebrates	s (B13)			-Season Water Table (C2)
Sedimen	t Deposits (B2)			Sulfide Od	or (C1)		Sat	turation Visible on Aerial Imagery (C9)
	OSIIS (B3)			nizospner	es along			omorphic Position (D2)
	t or Crust (B4)			Deduction	a iron (C <sup>2</sup>	t) d Saila (CS)		allow Aquitard (D3)
	Soil Cracks (B6)			Strossod	Dante (D			C-Neutral Test (D5)
	Sull Clacks (DU)	magery (B	7) Other (Evol	Juesseu I	narke)	1) ( <b>LKK A</b> )		est-Heave Hummocks (D7)
	Vegetated Concave	Surface (I			nanxsj			
Field Obser	vations:							
Surface Wat	er Present? Y	es No	Depth (inches	;);				
Water Table	Present? Y	es 🗌 No	Depth (inches	); ;);				
Saturation P	resent? Y	es 🖌 No	Depth (inches	)· 2"		Wetla	and Hydrology	Present? Yes
(includes cap	oillary fringe)							
Describe Re	corded Data (stream	gauge, m	onitoring well, aerial p	photos, pre	evious ins	spections),	if available:	
Remarks:								

Project/Site: #22264 Goat Hill		City/County	: City of Kir	kland	Sampling Date: 11/21/22
Applicant/Owner: CPG Consultants				State: WA	Sampling Point: S8
Investigator(s): <u>MK</u> , AW			Section, To	ownship, Range: <u>Sec 30, 1</u>	wp 26N, Rge 05E, W.M.
Landform (hillslope, terrace, etc.): Hillslope		Local relie	f (concave	, convex, none): <u>None</u>	Slope (%): <u>10%</u>
Subregion (LRR): LRR A	Lat: <u>47.7</u>	0418		Long: <u>122.22447</u>	Datum: NAD83
Soil Map Unit Name: <u>Alderwood gravelly sandy loam, 15 to 3</u>	30 percent sl	opes		NWI classifica	tion: N/A
Are climatic / hydrologic conditions on the site typical for this Are Vegetation, Soil, or Hydrology signif Are Vegetation, Soil, or Hydrology natura SUMMARY OF FINDINGS – Attach site map	s time of yea ficantly distu ally problema <b>showing</b>	ar? Yes rbed? atic? samplin	No (I Are "Nor (If needed g point I	If no, explain in Remarks.) mal Circumstances" prese d, explain any answers in I ocations, transects	nt? Yes  No Remarks.) important features, etc.
Hydrophytic Vegetation Present?       Yes       No         Hydric Soil Present?       Yes       No         Wetland Hydrology Present?       Yes       No         Remarks:       Data taken out of Wetland D. It was determined	d using a	Is the with	e Sampled in a Wetlar	I Area nd? Yes N	o
to the November 2022 inspection were signific	antly drie	r than the	30-year	average.	three months leading up
VEGETATION – Use scientific names of plan	lts.				
Tree Stratum       (Plot size: 5m^2         1.       Acer macrophyllum         2.	Absolute <u>% Cover</u> 45	Dominant Species? Y	Indicator Status FACU	Dominance Test works Number of Dominant Sp That Are OBL, FACW, of Total Number of Dominis Species Across All Stra	sheet: pecies or FAC: 0 (A) ant ta: 2 (B)
Sapling/Shrub Stratum (Plot size: 3m^2	45	= Total Co	over	That Are OBL, FACW, o	r FAC: <u>50</u> (A/B)
2 3 4 5	  0	= Total Co		Total % Cover of:         OBL species         FACW species         FAC species         120         FACU species	
Herb Stratum         (Plot size: 1m^2           1.         Helix hedera           2.	40	Y	FACU	UPL species Column Totals: 190 Prevalence Index	x 5 = 0  (A) 640 (B)  = B/A = 3.4  (B)
4.         5.         6.         7.         8.         9.         10.         11.	65			Hydrophytic Vegetation Rapid Test for Hydr Dominance Test is 3 Prevalence Index is Morphological Adap data in Remarks Wetland Non-Vascu Problematic Hydrop <sup>1</sup> Indicators of hydric soil be present, unless distu	n Indicators: ophytic Vegetation >50% ≤3.0 <sup>1</sup> tations <sup>1</sup> (Provide supporting or on a separate sheet) lar Plants <sup>1</sup> hytic Vegetation <sup>1</sup> (Explain) and wetland hydrology must rbed or problematic.
Woody Vine Stratum       (Plot size: 3m^2         1.       None         2.	0	 = Total Co	over	Hydrophytic Vegetation Present? Yes	. No 🗸

#### SOIL

#### ATTACHMENT 4

Profile Des	cription: (Describe	to the dept	h needed to docum	ent the i	ndicator	or confirm	the absence	of indicators.)
Depth	Matrix		Redox	Features	<u>s</u>			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-16	10YR 3/2	100					Sandy Loam	
		·		-				
		·			·			
<sup>1</sup> T			Deduced Metric CC				21 -	
Type: C=C	Indicators: (Applic	able to all	Reduced Matrix, CS	=Covered	d or Coate	d Sand Gra	ains. Loo Indicato	rs for Problematic Hydric Soils <sup>3</sup>
			Condy Bodoy (S)	wise note	eu.)			Muck (A10)
	(AT) pipedon (A2)		Stripped Matrix (	5) S6)				Parent Material (TE2)
	stic (A3)		Loamy Mucky M	ineral (F1	) (excent	MI RA 1)		Shallow Dark Surface (TF12)
	n Sulfide (A4)		Loamy Gleved N	latrix (F2)			✓ Othe	er (Explain in Remarks)
Depleted	d Below Dark Surfac	e (A11)	Depleted Matrix	(F3) `´				, , , , , , , , , , , , , , , , , , ,
Thick Da	ark Surface (A12)		Redox Dark Surf	ace (F6)			<sup>3</sup> Indicato	rs of hydrophytic vegetation and
Sandy N	lucky Mineral (S1)		Depleted Dark S	urface (F	7)		wetla	nd hydrology must be present,
Sandy G	leyed Matrix (S4)		Redox Depression	ons (F8)			unles	s disturbed or problematic.
Restrictive	Layer (if present):							
Type:	· · · · ·							
Depth (in	ches):						Hydric Soil	Present? Yes No
Remarks:								
HYDROLO	GY							
Wetland Hy	drology Indicators:							
Primary Indi	cators (minimum of o	one required	· check all that apply	')			Secor	ndary Indicators (2 or more required)
	Water (A1)		Water-Stain	, ed Leave	es (B9) (ex	cent MI R		ater-Stained Leaves (B9) ( <b>MLRA 1 2</b>
	iter Table (A2)			and 4R)				44 and 48)
	$\frac{1}{2} (A3)$			, and 40, R11)				rainage Patterns (B10)
Water M	arks (B1)			ertebrates	s (B13)			v-Season Water Table (C2)
	at Deposits (B2)		Hydrogen S	ulfide Od	or $(C1)$			aturation Visible on Aerial Imagery (C9)
	(B3)			nizospher	es along l	iving Root	s (C3)	eomorphic Position (D2)
	at or Crust (B4)		Presence or	f Reduced	d Iron (C4	)		nallow Aguitard (D3)
	osits (B5)		Recent Iron	Reductio	on in Tilled	,   Soils (C6)		AC-Neutral Test (D5)
Surface	Soil Cracks (B6)		Stunted or S	Stressed	Plants (D1	) (LRR A)		aised Ant Mounds (D6) ( <b>LRR A</b> )
Inundatio	on Visible on Aerial I	magery (B7	) 🗍 Other (Expl	ain in Rer	marks)	,, ,	Fr Fr	ost-Heave Hummocks (D7)
Sparsely	Vegetated Concave	e Surface (B	8)		,		_	× ,
Field Obser	vations:	,	,					
Surface Wat	er Present?	′es∏ No	Depth (inches)	:				
Water Table	Present?	′es∏ No	Depth (inches)	:				
Saturation P	resent?		Depth (inches)			Wotla	and Hydrology	
(includes ca	pillary fringe)					wend	and Hydrolog	
Describe Re	corded Data (stream	n gauge, mo	nitoring well, aerial p	hotos, pre	evious ins	pections), i	if available:	
Remarks:								

**APPENDIX B:** 

#### **DEPARTMENT OF ECOLOGY 2014 RATING FORMS AND FIGURES**

# **RATING SUMMARY – Western Washington**

Name of wetland (or ID #): Wetland A Date of site visit: 11/21/22

Rated by MK, AW \_\_\_\_\_ Trained by Ecology? ✓ Yes \_\_\_\_ No Date of training 3/15

HGM Class used for rating DEPRESSIONAL Wetland has multiple HGM classes? Y V N

**NOTE**: Form is not complete without the figures requested (figures can be combined). Source of base aerial photo/map ESRI, King Co.

**OVERALL WETLAND CATEGORY** []] (based on functions **/** or special characteristics\_\_\_)

## 1. Category of wetland based on FUNCTIONS

**\_\_\_\_Category I** – Total score = 23 - 27

\_\_\_\_\_Category II – Total score = 20 - 22

✓ Category III – Total score = 16 - 19

**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality		Hydrologic			Habitat				
	Circle the appropriate ratings									
Site Potential	Н	Μ	L	Н	Μ	L	Н	М	L	
Landscape Potential	Н	Μ	L	Н	Μ	L	Н	Μ	L	
Value	Н	Μ	L	Н	Μ	L	Н	Μ	L	TOTAL
Score Based on Ratings		7			7			5		19

Score for each function based on three ratings (order of ratings is not important)

9 = H,H,H 8 = H,H,M 7 = H,H,L 7 = H,M,M 6 = H,M,L 6 = M,M,M 5 = H,L,L 5 = M,M,L 4 = M,L,L

3 = L,L,L

# 2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY					
Estuarine	Ι	II				
Wetland of High Conservation Value		Ι				
Bog	Ι					
Mature Forest		Ι				
Old Growth Forest		Ι				
Coastal Lagoon	Ι	II				
Interdunal	I II	III IV				
None of the above						

# Maps and figures required to answer questions correctly for Western Washington

#### **Depressional Wetlands**

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	1
Hydroperiods	D 1.4, H 1.2	1
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	1
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	1
Map of the contributing basin	D 4.3, D 5.3	2
1 km Polygon: Area that extends 1 km from entire wetland edge - including	Н 2.1, Н 2.2, Н 2.3	2
polygons for accessible habitat and undisturbed habitat		2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	4

#### **Riverine Wetlands**

Map of:	To answer questions:	Figure #
Cowardin plant classes	Н 1.1, Н 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (can be added to another figure)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	Н 2.1, Н 2.2, Н 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

#### Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	Н 2.1, Н 2.2, Н 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

#### Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	Н 1.1, Н 1.4	
Hydroperiods	H 1.2	
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

# HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

NO – go to 2

**YES** – the wetland class is **Tidal Fringe** – go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

**NO – Saltwater Tidal Fringe (Estuarine)** If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

NO – go to 3 **YES** – The wetland class is **Flats** If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria? The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size; At least 30% of the open water area is deeper than 6.6 ft (2 m).

NO - go to 4

**YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?

The wetland is on a slope (*slope can be very gradual*),

The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,

The water leaves the wetland **without being impounded**.

NO – go to 5

**YES** – The wetland class is **Slope** 

**NOTE**: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?

The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river.

The overbank flooding occurs at least once every 2 years.

# **YES - Freshwater Tidal Fringe**

Wetland name or number <u>A</u>

NO – go to 6 YES – The wetland class is **Riverine** NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.* 

NO – go to 7

YES – The wetland class is Depressional

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO - go to 8

YES – The wetland class is Depressional

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

**NOTE**: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream	Depressional
within boundary of depression	
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other	Treat as
class of freshwater wetland	ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

DEPRESSIONAL AND FLATS WETLANDS		
Water Quality Functions - Indicators that the site functions to improve water quality		
D 1.0. Does the site have the potential to improve water quality?		
D 1.1. Characteristics of surface water outflows from the wetland:		
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no out	tlet).	
poin Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outle poin	nts = 3 et. <b>2</b> nts = 2	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing poin Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. poin	nts = 1 nts = 1	
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). Yes = 4	No = 0 0	
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin	classes):	
✓ Wetland has persistent, ungrazed, plants > 95% of area point	nts = 5	
$\square$ Wetland has persistent, ungrazed, plants > $\frac{1}{2}$ of area poin	nts = 3 <b>5</b>	
$\Box$ Wetland has persistent, ungrazed plants > $1/10$ of area poin	nts = 1	
$\square$ Wetland has persistent, ungrazed plants < <sup>1</sup> / <sub>10</sub> of area poin	nts = 0	
D 1.4. Characteristics of seasonal ponding or inundation:		
This is the area that is ponded for at least 2 months. See description in manual.		
Area seasonally ponded is > ½ total area of wetland poin	nts = 4 <b>4</b>	
Area seasonally ponded is > ¼ total area of wetland poin	nts = 2	
Area seasonally ponded is < ¼ total area of wetland poin	nts = 0	
Total for D 1Add the points in the boxes a	above <b>11</b>	

#### Rating of Site Potential If score is: 12-16 = H $\checkmark$ 6-11 = M \_\_\_\_\_0-5 = L Record the rating on the first page

D 2.0. Does the landscape have the potential to support the water quality function of the site?		
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	0	
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1	
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0	
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? SourceYes = 1 No = 0	0	
Total for D 2Add the points in the boxes above	1	

Rating of Landscape Potential If score is: 3 or 4 = H / 1 or 2 = M 0 = L Record the rating on the first page

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (answer YES if there is a TMDL for the basin in which the unit is found)? Yes = 2 No = 0	
Total for D 3Add the points in the boxes above	4
Rating of Value       If score is:        2-4 = H       1 = M       0 = L       Record the rating on the first page	

Wetland name or number **A** 

DEPRESSIONAL AND FLATS WETLANDS		
Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation	ion	
D 4.0. Does the site have the potential to reduce flooding and erosion?		
D 4.1. Characteristics of surface water outflows from the wetland:	2	
<ul> <li>D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.</li> <li>Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7</li> <li>Marks of ponding between 2 ft to &lt; 3 ft from surface or bottom of outlet points = 5</li> <li>Marks are at least 0.5 ft to &lt; 2 ft from surface or bottom of outlet points = 3</li> <li>The wetland is a "headwater" wetland points = 1</li> <li>Wetland is flat but has small depressions on the surface that trap water points = 1</li> <li>Marks of ponding less than 0.5 ft (6 in)</li> </ul>	3	
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.         □ The area of the basin is less than 10 times the area of the unit       points = 5         □ The area of the basin is 10 to 100 times the area of the unit       points = 3         □ The area of the basin is more than 100 times the area of the unit       points = 0         □ The area of the basin is in the Flats class       points = 5	3	
Total for D 4   Add the points in the boxes above	8	
<b>Rating of Site Potential</b> If score is: $12-16 = H \checkmark 6-11 = M \_ 0-5 = L$ Record the rating on the	first page	
D 5.0. Does the landscape have the potential to support hydrologic functions of the site?		
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0	
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? $Yes = 1$ No = 0	1	
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	1	
Total for D 5Add the points in the boxes above	2	
Rating of Landscape Potential       If score is:3 = H1 or 2 = M0 = L       Record the rating on the	first page	
D 6.0. Are the hydrologic functions provided by the site valuable to society?	-	
<ul> <li>D 6.1. The unit is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met. The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):</li> <li> <ul> <li>Flooding occurs in a sub-basin that is immediately down-gradient of unit.</li> <li>points = 2</li> <li>Surface flooding problems are in a sub-basin farther down-gradient.</li> <li>points = 1</li> <li>Flooding from groundwater is an issue in the sub-basin.</li> <li>points = 1</li> <li>The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. <i>Explain why</i> points = 0</li> </ul> </li> </ul>	2	
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0	
Total for D 6 Add the points in the boxes above	2	

Rating of Value If score is:  $\checkmark$  2-4 = H \_\_\_\_1 = M \_\_\_0 = L

These questions apply to wetlands of all HGM classes.	
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	-
H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.        Aquatic bed       4 structures or more: points = 4        Emergent       3 structures: points = 2        Scrub-shrub (areas where shrubs have > 30% cover)       2 structures: points = 1        Forested (areas where trees have > 30% cover)       1 structure: points = 0         If the unit has a Forested class, check if:      The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover)         that each cover 20% within the Forested polygon       1 structures	0
H 1.2. Hydroperiods	
Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (see text for descriptions of hydroperiods).        Permanently flooded or inundated       4 or more types present: points = 3        Seasonally flooded or inundated       3 types present: points = 2        Occasionally flooded or inundated       2 types present: points = 1        Saturated only       1 type present: points = 0        Permanently flowing stream or river in, or adjacent to, the wetland       2 points        Seasonally flowing stream in, or adjacent to, the wetland       2 points        Seasonally flowing stream in, or adjacent to, the wetland       2 points	0
H 1.3. Richness of plant species         Count the number of plant species in the wetland that cover at least 10 ft <sup>2</sup> .         Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.         Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle         If you counted: > 19 species         5 - 19 species         < 5 species	1
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. <i>If you</i> <i>have four or more plant classes or three classes and open water, the rating is always high.</i> None = 0 points Low = 1 point All three diagrams in this row are HIGH = 3points	0

H 1.5. Special habitat features:	
<ul> <li>Check the habitat features that are present in the wetland. <i>The number of checks is the number of points</i>.</li> <li>Large, downed, woody debris within the wetland (&gt; 4 in diameter and 6 ft long).</li> <li>Standing snags (dbh &gt; 4 in) within the wetland</li> <li>Undercut banks are present for at least 6.6 ft (2 m) <b>and/or</b> overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)</li> <li>Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)</li> <li>At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)</li> <li>Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</li> </ul>	0
Total for H 1 Add the points in the boxes above	1

Rating of Site Potential If score is: \_\_\_15-18 = H \_\_\_7-14 = M \_\_\_0-6 = L

Record the rating on the first page

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat that directly abuts wetland unit).	
<i>Calculate:</i> % undisturbed habitat <u>0</u> + [(% moderate and low intensity land uses)/2] <u>0</u> = <u>0</u> %	
If total accessible habitat is:	
$\square > 1/3$ (33.3%) of 1 km Polygon points = 3	0
20-33% of 1 km Polygon points = 2	
points = 1	
< 10% of 1 km Polygonpoints = 0	
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.	
<i>Calculate:</i> % undisturbed habitat $\frac{10}{10}$ + [(% moderate and low intensity land uses)/2] $\frac{5}{5}$ = $\frac{16}{3}$ %	
Undisturbed habitat > 50% of Polygon points = 3	
Undisturbed habitat 10-50% and in 1-3 patches points = 2	1
Undisturbed habitat 10-50% and > 3 patches points = 1	
Undisturbed habitat < 10% of 1 km Polygon points = 0	
H 2.3. Land use intensity in 1 km Polygon: If	
> 50% of 1 km Polygon is high intensity land usepoints = (- 2)	-2
$1 \le 50\%$ of 1 km Polygon is high intensity points = 0	
Total for H 2Add the points in the boxes above	-1
Rating of Landscape Potential If score is:4-6 = H1-3 = M< < 1 = L Record the rating on the	

H 3.0. Is the habitat provided by the site valuable to society?		
<ul> <li>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the that applies to the wetland being rated.</i></li> <li>Site meets ANY of the following criteria: <ul> <li>It has 3 or more priority habitats within 100 m (see next page)</li> <li>It provides habitat for Threatened or Endangered species (any plant or animal on the state)</li> <li>It is mapped as a location for an individual WDFW priority species</li> <li>It is a Wetland of High Conservation Value as determined by the Department of Natural Reference in the state of the state in a local or regional comprehensive postoreline Master Plan, or in a watershed plan</li> <li>Site has 1 or 2 priority habitats (listed on next page) within 100 m</li> </ul> </li> </ul>	he highest score points = 2 e or federal lists) esources lan, in a points = 1 points = 0	2
Rating of Value If score is: 2 = H1 = M0 = L Re	cord the rating on	the first page

# **WDFW Priority Habitats**

<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. <u>http://wdfw.wa.gov/publications/00165/wdfw00165.pdf</u> or access the list from here: <u>http://wdfw.wa.gov/conservation/phs/list/</u> )
Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: <b>NOTE:</b> This question is independent of the land use between the wetland unit and the priority habitat.
<b>Aspen Stands:</b> Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
<b>Biodiversity Areas and Corridors</b> : Areas of habitat that are relatively important to various species of native fish and wildlife ( <i>full descriptions in WDFW PHS report</i> ).
Herbaceous Balds: Variable size patches of grass and forbs on shallow soils over bedrock.
<b>Old-growth/Mature forests:</b> <u>Old-growth west of Cascade crest</u> – Stands of at least 2 tree species, forming a multi- layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. <u>Mature forests</u> – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
<b>Oregon White Oak:</b> Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important ( <i>full descriptions in WDFW PHS report p. 158 – see web link above</i> ).
✔ Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
<b>Westside Prairies:</b> Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie ( <i>full descriptions in WDFW PHS report p. 161 – see web link above</i> ).
✓ <b>Instream:</b> The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
<b>Nearshore</b> : Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. ( <i>full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page</i> ).
<b>Caves:</b> A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
<b>Cliffs:</b> Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
<b>Talus:</b> Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
✓ Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
<b>Note:</b> All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number **A** 

# **CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

Wetland Type	Category
Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met	
SC 1.0. Estuarine wetlands	
Does the wetland meet the following criteria for Estuarine wetlands?	
The dominant water regime is tidal,	
Vegetated, and	
With a salinity greater than 0.5 ppt Yes –Go to <b>SC 1.1</b> No= <b>Not an estuarine wetland</b>	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area	
Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?	
Yes = Category I No - Go to SC 1.2	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?	
The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less	
than 10% cover of non-native plant species. (If non-native species are Spartina, see page 25)	
At least % of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-	
The wetland has at least two of the following features: tidal channels, depressions with open water, or	Cat. II
contiguous freshwater wetlands. Yes = Category I No = Category II	
SC 2.0. Wetlands of High Conservation Value (WHCV)	
SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High	Cat. I
SC 2.2 Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?	
Yes = Category I No = Not a WHCV	
SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?	
http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf	
Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV	
SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on	
their website? Yes = Category I No = Not a WHCV	
SC 3.0. Bogs	
below. If you answer VES you will still need to rate the wetland based on its functions	
SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or	
more of the first 32 in of the soil profile? Yes – Go to SC 3.3 No – Go to SC 3.2	
SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep	
over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or	
pond? Yes – Go to SC 3.3 No = Is not a bog	
SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30%	
Cover of plant species listed in Table 4? Yes = <b>Is a Category I bog</b> NO – Go to <b>SC 3.4</b>	
measuring the nH of the water that seens into a hole dug at least 16 in deep. If the nH is less than 5.0 and the	
plant species in Table 4 are present, the wetland is a bog.	
SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar,	
western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the	
species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?	
Yes = Is a Category I bog No = Is not a bog	

SC 4.0. Forested Wetlands	
Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA	
Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate</i>	
Old-growth forests (west of Cascade crest): Stands of at least two tree species forming a multi-layered	
canopy with occasional small openings: with at least 8 trees/ac (20 trees/ha) that are at least 200 years of	
age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.	
Mature forests (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the	
species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).	
Yes = Category I No = Not a forested wetland for this section	Cat. I
SC 5.0. Wetlands in Coastal Lagoons	
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?	
The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from	
marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks	
The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt)	Cat
during most of the year in at least a portion of the lagoon (needs to be measured near the bottom)	Cat. I
$\frac{1}{100} = \frac{1}{100} = \frac{1}$	
The wetland is relatively undisturbed (has no diking ditching filling cultivation grazing) and has less	
than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).	
At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-	
mowed grassland.	
The wetland is larger than $1/_{10}$ ac (4350 ft <sup>2</sup> )	
Yes = Category I No = Category II	
SC 6.0. Interdunal Wetlands	
Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? If	
you answer yes you will still need to rate the wetland based on its habitat functions.	
In practical terms that means the following geographic areas:	
Long Beach Peninsula: Lands west of SR 103	Catl
Grayland-Westport: Lands West of SR 105	Cati
Vec = Go to SC 6.1 No = not an interdupal wetland for rating	
SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M	Cat. II
for the three aspects of function)? Yes = Category I No – Go to SC 6.2	
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?	<b>.</b>
Yes = Category II No – Go to SC 6.3	Cat. III
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?	
Yes = <b>Category III</b> No = <b>Category IV</b>	Cat. IV
Category of wetland based on Special Characteristics	
Category or westally based on special characteristics	

If you answered No for all types, enter "Not Applicable" on Summary Form

# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 1- WETLAND A

ATTACHMENT 4




# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 2- WETLAND A



# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 3- WETLAND A

ATTACHMENT 4



AQUATIC RESOURCES ON THE 303(d) LIST

Wetland Resources, Inc. Defineation / Mitigation / Restoration / Habitat Creation / Permit Assistance 9505 19th Avenue S.E. Suite 106 Everett. Washington 98208 Phone: (425) 337-3174 Fax: (425) 337-3045 Email: mailbox@wetlandresources.com

WETLAND RATING Wetland A

Figure A-3 WRI Job # 22264 Rated by: AW

# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 4- WETLAND A

#### WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (<u>WRIA</u>). Please use links (where available) for more information on a project.

#### Counties

- King
- Snohomish



Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan
	Dissolved Oxygen Temperature	Approved by EPA	425-649-4425
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	<u>Tricia Shoblom</u> 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	<u>Joan Nolan</u> 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svricek 425-649-7036
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036
Pipers Creek	Fecal Coliform	Approved by EPA	<u>Joan Nolan</u> 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Field work starts summer 2015	Ralph Svrjcek 425-649-7036
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svricek 425-649-7036

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#### WETLAND RATING Wetland A

Figure A-4 WRI Job # 22264 Rated by: AW

# **RATING SUMMARY – Western Washington**

Name of wetland (or ID #): Wetland B \_\_\_\_\_ Date of site visit: 11/21/22 Rated by MK, AW Trained by Ecology? 🖌 Yes \_\_\_\_ No Date of training\_3/15

HGM Class used for rating RIVERINE \_\_\_\_\_ Wetland has multiple HGM classes?\_\_\_Y ⊻ N

**NOTE:** Form is not complete without the figures requested (figures can be combined). Source of base aerial photo/map ESRI, King Co.

**OVERALL WETLAND CATEGORY II** (based on functions  $\checkmark$  or special characteristics )

#### 1. Category of wetland based on FUNCTIONS

Category I – Total score = 23 - 27

✓ Category II – Total score = 20 - 22

**Category III** – Total score = 16 - 19

**Category IV** – Total score = 9 - 15

FUNCTION	lr Wa	nprov ter Q	ving uality	Hy	/drolo	ogic		Habita	at	
		Circle the appropriate ratings								
Site Potential	Н	Μ	L	Н	Μ	L	Н	М	L	
Landscape Potential	Н	Μ	L	Η	М	L	Н	Μ	L	
Value	Η	Μ	L	Η	Μ	L	Н	Μ	L	ΤΟΤΑ
Score Based on Ratings		8			8			4		20

Score for each function based on three ratings (order of ratings ìs not *important*)

9 = H, H, H8 = H, H, M7 = H, H, L7 = H, M, M6 = H, M, L6 = M, M, M5 = H,L,L 5 = M,M,L

4 = M, L, L3 = L,L,L

AL

## 2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY	
Estuarine	Ι	II
Wetland of High Conservation Value	I	
Bog		Ι
Mature Forest	I	
Old Growth Forest		I
Coastal Lagoon	Ι	II
Interdunal	I II	III IV
None of the above		

# Maps and figures required to answer questions correctly for Western Washington

#### **Depressional Wetlands**

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

#### Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (can be added to another figure)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

#### Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	Н 2.1, Н 2.2, Н 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

#### Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of <b>dense</b> trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	
(can be added to figure above)		
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland Rating System for Western WA: 2014 Update Rating Form – Effective January 1, 2015

# HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

NO – go to 2

**YES** – the wetland class is **Tidal Fringe** – go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

NO – Saltwater Tidal Fringe (Estuarine) If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

NO - go to 3**YES** – The wetland class is **Flats** If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria? The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size; At least 30% of the open water area is deeper than 6.6 ft (2 m).

NO – go to 4

**YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?

The wetland is on a slope (*slope can be very gradual*),

The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks, The water leaves the wetland **without being impounded**.

NO – go to 5

**YES** – The wetland class is **Slope** 

**NOTE**: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?

The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river.

The overbank flooding occurs at least once every 2 years.

#### **YES - Freshwater Tidal Fringe**

NO – go to 6 **YES** – The wetland class is **Riverine NOTE**: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.* 

NO – go to 7

#### YES – The wetland class is Depressional

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8

YES – The wetland class is Depressional

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

**NOTE**: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream	Depressional
within boundary of depression	
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other	Treat as
class of freshwater wetland	ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

#### **RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS**

#### Water Quality Functions - Indicators that the site functions to improve water quality

R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event:	
Depressions cover $>^{3}/_{4}$ area of wetland points = 8	
Depressions cover > 1/2 area of wetland points = 4	0
Depressions present but cover < ½ area of wetland points = 2	
No depressions present points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, <b>not</b> Cowardin classes)	
Trees or shrubs > $^{2}/_{3}$ area of the wetland points = 8	
Trees or shrubs > $^{1}/_{3}$ area of the wetland points = 6	8
Herbaceous plants (> 6 in high) > $^{2}/_{3}$ area of the wetland points = 6	0
Herbaceous plants (> 6 in high) > $\frac{1}{_3}$ area of the wetland points = 3	
Trees, shrubs, and ungrazed herbaceous $< \frac{1}{3}$ area of the wetland points = 0	
Total for R 1Add the points in the boxes above	8

Rating of Site Potential If score is: 12-16 = H 🖌 6-11 = M \_\_\_\_0-5 = L

Record the rating on the first page

R 2.0. Does the landscape have the potential to support the water quality function of the site?			
R 2.1. Is the wetland within an incorporated city or within its UGA? Yes = 2 No = 0	2		
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area? Yes = 1 No = 0	1		
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 No = 0	0		
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? $Yes = 1$ No = 0	1		
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4         Other sources       Yes = 1	0		
Total for R 2Add the points in the boxes above	4		
Rating of Landscape Potential If score is: <u>·</u> 3-6 = H1 or 2 = M0 = L Record the rating on	the first page		

R 3.0. Is the water quality improvement provided by the site valuable to society?		
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one with Yes = :	thin 1 mi? 1 No = 0	0
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? Yes = 1	1 No = 0	0
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality?         YES if there is a TMDL for the drainage in which the unit is found)	<u>(answer</u> 2 No = 0	2
Total for R 3Add the points in the box	es above	2

Rating of Value If score is: <u></</u>2-4 = H <u>1</u> = M <u>0</u> = L

Record the rating on the first page

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS		
Hydrologic Functions - Indicators that site functions to reduce flooding and stream erosio	n	
R 4.0. Does the site have the potential to reduce flooding and erosion?		
R 4.1. Characteristics of the overbank storage the wetland provides:		
Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the		
stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average		
width of stream between banks).		
If the ratio is more than 20 points = 9	2	
If the ratio is 10-20 points = 6		
If the ratio is 5-<10 points = 4		
✓ If the ratio is 1-<5 points = 2		
If the ratio is < 1 points = 1		
R 4.2. Characteristics of plants that slow down water velocities during floods: Treat large woody debris as forest or		
shrub. Choose the points appropriate for the best description (polygons need to have >90% cover at person		
height. These are <u>NOT Cowardin</u> classes).	-	
Forest or shrub for $>^{1}/_{3}$ area OR emergent plants $>^{2}/_{3}$ area points = 7	/	
Forest or shrub for $> \frac{1}{10}$ area OR emergent plants $> \frac{1}{3}$ area points = 4		
Plants do not meet above criteria points = 0		
Total for R 4 Add the points in the boxes above	9	
<b>Rating of Site Potential</b> If score is: $12-16 = H \checkmark 6-11 = M = 0-5 = L$	he first page	
	ine jihet paige	
R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	-	
R 5.1. Is the stream or river adjacent to the wetland downcut? Yes = $0$ No = 1	1	
R 5.2. Does the up-gradient watershed include a UGA or incorporated area? Yes = 1 No = 0	1	
R 5.3. Is the up-gradient stream or river controlled by dams? Yes = 0 No = 1	1	
Total for R 5Add the points in the boxes above	3	
<b>Rating of Landscape Potential</b> If score is: $\checkmark$ 3 = H1 or 2 = M0 = L Record the rating on t	he first page	
R 6.0. Are the hydrologic functions provided by the site valuable to society?		
R 6.1. Distance to the nearest areas downstream that have flooding problems?		
Choose the description that best fits the site.		
The sub-basin immediately down-gradient of the wetland has flooding problems that result in damage to		
human or natural resources (e.g., houses or salmon redds) points = 2	2	
Surface flooding problems are in a sub-basin farther down-gradient points = 1		
No flooding problems anywhere downstream points = 0		
K 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	0	
Yes = 2 <u>No = 0</u>		
Total for R 6     Add the points in the boxes above	2	
Rating of Value If score is: <u>2</u> -4 = H <u>1</u> = M <u>0</u> = L Record the rating on t	he first page	

These questions apply to wetlands of all HGM classes.	
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.        Aquatic bed       4 structures or more: points = 4        Emergent       3 structures: points = 2        Scrub-shrub (areas where shrubs have > 30% cover)       2 structures: points = 1        Forested (areas where trees have > 30% cover)       1 structure: points = 0         If the unit has a Forested class, check if:      The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover)         that each cover 20% within the Forested polygon       1 structures	1
H 1.2. Hydroperiods	
Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (see text for descriptions of hydroperiods).        Permanently flooded or inundated       4 or more types present: points = 3        Seasonally flooded or inundated       3 types present: points = 2        Occasionally flooded or inundated       2 types present: points = 1        Saturated only       1 type present: points = 0        Permanently flowing stream or river in, or adjacent to, the wetland       2 points        Seasonally flowing stream in, or adjacent to, the wetland       2 points        Seasonally flowing stream in, or adjacent to, the wetland       2 points	1
H 1.3. Richness of plant species         Count the number of plant species in the wetland that cover at least 10 ft <sup>2</sup> .         Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.         Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle         If you counted: > 19 species         5 - 19 species         < 5 species	1
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. <i>If you</i> <i>have four or more plant classes or three classes and open water, the rating is always high.</i> None = 0 points All three diagrams in this row are HIGH = 3points	1

- 1

H 1.5. Special habitat features:	
<ul> <li>Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></li> <li>Large, downed, woody debris within the wetland (&gt; 4 in diameter and 6 ft long).</li> <li>Standing snags (dbh &gt; 4 in) within the wetland</li> <li>Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)</li> <li>Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)</li> <li>At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)</li> <li>Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</li> </ul>	1
Total for H 1Add the points in the boxes above	5
Rating of Site Potential If score is:       15-18 = H       7-14 = M       ✓       0-6 = L       Record the rating on the standard sta	the first page
H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat that directly abuts wetland unit).	

H 2.1. Accessible habitat (include only habitat that directly abuts wetland unit).	
Calculate: % undisturbed habitat <u>0</u> + [(% moderate and low intensity land uses)/2] <u>0</u> = <u>0</u> %	
If total accessible habitat is:	
1/3 (33.3%) of 1 km Polygon points = 3	0
20-33% of 1 km Polygon points = 2	
Direction points = 1	
✓< 10% of 1 km Polygonpoints = 0	
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.	
Calculate: % undisturbed habitat <u>8</u> + [(% moderate and low intensity land uses)/2] <u>5</u> = <u>13</u> %	
Undisturbed habitat > 50% of Polygon points = 3	
Undisturbed habitat 10-50% and in 1-3 patches points = 2	1
✓ Undisturbed habitat 10-50% and > 3 patches points = 1	
Undisturbed habitat < 10% of 1 km Polygon points = 0	
H 2.3. Land use intensity in 1 km Polygon: If	
✓ > 50% of 1 km Polygon is high intensity land use points = (- 2)	-2
$\leq$ 50% of 1 km Polygon is high intensity points = 0	
Total for H 2 Add the points in the boxes above	-1
<b>Rating of Landscape Potential</b> If score is:4-6 = H1-3 = M	he first page

H 3.0. Is the habitat provided by the site valuable to society?	
<ul> <li>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the highest score that applies to the wetland being rated.</i></li> <li>Site meets ANY of the following criteria: points = 2</li> <li>It has 3 or more priority habitats within 100 m (see next page)</li> <li>It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)</li> <li>It is mapped as a location for an individual WDFW priority species</li> <li>It is a Wetland of High Conservation Value as determined by the Department of Natural Resources</li> <li>It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan</li> <li>✓ Site has 1 or 2 priority habitats (listed on next page) within 100 m</li> </ul>	1
<b>Rating of Value</b> If score is: $2 = H$ $\checkmark$ $1 = M$ $0 = L$ Record the rating on	the first page

# **WDFW Priority Habitats**

<u>Priority habitats listed by WDFW</u> (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington.
177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here:
<u>http://wurw.wa.gov/conservation/piis/list/j</u>
Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: <b>NOTE:</b> This question is independent of the land use between the wetland unit and the priority habitat.
<b>Aspen Stands:</b> Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
<b>Biodiversity Areas and Corridors</b> : Areas of habitat that are relatively important to various species of native fish and wildlife ( <i>full descriptions in WDFW PHS report</i> ).
Herbaceous Balds: Variable size patches of grass and forbs on shallow soils over bedrock.
<b>Old-growth/Mature forests:</b> <u>Old-growth west of Cascade crest</u> – Stands of at least 2 tree species, forming a multi- layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. <u>Mature forests</u> – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
<b>Oregon White Oak:</b> Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important ( <i>full descriptions in WDFW PHS report p. 158 – see web link above</i> ).
✔ Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
<b>Westside Prairies:</b> Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie ( <i>full descriptions in WDFW PHS report p. 161 – see web link above</i> ).
✓ Instream: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
<b>Nearshore</b> : Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. ( <i>full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).</i>
<b>Caves:</b> A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
<b>Cliffs:</b> Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
<b>Talus:</b> Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
<b>Snags and Logs:</b> Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
<b>Note:</b> All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.         SC 1.0. Estuarine wetlands
SC 1.0. Estuarine wetlands         Does the wetland meet the following criteria for Estuarine wetlands?         The dominant water regime is tidal,         Vegetated, and         With a salinity greater than 0.5 ppt         Yes –Go to SC 1.1         No= Not an estuarine wetland         SC 1.2. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area         Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?         Yes = Category I       No - Go to SC 1.2         SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?         The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are Spartina, see page 25)         At least % of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.         The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.         Yes = Category I       No = Category II         Cat. II       SC 2.0. Wetlands of High Conservation Value (WHCV)         SC 2.1. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?       Yes = Category I       No = Not a WHCV         SC 2.2. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?
Does the wetland meet the following criteria for Estuarine wetlands?       Image: Category I and the preserve is tidal,         Degetated, and       With a salinity greater than 0.5 ppt       Yes –Go to SC 1.1       No= Not an estuarine wetland         SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?       Cat. I         SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?       Cat. I         The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are Spartina, see page 25)       Cat. I         At least X of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.       Cat. II         Contiguous freshwater wetlands.       Yes = Category I       No = Category II         SC 2.0. Wetlands of High Conservation Value (WHCV)       Sc 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       Yes – Go to SC 2.2       No – Go to SC 2.3         Sc 1.2. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       No = Not a WHCV       Cat. I         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       No = Not a WHCV       Sc 2.4. Has WDNR identified the wetland within the
The dominant water regime is tidal,       Vegetated, and       No=Not an estuarine wetland         With a salinity greater than 0.5 ppt       Yes -Go to SC 1.1       No=Not an estuarine wetland         SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category 1       No - Go to SC 1.2       Cat. I         SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?       Cat. I       Cat. I         The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are Spartina, see page 25)       Cat. I         At least % of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un- mowed grassland.       Cat. II         The wetland of High Conservation Value (WHCV)       Sc 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       Yes - Go to SC 2.2       No - Go to SC 2.3         Sc 2.2. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       Yes - Contact WNHP/WDNR and go to SC 2.4       No = Not a WHCV         Sc 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       Yes - Contact WNHP/WDNR and go to SC 2.4       No = Not a WHCV         Sc 2.4. Has WDNR identified the wetland within the S/T
Vegetated, and       With a salinity greater than 0.5 ppt       Yes -Go to SC 1.1       No= Not an estuarine wetland         SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category 1       No - Go to SC 1.2       Cat. I         SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?       Scientific Reserve designated under WAC 332-30-151? Yes = Category 1       No - Go to SC 1.2       Cat. I         SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are Spartina, see page 25)       Cat. I         At least % of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un- mowed grassland.       Cat. II         The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.       Yes - Go to SC 2.2       No - Go to SC 2.3         SC 2.0. Wetlands of High Conservation Value (WHCV)       SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       Yes - Go to SC 2.2       No - Go to SC 2.3       Cat. I         SC 2.2. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? <a href="http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf">http://www1.dnr.wa.gov/nhp/refde</a>
With a salinity greater than 0.5 ppt       Yes -Go to SC 1.1       No= Not an estuarine wetland         SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category 1       No - Go to SC 1.2       Cat. I         SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are Spartina, see page 25)       Cat. I         At least ½ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.       Cat. II       Cat. II         SC 2.0. Wetlands of High Conservation Value (WHCV)       Sc 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       Yes - Go to SC 2.2       No - Go to SC 2.3         SC 2.2. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       Yes - Contact WNHP/WDNR and go to SC 2.4       No = Not a WHCV         SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on the WHCV       No = Not a WHCV
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category 1       Cat. I         SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?       Image: Category 1       No - Go to SC 1.2       Cat. I         SC 1.2. Is the wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are Spartina, see page 25)       Cat. I         At least % of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un- mowed grassland.       No - Category I       No - Category II         SC 2.0. Wetlands of High Conservation Value (WHCV)       Sc 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       No - Go to SC 2.2       No - Go to SC 2.3         SC 2.2. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes - Contact WNHP/WDNR and go to SC 2.4       No = Not a WHCV         SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV
Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?       Cat. I         Yes = Category I       No - Go to SC 1.2         SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?       Cat. I         The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are Spartina, see page 25)       Cat. I         At least % of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.       Cat. II         The wetland is at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.       Yes = Category I       No = Category II       Cat. II         SC 2.0. Wetlands of High Conservation Value (WHCV)       Sc 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       Yes - Go to SC 2.2       No - Go to SC 2.3       Cat. I         SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?       Yes = Category I       No = Not a WHCV         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       No = Not a WHCV       SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV         SC 2.4. Has WDNR identified the wetla
Yes = Category I       No - Go to SC 1.2       Cat. I         SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?               ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25)              △ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.              ○ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.             Yes = Category I No = Category II                Cat. II             SC 2.0. Wetlands of High Conservation Value (WHCV)           SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to SC 2.2 No – Go to SC 2.3          No – Go to SC 2.3               Cat. I            SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? <u>Http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</u> Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV               No = Not a WHCV            SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV
The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are Spartina, see page 25)       Cat. I         At least ¼ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.       Cat. II         The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.       Yes = Category I       No = Category II       Cat. II         SC 2.0. Wetlands of High Conservation Value (WHCV)       Sc 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       Yes - Go to SC 2.2       No - Go to SC 2.3       Cat. I         SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?       Yes = Category I       No = Not a WHCV       Cat. I         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       Yes - Contact WNHP/WDNR and go to SC 2.4       No = Not a WHCV         SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV
than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25)       Cat. I         At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.       Cat. II         The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.       Yes = Category I       No = Category II         SC 2.0. Wetlands of High Conservation Value (WHCV)       SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       Yes - Go to SC 2.2       No - Go to SC 2.3         SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?       Yes = Category I       No = Not a WHCV         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       No = Not a WHCV       Cat. I         SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV
At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un- mowed grassland. The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = Category I No = Category II SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to SC 2.2 No – Go to SC 2.3 SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = Category I No = Not a WHCV SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? <u>http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</u> Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV
mowed grassland.       The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.       Cat. II         SC 2.0. Wetlands of High Conservation Value (WHCV)       No = Category I       No = Category II         SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       Yes - Go to SC 2.2       No - Go to SC 2.3         SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?       Yes = Category I       No = Not a WHCV         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       No = Not a WHCV       Cat. I         SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV
The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.       Yes = Category I       No = Category II         SC 2.0. Wetlands of High Conservation Value (WHCV)         SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       No = Go to SC 2.2       No - Go to SC 2.3       Cat. I         SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?       Yes = Category I       No = Not a WHCV         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       No = Not a WHCV       Cat. I         SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV         SC 3.0. Bogs       SC 3.0. Bogs       Yes = Category I       No = Not a WHCV
contiguous freshwater wetlands.       Yes = Category I       No = Category II         SC 2.0. Wetlands of High Conservation Value (WHCV)       SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       Yes - Go to SC 2.2       No - Go to SC 2.3       Cat. I         SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?       Yes - Category I       No = Not a WHCV       Cat. I         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       No = Not a WHCV       Yes - Contact WNHP/WDNR and go to SC 2.4       No = Not a WHCV         SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV
SC 2.0. Wetlands of High Conservation Value (WHCV)       SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       No - Go to SC 2.2       No - Go to SC 2.3       Cat. I         SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?       Yes = Category I       No = Not a WHCV       Cat. I         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       No = Not a WHCV       SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV         SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV
SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?       Yes – Go to SC 2.2       No – Go to SC 2.3         SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?       Yes = Category I       No = Not a WHCV         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       No = Not a WHCV       Yes - Contact WNHP/WDNR and go to SC 2.4       No = Not a WHCV         SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV         SC 3.0. Bogs       SC 3.0. Bogs       SC 3.0. Set
Conservation Value?       Yes – Go to SC 2.2       No – Go to SC 2.3       Cat. I         SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?       Yes = Category I       No = Not a WHCV         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       No = Not a WHCV         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       No = Not a WHCV         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland?       Yes – Contact WNHP/WDNR and go to SC 2.4       No = Not a WHCV         SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV         SC 3.0. Bogs       SC 3.0. Bogs       SC 3.0. Solution       SC 3.0. Solution       SC 3.0. Solution
SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = Category I No = Not a WHCV SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? <u>http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</u> Yes - Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV SC 3.0. Bogs
Yes = Category I       No = Not a WHCV         SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? <a href="http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf">http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</a> Yes - Contact WNHP/WDNR and go to SC 2.4       No = Not a WHCV         SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV         SC 3.0. Bogs       SC 3.0. Bogs       SC 3.0. Solution (Second Second
SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? <u>http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</u> Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV SC 3.0. Bogs
http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV SC 3.0. Bogs
Yes - Contact WNHP/WDNR and go to SC 2.4       No = Not a WHCV         SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?       Yes = Category I       No = Not a WHCV         SC 3.0. Bogs       SC 3.0. Bogs       SC 3.0. Bogs       No = Not a WHCV
their website? Yes = Category I No = Not a WHCV SC 3.0. Bogs
SC 3.0. Bogs
SC 3.0. Bogs
Does the wetland (or any part of the unit) meet both the criteria for coils and vogstation in here? Use the key
below. If you answer VES you will still need to rate the wetland based on its functions
SC 3.1 Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or
more of the first 32 in of the soil profile? Yes – Go to SC 3.3 No – Go to SC 3.2
SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep
over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or
pond? Yes – Go to SC 3.3 No = Is not a bog
SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30%
cover of plant species listed in Table 4?Yes = Is a Category I bogNo - Go to SC 3.4
<b>NOTE:</b> If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by
measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the
plant species in Table 4 are present, the wetland is a bog.
substance with peaks of mucks forested (> 50% tover) with Silka Spruce, subalpine fir, western few teadr,
species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?
Yes = Is a Category I bog No = Is not a bog

SC 4.0. Forested Wetlands		
Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate</i> <i>the wetland based on its functions.</i>		
Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.		
Mature forests (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).		
Yes = Category I No = Not a forested wetland for this section	Cat. I	
SC 5.0. Wetlands in Coastal Lagoons		
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?		
marine waters by sandbanks, gravel banks, shingle, or less frequently, rocks		
The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt)		
during most of the year in at least a portion of the lagoon (needs to be measured near the bottom)	Cat. I	
Yes – Go to SC 5.1 No = Not a wetland in a coastal lagoon		
The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less		
than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).	Cat. II	
At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-		
mowed grassland.		
The wetland is larger than $^{-}/_{10}$ ac (4350 ft <sup>-</sup> )		
SC 6.0. Interdunal Wetlands		
vou answer ves vou will still need to rate the wetland based on its habitat functions.		
In practical terms that means the following geographic areas:		
Long Beach Peninsula: Lands west of SR 103		
Grayland-Westport: Lands west of SR 105	Cat I	
Ocean Shores-Copalis: Lands west of SR 115 and SR 109		
SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = <b>Category I</b> No – Go to <b>SC 6.2</b>	Cat. II	
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = Category II No – Go to SC 6.3	Cat. III	
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?		
res = Category III NO = Category IV	Cat. IV	
Category of wetland based on Special Characteristics	NI/A	
If you answered No for all types, enter "Not Applicable" on Summary Form	IN/A	

# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 1- WETLAND B



## GOAT HILL SD CIP 3 WETLAND RATING FIGURE 2- WETLAND B



GOAT HILL SD CIP 3 WETLAND RATING FIGURE 3- WETLAND B



# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 4- WETLAND B

#### WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (<u>WRIA</u>). Please use links (where available) for more information on a project.

#### Counties

- King
- Snohomish



Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan
	Dissolved Oxygen Temperature	Approved by EPA	425-649-4425
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	<u>Tricia Shoblom</u> 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	<u>Joan Nolan</u> 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svricek 425-649-7036
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036
Pipers Creek	Fecal Coliform	Approved by EPA	<u>Joan Nolan</u> 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Field work starts summer 2015	Ralph Svrjcek 425-649-7036
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036

Wetland Resources, Inc. Detinention / Mithaution / Restoration / Habitat Creation / Permit Assistance 9505 19th Avenue S.E. Suite 106 Everett. Washington 98208 Phone: (425) 337-3174 Fax: (425) 337-3045 Email: mailbox@wetlandresources.com

#### WETLAND RATING Wetland B

Figure B-4 WRI Job # 22264 Rated by: AW

#### ATTACHMENT 4

## GOAT HILL SD CIP 3 WETLAND RATING FIGURE 5- WETLAND B



Figure B-5 WRI Job # 22264 Rated by: AW

# **RATING SUMMARY – Western Washington**

 Name of wetland (or ID #):
 Wetland C
 Date of site visit:
 11/21/22

 Rated by
 MK, AW
 Trained by Ecology?
 Yes \_\_\_\_\_No Date of training 3/15

HGM Class used for rating SLOPE Wetland has multiple HGM classes? Y V

**NOTE**: Form is not complete without the figures requested (figures can be combined). Source of base aerial photo/map ESRI, King Co.

**OVERALL WETLAND CATEGORY III** (based on functions  $\checkmark$  or special characteristics )

## 1. Category of wetland based on FUNCTIONS

**\_\_\_\_Category I** – Total score = 23 - 27

\_\_\_\_\_Category II – Total score = 20 - 22

✓ Category III – Total score = 16 - 19

Category IV – Total score = 9 - 15

FUNCTION	Improving Water Quality		Hydrologic		Habitat					
					Circle	the ap	propr	iate ra	atings	
Site Potential	Н	Μ	L	Н	М	L	Н	М	L	
Landscape Potential	Н	Μ	L	Н	Μ	L	Н	Μ	L	
Value	Н	Μ	L	Η	Μ	L	Η	Μ	L	TOTAL
Score Based on Ratings		6			6			5		17

Score for each function based on three ratings (order of ratings is not important) 9 = H,H,H

5 = H,H,H 8 = H,H,M 7 = H,H,L 7 = H,M,M 6 = H,M,L 6 = M,M,M 5 = H,L,L 5 = M,M,L

4 = M,L,L 3 = L,L,L

## 2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY	
Estuarine	Ι	II
Wetland of High Conservation Value	I	
Bog	Ι	
Mature Forest	I	
Old Growth Forest	I	
Coastal Lagoon	Ι	II
Interdunal	I II	III IV
None of the above	Ŀ	

# Maps and figures required to answer questions correctly for Western Washington

## **Depressional Wetlands**

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

#### **Riverine Wetlands**

Map of:	To answer questions:	Figure #
Cowardin plant classes	Н 1.1, Н 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (can be added to another figure)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

#### Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	Н 2.1, Н 2.2, Н 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

#### Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	1
Hydroperiods	H 1.2	1
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	5
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	-
(can be added to figure above)		5
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	1
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	2
polygons for accessible habitat and undisturbed habitat		2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	4

Wetland Rating System for Western WA: 2014 Update Rating Form – Effective January 1, 2015

# HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

NO – go to 2

**YES** – the wetland class is **Tidal Fringe** – go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

NO – Saltwater Tidal Fringe (Estuarine) If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

NO - go to 3**YES** – The wetland class is **Flats** If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria? The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size; At least 30% of the open water area is deeper than 6.6 ft (2 m).

NO – go to 4

**YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?

The wetland is on a slope (*slope can be very gradual*),

The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,

The water leaves the wetland **without being impounded**.

NO - go to 5

**YES –** The wetland class is **Slope** 

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

- 5. Does the entire wetland unit **meet all** of the following criteria?
  - The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river.
  - \_\_\_\_The overbank flooding occurs at least once every 2 years.

**YES - Freshwater Tidal Fringe** 

ATTACHMENT 4

Wetland name or number <u>C</u>

NO – go to 6 **YES** – The wetland class is **Riverine NOTE**: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.* 

NO – go to 7

## YES – The wetland class is Depressional

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8

YES – The wetland class is Depressional

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

**NOTE**: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit	HGM class to
being rated	use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream	Depressional
within boundary of depression	
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other	Treat as
class of freshwater wetland	ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

SLOPE WETLANDS	
Water Quality Functions - Indicators that the site functions to improve water quality	
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (a 1% slope has a 1 ft vertical drop in elevation for every	
100 ft of horizontal distance)	
Slope is 1% or less points = 3	0
Slope is > 1%-2% points = 2	_
Slope is > 2%-5% points = 1	
Slope is greater than 5% points = 0	
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions): Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants:	
Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you	
have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher	
than 6 in.	
Dense, uncut, herbaceous plants > 90% of the wetland area points = 6	1
Dense, uncut, herbaceous plants > ½ of area points = 3	
Dense, woody, plants > ½ of area points = 2	
Dense, uncut, herbaceous plants > ¼ of area points = 1	
Does not meet any of the criteria above for plants points = 0	
Total for S 1Add the points in the boxes above	1
Rating of Site Potential If score is: 12 = H6-11 = M0-5 = L Record the rating on the second the seco	the first page
S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants?	
Yes = 1 No = 0	1
Yes = 1       No = 0         S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?	1
Yes = 1       No = 0         S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?       Ves = 1         Other sources       Yes = 1       No = 0	1 0
Yes = 1       No = 0         S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?         Other sources       Yes = 1         No = 0         Total for S 2       Add the points in the boxes above	1 0 1
Yes = 1       No = 0         S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?         Other sources       Yes = 1         No = 0         Total for S 2       Add the points in the boxes above         Rating of Landscape Potential If score is:       ✓ 1-2 = M       0 = L	1 0 1 the first page
Yes = 1       No = 0         S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?       Other sources	1 0 1 the first page
Yes = 1       No = 0         S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sourcesYes = 1       No = 0         Total for S 2       Add the points in the boxes above         Rating of Landscape Potential If score is:        ✓ 1-2 = M       _0 = L         S 3.0. Is the water quality improvement provided by the site valuable to society?       S 3.0. Is the water quality improvement provided by the site valuable to society?	1 0 1 the first page
Yes = 1 No = 0   S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?   Other sources Yes = 1   No = 0   Total for S 2   Add the points in the boxes above   Rating of Landscape Potential If score is: <a href="https://withus.com"></a> /withus.com"/withus.com"/withus.com    S 3.0. Is the water quality improvement provided by the site valuable to society?   S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?   Yes = 1 No = 0	1 0 1 the first page 0
Yes = 1 No = 0   S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?   Other sources Yes = 1   No = 0   Total for S 2 Add the points in the boxes above Rating of Landscape Potential If score is: <u>v</u> 1-2 = M0 = L Record the rating on S 3.0. Is the water quality improvement provided by the site valuable to society? S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0 S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? At least one aquatic resource in the basin is on the 303(d) list. Yes = 1 No = 0	1 0 1 the first page 0 1
Yes = 1 No = 0   S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?   Other sources Yes = 1   No = 0   Total for S 2 Add the points in the boxes above Rating of Landscape Potential If score is: ✓ 1-2 = M0 = L S 3.0. Is the water quality improvement provided by the site valuable to society? S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0 S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? At least one aquatic resource in the basin is on the 303(d) list. Yes = 1 No = 0 S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? Answer YES if there is a TMDL for the basin in which unit is found. Yes = 2 No = 0	1 0 1 the first page 0 1 2
Yes = 1 No = 0   S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?   Other sources Yes = 1   No = 0   Total for S 2   Rating of Landscape Potential If score is: ✓ 1-2 = M   0 = L   Record the rating on   S 3.0. Is the water quality improvement provided by the site valuable to society?   S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?   Yes = 1   No = 0   S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? At least one aquatic resource in the basin is on the 303(d) list.   Yes = 1   No = 0   S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? Answer YES if there is a TMDL for the basin in which unit is found.   Yes = 2   No = 0   Total for S 3	1 0 1 the first page 0 1 2 3

#### Go to First Page

SLOPE WETLANDS	
Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion	
S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > <sup>1</sup> / <sub>8</sub> in), or dense enough, to remain erect during surface flows.         □ Dense, uncut, rigid plants cover > 90% of the area of the wetland       points = 1 points = 1         ✓ All other conditions       points = 0         Rating of Site Potential       If score is:1 = M _ ✓ 0 = L	<b>0</b> The first page
S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	1
S 6.0. Are the hydrologic functions provided by the site valuable to society?	, , ,
<ul> <li>S 6.1. Distance to the nearest areas downstream that have flooding problems:         <ul> <li>✓ The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds)</li> <li>✓ Surface flooding problems are in a sub-basin farther down-gradient</li> <li>✓ No flooding problems anywhere downstream</li> </ul> </li> </ul>	2
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 6Add the points in the boxes above	2
Rating of Value If score is:        2-4 = H       1 = M       0 = L       Record the rating on t	he first page
NOTES and FIELD OBSERVATIONS:	

These questions apply to wetlands of all HGM classes.	
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.        Aquatic bed      A structures or more: points = 4        Emergent      A structures: points = 2        Scrub-shrub (areas where shrubs have > 30% cover)      2 structures: points = 1        Forested (areas where trees have > 30% cover)      2 structure: points = 0        If the unit has a Forested class, check if:      The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover)        The ach cover 20% within the Forested polygon	1
H 1.2. Hydroperiods	
Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (see text for descriptions of hydroperiods).        Permanently flooded or inundated       4 or more types present: points = 3        Seasonally flooded or inundated       3 types present: points = 2        Occasionally flooded or inundated       2 types present: points = 1        Saturated only       1 type present: points = 0        Permanently flowing stream or river in, or adjacent to, the wetland       2 points        Seasonally flowing stream in, or adjacent to, the wetland       2 points        Seasonally flowing stream in, or adjacent to, the wetland       2 points	1
H 1.3. Richness of plant species         Count the number of plant species in the wetland that cover at least 10 ft <sup>2</sup> .         Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.         Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle         If you counted: > 19 species         5 - 19 species         < 5 species	1
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. <i>If you</i> <i>have four or more plant classes or three classes and open water, the rating is always high.</i> None = 0 points All three diagrams in this row are HIGH = 3points	1

<b>Rating of Site Potential</b> If score is: $15-18 = H$ 7-14 = M $\checkmark$ 0-6 = L Record the rating on the first page	
Total for H 1Add the points in the boxes above	/e <b>5</b>
Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)	
permanently or seasonally inundated (structures for egg-laying by amphibians)	
At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are	
where wood is exposed)	
slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not vet weathered	-
Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree	1
over a stream (or ditch) in or contiguous with the wetland for at least 33 ft (10 m)	,
Undercut banks are present for at least 6 6 ft (2 m) and/or overhanging plants extends at least 3 3 ft (1	m)
Standing snags (dbh > 4 in) within the wetland	
Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).	
Check the habitat features that are present in the wetland. The number of checks is the number of points.	
n 1.5. Special habitat leatures:	

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat that directly abuts wetland unit).	
Calculate: % undisturbed habitat <u>0</u> + [(% moderate and low intensity land uses)/2] <u>0</u> = <u>0</u> %	
If total accessible habitat is:	
$\square$ > <sup>1</sup> / <sub>3</sub> (33.3%) of 1 km Polygon points = 3	0
20-33% of 1 km Polygon points = 2	
points = 1	
<pre>r &lt; 10% of 1 km Polygon points = 0</pre>	
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.	
Calculate: % undisturbed habitat 9 + [(% moderate and low intensity land uses)/2] 5 = 14 %	
Undisturbed habitat > 50% of Polygon points = 3	
Undisturbed habitat 10-50% and in 1-3 patches points = 2	1
Undisturbed habitat 10-50% and > 3 patches points = 1	
Undisturbed habitat < 10% of 1 km Polygon points = 0	
H 2.3. Land use intensity in 1 km Polygon: If	
> 50% of 1 km Polygon is high intensity land use points = (- 2)	-2
≤ 50% of 1 km Polygon is high intensity points = 0	
Total for H 2Add the points in the boxes above	-1
Rating of Landscape Potential If score is:4-6 = H1-3 = M<1 = L Record the rating on	the first page

H 3.0. Is the habitat provided by the site valuable to society?		
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose on	ly the highest score	
that applies to the wetland being rated.		
Site meets ANY of the following criteria:	points = 2	
It has 3 or more priority habitats within 100 m (see next page)		
It provides habitat for Threatened or Endangered species (any plant or animal on the st	tate or federal lists)	
It is mapped as a location for an individual WDFW priority species		2
It is a Wetland of High Conservation Value as determined by the Department of Natura	l Resources	
It has been categorized as an important habitat site in a local or regional comprehensiv	ve plan, in a	
Shoreline Master Plan, or in a watershed plan		
Site has 1 or 2 priority habitats (listed on next page) within 100 m	points = 1	
Site does not meet any of the criteria above	points = 0	
Rating of Value If score is: 2 = H 1 = M 0 = L	Record the rating on	the first page

# **WDFW Priority Habitats**

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can
be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington.
177 pp. <u>http://wdfw.wa.gov/publications/00165/wdfw00165.pdf</u> or access the list from here:
http://wdfw.wa.gov/conservation/phs/list/)
Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: <b>NOTE:</b> This question is independent of the land use between the wetland unit and the priority habitat.
Aspen Stands: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
<b>Biodiversity Areas and Corridors</b> : Areas of habitat that are relatively important to various species of native fish and wildlife ( <i>full descriptions in WDFW PHS report</i> ).
Herbaceous Balds: Variable size patches of grass and forbs on shallow soils over bedrock.
<b>Old-growth/Mature forests:</b> <u>Old-growth west of Cascade crest</u> – Stands of at least 2 tree species, forming a multi- layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. <u>Mature forests</u> – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
<b>Oregon White Oak:</b> Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important ( <i>full descriptions in WDFW PHS report p. 158 – see web link above</i> ).
<b>Riparian</b> : The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
<b>Westside Prairies:</b> Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie ( <i>full descriptions in WDFW PHS report p. 161 – see web link above</i> ).
<b>Instream:</b> The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
<b>Nearshore</b> : Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. ( <i>full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).</i>
<b>Caves:</b> A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
<b>Cliffs:</b> Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
<b>Talus:</b> Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
<b>Note:</b> All vegetated wetlands are by definition a priority babitat but are not included in this list because they are addressed

**Note:** All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

ATTACHMENT 4

Wetland name or number <u>C</u>

# **CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

Wetland Type	Category
Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.	
SC 1.0. Estuarine wetlands	
Does the wetland meet the following criteria for Estuarine wetlands?	
The dominant water regime is tidal,	
Vegetated, and	
With a salinity greater than 0.5 ppt Yes –Go to <b>SC 1.1</b> No= <b>Not an estuarine wetland</b>	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area	
Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?	Cat. I
Yes = Category I No - Go to SC 1.2	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?	
The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less	Cat I
than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25)	Cat. I
At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-	
mowed grassiand.	Cat. II
contiguous freshwater wetlands	
SC 2.0. Wetlands of High Conservation Value (WHCV)	
SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High	Cat I
Conservation Value? Yes – Go to SC 2.2 No – Go to SC 2.3	
SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?	
Yes = Category I NO = Not a WHCV	
bttn://www1 dnr wa gov/nbn/refdesk/datasearch/wnbnwetlands ndf	
Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV	
SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on	
their website? Yes = Category I No = Not a WHCV	
SC 3.0. Bogs	
Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? Use the key	
below. If you answer YES you will still need to rate the wetland based on its functions.	
SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or	
more of the first 32 in of the soil profile? Yes – Go to SC 3.3 No – Go to SC 3.2	
SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep	
over bedrock, or an impermeable nardpan such as clay or volcanic ash, or that are floating on top of a lake or	
SC 3.3 Does an area with peats or mucks have more than 70% cover of mosses at ground level. AND at least a 30%	
cover of plant species listed in Table 4? Yes = Is a Category I bog $N_0 - G_0$ to SC 3.4	
<b>NOTE:</b> If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by	
measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the	
plant species in Table 4 are present, the wetland is a bog.	Cat. I
SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar,	
western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the	
species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?	
Yes = Is a Category I bog No = Is not a bog	

SC 4.0. Forested Wetlands	
Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA	
Department of Fish and Wildlife's forests as priority habitats? If you answer YES you will still need to rate	
the wetland based on its functions.	
<b>Canopy</b> with occasional small openings: with at least 8 trees/ac (20 trees/ha) that are at least 200 years of	
age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.	
Mature forests (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the	
species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).	
Yes = Category I No = Not a forested wetland for this section	Cat. I
SC 5.0. Wetlands in Coastal Lagoons	
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?	
The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from	
marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks	
The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt)	Cat I
during most of the year in at least a portion of the lagoon (needs to be measured hear the bottom)	Cat. I
SC 5.1 Does the wetland meet all of the following three conditions?	
The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less	
than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).	Cat. II
At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-	
mowed grassland.	
The wetland is larger than $1/_{10}$ ac (4350 ft <sup>2</sup> )	
Yes = Category I No = Category II	
SC 6.0. Interdunal Wetlands	
Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? If	
you answer yes you will still need to rate the wetland based on its habitat functions.	
In practical terms that means the following geographic areas:	
Gravland-Westport: Lands west of SR 105	Cat I
Ocean Shores-Conalis: Lands west of SR 115 and SR 109	
$\frac{1}{\text{Yes}} - \text{Go to SC 6.1} \qquad \text{No} = \text{not an interdunal wetland for rating}$	
SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M	Cat. II
for the three aspects of function)? Yes = Category I No – Go to SC 6.2	
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?	Cat. III
Yes = <b>Category II</b> NO – GO to <b>SC 0.3</b> SC 6.3 Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?	<b>c</b> ut: III
Yes = Category III No = Category IV	
	Cat. IV
Category of wetland based on Special Characteristics	NI / A
If you answered No for all types, enter "Not Applicable" on Summary Form	IN/A

# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 1- WETLAND C



GOAT HILL SD CIP 3 WETLAND RATING FIGURE 2- WETLAND C



# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 3- WETLAND C



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Email: mailbox@wetlandresources.com

AQUATIC RESOURCES

ON THE 303(d) LIST



Figure C-3 WRI Job # 22264 Rated by: AW

# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 4- WETLAND C

#### WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (<u>WRIA</u>). Please use links (where available) for more information on a project.

#### Counties

- King
- Snohomish



Waterbody Name	Pollutants	Status**	TMDL Lead	
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288	
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	<u>Joan Nolan</u> 425-649-4425	
	Dissolved Oxygen Temperature	Approved by EPA		
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	<u>Tricia Shoblom</u> 425-649-7288	
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	<u>Joan Nolan</u> 425-649-4425	
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svrjcek 425-649-7036	
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036	
Pipers Creek	Fecal Coliform	Approved by EPA	<u>Joan Nolan</u> 425-649-4425	
Sammamish River	Dissolved Oxygen Temperature	Field work starts summer 2015	Ralph Svrjcek 425-649-7036	
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036	

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#### WETLAND RATING Wetland C

Figure C-4 WRI Job # 22264 Rated by: AW

## GOAT HILL SD CIP 3 WETLAND RATING FIGURE 5- WETLAND C





# **RATING SUMMARY – Western Washington**

 Name of wetland (or ID #):
 Wetland D
 Date of site visit:
 11/21/22

 Rated by\_MK, AW
 Trained by Ecology? ✓ Yes \_\_\_\_No Date of training 3/15

 HGM Class used for rating SLOPE
 Wetland has multiple HGM classes? \_\_\_Y ✓ N

NOTE: Form is not complete without the figures requested (figures can be combined).

Source of base aerial photo/map ESRI, King Co.

**OVERALL WETLAND CATEGORY III** (based on functions  $\checkmark$  or special characteristics )

## 1. Category of wetland based on FUNCTIONS

\_\_\_\_Category I – Total score = 23 - 27

\_\_\_\_\_Category II – Total score = 20 - 22

✓ Category III – Total score = 16 - 19

**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality		Hydrologic		Habitat					
					Circle	the ap	propi	riate ra	tings	
Site Potential	Н	Μ	L	Н	Μ	L	Н	М	L	
Landscape Potential	Н	Μ	L	Н	Μ	L	Н	М	L	
Value	Н	Μ	L	Н	Μ	L	Н	Μ	L	TOTAL
Score Based on Ratings		7			5			4		16

Score for each function based on three ratings (order of ratings is not important)

9 = H,H,H 8 = H,H,M 7 = H,H,L 7 = H,M,M 6 = H,M,L 6 = M,M,M 5 = H,L,L 5 = M,M,L

4 = M,L,L 3 = L,L,L

## 2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY			
Estuarine	Ι	II		
Wetland of High Conservation Value	I			
Bog	Ι			
Mature Forest	Ι			
Old Growth Forest		I		
Coastal Lagoon	Ι	II		
Interdunal	I II III IV			
None of the above				
# Maps and figures required to answer questions correctly for Western Washington

# **Depressional Wetlands**

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (can be added to map of hydroperiods)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	Н 2.1, Н 2.2, Н 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

#### **Riverine Wetlands**

Map of:	To answer questions:	Figure #
Cowardin plant classes	Н 1.1, Н 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (can be added to another figure)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (can be added to another figure)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

#### Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (can be added to another figure)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	Н 2.1, Н 2.2, Н 2.3	
polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

#### Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	1
Hydroperiods	H 1.2	1
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	5
Plant cover of dense, rigid trees, shrubs, and herbaceous plants	S 4.1	F
(can be added to figure above)		5
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	1
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	2
polygons for accessible habitat and undisturbed habitat		2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	4

# HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

NO – go to 2

**YES** – the wetland class is **Tidal Fringe** – go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

NO – Saltwater Tidal Fringe (Estuarine) If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

NO – go to 3 If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria? The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size; At least 30% of the open water area is deeper than 6.6 ft (2 m).

NO – go to 4

**YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?

The wetland is on a slope (*slope can be very gradual*),

The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,

The water leaves the wetland **without being impounded**.

NO - go to 5

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

- 5. Does the entire wetland unit **meet all** of the following criteria?
  - The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river.
  - \_\_\_\_The overbank flooding occurs at least once every 2 years.

# **YES - Freshwater Tidal Fringe**

**YES** – The wetland class is **Flats** 

**YES –** The wetland class is **Slope** 

ATTACHMENT 4

Wetland name or number **D** 

NO – go to 6 **YES** – The wetland class is **Riverine NOTE**: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.* 

NO – go to 7

# YES – The wetland class is Depressional

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8

YES – The wetland class is Depressional

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

**NOTE**: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit	HGM class to
being rated	use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream	Depressional
within boundary of depression	
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other	Treat as
class of freshwater wetland	ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

SLOPE WETLANDS Water Quality Functions - Indicators that the site functions to im	prove water quality	
S 1.0. Does the site have the potential to improve water quality?		
S 1.1. Characteristics of the average slope of the wetland: (a 1% slope has a 1 ft vertical drop	in elevation for every	
100 ft of horizontal distance)		
Slope is 1% or less	points = 3	0
Slope is > 1%-2%	points = 2	
Slope is > 2%-5%	points = 1	
Slope is greater than 5%	points = 0	•
S 1.2. <u>The soil 2 in below the surface (or duff layer)</u> is true clay or true organic (use NRCS defined to the surface of the	<i>itions</i> ): Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants:		
Choose the points appropriate for the description that best fits the plants in the wetlan	d. Dense means you	
have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowe	ed and plants are higher	
than 6 in.		
Dense, uncut, herbaceous plants > 90% of the wetland area	points = 6	6
Dense, uncut, nerbaceous plants > ½ or area	points = 3	
Dense, woody, plants > $\frac{1}{2}$ of area	points = 2	
Dense, uncut, nerbaceous plants > ¼ of area	points = 1	
Does not meet any of the criteria above for plants	points = 0	
Total for S 1 Add the poi	nts in the boxes above	6
Rating of Site Potential If score is: 12 = H 🖌 6-11 = M0-5 = L	Record the rating on t	he first page
S 2.0. Does the landscape have the potential to support the water quality function of	the site?	
S 2.0. Does the landscape have the potential to support the water quality function of S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generation of the second	the site? erate pollutants? Yes = 1 No = 0	1
S 2.0. Does the landscape have the potential to support the water quality function of S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that gene S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in questions.	the site? erate pollutants? Yes = 1 No = 0 stion S 2.1?	1
<ul> <li>S 2.0. Does the landscape have the potential to support the water quality function of</li> <li>S 2.1. Is &gt; 10% of the area within 150 ft on the uphill side of the wetland in land uses that gene</li> <li>S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in ques</li> <li>Other sources</li> </ul>	the site? erate pollutants? Yes = 1 No = 0 stion S 2.1? Yes = 1 No = 0	1
S 2.0. Does the landscape have the potential to support the water quality function of         S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that gene         S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in ques         Other sources         Total for S 2       Add the point	the site? erate pollutants? Yes = 1 No = 0 stion S 2.1? Yes = 1 No = 0 nts in the boxes above	1 0 1
S 2.0. Does the landscape have the potential to support the water quality function of         S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that gend         S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in ques         Other sources         Total for S 2       Add the poi         Rating of Landscape Potential If score is: ✓ 1-2 = M0 = L	the site? erate pollutants? Yes = 1 No = 0 stion S 2.1? Yes = 1 No = 0 nts in the boxes above Record the rating on the	1 0 1 he first page
S 2.0. Does the landscape have the potential to support the water quality function of         S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that gene         S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in ques         Other sources         Total for S 2       Add the poi         Rating of Landscape Potential If score is: ✓ 1-2 = M0 = L         S 3.0. Is the water quality improvement provided by the site valuable to society?	the site? Prate pollutants? Yes = 1 No = 0 Stion S 2.1? Yes = 1 No = 0 Its in the boxes above Record the rating on the	1 0 1 he first page
S 2.0. Does the landscape have the potential to support the water quality function of         S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that gend         S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in ques         Other sources         Total for S 2       Add the poi         Rating of Landscape Potential If score is: ✓ 1-2 = M0 = L         S 3.0. Is the water quality improvement provided by the site valuable to society?         S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine 303(d) list?	the site? erate pollutants? Yes = 1 No = 0 stion S 2.1? Yes = 1 No = 0 nts in the boxes above Record the rating on the Yes = 1 No = 0	1 0 1 he first page
<ul> <li>S 2.0. Does the landscape have the potential to support the water quality function of S 2.1. Is &gt; 10% of the area within 150 ft on the uphill side of the wetland in land uses that gene S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in quest Other sources</li></ul>	the site? Perate pollutants? Yes = 1 No = 0 Stion S 2.1? Yes = 1 No = 0 Its in the boxes above Record the rating on the Yes = 1 No = 0 tic resource in the basin is Yes = 1 No = 0	1 0 1 he first page 0 1
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# Go to First Page

SLOPE WETLANDS	
Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosic	on
S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.            ✓ Dense, uncut, rigid plants cover > 90% of the area of the wetland             All other conditions             Rating of Site Potential             If score is: ✓ 1 = M0 = L	<b>1</b> ne first page
S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	1
Rating of Landscape Potential If score is:        I = MO = L       Record the rating on the second the ratio the second the second the second the second the ratio the second the ratio the second t	e first page
S 6.0. Are the hydrologic functions provided by the site valuable to society?	
<ul> <li>S 6.1. Distance to the nearest areas downstream that have flooding problems:</li> <li>The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds)</li> <li>Surface flooding problems are in a sub-basin farther down-gradient</li> <li>Points = 1</li> <li>✓ No flooding problems anywhere downstream</li> </ul>	0
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 $No = 0$	0
Total for S 6Add the points in the boxes above	0
Rating of Value If score is:2-4 = H1 = M $\checkmark$ 0 = LRecord the rating on the	e first page
NOTES and FIELD OBSERVATIONS:	

These questions apply to wetlands of all HGM classes.	
HABITAT FUNCTIONS - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.        Aquatic bed       4 structures or more: points = 4        Emergent       3 structures: points = 2        Scrub-shrub (areas where shrubs have > 30% cover)       2 structures: points = 1        Forested (areas where trees have > 30% cover)       1 structure: points = 0         If the unit has a Forested class, check if:      The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover)         that each cover 20% within the Forested polygon       1 structures	1
H 1.2. Hydroperiods         Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (see text for descriptions of hydroperiods).        Permanently flooded or inundated       4 or more types present: points = 3        Seasonally flooded or inundated       3 types present: points = 2        Occasionally flooded or inundated       2 types present: points = 1        Saturated only       1 type present: points = 0        Permanently flowing stream or river in, or adjacent to, the wetland       2 points        Seasonally flowing stream in, or adjacent to, the wetland       2 points        Seasonally flowing stream in, or adjacent to, the wetland       2 points	1
H 1.3. Richness of plant species         Count the number of plant species in the wetland that cover at least 10 ft <sup>2</sup> .         Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.         Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle         If you counted: > 19 species         5 - 19 species         < 5 species	1
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. <i>If you</i> <i>have four or more plant classes or three classes and open water, the rating is always high.</i> None = 0 points All three diagrams in this row are HIGH = 3points	1

H 1.5. Special habitat features:	
Check the habitat features that are present in the wetland. The number of checks is the number of points.	
Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).	l
Standing snags (dbh > 4 in) within the wetland	
Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)	
Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed)	1
At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are	
permanently or seasonally inundated <i>(structures for egg-laying by amphibians)</i>	
Invasive plants cover less than 25% of the wetland area in every stratum of plants ( <i>see H 1.1 for list of strata</i> )	
Total for H 1Add the points in the boxes above	5
Rating of Site Potential If score is:       15-18 = H       7-14 = M       ✓ 0-6 = L       Record the rating on	the first page
H 2.0. Does the landscape have the potential to support the habitat functions of the site?	

H 2.1. Accessible habitat (include only habitat that directly abuts wetland unit).	Ţ
Calculate: % undisturbed habitat 2 + [(% moderate and low intensity land uses)/2] 1 = 3 %	
If total accessible habitat is:	
$\square$ > <sup>1</sup> / <sub>3</sub> (33.3%) of 1 km Polygon points = 3	0
20-33% of 1 km Polygon points = 2	
points = 1	
<pre>r &lt; 10% of 1 km Polygon points = 0</pre>	
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.	
<i>Calculate:</i> % undisturbed habitat <u>9</u> + [(% moderate and low intensity land uses)/2] <u>5</u> = <u>14</u> %	
Undisturbed habitat > 50% of Polygon points = 3	
Undisturbed habitat 10-50% and in 1-3 patches points = 2	1
Undisturbed habitat 10-50% and > 3 patches points = 1	
Undisturbed habitat < 10% of 1 km Polygon points = 0	
H 2.3. Land use intensity in 1 km Polygon: If	
> 50% of 1 km Polygon is high intensity land use points = (- 2)	-2
Description is high intensity points = 0	
Total for H 2 Add the points in the boxes above	-1
<b>Rating of Landscape Potential</b> If score is:4-6 = H1-3 = M< < 1 = L Record the rating on	the first page

<b>Rating of Landscape Potential</b>	If score is:	4-6 = H	1-3 = M	V
<b>o</b> 1				

H 3.0. Is the habitat provided by the site valuable to society?		
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose only	the highest score	
that applies to the wetland being rated.		
Site meets ANY of the following criteria:	points = 2	
It has 3 or more priority habitats within 100 m (see next page)		
It provides habitat for Threatened or Endangered species (any plant or animal on the stat	te or federal lists)	
It is mapped as a location for an individual WDFW priority species		1
It is a Wetland of High Conservation Value as determined by the Department of Natural F	Resources	
It has been categorized as an important habitat site in a local or regional comprehensive	plan, in a	
Shoreline Master Plan, or in a watershed plan		
Site has 1 or 2 priority habitats (listed on next page) within 100 m	points = 1	
Site does not meet any of the criteria above	points = 0	
Rating of ValueIf score is:2 = H1 = M0 = LF	Record the rating on	the first page

# **WDFW Priority Habitats**

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can
be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington.
177 pp. <u>http://wdfw.wa.gov/publications/00165/wdfw00165.pdf</u> or access the list from here:
<u>http://wdfw.wa.gov/conservation/phs/list/</u>
Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: <b>NOTE:</b> This question is independent of the land use between the wetland unit and the priority habitat.
Aspen Stands: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
<b>Biodiversity Areas and Corridors</b> : Areas of habitat that are relatively important to various species of native fish and wildlife ( <i>full descriptions in WDFW PHS report</i> ).
Herbaceous Balds: Variable size patches of grass and forbs on shallow soils over bedrock.
<b>Old-growth/Mature forests:</b> <u>Old-growth west of Cascade crest</u> – Stands of at least 2 tree species, forming a multi- layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. <u>Mature forests</u> – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
<b>Oregon White Oak:</b> Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important ( <i>full descriptions in WDFW PHS report p. 158 – see web link above</i> ).
<b>Riparian</b> : The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
<b>Westside Prairies:</b> Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie ( <i>full descriptions in WDFW PHS report p. 161 – see web link above</i> ).
<b>Instream:</b> The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
<b>Nearshore</b> : Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. ( <i>full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).</i>
<b>Caves:</b> A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
<b>Cliffs:</b> Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
<b>Talus:</b> Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
<b>Snags and Logs:</b> Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

**Note:** All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

ATTACHMENT 4

# **CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

Wetland Type	Category
Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met	
SC 1.0. Estuarine wetlands	
Does the wetland meet the following criteria for Estuarine wetlands?	
The dominant water regime is tidal,	
Vegetated, and	
With a salinity greater than 0.5 ppt Yes –Go to SC 1.1 No= Not an estuarine wetland	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area	
Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?	Cat I
Yes = Category I No - Go to SC 1.2	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?	
The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less	Cat I
than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25)	cat. I
At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-	
mowed grassiand.	Cat. II
contiguous freshwater wetlands	
SC 2.0. Wetlands of High Conservation Value (WHCV)	
SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High	Cat
Conservation Value? Yes – Go to SC 2.2 No – Go to SC 2.3	Cat. I
SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?	
Yes = Category I No = Not a WHCV	
bttp://www.1 dpr.wa.gov/pbp/refdeck/datasearch/wpbpwetlands.pdf	
$\frac{\text{Mtp.//www1.ull.wa.gov/mp/reldesk/datasearch/wimp/wetlands.pdf}}{\text{Yes} - Contact WNHP/WDNB and go to SC 2.4 No = Not a WHCV$	
SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on	
their website? Yes = Category I No = Not a WHCV	
SC 3.0. Bogs	
Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? Use the key	
below. If you answer YES you will still need to rate the wetland based on its functions.	
SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or	
more of the first 32 in of the soil profile? Yes – Go to <b>SC 3.3</b> No – Go to <b>SC 3.2</b>	
SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep	
over bedrock, or an impermeable nardpan such as clay or volcanic ash, or that are floating on top of a lake or	
SC 3.3 Does an area with peats or mucks have more than 70% cover of mosses at ground level. AND at least a 30%	
cover of plant species listed in Table 4? Yes = Is a Category I bog $N_0 - G_0$ to SC 3.4	
<b>NOTE:</b> If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by	
measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the	
plant species in Table 4 are present, the wetland is a bog.	Cat. I
SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar,	
western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the	
species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?	
Yes = Is a Category I bog No = Is not a bog	

SC 4.0. Forested Wetlands	
Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA	
Department of Fish and Wildlife's forests as priority habitats? If you answer YES you will still need to rate	
the wetland based on its functions.	
<b>Old-growth forests</b> (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with associated small openings; with at least 8 trees (as (20 trees (ba) that are at least 200 years of	
age OR have a diameter at breast beight (dbb) of 32 in (81 cm) or more	
Mature forests (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OB the	
species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).	
Yes = Category I No = Not a forested wetland for this section	Cat. I
SC 5.0. Wetlands in Coastal Lagoons	
Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?	
The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from	
marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks	
The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt)	Cat I
during most of the year in at least a portion of the lagoon (needs to be measured near the bottom)	Cat. I
Yes – Go to SC 5.1 No = Not a wetland in a coastal lagoon	
SC 5.1. Does the wetland meet all of the following three conditions?	
than 20% cover of aggressive, expertupistic plant species (see list of species on p. 100)	Cat. II
At least 3/ of the landward edge of the wetland has a 100 ft huffer of shrub, forest, or un-grazed or un-	
mowed grassland.	
The wetland is larger than $1/_{10}$ ac (4350 ft <sup>2</sup> )	
Yes = Category I No = Category II	
SC 6.0. Interdunal Wetlands	
Is the wetland west of the 1889 line (also called the Western Boundary of Unland Ownership or WBUO)? If	
you answer ves you will still need to rate the wetland based on its habitat functions.	
In practical terms that means the following geographic areas:	
Long Beach Peninsula: Lands west of SR 103	
Grayland-Westport: Lands west of SR 105	Cat I
Ocean Shores-Copalis: Lands west of SR 115 and SR 109	
Yes – Go to SC 6.1 No = not an interdunal wetland for rating	
SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the babitat functions on the form (rates H H H or H H M	Cat. II
for the three aspects of function)? $Yes = Category I No - Go to SC 6.2$	
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?	
Yes = Category II No – Go to SC 6.3	Cat. III
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?	
Yes = Category III No = Category IV	<b>a</b>
	Cat. IV
Category of wetland based on Special Characteristics	N/A
It you answered No for all types, enter "Not Applicable" on Summary Form	••, ••

# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 1- WETLAND D



# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 2- WETLAND D



# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 3- WETLAND D



# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 4- WETLAND D

#### WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (<u>WRIA</u>). Please use links (where available) for more information on a project.

#### Counties

- King
- Snohomish



Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	<u>Joan Nolan</u> 425-649-4425
	Dissolved Oxygen Temperature	Approved by EPA	
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	<u>Tricia Shoblom</u> 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	<u>Joan Nolan</u> 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svrjcek 425-649-7036
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036
Pipers Creek	Fecal Coliform	Approved by EPA	<u>Joan Nolan</u> 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Field work starts summer 2015	Ralph Svrjcek 425-649-7036
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036

Wetland Resources, Inc. Detinention / Mitikation / Restantion / Habitat Creation / Permit Assistance 9505 19th Avenue S.E. Suite 106 Everett, Washington 98208 Phone: (425) 337-3174 Fax: (425) 337-3045 Email: mailbox@wetlandresources.com

#### WETLAND RATING Wetland D

Figure D-4 WRI Job # 22264 Rated by: AW

# GOAT HILL SD CIP 3 WETLAND RATING FIGURE 5- WETLAND D







# APPENDIX C: Critical Area Study Maps

# CRITICAL AREA STUDY MAP - OVERVIEW <u>CPH CONSULTANTS - GOAT HILL SD CIP 3</u>

ATTACHMENT 4

PORTION OF SECTION 30, TOWNSHIP 26N, RANGE 05E, W.M.







# CRITICAL AREA STUDY MAP - INSET 3 <u>CPH CONSULTANTS - GOAT HILL SD CIP 3</u>

ATTACHMENT 4

PORTION OF SECTION 30, TOWNSHIP 26N, RANGE 05E, W.M.

STREAM F TYPE F -----50' BUFFER

**INSET 3** 





ATTACHMENT 5



# **CRITICAL AREA STUDY AND BUFFER MITIGATION PLAN**

FOR

# GOAT HILL DRAINAGE DITCH CONVEYANCE AND CHANNEL STABILIZATION PROJECT – PHASE 1

Wetland Resources, Inc. Project #22264

<u>Prepared By</u> Wetland Resources, Inc. 9505 19th Avenue SE, Suite 106 Everett, WA 98208 (425) 337-3174

> Prepared For CPH Consultants Attn. Matt Hough 11321-B NE 120th St. Kirkland, WA 98034

July 25, 2023 Revision #1: September 26, 2023

# TABLE OF CONTENTS

1.0 INTRODUCTION	1
1.1 PROJECT AREA DESCRIPTION	1
1.2 WETLAND AND STREAM DETERMINATION	2
1.2.1 Wetland Determination Findings	2
1.2.2 Stream Determination Findings	2
1.3 INTERRUPTED BUFFER WAIVER	3
1.4 STREAM BUFFERS AND CULVERTS	3
2.0 PROJECT DESCRIPTION	4 4
3.0 BUFFER MITIGATION PLAN. 3.1 ELIGIBILITY FOR USE OF AMP	5 5
5.2 MITIGATION CREDIT DETERMINATION	5
4.0 WETLAND AND STREAM FUNCTIONS AND VALUES ASSESSMENT 4.1.1 Existing Conditions 4.1.2 Post-Development Functions and Values	6 6 6
5.0 Use of this Report	7
6.0 References	8

# LIST OF APPENDICIES

APPENDIX A: EXISTING CONDITIONS AND PROPOSED PROJECT MAPS FOR

PHASE 1 – GOAT HILL DRAINAGE IMPROVEMENTS

# **1.0 INTRODUCTION**

*Wetland Resources, Inc. (WRI)* conducted site investigations on October 10 and November 21, 2022, to locate and evaluate jurisdictional wetlands and streams on and in the vicinity of the Goat Hill Drainage Ditch Conveyance and Channel Stabilization project area. The Goat Hill neighborhood is the City of Kirkland, WA, and located within Section 30, Township 26, Range 5, W.M. The area reviewed for wetlands and streams is shown in the figure below.



Figure 1 - Aerial of the Study Area

#### **1.1 PROJECT AREA DESCRIPTION**

The project area and surrounding land use include single- and multi-family residential development. Topography of the area generally slopes steeply to the south, with level areas around existing residences. Six streams and seven wetlands were identified within the study area for Goat Hill SD CIP 3. The project area is within the Juanita Creek drainage basin, which is in Watershed Resources Inventory Area (WRIA) 8.

1

#### **1.2 WETLAND AND STREAM DETERMINATION**

Wetland and stream delineation methodology, locations, classifications, and standard buffer widths were included in the *Critical Area Study for Goat Hill SD CIP 3*, Revision #1, dated May 10, 2023. This report was reviewed under SAR23-00191 and the wetland and stream locations and classifications presented in that report have been approved. A summary of the information approved through the SAR23-00191 review is provided below.

# 1.2.1 Wetland Determination Findings

Seven wetlands were identified within the project area. As required by the Kirkland Zoning Code (KZC) 90.55, the wetlands were classified using the *Washington State Department of Ecology Wetland Rating System for Western Washington: 2014 Update.* Wetland buffer widths were determined using the category and habitat score, as listed in KZC Table 90.55.1.

Wetland	HGM Class	Category	Habitat Score	Standard Buffer Width
Wetland A	Depressional	III	5 points	60 feet
Wetland B	Slope + Riverine	II	4 points	75 feet
Wetland C	Slope	III	5 points	60 feet
Wetland D	Slope	III	4 points	60 feet
Wetland E	Riverine	III	5 points	60 feet
Wetland F	Riverine	III	5 points	60 feet
Wetland G	Slope	IV	6 points	40 feet

Table 1 - Wetland Classifications and Buffer Widths

# 1.2.2 Stream Determination Findings

Six streams were identified within the project area. Streams were classified in accordance with WAC 222-16-030, as required by KZC 90.65 and their buffer widths were determined using KZC Table 90.65.1.

Stream Classificatio		Standard Buffer Width
Stream A	Type Np	50 feet
Stream B	Type Np	50 feet
Stream C	Type Ns	50 feet
Stream D	Type Ns	50 feet
Stream E	Type Np	50 feet
Stream F	Type F	50 feet

Table 2 - Stream Classifications and Buffer Widths

The physical parameters of Stream F meet the definition for a fish-bearing (Type F) stream. However, given the extensive stormwater infrastructure and arterial between Stream F and Lake Washington, Stream F does not contain fish. Per the approved *Critical Area Study for Goat Hill SD*  *CIP 3*, the required buffer width for a non-fish bearing stream will apply to Stream F, as allowed in KZC 90.120.2.

#### **1.3 INTERRUPTED BUFFER WAIVER**

Per KZC 90.120.1, a critical area buffer may be terminated along the edge of an improved rightof-way when the improved road interrupts a portion of the critical area buffer from the portion of the buffer adjacent to the critical area. An interrupted buffer must meet the criteria in KZC 90.120.1.d, listed below.

1) The existing legal improvement creates a substantial barrier to the buffer function;

2) The interrupted buffer does not provide additional protection of the critical area from the proposed development; and

3) The interrupted buffer does not provide significant hydrological, water quality and wildlife buffer functions relating to the portion of the buffer adjacent to the critical area.

The roads providing access to the Goat Hill neighborhood interrupt the standard buffer widths of the identified wetlands and streams in the project area. Existing improved rights-of-way within the wetland/stream buffers that contain asphalt, gravel, and other infrastructure does not contribute to wetland/stream buffer functions. These improvements do not assist in filtering sediment or pollutants out of stormwater or slow velocity of runoff. Regularly used roads present an obstacle for terrestrial animals moving from one area to another. Since the roads fragment the standard buffer and do not contribute to buffer functions, they prevent buffer area on one side of the road from providing protection to the interrupted buffer area on the other side of the road.

Given that the improved rights-of-way within the wetland/stream buffers do not provide any hydrological, water quality, or wildlife benefits, these areas do not provide protection of the wetlands or streams in the project area. The wetland/stream buffers are functionally interrupted and should terminate along the edge of improvements within the rights-of-way.

The interrupted buffers are shown in the figures in Appendix A.

#### **1.4 STREAM BUFFERS AND CULVERTS**

The figures within the approved *Critical Area Study for Goat Hill SD CIP 3* depicted the standard stream buffer widths without consideration of existing culvert locations. All stream buffers shown on the figures within Appendix A are based on the guidance for culverted streams and their buffers in Plate 16 A of KZC.

# **2.0 PROJECT DESCRIPTION**

Phase 1 of the Goat Hill Drainage Ditch Conveyance and Channel Stabilization project proposes to remove, replace, and install new storm drainage facilities in the Goat Hill neighborhood to improve collection and conveyance capacity as well as to protect against flooding, landslides, and other related hazards. The existing road surface is proposed to be replaced and widened in some areas. The primary purpose of this work is to improve stormwater runoff collection and conveyance, it is not targeted at improving traffic safety. However, traffic safety is expected to be improved as a result of these improvements. The majority of the proposed work is located within public rights-of-way, with some minor areas of work on private property in order to construct necessary improvements.

No direct impacts to any streams or wetlands are proposed as part of this phase of the project. The proposed storm drainage improvement project will impact the a few minor areas within the wetland/stream buffers adjacent to the existing roads. New stormwater lines and widening of existing public streets within wetland and stream buffers are allowed activities per KZC 90.40. Mitigation will be provided for all wetland/stream buffer impacts.

#### 2.1 BUFFER IMPACTS

Widening the pavement, installation of new stormwater pipes, and necessary grading for the project on NE 117th Place will result in two areas of permanent buffer impact.

Wetland/Stream Buffer Impacted	Type of Buffer Impact	Impact Size (square feet)	Existing Vegetation in Impact Area	Mitigation
Stream A/ Wetland C Buffer	Permanent (road widening)	175 sf	Himalayan Blackberry, English Ivy	Advance Mitigation Program
Stream A Buffer	Permanent (road widening)	280 sf	Himalayan Blackberry, English Ivy	Advance Mitigation Program

**Table 3** - Buffer Impacts and Mitigation

A total of 455 square feet of Stream A/Wetland C buffer will be impacted for drainage improvements along NE 117th Place. Per KZC 90.40.6.d.1, new stormwater lines are allowed in critical area buffers, *provided they shall be located as far as possible from the critical area edge.* The proposed drainage improvements are a combination of upgrading/rerouting existing stormwater infrastructure and installing new stormwater collection and conveyance infrastructure. Since this project is focused on conveying runoff from existing development and roads, the new stormwater collection and conveyance features will be located within and/or along the existing roads. The stormwater lines proposed within the Stream A/Wetland C buffer are within a few feet of the edge of asphalt of the existing road. As NE 117<sup>th</sup> Place crosses over Stream A, it is not possible to locate the new stormwater pipes further away from the stream. The drainage improvements will expand

the paved road width by 1 to 7 feet, with the narrowest width expansion where NE 117th Place crosses Stream A. This is the minimum amount of impact possible while providing necessary upgrades to the stormwater infrastructure in this area.

Mitigation for permanent buffer impacts will be provide through purchasing credits from the City's Critical Area Buffer Advance Mitigation Program. Given the location of the buffer impacts, and ownership of property between impacts and wetlands and streams, using this local mitigation bank is the most suitable location for the proposed project's compensatory mitigation requirements. Use of the City's mitigation bank also complies with the preferred mitigation requirements in 90.145.3.a, as discussed below in Section 3.1.1

If for some reason use of the AMP for this project's mitigation needs is not possible, the applicant will purchase credits through the Keller Farm Mitigation Bank or explore options available through the King County Mitigation Reserves Program.

# **3.0 BUFFER MITIGATION PLAN**

Mitigation for the Stream A/Wetland C buffer impacts associated with the drainage improvement project will be provided through purchasing credits from the City of Kirkland's Critical Area Buffer Advance Mitigation Program (AMP). This City-Responsible Mitigation program allows for purchase of credits for permanent wetland and stream buffer impacts, as discussed in KZC 90.145.4.c.

#### 3.1 ELIGIBILITY FOR USE OF AMP

The Goat Hill Drainage improvement project proposes work within and adjacent to rights-of-way. The City does not own the property between the work areas and the wetlands and streams within the project area. Therefore, the project meets the following eligibility criteria discussed in the AMP Administrative Framework document: *The applicant does not own or control the land between the impact and the edge of the wetland or stream*.

Use of the AMP also complies with the mitigation location requirements in KZC 90.145.3. Since the work will be done in and adjacent to the right-of-way and the property between the project limits and the wetland and streams is privately owned, on-site in-kind mitigation is not possible. By purchasing credits through the AMP, in-kind mitigation will be provided off-site within the City of Kirkland.

# 3.2 MITIGATION CREDIT DETERMINATION

Phase 1 of the Goat Hill Drainage improvement project will result in a total of 455 square feet of Stream A/Wetland C buffer impact. Mitigation for this impact will be provided through purchasing credits from the City's AMP. In general, one square foot of buffer impact requires one AMP credit. This project will require purchase of 455 AMP credits.

# 4.0 WETLAND AND STREAM FUNCTIONS AND VALUES ASSESSMENT

The methodology for this functions and values assessment is based on professional opinion developed through past field analyses and interpretation. This assessment pertains specifically to the wetlands and streams within the project area, but is typical for assessments of similar systems common to western Washington.

Wetlands in western Washington perform a variety of ecosystem functions. Included among the most important functions provided by wetlands are stormwater storage and flood flow attenuation, water quality improvement, and fish and wildlife habitat. An assessment of these functions for the project site is provided below.

Streams provide both hydrologic and habitat connections throughout the Western Washington Region. Many channels serve as rearing grounds for a variety of fish species, including salmonids. Many wildlife species make use of the resources provided by riparian ecosystems.

#### 4.1.1 Existing Conditions

Wetland C is a small slope wetland adjacent to Stream A and NE 117th Place. Emergent vegetation in Wetland C provides some biofiltration function and reduction in velocity of water moving downslope. However, this wetland is limited in the level of function provided due to its small size and its's location along a road. Wetland C provides a low to moderate value of functions.

Stream A consists of a combination of open and piped segments. The open channel areas are generally straight, narrow channels that lack meanders and pools. Consequently, the velocity of water within these streams is high and there are few areas that slow water flow. Without the ability to allow for particulates to settle, these streams provide a low value for water quality functions. Piped segments and steep gradients make these stream impassable to fish. The open channel segments of these streams do provide a water source and some areas with food sources and cover for wildlife. Overall, this stream provides a low value for wildlife habitat.

#### 4.1.2 Post-Development Functions and Values

This project will retain all open channel stream segments and does not propose any direct wetland or stream impacts. Wetland functions and values will not be changed as a result of the proposed project. Overall, the stormwater drainage improvement project will reduce high velocity flows and erosion control measures will be increased, which will improve the overall water quality and hydrological functions of the project area.

Necessary permanent impacts to the Stream A/Wetland C buffer will be compensated through the purchase of credits from the City's AMP, ensuring that no net loss of wetland functions and values in the watershed will result from this proposal. The area that will be impacted to complete the project is low-quality buffer that provides minimal functional value to surrounding ecosystems. The ecologically improved land provided by the AMP will have a much higher value than that impacted by the proposed development. Thus, the proposed development and mitigation is expected to improve the functions and values of wetlands and streams within the basin.

# **5.0 Use of this Report**

This Critical Area Study and Buffer Mitigation Plan is supplied to CPH Consultants as a means of describing jurisdictional wetlands and streams, as required by the City of Kirkland during the permitting process. This report is based largely on readily observable conditions and to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions. Reports may be adversely affected due to the physical condition of the site and the difficulty of access, which may lead to observation or probing difficulties.

The laws applicable to wetlands are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report, and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.

Meryl Kamowski, PWS Senior Ecologist

# **6.0 REFERENCES**

- Brinson, M.M. 1993. <u>A Hydrogeomorphic Classification for Wetlands.</u> Technical Report WRPDE-4. US Army Engineers Waterways Experiment Station, Vicksburg, MS.
- Cowardin, et al., 1979. <u>Classification of Wetlands and Deepwater Habitats of the United States</u>. U.S. Department of the Interior. FWS/OBS-79/31. December 1979.
- Environmental Laboratory. (1987). <u>Corps of Engineers Wetlands Delineation Manual</u>, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.
- Hruby, T. 2014. <u>Washington State Wetland Rating System for Western Washington- 2014</u> <u>Update</u>. WA State Department of Ecology. Publication #14-06-029.
- Kirkland, City of. Kirkland Zoning Code. Chapter 90 Critical Areas.
- Lichvar, R.W. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016 30: 1-17. Published April 28, 2016. ISSN 2153 733X
- US Army Corps of Engineers. 2010. <u>Regional Supplement to the Corps of Engineers Wetland</u> <u>Delineation Manual: Western Mountains, Valleys, and Coast Region</u> (Version 2.0). Vicksburg, MS

8

# APPENDIX A: Existing Conditions and Proposed Project Maps for Phase 1 – Goat Hill Drainage Improvements

# **EXISTING CONDITIONS - OVERVIEW PHASE 1 - GOAT HILL DRAINAGE IMPROVEMENTS**

ATTACHMENT 5

600

PORTION OF SECTION 30, TOWNSHIP 26N, RANGE 05E, W.M.







# EXISTING CONDITIONS - INSET 3 PHASE 1- GOAT HILL DRAINAGE IMPROVEMENTS

PORTION OF SECTION 30, TOWNSHIP 26N, RANGE 05E, W.M.




## PROPOSED PROJECT - OVERVIEW <u>PHASE 1 - GOAT HILL DRAINAGE IMPROVEMENTS</u>

ATTACHMENT 5

PORTION OF SECTION 30, TOWNSHIP 26N, RANGE 05E, W.M.





## PROPOSED PROJECT - INSET 2 <u>PHASE 1 - GOAT HILL DRAINAGE IMPROVEMENTS</u>

**ATTACHMENT 5** 

PORTION OF SECTION 30, TOWNSHIP 26N, RANGE 05E, W.M.







Planning & Building Department Kirkland, WA 9 123 5th Avenue, Kirkland, WA 98033 425.587.3600 ~ www.kirklandwa.gov

#### MEMORANDUM

To: Adam Weinstein, AICP, SEPA Responsible Official

From: David Aldridge III, Planner

October 13, 2023 Date:

File: SEP23-00526

STATE ENVIRONMENTAL POLICY ACT (SEPA) DETERMINATION Subject: GOAT HILL DRAINAGE DITCH CONVEYANCE AND CHANNEL STABILIZATION -PHASE 1

#### GENERAL

This applicant, Matthew Hough with CPH Consultants, proposes to remove, replace, and install new storm drainage facilities in three specific work areas of the Goat Hill neighborhood of Kirkland (see Attachment 1). The three work areas are described as follows:

Work Area A – This project area includes approximately 700 lineal feet (LF) of NE 117<sup>th</sup> PL and 330 LF of 90<sup>th</sup> Avenue NE, with a total approximate area of 42,630 ft<sup>2</sup>.

Work Area B – This project area includes approximately 750 LF of NE117<sup>th</sup> Place, 1,065 LF of NE 116<sup>th</sup> PL, and 160 LF of NE 118<sup>th</sup> PL, with a total approximate area of 99,000 ft<sup>2</sup>.

Work Area C – This project area includes approximately 40 LF of 91<sup>st</sup> Lane NE, with a total approximate area of 3,200 ft<sup>2</sup>.

#### ANALYSIS

The SEPA "threshold determination" is the formal decision as to whether the proposal is likely to cause a significant adverse environmental impact for which mitigation cannot be identified. If it is determined that a proposal may have a significant adverse impact that cannot be mitigated, an Environmental Impact Statement (EIS) would be required.

Many environmental impacts are mitigated by City codes and development regulations. For example, the Kirkland Zoning Code has regulations that protect sensitive areas, limit noise, provide setbacks, establish height limits, etc. Where City regulations have been adopted to address an environmental impact, it is presumed that such regulations are adequate to achieve sufficient mitigation [WAC 197-11-660(1)(e) and (g)].

I have had an opportunity to visit the subject property and review the following documents:

- Environmental Checklist dated July 11, 2023 (see Attachment 2)
- Critical Area Report dated May 10, 2023 (see Attachment 3) •
- Critical Area Report dated July 25, 2023 (see Attachment 4)

Below is an analysis of key SEPA elements identified by staff:

#### Transportation

Construction will occur during normal work hours. While the primary purpose of this work is to improve stormwater runoff collection and conveyance, the proposal includes street widening and a sidewalk extension that will improve pedestrian and vehicular safety.

#### CONCLUSION

Based on my review of all available information and adopted policies of the City, I have not identified any significant adverse environmental impacts. Therefore, I recommend that a Determination of Non-Significance be issued for this proposed action.

#### ATTACHMENTS

- 1. Project Plans
- 2. Environmental Checklist dated July 11, 2023
- 3. Critical Area Report dated May 10, 2023
- 4. Critical Area Report dated July 25, 2023

I concur I do not concur

Comments:

October 13, 2023

for Adam Weinstein, Planning & Building Director Date

cc: Matthew Hough, CPH Consultants George Minassian, City of Kirkland, CIP Team

## **Environmental Checklist (SEPA)**

Submitted on	13 July 2023, 11:40AM
Receipt number	52
Related form version	18

## Use of checklist for non-project proposals:

Name of proposed project, if applicable:	Capital Improvement Project (CIP) SDC090000 Goat Hill Drainage Ditch Conveyance and Channel Stabilization – Phase 1
Name of applicant	City of Kirkland
Phone #	4255873821
Applicant Address	City of Kirkland – Public Works 123 Fifth Avenue
City	Kirkland
State	Washington
Zip	98033
Date checklist prepared	07/11/2023
Agency requesting checklist	City of Kirkland
Proposed timing or schedule (including phasing, if applicable)	The project is being proposed and executed in two phases to accommodate anticipated permit timelines. Each of these phases can be completed independently. This checklist pertains to the improvements proposed with Phase 1. Permit approvals for Phase 1 are anticipated by January 1, 2024 to allow construction activities for Phase 1 to begin Early Spring 2024 after all necessary permits are obtained and contractor is selected, and is projected to be completed by the end of 2024. Agency permit approvals for Phase 2 are predicted to be completed by Fall 2024. Construction for Phase 2 will follow permit approval. That start could be as early as Winter 2024, but could be delayed to Early Spring 2025 based on weather and funding.
Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.	Yes. Modifications to some of the Phase 1 improvements will be performed with a future Phase 2. Future modifications to some of the improvements completed with this proposal will occur in a second phase (Phase 2). Those Phase 2 improvements are anticipated to require outside Agency permits (e.g., US Army Corps of Engineers Section 404; USACE) that are not expected to be in place until Fall 2024.
List any environmental information you know about that has been prepared, or will be prepared, directly related to this	Geotechnical Report (Associated Earth Sciences, Inc., December 5, 2022)

Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

List any government approvals or permits that will be needed for your proposal, if known.

Critical Area Study (Wetland Resources, Inc., December 21, 2022) Cultural Resources Assessment (Cultural Resource Consultants, February 28, 2023)

There are no applications currently pending governmental approvals that directly affect the property covered by the proposed improvements.

City of Kirkland: Land Surface Modification (LSM) permit, Right-of-Way permit, Critical Area Review, Building Permit for retaining wall
Department of Ecology: Section 401 Clean Water Act permit, Construction Stormwater General Permit (CSWGP)
Washington Department of Fish & Wildlife: Hydraulic Project Approval (HPA)

Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. This project proposes to remove, replace, and install new storm drainage facilities in three specific work areas of the Goat Hill neighborhood in the City of Kirkland to improve collection and conveyance capacity and to protect against flooding, landslides, and other related hazards. The existing road surface is proposed to be replaced and widened in some areas. The primary purpose of this work is to improve stormwater runoff collection and conveyance, it is not targeted at improving traffic safety. However, traffic safety is expected to be improved as a result of these improvements. The majority of the proposed work is located within public right-of-way. There are some limited areas outside of the public right-of-way where work is proposed in order to construct necessary improvements. The following is a brief description of the size of each work area:

• Work Area A – This project area includes approximately 700 lineal feet (LF) of NE 117th Place and 330 LF of 90th Avenue NE, with a total approximate area of 42,630 square feet.

• Work Area B – This project area includes approximately 750 LF of NE 117th Place, 1,065 LF of NE 116th Place, and 160 LF of NE 118th Place, with a total approximate area of 99,000 square feet.

• Work Area C – This project area includes approximately 40 LF of 91st Lane NE, with a total approximate area of 3,200 square feet.

The project is comprised of three specific work areas in the Goat Hill neighborhood in the City of Kirkland. The majority of the work area is located in Section 30, Township 26 North, Range 5 East, and a small portion of Work Area C is located in Section 31, Township 26 North, Range 5 East. Below is a brief description of the location for each work area:

• Work Area A – This project area encompasses a portion of NE 117th Place beginning at and north of the intersection with 90th Avenue NE and ending near the southwest property corner of Parcel No. 375450-0220, and also encompasses 90th Avenue NE from the intersection with NE 117th Place north until the southwest property corner of Parcel No. 375450-0135.

Work Area B – This project area encompasses a portion of NE 116th Place beginning approximately 60 feet west of the intersection with 91st Place NE and ending at the intersection with NE 117th Place, a portion of NE 117th Place beginning at the intersection with NE 116th Place and ending about 100 feet NE of the intersection with NE 118th Place, and a portion of NE 118th Place beginning at the intersection with NE 117th Place and ending approximately 160 feet to the north of the intersection.
Work Area C – This project area encompasses a portion of 91st Lane NE beginning at the intersection with NE 116th Place and ending approximately 40 feet to the north of the intersection.

#### 1. Earth

a. General description of the site

Steep slopes

Other (general description):	
b. What is the steepest slope on the site (approximate percent slope)?	Per the Geotechnical Engineering Report prepared by Associated Earth Sciences, Inc. (AESI; December 5, 2022), isolated portions of the site reach inclinations of up to 45 percent.
c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.	Based on subsurface explorations and boring logs prepared by AESI, the site consists of a wide range of soils dependent on specific locations. These include sand, gravel, and silt. The soils are characterized as Till, Outwash, Landslide Debris, and Fill.
d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.	Yes, there are several localized areas throughout the site where landslide debris was encountered during subsurface explorations. Refer to the Geotechnical Engineering Report for further discussion.
e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.	Roadway and utility trench excavation, backfill, and restoration is proposed at all work area (site) locations to facilitate the proposed public infrastructure improvements, which includes new drainage collection and conveyance facilities, roadway pavement widening, and retaining wall or rock facing (rockery) installations. Embankment and trench backfill are currently planned to use import materials. Excavated pavement sections and trench materials are not expected to be suitable for structural use and will be exported offsite. Fill/backfill material will be imported from approved commercial sources. Excavated pavement and unsuitable soil materials will be hauled to an approved offsite disposal location. Approximately 5,000 cy of excavation and 6,500 cy of clean fill material, for a total earthwork volume of 11,500 cy, are currently estimated to complete the project.
f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.	Mass clearing and grading is not proposed for this project. There is potential for erosion to occur during roadway excavation when subgrade or base material is exposed as a result of pavement removal, or when existing slopes are excavated in order to construct retaining walls and storm drain outfalls.
g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?	The project does not propose a significant amount of new impervious surface relative to the amount of existing impervious surface in the work areas. The approximate percentage of impervious surface coverage after construction per work area (calculated using the areas listed in the response to question A.11) is listed below: • Work Area A – 54.0% impervious coverage (2,480 square feet of new impervious surface, 23,000 square feet existing/replaced impervious surface) • Work Area B – 53.0% impervious coverage (2,800 square feet of new impervious surface) • Work Area C – 78.0% impervious coverage (200 square feet of new impervious surface) • Work Area C – 78.0% impervious coverage (200 square feet of new impervious surface) • Work Area C – 78.0% impervious coverage (200 square feet of new impervious surface) • Work Area C – 78.0% impervious coverage (200 square feet of new impervious surface) • Work Area C – 78.0% impervious coverage (200 square feet of new impervious surface) • Work Area C – 78.0% impervious coverage (200 square feet of new impervious surface) • Work Area C – 78.0% impervious coverage (200 square feet of new impervious surface) • Work Area C – 78.0% impervious coverage (200 square feet of new impervious surface) • Work Area C – 78.0% impervious coverage (200 square feet of new impervious surface) • Work Area C – 78.0% impervious coverage (200 square feet of new impervious surface) • Work Area C – 78.0% impervious coverage (200 square feet of new impervious surface)
h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:	A temporary erosion and sediment control plan, details, and specifications have been prepared with the construction documents that accompany this checklist. Erosion control BMP's may include, but are not limited to, the following: silt fencing, rock check dams, straw wattles, coir logs, erosion control blankets, pipe outlet protection, storm drain inlet protection, and temporary covering of disturbed slopes and storage piles.

## **2. AIR**

a. What types of emissions to the air would result from the

Temporary exhaust emissions will occur along with some noise increase

proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. from heavy equipment during construction. Soil dust emissions may result from construction operations during dry weather conditions. Approximate quantities of emissions are not known.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

There are no known off-site sources of emission or odor that will affect this proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Construction activities will be limited to established City of Kirkland standard work hours to reduce or control emissions, noise, and other impacts to air. Water trucks or similar methods will be used to limit errant dust from work areas during construction.

## 3. WATER

1) Is there any surface water body on or in the immediate vicinity of the site (includingyear-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.	Several streams and wetlands have been confirmed to exist in the vicinity of and/or within portions of the work areas. Six streams were identified within the project limits based on a Critical Areas Study performed by Wetland Resources, Inc. The streams have been identified by the project biologist as streams A thru F. Three of the streams are classified as Type Np and three are classified as Ns. Runoff from each of the streams ultimately reaches Lake Washington, which is located just south of the project area.	
	Seven wetlands were identified in the Critical Areas Study. The wetlands do not have official names, but are identified as wetlands A-G for project purposes. Five of the wetlands are classified as Category III, one is classified as Category II, and one is classified as Category IV.	
2) Will the project require any work over, in, or adjacent to (within 200 feet) the describedwaters? If yes, please describe and attach available plans.	Yes. Construction for roadway and stormwater infrastructure improvements will occur in areas adjacent to the above-mentioned streams and wetlands. The work and location of each of the streams and wetlands are illustrated in the construction plans that accompany this checklist.	
3) Estimate the amount of fill and dredge material that would be placed in or removedfrom surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.	No fill or dredge materials are anticipated to be placed or removed from surface waters or wetlands.	
4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.	The project does not propose any surface water withdrawals or diversions.	
5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.	No, the proposal does not lie within a 100-year floodplain.	
6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.	No, the proposal does not involve discharge of waste materials to surface waters.	
1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.	No, groundwater will not be withdrawn from a well nor will water be discharged to groundwater.	
2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example:	No, waste materials associated with this project will discharge into the ground	

Domestic sewage; industrial, containing thefollowing

chemicals...; agricultural; etc.). Describe the general size of the system, thenumber of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

1) Describe the source of runoff (including storm water) and method of collectionand disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.	Stormwater runoff is anticipated to be generated from impervious and pervious surfaces within and upstream of the project work areas. This runoff will be collected by new and existing catch basin inlets along flow paths, primarily within the road surfaces, or via ditch/stream culvert inlets. Runoff will be conveyed through a combination of underground conveyance pipes and existing streams, which ultimately discharge to Lake Washington at various locations downstream of the project site.
2) Could waste materials enter ground or surface waters? If so, generally describe.	No. The project will not result in waste discharge to ground or surface waters.
3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.	Yes, the project proposes to alter the drainage pattern in a portion of Work Area B. The existing drainage systems in the NE 117th PI right-of- way in Work Area B generally collect and convey runoff south and west towards the intersection with NE 116th PI where it is conveyed via an 8- in diameter pipe over the steep slope through private property to NE Juanita Drive. The project proposes to abandon the connection to the outfall to NE Juanita Drive and re-direct that flow to the NE 116th PI drainage systems. The improved systems within this work area will ultimately connect and discharge to the recently installed CIP#1 drainage improvements at SDMH #6910 (City GIS #44861).
d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:	New roadway thickened edges, catch basins, and underground conveyance pipes are proposed to control and improve stormwater runoff. No adverse drainage pattern impacts are expected.

## 4. PLANTS

	deciduous tree: alder, maple, aspen, other
	evergreen tree: fir, cedar, pine, other
	shrubs
	grass
	pasture
	wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
	water plants: water lily, eelgrass, milfoil, other
b. What kind and amount of vegetation will be removed or altered?	Nominal amounts of vegetation will need to be removed to complete the proposed improvements. This vegetation consists primarily of grass and blackberry bushes. The extent of clearing is represented in the construction plans that accompany this checklist.
c. List threatened and endangered species known to be on or near the site.	No threatened or endangered plant species are known to be on or near the site.
d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:	The scope of the project does not involve landscape or vegetation improvements. Temporary erosion and sediment control measures will be employed during construction to protect existing vegetation to the maximum extent feasible.
e. List all noxious weeds and invasive species known to be on or near the site.	Himalayan blackberry

## 5. ANIMALS

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. Examples include: birds: hawk, heron, eagle, songbirds, other. Mammals: deer, bear, elk, beaver, other. Fish: bass, salmon, trout, herring, shellfish, other.	hawk, heron, eagle, songbirds, deer
b. List any threatened and endangered species known to be on or near the site.	No threatened or endangered species are known to be on or near the project site.
c. Is the site part of a migration route? If so, explain.	The Puget Sound lowlands is located within the greater Pacific Flyway migratory bird route, and as such, the site would be within this greater migratory route.
d. Proposed measures to preserve or enhance wildlife, if any:	There are no proposed measures to preserve or enhance wildlife. The proposed improvements are not expected to adversely affect wildlife habitat.
e. List any invasive animal species known to be on or near the site.	No known invasive animal species are known to be on or near the project site.

## 6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meetthe completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.	The completed project improvements will not require an energy source.
b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.	The proposed project would not affect the potential use of solar energy by adjacent properties.
c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:	The project will be constructed to current City of Kirkland standards. No additional energy conservation features are proposed or expected to be necessary.
7. Environmental Health	
a. Are there any environmental health hazards, including exposure to toxic chemicals, riskof fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.	Local fuel spills are possible from equipment during construction activities for the project. No post-construction environmental health hazards will result from the project.
1) Describe any known or possible contamination at the site from present or past uses.	No contamination is known to be on or near the project site.
2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.	Existing buried natural gas lines are present throughout the project site work areas. The proposed storm improvements will be designed to limit impacts to gas lines as much as practical. It is expected that some portions of the existing gas lines within the work areas will need to be relocated by Puget Sound Energy in order to complete the proposed improvements.
3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the	No toxic or hazardous chemicals will be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

4) Describe special emergency services that might be required.	No special emergency services are required for the proposed project.
5) Proposed measures to reduce or control environmental health hazards, if any:	A Construction Stormwater Pollution Prevention (CSWPP) Plan will be prepared with the Land Surface Modification (LSM) Permit and construction documents for the project as required by City of Kirkland standards. The CSWPP Plan will include specific measures for addressing construction equipment fuel or other lubricant spills, which will include provisions for maintaining emergency spill control equipment and for preventing or containing such spills.
1) What types of noise exist in the area which may affect your project (for example:traffic, equipment, operation, other)?	Typical traffic noise from the surrounding residences and roads exist in the area. There are a number of single-family residences currently under construction in the Goat Hill neighborhood, which will produce typical construction noise.
2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indi-cate what hours noise would come from the site.	No long-term noise will be created with the project. Short-term noise level increases will result from equipment during construction activities. Construction activities will be limited to established City of Kirkland standards. Construction hours will be limited conform to current City of Kirkland municipal code and other applicable development standards.
3) Proposed measures to reduce or control noise impacts, if any:	Construction activities will be limited to established City of Kirkland standard work hours to limit and control emission and noise.
8. Land and Shoreline Use	
a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.	The proposed work areas contain primarily improved public right-of-way areas with some limited work occurring in adjacent private properties Most of the adjacent properties contain single-family residential homes. There is some multi-family housing adjacent to Work Area C. The proposal is not expected to affect land uses on nearby or adjacent properties.
b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?	The project site has not been used as working farmlands or working forest lands. The project site does not contain any agricultural or forest land.
1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:	There are no working farms or forest lands near the site, so the proposal will not affect or be affected by any working farm or forest land.
c. Describe any structures on the site.	There are existing retaining walls and rockeries within some of portions of some of the work areas. Private single-family homes and associated

areas.

d. Will any structures be demolished? If so, what?

e. What is the current zoning classification of the site?

The majority of the properties surrounding the work areas are zoned RSA 4, Low Density Residential. The properties surrounding Work Area C are zoned RMA 1.8, High Density Residential, and there are a few

All or portions of existing gabion retaining walls will be removed with the

project. No other structures are proposed to be demolished.

exterior features are located immediately adjacent to or within the k

	properties near Work Area A that are zoned RMA 3.6, Medium Density Residential.
f. What is the current comprehensive plan designation of the site?	The majority of the properties surrounding the work areas have a comprehensive plan designation of Low Density Residential. The properties surrounding Work Area C are designated High Density Residential, and there are a few properties near Work Area A that are designated Medium Density Residential.
g. If applicable, what is the current shoreline master program designation of the site?	Not applicable. The site does not have a shoreline master program designation as it is not within 200 feet of Lake Washington's ordinary high water mark nor within wetlands connected to Juanita Bay and Yarrow Bay.
h. Has any part of the site been classified as a critical area by the city or county? If so, specify.	Yes, there are multiple wetlands and streams within the project area as identified in the Critical Area Study performed by Wetland Resources, Inc. Portions of the site are also located within Moderate to High Landslide Hazard Areas as identified by the City of Kirkland interactive map and as stated by the project's Geotechnical Report.
i. Approximately how many people would reside or work in the completed project?	No people will reside or work in the completed project work areas. The proposed project work is limited to storm drainage and roadway improvements mostly within public right-of-way.
j. Approximately how many people would the completed project displace?	This project will not displace any people.
k. Proposed measures to avoid or reduce displacement impacts, if any:	No measures are proposed or expected to be necessary to avoid or reduce displacement of people.
I. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:	The proposed improvements are limited to existing public storm drainage and road facilities. These improvements do not conflict with existing or projected land uses and plans, therefore no specific measures are proposed or expected to be necessary to ensure compatibility.
m. Proposed measures to ensure the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:	Not applicable – the project will not impact agricultural or forest lands.

## 9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.	No housing will be provided with this project.
b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.	No units will be eliminated with this project.
c. Proposed measures to reduce or control housing impacts, if any:	No measures are necessary to reduce or control housing impacts.

## **10. Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Rock facing (i.e. rockeries) and timber lagging soldier pile retaining walls are likely to be installed with the project to facilitate grading and pavement widening proposed with this project. The maximum height of rockeries is anticipated to be about six feet and the maximum height of soldier pile retaining walls is anticipated to be about twelve feet.

b. What views in the immediate vicinity would be altered or obstructed? The project improvements will not significantly affect any view.	'S.

 c. Proposed measures to reduce or control aesthetic impacts, if any: No measures are proposed or expected to be necessary to reduce or control aesthetic impacts.

## 11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?	The proposed improvements will not produce any light or glare.
b. Could light or glare from the finished project be a safety hazard or interfere with views?	Not applicable – the finished project improvements will not produce any light or glare.
c. What existing off-site sources of light or glare may affect your proposal?	No existing off-site sources of light or glare are expected to affect the proposal.
d. Proposed measures to reduce or control light and glare impacts, if any:	Not applicable – the project will not have any light or glare impacts.

## 12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?	Juanita Beach Park is located approximately 400 feet SE of the nearest project work area (Work Area C).
b. Would the proposed project displace any existing recreational uses? If so, describe.	The project is not expected to displace any existing recreational uses. Construction work may temporarily dissuade some residents of the Goat Hill neighborhood from walking to Juanita Beach Park.
c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:	No measures are proposed or expected to be necessary to reduce or control impacts on recreation. The proposed project improvements do not include any new recreation opportunities.

## 13. Historic and cultural preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers located on or near the site? If so, specifically describe.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. There are no known buildings, structures, or sites located on or near the project area that are over 45 years old and listed in or eligible for listing in national, state, or local preservation registers.

There are no known landmarks, features, or other evidence of Indian or historic use or occupation of the project area. There are no known material evidence, artifacts, or areas of cultural importance on or near the site.

A Cultural Resources Assessment was completed for the project by the project archaeologist, Cultural Resources Consultants (CRC). That assessment used a variety of methods to identify the potential impacts to cultural and historic resources on or near the project site. These methods included the following: • Review of available project information and correspondence provided by the project proponent • Examination of local environmental, historical, and archaeological datasets • Field investigation • Correspondence with cultural resources personnel at the

Duwamish Tribe, Muckleshoot Tribe, Snoqualmie Tribe, Stillaguamish Tribe, Suquamish Tribe, and Tulalip Tribes A copy of the CRC report accompanies this checklist.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. The completed Cultural Resources Assessment for the project contains inadvertent discovery protocol in Appendix C of the report.

## 14. Transportation

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.	The public roads serving the project work areas include the following: 90th Avenue NE, NE 116th Place, NE 117th Place, NE 118th Place, and 91st Lane NE. The project improvements do not require any new street access, and no significant changes to the existing street system are proposed.
b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?	The project area is not currently served by public transit. The nearest transit stop is located approximately 2,400 feet to the east on 98th Ave NE.
c. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).	The proposed project includes some areas of road and pedestrian improvements. Work Area C includes a short sidewalk extension and new curb ramp in the northeast portion of the NE 116th Place and 91st Lane NE intersection. Work Areas A and B include areas within the public right-of-ways where pavement widening is proposed to improve traffic safety. Pavement widening is also proposed along the outside radius of the hair-pin turn at the intersection of NE 116th Place and NE 117th Place to improve its function by encouraging wider turns. A significant portion of the existing road surface within the Work Areas is proposed to be replaced. The primary purpose of this work is to improve stormwater runoff collection and conveyance, it is not targeted at improving traffic safety. However, traffic safety is expected to be improved as a result of these improvements.
d. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.	The project will not use or occur in the immediate vicinity of water, rail, or air transportation.
e. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?	This project will not generate any vehicular trips.
f. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.	No, the proposal will not interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area of the project.
g. Proposed measures to reduce or control transportation impacts, if any:	Traffic control measures will be used during construction (when necessary) to control transportation impacts. Specific Traffic Control Plans and/or traffic control performance specifications will be prepared and included in the final contract documents for construction.

## **15. Public Services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The project will not result in an increased need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Not applicable – the project will not impact public services.

## 16. Utilities

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. Portions of some existing utilities will require relocation and/or replacement to accommodate the proposed City infrastructure improvements. Public water and sanitary sewer facilities within the project work areas are owned and maintained by Northshore Utility District (NUD). Puget Sound Energy (PSE) owns, operates, and is responsible for all power and natural gas facilities at the site. Other utilities and service providers with facilities and activities within the project area that may be temporarily impacted from the proposed project improvements are the following: Waste Management for garbage and recycling pickup; and Comcast/Xfinity, Ziply (fka, Frontier), and Lumen (fka, CenturyLink) for communications.

electricity, natural gas, water, refuse service, telephone, sanitary sewer

Declaration:

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

c. Signature:

#### Uploaded signature image: Matt Signature.jpg

Print/Type Name of Signature:	Matthew Hough
Position and Agency/Organization	PE, CPH Consultants
Email Address	matt@cphconsultants.com
Date:	07/13/2023
City	Kirkland
State	Washington
Zip	98034
Country	USA
1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?	
Proposed measures to avoid or reduce such increases are:	

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

3. How would the proposal be likely to deplete energy or natural resources?

Proposed measures to protect or conserve energy and natural resources are:

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

Proposed measures to protect such resources or to avoid or reduce impacts are:

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

Proposed measures to avoid or reduce shoreline and land use impacts are:

6. How would the proposal be likely to increase demands on transportation or publicservices and utilities?

Proposed measures to reduce or respond to such demand(s) are:

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

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I understand that I will need to upload the PDF copy of this form to MBP along with the permit application to start the application process

# Appendix E: Geotechnical Reports



associated earth sciences incorporated



Subsurface Exploration, Geologic Hazard, and Geotechnical Engineering Report

## **GOAT HILL DRAINAGE IMPROVEMENTS (CIP #3)**

Prepared For: CPH CONSULTANTS

Project No. 20220263E001 December 5, 2022



Associated Earth Sciences, Inc.

www.aesgeo.com

Kirkland | Mount Vernon | Tacoma



December 5, 2022 Project No. 20220263E001

CPH Consultants 11321-B NE 120<sup>th</sup> Street Kirkland, Washington 98034

Attention: Mr. Matt Hough

Subject: Subsurface Exploration, Geologic Hazard, and Geotechnical Engineering Report Goat Hill Drainage Improvements (CIP #3) Kirkland, Washington

Dear Mr. Hough:

We are pleased to present the enclosed copy of the above-referenced report. This report summarizes the results of our subsurface exploration, geologic hazard, and geotechnical engineering studies and offers recommendations for the design and development of the proposed project, as currently envisioned.

We have enjoyed working with you on this study and are confident the recommendations presented in this report will aid in the successful completion of your project. If you should have any questions, or if we can be of additional help to you, please do not hesitate to call.

Sincerely, ASSOCIATED EARTH SCIENCES, INC. Kirkland, Washington

Bruce L. Blyton, P.E. Senior Principal Geotechnical Engineer

BLB/jh - 20220263E001-002

## SUBSURFACE EXPLORATION, GEOLOGIC HAZARD, AND GEOTECHNICAL ENGINEERING REPORT

## **GOAT HILL DRAINAGE IMPROVEMENTS (CIP #3)**

Kirkland, Washington

Prepared for: CPH Consultants 11321-B NE 120<sup>th</sup> Street Kirkland, Washington 98034

Prepared by: Associated Earth Sciences, Inc. 911 5<sup>th</sup> Avenue Kirkland, Washington 98033 425-827-7701

December 5, 2022 Project No. 20220263E001

#### I. PROJECT AND SITE CONDITIONS

#### 1.0 INTRODUCTION

This report presents the results of Associated Earth Sciences, Inc.'s (AESI's) subsurface exploration, geologic hazard, and geotechnical engineering study for the proposed Goat Hill Drainage Improvements for the City of Kirkland Capital Improvement Program #3 (CIP #3) The project area is located in Kirkland, Washington as shown on Figure 1, "Vicinity Map." The approximate locations of the explorations accomplished for this study are presented on Figure 2 titled "Existing Site and Exploration Plan." In the event that any changes in the nature, design, or location of the stormwater improvements are planned, the conclusions and recommendations contained in this report should be reviewed and modified, or verified, as necessary.

#### 1.1 Purpose and Scope

The purpose of this study was to provide subsurface data to be utilized in the design and construction of the above-referenced project. Our study included reviewing available geologic literature, drilling seven exploration borings, and performing geologic studies to assess the type, thickness, distribution, and physical properties of the subsurface sediments and groundwater conditions along the proposed stormwater improvements. Geologic hazard evaluations and geotechnical engineering studies were also conducted to determine suitable geologic hazard mitigation techniques and backfill recommendations. This report summarizes our current geotechnical fieldwork and offers geotechnical hazard mitigation and development recommendations based on our present understanding of the project.

#### 1.2 Authorization

Our study was accomplished in general accordance with our proposal, dated July 12, 2022. This report has been prepared for the exclusive use of CPH Consultants, and their agents, for specific application to this project. Within the limitations of scope, schedule and budget, our services have been performed in accordance with generally accepted geotechnical engineering and engineering geology practices in effect in this area at the time our report was prepared. No other warranty, express or implied, is made.

#### 2.0 PROJECT AND SITE DESCRIPTION

The subject project concerns the existing storm drainage system at the Goat Hill area of Kirkland, Washington. The Goat Hill neighborhood of Kirkland is situated on a south to southeast facing slope with a total height of approximately 400 feet, and an average inclination of approximately

25 percent. Isolated portions of this slope reach inclinations of 35 to 45 percent. Goat Hill is accessed by NE 116<sup>th</sup> Place and NE 117<sup>th</sup> Place, switching back up the slope.

The drainage system in this area includes both open channel and piped segments along NE 116<sup>th</sup> Place, NE 117<sup>th</sup> Place, 90<sup>th</sup> Avenue NE, and 91<sup>st</sup> Lane NE. We understand that proposed improvements at the project site may include new stormwater outfall structures, retaining walls, road regrading, or the replacement of existing storm drainage pipes and associated structures.

The City of Kirkland requires a geotechnical engineering report for the proposed project due to the site lying within Moderate and High Landslide Hazard Areas, as well as a portion of the site (91<sup>st</sup> Lane NE) lying with Medium or Mixed, or High, Liquefaction Hazard Areas, as delineated in the City of Kirkland maps. We have previously performed subsurface explorations and site reconnaissance at a portion of the project area and are familiar with conditions at those locations.

#### 3.0 SUBSURFACE EXPLORATION

AESI applied for a right-of-way Construction Permit from the City of Kirkland and received written approval before beginning our fieldwork. AESI completed a subsurface exploration program consisting of seven total exploration borings on September 21 and 22, 2022, to gain subsurface information about the site. The various types of soils, as well as the depths where characteristics of the soils changed, are indicated on the exploration logs presented in Appendix A. The depths indicated on the logs where conditions changed may represent gradational variations between soil types. Our explorations were approximately located in the field by measuring from known site features and are shown on Figure 2 titled "Existing Site and Exploration Plan."

The conclusions and recommendations presented in this report are based, in part, on the exploration borings completed for this study. The number, location, and depth of the explorations were completed within site/access constraints. The boring locations were chosen to produce both general site information and area-specific information based on the preliminary pipeline layout. Significant changes to the layout may require the completion of additional subsurface explorations. Because of the nature of exploratory work below ground, extrapolation of subsurface conditions beyond our field exploration is necessary. It should be noted that differing subsurface conditions may be present due to the random nature of deposition and the alteration of topography by past grading, filling, and utility construction. The nature and extent of any variations beyond our field exploration may not become fully evident until construction. If variations are observed at that time, it may be necessary to re-evaluate specific recommendations in this report and make appropriate changes.

#### 3.1 Exploration Borings

The exploration borings were completed by a rubber track-mounted drill rig advancing hollow-stem auger and tooling under subcontract to AESI. To prevent damage to existing utilities, a vacuum truck and air knife were used to clear and excavate the topmost 5 feet before drilling began. During the drilling process, samples were obtained at generally 5-foot-depth intervals. The exploration borings were continuously observed and logged by a geologist from our firm. The exploration logs presented in Appendix A are based on the field logs, drilling action, and inspection of the samples secured.

Disturbed but representative samples were obtained by using the Standard Penetration Test (SPT) procedure in accordance with *ASTM International* (ASTM) D-1586. This test and sampling method consists of driving a standard 2-inch, outside-diameter, split-barrel sampler a distance of 18 inches into the soil with a 140-pound hammer free-falling 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. If a total of 50 blows is recorded at or before the end of one 6-inch interval, the blow count is recorded as the number of blows for the corresponding number of inches of penetration. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils. These values are plotted on the attached boring log.

The samples obtained from the split-barrel sampler were classified in the field, and representative portions placed in watertight containers. The samples were then transported to our laboratory for further visual classification, as necessary.

The various types of soil and groundwater elevations, as well as the depths where soil and groundwater characteristics changed, are indicated on the exploration boring logs presented in Appendix A of this report.

#### 3.2 Previous Exploration Borings by AESI

In 2015, AESI completed subsurface explorations for a previous phase of Goat Hill drainage improvements located near the intersection of 90<sup>th</sup> Avenue NE and NE 117<sup>th</sup> Place. Exploration borings EB-1 through EB-3 were completed by a dolly-mounted drilling rig advancing a hollow stem auger and tooling. Sampling and documentation were conducted similar to our recent explorations. The approximate locations of these borings are shown on Figure 2 and copies of these exploration logs are included in Appendix A.

#### 4.0 SUBSURFACE CONDITIONS

Subsurface conditions at the project site were inferred from the field exploration completed for this study, visual reconnaissance of the site, and review of applicable geologic literature.

As shown on the boring logs, the exploration borings generally encountered an asphalt road section overlying localized deposits of variable density fill, landslide debris, Holocene lacustrine deposits, and/or Vashon recessional lacustrine deposits, all overlying dense/stiff glacially consolidated sediments. The following section presents more detailed subsurface information organized from the youngest (shallowest) to the oldest (deepest) soil types.

#### 4.1 Stratigraphy

#### Asphalt Pavement / Crushed Rock

A surficial layer of asphalt pavement was encountered at the location of all exploration borings completed for this study. The asphalt ranged in thickness from 3 to 8 inches and the crushed rock road base was an additional 0 to 3 inches thick. These materials are not considered suitable for pipe support or for reuse as structural fill.

#### Fill

To prevent damage to existing utilities, a vacuum truck and air knife were used to clear and excavate the topmost 5 feet before drilling began. As the vacuum truck traveled ahead of the drill rig, visual observation of the excavation, qualitative density observations, and grab samples in the upper 5 feet were not available for all borings. Fill soils of variable consistency and density were observed at EB-101, EB-104, EB-1, EB-2, and EB-3, to depths of up to 15 feet. Although not present on the exploration logs, fill may be present at the explored locations and may be encountered during trenching along the proposed utility alignment. Fill is generally not suitable for pipe support. At the location of EB-101, the fill consisted of gray, silty, sandy, angular gravel similar to a manufactured crushed rock product. At the location of EB-104, the fill consist predominantly of granular soil (sand and/or gravel), are free of organic debris and other deleterious materials, and exhibit a moisture content compatible with achieving the specified level of compaction may be suitable for reuse as structural fill provided it meets City of Kirkland requirements. AESI is available to observe these areas during construction to confirm suitability.

#### Landslide Debris / Slide Debris

EB-104 and EB-105 encountered approximately 7 feet of grayish brown, silt and fine sand and zones of blocky and brecciated texture. EB-3 encountered brown, silty, fine sand with highly variable density underlying fill soils. These materials are interpreted as sediments that have experienced movement since the most recent deglaciation. Samples obtained within the landslide debris displayed high angled, polished fracture planes and frequent blocky and brecciated texture, indicative of post-depositional movement (mass wasting) and consistent with regional geologic mapping. The landslide deposits are generally not suitable for support of

structuress. Due to their very high fine-grained content and very high sensitivity to moisture, these materials are not recommended for use as structural fill.

#### Holocene Lacustrine

Underlying the surficial road section and fill soils, EB-101 encountered a fining upwards sequence of gray, coarse to fine sand with variable silt content and trace bedded organics. We interpret these sediments as lacustrine sediments deposited during the post-glacial environment of the last 10,000 years. The Holocene lacustrine sediments extended to a depth approximately 13 feet below ground surface. The Holocene lacustrine sediments are suitable for structure support when prepared as recommended in this report. Due to their very high fine-grained content and very high sensitivity to moisture, these materials are not recommended for use as structural fill.

#### Vashon Recessional Lacustrine

Underlying the Holocene lacustrine sediments, EB-101 encountered gray, massive, micaceous, very silty fine sand with trace gravel. We interpret these sediments as having been deposited in a low-energy, glacial lacustrine environment during the deglaciation of the Puget Lowlands approximately 12,500 years ago. The thickness of the recessional lacustrine deposits was approximately 9 feet at EB-101. The recessional lacustrine deposits are suitable for structure support when prepared as recommended in this report. Due to their very high fine-grained content and very high sensitivity to moisture, these materials are not recommended for use as structural fill.

#### Vashon Lodgement Till

Exploration boring EB-1 from our 2015 study encountered dense to very dense, mottled grayish brown, silty fine to medium sand, with some gravel. We interpret these sediments to be representative of Vashon lodgement till. The Vashon lodgement till was deposited directly from basal, debris-laden glacial ice during the Vashon Stade of the Fraser Glaciation, approximately 12,500 to 15,000 years ago. The high relative density characteristic of the Vashon lodgement till is due to its consolidation by the massive weight of the glacial ice from which it was deposited. Lodgement till is suitable for support of structures when prepared as recommended in this report. Lodgement till contains a significant fine-grained fraction and is sensitive to excess moisture during placement in structural fill applications, if allowed by City of Kirkland specifications.

#### Vashon Advance Outwash

Underlying the fill soils and landslide debris in exploration boring EB-3 from our 2015 study, sediments encountered consisted of dense to very dense, grayish brown, fine to medium sand, with some silt. We interpret these sediments to be representative of Vashon advance outwash.

The Vashon advance outwash was deposited by meltwater streams flowing from the advancing glacial ice during the early portion of the Vashon Stade of the Fraser Glaciation, approximately 12,500 to 15,000 years ago. Vashon advance outwash is suitable for support of structures and is suitable for reuse as structural fill if allowed by City of Kirkland specifications.

#### Pre-Olympia Non-Glacial Coarse Grained

Sediments encountered underlying the Vashon recessional lacustrine in EB-101 and underlying the landslide debris in EB-105 consisted of very dense, gray to greenish dark gray, fine to medium sand, with variable silt and gravel content. We interpret these sediments to be representative of pre-Olympia non-glacial coarse-grained deposits. These sediments were deposited before the Olympia interglacial period which occurred from 15,000 to 60,000 years ago. The high relative density characteristic of these sediments is due to its consolidation from subsequent glaciations. The non-glacial coarse-grained sediments were approximately 5 feet thick in EB-105 and extended beyond the maximum depth explored of 30 feet in EB-101. Pre-Olympia non-glacial coarse-grained sediments are suitable for structure support when prepared as recommended in this report and are suitable for reuse as structural fill if allowed by City of Kirkland specifications.

#### Pre-Olympia Fine Grained / Pre-Olympia Undifferentiated

Sediments encountered below the surficial road section at EB-106 consisted of hard, thinly bedded, brownish gray ranging to dark gray with depth, silt, with some fine sand. Samples obtained at this location displayed steeply dipping bedding and closed/healed fracture planes. We interpret these sediments as pre-Olympia fine grained sediments from an unknown origin. We interpret the closed and healed fractures at EB-106 as older landslide debris that was re-consolidated during at least one subsequent glacial advance. Underlying the fill soils at a depth of 15 feet in exploration boring EB-2 from our 2015 study, sediments encountered consisted of hard, gray, silt, with some gravel and trace sand. We interpret these sediments as pre-Olympia sediments from an unknown origin. The pre-Olympia fine grained and undifferentiated sediments were deposited before the Olympia interglacial period which occurred from 15,000 to 60,000 years ago. The high relative density characteristic of these sediments is due to its consolidation from subsequent glaciations. Pre-Olympia fine grained and undifferentiated deposits are suitable for structure support when prepared as recommended in this report. Due to their very high fine-grained content and very high sensitivity to moisture, these materials are not recommended for use as structural fill.

#### Pre-Olympia Glacial Till

Sediments encountered below the surficial road section at EB-102, EB-103, EB-107, and below the landslide debris and pre-Olympia nonglacial coarse grained sediments in EB-105, consisted of dense to very dense, non-stratified, grayish brown ranging to gray, silty fine sand or sandy silt, with variable gravel content. We interpret these sediments to be representative of pre-Olympia

glacial till. The pre-Olympia glacial till was deposited directly from basal, debris-laden glacial ice during a glaciation before the Olympia interglacial period which occurred from 15,000 to 60,000 years ago. The high relative density characteristic of the pre-Olympia glacial till is due to its consolidation by the massive weight of the glacial ice from which it was deposited and additional consolidation from subsequent glaciations. Where encountered, the glacial till sediments extended to a depth of 15 feet in EB-103, and beyond the full depth explored of approximately 20 feet in EB-102, EB-105, and EB-107. Pre-Olympia glacial till is suitable for structure support when prepared as recommended in this report. Due to their very high finegrained content and very high sensitivity to moisture, these materials are not recommended for use as structural fill.

#### Pre-Olympia Glacial Fine Grained

Sediments encountered below the pre-Olympia glacial till in EB-103, and below the landslide debris in EB-104, consisted of very stiff to hard, gray to dark gray, silt with some fine sand. When exposed to hydrochloric acid, samples of these sediments reacted to form gas bubbles, which may indicate the presence of calcium carbonate associated with marine deposition. We interpret these materials as fine-grained glacial sediments, deposited in a glacial marine environment prior to the Olympia interglacial period and overridden by glacial ice during at least one subsequent glaciation. The pre-Olympia glacial fine-grained deposits are suitable for structure support when prepared as recommended in this report. Due to their very high fine-grained content and very high sensitivity to moisture, these materials are not recommended for use as structural fill.

#### 4.2 Geologic Mapping Review

Review of the regional geologic map titled *Surficial Geology of Kirkland*, published by GeoMapNW, dated December 3, 2017, indicates that the subject site is underlain by multiple geologic units. The lower elevation portion of the site along 91<sup>st</sup> Lane NE is mapped as Vashon recessional Lake Juanita deposits. The higher elevation portion of the site along NE 116<sup>th</sup> Place and NE 117<sup>th</sup> Place is mapped as various pre-Fraser and pre-Olympia glacial, nonglacial, and undifferentiated deposits with a landslide overlay west of EB-104 and a mass wasting overlay along the eastern portion of NE 117<sup>th</sup> Place near EB-3. Our interpretations are in general agreement with the published geologic mapping.

#### 4.3 Soil Mapping Review

Review of the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), *Web Soil Survey* indicates that the site along NE 117<sup>th</sup> Place and the western portion of NE 116<sup>th</sup> Place is underlain by *Alderwood gravelly sandy loam, 15 to 30 percent slopes (AgD),* which has a parent material of "glacial drift" while the lower elevation portion of the site along NE 116<sup>th</sup> Place and 91<sup>st</sup> Lane NE is underlain by *Kitsap silt loam, 2 to 8 percent slopes (KpB)* which has a parent material of "lacustrine deposits with a minor amount of volcanic ash". Our

interpretation of the soils encountered in our exploration is in general agreement with the regional soils mapping.

#### 4.4 Hydrology

Groundwater seepage was encountered at multiple explorations and varying depths. At the time of our explorations, we observed continuous flow in multiple stream channels and storm drainage pipes throughout the Goat Hill area.

EB-101 encountered groundwater seepage beginning at approximately 6 feet below ground surface and extending the full depth explored of 30 feet. We interpret this groundwater as a shallow, unconfined aquifer present within the recent lacustrine deposits, Vashon recessional lacustrine deposits, and pre-Olympia nonglacial coarse grained deposits that is likely hydraulically connected to nearby Lake Washington.

EB-104, EB-105, EB-2, and EB-3 all encountered thin zones of groundwater seepage at varying depths below the ground surface. These intervals generally corresponded to the base of fill soils, base of landslide debris, or the upper portion of the underlying pre-Olympia nonglacial coarse grained deposits. This groundwater likely represents a local groundwater table perched on top of the underlying very dense, very silty, pre-Olympia glacial till or glacial fine-grained deposits. This groundwater likely represents a local groundwater table perched on top of the underlying very dense, very silty, pre-Olympia glacial till or glacial fine-grained deposits. This groundwater likely represents a local groundwater table perched on top of the underlying very dense, very silty, pre-Olympia glacial till deposits. In areas underlain by glacial till, it is common for shallow perched seepage to accumulate seasonally at the base of more permeable fill or landslide deposits, or for groundwater to be present within the weathered till horizon during the wetter winter months. Groundwater present within the weathered till sediments is known as "interflow," and is perched atop the underlying, dense, low-permeability, unweathered till. This water may travel laterally and typically will follow the ground surface topography.

It should be noted that the occurrence and level of groundwater seepage will largely depend on the soil grain-size distribution, topography, seasonal precipitation, on- and off-site land usage, and other factors. Groundwater seepage should be anticipated along existing utility trenchlines, both within backfill zones and pipe bedding, as perched interflow along the base of roadway fills, and where these lines intersect relict drainage channels or ravines. Our field explorations were conducted in late September, when the groundwater levels are typically nearing a seasonal low and the interflow network is poorly connected.

#### 4.5 Laboratory Testing

We completed laboratory testing of selected soil samples collected from our exploration boring EB-101. A total of two grain-size analyses were performed to be utilized in liquefaction analyses. Copies of the laboratory test results are included in Appendix B.

#### II. GEOLOGIC HAZARDS AND MITIGATIONS

The following discussion of potential geologic hazards is based on the geologic conditions as observed and discussed herein.

#### 5.0 LANDSLIDE HAZARDS AND MITIGATION

The *Kirkland Zoning Code* (KZC 5.10.361.5) defines High Landslide Hazard Areas as the following:

- 1. Areas that have shown movement during the Holocene epoch (from 10,000 years ago to the present) or that are underlain or covered by mass wastage debris of that epoch; or,
- 2. Areas with both of the following characteristics:
  - a. Slopes steeper than 15 percent that intersect geologic contacts with a relatively permeable sediment overlying a relatively impermeable sediment; and
  - b. Springs; or
- 3. Areas potentially unstable because of rapid stream incision, stream bank erosion, or undercutting by wave action; or
- 4. Any area with a slope of 40 percent or steeper over a height of at least 10 feet.
- 5. For areas meeting the criteria of subsections (1) through (4) of this definition, the high landslide hazard area also includes the area within a horizontal distance "H" equal to either the height of the slope or 50 feet, whichever is greater.

The *Kirkland Zoning Code* (KZC 5.10.536.7) defines Moderate Landslide Hazard Areas as:

Areas with slopes between 15 percent and 40 percent which do not meet the definition of high landslide hazard area.

The Goat Hill neighborhood of Kirkland is situated on a south to southeast facing slope with a total height of approximately 400 feet, and an average inclination of approximately 25 percent. Portions of this slope reach inclinations of 35 to 45 percent. 116<sup>th</sup> Place NE is approximately 1,100 feet long and climbs the slope from east to west, where it terminates at 117<sup>th</sup> Place NE. 117<sup>th</sup> Place then continues along the slope from west to east, reaching a peak elevation of approximately 195 feet where it meets NE 118<sup>th</sup> Place NE. As 117<sup>th</sup> Place continues east, elevations decrease toward where it terminates at NE 120<sup>th</sup> Street.

Review of the *City of Kirkland Landslide Susceptibility Map* by GeoMapNW and the City of Kirkland, Washington dated February 2020, indicates that all of the project area along NE 116<sup>th</sup> Place and NE 117<sup>th</sup> Place is mapped as either a Moderate Landslide Hazard Area or a High

Landslide Hazard Area. 91<sup>st</sup> Lane NE is mapped as a Moderate Landslide Hazard Area likely due to the proximity to short rockeries and steep slopes on private properties to the west.

Review of the topographic contours available on the City of Kirkland *Interactive Mapping Portal* and King County iMap indicates that NE 116<sup>th</sup> Place and NE 117<sup>th</sup> Place are generally inclined at 10 to 20 percent, with areas along the north and south margins of the paved City of Kirkland right-of-way reaching 35 to 40 percent. Much of the mapped High Landslide Hazard Areas are located on the private properties adjacent to the paved streets. This is likely due to previous legal grading of the existing streets and nearby residential properties. A LiDAR-based image of the subject site is presented in Figure 3.

Our recent and 2015 subsurface explorations discovered landslide deposits in limited portions of the site and/or various permeable and impermeable sediments. Based on our subsurface observations and the on and offsite topographic conditions, the entire project alignment along NE 116<sup>th</sup> and NE 117<sup>th</sup> Place meets the requirements for a Moderate Landslide Hazard Area.

The portions of the site that meet the requirements for a High Landslide Hazard Area include areas where landslide debris was discovered in our subsurface explorations, and where the proposed storm drainage improvements are located within a horizontal distance "H" equal to either the height of the steep slope or 50 feet, whichever is greater, to a slope of 40 percent or steeper over a height of at least 10 feet.

As the proposed storm drainage improvements project will be located within Moderate Landslide Hazard Areas and High Landslide Hazard Areas, project design will be required to follow KZC Chapter 85.25 *Critical Areas: Geologically Hazardous Areas – Performance Standards.* To that end, we have completed quantitative analyses of slope stability at multiple locations in the project area to consider the potential impacts to site slopes and mitigation, if necessary.

#### 5.1 Slope Stability Analysis

Quantitative slope stability analyses of the site were completed on multiple sections of the site using the computer program SLOPE/W, Version 8.16 by GeoSlope International. The program used the Morgenstern-Price method for evaluating a rotational failure. Input parameters for the analyses included slope geometry, geology, and soil strength parameters. The slope profiles used for our analysis was located along section line A-A', B-B', and C-C' as depicted on Figure 2. The geology of the slopes was based on the subsurface conditions encountered in our explorations. Soil strength parameters used for our analysis were assumed based on typical published values for similar materials and our prior experience. The values assumed for our analysis were selected to be conservatively low and are shown on the SLOPE/W profiles included in Appendix C. Where groundwater was encountered during our explorations it was included as part of these calculations. For evaluation of slope stability under seismic conditions a horizontal ground acceleration of 0.295g was used for our analysis. This value is equivalent to ½ of the peak

horizontal ground acceleration based on a seismic event with a 2-percent probability of exceedance in 50 years in accordance with the 2018 *International Building Code* (IBC). To model the proposed storm drainage improvements, a 6-foot-deep, 3-foot-wide trench backfilled with structural fill was placed where each road crossed the section.

The factor of safety of a slope is the ratio between the forces that resist sliding to the forces that drive sliding. For example, a factor of safety of 1.0 would indicate a slope where the driving forces and the resisting forces are exactly equal. Increasing factor of safety values greater than 1.0 indicate increased stability.

#### A-A'

We conducted an analysis of the conceptual post-construction slope conditions with a trench backfilled with structural fill in the right-of-way. Minimum factors of safety calculated for the A-A' portion of the proposed post-construction slope were equal to of 2.1 for static conditions and 1.4 for seismic conditions.

#### B-B'

We conducted an analysis of the conceptual post-construction slope conditions with a trench backfilled with structural fill in the right-of-way. Minimum factors of safety calculated for the B-B' portion of the proposed post-construction slope were equal to of 3.2 for static conditions and 1.6 for seismic conditions.

#### C-C'

We conducted an analysis of the conceptual post-construction slope conditions with a trench backfilled with structural fill in the right-of-way. Minimum factors of safety calculated for the C-C' portion of the proposed post-construction slope were equal to of 2.1 for static conditions and 1.1 for seismic conditions.

#### 5.2 Slope Stability Conclusions

The factors of safety calculated for the slope conditions with proposed stormwater improvements meet or exceed the City of Kirkland standard of 1.5 for static conditions and 1.1 for seismic conditions for a permanent slope. Copies of the slope stability analyses are included in Appendix C.

Provided that the recommendations presented in this report are properly followed, and conceptual plans do not substantially change, it is our opinion that the proposed stormwater drainage improvement project will not result in adverse impacts to the stability of slopes

throughout the subject site or on the adjacent properties and the risk of the damage to the proposed stormwater improvements by landsliding is low.

It must be understood that no recommendations or engineering design can yield a guarantee of stable slopes. At this time, we understand that the proposed stormwater drainage improvements will likely be limited to the currently paved portions of 91<sup>st</sup> Lane NE, NE 116<sup>th</sup> Place, and NE 117<sup>th</sup> Place.

At no time should loose fill be pushed over the top of a slope or soil excavated from a toe area without support by an engineered retaining structure. Uncontrolled fill on slopes or toe excavation may promote landslides or debris flow activity. AESI should review grading plans if grading is desired at the top of, or on, any of the steep slopes. Since current plans are preliminary, AESI should be allowed to review the final project plans once they have been developed to update our recommendations, as necessary.

#### 6.0 SEISMIC HAZARDS AND MITIGATION

The following discussion is a general assessment of seismic hazards that is intended to be useful to the project design team in terms of understanding seismic issues, and to the structural engineer for design.

All of Western Washington is at risk of strong seismic events resulting from movement of the tectonic plates associated with the Cascadia Subduction Zone (CSZ), where the offshore Juan de Fuca plate subducts beneath the continental North American plate. The site lies within a zone of strong potential shaking from subduction zone earthquakes associated with the CSZ. The CSZ can produce earthquakes up to magnitude 9.0, and the recurrence interval is estimated to be on the order of 500 years. Geologists infer the most recent subduction zone earthquake occurred in 1700 (Goldfinger et al., 2012<sup>1</sup>). Three main types of earthquakes are typically associated with subduction zone environments: crustal, intraplate, and interplate earthquakes. Seismic records in the Puget Sound region document a distinct zone of shallow crustal seismicity (e.g., the Seattle Fault Zone). These shallow fault zones may include surficial expressions of previous seismic events, such as fault scarps, displaced shorelines, and shallow bedrock exposures. The shallow fault zones typically extend from the surface to depths ranging from 16 to 19 miles. A deeper zone of seismicity is associated with the subducting Juan de Fuca plate. Subduction zone seismic events produce intraplate earthquakes at depths ranging from 25 to 45 miles beneath the Puget Lowland including the 1949, 7.2-magnitude event; the 1965, 6.5-magnitude event; and the 2001, 6.8-magnitude event) and interplate earthquakes at shallow depths near the Washington coast including the 1700 earthquake, which had a magnitude of approximately 9.0. The

<sup>&</sup>lt;sup>1</sup> Goldfinger, C., Nelson, C.H., Morey, A.E., Johnson, J.E., Patton, J.R., Karabanov, E., Gutierrez-Pastor, J., Eriksson, A.T., Gracia, E., Dunhill, G., Enkin, R.J, Dallimore, A., and Vallier, T.,2012, *Turbidite Event History—Methods and Implications for Holocene Paleoseismicity of the Cascadia Subduction Zone*: U.S. Geological Survey Professional Paper 1661–F, 170.

1949 earthquake appears to have been the largest in this region during recorded history and was centered in the Olympia area. Evaluation of earthquake return rates indicates that an earthquake of the magnitude between 5.5 and 6.0 is likely within a given 20-year period.

The Kirkland Zoning Code (KZC 5.10.827) defines Seismic Hazard Areas as the following:

Those areas subject to severe risk of earthquake damage as a result of seismically induced ground shaking, slope failure, settlement or soil liquefaction, which typically occurs in areas underlain by cohesionless soils of low density, usually in association with a shallow groundwater table.

Generally, there are four types of potential geologic hazards associated with large seismic events: 1) surficial ground rupture, 2) seismically induced landslides or lateral spreading, 3) liquefaction, 4) ground motion. The potential for each of these hazards to adversely impact the proposed project is discussed below.

#### 6.1 Surficial Ground Rupture

The site is located approximately 6 miles southwest of an inferred trace of the southeastward extension of the Southern Whidbey Island (SWIFZ). A recent study by the U.S. Geological Survey (USGS) (Sherod et al, 2005<sup>2</sup>) indicates that "strong" evidence of prehistoric earthquake activity has been observed along two fault strands thought to be part of the southeastward extension of the SWIFZ located about 7 miles northeast of the site. The study suggests as many as nine earthquake events along the SWIFZ may have occurred within the last 16,400 years. Understanding of this fault system is somewhat limited with studies still ongoing.

The recurrence interval of movement along this fault system is still unknown, although it is hypothesized to be in excess of one thousand years. Due to the significant distance to the nearest inferred fault, and the suspected long recurrence interval, the potential for surficial ground rupture along the SWIFZ is considered to be low during the expected life of the proposed pipeline improvements.

#### 6.2 Seismically Induced Landslides

As discussed in Section 5.2, it is our opinion that the impact from the project to the stability of the existing slopes is low. This opinion is dependent upon site grading and construction practices being completed in accordance with the geotechnical recommendations presented in this report.

#### 6.3 Liquefaction

Liquefaction is a process through which unconsolidated soil loses strength as a result of vibrations, such as those which occur during a seismic event. During normal conditions, the

<sup>&</sup>lt;sup>2</sup> Sherrod et al., 2005, *Holocene Fault Scarps and Shallow Magnetic Anomalies Along the Southern Whidbey Island Fault Zone near Woodinville, Washington*, Open-File Report 2005-1136, March 2005
weight of the soil is supported by both grain-to-grain contact and by the fluid pressure within the pore spaces of the soil below the water table. Extreme vibratory shaking can disrupt the grain-to-grain contact, increase the pore pressure, and result in a temporary decrease in soil shear strength. The soil is said to be liquefied when nearly all of the weight of the soil is supported by pore pressure alone. Liquefaction can result in deformation of the sediment and settlement of overlying structures. Areas most susceptible to liquefaction include those areas underlain by non-cohesive silt and sand with low relative densities, accompanied by a shallow water table.

Review of the *City of Kirkland Liquefaction Potential Map* by GeoMapNW and the City of Kirkland, Washington dated February 2022, indicates that the lower elevation portion of the site along 91<sup>st</sup> Lane NE has a liquefaction potential of "High" and "Medium or Mixed" while the higher elevation portion of the site extending along NE 116<sup>th</sup> Place and NE 117<sup>th</sup> Place is mapped as "Low". The following sections discuss liquefaction hazards in each portion of the project area.

# 6.3.1 91<sup>st</sup> Lane NE Liquefaction Analysis & Mitigation

Our exploration completed at the lowest elevation portion of the site along 91<sup>st</sup> Lane NE encountered loose to medium dense, saturated Holocene lacustrine and Vashon recessional lacustrine sediments that may be prone to liquefaction. A liquefaction hazard analysis was performed to assess the liquefaction potential of the subsurface soils encountered within the maximum depth of our boring (30 feet). The liquefaction analysis was performed in accordance with guidelines published in Seed & Idriss, 1982; Seed et al., 1985; and Kramer, 1996. Our liquefaction analysis was completed with the aid of Liquefy Pro computer software Version 5.9a by CivilTech Corporation. This program accepts input for SPT data, groundwater levels, soil unit weight, and the depth and grain-size distribution of the sediments of concern to calculate seismically induced settlement. The liquefaction analysis was conducted based on the subsurface conditions encountered in exploration boring EB-101. The following parameters were used for the analysis:

- Soil unit weights are inferred from SPT data and prior experience;
- Silt contents are inferred from a combination of visual and laboratory classification of soil samples obtained from the exploration boring;
- We used the Ishihara/Yoshimine analysis method to obtain the liquefaction-induced settlement values for the SPT data;
- A design event is considered a magnitude 7.0 earthquake with a peak horizontal ground acceleration of 0.589g;
- SPT data were automatically normalized for overburden stresses and corrected for seismic magnitude by the Liquefy Pro computer software.

Based on our liquefaction analysis utilizing soil data from EB-101, and conservatively assuming a seasonal high groundwater level of 3 feet below the existing ground surface within the Holocene lacustrine deposits, the subsurface conditions at EB-101 pose a moderate risk of seismic-induced liquefaction and associated settlement. Our analysis for EB-101 indicates that the estimated liquefaction-induced settlement is approximately 3.96 inches, with a differential settlement estimated at one-half the total estimated total. Liquefaction analysis is included in Appendix D.

To mitigate the effects of liquefaction-induced settlement to the proposed new subsurface drainage pipes and catch basin structures along 91<sup>st</sup> Lane NE, we recommend that, rather than wholesale overexcavation to bearing soils (encountered deeper than 22 feet below the ground surface in EB-101), subgrade support for new drainage elements be attained by overexcavation and replacement of the topmost 2 feet of the pipe or structure subgrade soils with clean crushed rock or quarry spalls prepared as recommended in the "Structural Fill" section of this report.

# 6.3.2 NE 116<sup>th</sup> / 117<sup>th</sup> Place Liquefaction Analysis

In our opinion, the potential risk of damage to the proposed stormwater improvements in the higher elevation portions of the site along NE 116<sup>th</sup> Place and NE 117<sup>th</sup> Place by liquefaction is low due to the high relative density of the underlying sediments and the absence of a shallow groundwater table. No detailed quantitative liquefaction assessment for these portions of the site were completed as part of this study, and none is warranted, in our opinion.

#### 6.4 Ground Motion

It is our opinion that earthquake damage to the proposed storm drainage improvements, when founded on suitable bearing strata in accordance with the recommendations contained herein, will likely be caused by the intensity and acceleration associated with the event. Structural design of the improvements should follow 2018 *International Building Code* (IBC) standards using Site Class "D" as defined in Table 20.3-1 of *American Society of Civil Engineers (ASCE) 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other Structures* 

#### 7.0 EROSION HAZARDS AND MITIGATION

The *Kirkland Zoning Code* (KZC 5.10.292) defines Erosion Hazard Areas as the following:

Those areas containing soils which, according to the United States Department of Agriculture (USDA) Natural Resource Conservation Services (NRCS) Web Soil Survey, may experience severe to very severe erosion hazard. Due to potential for mapping errors and other discrepancies in the RCS data, erosion hazard area designation should be based on actual site conditions as verified in the field by the geotechnical professional.

Review of the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), *Web Soil Survey* indicates that the portion of the site along NE 117<sup>th</sup> Place and the western

portion of NE 116<sup>th</sup> Place is underlain by *Alderwood gravelly, sandy loam, 15 to 30 percent slopes* (*AgD*), which has an erosion hazard rating of "severe," while the lower elevation portion of the site along NE 116<sup>th</sup> Place and 91<sup>st</sup> Lane NE is underlain by *Kitsap silt loam, 2 to 8 percent slopes* (*KpB*) which has an erosion hazard rating of "slight to moderate".

Therefore, the higher elevation portion of the site along NE 116<sup>th</sup> and NE 117<sup>th</sup> Place is classified as an Erosion Hazard Zone. The erosion hazard is partially mitigated by the location of the proposed improvements within the City of Kirkland right-of-way, which has previously been graded to moderate inclinations and is currently covered by asphalt pavement.

The sediments encountered throughout the site contain substantial quantities of silt and fine sand that are sensitive to disturbance when wet. To mitigate erosion hazards and the potential for off-site sediment transport during construction, we recommend the following:

- 1. If possible, construction should proceed during the drier periods of the year, and disturbed areas should be revegetated, paved, or otherwise protected as soon as possible.
- 2. All stormwater from impermeable surfaces should be directed to a stormwater drainage system or temporary storage facilities and kept away from the proposed work areas.
- 3. Ground disturbance beyond the project utility alignment should be kept to a minimum.
- 4. Temporary sediment catchment facilities adjacent to the proposed utility alignment should be cleaned out and maintained periodically, as necessary, to maintain their capacity and function. Provide and maintain inlet protection of catch basins and drain systems that receive runoff from planned work areas.
- 5. Soils that will be stockpiled at the site should be stored in such a manner as to reduce erosion. Protective measures may include, but are not necessarily limited to, covering with plastic sheeting or the use of straw bales/silt fences.
- 6. Where needed, construction access should be constructed with quarry spalls or equivalent according to City of Kirkland standards. Maintain existing paved surfaces, where practical, and sweep as needed.

It is our opinion that with the proper implementation of the TESC plans and by field-adjusting appropriate erosion mitigation (BMPs) throughout construction, the potential adverse impacts from erosion hazards on the project should be mitigated.

#### **III. DESIGN RECOMMENDATIONS**

#### 8.0 INTRODUCTION

Our exploration indicates that, from a geotechnical standpoint, the proposed stormwater system improvements are feasible provided that the recommendations in this report are followed.

The following recommendations pertain to the site and infrastructure improvements for work occurring within the City public right-of-way. In general, all work should be done in accordance with the current edition of the *City of Kirkland Pre-Approved Plans*.

The project area can be divided into two regions, each with its own challenges for construction.

The proposed stormwater improvements on the higher elevation, upslope portion of Goat Hill along NE 116<sup>th</sup> Place, NE 117<sup>th</sup> Place, and 90<sup>th</sup> Avenue NE are situated along narrow streets bordered by steep slopes. The sediment type for the bulk of trenching in these portions of the project area will consist of older glacial and nonglacial deposits. These sediments largely consist of silt and silty fine sand. Loose fill soils and landslide debris with varying thickness are present along portions of the stormwater alignment in this area.

The proposed stormwater improvements along the eastern portion of NE 116<sup>th</sup> Place, 91<sup>st</sup> Lane NE, and Juanita Drive NE are situated in relatively level areas at the base of Goat Hill. The sediment type for the bulk of trenching in this portion of the project area will generally consist of lacustrine sediments. Groundwater seepage was encountered at a depth of 6 feet in our exploration boring in this area. We anticipate that temporary dewatering of groundwater seepage in shallow utility trenches may be handled in the form of pumped sumps or other measures. Advance dewatering may be necessary for deep excavations, such as to install deep manhole structures. An excavation dewatering plan was beyond the scope of this current study.

Throughout the project area, sloped trench sidewalls and suitable temporary shoring (e.g., trench boxes) should be used to mitigate caving/collapsing conditions. We recommend that construction occur during the dry season, typically between June and September, and that the contractor be prepared to mitigate soils that may be prone to caving and groundwater flow conditions along the storm alignment.

Due to the significant fines content of the onsite sediments, reuse of these materials as trench backfill is not recommended. Meeting compaction standards with on-site sediments may be difficult or impossible.

#### 9.0 SITE PREPARATION

Site preparation should include removal of all trees, brush, debris, and any other deleterious material within the proposed work areas. Additionally, fill and organic soils, if encountered,

should be segregated from mineral soils in the trench excavation if on-site material is planned to be used for backfill. Since the density and composition of the soil can vary in existing utility trenches, random soft/organic pockets may exist, and the depth and extent of fill/organics/stripping depths can best be determined in the field by the geotechnical engineer or engineering geologist.

#### 9.1 Temporary Cut Slopes

In our opinion, stable construction slopes should be the responsibility of the contractor and should be determined during construction based on the local soil and groundwater conditions encountered at the particular location at that time. We anticipate that trenched excavations for the planned stormwater system improvements may cave, potentially resulting in a widening of the trench leading up to the ground surface. The sawcutting and removal of a pavement strip wider than the planned trench width can mitigate the risk of pavement cracking due to this undermining. Trench boxes should be used where warranted, as described in Section 10.0 "Trenching Considerations." In addition, WISHA/OSHA regulations should be followed at all times.

#### 9.2 Site Disturbance

The contractor must use care during site preparation and excavation operations so that the underlying soils are not softened, particularly during wet weather conditions. If disturbance occurs, the softened soils should be removed and the area brought to grade with structural fill. Softened soils are defined as any soil not in a firm and unyielding condition. We anticipate that wet weather construction would increase project costs over dry weather construction.

#### 10.0 TRENCHING CONSIDERATIONS

# 10.1 Excavation

Much of the proposed stormwater system improvements will be installed below currently paved areas. Pavement surfaces should be saw-cut prior to trenching operations. Existing buried utilities will complicate the excavation process due to localized groundwater seepage and sidewall caving of the trench backfill. Where present, overhead power lines and nearby tree limbs may limit the pick and swing radius of the trenching equipment.

We anticipate that the installation of new stormwater lines will require steep-sided trench excavations. Where loose soils/fill or seepage are encountered, we anticipate that trenched excavations for the planned stormwater system improvements will likely cave unless sloped, potentially resulting in a widening of the trench leading up to the ground surface and undermining of adjacent pavement, necessitating additional excavation, backfill, and paving

efforts. Due to the presence of fill soils and/or groundwater seepage, the on-site soils are considered Type C soils as defined by the *Washington Administrative Code* (WAC) Section 296-155-66401. The project should have a designated "competent person" on site to observe soil and groundwater conditions within the trench excavations. and modify trench slopes, groundwater control/dewatering measures, add shoring, or other measures, as needed.

We anticipate that the Vashon lodgement till, Vashon advance outwash, and pre-Olympia-age soils to be encountered during the excavation process will provide moderate to severe resistance to digging. Local groundwater seepage into the trench can cause some caving/sloughing to occur. The contractor should be experienced with excavating in moist to wet subgrade conditions.

#### 10.2 Pipe Subgrade

The undisturbed native, glacially consolidated soils are suitable for support of the pipe. In the event that localized soft, organic or disturbed soils, loose fill soils, or loose landslide debris are encountered at the bottom of the trench, these soils should be overexcavated, up to 1 foot where needed, and replaced with "pipe bedding" material, described below. An AESI representative should be onsite to observe subgrade conditions, provide recommendations for pipe subgrade remediation and document backfill operations.

#### 10.3 Pipe Zone Bedding and Trench Backfill

The City of Kirkland Public Works Department maintains pre-approved plans for storm drainage improvements in the City of Kirkland. Plan No. CK-D.02 *Storm Trench Detail*, dated July 2021, requires that pipe zone bedding and trench backfill under paved areas consist of material conforming to Washington State Department of Transportation (WSDOT) Standard Specification 9-03.9(3) "Crushed Surfacing Top Course" compacted to the required density. Where the trench is perpendicular to travel lanes, the full trench depth must be backfilled with Crushed Surfacing Top Course. Where the trench is parallel to travel lanes, the upper 4 feet of the trench must be backfilled with Crushed Surfacing Top Course, but the lower portion of the trench may be backfilled with suitable excavated material provided it can be compacted to 95% of its maximum dry density.

The on-site sediments contain a significant fine-grained fraction and are highly sensitive to excess moisture during placement in structural fill applications. Compaction of on-site sediments in trench backfill to the required density may be difficult or impossible to attain and should probably not be attempted.

Trench backfill should be placed in uniform, horizontal lifts and compacted to the above standard. Thickness of structural backfill layers before compaction should not exceed 1.5 feet for a large, excavator-mounted, vibratory plate-type compactor. Smaller compaction equipment will require use of thinner lifts; hand-operated mechanical compactors should be

used to compact lifts no thicker than 6 inches. Final lift thickness should be based on field performance testing using actual materials under field conditions and uniform compactive effort. In some cases, additional pipe zone bedding material above the pipe may be advisable to reduce required compactive effort needed to achieve the specified density in this area.

### 11.0 DRAINAGE AND DEWATERING CONSIDERATIONS

Groundwater seepage was encountered at multiple explorations and varying depths. At the time of our explorations, we observed continuous flow in surface stream channels and storm drainage pipes throughout the Goat Hill area.

EB-101 encountered groundwater seepage beginning at approximately 6 feet below ground surface and extending the full depth explored of 30 feet. We interpret this groundwater as a shallow, unconfined aquifer present within the recent lacustrine deposits, Vashon recessional lacustrine deposits, and pre-Olympia nonglacial coarse grained deposits that is likely hydraulically connected to nearby Lake Washington.

EB-104, EB-105, EB-2, and EB-3 all encountered thin zones of groundwater seepage at varying depths below the ground surface. These intervals generally corresponded to the base of fill soils, base of landslide debris, or the upper portion of the underlying pre-Olympia nonglacial coarse grained deposits. This groundwater likely represents a local groundwater table perched on top of the underlying very dense, very silty, pre-Olympia glacial till or glacial fine-grained deposits. In areas underlain by glacial till, it is common for shallow perched seepage to accumulate seasonally at the base of more permeable fill or landslide deposits, or for groundwater to be present within the weathered till horizon during the wetter winter months. Groundwater present within the weathered till sediments is known as "interflow," and is perched atop the underlying, dense, low-permeability, unweathered till. This water may travel laterally and typically will follow the ground surface topography.

The quantity and duration of flow from an excavation that encounters groundwater depends on a number of factors including topography, size and depth of the excavation, proximity to surface water features, soil grain size, lateral extent of the water-bearing zone or aquifer, and season. Our field explorations were conducted in late September, when the groundwater levels are typically nearing a seasonal low and the interflow network is poorly connected.

We expect that the majority of groundwater seepage can be managed by pumped sumps during trenching, and we recommend work proceed during the drier summer months. Advance dewatering may be required for the installation of deep manhole structures or for the planned improvements along 91<sup>st</sup> Lane NE, should the excavation for these improvements extend below the groundwater table (encountered at approximately 6 feet below the ground surface in EB-101). Prior to site work and construction, the contractor should be prepared to provide

excavation drainage/dewatering and subgrade protection, as necessary, for utility trenches and, if planned, underground structure excavations. If encountered, water levels inside the excavations should be drawn down a minimum of 2 feet below the base of the excavation in order to avoid heaving or flowing sands during construction. Groundwater seepage that enters the excavation and flows along the trench alignment may degrade the exposed subgrade. We recommend that the contractor utilize pumped sumps, check-dams, or other features to reduce flow along trench alignments, should it occur. However, an excavation dewatering plan is beyond the scope of this current study and is typically contractor-designed. AESI is available to provide review or consultation services in support of the proposed dewatering plan.

# 12.0 PROJECT DESIGN AND CONSTRUCTION MONITORING

We are available to provide additional geotechnical consultation as the project design develops and possibly changes from that upon which this report is based. We recommend that AESI perform a geotechnical review of the plans prior to final design completion. In this way, our earthwork and foundation recommendations may be properly interpreted and implemented in the design. This review is not included in the current scope of work and budget.

We are also available to provide geotechnical engineering and monitoring services during construction. The integrity of the new stormwater system depends on proper site preparation and construction procedures. In addition, engineering decisions may have to be made in the field in the event that variations in subsurface conditions become apparent. Construction monitoring services are not part of this current scope of work. If these services are desired, please let us know, and we will prepare a proposal.

We have enjoyed working with you on this study and are confident these recommendations will aid in the successful completion of your project. If you should have any questions, or require further assistance, please do not hesitate to call.

Sincerely, ASSOCIATED EARTH SCIENCES, INC. Kirkland, Washington

Joshua S. P. Greer, L.G. Project Geologist

Jeffrey P. Laub, P.E., L.G., L.E.G. Associate Engineer/Geologist



Bruce L. Blyton, P.E. Senior Principal Geotechnical Engineer

Attachments:	Figure 1.	Vicinity Map
	Figure 2.	Existing Site and Exploration Plan
	Figure 3:	LiDAR-Based Topography
	Appendix A.	Exploration Logs
	Appendix B.	Laboratory Testing Results
	Appendix C.	Slope Stability Analysis
	Appendix D.	Liquefaction Analysis







# **APPENDIX A**

**Exploration Logs** 

	~		as	sso	ciated Exploration Boring			E	EB-	101
	1	1	e a	rth	sciences Goat Hill Drainage			S and B	heet:	1 of 1
4			i n	CO	r p o r a t e d 20220263E001 Ending Date: 9/21/2	22	App	provec	y. JG d By:	JHS
Drill Ham Hole	er/Eq nmer e Dian Grour	uipr Wei nete ndwa	nent ght/ er (in ater	t: Geo Drop: ): 6 Depth	ologic Drill / Mini BobcatTotal Depth (ft): 30140#/30Ground Surface Elevation (ft): 45ATD (ft): 6✓ Groundwater Depth Post Drilling (	ft) (I	Date	): ()		
Depth (ft)	ample Type	Sample	6 Recovery	Graphic Symbol	Description	Vater Level	Blows/6"	Blov	ws/Fc	ot
0	S		8		Asphalt - 3 inches	>		10	40	20-
- - - - 5 - - -		2			Fill Moist, brownish gray, silty, sandy, GRAVEL; frequent fractured gravel (GM). Holocene Lacustrine Vacuum truck excavation to 5 feet. Drill Rig 5 feet to bottom. Very moist, gray, fine SAND, some silt to silty; trace bedded organics; massive (SP-SM/SM).		3 6 5	11		
- 10 - -		3			Wet, gray, medium to coarse SAND, trace silt; stratified (SP); interbed (4 inches thick) of moist, very silty, fine sand in middle of sample (SM).		7 9 7	16		
					Vashon Recessional Lacustrine					
- 15 - -		4			Very moist, gray, very silty, fine SAND, trace gravel dropstones; micaceous (SM).		4 5 5	10		
- 20 - -		5			Moist, gray, fine SAND, some silt, trace gravel; micaceous; massively bedded; bed (1 inch thick) of brown silt at top of sampler) (SP). Pre-Olympia Non-Glacial Coarse Grained		4 7 10	17		
- 25 -		6			Very moist, gray, fine to medium SAND, trace gravel, trace silt; stratified (SP).		16 29 47			76
- 30 - -					Drilled to 30 feet. Removed 25 foot sample. Cannot sample at 30 feet due to heave. Groundwater encountered at ≈6 feet ATD.					
- - - 35 -					Accoriated Earth Sciences Inc.					

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╞	<b>I</b> G	Four	ndw	ater	Depth	AID (ft): Not encountered	_⊻ Grou	undwater	Depth Post Drilling (	ft) (l	Jatej	): ()			
	Depth (ft)	Sample Typ	Sample	% Recover	Graphic Symbol		Description			Water Leve	Blows/6"	Blo	ws/F	ioot	Other Tests
ŀ	0					\ As	sphalt - 3 inc	hes					Ω Ω	2 4	
-	- - -					Pre-C Vacuum truck excavation to 5	Diympia Glac	ial Till	om; high drilling					42	
-	<b>-</b> 5		1			action 5 feet to bottom. Moist, grayish brown with oct some gravel; unsorted (SM)	casional oxida	tion stainir	ng, silty, fine SAND,		10 20 22				
	- 10		2			Moist, grayish brown with oc trace gravel; unsorted; one fr (SM).	casional oxida acture near ti	tion stainir p with trace	ng, silty, fine SAND, e rootlet intrusions		13 16 23			39	
	- 15 -		3			Moist, grayish brown with tra gravel; unsorted; no fractures	ace oxidation s s in sample (Sf	staining, sil1 VI).	ty, fine SAND, trace		17 25 32				57
	- 20 -		4			Becomes some gravel, increas	sed oxidized s	taining surr	rounding gravel (SM).		23 31 32				53
-	- 25														
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	-						Crushed Rock	< - 2 inches							
-	-					Vacuum truck excavatio	Pre-Olympia on to 5 feet. Dri	Glacial Till Il rig 5 feet to b	ottom.						
-	— 5 - -		1			Moist, brownish gray, v sample; slightly fracture High drill action at 6 fee	very silty, fine S. ed in gravel cor et.	AND, trace grave Itaining zones (S	el; in sorted; intact M).		8 11 11		!2 •		
-	- - 10 - -		2			Moist, brownish gray, v	very silty, fine S.	AND, trace grave	el; unsorted (SM).		9 18 26			44	_
-	- — 15 -		3			_Upper 6 inches: As abov Pre-(	ove. Olympia Glaci	al Fine Graine	d	_	7 20 23			43	_
-	- - - - 20 -		4			Lower 12: Moist, dark g Moist, dark gray, SILT, t to 5 horizontal polishec	gray, SİLT, some trace fine SAND d planes; occasi	fine sand; mass ; massive; samp onal blocky text	sive (ML). le fractured along 3 ure (ML).		18 25 25			50	_
-	- -  25 -					No groundwater encount	ntered.								
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	0	S		0		Asphalt - 2 inches		_		20 20	40	20	-
-	-					Fill Vacuum truck excavation to 5 feet. Drill Rig 5 feet to bottom	n.			14			
	– 5 -		1			Moist, brown, fine SAND, some silt to silty, trace organics; la thick) of grav silt at tip (SM)	ayer (1 inch	⊻	4 7				
-	-					Landslide Debris			T				
	— 10 - -		2			Moist, grayish brown, SILT, some fine sand; zones of blocky texture (ML).	brecciated		8 10 10	20			
	-					Pre-Olympia Glacial Fine Grained				20			
-	– 15 - -		3			Moist, gray with occasional bluish green inclusions, SILT; tra massively bedded; occasional hard silt clasts within massive reaction with hydrochloric acid (ML).	ice dropstones; e matrix; faint		10 10 10				
-	- - 20 - -		4			As above; unsorted with some sand to sandy beds; faint rea hydrochloric acid.	action with		9 14 17		31		-
-	- - 25		5			Upper 12 inches: As above.			12			48	-
	-					Lower 12 inches: Becomes grayish brown.			22	+	+		-
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-						Landslide Debris Groundwater at bottom of vacuum truck hole. Vacuum truck to 5 feet. Drill rig 5 feet to bottom.			5			
-	5		1			Upper 4 inches: Wet, brown, gravelly, fine SAND, some silt; possibly a pulverized rock (SP-SM). Lower 14 inches: Very moist, gray with oxidation staining and bluish green inclusions, SILT; scattered fine organics; pockets of sand; becomes dark bluish gray sand at tip: bigbly fractured and brecciated texture (ML)	<b>_</b>	332	Å			
-	10		2			Pre-Olympia Non-Glacial Coarse Grained Moist, slightly greenish dark gray, fine SAND, some silt, some gravel; stratified (SP-SM).		22 18 32			50	_
-	15		3			Pre-Olympia Glacial Till Moist with wet coating from above water, gray, sandy, SILT, some gravel;		15			50/4'	
			Л			unsorted (ML)		50/4				
-	20					Groundwater encountered at 5 feet ATD.						
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	-						<u> </u>	Crushed Rock -	2 inches							
							P Vacuum truck to 5 feet.	Pre-Olympia Find . Drill rig 5 feet to	e Grained bottom.							
	— 5 - -		1				Moist, brownish gray wi sand; thinly bedded (ML	vith horizontal oxic L).	lation planes	, SILT, some fine		7 14 23		37		_
	- 10 - -		2				Moist, gray to dark gray dipping beds; intact silt	y, SILT, some fine clasts with closed	andy beds; ti /healed fract	hinly bedded; steeply ures (ML).		11 15 16		31		_
	- - 15 -		3				Moist, gray, SILT, trace f	fine sand; laminat	ed (ML).			11 20 27			47	_
	-   -		4				As above. Drilling speed slowing. No groundwater encount	tered.				27 32 42			7/	4
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-						<u>}</u> C	Crushed Rock -	3 inches							
-						P Difficult vacuum truck ex rig 5 to 16.5 feet. High c	Pre-Olympia Gl ccavation 0 to 5 f drill action. Slow	acial Till eet. Vacuum drill progress	truck to 5 feet. Drill					40	
	5		1			Moist, gray with occasior gravel to gravelly; unsort	nal oxidation mo ted (SM).	ttling, silty, fi	ne SAND, some		13 22 18			*0	
-	10		2			Moist, grayish brown, silt (SM).	ty, fine to mediu	m SAND, som	e gravel;unsorted		27 33 38				71
	15		3			Attempt SPT=50/2". No r Driving rock spike to mov 2inches of brown fine sar	recovery. ve obstructing ro nd at tip.	ck; resample	d; likely disturbed.		10 13 20		33		
	20					No groundwater encounte	ered								
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					Fill				1	10	20	30 4		
-		S-1		Very loose, moi some fine crush	st, rust mottled, gray brown, very silty f ed gravel (SM).	ine to medium SAND,			12	<b>▲</b> 3				
-		S-2		Very loose, moi fine gravel (SM)	st, rust mottled brown, very silty, fine to	o medium SAND, some			1	<b>2</b>				
- 5														
-		S-3		Hard drilling at	5.5 feet. Vashon Lodgement Till	/			9 17				38	
-				Dense, moist, r coarse gravel (S	ust mottled gray brown, silty fine to me SM).	dium SAND, some fine to			21					
-		S-4		As above, very	deńse.				17 31					81
- 10				Bottom of explore	ation boring at 9 feet			5	0/5"					
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AESII	°C	Grab	Sample	e	Shelby Tube Sample	Water Level at time of o	drilling	(AT	D)					

	assi	ociated		Exploratio	n Log				
$\triangleleft$	in co	sciences rporalad	Project Number KE150574A	Exploration Nu EB-2	mber		Sheet 1 of 1		
Project Na	ame	<u>Goat Hill Ste</u>	orm Improvement		Ground Surf	ace Eleva	ation (ft)		
Driller/Equ	uipment Veight/Drop	<u>CN Drilling</u>	Acker		Date Start/Fi	nish _	11/18/15,1	1/18/15	j
		_1+0#7 30				a (III) _	o incries		
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-	S-1	Medium dense, coarse gravel; s	Fill moist, rust stained brown, very silty fine palls present in cutting; blow counts ma	e SAND, some fine to ay be overstated (SM).	3 7 13		▲20		
	S-2	Loose, moist, gi SAND (SM).	ray brown, very fine to coarse gravelly, s	silty, medium to coarse	2 2 3	<b>▲</b> 5			
	S-3	Medium stiff, m	oist, gray, SILT, some fine sand, some	fine gravel (ML).	2 1 4	<b>▲</b> 5			
	S-4	Medium stiff, m (ML). Driller indicated	oist, gray, SILT, some fine to coarse gra ground water at 9 feet.	avel, trace coarse sand	<b>▼</b> 1 2 3	▲5			
- 10	S-5	Medium stiff, m	oist, gray, fine sandy SILT, some fine g	ravel (ML).	1 2 3	<b>▲</b> 5			
	S-6	Stiff, moist, gray	y, fine sandy SILT, some fine to coarse	gravel (ML).	2 4 6	10			
- 15	S-7	Hard, moist, gra	<b>Pre-Olympia Undifferentiate</b> ay, SILT, some fine sand, some fine gra	d vel (ML).	7 18 26			▲44	
	S-8	Hard, moist, gra stained fine san	ay, SILT, some fine to coarse gravel, tra at sampler tip (ML).	ce fine sand; rust	15 23 50/3.5	"			73
- 20 - - - - 25		Bottom of explor:	ation boring at 19 feet						
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3PJ November 24, 2015									
	oler Type (ST) 2" OD Split S 3" OD Split S Grab Sample	: Spoon Sampler (Sl Spoon Sampler (D S	PT) No Recovery M & M) Ring Sample $\checkmark$ Shelby Tube Sample $\checkmark$	- Moisture Water Level () Water Level at time of	drilling (ATD)		Logged by Approved	r: SKI by: JNS	-

1	2		ass	ociated		Exploratio	n Log	J	1			
$\triangleleft$	2		nco	sciences rporalad	Project Number KE150574A	Exploration Nu EB-3	mber				Sheet 1 of 1	
Projec	t Na on	me		Goat Hill Ste	orm Improvement	· 	Ground	Surf	ace Ele	vation (ft)	)	
Driller/ Hamm	Equ er V	ipmer Veiah	nt t/Drop	<u>CN Drilling</u> / 140# / 30"	Acker		Date Sta Hole Dia	art/Fi amete	nish er (in)	11/18	8/15,11/	/18/15
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th (ft)		ples	aphic mbol				/ell oletion	NS/6"		Blows	/Foot	H
Dep	T	San	S S G		DESCRIPTION		Com	Blo	10			
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-		3-1	0. p. q.	Medium dense,	moist, gray to black, silty SPALLS and	CRUSHED ROCK.		9 9		18		
-	T	S-2	0.0	As above.				3 4	▲7			
- 5			0.0.0	A start start				3				
-		S-3	0. v. 0 0. v	As above.				2 2 4	<b>▲</b> 6			
-	$\square$	0.4	000		Slide Debris		_	1				
-		5-4		Loose, moist, br	rown, silty fine to medium SAND, som	e fine gravel (SM).		3 5	<b>A</b> 8			
- 10	Τ	S-5		Loose, moist, ru	ust mottled brown, very silty, fine to me	edium SAND (SM).		3	▲8			
-								4				
-		S-6		Medium dense,	moist, brown, silty fine to medium SA	ND (SM).		14 16 14			▲30	
- 15				Driller indicated	easier drill and ground water at 14 fee	et.		4				
-		S-7		Loose, moist, br	rown, silty fine to medium SAND (SM)			3 5	<b>A</b> 8			
		S-8		Dense, moist, g	Vashon Advance Outwash gray brown, fine to medium SAND, son	n ne silt (SP/SM).		7 15 20			<b>▲</b> 35	
- 20	Τ	S-9		As above, very o	dense.			13 27				▲59
-				Bottom of explora	ation boring at 21.5 feet			32				
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		2 OL 3" OL	) Split S	Spoon Sampler (Si Spoon Sampler (D	& M) Ring Sample	$\overline{\Psi}$ Water Level ()				Ap	proved b	JNS
AESI	<u>m</u>	Grab	Sample	9	Shelby Tube Sample	Water Level at time of	drilling (A	TD)				

# **APPENDIX B**

**Laboratory Testing Results** 





# **APPENDIX C**

**Slope Stability Analysis** 


















## **APPENDIX D**

**Liquefaction Analysis** 



**CivilTech Corporation** 

Appendix

# Appendix F: SWPPP

## Construction Stormwater Pollution Prevention Plan (CSWPPP) - 2022



Submitted on	3 January 2024, 10:53AM
Receipt number	62
Related form version	3
Project Name	Goat Hill Drainage Ditch Conveyance and Channel Stabilization Phase 1
City of Kirkland Permit #	CIP No. SDC0900000
Email Address	casey@cphconsultants.com
Date Of Submittal	01/03/2024

## **Table of Contents**

**Project & CSWPP Information** Purpose Disclaimer **CSWPP** Supervisor and Prepartion Instructions For Use 'Notice Of Intent' Advisory **Project Background** Part A - Erosion And Sediment Control (ESC) Plan [Required For All Projects] 1. Clearing Limits 2. Cover Measures 3. Perimeter Protection 4. Traffic Area Stabilization 5. Sediment Retention 6. Surface Water Collection 7. Dewatering Control 8. Dust Control 9. Flow Control 10. Control Of Pollutants 11. Protect Existing And Proposed Flow Control BMPs 12. Maintain Protective BMPs 13. Manage The Project Part B - Stormwater Pollution Prevention And Spill (SWPPS) Measures [Required For All Projects] 1. Concrete Handling 2. Concrete Washout Area 3. Sawcutting And Surfacing Pollution Prevention 4. Material Delivery, Storage And Containment 5. Construction Stormwater Chemical Treatment 6. Construction Stormwater Filtration 7. High pH Neutralization Using CO2 8. pH Control For High pH Water 9. Use Of High pH Soil Amendments On Construction Sites 10. Maintain Protective BMPs

11. Manage The Project

Part C - Site Inspection, Monitoring, And Sampling Requirements And Enforcement

- Site Inspections
- Turbidity Control Requirements For Construction Stormwater Discharge
- Monitoring Of Discharges
- Enforcement Of Turbidity Control Requirements
- pH Control Requirements For Construction Stormwater Discharge

Next Steps

## **Project & CSWPP Information**

Project		
Site Address	N/A - Goat Hill Neighborhood	
Parcel Number(s)		
Receiving Waterbody	Juanita Creek	
Applicant Contact		
Permittee/Owner	City of Kirkland	
Permittee's/Owner's Phone Number		
Permittee's/Owner's Address		
Developer		
Developer's Phone Number		
Developer's Address		
Operator/Contractor	TBD	
Operator's/Contractor's Phone Number		
Operator's/Contractor's Address		
CSWPP Supervisor		
CSWPP Supervisor's Name	TBD	
CSWPP Supervisor's Organization		
CSWPP Supervisor's Phone Number		
CSWPP Prepared By		

Preparer's Name	Casey Torres	
Preparer's Organization	CPH Consultants	
Preparer's Phone Number	4254840945	
Project Construction Dates		
Activity/Phase	Construction Start	
Start Date	03/01/2024	
End Date	10/31/2024	

Note: Bring the contact information for the CSWPP Supervisor and the contractor to the presubmittal conference or first meeting with City officials following completion of the CSWPP. Complete this form with the best information available, and update as personnel/construction timeline changes.

### **Purpose**

A Construction Stormwater Pollution Prevention (CSWPP) Plan shall be completed for proposed projects that will conduct construction activities onsite, or offsite, within the City of Kirkland (City or COK) that require a targeted or full drainage review to comply with the following:

- <u>Core Requirement #5 of the 2021 King County Surface Water Design Manual (KCSWDM)</u>, and <u>Appendix D</u> of the KCSWDM (1.2.5.2.C/D.2.3.3).
- Storm Drainage Policy D-12 of the COK Pre-Approved Plans.

Information provided in this document and on the plans shall be considered a minimum. The general contractor shall be solely responsible for providing necessary and adequate measures for proper erosion and sediment control related to the project site.

The general contractor is responsible for keeping streets clean and free of contaminants at all times and for preventing an illicit discharge (defined in KMC 15.52.090) into the municipal separate storm sewer system (MS4) or natural water body(ies). If construction activity causes an illicit discharge, the City of Kirkland Storm Maintenance Division will be instructed to clean and restore any publicly owned and maintained surface water assets, and other affected public infrastructure.

The Permittee, Contractor(s), Property Owner, and any other responsible party may be subject to cost recovery associated with the clean-up and response and may also be assessed monetary penalties (defined in KMC 1.12.200) associated with an illicit discharge. The minimum penalty is \$500. A fine may be reduced or waived for parties who immediately self-report violations to the City at (425) 587-3900. If a project is found in violation of the City's codes regarding an illicit discharge in the future, those violations will be deemed "repeat violations" and the fine shall be determined by multiplying a surface water fine by the number of prior violations. "Repeat violation" means a violation of the same regulation in any location in the city by the same person or responsible party for which compliance previously has been sought or a notice of civil violation has been issued (KMC 1.12.020(I)).

A Final Inspection of the project will not be granted until all costs associated with a cost recovery and penalties are paid in full to the City of Kirkland.

The CSWPP shall include project-related content in accordance with the Implementation Requirements detailed within the latest adoption of the KCSWDM. The following plans are **Required For All Projects**:

- Erosion and Sediment Control (ESC) Plan, and
- Stormwater Pollution Prevention and Spill (SWPPS) Plan

The CSWPP is a living document reflecting current conditions and changes throughout the life of the project. These changes may be informal (i.e. hand-written notes and deletions). Update the CSWPP when there is a deficiency in Best Management Practices (BMPs) or update to the original design (and any subsequent) CSWPP.

## Disclaimer

It is the responsibility of the applicant to ensure that all applicable codes and regulations have been addressed. Use of this template does not relieve the applicant of meeting all the project's legal obligations, even if they are related to erosion sediment control and stormwater pollution prevention and do not appear in the template. Any conflicts between this document and 2021 KCSWDM shall defer to the manual, with consideration of the City's Pre-Approved Plan Policy D-10, *The Addendum to the 2021 King County Surface Water Design Manual*. Any references to DLS-Permitting within the 2021 KCSWDM shall be considered equivalent to City of Kirkland.

## **CSWPP Supervisor and Preparation**

For all projects, the applicant must comply with the following:

 The applicant shall designate a CSWPP Supervisor who will be responsible for the performance, maintenance, and review of ESC and SWPPS measures and for compliance with all permit conditions relating to the CSWPP as described in the instructions of this template.

o The applicant's selection of a CSWPP Supervisor may require approval by the City. City approval may be rescinded for non-compliance or not meeting qualifications, requiring the applicant to select another CSWPP Supervisor and obtain City approval prior to continuing work on the project site.

o The City may require the CSWPP Supervisor to be a Certified Professional in Erosion and Sediment Control or a Certified Erosion and Sediment Control Lead if the City determines that onsite ESC measures are inadequately installed, located, or maintained. If the site is considered sensitive, the City may require the CSWPP Supervisor to have certification as well as be an individual with background in geology, soil science, or agronomy.

- The CSWPP Supervisor shall keep an organized logbook of construction activities.
- The CSWPP Supervisor is the primary point of contact for all ESC and SWPPS issues.

If the CSWPP Supervisor revises ESC measures that require engineering calculations, the revisions shall be stamped and sealed by the engineer of record for the project or by the CSWPP Supervisor if that individual is registered as a professional engineer in the State of Washington.

## **Instructions For Use**

- 1. Proceed through the template in order and provide information about the project as instructed (in italics) for each section. Project details should correspond to the project plan set found onsite during construction to guide the contractor in establishing erosion and sediment control.
- 2. If an entire section is not applicable to the project, please indicate this in the provided "Design & Installation" textbox under that section and state why it is not applicable.
- 3. Place drawings (e.g. ESC plan and details) directly after the page where they are requested or reference them as an appendix and attach them accordingly OR attached with submittal online.
- 4. Other additions (calculations, BMPs, maintenance guidelines, etc.) should be placed in an appendix. Reference them and attach accordingly. Additions may be attached with submittal online.
- 5. Update documents when changes are required.

If this project does not require a full or targeted drainage review, please see the following:

- Simplified Drainage Review submit a Small-Site CSWPP as outlined in <u>COK Policy D-12</u>. The Simplified Drainage Review Template is found <u>here</u>.
- Basic Drainage Review not required to submit a CSWPP or Small-Site CSWPP. However, a drainage plan and ESC plan are still required for this type of review per <u>COK Policy D-2</u>.

## 'Notice Of Intent' Advisory

For projects 1 acre or larger, applicants are required to submit a Notice of Intent (NOI) to WA State Department of Ecology (Ecology) and obtain coverage under Ecology's Construction Stormwater General Permit (CSWGP) issued as part of the Federal Clean Water Act. Applicants *instead* must submit a draft Ecology CSWPP at COK permit submittal, and final Ecology CSWPP at the COK Pre-Construction Meeting. The Ecology CSWPP meets King County and COK requirements listed above. For additional information, see the following Ecology

### **Project Background**

#### **Existing Conditions**

Hydrology and topography (average slope, soil, presence of groundwater):

Drainage patterns:

The project is comprised of three work areas. Work Area A - Stormwater runoff is collected and conveyed by a patchwork of historically and recently installed buried storm pipes, catch basin inlets, and surface treatments (i.e., asphalt thickened edges and berms). These existing facilities/systems are mostly located within the City's rights-of-way, but some extend onto private property. Runoff from the northern portion of 90th Avenue NE flows south and reaches a recently installed storm drain manhole (SDMH 1925) which outlets to a 12-inch culvert that crosses underneath 90th Avenue NE and discharges to Stream A at a rock channel. Runoff from the southern portion of the road surface flows south until reaching the intersection with NE 117th PI where it flows into an existing ditch along the west side of the road before reaching Wetland B and Stream B. North of the intersection with 90th Avenue NE, runoff from the southern portion of NE 117th Pl in this work area flows north and reaches a storm line that conveys to a Type 1 catch basin (CB 7900) which outlets to a 12-inch culvert that crosses underneath NE 117th PI and discharges to Stream A. Runoff north of this culvert reaches an existing Type 1 catch basin (CB 3111) that currently drains east from NE 117th Place to 91st Place NE over two private properties (9037 NE 117the Place and 11655 91st Place NE). North of this point runoff from the road is conveyed in an existing system which leads to 93rd Ave NE and ultimately discharges to Juanita Creek south of NE Juanita Dr. Work Area B - Stormwater runoff is collected and conveyed by a patchwork of mostly below-grade pipes and catch basin inlets with a few shallow roadside ditches. The drainage systems in the NE 117th Place right-ofway generally flow south and west toward the intersection of NE 116th PI where runoff is conveyed via an 8-inch diameter pipe draining over the steep slope to NE Juanita Drive. The drainage facilities in NE 116th Place generally flow east down this meandering road and reach a flow splitter installed with CIP #1 (CB 9102). The conveyance systems downstream of this structure both ultimately discharge to the energy dispersion (i.e., bubble up) structure at Juanita Beach Park that was also installed with CIP #1. Work Area C - 91st Lane NE is fully improved with curb, gutter, and sidewalk along its west side. The east half of this road is paved to a minimum 14-foot width. A recent residential duplex project (City file no. BSF19-06500; 11626 91st Place NE) improved the east side of 91st Place NE north of and adjacent to Stream F with additional paved width, concrete curb and gutter, and a new 48-inch Type 2 catch basin (SDMH 12159) connection to the 12-inch concrete culvert outlet to Stream F. Buried storm pipes along the west side of the road convey runoff to SDMH 12159 and the downstream Stream F outfall on the east side of 91st Lane NE. The stream flow continues to the east and enters a pipe system that has caused historic flooding of the apartment complex east of 91st Lane NE from flows overtopping catch basins in the parking lot. When contained, this storm line ultimately discharges to the energy dispersion (i.e., bubble up) structure at Juanita Beach Park that was recently installed with CIP #1.

• Critical Areas (wetlands, streams, high erosion risk, steep or difficult to stabilize slopes):

Six streams were identified within the project limits based on a Critical Areas Study performed by Wetland Resources, Inc. The streams have been identified by the project biologist as streams A through F. Three of the streams are classified as Type Np and three are classified as Ns. Runoff from each of the streams ultimately reaches Lake Washington, which is located just south of the project area. Seven wetlands were identified in the Critical Areas Study. The wetlands do not have official

names, but are identified as wetlands A-G for project purposes. Five of the wetlands are classified as Category III, one is classified as Category II, and one is classified as Category IV. There are areas of steep slopes and landslide hazard areas surrounding the work areas.

#### **City of Kirkland Waterbodies**

Check the box next to the pollution type(s) (Category 5, unless advised otherwise) if the project site currently drains, or will drain during construction or developed condition, to the following waterbodies:

• Forbes Lake:		
Forbes Creek:		
• Totem Lake:		
Juanita Creek:	Dissolved Oxygen	
	Temperature	
	Bacteria	
• Lake Washington @ Marina Park:		

#### • Other:

If the project site will cause an adverse impact to existing 303(d) impairments at one or more of the listed waterbodies above, indicate how the project site will control those pollutants and/or mitigate impacts. An adverse impact may be caused by diverting stormwater to and/or away from a waterbody.

Refer to https://fortress.wa.gov/ecy/waterqualityatlas/map.aspx for unnamed waterbodies with impairments if applicable to project site location and discharge.

#### **Proposed Construction Activities**

Description of site development (example: subdivision):	This project proposes to remove, replace, and install new storm drainage facilities in three specific work areas of the Goat Hill neighborhood in the City of Kirkland to improve collection and conveyance capacity and to protect against flooding, landslides, and other related hazards. The existing road surface is proposed to be replaced and widened in some areas. The primary purpose of this work is to improve stormwater runoff collection and conveyance, it is not targeted at improving traffic safety. However, traffic safety is expected to be improved as a result of these improvements.	
Description of construction activities (example: site preparation, demolition, excavation):	Construction activities will include the following: site preparation and staging of construction equipment, demolition of existing pavement and stormwater/utility infrastructure, installation of new stormwater/utility infrastructure, retaining wall construction, road widening and reconstruction.	
Description of site drainage including flow from and onto adjacent properties. Must be consistent with Site Map to be attached:	Work Area A – The project will replace and install new storm drainage facilities to improve the collection and conveyance capacity of the overall City drainage system to reduce potential for local flooding and erosion. A continuous thickened HMA edge per City Pre-approved Plan CK-R.11 will be installed along the roads in the work area to prevent surface flows from escaping the road surfaces and flowing down the existing steep slopes in the area. The project proposes to disconnect approximately 140 LF portion of the City's existing conveyance system that currently	

the 91st Ln NE and NE 116th PI Intersection.
install a new SD line connecting CB9235 to SDMH6912 in the vicinity of
modifications to a portion of the existing City storm drainage systems to
Work Area C – The proposed work in this area involves limited
#44861).
installed CIP#1 drainage improvements at SDMH #6910 (City GIS
within this work area will ultimately connect and discharge to the recently
the improved NE 116th Place drainage system. The improved systems
outfall from NE 116th PI to NE Juanita Drive and re-direct that flow down
slopes in the area. The project will abandon the connection to the 8-inch
from escaping the road surfaces and flowing down the existing steep
will be installed along the roads in the work area to prevent surface flows
City drainage system to reduce potential for local flooding and erosion. A
facilities to improve the collection and conveyance capacity of the overall
Work Area B – The project will replace and install new storm drainage
owned and maintained.
system that lies outside of the public right-of-way will become privately
the residence at 9116 NE 117th PI. The disconnected portion of the
system to the north near the outfall of Stream D and private driveway to
remaining portion of the public system with the existing City drainage
inlets will be installed within the NE 117th PI right-of-way to connect the
(9037 NE 117the PI and 11655 91st PI NE). New pipes and catch basin
drains east from NE 117th PI to 91st PI NE over two private properties

Description of final stabilization (example: extent of revegetation, paving, landscaping):

All temporary BMPs shall be removed after completion of new stormwater/utility infrastructure and road reconstruction. Disturbed areas of vegetation shall be revegetated.

#### Land Use Areas

Total Project Site* Area - Predeveloped (in square feet)	144830
Total Project Site* Area - Developed (in square feet)	144830
Total Site+ Area - Predeveloped (in square feet)	144830
Total Site+ Area - Developed (in square feet)	144830
Land Disturbing Activity - Predeveloped (in square feet)	
Land Disturbing Activity - Developed (in square feet)	68600
Impervious Surface - Predeveloped (in square feet)	77140
Impervious Surface - Developed (in square feet)	80550
Percentage Impervious on Project Site* - Predeveloped (in percentage)	53
Percentage Impervious on Project Site* - Developed	56

New Impervious Surface - Predeveloped (in square feet)	
New Impervious Surface - Developed (in square feet)	3410
Replaced Impervious Surface - Predeveloped (in square feet)	
Replaced Impervious Surface - Developed (in square feet)	77140
New Pollution Generating Impervious Surface - Predeveloped (in square feet)	
New Pollution Generating Impervious Surface - Developed (in square feet)	3410
Replaced Pollution Generating Impervious Surface - Predeveloped (in square feet)	
Replaced Pollution Generating Impervious Surface - Developed (in square feet)	77140
Pervious Surface - Predeveloped (in square feet)	67690
Pervious Surface - Developed (in square feet)	64280
New Pervious Surface - Predeveloped (in square feet)	
New Pervious Surface - Developed (in square feet)	0
Replaced Pervious Surface - Predeveloped (in square feet)	
Replaced Pervious Surface - Developed (in square feet)	0
New Pollution Generating Pervious Surface - Predeveloped (in square feet)	
New Pollution Generating Pervious Surface - Developed (in square feet)	0
Replaced Pollution Generating Pervious Surface - Predeveloped (in square feet)	
Replaced Pollution Generating Pervious Surface - Developed (in square feet)	

\*Project Site as defined within the 2021 King County Stormwater Drainage Manual +Site as defined within the 2021 King County Stormwater Drainage Manual

## Part A - Erosion and Sediment Control (ESC) Plan [Required For All Projects]

The implementation of this ESC plan and the construction, maintenance, replacement, and upgrading of applicable BMP facilities is the responsibility of the Permittee/Contractor until all construction is approved.

The ESC Plan may also include any and all of the following:

- · Locations of all receiving waterbodies.
- Direction of stormwater flows from facilities.
- Locations of all ditches, pipes, swales, drains, inlets, outfalls or other stormwater conveyances existing or used during the construction phase.
- · Location of construction stormwater discharge point(s).
- · Locations of secondary containment structures.
- · Locations and quantities of potential stormwater pollutants.
- · Areas where spills occurred previously.
- Stormwater monitoring locations.
- Locations of fueling stations, offloading areas, outdoor maintenance and equipment storage, tanks, and transfer areas.
- · Sources of run-on from adjacent properties that could cause pollution.
- · Background turbidity levels.

Following this page, attach the ESC plan. See COK General Policy G-7 for plan submittal requirements. See COK Pre-Approved Plan CK-E.04 for an example plan. Design ESC elements to City of Kirkland standards. If a city standard is not available, refer to the equivalent King County design standards. If a county standard is not available, refer to the equivalent Ecology design standards found in the latest Stormwater Management Manual of Western Washington (SWMMWW). **Reference the standard(s) being used where appropriate.** Under the Design & Installation and Maintenance textboxes, add relevant information concerning the BMPs.

Please upload the ESC plan here.

TESC Plans.pdf

### 1. Clearing Limits

Prior to any site clearing or grading, areas to remain undisturbed during project construction will be delineated on the project's ESC plan and physically marked on the project site. The purpose of clearing limits is to prevent disturbance of those areas of the project site that are not designated for clearing or grading.

Check the box next to applicable clearing limit measures.	Clearing Control Fence (Note #20 Erosion Control Plan Notes, KCSWDM D 2 1 1 1)	
	Silt Fence (CK-E.03)	
<b>Design &amp; Installation (or why section is not applicable)</b> Use the following space to specify how clearing limits are to be delineated, and instructions on their installation.	Clearing limits are to be delineated with high visibility construction fence and/or silt fence as shown on the approved construction plans. The limits of construction shall be clearly marked before land-disturbing activities begin. In general, natural vegetation and native topsoil shall be retained	

in an undisturbed state to the maximum extent possible.

#### Maintenance

Use the following space to specify maintenance requirements for the clearing limits measures.

Fencing shall be inspected regularly and repaired/replaced as necessary.

## 2. Cover Measures

Temporary and permanent cover measures will be provided to protect all disturbed areas, including the faces of cut and fill slopes. The purpose of covering exposed soils is to prevent erosion, thus reducing reliance on less effective methods that remove sediment after it is entrained in runoff.

If project site is within a landslide hazard area describe how slopes will be designed, constructed, and protected to minimize erosion; additional protective measures may be required.

Check the box next to applicable cover measures.	Mulching (D.2.1.2.2, p. D-16) Plastic Covering (D.2.1.2.4, p. D-20 and CK-E.05) Straw Wattles (D.2.1.2.5, p. D-21 and CK-E.10) Temporary and Permanent Seeding (D.2.1.2.6, p. D-24)
	Sodding (D.2.1.2.7, p. D-28)
<b>Design &amp; Installation (or why section is not applicable)</b> Use the following space to specify the design and installation of cover measures.	Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. 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 where possible, be located away from storm drain inlets, waterways, and drainage channels. Exposed and unworked soils will be stabilized within 2 days during the wet season (October 1 - April 30) and within 7 days during the dry season (May 1 - September 30).
Maintenance Use the following space to specify maintenance requirements for the cover measures.	Cover Measures shall be inspected weekly and after each rain event and repaired/replaced as necessary.

## 3. Perimeter Protection

Perimeter protection to filter sediment from sheetflow will be located downslope of all disturbed areas and will be installed prior to upslope grading. The purpose of perimeter protection is to reduce the amount of sediment transported beyond the disturbed areas of the construction site.

Check the box next to applicable perimeter protection measures.	Silt Fence (D.2.1.3.1, p. D-33 and CK-E.03) Brush Barrier (D.2.1.3.2, p. D-36) Compost Socks (D.2.1.3.6, p. D-40)
<b>Design &amp; Installation (or why section is not applicable)</b> Use the following space to specify the design and installation of perimeter protection.	All stormwater runoff from disturbed areas shall pass through an appropriate sediment removal BMP before leaving the construction site. Silt fence and inlet/outlet protection shall be placed as shown on the plans or as directed by the City inspector.
Maintenance Use the following space to specify maintenance requirements for the perimeter protection.	Perimeter Protection shall be inspected weekly and after each rain event and repaired/replaced as necessary.

## 4. Traffic Area Stabilization

Unsurfaced entrances, roads, and parking areas used by construction traffic will be stabilized to minimize erosion and tracking of sediment offsite. The purpose of traffic area stabilization is to reduce the amount of sediment transported offsite by construction vehicles and to reduce the erosion of areas disturbed by vehicle traffic.

Check the box next to applicable traffic area stabilization measures.	Construction Road/Parking Area Stabilization (D.2.1.4.2, p. D-44)
<b>Design &amp; Installation (or why section is not applicable)</b> Use the following space to specify the design and installation of traffic area stabilization measures.	Construction access or activities occurring on unpaved areas shall be minimized. Street sweeping and cleaning shall be employed to prevent sediment from entering surface waters.
Maintenance Use the following space to specify maintenance requirements for the traffic area stabilization measures.	Traffic Area Stabilization measures shall be inspected weekly and after each rain event and repaired/replaced as necessary.

## 5. Sediment Retention

Surface water collected from disturbed areas of the site will be routed through a sediment pond or trap or similar BMP prior to release from the site. The purpose of sediment retention facilities is to remove sediment from runoff generated from disturbed areas.

Check the box next to applicable sediment retention measures.	Storm Drain Inlet Protection (D.2.1.5.3, p. D-53 and CK-E.08, E.11)		
<b>Design &amp; Installation (or why section is not applicable)</b> Use the following space to specify the design and installation of sediment retention measures. Include 2- and 10-year peak flows modeled on a 15- minute time step for the developed conditions. Paste calculations under 'Sizing' section.	Storm Drain Inlet Protection shall be installed as a first step in all existing catch basins within and downstream of the works areas that may receive runoff from the project area. Storm Drain Inlet Protection shall be provided in new catch basins at the time of installation. Due to the topographic constraints and narrow nature of the work areas, sediment traps are not feasible for this project.		
Maintenance Use the following space to specify maintenance requirements for the sediment retention measures.	Sediment Retention measures shall be inspected weekly and after each rain event and repaired/replaced as necessary.		

#### Sizing Modeling Report

In the space below, upload an image from WWHM/MGS Flood stating the 2and 10-year peak flows modeled on a 15-minute time step for the developed conditions.

#### **Sizing Requirement Calculations**

The point of connection (POC) will be the basin outlet comparing predeveloped and post- clear-and-graded conditions.

In the space below or as attachment, upload calculations showing the sizing requirements.

## 6. Surface Water Collection

All surface water from disturbed areas will be intercepted, conveyed to a sediment pond or trap, and discharged downslope of any disturbed areas. The purpose of surface water control is to collect and convey surface water so that erosion is minimized, and runoff from disturbed areas is treated by a sediment pond or trap.

Check the box next to applicable surface water collection measures.	Subsurface Drains (D.2.1.6.3, p. D-63) Ditches (D.2.1.6.4, p. D-64) Outlet Protection (D.2.1.6.5, p. D-66)	
<b>Design &amp; Installation (or why section is not applicable)</b> Use the following space to specify the design and installation of surface water collection measures.	Stormwater runoff from the site shall be captured by the existing catch basins and ditches and conveyed by the existing stormwater infrastructure in the initial stages of construction. New catch basins installed with the project shall be made operable as soon as possible as construction progresses. Given the narrow geometry of the work areas and existing steep topography, interceptor dikes and swales are not likely able to be utilized.	
Maintenance Use the following space to specify maintenance requirements for the surface water collection measures.	Surface Water Collection measures shall be inspected weekly and after each rain event and repaired/replaced as necessary.	

## 7. Dewatering Control

The purpose of dewatering control is to prevent the untreated discharge of sediment-laden water from dewatering of utilities, excavated areas, foundations, etc.

Check the box next to applicable dewatering control measures.

Sedimentation bags for small volumes of localized dewatering (D.2.1.7.1.d, p. D-69)

Construction dewatering discharges shall always meet water quality guidelines listed in COK Policy E-1. Specifically, discharges to the public stormwater drainage system must be below 25 NTU, and not considered an illicit discharge (per KMC 15.52.090, enforcement measures covered in Part C of this template). Temporary discharges to sanitary sewer require prior authorization and permit from King County Industrial Waste Program [(206) 477-5300] and notification to the Public Works Construction Inspector.

. Highly turbid dewatering water from soils known or contaminated, or from use of construction equipment, ional monitoring and treatment as required for the ts based on the receiving waters into which the surring. Such monitoring is the responsibility of the
. Hig con iona ts ba

#### Maintenance

Use the following space to specify maintenance requirements for the dewatering control measures.

Dewatering Control measures shall be inspected regularly while in use.

## .

8. Dust Control

Preventative measures to minimize the wind transport of soil will be taken when a traffic hazard may be created or when sediment transported by wind is likely to be deposited in water resources or adjacent properties. The purpose of dust control is to prevent wind transport of dust from exposed soil surfaces onto roadways, drainage ways, and surface waters.

Check the box next to applicable dust control measures.

Water

#### Design & Installation (or why section is not applicable)

Use the following space to specify the design and installation of dust control measures.

Dust control measures shall be implemented to prevent wind transport of dust from disturbed soil surfaces onto roadways, drainage ways, and surface waters. When using water for dust control, the exposed soils shall be sprayed until wet, but runoff shall not be generated by spraying. Exposed areas shall be sprayed as needed.

Maintenance

Use the following space to specify maintenance requirements for the dust control measures.

## 9. Flow Control

Check this box if this section is not applicable to the project.

Surface water from disturbed areas must be routed through the project's onsite flow control facility or other provisions must be made to prevent increases in the existing site conditions 2-year and 10-year runoff peaks discharging from the project site during construction. The purpose of stormwater flow control is to mitigate increases in runoff peaks that occur during construction because of clearing vegetation, compacting the soil, and adding impervious surface. Such increases can cause or aggravate downstream flooding and erosion.

#### **Design & Installation (or why section is not applicable)** Use the following space to specify the design and installation of flow control measures. Include 2- and 10-year peak flows for the developed conditions. Paste calculations under 'Sizing' section.

Maintenance

Use the following space to specify maintenance requirements for the flow control measures.

#### Sizing Modeling Report

In the space below, upload an image from WWHM/MGS Flood stating the 2and 10-year peak flows modeled on a 15-minute time step for the developed conditions.

#### Sizing Requirement Calculations

The point of connection (POC) will be the basin outlet comparing predeveloped and post- clear-and-graded conditions.

In the space below or as attachment, upload calculations showing the sizing requirements.

## **10. Control Of Pollutants**

The requirements for this section are covered in the SWPPS Plan, Part B of this document. SPPPS measures are required to prevent, reduce, or eliminate the discharge of pollutants to onsite or adjacent stormwater systems or water courses from construction-related activities such as materials delivery and storage, onsite equipment fueling and maintenance, demolition of existing buildings and disposal of demolition materials and other waste, and concrete handling, washout, and disposal.

## 11. Protect Existing And Proposed Flow Control BMPs

Check this box if this section is not applicable to the project.

Protection measures will be applied/installed and maintained to prevent adverse impacts to existing flow control BMPs and areas of proposed flow control BMPs for the project. The purpose of protecting existing and proposed flow control BMP areas is to avoid sedimentation and soil compaction that would adversely affect infiltration, and avoid contamination by other pollutants.

The project is exempt from flow control as less than 5,000 square feet of new impervious surface is proposed.

### Dust Control measures shall be monitored while in use.

Use the following space to specify the design and installation of flow control BMP protection measures.

#### Maintenance

Use the following space to specify maintenance requirements for the flow control BMP protection measures.

## 12. Maintain Protective BMPs

The purpose of maintaining protective BMPs is to provide continuous ESC protection throughout the life of the project, and avoid sedimentation, soil compaction and contamination by other pollutants that would adversely affect infiltration and surface runoff.

#### Maintenance (or why section is not applicable)

Use the following space to specify maintenance requirements for the protective BMPs.

Erosion and Sediment Control (ESC) BMPs shall be maintained and repaired as needed throughout construction to assure continued performance of their intended function in accordance with the BMP specifications. Visual monitoring of all BMPs installed at the site shall 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 may be reduced to once every calendar month. All temporary ESC 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 stabilized on-site or removed. Disturbed soil resulting from removal of either BMPs or vegetation shall be permanently stabilized. Additionally, protection must be provided for all BMPs installed for the permanent control of stormwater from sediment and compaction. BMPs that are to remain in place following completion of construction shall be examined and restored to full operating condition. If sediment enters these BMPs during construction, the sediment shall be removed and the facility shall be returned to conditions specified in the construction documents

## 13. Manage The Project

Projects shall assign a qualified CSWPP Supervisor (Section D.2.3.1) to be the primary contact for ESC issues and reporting, coordination with subcontractors and implementation of the CSWPP.

Considerations:

- 1. Phase development projects to the maximum degree practicable and consider seasonal work limits.
- Inspection and monitoring Inspect, maintain, and repair all BMPs as needed to assure continued performance of their intended function throughout the life of the project.
- 3. Maintaining an updated CSWPP Maintain, update, and implement the CSWPP throughout the life of the project.
- 4. Keep public works inspector informed on any changes.

The CSWPP Supervisor or inspector must have the skills to:

- Assess site conditions and construction activities that could impact the quality of stormwater (e.g., site grading operations, or concrete construction and dewatering operations for a detention vault).
- Assess effectiveness of ESC measures used to control the quality of stormwater discharges at least weekly and within 24 hours of significant storms (0.5 inches or greater).
- Examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen.
- Assess effectiveness of BMPs and determine if it is necessary to install, maintain, or repair BMPs to improve the quality of stormwater discharges (procedure covered in Part C of this template).
- · Update the site logbook accordingly with pertinent information related to above bullets.

# Part B - Stormwater Pollution Prevention and Spill (SWPPS) Measures [Required For All Projects]

The purpose of SWPPS control is to prevent, reduce, or eliminate the discharge of pollutants to onsite or adjacent stormwater systems or

watercourses from construction-related activities such as materials delivery and storage, onsite equipment fueling and maintenance, demolition of existing buildings and disposition of demolition materials and other waste, and concrete handling, washout, and disposal.

The implementation of this SWPPS plan and the construction, maintenance, replacement, and upgrading of the SWPPS facilities is the responsibility of the Permittee/Contractor until all construction is approved.

#### **Contaminated Site Information:**

Proposed activities regarding contaminated soils or groundwater (example: onsite treatment system, authorized sanitary sewer discharge) should be listed below:

All significant spills that have occurred in the past three years should be documented in Part B.

Following this page, attach the SWPPS plan. See <u>COK General Policy G-7</u> for plan submittal requirements. The level of detail should be similar to that of <u>COK Pre-Approved Plan CK-E.04</u>. Plan for SWPPS measures to City of Kirkland standards. If a city standard is not available, refer to the equivalent King County design standards. If a county standard is not available, refer to the equivalent Ecology design standards found in the latest Stormwater Management Manual of Western Washington (SWMMWW). **Reference the standard(s) being used where appropriate.** Under the Design & Installation and Maintenance textboxes, add relevant information concerning the BMPs.

Please upload the SWPPS plan here.

## 1. Concrete Handling

Concrete work can generate process water and slurry that contain fine particles and high pH, both of which can violate water quality standards in the receiving water. Concrete spillage or concrete discharge to surface waters of the State is prohibited. Use this BMP to minimize and eliminate concrete, concrete process water, and concrete slurry from entering waters of the state.

#### Procedures (or why section is not applicable)

Describe the management practices to be employed to prevent concrete washwater from discharging offsite. Specifically identify where unused concrete will be placed and how project will prevent washwater or slurry from discharging into storm drain. Any time concrete is used, utilize these management practices:

1. Assure that washout of concrete trucks, chutes, pumps, and internals is performed at an approved offsite location or in designated concrete washout areas. Do not wash out concrete trucks, chutes, pumps, or internals onto the ground, or into storm drains, open ditches, streets, or streams. Refer to BMP D.2.2.2 (p. D-78) for information on concrete washout areas.

2. Return unused concrete remaining in the truck and pump to the originating batch plant for recycling. Do not dump excess concrete on site, except in designated concrete washout areas.

3. Wash off hand tools including, but not limited to, screeds, shovels, rakes, floats, and trowels into formed areas awaiting future concrete pours only.

4. Do not wash out to formed areas awaiting infiltration BMPs.5. Wash equipment difficult to move, such as concrete pavers in areas that do not directly drain to natural or constructed stormwater conveyances.

Do not allow washdown from areas, such as concrete aggregate driveways, to drain directly to natural or constructed stormwater conveyances.

 Contain washwater and leftover product in a lined container when no formed areas are available,. Dispose of contained concrete in a manner that does not violate ground water or surface water quality standards.
 Always use forms or solid barriers for concrete pours, such as pilings, within 15-feet of surface waters. 9. Refer to BMPs D.2.2.7 and D.2.2.8 for pH adjustment requirements.

10. Refer to the Construction Stormwater General Permit for pH monitoring requirements if the project involves one of the following activities:

• Significant concrete work (greater than 1,000 cubic yards poured concrete or recycled concrete used over the life of a project).

• The use of engineered soils amended with (but not limited to) Portland cement-treated base, cement kiln dust or fly ash.

• Discharging stormwater to segments of water bodies on the 303(d) list (Category 5) for high pH.

## 2. Concrete Washout Area

Prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout offsite or performing onsite washout in a designated area to prevent pollutants from entering surface waters or ground water.

## Design and Installation Specifications (or why section is not applicable)

If concrete washout is performed onsite, specify the design and installation of the washout containment area(s). Specifically describe the type, size and location on site, and how you will prevent washwater or slurry from discharging into storm drain. The following steps will help reduce stormwater pollution from concrete wastes:

1. Perform washout of concrete trucks at an approved off-site location or in designated concrete washout areas only.

2. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams.

3. Do not allow excess concrete to be dumped on-site, except in designated concrete washout areas.

4. Concrete washout areas may be prefabricated concrete washout containers, or self-installed structures (above-grade or below-grade).
5. Prefabricated containers are most resistant to damage and protect against spills and leaks. Companies may offer delivery service and provide regular maintenance and disposal of solid and liquid waste.
6. If self-installed concrete washout areas are used, below-grade structures are preferred over above grade structures because they are less prone to spills and leaks.

7. Self-installed above-grade structures should only be used if excavation is not practical.

#### Maintenance

Prescribe inspection and maintenance schedules and procedures to be conducted on the washout containment area(s). Specifically explain how you will ensure that containers don't overtop or leak. Concrete washout areas shall apply the maintenance standards set forth in D.2.2.2.

### 3. Sawcutting and Surfacing Pollution Prevention

Sawcutting and surfacing operations generate slurry and process water that contains fine particles and high pH (concrete cutting), both of which can violate the water quality standards in the receiving water. Concrete spillage or concrete discharge to surface waters of the State is prohibited. Use this BMP to minimize and eliminate process water and slurry created through sawcutting or surfacing from entering waters of the State.

#### Procedures (or why section is not applicable)

Specify the management practices to be employed to prevent sawcutting and surfacing pollution from discharging offsite. Specifically describe how you will prevent slurry, cuttings or process water from discharging into storm drain. Utilize these management practices anytime sawcutting or surfacing operations take place.

 Vacuum slurry and cuttings during cutting and surfacing operations.
 Slurry and cuttings shall not remain on permanent concrete or asphalt pavement overnight.

3. Slurry and cuttings shall not drain to any natural or constructed drainage conveyance including stormwater systems. This may require temporarily blocking catch basins.

4. Dispose of collected slurry and cuttings in a manner that does not violate ground water or surface water quality standards.

5. Do not allow process water generated during hydro-demolition, surface roughening or similar operations to drain to any natural or constructed drainage conveyance including stormwater systems. Dispose process water in a manner that does not violate ground water or surface water quality standards.

6. Handle and dispose cleaning waste material and demolition debris in a manner that does not cause contamination of water. Dispose of sweeping material from a pick-up sweeper at an appropriate disposal site.

Prevent, reduce, or eliminate the discharge of pollutants to the stormwater system or watercourses from material delivery and storage. Minimize the storage of hazardous materials onsite, store materials in a designated area, and install secondary containment.

## Design and Installation Specifications (or why section is not applicable)

Specify the design and installation of measures to protect prevent hazardous materials from discharging offsite. Specifically describe the type, size and location on site of secondary containment and/or cover measures.

The following steps should be taken to minimize the risk of discharge of pollutants to the stormwater system or watercourses from material delivery and storage:

1. Temporary storage area should be located away from vehicular traffic, near the construction entrance(s), and away from waterways or storm drains.

2. Material Safety Data Sheets (MSDS) should be supplied for all materials stored. Chemicals should be kept in their original labeled containers.

3. Hazardous material storage on-site should be minimized.

Hazardous materials should be handled as infrequently as possible.
 During the wet weather season (Oct 1 – April 30), consider storing materials in a covered area.

6. Materials should be stored in secondary containments, such as earthen dike, horse trough, or even a children's wading pool for non-reactive materials such as detergents, oil, grease, and paints. Small amounts of material may be secondarily contained in "bus boy" trays or concrete mixing trays.

7. Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, and within secondary containment.

8. If drums must be kept uncovered, store them at a slight angle to reduce ponding of rainwater on the lids to reduce corrosion. Domed plastic covers are inexpensive and snap to the top of drums, preventing water from collecting.

## 5. Construction Stormwater Chemical Treatment

Check this box if this section is not applicable to the project.

This BMP applies when using stormwater chemicals in batch treatment or flow-through treatment. Chemical treatment can reliably provide exceptional reductions of turbidity and associated pollutants. Chemical treatment may be required to meet turbidity stormwater discharge requirements, especially when construction is to proceed through the wet season.

## Design and Installation Specifications (or why section is not applicable)

Specify the design and installation of the chemical treatment system(s) to be employed at the site.

#### Maintenance

Prescribe inspection and maintenance schedules and procedures to be conducted on the chemical treatment systems.

#### Sizing Modeling Report

In the space below, upload an image of the report from WWHM stating the 2and 10-year peak flows modeled on a 15-minute time step for the developed conditions.

#### Sizing Requirement Calculations

The point of connection (FOC) will be the basin outlet comparing predeveloped and post- clear-and-graded conditions.

In the space below, upload calculations showing the sizing requirements

N/A – Stormwater Chemical Treatment is not expected to be necessary for the project.

## 6. Construction Stormwater Filtration

Check this box if filtration will not be used on this project.

N/A - Construction Stormwater Filtration is not expected to be necessary

Filtration removes sediment from runoff originating from disturbed areas of the site.

## Design and Installation Specifications (or why section is not applicable)

Specify the design and installation of the filtration system(s) to be employed at the site. Specifically describe the type, size and location on site of stormwater filtration.

#### **Maintenance Standards**

Prescribe inspection and maintenance schedules and procedures to be conducted on the filtration system(s).

## 7. High pH Neutralization Using CO2

Check this box if CO2 sparging will not be used on this project.

When pH levels in stormwater rise above 8.5 it is necessary to lower the pH levels to the acceptable range of 6.5 to 8.5, this process is called pH neutralization. pH neutralization involves the use of solid or compressed carbon dioxide gas in water requiring neutralization. Neutralized stormwater may be discharged to surface waters under the General Construction National Pollution Discharge Elimination System (NPDES) permit.

for the project.

## Design and Installation Specifications (or why section is not applicable)

Specify the design and installation of the CO2 sparging system to be employed at the site. Specifically describe the type, capacity and location onsite of the sparging system. N/A - CO2 sparging is not expected to be necessary for the project.

#### Maintenance Standards

Prescribe inspection and maintenance schedules and procedures to be conducted on the filtration system(s).

## 8. pH Control For High pH Water

When pH levels in stormwater rise above 8.5 it is necessary to lower the pH levels to the acceptable range of 6.5 to 8.5, this process is called pH neutralization. Stormwater with pH levels exceeding water quality standards may be treated by infiltration, dispersion in vegetation or compost, pumping to a sanitary sewer, disposal at a permitted concrete batch plant with pH neutralization capabilities, or carbon dioxide sparging (see previous page).

Check the box next to applicable treatment measures.	Dispersion		
	Sanitary Sewer Disposal		
	Concrete Batch Plant Disposal		
Design and Installation Specifications (or why section is not applicable) Specify the design and installation of the pH control system(s) to be employed at the site.	Dispersion • Dispersion techniques should be consistent with Chapter 5 and Appendix C of the King County Surface Water Design Manual Sanitary Sewer Disposal • Local sewer authority approval is required prior to disposal via the sanitary sewer Concrete Batch Plant Disposal • Only permitted facilities may accept high pH water		

· Facility should be contacted before treatment to ensure they can

#### **Maintenance Standards**

Prescribe inspection and maintenance schedules and procedures to be conducted on the pH control system(s).

All pH control systems shall be maintained per the manufacturer's specifications and per the KCSWDM.

pH monitoring is required for "Significant concrete work" (i.e. greater than 1000 cubic yards poured concrete over the life of the project). The use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD] or fly ash) also requires pH monitoring. Recycled concrete is not allowed for use within the City.

For significant concrete work, pH sampling will start the first day concrete is poured and continue until it is cured, typically three (3) weeks after the last pour.

For engineered soils and recycled concrete, pH sampling begins when engineered soils or recycled concrete are first exposed to precipitation and continues until the area is fully stabilized.

If the measured pH is 8.5 or greater, the following measures will be taken:

- 1. Prevent high pH water from entering storm sewer systems or surface water.
- 2. Adjust or neutralize the high pH water to the range of 6.5 to 8.5 su using appropriate technology such as carbon dioxide (CO2) sparging (liquid or dry ice).
- 3. Written approval will be obtained from Ecology prior to the use of chemical treatment other than CO2 sparging or dry ice.
- 4. Provide details on disposal of water with elevated pH or of the treated water.

Method for sampling pH:

Check the analysis method you will use:

Table 8 – pH Sampling Method

## 9. Use Of High pH Soil Amendments On Construction Sites

Check this box if high pH soil amendments will not be used on this site.

Soil amendments used for stability purposes (as described on page D-97) are often high pH and require approval from City of Kirkland before use. Please use the following space to describe how the project will meet the conditions of COK Policy D-16 and Section D.2.2.9.

Conditions (or why section is not applicable)

10. Maintain Protective BMPs

Pollutant protection measures will be maintained to assure continued performance of their intended function. Reporting and documentation will be kept current and made available to City of Kirkland as indicated.

Maintenance (or why section is not applicable)

Describe the procedures required to maintain all pollutant control BMPs.

N/A – High pH soil amendments are not expected to be necessary for the project.

Protection measures shall be monitored per Section D.2.4.4 at a minimum, continuously during operation, and promptly maintained to fully functioning condition as necessary to assure continued performance of their intended function. Documentation shall be kept current per specific BMP requirements.

Measures to Use:

1. Maintain and repair all pollutant control BMPs as needed to assure continued performance of their intended function in accordance with BMP specifications.

 Maintain and repair storage locations for equipment and materials associated with BMP processes. Conduct materials disposal in compliance with County regulatory requirements. SECTION D.2.2 SWPPS MEASURES 7/23/2021 2021 Surface Water Design Manual – Appendix D D-110

As required, provide current reporting and performance documentation at an accessible location for the site inspector and other DLS-Permitting staff.

## **11. Manage The Project**

Projects shall assign a qualified CSWPP Supervisor (Section D.2.3.1) to be the primary contact for SWPPS issues and reporting, coordination with subcontractors and implementation of the CSWPP.

Considerations:

- 1. Phase development projects to the maximum degree practicable and consider seasonal work limits.
- Inspection and monitoring Inspect, maintain, and repair all BMPs as needed to assure continued performance of their intended function throughout the life of the project.
- 3. Maintaining an updated CSWPP Maintain, update, and implement the CSWPP throughout the life of the project.
- 4. Keep public works inspector informed on any changes.

The CSWPP Supervisor or inspector must have the skills to:

- Assess site conditions and construction activities that could impact the quality of stormwater (e.g., site grading operations, or concrete construction and dewatering operations for a detention vault).
- Assess effectiveness of ESC measures used to control the quality of stormwater discharges at least weekly and within 24 hours of significant storms (0.5 inches or greater).
- Examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen.
- Assess effectiveness of BMPs and determine if it is necessary to install, maintain, or repair BMPs to improve the quality of stormwater discharges (procedure covered in Part C of this template).
- Update the site logbook accordingly with pertinent information related to above bullets.

# Part C - Site Inspection, Monitoring, And Sampling Requirements And Enforcement

A site logbook shall be maintained for all onsite construction activities and may include:

· Previous versions of the CSWPP and other permits related to the CSWPP.

· Dated visual site inspections

· Stormwater sampling data (water quality parameters of concern).

## Site Inspections

Site inspections will occur in all areas disturbed by construction activities and at all stormwater discharge points. The CSWPP Supervisor shall 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 shall be documented in the site logbook. All new BMPs that are used shall be detailed in the amended CSWPP.

## **Turbidity Control Requirements For Construction Stormwater Discharge**

The contractor is responsible for reporting an Illicit Discharge Detection and Elimination (IDDE) when construction stormwater discharge is released offsite during a construction project that does not meet City water quality standards. City staff will investigate concerns as a violation of the Kirkland Municipal Code (KMC) 15.52.090. If a violation is determined, a sample will be taken at any location deemed to be a discharge point. This may be a point source (pipe) or non-point source (runoff). The public works construction inspector assigned to the project will work with the contractor to implement changes needed on the project's ESC and SWPPS plans to assure effort has been taken to reduce pollution caused by construction stormwater discharge.

#### Basis of Requirements:

Refer to the <u>2021 KCSWDM</u>, Core Requirement 5, Chapter 1.2.5 and Appendix D, and Policy E-1 of the City of Kirkland Pre-Approved Plans for more information on site discharge requirements. Refer to KMC 15.52.090 and KMC 01.12.200 for rules on enforcement.

If a violation results in a corrective action notice, the proposed changes found within the notice should be reflected in the updated CSWPP, technical information report (TIR), and plan set, if applicable.

The CSWPP Supervisor may create their own Discharge Sampling Log or use the Discharge Sampling Log used by the City, provided at the end of this template.

## **Monitoring Of Discharges**

Following the guidelines detailed by King County (KCSWDM D.2.3.2), the CSWPP Supervisor shall do the following:

Daily:

- Inspect ESC and SWPPS facilities.
- Maintain ESC and SWPPS facilities to ensure continued proper functioning (KCSWDM D.2.4.1).
- Review the site for ESC and SWPPS during periods of active construction where maintenance conditions change with construction activity.

At least weekly, and within 24 hours of significant storms (see below for definition of significant storm) review the site for ESC and SWPPS:

- Sample at discharge locations, or any location where discharge off-site is occurring.
- Keep a log of all turbidity measurements (recorded as Nephelometric Turbidity Units [NTUs]) and make it available to the City of Kirkland upon request. If the project site is subject to a NPDES general permit for construction issued by the Ecology, then the project must also comply with the monitoring requirements of that permit.
- A significant storm is quantified as one resulting in greater than 0.5 inches of rain within the timespan of 24 hours; if temporary surface flow control or water quality facilities used for construction are overcapacity, a storm event can be categorized as significant.

## **Enforcement Of Turbidity Control Requirements**

Enforcement will follow this procedure:

1. To verify turbidity readings, the CSWPP Supervisor will analyze discharge samples with a turbidity meter (following the procedures of KCSWDM 1.2.5.2.B/D.2.3.2).

2. If a discharge of the following characteristics is made to the municipal separate storm sewer system (MS4) or waters of the state, this may be considered an illicit discharge:

- Turbidity test results in greater than the benchmark value of 25 NTU, but less than 250 NTU.
- Observed to have a visible sheen or suspected to contain a pollutant.

The CSWPP Supervisor shall do all of the following in response:

A. Report incident(s) to the City of Kirkland at (425) 587-3900.

B. Review the ESC and SWPPS plans for compliance and make appropriate revisions as soon as possible but no later than 7 days of the discharge that exceeded the benchmark of 25 NTU. The City of Kirkland will issue a Corrective Action Notice as reference for advised improvements. The Permittee may be subject to code compliance for cost recovery related to an illicit discharge as reimbursement of work completed by the City of Kirkland.

C. Fully implement and maintain appropriate ESC and SWPPS measures as soon as possible but no later than 10 days after the discharge that exceeded the benchmark.

D. Document the ESC and SWPPS implementation and maintenance in the site logbook.

For projects discharging to a sensitive area (e.g. onsite wetland), see the following:

a. If the turbidity level is found to be less than 5 NTU above background level if background turbidity is 50 NTU or less, OR

b. If the turbidity level is found to be less than 10% above background level if background turbidity is greater than 50 NTU, THEN

c. This discharge is allowed **but incident shall still be recorded and reported to the City of Kirkland**. Correction Action Notice may be provided but cost recovery and fines are not anticipated.

d. Procedures for reducing turbidity are the same as above except the benchmark value is the background turbidity (instead of 25 NTU).

3. If the turbidity reading is higher than 250 NTUs for discharges made to the municipal separate storm sewer system (MS4) or waters of the state, the CSWPP Supervisor shall do all of the following:

A. Report incident(s) to the City of Kirkland at (425) 587-3900.

B. Review the ESC and SWPPS plans for compliance and make appropriate revisions as soon as possible but no later than 7 days of the discharge that exceeded the benchmark of 25 NTU. The City of Kirkland will issue a Corrective Action Notice as reference for advised improvements. The City may impose a "Stop Work Order" until turbidity levels return to a safe level (less than 250 NTUs). The Permittee may be subject to code compliance for cost recovery related to a discharge violation as reimbursement of work completed by the City of Kirkland.

Cost recovery would be in addition to fines in relation to a violation of KMC 15.52.090.

C. Fully implement and maintain appropriate ESC and SWPPS measures as soon as possible but no later than 10 days after the discharge that exceeded the benchmark.

D. Document the ESC and SWPPS implementation and maintenance in the site logbook.

E. Continue to sample discharges until turbidity is 25 NTU or lower, or the turbidity is no more than 10% over background turbidity. "Stop Work Order", if imposed, is lifted when turbidity samples are below 250 NTU.

4. If the project site is subject to a NPDES general permit for construction issued by the Ecology, then the project must also comply with the monitoring requirements of that permit.

## pH Control Requirements For Construction Stormwater Discharge

Prior to discharge, treated stormwater shall be sampled and tested for compliance with pH levels. pH shall be within the range of 6.5 to 8.5 standard units and not cause a change in the pH of the receiving water of more than 0.2 standard units.

pH monitoring is required for "Significant concrete work" (i.e. greater than 1000 cubic yards poured concrete or recycled concrete over the life of the project). The use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD] or fly ash) also requires pH monitoring.

For significant concrete work, pH sampling will start the first day concrete is poured and continue until it is cured, typically three (3) weeks after the last pour.

For engineered soils and recycled concrete, pH sampling begins when engineered soils or recycled concrete are first exposed to precipitation and continues until the area is fully stabilized.

If the measured pH is expected to be 8.5 or greater, the following measures will be taken:

- 1. Prevent high pH water from entering storm sewer systems or surface water.
- 2. Method for sampling pH shall be by pH meter probe.
- 3. Adjust or neutralize the high pH water to the range of 6.5 to 8.5 standard units (su) using appropriate technology such as carbon dioxide (CO2) sparging (liquid or dry ice).
- 4. Written approval will be obtained from Ecology prior to the use of chemical treatment other than CO2 sparging or dry ice.
- 5. Provide details on disposal of water with elevated pH or of the treated water.

Recycled concrete and cement treatment are construction activities that result in the need for the pH control requirement. See <u>COK Policy D-16</u> for more information on these common practices to be better prepared for properly controlling pH in construction stormwater discharge.

### **Next Steps**

#### Note:

Once you submit this form, you will receive an email confirmation from our third-party provider, OpenForms, along with a PDF copy of the form you submitted. Keep it for your records. Be sure to check your spam/junk folder so you don't miss it!

You will need to upload the PDF document to MyBuildingPermit.com along with your permit application to complete this application process.

## Title VI

To request information from this document in your language, please contact the Title VI Coordinator at titlevicoordinator@kirklandwa.gov or 425-587-3831.

Чтобы запросить перевод этого документа на по-русски, свяжитесь с координатором по вопросам Раздела VI по электронной почте titlevicoordinator@kirklandwa.gov или по номеру 425-587 3831

Para pedir información sobre este documento en español, comuníquese con el coordinador del Título VI escribiendo a titlevicoordinator@kirklandwa.gov o llamando al 425-587-3831.

Para solicitar informações deste documento em português, entre em contato com o Coordenador do Título VI em titlevicoordinator@kirklandwa.gov ou 425-587-3831.

Để yêu cầu thông tin từ tài liệu này bằng tiếng Việt, vui lòng liên hệ với Điều Phối Viên Tiêu Đề VI theo địa chỉ titlevicoordinator@kirklandwa.gov hoặc theo số (425) 587-3831.

#### Alternate Formats:

People with disabilities may request materials in alternate formats.

Title VI: Kirkland's policy is to fully comply with Title VI of the Civil Rights Act by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its programs and activities. Any person who believes his/her Title VI protection has been violated, may file a complaint with the City.

To request an alternate format, file a complaint or for questions about Kirkland's Title VI Program, contact the Title VI Coordinator at 425-587-3831 (TTY Relay: 711) or TitleVICoordinator@kirklandwa.gov.

# APPENDIX G: Critical Areas Report



## **CRITICAL AREA STUDY AND BUFFER MITIGATION PLAN**

FOR

## GOAT HILL DRAINAGE DITCH CONVEYANCE AND CHANNEL STABILIZATION PROJECT – PHASE 1

Wetland Resources, Inc. Project #22264

<u>Prepared By</u> Wetland Resources, Inc. 9505 19th Avenue SE, Suite 106 Everett, WA 98208 (425) 337-3174

> Prepared For CPH Consultants Attn. Matt Hough 11321-B NE 120th St. Kirkland, WA 98034

July 25, 2023 Revision #1: September 26, 2023

## TABLE OF CONTENTS

1.0 INTRODUCTION	1
1.1 PROJECT AREA DESCRIPTION	1
1.2 WETLAND AND STREAM DETERMINATION	2
1.2.1 Wetland Determination Findings	2
1.2.2 Stream Determination Findings	2
1.3 INTERRUPTED BUFFER WAIVER	3
1.4 STREAM BUFFERS AND CULVERTS	3
2.0 PROJECT DESCRIPTION	4 4
3.0 BUFFER MITIGATION PLAN.	5
3.2 MITIGATION CREDIT DETERMINATION	5
4.0 WETLAND AND STREAM FUNCTIONS AND VALUES ASSESSMENT	6 6
4.1.2 Post-Development Functions and Values	6
5.0 Use of this Report	7
6.0 References	8

### LIST OF APPENDICIES

APPENDIX A: EXISTING CONDITIONS AND PROPOSED PROJECT MAPS FOR

PHASE 1 – GOAT HILL DRAINAGE IMPROVEMENTS

## **1.0 INTRODUCTION**

*Wetland Resources, Inc. (WRI)* conducted site investigations on October 10 and November 21, 2022, to locate and evaluate jurisdictional wetlands and streams on and in the vicinity of the Goat Hill Drainage Ditch Conveyance and Channel Stabilization project area. The Goat Hill neighborhood is the City of Kirkland, WA, and located within Section 30, Township 26, Range 5, W.M. The area reviewed for wetlands and streams is shown in the figure below.



Figure 1 - Aerial of the Study Area

## **1.1 PROJECT AREA DESCRIPTION**

The project area and surrounding land use include single- and multi-family residential development. Topography of the area generally slopes steeply to the south, with level areas around existing residences. Six streams and seven wetlands were identified within the study area for Goat Hill SD CIP 3. The project area is within the Juanita Creek drainage basin, which is in Watershed Resources Inventory Area (WRIA) 8.

1

### **1.2 WETLAND AND STREAM DETERMINATION**

Wetland and stream delineation methodology, locations, classifications, and standard buffer widths were included in the *Critical Area Study for Goat Hill SD CIP 3*, Revision #1, dated May 10, 2023. This report was reviewed under SAR23-00191 and the wetland and stream locations and classifications presented in that report have been approved. A summary of the information approved through the SAR23-00191 review is provided below.

### 1.2.1 Wetland Determination Findings

Seven wetlands were identified within the project area. As required by the Kirkland Zoning Code (KZC) 90.55, the wetlands were classified using the *Washington State Department of Ecology Wetland Rating System for Western Washington: 2014 Update.* Wetland buffer widths were determined using the category and habitat score, as listed in KZC Table 90.55.1.

Wetland	HGM Class	Category	Habitat Score	Standard Buffer Width
Wetland A	Depressional	III	5 points	60 feet
Wetland B	Slope + Riverine	II	4 points	75 feet
Wetland C	Slope	III	5 points	60 feet
Wetland D	Slope	III	4 points	60 feet
Wetland E	Riverine	III	5 points	60 feet
Wetland F	Riverine	III	5 points	60 feet
Wetland G	Slope	IV	6 points	40 feet

Table 1 - Wetland Classifications and Buffer Widths

## 1.2.2 Stream Determination Findings

Six streams were identified within the project area. Streams were classified in accordance with WAC 222-16-030, as required by KZC 90.65 and their buffer widths were determined using KZC Table 90.65.1.

Stream	Stream Classification	
Stream A	Type Np	50 feet
Stream B	Type Np	50 feet
Stream C	Type Ns	50 feet
Stream D	Type Ns	50 feet
Stream E	Type Np	50 feet
Stream F	Type F	50 feet

**Table 2 -** Stream Classifications and Buffer Widths

The physical parameters of Stream F meet the definition for a fish-bearing (Type F) stream. However, given the extensive stormwater infrastructure and arterial between Stream F and Lake Washington, Stream F does not contain fish. Per the approved *Critical Area Study for Goat Hill SD*  CIP 3, the required buffer width for a non-fish bearing stream will apply to Stream F, as allowed in KZC 90.120.2.

## **1.3 INTERRUPTED BUFFER WAIVER**

Per KZC 90.120.1, a critical area buffer may be terminated along the edge of an improved rightof-way when the improved road interrupts a portion of the critical area buffer from the portion of the buffer adjacent to the critical area. An interrupted buffer must meet the criteria in KZC 90.120.1.d, listed below.

1) The existing legal improvement creates a substantial barrier to the buffer function;

2) The interrupted buffer does not provide additional protection of the critical area from the proposed development; and

3) The interrupted buffer does not provide significant hydrological, water quality and wildlife buffer functions relating to the portion of the buffer adjacent to the critical area.

The roads providing access to the Goat Hill neighborhood interrupt the standard buffer widths of the identified wetlands and streams in the project area. Existing improved rights-of-way within the wetland/stream buffers that contain asphalt, gravel, and other infrastructure does not contribute to wetland/stream buffer functions. These improvements do not assist in filtering sediment or pollutants out of stormwater or slow velocity of runoff. Regularly used roads present an obstacle for terrestrial animals moving from one area to another. Since the roads fragment the standard buffer and do not contribute to buffer functions, they prevent buffer area on one side of the road from providing protection to the interrupted buffer area on the other side of the road.

Given that the improved rights-of-way within the wetland/stream buffers do not provide any hydrological, water quality, or wildlife benefits, these areas do not provide protection of the wetlands or streams in the project area. The wetland/stream buffers are functionally interrupted and should terminate along the edge of improvements within the rights-of-way.

The interrupted buffers are shown in the figures in Appendix A.

## 1.4 STREAM BUFFERS AND CULVERTS

The figures within the approved *Critical Area Study for Goat Hill SD CIP 3* depicted the standard stream buffer widths without consideration of existing culvert locations. All stream buffers shown on the figures within Appendix A are based on the guidance for culverted streams and their buffers in Plate 16 A of KZC.

## 2.0 PROJECT DESCRIPTION

Phase 1 of the Goat Hill Drainage Ditch Conveyance and Channel Stabilization project proposes to remove, replace, and install new storm drainage facilities in the Goat Hill neighborhood to improve collection and conveyance capacity as well as to protect against flooding, landslides, and other related hazards. The existing road surface is proposed to be replaced and widened in some areas. The primary purpose of this work is to improve stormwater runoff collection and conveyance, it is not targeted at improving traffic safety. However, traffic safety is expected to be improved as a result of these improvements. The majority of the proposed work is located within public rights-of-way, with some minor areas of work on private property in order to construct necessary improvements.

No direct impacts to any streams or wetlands are proposed as part of this phase of the project. The proposed storm drainage improvement project will impact the a few minor areas within the wetland/stream buffers adjacent to the existing roads. New stormwater lines and widening of existing public streets within wetland and stream buffers are allowed activities per KZC 90.40. Mitigation will be provided for all wetland/stream buffer impacts.

### 2.1 BUFFER IMPACTS

Widening the pavement, installation of new stormwater pipes, and necessary grading for the project on NE 117th Place will result in two areas of permanent buffer impact.

Wetland/Stream Buffer Impacted	Type of Buffer Impact	Impact Size (square feet)	Existing Vegetation in Impact Area	Mitigation
Stream A/ Wetland C Buffer	Permanent (road widening)	175 sf	Himalayan Blackberry, English Ivy	Advance Mitigation Program
Stream A Buffer	Permanent (road widening)	280 sf	Himalayan Blackberry, English Ivy	Advance Mitigation Program

**Table 3** - Buffer Impacts and Mitigation

A total of 455 square feet of Stream A/Wetland C buffer will be impacted for drainage improvements along NE 117th Place. Per KZC 90.40.6.d.1, new stormwater lines are allowed in critical area buffers, *provided they shall be located as far as possible from the critical area edge.* The proposed drainage improvements are a combination of upgrading/rerouting existing stormwater infrastructure and installing new stormwater collection and conveyance infrastructure. Since this project is focused on conveying runoff from existing development and roads, the new stormwater collection and conveyance features will be located within and/or along the existing roads. The stormwater lines proposed within the Stream A/Wetland C buffer are within a few feet of the edge of asphalt of the existing road. As NE 117<sup>th</sup> Place crosses over Stream A, it is not possible to locate the new stormwater pipes further away from the stream. The drainage improvements will expand

the paved road width by 1 to 7 feet, with the narrowest width expansion where NE 117th Place crosses Stream A. This is the minimum amount of impact possible while providing necessary upgrades to the stormwater infrastructure in this area.

Mitigation for permanent buffer impacts will be provide through purchasing credits from the City's Critical Area Buffer Advance Mitigation Program. Given the location of the buffer impacts, and ownership of property between impacts and wetlands and streams, using this local mitigation bank is the most suitable location for the proposed project's compensatory mitigation requirements. Use of the City's mitigation bank also complies with the preferred mitigation requirements in 90.145.3.a, as discussed below in Section 3.1.1

If for some reason use of the AMP for this project's mitigation needs is not possible, the applicant will purchase credits through the Keller Farm Mitigation Bank or explore options available through the King County Mitigation Reserves Program.

## **3.0 BUFFER MITIGATION PLAN**

Mitigation for the Stream A/Wetland C buffer impacts associated with the drainage improvement project will be provided through purchasing credits from the City of Kirkland's Critical Area Buffer Advance Mitigation Program (AMP). This City-Responsible Mitigation program allows for purchase of credits for permanent wetland and stream buffer impacts, as discussed in KZC 90.145.4.c.

## 3.1 ELIGIBILITY FOR USE OF AMP

The Goat Hill Drainage improvement project proposes work within and adjacent to rights-of-way. The City does not own the property between the work areas and the wetlands and streams within the project area. Therefore, the project meets the following eligibility criteria discussed in the AMP Administrative Framework document: *The applicant does not own or control the land between the impact and the edge of the wetland or stream*.

Use of the AMP also complies with the mitigation location requirements in KZC 90.145.3. Since the work will be done in and adjacent to the right-of-way and the property between the project limits and the wetland and streams is privately owned, on-site in-kind mitigation is not possible. By purchasing credits through the AMP, in-kind mitigation will be provided off-site within the City of Kirkland.

## 3.2 MITIGATION CREDIT DETERMINATION

Phase 1 of the Goat Hill Drainage improvement project will result in a total of 455 square feet of Stream A/Wetland C buffer impact. Mitigation for this impact will be provided through purchasing credits from the City's AMP. In general, one square foot of buffer impact requires one AMP credit. This project will require purchase of 455 AMP credits.

## 4.0 WETLAND AND STREAM FUNCTIONS AND VALUES ASSESSMENT

The methodology for this functions and values assessment is based on professional opinion developed through past field analyses and interpretation. This assessment pertains specifically to the wetlands and streams within the project area, but is typical for assessments of similar systems common to western Washington.

Wetlands in western Washington perform a variety of ecosystem functions. Included among the most important functions provided by wetlands are stormwater storage and flood flow attenuation, water quality improvement, and fish and wildlife habitat. An assessment of these functions for the project site is provided below.

Streams provide both hydrologic and habitat connections throughout the Western Washington Region. Many channels serve as rearing grounds for a variety of fish species, including salmonids. Many wildlife species make use of the resources provided by riparian ecosystems.

### 4.1.1 Existing Conditions

Wetland C is a small slope wetland adjacent to Stream A and NE 117th Place. Emergent vegetation in Wetland C provides some biofiltration function and reduction in velocity of water moving downslope. However, this wetland is limited in the level of function provided due to its small size and its's location along a road. Wetland C provides a low to moderate value of functions.

Stream A consists of a combination of open and piped segments. The open channel areas are generally straight, narrow channels that lack meanders and pools. Consequently, the velocity of water within these streams is high and there are few areas that slow water flow. Without the ability to allow for particulates to settle, these streams provide a low value for water quality functions. Piped segments and steep gradients make these stream impassable to fish. The open channel segments of these streams do provide a water source and some areas with food sources and cover for wildlife. Overall, this stream provides a low value for wildlife habitat.

## 4.1.2 Post-Development Functions and Values

This project will retain all open channel stream segments and does not propose any direct wetland or stream impacts. Wetland functions and values will not be changed as a result of the proposed project. Overall, the stormwater drainage improvement project will reduce high velocity flows and erosion control measures will be increased, which will improve the overall water quality and hydrological functions of the project area.

Necessary permanent impacts to the Stream A/Wetland C buffer will be compensated through the purchase of credits from the City's AMP, ensuring that no net loss of wetland functions and values in the watershed will result from this proposal. The area that will be impacted to complete the project is low-quality buffer that provides minimal functional value to surrounding ecosystems. The ecologically improved land provided by the AMP will have a much higher value than that impacted by the proposed development. Thus, the proposed development and mitigation is expected to improve the functions and values of wetlands and streams within the basin.

## 5.0 Use of this Report

This Critical Area Study and Buffer Mitigation Plan is supplied to CPH Consultants as a means of describing jurisdictional wetlands and streams, as required by the City of Kirkland during the permitting process. This report is based largely on readily observable conditions and to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions. Reports may be adversely affected due to the physical condition of the site and the difficulty of access, which may lead to observation or probing difficulties.

The laws applicable to wetlands are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report, and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.

Mengl A. Kamongin

Meryl Kamowski, PWS Senior Ecologist
### **6.0 REFERENCES**

- Brinson, M.M. 1993. <u>A Hydrogeomorphic Classification for Wetlands.</u> Technical Report WRPDE-4. US Army Engineers Waterways Experiment Station, Vicksburg, MS.
- Cowardin, et al., 1979. <u>Classification of Wetlands and Deepwater Habitats of the United States</u>. U.S. Department of the Interior. FWS/OBS-79/31. December 1979.
- Environmental Laboratory. (1987). <u>Corps of Engineers Wetlands Delineation Manual</u>, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.
- Hruby, T. 2014. <u>Washington State Wetland Rating System for Western Washington- 2014</u> <u>Update</u>. WA State Department of Ecology. Publication #14-06-029.

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- Lichvar, R.W. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016 30: 1-17. Published April 28, 2016. ISSN 2153 733X
- US Army Corps of Engineers. 2010. <u>Regional Supplement to the Corps of Engineers Wetland</u> <u>Delineation Manual: Western Mountains, Valleys, and Coast Region</u> (Version 2.0). Vicksburg, MS

# APPENDIX A: Existing Conditions and Proposed Project Maps FOR Phase 1 – Goat Hill Drainage Improvements

# **EXISTING CONDITIONS - OVERVIEW PHASE 1 - GOAT HILL DRAINAGE IMPROVEMENTS**

PORTION OF SECTION 30, TOWNSHIP 26N, RANGE 05E, W.M.



600





# EXISTING CONDITIONS - INSET 3 PHASE 1- GOAT HILL DRAINAGE IMPROVEMENTS

PORTION OF SECTION 30, TOWNSHIP 26N, RANGE 05E, W.M.





# PROPOSED PROJECT - OVERVIEW <u>PHASE 1 - GOAT HILL DRAINAGE IMPROVEMENTS</u>

PORTION OF SECTION 30, TOWNSHIP 26N, RANGE 05E, W.M.





## PROPOSED PROJECT - INSET 2 PHASE 1 - GOAT HILL DRAINAGE IMPROVEMENTS

PORTION OF SECTION 30, TOWNSHIP 26N, RANGE 05E, W.M.





# APPENDIX H: Structural Calculations



associated earth sciences incorporated

November 1, 2023 Project No. 20220263E002

CPH Consultants 11321-B NE 120<sup>th</sup> Street Kirkland, Washington 98034

Attention: Mr. Matt Hough

Subject: Retaining Wall Design Package Goat Hill Drainage Ditch Conveyance and Channel Stabilization – Phase 1 CIP No. SDC0900000 Kirkland, Washington

Dear Mr. Hough:

Associated Earth Sciences, Inc. (AESI) is pleased to present this letter summarizing our wall design assumptions and presenting the results of our engineering design calculations, global stability analyses, and wall design drawings associated with the proposed retaining walls for the above-referenced project. Our work has been completed in general accordance with our proposal, dated August 8, 2023, and in accordance with generally accepted geotechnical engineering practices. This letter was prepared for the exclusive use of CPH Consultants (CPH), and their authorized agents, for specific application to this project. No other warranty, express or implied, is made.

This letter and the attached wall design plans and calculations are based on the following documents:

- 1. A geotechnical report prepared by AESI, titled "Subsurface Exploration, Geologic Hazard, and Geotechnical Engineering Report, Goat Hill Drainage Improvements (CIP #3)," dated December 5, 2022.
- Subsurface data (exploration logs EB-1 through EB-4) obtained by AESI in January 2011 as part of a landslide evaluation and mitigation report for the property located at 11711 90<sup>th</sup> Avenue NE.
- 3. A plan set prepared by CPH, titled "Goat Hill Drainage Ditch Conveyance and Channel Stabilization Phase 1," dated September 29, 2023.

### Site and Project Description

The project site is a portion of the existing storm drainage system at the Goat Hill area of Kirkland, Washington. We understand the proposed improvements for the project include new stormwater infrastructure, retaining walls, and road regrading. As noted on Sheets C3.04,

C3.05, and C3.09 of the referenced plan set prepared by CPH, we understand that wall designs are needed for three separate retaining walls proposed at the following locations:

- A gravity block wall is proposed along the west side of NE 116<sup>th</sup> Place from about station 21+10 to 22+20. The wall has a total length of about 110 feet and the exposed wall height ranges from about 1 to 3.5 feet. This wall will retain a slope cut needed for the proposed roadway grading. The topographic survey indicates the existing backslope has a maximum inclination at about 50 percent.
- A gravity block wall is proposed along the east side of 90<sup>th</sup> Avenue NE from about station 70+80 to 71+70. The wall has a total length of about 90 feet and the exposed wall height ranges from about 2 to 5.5 feet. This wall will retain the proposed roadway fill. The topographic survey indicates the existing toe slope in front of the wall has a maximum inclination at about 75 percent.
- A geogrid-reinforced modular block wall (or MSE wall) is proposed along the east side of NE 117<sup>th</sup> Place from about station 43+60 to 44+70. The wall has a total length of about 110 feet and the exposed wall height ranges from about 1 to 3.6 feet. This wall will retain the proposed roadway fill. The topographic survey indicates the existing toe slope in front of the wall has a maximum inclination at about 80 percent.

We understand that the specific block types and geogrid will be proposed by the contractor and approved by the design team and City of Kirkland prior to construction. Our design for the gravity block walls assumes the block type will consist of Ultrablock units or equivalent. Our design for the MSE wall assumes the block type will consist of Keystone Compac units or equivalent, and the geogrid will consist of Mirafi 5XT or equivalent. If there is a change in block size or geogrid, or any of the walls change location or height, the wall design and design details should be reviewed and modified, as necessary.

### Subsurface Conditions

Based on the subsurface exploration data contained within our referenced geotechnical report and 2011 landslide evaluation and mitigation study, the site is generally underlain by localized deposits of variable density fill and landslide debris overlying dense/very stiff glacially consolidated sediments. Groundwater seepage was encountered at various locations and depths across the site. The subsurface conditions anticipated to be encountered at each retaining wall location are summarized below. The locations of past explorations completed by AESI are presented on the "Existing Site and Exploration Plan," Figure 1, and copies of the exploration logs are attached in Appendix A.

### Gravity Block Wall along NE 116<sup>th</sup> Place

Based on nearby exploration EB-104, the proposed gravity block wall along NE 116<sup>th</sup> Place is anticipated to be underlain by existing fill overlying landslide debris and glacially consolidated

pre-Olympia fine-grained sediments. The thickness of the fill and underlying landslide debris at EB-104 was about 6 feet and 7 feet, respectively. The fill consisted of loose to medium dense, moist to wet, brown, sand, with some silt to silty, and trace organics. A thin zone of perched groundwater was encountered near the base of the fill at about 6 feet below existing grade. Below the fill, the landslide debris consisted of very stiff, moist, grayish brown, silt, with some fine sand and zones of blocky/brecciated texture. Where encountered, the existing fill and/or landslide debris may require overexcavation and replacement with crushed rock or quarry spalls to provide a suitable base.

### Gravity Block Wall along 90<sup>th</sup> Avenue NE

Based on nearby borings EB-1 through EB-4 (2011), the proposed gravity block wall along 90<sup>th</sup> Avenue NE is anticipated to be underlain by a variable thickness of fill and possible landslide debris overlying glacially consolidated silt and silty sand. If encountered, we anticipate the fill and/or landslide debris will be in a loose to medium condition and will likely consist of silty sand and silt. Thin zones of perched groundwater may be encountered within the existing fill and/or landslide debris. Where encountered, the existing fill and/or landslide debris may require overexcavation and replacement with crushed rock or quarry spalls to provide a suitable base.

### MSE Wall along NE 117<sup>th</sup> Place

Based on nearby exploration EB-105, the proposed MSE wall along NE 117<sup>th</sup> Place is anticipated to be underlain by landslide debris overlying glacially consolidated pre-Olympia coarse-grained sediments and pre-Olympia glacial till. Areas of existing fill can also be expected directly below NE 117<sup>th</sup> Place. The landslide debris consisted of loose, moist to wet, brown, gravelly sand with some silt and very moist, gray, silt, with scattered fine organics and pockets of sand. The silt also had a highly fractured and brecciated texture. A zone of perched groundwater was encountered near the base of the landslide debris from a depth of about 5 to 7 feet. Where encountered, landslide debris and/or existing fill may require overexcavation and replacement with crushed rock or quarry spalls to provide a suitable base.

### Considerations to Variable Subsurface Conditions

It should be noted that highly variable subsurface conditions can be expected along each wall alignment due to past site grading, earthwork related to drainage infrastructure and other utilities, previous landslide mitigation work, and the random deposition of native materials. AESI should have a full-time presence during wall construction to verify the foundation subgrades below each wall are prepared or remediated in accordance with our recommendations.

It should also be noted that the occurrence and level of groundwater seepage encountered during construction will largely depend on the soil grain-size distribution, topography, seasonal

precipitation, on- and off-site land usage, and other factors. Groundwater seepage should be anticipated along existing utility trench lines, both within backfill zones and pipe bedding, as perched interflow along the base of roadway fills, and where these lines intersect relict drainage channels or ravines. Our 2022 site explorations were conducted in late September when groundwater levels are typically nearing a seasonal low and the interflow network is poorly connected.

### Retaining Wall Design

AESI designed the retaining walls based on the referenced plan set by CPH and the subsurface exploration data contained within our referenced geotechnical report and 2011 landslide evaluation and mitigation study. We have provided our retaining wall design sections and details in Figures W1 through W3, attached to this cover letter. Soil parameters were derived based on established correlations and previous experience in similar soils in the Puget Sound area. For seismic design, we used a peak ground acceleration of 0.59g. The peak ground acceleration corresponds to a 2-percent probability of exceedance in 50 years in accordance with the American Society of Civil Engineers (ASCE) 7-16. Our methodology for completing the gravity block wall and MSE wall designs are provided below.

### Gravity Block Wall Design

For design of the gravity block walls, AESI completed software-aided conventional retaining wall stability calculations using the UltraWall design software, Version 6.0, dated October 25, 2022. Calculations for the gravity block walls are presented in Appendix B. The UltraWall software used the segmental retaining wall design methodology as outlined in the National Concrete Masonry Association (NCMA) *Design Manual for Segmental Retaining Walls, 3<sup>rd</sup> Edition*. Our analysis included sliding and overturning calculations for the various block wall configurations shown on Figures W1 and W2.

### MSE Wall Design

For design of the gravity block walls, AESI completed software-aided geogrid-reinforced retaining wall stability calculations using the MSEW 3.0 design software. Calculations for the MSE wall are presented in Appendix B. The MSEW software used the segmental retaining wall design methodology as outlined in the NCMA *Design Manual for Segmental Retaining Walls, 3<sup>rd</sup> Edition*. Our analysis included internal and external stability calculations for the wall section shown on Figure W3, which is considered the critical wall section for the proposed wall alignment.

### Global Stability Analysis

We performed global stability analyses for selected critical wall cross-sections using the computer program SLOPE/W, Version 8.16, by Geo-Slope International. The program uses the Morgenstern-Price method for evaluating various potential rotational failures beneath the wall.

Input parameters for the analysis included wall and slope geometry, geology and groundwater conditions, soil strength parameters, and seismic ground motions. For seismic design we used a ground acceleration of 0.295g which corresponds to one-half of the peak ground acceleration.

Soil strength parameters were based on the subsurface conditions encountered within nearby explorations and our experience with similar subsurface conditions encountered in the Puget Sound region, and are shown on the SLOPE/W models in Appendix C. The reinforced wall backfill was modeled as granular structural fill compacted to at least 95 percent of the modified Proctor maximum dry density. We used a vehicle surcharge load of 250 pounds per square foot (psf) to model traffic loading behind the walls.

The City of Kirkland requires minimum safety factors of 1.5 for static conditions and 1.1 for seismic conditions. Our global stability analyses indicate that the minimum safety factors meet or exceed 1.5 and 1.1 for static and seismic conditions, respectively. The wall and slope profiles generated for the SLOPE/W modeling with the calculated minimum safety factors are included in Appendix C.

### **Remediation of Wall Foundation Soils**

As mentioned in the "Subsurface Conditions" section above, the site is generally underlain by localized deposits of variable density fill and landslide debris overlying dense/very stiff glacially consolidated sediments. Where encountered, the existing fill and/or landslide debris may require remediation such as overexcavation and replacement with crushed rock or quarry spalls to provide a firm and stable base. We recommend that the depth/extent and method of remediation be determined at the time of construction in coordination with AESI.

### Structural Fill

All fill placed beneath or behind the walls should be considered structural fill. All references to structural fill in this letter refer to subgrade preparation, fill type and placement, and compaction of materials, as discussed in this section.

Any existing site soils containing organics or debris should be stripped from all areas to receive structural fill. The existing grade should then be compacted to a firm and non-yielding condition. After recompaction or remediation of the exposed ground is approved, structural fill may be placed as required to attain desired grades. Structural fill is defined as non-organic soil, acceptable to the geotechnical engineer, placed in maximum 8-inch loose lifts, with each lift being compacted to at least 95 percent of the modified Proctor maximum density using ASTM D-1557 as the standard.

The gravity block wall and MSE wall plans (Figures W1 through W3) specify the requirements for structural fill placed behind the gravity block walls, reinforced zone of the MSE wall, and common backfill outside of the reinforced zone.

A representative from AESI should observe the stripped subgrade and be present during placement of structural fill to observe the work and perform a representative number of in-place density tests. In this way, the adequacy of the earthwork may be evaluated as filling progresses and problem areas may be corrected at that time. Our field technicians and engineers are available to aid the owner in developing a suitable monitoring and testing program, such that quality control is adequately provided.

### Wet Weather Considerations for Common Backfill

Earthwork during extended periods of wet weather will be challenging if the common backfill (i.e., material placed outside the reinforced zone of the MSE wall) contains more than 5 percent fines (silt and clay). The contractor will need to take care to protect the soils in covered stockpiles and grade the site each day so that natural surface drainage is achieved and the soils do not become overly wet prior to placement as structural fill. If wall construction occurs in the wet season, typically between October 1<sup>st</sup> and July 1<sup>st</sup>, an import granular material or crushed rock with less than 5 percent fines (silt and clay) will likely be required to achieve the required minimum compaction.

### **Temporary Cut Slopes**

In our opinion, temporary construction slopes should be the responsibility of the contractor and should be determined during construction based on local soil and groundwater conditions. For planning purposes, however, we anticipate that a near-vertical cut face can be made for a maximum height of about 4 feet in dry weather conditions in flat areas without backslopes. In wet weather or deeper excavations, we anticipate that temporary, unsupported cut slopes can be planned at 1.5H:1V (Horizontal:Vertical) in unsaturated fill soils and landslide debris, and 1H:1V in unsaturated glacially consolidated soils. These slope angles are for areas where groundwater seepage is not present at the faces of the slopes. If groundwater or surface water is present when the temporary excavation slopes are exposed, flatter slope angles may be required. As is typical with earthwork operations, some sloughing and raveling may occur, and cut slopes may have to be adjusted in the field. In addition, WISHA/OSHA regulations should be followed at all times.

### Wall Drainage

It is imperative that proper drainage be provided so that hydrostatic pressures do not develop against the walls. All walls should be provided with a minimum 1-foot-wide curtain drain along the full wall height using imported, washed crushed gravel. We also recommend a 1-foot-thick blanket drain be placed along the entire length of the reinforced zone at the base of the MSE wall using imported, washed crushed gravel. A drainpipe consisting of rigid, perforated, polyvinyl chloride (PVC) pipe surrounded by washed crushed gravel should be placed behind the base of the wall. The drains should be constructed with sufficient gradient to allow gravity discharge to a suitable discharge location.

#### **Construction Monitoring**

We recommend that AESI provide geotechnical monitoring during construction of the walls to verify conformance with our design. AESI will need to be onsite for the following:

- Verify the wall base bears on suitable subgrade soils and leveling pad.
- Verify placement of blocks is in accordance with the plans.
- Verify proper installation and type of geogrid.
- Verify placement and compaction of wall backfill.
- Verify installation of proper wall drainage.

#### Closure

We appreciate assisting you in this phase of the project. Should you have any questions, or require additional information, please do not hesitate to call.

Sincerely, ASSOCIATED EARTH SCIENCES, INC. Kirkland, Washington

Bruce L. Blyton, P.E. Senior Principal Engineer

G. Bradford Drew, P.E. Senior Engineer

Attachments:	Figure 1:	Existing Site and Exploration Plan
	Figure W1:	Gravity Block Wall Plan – NE 116 <sup>th</sup> Place
	Figure W2:	Gravity Block Wall Plan – 90 <sup>th</sup> Avenue NE
	Figure W3:	MSE Wall Plan – NE 117 <sup>th</sup> Place
	Appendix A:	Exploration Logs
	Appendix B:	Wall Design Calculations
	Appendix C:	Global Stability Modeling Results





NOTES: 1. DESIGN OF THE BLOCK RETAINING WALL IS BASED ON THE FOLLOWING: INTERNAL ANGLE OF FRICTION FOR RETAINED SOIL = 32 DEGREES UNIT WEIGHT OF SOIL = 120 POUNDS PER CUBIC FOOT (PCF) MAXIMUM WALL HEIGHT = 5 FEET BATTER OF WALL = VERTICAL BACKSLOPE = 2H:1V MAXIMUM EMBEDMENT DEPTH = 1-FOOT MINIMUM SEISMIC SURCHARGE = 0.295G

2. OBSERVATION OF SUBGRADE, ROCK BEARING PAD, PLACEMENT OF DRAIN PIPE, GRAVEL, AND FINISHED BLOCKS BY GEOTECHNICAL ENGINEER IS REQUIRED.

3. WALL ELEVATIONS AND LAYOUT ARE TO BE PER CIVIL DRAWINGS.

4. CONTRACTOR TO VERIFY ALL LOCATIONS, ELEVATIONS, DIMENSIONS AND SETBACKS.

#### GENERAL NOTES

WALL UNITS 1. WALL UNITS ARE TO BE FULL BLOCKS, FULL FLAT BLOCKS, HALF BLOCKS, HALF FLAT BLOCKS, AND FLAT CAPS AS MANUFACTURED BY ULTRA-BLOCK, INC., OR ENGINEER APPROVED EQUAL.

DRAINAGE AGGREGATE 1. DRAINAGE LAYER MATERIALS FOR WALL DRAIN SHALL BE WASHED CRUSHED ROCK MATERIAL MEETING WSDOT STANDARD SPECIFICATION 9-03.9(2) FOR PERMEABLE BALLAST OR APPROVED EQUAL.

WALL BACKFILL 1. VOIDS BETWEEN THE BACK OF WALL AND TEMPORARY CUT SLOPE SHOULD BE BACKFILLED WITH CRUSHED ROCK AGGREGATE (WSDOT CRUSHED SURFACING BASE COURSE OR APPROVED EQUAL) AND COMPACTED TO 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY (ASTM D1557).

BEARING PAD CONSTRUCTION 1. BEARING PAD SHALL BE PLACED AS SHOWN ON THE CONSTRUCTION DETAILS WITH A MINIMUM THICKNESS OF 6 INCHES.

#### SITE PLAN REFERENCE: CPH CONSULTANTS, GOAT HILL DRAINAGE

DITCH CONVEYANCE AND CHANNEL STABILIZATION PHASE 1. SHEET C3.05, 9/29/23.



2. FOUNDATION SOIL SHALL EITHER BE FIRM AND UNYIELDING NATIVE SOIL OR CRUSHED ROCK AGGREGATE PLACED AND COMPACTED TO AT LEAST 95 PERCENT OF MODIFIED PROCTOR DENSITY.

3. SOIL BEARING PAD MATERIAL SHALL BE COMPACTED TO PROVIDE A HARD SURFACE ON WHICH TO PLACE THE FIRST COURSE OF UNITS. COMPACTION WILL BE WITH MECHANICAL PLATE COMPACTORS TO A FIRM AND UNYIELDING CONDITION AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR THEIR REPRESENTATIVE.

4. BEARING PAD SHALL BE PREPARED TO ALLOW INTIMATE CONTACT OF BLOCKS WITH PAD

BLOCK UNIT INSTALLATION 1. FIRST COURSE OF BLOCKS SHALL BE PLACED ON THE BEARING PAD. THE UNITS SHALL BE CHECKED FOR BATTER AND ALIGNMENT. THE FIRST COURSE IS THE MOST IMPORTANT TO ENSURE ACCURATE AND ACCEPTABLE RESULTS.

2. ENSURE THAT UNITS ARE IN FULL CONTACT WITH BASE.

3. UNITS ARE PLACED SIDE BY SIDE FOR FULL LENGTH OF STRAIGHT WALL ALIGNMENT. ALIGNMENT MAY BE DONE BY MEANS OF A STRING LINE OR OFFSET FROM BASE LINE TO A MOLDED FINISHED FACE OF THE UNIT. ADJUST UNIT SPACING FOR CURVED SECTIONS ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

4. PLACE AND COMPACT FILL BEHIND UNITS.

5. CLEAN ALL EXCESS DEBRIS FROM TOP OF UNITS AND INSTALL NEXT COURSE

6. LAY EACH SUCCESSIVE COURSE SO THAT SHEAR CONNECTORS ARE ENGAGED. STAGGER EACH LAYER OF BLOCKS BY HALF BLOCK LENGTH.

7. REPEAT PROCEDURES TO THE EXTENT OF THE WALL HEIGHT

#### INSPECTIONS

1. INSPECTION OF THE WALL BASE, BLOCK PLACEMENT, DRAIN, AND BACKFILL BY THE GEOTECHNICAL ENGINEER IS REQUIRED.









#### **ULTRA-BLOCK MANUFACTURER'S DETAILS** NO SCALE - DIMENSIONS AND KEY PATTER

MAY VARY SLIGHTLY BLOCK TO BLOCK









#### SITE PLAN

REFERENCE: CPH CONSULTANTS, GOAT HILL DRAINAGE DITCH CONVEYANCE AND CHANNEL STABILIZATION PHASE 1 SHEET C3.09, 9/29/23.

- NOTES: 1. DESIGN OF THE SEGMENTAL RETAINING WALL IS BASED THE FOLLOWING DESIGN VALUES: INTERNAL ANGLE OF FRICTION FOR REINFORCED SOIL = 36 DEGREES UNIT WEIGHT OF REINFORCED SOIL = 125 LB/CU FT INTERNAL ANGLE OF FRICTION FOR RETAINED SOIL = 28 DEGREES UNIT WEIGHT OF RETAINED SOIL = 115 LB/CU FT TRAFFIC SUBDQUABLE = 350 DSE TRAFFIC SURCHARGE = 250 PSF SEISMIC SURCHARGE = 0.295G
  - MAXIMUM WALL HEIGHT = AS SHOWN BATTER OF WALL = NEAR VERTICAL EMBEDMENT = 3 FEET MIN
- 2. CONTRACTOR TO VERIFY ALL LOCATIONS, ELEVATIONS, AND DIMENSIONS.
- FOR BIDDING PURPOSES, THE DESIGN WALL HEIGHT SHALL INCLUDE BOTH THE ABOVE GRADE DIMENSIONS SHOWN ON THE CIVIL PLANS <u>AND</u> THE BELOW GRADE EMBEDDED PORTION OF THE WALLS INDICATED HEREIN.

- GENERAL NOTES: SEGMENTAL RETAINING WALL (SRW) UNITS 1. SRW UNITS SHALL BE MACHINE-FORMED CONCRETE BLOCKS SPECIFICALLY DESIGNED FOR RETAINING WALL APPLICATIONS.
- SRW UNITS SHALL MEET THE FOLLOWING STRUCTURAL REQUIREMENTS CONCRETE USED TO MANUFACTURE SRW UNITS SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI IN ACCORDANCE WITH ASTM C90. THE CONCRETE SHALL HAVE ADEQUATE FREEZE/THAW PROTECTION WITH A MAXIMUM MOISTURE ABSORPTION RATE, BY WEIGHT OF 6%.
- B. UNITS SHALL BE POSITIVELY INTERLOCKED TO PROVIDE A MINIMUM SHEAR CAPACITY OF 1500 PLF AT 2 PSI NORMAL PRESSURE.
- C. UNITS SHALL PROVIDE A MINIMUM CONNECTION STRENGTH BETWEEN IT AND THE GEOSYNTHETIC REINFORCEMENT OF 1000 PLF AT 2 PSI NORMAL FORCE
- D. SRW UNITS MOLDED DIMENSIONS SHALL NOT DIFFER MORE THAN ± 1/8 INCH FROM THAT SPECIFIED, EXCEPT HEIGHT WHICH SHALL BE ± 1/16 INCH.
- SRW UNITS SHALL MEET THE FOLLOWING CONSTRUCTABILITY AND GEOMETRIC REQUIREMENTS A. UNITS SHALL BE CAPABLE OF ATTAINING CONCAVE AND CONVEX CURVES.
- B. UNITS SHALL BE POSITIVELY ENGAGED TO THE UNIT BELOW SO AS TO PROVIDE A MINIMUM 1/16-INCH HORIZONTAL SETBACK PER VERTICAL FOOT OF WALL HEIGHT
- 4. SRW UNIT COLOR AND FACE FINISH SHALL BE SELECTED BY PROJECT ARCHITECT OR
- /ELING PAD AND UNIT FILL FILL MATERIAL MATERIAL FOR LEVELING PAD SHALL CONSIST OF COMPACTED GRAVEL OR UNREINFORCED CONCRETE AND SHALL BE A MINIMUM OF 6 INCHES IN DEPTH.
- 2. FILL FOR UNITS SHALL BE FREE-DRAINING 1-INCH MINUS WASHED CRUSHED GRAVEL
- 3. DO NOT RUN MECHANICAL VIBRATING PLATE COMPACTORS ON TOP OF THE UNITS COMPACT UNIT FILL BY RUNNING HAND-OPERATED COMPACTION EQUIPMENT JUST BEHIND UNIT. COMPACT TO MINIMUM 95% OF MODIFIED PROCTOR (ASTM D-1557).
- DRAINAGE AGGREGATE
  1. DRAINAGE LAYER FOR WALL DRAINAGE MATERIALS SHALL BE 1-INCH MINUS WASHED
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  1. DRAINAGE MINUS WASHED
  1. DRAINAGE MATERIALS SHALL BE 1-INCH MINUS WASHED
  1. DRAINAGE MATERIALS SHALL BE 1-INCH MINUS WASHE CRUSHED ROCK MATERIAL AND FREE OF ORGANICS, WITH LESS THAN 5% FINES (SILT AND CLAY PARTICLES PASSING THE #200 SIEVE MEASURED ON THE MINUS #4 SIEVE SIZE

- REINFORCED BACKFILL MATERIAL 1. THE REINFORCED BACKFILL MATERIAL SHALL BE FREE OF DEBRIS AND CONSIST OF A WELL GRADED GRANULAR MATERIAL WITH LESS THAN 5 PERCENT FINES. BACKFILL MATERIAL SHALL BE EVALUATED AND APPROVED BY GEOTECHNICAL ENGINEER PRIOR TO USE.
- 2. THE REINFORCED BACKFILL MATERIAL SHALL BE PLACED IN MAXIMUM 8-INCH LIFTS AND COMPACTED TO AT LEAST 95% OF THE MODIFIED PROCTOR MAXIMUM DENSITY AS DEFINED BY ASTM D-1557.
- COMMON BACKFILL (RETAINED SOIL) 1. SOIL PLACED BEHIND THE INFILL (REINFORCED SOIL ZONE) SHALL BE INORGANIC ON-SITE STRUCTURAL FILL WITH PLASTICITY INDEX <20, OR AS DIRECTED BY THE SOILS ENGINEER. COMMON BACKFILL SHOULD BE PLACED IN ACCORDANCE WITH THE RECOMMENDATIONS FOR STRUCTURAL FILL PRESENTED IN GEOTECHNICAL REPORT.
- BACKFILL SHALL BE COMPACTED TO A MINIMUM 95% OF THE MODIFIED PROCTOR, MAXIMUM DENSITY AS DEFINED BY ASTM D-1557.
- LEVELING PAD CONSTRUCTION 1. LEVELING PAD SHALL BE PLACED AS SHOWN ON THE CONSTRUCTION DETAILS WITH A MINIMUM THICKNESS OF 6 INCHES.
- 2. FOUNDATION SOIL SHALL BE COMPACTED TO AT LEAST 95% OF MODIFIED PROCTOR OVEREXCAVATION (OR OTHER METHODS) AT THE DIRECTION OF THE GEOTECHNICAL ENGINEER MAY BE REQUIRED TO PROVIDE A SUITABLE BASE FOR LEVELING PAD CONSTRUCTION, OVEREXCAVATED AREAS SHALL BE BACKELLED WITH AN APPROVED STRUCTURAL FILL COMPACTED TO AT LEAST 95% OF THE MODIFIED PROCTOF
- 3. LEVELING PAD MATERIAL SHALL BE COMPACTED TO PROVIDE A LEVEL HARD SURFACE ON WHICH TO PLACE THE FIRST COURSE OF UNITS. COMPACTION WILL BE BY MECHANICAL PLATE COMPACTORS TO AT LEAST 95% OF MODIFIED PROCTOR DENSITY.
- 4. LEVELING PAD SHALL BE PREPARED TO PROVIDE INTIMATE CONTACT OF RETAINING WALL
- SEGMENTAL UNIT INSTALLATION 1. FIRST COURSE OF SRW UNITS SHALL BE PLACED ON THE LEVELING PAD. THE UNITS SHALL BE CHECKED FOR LEVEL AND ALIGNMENT. THE FIRST COURSE IS THE MOST IMPORTANT TO ENSURE ACCURATE AND ACCEPTABLE RESULTS.
- 2. ENSURE THAT UNITS ARE IN FULL CONTACT WITH BASE.
- 3. UNITS ARE PLACED SIDE BY SIDE FOR FULL LENGTH OF STRAIGHT WALL ALIGNMENT. ALIGNMENT MAY BE DONE BY MEANS OF A STRING LINE OR OFFSET FROM BASE LINE TO A MOLDED FINISHED FACE OF THE SRW UNIT. ADJUST UNIT SPACING FOR CURVED SECTIONS ACCORDING TO MANUFACTURER'S RECOMMENDATIONS
- 4. INSTALL SHEAR CONNECTORS.
- 5. PLACE UNIT FILL. TAMP OR ROD UNIT FILLS TO ENSURE ALL VOIDS ARE COMPLETELY FILLED. 6. PLACE AND COMPACT FILL BEHIND AND WITHIN UNITS
- 7. CLEAN ALL EXCESS DEBRIS FROM TOP OF UNITS AND INSTALL NEXT COURSE. ENSURE EACH COURSE IS COMPLETELY FILLED PRIOR TO PROCEEDING TO NEXT COURSE.
- 8. LAY EACH SUCCESSIVE COURSE ENSURING THAT SHEAR CONNECTORS ARE ENGAGED.
- 9. MAXIMUM STACKED VERTICAL HEIGHT OF WALL UNITS, PRIOR TO UNIT FILL AND BACKFILL PLACEMENT AND COMPACTION. SHALL NOT EXCEED TWO COURSES
- 10. REPEAT PROCEDURES TO THE EXTENT OF THE WALL HEIGHT
- 11. UPPERMOST ROW OF SRW OR CAPS SHALL BE GLUED TO UNDERLYING UNITS WITH AN ADHESIVE, AS RECOMMENDED BY THE MANUFACTURER.

#### GEOSYNTHETIC REINFORCEMENT INSTALLATION 1 THF GEOSYNTHETIC REINFORCEMENT SHALL BE INSTALLED AT THE WALL HEIGHT RECONTACTION, AND TO THE EXTENT AS SHOWN ON THE CONSTRUCTION DETAILS

- THE GEOSYNTHETIC REINFORCEMENT SHALL BE LAID HORIZONTALLY ON COMPACTED INFILL AND CONNECTED TO THE CONCRETE SRW UNITS PER MANUFACTURER'S RECOMMENDATIONS.
- 3. CORRECT ORIENTATION (ROLL DIRECTION) OF THE GEOSYNTHETIC REINFORCEMENT SHALL BE VERIFIED BY THE CONTRACTOR.
- 4. PLACE SEGMENTAL UNIT AND FILL IN ACCORDANCE WITH SECTION ABOVE SEGMENTAL RETAINING WALL UNITS.
- 5. THE GEOSYNTHETIC REINFORCEMENT SHALL BE PULLED TAUT AND FREE OF WRINKLES PRIOR TO PLACEMENT OF SOIL FILL. STAKE OR SECURE BACK EDGE OF GEOGRID PRIOR TO AND DURING BACKFILL AND COMPACTION.
- 6. THE PROCEDURE FOR TENSIONING GEOSYNTHETIC REINFORCEMENT SHALL BE UNIFORM THROUGHOUT WALL LENGTH AND HEIGHT.
- OVERLAPS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. GEOSYNTHETIC REINFORCEMENT WILL BE CONTINUOUS THROUGHOUT WALL LENGTH, EXCEPT FOR CURVES.
- FILL PLACEMENT OVER GEOSYNTHETIC REINFORCEMENT
  1. REINFORCED WALL FILL MATERIAL SHALL BE PLACED IN MAXIMUM 8-INCH LOOSE LIFTS ON
  THE GEOSYNTHETIC REINFORCEMENT.
- 2. THE GEOSYNTHETIC REINFORCEMENT SHALL BE PRETENSIONED BY HAND TO REMOVE THE GEOSTRITHETIC REINFORCEMENT SHALL BE PRETENSIONED BY TAND TO REMOVE WRINKLES. TENSIONING IS USUALLY FACILITATED BY THE USE OF STELL STAKES. APPLY CONSTANT TENSION TO EACH SECTION OF GEOSYNTHETIC REINFORCEMENT UNTIL SOLL FILL HAS BEEN PLACED. SOLL FILL SHALL BE PLACED, SPREAD, AND COMPACTED IN SUCH A MANNER THAT PREVENTS THE DEVELOPMENT OF WRINKLES AND/OR MOVEMENT OF THE GEOSYNTHETIC REINFORCEMENT.
- 3. ONLY HAND-OPERATED COMPACTION EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET FROM THE TAIL OF THE MODULAR CONCRETE UNITS.
- IF POSSIBLE, SOIL FILL SHALL BE PLACED FROM THE WALL FACE OUTWARD TO ENSURE THAT THE GEOSYNTHETIC REINFORCEMENT REMAINS TAUT. SOIL SHALL BE PLACED IN UNIFORM LIFTS.
- 5. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOSYNTHETIC REINFORCEMENT. A MINIMUM FILL THICKNESS OF 8 INCHES IS REQUIRED PRIOR TO OPERATION OF TRACKED VEHICLES OVER THE GEOSYNTHETIC REINFORCEMENT. TURNING OF TRACKED VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND DAMAGING THE GEOSYNTHETIC REINFORCEMENT
- IF IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, RUBBER-TIRED EQUIPMENT MAY PASS OVER THE GEOSYNTHETIC REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.
- SURFACE DRAINAGE DURING AND AFTER CONSTRUCTION OF THE WALL SHALL BE PROVIDED TO MINIMIZE WATER INFILTRATION IN THE REINFORCED SOIL ZONE.
- CONSTRUCTION MONITORING 1. FULL-TIME OBSERVATION OF THE WALL CONSTRUCTION, INCLUDING FOUNDATION SOIL, LEVELING PAD CONSTRUCTION, DRAINAGE, GRID PLACEMENT, AND BACKFILL, BY THE GEOTECHNICAL ENGINEER IS REQUIRED.





# **APPENDIX A**

**Exploration Logs** 

	raction	s <sup>(2)</sup>	Popo		G	W	Well-graded gravel and gravel with sand,		Terms Desc Density an	cribing R d Consis	elative stency	
on No. 200 Sieve	nan 50% <sup>(1)</sup> of Coarse F ned on No. 4 Sieve	(2) ≤5% Fine				€P	little to no fines Poorly-graded gravel and gravel with sand, little to no fines Silty gravel and silty	Coarse- Grained Soils	Density Very Loose Loose Medium Dense Dense Very Dense Consistency	$\frac{\text{SPT}^{(3)}\text{blow}}{\begin{array}{c} 0 \text{ to } 4 \\ 4 \text{ to } 10 \\ 10 \text{ to } 30 \\ 30 \text{ to } 50 \\ \end{array}}{\begin{array}{c} \text{SPT}^{(3)}\text{blow} \end{array}}$	<u>s/foot</u>	<b>Test Symbols</b> G = Grain Size M = Moisture Content A = Atterberg Limits C = Chemical
50% <sup>(1)</sup> Retained	Gravels - More th Retair	≥12% Fines	No Xo Xo Xo			9C	Clayey gravel and clayey gravel with sand	Fine- Grained Soils	Very Soft Soft Medium Stiff Stiff Very Stiff Hard	0 to 2 2 to 4 4 to 8 8 to 15 15 to 30 >30		DD = Dry Density K = Permeability
- More than	e Fraction	Fines <sup>(2)</sup>		000000000000000000000000000000000000000	0000000	w	Well-graded sand and sand with gravel, little to no fines	Descript Boulders	Compone tive Term	<b>nt Defini</b> Size Rang Larger tha	<b>tions</b> je and Sie n 12"	eve Number
ained Solis -	re of Coars o. 4 Sieve	₹2%			S S	βP	Poorly-graded sand and sand with gravel, little to no fines	Cobbles Gravel Coarse Fine G	e Gravel ravel	3" to 12" 3" to No. 4 3" to 3/4" 3/4" to No.	(4.75 mm) . 4 (4.75 mr	n)
Coarse-Gr	50% <sup>(1)</sup> or Mo Passes N	Fines <sup>(2)</sup>			S	M	Silty sand and silty sand with gravel	Sand Coarse Mediur Fine Sa	e Sand m Sand and	No. 4 (4.75 No. 4 (4.75 No. 10 (2.0 No. 40 (0.4	5 mm) to N 5 mm) to N 00 mm) to N 425 mm) to	o. 200 (0.075 mm) o. 10 (2.00 mm) No. 40 (0.425 mm) No. 200 (0.075 mm)
	Sands - 5	≧12%	/		S	C	Clayey sand and clayey sand with gravel	Silt and ( <sup>(4)</sup> Estima Component	Clay ted Percent Percentage b	Smaller the	an No. 200 <b>Moist</b> Dry - Abs	(0.075 mm)
	ys han 50				N	۱L	Silt, sandy silt, gravelly silt, silt with sand or gravel	Trace Some	<5 5 to <	<12	dus Slightly N Moist - D	ty, dry to the touch Aoist - Perceptible moisture Damp but no visible
	ilts and Cla				C	:L	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay	<i>Modifier</i> (silty, sandy, s Very <i>modifier</i>	12 to gravelly)	<30 <50	w Very Moi Wet - Vis	vater st - Water visible but not free draining sible free water, usually
	S Lionid	ridaia			C	DL	Organic clay or silt of low plasticity	(silty, sandy, s	gravelly) <b>Sym</b>	bols	frc	Cement grout
	iys r More				N	ЛН	Elastic silt, clayey silt, silt with micaceous or diatomaceous fine sand or silt	Sampler Type ar	nd Description or portion of 6" Sampler (SPT)	Groundwa <u>depth</u> AT At tim	ater 🖄 🕅 D ⊈ ne	Surrace seal Bentonite seal Filter pack with
5) 5) 50	Silts and Cla			/ /	C	H	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel	California Sampl Ring Sampl Continuous	ampler er Sampling le	of drillin Static wate level (date	ng er <b>V</b>	plank casing section Screened casing or Hydrotip with
? : -					C	ЭН	Organic clay or silt of medium to high plasticity	Classifications of soi	recovered	pased on visual	l field and/or	Intel pack End cap laboratory observations,
Highly	Organic Soils				) ) F	т	Peat, muck and other highly organic soils	which include densit and should not be co Visual-manual and/c used as an identifica	y/consistency, mois onstrued to imply fie or laboratory classific tion guide for the Ur	ture condition, g ld or laboratory cation methods nified Soil Class	grain size, ar testing unles of ASTM D- sification Sys	nd plasticity estimates ss presented herein. 2487 and D-2488 were stem.

(3) (SPT) Standard Penetration Test (ASTM D-1586)
 (4) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)



A1

Blocks\ dwg \ log\_key 2022.dwg LAYOUT: Layout 5 - 2022 Logdraft

1	2		as	sso	ciated Exploration Boring			E	EB-	101
	1	1	e a	rth	sciences Goat Hill Drainage			S and B	heet:	1 of 1
4		2	i n	CO	rporated 20220263E001 Ending Date: 9/21/22	22	App	prove	y. je d By:	JHS
Drill Ham Hole	er/Eq nmer è Dian Grour	uipr Wei nete ndwa	nent ght/ er (in ater	t: Geo Drop: ): 6 Depth	ologic Drill / Mini BobcatTotal Depth (ft): 30140#/30Ground Surface Elevation (ft): 45ATD (ft): 6✓ Groundwater Depth Post Drilling (	ft) (I	Date	): ()		
Depth (ft)	ample Type	Sample	6 Recovery	Graphic Symbol	Description	Vater Level	Blows/6"	Blov	ws/Fc	ot From
0	S		8		Asphalt - 3 inches	>		10	40	20-
- - - - 5 - - -		2			Fill Moist, brownish gray, silty, sandy, GRAVEL; frequent fractured gravel (GM). Holocene Lacustrine Vacuum truck excavation to 5 feet. Drill Rig 5 feet to bottom. Very moist, gray, fine SAND, some silt to silty; trace bedded organics; massive (SP-SM/SM).		3 6 5	11		
- 10 - -		3			Wet, gray, medium to coarse SAND, trace silt; stratified (SP); interbed (4 inches thick) of moist, very silty, fine sand in middle of sample (SM).		7 9 7	16		
					Vashon Recessional Lacustrine					
- 15 - -		4			Very moist, gray, very silty, fine SAND, trace gravel dropstones; micaceous (SM).		4 5 5	10		
- 20 - -		5			Moist, gray, fine SAND, some silt, trace gravel; micaceous; massively bedded; bed (1 inch thick) of brown silt at top of sampler) (SP). Pre-Olympia Non-Glacial Coarse Grained		4 7 10	17		
- 25 -		6			Very moist, gray, fine to medium SAND, trace gravel, trace silt; stratified (SP).		16 29 47			76
- 30 -					Drilled to 30 feet. Removed 25 foot sample. Cannot sample at 30 feet due to heave. Groundwater encountered at ≈6 feet ATD.					
- - - 35 -					Associated Earth Sciences Inc.					

	6	3	>	as	sso	ciated Explo	ration Bor	ing					EB	-1(	)2
	J	7	I	e a	rth	sciences Goat H	lill Drainage		Start Date: 9/21/22		Loa	aed E	Shee 3v:	t: 1 c IG	of 1
				i n	0 0	porated 202202	63E001		Ending Date: 9/21/2	22	App	prove	d By	: JH	S
	Drille Hami Hole	er/Eq mer Dian	uipr Wei nete	nen ght/ er (in	t: Geo Drop: I): 6	logic Drill / Mini Bobcat 140#/30	Iota Grou Datu	I Depth (fi Ind Surfac Im: NAVD	t): 21.5 e Elevation (ft): 115 88	) (1) (1	~				
┠	<b>I</b> G	Four	ndw	ater	Depth	AID (ft): Not encountered	_⊻ Grou	Indwater	Depth Post Drilling (	ft) (l	Jatej	): ()			
	Depth (ft)	Sample Typ	Sample	% Recover	Graphic Symbol		Description			Water Leve	Blows/6"	Blo	ws/F	:oot	Other Tests
ŀ	0					\ As	sphalt - 3 incl	nes					Ω Ω	2 4	
-	- - -					Pre-C Vacuum truck excavation to 5	Dlympia Glac	ial Till eet to bott	om; high drilling					42	
	<b>-</b> 5		1			action 5 feet to bottom. Moist, grayish brown with oc some gravel; unsorted (SM)	casional oxida	tion stainir	ng, silty, fine SAND,		10 20 22				
	- 10		2			Moist, grayish brown with oc trace gravel; unsorted; one fr (SM).	casional oxida acture near tip	tion stainir o with trace	ng, silty, fine SAND, e rootlet intrusions		13 16 23			39	_
	- 15 -		3			Moist, grayish brown with tra gravel; unsorted; no fractures	ace oxidation s s in sample (SN	taining, sil1 /I).	ty, fine SAND, trace		17 25 32				57
	- 20 -		4			Becomes some gravel, increa No groundwater encountered.	sed oxidized s	aining suri	rounding gravel (SM).		23 31 32				63
-	- 25														
11/3/2022	- 30 -														
0263E001	- - 35														
2022						Associat	ted Earth Sci	ences, In	C						

	6	3	2	as	s s c	ciated E	Exploration	Boring					EB-	10	)3
	J	7	T	e a	rth	sciences G	Goat Hill Drair	nage	Start Date: 9/21/22		100	s aed F	sheet	:10	f 1
	1			in	CO	porated 20	0220263E001		Ending Date: 9/21/2	22	App	prove	d By:	<u></u>	3
	Drille Hami Hole	er/Eq mer Dian	uipr Wei nete	nen ght/ er (in	t: Geo Drop: i): 6	logic Drill / Mini Bobca 140#/30	at	Total Depth (f Ground Surfac Datum: NAVD	i): 21.5 e Elevation (ft): 15 88	)	<b>-</b> + - <sup>1</sup>				
┢	<u> </u>	ງrour 	nawa	ater	Deptr	ATD (IT): Not encounte	ered <u>V</u>	Groundwater	Depth Post Drilling (	_TT) (I │		): ()			
	Depth (ft)	Sample Typ	Sample	% Recover	Graphic Symbol		Descrip	tion		Water Leve	Blows/6"	Blo	ws/Fo	oot	Other Tests
ŀ	0				Î		Asphalt - 4	1 inches					1 00 -		+
	-						Crushed Rock	< - 2 inches							
-	-					Vacuum truck excavatio	Pre-Olympia on to 5 feet. Dri	Glacial Till Il rig 5 feet to b	ottom.						
-	— 5 - -		1			Moist, brownish gray, v sample; slightly fracture High drill action at 6 fee	very silty, fine S. ed in gravel cor et.	AND, trace grave Itaining zones (S	el; in sorted; intact M).		8 11 11		!2 •		
-	- - 10 - -		2			Moist, brownish gray, v	very silty, fine S.	AND, trace grave	el; unsorted (SM).		9 18 26			44	_
-	- — 15 -		3			_ Upper 6 inches: As abov Pre-(	ove. Olympia Glaci	al Fine Graine	d	_	7 20 23			43	_
-	- - - - 20 -		4			Lower 12: Moist, dark g Moist, dark gray, SILT, t to 5 horizontal polishec	gray, SILT, some trace fine SAND d planes; occasi	fine sand; mass ; massive; samp onal blocky text	sive (ML). le fractured along 3 ure (ML).		18 25 25			50	_
-	- -  25 -					No groundwater encount	ntered.								
11/3/2022	-  30  														
20263E001	- 35 -														
202						Ass	sociated Eart	h Sciences, In	C						

	6	$\sim$	>	a s	s s c	ciated Exploration Boring				E	B-	10	4
	Y	3	]	e a	rth	sciences Goat Hill Drainage Norra te d Kirkland, WA Star	t Date: 9/22/22		Log	Sł ged By	neet: /: JG	1 of	1
	Drille	er/Fa	uinr	nen <sup>:</sup>	t. Ger	20220263E001 Endi	ng Date: 9/22/2	2	Арр	roved	By:	JHS	
	Hami Hole	mer Dian Grour	Wei nete	ght/ er (in ater	Drop: ): 6 Depth	140#/30Ground Surface Ele Datum: NAVD88ATD (ft): 6⊥	vation (ft): 160 h Post Drilling (f	<sup>-</sup> t) (E	Date)	: ()			
	Depth (ft)	ample Type	Sample	6 Recovery	Graphic Symbol	Description		Nater Level	Blows/6"	Blov	vs/Fc	oot	Other Tests
	0	S		0		Asphalt - 2 inches		_		20 20	40	20	-
-	-					Fill Vacuum truck excavation to 5 feet. Drill Rig 5 feet to bottom	n.			14			
	– 5 -		1			Moist, brown, fine SAND, some silt to silty, trace organics; la thick) of grav silt at tip (SM)	ayer (1 inch	⊻	4 7				
-	-					Landslide Debris			T				
-	— 10 - -		2			Moist, grayish brown, SILT, some fine sand; zones of blocky texture (ML).	brecciated		8 10 10	20			
	-					Pre-Olympia Glacial Fine Grained				20			
-	– 15 - -		3			Moist, gray with occasional bluish green inclusions, SILT; tra massively bedded; occasional hard silt clasts within massive reaction with hydrochloric acid (ML).	ice dropstones; e matrix; faint		10 10 10				
-	- - 20 - -		4			As above; unsorted with some sand to sandy beds; faint rea hydrochloric acid.	action with		9 14 17		31		-
-	- - 25		5			Upper 12 inches: As above.			12			48	-
	-					Lower 12 inches: Becomes grayish brown.			22	+	+		-
-	- - — 30												
11/3/2022	-												
	- — 35												
)263E001	-												
2022(						Associated Earth Sciences, Inc.							

	1	3	>	as	sso	ciated Exploration Boring				EB	-10	)5
	И	7	1	e a	rth	sciences Goat Hill Drainage Start Date: 9/22/22	<del>,</del>		naed	Shee Bv <sup>.</sup>	t: 1 o IG	f 1
	1			in	C O	20220263E001 Ending Date: 9/22/	22	Ap	prove	ed By	: JHS	3
	Drille łami łole ⊈ G	r/Eq mer Dian irour	uipr Wei nete ndw	nen ght/ er (ir ater	t: Geo Drop: n): 6 Depth	a ATD (ft): 5 Dogic Drill / Mini Bobcat 140#/30 ATD (ft): 5 I otal Depth (ft): 19 Ground Surface Elevation (ft): 19 Datum: NAVD88 _型 Groundwater Depth Post Drilling	0 (ft) (	Date	e): ()			
	Depth (ft)	Sample Type	Sample	% Recovery	Graphic Symbol	Description	Water Level	Blows/6"	Blo	)ws/F	oot	Other Tests
┢	0				5 5 4 4 4	Asphalt - 8 inches					1 4 24 02 25 40	+
-						Landslide Debris Groundwater at bottom of vacuum truck hole. Vacuum truck to 5 feet. Drill rig 5 feet to bottom.			5			
-	5		1			Upper 4 inches: Wet, brown, gravelly, fine SAND, some silt; possibly a pulverized rock (SP-SM). Lower 14 inches: Very moist, gray with oxidation staining and bluish green inclusions, SILT; scattered fine organics; pockets of sand; becomes dark bluish gray sand at tip: highly fractured and brecciated texture (ML)		332				
-	10		2			Pre-Olympia Non-Glacial Coarse Grained Moist, slightly greenish dark gray, fine SAND, some silt, some gravel; stratified (SP-SM).		22 18 32			50	_
-	15		3			Pre-Olympia Glacial Till Moist with wet coating from above water, gray, sandy, SILT, some gravel;		15			50/4'	
			Л			unsorted (ML)		50/4				
-	20					Groundwater encountered at 5 feet ATD.						
-	25											
	30											
	35											
						Associated Earth Sciences Inc						
Ľ		-										

	1	2		a	s s	ociated E	Exploration Bor	ng				E	B-	10	6
		7	1	e a	rtł	sciences C	Goat Hill Drainage	Start Date	<u>⊳· 9/22/22</u>		100	Sł ned By	neet:	1 of	<sup>:</sup> 1
	1	/		in	C O	rporated 2	20220263E001	Ending Date	ate: 9/22/22	22	App	proved	By:	JHS	
	Drille Ham Hole	er/Eq mer Dian Grour	uipr Wei nete ndw	men ght/ er (ir ater	t: G∉ ′Drop ∩): 6 ∙Dept	ologic Drill / Mini Bobca 140#/30 h ATD (ft): Not encounte	at Total Grou Datur ered _∑ Grou	Depth (ft): 21.5 nd Surface Elevatic n: NAVD88 ndwater Depth Pos	on (ft): 185 st Drilling (	5 ft) (I	Date)	): ()			
	Depth (ft)	ample Type	Sample	s Recovery	Graphic		Description			Vater Level	Blows/6"	Blov	vs/Fc	ot	Other Tests
	0	S		8			Asphalt - 5 inch	<u>م</u>		>		10	40	20-	
	-						Crushed Rock - 2 in	iches							
						Vacuum truck to 5 feet	Pre-Olympia Fine G t. Drill rig 5 feet to bo	rained ttom.							
	— 5 - -		1			Moist, brownish gray v sand; thinly bedded (N	vith horizontal oxidati /IL).	on planes, SILT, som	e fine		7 14 23		37		-
	- 10 - -		2			Moist, gray to dark gra dipping beds; intact sil	iy, SILT, some fine san t clasts with closed/he	dy beds; thinly bedd aled fractures (ML).	ed; steeply		11 15 16		31		-
	- - 15 -		3			Moist, gray, SILT, trace	e fine sand; laminated	(ML).			11 20 27			47	_
	- 20 -		4			As above. Drilling speed slowing. No groundwater encour	ntered.				27 32 42			74	-
	- 25 -														
11/3/2022	- 														
20263E001	- 35 - -														
202						As:	sociated Earth Scie	ences, Inc. 🛛 💻							

	6	3	>	as	sso	ciated Exploration Boring				EF	3-1	10	7
		A	T	e a	rth	sciences Goat Hill Drainage	)		hon	She	et:	1 of	1
	1			i n	C O	r p o r a t e d 20220263E001 Ending Date: 9/22/2	22	Ap	prov	red E	<u>3y:</u>	JHS	
	Drille Hami Hole ▼ G	er/Eq mer Dian Grour	uipr Wei nete ndwa	men <sup>†</sup> ght/ er (in ater	t: Geo Drop: ): 6 Depth	Dologic Drill / Mini BobcatTotal Depth (ft): 16.5140#/30Ground Surface Elevation (ft): 13Datum: NAVD88✓ATD (ft): Not encountered✓Image: Construction of the second s	0 (ft) (i	Date	): ()	)			
	Depth (ft)	ample Type	Sample	Recovery	Graphic Symbol	Description	Vater Level	Blows/6"	BI	OWS	;/Fo	ot	Other Tests
┢	0	Š		8		Δsphalt - 5 inches	>		10	20	<u>}</u>	20+	$\vdash$
╞						Crushed Rock - 3 inches	1						
-						Pre-Olympia Glacial Till Difficult vacuum truck excavation 0 to 5 feet. Vacuum truck to 5 feet. Drill rig 5 to 16.5 feet. High drill action. Slow drill progress.							
	<del>-</del> 5		1			Moist, gray with occasional oxidation mottling, silty, fine SAND, some gravel to gravelly; unsorted (SM).		13 22 18			40		-
-	- 10		2			Moist, grayish brown, silty, fine to medium SAND, some gravel;unsorted (SM).		27 33 38				71	•
	<b>-</b> 15		3			Attempt SPT=50/2". No recovery. Driving rock spike to move obstructing rock; resampled; likely disturbed. 2inches of brown fine sand at tip.		10 13 20			33		-
	- 20					No groundwater encountered							
	- 25												
11/3/2022	- 30												
0263E001	- 35												
2027						Associated Earth Sciences, Inc.							

1	2		S S	ociated		Exploration	ו Lo	bg						
$\triangleleft$	J	] e	n c o	sciences rporsied	Project Number KE150574A	Exploration Nur EB-1	nber				ç	Sheet 1 of 1		
Projec	t Nar	ne		<u>Goat Hill St</u>	orm Improvement		Grour	nd S	Surfa	ace Ele	evation (ft)			
Driller/	Equi	pmen	t	<u>CN Drilling</u>	Acker		Date \$	Star	t/Fir	nish	_11/18	/15,11	/18/1	5
Hamm	er W	/eight	/Drop	140#/30"			Hole [	Dian	nete	er (in)	_6 inch	nes		·
f.		S	0 -				u	vel	50					sts
pth (j	s	nple	/mbc				Vell	er Le	)/S/(		Blows/	Foot		er Te
De	T	Sal	QŲ		DESCRIPTION		Con	Wat	ы	4.0			•	Othe
	++				Fill				1	10	20	30 4		
-		S-1		Very loose, moi some fine crush	st, rust mottled, gray brown, very silty f led gravel (SM).	ine to medium SAND,			12	<b>▲</b> 3				
E	Τ	S-2		Very loose, moi fine gravel (SM)	st, rust mottled brown, very silty, fine to	o medium SAND, some			1	2				
- 5									'					
-		S-3		Hard drilling at	5.5 feet. Vashon Lodgement Till	,			9 17				38	
-				Dense, moist, re coarse gravel (S	ust mottled gray brown, silty fine to me	dium SAND, some fine to			21					
-		S-4		As above, very	dense.				17 31				4	81
- 10				Bottom of explor	ation boring at 9 feet			50	0/5"					
-				No ground water	encountered.									
-														
- 15														
-														
-														
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<sub>یو</sub> – 35														
24, 20														
mper														
Nove														
S 4.GPJ		er Tvr	e (ST	):										
] [0		2" OD	Split S	,. Spoon Sampler (Sl	PT) No Recovery N	/ - Moisture					Log	ged by:	Sł	٢L
BOR	<u> </u>	3" OD	Split S	Spoon Sampler (D	& M) Ring Sample	Z Water Level ()					Арр	proved b	<b>y:</b> JN	IS
AESI	<u>"</u> (	Grab	Sample	9	Shelby Tube Sample	Water Level at time of	drilling	(AT	D)					

	asso	ciated		Exploratio	n Log				
$\triangleleft$	in con	poraled	Project Number KE150574A	Exploration Nu EB-2	mber		Shee 1 of	t 1	
Project Na	ame	Goat Hill Ste	orm Improvement		Ground Surf	ace Elev	ation (ft) _		
Driller/Equ	uipment Veight/Drop	CN Drilling	Acker		Date Start/Fi	nish ar (in)	11/18/15,	11/18/1	5
		140#7 30				51 (11)			
Depth (ft)	amples Graphic Symbol				Well ompletion ater Level 3lows/6"		Blows/Foo	ot	her Tests
	0		DESCRIPTION		ŭ≥ E	10	20 30	40	ð
-	S-1	Medium dense, coarse gravel; s	<b>Fill</b> moist, rust stained brown, very silty fine palls present in cutting; blow counts ma	e SAND, some fine to y be overstated (SM).	3 7 13		▲20		
	<b>S-2</b>	Loose, moist, gr SAND (SM).	ray brown, very fine to coarse gravelly, s	ilty, medium to coarse	2 2 3	<b>▲</b> 5			
	S-3	Medium stiff, m	oist, gray, SILT, some fine sand, some	fine gravel (ML).	2 1 4	<b>▲</b> 5			
	S-4	Medium stiff, m (ML). Driller indicated	oist, gray, SILT, some fine to coarse gra ground water at 9 feet.	avel, trace coarse sand	<b>⊥</b> 1 2 3	<b>▲</b> 5			
- 10	S-5	Medium stiff, m	oist, gray, fine sandy SILT, some fine g	ravel (ML).	1 2 3	<b>▲</b> 5			
	S-6	Stiff, moist, gray	y, fine sandy SILT, some fine to coarse	gravel (ML).	2 4 6	<b>▲</b> 1	0		
- 15	S-7	Hard, moist, gra	<b>Pre-Olympia Undifferentiate</b> ay, SILT, some fine sand, some fine gra	<b>t</b> vel (ML).	7 18 26			<b>▲</b> 44	
	S-8	Hard, moist, gra stained fine san	ay, SILT, some fine to coarse gravel, tra at sampler tip (ML).	ce fine sand; rust	15 23 50/3.5	, <b>"</b>			73
- 20 - - - - 25		Bottom of explora	ation boring at 19 feet						
-									
3PJ November 24, 2015									
	oler Type (ST): 2" OD Split S 3" OD Split S Grab Sample	: poon Sampler (Sl poon Sampler (D	PT) No Recovery M & M) Ring Sample ♀ ✓ Shelby Tube Sample ♀	- Moisture Water Level () Water Level at time of	drilling (ATD)		Logged Approve	by: Sł ed by: JN	(L IS

1	2		ass	ociated		Exploratio	n Log	J	1			
$\triangleleft$	2		nco	sciences rporalad	Project Number KE150574A	Exploration Nu EB-3	mber				Sheet 1 of 1	
Projec	t Na on	me		Goat Hill Ste	orm Improvement		Ground	Surf	ace Ele	vation (ft)	)	
Driller/ Hamm	Equ er V	ipmer Veiah	nt t/Drop	<u>CN Drilling</u> / 140# / 30"	Acker		Date Sta Hole Dia	art/Fi amete	nish er (in)	11/18	8/15,11/	18/15
			p					-	()		100	
th (ft)		ples	aphic mbol				/ell oletion	NS/6"		Blows	/Foot	400 H
Dep	T	San	SY SY		DESCRIPTION		Com	Blo	10			
		<b>Ç</b> 1	0.00		Fill			6	10	20	30 40	
-		3-1	0. v. 0	Medium dense,	moist, gray to black, silty SPALLS and	CRUSHED ROCK.		9 9		18		
-	T	S-2	0.0	As above.				3 4	▲7			
- 5			0.0.0	A start start				3				
-		S-3	0. p. q.	As above.				2 2 4	<b>▲</b> 6			
-	$\square$	0.4	000		Slide Debris		_	1				
-		5-4		Loose, moist, br	rown, silty fine to medium SAND, some	e fine gravel (SM).		3 5	<b>A</b> 8			
- 10	Τ	S-5		Loose, moist, ru	ust mottled brown, very silty, fine to me	dium SAND (SM).		3	▲8			
-								4				
-		S-6		Medium dense,	moist, brown, silty fine to medium SAI	ND (SM).		14 16 14			▲30	
- 15				Driller indicated	easier drill and ground water at 14 fee	et.		4				
-		S-7		Loose, moist, br	rown, silty fine to medium SAND (SM)			3 5	<b>A</b> 8			
		S-8		Dense, moist, g	Vashon Advance Outwash gray brown, fine to medium SAND, son	n ne silt (SP/SM).		7 15 20			<b>▲</b> 35	
- 20	Τ	S-9		As above, very o	dense.			13 27				<b>▲</b> 59
-				Bottom of explora	ation boring at 21.5 feet			32				
-												
- 25												
-												
-												
- 30												
-												
-												
- 35												
24, 201												
ON C												
0.5/4.G	ampl	ler Ty	pe (ST)	: Sooon Sampler (St		M - Moisturo	_, ,				nded by:	eki
		2 OL 3" OL	) Split S	Spoon Sampler (Si Spoon Sampler (D	& M) Ring Sample	$\overline{2}$ Water Level ()				Ap	proved b	JNS
AESI	99 19	Grab	Sample	9	Shelby Tube Sample	Water Level at time of	drilling (A	TD)				

Associated Earth Sciences, Inc. Exploration Log												
- 10. 232	Ţ				Project Number KE100392A	Exploration Nu EB-1	Imber		S 1	heet of 1		
Project Locatior Driller/E Hamme	Nam n Equip er We	mer eight	nt /Drop	Watson Res Kirkland, W Geologic Dr 140# / 30"	sidence A ill/Acker		Ground Sur Datum Date Start/F Hole Diame	face El finish ter (in)	levation (ft _N/A _1/7/11	) <u>Unl</u> ,1/7/11	(nown	
Depth (ft)	S T	Samples	Graphic Symbol		Well Completion Water Level Blows/6"	10	Blows/f	=oot 80 40	Other Tests			
5		5-1		Very moist, tan Becomes brow debris	Fill , silty fine SAND (SM). n and tan (mixed); saturated at tip of	sampler, trace wood	1 1 2 1 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 2 1 1 1 1 2 1 1 1 1 2 1 1 1 1 2 1 1 1 1 1 2 1	<b>▲</b> 3 <b>▲</b> 4				
10		5-3 5-4		Very moist, trac Very moist, mo Becomes tan, c	ce gravel. Landslide Debris ttled gray, fine sandy SILT (ML). contains thin lenses of silty fine SANI	D; blocky texture.	6 13 13 3 6	•	▲ <sub>18</sub>	25		
- - - 15		S-5		Moist to very m Bottom of explora Exploration termi	Pre-Vashon Undifferentiated oist, grayish tan, silty SAND, with gra ation boring at 14 feet nated due to refusal on gravel.	d avel (SM); till-like.	23 33 34				<b>▲</b> 67	
- - - 20 -												
- 25												
- 30 - 30 -												
35												
	mple ] 2" ] 3" ] G	r Tyj OD OD	pe (ST Split : Modif Sampl	<sup>-</sup> ): Spoon Sampler (: ïed California Sa e	SPT) 🔲 No Recovery M mpler 🚺 Ring Sample 💆	1 - Moisture 7 Water Level () 2 Water Level at time (	of drilling (AT	D)	Log App	ged by: roved by:	TJP	
Associ	ate	ed E	arth S	Sciences, Inc.		Exploratio	n Lo	g				
---------------------	--------	---------------	--	---	---	-------------------------	-------------------	------------------------	--------------	--------------------------	----------------	--
	Į	Ţ	S. S. S. S		Project Number KE100392A	Exploration Nu EB-2	umber			Sheet 1 of 1		
roject N ocation	lan	ne		Watson Resider Kirkland, WA			Groui Datur	nd Su n Stort/I	rface Elevat	ion (ft) <u>U</u>	nknown	
ammer	· W	pmer eight	n /Drop	<u>140# / 30"</u>			Hole	Diame	eter (in)		I	
Depth (ft)	S	Samples	Graphic Symbol				Well ompletion	ater Level Blows/6"	Bl	Blows/Foot		
	_	0)			DESCRIPTION		Ŭ	3_	10 2	20 30 40	)  Ö	
					Fill							
	Π	S-1		Very moist, brown, s in tip of sampler.	ilty fine SAND, trace pebble	gravel (SM); wood stuck		2 6 5	<b>▲</b> 11			
5		S-2		Moiet to very moiet	Pre-Vashon Undifferentia	ted		4 14 50/5	-		<b>▲</b> 50/5"	
				Bottom of exploration t Exploration terminated	poring at 7 feet due to refusal on gravel.	giavei (SM), tili-like.						
10												
15												
20												
25												
30												
35												
Sam	nple	er Ty	pe (S <sup>-</sup>	"):								
	2	" OD	Split	Spoon Sampler (SPT)	No Recovery	M - Moisture				Logged by: Approved b	TJP	
E B	ර G	Grab :	Sampl	spoon sampier (D & N e	<ul> <li>B Shelby Tube Sample</li> </ul>		of drillin	g (AT	D)		· • •	

Ass	ocia	ated Ear	th Sciences, Inc.		Geol	ogic	: & N	Ionitoring Well Con	struction Log
	3			ſ	Project Nur KE10039	nber 92A		Well Number EB-3	Sheet 1 of 1
Proje	ct N	ame	Watson Reside	nce				Location	Kirkland, WA
Wate	r Le	(Top of V vel Elevat	tion <u>Unkno</u>	bwn				Surface Elevation (ft) Date Start/Finish	1/19/11,1/19/11
Drillir Hamı	ng/Eo mer	quipment Weight/D	rop <u>Geolo</u>	<u>gic Drill/1</u> / 30"	Frack Rig			Hole Diameter (in)	
	lave					/	ol		
Dept	terLe					slows 6"	Graph Symb		
	Ma	W	/ELL CONSTRU	CTION	T	ш		DESCR	RIPTION
	_		Monument, thread	ed cap					Fill
-			Bentonite chips		_				
-					-	1 2		Very moist, grayish brown, silty S	AND, little gravel (SM)
- 5			1" I.D. Schedule 8 blank	0 PVC	+++ 	2			
-			#10/20 sand		-	2 2 3		Becomes brown and grayish tan	(mixed); few gravel
-						1		Landsl	ide Debris
-	$\overline{\Sigma}$					35			
- 10	Ā		1" I.D. Schedule 8	0 PVC		5		Becomes wet, no mottling, trace	fine gravel (recovery limited to
-			machine slotted w	ell screen		7 12			
F			Slip cap		-11	12 16		Pre-Vashon I Very moist, tan, SILT (ML).	Undifferentiated
-					_ <b>_</b>	38		With gravel at14 feet (tip of samp	ler).
- 15					-	10 27		Very moist, tan, silty fine SAND, v	with gravel (SM); till-like.
-					 - 	22			
						14 18 24		Contains pockets of gravely sitt.	
- 20			Bentonite chips		-	21		Very moist, tan SAND, with grave	el, little silt (SW/SM) (outwash-like)
-					ul-t-	50/3"			
ļ					-			Bro Vochon Cl	Incial Marina Driff
-					-			(Drilling action smooths out below	v 23 feet)
- 25						13 32		Very moist, blue-gray, SILT, trace Hcl.	e pebble gravel (ML); effervesces in
-		888888			 	45		Boring terminated at 26 5 feet on	1/19/11
-					-				
- 30									
-					-				
ŀ					-				
-									
11 - 35					-				
GDT 2					-				
DRING					-				
SPJ BC					-				
392A.C	Sam	oler Type	(ST):	(0DT) [	7				
LL 100	Ш Ш	2" OD 9 3" OD 1	Split Spoon Sampler Modified California S	(SPT) [ ampler ]		ample		M - Moisture $\overline{\Sigma}$ Water Level (1/21/11)	Logged by: TJP
NWWE	<ul> <li>3" OD Modified California Sampler</li> <li>Grab Sample</li> </ul>				U Shelby	Tube S	Sample	Water Level at time of dril	lling (ATD)

Asso	cia	ted E	arth S	Sciences, Inc.		Exploratio	n Log		
		Ţ	$\widehat{\mathcal{L}}_{\mathcal{L}}_{\mathcal{L}_{\mathcal{L}_{\mathcal{L}_{\mathcal{L}_{\mathcal{L}_{\mathcal{L}_{\mathcal{L}_{\mathcal{L}}_{\mathcal{L}_{\mathcal{L}}_{\mathcal{L}_{\mathcal{L}}}}}}}}}}$		Project Number KE100392A	Exploration Nu EB-4	mber	Sh   1	eet of 1
Project	Na Na	me		Watson Resi	dence	······	Ground Surf Datum	face Elevation (ft) N/Δ	Unknown
Driller/	Equ er V	ipmei Veiah	nt t/Drop	Geologic Dril	l/Acker		Date Start/F	inish <u>1/19/1</u>	1,1/19/11
ц(ft)		oles	phic				ell letion Leve s/6"	Blows/F	Tests
Dept	S T	Sam	Syn				Comp Vater Blow		Other
					DESCRIPTION Slide Debris/Fill			10 20 3	0 40
-									
-	$\square$			Very moist to we	t, tan, silty SAND, with gravel (SM)	•	5		
-		S-1		Very moist, tan,	Pre-Vashon Undifferentiate	d 	26 27		<b>A</b> 53
- 5	Π	S-2		Orilling action be Very moist, tan, :	ecomes gravelly at 4 feet) silty SAND, with gravel (SM); till-like	9.	25 26		<b>▲</b> 55
-				Bottom of explorat	ion boring at 6 feet		29		
-				Ground water not e	encountered.				
-									
- 10 -									
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9.929 Sa	Imp	ler Ty	l_ ′pe (S⊺	<b>)</b> :				I	
		2" OE	) Split	Spoon Sampler (S	PT)	1 - Moisture		Logg	ed by: TJP oved by:
ESIBO	U 7	o≏ OE Grab	Sampl	Spoon Sampler (D e	<ul> <li>▲ IVI) ▲ Ring Sample ▲</li> <li>▲ Shelby Tube Sample ▲</li> </ul>	ב vvater Level () ע Water Level at time o	of drilling (ATE	)) 	с. са <i>бу</i> .

# **APPENDIX B**

Wall Design Calculations



# UltraWall

Project: Location: Designer: Date: Section:	Goat Hill I Kirkland, \ AESI 10/3/2023 NE 116th	Drainage I NA Place - S <sup>-</sup>	mprovements FA 21+00 - 1	s Phase 1 stack			
Design Method:	NCMA_09	3rd_Ed,	Ignore Vert. I	Force			1
Design Unit:	UltraBlock	 <		49#		1	
Seismic Acc:	0.590			<del>evi</del> –			
SOIL PARAMETE	ERS	φ	coh	Y T			
Retained Soi	l:	32 deg	50psf	120pcf			
Foundation S	ioil:	32 deg	50psf	120pcf	-	2.46	- I
Leveling Pad	:	40 deg	0psf	135pcf			-5-
Crushed Stone Lving Pad							

#### GEOMETRY

Design Height:	2.49ft	Live Load:	0psf
Wall Batter/Tilt:	0.00/ 0.00 deg	Live Load Offset:	0.00ft
Embedment:	1.00ft	Live Load Width:	Oft
Leveling Pad Depth:	0.50ft		
Slope Angle:	26.0 deg	Dead Load Offset:	0.0ft
Slope Length:	10.0ft	Dead Load Width:	Oft
Slope Toe Offset:	1.0ft	D.L. Embedment:	Oft
Leveling Pad Width:	3.46ft		
Vert $\delta$ on Single Dpth		Toe Slope Angle:	3.00
		Toe Slope Length:	21.00
		Toe Slope Bench:	0.00

Note: for typical designs the passive resistance in front of the wall units is ignored for sliding, overturning (eccentricity) and bearing calculations.

FACTORS OF SAFETY (Static / Seismic) Sliding: 1.50 / 1.125 Bearing: 2.00 / 1.5

Overturning: 1.50 / 1.125



### RESULTS (Static / Seismic)

FoS Sliding:	100.00 (fnd) / 2.84	FoS Overturning:	100.00 / 3.59
Bearing:	347.82 / 253.00	FoS Bearing:	28.73 / 31.76

Name	Elev.	ka	kae	Pa	Pae	Pif	- PaC	PaT	PaTs	FSsl	siesFSsl	FoS OT	FoS SeisOT
1	0.00	0.309	0.522	115	194	207	-138	0	263	100.00	2.84	100.00	3.59
0.1	<u> </u>												

Column Descriptions:

ka: active earth pressure coefficient

kae: active seismic earth pressure coefficient

Pa: active earth pressure

Pae: dynamic earth pressure

Pir: inertia force

Paq: live surcharge earth pressure

Paq2: live load 2 surcharge earth pressure

Paqd: dead surcharge earth pressure

(PaC): reduction in load due to cohesion

PaT: sum of all earth pressures

FSsl(IvI Pad): factor of safety for sliding at each layer. (FS sliding below the leveling pad) FSot: factor of safety of overturning about the toe.



# UltraWall

<b>-</b> · ·	0	<b>.</b> .					/
Project:	Goat Hill	Drainage	Improvement	is Phase 1			
Location:	Kirkland,	WA					
Designer:	AESI				100	1	
Date:	10/3/2023	3			+		
Section:	NE 116th	Place - S	TA 21+00 - 2	stack	1		
Design Method:	NCMA_0	9_3rd_Ed			- II '	fund	/
Design Unit:	UltraBloc	ĸ		0		build	_ /
Ū				*	4		
Seismic Acc:	0.590			_		1E-1E	
					1		
SOIL PARAMET	ERS	φ	coh	γ	-11		V
Retained So	il:	32 deg	50psf	120pcf		4 92	
Foundation S	Soil:	32 deg	50psf	120pcf	-	4.02	
Leveling Pac	l:	40 deg	0psf	135pcf	V		
Crushed Sto	ne Lvlng P	ad					

GEOMETRY

Design Height:	4.90ft	Live Load:	0psf
Wall Batter/Tilt:	0.00/ 0.00 deg	Live Load Offset:	0.00ft
Embedment:	1.00ft	Live Load Width:	Oft
Leveling Pad Depth:	0.50ft		
Slope Angle:	26.0 deg	Dead Load Offset:	0.0ft
Slope Length:	10.0ft	Dead Load Width:	Oft
Slope Toe Offset:	1.0ft	D.L. Embedment:	Oft
Leveling Pad Width:	5.92ft		
Vert $\delta$ on Single Dpth		Toe Slope Angle:	3.00
		Toe Slope Length:	21.00
		Toe Slope Bench:	0.00

Note: for typical designs the passive resistance in front of the wall units is ignored for sliding, overturning (eccentricity) and bearing calculations.

FACTORS OF SAFETY (Static / Seismic) Sliding: 1.50 / 1.125 2.00 / 1.5 Bearing:

Overturning: 1.50 / 1.125



ANA

FoS Sliding:	3.56 (lvlpd) / 1.56	FoS Overturning:	8.32 / 2.58
Bearing:	774.36 / 749.54	FoS Bearing:	17.51 / 14.49

Name	Elev.	ka	kae	Pa	Pae	Pif	- PaC	PaT	PaTs	FSsl	siesFSsl	FoS OT	FoS SeisOT
1	2.46	0.307	0.519	110	186	207	-135	0	257	42964.11	20.37	100.00	4.38
1E-1E	0.00	0.887	1.425	1279	2053	621	-462	1048	2212	3.56	1.56	8.32	2.58

Column Descriptions:

ka: active earth pressure coefficient

kae: active seismic earth pressure coefficient

Pa: active earth pressure

Pae: dynamic earth pressure

Pir: inertia force

Paq: live surcharge earth pressure

Paq2: live load 2 surcharge earth pressure

Paqd: dead surcharge earth pressure

(PaC): reduction in load due to cohesion

PaT: sum of all earth pressures

FSsl(IvI Pad): factor of safety for sliding at each layer. (FS sliding below the leveling pad)

FSot: factor of safety of overturning about the toe.



# UltraWall

Project: Location:	Goat Hill [ Kirkland \	Drainage I WA	mprovements	Phase 1			
Designer:	AESI						
Date:	10/3/2023			Ť.		N	1
Section:	90th Ave I	NE - STA	71+40 - 2 sta	ck 📗	1	E.	1
Design Method:	NCMA_09	_3rd_Ed		0-		and	1
Design Unit:	UltraBlock	Ι.		00	-	finns	- /
Seismic Acc:	0.590			1	1	IE-1E	
SOIL PARAMETE	ERS	φ	coh	γ <u>+</u>			1
Retained Soi	l:	40 deg	0psf	135pcf		4 02	-
Foundation S	Soil:	40 deg	0psf	135pcf		4.02	+
Leveling Pad	:	40 deg	0psf	135pcf			1
Crushed Stor	ne Lvlng Pa	ad					

#### GEOMETRY

Design Height:	4.90ft	Live Load:	250psf
Wall Batter/Tilt:	0.00/ 0.00 deg	Live Load Offset:	0.00ft
Embedment:	2.40ft	Live Load Width:	15ft
Leveling Pad Depth:	0.50ft		
Slope Angle:	2.0 deg	Dead Load Offset:	0.0ft
Slope Length:	15.0ft	Dead Load Width:	Oft
Slope Toe Offset:	0.0ft	D.L. Embedment:	Oft
Leveling Pad Width:	5.92ft		
Vert $\delta$ on Single Dpth		Toe Slope Angle:	37.00
		Toe Slope Length:	15.00
		Toe Slope Bench:	0.00

Note: for typical designs the passive resistance in front of the wall units is ignored for sliding, overturning (eccentricity) and bearing calculations.

FACTORS OF SAFETY (Static / Seismic) Sliding: 1.50 / 1.125 Bearing: 2.00 / 1.5

Overturning: 1.50 / 1.125



#### RESULTS (Static / Seismic)

FoS Sliding:	3.35 (lvlpd) / 1.69	FoS Overturning:	5.33 / 2.63
Bearing:	848.32 / 581.25	FoS Bearing:	68.50 / 80.92

Name	Elev.	ka	kae	Pa	Pae	Pif	Paq	PaT	PaTs	FSsl	siesFSsl	FoS OT	FoS SeisOT
1	2.46	0.204	0.421	82	169	246	124	206	540	23.31	10.64	5.33	2.50
1E-1E	0.00	0.500	0.962	811	1560	738	613	1424	2911	3.35	1.69	6.68	2.63

**Column Descriptions:** 

ka: active earth pressure coefficient

kae: active seismic earth pressure coefficient

Pa: active earth pressure

Pae: dynamic earth pressure

Pir: inertia force

Paq: live surcharge earth pressure

Paq2: live load 2 surcharge earth pressure

Paqd: dead surcharge earth pressure

(PaC): reduction in load due to cohesion

PaT: sum of all earth pressures

FSsl(IvI Pad): factor of safety for sliding at each layer. (FS sliding below the leveling pad)

FSot: factor of safety of overturning about the toe.



# UltraWall

Project: Location:	Goat Hill [ Kirkland, \	Drainage I NA	Improvement	s Phase 1	
Designer:	AESI			4	
Date:	10/3/2023	1			18 /
Section:	90th Ave	NE - STA	71+40 - 3 sta	ack	
Design Method:	NCMA_09	9_3rd_Ed		110	
Design Unit:	UltraBlock	(		FX	
Seismic Acc:	0.590				1E-1E
SOIL PARAMETE	ERS	φ	coh	γ –	L V
Retained Soi	l:	40 deg	0psf	135pcf	4.92
Foundation S	Soil:	40 deg	0psf	135pcf	
Leveling Pad	:	40 deg	0psf	135pcf	

GEOMETRY

Crushed Stone LvIng Pad

Design Height:	7.40ft	Live Load:	250psf
Wall Batter/Tilt:	0.00/ 0.00 deg	Live Load Offset:	0.00ft
Embedment:	3.50ft	Live Load Width:	15ft
Leveling Pad Depth:	0.50ft		
Slope Angle:	2.0 deg	Dead Load Offset:	0.0ft
Slope Length:	15.0ft	Dead Load Width:	Oft
Slope Toe Offset:	0.0ft	D.L. Embedment:	Oft
Leveling Pad Width:	5.92ft		
Vert $\delta$ on Single Dpth		Toe Slope Angle:	37.00
		Toe Slope Length:	15.00
		Toe Slope Bench:	0.00

Note: for typical designs the passive resistance in front of the wall units is ignored for sliding, overturning (eccentricity) and bearing calculations.

FACTORS OF SAFETY (Static / Seismic) Sliding: 1.50 / 1.125 Bearing: 2.00 / 1.5

Overturning: 1.50 / 1.125



# RESULTS (Static / Seismic)

FoS Sliding:	2.62 (lvlpd) / 1.43	FoS Overturning:	3.47 / 1.49
Bearing:	1398.38 / 822.29	FoS Bearing:	44.51 / 56.06

Name	Elev.	ka	kae	Pa	Pae	Pif	Paq	PaT	PaTs	FSsl	siesFSsl	FoS OT	FoS SeisOT
1	4.92	0.204	0.421	85	175	246	126	211	547	22.76	10.50	5.12	2.43
1	2.46	0.205	0.431	85	457	492	127	213	1077	27.46	5.55	5.94	1.52
1E-1E	0.00	0.379	0.724	1400	2677	984	701	2101	4362	2.62	1.43	3.47	1.49

Column Descriptions:

ka: active earth pressure coefficient

kae: active seismic earth pressure coefficient

Pa: active earth pressure

Pae: dynamic earth pressure

Pir: inertia force

Paq: live surcharge earth pressure

Paq2: live load 2 surcharge earth pressure

Paqd: dead surcharge earth pressure

(PaC): reduction in load due to cohesion

PaT: sum of all earth pressures

FSsl(IvI Pad): factor of safety for sliding at each layer. (FS sliding below the leveling pad)

FSot: factor of safety of overturning about the toe.



# UltraWall

Project:	Goat Hill I	Drainage	Improvement	ts Phase 1	
Location:	Kirkland,	WA	•	1.0	AU PROVINCE AND A DECIMAL ADDRESS AND A DECIMAL ADDRESS ADDRES
Designer:	AESI				118
Date:	10/3/2023	5			
Section:	90th Ave	NE - STA	71+40 - 4 sta	ack	
Design Method:	NCMA_09	9_3rd_Ed		408	S Line /
Design Unit:	UltraBlock	K		2	1E-1E
Seismic Acc:	0.590				1E-1E
SOIL PARAMETE	ERS	φ	coh	Y	<u>n</u> v
Retained Soi	l:	40 deg	0psf	135pcf	4.92
Foundation S	Soil:	40 deg	0psf	135pcf	
Leveling Pad	:	40 deg	0psf	135pcf	

Crushed Stone LvIng Pad

### GEOMETRY

Design Height:	9.80ft	Live Load:	250psf
Wall Batter/Tilt:	0.00/ 0.00 deg	Live Load Offset:	0.00ft
Embedment:	5.00ft	Live Load Width:	15ft
Leveling Pad Depth:	0.50ft		
Slope Angle:	2.0 deg	Dead Load Offset:	0.0ft
Slope Length:	15.0ft	Dead Load Width:	Oft
Slope Toe Offset:	0.0ft	D.L. Embedment:	Oft
Leveling Pad Width:	5.92ft		
Vert $\delta$ on Single Dpth		Toe Slope Angle:	37.00
		Toe Slope Length:	15.00
		Toe Slope Bench:	0.00

Note: for typical designs the passive resistance in front of the wall units is ignored for sliding, overturning (eccentricity) and bearing calculations.

FACTORS OF SAFETY (Static / Seismic) Sliding: 1.50 / 1.125 2.00 / 1.5 Bearing:

Overturning: 1.50 / 1.125



A

RESULTS (Static / Seismic)	1		
FoS Sliding:	2.38 (lvlpd) / 1.49	FoS Overturning:	2.50 / 1.24
Bearing:	2152.15 / 923.32	FoS Bearing:	33.81 / 59.11

Name	Elev.	ka	kae	Pa	Pae	Pif	Paq	PaT	PaTs	FSs/	siesFSsl	FoS OT	FoS SeisOT
1	7.38	0.204	0.374	81	149	207	123	204	479	23.53	12.42	5.41	2.91
1	4.92	0.205	0.382	81	367	414	124	206	905	28.37	6.70	6.18	1.78
1E-1E	2.46	0.205	0.382	746	1391	827	376	1123	2595	8.16	3.64	5.15	2.25
1E-1E	0.00	0.329	0.461	2133	2987	1241	806	2938	5034	2.38	1.49	2.50	1.24

Column Descriptions:

ka: active earth pressure coefficient

kae: active seismic earth pressure coefficient

Pa: active earth pressure

Pae: dynamic earth pressure

Pir: inertia force

Paq: live surcharge earth pressure

Paq2: live load 2 surcharge earth pressure

Paqd: dead surcharge earth pressure

(PaC): reduction in load due to cohesion

PaT: sum of all earth pressures

FSsl(IvI Pad): factor of safety for sliding at each layer. (FS sliding below the leveling pad)

FSot: factor of safety of overturning about the toe.

# NCMA DESIGN METHOD Goat Hill Drainage Improvements Phase 1 MSEW(3.0): Update # 14.94

### **PROJECT IDENTIFICATION**

Title: Goat Hill Drainage Improvements Phase 1 Project Number: 20220263E002 CPH Client: Designer: AESI Station Number:

#### **Description**:

MSE Wall along NE 117th Place - Matches typical section on Figure W3. Deeper embedment conservatively results in larger assumed failure plane behind wall.

#### Company's information:

Name: AESI Street: 911 5th Ave

Kirkland, WA Telephone #: Fax #: E-Mail:

Original file path and name:

C:\Users\bdrew\OneDrive - Associated Earth Sciences Inc..... .....\Goat Hill\MSEW1.BEN Wed Oct 11 11:08:07 2023 Original date and time of creating this file:

PROGRAM MODE:

ANALYSIS of a SIMPLE STRUCTURE using GEOGRID as reinforcing material.

# SOIL DATA

$\begin{array}{l} \text{REINFORCED SOIL} \\ \text{Unit weight, } \gamma \\ \text{Design value of internal angle of friction,} \end{array}$	φ	125.0 lb/ft <sup>3</sup> 36.0 °
RETAINED SOIL Unit weight, $\gamma$ Design value of internal angle of friction,	φ	125.0 lb/ft <sup>3</sup> 36.0 °
FOUNDATION SOIL (Considered as	an equi	valent uniform soil)

1001(Difficit Sole (Combineted us a	n equivalent annorm son)
Equivalent unit weight, $\gamma_{equiv.}$	125.0 lb/ft <sup>3</sup>
Equivalent internal angle of friction, $\phi_{equiv}$	v. 36.0 °
Equivalent cohesion, c equiv.	0.0 lb/ft <sup>2</sup>

Water table does not affect bearing capacity

# LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.2327Inclination of internal slip plane,  $\psi = 58.82^{\circ}$ . Ka (external stability) = 0.2387

# BEARING CAPACITY

Bearing capacity coefficients (calculated by MSEW): Nc = 0.00

#### SEISMICITY

Maximum ground acceleration coefficient, A = 0.590

Kae ( Kh > 0 ) = 0.5203Kae ( Kh = 0 ) = 0.2387 $\Delta$  Kae = 0.2815Seismic soil-geogrid friction coefficient, F\* is 100.0% of its specified static value.

N γ= 7.28

# INPUT DATA: Geogrids (Analysis)

D A T A	Geogrid type #1	Geogrid type #2	Geogrid type #3	Geogrid type #4	Geogrid type #5
Tult [lb/ft] Durability reduction factor, RFd Installation-damage reduction factor, RFid Creep reduction factor, RFc Fs-overall for strength Coverage ratio, Rc	4700.0 1.10 1.05 1.44 N/A 1.000	N/A	N/A	N/A	N/A
Cds = tan(ro) / tan(Phi.reinforced) Ci	0.93 0.80	N/A	N/A	N/A	N/A

# Variation of Lateral Earth Pressure Coefficient With Depth

Ζ	K / Ka
0 ft	1.00
3.3 ft	1.00
6.6 ft	1.00
9.8 ft	1.00
13.1 ft	1.00
16.4 ft	1.00
19.7 ft	1.00



## INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

7.33	[ft]	{ Embedded depth is E = 3.00 ft, and height above top of finished bottom grade is H = 4.33 ft }
1.0	[deg]	-
2.0	deg	
2.0	[ft]	Broken back equivalent angle, $I = 2.00^{\circ}$
	7.33 1.0 2.0 2.0	7.33 [ft] 1.0 [deg] 2.0 [deg] 2.0 [ft]

UNIFORM SURCHARGE

Uniformly distributed dead load is 0.0 [lb/ft 2], and live load is 250.0 [lb/ft 2]

#### ANALYZED REINFORCEMENT LAYOUT:



SCALE:

0 2 4 6[ft]

Goat Hill Drainage Improvements Phase 1 Copyright © 1998-2014 ADAMA Engineering, Inc.

### ANALYSIS: CALCULATED FACTORS (Static conditions)

	state conditions,
	Bearing capacity, $Fs = 14.46$ , Meyerhof stress = $1197 \text{ lb/ft}^2$ .
Foundation Interface: Direct sliding $F_{s} = 4.593$ Eccen	tricity $e/I = 0.0501$ Es-overturning = 8.03

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G E O G R I D # Elevation Length Type [ft] [ft] #				CONNECTION Fs @ 3/4" Fs-peak Fs-overall [service [failure [geogrid criterion] criterion] strength]			Geogrid strength Fs	Pullout resistance Fs	Eccentricity e/L	Product name		
	$\begin{array}{cccc} 1 & 0.82 \\ 2 & 2.46 \\ 3 & 4.10 \\ 4 & 5.74 \end{array}$	7.30 7.30 7.30 7.30	1 1 1 1	3.48 4.31 5.66 6.27	3.48 4.31 5.66 6.27	7.56 9.36 12.30 13.64	7.559 9.363 12.297 13.640	14.983 11.696 8.319 3.614	8.725 11.843 14.800 14.099	0.0405 0.0236 0.0091 -0.0061	Mirafi 5XT Mirafi 5XT Mirafi 5XT Mirafi 5XT	

# ANALYSIS: CALCULATED FACTORS (Seismic conditions)

Bearing capacity, Fs = 11.31, Meyerhof stress = 1479 lb/ft<sup>2</sup>. Foundation Interface: Direct sliding, Fs = 1.989, Eccentricity, e/L = 0.1617, Fs-overturning = 2.93

G E O G R I D # Elevation Length Type [ft] [ft] #				C O N N Fs @ 3/4" [service criterion]	E C T I O N Fs-peak [failure criterion]	Fs-overall [geogrid strength]	Geogrid strength Fs	Pullout resistance Fs	Eccentricity e/L	Product name	
1	0.82	7.30	1	1.57	1.57	4.91	4.914	6.764	3.585	0.1410	Mirafi 5XT
2	2.46	7.30	1	1.40	1.40	4.39	4.395	3.812	4.315	0.1011	Mirafi 5XT
3	4.10	7.30	1	1.27	1.27	3.97	3.975	1.867	4.652	0.0623	Mirafi 5XT
4	5.74	7.30	1	0.80	0.80	2.50	2.504	0.461	3.706	0.0218	Mirafi 5XT

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# DIRECT SLIDING for GIVEN LAYOUT (for GEOGRID reinforcements)

Along reinforced and foundation soils interface: Fs-static = 4.593 and Fs-seismic = 1.989

#	Geogrid Elevation [ft]	Geogrid Length [ft]	Fs Static	Fs Seismic	Geogrid Type #	Product name
1	0.82	7.30	8.725	3.585	1	Mirafi 5XT
2	2.46	7.30	11.843	4.315	1	Mirafi 5XT
3	4.10	7.30	14.800	4.652	1	Mirafi 5XT
4	5.74	7.30	14.099	3.706	1	Mirafi 5XT

on 3.0 MSEW Version 3.0 MSE

#### ECCENTRICITY for GIVEN LAYOUT

At interface with foundation: e/L static = 0.0501, e/L seismic = 0.1617; Overturning: Fs-static = 8.03, Fs-seismic = 2.93

#	Geogrid Elevation [ft]	Geogrid Length [ft]	e / L Static	e / L Seismic	Geogrid Type #	Product name
1	0.82	7.30	0.0405	0.1410	1	Mirafi 5XT
2	2.46	7.30	0.0236	0.1011	1	Mirafi 5XT
3	4.10	7.30	0.0091	0.0623	1	Mirafi 5XT
4	5.74	7.30	-0.0061	0.0218	1	Mirafi 5XT

#### **RESULTS for STRENGTH**

Live Load included in calculating Tmax

#	Geogrid Elevation [ft]	Tavailable [lb/ft]	Tmax [lb/ft]	Tmd [lb/ft]	Specified minimum Fs-overall static	Actual calculated Fs-overall static	Specified minimum Fs-overall seismic	Actual calculated Fs-overall seismic	Product name
1 2 3 4	0.82 2.46 4.10 5.74	2826 2826 2826 2826 2826	373.83 301.81 229.80 207.17	454.24 624.12 793.99 1418.18	N/A N/A N/A N/A	7.559 9.363 12.297 13.640	N/A N/A N/A	4.914 4.395 3.975 2.504	Mirafi 5XT Mirafi 5XT Mirafi 5XT Mirafi 5XT

RESULTS for PULLOUT

Live Load included in calculating Tmax

NOTE: Live load is not included in calculating the overburden pressure used to assess pullout resistance.

#	Geogrid Elevation [ft]	Coverage Ratio	Tmax [lb/ft]	Tmd [lb/ft] (s	Le [ft] see NOTE	La [ft] E)	Avail.Static Pullout, Pr [lb/ft]	Specified Static Fs	Actual Static Fs	Avail.Seism. Pullout, Pr [lb/ft]	Specified Seismic Fs	Actual Seismic Fs
1	0.82	1.000	373.8	454.2	5.82	0.48	5600.9	N/A	14.983	5600.9	N/A	6.764
2	2.46	1.000	301.8	624.1	4.85	1.45	3530.0	N/A	11.696	3530.0	N/A	3.812
3	4.10	1.000	229.8	794.0	3.89	2.41	1911.7	N/A	8.319	1911.7	N/A	1.867
4	5.74	1.000	207.2	1418.2	2.93	3.37	748.8	N/A	3.614	748.8	N/A	0.461

#### RESULTS for CONNECTION (static conditions) Live Load included in calculating Tmax

\*\*\*\*\*\* Important: Hinge height concept is ignored. \*\*\*\*\*\*

#	Geogrid Elevatio [ft]	Connection nforce, To [lb/ft]	FS - Peak	Bulging Deformatio	Available connection onstrength,	Available connection strength,	Available Geogrid strength,	Fs-overal connectio peak	l on	Fs-overa connecti service	ll on	Fs-overa Geogrid strength	.11	Product name
					Tcl-failure criterion [lb/ft]	Tcs-service criterion [lb/ft]	e Tavailable [lb/ft]	Specified	Actua	l Specified	Actual	Specified	Actual	
1 2 3 4	0.82 2.46 4.10 5.74	374 302 230 207	23.54 28.59 27.19 7.64	17.18 21.26 20.77 6.66	1300 1300 1300 1300	1300 1300 1300 1300	2826 2826 2826 2826	N/A N/A N/A N/A	3.48 4.31 5.66 6.27	N/A N/A N/A N/A	3.48 4.31 5.66 6.27	N/A N/A N/A N/A	7.56 9.36 12.30 13.64	Mirafi 5XT Mirafi 5XT Mirafi 5XT Mirafi 5XT

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# RESULTS for CONNECTION (seismic conditions)

\*\*\*\*\*\* Important: Hinge height concept is ignored. \*\*\*\*\*\*

		Live	Load in	ciuded in ca	iculating T	max								
#	Geogrid Elevatio	Connection	FS -	Bulging	Available connection	Available connection	Available Geogrid	Fs-overal connection	l on	Fs-overa connecti	ll on	Fs-overa Geogrid	all	Product
	[ft]	[lb/ft]	Peak	Deformatio	onstrength,	strength,	strength,	break		service		strength		name
					Tcl-failure	Tcs-service	e Tavailable							
					criterion	criterion	[lb/ft]	Specified	Actual	Specified	Actual	Specified	Actual	
					[lb/ft]	[lb/ft]								
1	0.82	828	8.63	6.30	1300	1300	2826	N/A	1.57	N/A	1.57	N/A	4.91	Mirafi 5XT
2	2.46	926	7.59	5.65	1300	1300	2826	N/A	1.40	N/A	1.40	N/A	4.39	Mirafi 5XT
3	4.10	1024	4.94	3.77	1300	1300	2826	N/A	1.27	N/A	1.27	N/A	3.97	Mirafi 5XT
4	5.74	1625	0.80	0.70	1300	1300	2826	N/A	0.80	N/A	0.80	N/A	2.50	Mirafi 5XT

# NCMA DESIGN METHOD Goat Hill Drainage Improvements Phase 1 MSEW(3.0): Update # 14.94

## **PROJECT IDENTIFICATION**

Goat Hill Drainage Improvements Phase 1 Title: Project Number: 20220263E002 CPH Client: Designer: AESI Station Number:

#### **Description**:

MSE Wall along NE 117th Place - Maximum exposed height analysis (ignores embedment).

#### Company's information:

Name: AESI Street: 911 5th Ave

Kirkland, WA Telephone #: Fax #: E-Mail:

Original file path and name:

C:\Users\bdrew\OneDrive - Associated Earth Sciences Inc..... .....\Goat Hill\MSEW1.BEN Wed Oct 11 11:08:07 2023

Original date and time of creating this file:

**PROGRAM MODE:** 

ANALYSIS of a SIMPLE STRUCTURE using GEOGRID as reinforcing material.

# SOIL DATA

$\begin{array}{l} REINFORCED \ SOIL \\ Unit \ weight, \ \ \gamma \\ Design \ value \ of \ internal \ angle \ of \ friction, \end{array}$	φ	125.0 lb/ft <sup>3</sup> 36.0 °
RETAINED SOIL Unit weight, $\gamma$ Design value of internal angle of friction,	φ	125.0 lb/ft <sup>3</sup> 36.0 °
FOUNDATION SOIL (Considered as	s an eoui	valent uniform soil)

1 o or Driffor o old (combiation as	
Equivalent unit weight, $\gamma_{equiv.}$	125.0 lb/ft <sup>3</sup>
Equivalent internal angle of friction, $\phi_{ec}$	guiv. 36.0 °
Equivalent cohesion, c equiv.	0.0 lb/ft <sup>2</sup>

Water table does not affect bearing capacity

# LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.2327Inclination of internal slip plane,  $\psi = 58.82^{\circ}$ . Ka (external stability) = 0.2387

# BEARING CAPACITY

Bearing capacity coefficients (calculated by MSEW): Nc = 50.59 N  $\gamma$ = 56.31

#### SEISMICITY

Maximum ground acceleration coefficient, A = 0.590

Kae ( Kh > 0 ) = 0.5203Kae ( Kh = 0 ) = 0.2387 $\Delta$  Kae = 0.2815Seismic soil-geogrid friction coefficient, F\* is 100.0% of its specified static value.

# INPUT DATA: Geogrids (Analysis)

D A T A	Geogrid type #1	Geogrid type #2	Geogrid type #3	Geogrid type #4	Geogrid type #5
Tult [lb/ft] Durability reduction factor, RFd Installation-damage reduction factor, RFid Creep reduction factor, RFc Fs-overall for strength Coverage ratio, Rc	4700.0 1.10 1.05 1.44 N/A 1.000	N/A	N/A	N/A	N/A
Cds = tan(ro) / tan(Phi.reinforced) Ci	0.93 0.80	N/A	N/A	N/A	N/A

# Variation of Lateral Earth Pressure Coefficient With Depth

Ζ	K / Ka
0 ft	1.00
3.3 ft	1.00
6.6 ft	1.00
9.8 ft	1.00
13.1 ft	1.00
16.4 ft	1.00
19.7 ft	1.00



## INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

Design height, Hd	3.60	[ft]	{ Embedded depth is $E = 0.00$ ft, and height above top of finished bottom grade is $H = 3.60$ ft }
Batter, $\omega$	1.0	[deg]	- ,
Backslope, β	2.0	[deg]	
Backslope rise	2.0	[ft]	Broken back equivalent angle, $I = 2.00^{\circ}$

UNIFORM SURCHARGE

Uniformly distributed dead load is 0.0 [lb/ft <sup>2</sup>], and live load is 250.0 [lb/ft <sup>2</sup>]

#### ANALYZED REINFORCEMENT LAYOUT:





Goat Hill Drainage Improvements Phase 1 Copyright © 1998-2014 ADAMA Engineering, Inc.

### ANALYSIS: CALCULATED FACTORS (Static conditions)

	ormoopring riter	S (Statie Conditions)
		Bearing capacity, $Fs = 35.55$ , Meyerhof stress = 699 lb/ft <sup>2</sup> .
Foundation Interface	Direct sliding $Fs = 6.674$	ccentricity $e/L = 0.0116$ Es-overturning = 21.48

#	G E O Elevation [ft]	G R I D Length [ft]	Type #	C O N N Fs @ 3/4" [service criterion]	E C T I O N Fs-peak [failure criterion]	Fs-overall [geogrid strength]	Geogrid strength Fs	Pullout resistance Fs	Direct sliding Fs	Eccentricity e/L	Product name
1	0.82	7.30	1	6.19	6.19	13.46	13.463	11.666	15.082	0.0047	Mirafi 5XT
2	2.46	7.30	1	8.31	8.31	18.07	18.069	5.747	12.570	-0.0129	Mirafi 5XT

#### ANALYSIS: CALCULATED FACTORS (Seismic conditions)

Bearing capacity, Fs = 37.79, Meyerhof stress = 677 lb/ft<sup>2</sup>. Foundation Interface: Direct sliding, Fs = 3.459, Eccentricity, e/L = 0.0387, Fs-overturning = 10.06

#	G E O Elevation [ft]	G R I D Length [ft]	Type #	CONN Fs @ 3/4" [service criterion]	E C T I O N Fs-peak [failure criterion]	Fs-overall [geogrid strength]	Geogrid strength Fs	Pullout resistance Fs	Direct sliding Fs	Eccentricity e/L	Product name
1	0.82	7.30	1	2.43	2.43	7.60	7.603	4.575	7.294	0.0263	Mirafi 5XT
2	2.46	7.30	1	1.74	1.74	5.44	5.438	1.201	5.199	-0.0032	Mirafi 5XT

# DIRECT SLIDING for GIVEN LAYOUT (for GEOGRID reinforcements)

Along reinforced and foundation soils interface: Fs-static = 6.674 and Fs-seismic = 3.459

#	Geogrid Elevation [ft]	Geogrid Length [ft]	Fs Static	Fs Seismic	Geogrid Type #	Product name
1	0.82	7.30	15.082	7.294	1	Mirafi 5XT
2	2.46	7.30	12.570	5.199	1	Mirafi 5XT

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#### ECCENTRICITY for GIVEN LAYOUT

At interface with foundation: e/L static = 0.0116, e/L seismic = 0.0387; Overturning: Fs-static = 21.48, Fs-seismic = 10.06

#	Geogrid Elevation [ft]	Geogrid Length [ft]	e / L Static	e / L Seismic	Geogrid Type #	Product name
1	0.82	7.30	0.0047	0.0263	1	Mirafi 5XT
2	2.46	7.30	-0.0129	-0.0032	1	Mirafi 5XT

#### **RESULTS for STRENGTH**

Live Load included in calculating Tmax

#	Geogrid Elevation [ft]	Tavailable [lb/ft]	Tmax [lb/ft]	Tmd [lb/ft]	Specified minimum Fs-overall static	Actual calculated Fs-overall static	Specified minimum Fs-overall seismic	Actual calculated Fs-overall seismic	Product name
1	0.82	2826	209.90	325.35	N/A	13.463	N/A	7.603	Mirafi 5XT
2	2.46	2826	156.39	591.86	N/A	18.069	N/A	5.438	Mirafi 5XT

**RESULTS for PULLOUT** 

Live Load included in calculating Tmax

NOTE: Live load is not included in calculating the overburden pressure used to assess pullout resistance.

#	Geogrid Elevation [ft]	Coverage Ratio	Tmax [lb/ft]	Tmd [lb/ft]	Le [ft] see NOTH	La [ft] E)	Avail.Static Pullout, Pr [lb/ft]	Specified Static Fs	Actual Static Fs	Avail.Seism. Pullout, Pr [lb/ft]	Specified Seismic Fs	Actual Seismic Fs
1	0.82	$1.000 \\ 1.000$	209.9	325.3	5.82	0.48	2448.6	N/A	11.666	2448.6	N/A	4.575
2	2.46		156.4	591.9	4.85	1.45	898.8	N/A	5.747	898.8	N/A	1.201

#### RESULTS for CONNECTION (static conditions) Live Load included in calculating Tmax

\*\*\*\*\*\* Important: Hinge height concept is ignored. \*\*\*\*\*\*

#	Geogrid Elevation	Connection nforce, To [lb/ft]	FS - I Peak	Bulging Deformatio	Available connection	Available connection strength.	Available Geogrid strength	Fs-overa connecti peak	ll on	Fs-overal connectionservice	ll on	Fs-overa Geogrid strength	11	Product
	[-•]	[			Tcl-failure criterion [lb/ft]	Tcs-service criterion [lb/ft]	Tavailable [lb/ft]	Specified	Actual	Specified	Actual	Specified	Actual	
1 2	0.82 2.46	210 156	24.35 5.81	18.88 5.81	1300 1300	1300 1300	2826 2826	N/A N/A	6.19 8.31	N/A N/A	6.19 8.31	N/A N/A	13.46 18.07	Mirafi 5XT Mirafi 5XT

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#### RESULTS for CONNECTION (seismic conditions) Live Load included in calculating Tmax

\*\*\*\*\*\* Important: Hinge height concept is ignored. \*\*\*\*\*\*

		LIVE	Loud I		ieuluing 1	шил								
#	Geogrid Elevatio	Connection nforce, To	FS	- Bulging	Available connection	Available connection	Available Geogrid	Fs-overa connecti	ll on	Fs-overa connecti	ll on	Fs-overa Geogrid	11	Product
	[ft]	[lb/ft]	Peak	Deformatio	onstrength, Tcl-failure	strength, Tcs-service	strength, Tavailable	break		service		strength		name
					criterion [lb/ft]	criterion [lb/ft]	[lb/ft]	Specified	Actual	Specified	Actual	Specified	Actual	
1 2	0.82 2.46	535 748	7.80 0.98	6.04 0.98	1300 1300	1300 1300	2826 2826	N/A N/A	2.43 1.74	N/A N/A	2.43 1.74	N/A N/A	7.60 5.44	Mirafi 5XT Mirafi 5XT

# **APPENDIX C**

**Global Stability Modeling Results** 

			Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
				Existing Fill	Mohr-Coulomb	120	50	32
	Critical Cros	ss-Section STA 21+00		Landslide Debris	Mohr-Coulomb	115	100	28
				Modular Block	High Strength	150		
				Pre-Olympia Fine-Grained	Mohr-Coulomb	130	1,000	25
170			Horizon	tal Seismic Accelera	tion = 0		1	
165 — 160 —			NE 116th E	lace				
155 —							ŀ	
155 — 150 — 145							ŀ	
155 150 145 140 -30	-20	-10		2	0	30	ŀ	
155 — 150 — 145 — 140 — -30	-20	-10 0 Distanc	) 10 ce (feet)	2	0	30	•	
155 — 150 — 145 140 -30	-20	-10 O Distanc	10 the (feet)	2	0	30	•	
155 — 150 — 145 140 -30	-20	-10 0 Distanc	0 10 Ce (feet) NE 116th Place -	2 2 Stack Gloi	0 Dal Stability	30 - Static	c Conditi	ons
155 150 145 140 -30	-20	-10 0 Distanc	0 10 Ce (feet) NE 116th Place - Goat Hill Drainag	2 2 Stack Glob 2 Improveme	0 Dal Stability ents - Phase	30 - Static e 1, Kir	c Conditi kland, W	ons /A

		Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
			Existing Fill	Mohr-Coulomb	120	50	32
	Critical Cross-Section STA 21+00		Landslide Debris	Mohr-Coulomb	115	100	28
			Modular Block	High Strength	150		
			Pre-Olympia Fine-Grained	Mohr-Coulomb	130	1,000	25
170		Horizon	tal Seismic Accelera	tion = 0.295g			
165 —		<u></u>					
155 —		NE 116th P	lace				
						6	
150 —						ŀ	
150 —						ŀ	
150 - 145						ŀ	
150 145 140 -30	-20 -10 0	10	2	0	30	•	
150 145 140 -30	-20 -10 0 Distance	10 (feet)	2	0	30	•	
150 145 140 -30	-20 -10 0 Distance	10 (feet) NE 116th Place -	2 2 Stack Gloi	0 Dal Stability	30 - Seisr	nic Conc	ditions
150 145 140 -30	-20 -10 0 Distance	10 (feet) NE 116th Place - Goat Hill Drainag	2 2 Stack Glol ge Improveme	0 Dal Stability ents - Phase	30 - Seisr e 1, Kir	mic Conc	ditions /A
















# Appendix I : Cultural resource report

## CULTURAL RESOURCES REPORT COVER SHEET

DAHP Project Number: 2023-02-01269

Author: <u>David Carlson</u>

 Title of Report:
 Cultural Resources Assessment for the Goat Hill Drainage Ditch

 Conveyance and Channel Stabilization Project (City of Kirkland

 Project SDC0990000), Kirkland, King County, Washington

Date of Report: February 28, 2023

County(ies): King Section: <u>30</u> Township: <u>26 N</u> Range: <u>05 E</u>

Quad: <u>Kirkland, WA</u> Acres: <u>~3.2</u>

PDF of report submitted (REQUIRED) Xes

Historic Property Inventory Forms to be Approved Online? 
Yes No

Archaeological Site(s)/Isolate(s) Found or Amended? 
Yes 
No

 $\underline{\mathsf{TCP}(\mathsf{s}) \text{ found?} \Box \mathsf{Yes} \boxtimes \mathsf{No}}$ 

Replace a draft? 
Yes 
No

Satisfy a DAHP Archaeological Excavation Permit requirement? 
Yes # 
No

Were Human Remains Found? Yes DAHP Case # No

DAHP Archaeological Site #:

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.



Cultural Resource Consultants

Cultural Resources Assessment for the Goat Hill Drainage Ditch Conveyance and Channel Stabilization Project (City of Kirkland Project SDC0990000), Kirkland, King County, Washington

> Report Prepared by David Carlson

Principal Investigator Margaret Berger

February 28, 2023

Technical Memo 2206K-1 DAHP PROJECT: 2023-02-01269

> Report Submitted to Matt Hough CPH Consultants

Cultural Resource Consultants, LLC P.O. Box 4159 Seattle, Washington 98194

### Cultural Resources Assessment for the Goat Hill Drainage Ditch Conveyance and Channel Stabilization Project (City of Kirkland Project SDC0990000), Kirkland, King County, Washington

I. MANAGEMENT SUMMARY	3
1.1 Regulatory Context	3
1.2 Research Design	4
1.3 Project Information	5
2. BACKGROUND RESEARCH	17
2.1 Overview	.17
2.2 Environmental Context	.17
2.3 Paleoclimate and Vegetation	.23
2.4 Archaeological Context	.24
2.5 Native Peoples	.26
2.6 Recent History	.29
2.7 Historical Records Search	.32
2.8 Cultural Resources Database Review	.36
3. ARCHAEOLOGICAL PREDICTIVE MODELS	40
3.1 DAHP Statewide Predictive Model	.40
3.2 King County Sensitivity Model	.40
4. ARCHAEOLOGICAL EXPECTATIONS	40
5. FIELD INVESTIGATION	42
5.1 Field Data	.42
5.2 Field Methodology	.42
5.3 Investigation Results	.43
6. FINDINGS AND RECOMMENDATIONS	59
6.1 Conclusion	.59
7. LIMITATIONS OF THIS ASSESSMENT	60
8. References	60
APPENDIX A. GOAT HILL CONCEPTS AND ALTERNATIVES SUMMARY MATRIX	71
APPENDIX B. TRIBAL CORRESPONDENCE	79
APPENDIX C. INADVERTENT DISCOVERY PROTOCOL	88

C.1 Procedures for Discovery of Potential or Actual Cultural Resources .	88
C.2 Procedures for Discovery of Human Skeletal Remains	89

#### I. Management Summary

This report provides a cultural resources assessment for the Goat Hill Drainage Ditch Conveyance and Channel Stabilization Project (City of Kirkland Project SDC0990000). CPH Consultants, on behalf of the City of Kirkland, requested that Cultural Resource Consultants, LLC (CRC) complete a cultural resources assessment prior to proposed transportation developments in the Goat Hill neighborhood of Kirkland in King County, Washington. These developments include street widening, installation and replacement of a pre-existing storm drain system, relocation of other previously installed utilities, and other associated utility and pedestrian/transportation improvements. This assessment was conducted in compliance with Section 106 of the National Historic Preservation Act (NHPA). It was developed to document recorded and unrecorded archaeological sites, historic built environment resources, and other cultural resources and to evaluate the potential for project activities to affect said resources.

Background research and field investigation identified no archaeological or historic built environment resources at the project location. Field investigation consisted of pedestrian survey of all proposed work areas and the opportunistic excavation of four shovel and one auger probe. Sediments consisted largely of fill over varying types of glacially-derived sediments, all of which were consistent with mapped surface geology. Based on background research and field investigation, the likelihood of project-related activities encountering archaeological or other cultural material is considered low. No additional cultural resources investigation is recommended at this time. If project activities result in the inadvertent discovery of archaeological materials or deposits, project staff should follow the inadvertent discovery protocol provided.

#### 1.1 Regulatory Context

This cultural resources assessment was developed as a component of preconstruction environmental review for the Goat Hill Drainage Ditch Conveyance and Channel Stabilization Project (City of Kirkland Project SDC0990000, hereafter "Goat Hill SD Project"). It sought to prevent adverse impacts to cultural resources during ground disturbing activities by evaluating whether archaeological sites, historic built environment resources (i.e., buildings or structures at least 50 years old), or other cultural resources exist within the boundaries of the project. CRC's work was intended, in part, to assist in addressing state regulations pertaining to the identification and protection of cultural resources. The Archaeological Sites and Resources Act (RCW 27.53) prohibits knowingly disturbing archaeological sites without a permit from the Washington State Department of Archaeology and Historic Preservation (DAHP); the Indian Graves and Records Act (RCW 27.44) prohibits knowingly disturbing Native American or historic graves; and the Abandoned and Historic Cemeteries and Historic Graves Act (RCW 68.60) calls for the protection and preservation of historic era cemeteries and graves.

Portions of the project is expected to require permitting from the US Army Corps of Engineers (USACE), Washington State's Department of Fish and Wildlife, and the Department of Ecology. Furthermore, the project will be receiving federal funds administered by King County. This project is therefore considered a federal undertaking and is therefore subject to Section 106 of the NHPA. Under Section 106, agencies involved in a federal undertaking must consider the undertaking's potential effects to historic properties within a defined Area of Potential Effect (APE) (36 CFR 800.16(l)(1)). Historic properties are defined as buildings, districts, sites, structures or objects, typically more than 50 years old, that are deemed eligible for listing on the NRHP. The Section 106 process involves identifying and inventorying historic properties within the APE and evaluating whether those properties satisfy NRHP eligibility criteria and integrity considerations. If NRHPeligible historic properties are identified within the APE, potential adverse effects to historic properties must be assessed and a resolution of adverse effects recommended.

#### 1.2 Research Design

CRC's investigation consisted of (1) review of available project information and correspondence provided by the project proponent; (2) examination of local environmental, historical, and archaeological datasets; and (3) field investigation. On January 16, 2023, CRC contacted cultural resources personnel at the Duwamish Tribe, Muckleshoot Tribe, Snoqualmie Tribe, Stillaguamish Tribe, Suquamish Tribe, and Tulalip Tribes on a technical staff to technical staff basis to inquire about project-related cultural information or concerns (Appendix A). This correspondence was not intended to be or replace formal governmentto-government consultation. On January 16, staff from the Suquamish Tribe responded that they are not aware of any cultural resources at the project location. On January 17, staff from the Snoqualmie Tribe requested to be on-site during all project-related grounddisturbing activities. On January 31, staff from the Duwamish Tribe responded that a Duwamish village was once located at Juanita Beach, near the mouth of Juanita Creek. They requested notification of any archaeological or monitoring work and indicated that they would accept an inadvertent discovery plan for this project. Information provided by Tribes' cultural resources personnel subsequent to the submission of this report will be included in a revised version. This assessment considered comments provided by Tribes, previous studies in the project vicinity, the magnitude and nature of the undertaking, the nature and extent of potential effects on historic properties, and the likely nature and location of historic properties at the project location, as well as other applicable laws, standards, and guidelines (per 36CFR800.4 (b)(1)) (DAHP 2022).

#### **1.3 Project Information**

#### 1.3.1 Project Location

The project encompasses approximately 3.2 acres largely within the right-of-way (ROW) of portions of 90th Ave NE, NE 116th and 117th Place, and 91st Lane NE in Kirkland, King County, Washington. The legal description for the project is the SE<sup>1</sup>/<sub>4</sub> of the SW<sup>1</sup>/<sub>4</sub> of Section 30 in Township 26 North, Range 05 East, Willamette Meridian (Figure 1).

#### 1.3.2 Project Description

As part of the Goat Hill SD Project, the City of Kirkland proposes a number of improvements to the storm drainage system along portions of 90th Ave NE, NE 116th Place, NE 117th Place, and 91st Lane NE in Kirkland, King County, Washington. Project-related activities are divided into five work areas, labeled A through E (Figure 2). What follows are brief summaries of potential ground-disturbing activities within each work area. A full description of all project activities currently proposed can be found in Appendix A.

<u>Work Area A:</u> This work area encompasses approximately 650 lineal feet (LF) of 90th Avenue NE north of and including the intersection with NE 117th Place along with that portion of NE 117th Place approximately 200 LF southwest and 430 LF northeast of the intersection. The project will replace and install new inlet and pipe storm drainage facilities to improve the collection and conveyance capacity of the overall City drainage system to reduce potential for local flooding and erosion. It includes three stream outfall improvements. These include the removal of an existing outlet pipe and outfall from 90th Avenue NE to Stream A, replacement to upsize and update the culvert and outfall for Stream A under NE 117th Place, and replacement and upgrade of the existing culvert crossing conveying Stream B under NE 117th Place NE. The conveyance modifications/upgrades for this project will modify the contributing drainage areas for each of these outfalls. Two alternatives are proposed for Work Area A. Summaries of each alternative are presented in Table 1 below.

Alternative	Conveyance	Roadway	Existing Utility
	Improvements	Improvements	Impacts
1	Install 600 LF of storm	Roadway widening;	Relocate 200 LF of
	drain and 15 catch basins;	installation of four	gas main; Relocate
	Remove and/or replace	retaining walls; pavement	50 LF of water main;
	existing culverts; install	regrading and	Incident impacts to
	dissipator structure	replacement	other buried utilities

Table 1.	Work	Area A	Concer	nt Altern	natives	Summary	v
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Alternative	Conveyance	Roadway	Existing Utility
	Improvements	Improvements	Impacts
1A	As base design, with some location changes	As base design, with additional pavement widening and extended retaining walls	As base design, with additional relocation of 320 LF of overhead power

<u>Work Area B:</u> This work area includes approximately 640 LF of NE 117th Place, 925 LF of NE 116th Place, and 150 LF of NE 118th Place. These roadway corridors contain the narrow pavement widths covering a dense network of irregularly located buried utilities typical of the Goat Hill study area. Stormwater runoff in this work area is collected and conveyed by a patchwork of mostly below-grade pipes and catch basin inlets with a couple of shallow roadside ditches. The project will abandon the NE 117th Place connection to the outfall to NE Juanita Drive and re-direct that flow to the NE 116th Place drainage systems. The improved systems within this work area will ultimately connect and discharge to the recently installed CIP#1 drainage improvements at SDMH #6910 (City GIS #44861). Three alternatives are proposed for this area. Summaries of them are presented on Table 2.

Alternative	Conveyance Improvements	Roadway Improvements	Existing Utility Impacts
1	Abandon and replace 130 LF of storm ditches with pipe; Remove and replace low- capacity storm piping; Install additional catch basins and SD pipes as needed	Regrade and replace sections of pavement; Install one retaining wall; Install one rockery	Relocate 490 LF of gas main; Relocate 150 LF of water main and replace 1 hydrant; Relocate other utilities as needed
1A	As base design, with additional concrete pipe and catch basin replacements as needed	As base design	As base design
2	Conveyance improvements similar to Alt. 1 and 1A; Install new conveyance system over most of project	As base design, with possible reduction in pavement regrading and replacement	As base design

Table 2. Work Area B Concept Alternatives Summary.

<u>Work Area C:</u> The proposed work in this area involves limited modifications to a portion of the existing City storm drainage systems to install a flow splitter structure within the existing public drainage system in the vicinity of the 91st Lane NE and NE 116th Place intersection. The purpose of the flow splitter retrofit is to maintain a base flow to Stream B equal to the current 2-year discharge rate. Four alternatives are proposed for Work Area C. Summaries of them are presented on Table 3.

Alternative	Conveyance Improvements	Roadway Improvements	Existing Utility Impacts
1	Install diversion weir; Install new catch basin and associated piping	Sawcut, remove, and replace/restore/patch pavement	None below ground
1A	As base design	ADA-improvements to curb, gutter, and sidewalk at intersection of 91st Lane NE and 116th Pl NE	As base design
2	Install catch basin with diversion weir structure; Install 150 LF piping with 3 catch basins	Remove and replace 105 LF of curb and gutter, 59 sq. ft. of concrete sidewalk, and ADA concrete ramp	None
2A	As base design	ADA-improvements to curb, gutter, and sidewalk at intersection of 91st Lane NE and 116th Pl NE	None

Table 3. Work Area C Concept Alternatives Summary.

<u>Work Area D</u>: An existing 12-inch diameter lined corrugated polyethylene (LCPE) pipe currently conveys Stream E south and east under an HMA paved roadway/private drive west of the NE 117th Place/NE 116th Place intersection. This stream flows almost entirely over private yards and open space areas in the neighborhoods of Finn Hill and Goat Hill. The portion immediately upstream of the subject culvert inlet has been re-channeled by the owner of 8800 NE 117th Place with treated landscape timbers over the western limit of that property. This unauthorized modification results in an artificial, rectangular channel section with a bottom width that varies from generally 2 feet down to almost 1-foot.

The project will establish the size, slope, and material for a replacement culvert to safely collect and convey the 100-year peak design flow. Improvements will include a riprap or rock gabion headwall to protect the culvert inlet. A riprap or rock gabion outfall structure at the

outlet of the culvert is proposed with all design alternatives to dissipate energy and reduce flow velocities as they enter the downstream reaches of Stream E. Two alternatives are proposed for Work Area D. Summaries of them are presented on Table 4.

Alternative	Conveyance Improvements	Roadway Improvements	Existing Utility Impacts
1	Remove and replace culvert; Install gabion or headwall, as well as buried gabion basket or riprap protection	Sawcut, remove, and replace/restore/patch pavement	Possible relocation of gas main
1A	As base design	As base design, with addition of asphalt thickening edge	As based design

Table 4. Work Area D Concept Alternatives Summary.

<u>Work Area E;</u> Two separate storm drainage improvements are proposed within this work area. The first improvement disconnects approximately 140 LF portion of the City's existing conveyance system that currently drains east from NE 117th Place to 91st Place NE over two private properties (9037 NE 117the Place and 11655 91st Place NE). New pipes and catch basin inlets will be installed within the NE 117th Place right-of-way to connect the remaining portion of the public system with the existing City drainage system to the north near the outfall of Stream D and private driveway to the residence at 9116 NE 117th Place. The disconnected portion of the system that lies outside of the public right-of-way will become privately owned and maintained.

The project includes the removal and replacement of existing storm drainage pipes and catch basins within 91st Place NE. Approximately 95 LF of existing storm drainage pipe parallel to the west right-of-way line will be abandoned. New pipes and catch basins replace the abandoned systems. Existing water and natural gas mains on the west side of the right-of-way require that the new storm drainage facilities be positioned on the east side of the 91st Place NE.

Two alternatives are proposed for Work Area E. Summaries of them are presented on Table 5.

Alternative	Conveyance Improvements	Roadway Improvements	Existing Utility Impacts
1	Install 390 LF of new storm drain and 9 associated catch basins; abandon 180 LF of existing storm drain	Sawcut, remove, and replace/restore/patch pavement	Avoidance or relocation of below- grade utilities, incl. water and gas mains
1A	As base design	As base design, with replacement of pavement edges and minor regrading and replacement of driveway transitions	As base design

Table 5. Work Area E Concept Alternatives Summary.

For the purposes of this assessment, the area of effect for cultural resources (hereafter, "the project" or "the project location") is understood to be all areas within 15 feet of the proposed construction plans listed above, as depicted in Figures 1 - 7.





Figure 2. Satellite imagery of the project location.



Figure 3. Design plan for proposed construction activities at Work Areas A and E – Concept 1. Image courtesy of CPH Consultants.



Figure 4. Design plan for proposed construction activities at Work Areas A and E – Concept 1A. Image courtesy of CPH Consultants.



Figure 5. Design plan for proposed construction activities at Work Areas B, C, and D - Concept 1. Image courtesy of CPH Consultants.



Figure 6. Design plan for proposed construction activities at Work Areas B, C, and D – Concept 1A. Image courtesy of CPH Consultants.



Figure 7. Design plan for proposed construction activities at Work Areas B, C, and D - Concept 2. Image courtesy of CPH Consultants.

#### 2. Background Research

#### 2.1 Overview

Background research was conducted in February of 2023.

Recorded Cultural Resources Present: Yes [] No [x] No archaeological sites, historic buildings, register-listed historic properties, or other cultural resources have been recorded at the project location (DAHP 2023a).

The following context overview summarizes environmental, historical, and archaeological information contained in local cultural resource reports; archaeological and historical data from DAHP and the Washington Information System for Architectural and Archaeological Records Data (WISAARD); ethnographic resources; geological and soils surveys; historical maps and documents from the United States Bureau of Land Management (BLM) and United States Surveyor General (USSG) Land Status & Cadastral Survey Records database; HistoryLink; Historic Map Works; HistoricAerials; University of Washington's Digital Collection; Washington State University's Early Washington Maps Collection; and CRC's library. This report's discussion of geology, archaeology, and history at the project location incorporates context information from CRC's previous work in the northern Lake Washington area (e.g., Gardner and Carlson 2022; Kleinschmidt 2022; Kretzler 2022).

In this and subsequent sections, all dates are presented in calendar years BP (before present). All dates based on radiocarbon data have been calibrated to yield a calendrical age).

#### 2.2 Environmental Context

The Goat Hill SD Project encompasses approximately 3.2 acres in northwest Kirkland in northwestern King County. It consists of a series of roads and associated ROWs built on the southeastern-facing side slope of a glacial terrace just northwest of Juanita Bay. Several of the roads form a switchback providing access to residences built into the side of the terrace. Work Areas A, B, D, and E are all found on the steeper portions of the terrace slope, with elevations ranging from 100 to 220 feet above sea level. Work Area C is on a more level transition zone between the side slope to the west and a recessional outwash plain to the east. Elevation there is approximately 30 feet above sea level (Figure 1).

Nearby water resources include Juanita Bay (0.1 mile southeast) and Juanita Creek (0.2 mile east). Juanita Bay is a part of Lake Washington, approximately 0.75 mile south. Another, unnamed creek can be found 0.85 mile to the west. Much of the area has been significantly developed, and the project location is both the site of and is surrounded by an extensive array of residential subdivisions. The project is situated within the Central Puget Lowland ecoregion of the Puget Lowlands (Pater et al. 1998). The ecoregion extends from the eastern

shoreline of Puget Sound west across the Kitsap Peninsula to southwestern Mason County. The eastern portion of the ecoregion is heavily urbanized, containing Seattle, Tacoma, Olympia, Everett, and smaller cities along the coast of Puget Sound. The western portion contains dense forests and fewer inhabitants. Well-drained, gravelly soils are common across the ecoregion.

#### 2.2.1 Geomorphology

The landscape of western Washington is a product of crustal deformation initiated by the Cascadia subduction zone; repeated glacial scouring and deposition; landslides, erosion, and deposition; and Holocene human activity. The project is located within the Puget Trough physiographic province, which extends from the Canadian border to the Willamette Valley in Oregon (Franklin and Dyrness 1988). During the late Pleistocene (110,000 to 12,000 years BP), much of the Pacific Northwest was scoured by repeated advances and retreats of the Cordilleran Ice Sheet (Kruckeberg 1991; Thorson 1980; Troost and Booth 2008). The northern half of the Puget Trough was formed by these glacial events, as moving ice up to thousands of feet thick sculpted a series of north-south trending valleys within a wide basin between the Coast and Cascade Ranges (Booth 1994; McKee 1972).

The ice sheet's Puget Lobe most recently advanced during the Vashon Stade of the Fraser glaciation. Glacial ice crossed the Canadian border approximately 18,700 years BP, reached Seattle 17,600 years BP, and achieved its maximum extent near Tenino 16,950 years BP. The onset of climatic warming caused the ice sheet to rapidly retreat. The Puget Lobe reached Seattle by 16,500 years BP and northern Puget Sound 500 years later (Booth et al. 2004; Borden and Troost 2001; Porter and Swanson 1998). As the glacier receded, meltwater became impounded behind the ice, forming a series of meltwater channels that flowed across a broad outwash plain that encompassed much of present-day southern Puget Sound. Glacial meltwater ponded to form a series of proglacial lakes. These included Glacial Lake Puyallup in the upper Puyallup and Carbon River drainages, Glacial Lake Hood in southwestern Hood Canal, and early Glacial Lake Russell in southern Puget Sound. As ice retreat continued, Glacial Lake Puyallup and other lakes merged to form an expanded Glacial Lake Russell, which occupied much of the southern Puget Sound basin and drained into the Pacific Ocean via the Black Lake spillway and the Chehalis River. Additional lakes later merged with Glacial Lake Russel, forming Glacial Lake Bretz. At its maximum extent, the lake spanned most of central and southern Puget Sound from the southern margin of Whidbey Island to Olympia. The lake drained northward along the Leland Creek spillway, which carried meltwater into Discovery Bay. Once the Puget Lobe passed the Strait of Juan de Fuca 16,000 years BP, marine waters were reintroduced into what is now Puget Sound (Bretz 1913; Collins and Montgomery 2011; Thorson 1989; Waitt and Thorson 1983; Washington State Department of Natural Resources [WA DNR] 2022a).

Large quantities of till, outwash, and ice-contact sediment were deposited throughout the region during glacial retreat and immediate postglacial periods. Active deposition during the Holocene was confined to river valleys and the base of steep slopes. Water, sediment, and organic matter accumulated in scoured depressions, forming lakes, wetlands, and alluvial lowlands. Upland areas experienced minimal postglacial deposition. They continue to be composed predominately of compacted glacial drift interspersed by small lakes and peat bogs occupying surface depressions created during glacial retreat (Booth 1994; Booth et al. 2003).

Isostatic rebound, global sea level change, and tectonic activity also shaped the Puget Trough during the Holocene. The retreat of glacial ice caused the landscape to rise, leading to lower sea levels. Rebound was largely complete 1000 years after glacial retreat (Dethier et al. 1995; James et al. 2000; Thorson 1981, 1989; Troost and Booth 2008). Sea levels began to rise 8000 years BP, reaching their current levels between 5000- and 1000-years BP (Eronen et al. 1987). Stratigraphic markers of subduction-thrust earthquakes and associated uplift, subsidence, and deformation have been observed at multiple locations around Puget Sound and along the Washington coast. The east-west aligned Seattle Fault Zone extends 43 miles across central Puget Sound between Fall City and Hood Canal (Nelson et al. 2002). Approximately 1100 years BP, an earthquake originating at the fault dramatically reshaped the local landscape. Areas north of the fault zone subsided at least three feet; areas south of the fault were uplifted up to 23 feet (Atwater and Moore 1992; Bucknam et al. 1992). Accounts of seismic events along the Seattle Fault Zone are preserved in Tribes' oral histories (Ludwin et al. 2005), and evidence of sudden landscape change has been identified at local archaeological sites (e.g., Daugherty 1993; Troost and Stein 1995).

The geomorphology of the vicinity of the project location has been heavily influenced by aforementioned glacial and pre-glacial processes. As ice advanced during the Vashon Stade, meltwater built broad outwash plains across much of this area. Sediment was also deposited in ponds and lakes when glaciers blocked drainage. As the glacier advanced, it deposited coarser sediments on top of the pre-existing finer ones, creating a vertical pattern of deposition which grows finer with depth. Glacial and fluvial channels cut into these deposits, exposing both the advance outwash and layers of till deposited by the glaciers themselves. As the ice began to retreat, meltwater deposited recessional outwash sediments at the margins of the glacier, either leaving sediment on top of the till or eroding through the till to deposit directly on the advance outwash. This recessional outwash typically fines upward, and is thinner than the advance outwash. This meltwater, along with Holocene fluvial activity, are responsible for some of the north-south valley formation found in the vicinity of the project, including the extensive alluvial plain formed by the Sammamish River to the east. Holocene deposition is largely limited to alluvial activity from rivers and streams, erosion along the steep slopes which make up this area, and landslides (Minard 1983).

#### 2.2.2 Surface Geology

At 1:24,000-scale, three surface geologic units are mapped within the project location (Figure 8; Minard 1983; WA DNR 2023). Work Areas A, B, D, and the western segment of E are mapped as Qvt, Fraser-age Vashon Stade glacial till. This is a non-sorted mixture of clay, silt, sand, pebbles, cobbles, and boulders in variable amounts. It is generally quite sandy, though it can locally contain significant clay deposits. Its overall poor sorting reflects the mixing of materials by ice, which deposited the till directly as it advanced over an eroded, irregular surface of older materials. The till is typically very compact. The eastern segment of Work Area E is mapped as Qva, advance Vashon Drift outwash. This typically consists of a thick section of clean, pebbly sand with increasing gravel concentration in areas. The sediments typically coarsen upward due to local channel deposits and proximity to advancing ice. Finally, Work Area C is mapped as Qtb, transitional beds of the Fraser and pre-Fraser Glaciations. These are nonglacial and glacial deposits beneath sand associated with Vashon advance outwash. Deposits mostly consist of massive to bedded (thick, thin, and laminae) medium-gray to dark-gray clay, silt, and fine to very fine sand. Peaty sand and gravel may be present in lower elevations.

#### 2.2.3 Soils

Two soil units are mapped at this location (Figure 9; NRCS 2023; Snyder et al. 1973). Work Areas A, D, E, and the western two-thirds of B are mapped as Alderwood gravelly sandy loam, 15 to 30 percent slopes. This forms on ridges and hills out of glacial drift and/or glacial outwash over dense glaciomarine deposits. A typical soil profile for this area starts with 18 centimeters (-cm; seven inches) of a very dark brown gravelly sandy loam A horizon. Beneath this are three dark brown to gray-brown B horizons of very gravelly sandy loam to 89 cm (35 inches), followed by two cemented gray-brown very gravelly sandy loam C horizons to 150 cm (60 inches). The remainder of Work Area B and Work Area C are mapped as Kitsap silt loam, two to eight percent slopes. This forms on terraces out of lacustrine deposits with a minor amount of volcanic ash. It consists of three horizons. The first is a very dark brown silt loam B horizon to 61 cm (24 inches). The C horizon is a stratified olive-gray silt to silty clay loam to 150 cm (60 inches).





Figure 9. Mapped soils at the project location (NRCS 2023).

#### 2.3 Paleoclimate and Vegetation

The paleoclimate of the Pacific Northwest during the late Pleistocene and Holocene is defined by four periods, which exhibit general trends based on variations in temperature and moisture (Kopperl et al. 2016:37-38).

- o 17,000 to 13,000 years BP: the region was much cooler and drier compared to the present.
- 13,000 to 7000 years BP: the retreat of glacial ice and increased solar radiation led to higher temperatures, less precipitation, colder winters, and more severe summer droughts compared to the present.
- o 7000 to 5000 years BP: cooler, moister conditions returned to the region, with temperature ranges similar to the present. The current maritime climate regime of the Puget Sound region was fully established by the end of this period.
- 5000 years BP to present: climatic conditions have undergone short-term fluctuations such as the Little Ice Age (500 to 100 years BP) and the Medieval Climatic Anomaly (1100 to 700 years BP).

Regional fluctuations in temperature and moisture have supported different plant communities through time. Following glacial recession and meltwater subsidence, landforms stabilized and vegetation began to return. Newly exposed soils were first colonized by lodgepole pine (*Pinus contorta*), Sitka spruce (*Picea sitchensis*), and western hemlock (*Tsuga heterophylla*). As temperatures rose between 12,000 and 10,000 years BP, trees advanced to higher elevations while lowland forests became dominated by Douglas fir, red alder (*Alnus rubra*), and bracken fern (*Pteridium aquilinum*). These patterns continued into the early and middle Holocene. Present-day vegetation communities emerged after 6000 years BP. Western redcedar (*Thuja plicata*) and western hemlock became important components of mid-low elevation forests while Alaska cedar (*Cupressus nootkatensis*), mountain hemlock (*Tsuga mertensiana*), and silver fir (*Abies amabilis*) emerged at cooler, moister higher elevations.

Today, the project location is situated within western Washington's western hemlock vegetation zone, which extends south from British Columbia through the Olympic Peninsula, Coast Ranges, Puget Trough, and Cascade physiographic provinces. The zone's wet, mild, maritime climate supports diverse plant taxa. In the Puget Lowlands, vegetation communities commonly consist of western hemlock, western redcedar, Douglas fir, vine maple (*Acer circinatum*), salal (*Gaultheria shallon*), Oregon grape (*Mahonia aquifolium*), ocean spray (*Holodiscus discolor*), ferns (especially *Pteridium aquilinum*), brambles (*Rubus* sp.), and huckleberry (Vaccinium sp.) (Franklin and Dyrness 1988:72-74.

#### 2.4 Archaeological Context

#### 2.4.1 Western Washington Archaeology

Thousands of years of human occupation in western Washington have been summarized in a number of archaeological, ethnographic, and historical investigations over the past several decades. These studies provide regional context for evaluating the potential of archaeological deposits at the project location (e.g., Ames and Maschner 1999; Carlson 1990; Greengo 1983; Kopperl et al. 2016; Larson and Lewarch 1995; Nelson 1990).

Human history in western Washington extends to at least 14,000 years BP, a period corresponding with the most recent retreat of glacial ice in the region. Over the next six millennia, Native peoples lived in small, mobile groups that moved seasonally between productive hunting, fishing, and gathering locations. Archaeological evidence dating to immediate postglacial periods is limited to isolated projectile points (Meltzer and Dunnell 1987). Sites dated to the early Holocene generally consist of small resource processing camps. Late Pleistocene and early Holocene sites have been identified on upland drift plains, landforms that experienced little deposition in subsequent millennia. Habitation sites and other site types may have existed in lowland areas and along marine shorelines, but they have likely been destroyed by alluvial erosion and inundated by sea level rise, respectively (Kopperl et al. 2016:114-115). One exception is the Bear Creek Site (45KI839) near Lake Sammamish, which contained concave-based and stemmed projectile points situated below peat deposits dated to approximately 11,000 years BP (Kopperl et al. 2015).

Middle and late Holocene sites are better represented in Washington's archaeological record due to the stabilization of sea levels and, in recent millennia, regional population increases. During the middle Holocene, roughly 8000 to 3000 years BP, Native peoples established a broader range of residential and resource procurement site types and sizes. Middle Holocene sites have been identified on upland glacial landforms, in lowland river valleys, and along marine shorelines. Lithic assemblages consisting of chipped flake tools and large, leaf-shaped and stemmed points fashioned from coarse-grained raw materials are present at sites predating approximately 5000 years BP. After this period, lithic assemblages exhibit greater variation in form and raw material. Harvest of and occupation near littoral resourcesactivities that often produced sizable shell middens-emerged approximately 4500 years BP. The expansion in site type and size during the middle Holocene coincided with decreased mobility as Native groups developed specialized adaptations to local environments. Middle Holocene archaeological deposits were identified at the West Point Site (45KI428/429) near Discovery Park in Seattle. The site contained large quantities of faunal remains, stone projectile points, and shell and stone beads. The presence of fish, shellfish, bird, and mammal remains pointed to year-round utilization as Native peoples took advantage of the site's sheltered bluff and abundant nearby resources (Larson and Lewarch 1995). Other

notable middle Holocene sites include the Marymoor Site (45KI9) near the confluence of Bear Creek and the Sammamish River (Greengo and Houston 1970) and the DuPont Southwest Site (45PI72) along the Puget Sound shoreline in DuPont (Wessen 1989).

Middle Holocene patterns intensified during the late Holocene. After around 3000 years BP, the archaeological record is characterized by diverse site and artifact types located in a range of environments. Semi-permanent winter village sites appear for the first time. Villages contained large shed- or gable-roofed plank houses built along marine shorelines and major waterways. During the non-winter months, Native peoples established single- and multipleresource acquisition camps in lowland and upland areas. They harvested an array of plant and animal foods, and some sites, especially large coastal shell middens, exhibit evidence of intensive collection of resources such as salmon and shellfish. Lithic assemblages are characterized by local and imported raw material fashioned into chipped and ground tools, ground slate knives, and generally small, triangular projectile points. Organic materials such as basketry, wood and bone tools, and structural elements from this period are more likely to preserved, both in sealed storage pits and in submerged anaerobic sites. Notable late Holocene archaeological sites in western Washington include the Mellen Site (45LE125) near Centralia (Kopperl et al. 2014), Ozette (45CA24) on the Olympic Peninsula (Samuels 1994), Cathlapotle (45CL1) along the Columbia River near Ridgefield (Ames et al. 1999), late components of the West Point Site (45KI428/429) (Larson and Lewarch 1995), and Old Man House (45KP2) near Suquamish (Schalk and Rhode 1985).

The arrival of Euro-Americans and other newcomers in the late eighteenth century marked the beginning of the colonial period. The establishment of the Pacific fur trade and later the transformation of Washington and Oregon into U.S. settler colonies upended regional demography and ecology. Beginning around 1850, Native people and non-Native newcomers established new archaeological site types, including forts, logging camps, industrial areas, and urban centers. Materials and structures associated with these sites dominate the archaeological record of the late nineteenth and twentieth centuries. Notable sites dating to the colonial period include Fort Vancouver (45CL163) along the Columbia River (Wilson 2018) and the Dearborn South Tideland Site (45KI924) in downtown Seattle (Schneyder et al. 2011).

#### 2.4.2 King County Chronology

Kopperl et al. (2016) forwarded a five-part archaeological chronologic sequence for King County based on existing cultural history, selectionist, and evolutionary ecological studies of western Washington. They also developed an archaeological resource classification system that distinguishes archaeological materials by activity association (residential activity, nonresidential activity, other), task intensity (multi-task, limited-task, no task), and site type (base camp, specific-resource field camp, rock art, etc.) (Kopperl et al. 2016:100). Transitions between each stage, or Analytic Period (AP), in their sequence follow changes in the geological, paleobotanical, and archaeological record, including shifting proportions of archaeological resources. Available data point to an increase in the number and diversity of archaeological resources through time. Earlier periods are characterized by limited-task site types such as specific-resource procurement/processing sites and specific-resource field camps. Later periods are characterized by residential, multi-task site types such as villages and base camps. The chronological sequence can be summarized as follows (Kopperl et al. 2016:112-121):

- Analytic Period 1 (14,000 years BP to 12,000 years BP) was a period of relative postglacial environmental stability in western Washington. During this period, Native peoples entered western Washington following the retreat of the Cordilleran Ice Sheet. Archaeological evidence from this period is limited to isolated projectile point finds.
- 2) Analytic Period 2 (12,000 years BP to 8000 years BP) is characterized by specific-resource field camps and other non-residential processing sites. Residential camps, while not currently identified, may be located on now-submerged shorelines and/or buried alluvial floodplains.
- 3) Analytic Period 3 (8000 years BP to 5000 years BP) features a greater diversity of site types, including specific-resource field camps, multiple-resource field camps, and base camps. Documented archaeological sites are located in a range of environments, attesting to the increasing sophistication of Native peoples' subsistence and settlement practices.
- 4) Analytic Period 4 (5000 years BP to 2500 years BP) exhibits a sizable increase in the number and diversity of archaeological sites, a shift attributed to regional population increases, diversification of land use strategies, and better preservation of archaeological materials. Sites situated on the marine littoral appear during this period.
- 5) Analytic Period 5 (2500 years BP to 200 years BP) includes the greatest number of documented archaeological sites. Village sites appear during this period, potentially reflecting a shift toward more sedentary settlement patterns. Other site types reveal extensive use of a variety of environments and intensive harvest of particular resources such as anadromous salmon runs and shellfish beds. The end of this period coincides with the arrival of Euro-American traders and explorers.

#### 2.5 Native Peoples

The project is located within the ancestral homelands of Southern Lushootseed-speaking Scabábš, or "meander dwellers," who lived in the area between Lake Washington and Lake Sammamish and along the Sammamish River (Suttles and Lane 1990). The Scabábš, or Sammamish, maintained close relationships with Duwamish groups around Lake Washington and Snoqualmie groups to the east (Gibbs 1877:179; Haeberlin and Gunther 1930; Smith 1940:17; Spier 1936:34). According to Nancy Sackman at the Duwamish Tribe, Duwamish peoples were also present in this area (Sackman, pers. comm., January 31, 2023).

During the nineteenth century, and for centuries prior, the lifeways of these groups and their neighbors featured seasonal movements to different settlements and resource gathering locations. During the spring, summer, and fall families travelled, primarily via canoe, to resource gathering camps situated in a number of environmental zones. At these camps, they assembled temporary dwellings consisting of gabled, pole-framed structures covered in cattail mats. Native groups developed landscape management strategies such as prescribed burning and tending of important plants to enhance the productivity of particular habitats. They used seines, gill nets, and weirs to catch salmon and other fish; collected shellfish along shorelines; hunted birds and terrestrial mammals such as elk and deer, especially in inland areas; and gathered berries, roots, and other plants. Harvested resources were roasted, dried, and stored at villages for consumption during the leaner winter months or processed for manufacture of clothing, medicines, baskets, and tools (Haeberlin and Gunther 1930; Miller 1999; Smith 1940; Suttles and Lane 1990; Tweddell 1974).

Socializing was also an important summer activity. Native groups from across central and southern Puget Sound met at productive clamming and berry picking areas to gather resources and formalize economic and social ties via marriage and exchange. Meeting areas were located at Point Elliott in Mukilteo, Redondo Beach in Des Moines, on Vashon Island, and at other locations (Haeberlin and Gunther 1930; Rinck and Boggs 2010:10; Smith 1940:26-27).

As fall turned to winter, families relocated to winter villages. One Duwamish or associated village, known as *Tabtabi'ukh*, was located along Juanita Beach, near the mouth of Juanita Creek, likely within 0.25 mile of the project location (Roedel et al. 2003; Sackman, pers. comm., January 31, 2023). The primary Scabábš village was located at the mouth of the Sammamish River. Other villages were located at Mercer Slough, at the northern end of Lake Washington, and along the Sammamish River (Boswell et al. 2011; Kopperl et al. 2016:59-60; Smith 1940:17; Waterman 2001:46, 95). Villages usually contained two to four plank houses, each of which housed multiple families, and other structures. Plank houses measured up to several hundred feet in length and were fashioned from split cedar planks and carved house posts, with mats used for insulation. They contained multiple interior hearths, sleeping platforms, and extensive storage facilities. Winter was a time for ceremonial activities and strengthening relationships within and between village communities. Through these relationships, Native people maintained complex and often fluid group affiliations

rooted in kinship, language, and economic lifeways (Haeberlin and Gunther 1930; Suttles and Lane 1990).

The project location is part of a storied landscape. The names given to rivers, mountains, food gathering areas, and other geographic markers encapsulate the creation and ordering of the world, stories for proper behavior toward human and non-human relations, and Native peoples' millennia-old and ongoing histories. During the early twentieth century, ethnographers recorded hundreds of named places around Puget Sound. This collection is far from complete—the lands and waters of Puget Sound have been known by many thousands of names through time—and many of the translations offered by ethnographers do not capture the full significance of these places to local Native peoples (Thrush 2017:209-214). Even so, recorded place names speak to the connections between Native peoples and their ancestral homelands as well as the nature of cultural resources that may be encountered during this assessment.

Waterman (2001:82-84) recorded several place names along the eastern shore of Lake Washington and in the vicinity of Juanita Bay. The closest of these was *TE'btub1* ("loamy place"), for a creek at Juanita Bay (presumably Juanita Creek) approximately 0.2 miles east of the project. Approximately 0.8 miles to the southeast was *Leqa'bt* ("paint"), or Nelson Point. This location was apparently mined for ochre. A total of eight named places can be found north of the project. These include:

- *Tce':tcubEd* (untranslated) for an open space near the present town of Juanita, 2.2 miles northwest of the project.
- *Li'lskůt* (untranslated), for a spot on the eastern shore of Lake Washington, south of  $q^3a$ 's and 2.6 miles to the northwest.
- o  $q^3a's$  ("gravel rattling down"), for North Point, 3.0 miles northwest of the project.
- *Xwi'alad*<sup>\*\*</sup> ("niggardly, scanty"), for a small promontory where it was difficult to catch fish, approximately 3.2 miles to the northwest.
- o Qwai'ted ("across"), for Peterson's Point, 3.4 miles to the north-northwest.
- o *sts!ap* ("crooked, meandering") for Squawk Slough, known as the Sammamish River. Originally crooked, it has since been dredged out and straightened for mill work. It was located 3.5 miles north-northwest of the project.
- *Cxa'tengwEs* ("where the lake becomes elongated"), for where the Sammamish River enters Lake Washington, 3.5 miles north-northwest of the project.
- TL3ahwa'd1s ("something growing or sprouting"), for an old village site on the north shore of Lake Washington, near where the Sammamish River enters, approximately 3.8 miles to the north-northwest.
Waterman (2001:90-91) further recorded an additional five named places south of the project:

- W1 equation W1 equation  $M^{a}$  (untranslated), for a beach north of Kirkland, 1.9 miles south-southeast of the project location.
- *Tse'xub* ("dripping water"), for a water channel on the hillside north of Kirkland and 2.1 miles south-southeast of the project.
- o *S-taLaL* (untranslated), for the site of Kirkland, 2.3 miles to the south-southeast.
- $Tc^3$ utsid ("mouth of Tc3u"), for the mouth of Northup Creek, 3.9 miles to the south of the project.
- Sl#Li'ŭqs ("three promontories"), for three promontories divided by narrow inlets: Hunts Point, Fairweather Point, and an unnamed third. They are approximately 3.7 miles to the south-southwest.

Knowledge of place names, village and resource gathering locations, and other lifeways continues to be passed down among contemporary Native peoples. Today, the descendants of Scabábš and Duwamish peoples and other original inhabitants of the Kirkland area are members of the Muckleshoot Tribe, Snoqualmie Tribe, Duwamish Tribe, Stillaguamish Tribe, and other Tribes.

# 2.6 Recent History

# 2.6.1 Colonization of Oregon Country

During the late eighteenth and early nineteenth centuries, Oregon Country, which encompassed the present-day Pacific Northwest, emerged as an epicenter of British and U.S. imperial activities. In May 1792, the Vancouver Expedition, led by George Vancouver, entered Puget Sound. The expedition was tasked with exploring whether the Strait of Juan de Fuca represented the western extent of the fabled Northwest Passage, which would facilitate water transport across North America. After dropping anchor between Bainbridge and Blake Islands, Vancouver dispatched a small crew led by Lieutenant Peter Puget to survey the southern sound. The expedition named several geographical features—including Mount Rainier, Hood Canal, and Whidbey Island—after crew members and British naval officers (Crowley 2003a; Morgan 2018:3-23).

In 1833, Britain's Hudson's Bay Company (HBC) established Puget Sound's first Euro-American trading post, Fort Nisqually. The fort was situated halfway between HBC's Fort Vancouver to the south and Fort Langley to the north, and the local prairie was seen as a promising fur-gathering and agricultural area (Bagley 1915; Carpenter 1986:24-25, 36). In addition to economic aims, the fort was intended to strengthen British claims to the region and discourage U.S. settlement. The fort became home to a diverse population of HBC employees who established trading relationships with local Native groups. As the number of fur-bearing animals dwindled, the fort's economic emphasis shifted to agriculture and husbandry. The Puget Sound Agricultural Company (PSAC) was established in 1838 as an HBC subsidiary to oversee cattle ranching at the fort and raise wheat, barley, oat, potato, and peas at the 4,000-acre Cowlitz Farm near present-day Toledo (Morgan 2018:50-53; Wilma 2005).

In May 1841, the United States Exploring Expedition entered Puget Sound. Led by Charles Wilkes, the expedition spent four years producing detailed surveys of the Antarctic coast, islands in the south and central Pacific, and the Pacific Northwest. The expedition's naturalists also collected zoological, botanical, and geological specimens and material culture from numerous Indigenous peoples. In the Pacific Northwest, these scientific aims were pursued alongside a larger geopolitical goal: assess the region's economic potential in the hopes of tilting imperial control toward the United States (Walker 2020). After meeting with HBC personnel at Fort Nisqually, the expedition set out to map the islands, harbor, and inlets of Puget Sound. In order to emphasize U.S. connection to the region, Wilkes named dozens of Puget Sound inlets, islands, and other areas after expedition officers and crewmembers. Many of these names, such as Elliott Bay, remain in use today (Crowley 2003b).

The Oregon Treaty of 1846 resolved the United Kingdom and United States' competing imperial claims in the Pacific Northwest. The treaty ceded land south of the 49th parallel to the United States. Oregon Territory (which included present-day Washington State) soon attracted interest as a site of economic potential, religious proselytization, and territorial expansion. In 1850, the federal government passed the Donation Land Act, which attracted settlers to the region with the promise of free land. The act allowed individuals to claim 320 acres and married couples to claim 640 acres provided they arrived before December 1850 and occupied the land for four consecutive years. The act was later extended so that settlers who arrived as late as 1855 could claim 160 acres (Boswell 2017:33). The act passed despite the fact that, in the absence of ratified treaties, the federal government did not hold title to the land it offered. The Donation Land Act transformed Oregon Territory into a settler colony, a form of territorial control that relies on the appropriation of Native land and the removal of Native peoples (Veracini 2011). As the Euro-American population grew, settlers came to see the continued presence of Native peoples as antithetical to the region's future.

During the first half of the nineteenth century, Native peoples across western Washington grappled with the impacts of foreign diseases, introduction of new plants and animals, land seizure, and other outcomes of Euro-American colonization. It was against this backdrop that Washington territorial governor and ex officio superintendent of Indian affairs Isaac Stevens negotiated treaties with Native groups. In January 1855, Native leaders representing Duwamish, Snohomish, Suquamish, Snoqualmie, and other groups from central and northern Puget Sound signed the Treaty of Point Elliott. The treaty ceded title to Native lands in exchange for small reservations and preservation of hunting and fishing rights. Later that year, the Puget Sound War erupted in part due to the asymmetrical terms of the 1854 Treaty of Medicine Creek negotiated with southern Puget Sound groups. After the conflict, government officials compelled Native people to relocate to the Tulalip, Port Madison, Muckleshoot, and other reservations. Some refused to relocate, taking up residence in urban and rural settings across the region. Others lived on reservations while maintaining relationships with important gathering places and other locations in their ancestral homelands (Harmon 1998; Miller and Blukis Onat 2004; Thrush 2017). Some Scabábš people moved to reservations, others remained in their ancestral homelands or relocated to the logging community of Monohon on Lake Sammamish (Ames et al. 2016:32).

## 2.6.2 History of Kirkland

The federal government's appropriation of Native land through treaties, combined with legislation such as the Donation Land Act of 1850, Land Act of 1820, and Homestead Act of 1862, paved the way for Euro-American settlement (Boswell 2017). Euro-American settlers began arriving in the Kirkland area in the 1870s. One of the earliest settler families in the area were the Hubbards. In fact, the area now known as Juanita was originally known as Hubbard or Hubbard's Landing, after said family (Roedel et al. 2003). Early travel routes in the project vicinity followed watercourses and trails such as those noted on GLO maps. Roads were later established across the uplands between Lake Washington, Lake Sammamish, and the Sammamish River (USGS 1895). The early economy of the Lake Washington area focused heavily on logging, and by 1900, all of the timber around Lake Washington had been logged (Roedel et al. 2003).

In 1888, the discovery of iron near Snoqualmie Pass led to the speculative construction of the Great Western Iron & Steel Company mill works at Forbes Lake and the creation of the Kirkland Land & Improvement Company, set to develop 5,000 acres of land between Lake Washington and Rose Hill, Juanita Slough, and the present-day Central Avenue (Harvey 1992). As part of the development, large areas were platted and construction began on five brick commercial buildings and several speculative houses, and it was hoped the town would become a boomtown centered on steel production. As such, planners reserved shoreline lots for later sale or development, constructing further inland in anticipation of increased land values. Unfortunately, the Panic of 1893 and associated economic depression dried up funding and the steel mill never came to fruition. While this caused an initial setback, Kirkland began to grow as an agricultural town, incorporating in 1905 and increasing in population after the Anderson Shipyard in Houghton was constructed following the completion of the Lake Washington Ship Canal in 1917 (ExploreKirlkand.com 2022; Harvey

1992). The expansion of the shipyard at the advent of WWI sharply expanded the population of Kirkland. The shipyard closed following the war.

Transportation improvements over the years greatly altered both the population and the type of resident living in Kirkland. The community was served by a ferry for many decades, operating 18 hours a day and allowing goods to reach market and willing Seattle workers to commute to a rural home (ExploreKirkland 2022; Stein 1998; Whitely 2003). The completion of floating bridges on Lake Washington in 1940 and the 1960s, and the construction of Interstate 405 starting in 1952, allowed for greater mobility and population growth. The City of Kirkland expanded in 1968 to include the community of Houghton and again in 1988 to include the communities of Juanita and Rose Hill. Today, Kirkland is part of Seattle's growing suburban Eastside.

# 2.7 Historical Records Search

Information about landscape change, land use, and property ownership at the project location during the nineteenth and twentieth centuries is preserved in historical county atlases, topographic maps, census records, and aerial photographs. The General Land Office (GLO) conducted early cadastral surveys to define or re-establish the boundaries and subdivisions of federal lands so that land patents could be issued to settlers. The GLO surveyed the project vicinity in 1859 and 1870 (Figure 10; GLO 1858, 1870). The only nearby cultural resource is a homestead associated with the Hubbard family, approximately 0.25 mile to the east. Creeks can be found to the east and west of the project, including what is presumably Juanita Creek 0.2 mile east. Beyond this, no other natural resources are noted nearby. Bureau of Land Management (BLM) records indicate that the project is on land patented by Martin W. Hubbard, one of the early settlers of Kirkland, in 1874 (BLM Serial/Accession No. WAOAA 068902; Document No. 4682; Authority: Sale-Cash Entry [3 Stat. 566]; 157.5 acres; BLM 2023).

County atlases, USGS maps, and aerial imagery provide information regarding project location land ownership and use during the 1900s and 2000s. One USGS 30' Snohomish quadrangle topographic map is available from 1895 (USGS 1895). County atlases available for this project include maps from the Anderson Map Company (Anderson 1907), the Kroll Map Company (Kroll 1912, 1926), the Metsker Map Company (Metsker 1936), and the Thomas Brothers Company (Thomas 1955). Overall, these maps show a pattern of minimal development prior to the 1920s to 1930s, at which point a small amount of development including construction of modern roads—occurred.

The USGS map shows no development at or near the project location, which is dominated by steep terrain. A few structures and some roads were noted in nearby Juanita to the east (Figure 11; USGS 1895). In 1907, the project location rested on land owned by Crawford and Conover. Most land in the area appeared to be owned by individual persons, though some companies were represented. A stream and a series of roads were present to the east, as was a parcel labeled "Waterfront to Kirkland" (Anderson 1907). Crawford and Conover still owned the land the project location rests on in 1912. Docks were built along the waterfront of Juanita Bay to the southeast, and additional roads were constructed within 0.5 miles east and northwest of the project (Kroll 1912). By 1926, Crawford and Conover still owned most of the land the project is on. The area around the shore of Juanita Bay to the southeast was labeled "Urania," and a road was present between there and the project, to the project's immediate southeast. Parcels in the area had, in general, become noticeably subdivided by this point (Kroll 1926). Major changes are noted by 1936. Significant, presumably residential subdivision occurred in the parcels around the project. In addition, several of the roads which form parts of the project location appear to have been constructed, though they are not labeled (Metsker 1936). By 1955, NE 116th St, NE 117th St, 118th Place, 116th Place, and 89th Ave NE were present (Thomas 1955).

Aerial imagery is available through NETR starting in 1936 (NETR 2023). They confirm that a period of initial development occurred by the 1930s. They also indicate that another one followed starting in the 1980s. In 1936, modern roads were present, as were a few residences, but the project location remained almost entirely forested and undeveloped. The area surrounding it was dominated by farms and orchards. By 1964, some clearing and development within the project location occurred, but it remained largely forested. More development was present along the shoreline of Juanita Bay to the southeast, as well as to the northeast, in the form of a residential subdivision. Starting in 1980, additional residences were constructed along NE 116th St and 117th St. By 1998, the land along 89th Place had been cleared and developed, and by 2002 the project location looked much as it does in the present day.



Figure 10. Composite of 1858 and 1870 GLO survey plats of the project vicinity, with the project location annotated in red (GLO 1858, 1870).



Figure 11. 1895 USGS 30' Snohomish quadrangle map of the project vicinity, with the project location annotated in red (USGS 1895)

# 2.8 Cultural Resources Database Review

A review of the WISAARD database identified cultural resource investigations, precontact and postcontact archaeological sites, register-listed historic properties, and historic built environment resources in the vicinity of the project. This review provides information about the nature and likelihood of cultural resources at the project location. A total of six cultural resource investigations, one archaeological site, and 643 historic built environment resources have been recorded within one mile of the project location. No cemeteries, register-listed properties, or Traditional Cultural Properties have been recorded in that area (DAHP 2023a).

# 2.8.1 Cultural Resources Investigations

A total of six cultural resource investigations have been conducted within one mile of the project location (Table 6). The six projects were associated with a mixture of utility and infrastructure improvements (Chambers and Amell 2014; LeTourneau 2006; Roedel et al. 2003), transportation improvements (Bush and Baxley 2021; Shaw and Hicks 2008), and architectural assessment (Stipe 2018). All involved some degree of subsurface investigation, ranging from shovel probing to monitoring of construction activity. Generally speaking, sediments encountered by archaeologists consisted of either fill or material consistent with underlying surface geology (e.g. alluvium, glacial outwash, and/or glacial till).

One pair of projects was conducted in close vicinity to the current one. They are a cultural resources assessment and subsequent monitoring report associated with improvements to the Juanita Bay pump station and force mains (LeTourneau 2006; Roedel et al. 2003). The first of these consisted of pedestrian survey and 15 shovel probes conducted in advance of the planned replacement of the Juanita Bay Pump Station and the potential upgrade of 1.8 miles of force mains associated with it (Roedel et al. 2003). Subsurface investigation focused on the staging area for the project, as the Pump Station itself had been the site of significant construction-related disturbance. The identified sediments consisted of dark brown silty sand above glacial outwash soils comprised of yellowish-brown sand with small gray silt inclusions and rounded cobbles and pebbles. No archaeological material was identified, though five historic building were noted. One building was recommended not eligible for historic registers, while authors recommended that the other four be evaluated by a qualified historian.

In 2006, archaeologists with BOAS, Inc. monitored eight days of construction activities at the project staging area (LeTourneau 2006). Construction activities were associated with a microtunnel access shaft, and included installation of sheet piling, boring, and general excavation within the access shaft. Sediments identified consisted of bluish-gray, dark grayish-brown, grayish-brown, and brownish-gray fine to medium sands, silts, and clays, interpreted as Holocene alluvium. They overlayed gray medium to coarse sands, interpreted as possible Vashon Stade outwash. No archaeological material was identified.

Reference (NADB)	Project / Report Title	Field Methodology	Distance from Project	Results
Roedel et al. 2003 (1342532)	Final Juanita Bay Pump Station and Force Mains Cultural Resources Overview and Assessment	10-m pedestrian survey, 15 shovel probes	915-ft E	None
LeTourneau 2006 (1348232)	Cultural Resources Monitoring of Microtunnel Access Shaft Excavations for King County's Juanita Bay Pump Station Replacement Project	Excavation, boring, and auger monitoring	915-ft E	None
Shaw and Hicks 2008 (1352413)	Archaeological Resources Assessment for the 100th Ave NE and 99th Place NE Sidewalks Improvement Project	<10-m pedestrian survey, 6 shovel probes	0.57-mi ESE	None
Chambers and Amell 2014 (1686378)	Juanita Creek Stream Bank Adjustment and Retaining Wall Replacement	Pedestrian survey, 5 shovel probes	1.0-mi NE	None
Stipe 2018 (1690795)	Juanita Park Bath House Historic Structures Assessment	Historic property inventory, 1 shovel probe	0.48-mi ESE	None
Bush and Baxley 2021 (1695674)	Archaeological Monitoring Letter Report: Intersection Modifications at 100th Ave NE and 124th St NE	Excavation monitoring	0.78-mi NE	None

Table 6. Cultural resources investigations completed within one mile of the project.

## 2.8.2 Archaeological Sites

One archaeological site has been recorded within one mile of the project location. Site 45KI1665 is a historic debris scatter or concentration identified 0.7 mile west of the project (Wolman 2022). The site consists of ca. 1930s to 1970s artifacts found from zero to up to 70 cm below surface in the Finn Hill area of Kirkland. Additional material may be present at deeper depths. The site has been determined not eligible for historic registers and will not be affected by project-related activity.

# 2.8.3 Historic Properties

No historic properties listed on the NRHP, Washington Heritage Register (WHR), King County Landmarks, or City of Kirkland Landmarks are located within one mile of the project. The closest register-listed property is the John George Kellet House (45KI612), approximately 1.33 miles southeast of the project (Harris and Garfield 1992). The Kellet House is a Late Victorian residence built in 1889 by the manager of the planned industrial community of Kirkland. It is listed on the WHR.

# 2.8.4 Historic Built Environment Resources

A total of 643 historic built environment resources have been recorded within one mile of the project location. Due to the density of said resources, only those located along streets included within the project location are considered here. A total of 14 such resources are recorded (Table 7). These resources consist entirely of domestic single-family residences whose construction dates range from 1922 to 1960. Two were constructed in the 1920s, six in the 1930s, four in the 1940s, one in the 1950s, and one in the 1960s. None have received a determination of eligibility, and none will be impacted by project-related activities.

Address (DAHP Property #)	Construction Dates	Historical Use	NRHP Status
9001 NE 116th St (673810)	1937	Domestic – Single Family House	No determination
8822 NE 117th Pl (656889)	1930	Domestic – Single Family House	No determination
8953 NE 116th Pl (652124)	1922	Domestic – Single Family House	No determination

Table 7. Inventoried historic built environment resources located along streets included within the project location.

Address (DAHP Property #)	Construction Dates	Historical Use	NRHP Status
11611 91st Pl NE (638231)	1934	Domestic – Single Family House	No determination
8839 NE 117th Pl (467648)	1939	Domestic – Single Family House	No determination
11636 91st Ln NE (455772)	1957	Domestic – Single Family House	No determination
8933 NE 117th Pl (420191)	1926	Domestic – Single Family House	No determination
9001 NE 116th Pl (405755)	1937	Domestic – Single Family House	No determination
9000 NE 116th Pl (367832)	1960	Domestic – Single Family House	No determination
8851 NE 116th Pl (367520)	1947	Domestic – Single Family House	No determination
9050 NE 117th Pl (296736)	1930	Domestic – Single Family House	No determination
9006 NE 116th Pl (298038)	1942	Domestic – Single Family House	No determination
11615 91st Ln NE (340640)	1942	Domestic – Single Family House	No determination
11630 91st Ln NE (293288)	1944	Domestic – Single Family House	No determination

## 2.8.5 Cemeteries

No recorded cemeteries or burial areas are located within one mile of the project. The closest recorded cemetery is 45KI634, located approximately 2.6 miles northwest of the project. This is the Saint Edwards Seminary Graveyard, formerly located within what is now Saint Edward State Park (DAHP 2023b).

# 2.8.6 Traditional Cultural Properties

No Traditional Cultural Properties (TCPs) listed on WISAARD are located within one mile of the project.

# 3. Archaeological Predictive Models

# 3.1 DAHP Statewide Predictive Model

The DAHP statewide predictive model uses environmental data associated with documented archaeological sites to identify areas at which unknown sites may be found (Kauhi and Markert 2009). Environmental categories included in the model are elevation, slope, aspect, distance to water, geology, soils, and landforms. The model contains five probability ranks: (1) very high risk, (2) high risk, (3) moderate risk, (4) moderately low risk, and (5) low risk. The model ranks the project location as low to moderate risk, with survey contingent upon project parameters (for low risk areas) to survey recommended (moderate risk). Work Areas A, D, and E are ranked low risk. Work Area B is ranked low risk to moderately low risk, with a small portion of the eastern end of NE 116th Pl ranked as moderate risk. Work Area C is ranked moderate risk.

# 3.2 King County Sensitivity Model

A county-specific archaeological sensitivity model was developed as a part of an archaeological context statement for King County (Kopperl et al. 2016:173-208). The model calculates archaeological sensitivity along two axes: sensitivity and preservation. The sensitivity axis combines slope, aspect, proximity to water, and other physical and biotic attributes to quantify a location's suitability for human occupation. The preservation axis draws on geophysical data to classify present-day landforms as stable, aggradational (i.e., depositional), or erosional, which has implications for the long-term preservation of archaeological materials. The model calculates archaeological sensitivity across five temporal periods to account for changes in King County climate, geomorphology, and vegetation regimes since the late Pleistocene. These periods correspond with the Analytic Periods (AP) discussed above. The model classifies the project as low sensitivity for archaeological sites dating to AP 1; moderate for sites dating to AP 2 and 3; and low for sites from AP 4 and 5. The project is classified as low to moderate sensitivity for archaeological sites in general.

# 4. Archaeological Expectations

This assessment combines the above cultural resources database review and predictive modeling results with information about local geomorphology, settlement patterns, and post-depositional processes to evaluate the possibility that archaeological deposits will be encountered at the project location. The Goat Hill SD Project encompasses approximately 3.2 acres in northwestern King County. It occurs primarily on the side slope of a glacially

formed terrace, though portions of it can also be found on an advance outwash plain. These landforms were formed by the advancement and retreat of glacial ice during and after the Fraser glaciation. Since then, non-anthropogenic Holocene-era changes to local geomorphology have largely been limited to erosions, landslides, and minor alluvial activity. This geological history is reflected in the mapped surface geology (Vashon Stade till, advance outwash, and Fraser to pre-Fraser glaciation transitional beds) and soil units (Alderwood gravelly sandy loam, Kitsap silt loam) at the project location. The terrain around the project, prior to development, appears to have been very steep, reducing its utility as a place of human habitation or activity. Furthermore, potentially significant changes to local geomorphology may have occurred as a result of the extensive development of the project location.

Review of ethnohistoric, historic, and archaeological datasets suggests that there is a low to moderate likelihood of archaeological material within the project location. The project is located in close proximity to several ethnohistorical named places, as well as one potential village site, found around Juanita Bay and Juanita Creek. The eastern shores of Lake Washington, close to where the project is located, have been an area of Indigenous activity for potentially thousands of years. At the same time, there are no precontact archaeological sites within one mile of the project. The only archaeological site present is a postcontact debris scatter, determined not eligible for historic registers, approximately 0.7 mile to the west. GLO maps of the area show no cultural features and few resources in the vicinity, save for a homestead belonging to an early settler. Historic maps of the area indicate that it was relatively undeveloped until the 1930s, but remained overall minimally developed and heavily forested until the 1980s. Finally, predictive models for this area rank it as a low to moderate likelihood of containing archaeological resources.

Given this, there is a low to moderate likelihood of precontact and Indigenous early postcontact archaeological sites and materials in the project location. Such material, if present, would most likely take the form of lithic material and features associated with resource acquisition. Lithic material could include debitage, tools (such as scrapers or projectile points), cores, and ground stone artifacts, most of which would be sourced from local materials. Features could include postholes, hearths, and occupation surfaces, and would likely be associated with charcoal and FMR deposits. Based on local geomorphology, any materials present are likely to be found in the near-surface deposits within the project and are not expected to be found at great depths. Furthermore, it is highly likely that, if such material were once present, it has since been disturbed or even removed in the course of mid- to late-20th century development.

The likelihood of non-Indigenous postcontact archaeology is low to moderate. Review of historical documents and aerial photographs indicate that little activity took place here prior

to the 1930s, and even then, the area was sparsely inhabited. Archaeological material deriving from this time period would most likely reflect logging, construction, or residential activities. It could include logging tools and debris, construction debris, architectural debris, and domestic artifacts (e.g. ceramics, vessel glass, clothing) associated with the mid- to late-20th century occupation of this area. As with precontact material, these materials are not likely to be found at great depths and may have been significantly impacted by post-depositional construction and development in this area.

# 5. Field Investigation

# 5.1 Field Data

Total area examined: The entire project location (~3.2 acres)

Areas not examined: None.

Dates of survey: February 23, 2023.

Fieldwork conducted by: David Carlson. Field notes are on file with CRC.

Weather and surface visibility: Weather conditions were lightly cloudy, with temperatures between 30 and 40 degrees Fahrenheit. Surface visibility ranged from zero to 100 percent, depending on overgrowth, though mineral soil visibility was zero percent due to extensive development throughout the project location.

# 5.2 Field Methodology

Field investigation consisted of surface and subsurface survey. Surface survey consisted of vehicular examination of the project location and pedestrian transects conducted along sidewalks or the sides of roads throughout it. The ROW on both sides of each street was examined. Evidence of prior construction or any other sources of ground-disturbing activities was photo-documented. Subsurface survey consisted of four cylindrical, 30- to 40- cm diameter (~16 inch) shovel probes and one 10-cm diameter auger probe excavated opportunistically within the project location. Probes were distributed as evenly as possible within and across planned work areas and in close proximity to planned ground disturbance, which will be largely restricted to the existing ROW. Shovel probes were to be dug to a depth of 100-cm below surface, at which point a 10-cm bucket auger was to be used. Probes were be excavated to 20-cm into intact glacial deposits or to the limits of the crew's ability to dig (up to 150-cm, barring obstruction). All excavated sediments were screened through 1/4-inch hardware mesh. Probe locations were recorded using GPS units (NAD 1983s UTM Zone 10 coordinates,  $\pm 3$  meters).

## 5.3 Investigation Results

## 5.3.1 Surface Survey

Surface survey was conducted to assess project conditions, document archaeological materials, and identify areas suitable for subsurface testing. The work areas typically consisted of single-lane roads bordered by steep slopes. All work areas evidenced considerable disturbance from development-related activities, including landscaping, utility installation, and the construction of retaining walls. Vegetation throughout this area consists of a mix of landscaped lawns, surfaces overgrown with ivy and Himalayan blackberry, and thickets of deciduous forest.

Work Area A consists of two segments, an eastern and a western segment. The eastern segment is a winding, paved single-lane road (NE 117th Pl) bordered to the northwest by a mix of heavily vegetated and developed, steep (45 to 90 degree) slopes (Figures 12 and 13) To the southeast are 60-to-90-degree vegetated slopes. The western segment of Work Area A is a long, slightly curved north-south road (90th Ave NE) whose southern end is the intersection of 90th Ave NE and NE 117th Pl. It rises in elevation from south to north (Figure 14). This portion of Work Area A is marked by significant development, including multiple retaining walls, paved surfaces, and utility installations. A cutbank was identified approximately halfway along the road (Figures 15 and 16). A relatively fresh, 60- to 90-cm high cut, it consisted first of a gray brown slightly silty fine sand with five to 10 percent very small to medium, subrounded to rounded pebbles to a depth of 30cm below surface. From there to the base was a brownish-gray to gray fine sand, with some medium sand and 30 to 40 percent very small to very large, subrounded to rounded pebbles. This second stratum was compact and showed signs of oxidation. This cut bank was consistent with the mapped soils (Alderwood gravelly sandy loam) for this area.

Work Area B also consisted of two segments, a northern and a southern one. The northern segment is a relatively straight, single-land road (NE 117th Pl) going downhill from northeast to southwest (Figure 17). The curved portion at its northeastern end is very steep, in excess of 30 degrees, while the remainder undulates a bit, ranging from relatively level to as much as 30 degrees in slope. Its northern boundary largely consists of a series of grassy, 60-degree-plus slopes and rock or concrete retaining walls. The southern boundary is disturbed ground comprised of compacted or semi-compacted gravels, asphalt, and concrete followed by more steep slopes. One cut bank was identified at the base of the curve on the northern end of this segment (Figures 18 and 19). It was at the base of a steep slope reinforced by landscaping fabric and appeared to be disturbed. The upper 13 cm of the cut was a gray-brown clayey silt with some fine sand. Beneath this to the road surface, an additional 28 cm lower, was a gray, brown, and gray-brown clayey silt with some fine sand. This second stratum had signs of oxidation and less than five percent small pebbles. While

not consistent with mapped soils for the area, it is consistent with mapped surface geology (Vashon Stade till), which is noted to potentially include considerable clay content.

The southern segment of Work Area B consisted of a single-lane road (NE 116th Pl) going downhill from northwest to southeast, with slopes ranging from minimal to 30 degrees (Figure 20). It is relatively straight, though it undulates towards its southeastern end. As with other work areas, the northern boundary consists of a mix of grassy surfaces, overgrowth and retaining walls, all very steep, while the southern boundary is marked by steep slopes and/or drops. One soil profile, exposed as a result of a small landslide, was identified in this segment (Figures 21 and 22). Sediments consisted of a gray brown or dark brown clayey silt with one to five percent gravels over a brownish-gray to gray-brown clayey, slightly fine sandy silt which showed signs of oxidation. It appeared to have between five and 10 percent gravels within it. As with the previous cutbank, this one reflects mapped surface geology (Vashon Stade till) for the area.

Work Area C consists of a two-lane road and T-intersection at 91st Lane NE and 116th Place NE (Figure 23). Unlike other work areas, this one is relatively level from east to west and only rises slightly from south to north. The entire work area is heavily developed from utilities, parking lots, and landscaping. Work Area D is a series of small private roads at the western end of Work Area B (Figure 24). It is bordered to the north by heavily landscaped lawns and to the south by a greater-than-60-degree drop, heavily vegetated, which leads to several residences below.

Finally, Work Area E consists of two segments, an eastern and a western half (Figures 25 and 26). The eastern segment (91st Lane NE) is relatively level north to south, but varies significantly east to west, as a steep side slope cuts through the middle of the work area. The slope is dense with blackberry bushes and ivy, and the remainder of the work area is either grassy lawn or pavement. Several mole mounds were identified in the grassy areas of this segment. The sediments they exposed consisted of a very dark gray-brown to black slightly silty fine sand with 20 to 30 percent very small to medium, subrounded to rounded pebbles. The western segment of Work Area E is an undulating road (NE 117th Pl) which connects to portions of the eastern half of Work Area A. It rises in elevation from east to west. As with other work areas, it is bordered to the north by heavily landscaped lawns, steep, overgrown slopes, and retaining walls, while the south consists of steep drops.

No archaeological sites or materials were observed during surface survey.



Figure 12. Overview of Work Area A, eastern segment, from northeast border. View to the southwest.



Figure 13. Work Area A, eastern segment, southern slope. View to the southwest.



Figure 14. Overview of Work Area A, western segment, from southern border. View to the north.



Figure 15. Profile of cutbank along western border of Work Area A, western segment.



Figure 16. Closeup of aforementioned cutbank, eastern profile.



Figure 17. Overview of Work Area B, northern segment, from northeastern portion just southwest of NE 118th Pl. View to the southwest.



Figure 18. Cutbank observed at the northeastern end of Work Area B, at the intersection of NE 117th and NE 118th Pl. View to the north.



Figure 19. Closeup of aforementioned cutbank, southern profile.



Figure 20. Overview of Work Area B, southern segment, from southwestern border. View to the northeast.



Figure 21. Overview of small landslide located in the center of Work Area A. View to the northeast.



Figure 22. Closeup of exposed soil along aforementioned landslide, southwestern profile.



Figure 23. Overview of Work Area C, from southern border. View is to the north.



Figure 24. Overview of Work Area D, from eastern border. View is to the west.



Figure 25. Overview of Work Area E, eastern segment, from center of segment. View is to the northeast.



Figure 26. Overview of Work Area E, western segment, from southeast border. View is to the northwest.

## 5.3.2 Subsurface Survey

Subsurface survey was achieved via the excavation of four shovel probes and one auger probe (Figure 27). Most of the project location was not amenable to excavation with hand tools, but five suitable locations were identified during surface survey. One auger probe and one shovel probe were excavated in Work Area B; one shovel probe in Work Area C; one in Work Area D; and one in Work Area E. No probes or augers were excavated in Work Area A. Individual probe and auger results are presented on Table 8 below.

Probe results varied based on work area but were consistent with mapped soil profiles and surface geology. In Work Areas A, B, and D, shovel probes contained fill over disturbed or graded, glacially-derived material consistent with mapped soil units (Alderwood gravelly sandy loam) and surface geology (Fraser age Vashon Stade till). Probe 1, conducted in a storm ditch which was planned to be replaced by piping, consisted of a dark gray slightly silty fine to medium sand with up to 15 percent very small to medium, subangular to rounded pebbles, and was interpreted as disturbed glacial parent material (C horizon; Figure 28). Probe 2 consisted entirely of interbedded dark brown, gray-brown, and dark gray-brown fill to 35 cm below surface, at which point a brownish-gray fine to medium, very compact sand appeared (Figure 29). This sand was likely the upper boundary of glacial parent material (C horizon). Probe 5 offered a glimpse of materials not graded during previous construction (Figure 30). The upper 20 cm was a black silty fine sand with 30 to 50 percent gravels and an

abrupt lower transition, interpreted as a disturbed A/B horizon derived from glacial material. Beneath this was a brownish-gray slightly silty fine sand with similar gravel content. Firmer than the material above, it appeared consistent with mapped, glacially derived parent material (C horizon).

Sediments encountered in Work Area C were consistent with mapped surface geology (Fraser to pre-Fraser glaciation transitional beds; Figure 31). They consisted of 20 cm of imported topsoil over 70 cm of increasingly less gravelly fill deposits. Beneath this, from 90-110 cm, was a mixture of fill deposits and black to very dark brown clayey silt and clayey, fine sandy silt with a moderate amount of small to large pebbles. This was interpreted as non-glacial and pre-glacial deposits originally laid down beneath Vashon advance outwash sand. Finally, sediments in Work Area E were largely consistent with the mapped surface geology of advance glacial outwash. Sediments consisted of 75 cm of gravelly fill over a gray silty clay with irregular inclusions of black clayey silt to 140 cm. This stratum had highly variable gravel content. Beneath it was a dark gray fine sand mottled red-brown from oxidation. The dark gray sand is consistent with the clean sands sometimes encountered in advance outwash. The thick stratum of gravelly clayey silt and silty clay likely represents glacial till—possibly disturbed—laid down over the advance outwash as glaciers advanced southward during the last glaciation.

No archaeological material was identified during subsurface survey. The only material culture present is nondiagnostic trash, found in fill deposits, and likely associated with the late twentieth century development of the area.



Figure 27. Individual shovel probe locations within project location.

Probe #	Probe Type	Probe Location (UTMs)	Stratigraphic Description (depths are centimeters below surface [cmbs])	Cultural Materials (cmbs)
1	Auger	5283842 N 558326 E	0-20: Dark gray slightly silty fine to medium sand; 5-15% very small to medium pebbles, subangular to rounded; weak to friable; 1% rootlets; terminated at 20cm due to rock	0-20: Painted wood (1)
	Area B	(disturbed glacial till, parent material)		
		In storm ditch which will be replaced by piping	Terminated at 20cm due to rock obstruction. Completely submersed in water.	
2	Shovel	5283719 N	0-35: Interbedded dark brown, gray-brown,	10-30: terra
		558191 E	and dark gray slightly silty fine to medium sand; >50% very small to small pebbles, subangular to angular; firm to compact;	cotta fragment (1)
		Area D	cut/abrupt lower transition; base is brownish-gray fine to medium sand, compact, possible C horizon (fill)	
			Terminated at 35cm due to compaction.	

Table 8. Individual shovel and auger probe results.

Probe #	Probe Type	Probe Location (UTMs)	Stratigraphic Description (depths are centimeters below surface [cmbs])	Cultural Materials (cmbs)
3 Shovel 5283861 N	0-20: Gray and black silty fine sand; 5-15%	20-30: White		
		558557 Every small to medium pebbles, subroun to rounded; occasional rootlet; cut lowe transition, marked with landscaping tar and imported topsoil)	very small to medium pebbles, subrounded to rounded; occasional rootlet; cut lower	plastic fragments in north wall 60-80:
			transition, marked with landscaping tarp (fill and imported topsoil)	
20-60: Br medium, medium p friable; oo gradual to	20-60: Brown-gray slightly silty fine, some medium, sand; 30-50% very small to medium pebbles, angular to subrounded; friable; occasional <1cm root and rootlet; gradual to diffuse lower transition (fill)	Possible brick fragment (1)		
			60-90: Brown-gray fine sand; 15-30% very small to medium pebbles, angular to subrounded; friable; large root in north half of unit at 80cm, augered below; abrupt to gradual lower transition (fill)	
			90-110: Mix of Stratum III and black to very dark gray-brown clayey silt and clayey, fine sandy silt; 5-15% very small to large pebbles, subangular to rounded; friable to firm; occasional root (disturbed pre-glacial sediments)	
			Terminated at 110cm due to obstruction.	
4	Shovel	5284017 N	0-75: Very dark gray silty fine sand, some	0-20: Asphalt
5585 Area	558545 E	subangular to rounded, heavy with medium	20-30: Shell	
	Ar	Area E	pebbles; friable; occasional rootlet; abrupt lower transition (fill)	conglomerate in E wall (4)
		75-140: Gray silty clay with irregular inclusions of black clayey silt; 5-30% very small to large pebbles, subrounded to rounded: firm: augered at 70cm due to	20-40: plastic (2), aqua glass (1)	
density; wa lacustrine o			density; water at 100cm (post-glacial lacustrine or alluvium)	40-90: plastic (3)
			140-165: Dark gray mottled with dark red- brown fine sand; weak; wet (glacial outwash)	

Probe #	Probe Type	Probe Location (UTMs)	Stratigraphic Description (depths are centimeters below surface [cmbs])	Cultural Materials (cmbs)		
5 Sł	Shovel5283832 N0-20: Black slightly silty fine sand; 30-50 very small to large pebbles, subangular to rounded; friable; abrupt lower transition rootlets and <1cm roots (glacial till-der disturbed A/B horizon)Area B20-40: Brown-gray slightly silty fine san some medium; 30-50% very small to lar pebbles, subangular to rounded; firm (g till-derived C horizon)	5283832 N	0-20: Black slightly silty fine sand; 30-50%	None		
		rounded; friable; abrupt lower transition; 1% rootlets and <1cm roots (glacial till-derived disturbed A/B horizon)				
						20-40: Brown-gray slightly silty fine sand, some medium; 30-50% very small to large pebbles, subangular to rounded; firm (glacial till-derived C horizon)



Figure 28. Sediments encountered in Probe 1, overview.



Figure 29. Sediments encountered in Probe 2, west wall profile.



Figure 30. Sediments encountered in Probe 5, north wall profile.



Figure 31. Sediments encountered in Probe 3, north wall profile.

# 6. Findings and Recommendations

During background research and field investigation, no archaeological sites or historic structures were identified within the project.

# 6.1 Conclusion

This assessment was conducted to determine potential effects of this project on cultural resources. Review of historical, archaeological, and environmental datasets and the results of field investigation suggest that project activities are unlikely to encounter archaeological materials. No precontact archaeological sites were identified within one mile of the project location, and the only postcontact site present has been deemed not eligible for historic registers. There are no TCPs, cemeteries, or heritage register-listed sites or structures recorded within one mile of the project location. Review of historic maps identified no major cultural or natural resources in the vicinity of the project, and historic aerial imagery suggests that the project location saw bursts of development in the 1930s and 1980s, both of which are likely to have significantly disturbed any preexisting archaeological material. State and county predictive models indicate that the project has a low to moderate sensitivity for archaeological material.

Based upon the results of background research, the likelihood of finding archaeological material at the project location was considered to be low to moderate. Subsequently, no

archaeological material or historic structures were encountered during field investigations at the project location. Sediments were consistent with mapped surface geology, albeit with signs of heavy disturbance, including cutting and filling, likely originating from mid- to late-20th century development. Based on local history, geomorphology, and the results of field investigation, the likelihood of project-related activities encountering archaeological material is considered low. No additional cultural resources investigation is recommended at this time.

If project activities result in the discovery of archaeological materials, project staff should halt work in the immediate area and contact the technical staff at DAHP and representatives of identified area Tribes, as outlined in the inadvertent discovery protocol described below (Appendix C). Work should be stopped until further investigation and appropriate consultation have concluded. In the event that human remains are inadvertently revealed, project staff should immediately stop work, cover, and secure the remains against further disturbance, and contact law enforcement personnel, consistent with the provisions set forth in RCW 27.44.055 and RCW 68.60.055.

## 7. Limitations of this Assessment

No cultural resources study can assess with complete certainty whether archaeological sites, historic properties, or traditional cultural properties exist at a project location. The information presented in this report is based on professional opinions derived from CRC's analysis and interpretation of available documents, records, literature, and information identified in this report and on field investigation and observations. The conclusions and recommendations presented apply to current and reasonably foreseeable project conditions. The data, conclusions, and interpretations in this report should not be construed as a warranty of subsurface conditions. They do not apply to site changes of which CRC is not aware and has not had the opportunity to evaluate.

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Appendix A. Goat Hill Concepts and Alternatives Summary Matrix

Goat Hill Conveyance Improvements Concepts and Alternatives Summary Matrix CIPH Figure C1.1 Page 1 of 7. ndition of the subgrade 90° Avenue NE (i.e., abandaried alvert) and at pavenent widening at east side of NE 117° Place NE to This concept anticipates the remarkal and replacement of the HMA parament section over the length of 90°. Avenue NE based on the visual condition of the subgrad and HMA section to correct the highly variable. Widening the pavement to a minimum 16-foot width is proposed to improve runoff collection capabilities, sight lines, and safety in the neighborhood longitudinal grades and cross slopes to improve surface geotechnical engineer at upstream end of Stream A at This work area encompasses approximately 650 lineal feet (LF) of 90" Avenue NE north of and including the intersection with NE 117" Place along with that portion of NE 117" Place approximately 200 LF southwest and 430 LF northeast of the intersection. The area is comprised of a patchwork of historically and recently installed buried storm pipes, structures, franchise vilities, and surface treatments (i.e., asphalt, concrete, gravel drives). These existing facilities/systems are mostly located within the City's rights-of-way, bur some extend onto private property. The existing pavement surface along the 90<sup>th</sup> Avenue NE corridor (where it exists) is in poor Previous studies and the brief scope provided with the copital improvement project (CIP) budget summary for this area recommend reconstruction of an existing dirich along the west side of the road (north end of streen), abondonment of a cuivert crossing, installation of new conch basins and below-grade pipes, and roadway resurtacing with the addition of a thickened edge within this project area. Since then, there have been a number of single-family residences built or actively under construction whose permits include frontage and storm drainage improvements. The timing of the completion of those inprovements is uncertain, but where work was active of single-family residences built or actively under construction whose permits include frontage and storm drainage improvements. The timing of the completion of those inprovements is uncertain, but where work was active safety, performance, and maintenance of the road are also presented for the City's consideration. These incremental and complementary roadway improvements can be installed with greater efficiency and lower overall cost when completed concurrent with this project, and performing the work now avoids future impacts to the neighborhood. Gity Pre-approved Plans Policy G-12 requires that development improve individual lof frontages with a minimum parement width of 20 feet. Right-of-way limitations and budgetary limitations and topography do not allow for the project to complete a full 20-foot parement width in most areas. However, the project's The project will replace and install new inlet and pipe starm drainage facilities to improve the collection and conveyance capacity of the overall City drainage system to reduce potential for local floading and erosion. It includes three stream outfall inprovements. These include the removal of an existing autient pipe and outfall from 90<sup>th</sup> Avenue NE to Stream A, replacement to upsize and update the curvert and outfall for Stream A under NE 117<sup>th</sup> Place, and replacement and update the curvert and outfall for Stream A under NE 117<sup>th</sup> Place, and replacement and update the existing curvert crossing conveying Stream B under NE 117<sup>th</sup> Place NE. The conveyance modifications/upgrades for this project will modify the contributing drainage Thickened HMA edge proposed both sides, including uphill edge, to reduce out and improve shoulder transitions to existing driveways modate limited work zone areas and speed of (Streams A and B). These drainage improvements will require some removal, replacement, and/or re-grading of certain roodway payement areas. The cross-slope direction of the existing payement will be generally maintained to minimize overall construction efforts, costs, and durations and to limit impacts to adjacent slopes. Alternatives that include additional payement widening, grading, and associated retaining walls to improve It is understood that the overall objective of the project and the allothed capital bydget is to confirm and upgrade the capacity of the existing drainage systems that discharge to the stream outfolls within the work area ended by condition with highly variable cross slopes and many narrow segments with total pavement/ipadway widths on the order of only 12 to 13 feet. Surfacing and re-grading by overlay are not expected to be feasible Structural design required for retaining walls. -collection and conveyonce. Soldier pile retaining walls are recomm 90° Avenue NE (i.e., abandaned allv OTHER DESIGN CONSIDERATIONS, NOTES proposal to widen the apphalt surfacing to a consistent minimum width of 16 or 18 feet improves the sofety and function of the roadways within the work area consistent with the intent of this Policy G-12. areas for each of these outfolls. Flows to Stream A will be reduced slightly and those to Stream B will be increased by the proposed removal of the existing 90th Avenue NE culvert outfoll to Stream A. runoff controls construction. Relocate approximately 200 LF of PSE gas main at 90<sup>th</sup> Avenue NE north of 1 17<sup>th</sup> Intersection Relocate approximately 50 LF 8" Di water main and replace existing hydrant along west side of 90n Avenue NE Areas of incidental impacts to existing buried PSE power, fiber optic (Ziply, Comcasi), and based on the limited thickness of the existing HMA and unknown subgrade conditions. Povement improvements should be expected to be full section replacement. Hons lines; relocation or EXISTING UTIUTY IMPACTS epiocement likely under a valid City building permit, hase improvements were considered as existing for the purpase of the project design. ant widening improvements (see notes) crossing to create new low point; remove existing storm drainage pipes and catch basins Install retaining wall east side of NE 117\* Place, topography. Thickened edges are proposed on both sides to reduce out and better transition Widen portions of roadway section to 16-foot minimum width with thickened edges along 90° Avenue NE. A combination of crawned and Add 3 separate retaining walls along east side of 90<sup>th</sup> Avenue NE to accommodate draimage superelevoted (i.e., sloped to one side) sections Remove, regrade, and replace HMA pavement at portion of NE 117th Place south of Stream A remove purtion existing gabion wall as require date existing grades on uphill side of roadway. ROADWAY IMPROVEMENTS are proposed to acco and pavem Permanent right-of-entry and ectement over the western pointer of the trox porcial on 14 13:30-01 20 (11 651 91 Place NE, Sewag) ore required to complete the installation and maintenance of the new clivert and burfall structure for Stream A. Install dissipator structure at outlet of culvert under NE 117\* Place at Streams A and B; types and locations to be coordinated Permanent right-of-entry and easement over the Install approximately 600 LF of new storm drain northerly portion of the vocant tax parcel no. 375450-1430 (Mohsent Jalat) are required to Remove and replace existing culverts and inlet structures of Streams A and 8 crossing of NE 1177th Place Remove existing 12" PVC culvert to Stream A complete the installation and long-term maintenance of the new conveyance to and outfall structure for Stream B. AREA A - 90<sup>14</sup> AVENUE NE CONVEYANCE [JPGRADES Ctty of Kirkland JL# 5DC09000, Contract No. 32200354 CPH Project No. 0082-22-014 pipes and 15 new catch basins ALTERNATIVE CONVEYANCE IMPROVEMENTS Concept 1 (Base Design) Figure C2.1

ITERNATIVE CONVI - So - So	UE NE CONVEYANCE UPGRADES (CONTINU	ED)		
• Sa ancept 1.A gure C2.1.A	EYANCE IMPROVEMENTS	ROADWAY IMPROVEMENTS	EXISTING UTIUTY IMPACTS	OTHER DESIGN CONSIDERATIONS, NOTES
	me ci Sose Design, excepti emical increate in conveyance pipe lengths to accommodate vice potenimal revioce transformed and the pipe conveyance for Stream B under NE 117* Place to route around CIP under NE 117* Place to controlled by new (active) bighe-foundy residence at 8933 NE 117* Place	<ul> <li>Some as Bate Design</li> <li>Additional pownent vridening along 90<sup>es</sup> Avenue Net (approximately 400 st) to acheve minimum parement width of 18 feet</li> <li>Additional pownent width of 19 feet</li> <li>Additional pownent width of 20 feet south and in the (approximately 1, 100 st) to acheve minimum pownent width of 20 feet south and in the widhiny of Stream A cossing</li> <li>approximately 120 st additional retaining wall at R/A-wenue K</li> <li>approximately 120 st additional retaining wall at NE 117<sup>th</sup> Place</li> <li>approximately 830 st additional retaining wall at NE 117<sup>th</sup> Place</li> <li>Thickend adges are proposed on both sides to reduce aut and better transition grades on uphill side of roadway.</li> </ul>	<ul> <li>Same as Bare Design</li> <li>Source opportionately 320 LF of existing overhead power to new poles or undergraund trench along east edge of raadway/right-of- way</li> </ul>	<ul> <li>The additional parametriv videning and facturing walls proposed with this alternative are for the CIty's consideration to improve the safety, performmers, and long-term maintenance of the current abstandard road sections. The cost and finine to install these intermental roadwoy improvements are expected to be notable less than if they are performing this work now will elimitate project, and performing this work now will elimitate the need to disturb the meighborhood with a future project.</li> </ul>
ECOMMENDATION: Ev timate for Concept	aluate and facilitate City selection of prefe 1.4. City to review 30% estimate to conside	irred conveyance configuration and dissipator struct r and determine whether o include additional scope	ure 1ype at Stream 8 outfall. Complete design an Maprovements of Concept 1.A in final design and	L PS&E for Concept 1. Design and prepare 30% plans an bid documents. Confirm woll types and additional
ty of Kirkland JL# SDC0 PH Project No. 0082-22	99000, Contract No. 32200354 -014			Poge 2 of C [P]

Goat Hill Conveyance Improvements Concepts and Alternatives Summary Matrix Figure C1.2 CIPH This base design makes use of (i.e., maintaina) existing SD catch basins and pipes where the copacity and condition are confirmed. concrete drivewory than projects into the roadway section. This encroachement reduces the efficiency works with and interrupts the horizontal alignment of the traveled way. A cuiver flows under this driveway and the inter and pullet ends are different materials. The driveway is proposed to be removed and reglaced to replace this Structural design required for retaining walls. Would City consider performance specifications and design-build? Page 3 of 7 CK.R.52 with any supplemental, site-specific recommendations from the geotechnical engineer as may be incorporated in the contract documents. Rockeries will be installed per City Pre-approved Plan CK-R.52 with any supplemental, site-specific It is understood that the overall abjective of the project and the allatted capital budget is to upgrade existing drainage facilities and to improve a new, reliable, and continuous extension of the drainage systems installed in the lower reaches of NE 116<sup>th</sup> Place with CIP #1. This new system should be designed to maximize flexibility with thrure pavement widening to minimize costs and efforts to modify as private properties develop or future capital projects are considered. Drainage improvements will require some removal, replacement, and/or re-grading of certain roadway pavement areas. The cross-slope direction of the existing pavement will be improve safety, performance, and mointenance of the road are also presented for the City's cansideration. These incremental and complementary roadway improvements can be installed with greater efficiency and lower generally maintained to minimize overall construction efforts, casts, and durations and to limit impacts to adjacent slopes. Alternatives that include additional pavement widening, grading, and associated retaining walls to over the steep slope to NE Juantia Drive. The drainage facilities in NE 116" Place flow east and north down this meandering road. The project will abandon the NE 117th Place connection to the outfall to NE Juantia Drive Pre-approved Plan CK-R.11. Project geotedmical investigations confirmed that the existing HMA thicknesses along NE 11.6" Place generally varies between 2 and 3 indres with one baring showing a thickness of 4 indres. Barings along NE 117" Place show pavement HMA pavement thicknesses varying between 5 and 8 indres. The surface condition of the pavement along NE 116" Place was observed to vary from good to poor with some indicators of poor subgrade or subsurface drainage issues. The surface condition of NE 117" Place was observed to subsurface was observed to wark practing and drainage indicators of poor subgrade or subsurface drainage issues. The surface condition of NE 117" Place was observed to bar with grading and drainage irregularly located buried utilities typical of the Goat Hill study area. Stormwater runoff in this work area is collected and correved by a patchwork of mostly below-grade pipes and carch basin inlets with a couple of shallow roadside ditches. The drainage systems in the NE 117th Place right-of-work generally flow south and west toward the intersection of NE 116th Place where runoff is conveyed via an 8-inch diameter pipe draining The cross stopes of the roads within this work area vary in grade and direction. There are instances where catch basin inlets are located on the downstope edge of the pavement. More aften, though, the pavement edges drain directly onto adjacent stopes and private properties as sheer or shallow concentrated flows. Asphalt beints have been installed sporadically along the pavement edge or perpendicular to the travelled way along and re-direct that flow to the NE 116th Place drainage systems. The improved systems within this work area will ultimately connect and discharge to the recently installed CP#1 drainage improvements or SDMH #6910 overall cost when completed concurrent with this project, and performing the work now avoids future impacts to the neighborhood. City Pre-approved Plans Policy G-12 requires that development improve individual lot frontages with a minimum pavement width of 20 feet. Right-of-way limitations and topography do not allow for the project to complete a full 20-foot pavement width in most areas. However, standards. Drainage improvements within this work area will require different levels of pavement removal and re-grading to improve collection and conveyance, but all concepts include a thickened HMA edge per City conveyance readh, but private driveway cannot be steepened further to eliminate or reduce encroachm The residence at 8812 NE 117" Place has a steep design that can be accomplished with a grind and overlay, but NE 110th Place pavement repairs are expected to require either a partial or full pavement section removal to some extent with each design alternative. This work area includes approximately 640 LF of NE 117" Place, 925 LF of NE 114" Place, and 150 LF of NE 118" Place. These roadway corridors contain the narrow parsement widths covering a dense network of both the NE 117# Place and NE 116# Place corridors in an attempt copture and direct water to specific catch basin limits. This patchwork of "carb" features is tregular, not contiguous, and they do not meet City the project's proposal to widen the apphalt surfacting to a consistent minimum width of 16 feet improves the safety and function of the roadways within the work area consistent with the intext of this Policy G-12. **OTHER DESIGN CONSIDERATIONS, NOTES**  Relocate approximately 190 LF of 2" FE gas main at NE 117" Place wortheast of NE 11 bit Place intersection; approximately 300 LF 2" PE gas main at NE 116" Place wort of NE 117" Place Relocate approximately 150 LF 8-inch DI water main and replace existing hydrant along NE 117\* Place Areas of incidental impacts to existing burled PSE power, fiber optic (Ziphy, Comcast), and Relocated utility guy pole north (inta stope) cations lines; relocation or Relocate existing fire hydram EXISTING UTILITY IMPACTS replacement likely other commu . Install 4-foot maximum MSE retaining wall along southeast shoulder of NE 117\* Place and along the north side of NE 11 of Place immediately east of the NE 11 7\* Place intersection to re-grade Remove, re-grade, and replace HMA pavement section with hiddenend edge each side to provide minimum 16-foot povement width an NE 117º Place and NE 116^h Place Install 4- to 6-foot cut rackery at north side of NE 116m Place to facilitate pavement widening and Sawcut, remove, and replace HMA pavement section to install thickened edge each side of NE HMA povement with thickened edge and install ROADWAY IMPROVEMENTS 118" Place CB Inlets. re-grade AREA B -- NE 116" PLACE / NE 117" PLACE CONVEYANCE UPGRADES Install additional catch basins and SD pipes where capacity or condition to safely pass the 100-year Maintain existing PVC 3034 or C900 pipes that Remove existing outlet pipe from SDMH 7930 and abandon existing 8-indi pipe ta NE Juanita Dr. ditches and replace with new catch basin inlefs and below-grade conveyance pipes Remove and replace existing storm drainage pipes that are confirmed to not have sufficient Abandon approximately 130 LF of roadside maximum spacing is exceeded to meet City standards are confirmed to have sufficient copacity, City of Kirkland JL# SDC090000, Contract No. 32200354 CPH Project No. 0082-22-014 ALTERNATIVE CONVEYANCE IMPROVEMENTS condition, and cover design storm (City GIS #44861). . Concept 1 (Base Design) Figure C3.1

Page 74

Goat Hill Conveyence Immediate

Instruction         Existing Unitry lawACIS         Rodwit lawacusers         Existing Unitry lawACIS           • Some of Sose Design andeming to currents (Try structor more rules in conforming to currents (Try structor more rules in conforming to currents (Try structor more rules in conforming to current (Try structor more rule)         Existing current in conforming to current (Try structor conforming to current (Try structor more rule)         Existing current in conforming to current (Try structor conforming to current (Try structor more struct)         Existing current in conforming to current in current in the rule structor concept to current in the rule structor concept to in the rule structor concept to the reactor of the rule structor concept.         Existing current in the rule concept to the reactor concept.         Existing current in the rule concept to the reactor of the rule structor concept.         Existing current in the rule concept to the reactor concept.         Existing current in the rule concept.         Existing current in the rule contincore or rule concept.         Existing cur	OTHER DESIGN CONSIDERATIONS, Nortes Some as Base Design
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	<ul> <li>T2" FE gas</li> <li>This offernative differs in that It proposes an all new SD at ORE 116*</li> <li>Trunk line peareality entred within the lower and mid-reaches of KE 116*</li> <li>Trunk line peareality entred within the lower and mid-reaches of KE 116*</li> <li>Trunk line peareality entred within the lower and mid-reaches of KE 110*</li> <li>Ta ONE 117*</li> <li>Text SD and sorings with froure walking profess.</li> <li>Shellow storm helts along the flowine of the road compare and atompare profess.</li> <li>Shellow storm helts along the flowine of the road compare and long NE and a comect to the runk line of store and the and atompare profess.</li> <li>Retaining burled</li> <li>Retaining walls and rockerles shown ore minimum mecessity to accommodate limited povement width and and atompare profess.</li> <li>Shellow storm interviewent, Additional povement width and and atompare and and and and and a store and a store manimum mecessity to accommodate limited povement width and and atompare and and and another and in the loss of the approved prior build?</li> <li>Structurel entry in an another and in the loss of the generical view of a degree to the post-flowing and the approved Plan recommendations from the generical and design-build.</li> </ul>
commentations. Merge key conveyance improvements from Concepts 1, 1A, and 2 for efficiency including the installation of a centralized storm mair ty. Confirm wall types and additional structural services and/or if performance specifications are acceptable approach to soldier pile design at 30%	in at NE 116" Place, based on further discussion and collaboration with 6 PS&E phase.

Goat Hill Conveyance Improvements Concepts and Alternatives Summary Matrix Poge 5 of 7 C |P |H Figure C1.3 prior to 90% design and preferably at 60% design level to confirm proximity of water. gurter, and additional povement partit with Concept 1A is proposed for the City's consideration because this work could be completed efficiently with the drainage guiter, and additional pavement patch with Concept 1A is proposed for the City's consideration because this work improvements. These pedestrian facilities are needed to complete the pedestrian route and it is unlikely to be completed by development in the future given its improvements. These pedestrian facilities are needed to complete the pedestrian route and it is unlikely to be completed by development in the future given its. 91\* Lane NE is fully improved with curb, guther, and sidewalk along its west side. The east half of this road is paved to a minimum 14-foot width. A recent residential duplex project (City file no. 85119-06500; 11626 91 = Place NE) improved the east side of 91\* Place NE north of and adjacent to Stream 8 with additional paved width, concrete curb and guther, and a new 48-inch 17ype 2 catch basin connection to the 12-inch concrete curvert outer 0. Stream 8. This existing structure has the new totic structure outer basin connection to the 12-inch concrete curvert outer 0. Stream 8. This existing structure has the new file of 91\* Place NE. While this is a vialle different paved width, concrete curve and a guther, and a new 48-inch 17ype 2 catch basin connection to the 12-inch concrete curvert outer 0. Stream 8. This existing structure has the neutron to the resolution to include the structure external structure for the neutron on the visited evolution on the visited externed structure that the neutron outer out out replacement of a significant amount of completed curb, guther, and are concert at the visiteg advectore systems on the visited evolution. The Ninke this is a viable option, it will require removal and replacement of a significant amount of completed curb, guther, and sidewalk facilities to install new pipes. This curves the advectore of the state of the state of the visite of the state of the The new infrastructure installed with the residential development of 11626 91" Place NE provides an opportunity to minimize disturbance to the existing roadway infrastructure by installing the diversion structure in the existing Type 2 catch basin at the east curb line. Installation of the new bypass conveyance pipes and heles at hese east side of the roadway disa does not require dary concrete curb, gutter, or sidewalk except for a limited amount of curb and editer at the project concept expects to remove and replace the existing ADA ramp at the northwest corner of the instructure. This project concept expects to remove and replace the existing ADA ramp at the northwest corner of the instructure. Recommendations: City or NUD operations to paint and portrole existing 8-inch DI water main to confirm clearance to proposed storm. Proceed with PS&E for Concept 1 and Concept 1A improvements. Engineer's estimate to itemize Concept 1A as bid obtendive. This will allow option to include in contract if price/budget permits. The proposed work in this area involves limited modifications to a portion of the existing City storm drainage systems to install a flow splitter structure within the existing public drainage system in the vicinity of the 91<sup>s</sup>. Lane NE and NE 116<sup>th</sup> Place intersection. The purpose of the flow splitter retraft is to maintain a base flow to Stream 8 equal to the current 2-year discharge rate. This baseline flow standard was established by previous studies and noilyses completed by others with the earlier CIP #1 project and it is untained to Stream 8 equal to the current 2-year discharge rate will will follow the approxement of the 91<sup>st</sup> and noilyses standard by others with the earlier CIP #1 project and it is untained to Stream 8 equal to the current 2-year discharge reter will will followilly maintained as established by previous studies according of the start and the secular in the resource. The most effective type of splitter structure would be a diversion wer within a Type 2 carch basin given the single, low-flow even that is approximated to the stream with the remainder base by passed to the existing facilities in NE 116<sup>k</sup> Place. The ultimate discharge of Stream 8 and the 0.1 <sup>1</sup> of Place systems is the energy dispersion [Lev, bubble up] structure at Juanita Beach Park that was recently installed with CIP #1. ndad Patholing and/or tracing with additional paint marks along the full length of the work area is recommender The additional scope of work to add sidewolk, curb, The additional scope of work to add sidewalk, curb, Proposed storm drainage canveyances would be relatively shallow and Mis alignment minimizes der and restoration efforts. could be completed efficiently with the drainage OTHER DESIGN CONSIDERATIONS, NOTES location. Incetion. Existing NUD 8-indiverse main is parallel and in proximity to the proposed bypass outlet pipe structure excaration zones based on an existing reacting patch observed in the field and baccuse the existing 48<sup>-1</sup>79p 2 that is to be replaced with the diversion weir was recently installed by a housing development to the north. draining south along the west side of 91<sup>at</sup> Lane, but it is expected to be dear of the SD and Overhead power and communication lines exist parallel and immediately west of new storm drainage conveyance systems EXISTING UTILITY IMPACTS Same as Base Design None None . Type 1 catch basin. That impact may be able to be avaided ar minimized after some additional field investigation Extend curb, gutter, and sidewolk morth with new outb return and ADA rang of northeast corner of intersection of 91<sup>st</sup> Lone NE and 116<sup>th</sup> Place NE Extend ourb, gutter, and sidewalk north with new curb return and ADA ramp at northeast corner of intersection of 91° Lane NE and 116° Place NE Sawout, remove, and replace/restore/patch existing HMA pavement at trench and structure Remove and replace approximately 105 LF concrete curb and gutter, 59 SY concrete sidewalk, and ADA concrete curb ramp. ROADWAY IMPROVEMENTS (CB6923) or remove and replace with new 48"-Install approximately 150 LF 18" LCPE w/3 new Type 2 cercls basin install new Type 1 cercls basin and 12° LCPE to existing 026/912 for new butfall to NE 116<sup>th</sup> Place drollooge systems install new 48"-Type 2 catch basin w/diversion weir structure Install diversion weir (flow splitter) at east curb line of 91" Lane NE in existing 48"-Type 2 or replacement Type 1-L catch basin inlets AREA C - 91<sup>-37</sup> LANE NE FLOW SPLITTER IMPROVEMENTS Cthy of Kinkland JL# SDC090000, Contract No. 32200354 CPH Project No. D082-22-014 CONVEYANCE IMPROVEMENTS Same os Base Design Same as Base Design . . . Concept 1 (Base Design) Figure C3.1 ALTERNATIVE Concept 1A Figure C3.1A Concept 2 (Base Design) Figure C3.2 Concept 2A

y the owner rom received. rectives to		oce has a E without i techred for nown what for that by burying clearances	main crossing.	Poge 6 of 7 C[P]H Burner
bject culvert inlet hos been re-channeled by reposed milgation plan has not yet been , renored to a context the convertient renored milgation plan has not yet been , renort culvert to safely collect and convey th f the culvert is proposed with all design after	OTUGE DESIGN CONSIDERATIONS MOTES	<ul> <li>The property owner of 8800 NE 117" Pl formal violation for re-diameling Stream permit and inconsistent with the approval their LSM and building permits. It is not kr restoration measures have been required violation.</li> <li>Ardred pipe a ropies abore accomplished culvert may be required to accommodified</li> </ul>	and avoid adjustments to gas and water	
diffication results in an antificial, rectangular chann . City for this stream and buffer impact, but their <u>1</u> stablish the size, slope, and material for a replace rap ar rock gabion outfall structure at the outlet o	Sustains I fruitry latest cris	A PSE gas main (1-1,4" PE) and NUD water main (8" D) cross the north end of the cuivert and will affect new invest elevations and/or may require relacation to accommodate upsized cuivert.	Some as Base Design	
ty owner fros received a notice of violation from the opped the current 1.2-inds culvert. The project will e. a gabion headwoll to protect the culvert inter. A ripr	Vistream reaches of Stream E. 20 Anut / Masonicator	<ul> <li>Sowcur, remove, and replace / restore/ patch</li> <li>Sowcur, remove, and replace / restore/ patch</li> <li>excavations</li> </ul>	Some as Base Design Add oxpholt Mickened edge (wedge curb) at south side of estaining drive to callert and direct powement variat easterly to NE 11 0 <sup>th</sup> Place/NE 117 <sup>th</sup> Place	
ported by the residents that flow events have overti sign flow. Improvements will include a riprap or root	(g) and reduce flow velocities as they enter the dow conversion and enter the dow	Remove and replace existing 12-indi CPP advert w/larger diameter outvert install gobion or heary riptrap teadwall at cutvert liatet to retain adjacent materials and manitions riteram bank and battom to cutvert end install buried gobion basket or riprop protection of new pipe outfall	Some as Base Design	1 SDC090000, Centrad Na. 32200354
generally 2 fer It has been rep year peak desi	ALTERNATIVE O	Concept 1 Base Design) Figure C3, 1	• Concept 1A Figure C3.1A	thy of Kitebood الله ماليانية به 100 مالية 100 مال

The additional powement widening proposed along NE 11.7\* Places are for the Chy's consideration in improve the safety, performance, and long-sterm multihemace of the current substandard road sections. The cost and time to insume these increment in orderary improvements are expected to be notable less than it they are performed taler as a stand-alone project, and performing this work now will eliminate the need to disturb the neighborhood with a foure project. Goat Hill Conveyance Improvements Concepts and Alternatives Summary Matrix Figure C1.5 Poge 7 of 7 C | P | H Recommendations. Complete copacity analysis and preliminary conveyance system design for Concept 1. Estimate cost of Concept 1.A at 30% phase for City consideration and determination of whether to include additional scope through final design, PS&E. Two separate storm drainage improvements are proposed within this work area. The first improvement disconnects approximately 140 LF portion of the City's existing conveyance system that currently drains east from NE 117<sup>th</sup> Place NE over two private properties (9037 NE 117the Place and 11635 91<sup>th</sup> Place NE). New pipes and catch basin inlets will be installed within the NE 117<sup>th</sup> Place right-of-way to connect the remaining partion of the public system with the existing City drainage system to the north near the outfall of Stream D and private driveway to the residence at 9116 NE 117<sup>th</sup> Place. The disconnected portion of the system that fies outside of the public right-of-way will become privately owned and maintained. The project includes the removal and replacement of existing storm drainage pipes and cards basins within 01<sup>a</sup> Place NE. Approximately 9.5 UF of existing storm drainage pipe parallel to the west right-of-way line will be abandoned. New pipes and cards basins replace the abandoned systems. Existing water and natural gas mains on the west side of the righ-of-way require that the new storm drainage toalihies be positioned an the east side of the 91<sup>a</sup> Place NE. The proposed position of the pipes and structures in this mostly unimproved right-of-way is expected/intended to accommodate a potential paved pedestrian trail connection and pravide least likely conflicts for future utility extensions or other drainage improvements. OTHER DESIGN CONSIDERATIONS, NOTES A pole is in close proximity and its guy wire costs the propered some decoder line within the 91 = Place NE corridor. These PEE restures could remotin, but will require securing the pole and removing and resetting the guy wire Overhead PSE power lines, poles, and guy lines exist within both road rights, off-way: - Lines within NE 1174 Place cross withe roadway area and could limit equipment Construction requires avoidance of a relacation of a number of esting below-grade utilities:
 NUD 8-indi Di water main in west half of NE 11.7<sup>m</sup> (Place NE) PSE 2-inch PE gas main south side of NE 117<sup>th</sup> Place and center to north side of 91<sup>th</sup> EXISTING UTIGITY IMPACTS Some as Base Design Place NE Same as Base Design Sawou and remove existing purement edge each side, install new HMA pavement edge to oblieve a minimum 16-foot and typical 19-5001 HMA overlay and/or pavement replacement for minor re-grading and transitions to existing Sawaut, remove, and replace/restore/patch existing HMA pavement at trench and structure povement width, including thickened edge each ROADWAY IMPROVEMENTS private driveways PERCENCIAL STOCK side. . . . AREA E – NE 117<sup>14</sup> PLACE / 91<sup>57</sup> PLACE NE CONVEYANCE RETROFIT pipe, 3 new cotch basins, connection to 3 existing cotch basins (91 e Place NE) Abandon approximately 180 LF existing storm pipe (various sizes and materials) in-place or histell approximately 240 LF new storm drain pipe, 6 new catch basin inlers, connection to 2 existing catch basins (NE 117n Place) install approximately 150 LF new storm drain City of Kirkland JL# SDC090000, Contract No. 32200354 CPH Project No. 0082-22-014 ALTERNATIVE CONVEYANCE IMPROVEMENTS Some as Base Design remove as required . Concept 1 (Base Design) Figure C2.1 Concept 1A Figure C2.1A

#### **Appendix B. Tribal Correspondence**

Cultural Resource Consultants Duwamish Tribe Cecile Hansen, Chair 4705 W Marginal Way SW Seattle, WA 98106 January 16, 2023 Re: Cultural Resources Assessment for the Goat Hill SD Improvements Project, Kirkland, King County, Washington Dear Cecile: I am writing to inform you of a cultural resources assessment for the above referenced project and to seek additional information about the project area the Tribe may have that is not readily available through other written sources. This letter is on a technical staff-to-technical staff basis to inquire about project-related cultural information or concerns. It is not intended as formal government-to-government consultation to be initiated by the appropriate regulatory agency. The project is located in Section 30 of Township 26 North, Range 05 East, Willamette Meridian along 90th Avenue NE, NE 117th Place, and NE 116th Place northwest of Juanita Beach Park. The project proposes to reconstruct ditch lines, upsize culverts, install catch basins, and complete other storm system improvements. We are in the process of reviewing available information. Background research will include a site files search at the Washington State Department of Archaeology and Historic Preservation, review of previously recorded cultural resource reports, and review of pertinent published literature and ethnographies. Results of our investigations will be presented in a technical memo. We are aware that not all information is contained within published sources. Should the Tribe have additional information to support our assessment, we would very much like to include it in our study. Please contact me at ian@crcwa.com or 360.431.3433 should you wish to provide any comments. I appreciate your assistance in this matter and look forward to hearing from you, Sincerely. lan Kretzler Projects Manager CUITOTUM PERSONNUT CONSULTANTS, LLC PO Box 4159, SOATTLE, WA 98194 PHONE 200,835,9020 Soma@ctrcws.com



# DUWAMISH TRIBE dx<sup>w</sup>dəw?abš

#### 01/31/2023

CRCWA Goat Hill SD Improvements

Dear lan Kretzler,

Thank you for the opportunity to comment on the project called Goat Hill SD Improvements located along 90<sup>th</sup> Ave NE, NE 117<sup>th</sup> PI and NE 116 PI northwest of Juanita Beach Park in Kirkland. Based on the information provided and our understanding of the project and its APE, we would typically recommend an archaeological review performed for this project. This is in an area the Duwamish Tribe considers culturally significant and has a high probability of having unknown archaeological deposits, especially if excavation cuts below fill. The DAAP WISAARD predictive model indicates that an archaeological survey runs from survey contingent upon project parameters (low risk) to highly recommended with very high risk of encountering cultural resources.

The Duwamish, or a band of the Duwamish (the Lake People), had a village at what is now known as Juanita Beach near the mouth of Juanita Creek. This is where we cultivated wapato. According to historian David Buerge, the name of our village there was Tabtabi'ukh. Our ancestors, the people in this village, fished and gathered resources (both food and materials) from the immediate vicinity including items to make and decorate baskets.

As this area of Kirkland has been developed previously, the Tribe would accept an IDP for ground disturbance for depths below fill to depth or upon encountering glacial till. We also request that if any archaeological work or monitoring is performed, we would like notification. Cultural and archaeological resources are non-renewable and are best discovered prior to ground disturbance. The Tribe would also like the opportunity to be present if or when an archaeologist is on site if an artifact or cultural resource is encountered.

Thank you,

Nancy A Sackman Cultural Preservation



Duwamish Tribal Services | 4705 W. Marginal Way SW, Seattle, WA 98106 | 206-431-1582 www.duwamishtribe.org

Cultural Resource Consultants Muckleshoot Tribe Laura Murphy, Cultural Resources 39015 172nd Avenue SE Auburn, WA 98092 January 16, 2023 Re: Cultural Resources Assessment for the Goat Hill SD Improvements Project, Kirkland, King County, Washington Dear Laura: I am writing to inform you of a cultural resources assessment for the above referenced project and to seek additional information about the project area the Tribe may have that is not readily available through other written sources. This letter is on a technical staff-to-technical staff basis to inquire about project-related cultural information or concerns. It is not intended as formal government-to-government consultation to be initiated by the appropriate regulatory agency. The project is located in Section 30 of Township 26 North, Range 05 East, Willamette Meridian along 90th Avenue NE, NE 117th Place, and NE 116th Place northwest of Juanita Beach Park. The project proposes to reconstruct ditch lines, upsize culverts, install catch basins, and complete other storm system improvements. We are in the process of reviewing available information. Background research will include a site files search at the Washington State Department of Archaeology and Historic Preservation, review of previously recorded cultural resource reports, and review of pertinent published literature and ethnographies. Results of our investigations will be presented in a technical memo. We are aware that not all information is contained within published sources. Should the Tribe have additional information to support our assessment, we would very much like to include it in our study. Please contact me at ian@crcwa.com or 360.431.3433 should you wish to provide any comments. I appreciate your assistance in this matter and look forward to hearing from you, Sincerely. lan Kretzler Projects Manager CUETURAL RESIDING CONSULTANTS LLC POBON HER SEATTLE WA MORE PHONE 200 KAT HORN SPEAK STORAGE

Cultural Resource Consultants Snoqualmie Tribe Steven Moses, Archaeology and Historic Preservation PO Box 969 Snoqualmie, WA 98065 January 16, 2023 Re: Cultural Resources Assessment for the Goat Hill SD Improvements Project, Kirkland, King County, Washington Dear Steven: I am writing to inform you of a cultural resources assessment for the above referenced project and to seek additional information about the project area the Tribe may have that is not readily available through other written sources. This letter is on a technical staff-to-technical staff basis to inquire about project-related cultural information or concerns. It is not intended as formal government-to-government consultation to be initiated by the appropriate regulatory agency. The project is located in Section 30 of Township 26 North, Range 05 East, Willamette Meridian along 90th Avenue NE, NE 117th Place, and NE 116th Place northwest of Juanita Beach Park. The project proposes to reconstruct ditch lines, upsize culverts, install catch basins, and complete other storm system improvements. We are in the process of reviewing available information. Background research will include a site files search at the Washington State Department of Archaeology and Historic Preservation, review of previously recorded cultural resource reports, and review of pertinent published literature and ethnographies. Results of our investigations will be presented in a technical memo. We are aware that not all information is contained within published sources. Should the Tribe have additional information to support our assessment, we would very much like to include it in our study. Please contact me at ian@crcwa.com or 360.431.3433 should you wish to provide any comments. I appreciate your assistance in this matter and look forward to hearing from you, Sincerely. lan Kretzler Projects Manager CUETURAL RESIDING CONSULTANTS LLC POBON HER SEATTLE WA MORE PHONE 200 KAT HORN SPEAK STRAINS

M Gmail	lan Kretzler <ian@crcwa.com></ian@crcwa.com>
Cultural Resources Assessment for the Goat H Kirkland, King	III SD Improvements Project,
Adam Osbekoff <adam@snoqualmietribe.us> fo: lan Kretzler <ian@crowa.com></ian@crowa.com></adam@snoqualmietribe.us>	Tue, Jan 17, 2023 at 12:03 PN
Helio Ian	
The Snoqualmie Indian Tribes Department of Archaeology and Histo during ground disturbing activities associated with the above-mention	oric Preservation request the opportunity to be onsite med project.
Thank you.	
Adam Osbekoff	
Cultural Resource Compliance Manager	
adam@snoqualmietribe.us	
C: 425.753.0388	
9416 384th Ave SE	
PO BOX 969	
Snoqualmie Washington 98065	





0/23_6:14 PM C	utural Resource Consultants, Inc. Mail - #2200K Boat H	III 3D Improvements Project Letter to Suquantish Tribe
M Gmail		lan Kretzler <ian@crcwa.com< td=""></ian@crcwa.com<>
#2206K Goat Hill SE	D Improvements Project Letter I	to Suquamish Tribe
Dennis Lewarch <dlewarch To: Ian Kretzler <ian@crcwa, Cc: Margaret Berger <marga< td=""><td>@suquamish.nsn.us&gt; .com&gt; ret@orcwa.com&gt;</td><td>Mon, Jan 16, 2023 at 3:11 PM</td></marga<></ian@crcwa, </dlewarch 	@suquamish.nsn.us> .com> ret@orcwa.com>	Mon, Jan 16, 2023 at 3:11 PM
ha?l sləžil (good day)		
Hello Ian,		
Thank you for contactin Improvements Project in referencing the project a	g the Suquamish Tribe regarding cultural n Kirkland. The Tribe does not have ethn area vicinity.	resources in the Goat Hill SD ographic or historic information specifically
Best.		
Dennis		
tižíždubut čəx* (take ca	re of yourself)	
Every time you use Lushootse	eed you are breathing life into It.	
Dennis E. Lewarch		
Tribal Historic Preservatio	n Officer	
Archaeology and Historic	Preservation Department	
Suquarnish Tribe		
I am working remotely	<ol> <li>Please call my cell number 360-509</li> </ol>	9-1321 if you need to speak with me.
Munne	Office Telephone:360-394-8529 Cell:360-	509-1321 F4X:360-598-4666
THE SUQUAMISH TRIBE		
Mailing Address:	Suquamish Tribe Administration Build	ding Street Address:

Cultural Resource Consultants Tulalip Tribes Richard Young, Cultural Resources 6406 Marine Drive Tulalip, WA 98271 January 16, 2023 Re: Cultural Resources Assessment for the Goat Hill SD Improvements Project, Kirkland, King County, Washington Dear Richard: I am writing to inform you of a cultural resources assessment for the above referenced project and to seek additional information about the project area the Tribe may have that is not readily available through other written sources. This letter is on a technical staff-to-technical staff basis to inquire about project-related cultural information or concerns. It is not intended as formal government-to-government consultation to be initiated by the appropriate regulatory agency. The project is located in Section 30 of Township 26 North, Range 05 East, Willamette Meridian along 90th Avenue NE, NE 117th Place, and NE 116th Place northwest of Juanita Beach Park. The project proposes to reconstruct ditch lines, upsize culverts, install catch basins, and complete other storm system improvements. We are in the process of reviewing available information. Background research will include a site files search at the Washington State Department of Archaeology and Historic Preservation, review of previously recorded cultural resource reports, and review of pertinent published literature and ethnographies. Results of our investigations will be presented in a technical memo. We are aware that not all information is contained within published sources. Should the Tribe have additional information to support our assessment, we would very much like to include it in our study. Please contact me at ian@crcwa.com or 360.431.3433 should you wish to provide any comments. I appreciate your assistance in this matter and look forward to hearing from you, Sincerely. lan Kretzler Projects Manager CUETURAL RESIDING CONSULTANTS LLC POBON HER SEATTLE WA MORE PHONE 200 KAT HORN SPEAK STORAGE

# Appendix C. Inadvertent Discovery Protocol

In accordance with RCW 27.44 Indian Graves and Records Act, RCW 27.53 Archaeological Sites and Resources, RCW 68.50 Human Remains, and RCW 68.60, Abandoned and Historic Cemeteries and Historic Graves, the following steps will be taken in the event that archaeological materials and/or human remains are discovered:

# C.1 Procedures for Discovery of Potential or Actual Cultural Resources

Upon discovery of a potential or actual archaeological site or cultural resources as defined by RCW 27.44 Indian Graves and Records Act and RCW 27.53 Archaeological Sites and Resources, the project proponent, its employees, contractors, and sub-contractors shall:

(a) Immediately cease or halt ground disturbing, construction, or other activities around the area of the discovery and secure the area with a perimeter of not less than 30 feet until all procedures are completed and the parties agree that activities can resume. If such a perimeter would materially impact agency functions mandated by law, related to health, safety, or environmental concerns, then the secured area shall be of a size and extent practicable to provide maximum protection to the resource under the circumstances. Project activities that are not ground disturbing may continue outside the secured perimeter around the findings. No one shall excavate any findings and all findings will be left in place, undisturbed and without analysis, until consultation with DAHP and identified area Tribes regarding a final disposition of the findings has been completed. In accordance with RCW 27.53.060, no one shall knowingly remove or collect any archaeological objects without obtaining a permit.

(b) Notify the State Archaeologist at DAHP and identified area Tribes of the discovery as soon as possible and no later than 24 hours of the discovery. If human remains are found, the project proponent shall follow notification procedures specified below.

(c) Arrange for the parties to conduct a joint viewing of the discovery within 48 hours of the notification; or at the earliest possible time thereafter, the project proponent or their authorized representative shall arrange for the archaeologist to attend the joint viewing. After the joint viewing, taking into account any recommendations of the Tribes DAHP, and the archaeologist, the parties shall discuss the potential significance, if any, of the discovery.

(d) Consult with the identified area Tribes and DAHP on the transfer and final disposition of artifacts. Until the Tribe has a repository that meets the standards of curation established 36 CFR Part 79, artifacts shall be curated using an institution or organization that meets curation standards, selected through consultation with the Tribes.

# C.2 Procedures for Discovery of Human Skeletal Remains

Upon discovery of human skeletal remains on non-federal and non-tribal land and in accordance with RCWs 68.50.645, 27.44.055, and 68.60.055, the project proponent, its employees, contractors, and sub-contractors shall:

(a) If ground-disturbing activities encounter human skeletal remains during the course of construction, then all activity must cease that may cause further disturbance to those remains and the area of the find must be secured and protected from further disturbance. In addition, the finding of human skeletal remains must be reported to the King County Medical Examiner's Office and King County Sheriff's Office in the most expeditious manner possible. The remains should not be touched, moved, or further disturbed.

(b) The King County Medical Examiner's Office will assume jurisdiction over the human skeletal remains and make a determination of whether those remains are forensic or non-forensic. If the county medical examiner determines the remains are non-forensic, then they will report that finding to DAHP who will then take jurisdiction over the remains and report them to the appropriate cemeteries and affected Tribes. The State Physical Anthropologist will make a determination of whether the remains are Indian or Non-Indian and report that finding to any appropriate cemeteries and the affected Tribes. DAHP will then handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains.

(c) DAHP will handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains if no federal agency is involved.

# Confidentiality of Information

The project proponent and their authorized representative recognizes that archaeological sites are sensitive cultural resources that can become targets of vandalism and illegal removal activities. The project proponent or their authorized representative shall keep and maintain as confidential all information regarding any discovered cultural resources, particularly the location of known or suspected archaeological property, and exempt all such information from public disclosure consistent with RCW 42.17.300.

# **Contact Information**

The lead representatives and primary contacts of each party under this plan are as identified below. The parties may identify other specific personnel before the commencement of any particular project element as the contacts.

## **Duwamish Tribe**

4705 W. Marginal Way S.W. Seattle, WA 98106-1514 Primary Contact: John Body, THPO, johnboddy@duwamishtribe.org

## Muckleshoot Indian Tribe

39015 172nd Avenue SE Auburn, WA 98092 Primary Contact: Laura Murphy, Archaeologist, Cultural Resources, 253-876-3272, laura.murphy@muckleshoot.nsn.us

## Snoqualmie Indian Tribe

8130 Railroad Avenue, Suite 103
P.O. Box 969
Snoqualmie, WA 98065
Primary Contact: Steven Mullen-Moses, Director of Archaeology and Historic Preservation, 425-495-6097, steve@snoqualmietribe.us

# Stillaguamish Tribe of Indians

3310 Smokey Point Drive PO Box 277 Arlington, WA 98223-0277 Primary Contact: Kerry Lyste, THPO, Cultural Resources, 360-652-7362 x226, klyste@stillaguamish.com

# Suquamish Tribe

PO Box 498 Suquamish, WA 98392-0498 Primary Contact: Dennis Lewarch, THPO, 360-394-8529, dlewarch@suquamish.nsn.us

# Washington Department of Archaeology and Historic Preservation (DAHP)

P.O. Box 48343, Olympia, WA 98504-8343 Primary Contact: Rob Whitlam, State Archaeologist, 360-890-2615, Rob.Whitlam@dahp.wa.gov Primary Contact for Human Remains: Guy Tasa, State Physical Anthropologist, 360-790-1633, Guy.Tasa@dahp.wa.gov

# King County Medical Examiner's

Harborview Medical Center Ninth & Jefferson Building, 2nd Floor 908 Jefferson St Seattle, WA 98104 Primary Contact: Richard Harruff, MD, PhD, Chief Medical Examiner, 206-731-3232

### King County Sheriff's Office

516 Third Avenue , Room W-116 Seattle, WA 98104-2312 Primary Contact: Non-Emergency Line, 206-296-3311

# APPENDIX J: Pothole Data





# TEST HOLE DATA SHEET

APPLIED PROFESSIONAL SERVICES INC.



Overlay Thickness (in):	Pothole Number: G 2	Lead. <u>New</u>
Asphalt (in): -		
Concrete (in): ~		retaining
Brick (in): -	Date: 12/7/23	CONCRETP DIA
soil type: Clay		
	Notes:	
Target Utility:		1 134 13
Utility Type: GAS		
Size: 2 °		
Top (in): 33 "		
Bottom (in): 35 "		14 26 1 2
Width (in): –		Real And
Thickness (in): ~		1 × road
Pipe Direction; NE3SW		O E ENds
Material: PE		U & 450
Additional Utility:	Utility Config Facing: NE	
Utility Type: ~		
Size:		
Top (in): -		
Bottom (in): ~	$(2^{n})$	
Width (in): -		
Thickness (in): _		
Pipe Direction:		to include: lane dividers, 3 offsets, street names, pothole location, north arrow
Material:		





# TEST HOLE DATA SHEET

APPLIED PROFESSIONAL SERVICES INC.


























