SOLICITATION
FOR
CONSTRUCTION BIDS

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PORT GAMBLE S'KLALLAM TRIBE

Raccoon Town Project
39 Lot Subdivision

A portion Gov't Lot 5 & the NE ¼ NE ¼ Section 5, Township 27 N, Range 2 E, W.M., Kitsap County, Washington

March 18, 2026

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ADVERTISEMENT FOR BIDS

Notice is hereby given that Rory McLeod, Project Manager for The Port Gamble S'Klallam Tribe (PGST), will receive proposals until 12:00 p.m., P.D.T., on Wednesday April 15, 2026 either by mail or hardcopies physically delivered at the PGST Main Tribal Center Office at 31912 Little Boston Road NE, Kingston, WA 98346, for furnishing all labor, equipment, and materials for construction of site civil infrastructure work for the 39-lot Raccoon Town Subdivision Project located on the PGST Indian Reservation in north Kitsap County, Washington. All bid proposals will be opened, evaluated for completeness and summarized from lowest to highest and include the submitting construction company's name. The summarized list will be automatically sent to each bidder electronically via email within 5 business days.

A mandatory pre-bid site visit is scheduled for Wednesday March 25, 2026 at 10:00 am at the site entrance on Hood Canal Drive NE next to the water booster pump station.

The work consists of three schedules, all of which must be completed and included as part of the bid proposal to be determined responsive:

Schedule A: Sanitary Sewer and Water Distribution System
Schedule B: Stormwater and Roadway Infrastructure
Schedule C: All other Infrastructure and Construction

Bid Documents for this project are available at the following website: http://pgst.nsn.us/planning/ . Bidders are encouraged to "register" by email to both rorym@pgst.nsn.us and patf@map-limited.com in order to receive automatic email notification and future addenda and to be placed on the "Bidders List" on the website. For assistance, please contact the Project Engineer Pat Fuhrer at patf@map-limited.com. Contract questions shall be directed to the Project Engineer. All bidding and construction is to be performed in compliance with the Contract Plans and Specifications for this project and any addenda issued thereto.

The contract award will be made to the lowest responsible bidder based on the total cost of the development project and completeness. The Engineer's estimate for this project is approximately $4,936,000 - $5,484,000. The work shall be physically complete within 300 working days after the commencement date stated in the Notice To Proceed.

Each bid shall be made out on the proposal form furnished with the specifications. Each bid shall be accompanied by a certified check, cashier's check, bid bond or cash, made payable to the order of the Port Gamble S'Klallam Tribe in the sum of 5% of the amount bid, to be forfeited to the Port Gamble S'Klallam Tribe by the successful bidder in case they fail to enter into a contract, file an acceptable surety bond in the sum of 100% of the contract price, or fulfill the other applicable conditions of said contract within ten (10) calendar days of the date of the award. All sealed bids are to be submitted by mail or in-person at the place and address listed above Attention: Rory

McLeod.. Award of contract, if made, will be made to the lowest responsive and responsible bidder. The Tribe reserves the right to reject any or all bids and to waive all informalities in the bidding.

Financing of this project has been provided by the Port Gamble S'Klallam Tribe, Indian Health Services and Bureau of Indian Affairs. The Port Gamble S'Klallam Tribe expressly reserves the right to reject any all Proposal and to waive minor irregularities or informalities and to Award the Project to the lowest responsive, responsible bidder as it best serves the interests of the Tribe.

Dated this: _18th_ day of March, 2026 by: _____

Joe Sparr, Director
Planning Department
Port Gamble S'Klallam Tribe

INSTRUCTIONS TO BIDDERS

1. STATEMENT OF QUALIFICATIONS

Prequalification of bidders is not required for this project. Each bidder must furnish a statement with their bid on the form furnished in Exhibit 1. The statement must provide the bidder's construction experience, the bidder's availability for the performance of the contract, a listing of all other work which the bidder currently has under contract during the period of performance of the work for this contract, and a statement that the bidder is able to perform the work contemplated within the period of performance. In addition, each bidder shall submit with their bid, a statement of equipment that is proposed for use under this contract, its present location, and the dates of availability. The Tribe may request additional information from a bidder to demonstrate that the bidder is able to perform the work.

The Tribe will accept bids from responsible contractors who show evidence of their ability to complete the total development project, their financial and technical resources, and their professional integrity. A bid may be rejected if the information submitted fails to demonstrate that the bidder is qualified to perform the scope of work under the contract or is qualified to complete the total development project.

2. SCOPE OF WORK

Included in this bid package is Exhibit 2 which contains geotechnical soils investigations and construction recommendations, Project Design report, logging firewood sharing, and construction plans that show the site plan, existing conditions and topographic information for the subdivision project, along with construction drawings for erosion control, road plan, grading, storm drainage, sanitary sewer, water and dry utility plans including fiber optic and final design for permanent power and streetlights from Puget Sound Energy (PSE) . The work required under this contract includes all labor, materials, transportation, equipment, supplies and services necessary for, and incidental to, the completion of all contract work in accordance with the contract, plans, PSE design and construction standards and geotechnical information provided in Exhibit 2. Any bulletins or addenda issued during the time of bidding are to be covered in the proposal and will become part of any subsequent contract.

The proposal is shown in the three bid schedules in Exhibit 3 and a bid summary. The bidder is required to bid on all of the bid schedules for the work and contract amount awarded will be based on the bid summary amount.

Details of work which are necessary to carry out the intent of the contract, or which are customarily performed, shall not relieve the contractor from performing the omitted work, but the work shall be performed as if fully and correctly set forth and described in the contract. The contract bid prices shall be full pay for all work and materials required to complete the contract.

3. EXAMINATION OF SITE, DRAWINGS, AND OTHER

Each bidder shall visit and investigate the site of the proposed work and fully acquaint him or herself with conditions relating to construction and labor so that he/she may fully understand the facilities, difficulties, and restrictions attending the execution of the work under the contract.

The Contractor is presumed to be familiar with local soil geology and, by signing the bid documents, acknowledges that he has been given an adequate opportunity to review the geotechnical data provided in Exhibit 2 and has accessed the site prior to bidding the contract. Subsurface soil conditions will not be considered a valid reason for a claim based on changed conditions or differing conditions. The Tribe makes no representations or guarantees regarding the sub-surface soil conditions at the site.

Bidders shall thoroughly examine and be familiar with the drawings and supporting documents. The failure or omission of any bidder to receive or examine any form, instrument, addendum or other document or to visit the site and acquaint themselves with conditions there, which may have a bearing on construction costs, shall in no way relieve any bidder from any obligation with respect to their bid or the contract. By submitting a bid the bidder warrants, agrees and acknowledges that they have complied with this paragraph and is familiar with the conditions such examination and investigation would reasonably disclose.

4. BID PREPARATION AND SUBMISSION

(a) The bidder shall submit their cost proposal for each of the three schedules listed on the Bid Summary on the forms furnished by the Tribe and included in Exhibit 3. The mailing address, email address and phone number of the bidder shall be typed or printed on the proposal. All blank spaces in the proposal form shall be properly filled in.

(b) All prices must be stated in both words and figures.

(c) Bids must be signed and the bidder's name typed or printed on the bid sheet and each continuation sheet which requires the entry of information by the bidder.

i. If the proposal is made by a partnership, it shall contain the names of each partner and shall be signed in the firm name, followed by the signature of the person authorized to sign.

ii. Bids signed by an agent shall be accompanied by evidence of that agent's authority. (Bidders should retain a copy of their bid for their records).

iii. If the proposal is made by a corporation, it shall be signed in the name of the corporation, followed by the written signature of the officer signing and printed or type-written designation of the office he holds in the corporation.

(d) All bid documents shall be submitted electronically and/or physically and shall be clearly marked with the words "Bid Documents," the name of the project, and the bidder's name. Failure to bid on all items will disqualify the bid.

4.1. FIXED PRICE LUMP SUM BID

Bidders shall submit a fixed price lump sum bid on the bid schedule provided in Exhibit 3. Bidders are required to establish an overall construction budget that corresponds to the construction schedules (see Section 12) for the entire project, and include that in their Bid. Failure to provide an overall construction budget will be considered non-responsive.

The Tribe is providing professional services for the construction of the work related to Construction Surveying, Inspections, and Soil Testing/Construction Monitoring and Field Quality control.

As required in Title 10.04 of the Port Gamble S'Klallam Tribal Code, all laborers and mechanics employed by contractors or subcontractors in the construction, alteration, or repair, including painting or decorating of buildings or other facilities in connection with this bid proposal shall be paid wages at not less than those prevailing on similar construction in the locality, as determined by the Secretary of Labor in accordance with the Davis-Bacon Act of March 3, 1931 (46 Stat. 1494), as amended (40 U.S.C. 276a et seq.) as shown in Exhibit 4.

The work will be conducted under the general supervision of the Tribe's designated representatives and will be subject to inspection to ensure strict compliance with the terms of the contract documents. No inspector is authorized to change any provision of the specifications without written authorization of the Tribe.

5. EXPLANATION AND INTERPRETATION

Every request for an interpretation of the bid documents shall be made to the Project Engineer Pat Fuhrer, patf@map-limited.com electronically via email and copied to the Port Gamble S'Klallam Tribe's Project Manager Rory McLeod, rorym@pgst.nsn.us five (5) or more business days before the deadline for bid submissions. Oral interpretations shall not be provided to any bidder as to the meaning of the drawings and specifications or other contract documents.

Any information given a prospective bidder concerning this solicitation will be furnished promptly to all other prospective bidders via addendum to whom drawings have been issued as a written amendment to the solicitation, if that information is necessary in submitting bids, or if the lack of it would be prejudicial to other prospective bidders.

All such amendments shall become part of the contract bid documents and shall be acknowledged by the bidder in the space provided on the Bid Proposal.

6. LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWAL OF BIDS

6.1 Late Submissions

Any bid received after the exact time specified for submission to Rory McLeod will not be considered.

6.2 Erasure and Modifications

The proposal form invites bids on definite construction plans. Only the amounts and information asked on the proposal form furnished will be considered as the bid, each bidder shall bid upon the work exactly as provided in the proposal form.

The bids submitted must not contain any erasures, delineations, or other corrections unless each such correction is suitably authenticated by affixing in the margin immediately opposite the correction the surname or surnames of the person or persons signing the bid and their signature initials.

Modifications to bid proposals already submitted and received will be considered only if the request for such modifications and the modifications themselves are made prior to the scheduled closing time for the receipt of the bid proposals.

Modifications must be made in writing, submitted electronically via email and have present the signature of the bidder. Oral, telephonic, telefax or telegraphic modifications are prohibited. Changes in or additions to the bid form, recapitulations of the work bid upon, alternate proposals, exclusions or any-other modifications of the bid form which are not specifically called for in the contract documents, may result in the Tribe's rejection of the bid as non-responsive.

6.3 Withdrawal of Bid

Bids may be withdrawn by written notice submitted electronically via email at any time prior to the exact closing time set for submittal of bids. Submission of withdrawal of bid shall be submitted by an authorized representative of the bidder and must have their signature affixed to the electronic documents.

After the scheduled closing time for the receipt of proposals, no bidder will be permitted to withdraw their proposal unless the award of the contract is delayed by the Tribe for a period exceeding sixty (60) calendar days. Negligence on the part of the bidder in preparing the bid confers no rights for the withdrawal of the bid after it has been opened.

7. PERMITS AND TAXES

There are no permits required to be obtained by the Contractor, and no State or County taxes will be charged to the development since all land for the project is currently in Trust status and located upon a federally recognized Indian Reservation.

8. PAYMENTS

The Tribe will make monthly payments to the Contractor based on progress (by percentage of completion) on the contractor's overall budget that sets forth the schedule of values as required in Section 4.1.

9. INSPECTIONS

The project will be inspected by the Tribe and its designated representatives. The Contractor shall provide for and include weekly construction progress/inspection meetings with the Tribe's project representatives in their bid.

10. DETERMINATION OF LOW BID

Bids will be considered based upon the provisions of Sections 1.02 and 1.03 of the WSDOT/APWA current edition Standard Specifications, however, generally:

A. Lump Sum Contracts: Where the lowest base bid submitted by a responsible bidder for a proposed lump sum contract does not exceed the funds available to finance the contract, the award of the contract will be made to such lowest responsible bidder on the basis of the base bid. If the lowest bid submitted by a responsible bidder exceeds the funds available to finance the contract, the contract may be awarded to that responsible bidder whose base bid, when reduced by the smallest number of alternates taken in the sequence specified in the Schedule of Prices, does not exceed such funds, and is the lowest in comparison with all other bids which are similarly reduced by the same alternates.

B. Unit Price Contract: The quantities for which unit prices are indicated in the proposal form are approximate only and are to be used for the purpose of comparison of bids and determining the low bid and the amount of the payment and performance bond required. If a discrepancy exists between the price per unit and the extended amount of any bid item, the price per unit will control. The total of the extension, corrected where necessary, will be used for award purposes and to determine the amount of the performance and payment bond. The Tribe expressly reserves the right to increase or decrease these quantities during construction and to make reasonable changes in the design without being responsible to the Contractor for extra costs, loss or for anticipated profits. Payment will be made on the basis of the actual quantities of each item of work completed in accordance with the contract documents.

C. Alternates and Add-on's: If the lowest bid submitted by a responsible bidder exceeds the funds available to finance the contract, the contract may be awarded to that responsible bidder whose base bid, when reduced by the smallest number of add on' s and/or alternate bid items, sequence specified in the Schedule of Prices, does not exceed such funds, and is the lowest in comparison with all other bids which are similarly reduced by the same alternates. The Contractor is requested to bid both proposals; basic bid, alternate bid, and add-ons; the determination of the lowest responsive bid will be determined as noted above.

In the case of a tie of low bids, award shall be made in accordance with the Tribe's written policy and procedure.

The lowest responsible Bidder will be asked to enter into a contract for the total development schedule of the project. In the event that the Tribe and the highest ranking contractor are not successful in reaching a contract format, the next highest ranking bidder will be approached in the same manner. In the event that none of the bidders reach a successful contract agreement, the Tribe reserves the right to reject all proposals and re-advertise the project to the General Public using the same general development conditions.

11. CONSIDERATION OF BIDS

All bids may be rejected if the lowest responsive bid received exceeds the Engineer's estimate by an unreasonable amount. In the event that all bids received are rejected for this reason, this project may be deferred to re-advertising for bids until a more competitive bidding situation exists.

The Tribe reserves the right to reject any/or all proposals, and to waive any informalities in connection with said proposals or bids.

If any bidder submits more than one proposal for an item, all proposals of that bidder for all items may be rejected. If the proposal includes a supplemental schedule or predetermined unit prices for labor and materials or other items for the purpose of establishing a cost basis on unforeseen contract changes, the Tribe reserves the right to reject, without impairing the balance of the proposal, any or all such predetermined unit prices or such supplemental schedules which the Tribe may consider excessive or unreasonable.

12. SCHEDULE

Bidders are required to establish an overall construction schedule for the entire project, and include such schedule in their Bid. Failure to submit this schedule will be considered non-responsive.

13. REPRESENTATIONS AND CERTIFICATIONS

None required

14. BID GUARANTY

A certified check, cashier's check, cash, or a bid bond made payable to the Port Gamble S'Klallam Tribe for an amount equal to at least five (5) percent of the total amount bid, and the completed form provided in Exhibit 5 shall accompany each bid as evidence of good faith and as a guarantee that if awarded the contract, the bidder will execute the contract and provide the required bond(s).

The successful bidder's bid guarantee payment will be retained until they have entered into a contract with the Tribe and have furnished a 100 percent payment and performance bond. The Tribe reserves the right to hold the cash; certified checks, cashier's check, or bid bond of the three (3) lowest bidders until the successful bidder has entered into a contract and furnished a payment and performance bond. Once the project is awarded, the Tribe will return the Bid Guaranty to the non-selected bidders.

Bid bonds shall be furnished by a surety company authorized to do business in the State of Washington. It is the bidder's responsibility to advise their surety company that the bond to be furnished relates to work to be performed on an Indian Reservation. Should the successful bidder fail to enter into a contract and furnish a satisfactory payment and performance bond within ten (10) business days after their proposal has been accepted, the cash, certified check, cashier's check or bid bond shall be forfeited as liquidated damages.

15. PERFORMANCE AND PAYMENT BOND

The successful bidder shall furnish an assurance of completion prior to the execution of the contract under this solicitation in the form of a payment and performance bond and in the full amount of the contract price. Such bond shall be furnished by a surety company and deemed acceptable to the Tribe. Notwithstanding anything herein to the contrary, said bond(s) shall in all respects comply with the requirements of Chapter 39.08 of the Revised Code of Washington. The expense of this bond shall be borne by the Contractor.

16. PRECONSTRUCTION CONFERENCE

After award of a contract under this solicitation and prior to the start of work, the successful bidder will be required to attend a preconstruction conference with representatives of the Tribe and its Engineer, and other interested parties convened by the Tribe. The conference will serve to acquaint the participants with the general plan of the construction operation and all other requirements of the contract. The Tribe will

provide the successful bidder with the date, time, and place of the conference.

17. EQUAL OPPORTUNITY AND NATIVE AMERICAN PREFERENCE

Contractor shall not discriminate against any employee or applicant for employment on the basis of race, color, ethnicity, religion, age, national origin, gender or disability, with regard to employment, promotion, demotion, transfer, recruitment, advertising, lay off, termination, rates of pay or other forms of compensation or selection for training.

This procurement is subject to the Port Gamble S'Klallam Tribal practice of Indian Preference regarding the use of Port Gamble S'Klallam and Native American businesses and increased employment of qualified Port Gamble S'Klallam Tribal Members and other Native Americans. All bidders are urged to seek out and utilize businesses owned by Port Gamble S'Klallam Tribal Members.

Indian Preference Requirements

Port Gamble S'Klallam Tribe
Raccoon Town Project

1. The Port Gamble S'Klallam Tribe's "Tribal Construction Preference Policy" applies to this Project and is hereby incorporated into "Instructions to Bidders for Contracts" by reference.

2. The general Contractor selected for the project shall make best efforts at awarding subcontracts in compliance with the Port Gamble S'Klallam Tribe's "Tribal Construction Preference Policy".

4. Proof of Indian business ownership shall be required for the Project if claiming Indian Preference.

5. If claiming Indian Preference, the following form must be completed and submitted along with the bid:

Indian Preference Form

Port Gamble S'Klallam Tribe
Raccoon Town Project

1. Organizational Structure:

_____SOLE PROPRIETOR
_____PARTNERSHIP
_____CORPORATION
_____JOINT VENTURE
_____OTHER

2. Name of Owner/Owners:

_____
_____
_____
_____
_____

3. Tribe of Owner Claiming Indian Preference:_____

Please attach official supporting documentation from the Tribe for each officer, partner, or individual claiming Indian Preference.

If your company is either a partnership or corporation, attach a written narrative to this form explaining the stock ownership, structure, management, control, financing, and salary or profit sharing arrangements of the enterprise. Attach copies of all shareholder agreements, including voting trust, employment contracts, agreements between owners and enterprise. Include information on salaries, fees, profit sharing, material purchases, and equipment lease or purchase agreements. Evidence relating to structure, management, control, and financing should be specifically included. Also, list the specific management responsibilities of each principal, sole proprietor, partner, or party to a joint venture**.**

4. Indian Ownership Interest: _____PARTIAL (List percentages of Ownership)
_____100% OWNERSHIP

C E R T I F I C A T I O N

I CERTIFY THAT ALL STATEMENTS MADE BY ME ON THIS INDIAN PREFERENCE FORM ARE TRUE, COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE. I HEREBY GRANT PERMISSION TO THE PORT GAMBLE S'KLALLAM TRIBE TO CONFIRM BY PERSONAL INQUIRY OR OTHERWISE, THE INFORMATION I HAVE

GIVEN. I UNDERSTAND THAT ANY WILLFUL MISREPRESENTATION OF FACTS GIVEN TO THIS PROCESS IS GROUNDS FOR REJECTION OF THIS QUALIFICATION FOR INDIAN PREFERENCE. I RELEASE ALL PERSONS CONNECTED WITH ANY REQUESTS FOR INFORMATION FROM ALL CLAIMS, LIABILITY, AND DAMAGES FOR WHATEVER REASON ARISING OUT OF FURNISHING THE INFORMATION.

I hereby acknowledge that I have read and understand the above statement.

_____ _____

Owner/Contractor's SIGNATURE DATE
If applicant is Sole Proprietor

_____ _____

PARTNER'S SIGNATURE (IF APPLICABLE) DATE
If applicant(s) is/are in a Partnership or Joint Venture

IF APPLICANT IS A CORPORATION
AFFIX CORPORATE SEAL:

_____

CORPORATE SEAL

BY:_____ _____

PRESIDENT'S SIGNATURE DATE

ATTESTED BY:_____ _____

CORPORATE SECRETARY DATE

RESOLUTION NO. 03-A-84

THE
PORT GAMBLE S'KLALLAM
BUSINESS COMMITTEE
OF THE
PORT GAMBLE S'KLALLAM
COMMUNITY COUNCIL

I.

WHEREAS, the Port Gamble S'Klallam Indian Community is organized under the Indian Reorganization Act of June 18, 1934; and

II.

WHEREAS, under its Constitution and Bylaws adopted August 5, 1939, the Community Council was designated as the governing body of the Port Gamble S'Klallam Indian Community; and

III.

WHEREAS, by resolution dated April 22, 1956, the Port Gamble S'Klallam Community Council delegated the authority to conduct the business of the Port Gamble S'Klallam Indian Community to the Port Gamble S'Klallam Business Committee; and

IV.

WHEREAS, the Port Gamble S'Klallam Business Committee has determined it necessary to adopt a Tribal Preference Policy for construction projects in an effort to support Indian contractors; and

WHEREAS, the Tribal Preference Policy will ensure compliance with Federal and State grant requirements that require a tribal preference policy; and

V.

NOW THEREFORE BE IT RESOLVED, that the Port Gamble S'Klallam Business Committee hereby adopts the attached Tribal Preference Policy dated June 10, 2003 (Attachment A).

CERTIFICATION

WE HEREBY CERTIFY that on this date there was a regular meeting held of the Port Gamble S'Klallam Business Committee on the Port Gamble S'Klallam Indian Reservation, at which time a quorum was present;

WE FURTHER CERTIFY, that the above numbered resolution, was at said meeting, introduced, evaluated, and was passed by a vote of 5 FOR, 0 AGAINST, dated this 10th day of June, 2003.

Ronald G. Charles
Chairman

Marie Hebert
Secretary

ATTACHMENT A (RESOLUTION 03-A-84)

Port Gamble S'Klallam
TRIBAL CONSTRUCTION PREFERENCE POLICY[1]
June 10, 2003

(1) This Tribe Preference Policy only applies to Tribal construction projects over $100,000 in size that is funded by State and Federal grant money. Construction projects include site work (grading, utilities, etc.), building construction (foundation, plumbing, framing, electrical, sheetrock, etc.), and road construction.

(2) This policy grants preference to certified, qualified Indian-owned companies that bid within five (5) percent of the lowest qualified responsible Non-Indian bidder(s). To be certified, an Indian-owned firm must be at least 51 percent owned and actively managed by registered member of a federally recognized Tribe. To be qualified, the Indian-owned firm must meet bonding requirements, financial stability requirements, experience requirements and other qualifications and criteria set forth by the Construction Manager for the project.

[1] Approved by Tribal Council on June 10, 2003

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18. SUBCONTRACTORS

Bidders shall identify in writing where shown on Exhibit 1, the names of all subcontractors together with a summary of the extent and character of the work to be done by each subcontractor, and whether or not they are Indian owned, woman owned or minority business.

19. INELIGIBLE CONTRACTORS/SUBCONTRACTORS

The use of debarred, suspended, or ineligible contractors is prohibited under 24 CFR § 24 and §1001.44.

20. DATE OF OPENING BID

Each proposal, shall be either mailed or hardcopies physically delivered at the PGST Main Tribal Center 31912 Little Boston Road NE, Kingston, WA 98346, properly addressed attention Rory McLeod with the name of the bidder and the project title written in the subject line.

Bids will be accepted until 12:00 pm on April 15, 2026. It will be the sole responsibility of the bidder to see that their bid is received in proper time. Any bid received after the scheduled closing time for receipt of bids will not be considered. The bid opening shall occur over the next 5 business day and shall be organized beginning with lowest bidder and name of bidder and shall be sent via email to all bidders.

21. SERVICE OF PROTEST

Written objections concerning a proposed or actual award of a contract under this solicitation by an actual or prospective bidder may be served on the Director of Planning of the PGST. All protests shall be resolved in accordance with the Tribe's protest policy and procedures, copies of which are maintained at the Port Gamble S'Klallam Tribal Center.

22. AWARD OF CONTRACT

The Tribe reserves the right to reject all bids and not make an award. The award of the contract will be made to the qualified bidder submitting the lowest bid, provided that the Tribe determines that the bidder is qualified to perform the Contract, and whether it is in the interest of the Tribe to accept the bid. The Tribe will assess bidder qualifications with respect to the project needs for equipment, manpower, availability, bonding capacity, etc. Upon a request by the Tribe, a bidder whose bid is under consideration for the award of the contract shall submit promptly to the Tribe satisfactory evidence showing the bidder's financial resources and evidence of current bonding ability.

A written award will be furnished to the successful bidder within the period of acceptance (see Exhibit 6).

23. EXECUTION OF CONTRACT

A example copy of the construction contract for this project is provided in Exhibit 7. Within ten (10) business days after receiving the notice of award, the successful bidder shall furnish the Tribe the required Contractor's Payment and Performance bond and the Certificate of Insurance and the Contractor shall execute the contract. The Contract will be presented to the Port Gamble S'Klallam Tribal Council for review and approval. Signature by both parties constitutes execution of the contract.

If the successful bidder fails to execute said contract and to furnish said bond and insurance within ten (10) business days from the date of delivery of the Notice of Award, Tribe will consider such Bid abandoned, and shall retain the bid guarantee submitted with the bid proposal. The Tribe may award said contract to another qualified contractor, may re-advertise the work, or may otherwise dispose thereof as the Tribe deems fit.

EXHIBIT 1
STATEMENT OF BIDDERS QUALIFICATIONS

Each contractor bidding on work included in these contract documents shall prepare and submit the data requested in the following schedule of information.

This data must be included in and made a part of each bid document. Additional pages may be added if needed.

1. Name of Bidder: _____

2. Business and Email Address:
_____

3. How many years have you been engaged in the contracting business under the present firm name? _____

4. Contracts now in hand, gross amount? _____, $_____

5. General character of work performed by your company:
_____
_____

6. List of important projects accomplished by your company, including approximate costs:
_____
_____
_____
_____

7. List of your major equipment:
_____
_____
_____

8. Bank References: (at least 1 required) _____,
_____

9. Current business form and owners names:
_____
_____
_____

10. Other names used or business operated in the last 10 years:_____

_____
_____

11. Other partners, principal and shareholders in the past 10 years: _____
_____

12. List how your company will provide Indian Preference in the award of subcontracts:
_____
_____
_____
_____

13. Washington State Contractor's License Number: _____

14. List all Subcontractors, together with a summary of the extent and character of their work, and whether or not they are Indian owned, woman owned or minority business owned:
_____
_____
_____
_____ _____

15. Acknowledgement of Addendum Received. Bidder shall acknowledge receipt of all addenda. Bidder is responsible for verifying the actual number of addenda issued prior to submitting a proposal.

Addendum No.	Date Received	Name of Recipient

EXHIBIT 2
PLANS AND SPECIFICATIONS

INSERTIONS :

WSDOT Standard Specifications and Plans Hyperlinks
Timber Harvest Sharing Specifications
BABA Specifications
Geotechnical Engineering Recommendations
Willamette CRA
Inadvertent Discovery Plan
Construction Plans
PSE Preliminary Design
Earthwork Services quantities and Volumes report
Raccoon Town Final Design Report

EXHIBIT 3
BID SUMMARY

The contractor is required to bid on all of the work specified in Exhibit 2 and complete Exhibit 3 Bid Summary and Bid Schedules. The contractor shall signify that the bid amount is correct below.

RACCOON TOWN HOUSING PROJECT		
	Description	**Amount ($)**
	SCHEDULE A: Sanitary Sewer and Water Distribution System	
	SCHEDULE B: Stormwater and Roadway Infrastructure	
	SCHEDULE C: All Other Infrastructure and Construction	
TOTAL	SCHEDULE A + SCHEDULE B + SCHEDULE C	

By signing this agreement Contractor represents, warrants and certifies that in submitting its bid that Contractor has not participated and agrees not to participate in any agreement, arrangement or collusion with any other person, entity, bidder, vendor or any subcontractor pertaining to receiving or giving certain benefits to Contractor or to any of these aforesaid parties, or made any promises of future benefit to anyone, or made any payment or gift to any TRIBAL agent, representative, employee or official. In addition, Contractor shall not make any payments or gifts to any TRIBAL official, employee or any Tribal member or Tribal agent as a result of or related to Contractor performing work pursuant to this Contact. Violation of this paragraph shall be grounds for immediate termination of consideration of this bid and shall bar the Contractor from future TRIBE contracts.

Name of Firm_____

_____
Authorized Official Signature Title

Business Physical Address:_____

_____
Mailing Address City State Zip Code

_____
Telephone Number Email

Washington State Contractor's License No._____

Date of Issue _____ Expiration Date _____

EXHIBIT 3 BID SCHEDULE A
SANITARY SEWER AND WATER DISTRIBUTION SYSTEM
RACCOON TOWN HOUSING PROJECT

WORK ITEM	Written	Dollars
On-site Sanitary Sewers including manholes, side sewers, and cleanouts		
Little Boston Road Off-site sewer extension/connection including Saw-Cut, Unsuitable Excavation & Haul, Excavation Safety System, Traffic Control, Testing, Imported/Compacted Roadway Gravel Borrow, and Paving		
Reservoir Watermain Fill Pipe Replacement, including Special Excavation, Existing Pipe Preservation, Sampling Tee, New Watermain Separation and Testing, Existing Pipe removal and disposal		
On-site watermain including hydrants, lot services, meters, meter boxes, blow-off and air-vac assemblies, and New watermain Separation and Testing		
TOTAL SCHEDULE A		

EXHIBIT 3 BID SCHEDULE B STORMWATER AND ROADWAY INFRASTRUCTURE RACCOON TOWN HOUSING PROJECT		
WORK ITEM	**Written**	**Dollars**
On-site Storm Drainage incl. Storm Pond and Appurtenances, Pond and Pedestrian Access Road and bollards, Dispersion Systems, Lot Connection Drains		
On-site Cement Concrete Curb & Gutter and Rolled Curb, curbing transitions, curb cuts & cement concrete ramps, signage, striping, and channelization		
Hood Canal Drive Frontage Work including Sawcutting, Clearing/Grubbing, Grading, Storm Drainage System, Concrete Curb and gutter, cement concrete ramps and driveway entrance, cement sidewalks, pavement section and pavement restoration, signage, crosswalk and warning system, traffic control		
On-site Cement Concrete Sidewalk		
Roadway Grading including CSTC & CSBC		
On-site Paving HMA including speed humps, raised crosswalk and pedestrian warning system, signage, and centerline monuments		
TOTAL SCHEDULE B		

EXHIBIT 3 BID SCHEDULE C
ALL OTHER INFRASTRUCTURE & CONSTRUCTION
RACCOON TOWN HOUSING PROJECT

WORK ITEM	Written	Dollars
Mobilization and Demobilization		
Minor Changes ALLOWANCE	Twenty-Five Thousand and 0/100 dollars	$25,000.00
Stormwater Pollution Prevention Plan including BMP installation and maintenance, seeding, jute mat		
Clearing & Grubbing including topsoil strip, stockpile, placement, and excess disposal		
Timber Harvest Firewood Sharing and Delivery		
Mass Grading incl. Excavation and Embankment Haul, Compaction & Import		
Dry Utility Trenching, Conduit & Backfill and Fiber Handholds(Power, New Street Lighting, Fiber)		
Hood Canal Drive Street Lighting overhead power demo/removal, trenching and backfill for conduit between existing light standards, 2” Sch 80 conduit, cable, re-connect street lights, energize at V-09		
Park Tract Amenities, including equipment purchase and install, curbing, boulder relocation ALLOWANCE	One Hundred Fifty-Thousand and 0/100 Dollars	$150,000.00
Final Cleanup		
TOTAL SCHEDULE C		

EXHIBIT 4
Davis Bacon
Construction Labor Rates 1/1/2025 – 12/31/2026

EXHIBIT 5
BID GUARANTEE

A bid guaranty in an amount of five percent (5%) of the total bid based upon the approximate estimate of quantities at the above prices and in a form as indicated below is attached hereto:

CASH in the amount of $_____

CASHIER'S CHECK for $_____dollars made payable to Port Gamble S'Klallam Tribe

CERTIFIED CHECK for $_____ dollars made payable to Port Gamble S'Klallam Tribe

Receipt is hereby acknowledged of addendum(s) no. (s)

_____, _____, _____

DATED this _____ day of _____, 2026

_____
Authorized Signature(s)

_____
Firm Name

_____
Address

_____
Contractor's License No.

_____
Phone Number

Subscribed and sworn to before me this ____ day of _____, 2026.

_____
Notary Public

My Commission expires on the ___ day of _____, _____.

EXHIBIT 6
NOTICE OF AWARD

The Port Gamble S'Klallam Tribe ("Tribe") represented by the undersigned has considered the Bid Proposal submitted by _____ for the construction of _____ in response to its Notice and Instructions to Bidders dated: _____.

The Tribe accepts your bid proposal for the _____dated _____ in the amount of

_____

$_____ . You are hereby notified that your Proposal has been accepted for all Bid schedules.

You are required by this Notice and Instructions to Bidders to furnish the required Contractor's Performance Bond, and Certificate of Insurance and execute the formal contract with the Tribe within 10 business days from the date of your receipt of this notice.

If you fail to execute said contract and to furnish said bond and insurance within ten business days from the date of delivery of this notice, said Tribe will be entitled to consider your Bid as abandoned, to retain as liquidated damages the cash, certified check, cashiers check or bid bond submitted with the bid proposal, and to award the work covered by your Bid to another qualified contractor or to re-advertise the work or otherwise dispose thereof as the Tribe may see fit.

Dated this _____ day of _____, 2026

Port Gamble S'Klallam Tribe

BY: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged

This _____ day of _____, 2026

BY: _____

TITLE: _____

EXHIBIT 7
PORT GAMBLE S'KLALLAM TRIBE
CONSTRUCTION CONTRACT

This agreement is entered into on the ___ day of _____, 2026, between the Port Gamble S'Klallam Tribe, P.O. Box 498, Kingston, WA 98346, a federally recognized Indian TRIBE ("TRIBE") and _____ ("Contractor") for the purpose of Contractor providing all labor, equipment and materials for the construction of infrastructure to support the 39-home Raccoon Town Development within the Port Gamble S'Klallam Indian Reservation ("Project"), under the terms and conditions stated below:

1. Term. The Work commenced approximately May 15, 2026 upon a Notice to proceed issued by TRIBE and will be completed on or before July 28, 2027.

2. Compensation. This contract is on a lump sum basis in the not to exceed amount of _____ to be paid in accordance the payment terms in Paragraph 13 below. The maximum amount allowable for this contract is _____. No money exceeding this amount shall be paid to Contractor absent a written change order as provided in Paragraph 26 below or a written consent of the Port Gamble S'Klallam Tribal Council.

3. Taxes and Fees: No allowance has been made in contract price for sales tax. TRIBE will furnish Contractor tax exemption documentation. No allowance has been made in contract price for any fees or permits that Contractor may need to obtain to perform this Work, and no state or local permits are necessary for performing this work on the Port Gamble S'Klallam Indian Reservation.

4. TRIBE's Representative, Project Manager, and Engineer. The TRIBE's representative, authorized to implement the terms and conditions of this agreement is Joe Sparr, Director of the Planning Department, or his successor. The TRIBE's Project Manager, also authorized to implement the terms and conditions of this agreement is Rory McLeod. The TRIBE's Engineer is Pat Fuhrer, MAP, LTD. Notification of any change in the TRIBE's representatives or the TRIBE's Engineer shall be given in writing by the TRIBE to the Contractor.

5. Contractor's Representative Contractor's representative and project manager for this Project is _____. Notification of any change in the Contractor's representative or project manager shall be given in writing by the Contractor to the TRIBE.

6. Scope of Work. Contractor shall provide all necessary labor, equipment and materials to perform the construction of infrastructure to support the 39-home Raccoon Town Development as set forth in the Contractor's Bid Proposal in Exhibit 1, awarded on _____, 2026 and in accordance with the TRIBE's bid plans and specifications provided in Exhibit 2.

7. Contractor's Duty to Examine. Contractor represents that it has examined the site of the Work and has compared the site with the Contract specifications, plans, drawings and other materials related to the Project. Contractor understands and is knowledgeable about the

facilities and any difficulties attending to the execution of this Contract. No allowance will be made by TRIBE on behalf of Contractor by reason of any error or neglect on Contractor's part regarding its site examination.

8. Building and Construction Standards. For the purposes of this contract, TRIBE does not adopt the laws or codes of any other jurisdiction. However, Contractor represents and warrants that the Work will be performed consistent with good construction industry standards. In the case of a conflict the WSDOT Standard Specifications, current edition will govern.

9. Materials/Approved Equals: All new materials shall be used for this project. Unless an item is indicated as "No substitute", special brands, when named, are intended to describe the standard of quality, performance or use desires. Equal items will be considered by TRIBE, provided that the Contractor has specified the substitute brand and model and provided all descriptive literature, independent test results, product samples, local servicing and part availability, at the time of contract execution. The decision of TRIBE as to what items are equal shall be final and conclusive. If TRIBE selects to use a brand that the Contractor represents as an equal, TRIBE's acceptance of the item is conditioned on TRIBE's inspection and testing after receipt. If TRIBE, in its sole judgment, determines the item is not an equal, the items shall be returned at Contractor's expense and Contractor shall install the item originally specified.

10. Performance Bond and Insurance. A 100% performance bond is required for this work.

11. Insurance. Contractor shall not commence work under this Contract until all required insurance has been obtained and approved by TRIBE. Contractor shall maintain all required insurance at all times any work, including guarantee work, is being performed by Contractor. The following insurance is required under this Agreement:

a. Workers' Compensation Insurance. . Contractor shall, during the life of this Contract, maintain and fully comply with all terms and conditions of the laws of the State of Washington pertaining to Workers' Compensation, together with any and all amendments and supplements thereto and any and all regulations promulgated thereunder. For purposes of this contract the TRIBE adopts the Washington State worker compensation laws (Title 51 RCW), but only to the limited extent that entitles a worker to receive benefits from the state for injuries a worker incurs while performing the subject work. TRIBE is not adopting any provisions of the said laws that could be interpreted to impose liability on TRIBE, and the TRIBE is not waiving sovereign immunity in this regard.

b. Public Liability and Property Damage Insurance. Contractor shall procure and maintain during the life of this Contract, a policy of comprehensive general liability insurance, with an insurance carrier authorized to do business in the State of Washington. The policy shall protect Contractor and TRIBE from liability imposed by law for damages suffered by any persons arising out of or resulting from acts or omissions in the performance of this Contract: (1) for bodily injury or death resulting from accidents or any act or omission by Contractor in the performance of this Contract, and (2) for injury to or destruction of any property, including TRIBE property, and including loss of use. The insurance policy shall include coverage for claims for damages because of bodily injury or death or property damage arising out of the

ownership, maintenance or use of any motor vehicle, including non-owned vehicles. TRIBE shall be designated in the insurance policy as a primary additional named insured and shall be provided thirty (30) calendar days written notice of cancellation, non-renewal, or material change in the coverage provided. The insurance shall be on an "occurrence basis" and shall be on a Comprehensive General Liability form with coverage to include Blanket Contractor, Broad Form Property Damage, Personal Injury, Protective Liability and Employers Liability. Limits shall be at $1,000,000.00 per occurrence, $2,000,000 aggregate. TRIBE's insurance shall be excess to any other collectible insurance. Contractor shall furnish evidence of the amount of any deductible or self-insured retention under the policy. Contractor shall be solely responsible to pay the amount of any deductible or self-insured retention towards the claim under the policy. TRIBE may require Contractor to furnish evidence of its ability to pay the amount of any deductible or self-insurance retention.

c. Contractor has the sole obligation to protect and insure itself from loss of its tools and equipment while at the work site.

12. Proof of Insurance. Contractor shall furnish to TRIBE a Certificate of Insurance coverage complying with Paragraph 11 above. An up-to-date certificate of insurance must be on file with TRIBE's Representative throughout the life of the Contract. TRIBE may, at any time, require the Contractor to furnish and file with TRIBE a certified true copy of any insurance policy together with a letter from the insurance carrier verifying that the premium has been paid for the period indicated. Contractor's failure to obtain or maintain the required insurance shall be grounds for immediate termination of this Contract. Nothing contained in this paragraph shall be construed as limiting the extent of Contractor' liability under this Contract.

13. Payment Terms TRIBE shall pay Contractor on the basis of monthly progress payment requests to the TRIBE's Project Manager by the tenth ($10^{th)}$ calendar day of each month. Each progress payment request shall state the date, identify this Project and include a brief description of the services performed in the preceding month. TRIBE will pay up to ninety percent (90%) of the actual work completed as identified in the request and approved by the TRIBE's Representative, with payment to be made within seven (7) calendar days of TRIBE approving the request. As to any part of the request TRIBE's Representative disapproves, TRIBE will request clarification or additional supporting documentation from Contactor and the parties will make a good faith effort to reconcile their differences. Upon resolution of disputed request amounts, any amounts found due shall be paid within seven (7) calendar days of the reconciliation. Progress payment requests received after the tenth (10^{th}) calendar day of the month may be processed by TRIBE with the following month's invoice. Payments made by TRIBE do not constitute a waiver of any claims by TRIBE against Contractor concerning or arising out of this Agreement. Contractor's acceptance of payment for particular services performed under the Agreement constitutes a waiver of all claims by Contractor for that portion of the Agreement. Acceptance by Contractor of the final payment under this Agreement constitutes a waiver of all claims under the Agreement. The making of any progress or final payment does not relieve Contractor from fully complying with the Contract.

14. Final Payment. Final payment of the retained ten percent (10%) of the Contract price will be approved and made immediately after TRIBE issues its letter of final acceptance of the

work. Before the final payment is released to Contractor, Contractor must provide to TRIBE:

a. A General Release of all claims to TRIBE, using an agreed upon form;

b. A General Release of all claims from all material suppliers and from any other person or entity who purports to make a claim against any monies retained by TRIBE; and

c. A letter from the State of Washington Department of Labor and Industries verifying that all industrial insurance and medical aid premiums have been paid.

15. Inspection of Work. All work performed pursuant to this contract shall be subject to inspection by TRIBE's Project Manager and Engineer. The TRIBE Project Manager and Engineer shall have access to Contractor's work where ever it is in progress or being performed and Contractor shall provide reasonable access for inspection at all times. No inspection by TRIBE shall relieve Contractor of its responsibility to perform the work correctly or utilizing competent labor and new materials in strict accordance with the Contract specifications. All materials or work approved and later found to be defective by TRIBE shall be replaced without cost to TRIBE.

16. Inspector's Authority. TRIBE Representative, Project Manager and Engineer shall have the power to reject materials or workmanship that does not fulfill the requirements of the Contract specifications. Where Contractor disputes the rejection, Contractor may appeal to the TRIBE's Executive Director, whose decision shall be final.

17. Equitable Deduction. If TRIBE deems it expedient not to correct work that fails to meet contract specifications, an equitable deduction from the Contract price shall be made.

18. Testing. Testing shall be performed on the water system and sewer system in accordance with construction codes and standards that are applicable to this type of work if such work is performed off an Indian Reservation in Washington state.

19. Contractor's License. Contractor represents that it is a licensed contractor with the Washington State Department of Labor and Industries, license number _____.

20. Independent Contractor. Contractor is an independent contractor, it being understood that TRIBE is interested solely in the results of this contract and is relying upon Contractor's own judgment and experience to select the means for its performance of this contract. Contractor and contractor's employees are not and shall not, under any circumstances, be deemed to be an employees of the TRIBE nor entitled to any benefits provided to TRIBE employees. Contractor understands it has no authority whatsoever to negotiate or enter into contracts for or on behalf of TRIBE.

21. Contractor's Employees. Contractor shall provide a competent supervisor to supervise Contractor's employees on the Project. Contractor shall employ only competent, skilled, faithful and orderly persons to perform work under this Contract.

22. Drug Free Workplace. TRIBE maintains Drug Free workplace requirements, policies and procedures applicable to all persons who provide services to the TRIBE. Contractor who contracts with TRIBE must comply with the Port Gamble S'Klallam TRIBE's Drug Free workplace requirements. A Contractor who maintains its own drug testing policies and who can assure TRIBE that it maintains a drug free workplace may be exempt from complying with the Tribal drug testing procedures. Contractor hereby warrants that any and all personnel performing work pursuant to this Contract will be drug and alcohol free and represents that it maintains a drug free workplace. Based on these representations, which the parties acknowledge TRIBE is expressly relying upon, TRIBE hereby waives the requirement that Contractor comply with TRIBE's drug testing policies and procedures. TRIBE reserves the right to immediately test at the Port Gamble S'Klallam TRIBE Wellness Clinic, at Contractor's cost, any of Contractor's employees or agent who, while working on the Port Gamble S'Klallam Indian Reservation, appears to be affected by or under the influence of drugs and/or alcohol. A breach of any portion of this paragraph is hereby deemed a material breach and is cause for immediate termination of this Contract.

23. Safety. Contractor shall, at all times, exercise adequate precautions for the safety of all persons, including its employees, in the performance of this Contract and shall comply with applicable safety laws and regulations. Contractor is solely responsible to furnish safety equipment to its workers. TRIBE's Representative, Project Manager, or Engineer may, but does not have any duty to, advise Contractor of a safety violation. Contractor is solely responsible to make necessary corrections of all safety violations. Failure to correct a safety violation is a breach of this Contract and is grounds for TRIBE to order Contractor to cease work until the unsafe condition is corrected. Time and wages lost due to such safety shutdowns shall not relieve Contractor of any provisions of this Contract and shall be at Contractor's sole cost and expense.

24. Cleaning Up of Work Site. Contactor shall at all times, at its sole expense, keep the work site from accumulation of waste materials and debris caused by the work. At the completion of its daily work, Contractor shall remove all of its waste materials from and about the site and all of its equipment and surplus materials. In the case of a dispute, TRIBE may remove the debris and charge such costs to Contractor. TRIBE will not pay for any material that is deposited at a place other than the storage area approved by TRIBE.

25. Changes in Plans or Quantities. TRIBE, without invalidating this Contract, may by written direction order extra work or make reasonable changes by altering, adding to or deducting from the materials, work or labor and the Contract sum shall be adjusted accordingly. All added work and labor shall be executed under the conditions of the original Contract except that any claim for extension of time caused thereby shall only be adjusted at the time of ordering such change. When work under the Contract is deducted, reduced or eliminated, no payment shall be made to Contractor for anticipated profits on such work.

26. Extra Work. Any claim or order for extra materials, work and labor made necessary by TRIBE's written request for alterations or additions to the Contract or by reason that no price is provided in the Contract, shall not be valid unless the parties have agreed on a price and such price is documented in a written change order executed prior to Contractor commencing such

extra work. If the total amount of change orders will exceed ten percent of the total contract price, then Tribal Council approval must be obtained before such additional amount exceeding ten percent becomes an obligation of the TRIBE.

27. Extension of Time to Perform. With the written approval of the TRIBE Representative, Contractor may be granted additional time to complete the work required under this Contract if, in the TRIBE Representative's opinion, the additional time requested arises from an unavoidable delay. Unavoidable delay in the performance of work shall mean and include only causes beyond the control of Contractor and which Contractor could not have avoided by the exercise of due care, prudence, foresight and diligence. Delays caused by a person other than Contractor will be considered an unavoidable delay insofar as the delay necessarily interferes with the Contractor's completion of the work and such delays are not part of this Contract.

28. Unavoidable Delays. Contractor shall be provided an extension of time for any work that is delayed through no cause of Contractor but due to poor weather conditions to properly perform the work. Contractor shall notify TRIBE's Representative in writing within 10 calendar days of any such delay and shall spell out the weather conditions that precluded performing the work.

29. Failure to Timely Complete Work. Should the completion of work required under the Contract be delayed beyond the expiration of the period set in the Contract for completion or beyond any time extension which had been allowed during the course of the Contract, in addition to its other remedies, there shall be deducted from the total Contract price of work, for each calendar day by which such completion was delayed, the sum of $250 per day. Such sum shall not be considered a penalty but the parties understand and acknowledge that such sum is deemed to be liquidated damages which TRIBE will suffer by reason of the Contractor's failure to timely perform the Contract. TRIBE may retain any money due or which becomes due to Contractor to cover its liquidated damages.

30. Assumption of Risk. Contractor has inspected the site of the Work and on its behalf and on behalf of its employees assumes all risks associated with working under these conditions and shall hold TRIBE harmless from all risk of loss, damage, liability, claim and lawsuits resulting from working under these site conditions.

31. Compliance with Laws. Contractor shall comply with all applicable laws and, before commencing work, shall obtain all required licenses and permits necessary to perform this agreement. Contractor is responsible to file all required tax returns and notices. When working on the Port Gamble S'Klallam Indian Reservation, Contractor and it's Sub-Contractors shall be subject to and comply with all Tribal laws and the jurisdiction of the Tribal Court. Contractor shall indemnify and hold TRIBE harmless from any and all costs, liabilities, or obligations by reason of the failure of Contractor to comply with any applicable law.

32. Equal Employment/Indian Preference. Contractor shall not discriminate against any employee or applicant for employment on the basis of race, color, ethnicity, religion, age, national origin, gender or disability, with regard to employment, promotion, demotion, transfer, recruitment, advertising, lay off, termination, rates of pay or other forms of compensation or selection for training. Non-discrimination requirements notwithstanding, in accordance with

Federal Indian preference laws, Contractor shall, in good faith, provide preference and opportunities for training and employment to Native Americans, including Port Gamble S'Klallam Tribal members.

33. Assignment/Subcontract of Contract. Contractor shall not assign or subcontract any work under this contract.

34. Indemnity. Contractor acknowledges that it is solely responsible for the safety of all persons and property in the performance of this Contract. Contractor assumes the risk of all damages, loss, costs, penalties and expenses and agrees to defend, indemnify and hold harmless TRIBE and its officials, employees, retained engineers and architects, against any and all loss, damage, liability or costs which may be sustained by TRIBE and/or any of the aforementioned parties, on a account of any claim, legal action or alternative dispute resolution for the injury or death of any person or damage to property arising out of and in connection with or incident to Contractor's performance of the Contract

35. Place of Contract/Consensual Contract. Contractor acknowledges and understands that the TRIBE is a federally recognized, sovereign Indian TRIBE. Contractor represents and states here that it voluntarily and knowingly enters into this consensual relationship with TRIBE. The negotiation and execution of this agreement is deemed by the parties to have occurred within the Port Gamble S'Klallam Indian Reservation. All work identified in this Agreement will be performed on the Port Gamble S'Klallam Indian Reservation.

36. Dispute Resolution/Choice of Law.

a. Purpose of Dispute Resolution Provisions. The parties intend to resolve their disputes through direct discussion and, if such is not possible, then through the dispute resolution framework established below. All stated time frames for resolving disputes may be lengthened by mutual consent.

b. Direct Discussions. To initiate dispute resolution under this Section, the complaining party will first submit a written complaint letter to the representative of the party (as identified in sections 4 and 4 of this Agreement) against whom a dispute is lodged, stating therein the nature of the dispute, the requested resolution, and the factual basis supporting the requested resolution. The responding party will, within ten (10) working days of receiving the complaint letter, provide a written response, stating its agreement or disagreement with the nature of the dispute and the requested resolution. If the responding party disagrees with the complaint or the proposed resolution, the written response must provide at least one alternate resolution and the factual basis supporting such resolution(s). Thereafter, the lead representatives of each party will, for fifteen (15) working days, make a good faith attempt to resolve the dispute through one or more direct discussions. If no mutually acceptable resolution is reached, the lead representatives will prepare a joint statement within 5 business days, which includes a chronology, a synopsis of the discussions which took place and the last stated positions of each party.

c. Mediation. If direct discussions between the parties fail to resolve the dispute, any participating party may, within five business days of completing the direct discussion process, make a written request for mediation to be conducted in Seattle, Washington or at another place as the parties may agree in writing. If all participating parties agree to engage in mediation, the parties shall seek a mutually acceptable mediator. If the parties cannot reach agreement on the selection of the mediator within fifteen (15) working days of the date the written mediation request letter was received by the other party or parties, the mediation will be administered by J.A.M.S., Seattle, Washington Office using a J.A.M.S. mediator and protocol. Enforcement of a mediation agreement reached shall be the same as enforcement of an arbitration decision as set forth herein. If a party objects to proceeding with mediation, then mediation may be bypassed, and the dispute resolved pursuant to arbitration as set forth herein.

d. Binding Arbitration in the Event of Unsuccessful Direct Discussions/Mediation. Should direct discussions prove unsuccessful in resolving the dispute, and either mediation is not requested, is bypassed, or is also unsuccessful, either the complaining or responding party may make a written demand for arbitration before a single arbitrator in Seattle, Washington or at another place as the parties may agree in writing. If the parties cannot reach agreement on the selection of the single arbitrator within fifteen (15) working days of the date the written demand letter was received, the arbitration will be administered by J.A.M.S., Seattle, Washington Office using a J.A.M.S. arbitrator. Any arbitrator selected must have a fundamental knowledge of and at least five (5) years' legal experience contract law and a working knowledge of Indian law. The arbitrator shall have the power to establish a schedule for the hearing which hearing shall be limited to no more than 2 consecutive business days to be equally divided between the parties, including preliminary discovery to the extent he or she deems necessary and proper under the circumstances and there shall not be more than 2 depositions allowed per party, to make reasonable rules and issue orders necessary for a fair and efficient conduct of the hearing, and to conduct the hearing and administer oaths and affirmations. The arbitrator's decision shall be accompanied by an explanation as to the basis for the award. Each party will pay for its own attorneys' fees. The substantially prevailing party shall be entitled to reimbursement from the other party of all moneys it paid to the arbitrator or J.A.M.S. related to the arbitration proceeding. All arbitration awards shall be binding upon the parties and non-appealable.

e. Enforcement of Arbitration Award. Upon the issuance of an arbitration award or mediation agreement, the prevailing party may seek the entry of judgment upon the award in any court of competent jurisdiction which for purposes of a party's enforcement against TRIBE means the Tribal Court, and for TRIBE's enforcement against Contractor means federal court based upon diversity jurisdiction or other jurisdiction. If federal court jurisdiction is not available, Contractor agrees to submit to Kitsap County Superior Court in Washington for enforcement of the award against Contractor. The court of competent jurisdiction shall enforce the decision of the arbitrator and shall not modify, correct, alter or vacate said decision in any way unless the court finds after notice and hearing upon application of a party to the arbitration, one or more of the following: (1) the arbitration decision was procured by corruption, fraud or undue means, (2) there was evident corruption in the arbitrator, or (3) the arbitrator was guilty of the specific misconduct of

refusing to hear evidence pertinent and material to the controversy which prejudiced the rights of a party. No court shall have jurisdiction to interfere in any way with any pending arbitration. No party may seek from such court any provisional remedy pending appointment of the arbitrator or the arbitrator's rendition of the award. If the court vacates the arbitration decision, then the court shall direct a rehearing either before the same arbitrator or before a new arbitrator to be chosen in the manner provided in this section.

f. Limited Waiver of Sovereign Immunity by the Port Gamble S'Klallam TRIBE. Except for the limited waiver of sovereign immunity provided in this Dispute Resolution Addendum, nothing in this Agreement shall be construed as a general or specific waiver of the TRIBE's sovereign immunity, which immunities are expressly asserted. The Port Gamble S'Klallam TRIBE hereby grants to Contractor a limited waiver of sovereign immunity solely for the purpose of dispute resolution as provided in this Addendum and such waiver shall not be extended to any other person, agency or entity ("Limited Waiver"). This Limited Waiver applies only to contractual claims arising out of or under this agreement and does not apply to any non-contractual claims or to claims under any other agreement between the TRIBE and Contractor. Furthermore, nothing contained in this Limited Waiver shall be construed to create a contractual relationship with or a cause of action in favor of any third party against the TRIBE. This Limited Waiver applies only to the enforcement of a mediation agreement or an arbitration award against the TRIBE, provided such mediation agreement or arbitration award has been secured in accordance with the provisions of this Agreement. Any monetary award by any arbitrator or any mediation agreement shall be limited to not exceed the total monetary amount under this Agreement. This limited waiver of sovereign immunity is not, and shall not be deemed to be, a consent by the TRIBE to the levy of any judgment, lien or attachment on any appropriations received from any of the TRIBE's governmental agencies and/or enterprises.

g. No Requirement of Exhaustion of Tribal Court Remedies. The parties acknowledge that under the limited waiver of sovereign immunity provided for herein, the assumption of jurisdiction by any arbitrator or court of competent jurisdiction shall not be delayed or curtailed by any doctrine requiring exhaustion of Tribal court remedies.

h. No Consent to State Court For Any Purpose. The TRIBE expressly states and the Contractor understands and acknowledges that the TRIBE does not consent to the jurisdiction of the Washington or any other state court for any purpose except if necessary to enforce an award against Contractor as set forth above.

37. Termination of Contract for Cause. If the Contractor files for bankruptcy, a general assignment for the benefit of creditors or a receiver appointed on account of Contractor's insolvency, or if the work is not being properly and diligently performed, TRIBE may serve written notice upon the Contractor and the Surety which executed the performance bond, of TRIBE's intent to terminate the Contract. Such notice will contain the general reasons for termination of the Contract and a demand that the Contractor cure of any alleged breach of contract to the satisfaction of TRIBE within ten (10) calendar days of receiving the Notice of Termination for Cause. In the event the Contractor is terminated for cause, any moneys then due but unpaid to the Contractor shall be set aside until the Project is complete. If the cost to

TRIBE to complete the contract is greater than the sums left to be paid the Contractor, TRIBE shall set off such sums against the costs to complete the Contact and Contractor shall pay TRIBE for the additional costs TRIBE incurred to complete the Contact. If the cost to complete the contract is less than the sum then owing to the Contractor, TRIBE shall release the unpaid sum to the Contractor upon closing of the Contract.

38. Termination for Convenience. Upon providing seven (7) calendar days' written notice, TRIBE may terminate this contract for its convenience. If the contract is terminated by TRIBE, Contractor will be entitled to receive payment, at a pro rata percent of the amount stated in paragraph 2 above, for all work completed or partially completed to the satisfaction of TRIBE prior to the termination date. Contractor shall not be entitled to any other compensation including anticipated profit.

39. Records. For three years after final payment, Contractor shall maintain for inspection by TRIBE all books, records, documents, and other evidence of Contractor's costs and expenses under this agreement, to the extent and in such detail as will properly reflect all costs which Contactor claimed as due under this agreement.

40. Notices. All notices required to be given in writing in this Contract shall be deemed to have been given on the date of delivery if: (1) sent by electronic mail that is confirmed by a written hard copy of the notice which is sent by first class, registered or certified mail, or (2) if personally delivered to the person, and on the third day after mailing if mailed to the person by first class mail, registered or certified, postage prepaid and addressed to TRIBE or to the address for each party stated above or another address designated in a notice given in the same manner.

41. TRIBE Right to Use Facilities Prior to Final Acceptance. TRIBE reserves the right to use the facilities prior to final acceptance under this Contract and such use shall not be construed as a waiver or relinquishment of any rights that TRIBE has under this Contract.

42. Guarantee. Contractor shall remedy any defects in the work and pay for any damages to other work resulting from the defects that appear within one year of the date of final acceptance of the work. Neither TRIBE's final payment nor partial or entire occupancy of the premises by TRIBE shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. TRIBE will exercise good faith efforts to give notice of observed defects with reasonable promptness. If a defect has been discovered before payment is required under the terms of this Contract, TRIBE has the right and may withhold payment until the defect is cured. In the case of a failure of any part of the work, materials, labor and equipment furnished by the Contractor, the Contractor shall make all corrections and repairs as may be necessary to fully meet all of the specification and requirements of the Contract. Such corrections and repairs shall be made at Contractor's sole cost and expense without delay and with the least inconvenience to TRIBE. Rejected material and equipment shall be removed from TRIBE's property by and at the expense of Contractor. It is understood and acknowledged that the guarantee period set forth in this paragraph does not bar TRIBE from pursuing negligence or breach of contract claim after the guarantee period expires,

however, Contractor and TRIBE hereby agree to a three year time limit on such claims that begin on the date TRIBE finally accepts Contractor's work. The Contract guarantee period shall be suspended from the time a significant defect is first documented by TRIBE until the work is corrected or equipment is repaired or replaced by Contractor and accepted by TRIBE. In addition, in the event that less than ninety (90) calendar days remain on the guarantee after any such recalculation, the guarantee period shall be extended to allow for the time needed to complete the work or replace or replace the equipment and have such work or equipment accepted by TRIBE.

43. Public Relations. Contractor agrees that its personnel and equipment shall at all times present a neat appearance. All work shall be done; all contacts with the public and all complaints shall be handled with regard for the TRIBE's public relations. Contractor agrees to notify the TRIBE of any complaints of any nature received from property owners, the public in general or public authorities and that all complaints shall receive immediate attention. Any such complaints shall be reported and approved by the TRIBE before any action is taken by the Contractor in connection with such complaints

44. No Collusion, Improper Payments or Gifts. All state and federal laws relating to prohibiting kick backs and/or collusion related to contracting are adopted herein by this reference. By signing this agreement Contractor represents, warrants and certifies that in submitting its proposal, bidding, negotiating, and/or executing or implementing this Contract, that Contractor has not participated and agrees not to participate in any agreement, arrangement or collusion with any other person, entity, bidder, vendor or any subcontractor pertaining to receiving or giving certain benefits to Contractor or to any of these aforesaid parties, or made any promises of future benefit to anyone, or made any payment or gift to any TRIBAL agent, representative, employee or official. In addition, Contractor shall not make any payments or gifts to any TRIBAL official, employee or any Tribal member or Tribal agent as a result of or related to Contractor performing work pursuant to this Contact. Violation of this paragraph shall be grounds for immediate termination of this Contract for cause and barring the Contractor from future TRIBE contracts. In addition Contractor is contractually obligated to reimburse TRIBE for any extra cost or expense TRIBE or TRIBE’s members incur as a result of violation of this provision or violation of any state or federal law that prohibits these types of activities.

45. No Waiver. Nothing whatsoever in this agreement constitutes or shall be construed as a waiver of the Port Gamble S’Klallam TRIBE's sovereign immunity.

46. Severability. If any provision of this Contract or the application of this Contract to any person or circumstance is determined to be invalid or unenforceable, the remainder of the Contract, or its application to other persons or circumstances, shall not be affected thereby and all remaining portions of the Contract shall be valid and enforceable.

47. Entire Agreement. This agreement represents the entire and complete agreement between the parties and supersedes all prior negotiations, representations or agreements, either written or oral, and may be amended or modified only in writing signed by both parties. This agreement shall not be valid unless each and every TRIBE signature designated below is affixed.

Signed and executed this ____ day of ____ 2026, by:

CONTRACTOR

_____

By: _____

WA Contractors License No.:
_____

Fed. Tax ID No: _____

PORT GAMBLE S'KLALLAM TRIBE

_____

_____
Amber Caldera, Tribal Council Chairwoman

Attested to by:

_____
, Secretary

EXHIBIT 2
PLANS AND SPECIFICATIONS

JUMP TO A SECTION IN THE TABLE OF CONTENTS:
A B C D E F G H I J K L M

Washington State
Department of Transportation

Standard Plans

M 21-01

September 2024

Engineering and Regional Operations
Development Division, Design Office

Copy and Paste into Browser:
https://wsdot.wa.gov/publications/fulltext/Standards/Standard-Plan-Manual-September2024.pdf

Washington State Department of Transportation

AMERICAN PUBLIC WORKS ASSOCIATION
APWA
Washington State Chapter

Standard Specifications

FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION
M 41-10

2026

COPY AND PASTE INTO BROWSER:
https://www.wsdot.wa.gov/publications/manuals/fulltext/M41-10/SS.pdf



Raccoon Town Timber Harvest Sharing Specifications

INTRODUCTION

This Timber harvest specification is intended to furnish you with the principal requirements and features of the Raccoon Town project's Timber Harvest and sharing for firewood processing by the Tribe.

TIMBER QUALITY

The timber harvest area is approximately 6.6 acres in total and consists of conifers and hardwoods. The Contractor shall inspect the site and make their own determination of the timber quality.

SHARING SPECIFICATIONS

All timber shall be removed from the Raccoon Town project clearing limits as shown on the project plans, unless otherwise approved by the Project Manager. The Contractor shall provide the Port Gamble S'Klallam Tribe with 25% of the volume of timber harvested by the Contractor for firewood processing purposes by others except for cedar, and will be delivered by the Contractor to a designated site on the Port Gamble S'Klallam Indian Reservation.

LOGGING CONSTRUCTION

The contractor shall be required to attend a pre-logging conference to review cutting line boundaries, buffers/leave trees, and firewood destination.

The exterior boundaries of the timber harvest/clearing limit area will be flagged with fluorescent flagging by the Raccoon Town Land Surveyor.

All cut trees will be whole-tree skidded to designated landings with tracked or wheeled skidding equipment equipped with a grapple designed for handling logs. The whole-tree skidding requirement should facilitate slash disposal and reduce the number of acres requiring mechanical site preparation.

Contractor shall pull back all trees and tops that fall outside the logging unit boundary back into the cutting unit.

Build America, Buy America Act Compliance Specification

1. Purpose
This specification ensures that all iron, steel, manufactured products, and construction materials used in the project comply with the Build America, Buy America Act (Pub. L. 117-58, §§ 70901–70927).

2. Scope
Applies to all contractors, subcontractors, and suppliers providing materials for federally funded infrastructure projects.

3. Requirements

Domestic Content

All iron and steel must be produced in the United States (melting, rolling, and coating processes included).
All manufactured products must be produced in the United States, with at least 55% domestic content by cost.
All construction materials (e.g., lumber, glass, drywall, fiber optic cable) must be manufactured in the United States.

Certification

Contractor shall provide a Certificate of Compliance for each material category.
Certificates must include:

Manufacturer name and location
Description of product
Statement of compliance with BABA requirements

Documentation

Maintain records for audit purposes for at least 3 years after project completion.
Submit documentation to the contracting officer prior to material installation.

4. Exceptions and Waivers

Waivers may be granted only by the Federal awarding agency under:

Public Interest Waiver
Non-availability Waiver
Unreasonable Cost Waiver

Contractor must submit waiver requests with supporting evidence.

5. Enforcement

Non-compliance may result in:

Withholding of payments
Termination for default
Reporting to federal authorities

GEOTECHNICAL ENGINEERING INVESTIGATION
NORTH KLOOMACHIN SUBDIVISION
PORT GAMBLE S'KLALLAM TRIBE
HOOD CANAL DRIVE NE
KINGSTON, WASHINGTON

PROJECT NO. 102-23017
OCTOBER 2, 2023

Prepared for:

MAP LTD.
P.O. BOX 720
SILVERDALE, WASHINGTON 98383

Prepared by:

KRAZAN & ASSOCIATES, INC.
GEOTECHNICAL ENGINEERING DIVISION
1230 FINN HILL RD. NW, SUITE A
POULSBO, WASHINGTON 98370
(360) 598-2126

Krazan & ASSOCIATES, INC.

GEOTECHNICAL ENGINEERING • ENVIRONMENTAL ENGINEERING
CONSTRUCTION TESTING & INSPECTION

October 2, 2023 KA Project No. 102-23017

MAP Ltd.
P.O. Box 720
Silverdale, Washington 98383

Attn: Mr. Pat Fuhrer
Email: patf@map-limited.com
Tel: 360-692-5525

Reference: **Geotechnical Engineering Investigation**
North Kloomachin Subdivision
Port Gamble S'Klallam Tribe
Hood Canal Drive NE
Kingston, Washington

Dear Mr. Fuhrer

In accordance with your request, we have completed a Geotechnical Engineering Investigation for the referenced site. The results of our investigation are presented in the attached report.

If you have any questions, or if we can be of further assistance, please do not hesitate to contact our office.

Respectfully submitted,
KRAZAN & ASSOCIATES, INC.



Vijay Chaudhary, P.E.
Project Engineer

AG:EA:VC

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October 2, 2023 KA Project No. 102-23017

GEOTECHNICAL ENGINEERING INVESTIGATION
NORTH KLOOMACHIN SUBDIVISION
PORT GAMBLE S'KLALLAM TRIBE
HOOD CANAL DRIVE NE
KINGSTON, WASHINGTON

INTRODUCTION.

This report presents the results of our geotechnical engineering investigation for the proposed North Kloomachin Subdivision project located on the Port Gamble S'Klallam Reservation on Hood Canal Drive NE in Kingston, Washington, as shown on the Vicinity Map in Figure 1. Discussions regarding site conditions and geological hazards are presented in this report, together with conclusions and recommendations pertaining to site preparation, excavations, structural fill, utility trench backfill, foundations, pavement design, stormwater infiltration, drainage, and erosion control.

The approximate locations of the explorations are presented following the text of this report on the Site Plan in Figure 2. A description of the field investigation and laboratory testing as well as the exploration logs are presented in Appendix A. Appendix B contains a guide to aid in the development of earthwork specifications. Pavement design guidelines are presented in Appendix C. The recommendations in the main text of the report have precedence over the more general specifications in the appendices. For our use in preparing this report, we were provided and have reviewed the following documents:

- A topographic map with survey points, prepared by AES Consultants Inc., dated August 7, 2023
- North Kloomachin Feasibility, pages 1 through 3, prepared by MAP Ltd., dated April 21, 2022.
- Initial Assessment Report for North Kloomachin Subdivision, prepared by Port Gamble S'Klallam Tribe Natural Resources Department, dated November 22, 2022.

PURPOSE AND SCOPE.

This investigation was conducted to evaluate the subsurface soil and groundwater conditions at the subject property, to develop geotechnical engineering recommendations for use in the design of specific construction elements, and to provide criteria for site preparation and earthwork construction.

Our scope of services was performed in general accordance with our proposal for this project, dated May 1, 2023 (Proposal Number G23024WAP) and included the following:

- Exploration of the subsurface soil and groundwater conditions by conducting fourteen (14) geotechnical test pits to depths ranging from 4.5 feet to 10.0 feet below existing ground surface (bgs) using a subcontracted excavator and operator;
- Exploration of the subsurface soil and groundwater conditions by conducting two (2) geotechnical borings, both to depths of 91.5 feet bgs using a subcontracted track mounted drill rig and operator;
- Prepare a site plan showing the locations of the test pits and soil borings;
- Prepare comprehensive exploration logs including soil stratification and classification, and groundwater levels where applicable;
- Provide geotechnical engineering evaluation and opinions regarding slope stability and structure setback distance from the western steep slopes;
- Provide shallow foundation recommendations for the proposed structures including allowable bearing pressure, anticipated settlements (both total and differential), coefficient of horizontal friction, and frost penetration depth;
- Provide recommendations for seismic design considerations including site coefficient and ground acceleration based on the 2018 IBC.
- Provide soil parameters for the design of slab-on-grade, as well as subgrade preparation, slab drainage, capillary break, and/or moisture barriers ;
- Provide recommendations for retaining wall design including lateral earth pressures (active and passive);
- Discuss construction and excavation considerations, topsoil/unsuitable soil stripping depth, identification of potentially problematic soils or groundwater conditions, and depth of over-excavation if required;
- Provide recommendations for structural fill materials, placement, and compaction;
- Provide recommendations regarding the suitability of on-site soils as structural fill;
- Provide recommendations for temporary excavations;
- Provide recommendations for site drainage and erosion control;
- Provide recommendations for the pavement design.

Environmental services, such as chemical analysis of soil and groundwater for possible environmental contaminants, are not included in our scope of services for this project

PROPOSED DEVELOPMENT

Based on our communications with the project civil engineer (MAP Ltd.) and our review of the available plan sheets, we understand that the site development will include design and construction of approximately 50 single-family residential lots. We understand that development will also consist of design and construction of associated roads, utilities, and landscape areas. We also understand that onsite stormwater management is being considered to manage the runoff from the proposed impervious areas.

SITE DESCRIPTION AND SURFACE CONDITIONS

The project site is located on the northern-most end of the Port Gamble S'Klallam Reservation (APN: 052702-1-001-2005) and covers an area of approximately 40 acres. The site can be accessed from Hood Canal Drive NE. The site is bounded by Little Boston Road to the east and by Hood Canal Drive Northeast to the west, which also crosses the south-central portion of the site as shown on Figures 1 & 2 attached to this report. The site can be access via gravel service road on the north side of Hood Canal Drive Northeast.

The planned development is on upland areas overlooking a west descending slope down to the entrance to Hood Canal, and the southeast descending slope of a ravine draining southwest to Hood Canal. The highest elevation of the site is in the north-central portion at 184 feet. The lowest elevation of the site is in the southeast portion at 90 feet. The western-portion of the site generally slopes to the west at an inclination of approximately 7.5 degrees (13 percent), from an elevation of approximately 170 to 95 feet. The eastern-portion of the site generally slopes to the southeast at an inclination of approximately 5 degrees (9 percent), from an elevation of approximately 170 to 90 feet. Moderate to steep south-southwest descending slopes located in the west-central portion of the site as well as a southeast descending slope in the east-central portion of the site have inclinations of up to about 24 degrees (45 percent). These slopes are addressed in the Geologic Hazards section of this report. Generally, the site is moderately to heavily vegetated with mature trees and underbrush

GEOLOGIC SETTING

The site lies within the central Puget Lowland. The lowland is part of a regional north-south trending trough that extends from southwestern British Columbia to near Eugene, Oregon. North of Olympia, Washington, this lowland is glacially carved, with a depositional and erosional history including at least four separate glacial advances/retreats. The Puget Lowland is bounded to the west by the Olympic Mountains and to the east by the Cascade Range. The lowland is filled with glacial and nonglacial sediments.

The Geologic Map Units of Kitsap County Washington, (DNR, April 2017), indicates that the site vicinity is underlain between Pleistocene continental glacial till and undifferentiated outwash. Glacial till is a compact deposit of clay, silt, sand, gravel, cobbles, and boulders deposited at the base of the continental

glacier. Undifferentiated outwash consists of proglacial stratified sand, gravel, and cobbles with minor silt and clays deposited in meltwater and stream environments.

FIELD INVESTIGATION

Soil Borings: Two (2) exploratory soil borings were completed to evaluate the subsurface soil and groundwater conditions at the site. The soil borings were completed on August 7th and August 8th, 2023 with a subcontracted drill rig. Both of the soil borings were advanced to a depth of 91.5 feet bgs.

Test Pits: Fourteen (14) exploratory test pits were completed in order to evaluate the subsurface soil and groundwater conditions at the site. The test pits were completed on August 7th and August 8th, 2023 with a subcontracted excavator and operator. The test pits were excavated to depths ranging from approximately 4.5 feet to 10.0 feet bgs.

A geologist from Krazan and Associates was present during the exploration, examined the soil and geologic conditions encountered, obtained samples of the different soil types, and maintained logs of the explorations. Representative samples of the subsurface soils encountered in the geotechnical explorations were collected and sealed in plastic bags. The soils encountered in the exploration were visually classified in general accordance with the Unified Soil Classification System (USCS). These samples were transported to our laboratory for further examination and testing. The approximate locations of the explorations are shown on the Site Plan in Figure 2.

SOIL PROFILE AND SUBSURFACE CONDITIONS

This section of the report is intended to provide a general description of the subsurface conditions. Detailed descriptions of the soils exposed in each of the explorations are presented in the exploration logs in Appendix A.

Organic Topsoil: Our borings and test pits exposed a surficial layer of about 0.2 to 0.5 feet of organic topsoil.

Native Glacial Soils: Underlaying the organic topsoil, our explorations of the site generally encountered/exposed unstratified, moist, medium dense to very dense, light brown to gray silty sand with gravel and cobbles, extending to the explored depths ranging from 4.5 to 91.5 feet bgs. Test pits TP-7 and TP-9 exposed stratified layers of moist, medium dense and very stiff to hard, gray silt, sand, and gravel. We interpreted these soils to be native glacial deposits.

Groundwater Observations: The soil borings and test pits were checked for the presence of groundwater during drilling operations. Groundwater seepage was not observed. However, it is our opinion that perched groundwater could occur at shallow depths on this property, especially during and after prolonged periods of wet weather.

Perched water occurs when surface water infiltrates through less dense, more permeable soils and accumulates on top of a relatively low permeability soil layer. Perched water does not represent a regional groundwater "table" within the upper soil horizons. Perched water tends to vary spatially and is dependent upon the amount of rainfall. We would expect the amount of perched water to decrease during drier times of the year and increase during wetter periods.

Note: Undocumented fill, loose/soft and organic soils were not encountered/exposed in our explorations , but may be present in the unexplored areas of the site.

GEOLOGIC HAZARDS

Erosion Concern/Hazard

The Natural Resources Conservation Services (NRCS) map for the Kitsap County Area, Washington (WA635), classifies the site area as following:

- Poulsbo gravelly sandy loam (0 to 6 percent slopes), Hydrologic soil group B/D;
- Poulsbo-Ragnar complex (0 to 6% slopes), Hydrologic soil group B/D;
- Poulsbo-Ragnar complex (6 to 15% slopes), Hydrologic soil group B/D;

Hydrologic group B/D soils have variable erosion dependent on local groundwater conditions; however, disturbed soil on steep slopes may erode rapidly if water is allowed to concentrate on slopes.

We have reviewed the Kitsap County Critical Areas map, in which the western slopes as well as slopes south adjacent to Hood Canal Drive Northeast in the west-central portion of the site are mapped as moderate erosion hazards. These slopes are mapped as moderate erosion hazard by Kitsap County because they are steeper than 15 percent with “erodible soils” as classified by the NRCS. During our site visit, we did not see any evidence of significant erosion or accumulation of surface water. Our exploration generally exposed/encountered medium dense to very dense and very stiff to hard native glacial soils. Based on our exploration, it is our opinion that the proposed development should not increase the erosion hazard, provided that our recommendations are followed for the design and construction.

It has been our experience that soil erosion due to wind can be minimized by limiting the amount of stripped soil areas exposed during construction activities, frequently wetting the surface soils during construction, and with proper landscaping of the site following completion of construction. Typically, erosion of exposed soils will be most noticeable during periods of rainfall. The potential for erosion may be mitigated by the use of temporary erosion control measures, such as silt fences, hay bales, straw wattles, mulching, control ditches or diversion trenching, and contour furrowing. The walls of excavations should be covered with plastic sheeting, or other erosion control surfacing during periods of rainfall. Erosion control measures should be in place before the onset of wet weather. To minimize erosion concerns, the Erosion and Sediment Control section of this report should be followed. Stormwater runoff should not be allowed to flow over or concentrate on the moderate to steep slopes.

Landslide Hazard

We have reviewed the Kitsap County Critical Areas map, in which the south-southwest descending slopes in the west-central portion of the site as well as a southeast descending slope in the east-central portion of the site have been mapped as moderate landslide hazard areas.

A visual surficial reconnaissance was performed during our site visits on August 7 and 8, 2023. The west-central steep slope overlooks Hood Canal Drive Northeast. The south-southwest descending slope ranges from about 118 to 170 feet in elevation, and has an inclination of about 24 degrees (45 percent). The slope was heavily vegetated with thick brambles, brush, and mature trees.

The east-central steep slope is a road cut on the north side of Hood Canal Drive Northeast. The southeast descending slope ranges from about 104 to 122 feet in elevation, and has an inclination of about 32 degrees (63 percent). The slope was lightly vegetated with grasses, brush, and immature trees.

During our site visit we did not observe signs of recent slide scarps, tension cracks, or slumps within the site that would indicate current deep-seated instability on the steep slopes within the property. Signs of shallow soil movement and soil creep, such as curved tree trunks, were not observed on the slopes of the property. However, it should be noted that soil creep is the gradual, imperceptible downslope movement of surficial soils under the effect of gravity, and is typical on steep slopes. Additionally, our exploration generally exposed/encountered medium dense to very dense native glacial soils, which form the core of the site slopes and are considered to have good shear strength.

The grading plan was not available at the time this report was prepared, however, based on the feasibility plan provided to us, we understand that the existing steep slopes and associated vegetation will not be disturbed during or after construction. Based on our exploration, and our review of the available data, and provided that the recommendations of this report is followed for design and construction, it is our opinion that the proposed development will not adversely impact the site slopes or vice versa.

The slope stability and setbacks are further discussed in the Slope Stability Section of this report.

Seismic Hazard

The 2018 International Building Code (IBC), Section 1613.2.2, refers to Chapter 20 of ASCE 7-16 for seismic Site Class Definitions. It is our opinion that the overall soil profile corresponds to Site Class C as defined by Table 20.3-1 "Site Class Definitions," according to the ASCE 7-16 Standard. Site Class C applies to a "very dense soil and soft rock" profile. The seismic site class is based on a soil profile extending to a depth of 100 feet. The soil explorations on this site extended to a maximum depth of 91.5 feet and this seismic site class designation is based on the assumption that medium dense to very dense, and stiff to hard conditions continue below the depth explored.

We referred to the Applied Technology Council (ATC) website and 2018 IBC to obtain values for S_S, S_{MS}, S_{DS}, S_1, S_{M1}, S_{D1}, F_a, *and* F_v. The ATC website utilizes the most updated published data on seismic

conditions from the United States Geological Survey. The seismic design parameters for this site are presented in the following table:

Seismic Design Parameters
(Reference: 2018 IBC Section 1613.2.2, ASCE 7-16, and ATC)

Seismic Item	Value
Site Coefficient F_a	1.200
S_s	1.302
S_{MS}	1.562
S_{DS}	1.041
Site Coefficient F_v	1.500
S_1	0.462
S_{M1}	0.693
S_{D1}	0.462

Additional seismic considerations include liquefaction potential and amplification of ground motions by soft soil deposits. The liquefaction potential is highest for loose sand with a high groundwater table. The native soils primarily consisting of medium dense to very dense granular soils interpreted to underlie the site are considered to have a low potential for liquefaction and amplification of ground motion.

The Liquefaction Susceptibility Map of Kitsap County, Washington, by Stephen Palmer, et al. (WADNR, September 2004) indicates that the subject site is mapped as an area of very low to low liquefaction susceptibility. Based on our explorations and review of the above-mentioned map, it is our opinion that the site has low liquefaction hazard, and the proposed development should not increase the liquefaction hazard provided that our recommendations are followed for both design and construction.

CONCLUSIONS AND RECOMMENDATIONS

General

It is our opinion from a geotechnical standpoint that the site is compatible with the planned development, provided that the geotechnical engineering recommendations presented in this report are included in the project design and implemented during construction. We recommended that Krazan review the development plans.

Soil Conditions: Our soil explorations generally encountered competent native glacial soils underlying organic topsoil, extending to the maximum depths explored, which ranged from 4.5 to 91.5 feet bgs. Organic debris was encountered at a depth of about 2.0 feet in test pit TP-6. Loose/soft soils, organic debris, or undocumented fill were not encountered below the topsoil in the other explorations. However, there may be layers of loose/soft soils, organic materials, or undocumented fill in unexplored areas of the site.

Cobbles were encountered during our exploration. Glacial till deposits often include cobbles and boulders, which may present some difficulties for excavation and grading on this site.

Generally, the soils exposed/encountered at this site are considered moisture-sensitive and will be easily disturbed and difficult to compact when wet. We recommend that construction take place during extended periods of dry weather in the summer months, if possible. If construction is to take place during wet weather, additional expenses and delays should be expected due to the wet conditions. Additional expenses could include the need for placing a blanket of rock spalls to protect exposed subgrades and construction traffic areas. The on-site granular soils may be suitable for use as structural fill material, provided the moisture content is near optimum and the soil could be suitably compacted to specifications. *This will depend on the moisture content of the soils at the time of construction.* Krazan and Associates should be retained to determine if the on-site soils can be used as structural fill material at the time of construction.

Foundations: Based on our explorations, conventional spread footings supported on medium dense/stiff or firmer native soil, or on structural fill extending to medium dense/stiff or firmer native soil, should provide adequate support for the proposed structures. Detailed geotechnical engineering recommendations for foundation design are presented in this report.

Stormwater Drainage: Proper site grading and drainage should help maintain current stability conditions. A comprehensive drainage plan will be an important part of a successful development project at this site. Surface water runoff should not be allowed to develop concentrated flow over the steep slopes on this property during or after construction. Proper grading and functional drainage systems are important for maintaining the current stable condition of the site slopes.

We understand that onsite stormwater management systems/ponds are also being considered in the northwest and southeast portions of the site. We conducted test pits TP-14 and TP-12 in the proposed stormwater management areas. However, shallow exposure of very low permeability very dense silty sand in TP-14 and very stiff to hard cohesive soils in TP-12, indicate that onsite stormwater infiltration is not feasible.

Site Preparation

In general site clearing should include removal of any vegetation and associated root systems; wood; abandoned utilities; structures including foundations, rubble; and rubbish. After stripping of organic topsoil is completed, the building pad and pavement areas should be proof-rolled with a loaded tandem-axle dump truck and be visually inspected to identify any loose/soft areas.

Subgrade Preparation: In the planned structural areas, organic soil and loose/soft soils should be excavated to expose the underlying firm native soils. The resulting excavations should be filled to the planned bottom of the structure's subgrade elevations with suitable soils as per the **Structural Fill** section of this report. Based on our soil explorations, we interpret the medium dense/stiff or firmer native load

bearing soils at this site to be about 1 to 2 feet bgs. There may be thicker layers of loose/soft soils, organic materials, or undocumented fill in unexplored areas of the site.

During wet weather conditions, which typically occur from October through May, subgrade stability problems and grading difficulties may develop due to excess moisture, disturbance of moisture sensitive soils and/or the presence of perched groundwater. Earthwork construction during extended periods of wet weather could create the need to remove wet disturbed soils if they cannot be suitably compacted due to elevated moisture contents. The soils exposed/encountered at the site are considered moisture-sensitive. If over-excavation is necessary, it should be confirmed through continuous monitoring and testing by a qualified geotechnical engineer or geologist. Soils that have become unstable may require drying to near their optimal moisture content before compaction is feasible. Selective drying may be accomplished by scarifying or windrowing surficial material during extended periods of dry, warm weather (typically during the summer months). If the soils cannot be dried back to a workable moisture condition, remedial measures may be required. Preparation of the site for wet weather conditions may consist of the placement of a layer of aggregate base for the protection of exposed soils during construction.

It should be understood that even if Best Management Practices (BMPs) for soil protection are implemented for the wet season, there is a significant chance that additional soil mitigation work will be needed.

Any buried structures encountered during construction should be completely removed and backfilled with structural fill. Excavations, depressions, or soft and pliant areas extending below the planned subgrade elevations should be excavated to expose medium dense or firmer soil, and be backfilled with structural fill. In general, any septic tanks, underground storage tanks, debris pits, cesspools, or similar structures and deleterious materials should be completely removed. Any concrete footings encountered in the planned foundation area should be removed to depth of at least 3 feet below proposed footing elevations or as recommended by the geotechnical engineer. The resulting excavations should be backfilled with structural fill.

All fill on the sloping areas should be placed as structural fill. Where fills greater than 8 feet are to be constructed on original ground that slopes at inclinations steeper than 6:1 (horizontal to vertical), benches should be cut into the existing slope as the filling operations proceed. Each bench should consist of a level terrace, a minimum of 4 to 8 feet wide (based on the width of the equipment utilized), with the rise to the next bench held to 4 feet or less. Where fills of comparable height will be constructed on ground that slopes at an inclination steeper than 4:1 (horizontal to vertical), a keyway should be provided along the toe of the fill slope in addition to the benches. Each keyway should consist of a level trench at least 8 feet wide and at least 2 feet deep, with side slopes not exceeding 1:1 (horizontal to vertical), cut into the existing slope.

Permanent fill slopes should be no steeper than 2 to 1 (horizontal to vertical). Fill materials should not be placed in any section of the slope until the subgrade for that section has been suitably prepared and evaluated by a representative of the geotechnical engineer. Brush, roots, sod or any other organic, perishable or unsuitable material should not be placed in the fill slope.

Site grading near the crowns of the reconstructed slopes should be accomplished, such that, excessive sheet run-off is prevented. The completed slopes should be seeded or otherwise vegetated to protect from future erosion. Well vegetated slopes at the recommended configuration should be reasonably protected from typical erosional effects. However, vegetation on the slopes may not provide protection from unusual flow conditions, such as flood events or concentrations of stormwater runoff occurring on the slopes.

A representative of our firm should be available on request during all grading operations to observe, test and evaluate earthwork construction. These testing and observation processes are an integral part of our service, as acceptance of earthwork construction is dependent upon compaction and stability of the material. The geotechnical engineer may reject any material that does not meet compaction and stability requirements. Further recommendations, contained in this report, are predicated upon the assumption that earthwork construction will conform to the recommendations set forth in this section and in the Structural Fill section of this report.

Structural Fill

Fill placed beneath foundations or other settlement-sensitive structures should be placed as structural fill. Structural fill, by definition, is placed in accordance with prescribed methods and standards, and is monitored by an experienced geotechnical professional. Field monitoring procedures would include the performance of a representative number of in-place density tests to document the attainment of the desired degree of relative compaction. A representative of the geotechnical engineer should evaluate the subgrade prior to structural fill placement.

BMP's should be followed when considering the suitability of the existing materials for use as structural fill. The native granular soils may be suitable for reuse as structural fill, provided the soil is free of organic material and debris, and it is within ± 2 percent of the optimum moisture content. Laboratory testing of some of the on-site soils indicated percentage of silt and clay (passing no. 200 sieve) to be greater than 5. It should be noted that the on-site soils with silt and clay content greater than 5 percent will be difficult to compact during the wet weather. Cobbles and boulders were noted at the time of our exploration. C*obbles and boulders should be screened from the soil prior to use as structural fill.* If the on-site soils are stockpiled for later use as structural fill, the stockpiles should be covered to protect the soil from wet weather conditions. We recommend that a representative of Krazan & Associates be on site during the excavation work to determine which soils are suitable for placement as structural fill.

Imported, all weather granular structural fill material should consist of well-graded gravel or a sand and gravel mixture with a maximum grain size of 3 inches and less than 5 percent fines (material passing the U.S. Standard No. 200 Sieve). Structural fill can also consist crushed rock, rock spalls and controlled density fill (CDF). All structural fill material should be submitted for approval to the geotechnical engineer at least 48 hours prior to delivery to the site.

Structural fill soils should be placed in horizontal lifts not exceeding 8 inches in thickness prior to compaction, moisture-conditioned as necessary, (moisture content of soil shall not vary by more than ±2

percent of optimum moisture) and the material should be compacted to at least 95 percent of the maximum dry density based on ASTM D1557 Test Method. In-place density tests should be performed on all structural fill to document proper moisture content and adequate compaction. Additional lifts should not be placed if the previous lift did not meet the compaction requirements or if soil conditions are not considered stable.

Temporary Excavations

The on-site soils have variable cohesion strengths, therefore the safe angles to which these materials may be cut for temporary excavations is limited, as the soils may be prone to caving and slope failures in temporary excavations deeper than 4 feet. Temporary excavations in the existing materials should be sloped no steeper than 1H:1V where room permits. Flatter inclinations may be necessary where caving conditions, and groundwater seepage are encountered. Steeper cuts up to ½H:1V may be feasible in the very dense glacial soil.

All temporary cuts should be in accordance with Washington Administrative Code (WAC) Part N, Excavation, Trenching, and Shoring. The temporary slope cuts should be visually inspected daily by a qualified person during construction work activities and the results of the inspections should be included in daily reports. The contractor is responsible for maintaining the stability of the temporary cut slopes and minimizing slope erosion during construction. The temporary cut slopes should be covered with plastic sheeting to help minimize erosion during wet weather and the slopes should be closely monitored until the permanent retaining systems are complete. Materials should not be stored and equipment operated within 10 feet of the top of any temporary cut slope.

A Krazan & Associates geologist or geotechnical engineer should observe the temporary cut slopes, at least periodically, during the excavation work. The reason for this is that all soil conditions may not be fully delineated by the limited sampling of the site from the geotechnical explorations. In the case of temporary slope cuts, the existing soil conditions may not be fully revealed until the excavation work exposes the soil. Typically, as excavation work progresses the maximum inclination of the temporary slope will need to be evaluated by the geotechnical engineer so that supplemental recommendations can be made. Soil and groundwater conditions can be highly variable. Scheduling for soil work will need to be adjustable, to deal with unanticipated conditions, so that the project can proceed smoothly and required deadlines can be met. If any variations or undesirable conditions are encountered during construction, Krazan & Associates should be notified so that supplemental recommendations can be made.

Slope Stability Analysis

Slope stability analyses were performed using the commercially available GeoStudio Slope/W computer program. Soil strength parameters for each layer used in our analyses were **estimated** based on the results of our exploratory borings, WADNR published geologic maps, and published soil parameter correlations, and are presented in the table below.

Soil Parameters for Slope Stability Analysis

Soil Type	Soil Frictional Angle (degrees)	Soil Cohesion (psf)	Soil Moist Unit Weight (pcf)
Very dense silty sand (native glacial soils)	38	200	132

The pseudo-static method was used for the slope stability analyses to estimate the Factor of Safety (FS) under seismic conditions. The seismic coefficient used in a pseudo-static analysis is typically taken to be 1/2 of the peak ground acceleration (PGA), which was 0.26g in this case.

The results of slope stability analyses are expressed as a Factor of Safety, FS, against displacement failure. The FS is the ratio of resisting forces to driving forces acting on the slope. A FS of 1.0 represents an equilibrium state, i.e. resisting forces are equal to driving forces in the modelled slope. A FS of less than 1.0 indicates failure of the modelled slope. Typically, a minimum FS of 1.5 for static conditions and 1.1 for seismic (pseudo-static) conditions are considered adequate in local standard engineering practice. A FS between 1.0 and 1.5 under static conditions or less than 1.1 under seismic conditions are not adequate due to the uncertainties in the modeling process.

The results of the slope stability analyses for the static and seismic conditions are presented in the following table. A graphical presentation of the results of the static and seismic slope stability analyses are presented in the attached Figures 3 through 6

Slope Stability Results

	Calculated FS
Static Global Stability Section AA’	2.39
Seismic Global Stability Section AA’	1.37
Static Global Stability Section BB’	3.38
Seismic Global Stability Section BB’	1.76

Uncertainties related to building along the top of steep slopes are typically addressed by the use of building setbacks. The purpose of the setback is to establish a “buffer zone” between the structure and the top of the slope so that ample room is allowed for normal slope recession during a reasonable life span of the

structure. In a general sense, the greater the setback, the lower the risk of slope failures to impact the structure. From a geological standpoint, the setback dimension is based on the slope's physical characteristics, such as slope height, surface angle, material composition, and hydrology. Other factors such as historical slope activity, rate of regression, and the type and desired life span of the development are important considerations as well.

Based on our exploration, slope stability analysis, and our review of the available data and the proposed development, it is our opinion that the proposed development will not adversely impact the site slopes or vice-versa. A **10-foot setback** from a minimum of **25-foot buffer** from 40 percent or greater steep slopes will be adequate.

This buffer should not to be disturbed or modified through placement of any fill or removal of the existing vegetation. No material of any kind should be placed on the buffer or slope or be allowed to reach the slope, such as excavation spoils, lawn clippings and other yard waste, trash, and soil stockpiles. Replacement of vegetation in the undisturbed buffer area should be performed in accordance with the Kitsap County code. Any proposed development within the setback area should be the subject of a specific geotechnical evaluation. Under no circumstances should water be allowed to concentrate on the steep slopes. Any sloping areas disturbed during construction should be planted with vegetation as soon as practical to reduce the potential for erosion.

Shallow Foundations

General: The proposed structures may be supported on a conventional spread foundation system bearing on the medium dense/stiff or firmer native soils or on structural fill including granular soils, rock spalls or CDF extending to the medium dense/stiff or firmer native soils. Based on our soil explorations, we interpreted the medium dense/stiff or firmer native load bearing soils at this site to be approximately one to two feet bgs. For the bearing capacity and settlement analyses, we have assumed following structural loads:

- Floor Loads: 100 to 200 pounds per square foot (psf)
- Column Loads: 50,000 to 75,000 pounds
- Wall Loads: 2,500 pounds per lineal foot

Soil Bearing: Footings supported as mentioned-above, may be designed using an allowable soil bearing pressure of **2,500 pounds per square foot (psf)** for dead plus live loads. This value may be increased by 1/3 for short duration loads such as wind or seismic loading. A representative of Krazan and Associates should evaluate the foundation bearing soil and observe structural fill placement, where utilized.

For frost protection and bearing capacity considerations, exterior footings should have a minimum embedment depth of 18 inches below pad subgrade (soil grade) or adjacent exterior grade, whichever is lower. Footing widths should be based on the anticipated loads and allowable soil bearing pressure. Footings should have a minimum width of at least 12 inches regardless of load. Water should not be allowed

to accumulate in footing trenches. All loose or disturbed soils should be removed from the foundation excavations prior to placing concrete.

Structural Fill in Footing Areas: Structural fill placed for foundation support should follow these recommendations. If structural fill consisting of granular soils or rock spalls are used, then the foundation excavations would need to be widened on both sides of the footing a distance equal to one-half of the depth of the over-excavation below the bottom of the footing. Structural fill consisting of granular soils should be compacted to at least 95 percent of the maximum dry density based on ASTM Test Method D1557. To reduce the volume of extra excavation needed for the footing trenches and to simplify structural fill placement, it may be practical to place CDF to fill the deeper footing trenches to the planned footing subgrade elevations. If CDF is used, the trench may be excavated only slightly wider (6 inches wider on each side) than the footing.

Potential Foundation Settlement: For foundations constructed as recommended, the total settlement is not expected to exceed 1-inch. Differential settlement should be less than ½-inch. Most settlement is expected to occur during construction, as the loads are applied. However, additional post-construction settlement may occur if the foundation soils are flooded or saturated. It should be noted that the risk of liquefaction is considered low, given the composition and density of the native glacial soils.

Design Parameters – Lateral Resistance: Resistance to lateral displacement can be computed using an allowable friction factor of 0.40 acting between the bases of foundations and the supporting subgrade soil. Lateral resistance for footings can alternatively be developed using an allowable equivalent fluid passive pressure of 300 pounds per cubic foot (pcf) acting against the appropriate vertical footing faces (neglecting the upper 12 inches). The allowable friction factor and allowable equivalent fluid passive pressure values include a factor of safety of 1.5. The frictional and passive resistance of the soil may be combined without reduction in determining the total lateral resistance.

Foundation Drainage: Seasonal rainfall, water run-off, and the normal practice of watering trees and landscaping areas around the proposed structures, should not be permitted to flood and/or saturate foundation subgrade soils. To reduce the buildup of water within the footing areas, continuous footing drains (with cleanouts) should be provided at the bases of the footings. The footing drains should consist of a minimum 4-inch diameter rigid perforated PVC pipe, sloped to drain, with perforations placed near the bottom and enveloped in all directions by washed rock and wrapped with filter fabric to limit the migration of silt and clay into the drain.

Floor Slabs and Exterior Flatwork

The floor slab and exterior flatwork subgrade should be prepared in accordance with the recommendations presented in the **Site Preparation** section of this report, and may be designed using a modulus of subgrade reaction value of k = 200 pounds per cubic inch (pci).

In areas where it is desired to reduce floor dampness, such as areas covered with moisture sensitive floor coverings, we recommend that concrete slab-on-grade floors be underlain by a water vapor retardant system. The system should consist of a vapor retardant sheeting underlain by a capillary break consisting of a minimum of 4-inches of compacted clean (less than 5 percent passing the U.S. Standard No. 200 Sieve), open-graded coarse rock of ¾-inch maximum size. The vapor retardant sheeting should be protected from puncture damage. In addition, ventilation of the structure may be prudent to reduce the accumulation of interior moisture.

The exterior flatwork should be placed separately in order to act independently of the walls and foundation system.

Lateral Earth Pressures and Retaining Walls

We have developed criteria for the design of retaining or below grade walls. Our design parameters are based on retention of the native soils or structural fill. The parameters are also based on level, well-drained wall backfill conditions. Walls may be designed as "restrained" retaining walls based on "at-rest" earth pressures, plus any surcharge on top of the walls as described below, if the walls are braced to restrain movement and/or movement is not acceptable. Unrestrained walls may be designed based on "active" earth pressure, if the walls are not part of the buildings and some movement of the retaining walls is acceptable. Acceptable lateral movement equal to at least 0.2 percent of the wall height would warrant the use of "active" earth pressure values for design. The following table, titled **Wall Design Criteria**, presents the recommended soil related design parameters for retaining walls with well-drained level backfill.

Wall Design Criteria	
"At-rest" Conditions (Lateral Earth Pressure)	55 pcf (Equivalent Fluid Density) (Triangular Distribution)
"Active" Conditions (Lateral Earth Pressure)	35 pcf (Equivalent Fluid Density) (Triangular Distribution)
Seismic Increase for "Active" Conditions (Lateral Earth Pressure)	10 psf x H (Uniform Distribution) Where H is the height of the wall in feet
Passive Earth Pressure on Low Side of Wall (includes factor of safety of 1.5)	Neglect upper 1-foot, then 300 pcf (Equivalent Fluid Density)
Soil-Footing Coefficient of Sliding Friction (includes factor of safety of 1.5)	0.40

If vehicular loads are expected to act behind the wall within a horizontal distance of less than or equal to one-half of the wall height, then a live load surcharge should be applied for the design. In this case, we recommend the addition of vehicle surcharges of 70 psf and 100 psf to the active and at-rest earth pressures, respectively.

The stated lateral earth pressures **do not** include the effects of hydrostatic pressure generated by water accumulation behind the retaining walls or loads imposed by construction equipment, foundations or roadways adjacent to the wall (surcharge loads). To minimize the lateral earth pressure and reduce the buildup of water pressure against the walls, continuous footing drains (with cleanouts) should be provided at the bases of the walls. The footing drains should consist of a minimum 4-inch diameter rigid PVC perforated pipe, sloped to drain, with perforations placed near the bottom. The drainpipe should be enveloped by 6 inches of washed gravel in all directions wrapped in filter fabric to prevent the migration of silt and clay into the drain.

The wall fills adjacent to and extending a lateral distance of at least 2 feet behind the walls should consist of free-draining granular material. All free-draining backfill should contain less than 3 percent fines (passing the U.S. Standard No. 200 Sieve) based upon the fraction passing the U.S. Standard No. 4 Sieve with at least 30 percent of the material being retained on the U.S. Standard No. 4 Sieve. **Alternatively,** a drainage composite may be used. It should be realized that the primary purpose of the free-draining material is the reduction of hydrostatic pressure. Some potential for the moisture to contact the back face of the wall may exist, even with treatment, which may require that more extensive waterproofing be specified for walls, which require interior moisture sensitive finishes.

We recommend that the wall fill be compacted to at least 95 percent of the maximum dry density based on ASTM D1557 Test Method. In-place density tests should be performed to verify adequate compaction. Soil compactors place transient surcharges on the backfill. Consequently, only light hand operated equipment is recommended for fill compaction within 3 feet of walls so that excessive stress is not imposed on the walls.

Erosion and Sediment Control

Erosion and sediment control (ESC) is used to minimize the transportation of sediment to wetlands, streams, lakes, drainage systems, and adjacent properties. Erosion and sediment control measures should be taken and these measures should be in general accordance with local regulations. At a minimum, the following basic recommendations should be incorporated into the design of the erosion and sediment control features of the site:

1) Phase the soil, foundation, utility, and other work, requiring excavation or the disturbance of the site soils, to take place during the dry season (generally May through September). However, provided precautions are taken using Best Management Practices (BMPs), grading activities can be undertaken during the wet season (generally October through April). It should be noted that this typically increases the overall project cost.

2) All site work should be completed and stabilized as quickly as possible.

3) Additional perimeter erosion and sediment control features may be required to reduce the possibility of sediment entering the surface water. This may include additional silt fences, silt

fences with a lower Apparent Opening Size (AOS), construction of a berm, or other filtration systems.

4) Any runoff generated by dewatering discharge should be treated through construction of a sediment trap if there is sufficient space. If space is limited other filtration methods will need to be incorporated.

5) Surface water runoff should not be allowed to develop concentrated flow over the steep slopes on this property during or after construction.

Groundwater Influence on Structures and Earthwork Construction

Groundwater seepage was not encountered in our test pits or soil borings at the time of our exploration. It should be recognized that groundwater elevations may fluctuate with time. The groundwater level will be dependent upon seasonal precipitation, irrigation, land use, and climatic conditions, as well as other factors. Therefore, groundwater levels at the time of the field investigation may be different from those encountered during the construction phase of the project. The evaluation of such factors is beyond the scope of this report.

If groundwater seepage is encountered during construction, we should observe the conditions to determine if dewatering will be needed. Design of temporary dewatering systems to remove groundwater should be the responsibility of the contractor. If earthwork is performed during or soon after periods of precipitation, the subgrade soils may become saturated. These soils may "pump," and the materials may not respond to densification techniques. Typical remedial measures include: disking and aerating the soil during dry weather; mixing the soil with drier materials; removing and replacing the soil with an approved fill material. A qualified geotechnical engineering firm should be consulted prior to implementing remedial measures to observe the unstable subgrade conditions and provide appropriate recommendations.

Drainage and Landscape

Special attention to the drainage and irrigation adjacent to the buildings is recommended. Grading should establish drainage away from the structures and this drainage pattern should be maintained. Water should not be allowed to collect adjacent to the structures. Excessive irrigation within landscaped areas adjacent to the structure should not be allowed to occur.

Surface water runoff should not be allowed to develop concentrated flow over the steep slopes on this property during or after construction. Proper grading and functional drainage systems are important for maintaining the currently stable condition of the site slopes.

The ground surface should slope away from building pads and pavement areas, toward appropriate drop inlets or other surface drainage devices. It is recommended that adjacent exterior grades be sloped a minimum of 2 percent for a minimum distance of 5 feet away from structures. Roof drains should be tightlined away from foundations. Roof drains should not be connected to the footing drains.

Pavement areas should be inclined at a minimum of 1 percent and drainage gradients should be maintained to carry all surface water to collection facilities, and suitable outlets. These grades should be maintained for the life of the project.

Utility Trench Backfill

We recommend that utility trench backfill be placed in general accordance with typical recommendations for structural fill placement. A firm and unyielding subgrade should allow for the proper placement of subsurface utilities. This could include the placement of geotextile and quarry rock in the bottom of utility trenches prior to placement of pipe bedding, utilities and trench backfill.

Utility trenches should be excavated according to accepted engineering practices following OSHA (Occupational Safety and Health Administration) standards, by a contractor experienced in such work. The responsibility for the safety of open trenches should be borne by the contractor. Traffic and vibration adjacent to trench walls should be minimized; cyclic wetting and drying of excavation side slopes should be avoided. Depending upon the location and depth of some utility trenches, groundwater flow into open excavations could be experienced, especially during or shortly following periods of precipitation.

All utility trench backfill for this project should follow the recommendation as per the Structural Fill section of this report. Utility trench backfill placed in or adjacent to buildings and exterior slabs should be compacted to at least 95 percent of the maximum dry density based on ASTM Test Method D1557. The upper 5 feet of utility trench backfill placed in pavement areas should be compacted to at least 95 percent of the maximum dry density based on ASTM Test Method D1557. Below 5 feet, utility trench backfill in pavement areas should be compacted to at least 90 percent of the maximum dry density based on ASTM Test Method D1557.

Pipe bedding should be in accordance with the pipe manufacturer's recommendations. The contractor is responsible for removing all water-sensitive soils from the trenches regardless of the backfill location and compaction requirements. The contractor should use appropriate equipment and methods to avoid damage to the utilities and/or structures during fill placement and compaction.

Pavement Design

The pavement subgrade should be prepared in accordance with the recommendations presented in the **Site Preparation** section of this report. It should be noted that subgrade soils that have relatively high silt contents may be highly sensitive to moisture conditions. The subgrade strength and performance characteristics of a silty subgrade material may be dramatically reduced if it becomes wet. Therefore, we recommend that the pavement subgrade not be exposed for long periods, especially during wet weather.

Traffic loads were not provided, however, based on our knowledge of the proposed project, we expect the traffic to range from light duty (passenger automobiles) to heavy duty (firetrucks). The following tables show the minimum recommended pavement sections for both light duty and heavy-duty traffic loads.

ASPHALTIC CONCRETE (FLEXIBLE) PAVEMENT
LIGHT DUTY

Asphaltic Concrete	Aggregate Base*
3.0 in.	6.0 in.

HEAVY DUTY

Asphaltic Concrete	Aggregate Base*
4.0 in.	6.0 in.

PORTLAND CEMENT CONCRETE (RIGID) PAVEMENT
LIGHT DUTY

Min. PCC Depth	Aggregate Base*
6.0 in.	6.0 in.

HEAVY DUTY

Min. PCC Depth	Aggregate Base*
8.0 in.	6.0 in.

** 95% compaction based on ASTM Test Method D1557*

The pavement specification in Appendix C provides additional recommendations. The asphaltic concrete depth in the flexible pavement tables should be a surface course type asphalt, such as Washington Department of Transportation (WSDOT) ½ inch HMA. The rigid pavement design is based on a Portland Cement Concrete (PCC) mix that has a 28-day compressive strength of 4,000 pounds per square inch (psi) with a fiber mesh. The design is also based on a concrete flexural strength or modulus of rupture of 575 psi.

Testing and Inspection

A representative of Krazan & Associates, Inc. should be present at the site during the earthwork activities to confirm that actual subsurface conditions, including foundation bearing soils, are consistent with those exposed during our exploratory field work. This activity is an integral part of our services as acceptance of earthwork construction is dependent upon compaction testing and stability of the material. This representative can also verify that the intent of our recommendations has been incorporated into the project design and construction. Krazan & Associates, Inc. will not be responsible for grades or staking, since this

is the responsibility of the Prime Contractor. Furthermore, Krazan & Associates is not responsible for the contractor's procedures, methods, scheduling, or management of the work site.

LIMITATIONS

This report has been prepared for the exclusive use of MAP Ltd. and their assigns, for the specific application to the subject site. Geotechnical engineering is one of the newest divisions of Civil Engineering. This branch of Civil Engineering is constantly improving as new technologies and understanding of earth sciences improves. Although your site was analyzed using the most appropriate current techniques and methods, undoubtedly there will be substantial future improvements in this branch of engineering. In addition to improvements in the field of geotechnical engineering, physical changes in the site either due to excavation or fill placement, new agency regulations, or possible changes in the proposed structure after the time of completion of the soils report may require the soils report to be professionally reviewed. In light of this, the owner should be aware that there is a practical limit to the usefulness of this report without critical review. Although the time limit for this review is strictly arbitrary, it is suggested that three years be considered a reasonable time for the usefulness of this report.

Foundation and earthwork construction are characterized by the presence of a calculated risk that soil and groundwater conditions have been fully revealed by the original geotechnical investigation. This risk is derived from the practical necessity of basing interpretations and design conclusions on limited sampling of the earth. Our report, design conclusions, and interpretations should not be construed as a warranty of the subsurface conditions. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report.

The recommendations made in this report are based on the assumption that soil conditions do not vary significantly from those encountered during our field investigation. The findings and conclusions of this report can be affected by the passage of time, seasonal weather conditions, manmade influences such as construction on or adjacent to the site, and natural events such as earthquakes, slope instability, flooding, or groundwater fluctuations. If any variations or undesirable conditions are encountered during construction, the geotechnical engineer should be notified so that supplemental recommendations can be made.

The conclusions of this report are based on the information provided regarding the proposed construction. If the proposed construction is relocated or redesigned, the conclusions in this report may not be valid. The geotechnical engineer should be notified of any changes so that the recommendations can be reviewed and re-evaluated.

Misinterpretations of this report by other design team members can result in project delays and cost over-runs. These risks can be reduced by having Krazan & Associates, Inc. involved in the design team's meetings and discussions prior to and following submission of the geotechnical report. Krazan & Associates, Inc. should also be retained to review pertinent elements of the design team's plans and specifications. To reduce the risk of contractors misinterpreting the recommendations of this report, Krazan

& Associates should participate in pre-bid and preconstruction meetings, and provide construction observations and testing during the site work.

This report is a geotechnical engineering investigation with the purpose of evaluating the soil conditions in terms of foundation design. The scope of our geotechnical engineering services did not include any environmental site assessment for the presence or absence of hazardous and/or toxic materials in the soil, groundwater or atmosphere, or the presence of wetlands. Any statements, or absence of statements, in this report or on any boring log regarding odors, unusual or suspicious items, or conditions observed are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous and/or toxic assessments.

The geotechnical information presented herein is based upon professional interpretation utilizing standard engineering practices and a degree of conservatism deemed proper for this project. It is not warranted that such information and interpretation cannot be superseded by future geotechnical developments. We emphasize that this report is valid for this project as outlined above, and should not be used for any other site. Our report is prepared for the exclusive use of our client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (360) 598-2126.

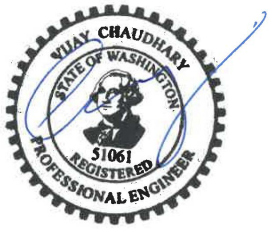
Respectfully submitted,

KRAZAN & ASSOCIATES, INC.

Erliana Acob
Staff Geologist

Andrew Glenn
Staff Geologist

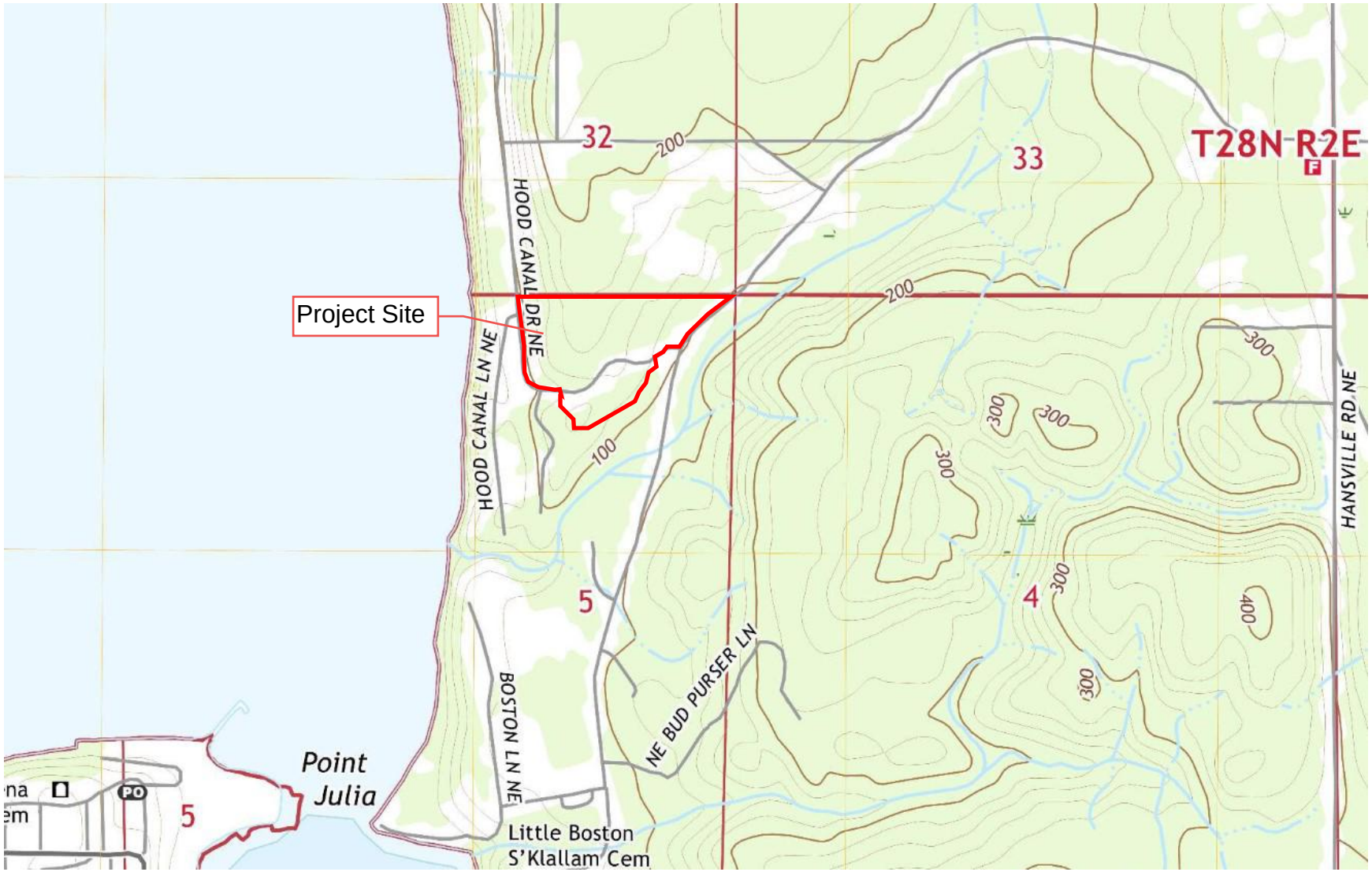
10/2/23



Vijay Chaudhary, P.E.
Project Engineer

AG:EA:VC

Vicinity Map



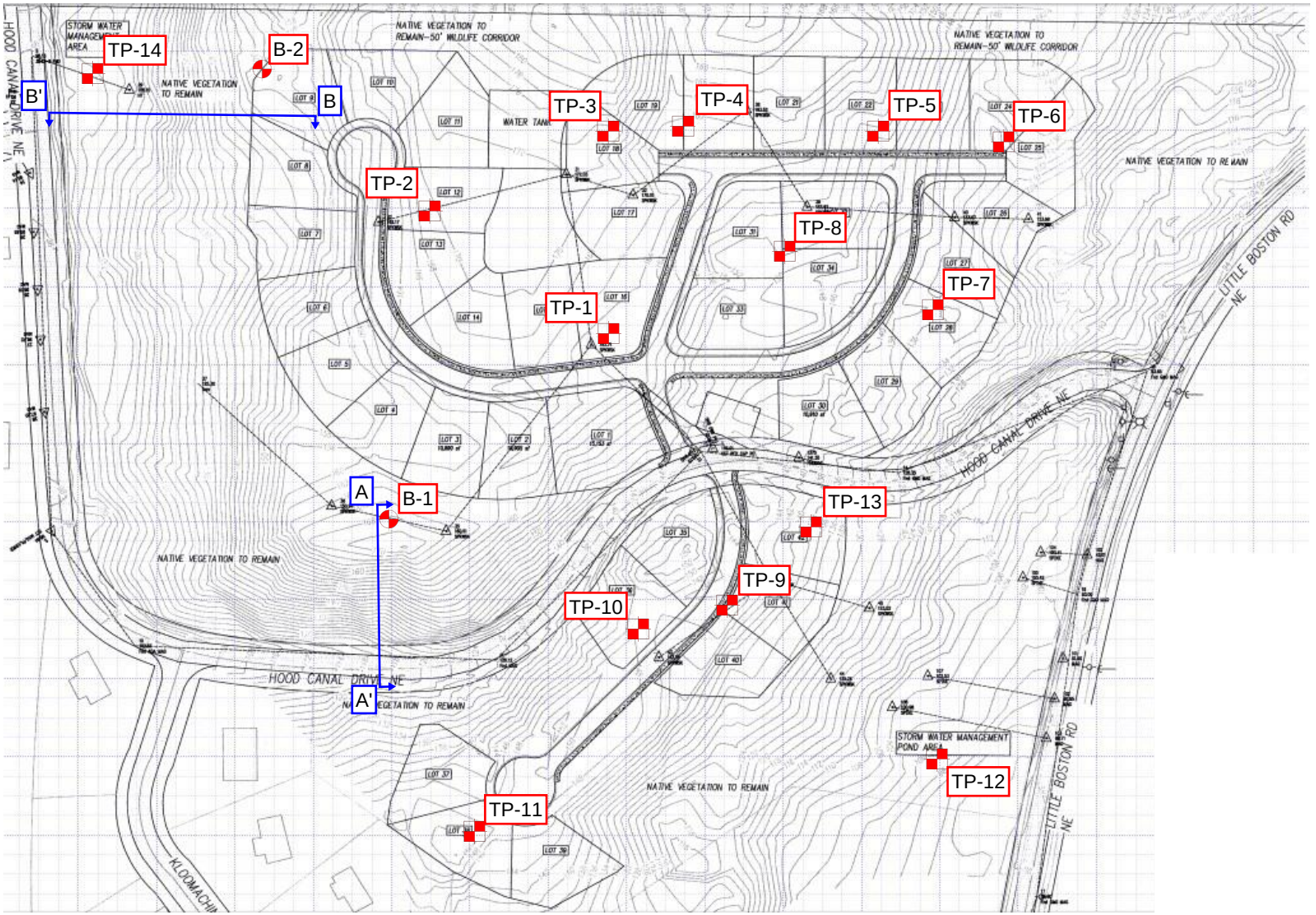
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Reference: USGS topographic map titled "Port Gamble Quadrangle, Washington, 7.5 Minute Series", dated 2020

Krazan

North Kloomachin Subdivision		
Date: August 2023	Project Number: 102-23017	
Drawn By: AG	Figure: 1	Not To Scale

Site Plan



TP-1 Test Pit Number and Approximate Location

B-1 Boring Number and Approximate Location

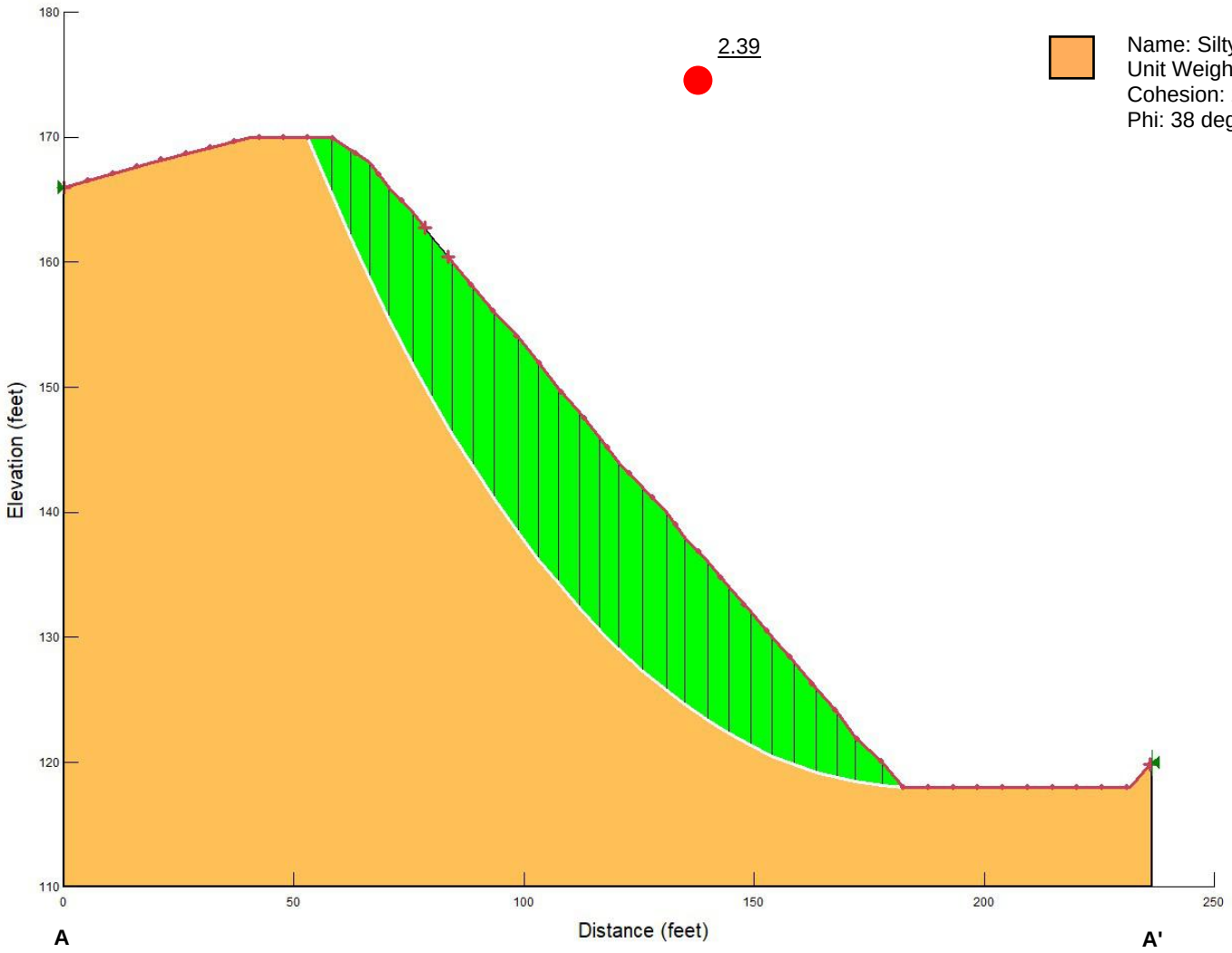
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Reference:Survey Point Map, created by AES Consultants Inc., dated August 7, 2023.

Krazan

North Kloomachin Subdivision		
Date: August 2023	Project Number: 102-23017	
Drawn By: AG	Figure: 2	Not To Scale

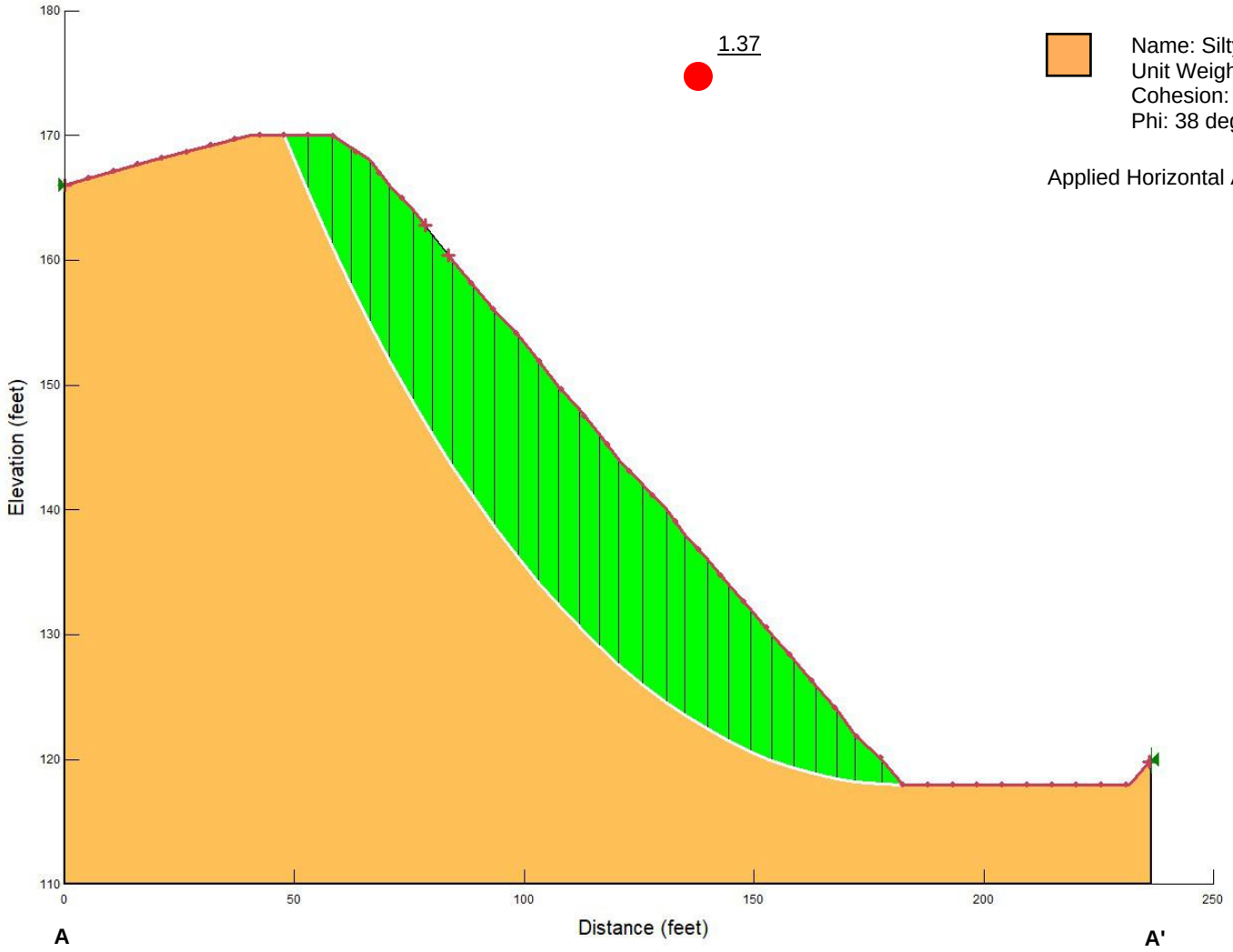
Section AA' Slope Stability Analysis (Static Condition)



Krazan

North Kloomachin Subdivision		
Date: August 2023	Project Number: 102-23017	
Drawn By: AG	Figure: 3	NTS

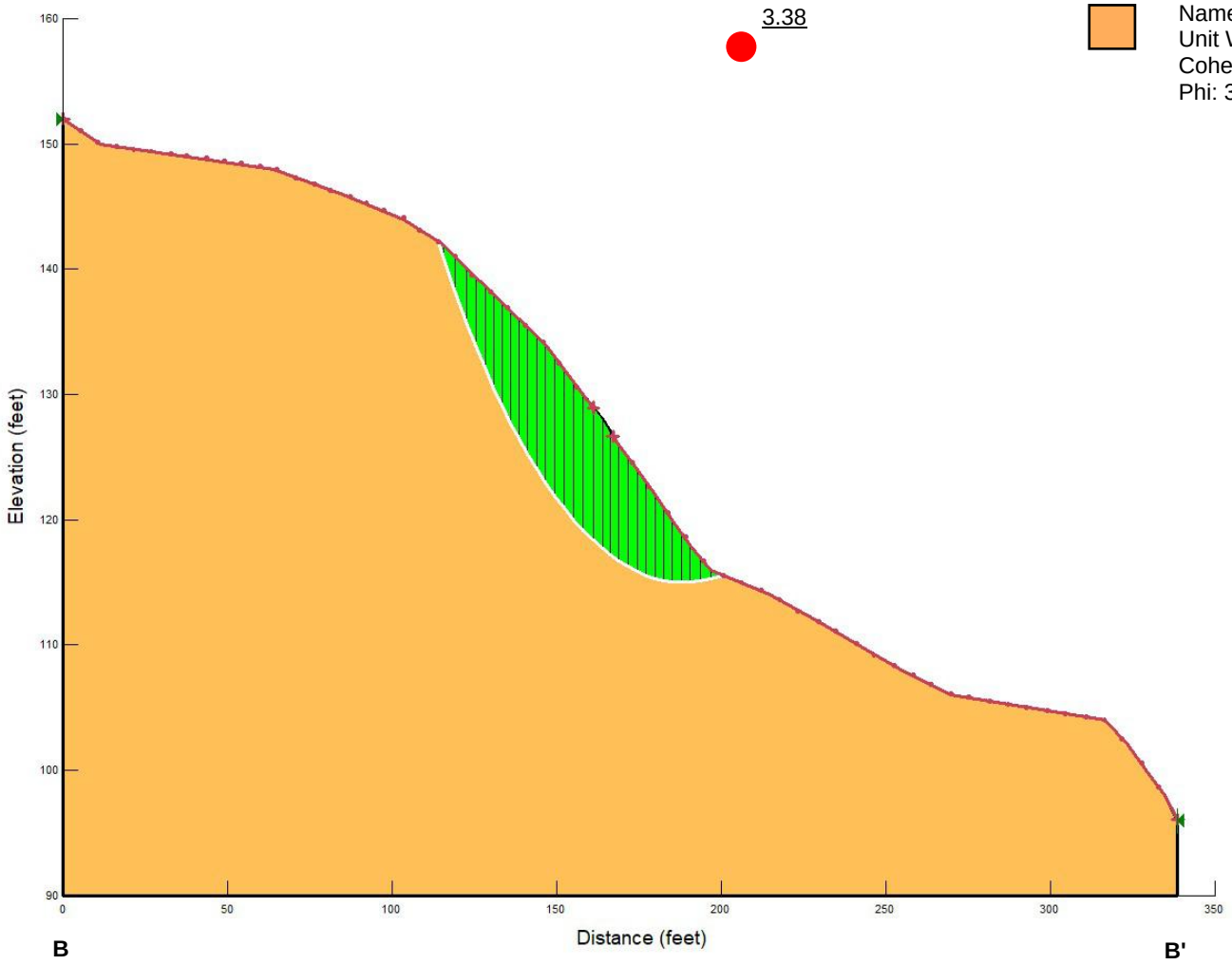
Section AA' Slope Stability Analysis (Seismic Condition)



Krazan

North Kloomachin Subdivision		
Date: August 2023	Project Number: 102-23017	
Drawn By: AG	Figure: 4	NTS

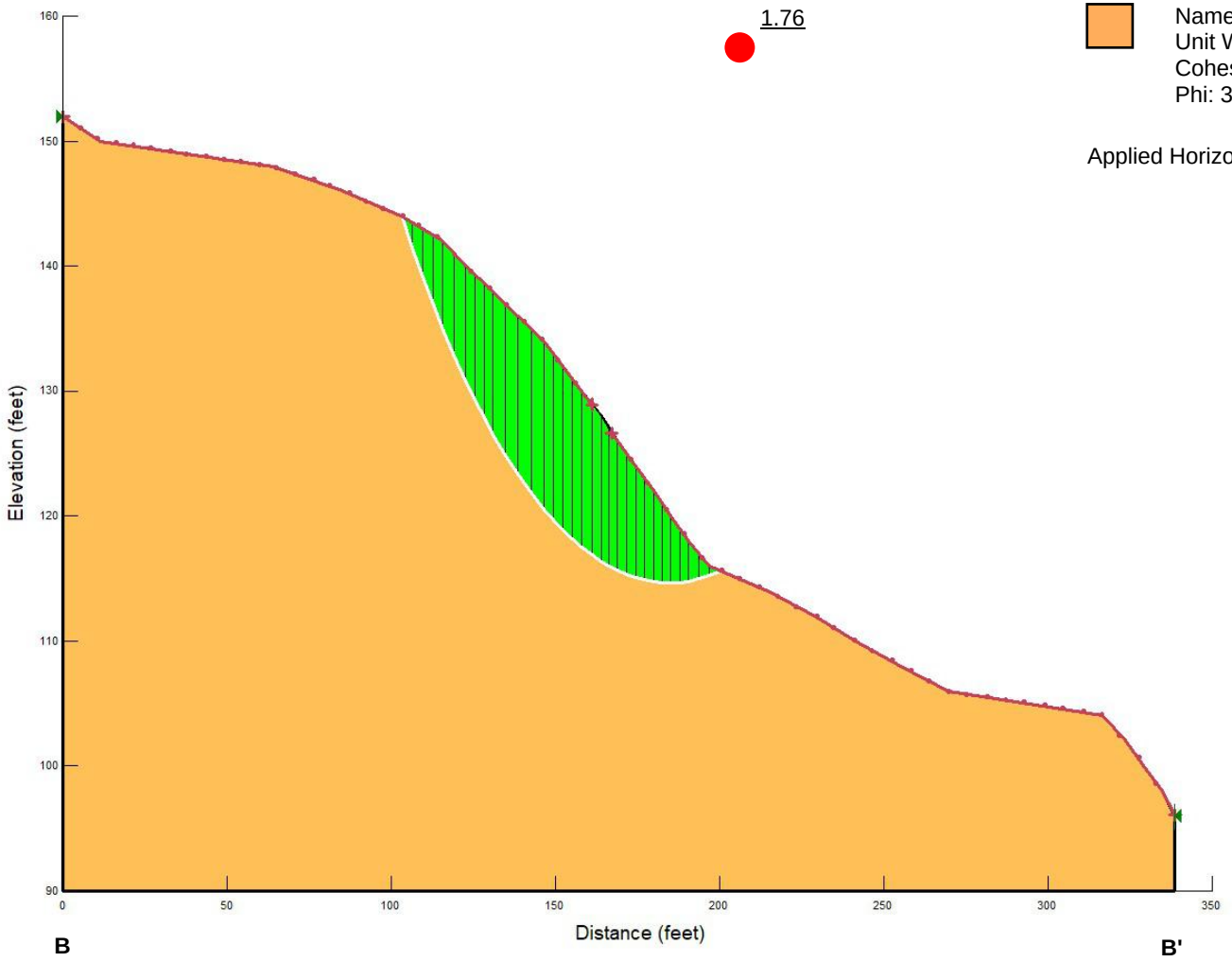
Section BB' Slope Stability Analysis (Static Condition)



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North Kloomachin Subdivision		
Date: August 2023	Project Number: 102-23017	
Drawn By: AG	Figure: 5	NTS

Section BB' Slope Stability Analysis (Seismic Condition)



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North Kloomachin Subdivision		
Date: August 2023	Project Number: 102-23017	
Drawn By: AG	Figure: 6	NTS

APPENDIX A

FIELD INVESTIGATION AND LABORATORY TESTING

Field Investigation

The field investigation consisted of a surface reconnaissance and a subsurface exploration program. Two (2) geotechnical soil borings and fourteen (14) test pits were conducted and sampled on August 7th and 8th, 2023 to evaluate the subsurface soil and groundwater conditions at the project site. The soil borings, designated B-1 and B-2, were advanced to a depth of 91.5 feet bgs using a subcontracted drill rig and operator under the direction of a Krazan field geologist.. The test pits were excavated on August 7th and 8th, to depths ranging from 4.5 to 10.0 feet bgs. The approximate boring and test pit locations are shown on the Site Plan (Figure 2). The depths shown on the attached boring and test pit logs are from the existing ground surface at the time of our exploration.

Soil boring samples were obtained by using the Standard Penetration Test (SPT) as described in ASTM Test Method D1586. The Standard Penetration Test and sampling method consists of driving a standard 2-inch outside-diameter, split barrel sampler into the subsoil with a 140-pound hammer free falling a vertical distance of 30 inches. The summation of hammer-blows required to drive the sampler the final 12-inches of an 18-inch sample interval is defined as the Standard Penetration Resistance, or N-value. The blow count is presented graphically on the boring log in this appendix. The resistance, or "N" value, provides a measure of the relative density of granular soils or of the relative consistency of cohesive soils.

A field geologist from Krazan and Associates was present during the explorations, continuously examined and visually classified the soils in general accordance with the Unified Soil Classification System (USCS), and maintained logs of the explorations, which are presented in this appendix. Representative samples of the soils encountered in the geotechnical explorations were collected and transported to our laboratory for further examination and testing.

Laboratory Testing

The laboratory testing program was developed primarily to determine the index properties of the soils. Test results were used for soil classification and as criteria for determining the engineering suitability of the surface and subsurface materials encountered. Sieve analysis and natural moisture content tests were performed on selected samples. The laboratory test results are included in this appendix.

Soil Classification

USCS Soil Classification				
Major Division			Group Description	
Coarse-Grained Soils < 50% passes #200 sieve	Gravel and Gravelly Soils < 50% coarse fraction passes #4 sieve	Gravel (with little or no fines)	GW	Well-Graded Gravel
			GP	Poorly Graded Gravel
		Gravel (with > 12% fines)	GM	Silty Gravel
			GC	Clayey Gravel
	Sand and Sandy Soils > 50% coarse fraction passes #4 sieve	Sand (with little or no fines)	SW	Well-Graded Sand
			SP	Poorly Graded Sand
		Sand (with > 12% fines)	SM	Silty Sand
			SC	Clayey Sand
Fine-Grained Soils > 50% passes #200 sieve	Silt and Clay Liquid Limit < 50		ML	Silt
			CL	Lean Clay
			OL	Organic Silt and Clay (Low Plasticity)
	Silt and Clay Liquid Limit > 50		MH	Inorganic Silt
			CH	Inorganic Clay
			OH	Organic Clay and Silt (Med. to High Plasticity)
Highly Organic Soils			PT	Peat

Relative Density with Respect to SPT N-Value			
Coarse-Grained Soils		Fine-Grained Soils	
Density	N-Value (Blows/Ft)	Density	N-Value (Blows/Ft)
Very Loose	0 - 4	Very Soft	0 - 1
Loose	5 -10	Soft	2 - 4
Medium Dense	11 - 30	Medium Stiff	5 - 8
Dense	31 - 50	Stiff	9 - 15
Very Dense	> 50	Very Stiff	16 - 30
		Hard	> 30

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North Kloomachin Subdivision

Date: August 2023 | References: USCS

Drawn By: AG | | Project Number: 102-23017

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-1

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~163 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
0			Organic topsoil			
	SM		Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
2				S1	G	
			-Becomes gray.			
3			-Becomes very dense.			
4				S2	G	
5			-Becomes dense.	S3	G	
6						
7			-Becomes very dense.			
8						
9			-Refusal.	S4	G	
			End of Exploratory Test Pit			
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered.

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-2

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~169 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
			Organic topsoil			
			Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
1						
			-Becomes dense.			
2				S1	G	
			-Becomes gray and very dense.			
3						
4						
			-Becomes dense.	S2	G	
5						
6						
7						
			-Becomes very dense.			
			-Refusal.	S3	G	
8			End of Exploratory Test Pit			
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-3

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~173 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
			Organic topsoil			
			Light brown to gray, silty sand with gravel (SM) (moist, medium dense to very dense)			
1						
2						
3			-Becomes gray and dense.			
			-Becomes very dense.			
4				S1	G	
5						
6						
7			-Refusal.	S2	G	
			End of Exploratory Test Pit			
8						
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-4

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~162 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
			Organic topsoil			
			Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
1				S1	G	
2						
3						
			-Becomes gray and very dense.	S2	G	
4						
5						
6						
7			-Refusal.	S3	G	
			End of Exploratory Test Pit			
8						
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-5

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~152 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits (10 20 30 40 50 60 70 80)
0			Organic topsoil			
			Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
2				S1	G	
3			-Becomes gray and dense.			
4			-Becomes very dense.			
5			-Becomes dense.	S2	G	
9			-Becomes very dense. -Refusal.	S3	G	
			End of Exploratory Test Pit			

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-6

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~132 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits (10 20 30 40 50 60 70 80)
0			Organic topsoil			
1	SM		Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
2			-Large wood/bark debris was encountered.			
3			-Becomes gray and dense.			
4			-Becomes very dense.			
5			-Refusal.			
6						
7						
8						
9						
10			End of Exploratory Test Pit			

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-7

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~136 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
			Organic topsoil			
1			Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense) -Boulders were encountered to 1.0 ft.			
				S1	G	
			-Becomes gray and dense.			
2				S2	G	
3						
4						
			-Becomes light brown and gray. Becomes medium dense.			
5				S3	G	
6			Gray, sand (SP) (moist, medium dense)	S4	G	
7						
			Gray, sandy gravel (GP) (moist, medium dense)	S5	G	
8						
9			-Cobbles were encountered.			
				S6	G	
10			End of Exploratory Test Pit			

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-8

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~152 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
			Organic topsoil			
1			Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
2			-Becomes gray.			
3			-Becomes dense.			
4				S1	G	
5						
6						
7			-Hard, sandy silt lense encountered from 7.4 ft. to 8.0 ft.	S2	G	
8			-Becomes very dense.	S3	G	
			-Refusal.			
9			End of Exploratory Test Pit			
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-9

PROJECT: N. Kloomachin Subdivision **DATE: August 8, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~147 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
0			Organic topsoil			
			Light brown, silty sand with gravel and cobbles (SM) (moist, medium dense)			
1						
2						
3						
			Light brown and gray to gray, gravelly sand with silt (SP-SM) (moist, dense to very dense)	S1	G	
4						
5			-Becomes gray sand with silt and gravel.			
				S2	G	
6						
7						
				S3	G	
8			-Becomes very dense.			
9						
			-Refusal.	S4	G	
10			End of Exploratory Test Pit			

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-10

PROJECT: N. Kloomachin Subdivision **DATE: August 8, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~146 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
0			Organic topsoil			
	SM		Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to dense)			
1						
2						
3			-Becomes gray and dense.			
4						
5			-Becomes very dense.	S1	G	
6						
7				S2	G	
			-Refusal.			
8			End of Exploratory Test Pit			
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-11

PROJECT: N. Kloomachin Subdivision **DATE: August 8, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~147 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
0			Organic topsoil			
	SM		Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
1						
2			-Becomes gray and dense.	S1	G	
3						
4						
5				S2	G	
6						
7			-Becomes very dense.			
8						
			-Refusal.			
9			End of Exploratory Test Pit			
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-12

PROJECT: N. Kloomachin Subdivision **DATE: August 8, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~100 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
0			Organic topsoil			
			Brown, silty sand with gravel and cobbles (SM) (moist, medium dense)	S1	G	
2			Gray, sandy silt (ML) (moist, very stiff to hard) -Mottling was observed from 2.0 ft. to approximatly 4.0 ft.	S2	G	
3				S3	G	
4				S4	G	
5			-Brown and gray sand lense was encountered from 5.0 ft. to 6.0 ft.	S5	G	
6			-Becomes hard.			
7			-Refusal	S6	G	
			End of Exploratory Test Pit			
8						
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-13

PROJECT: N. Kloomachin Subdivision **DATE: August 8, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~138 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
			Organic topsoil			
1			Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense) -Boulders were encountered from 0.3 ft. to 2.5 feet.			
				S1	G	
2			-Becomes light brown and gray.			
3						
				S2	G	
4						
5			-Becomes gray and very dense.	S3	G	
6						
7			-Refusal.	S4	G	
			End of Exploratory Test Pit			
8						
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-14

PROJECT: N. Kloomachin Subdivision **DATE: August 8, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~107 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits (10 20 30 40 50 60 70 80)
0			Organic topsoil			
			Brown, silty sand with gravel (SM) (moist, medium dense)			
1			Reddish brown, sand with gravel and cobbles (SP) (moist, medium dense)	S1	G	
2			Gray, silty sand with gravel (SM) (moist, dense to very dense)			
			-Iron oxide staining was observed at 2.5 ft.			
			-Becomes very dense.			
3				S2	G	
4			-Refusal.	S3	G	
			End of Exploratory Test Pit			
5						
6						
7						
8						
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

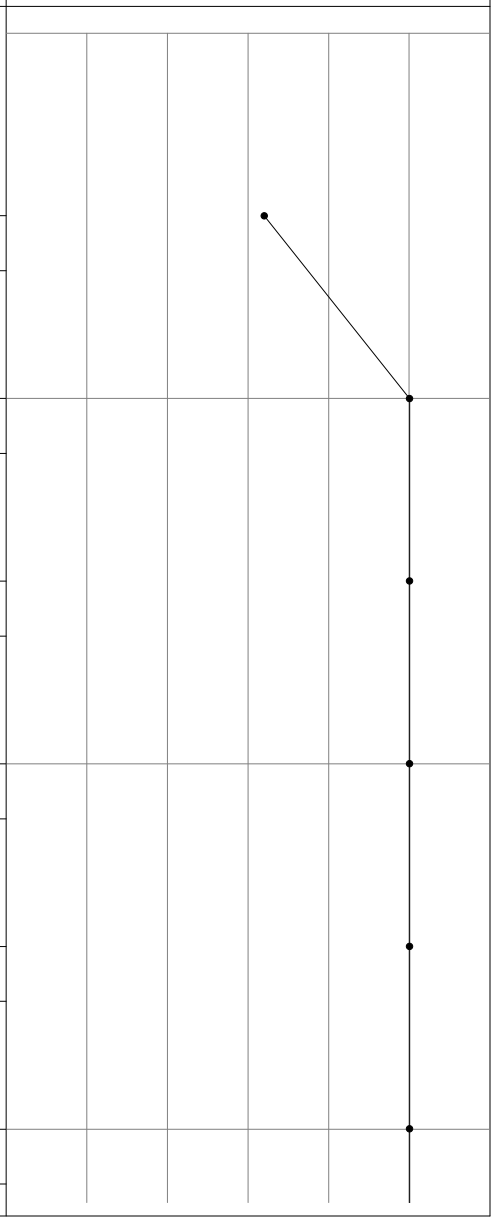
Krazan & Associates, Inc.

LOG OF BORING No. B-1

Date Drilled: 8/7/23	**Project: North Kloomachin Subdivision**	**Notes:**
Location: Kingston, WA	**Ground Elevation: ~170 ft.**	**Logged By: EA**
Hammer Type: Manual ☐ Automatic ☑ Other ☐		
Water Level: No groundwater encountered.	**Drilling Method: HSA**	

Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample No. /Type	1st 6"	2nd 6"	3rd 6"	N Value
	Ground Surface						
0	Brown to gray, silty sand with gravel (SM) (moist, dense to very dense)						
5			S1	6	13	19	32
10	-Becomes very dense.		S2	50/1"			50+
15	-Becomes gray.		S3	28	50/4"		50+
20			S4	38	50/3"		50+
25			S5	50/3"			50+
30			S6	40	50/4"		50+
32							

N VALUE GRAPH (Last 12")



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings-	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	D C - Driving Casing	

Krazan & Associates, Inc.

LOG OF BORING No. B-1

Date Drilled: 8/7/23	**Project: North Kloomachin Subdivision**		**Notes:**
Location: Kingston, WA	**Ground Elevation: ~170 ft.**	**Logged By: EA**	
Hammer Type: Manual ☐ Automatic ☑ Other ☐			
Water Level: No groundwater encountered.	**Drilling Method: HSA**		

Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample No. /Type	1st 6"	2nd 6"	3rd 6"	N Value
33							
34							
35	-Sand with gravel lens noted from 35 ft. to 37 ft.						
36			S7	35	50/5"		50+
37							
38							
39							
40			S8	50/4"			50+
41							
42							
43							
44							
45			S9	50/3"			50+
46							
47							
48							
49							
50			S10	31	50/5"		50+
51							
52							
53							
54							
55			S11	35	50/3"		50+
56							
57							
58							
59							
60	-4" silt lens noted at 60 ft.		S12	50/5"			50+
61							
62							
63							
64							

N VALUE GRAPH (Last 12")

10 20 30 40 50

LEGEND

SAMPLER TYPE				DRILLING METHOD			
SS	- Split Spoon	NQ	- Rock Core, 1-7/8"	HSA	- Hollow Stem Auger	RW	- Rotary Wash
ST	- Shelby Tube	CU	- Cuttings-	CFA	- Continuous Flight Augers	RC	- Rock Core
AWG	- Rock Core, 1-1/8"	CT	- Continuous Tube	D C	- Driving Casing		

Krazan & Associates, Inc.

LOG OF BORING No. B-1

Date Drilled: 8/7/23	**Project: North Kloomachin Subdivision**	**Notes:**
Location: Kingston, WA	**Ground Elevation: ~170 ft.**	**Logged By: EA**
Hammer Type: Manual ☐ Automatic ☑ Other ☐		
Water Level: No groundwater encountered.	**Drilling Method: HSA**	

Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample No. /Type	1st 6"	2nd 6"	3rd 6"	N Value
65	-4" sand lens noted at 65 ft.						
66			S13	50/6"			50+
67							
68							
69							
70	-1" sand lens noted at 70 ft.						
71			S14	50/5"			50+
72							
73							
74							
75			S15	50/6"			50+
76							
77							
78							
79							
80			S16	50/4"			50+
81							
82							
83							
84							
85			S17	50/6"			50+
86							
87							
88							
89							
90			-	50/2"			50+
91							
92	End of Exploratory Boring						
93							
94							
95							
96							

N VALUE GRAPH (Last 12")

10 20 30 40 50

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings-	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	D C - Driving Casing	

Krazan & Associates, Inc.

LOG OF BORING No. B-2

Date Drilled: 8/7/23	**Project: North Kloomachin Subdivision**	**Notes:**
Location: Kingston, WA	**Ground Elevation: ~200 ft.**	**Logged By: EA**
Hammer Type: Manual ☐ Automatic ☑ Other ☐		
Water Level: No groundwater encountered.	**Drilling Method: HSA**	

Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample No. /Type	1st 6"	2nd 6"	3rd 6"	N Value
	Ground Surface						
0	Brown to gray, silty sand with gravel (SM) (moist, very dense)						
5			S1	13	26	30	50+
10	-Becomes gray.		S2	19	50/6"		50+
15			S3	30	50/5.5"		50+
20			S4	50/5"			50+
25			S5	50/4"			50+
30			S6	35	50/3"		50+
32							

N VALUE GRAPH (Last 12")

10 20 30 40 50

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings-	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	D C - Driving Casing	

Krazan & Associates, Inc.

LOG OF BORING No. B-2

Date Drilled: 8/7/23	**Project: North Kloomachin Subdivision**	**Notes:**
Location: Kingston, WA	**Ground Elevation: ~200 ft.**	**Logged By: EA**
Hammer Type: Manual ☐ Automatic ☑ Other ☐		
Water Level: No groundwater encountered.	**Drilling Method: HSA**	

Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample No. /Type	1st 6"	2nd 6"	3rd 6"	N Value	N VALUE GRAPH (Last 12") 10 20 30 40 50
33								
34								
35								
36			S7	50/6"			50+	
37								
38								
39								
40								
41			S8	50/5"			50+	
42								
43								
44								
45								
46			S9	38	50/5"		50+	
47								
48								
49								
50								
51			S10	50/4"			50+	
52								
53								
54								
55								
56			S11	50/6"			50+	
57								
58								
59								
60								
61			S12	50/3"			50+	
62								
63								
64								

LEGEND

SAMPLER TYPE				DRILLING METHOD			
SS	- Split Spoon	NQ	- Rock Core, 1-7/8"	HSA	- Hollow Stem Auger	RW	- Rotary Wash
ST	- Shelby Tube	CU	- Cuttings-	CFA	- Continuous Flight Augers	RC	- Rock Core
AWG	- Rock Core, 1-1/8"	CT	- Continuous Tube	D C	- Driving Casing		

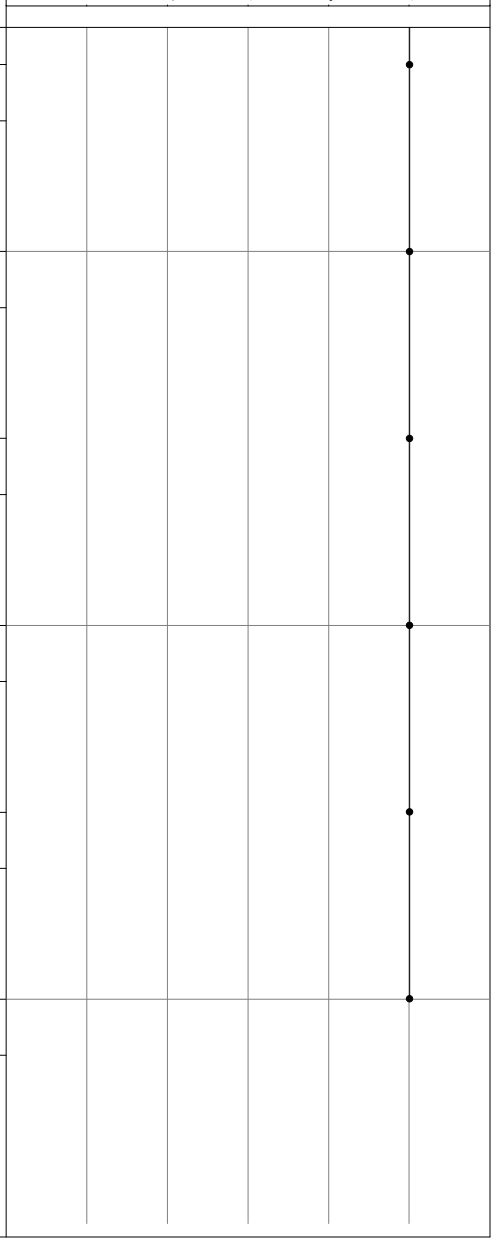
Krazan & Associates, Inc.

LOG OF BORING No. B-2

Date Drilled: 8/7/23	**Project: North Kloomachin Subdivision**		**Notes:**
Location: Kingston, WA	**Ground Elevation: ~200 ft.**	**Logged By: EA**	
Hammer Type: Manual ☐ Automatic ☑ Other ☐			
Water Level: No groundwater encountered.	**Drilling Method: HSA**		

Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample No. /Type	1st 6"	2nd 6"	3rd 6"	N Value
65							
66			S13	50/3"			50+
67							
68							
69							
70	-2" sand lens noted at 70 ft.		S14	50/3"			50+
71							
72							
73							
74							
75			S15	50/3"			50+
76							
77							
78							
79							
80			S16	50/2"			50+
81							
82							
83							
84							
85			S17	50/3"			50+
86							
87							
88							
89							
90			S18	50/4"			50+
91							
92	End of Exploratory Boring						
93							
94							
95							
96							

N VALUE GRAPH (Last 12")



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings-	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	D C - Driving Casing	

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	7	4	13	40	36	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.75	100		
.5	98		
.375	97		
#4	93		
#10	89		
#20	86		
#40	76		
#60	60		
#100	42		
#200	36		

* (no specification provided)

Material Description

Gray Silty Sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 2.3518 D_{85}= 0.7702 D_{60}= 0.2493
D_{50}= 0.1922 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample Location: B1-S3
Moisture Content: 7.5%

Date Received: 8/14/23 **Date Tested:** 8/16/23

Tested By: AC

Checked By: Aaron CLyde

Title: Laboratory Manager

Source of Sample: B-1 **Depth:** 15.0' **Date Sampled:** 8/7/23
Sample Number: 1020

Krazan

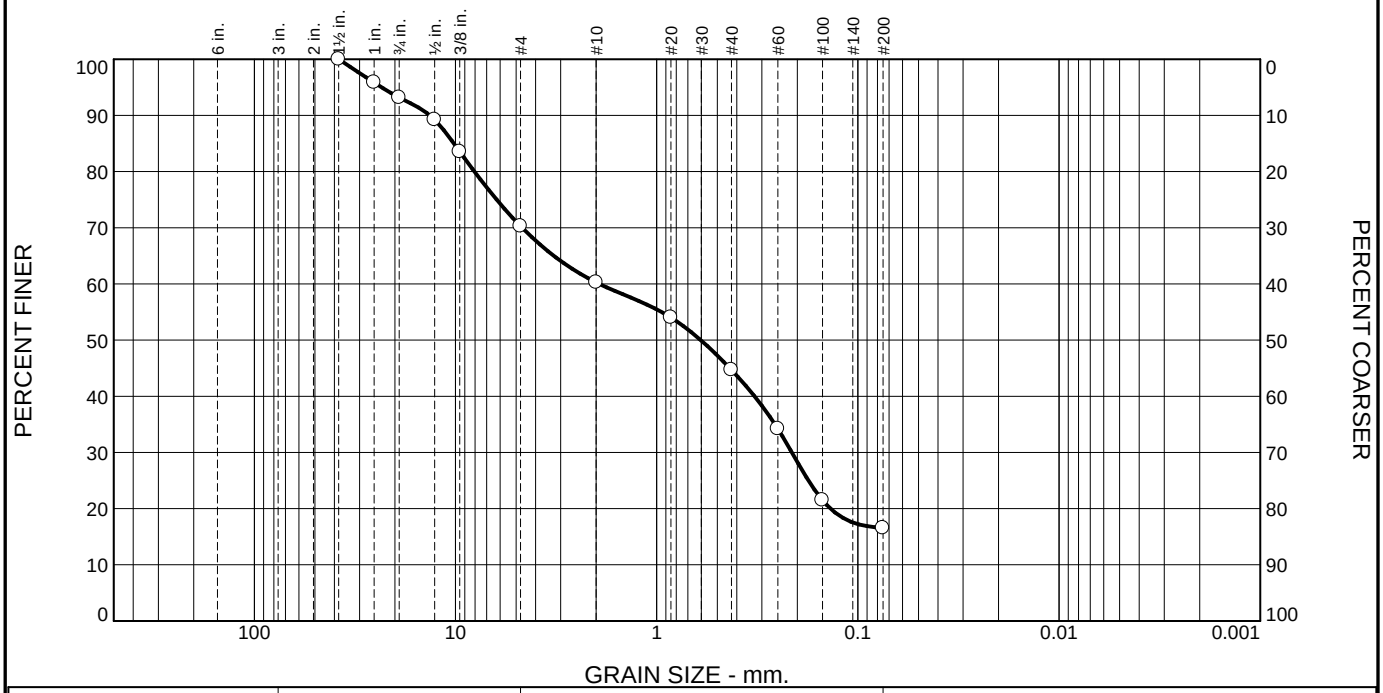
Client: Map Limited
Project: North Kloomachin Subdivision

Project No: 10223017 **Figure**

North Kloomachin Subdivision, 102-23017, August 15, 2023

Sample ID	Location	Elev/Depth	Moist Specimen (g)	Dry Specimen (g)	Mass Water (g)	% Moisture
1021	B1-S6	30’ 00”	954.95	886.42	68.53	7.7
1022	B1-S9	45’ 00”	771.24	722.75	48.49	6.7
1023	B2-S5	25’ 00”	1057.55	977.77	79.78	8.2
1024	B2-S9	45’ 00”	1129.9	1042.29	87.61	8.4
1025	B2-S11	55’ 00”	1101.02	1029.21	71.81	6.9
1026	B2-S13	65’ 00”	1019.65	962.46	57.19	5.9
1027	B1-S14	70’ 00”	823.93	705.21	118.72	16.8
1035	B2-S17	85’ 00”	1186.3	1112.89	73.41	6.5
1036	B1-S16	80’ 00”	1057.45	983.45	74.00	7.5
1037	B2-S15	75’ 00”	703.9	652.35	51.55	7.9

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	7	23	10	15	28	17	

Test Results (ASTM D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5	100		
1	96		
.75	93		
.5	89		
.375	84		
#4	70		
#10	60		
#20	54		
#40	45		
#60	34		
#100	21		
#200	17		

* (no specification provided)

Material Description

Gray Silty Sand with Gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-1-b

Coefficients

D_{90}= 13.4107 D_{85}= 10.1903 D_{60}= 1.9275
D_{50}= 0.6045 D_{30}= 0.2130 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample Location: TP1-S2
Moisture Content: 4.2%

Date Received: 8/14/23 **Date Tested:** 8/16/23

Tested By: AC

Checked By: Aaron Clyde

Title: Laboratory Manager

Source of Sample: TP-1 **Depth:** 3.5'
Sample Number: 1031

Date Sampled: 8/7/23

Krazan

Client: Map Limited
Project: North Kloomachin Subdivision

Project No: 10223017 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	9	12	5	15	36	23	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5	100		
1	93		
.75	91		
.5	87		
.375	85		
#4	79		
#10	74		
#20	70		
#40	59		
#60	45		
#100	29		
#200	23		

* (no specification provided)

Material Description

Gray Silty Sand with Gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 17.6922 D_{85}= 9.6663 D_{60}= 0.4376
D_{50}= 0.2920 D_{30}= 0.1577 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample Location: TP1-S3
Moisture Content: 5.2%

Date Received: 8/14/23 **Date Tested:** 8/16/23

Tested By: AC

Checked By: Aaron Clyde

Title: Laboratory Manager

Source of Sample: TP-1 **Depth:** 5.0'
Sample Number: 1032

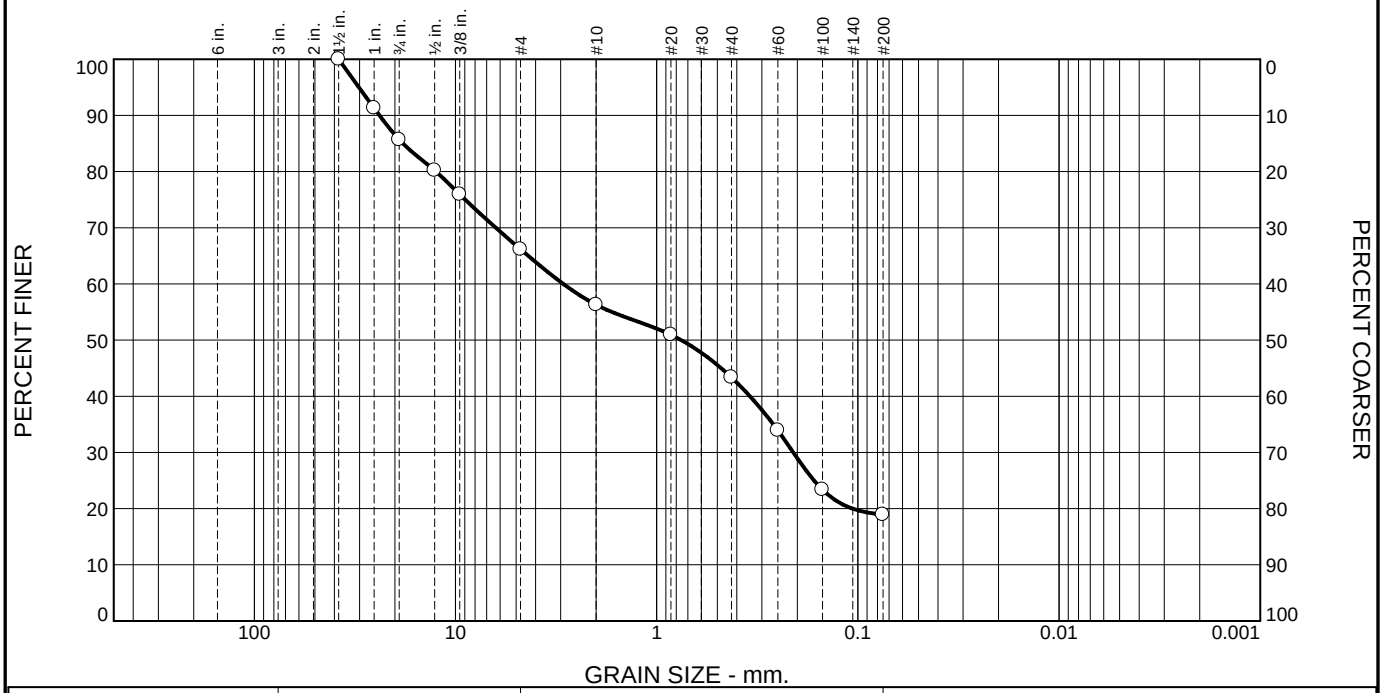
Date Sampled: 8/7/23

Krazan

Client: Map Limited
Project: North Kloomachin Subdivision

Project No: 10223017 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	14	20	10	13	24	19	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5	100		
1	91		
.75	86		
.5	80		
.375	76		
#4	66		
#10	56		
#20	51		
#40	43		
#60	34		
#100	23		
#200	19		

* (no specification provided)

Material Description

Light Brown Silty Sand with Gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-1-b

Coefficients

D_{90}= 23.8779 D_{85}= 18.2547 D_{60}= 2.9133
D_{50}= 0.7555 D_{30}= 0.2095 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample Location: TP4-S1
Moisture Content: 19.4%

Date Received: 8/14/23 **Date Tested:** 8/16/23

Tested By: AC

Checked By: Aaron Clyde

Title: Laboratory Manager

Source of Sample: TP-4 **Depth:** 1.0'
Sample Number: 1033

Date Sampled: 8/7/23

Krazan

Client: Map Limited
Project: North Kloomachin Subdivision

Project No: 10223017 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	4	15	7	21	39	14	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5	100		
1	98		
.75	96		
.5	92		
.375	88		
#4	81		
#10	74		
#20	67		
#40	53		
#60	37		
#100	20		
#200	14		

* (no specification provided)

Material Description

Gray Silty Sand with Gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 11.1573 D_{85}= 7.3477 D_{60}= 0.5715
D_{50}= 0.3773 D_{30}= 0.2051 D_{15}= 0.1108
D_{10}= C_u= C_c=

Remarks

Sample Location: TP8 S1
Moisture Content: 1.1%

Date Received: 8/14/23 **Date Tested:** 8/16/23

Tested By: AC

Checked By: Aaron Clyde

Title: Laboratory Manager

Source of Sample: TP-8 **Depth:** 4.5'
Sample Number: 1034 **Date Sampled:** 8/7/23

Krazan

Client: Map Limited
Project: North Kloomachin Subdivision

Project No: 10223017 **Figure**

APPENDIX B

EARTHWORK SPECIFICATIONS

GENERAL

When the text of the report conflicts with the general specifications in this appendix, the recommendations in the report have precedence.

SCOPE OF WORK: These specifications and applicable plans pertain to and include all earthwork associated with the site rough grading, including but not limited to the furnishing of all labor, tools, and equipment necessary for site clearing and grubbing, stripping, preparation of foundation materials for receiving fill, excavation, processing, placement and compaction of fill and backfill materials to the lines and grades shown on the project grading plans, and disposal of excess materials.

PERFORMANCE: The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications. This work shall be inspected and tested by a representative of Krazan and Associates, Inc., hereinafter known as the Geotechnical Engineer and/or Testing Agency. Attainment of design grades when achieved shall be certified to by the project Civil Engineer. Both the Geotechnical Engineer and Civil Engineer are the Owner's representatives. If the contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory as determined by both the Geotechnical Engineer and Civil Engineer. No deviation from these specifications shall be made except upon written approval of the Geotechnical Engineer, Civil Engineer or project Architect.

No earthwork shall be performed without the physical presence or approval of the Geotechnical Engineer. The Contractor shall notify the Geotechnical Engineer at least 2 working days prior to the commencement of any aspect of the site earthwork.

The Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineers harmless from any and all liability, real or alleged, in connection with the performance of work on this project, except for liability arising from the sole negligence of the Owner of the Engineers.

TECHNICAL REQUIREMENTS: All compacted materials shall be densified to a density not less than 95 percent of maximum dry density as determined by ASTM Test Method D1557 as specified in the technical portion of the Geotechnical Engineering Report. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work will be judged by the Geotechnical Engineer.

SOIL AND FOUNDATION CONDITIONS: The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the contents of the data presented in the soil report. The Contractor shall make his own interpretation of the data contained in said report, and the Contractor shall not be relieved of liability under the contractor for any loss sustained as a result of any variance between conditions indicated by or deduced from said report and the actual conditions encountered during the progress of the work.

DUST CONTROL: The work includes dust control as required for the alleviation or prevention of any dust nuisance on or about the site or the borrow area, or off-site if caused by the Contractor's operation either during the performance of the earthwork or resulting from the conditions in which the Contractor leaves the site. The Contractor shall assume all liability, including Court costs of codefendants, for all claims related to dust or windblown materials attributable to his work.

SITE PREPARATION

Site preparation shall consist of site clearing and grubbing and preparations of foundation materials for receiving fill.

CLEARING AND GRUBBING: The Contractor shall accept the site in this present condition and shall demolish and/or remove from the area of designated project earthwork all structures, both surface and subsurface, trees, brush, roots, debris, organic matter, and all other matter determined by the Geotechnical Engineer to be deleterious. Such materials shall become the property of the Contractor and shall be removed from the site.

Tree root systems in proposed building areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots larger than 1 inch. Tree root removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill or tree root excavation should not be permitted until all exposed surfaces have been inspected and the Geotechnical Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

SUBGRADE PREPARATION: Subgrade should be prepared as described in our site preparation section of this report.

EXCAVATION: All excavation shall be accomplished to the tolerance normally defined by the Civil Engineer as shown on the project grading plans. All over excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the applicable technical requirements.

FILL AND BACKFILL MATERIAL: No material shall be moved or compacted without the presence of the Geotechnical Engineer. Material from the required site excavation may be utilized for construction site fills provided prior approval is given by the Geotechnical Engineer. All materials utilized for constructing site fills shall be free from vegetable or other deleterious matter as determined by the Geotechnical Engineer.

PLACEMENT, SPREADING AND COMPACTION: The placement and spreading of approved fill materials and the processing and compaction of approved fill and native materials shall be the responsibility of the Contractor. However, compaction of fill materials by flooding, ponding, or jetting shall not be permitted unless specifically approved by local code, as well as the Geotechnical Engineer.

Both cut and fill shall be surface compacted to the satisfaction of the Geotechnical Engineer prior to final acceptance.

SEASONAL LIMITS: No fill material shall be placed, spread, or rolled while it is frozen or thawing or during unfavorable wet weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until the Geotechnical Engineer indicates that the moisture content and density of previously placed fill are as specified.

APPENDIX C

PAVEMENT SPECIFICATIONS

1. DEFINITIONS – The term "pavement" shall include asphalt concrete surfacing, untreated aggregate base, and aggregate subbase. The term "subgrade" is that portion of the area on which surfacing, base, or subbase is to be placed.

2. SCOPE OF WORK – This portion of the work shall include all labor, materials, tools and equipment necessary for and reasonable incidental to the completion of the pavement shown on the plans and as herein specified, except work specifically noted as "Work Not Included."

3. PREPARATION OF THE SUBGRADE – The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans and as per the pavement design section of this report. The upper 12 inches of the soil subgrade beneath the pavement section shall be compacted to a minimum compaction of 95 percent of maximum dry density as determined by test method ASTM D1557. The finished subgrades shall be tested and approved by the Geotechnical Engineer prior to the placement of additional pavement of additional pavement courses.

4. AGGREGATE BASE – The aggregate base shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate base should conform to WSDOT Standard Specification for Crushed Surfacing Base Course or Top Course (Item 9-03.9(3)). The base material shall be compacted to a minimum compaction of 95 percent as determined by ASTM D1557. Each layer of subbase shall be tested and approved by the Geotechnical Engineer prior to the placement of successive layers.

5. ASPHALTIC CONCRETE SURFACING – Asphaltic concrete surfacing shall consist of a mixture of mineral aggregate and paving grade asphalt, mixed at central mixing plant and spread and compacted on a prepared base in conformity with the lines, grades, and dimensions shown on the plans. The drying, proportioning, and mixing of the materials shall conform to WSDOT Specifications.

The prime coat, spreading and compacting equipment, and spreading and compacting the mixture shall conform to WSDOT Specifications, with the exception that no surface course shall be placed when the atmospheric temperature is below 50 degrees F. The surfacing shall be rolled with combination steel-wheel and pneumatic rollers, as described in WSDOT Specifications. The surface course shall be placed with an approved self-propelled mechanical spreading and finishing machine.

6. TACK COAT – The tack (mixing type asphaltic emulsion) shall conform to and be applied in accordance with the requirements of WSDOT Specifications.

WILLAMETTE
CULTURAL RESOURCES ASSOCIATES, LTD.



Cultural Resources Assessment for the North Kloomachin Subdivision Project, Port Gamble S'Klallam Tribe, Kingston, Washington

Cultural Resources Assessment for the North Kloomachin Subdivision Project, Port Gamble S'Klallam Tribe, Kingston, Washington

Prepared by
Robert Kopperl, Ph.D., R.P.A.
F. Scott Pierson

September 11, 2023

WillametteCRA Report No. 23-108
Seattle, Washington

Prepared for
MAP, Ltd.
Silverdale, Washington

and

Port Gamble S'Klallam Tribe
Kingston, Washington



WILLAMETTE
CULTURAL RESOURCES ASSOCIATES, LTD.

Report Details

Project Name:	North Kloomachin Subdivision
Agency:	Port Gamble S'Klallam Tribe
Client/Owner:	MAP, Ltd. / Port Gamble S'Klallam Tribe
Project Undertaking:	Residential Subdivision Development on Indian Reservation
Regulatory Framework:	Tribal Environmental Permitting Process (Title 24)
County(ies):	Kitsap
Legal Description:	Township 27N, Range 2E, Section 5
USGS Quad(s):	*Port Gamble, WA* 7.5-minute
Project Acreage:	~40 (Total parcel area)
Survey Acreage:	~20 (Portion proposed for subdivision, utilities, and development)
Field Note Location:	WillametteCRA, Seattle Office
Fieldwork Type:	Pedestrian Survey, Shovel Probes
Fieldwork Dates:	August 9, 2023
Field Personnel:	F. Scott Pierson, Althea Fitzpow, Breann Stoner
Findings:	No cultural resources identified
Recommendations:	Implement an Inadvertent Discovery Plan during construction.

Executive Summary

The Port Gamble S'Klallam Tribe (PGST) seeks to build a residential subdivision on 40 acres of currently undeveloped land near the north edge of the Port Gamble Reservation (Project). A cultural resources assessment was requested by PGST along with several other discipline reports as part of its Title 24 environmental process, given the general archaeological sensitivity of the Project vicinity and its proximity to their ancestral village of Little Boston. MAP, Ltd., is facilitating the various Project environmental reviews and subcontracted with Willamette Cultural Resources Associates, Ltd. (WillametteCRA) to complete this assessment with the goal of identifying and assessing the potential historic significance of cultural resources that may be impacted by the Project.

WillametteCRA completed background research on the natural and cultural setting of the Project, conducted a review of previous cultural resource studies in the area, and completed a thorough surface and subsurface archaeological survey of the Project limits. The Port Gamble Reservation has been an important place for traditional S'Klallam land use since time immemorial. The Project is located on nearby bluffs northeast of the historic village of Little Boston on Point Julia and southwest of an historic Indian Shaker Church cemetery. Twentieth century activity in and near the Project has generally been limited to several episodes of clearcut logging.

No significant cultural resources or places of elevated archaeological sensitivity were identified within the Project limits during this assessment, either from archival research, from our archaeological field survey that included pedestrian survey and excavation of 29 shovel probes within the ~20-acre portion of the Project where development is planned, or in our review of Project geotechnical data. However, culturally important places on the Reservation landscape are situated nearby, most notably the cemetery to the northeast and Point Julia to the southwest.

Historic clearcut logging episodes atop this geologically old surface composed of sterile glacial sediments indicates the likelihood of archaeological resources or other remains of traditional land use to be very low within the Project limits. No further identification efforts or other archaeological measures are recommended for completion of the Project as designed. We do recommend, however, an Inadvertent Discovery Plan (IDP) to be implemented by PGST and its construction contractors during all ground disturbing activities associated with this Project. The IDP should have clear procedures and protocols to be followed in the event, however unlikely, that significant archaeological resource or human skeletal remains are encountered during construction.

Acknowledgments

We wish to thank PGST for giving us another opportunity to assist them with the growth of their community and improvements to Reservation infrastructure. In particular, Misty Ives (Cultural Resources) and Abby Welch (Planning) are PGST staff who patiently answered our questions about the Project area and its natural and cultural history. We thank Pat Fuhrer at MAP, Ltd., for inviting us to be part of the consultant team, and Andrew Glenn at Krazan & Associates, Inc. for providing the geotechnical data for our review. Finally, we acknowledge our field technicians Althea Fitzpow and Breann Stoner for their hard work in the rare summer rain shower that greeted us during our fieldwork.

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Introduction

The Port Gamble S'Klallam Tribe (PGST) seeks to build a residential subdivision on 40 acres of currently undeveloped land near the north edge of the Port Gamble Reservation (Project). A cultural resources assessment was requested by PGST along with several other discipline reports as part of its Title 24 environmental process, given the general archaeological sensitivity of the Project vicinity and its proximity to their ancestral village of Little Boston. MAP, Ltd., is facilitating the various Project environmental reviews and subcontracted with Willamette Cultural Resources Associates, Ltd. (WillametteCRA) to complete this assessment with the goal of identifying and assessing the potential historic significance of cultural resources that may be impacted by the Project.

WillametteCRA completed background research on the natural and cultural setting of the Project, conducted a review of previous cultural resource studies in the area, and completed a thorough surface and subsurface archaeological survey of the Project limits. The Port Gamble Reservation has been an important place for traditional S'Klallam land use since time immemorial. The Project is located on nearby bluffs northeast of the historic village of Little Boston on Point Julia and southwest of an historic Indian Shaker Church cemetery. Twentieth century activity in and near the Project has generally been limited to several episodes of clearcut logging.

No significant cultural resources or places of elevated archaeological sensitivity were identified within the Project limits during this assessment, either from archival research, from our archaeological field survey, or in our review of Project geotechnical data. However, culturally important places on the Reservation landscape are situated nearby, most notably the cemetery to the northeast and Point Julia to the southwest. Because of this, we recommend PGST implements an Inadvertent Discovery Plan during construction in the event that any archaeological resources, human remains, or any other cultural resources are encountered.

Project Location and Description

The Project is on approximately 40 acres of undeveloped land near the north end of the Reservation, Township 27N, Range 2E, Section 5 (Figure 1). This land is situated on a bluff drained by Shipbuilder's Creek above Hood Canal north of Point Julia, with portions planned for development on both the north and south sides of Hood Canal Drive NE west of Little Boston Road NE (Figure 2). Only about half of the ~40-acre Project area is planned for development, including preliminary subdivision of 50 lots, construction of access roads and cul-de-sacs, and installation of stormwater facilities in up to two non-contiguous locations as well as other utilities. The other half of the Project area is on steep slopes, hosts critical plant and wildlife habitats, or is otherwise not planned for development.



Figure 1. Project location.

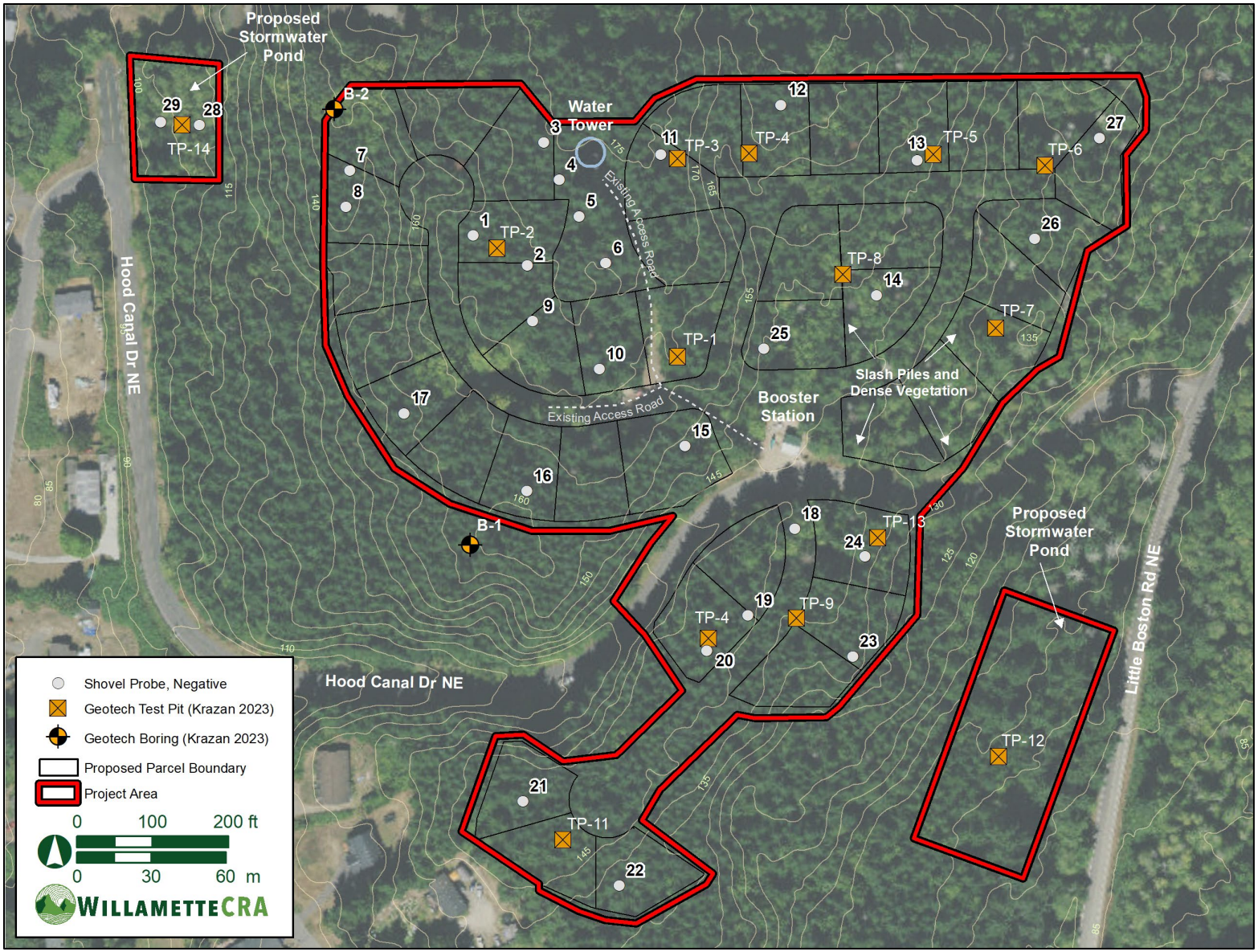


Figure 2. Project design, archaeological shovel probes, and geotechnical study locations.

Regulatory Context

This project was undertaken at the request of the PGST for an internal due diligence cultural resources review under the Tribe's general Title 24 environmental review process. As there is no outside funding or permitting requiring compliance with the National Environmental Policy Act or Section 106 of the National Historic Preservation Act, and the project is not within a known archaeological site, there are no applicable federal historic preservation regulation requirements. If such a federal nexus occurs later during the Project, this report is written to Washington State Department of Archaeology and Historic Preservation (DAHP) standards and can be used as documentation in support of Section 106 compliance and state and/or federal environmental permitting requirements.

Natural Setting

The modern landscape of western Washington is diverse and characterized by landforms and sediments produced across multiple spatial and temporal scales in glacial, deglacial, and non-glacial environments—many of which are found in the vicinity of Port Gamble. Some of the physical features associated with earlier glacial and deglacial conditions are still readily visible in this modern landscape; other landscape features are the products of much more recent Holocene geomorphic and anthropogenic processes.

Geology and Geomorphology

The modern topography and surficial geology of the Salish Sea region is the result of multiple widespread continental glaciations that extended southward from British Columbia into the northern lowland, along the western flanks of the Cascade Range and eastern flanks of the Olympic Mountains, and along the north margin of the Olympic Peninsula. Originating in the mountains of southwestern British Columbia, thick lobes of ice advanced southward several times during the Pleistocene Epoch between 1.8 million years ago and the beginning of the Holocene about 10,000 years ago. The latest glacial maximum, known in this region as the Vashon Stade of the Fraser glaciation, began about 17,000–18,000 years ago and ended abruptly with the onset of climatic warming about 14,000 years ago (Easterbrook 1993, 2003a).

The outwash deposited during the southward advance of the Puget Lobe of the Cordilleran ice sheet filled the Salish Sea basin, forming an extensive low-lying area bounded on the west by the Olympic Mountains and the Cascade Range on the east. Sometimes called the "great Lowland Fill", the surface of this fill rarely rises above 500 feet elevation (Booth and Goldstein 1994). Subglacial incision when the ice sheet overrode the advance outwash, and subglacial incision during the maximum extent and subsequent retreat of the ice sheet, created numerous large deep troughs and meltwater channels. As a result, the regional geomorphology is now dominated by well-defined north-to-south trending troughs separated by extensive drift uplands. At the regional scale, marine waters and freshwater lakes now occupy the larger Pleistocene

glacial troughs. The largest of these bodies of water include the south Salish Sea and its present-day marine embayments, both large (e.g., Puget Sound and Hood Canal) and small (e.g., Port Gamble, Liberty Bay, and Dyes Inlet).

Deglaciation of the Cordilleran ice sheet at the end of the Pleistocene was rapid and accompanied by the formation of a complex succession of meltwater channels and ice-marginal lakes behind the retreating ice. During the early stages of retreat, the meltwater trapped behind the retreating ice sheet formed proglacial lakes that overflowed south across the outwash plain and drained through the Chehalis Valley. Glacial Lake Russell, the first lake formed south of the north-retreating ice front, continually enlarged northward as ice-retreat continued. As the ice continued to retreat other independent ice-marginal lakes merged with Glacial Lake Russell to form Glacial Lake Bretz (Waitt and Thorson 1983). By about 13,000 years ago, during the later stages of deglaciation when the ice sheet retreated north of Port Gamble and reached the vicinity of Whidbey Island, the southern outlet through the Black Hills was abandoned and the lake drained northwestward along the western margin of the ice sheet into the Strait of Juan de Fuca through the Chimacum valley (Dethier et al. 1995; Easterbrook 1994, 2003a, 2003b; Haugerud 2004).

With the rapid melting of the ice sheets at the end of the Pleistocene, global sea level rose rapidly from 390 feet below present sea level (bpsl) at the time of maximum glacial extent and was 30 feet bpsl by 7,000 years ago. By about 5,700 years ago, global sea level was 16 feet bpsl but continued to rise, albeit more slowly until about 3,000 years ago. At the same time global sea levels were rising, land formerly depressed under the weight of the ice experienced uplift as local isostatic rebound raised land levels as high or higher than 200 feet above modern sea level throughout the south Salish Sea lowlands. Uplift due to rebound appears to have finished by 9,000 years ago, and the rapidly rising global sea-level rise began to drown the early Holocene shorelines (Dethier et al. 1995; Dragovich et al. 1994; Thorson 1989).

The mapped surface geology of the project vicinity reflects this history extending back into the last great Ice Age. Visible on LiDAR imagery (Figure 3), the bluff-top landform on which the project area is situated has been mapped as a Late Pleistocene glacial surface characterized by irregular pits, lumps, and fluting typical of Vashon stade recessional outwash surfaces (Haugerud 2009; Yount et al. 1993). This indicates that archaeological material, if deposited within the Project area, would be very close to the surface where natural ground surfaces in the project area remain and not buried at greater depths. Soil formation processes have weathered this old surface during the course of the Holocene. The soils within the project area are mapped primarily as Poulsbo and Poulsbo-Ragnar series, with a smaller area at the west edge of the overall Project area not planned for development as Ragnar series soil (McMurphy 1980). These soils form shallow forest soil A horizons on the often-sloped surfaces of glacial outwash and till parent material.

Krazan & Associates (Krazan) conducted a geotechnical study for the Project that included excavation of 14 mechanical test pits (TPs) to depths between about 6 and 10 feet below surface (fbs) and two hollow stem auger boreholes to depths of 91.5 fbs (see Figure 2) to characterize geological conditions (Krazan 2023). These tests corroborated the local Project conditions with the broader soil and surface geology efforts noted above, encountering thin forest topsoil that has formed on the surface of glacial deposits.

Biota

Climate in the Salish Sea lowlands was much cooler and drier than today at the end of the Pleistocene (Barnosky 1984; Barnosky et al. 1987; Brubaker 1991; Whitlock 1992). This influenced the species of plants that would inhabit the newly deglaciated surfaces across the Puget Lowland, such as lodgepole pine and bracken fern with scattered Douglas fir, white pine, spruce, and alder. The climate warmed at the onset of the Holocene. As the climate continued to dry during the warmer early Holocene, species like grasses, fir, alder, and oak replaced those that preferred a colder, wetter climate. By about 6,000 years ago, the regional climate had returned to cool and moist conditions that are comparable to the modern maritime regime, producing the western hemlock (*Tsuga heterophylla*) vegetation zone (Franklin and Dyrness 1988). The western hemlock zone is historically characterized by a high proportion of western hemlock and western redcedar, relative to the once dominant Douglas fir, red alder, and various grasses. Climate and vegetation have remained generally stable since the mid-Holocene when the closed-canopy forest typical of western Washington was established (Whitlock 1992).

As a focus of the early commercial logging industry in western Washington near some of the first sawmills in the region, the bluffs above Point Julia saw clearcut timber harvest that removed old-growth forest. A succession of harvests throughout what would become the Port Gamble Indian Reservation has left a mosaic of forest stands of various ages. PGST planning documents (PGST Natural Resources Department 2022; Welch 2022) note a second growth Douglas fir monoculture now dominates the Project area, and that the oldest forest stands within the Project area are over 50 years old along the east edge of the overall Project area but outside areas planned for subdivision and development. The remainder of the Project area is covered by forest stands that were last logged at least 30–40 years ago.

The Salish Sea lowlands historically supported substantial populations of large and small mammals including black-tailed deer, elk, black bear, rabbit, fox, wolf, mountain lion, muskrat, and beaver (Ingles 1965; Larrison 1970). Freshwater fish, both native and introduced, are resident in the streams and lakes of northern Kitsap County (Wydoski and Whitney 2003). Anadromous salmonids historically used the small streams that drain into Port Gamble to spawn at different times during the year. These include presumed runs of coho up Little Boston Creek, fall chinook and pink salmon up Gamble Creek, and winter steelhead up Martha John Creek, as

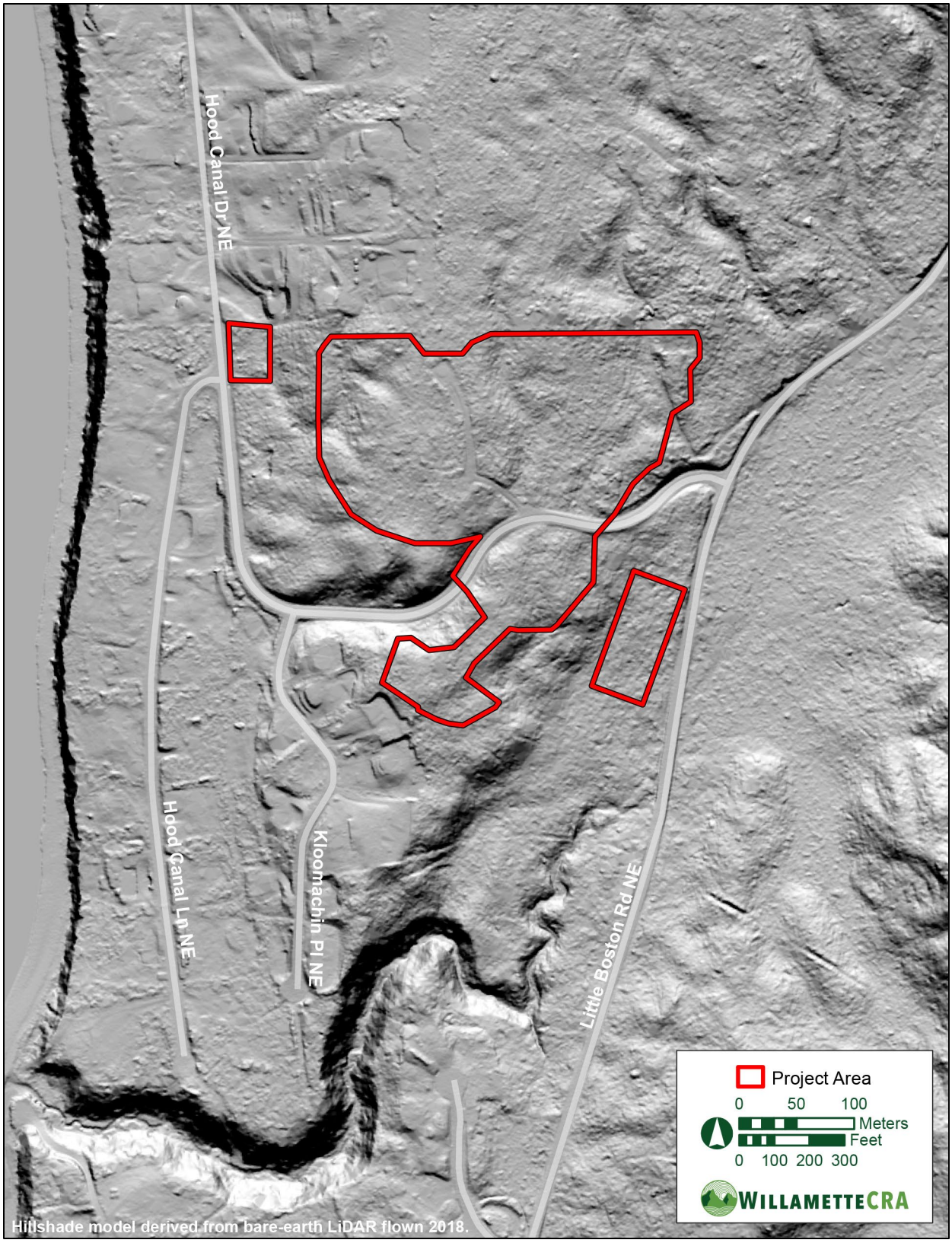


Figure 3. LiDAR imagery of the Project vicinity.

well as cutthroat trout up many of these creeks (Kuttel 2003). Shipbuilder Creek is one of several small streams in the area that support coho and fall chum salmon as well as cutthroat trout (May and Peterson 2003). Ducks, geese, and swans are seasonally abundant, as are resident birds (Angell and Balcomb 1982; Wahl and Paulson 1991).

Cultural Setting

Archaeological, ethnographic, and historical information about the region and the Project vicinity reflects land use of this area for well over 10,000 years. The history of Native American settlement and subsistence in the nearby uplands, river valleys, and tidewater both before and after European American contact also reveals important patterns that speak to the potential for archaeological resources and culturally important places.

Precontact Culture History

Little archaeological evidence has been found so far associated with Late Pleistocene and early Holocene human occupation of the Salish Sea lowlands, although investigation at the Bear Creek site (45KI839), about 25 miles southeast of Port Gamble near the north end of Lake Sammamish, has contributed a substantial amount of data from intact archaeological deposits dating between about 10,000 and 12,500 years ago (e.g., Kopperl et al. 2015). Aside from the Bear Creek site, knowledge of this period in the region is limited to several isolated finds of artifacts diagnostic to this time, but sparsely distributed across the region and lacking context. More common are Olcott sites, named after the type-site in Snohomish County and found mostly on glacial outwash surfaces in the Puget Lowland and inland foothill valleys (e.g., Chatters et al. 2020). The distinctive Olcott stone tool assemblage consists of large, leaf-shaped and stemmed points and flake tools manufactured from locally available cobbles. Several sites on the east and northeast side of the Olympic Peninsula are inferred to be contemporaneous with the Olcott tradition (e.g., Gallison 1994; Kiers and Feathers 2010). Assemblages of the Olcott tradition are usually interpreted as evidence of an early, highly mobile hunting and gathering adaptation. This pattern may have persisted for over 6,000 years and near its end it is marked by increasing reliance on marine and riverine resources.

After about 5,000 years ago, relative sea level stabilized and larger human populations in the Salish Sea lowlands organized in more complex ways to utilize a wide range of locally available resources including large and small mammals, shellfish, fish, berries, roots, and bulbs. An increasing emphasis on salmon over time is inferred as well. Shell middens containing large quantities of shellfish remains and marine fish and mammal bone are common on the saltwater shoreline. Ground stone, bone, antler, and shell tools became increasingly common and more diversified through time. Full-scale development of marine-oriented cultures on the coast and inland hunting, gathering, and riverine fishing traditions as represented in the ethnographic record are apparent after about 2500 before present (BP). Large semi-sedentary populations occupied cedar plank houses located at river mouths and confluences and on protected

shorelines. Artifacts made of both local and imported materials occur, indicating complex and diversified technologies for fishing, hunting, food processing, and storage. Wealth-status objects, status differentiation in burials, and artistic expression on ornamental items are also represented during this period (e.g., Ames and Maschner 1999; Moss 2011).

Large shell midden complexes such as the one at Point Julia nearby to the southwest of the Project have been found, and in some cases intensively studied, elsewhere along south Salish Sea shorelines. The similar geomorphological setting of Point Elliott at Mukilteo, for example, hosts an extensive complex of shell midden deposits with substantial place-to-place variability. Thicker deposits with the oldest cultural remains tend to be found near the base of the spit landform, and more recent archaeological remains found farther away from the base of the spit, horizontally correlating with the age of the spit as it developed over time. Such spits served as ideal platforms for both winter village occupations and base camps for seasonal harvest of marine resources, especially over the past two millennia (e.g., Kopperl 2020a, 2020b; Miss et al. 2013).

Native Peoples and Port Gamble History

The Project is in the traditional territory and on the Reservation lands of the Port Gamble S'Klallam. This Salish-speaking group, also called *Nux Sklai Yem* or "Strong People," lived much of the year in villages and smaller seasonal encampments on the northern Kitsap Peninsula and surrounding shores (e.g., Beckwith et al. 2015; Charles 2012). The Project is on a bluff above the landform on which their ancestral village was situated near several ethnographically recorded landscape features. It is north of the contemporary PGST administrative headquarters and historic Tribal cemetery, and southwest of the Indian Shaker Church cemetery.

Like other Native American groups in the region, the Port Gamble S'Klallam traditionally followed a seasonal round that was tied to available resources. During the winter, people lived in villages of cedar plank houses where social activities, religious ceremonies, and manufacture and maintenance of material items occurred. Much of the winter subsistence consisted of preserved and stored foods, especially salmon dried after harvest earlier in the year. At the end of winter, people dispersed to hunt, fish, and gather seasonally available resources. Salmon, berries, shellfish, and other resources collected throughout the spring, summer, and fall were dried and brought back to the winter villages (Haeberlin and Gunther 1930; Mansfield and Charles 2012). Point Julia was a place with resources available at different seasons year-round.

Several traditional place names near the Project were recorded by ethnographers in the early twentieth century, including James P. Harrington (Brooks 1997) and T. T. Waterman (Waterman et al. 2001). Harrington recorded place names in the traditional S'Klallam and Chemakum languages by his informants during the spring of 1942. The S'Klallam name for the settlement that became Little Boston was *nəxwq'ít*, meaning "land of the noon-day sun" (Brooks 1997; Stormy Purser, personal communication, 2020). The S'Klallam had traditional names for other

nearby places as well, including marshes, ponds, and creeks that fringed Port Gamble Bay (Brooks 1997:181).

The Port Gamble embayment was used by S'Klallam groups and their neighbors for millennia, as attested by the large shell midden at the sand spit of Point Julia, although as in other areas of the Pacific Northwest, increasing Euroamerican presence subjected the local inhabitants to the pressures of disease and changing lifeways (e.g., Boyd 1999). Totten Point—the spit opposite Point Julia at the entrance to Port Gamble—was an important, well-developed settlement for the Port Gamble S'Klallam at the time the founders of the Puget Mill Company arrived in 1853. The founders, William Talbot and Andrew Pope, claimed the land and established their mill on this western spit. Following negotiations between the S'Klallam and the mill owners, their village was moved across the bay entrance to Point Julia (Lawson 1856).

In 1855, the governor of Washington Territory, Isaac Stevens, sanctioned the Point-No-Point Treaty that extinguished Indian land title and assigned the S'Klallam to the Skokomish Reservation. However, most S'Klallam living around Port Gamble chose to stay in the village at Point Julia, eventually called Little Boston, and work for the mill across the bay on Totten Point (Beckwith et al. 2015). The S'Klallam at Little Boston quickly became, and remained, the backbone of labor at the mill well into the twentieth century (Charles 2012).

Before the S'Klallam moved from Totten Point on the west side of the bay to Point Julia on the east side of the Bay, the upland backing the east shoreline had undergone land claims by Euroamericans. By 1860, Job Drew and Gordon Thomas held land in the south-central portion of Section 5 that included the uplands east of Point Julia. The land was patented to them in 1862 under the Scrip Warrant Act of 1855 along with other land of theirs that would eventually become the PGST reservation (Bureau of Land Management 2023). A General Land Office (GLO) map of lands surveyed in 1860 (General Land Office 1860) shows burgeoning mill development on the west spit but no features of development on the east side at or near Point Julia. A more detailed coastal survey map from four years earlier; however, does show the "Indian Village" at Point Julia (Figure 4).

Over the subsequent decades, most of the land on the east side of Port Gamble was logged and sold. In 1934, passage of the Indian Reorganization Act (Wheeler-Howard Act) authorized the federal government to acquire land for tribes. In 1938, the area surrounding Point Julia was purchased from the Puget Mill Company and other owners to become a reservation for the PGST. Although maps dated as late as 1940 still showed the Native village at New Boston, new homes were being built on the heavily logged bluff above Port Gamble Bay in anticipation of reorganization, in an upland area called "Coontown" (Mansfield 2012a:130; Port Gamble S'Klallam Tribal Oral History Project 2007). A Shaker church and cemetery were established on the east side of Port Gamble in Coontown northeast of the Project area, from land deeded between 1913 and 1916 by the Andersons—the first and only S'Klallam family to formally homestead in the area (Mansfield 2012b:92–93, 112).



Figure 4. Project Area on a U.S. Coast and Geodetic Survey Topographic Sheet from 1856.

The S'Klallam sought to utilize funding from several of the New Deal programs prompted by the Great Depression to construct these new homes, but often encountered bureaucratic red tape. When the S'Klallam applied to the Works Progress Administration for labor funding to build the homes, they were denied since no S'Klallam men had received federal relief from May through November of the prior year. During this period S'Klallam families were gathering, fishing, and shellfishing at nearby locations, such as Foulweather Bluff and Skunk Bay, rather than receiving federal relief (Charles 2012). Following a visit from Eleanor Roosevelt, the S'Klallam were able to acquire funding for housing to be built on the blufftop (Charles 2012).

The original Little Boston houses on the spit were burned in 1940, an echo of the removal of the S'Klallam from their village at Port Townsend and its subsequent burning to clear the way for European American development (Beckwith et al. 2015; Charles 2012). The Indian Shaker Church cemetery was preserved through these times of profound reorganization of S'Klallam society and redrawing of property and Reservation boundaries on maps. At least 13 S'Klallam individuals have been interred at the cemetery, with records indicating burials as early as the 1920s that include a Tribal chief's burial. The early legal property history of the cemetery, adjacent to but off the Reservation (Figure 5), is somewhat unclear, except that the property was retained into the late 1970s by Catherine Shields, the daughter of Joseph Anderson, who owned the land on which the cemetery is situated and sold the remainder of his land in 1938 with a clause in his conveyance agreement with the church that it would revert back to his heirs if it was no longer used for church purposes; clarity on the legal ownership was lacking at that time. In the early 2000s, then-owner Pope Resources worked with PGST to exclude the cemetery and path leading to it from a proposed harvest (Misty Ives, personal communication, 2023). The Tribe now owns this land around the cemetery.

Mid-twentieth century historic maps and aerial imagery show the 1940s-era homes along the edge of the bluff west of the Project, and by the mid-1950s Hood Canal Drive was in its present configuration bisecting the Project area. As noted above and by Welch (2022), clearcut harvests began near the Project by the early twentieth century. Historic aerial imagery shows this sequence. Figure 6 is imagery from 1941 that shows Hood Canal Drive and Little Boston Road roughly aligned with their current configurations along and within the Project area. The entire Project vicinity appears to have been recently clearcut with patchy regrowth visible in some areas; the Shaker cemetery and the path leading to it from Little Boston Road does not appear to have been disturbed. Figure 7, imagery from a decade later, shows much of the Project area forest in a state of regrowth without any additional developments. Figures 8 and 9 are oblique-view aerial photographs of the Project area in 1977 and 2016, respectively. Another round of clearcut harvest across most of the Project area occurred in the 1980s (PGST Natural Resources Department 2022:3–4), but the land remained undeveloped except for the concrete water tank that was built ca. 2008.

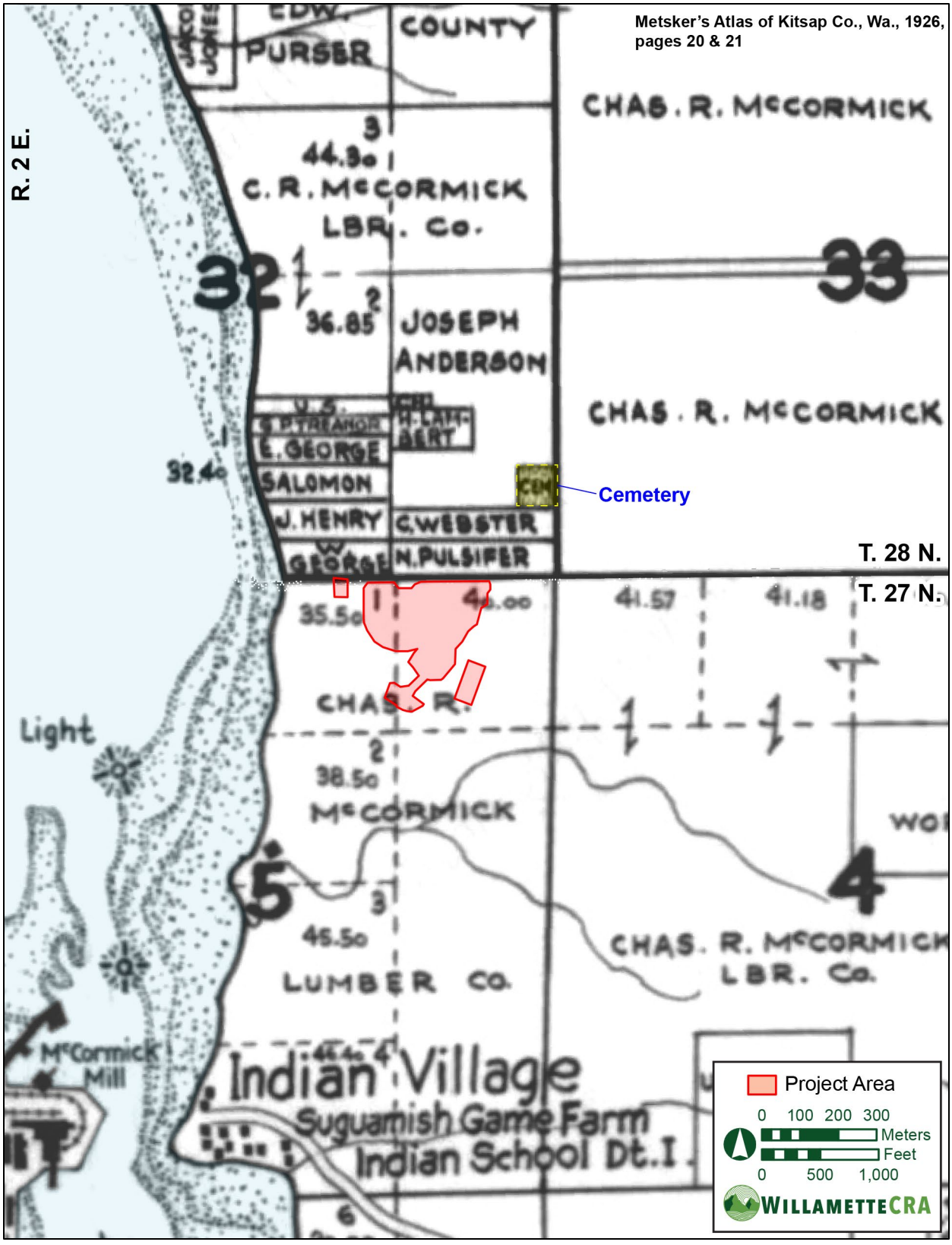


Figure 5. Composite 1926 Metsker showing Indian Shaker cemetery in relation to Project.

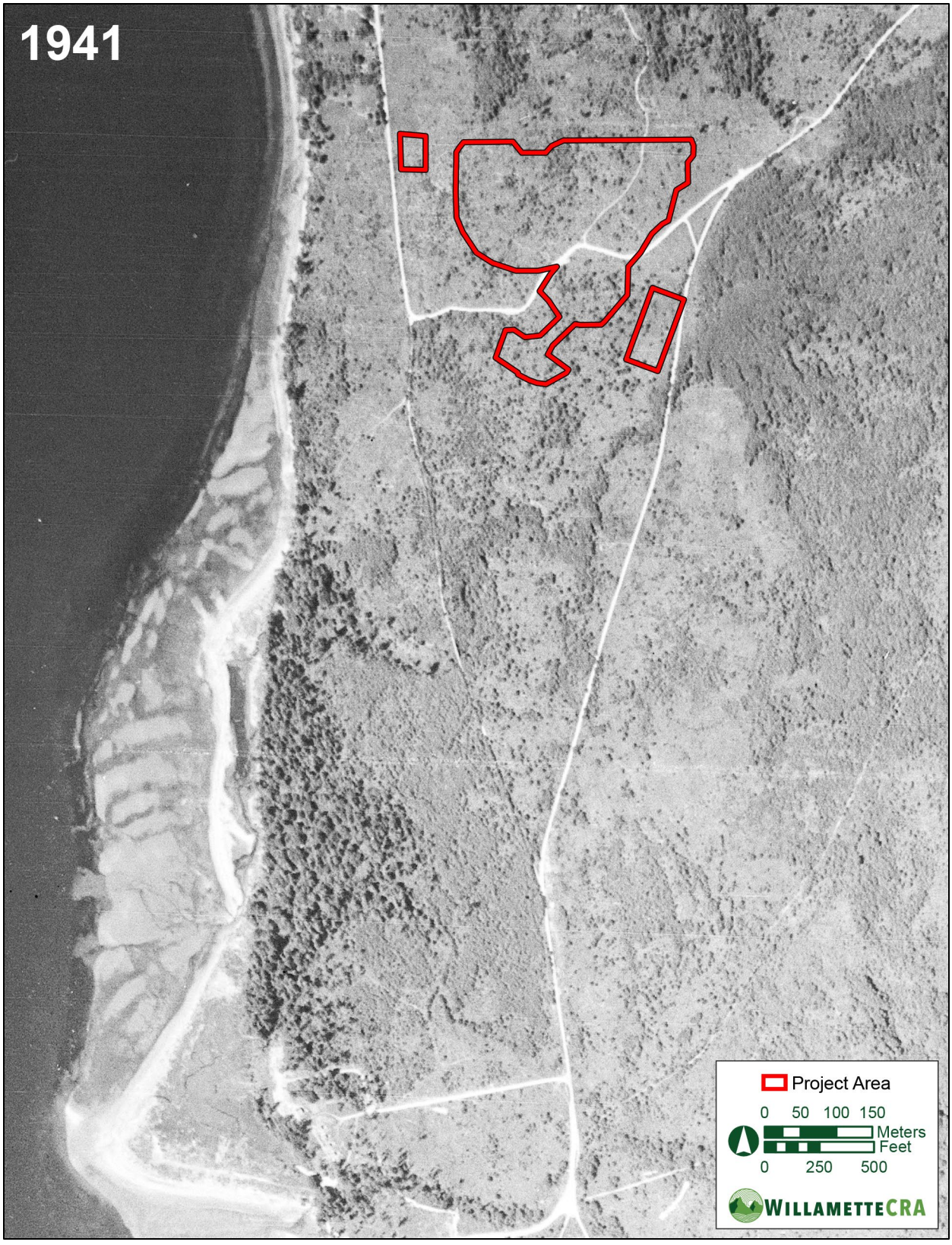


Figure 6. 1941 Aerial imagery of Project vicinity.

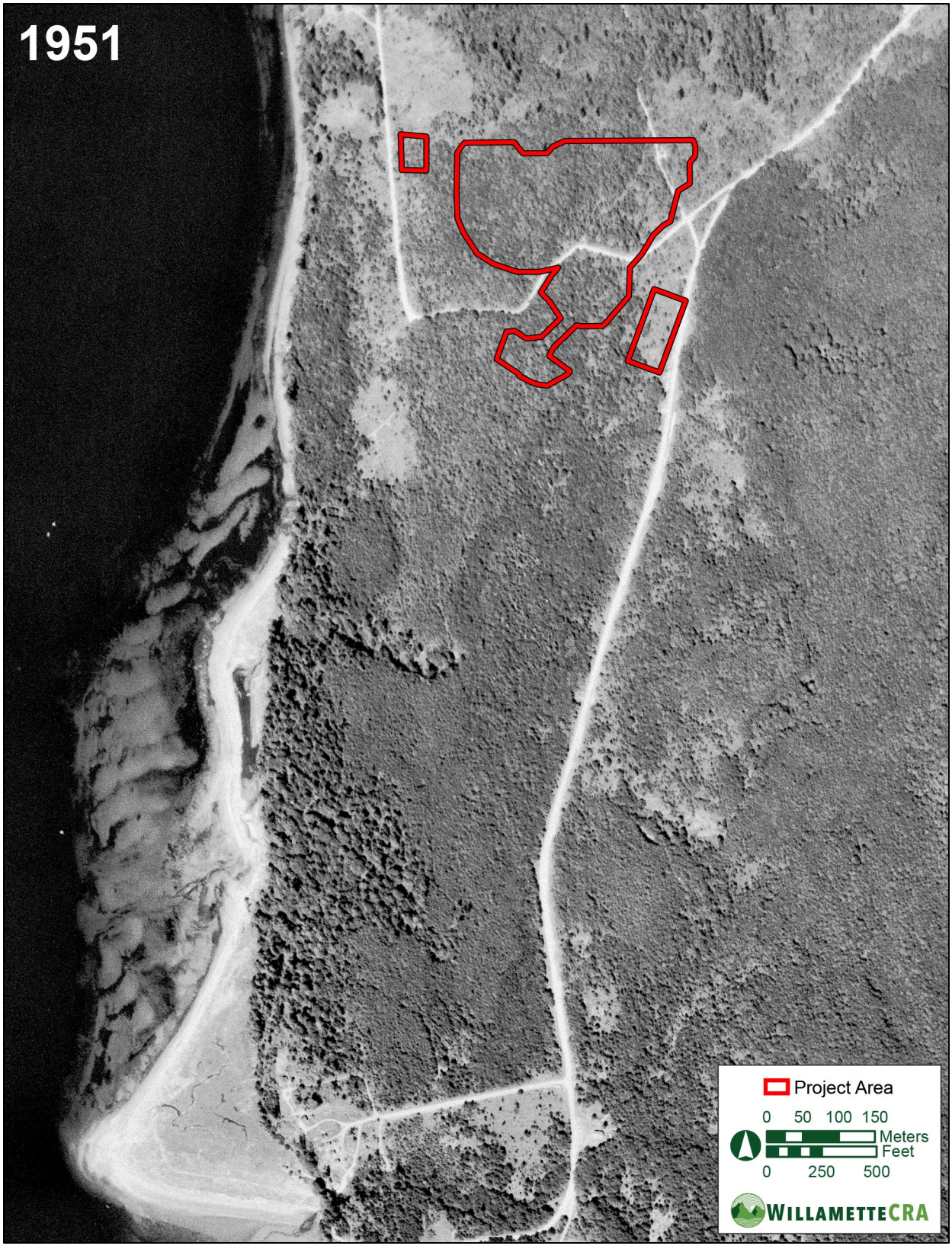


Figure 7. 1951 Aerial imagery of Project vicinity.

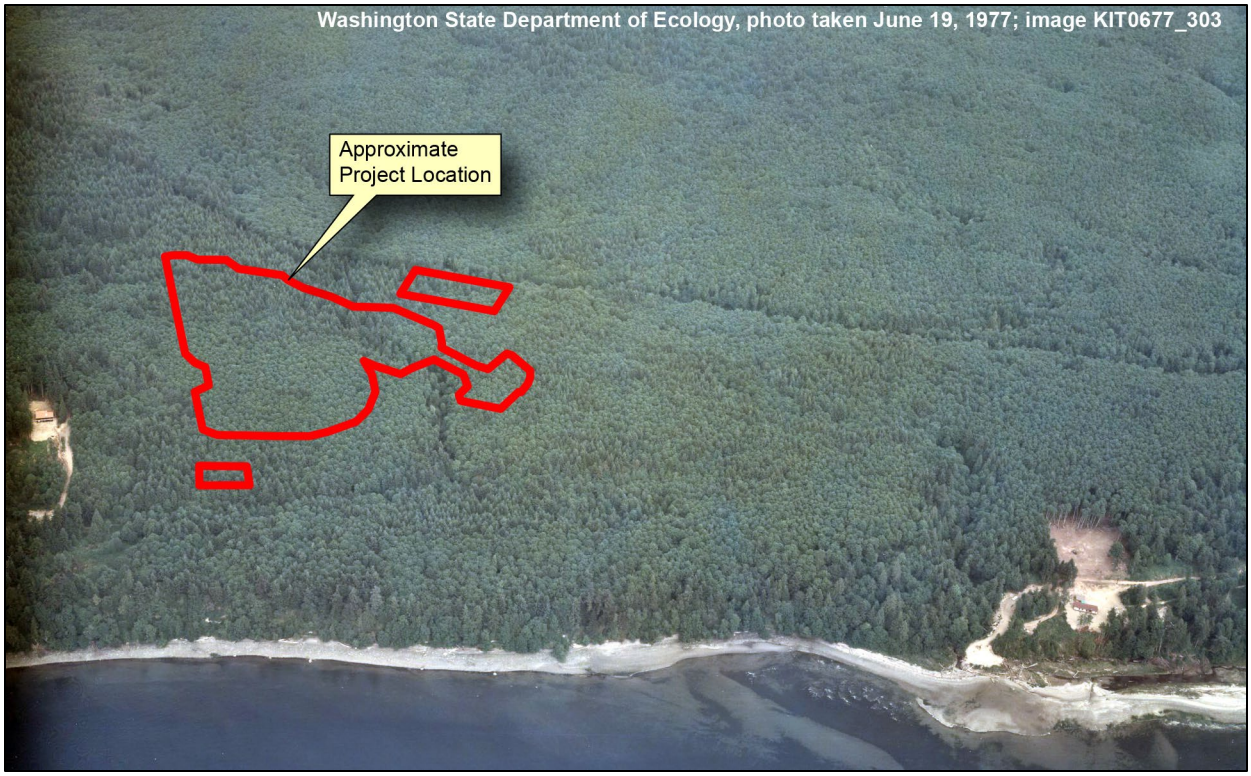


Figure 8. 1977 Oblique Aerial imagery of Project vicinity.

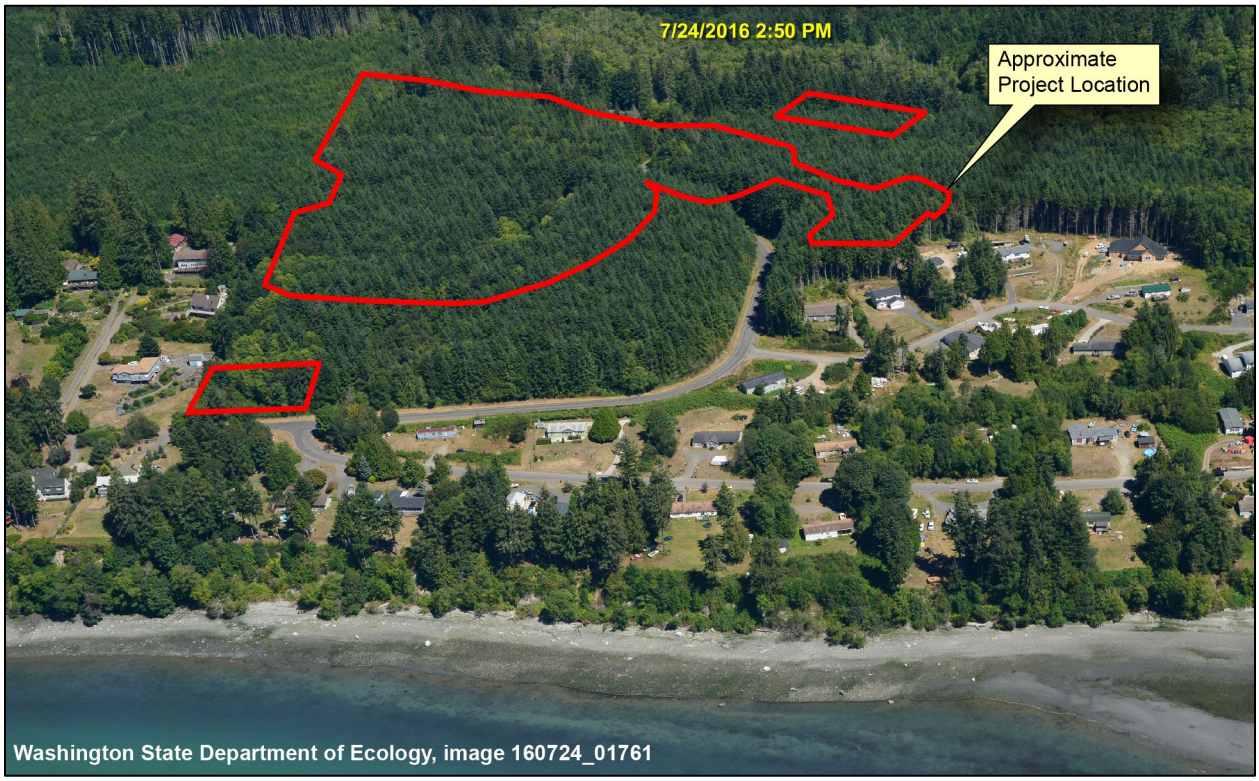


Figure 9. 2016 Oblique Aerial imagery of Project vicinity.

Previous Cultural Resources Studies

Numerous reports have been written of previous cultural resources investigations within 1 mile of the Project on the east side of Port Gamble Bay and Hood Canal (Table 1). The first recorded archaeological study on the Reservation was in 1982, when Richard Daugherty investigated Point Julia using pedestrian and shovel probe survey (Daugherty 1982a). Rick Oswald and, later, Astrida Blukis Onat expanded on Daugherty's work at Point Julia in conjunction with PGST road improvements, resulting in a more research-oriented archaeological excavation (Oswald 1986). Daugherty, Oswald, and Blukis Onat identified three discrete archaeological site areas near the project, 45KP21, 45KP22, and 45KP23 (Daugherty 1982a; Hess 1991a, 1991b; Oswald 1986). Their work also included a literature review and interviews with Tribal elders, and additional archaeological fieldwork to define site boundaries and classify the identified cultural materials.

Several other cultural resources investigations have since been completed on the east side of Port Gamble Bay south of the project, including trail installation (Roush and Kopperl 2022a), one for a flagpole installation at Jake Jones Park (Roush and Kopperl 2022b), one investigation carried out for Tribal housing development (Schumacher and Montgomery 2011), one study undertaken for removal of debris from the Bay (Wisniewski 2014), one survey for the PGST Wastewater Treatment Plant (Rinck 2015), and two surveys for Tribal public works projects (Bangs et al. 2017; Kopperl 2017). Assessments for a proposed expansion of the south boat ramp, fish hatchery, and multi-use shelters on Point Julia were recently completed (Kopperl 2020a, 2020b) and completion of the more intensive archaeological analysis for those projects is currently in progress. Wisniewski's (2014) report emphasizes Port Gamble Bay as an important traditional cultural place with many unique cultural features.

Several cultural resources have been previously identified near the project on the east side of Port Gamble Bay as a result of the cultural resources investigations described above (Table 2). The most substantial and well-studied of these is 45KP21, the ancestral village of Little Boston on Point Julia (Daugherty 1982a, 1982b; Hess 1991a, 1991b; Kopperl 2022a, 2022b). Much of the site as previously recorded consists of precontact or contact-era shell midden, while the historic component includes the burned remains of the Little Boston S'Klallam village occupied from 1856 to 1938. 45KP21 was formally evaluated as an archaeological site and a traditional cultural property in 1991 when surface exposures of midden were examined, and 41 auger holes were excavated to define the site boundaries. The site was later determined eligible for listing in the NRHP (Hess 1991b). Those excavations also included test units that explored intact midden almost two feet thick; midden was composed of clams—mainly horse, littleneck, and butter clams—as well as mussels. Abundant historical items were also found, such as glass, ceramic, bone artifacts, and wood posts where structural elements once stood. A charcoal sample from the middle of the underlying midden layer recovered near the shelter utility alignment produced a radiocarbon date of 680±90 radiocarbon years BP. Recently, the shovel and auger probe survey for the proposed south boat ramp expansion (Kopperl 2020a)

and shovel testing for a proposed multi-use shelter and hatchery improvements (Kopperl 2020b) identified intact shell midden deposits of varying thickness throughout the site.

Site 45KP23, the Little Boston Creek site, is on an upland terrace edge on the south side of the mouth of Little Boston Creek in an area that is now the Little Boston Tribal cemetery (Daugherty 1982a, 1982c). Shell, fire modified rock (FMR), bone, flaked cobble tools, and an antler wedge were identified in surface disturbances at 45KP23, but no formal excavations have been undertaken at this site. The Tribal cemetery and the Indian Shaker Church cemetery (assigned trinomial number 45KP182) are also recorded to the Department of Archaeology and Historic Preservation (DAHP) cemetery database on their online Washington Information System for Architectural and Archaeological Records Data (WISAARD).

One other precontact archaeological site has been recorded near the project but was poorly documented and remains unnumbered. It is a precontact lithic scatter identified by Hess (1991a). This lithic scatter was composed of several basalt cobble flakes found in the gravel on both sides of the mouth of Shipbuilder Creek (Hess 1991a), about one-third mile southwest of the Project.

Table 1. Reports of Previous Cultural Resources Investigations Within Approx. 1 Mile.

Report Reference	Type of Investigation and Project	Relation to Project Area	Cultural Resources
Schumacher and Montgomery 2011	Cultural Resources Assessment for The Port Gamble S'Klallam Housing Development And Access Road (BIA Route 40) Project, Kingston, Kitsap County, WA	0.2 mile SE	None
Bangs et al. 2017	Archaeological Resources Assessment for the Port Gamble S'Klallam Tribe East Salmonberries Subdivision Sewer and Water Project, Kitsap County, Washington	0.4 mile S	None
Roush and Kopperl 2022b	Cultural Resources Assessment for the Jake Jones Flagpoles Project, Port Gamble S'Klallam Tribe, Kitsap County, Washington	0.7 mile S	None
Wisniewski 2014	Cultural Resource Report for The Port Gamble Bay Derelict Debris Removal, Kitsap County Washington	0.9 mile S	None
Kopperl 2020a	Cultural Resources Assessment for The Point Julia South Boat Ramp Expansion Project, Port Gamble Indian Reservation, Kitsap County	0.8 mile SW	45KP21
Kopperl 2020b	Washington Cultural Resources Assessment for The Point Julia Multi-Use Shelter And Hatchery Improvement Projects, Port Gamble Indian Reservation, Kitsap County, Washington	0.8 mile S-SW	45KP21
Daugherty 1982a	A Cultural Resource Survey of the Proposed Port Gamble Indian Reservation Solid Waste Disposal Facility	0.8 mile S-SW	45KP21; 45KP22; 45KP23
Oswald 1986	A Cultural Resource Assessment of Road Improvements, Port Gamble Indian Reservation, Kitsap County, Washington	0.8 mile S-SW	45KP21; 45KP22; 45KP23
Kopperl 2017	Archaeological Resources Assessment for The Port Gamble S'Klallam Tribe Administration Campus Phase II Outfall Pond Project, Kitsap County, Washington	0.8 mile S	None
Roush and Kopperl 2022a	Cultural Resources Assessment for the Little Boston Road Pedestrian Trail Project, Port Gamble S'Klallam Tribe, Kitsap County, Washington	1.0 mile S	None

Table 2 . Previously Identified Archaeological Sites Within Approx. 1 Mile.

Site No.	Site Name	Site Type	Relation to Survey Area	Significance/Eligibility Recommendation
45KP21	Little Boston Archaeological Site	Historic Village of the Port Gamble S'Klallam Tribe	0.8 mile S-SW	Determined Eligible for Listing in the NRHP
45KP23	Little Boston Cemetery	Historic Cemetery Used by the Port Gamble S'Klallam Tribe	0.9 mile S	Determined Eligible for listing in the NRHP
45KP182	Indian Shaker Church Cemetery	Historic Cemetery Used by the Port Gamble S'Klallam Tribe	0.1 mile NE	Unevaluated
Unnumbered	Unnamed	Precontact Lithic Scatter	0.3 mile SW	Undocumented; Unevaluated

Expectations for Cultural Resources

Prior to fieldwork, the Project was considered to have a moderate to moderately low sensitivity for buried precontact archaeological resources. This was based on the surface geology of the Project, the logging history of the property, the results of nearby previous archaeological investigations and known archaeological deposits, the proximity of the Indian Shaker Church cemetery to the Project, and oral tradition and ethnographic information indicating long-term and continued S'Klallam use of this area. The DAHP WISAARD predictive model layer, based on environmental variables such as slope and proximity to water as well as distance to known archaeological resources, notes the entire vicinity as being moderate to highly sensitive for archaeological resources.

Expectation for archaeological resources specifically within the Project limits were tempered to some extent by the fact that the landform on which it is situated is an uneven surface. In many places the surface is steeply sloped to an extent that would limit the kind and intensity of human activity that tend to cause an accumulation of archaeological deposits, and these surfaces are not conducive for preservation of archaeological remains once deposited. In addition, the Project vicinity was clearcut on multiple occasions since the late nineteenth century to supply lumber to the mill across the bay, which would have potentially disturbed earlier precontact Native archaeological remains on this kind of geological landform that would have hosted those remains, if present, at shallow depths. Living cultural resources such as culturally modified trees (CMTs) that are also a common cultural resource reflecting traditional land use practices (e.g., Deur and QIN 2022) would likely have been removed during previous logging episodes. The field methods, detailed below, were tailored to these expectations and the existing conditions of the project area, with subsurface sampling to depths considered useful for detecting the potential for intact archaeological deposits.

Field Methods

WillametteCRA archaeologists F. Scott Pierson, Althea Fitzpow, and Breann Stoner conducted pedestrian and subsurface archaeological survey of the Project area on August 8 and 9, 2023. The pedestrian survey consisted of systematically walking over the Project area in transects to inspect for any surface or aboveground cultural resources and to identify areas with high potential for yielding subsurface cultural resources. The transects focused on the ~20 acres proposed for development, along with the proposed stormwater treatment area in the northwest corner of the property. Transects were walked with 10-meter interval spacing where possible, with meandering and less systematic transects in areas where consistent spacing was infeasible.

Shovel probes (SPs) were placed in areas determined to have the greatest sensitivity for encountering buried archaeological resources in the proposed areas of development within the

overall Project area. The immediate vicinity around each of the 14 geotechnical TPs dug shortly before our field survey was avoided to provide complementary spatial coverage for subsurface point data. The SPs measured 40–50 centimeters (cm) in diameter with a target depth of 100 cm below ground surface (cmbs). However, probes were terminated prior to reaching the target depth when boulders and dense cobbles prevented further excavation or when unweathered parent material was encountered. All excavated sediment was screened through ¼-inch mesh.

The findings of each probe were recorded on standard shovel probe forms that included information regarding sediment color, texture, composition, and observed cultural materials. Probes were backfilled after the excavation and appropriate documentation was completed. A GPS unit was used to collect coordinates of each shovel probe location. Digital photographs were taken of shovel probe locations and profiles. Overview photographs were taken of the general project area to help characterize the natural and cultural setting of the Project Area; all associated information was recorded on a standard photo log. Daily work records, field notes, and digital photographs are on file at the WillametteCRA office in Seattle.

Results

Areas proposed for development and ground-disturbing activity within the overall Project limits were thoroughly surveyed by pedestrian survey transects and excavation of 29 SPs that complemented the geotechnical TPs and boreholes (see Figure 2). The weather was warm with light rain showers during the investigation. *No archaeological material or other cultural resources were identified during the fieldwork.*

Overviews of the existing conditions of the mature secondary forest that characterizes the Project area are shown on Figures 10 and 11. The observed overstory was composed primarily of Douglas fir, with a few stands of western redcedar in the southern portion of the site and red alder and big leaf maple within the proposed stormwater pond area (Figure 12). The understory consisted of sword fern, salal, Oregon grape, stinging nettles, and pacific blackberry. Dense stands of Himalayan blackberry were present along the western edge of the Project area.

Two standing structures were observed within the project area: the fenced-in concrete water tank in the north-central portion of the Project area, and a booster station on the northern edge of Hood Canal Drive NE. Large and disbursed slash piles measuring up to 8 feet tall were observed over an approximately two-acre area northeast of the booster station. The slash piles were covered with salal, nettles, and blackberry, making traditional, linear pedestrian survey transects impractical in that area (Figure 13). Two meandering transects were conducted across the slash pile area, although ground surface visibility was extremely limited in this area.

A machine frame likely associated with past logging activity was observed near the slash piles (Figure 14). The exterior of the frame was rusted; however, a steering column and wires covered with intact thermoplastic were observed underneath the frame, somewhat protected

from the elements. No serial number could be found. Given the materials that compose the electrical components of the machinery, it is likely associated to the most recent timber harvest (ca. 1980s) and not considered an historic archaeological resource. The few other cultural materials observed in other portions of the survey area were also not old enough to be considered archaeological resources. These included a spear gun, a hunting vest, carbon fiber arrows, and two stuffed animals. Most of the Project geotechnical TPs were located during the pedestrian survey. Although they had been backfilled, the exposed sediments were carefully observed for evidence of precontact materials (Figure 15).

Following the pedestrian survey, 29 subsurface SPs were excavated across the Project. Each probe was placed at the discretion of the field director in relatively level areas, avoiding slopes in excess of 20 degrees. An attempt was made to get relatively uniform probe coverage across the Project, avoiding geotechnical TP locations. However, subsurface probing within the slash area was largely impractical and potentially hazardous, so no SPs were placed northeast of the booster station. Two shovel probes were placed within the proposed stormwater pond area on either side of a geotechnical borehole. Summaries of the content and stratigraphy of the SPs are provided in the Appendix.

Near-surface sediments within the Project area as observed in the SPs were relatively uniform, consisting of glacial deposits with thin forest soil A horizons formed at the top of the stratigraphic sequence under 5–15 cm of forest duff. Beneath the duff the typical probe stratigraphy consisted of a 5–10 cm thick layer of yellowish-brown to gray-brown silty very fine sand with very few small pebbles, representing the A horizon. Underneath was a light yellowish-gray fine sand with common subrounded to subangular small to very large pebbles, representing the B horizon (Figure 16). The B horizon also contained 20–40% rounded, small pebble-sized concretions. These concretions were very hard and could not be pushed through the screen (Figure 17). The B horizon was observed underlain by an extremely compact pale olive gray fine very fine to medium sand. This layer was interpreted as unweathered glacial till parent material (soil C horizon) during the field investigation.



Figure 10. Overview of the northwestern portion of the Project area. View northwest.



Figure 11. Overview of the southern portion of the Project area near SPs 19 and 20. View south.



Figure 12. Overview of SP 28 within the proposed stormwater pond area. View northwest.



Figure 13. Slash covered with thick vegetation northeast of the booster station. View north.



Figure 14. Abandoned machinery frame within slash-covered area northeast of booster station.



Figure 15. Backfilled geotechnical TP, flagged as “TP-5.” View northwest.

Conclusions and Recommendations

WillametteCRA completed the cultural resources assessment for the proposed North Kloomachin Subdivision Project as part of the PGST Title 24 environmental review process. This effort involved background research and surface and subsurface survey coverage within the Project area that integrated geotechnical data generated for this same project. Our assessment did not identify any disturbed or intact archaeological deposits or artifacts or any surface or above-ground historical or cultural resources. Historic clearcut logging episodes atop this geologically old surface composed of sterile glacial sediments indicates the likelihood of archaeological resources or other remains of traditional land use to be very low within the Project limits.

No further identification efforts or other archaeological measures are recommended for completion of the Project as designed. We do recommend, however, an Inadvertent Discovery Plan (IDP) to be implemented by PGST and its construction contractors during all ground-disturbing activities associated with this Project. The IDP should have clear procedures and protocols to be followed in the event, however unlikely, that significant archaeological resource or human skeletal remains are encountered during construction.



Figure 16. Profile of SP 10, typical stratigraphy observed within the Project area.



Figure 17. Sample of silty sandy concretions observed in the B horizon across the Project area.

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Appendix:
Tabulated Summary of Shovel Probes

Table. Summary of Shovel Probe Results.

SP #	Depth (cmbs)	Sediment Characteristics	Soil Horizon	Cultural Materials
1	0–26	Brownish-yellow silty sand; common subangular to subrounded granules to cobbles; many fine rootlets; surface duff from 0 to 6 cmbs; clear lower boundary	O/A	None
	26–72	Light grayish-yellow silty sand; common subangular to subrounded granules to cobbles; common fine rootlets; gradual lower boundary	B	None
	72–80	Light gray silty sand; common subangular to subrounded granules to cobbles; notably more large cobbles; terminated at parent material	C	None
2	0–30	Brownish-yellow silty sand; common subangular to subrounded granules to cobbles; many fine rootlets; trace charcoal; surface duff from 0 to 9 cmbs; clear lower boundary	O/A	None
	30–78	Light grayish-yellow silty sand; common subangular to subrounded granules to cobbles; common fine to medium roots; gradual lower boundary	B	None
	78–85	Light gray silty sand; common subangular to subrounded granules to cobbles; silty concretions present; terminated at parent material	C	None
3	0–25	Brownish-yellow medium to fine sands; common subrounded to rounded granules; surface duff from 0 to 10 cmbs; common very fine to fine roots; gradual lower boundary	O/A	None
	25–65	Yellow-gray fine sand; common subrounded to rounded granules to pebbles; common fine roots; few silty concretions; diffuse lower boundary	B1	None
	65–80	Pale olive-gray medium to very fine sand; common subangular to subrounded granules to cobbles; light compaction; terminated at parent material	B2	None
4	0–30	Brownish-yellow silty fine sand; common angular to rounded granules to cobbles; surface duff from 0 to 9 cmbs; very fine to fine roots; trace charcoal; clear lower boundary	O/A	None
	30–70	Light grayish-yellow silty sand; common subangular to subrounded granules to cobbles; common fine rootlets; gradual lower boundary	B	None
	70–100	Light gray silty sand; common subangular to subrounded granules to cobbles; fine to medium roots; terminated at parent material	C	None
5	0–10	Pale gray medium fine sand; trace granules; common organics; 15 cm of duff on surface; abrupt lower boundary	O/E	None
	10–50	Brownish-yellow fine sand; common subrounded to rounded granules to pebbles; many fine roots; few silty concretions; clear lower boundary	A/B1	None
	50–75	Pale yellow-gray very fine sand; many subrounded to rounded granules to pebbles; lens of organics and roots at upper boundary; few silty concretions; diffuse lower boundary	B2	None
	75–90	Pale olive-gray medium to very fine sand; common subangular to subrounded granules to pebbles; light compaction; terminated at parent material	C	None

Table. Summary of Shovel Probe Results (Cont.).

SP #	Depth (cmbs)	Sediment Characteristics	Soil Horizon	Cultural Materials
6	0–22	Brownish-yellow silty fine sand; common angular to rounded granules to cobbles; surface duff from 0 to 8 cmbs; very fine to fine roots; trace charcoal near surface; clear lower boundary	O/A	None
	22–60	Light grayish-yellow fine to medium sand; common subangular to subrounded granules to cobbles; common fine to medium roots; terminated at root obstruction	B	None
7	0–30	Brownish-yellow silty sand; common subangular to subrounded granules to cobbles; many fine rootlets; surface duff from 0 to 5 cmbs; clear lower boundary	O/A	None
	30–48	Light grayish-yellow silty sand; common subangular to subrounded granules to cobbles; common fine to medium roots; clear lower boundary	B	None
	48–50	Light gray silty sand; common subangular to subrounded granules to cobbles, predominantly cobbles; highly compact; terminated at parent material	C	None
8	0–28	Brownish-yellow silty fine sand; common angular to rounded granules to cobbles; surface duff from 0 to 5 cmbs; very fine to fine roots; trace charcoal near surface; clear lower boundary	O/A	None
	28–55	Light grayish-yellow silty sand; common subangular to subrounded granules to cobbles; common fine roots; clear lower boundary	B	None
	55–60	Light gray silty sand, ashy texture; common subangular to subrounded granules to cobbles; highly compact; terminated at parent material	C	None
9	0–32	Brownish-yellow silty fine sand; common subangular to subrounded granules to cobbles; duff and thin A horizon from 0 to 8 cmbs; common roots; trace charcoal; clear lower boundary	O/A/B	None
	32–57	Light grayish-yellow silty fine sand; common subangular to subrounded granules to cobbles; common roots; clear lower boundary	B	None
	57–70	Light gray silty fine sand; common subangular to subrounded granules to cobbles; highly compact; terminated at parent material	C	None
10	0–10	Brownish-yellow medium to fine sands; few subangular to rounded granules; surface duff from 0 to 5 cmbs; abrupt lower boundary	O/E	None
	10–50	Dark yellowish-gray fine sand; common subangular to subrounded granules to pebbles; trace rootlets; few silty concretions; highly compact; clear lower boundary	A/B1	None
	50–65	Pale olive-gray medium to fine sand; common subangular to rounded granules to cobbles; moderately compact; terminated at parent material	B2	None

Table. Summary of Shovel Probe Results (Cont.).

SP #	Depth (cmbs)	Sediment Characteristics	Soil Horizon	Cultural Materials
11	0–40	Brownish-yellow medium to very fine sand; few subrounded to rounded granules to pebbles; 0–20 surface duff and decomposing log; common very fine to fine roots; gradual lower boundary	O/A	None
	40–70	Light yellowish-gray fine sand; common subangular to rounded granules to cobbles; few silty concretions; gradual lower boundary	B1	None
	70–80	Pale olive-gray very fine to medium sand; many angular to rounded granules to cobbles; light compaction; terminated at parent material	B2	None
12	0–35	Brownish-yellow medium to fine sand; common subrounded to rounded granules to pebbles; 0–5 cm of duff on surface; common very fine to fine roots; clear lower boundary	O/A	None
	35–55	Light yellowish-gray fine sand; many angular to rounded granules to pebbles; trace rootlets; few silty concretions; gradual lower boundary	B1	None
	55–70	Pale olive very fine to medium fine sand; many angular to rounded granules to pebbles; light compaction; few concretions; terminated in parent material	B2	None
13	0–40	Dark yellow-gray medium fine sand; common subrounded to rounded granules to cobbles; many very fine to fine roots; duff from 0 to 10 cmbs; gradual lower boundary	O/A	None
	50–65	Light yellow-gray fine sand; common subrounded to rounded granules to pebbles; common very fine roots; diffuse lower boundary	B	None
	65–70	Pale olive-gray medium to fine sand; common subrounded to rounded granules to pebbles; light compaction; terminated in parent material	C	None
14	0–12	Dark grayish-brown very fine sandy silt; very few subangular to subrounded granules; many very fine to fine roots; surface duff; clear lower boundary	O/A	None
	12–35	Yellowish-brown silty very fine sand; common subrounded to rounded granules to cobbles; many very fine to fine roots; common silty concretions; clear lower boundary	B1	None
	35–60	Pale olive-gray silty very fine sand; many subangular to subrounded granules to cobbles; few fine roots; terminated in compacted parent material at base of layer	B2	None
15	0–14	Dark grayish-brown very fine sandy silt; few subrounded pebbles; many fine roots; 5cm of duff on surface; clear lower boundary	O/A	None
	14–55	Light yellowish-brown very fine sandy silt; few subrounded granules to cobbles; many fine roots; predominant pea sized silt peds; terminated at boulder impasse	B	None

Table. Summary of Shovel Probe Results (Cont.).

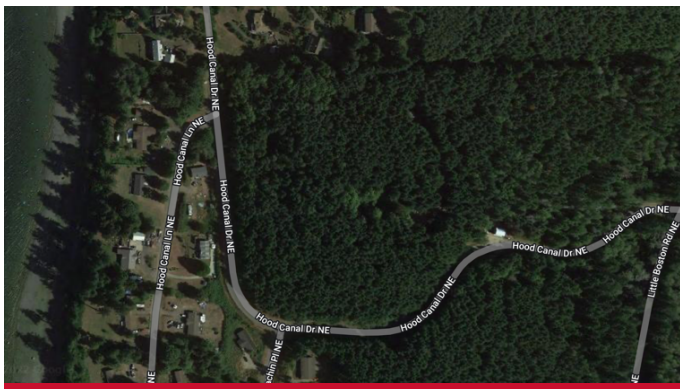
SP #	Depth (cmbs)	Sediment Characteristics	Soil Horizon	Cultural Materials
16	0–30	Light yellowish-brown very fine sandy silt; no gravels; many fine roots; 5 cm of duff on surface; many pea sized silty concretions; gradual lower boundary	O/A	None
	30–60	Very light yellowish-brown silty very fine sand; common subrounded granules; many fine roots; clear lower boundary	B	None
	60–65	Pale olive-brown very fine sandy silt; common subrounded granules to cobbles; few coarse roots; extremely compact	C	None
17	0–16	Light grayish-brown ashy very fine sandy silt; very few subangular to subrounded granules; many fine to coarse roots; abrupt lower boundary	O/A	None
	16–40	Dark yellowish-brown very fine sandy silt; common subangular to subrounded granules to pebbles; common very fine roots; many pea sized silty concretions; gradual lower boundary	B	None
	40–50	Pale olive-brown very fine sandy silt; many subangular to subrounded granules to cobbles; few fine roots; extremely compact; common silty concretions	C	None
18	0–10	Yellowish-brown silty very fine sand; common subangular to subrounded granules to pebbles; common very fine roots; 5cm duff on surface; abrupt lower boundary	O/A	Amber glass, n=1, 0–10 cmbs
	10–20	Light grayish-yellow silty very fine sand; few subangular to subrounded granules to pebbles; highly compact, possible hard pan; abrupt lower boundary	B?	Amber glass n=2, colorless glass, n=1, 10–15 cmbs
	20–65	Light brown silty very fine sand; common subangular to subrounded granules to pebbles; root mass in west wall; common very fine to fine roots; terminated due to diminishing returns	C?	None
19	0–25	Yellowish-brown silty very fine sand; no gravels; 10 cm of duff on surface; few very fine roots; clear lower boundary	O/A	None
	25–70	Dark yellowish-brown medium to fine sands; common subangular to subrounded granules to pebbles; very few very fine roots; light compaction; common silty concretions; gradual lower boundary;	B	None
	70–85	Pale olive-gray medium to fine sand, ashy texture; many subangular to subrounded granules to cobbles; light compaction; terminated in parent material	C	None
20	0–15	Brown fine sand; few subangular to subrounded granules to pebbles; 5 cm of duff on surface; large charcoal chunks on surface; many fine roots; abrupt lower boundary	O/A	None
	15–45	Light brownish-yellow silty fine sand; common subangular to subrounded granules to cobbles; few fine roots; clear lower boundary; slopes down in south half of unit	B	None
	45–60	Light olive-gray silty fine sand, ashy texture; few subangular to subrounded granules to pebbles; highly compact; terminated in parent material	C	None

Table. Summary of Shovel Probe Results (Cont.).

SP #	Depth (cmbs)	Sediment Characteristics	Soil Horizon	Cultural Materials
21	0–25	Yellowish-brown silty very fine sand; common subrounded to rounded granules to pebbles; 10 cm of duff on surface; common very fine to fine roots; clear lower boundary	E/A	None
	25–45	Dark yellowish-gray fine sand; common subangular to rounded granules to pebbles; common very fine roots; gradual lower boundary	B1	None
	45–80	Pale olive-gray very fine to medium sands; many subangular to subrounded granules to cobbles; few medium roots; common silty concretions; light compaction; clear lower boundary; terminated in compacted parent material at base of layer	B2/C	None
22	0–15	Gray sandy duff, no gravels; abrupt lower boundary	O/E	None
	15–45	Brownish-yellow very fine sand; few subrounded to rounded granules; many very fine to fine roots, one very coarse root at 35 cmbs; gradual lower boundary	A/B1	None
	45–80	Light yellowish-gray fine sand; many subangular to rounded granules to pebbles; common very fine roots; abrupt lower boundary	B2	None
	80–90	Olive coarse to fine sands; many subangular to rounded granules to cobbles; light compaction; terminated at parent material	C	None
23	0–25	Brownish-yellow very fine sand; common subangular to subrounded granules to cobbles; 5 cm of duff on surface; common very fine roots; very thin layer of brown sand under duff; clear lower boundary;	O/A	None
	25–65	Light grayish-yellow silty very fine sand; common subangular to rounded granules to cobbles, mostly cobbles; common very fine roots; terminated at cobble impasse	B	None
24	0–14	Brown silty fine sand; common subangular to subrounded granules to cobbles; 5 cm of duff on surface; many very fine to fine roots; clear lower boundary	O/A	None
	14–47	Light grayish-yellow silty very fine sand; common subangular to subrounded granules to cobbles; common very fine roots; clear lower boundary	B	None
	47–85	Light gray silty fine sand; common subangular to subrounded granules to pebbles; highly compact; terminated at parent material	C	None
25	0–10	Dark grayish-brown very fine sandy silt; few subangular to subrounded granules to pebbles; 5 cm of duff on surface; many very fine to fine roots; abrupt lower boundary	O/A	None
	10–33	Light yellowish-brown very fine sandy silt; common subangular to subrounded granules to pebbles; common silty concretions; clear lower boundary	B	None
	33–40	Yellowish-brown silty fine to medium sand; common subangular to subrounded granules to cobbles; common silty concretions; extremely compact; terminated at parent material	B/C	None

Table. Summary of Shovel Probe Results (Cont.).

SP #	Depth (cmbs)	Sediment Characteristics	Soil Horizon	Cultural Materials
26	0–15	Light grayish-brown very fine sandy silt; few subangular to subrounded granules to pebbles; 5 cm of duff on surface; many very fine to fine roots; clear lower boundary	O/A	None
	15–35	Light yellowish-brown very fine sandy silt; common subangular to subrounded granules to pebbles; common silty concretions; clear lower boundary	B1	None
	35–60	Yellowish-brown silty fine to medium sand; many subangular to subrounded granules to cobbles; common silty concretions; extremely compact; terminated at parent material	B2	None
27	0–12	Light grayish-brown very fine sandy silt; few subangular to subrounded granules to pebbles; 5 cm of duff on surface; many very fine to fine roots; clear lower boundary	O/A	None
	12–40	Light yellowish-brown very fine sandy silt; common subangular to subrounded granules to pebbles; common silty concretions; clear lower boundary	B1	None
	40–80	Pale brown fine sand; common subangular to subrounded granules to cobbles; few fine roots; few silty concretions; terminated at cobble impasse	B2	None
28	0–15	Dark gray-brown fine sand; common subangular to rounded granules to pebbles; thin layer of duff on surface; common very fine to fine roots; abrupt lower boundary	A/E	None
	15–35	Dark yellow silty very fine sand, pockets of pale olive-gray sand; common subrounded to rounded granules to cobbles; few very fine roots; highly compact; terminated due to compact ground	B/C	None
29	0–20	Light grayish-brown silty very fine sand; common subrounded to rounded granules to cobbles; many very fine to fine roots; clear lower boundary	A/E	None
	20–35	Dark yellowish-brown silty fine to medium sand; many subrounded to rounded granules to cobbles; common fine roots; terminated at cobble impasse	B/C	None



Biological Assessment

Port Gamble S'Klallam Tribe

North Kloomachin Site development project

November 23, 2022

Prepared by:
Abigail Welch-Project Manager/Planner
Port Gamble S'Klallam Tribe
31912 Little Boston Rd NE, Kingston WA
(360) 621-2323

Executive Summary

The Port Gamble S'Klallam Reservation consists of approximately 1,700 acres of land held in trust by the federal government. There is no private land ownership on the reservation. Most of the land is in forestry with residential, business, and office areas. As of 2022 there are 1321 enrolled tribal

members with over half of tribal members residing on the reservation with many others off reservation. Due to the limited availability of housing, homes on the reservation then to have more persons living in them than homes compared to Kitsap County and Washington State (CLUP 2003). Many homes have several generations of families living in them.

The Port Gamble S'Klallam Tribe maintains a waiting list of persons interested in rental housing, as well as home buyer housing on the reservation. There are currently 194 names on the list, with application dates going back to 1997. There is a need for more housing on the reservation to reduce overcrowding and meet the demands of the growing population.

Over half of the Tribe's reservation is managed as long-term productive timberlands. Forests are composed of Douglas-Fir, cedar, hemlock, alder, and maple. Most forest stands are young and offer limited opportunities for commercial timber harvest. However, the Tribe's forestlands are an important cultural resource to the community as an area for berry and brush picking, firewood cutting, recreation and spiritual practice.

In 2003, the Comprehensive Land Use Plan (CLUP) identified a 40-acre parcel northwest of Hood Canal Drive NE that is prime for housing, it has isolated forests, surrounded by roads with good views to west and good utility access (CLUP 2003).

The development of this parcel has been discussed since 2003. Sixteen additional homes were discussed for this west side of the proposed 40 acres. In 2007 a conceptual master plan increased the home development site to 49 homes throughout the 40 acres.

The Port Gamble S'Klallam Tribe is proposing converting 19.8 of the 40 acres of reservation land into 51 residential lots known as North Kloomachin located on Hood Canal Dr NE in Kingston, Washington. Of the 40 acres, 19.8 acres is developable (if all lots would be cleared). The stormwater management area consists of 2.4 acres with the water tower and booster station consuming 0.5 acres. The overall density of the project is 1.7 units per acre. The remaining 15.6 acres will stay as native vegetation. A 50-foot wildlife corridor is included in the initial design, runs along the reservation boundary north of the proposed lot sites.

The North Kloomachin parcel has a water booster building constructed on Hood Canal drive that will supply all water needed for the site. A sewer lift station on Little Boston Road was designed to support this development as well.

The PGST Tribe requires a Title 24-Environmental review on any new construction. With the potential to disrupt important habitat, the developer; the PGST Planning department; is required to analyze the effects of its actions on species listed under the Endangered Species Act (ESA), of 1973, as amended. This biological assessment (BA) documents PGSTs Planning Department's evaluation of the effects of the North Kloomachin development on United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Services (NMFS) regulated ESA-listed species that have the potential to occur in the action area and their critical habitats, as applicable. In addition, rare plants, culturally significant species, and Washington State listed species will also be assessed.

The proposed action does not have any identified fish bearing streams and will not impact aquatic habitat or riparian vegetation adjacent to fish-bearing streams. No culverts will be constructed or replaced as part of the proposed action. Therefore, the proposed action will have no effect on any aquatic species including ESA-listed Bull Trout/Dolly Varden (*Salvelinus confluentus*) and Bull Trout/Dolly Varden critical habitat.

The Marbled Murrelet (*Braychyramphus marmoratus*) forage areas are found near marine waters and nest in mature and old-growth conifer forests. With the proposed action areas proximity to the shoreline, it may affect but is not likely to adversely affect Marbled Murrelet due to the forest being predominantly second growth monoculture forest. The proposed action may affect but is not likely to effect on Marbled Murrelet critical habitat.

Although the yellow-billed cuckoo (*Coccyzus americanus*) is not documented to occur in the action area and presumed breeding in the region ended over a century ago, suitable foraging and nesting habitat is present in the project area. Therefore, the Proposed Action may affect, but is not likely to adversely affect yellow-billed cuckoo. The proposed action will have no effect on yellow-billed cuckoo critical habitat.

Due to the lack of suitable habitat and no recent history of use or presence within the action area or vicinity, the proposed action will have no effect on the Monarch Butterfly (*Danaus plexippus*).

Considered a culturally important species, the Common Raven is one of the most widespread birds in Washington state. The proposed action areas proximity to the shoreline, it may affect but is not likely to adversely affect common Raven. There is no critical habitat designated for Ravens.

Another culturally important species, the Bald Eagle, is found only in North America, generally in coastal areas or near large inland lakes and rivers abundant with fish and shores with large trees. They nest in large, varied trees near shorelines, and prey on fish, waterfowl, small mammals, or scavenge. With the proposed action areas proximity to the shoreline, it may affect but is not likely to adversely affect Bald Eagles due to the forest being predominantly second growth monoculture forest. There is no designated critical habitat for Bald Eagles.

The recommended effect determinations for ESA-listed species and their critical habitat are summarized in Table ES-1.

Table ES-1. Summary of Effect Determinations

Federally Recognized Species	Listing Status	Critical Habitat	Effect Determination
Marbled Murrelet *(Brachyramphus marmoratus)*	Threatened	None designated	May affect, not likely to adversely affect
Yellow-billed Cuckoo (*Coccyzus americanus)*	Threatened	None designated	May affect, not likely to adversely affect
Bull Trout/Dolly Varden (Salvelinus confluentus)	Threatened	None designated	No effect
Monarch Butterfly (Danaus plexippus)	Candidate	None designated	No effect

Culturally Important Species as directed by PGST Cultural Dept	Listing Status	Critical Habitat	Effect Determination
Common Raven *(Corvus corax)*	None	None designated; Present all year	May affect, not likely to adversely affect
Bald Eagle (*Haliaeetus leucocephalus*)	None/Recovered	None designated	May affect, not likely to adversely affect

1 Introduction

Port Gamble S'Klallam Tribe (PGST) is a federally recognized Tribe that resides on a 1,700-acre parcel of land held in trust with the federal government located in Kingston, Washington. For the last 20 years, PGST has been developing plans to increase the on-reservation housing opportunities for Tribal members. In 2003, the CLUP defined the following goals and policies to follow when creating new housing developments:

Housing Development Goals and Policies:

1. Housing development on the reservation should occur in planned communities of ten or more homes.
2. Lot sizes for should be quarter acre in size to ensure adequate land is available for future generations
3. Housing should be prohibited in forest areas identified as important to wildlife, habitat, cultural and recreational activities.
4. Tribal members who have half an acre or more should have the option of building a mother-in-law. Unit to care for an elderly family member or another family member in need.
5. Roads within and between subdivisions should be carefully planned and rerouted so as not to interfere with important forest lands or animal habitat.
6. Safety designs should be incorporated into new housing developments such as sidewalks, bicycle paths, speed bumps, winding roads, cul-de-sacs, and traffic circles.
7. New housing developments should retrain existing trees wherever possible.

The Port Gamble S'Klallam Tribe is proposing converting 19.8 of the 40 acres of reservation land into 51 residential lots known as North Kloomachin located on Hood Canal Dr NE in Kingston, Washington. The proposed action will require an internal PGST Title 24 review, the Planning department will comply with applicable federal laws, including the Endangered Species Act (ESA) of 1973, as amended. Under Section 7 of the ESA, the PD will consult with PGST Natural Resources (NR) to evaluate the effect of the Proposed Action on species listed or proposed for listing under the ESA, as well as effects on their designated critical habitats. This biological assessment (BA) documents the PD's evaluation of the effects of the Proposed Action on ESA-listed species regulated by the USFWS and their critical habitats, as required under the ESA.

1.1 Project Purpose and Need

The Port Gamble S'Klallam Tribe maintains a waiting list of persons interested in rental housing, as well as home buyer housing on the reservation. There are currently 194 names on the list, with application dates going back to 1997. There is a need for more housing on the reservation to reduce overcrowding and meet the demands of the growing population.

1.2 Project Location

The Proposed Action will take place on north of Hood Canal Road and bounded East by Little Boston Rd NE. This site is in Kitsap County, Washington and on PGST trust land. The site falls within the Water Resource Inventory Area (WRIA) 15, however no streams or creeks fall within the project area. No wetlands have been inventoried within the Proposed Action site (Soundview 2021).

Consultation History

A chronological list of communications related to the consultation history for the Proposed Action is provided below.

- March 9, 2022, Planning Department meeting with NR staff
- May 17, 2022, Planning Department meeting with NR, Utilities, and Cultural Departments.
- In April 2022, North Kloomachin Feasibility Plans
- In April 2022, Civil Engineering Scope, and Fee Estimate
- Site Visit August 15, 2022- NR department and PD
- October 5, 2022, Planning Department meeting with NR, Utilities, and Cultural Departments.
- October 8, 2022, follow up email to Cultural Department regarding culturally important species.

1.3 Listed Species Addressed in This BA

A list of federally threatened and endangered species with potential to occur in the action area is provided below, along with a list of designated critical habitats in the action area (Table 1-1).

Table 1-1. Federal listed Species with Potential to Occur in the Action Area

Species	Listing Status	Listing Notice	Critical Habitat	Critical Habitat Listing Notice
Mammals				
None	NA	NA	NA	NA
Birds				

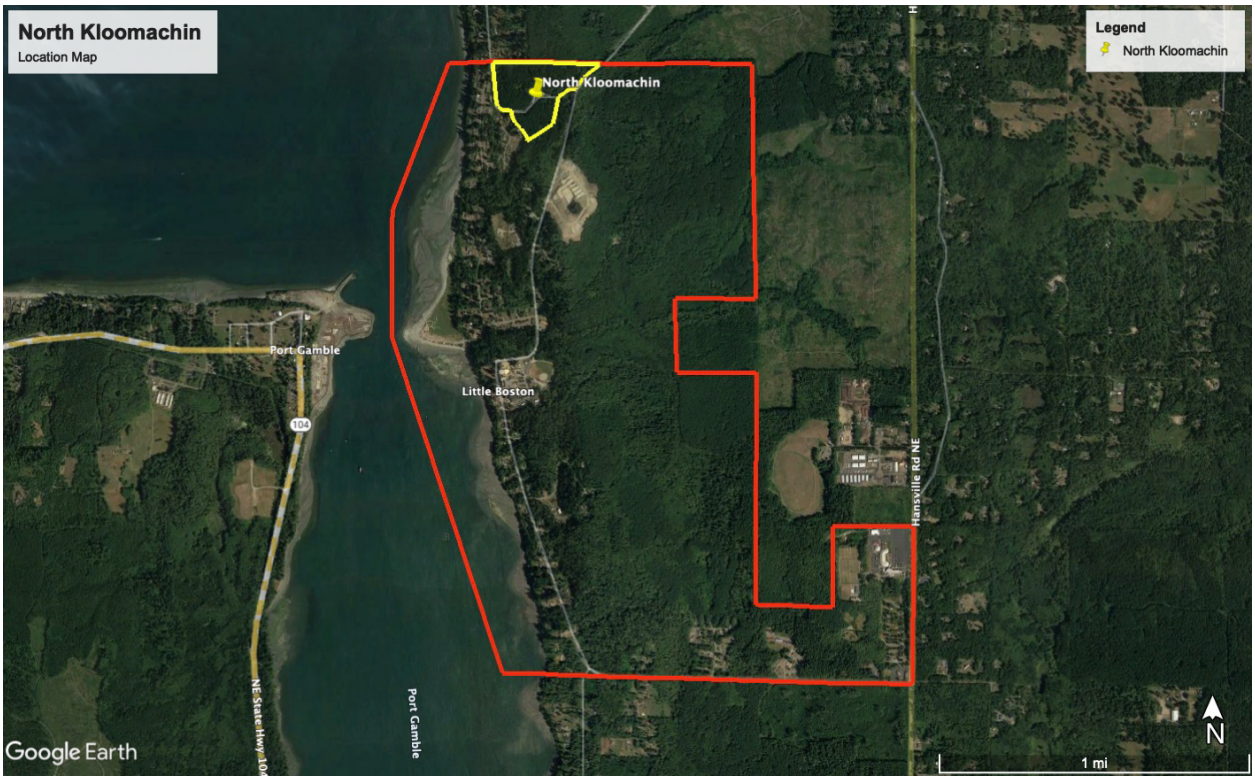
Species	Listing Status	Listing Notice	Critical Habitat	Critical Habitat Listing Notice
Marbled Murrelet *(Brachyramphus marmoratus)*	Threatened	10/1/1992 57 FR 45328	No critical habitat proposed or designated	11/4/2011 81 FR 51348
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	10/03/2013 79 FR 59992	No critical habitat proposed or designated	5/21/2021 86 FR 20798
Fish				
Bull Trout/Dolly Varden (*Salvelinus confluentus*)	Threatened	6/10/1998 63 FR 31647	No critical habitat proposed or designated	NA
Flowering Plants				
Golden paintbrush *(Castilleja levisecta)*	Threatened	6/11/1997 62 FR 31740	No critical habitat proposed or designated	NA
Note: FR = *Federal Register*, NA = not applicable.				

A list of Washington State listed species of concern with potential to occur in the action area is provided below. Critical habitats are not established for these species but can be found in Kitsap County (WDFW 2022b). (Table.1.2)

Table 1-2. State Listed Species with Potential to Occur in the Action Area

Species	State Status	Federal status
Western Toad	Candidate	None
Western Pond Turtle	Endangered	None
Common Loon	Sensitive	None
Western Grebe	Candidate	None
Marbled Murrelet	Threatened	Threatened
Yellow-billed cuckoo	Endangered	Threatened
Townsend's Big-eared Bat	Candidate	None
Keen's Myotis Bat	Candidate	None
Western Bumble Bee	Candidate	None
Puget Blue Butterfly	Candidate	None

Figure 1.1 Project Vicinity



2 Environmental Setting

In October 2022, the PD conducted a baseline habitat survey within the site location to collect sufficient information to characterize the affected environment for culturally sensitive, federal, and state listed wildlife, rare plants, and their habitats. The baseline habitat study, comprised of desktop analysis and field surveys within the site and was completed by qualified biologists in support of permitting activities and to provide information to avoid and minimize impacts to listed species and their habitats, to the extent practicable.

Within the site is a Water tank with a drainage basin line that extends to Hood Canal Drive NE. A booster station is located adjacent NW to the Hood Canal Dr NE. Just north of the site is a historical Shaker cemetery but is not within the bounds of this project site.

South of the site and outside of the project boundary is Shipbuilder's creek. The Proposed Action is outside of the 150 foot buffer as directed in PGST's Title 24 environmental Code.

Based on ground cover observations collected during baseline habitat surveys, the Project is dominated by second growth monoculture forest (Figure 2-1). Biologists documented dominant ground cover within proposed work areas where ground disturbance may occur as designed, including housing sites, roads, sidewalks, and temporary work areas.

Majority of the surveyed areas contained Douglas fir trees (*Pseudotsuga menziesii*) and common understory consisting of sword fern (*Polystichum munitum*), Oregon grape (*Mahonia aquifolium*), Trailing blackberry (*Rubus ursinus*). Along the perimeter of the forest, were Himalayan blackberry (*Rubus armeniacus*) and Salal (*Gaultheria shallon*). A few madrone trees (*Arbutus menziesii*) were found throughout the site, and a patch of Cedar trees (Thuja plicata) were present in the southern section of the site.



Figure 2-1. Forest and understory observed in proposed work areas





3 Proposed Action

Elements of the proposed action are described in detail below. A range of likely and feasible means and methods is considered for each element. If any project element is constructed or implemented in a manner not considered in this assessment and for which effects on listed species or critical habitats are not commensurate with those described in this assessment, PD will coordinate with NR to ensure that coverage is provided for ESA-listed species and their critical habitats.

3.1 Elements of the Proposed Action

The North Kloomachin site is located on Hood Canal Road within the PGST trust lands. The proposed action includes the following elements:

- Assumes the combined clearing of 19.8 acres of the North Kloomachin site to accommodate 51 lots for PGST tribal members.
- Tribal members that clear their lots are not bound to the construction best management practices as described in this BA.
- The only construction that will occur with the PD under this BA is establishing the necessary roads, sidewalks, and utility connections.
    - Install storm water management pond areas and rain gardens as needed
    - Additional sidewalk from the main entrance east to Little Boston Rd.

This BA considers the most extreme scenario in which all lots would be cleared. Current codes allow individuals given the lots have the sole discretion of how their own lots are cleared.

Elements of the Proposed Action are summarized in Table 3-1 and described in further detail below.

Table 3-1. Proposed Action Elements

Proposed Action Component	Quantity
Site Development & Vegetation removal	
Total area cleared	19.8 acres
Overall density (51 lots)	1.7 units/acre
Net Density (51 lots)	3.6 units/acre

3.1.1 Wildlife Corridor

To support the connectivity of the shoreline to forest, the wildlife corridor/buffer was increased from 25 feet to 50 feet. The wildlife corridor also serves as a buffer between the residents of N. Kloomachin and those living on Hood Canal Drive NE.

3.1.2 Material Storage

One laydown yard is required that would be used to provide material storage, construction equipment access. The laydown yard would be approximately 0.5 acres within an existing cleared area.

3.1.3 Construction Equipment and Material Disposal

Construction vehicles required for the Proposed Action could include a bucket truck, a dump truck, an excavator. Equipment used for access road work would include dump trucks, rollers, graders, bulldozers, and excavators.

Any materials removed during construction will be trucked off site for recycling or disposal at an appropriate facility.

3.1.4 Construction Schedule

The schedule for construction of the Proposed Action depends on the completion and outcome of the environmental review process, including the duration of PGST department reviews and timing of Title-24 permit approvals.

Impact Minimization Measures

Under the Proposed Action, PD will implement numerous impact minimization measures to avoid or reduce the potential for adverse effects upon the natural environment, including ESA-listed species and their habitat. Construction will be completed in accordance with Washington Water Quality Standards (Chapter 173-201A Washington Administrative Code). The following measures are considered part of the Proposed Action.

3.1.5 Soils and Erosion Best Management Practices

The Proposed Action will employ typical construction best management practices (BMPs) to stabilize soils and reduce erosion during construction, particularly during access road work. Impact minimization measures include the following:

- Stabilize permanent disturbance areas by applying a weed-free gravel (if available) top layer to the roadways.
- Conduct Project construction, including vegetation removal, during the dry season when rainfall, runoff, and stream flow are low to minimize erosion, compaction, and sedimentation, to the extent practicable.
- Install appropriate erosion-control devices where needed to minimize soil transport.
- Retain vegetative buffers where possible to prevent sediments from entering waterbodies.
- Include water control structures on improved access roads using low grades, water bars, and drain dips to help control runoff and prevent erosion.
- Apply water from water trucks on an as-needed basis to minimize dust and reduce erosion due to wind.
- Revegetate disturbed areas to help stabilize soils as soon as work in that area is completed and appropriate environmental conditions exist, such as moderate temperatures and adequate soil moisture.
- Inspect revegetated areas to verify adequate growth and implement contingency measures as needed.
- Inspect and maintain access roads and cross-drains to ensure proper function and nominal erosion levels after construction.

3.1.6 Vegetation Management

The Proposed Action will require removal of trees for clearing work areas as well as for road construction. No riparian vegetation will be removed. In addition, several measures have been incorporated into the Proposed Action to minimize vegetation removal, minimize the spread of noxious weeds, and revegetate temporarily impacted areas. These measures include:

- Minimize the construction area and disturbance to vegetation to the extent practicable.
- Locate materials storage and staging areas in previously disturbed areas, where feasible.
- Conduct as much work as possible, including tree removal during the dry season to minimize erosion and soil compaction.
- Conduct vegetation removal in a manner that minimizes disruption to remaining trees and shrubs.
- Revegetate disturbed areas with hydroseed to ensure appropriate vegetation coverage and soil stabilization prior to rainy season (November 1).

- Conduct post-construction site restoration monitoring once a month until site stabilization is achieved.
- Prior to construction, identify noxious weed infestation areas for avoidance (as practicable).

3.1.7 Aquatic Resource Impact Minimization Measures

The Proposed Action does not include any work within the ordinary high-water mark (OHWM) or bank full areas of any streams, waterbodies, or wetlands. No culverts will be constructed or replaced as part of the Proposed Action. The Proposed Action will employ typical construction BMPs to reduce impacts from runoff or sedimentation to aquatic resources, including streams, wetlands, and floodplains. Impact minimization measures include the following:

- Conduct soil-disturbing activities during the dry season, where possible.
- Return temporary disturbance areas for access road work to pre-construction contours and mulch, seed, and plant as per plans and specifications.
- Restrict construction vehicles and equipment to access roads and designated work areas.
- Store, fuel, and maintain all vehicles and other heavy equipment (when not in use) in a designated upland staging area located a minimum of 150 feet away from any stream, waterbody, or wetland or where any spilled material cannot enter natural or manmade drainage conveyances.
- Dispose of waste material generated from access road work in a stable upland site (in gentle terrain more than 200 feet from waterbodies or wetlands).
- Develop and implement a spill prevention and spill response plan.
- Confirm equipment is clean (e.g., power-washed) and that it does not have fluid leaks prior to contractor mobilization of heavy equipment to site; inspect equipment and tanks for drips or leaks daily and make necessary repairs within 24 hours.
- Contain petroleum product spills immediately, eliminate the source, deploy appropriate measures to clean and dispose of spilled materials in accordance with federal, state, and local regulations, and contact the PD project manager.
- Maintain emergency spill control materials, such as oil booms and spill response kits, on-site at all times and ready for immediate deployment.
- Revegetate disturbed areas using a slow-release fertilizer.
- Prepare and implement a storm water pollution prevention plan including installing basic stormwater ponds (PMPT10.10)(2001 SMMWA).
- Use existing roads to access structure locations, where feasible.
- Remove any temporary equipment mats and revegetate following temporary disturbance.

3.1.8 Terrestrial Wildlife Impact Minimization Measures

Several measures have been incorporated into the Proposed Action to minimize and prevent impacts to terrestrial wildlife and their habitat, including ESA-listed species. Remove all food scraps and food

packaging of any kind from the project sites and transport off-site after each workday; food cannot be left exposed and unattended for any amount of time; no food may be fed to or left for wildlife.

- Locate staging areas as close to construction sites as practicable to minimize driving distances between staging areas and construction sites.
- Locate staging areas in previously disturbed or graveled areas to minimize soil and vegetation disturbance where practicable.
- Due to the potential impact to nesting season for marbled murrelets, bald eagles, and common ravens, it will be conservatively assumed that individuals of this species may be present during project activities. The planning department proposes restricting construction activities to begin two hours after sunrise and end two hours before sunset between the dates of April 15 and August 15. To project Bald Eagles, PD proposed to have a Bald Eagle nesting survey done prior to construction activities and follow the guidelines of the National Bald Eagle Management Guidelines. If a nest is found and construction activity is visible from the nesting site and within 660 feet of the nest and/or if a nest is found but the construction site is not visible from the nest but within 330 feet of the nest, PD recommends that construction should be avoided between Feb 15 and July 30 (USFWS 2007).

4 Noise Disturbance

The action area is defined as the area to be affected directly or indirectly by the federal action (50 Code of Federal Regulations [CFR] § 402.02). It considers all consequences of the action and includes the geographic extent of the effects on the environment from the Proposed Action. Elements of the Proposed Action that may affect the environment include increased in-air (terrestrial) noise levels and terrestrial habitat modification. Thus, the action area includes:

1. Project footprint: i.e., the physical envelope of project disturbance.
2. Extent of in-air noise during the loudest noise-producing activity associated with the Proposed Action.

The Proposed Action will not impact riparian vegetation adjacent to fish-bearing streams and no culverts will be constructed or replaced. Activities associated with the Proposed Action, including access road work and materials staging, should not result in the discharge of sediment-laden runoff or construction materials into aquatic areas. Therefore, the action area is defined by the area of ground disturbance within the project footprint and the geographic extent of noise-related disturbance associated with the project. The action area includes all potential construction and staging areas.

Noise from construction activities along North Kloomachin is based on reference data from the *WSDOT Biological Assessment Preparation Manual* (WSDOT 2020). The loudest noise-producing equipment anticipated to be used on site, measured 50 feet from the point source, include a dump truck (91 dB), an excavator (87 dB), and a front-end loader (71 to 81 dB). Using the manual's rules for decibel addition, the maximum combined noise level from the construction equipment will be 91 dB at 50 feet.

The project area for the North Kloomachin site is characterized by forest, soft dirt, and grave road, and is adjacent to developed parcels within the residential homes to the west and north; this area is

considered to be a “soft site” for noise attenuation. Therefore, a noise transmission loss of 7.5 dB per doubling distance was used for noise attenuation on the terrestrial portion of the project site.

As the project will occur within the reservation boundaries, the background noise level is estimated to be 45 dB, based on the population density. Using a point source sound attenuation calculation and soft site characteristics for the landward portion of the project site, temporary construction noise should attenuate to ambient in-air noise levels approximately 3,459 feet (0.66 miles) from the project site.

5 Status of Federally Listed Species and Designated Critical Habitat in the Action Area

Lists of federally threatened and endangered species in the action area were obtained from the following sources:

- USFWS (2022a) Information for Planning and resource report (Appendix A).
- WDFW Priority Habitats and Species (PHS) on the web (2022a).

The USFWS species list was accessed in October 2022 specific to the action area were compared to the USFWS listings. Species that could potentially occur in the proposed action area are listed in Table 5-1.

Table 5-1. Federally Listed Species That May Occur in the Action Area

Species	DPS	Listing Status	Critical Habitat
Mammals			
None	NA	NA	NA
Birds			
Marbled Murrelet *(Brachyramphus marmoratus)*	NA	Threatened	Designated but not in action area
Yellow-billed cuckoo (*Coccyzus americanus*)	Western DPS	Threatened	Designated but not in action area
Fish			
Bull Trout (*Salvelinus confluentus*)	Coterminous United States	Threatened	Designated but not in action area
Flowering Plants			
Golden paintbrush *(Castilleja levisecta)*	NA	Threatened	No critical habitat proposed or designated

Note: DPS = Distinct Population Segment; NA = not applicable.

5.1 Presence of Federally Listed Species and Critical Habitat in the Action Area

The following sections describe the USFWS ESA-listed species and their potential to occur in the action area. The listing status, life history, and habitat requirements are described for each species. Critical habitat for each listed species in the action area, as applicable, is also discussed.

5.1.1 Marbled Murrelet

Listing Status and Distribution

The marbled murrelet is a small, robin-sized, diving seabird that spends majority of its time on the ocean (more than 90%) resting and feeding, but flies inland to nest in old growth forest stands. The USFWS listed the Washington, Oregon, and California population as a threatened species under the ESA in 1992 (57 FR 45328).

General Life History and Habitat Requirements

The range of the marbled murrelet is defined by breeding and wintering areas that extend from the northern terminus of Bristol Bay, Alaska, to the southern terminus of Monterey Bay in central California. In Washington, this species occurs in the greatest numbers in the Puget Sound and Strait of Juan de Fuca. Historical records and observations indicate that murrelets were common and regularly seen along Washington and Oregon coastlines (USFWS 1997). Marbled murrelets forage just beyond the breaker-line and along the sides of river mouths where greater upwelling and less turbulence occur. Murrelets fly between foraging areas off the coast and inland nesting habitat.

Marbled murrelets forage at sea, often along shorelines where prey may be concentrated by tides or river currents. Their prey primary includes small fish and zooplankton (The Cornell Lab 2019a). Although the marine environment is the murrelet's principal habitat, terrestrial habitat serves a vital function seasonally for nesting and reproduction. In their terrestrial environment, the presence of platforms (large branches or deformities) used for nesting is the most important characteristic of their nesting habitat. Camouflaged adults nest on mossy-limbed branches of large conifers such as coast redwood (*Sequoia sempervirens*), western hemlock (*Tsuga heterophylla*), Douglas fir (*Pseudotsuga menziesii*), and Sitka spruce (*Picea sitchensis*), in mainland mature stands typically located within 37 miles (60 kilometers) of marine waters (USFWS 2019). Murrelet habitat use during the breeding season is positively associated with the presence and abundance of mature and old-growth forests, large core areas of old-growth, low amounts of edge habitat, reduced habitat fragmentation, proximity to the marine environment, and forests that are increasing in stand age and height (USFWS 2019).

Suitable marbled murrelet nesting trees are mature conifers (more than 15 inches diameter at breast height (dbh)) situated in contiguous conifer-dominant (more than 60 percent conifer) stands (WSDOT Fish and Wildlife Program and FHWA 2015). These conifer-dominated stands may vary in size from several acres (at least 5 acres) to thousands of acres, with large unfragmented stands of old growth comprising the highest-quality habitat. Nests are not built, but rather the eggs are placed in small depressions or cups made in moss or other debris on the limb (ODFW 2017). A nesting platform can be composed of a wide bare branch, moss or lichen covering a branch, mistletoe, witches' brooms, or

other deformities (Evans Mack et al. 2003). During the nesting season (May through August), marbled murrelets fly inland from the coast, often using waterways as flight corridors to nesting areas.

Occurrence in Action Area

Occurrences of marbled murrelets have been reported in Jefferson County and areas around the Olympic Peninsula. Although WDFW reports no known nesting areas in the proposed action area (WDFW 2021a), however given their small size and the lack of protocol surveys completed for the area, it is common to lack detailed murrelet nest data.

The North Kloomachin Action Area contains second-growth conifer (the majority of which has been logged within the past 30 years). No potentially suitable nesting habitat was observed during field visits conducted in October 2022.

Critical Habitat

Critical habitat was designated for the marbled murrelet in 1996 and revised in October 2011 (76 FR 61599). The preservation of both marine foraging habitat and terrestrial nesting habitat is important to the recovery of the species; however, only terrestrial nesting habitat has been designated as critical habitat for the marbled murrelet and includes forested stands with trees generally more than 32 inches in diameter that have potential nesting platforms at least 33 feet above the forest floor (USFWS 1997).

Marbled murrelet critical habitat includes mature forest in the portions of Jefferson County but is not designated within the Action Area. The nearest block of designated critical habitat is located approximately 10 miles southwest of the project near Quilcene and Dabob Bay.

5.1.2 Yellow-billed Cuckoo

Listing Status and Distribution

On October 3, 2013, the Western DPS of the yellow-billed cuckoo (*Coccyzus americanus*) was proposed as a threatened species under the ESA and was subsequently listed on October 3, 2014 (79 FR 59992). The yellow-billed cuckoo is a slender, long-tailed passerine that formerly occurred on both sides of the Cascades in both Oregon and Washington but is a rare migrant in both states (Wiles and Kalasz 2017).

General Life History and Habitat Requirements

Yellow-billed cuckoos nest in deciduous habitats with clearings and dense, shrubby vegetation, especially those near rivers, streams, and wetlands (Wiles and Kalasz 2017). The species displays a strong preference for large (>40 hectares), wide (over 100 meters), continuous riparian zones dominated by cottonwoods (*Populus* spp.) and willows (*Salix* spp.) (WDFW 2022c; Wiles and Kalasz 2017). Canopy closure, interior foliage volume, and densities of small trees are also important characteristics of nest sites (Wiles and Kalasz 2017). Little is known about foraging and migrating habitat, but a high volume of cottonwoods appear important for foraging and a variety of riparian and coastal shrubs are used for migratory stopovers (USFWS 2015).

Occurrence in Action Area

The yellow-billed cuckoo is not documented to occur in the action area (WDFW 2022a). Currently, yellow-billed cuckoos are extremely rare summer visitors to Washington (Seattle Audubon Society 2022). In Washington, only 20 sightings have been reported since the 1950s, all or nearly all of which were likely non-breeding vagrants or migrants (Wiles and Kalasz 2017). Of the 20 sightings, 19 were recorded from 1974 to 2016, and 16 of the total sightings occurred in eastern Washington near the Cascades (Wiles and Kalasz 2017), well over 100 miles from the action area. Although historical observations of yellow-billed cuckoo occurred along the Columbia River in Clark County, WA, no detections have been documented in the county since 1937 (Wiles and Kalasz 2017). The timing of the cuckoo's decline throughout much of western Washington resembles similar declines in British Columbia and Oregon, where records of continuing presence and presumed breeding ended by the 1920s (Wiles and Kalasz 2017). However, due to a lack of surveys for the species and the presence of small areas of habitat in Washington, the possibility exists that this species may occasionally breed in the state (Wiles and Kalasz 2017).

Although the yellow-billed cuckoo is not documented to occur in the action area (WDFW 2022a) and breeding western yellow-billed cuckoos have not been confirmed for many decades in Oregon, Washington, or British Columbia, the action area is within the historic breeding range of the species and suitable foraging and nesting habitat is present on Hayden Island near Structure 5/1 through 5/3. Thus, the occurrence of yellow-billed cuckoo in the action area during summer months is possible, though highly unlikely.

Critical Habitat

Critical habitat was designated for the yellow-billed cuckoo on May 21, 2021; no critical habitat is designated in Washington or Oregon (86 FR 20798) because the species is considered extirpated as a breeder from these states since at least the 1940s (86 FR 20849).

5.1.3 Bull Trout

Listing Status and Distribution

In November 1999, the USFWS listed all populations of Bull Trout (*Salvelinus confluentus*) within the conterminous United States as a threatened species pursuant to the ESA (64 FR 58910). Bull Trout are native to Canada and the United States; the geographic range of the species is confined to northwestern North America from Alaska to northern California (USFWS 2022d). Bull Trout inhabit Arctic and Pacific waters and are usually found in mountain or coastal streams (USFWS 2022d).

General Life History and Habitat Requirements

Bull Trout express both resident and migratory life history strategies (Rieman and McIntyre 1993). Resident forms complete their entire life cycle in the tributary (or nearby) streams in which they spawn and rear. Migratory Bull Trout spawn in tributary streams, where juvenile fish rear for 1 to 4 years before migrating to either a lake (adfluvial form) (Downs et al. 2006) or a river (fluvial form) (Fraley and Shepard 1989) or, in certain coastal areas, to saltwater (amphidromous) (Brenkman and Corbett 2005).

Bull Trout have some of the most demanding habitat requirements of all salmonids (Rieman and McIntyre 1993). To successfully spawn and rear, Bull Trout need specific physical characteristics within watersheds, but those characteristics (e.g., appropriately sized, clean spawning gravels, cold water below 9 degrees Celsius; depths less than 1 meter; Fraley and Shepard 1989) are not necessarily present throughout watersheds even in pristine habitats (Rieman and McIntyre 1993; Watson and Hillman 1997).

Occurrence in Action Area

The shoreline along Dabob Bay in Jefferson county and the western shoreline of Hood Canal, Washington provides foraging, migration, and overwintering habitat for Bull Trout and is considered essential for maintaining connectivity for amphidromous and fluvial life histories (USFWS 2010a).

The Proposed Action is upland and will not impact aquatic habitat or riparian vegetation adjacent to fish-bearing streams. No culverts will be constructed or replaced as part of the Proposed Action.

Critical Habitat

Critical habitat for Bull Trout was revised in a final rule published on October 18, 2010 (75 FR 63898) and includes the Columbia River. In freshwater areas, Bull Trout critical habitat includes designated stream reaches and a lateral extent as defined by the bankfull elevation or the ordinary high water mark if bankfull elevation is not evident on either bank (USFWS 2010b).

The Proposed Action is upland and will not impact Bull Trout critical habitat.

5.1.4 Golden Paintbrush

Listing Status and Distribution

Golden paintbrush (*Castilleja levisecta*) was federally listed as threatened on June 11, 1997 (62 FR 31740). Historically, golden paintbrush was reported from more than 30 sites in the Puget Trough of Washington, in western British Columbia, and in the Willamette Valley of Oregon. Many populations have been extirpated due to agricultural, residential, and commercial development (USFWS 1997). Remaining habitat has been degraded by encroaching native and non-native vegetation that competes with golden paintbrush and creates shade, which the species does not tolerate (USFWS 2000).

General Life History and Habitat Requirements

Golden paintbrush is found in moist or wet meadows and prairies at low elevations west of the Cascade crest (Burke Museum Herbarium 2022a). The species occurs on generally flat grasslands, including some that are characterized by mounded topography, and on steep coastal bluffs that are grass-dominated (USFWS 2000). In Washington, mainland populations have been found in open, remnant prairies dominated by Roemer's fescue (*Festuca roemeri*) and red fescue (*F. rubra*) on gravelly or clayey glacial outwash (Washington Natural Heritage Program [WNHP] 2022).

Occurrence in Action Area

Golden paintbrush is unlikely to occur in the action area due to a lack of suitable habitat. There are no documented occurrences of this species in the action area (Burke Museum Herbarium 2022a;

WDFW 2022a; WDNR 2021). In Washington, the nearest documented population is in Thurston County over 100 miles north of the action area (Washington Department of Natural Resources [WDNR] 2021) and the nearest documented occurrence in Oregon is from an introduced population in Benton County, located approximately 100 miles south of the action area (Burke Museum Herbarium 2022a; ODA 2010).

Critical Habitat

No critical habitat has been designated for golden paintbrush (USFWS 2022e).

6 Presence of Washington State Listed Species and Priority Habitat in Action Area

Lists of Washington State listed threatened, endangered and candidate species in the action area were obtained from the following sources:

- WDFW – Species List (WDFW 2022b)

The WDFW species list specific to Kitsap County was accessed in November 2022. All project impacts will occur in forested upland areas with no expected impact to aquatic species, therefore fish and marine mammals are excluded from list. No priority habitat was identified within the action area for the species listed below. Species that could potentially occur in the proposed action area are listed in Table 9.1.

Table 9.1

Species	State Status	Federal status	Priority Habitat
Western Toad	Candidate	None	None
Western Pond Turtle	Endangered	None	None
Common Loon	Sensitive	None	None
Western Grebe	Candidate	None	None
Marbled Murrelet	Threatened	Threatened	None
Yellow-billed cuckoo	Endangered	Threatened	None
Townsend’s Big-eared Bat	Candidate	None	None
Keen’s Myotis Bat	Candidate	None	None
Western Bumble Bee	Candidate	None	None

Species	State Status	Federal status	Priority Habitat
Puget Blue Butterfly	Candidate	None	None

6.1 Amphibians and Reptiles

The Western Toad and Western Pond Turtle both require habitats that include wetlands and open water or ponds (WDFW 2022b). The Proposed Action has no wetlands or streams and will not impact aquatic habitat or riparian vegetation adjacent to streams. Due to the lack of suitable habitat, the Proposed Action area is not expected to have any impact on these species.

6.2 Birds

Both the Marbled Murrelet and the Yellow-Billed Cuckoo have been addressed in sections 5.1.1 and 5.1.2. The Common Loon has a small breeding population in Washington (between 20-50 breeding pairs) and utilize freshwater lakes and reservoirs for breeding areas. They can be found wintering in almost all nearshore marine habitat and larger freshwater bodies of water in Western Washington (WDFW 2022b).

The Western grebe can be found wintering throughout the Salish seas along the shorelines but prefer to nest more inland in Eastern Washington. Some non-breeding individuals have been found over-summer in marine waters (WDFW 2022b). Due to the lack of suitable habitat within the Proposed Action area, the project is not expected to have any impact on breeding areas for these species. However, activity that may occur in the winter months (which is expected to be limited) may impact their winter use of the shorelines.

6.3 Mammals

The Townsend's big-eared bats can be found in a variety of habitat's including westside lowland conifer-hardwood forest, ponderosa pine forest and woodlands, mixed highland conifer forest, eastside mixed conifer forest, shrubsteppe, and both eastside and westside riparian forest/wetlands and open fields. Many day and breeding roosts are in caves, abandoned mines, buildings, concrete bunkers, tunnels, and bridges. Old-growth trees with large basal hollows may have formerly been important roost type in the state. During the winter, caves, abandoned mines, tunnels, and concrete bunkers are commonly occupied by hibernating bats. These bats will also use caves, abandoned mines, tunnels, bridges, and buildings as night roosts, when they rest between foraging bouts (WDFW 2022b).

Keen's myotis bat species is closely associated with low elevation, moist, mature coastal conifer forests during the active season and may move to hibernacula in mid-elevation caves for winter. Summer roosts are in tree cavities, snags, rock crevices, small caves, and buildings. The few documented maternity sites have been found in caves and trees. Foraging occurs more frequently in mature and old growth forests than clearcuts or young forests; riparian areas are likely important foraging habitats (WDFW 2022b).

With the lack of suitable roosting and hibernacula sites available within the Action area, the project is not expected to have any impact on these species.

6.4 Invertebrates

Bumble bees depend on habitats with rich floral resources throughout the nesting season, and many species select specific suites of plants for obtaining nectar and pollen. They also select flowers based on their structure and the bee's tongue length. Bumble bees require above and below-ground micro-sites for overwintering and nesting, including logs, stumps, and abandoned rodent and ground-nesting bird nests (WDFW 2022b).

Bumble bee colonies are annual. In late-winter or early-spring, queens, which are the sole survivors from the previous year, emerge from their overwintering sites to feed on floral nectar, collect pollen, and search for suitable nest sites, which are often abandoned rodent holes. It is likely Bumble bees utilize the proposed Action area; however, the site has limited sources of floral nectar. Bumble Bees could utilize the perimeter of the site, where areas of non-native Himalayan blackberry can be found (WDFW 2022b).

The Puget blue inhabits low elevation grasslands in south Puget Sound, and sub-alpine meadows in the Olympic Mountains. The perennial sickle-keeled lupine is the larval host and primary adult nectar source for the Puget blue on two south Sound prairies. The butterfly's dependence on sickle-keeled lupine limits their habitat to areas and sites that support significant patches of this plant. The distribution of the Puget blue is limited in part by a combination of its dependence on rare hostplant occurrence within rare habitat types. In Washington, its distribution and abundance in Washington is characterized by small numbers of small, isolated populations (WDFW 2022b). Due to the lack of habitat and plant species required for the Puget blue, the action area will not have any impact on this species.

7 Presence of Culturally Significant Species

6.1.1 Common Raven

History and Distribution

Considered a culturally important species, the Common Raven (*Corvus corax*) is one of the most widespread birds in Washington state. For years, indigenous cultures around the world have revered ravens as spiritual figures. The Raven is known as a "trickster", being a symbol of change and transformation.

Common Ravens are commonly found and widespread through the year in non-urban areas of Washington. They are most common east of the Cascade Crest and are common along Washington's outer coast (Birdweb 2022).

General Life History and Habitat Requirements

Ravens can be found in every habitat except major metropolitan areas and high elevation glacial areas. Ravens prefer open and partially open areas. They avoid dense forests, where they are more vulnerable to predators. Ravens like to feed in open areas and are mainly scavengers. They generally roost on cliff ledgers or in large trees but also have established nests on powerlines, and billboards (NMP 2022).

Ravens form long-term pair bonds. Pairs typically stay together year-round, roosting historically on cliffs and trees, now power poles, and other manmade structures are commonly used. The nest usually consists of a base of large sticks woven into a bulky basket with smaller branches and twigs inside.

Occurrence in Action Area

Common Ravens have been documented in Kitsap County in Hansville and Kingston (Kitsap Audubon Society 2022). Once could be heard during the site visit in October.

Critical or Priority Habitat

This species is not at risk, therefore no critical or priority habitat has been designated for Common Raven.

6.1.2 Bald Eagle

History and Distribution

Considered a culturally important species, the Bald Eagle (*Haliaeetus leucocephalus*) is commonly found in Washington state. Eagles appear in many tribes' creation stories, and they are revered because of their strength, boldness, and courage to withstand any obstacles.

The Bald Eagle is found only in North America, generally in coastal areas or near large inland lakes and rivers abundant with fish and shores with large trees. They nest in large trees near shorelines, and prey on fish, waterfowl, small mammals, or scavenge.

General Life History and Habitat Requirements

Many birds that nest in Canada and Alaska migrate south to overwinter in Washington, concentrating with spawned-out salmon, especially chum. Winter roosts are usually located in varied aged patches of trees protected from the wind and inclement weather. Bald Eagles return to their breeding territories year after year and may use the same nest for successive years.

Breeding eagles require large trees near open water in locations with low levels of human activity. Nesting activities take place in January or February and disperse by late summer when many migrate north to coastal British Columbia and southeast Alaska (eopugetsound 2022).

Occurrence in Action Area

Bald Eagles have been documented in Kitsap County in Hansville and Kingston (Kitsap Audubon Society 2022).

Critical Habitat

This species is not at risk, therefore no critical or priority habitat has been designated for Bald Eagles.

8 Significant Populations of Non-Listed Species (deer, bear, cougar, etc.)

Animal trails were noted during the October site visit. With close vicinity to neighboring communities and roads, there was no evidence of denning sites or high use by a significant population of non-listed species. Deer, bear and couguars are commonly found within the region and any individuals found within this Action area would be considered transients.

9 Effects of the Proposed Action

Effects of the action entail all consequences to listed species or critical habitat that are caused by the Proposed Action, including the consequences of other activities that are caused by the Proposed Action. A consequence is caused by the Proposed Action if it would not occur but for the Proposed Action, and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (84 FR 45016).

As described in Section 4, the action area is defined by the area of ground disturbance and the geographic extent of noise-related disturbance associated with the project and includes construction and staging areas, and access roads. The project will result in permanent areas of ground disturbance to construct roads, sidewalks and utility connections. Some of these areas are located in places that have existing or previous ground disturbance and will not require tree clearing. Habitat quality in these work areas does not currently provide any suitable habitat for listed species. In particular, there are no suitable stands of old growth forest for marbled murrelets. Suitable habitat is also lacking for the listed plant species golden paintbrush as described in Section 5.1. For these reasons, the Proposed Action is not likely to adversely affect marbled murrelets and will not affect golden paintbrush or yellow-billed cuckoo.

The Proposed Action will not impact aquatic habitat or riparian vegetation adjacent to fish-bearing streams. PD will implement typical construction BMPs to avoid the discharge of sediment-laden runoff or construction materials into aquatic areas (Section 3.1.7). No culverts will be constructed or replaced as part of the Proposed Action. Therefore, no impacts to ESA-listed aquatic species (i.e., Bull Trout) will occur.

The main potential impact of the project on any individuals from listed species with potential to occur in the action area will be from elevated noise levels during construction activities. The elevated noise has the potential to cause temporary disturbance to individuals and may elicit a behavioral response

or cause them to alter their movements and avoid the area. Project construction activities will be conducted during daylight hours and noise disturbance will be limited to this time period and be temporary during the course of project activities.

The yellow-billed cuckoo is not documented to occur in the action area and presumed breeding in the region ended in the 1920s. Yellow-billed cuckoos are extremely rare visitors to Washington and the potential occurrence of the species in the action area is considered remote. In the exceedingly unlikely possibility that an individual is present in the action area during implementation of the Proposed Action, elevated noise associated with project construction may disturb individuals.

9.1 Cumulative Effects

Cumulative effects are those of future state or private activities, not involving activities of other federal agencies that are reasonably certain to occur within the area of the federal action subject to consultation (50 CFR 402.02 Definitions). Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA.

10 Effects Determinations on Federally Listed Species

This section presents the recommended effects determinations for each of the listed species with potential to occur in the action area and provides a summary of the factors that support each determination. Effects on critical habitat in the action area are also summarized. Table 10-1 summarizes effects determinations for each species and critical habitat.

Table 10-1. Summary of Recommended Effects Determinations

Species	DPS	Effect Determination	Critical Habitat
Marbled Murrelet	NA	NLAA	NE
Yellow-billed cuckoo	NA	NE	NE
Common Raven	NA	NLAA	NA
Bald Eagle	NA	NLAA	NA
Bull Trout	Coterminous United States	NE	NE
Golden paintbrush	NA	NE	NA
Note: DPS = Distinct Population Segment; NA = not applicable; NE = no effect; NLAA = not likely to adversely affect.			

10.1 Marbled Murrelet

As described in Section 5, marbled murrelets utilize old growth dense forests and forage primarily in the sea. Due to a lack of suitable habitat in the action area, the Proposed Action is ***not likely to adversely effect*** on marbled murrelets. Critical habitat has not been designated for marbled murrelet.

10.2 Yellow-Billed Cuckoo

As described in Section 5, although the yellow-billed cuckoo is not documented to occur in the action area or vicinity, the action area is within the historic breeding range of the species, however, suitable foraging and nesting habitat is not present in the Proposed Action area. In the exceedingly unlikely possibility that an individual is present in the action area during implementation of the Proposed Action, elevated noise associated may disturb individuals. However, yellow-billed cuckoos are extremely rare visitors to Washington and the potential occurrence of the species in the action area is considered remote, therefore the Proposed action will have ***no effect*** on the Yellow-Billed Cuckoo. Critical habitat has not been designated for yellow-billed cuckoo.

10.3 Common Raven

As described in Section 5, Common Raven utilize almost any habitat except for heavily populated regions. Due to a lack of suitable habitat in the action area, the Proposed Action is ***not likely to adversely effect*** on common raven. Critical habitat has not been designated for common raven.

10.4 Bald Eagle

As described in Section 5, bald eagles utilize varied aged forests and forage primarily in the sea. Due to a lack of suitable habitat in the action area, the Proposed Action is ***not likely to adversely effect*** bald eagles. Critical habitat has not been designated for bald eagles.

10.5 Bull Trout

The Proposed Action will not impact aquatic habitat or riparian vegetation adjacent to fish-bearing streams. No culverts will be constructed or replaced as part of the Proposed Action. Activities associated with the Proposed Action, including access road work and materials staging, will employ BMPs (Section 3.1.7) to avoid the discharge of sediment-laden runoff or construction materials into aquatic areas. For these reasons, the Proposed Action will have ***no effect*** on Bull Trout. Critical habitat has not been designated for Bull Trout.

10.6 Golden Paintbrush

Golden paintbrush is not documented to occur in the action area or vicinity; the nearest documented populations in Washington and Oregon are located over 100 miles north and approximately 100 miles south of the action area, respectively (Section 5.1.4). Due to a lack of suitable habitat in the action area and the distance to known populations (≥100 miles), the Proposed Action will have ***no effect*** on golden paintbrush. Critical habitat has not been designated for golden paintbrush.

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Appendix A: Information for Planning and Consultation (IPAC) List for Action Area

INADVERTENT DISCOVERY PLAN FOR PORT GAMBLE S'KLALLAM CULTURAL RESOURCES AND HUMAN REMAINS DISCOVERED ON TRIBAL LANDS AND PORT GAMBLE S'KLALLAM TRADITIONAL CULTURAL LANDSCAPES

The Port Gamble S'Klallam Tribe (PGST) Cultural Resource Management Policy also establishes an Inadvertent Discovery Plan (IDP) cultural resources protocol for when tribal members, employees, contractors or visitors encounter, locate, or receive cultural resources (including human remains) discovered on tribal lands or upon identified PGST traditional cultural landscapes. This protocol establishes what actions and responses should take place and provides a list of PGST contacts for when cultural resources are encountered on tribal lands, and identified PGST traditional cultural landscapes. Maintaining a policy and protocol for dealing with unanticipated encounters with cultural remains is an important aspect of the PGST Cultural Resource Management Policy cultural and establishes a process for insuring that cultural resources are protected to the most reasonable degree possible for the collective benefit of all tribal members. PGST will work with state and federal agencies to develop PA/MOA regarding cultural resources for individual projects through government-to-government consultation when PGST determines proposed planning, or grounding disturbing actions will have potential adverse affects on PGST Tribal Cultural Resources. The guidelines below outline standards and actions when cultural resources are inadvertently discovered.

The PGST Inadvertent Discovery Plan (IDP) outlines procedures to follow in accordance with the PGST Tribal Cultural Resource Management Policy as well as state and federal laws, if cultural resources or human remains are discovered.

1. WHAT ARE CULTURAL RESOURCES?[1]

An inadvertent discovery of cultural resources could be historic or pre-historic. Some examples of cultural resources include:

- Shell Middens (accumulations of shell, burnt rock and other processed food remains and tools) bones or small pieces of bone.
- An area of charcoal or dark stained soil with artifacts.
- Lithic Scatters (stone tools, or waste flakes, arrowheads, or stone chips)
- Culturally modified trees (Cedar trees with bark strips harvested from them, Yew trees used for tool handles).
- Clusters of beads, tin cans or bottles, logging, fishing or farming equipment that appears to be more than 50 years old.[2]
- Buried railroad tracks, decking or industrial remains.
- Any type of human skeletal remains.

[1] The Port Gamble S'Klallam Tribe's Cultural Resource Policy contains a more broad and encompassing definition of cultural resources then is offered in the PGST IDP. The cultural resources discussed here do not represent the limit of PGST identified cultural resources. They represent the most likely types of cultural resources to be encountered during disturbing activities.

[2] 50 years is the minimum age requirement for a potential cultural resource to be considered eligible for the National Register of Historic Properties.

When in doubt, assume materials encountered are cultural resources!

2. INADVERTENT DISCOVERY OF CULTURAL RESOURCES.

1. If any tribal members, tribal employees, contractors, visitors, state or federal agency employee or contractor believes that he or she has uncovered cultural resources at any point on a project on tribal lands or within an identified PGST Traditional Cultural Landscape all work near the discovery must stop. The discovery location should be secured at all times.

2. If there is an archeological monitor for the project notify that person. If there is a monitoring plan in place, the monitor will follow the steps outlined in the plan.

3. Notify the PGST tribal archeologist and the project manager. If the tribal archeologist is not available notify the PGST Natural Resource Department. The Natural Resource Department will notify the PGST tribal archeologist and Cultural Resources Director

4. If there is no archeological monitor and/or no monitoring plan the PGST tribal archeologist will travel to the site and perform a preliminary site assessment; including taking GPS readings and photographing items in their original context.

5. If they are on tribal land and in danger of being destroyed and can be removed while retaining their cultural integrity they will be removed by the archeologist, catalogued and entered into the tribal GIS cultural resource inventory database, and archived by the Tribe for additional research and documentation.

6. If the cultural resources can be left in place and or are too large to move the tribal archeologist will make every effort to record as much information as possible. This data will be incorporated into the tribal GIS cultural resource inventory database.

7. The PGST tribal archeologist will contact the potential involved agencies (if any) and the Department of Archeology and Historic Preservation (DAHP).

3. WHEN CULTURAL RESOURCES (INCLUDING HUMAN REMAINS) ARE DISCOVERED BY A VISITOR OR CONTRACTOR AND/OR ARE GIVEN TO A TRIBAL EMPLOYEE.

1. Immediately notify the PGST tribal archeologist. If the tribal archeologist is not available contact the PGST Natural Resource Department who will contact the tribal archeologist.

2. Thank the visitor. Obtain their name, address, and phone number. Ask them to keep the site information confidential.

3. Obtain as much information as possible on the source of the remains.

4. If from a site or location obtain as much information as possible as to the exact location they came from.

5. Suggest the importance of leaving cultural resources where they are discovered because of cultural resource site protection, burials, tribal property, possible crime scenes, etc.

6. The tribal archeologist and Natural Resources Department will find or attempt to find the site and identify it on a map.

7. The tribal archeologist will conduct a brief survey of the area of the discovery in order to assess the extent and amount of cultural remains present. The original context of the find will be photographed in order to document how it looked when it was discovered. Photographs will be taken of each cultural remain in-situ. GPS reading will be taken of each cultural remain. Photographs will be for PGST research/documentation only. No photographs will be given to outside sources, especially the media.

8. The tribal archeologist will take GPS readings and map out the site as fully as possible. A detailed description of the site will be recorded. The original context of the find will be photographed in order to document how it looked when it was discovered. Photographic documentation will include permanent landmarks whenever possible. Photographs will be taken of each bone fragment. GPS reading will be taken of each bone fragment. Photographs will be for PGST research/documentation only. No photographs will be given to outside sources, especially the media.

4. PROCEDURES FOR THE DISCOVERY OF HUMAN REMAINS.

There are different areas of the Port Gamble S'Klallam Reservation and within PGST Traditional cultural landscapes where there is a high probability that human remains may be encountered based on local tribal knowledge, historical records and previous archeological research. In the event tribal members, staff, contractors, state or federal agency staff/contractors or other visitors encounter human remains on tribal lands or on PGST traditional cultural landscapes it is important the following protocol should be followed:

1. If any tribal members, tribal employees, contractors, visitors, state or federal agency employee or contractor believes that he or she has uncovered human remains at any point on a project on tribal lands or within an identified PGST Traditional Cultural Landscape all work near the discovery must stop. The discovery location should be secured at all times.

2. If there is an archeological monitor for the project notify that person. If there is a monitoring plan in place. The monitor will follow the steps outlined in the plan.

3. Immediately notify the PGST tribal archeologist and the project manager. If the tribal archeologist is not available notify the PGST natural resource management office. The archeologist will notify the law enforcement agency with jurisdiction in the area of the discovery.

4. The tribal archeologist will conduct a brief survey of the area of the discovery in order to assess the extent and amount of remains present. The original context of the find will be photographed in order to document how it looked when it was discovered. Photographs will be taken of each bone fragment. GPS reading will be taken of each bone fragment. Photographs will be for PGST research/documentation only. No photographs will be given to outside sources, especially the media.

5. Law enforcement must determine if the remains are human and whether the discovery site constitutes a crime scene, and will notify DAHP.

   If remains *are not* associated with a crime scene the tribal archeologist will take GPS readings and map out the site as fully as possible. A detailed description of the site will be recorded. The original context of the find will be photographed in order to document how it looked when it was discovered. Photographic documentation will include permanent landmarks whenever possible. Photographs will be taken of each bone fragment. GPS reading will be taken of each bone fragment. Photographs will be for PGST research/documentation only. No photographs will be given to outside sources, especially the media.

6. Whenever possible PGST expressly desires that human remains be left in place until the tribal archeologist, the cultural resource director, the cultural committee can obtain advisement from Tribal elders in order to determine how remains should be handled.

5. TRIBAL PROCEDURE FOR THE REPORTED DISCOVERY OF HUMAN REMAINS ON TRIBAL LANDS.

1. Immediately notify the PGST tribal archeologist. If the PGST tribal archeologist is not available contact the Natural Resource Department who will contact the tribal archeologist. The archeologist will notify the law enforcement agency with jurisdiction in the area of the discovery.

2. Thank the visitor. Obtain their name, address, and phone number. Ask them to keep the site location confidential.

3. Obtain as much information as possible on the source of the remains.

4. If from a site or location obtain as much information as possible as to the exact location they came from.

5. Suggest the importance of leaving cultural resources where they are discovered because of cultural resource site protection, burials, tribal property, possible crime scenes, etc.

6. The tribal archeologist and Natural Resources Department will find or attempt to find the site and identify on a map.

7. The tribal archeologist will conduct a brief survey of the area of the discovery in order to assess the extent and amount of remains present. The original context of the find will be photographed in order to document how it looked when it was discovered. Photographs will be taken of each bone fragment. GPS reading will be taken of each bone fragment. Photographs will be for PGST research/documentation only. No photographs will be given to outside sources, especially the media.

8. Law enforcement must determine if the remains are human and whether the discovery site constitutes a crime scene, and will notify DAHP.

9. If remains *are not* associated with a crime scene the tribal archeologist will take GPS readings and map out the site as fully as possible. A detailed description of the site will be recorded. The original context of the find will be photographed in order to document how it looked when it was discovered. Photographic documentation will include permanent landmarks whenever possible. Photographs will be taken of each bone fragment. GPS reading will be taken of each bone fragment. Photographs will be for PGST research/documentation only. No photographs will be given to outside sources, especially the media.

10. Whenever possible PGST expressly desires that human remains be left in place until the tribal archeologist, the cultural resource director, the cultural committee can obtain advisement from Tribal elders in order to determine how remains should be handled.

6. CONTACTS

PGST THPO:
Juanita Holtyn, EdD
Office: 360-297-2646
Email: pgst-thpo@pgst.nsn.us

PGST Natural Resource Office:
Roma Call (NR Director)
Office: 360-297-6288
Cell: 360-516-3979
E-mail: romac@pgst.nsn.us

PGST Cultural Resources Office:
Laura Price (CR Director)
Office: 360-297-6358
Email: lives@pgst.nsn.us

PGST Dept of Public Safety
Brian George, Director/Chief
Office: 360-297-9685
Email: begeroge@pgst.nsn.us

PGST Natural Resource Enforcement:
Tyler Steinmetz, Deputy Cheif
Cell:360-621-0680
Email: tsteinmetz@pgst.nsn.us

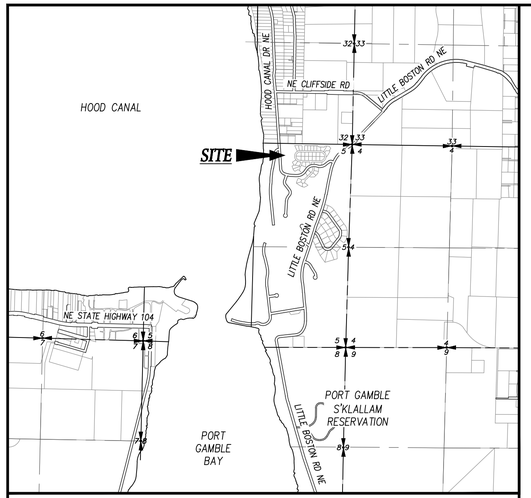
DAHP:
Dr. Allyson Brooks (SHPO)
Office: 360-586-3066

Kitsap County Sheriff Dept:
360-337-7170

Kitsap County Coroner:
360-337-7077

Jefferson County Sheriff Dept:
360-385-3831

Jefferson County Coroner:
360-385-9180



VICINITY MAP

N.T.S.

A PORTION OF GOVERNMENT LOT 5 & A PORTION OF THE NE 1/4, NE 1/4 , SECTION 5, TOWNSHIP 27, RANGE 2 EAST, W.M.
KITSAP COUNTY WASHINGTON

TRIBAL COUNCIL

CHAIRWOMAN	AMBER CALDERA
VICE CHAIRMAN	CHRIS TOM
COUNCIL PERSON I	RENEE VEREGGE
COUNCIL PERSON II	DONOVAN ASHWORTH
COUNCIL PERSON III	MATTHEW IVES
COUNCIL PERSON IV	KYLE CARPENTER

PROJECT CONTACTS

PLANNING DIRECTOR	JOE SPARR
PROJECT MANAGER	RORY MCLEOD
PROJECT MANAGER	ABIGAIL WELCH

CONSULTANTS

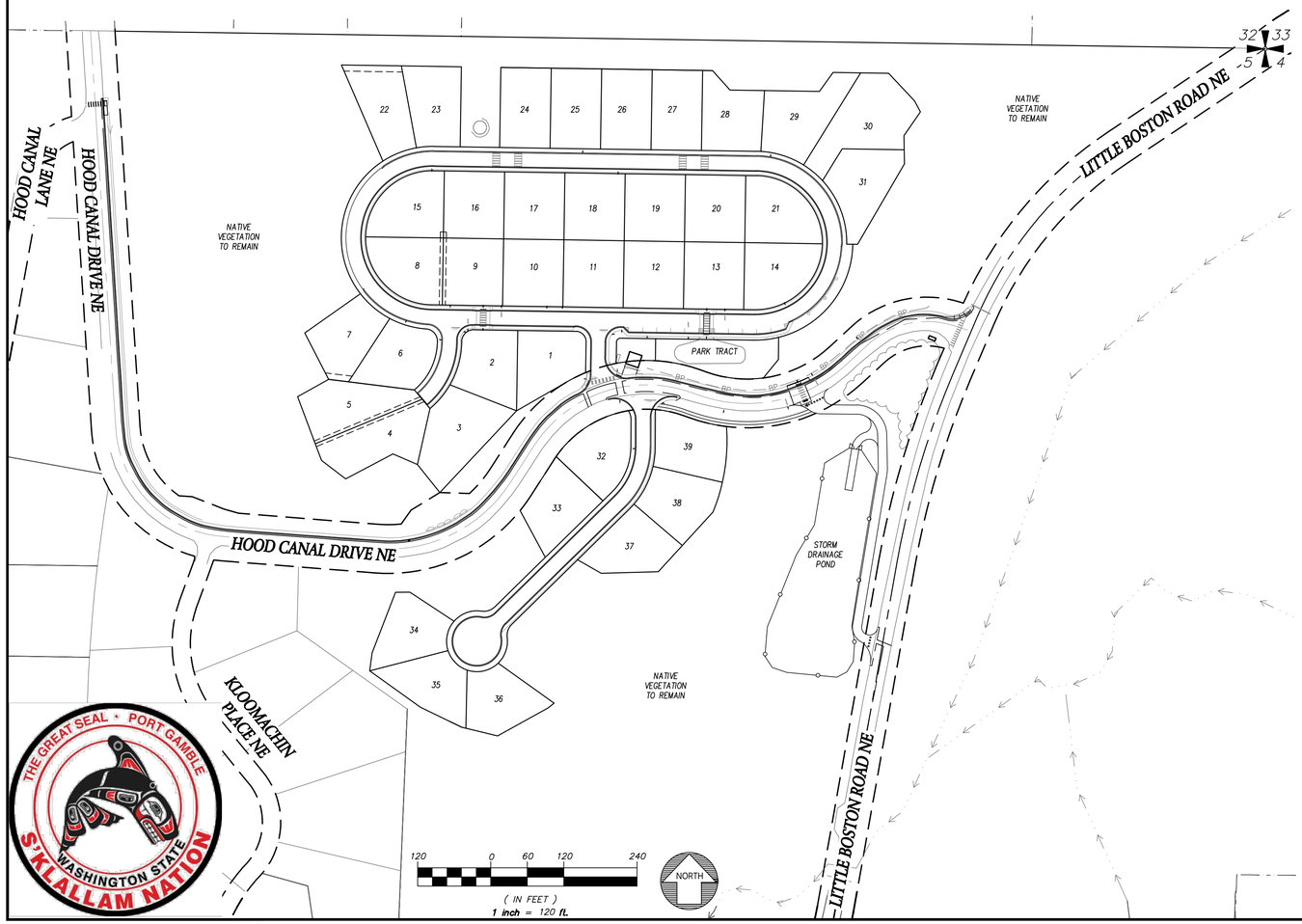
CIVIL ENGINEER	MAP, LTD PO BOX 720 SILVERDALE, WA 98383 K PAT FUHRER, PE, PRESIDENT patf@map-limited.com
CULTURAL RESOURCES	WILLAMETTE CULTURAL RESOURCES ASSOCIATES, LTD 2827 NE MARTIN LUTHER KING BLVD PORTLAND, OR 97212 ROBERT KOPPERL, PHD, RPA
GEO-TECHNICAL ENGINEER	KRAZAN & ASSOCIATES, INC 1230 FINN HILL RD NW, SUITE A POULSBO, WA 98370 SHAWN WILLIAMS, LEG shawnwilliams@krazan.com
LAND SURVEYOR	AES CONSULTANTS, INC PO BOX 930 SILVERDALE, WA 98383 STEVE OTTMAR, PLS aes@bainbridge.net
UTILITY LOCATES	APPLIED PROFESSIONAL SERVICES, INC. 43530 SE NORTH BEND WAY NORTH BEND, WA 98045 ADAM DAVIS adamd@apslocates.com

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GENERAL NOTES

1. THIS PROJECT IS SUBJECT TO AN INADVERTENT DISCOVERY PLAN WHICH IS INCLUDED IN THE PROJECT BID DOCUMENTS.
2. ALL CONSTRUCTION SHALL FOLLOW THE RECOMMENDATIONS CONTAINED IN THE GEO-TECHNICAL INVESTIGATION REPORT PREPARED FOR THIS PROJECT BY KRAZAN AND ASSOCIATES DATED OCTOBER 2, 2023.
3. ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE MOST CURRENT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION PREPARED BY WSDOT AND APWA AS ADOPTED BY THE PORT GAMBLE S'KLALLAM TRIBE.
4. ANY REVISIONS TO THE ACCEPTED CONSTRUCTION PLANS SHALL BE REVIEWED AND APPROVED BY THE PROJECT MANAGER PRIOR TO IMPLEMENTATION IN THE FIELD.
5. THE CONTRACTOR SHALL MAINTAIN A SET OF THE BID SET DRAWINGS ON-SITE AT ALL TIMES WHILE CONSTRUCTION IS IN PROGRESS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE TRAFFIC CONTROL AT ALL TIMES DURING CONSTRUCTION ALONGSIDE OR WITHIN ALL PUBLIC ROADWAYS. TRAFFIC FLOW ON EXISTING PUBLIC ROADWAYS SHALL BE MAINTAINED AT ALL TIMES, UNLESS PERMISSION IS OBTAINED FROM THE POST FOR ROAD CLOSURE AND/OR DETOURS.
7. THE LOCATION OF EXISTING UTILITIES ON THIS PLAN IS APPROXIMATE ONLY. THE CONTRACTOR SHALL CONTRACT THE "UNDERGROUND LOCATE" CENTER AT 811, AND NON-SUBSCRIBING INDIVIDUAL UTILITY COMPANIES 48 HOURS IN ADVANCE OF THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL PROVIDE FOR PROTECTION OF EXISTING UTILITIES FROM DAMAGE CAUSED BY THE CONTRACTOR'S OPERATIONS.

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

nəxʷqíyt nəxʷsƛ̓áýəm

PORT GAMBLE S'KLALLAM TRIBE

PLAT OF RACCOON TOWN

COVER SHEET

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. FARRIS — STATE OF WASHINGTON — 19853 — REGISTERED PROFESSIONAL ENGINEER

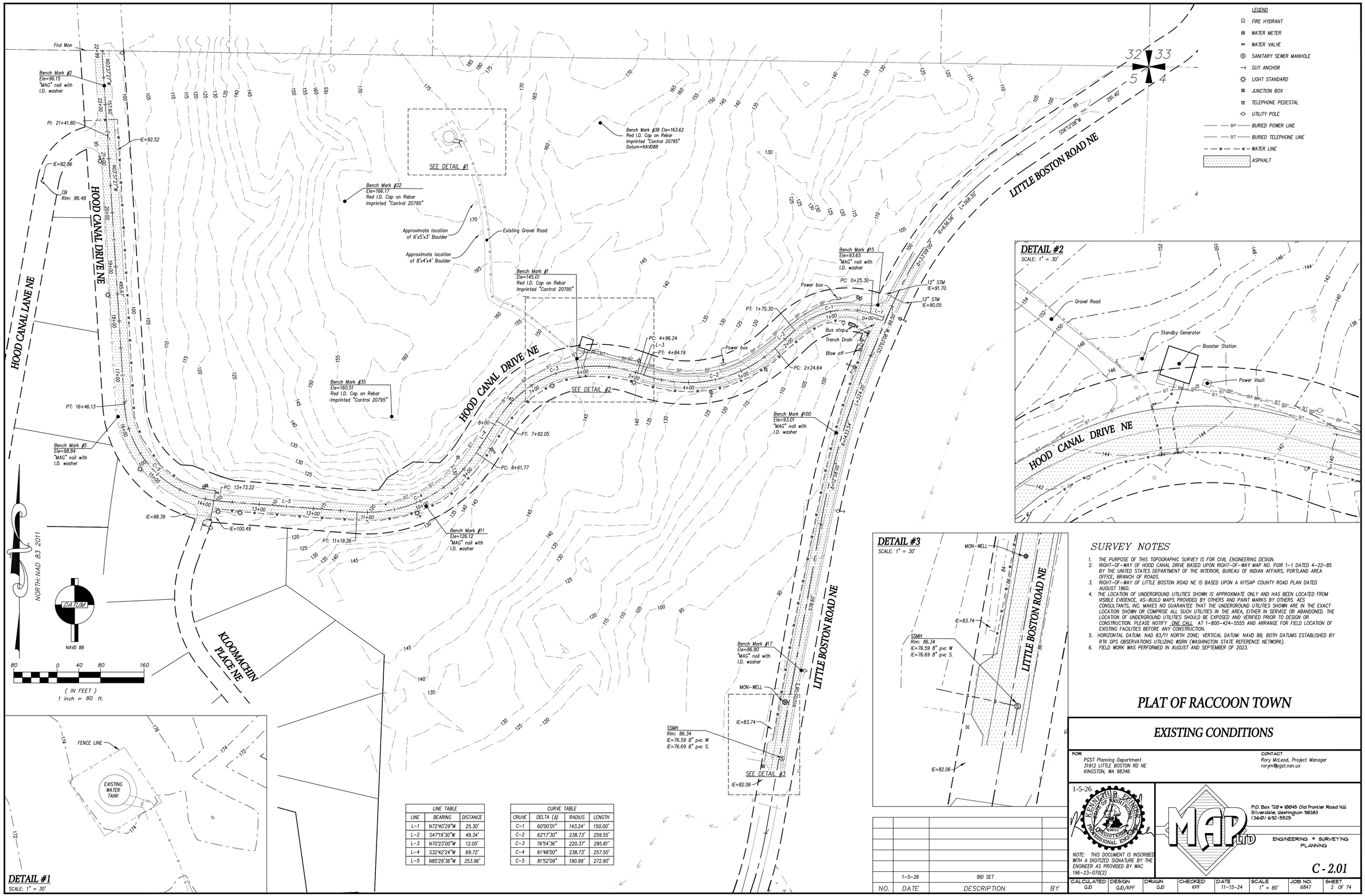
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Silverdale, Washington 98383
(360) 692-5525

MAP LTD ENGINEERING • SURVEYING PLANNING

C - 1.01

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 120'	6847	1 OF 74



LINE TABLE		
LINE	BEARING	DISTANCE
L-1	N72°40'29"W	25.30'
L-2	S47°19'30"W	49.34'
L-3	N70°23'00"W	12.05'
L-4	S32°42'24"W	69.72'
L-5	N85°29'36"W	253.96'

CURVE TABLE			
CRUVE	DELTA (Δ)	RADIUS	LENGTH
C-1	60°00'01"	143.24'	150.00'
C-2	62°17'30"	238.73'	259.55'
C-3	76°54'36"	220.37'	295.81'
C-4	61°48'00"	238.73'	257.50'
C-5	81°52'09"	190.99'	272.90'

SURVEY NOTES

1. THE PURPOSE OF THIS TOPOGRAPHIC SURVEY IS FOR CIVIL ENGINEERING DESIGN.
2. RIGHT-OF-WAY OF HOOD CANAL DRIVE BASED UPON RIGHT-OF-WAY MAP NO. PQIR 1-1 DATED 4-22-85 BY THE UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF INDIAN AFFAIRS, PORTLAND AREA OFFICE, BRANCH OF ROADS.
3. RIGHT-OF-WAY OF LITTLE BOSTON ROAD NE IS BASED UPON A KITSAP COUNTY ROAD PLAN DATED AUGUST 1960.
4. THE LOCATION OF UNDERGROUND UTILITIES SHOWN IS APPROXIMATE ONLY AND HAS BEEN LOCATED FROM VISIBLE EVIDENCE, AS-BUILD MAPS PROVIDED BY OTHERS AND PAINT MARKS BY OTHERS. AES CONSULTANTS, INC. MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION SHOWN OR COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE LOCATION OF UNDERGROUND UTILITIES SHOULD BE EXPOSED AND VERIFIED PRIOR TO DESIGN OR CONSTRUCTION. PLEASE NOTIFY ONE CALL AT 1-800-424-5555 AND ARRANGE FOR FIELD LOCATION OF EXISTING FACILITIES BEFORE ANY CONSTRUCTION.
5. HORIZONTAL DATUM: NAD 83/11 NORTH ZONE; VERTICAL DATUM: NAVD 88; BOTH DATUMS ESTABLISHED BY RTK GPS OBSERVATIONS UTILIZING WSRN (WASHINGTON STATE REFERENCE NETWORK).
6. FIELD WORK WAS PERFORMED IN AUGUST AND SEPTEMBER OF 2023.

PLAT OF RACCOON TOWN

EXISTING CONDITIONS

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

1-5-26
KENNETH P. PATNOE
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

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C - 2.01

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 80'	6847	2 OF 74

PLAT OF RACCOON TOWN

LOT LAYOUT

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH D. BERGSTROM — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER

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C - 3.01

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 60'	6847	3 OF 74

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

60 0 30 60 120
(IN FEET)
1 inch = 60 ft.

NORTH: NAD 83 2011

NATIVE VEGETATION TO REMAIN

10' DRAINAGE EASEMENT TO BENEFIT LOT 23

50' NATIVE VEGETATION TO REMAIN – WILDLIFE CORRIDOR

10' DRAINAGE EASEMENT TO BENEFIT LOT 6

10' DRAINAGE EASEMENT TO BENEFIT LOT 3

10' DRAINAGE EASEMENT TO BENEFIT LOT 8, 15 & 16

LOT 1 10,900 sf
LOT 2 10,895 sf
LOT 3 14,720 sf
LOT 4 12,740 sf
LOT 5 11,840 sf
LOT 6 10,900 sf
LOT 7 10,900 sf
LOT 8 11,420 sf
LOT 9 10,890 sf
LOT 10 10,890 sf
LOT 11 10,890 sf
LOT 12 10,890 sf
LOT 13 10,890 sf
LOT 14 11,420 sf
LOT 15 11,420 sf
LOT 16 10,890 sf
LOT 17 10,890 sf
LOT 18 10,890 sf
LOT 19 10,890 sf
LOT 20 10,890 sf
LOT 21 11,420 sf
LOT 22 11,560 sf
LOT 23 11,255 sf
LOT 24 10,892 sf
LOT 25 10,892 sf
LOT 26 10,892 sf
LOT 27 10,892 sf
LOT 28 10,957 sf
LOT 29 13,222 sf
LOT 30 16,350 sf
LOT 31 12,200 sf
LOT 32 11,005 sf
LOT 33 11,040 sf
LOT 34 10,890 sf
LOT 35 10,890 sf
LOT 36 10,890 sf
LOT 37 11,055 sf
LOT 38 10,930 sf
LOT 39 10,895 sf
PARK TRACT 12,170 sf
STORM POND

CATTAIL MAT LOOP ROAD
COMB COURT
DEER WOMAN ROAD
KLOOMACHIN PLACE NE
HOOD CANAL DR NE
LITTLE BOSTON ROAD NE

LINE TABLE		
LINE	BEARING	DISTANCE
L-1	S00°52'16"W	40.42'
L-2	S00°52'16"W	50.31'
L-3	N38°36'42"W	58.80'
L-4	N66°32'15"W	43.93'
L-5	N52°49'20"W	49.80'
L-6	S39°47'19"E	20.00'
L-7	S39°47'19"E	20.00'
L-8	N60°56'35"E	58.28'
L-9	N27°11'13"W	85.77'
L-10	S42°01'42"E	42.99'
L-11	N35°52'37"E	38.44'
L-12	S43°15'22"E	62.25'
L-13	S27°58'36"E	20.37'
L-14	S34°40'06"W	47.50'
L-15	S01°04'04"E	23.17'
L-16	N31°48'07"E	61.63'
L-17	S01°04'04"E	23.17'
L-18	N89°07'44"W	7.87'
L-19	N89°07'44"W	10.00'
L-20	S00°52'16"W	36.30'
L-21	S39°01'02"W	39.23'
L-22	S70°23'00"E	12.05'
L-23	S00°52'16"W	36.07'
L-24	S32°42'24"W	69.72'
L-25	S89°28'35"W	23.74'
L-26	S07°41'54"W	29.86'
L-27	S76°20'21"E	6.96'
L-28	S76°20'21"E	53.45'
L-29	S11°03'31"E	12.33'
L-30	S60°20'04"E	44.51'
L-31	S70°23'00"E	12.05'

CURVE TABLE			
CRUVE	DELTA (Δ)	RADIUS	LENGTH
C-1	49°20'25"	125.00'	107.64'
C-2	45°29'07"	125.00'	99.23'
C-3	7°50'56"	260.37'	35.67'
C-4	90°00'00"	17.00'	26.70'
C-5	90°08'40"	20.00'	31.47'
C-6	29°14'15"	145.00'	73.99'
C-7	20°14'50"	145.00'	51.24'
C-8	48°10'18"	150.00'	126.11'
C-9	86°44'20"	20.00'	30.28'
C-10	49°20'25"	105.00'	90.42'
C-11	48°10'18"	150.00'	126.11'
C-12	22°45'53"	150.00'	59.60'
C-13	11°08'37"	150.00'	29.17'
C-14	2°34'38"	150.00'	6.75'
C-15	28°21'13"	150.00'	74.23'
C-16	15°27'58"	150.00'	40.49'
C-17	43°36'12"	150.00'	114.15'
C-18	27°15'07"	198.73'	94.52'
C-19	16°23'52"	260.37'	74.52'
C-20	14°44'04"	160.00'	41.15'

CURVE TABLE			
CRUVE	DELTA (Δ)	RADIUS	LENGTH
C-21	14°12'30"	260.37'	64.57'
C-22	90°00'00"	7.00'	11.00'
C-23	33°11'33"	27.00'	15.64'
C-24	45°29'07"	105.00'	83.36'
C-25	6°18'27"	278.73'	30.68'
C-26	53°07'48"	25.00'	23.18'
C-27	57°40'48"	50.00'	50.34'
C-28	59°01'06"	50.00'	51.50'
C-29	26°25'54"	50.00'	23.07'
C-30	26°46'11"	50.00'	23.36'
C-31	62°55'25"	50.00'	54.91'
C-32	53°26'12"	50.00'	46.63'
C-33	53°07'48"	25.00'	23.18'
C-34	4°59'29"	145.00'	12.63'
C-35	27°39'52"	145.00'	70.01'
C-36	9°26'42"	310.00'	51.10'
C-37	17°01'36"	310.00'	92.12'
C-38	12°49'46"	145.00'	32.47'
C-39	14°57'38"	180.37'	47.10'
C-40	12°36'53"	278.73'	61.37'

NORTH: NAD 83 2011

NATIVE VEGETATION TO REMAIN

JUTE MAT & HYDRO-SEED SLOPES > 15% (TYPICAL) AREA = 850 SF / 0.02 AC.

EX. WATER TANK

JUTE MAT & HYDRO-SEED SLOPES > 15% (TYPICAL) AREA = 2,450 SF / 0.06 AC.

FILTER SOCKS TO BE PLACED IN ALL CATCH BASINS & KEPT CLEAN UNTIL SITE STABILIZATION (TYP.)

NATIVE VEGETATION TO REMAIN

CLEARING LIMITS (TYPICAL) AREA=184,100 S.F./4.23 AC (PORTION OF PLAT NORTH OF HOOD CANAL DRIVE NE)

500 L.F.~SILT FENCE

100 L.F.~SILT FENCE

JUTE MAT & HYDRO-SEED SLOPES > 15% (TYPICAL) AREA = 4,300 SF / 0.10 AC.

650 L.F.~SILT FENCE

JUTE MAT & HYDRO-SEED SLOPES > 15% (TYPICAL) AREA = 3,600 SF / 0.08 AC.

NATIVE VEGETATION TO REMAIN

FILTER SOCKS TO BE PLACED IN ALL CATCH BASINS & KEPT CLEAN UNTIL SITE STABILIZATION (TYP.)

NOTE: PRESERVE AND PROTECT EXISTING RESERVOIR WATER SUPPLY TO REMAIN IN OPERATION UNTIL BYPASS COMPLETED AND TESTED.

NATIVE VEGETATION TO REMAIN

JUTE MAT & HYDRO-SEED SLOPES > 15% (TYPICAL) AREA = 8,560 SF / 0.20 AC.

NOTE: HYDROSEED ALL DISTURBED AREAS AFTER COMPLETION OF GRADING ACTIVITY AND PRIOR TO INCLEMENT WEATHER

530 L.F.~SILT FENCE

NATIVE VEGETATION TO REMAIN

UTILIZE PARK TRACT FOR TEMPORARY SEDIMENT STORAGE DURING GRADING ACTIVITIES (SEE DETAIL BELOW). RESTORE PER GRADING PLAN AFTER COMPLETION OF GRADING ACTIVITIES

JUTE MAT & HYDRO-SEED SLOPES > 15% (TYPICAL) AREA = 2,250 SF / 0.05 AC.

JUTE MAT & HYDRO-SEED SLOPES > 15% (TYPICAL) AREA = 2,420 SF / 0.06 AC.

NATIVE VEGETATION TO REMAIN

STABILIZED CONSTRUCTION ENTRANCE

EX. BOOSTER STATION

PARK TRACT

JUTE MAT & HYDRO-SEED SLOPES > 15% (TYPICAL) AREA = 3,175 SF / 0.07 AC.

200 L.F.~SILT FENCE

CLEARING LIMITS (TYPICAL) AREA=59,780 S.F./1.37 AC. (PORTION OF CLEARING INSIDE R/W HOOD CANAL DRIVE NE)

HOOD CANAL DRIVE NE

LITTLE BOSTON ROAD NE

NATIVE VEGETATION TO REMAIN

STABILIZED CONSTRUCTION ENTRANCE

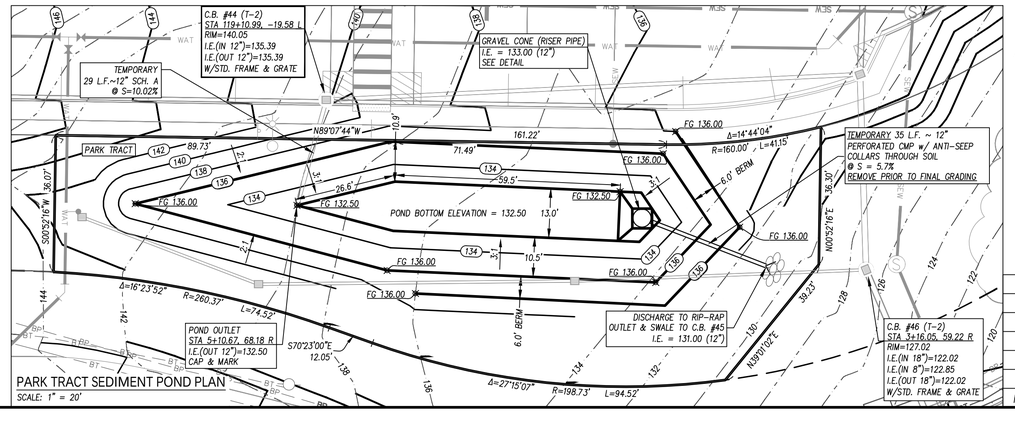
NATIVE VEGETATION TO REMAIN

70 L.F.~SILT FENCE

40 0 20 40 80

(IN FEET)
1 inch = 40 ft.

PLAT OF RACCOON TOWN



PARK TRACT SEDIMENT POND PLAN
SCALE: 1" = 20'

Table II-3.6: Mulch Standards and Guidelines

Mulch Material	Guideline	Description
Straw	Quality Standards	Air-dried; free from undesirable seed and coarse material.
	Application Rates	2"-3" thick; 5 bales per 1,000 sf or 2-3 tons per acre
	Remarks	Cost-effective protection when applied with adequate thickness. Hand-application generally requires greater thickness than blown straw. The thickness of straw may be reduced by half when used in conjunction with seeding. In windy areas straw must be held in place by crimping, using a tackifier, or covering with netting. Blown straw always has to be held in place with a tackifier as even light winds will blow it away. Straw, however, has several deficiencies that should be considered when selecting mulch materials. It often introduces and/or encourages the propagation of weed species and it has no significant long-term benefits It should also not be used within the ordinary high-water elevation of surface waters (due to flotation).

LEGEND

- SILT DRAIN INLET PROTECTION
- CL — CLEARING LIMITS
- SILT FENCING (TO BE PLACED AT TOE OF FILL SLOPES)
- JUTE MAT & HYDRO-SEED SLOPES <15%

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

STORM WATER POLLUTION PREVENTION PLAN - NORTH

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

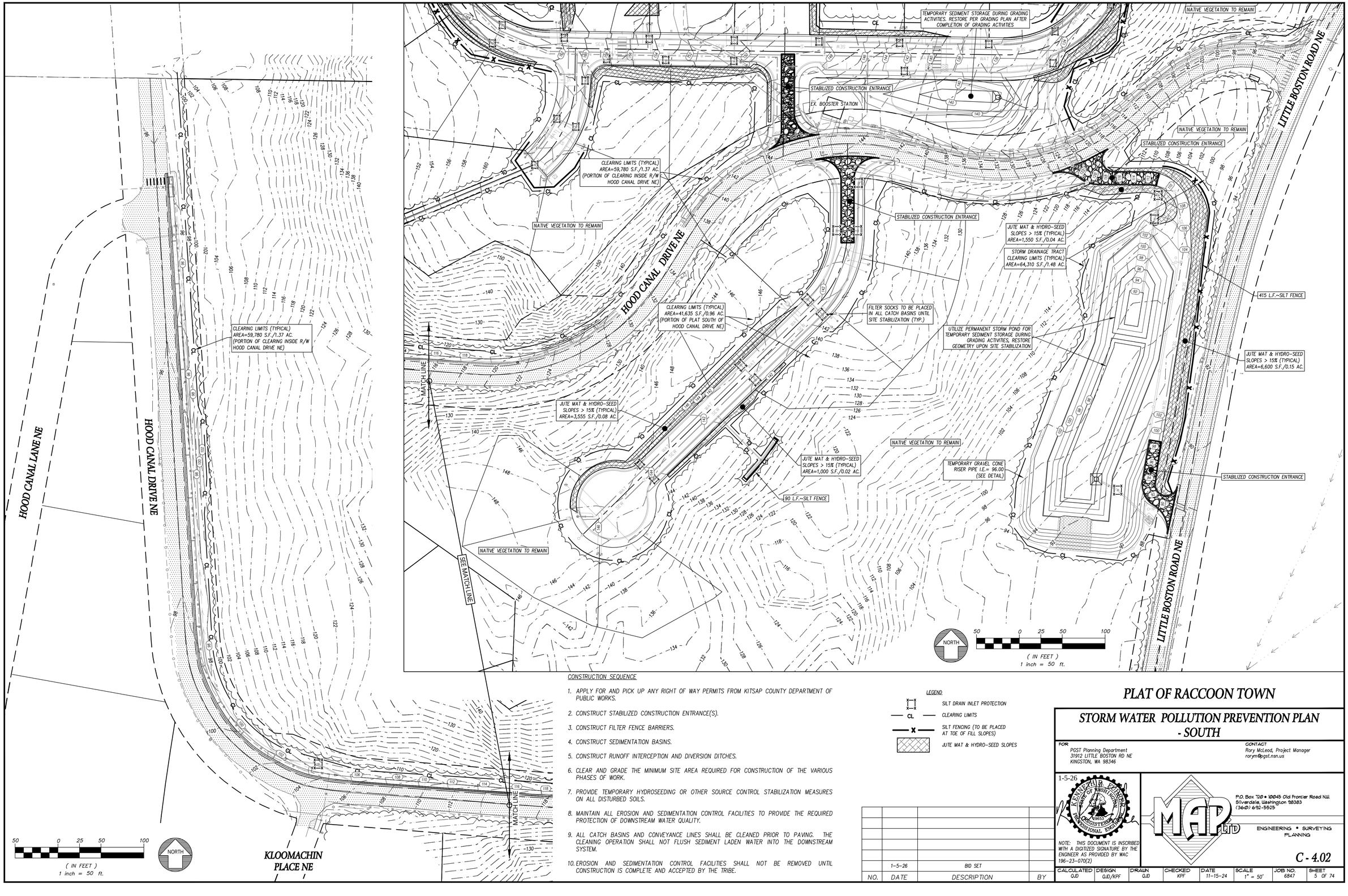
REGISTERED PROFESSIONAL ENGINEER — KENNETH P. FARRIS — STATE OF WASHINGTON — 19653

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PLANNING

C - 4.01

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 40'	6847	4 OF 74



CONSTRUCTION SEQUENCE

1. APPLY FOR AND PICK UP ANY RIGHT OF WAY PERMITS FROM KITSAP COUNTY DEPARTMENT OF PUBLIC WORKS.
2. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S).
3. CONSTRUCT FILTER FENCE BARRIERS.
4. CONSTRUCT SEDIMENTATION BASINS.
5. CONSTRUCT RUNOFF INTERCEPTION AND DIVERSION DITCHES.
6. CLEAR AND GRADE THE MINIMUM SITE AREA REQUIRED FOR CONSTRUCTION OF THE VARIOUS PHASES OF WORK.
7. PROVIDE TEMPORARY HYDROSEEDING OR OTHER SOURCE CONTROL STABILIZATION MEASURES ON ALL DISTURBED SOILS.
8. MAINTAIN ALL EROSION AND SEDIMENTATION CONTROL FACILITIES TO PROVIDE THE REQUIRED PROTECTION OF DOWNSTREAM WATER QUALITY.
9. 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.
10. EROSION AND SEDIMENTATION CONTROL FACILITIES SHALL NOT BE REMOVED UNTIL CONSTRUCTION IS COMPLETE AND ACCEPTED BY THE TRIBE.

LEGEND

- SILT DRAIN INLET PROTECTION
- CL — CLEARING LIMITS
- X — SILT FENCING (TO BE PLACED AT TOE OF FILL SLOPES)
- JUTE MAT & HYDRO-SEED SLOPES

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

STORM WATER POLLUTION PREVENTION PLAN - SOUTH

FOR
POST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. FARRIS — STATE OF WASHINGTON — 29853 — REGISTERED PROFESSIONAL ENGINEER

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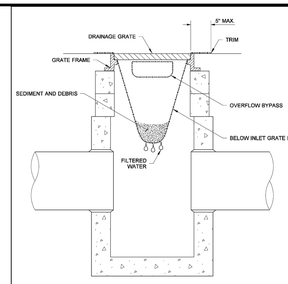
CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 50'	6847	5 OF 74

General Erosion and Sedimentation Control Notes

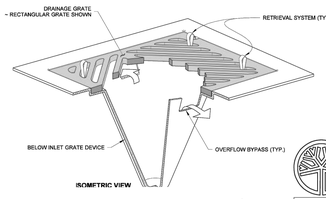
1. The following erosion and sedimentation control notes apply to all construction site activities at all times, unless otherwise specified on these plans:
2. Approval of this erosion and sedimentation control plan does not constitute an acceptance of the permanent road or drainage design.
3. The owner and his/her contractor shall be responsible at all times for preventing silt-laden runoff from discharging from the project site. Failure by the owner and/or contractor can result in a fine. The designated temporary contact person noted on this plan must be available for contact by telephone on a 24 hour basis throughout construction and until the project has been completed and accepted by the county.
4. The implementation of these ESC plans and the construction, maintenance, replacement and upgrading of these facilities is the responsibility of the owner and/or contractor from the beginning of construction until all construction is completed and accepted by the county and the site is stabilized.
5. Prior to beginning any work on the project site, a preconstruction conference must be held, and shall be attended by the general contractor, the project engineer, representatives from affected utilities, and a representative of Kitsap County.
6. The erosion and sedimentation control facilities shown on this plan are to be considered adequate basic requirements for the anticipated site conditions. During construction, deviations from this plan may be necessary in order to maintain water quality. Minor departures from this plan are permitted subject to the approval of the county inspector. However, except for emergency situations, all other deviations from this plan must be designed by the project engineer and approved by Kitsap County prior to installation.
7. All erosion and sedimentation control measures shall be inspected by the owner and/or contractor on a frequent basis and immediately after each rainfall, and maintained as necessary to insure their continued functioning. All sediment must be removed from silt fences, straw bales, sediment ponds, etc. prior to the sediment reaching 1/3 its maximum potential depth.
8. At no time shall concrete, concrete by-products, vehicle fluids, paint, chemicals, or other polluting matter be permitted to discharge to the temporary or permanent drainage system, or to discharge from the project site.
9. Permanent detention/retention ponds, pipes, tanks or vaults may only be used for sediment containment when specifically indicated on these plans.

Minimum Erosion and Sedimentation Control Requirements

1. Stabilization and sediment trapping. All exposed and unworked soils, including soil stockpiles, shall be stabilized by suitable application of BMPs that protect soil from the erosive forces of raindrop impact and flowing water. Applicable practices include, but are not limited to vegetative establishment, mulching, plastic covering, and the early application of gravel base on areas to be paved. From October 1 to April 30, no soils shall remain unstabilized for more than 2 days. From May 1 to September 30, no soils shall remain unstabilized for more than 7 days.
2. At all times of the year, the contractor shall have sufficient materials, equipment and labor on-site to stabilize and prevent erosion from all denuded areas within 12-hours as site and weather conditions dictate.
3. From October 1st to April 30th, the Project Engineer shall visit the development site a minimum of once per week for the purpose of inspecting the erosion and sedimentation control facilities, reviewing the progress of construction, and verifying the effectiveness of the erosion control measures being undertaken. The Project Engineer shall immediately inform the County of any problems or potential problems observed during said site visits, as well as of any recommended changes in the erosion control measures to be undertaken. When requested by the County, the Project Engineer shall provide the County with written records of said weekly site visits, including dates of visits and noted site observations.
4. In the event that ground on a project site is left bare after September 30th, the County may issue a Stop Work Order for the entire project until satisfactory controls are provided. In addition, the Owner will be subject to the penalties provided in Section 12.32 of the Kitsap County Code.
5. In the event that ground on a project site is left bare after September 30th, and the County is unsuccessful in contacting the Owner or his/her designated emergency contact person, the County may enter the project site and install temporary ground cover measures and bill the Owner for all expenses incurred by the County. These costs will be in addition to any monetary penalties levied against the Owner.
6. Delineation of clearing and easement limits. Clearing limits, setbacks, buffers, and sensitive or critical areas such as steep slopes, wetlands and riparian corridors shall be clearly marked in the field and inspected by Kitsap County Department of Community Development prior to commencement of land clearing activities. During the construction period, no disturbance beyond the flagged clearing limits shall be permitted. The flagging shall be maintained by the applicant/contractor for the duration of construction.
7. Protection of adjacent properties. Adjacent properties shall be protected from sediment deposition by appropriate use of vegetative buffer strips, sediment barriers or filters, dikes or mulching, or by a combination of these measures and other appropriate BMPs.
8. Timing and stabilization of sediment trapping measures. Sediment ponds and traps, perimeter dikes, sediment barriers and other BMPs intended to trap sediment on-site shall be constructed as a first step in grading. These BMPs shall be functional before land disturbing activities take place. Earthen structures such as dams, dikes, and diversions shall be stabilized according to the timing indicated in item (1) above.
9. Slope Stabilization. Cut and fill slopes shall be constructed in a manner that will minimize erosion. Roughened soil surfaces are preferred to smooth surfaces. Interceptors should be constructed at the top of long, steep slopes which have significant areas above that contribute runoff. Concentrated runoff should not be allowed to flow down the face of a cut or fill slope unless contained within an adequate channel or pipe slope drain. Wherever a slope face crosses a water seepage plane, adequate drainage or other protection should be provided. In addition, slopes should be stabilized in accordance with item (1) above.
10. Controlling off-site erosion. Properties and waterways downstream from development sites shall be protected from erosion due to increases in the volume, velocity, and peak flow rate of stormwater runoff from the development site by the implementation of appropriate BMPs to minimize adverse downstream impacts.
11. Stabilization of temporary conveyance channels and outlets. All temporary on-site conveyance channels shall be designed, constructed and stabilized to prevent erosion from the expected flow velocity from a 2-year frequency, 24-hour duration storm for the post-development condition. Stabilization adequate to prevent erosion of outlets, adjacent streambanks, slopes and downstream reaches shall be provided at the outlets of all conveyance systems.
12. Storm drain inlet protection. All storm drain inlets made operable during construction shall be protected so that stormwater runoff shall not enter the conveyance system without first being filtered or otherwise treated to remove sediment. After proper written application, the requirement for inlet protection may be waived by the County on a site-specific basis when the conveyance system downstream of the inlet discharges to an appropriate sediment containment BMP and the conveyance system can be adequately cleaned following site stabilization.
13. Underground utility construction. The construction of underground utility lines shall be limited, where feasible, to no more than 500 feet of open trench at any one time. Where consistent with safety and space considerations, excavated material shall be placed on the uphill side of the trench. Dewatering devices shall discharge to an appropriate sediment trap or pond, preceded by adequate energy dissipation, prior to runoff leaving the site.
14. Constructed access routes. Wherever construction vehicle access routes intersect paved roads, provisions must be made to minimize the transport of sediment (mud) onto the paved road by use of appropriate BMPs such as a Stabilized Construction Entrance. If sediment is transported onto a road surface, the roads shall be cleaned thoroughly, as a minimum, at the end of each day. Sediment shall be removed from roads by shoveling or sweeping and be transported to a controlled sediment disposal area. Street washing shall be allowed only after sediment is removed in this manner.
15. Removal of temporary BMPs. All temporary erosion and sediment control BMPs shall be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be removed or stabilized on-site. Disturbed soil areas resulting from removal of temporary BMPs shall be permanently stabilized. The removal of temporary erosion and sediment control BMPs may not be required for those projects, such as single family plats, that will be followed by additional construction under a different permit. In these circumstances, the need for removing or retaining the measures will be evaluated on a site-specific basis.
16. Dewatering construction sites. Dewatering devices shall discharge into an appropriate sediment trap or pond, designed to accept such a discharge, preceded by adequate energy dissipation, prior to runoff leaving the site.
17. Control of pollutants other than sediment on construction sites. All pollutants other than sediment that occur on-site during construction shall be handled and legally disposed of in a manner that does not cause contamination of storm or surface waters. Pollutants of concern include, but are not limited to, fuels, lubricants, solvents, concrete bi-products and construction materials
18. Maintenance. All temporary and permanent erosion and sediment control BMPs shall be maintained and repaired as needed to assure continued performance of their intended function. All maintenance and repair shall be conducted in accordance with the Manual. The Applicant shall be responsible for assuring that any such facilities damaged during floods, storms or other adverse weather conditions are immediately returned to normal operating condition.
19. Financial liability. A performance covenant or performance surety, shall be required for all projects to ensure compliance with the approved erosion and sediment control plan, as outlined in Section 12.12 of the Kitsap County Code.



SECTION VIEW
NOT TO SCALE



ISOMETRIC VIEW

NOTES

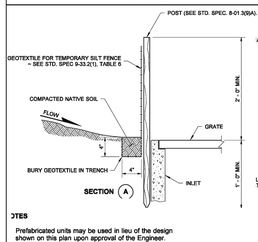
1. Size the Below Inlet Grate Device (BIGD) for the storm water structure it will service.
2. The BIGD shall have a built-in high-flow relief system (overflow bypass).
3. The retrieval system must allow removal of the BIGD without spilling the collected material.
4. Perform maintenance in accordance with Standard Specification 8-01.3(15).

STATE OF WASHINGTON
REGISTERED
LANDSCAPE ARCHITECT
MARK W. MAURER
CERTIFICATE NO. 000568

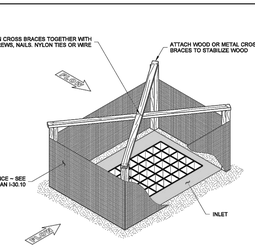
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STORM DRAIN INLET PROTECTION
STANDARD PLAN I-40.20-00

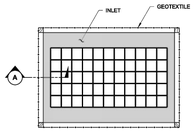
SHEET 1 OF 1 SHEET
APPROVED FOR PUBLICATION
Pasco Bakotich III 09-20-07
STATE DESIGN ENGINEER — DATE
Washington State Department of Transportation



SECTION (A)



ISOMETRIC VIEW
(FENCE FABRIC NOT SHOWN)



PLAN VIEW
(CROSS BRACES NOT SHOWN)

NOTES

Prefabricated units may be used in lieu of the design shown on this plan upon approval of the Engineer.

Structure shall be constructed such that geotextile material shall be fastened to posts creating a seam-less joint.

Ensure that ponding height of water does not cause flooding on adjacent roadways or private property.

Perform maintenance in accordance with Standard Specification 8-01.3(15).

STATE OF WASHINGTON
REGISTERED
LANDSCAPE ARCHITECT
MARK W. MAURER
CERTIFICATE NO. 000568

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TEMPORARY SILT FENCE FOR INLET PROTECTION IN UNPAVED AREAS
STANDARD PLAN I-40.10-00

SHEET 1 OF 1 SHEET
APPROVED FOR PUBLICATION
Pasco Bakotich III 09-20-07
STATE DESIGN ENGINEER — DATE
Washington State Department of Transportation

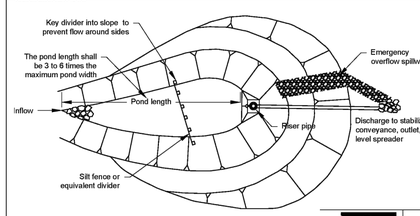


Figure II-3.28: Sediment Pond Plan View

Note: Pond may be formed by berm or by partial or complete excavation

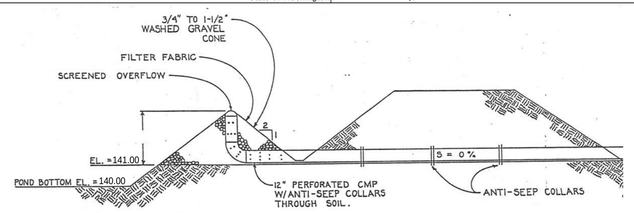
NOT TO SCALE

DEPARTMENT OF ECOLOGY
State of Washington

Sediment Pond Plan View

Revised June 2016

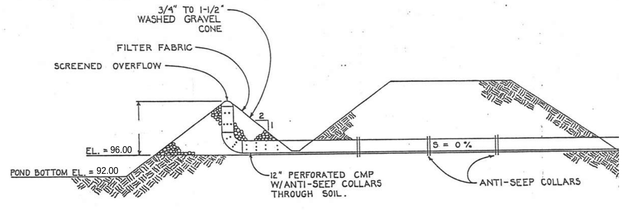
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PARK TRACT

GRAVEL CONE DETAIL

N.T.S.



STORM POND

GRAVEL CONE DETAIL

N.T.S.

BMP C233: Silt Fence

Purpose Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow. See Figure 4.19 for details on silt fence construction.

Conditions of Use Silt fence may be used downslope of all disturbed areas.

- Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Any concentrated flows must be conveyed through the drainage system to a sediment pond. The only circumstance in which overland flow can be treated solely by a silt fence, rather than by a sediment pond, is when the area draining to the fence is one acre or less and flow rates are less than 0.5 cfs.
- Silt fences should not be constructed in streams or used in V-shaped ditches. They are not an adequate method of silt control for anything deeper than sheet or overland flow.

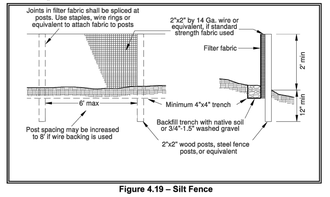


Figure 4.19 – Silt Fence

Design and Installation Specifications

- Drainage area of 1 acre or less or in combination with sediment basin in a larger site.
- Maximum slope steepness (normal (perpendicular) to fence line) 1:1.
- Maximum sheet or overland flow path length to the fence of 100 feet.
- No flows greater than 0.5 cfs.
- The geotextile used shall meet the following standards. All geotextile properties listed below are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values

Table 4.10 Geotextile Standards

Polymeric Mesh AOS (ASTM D4751)	0.60 mm maximum for slit film wovens (#30 sieve). 0.30 mm maximum for all other geotextile types (#50 sieve). 0.15 mm minimum for all fabric types (#100 sieve).
Water Permittivity (ASTM D4491)	0.02 sec^{-1} minimum
Grab Tensile Strength (ASTM D4632)	180 lbs. Minimum for extra strength fabric. 100 lbs minimum for standard strength fabric.
Grab Tensile Strength (ASTM D4632)	30% maximum
Ultraviolet Resistance (ASTM D4355)	70% minimum

- Standard strength fabrics shall be supported with wire mesh, chicken wire, 2-inch x 2-inch wire, safety fence, or jute mesh to increase the strength of the fabric. Silt fence materials are available that have synthetic mesh backing attached.
- Filter fabric material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0°F. to 120°F.
- 100 percent biodegradable silt fence is available that is strong, long lasting, and can be left in place after the project is completed, if permitted by local regulations.
- Standard Notes for construction plans and specifications follow. Refer to Figure 4.19 for standard silt fence details.

The contractor shall install and maintain temporary silt fences at the locations shown in the Plans. The silt fences shall be constructed in the areas of clearing, grading, or drainage prior to starting those activities. A silt fence shall not be considered temporary if the silt fence must function beyond the life of the contract. The silt fence shall prevent soil carried by runoff water from going beneath, through, or over the top of the silt fence, but shall allow the water to pass through the fence.

The minimum height of the top of silt fence shall be 2 feet and the maximum height shall be 2½ feet above the original ground surface.

The geotextile shall be sewn together at the point of manufacture, or at an approved location as determined by the Engineer, to form geotextile lengths as required. All sewn seams shall be located at a support post. Alternatively, two sections of silt fence can be overlapped, provided the Contractor can demonstrate, to the satisfaction of the Engineer, that the overlap is long enough and that the adjacent fence sections are close enough together to prevent silt laden water from escaping through the fence at the overlap.

BMP C105: Stabilized Construction Entrance

Purpose Construction entrances are stabilized to reduce the amount of sediment transported onto paved roads by vehicles or equipment by constructing a stabilized pad of quarry spalls at entrances to construction sites.

Conditions of Use Construction entrances shall be stabilized wherever traffic will be leaving a construction site and traveling on paved roads or other paved areas within 1,000 feet of the site.

On large commercial, highway, and road projects, the designer should include enough extra materials in the contract to allow for additional stabilized entrances not shown in the initial Construction SWPPP. It is difficult to determine exactly where access to these projects will take place; additional materials will enable the contractor to install them where needed.

Design and Installation Specifications

- See Figure 4.2 for details. Note: the 100' minimum length of the entrance shall be reduced to the maximum practicable size when the size or configuration of the site does not allow the full length (100').
- A separation geotextile shall be placed under the spalls to prevent fine sediment from pumping up into the rock pad. The geotextile shall meet the following standards:

Grab Tensile Strength (ASTM D4751)	200 psi min.
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

- Consider early installation of the first lift of asphalt in areas that will paved; this can be used as a stabilized entrance. Also consider the installation of excess concrete as a stabilized entrance. During large concrete pours, excess concrete is often available for this purpose.
- Hog fuel (wood-based mulch) may be substituted for or combined with quarry spalls in areas that will not be used for permanent roads. Hog fuel is generally less effective at stabilizing construction entrances and should be used only at sites where the amount of traffic is very limited. Hog fuel is not recommended for entrance stabilization in urban areas. The effectiveness of hog fuel is highly variable and it generally requires more maintenance than quarry spalls. The inspector may at any time require the use of quarry spalls if the hog fuel is not preventing sediment from being tracked onto pavement or if the hog fuel is being carried onto pavement. Hog fuel is prohibited in permanent roadbeds because organics in the subgrade soils cause degradation of the subgrade support over time.
- Fencing (see BMPs C103 and C104) shall be installed as necessary to
- Whenever possible, the entrance shall be constructed on a firm, compacted subgrade. This can substantially increase the effectiveness of the pad and reduce the need for maintenance.

Maintenance Standards

- Quarry spalls (or hog fuel) shall be added if the pad is no longer in accordance with the specifications.
- If the entrance is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash.
- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction entrance(s), fencing (see BMPs C103 and C104) shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

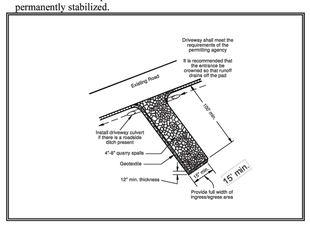


Figure 4.2 – Stabilized Construction Entrance

STANDARD EROSION CONTROL NOTES

THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.

THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED BY THE SURVEYOR IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.

THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.

THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITH 48 HOURS FOLLOWING A MAJOR STORM EVENT.

AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A TRAPPED 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.

STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

TEMPORARY EROSION AND SEDIMENTATION CONTROL MAINTENANCE REQUIREMENTS

1. *EROSION AND SEDIMENTATION CONTROL FACILITIES SHALL BE INSPECTED AFTER EACH STORM EVENT AND DAILY DURING PROLONGED RAINFALL.*
2. *NECESSARY REPAIRS OR REPLACEMENT OF FACILITIES SHALL BE ACCOMPLISHED PROMPTLY.*
3. *SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR WHEN THE LEVEL OF DEPOSITION REACHES APPROXIMATELY ONE-HALF THE MAXIMUM POTENTIAL DEPTH.*
4. *SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE ESC FACILITIES ARE NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.*

PLAT OF RACCOON TOWN

STORM WATER POLLUTION PREVENTION PLAN NOTES & DETAILS

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
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1-5-26

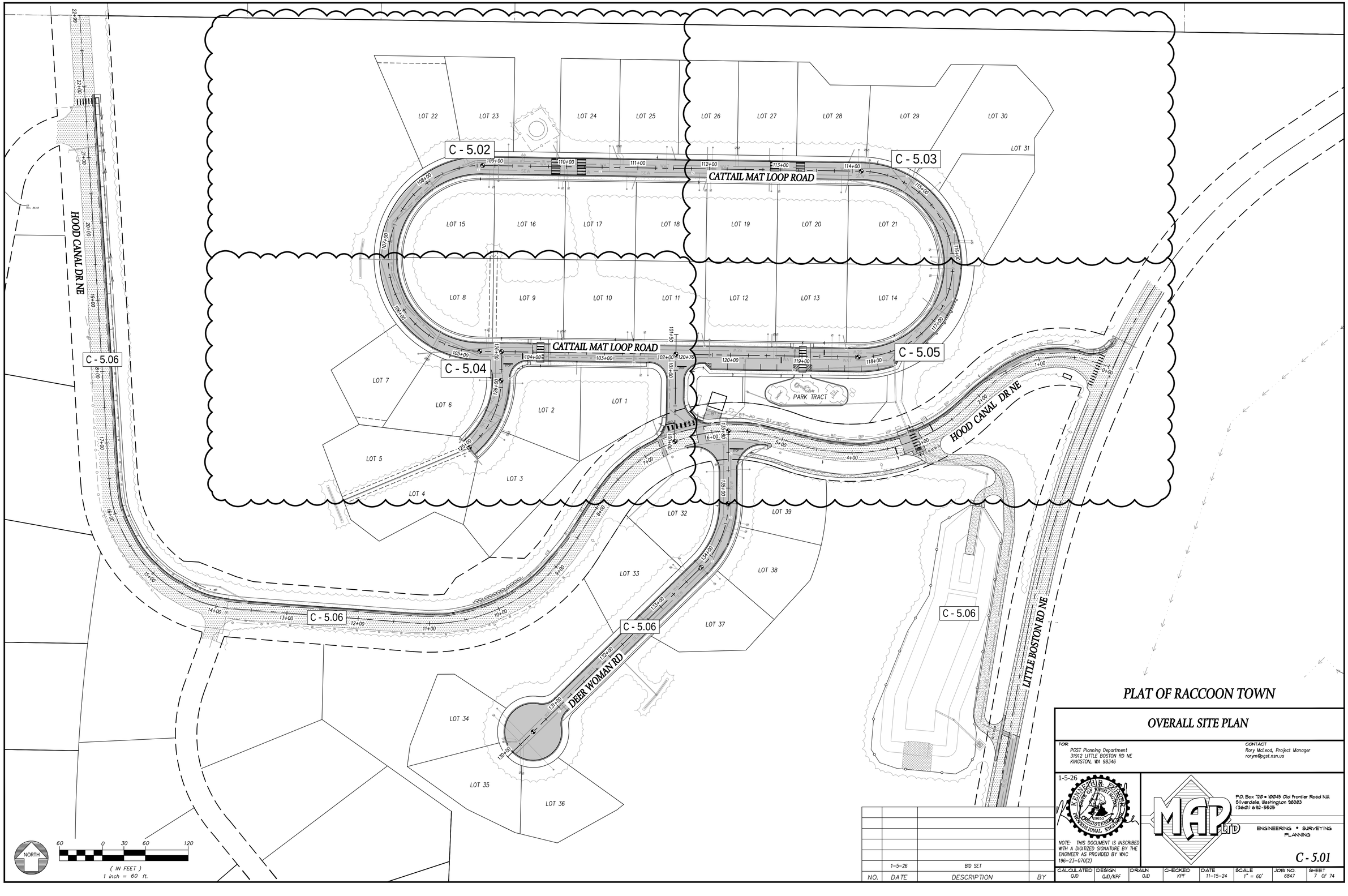
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QJD	QJD/KPF	QJD	KPF	11-15-24	--	6847	6 OF 74



PLAT OF RACCOON TOWN

OVERALL SITE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. EVANSON — STATE OF WASHINGTON — 22993 — REGISTERED PROFESSIONAL ENGINEER

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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPE	QJD	KPE	11-15-24	1" = 60'	6847	7 OF 74

20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

NORTH

LOT 22 LOT 23 LOT 24 LOT 25 LOT 26 LOT 27

EX. WATER TANK

CENTERLINE MONUMENT
STA=108+82.82

1.5' ROLLED CURB

TRAFFIC CALMING SPEED HUMP (SEE DETAIL)

WB-1(24"x24")
SPEED BUMP
15 MPH
STA=111+27.2, 15.0' L

C
SEE C-5.07

12' LANE WIDTH

STA 107+99.0 VERTICAL CURB TO STA 108+03.0 ROLLED CURB TRANSITION – SEE DETAIL

ROLLED CURB

VERTICAL CURB

12' 24' 12' 100'

CATTAIL MAT LOOP RD

109+00 110+00 111+00 112+00

SEE SITE PLAN – SHEET C-5.03

100'

WB-1(24"x24")
SPEED BUMP
15 MPH
STA=108+79.2, 19.0' R

WB-1(24"x24")
SPEED BUMP
15 MPH
STA=111+85.4, 19.0' R

5' SIDEWALK

1.5' ROLLED CURB

LOT 15 LOT 16 LOT 17 LOT 18 LOT 19

108+00

107+00

1.5' ROLLED CURB

1.5' VERTICAL CURB

LOT 8 LOT 9 LOT 10

CENTERLINE MONUMENT
STA=104+74.42

CENTERLINE MONUMENT
STA=104+44.09

1.5' ROLLED CURB

24.5' VERTICAL CURB

1.5' ROLLED CURB

STA 105+90.9 VERTICAL CURB TO STA 105+94.9 ROLLED CURB TRANSITION – SEE DETAIL

VERTICAL CURB

ROLLED CURB

1.5' ROLLED CURB

105+00 104+00 103+00

SEE SITE PLAN – SHEET C-5.04

CATTAIL MAT LOOP RD

LOT 7

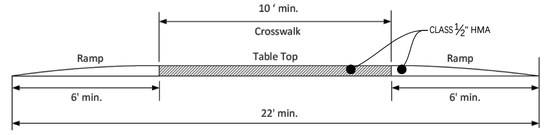
STOP

DETECTABLE WARNING SURFACE

RAISED CROSSWALK REQUIREMENTS

- Existing guidelines for marked crossings, including accessibility criteria, should be followed (see Section 1510.09(2)(b) - Marked Crossings).
- The width of the tabletop must be a minimum 10 feet with detectable warning surfaces on both ends.
- The entrance and exit ramp length must be a minimum of 6 feet or 4% to 8.3% slope (whichever is longer) with a parabolic cross section.

Exhibit 1510-25 Raised Crosswalk Cross-Section



- For streets with existing curb and sidewalk:
  - The height should match the sidewalk so pedestrians can cross at a constant grade.
  - If on-street parking is present, include a curb extension to make waiting pedestrians and the raised crosswalk itself more visible (see Section 1510.09(5) – Curb Extensions).
- For streets without existing curb and sidewalk:
  - The height should be 3-4 inches.
  - Ramps meeting the accessibility criteria must be installed on both ends of the tabletop.
  - Flexible delineators should be considered to prevent vehicles from swerving into the shoulder to avoid the speed table.
- Signage and pavement markings should follow Section 1510.09(2)(b) – Marked Crossings and MUTCD guidelines, specifically Section 3b.26 – Speed Hump Markings.

PLAT OF RACCOON TOWN

SITE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. PHILLIPS
STATE OF WASHINGTON
19653
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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	8 OF 74

LOT 25 LOT 26 LOT 27 LOT 28 LOT 29 LOT 30 LOT 31

LOT 18 LOT 19 LOT 20 LOT 21

LOT 11 LOT 12 LOT 13 LOT 14

WB-1(24"x24") SPEED BUMP 15 MPH
STA=111+27.2, 15.0' L

WB-1(24"x24") SPEED BUMP 15 MPH
STA=111+85.4, 19.0' R

WB-1(24"x24") SPEED BUMP 15 MPH
STA=114+33.4, 15.0' L

TRAFFIC CALMING SPEED HUMP (SEE DETAIL)

12' LANE WIDTH
1.5' ROLLED CURB
5' SIDEWALK
1.5' ROLLED CURB
12' LANE WIDTH

12' 24' 12'

111+00 SEE SITE PLAN – SHEET C-5.02 112+00 113+00 114+00 115+00 116+00 117+00 118+00 119+00 120+00

100' 100' 100'

CATTAIL MAT LOOP RD

C SEE C-5.07

CENTERLINE MONUMENT
STA=114+12.64

VERTICAL CURB TO ROLLED CURB TRANSITION – SEE DETAIL

ROLLED CURB
VERTICAL CURB

100 LF ~ BEAM GUARD RAIL w/ 6' POSTS – SEE DETAIL

1.5' ROLLED CURB

CENTERLINE MONUMENT
STA=118+21.04

DETECTABLE WARNING SURFACE
24.5'
VERTICAL CURB
B SEE C-5.07

RAISED CROSSWALK SEE DETAIL–BELOW

SEE SITE PLAN – SHEET C-5.05

DETECTABLE WARNING SURFACE

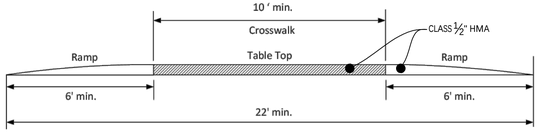
20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

NORTH

RAISED CROSSWALK REQUIREMENTS

- Existing guidelines for marked crossings, including accessibility criteria, should be followed (see Section 1510.09(2)(b) - Marked Crossings).
- The width of the tabletop must be a minimum 10 feet with detectable warning surfaces on both ends.
- The entrance and exit ramp length must be a minimum of 6 feet or 4% to 8.3% slope (whichever is longer) with a parabolic cross section.

Exhibit 1510-25 Raised Crosswalk Cross-Section



- For streets with existing curb and sidewalk:
  - The height should match the sidewalk so pedestrians can cross at a constant grade.
  - If on-street parking is present, include a curb extension to make waiting pedestrians and the raised crosswalk itself more visible (see Section 1510.09(5) – Curb Extensions).
- For streets without existing curb and sidewalk:
  - The height should be 3-4 inches.
  - Ramps meeting the accessibility criteria must be installed on both ends of the tabletop.
  - Flexible delineators should be considered to prevent vehicles from swerving into the shoulder to avoid the speed table.
- Signage and pavement markings should follow Section 1510.09(2)(b) – Marked Crossings and MUTCD guidelines, specifically Section 3b.26 – Speed Hump Markings.

PLAT OF RACCOON TOWN

SITE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	9 OF 74

SEE SITE PLAN – SHEET C–5.02

CATTAIL MAT LOOP RD

1.5' VERTICAL CURB

C SEE C-5.07

1.5' ROLLED CURB

VERTICAL CURB TO ROLLED CURB TRANSITION – SEE DETAIL

LOT 8

LOT 9

LOT 10

LOT 11

LOT 12

LOT 7

LOT 6

LOT 5

LOT 4

LOT 3

LOT 2

LOT 1

LOT 32

CENTERLINE MONUMENT
STA=104+44.09

CENTERLINE MONUMENT
STA=104+74.42

D3–1 STREET NAME SIGN (4" MIN. LETTERING HEIGHT)
COMB COURT NE
STA=104+44.1, 19.0' R

24.5' VERTICAL CURB w/ ROLLED CURB TRANSITIONS – SEE DETAIL

DETECTABLE WARNING SURFACE

RAISED CROSSWALK SEE DETAIL–BELOW

24.5' VERTICAL CURB w/ ROLLED CURB TRANSITIONS – SEE DETAIL

105+00 | 104+50 | 104+00 | 103+00 | 102+00 | 101+50 | 120+00 | 120+76

100' | 25' | 20' | R25'

STOP

AHEAD ③ SEE DETAIL SHEET C–6.16
STA=105+12.8, 14.0' L

NO TURN AROUND
STA=104+59.09

CENTERLINE MONUMENT
STA=126+09.58

126+00

C SEE C-5.07

STOP HERE FOR ② SEE DETAIL SHEET C–6.16
STA=104+14.6, 20.6' L

① SEE DETAIL SHEET C–6.16
STA=103+89.6, 19.0' R

STOP HERE FOR ② SEE DETAIL SHEET C–6.16
STA=103+59.6, 19.0' R

R2–1 (18"x24")
SPEED LIMIT 25
STA=102+85.0, 19.0' R

AHEAD ③ SEE DETAIL SHEET C–6.16
STA=102+59.6, 19.0' R

① SEE DETAIL SHEET C–6.16
STA=103+89.6, 19.0' L

12' LANE WIDTH | 1.5' ROLLED CURB | 5' SIDEWALK

VERTICAL CURB TO ROLLED CURB TRANSITION – SEE DETAIL

CENTERLINE MONUMENT
STA=100+00.00

R1–1 (30"x30")
STOP
STA=120+52.0, 23.8' L

AHEAD ③ SEE DETAIL SHEET C–6.16
STA=120+38.2, 18.5' L

CATTAIL MAT LOOP RD

SEE SITE PLAN – SHEET C–5.05

18" THERMO–PLASTIC STOP BAR

R2–1 (18"x24")
SPEED LIMIT 25
STA=119+96.4, 27.5' L

5' SIDEWALK

EXISTING BOOSTER STATION

R1–1 (30"x30")
STOP
STA=104+19.4, 23.7' L

18" THERMO–PLASTIC STOP BAR

SEE DETAIL BELOW

CENTERLINE MONUMENT
STA=125+02.94

COMB COURT

1.5' ROLLED CURB | 5' SIDEWALK

125+00

6+00 | 5+00 | 4+00

CENTERLINE MONUMENT
STA=5+76.96

SEE SITE PLAN – SHEET C–5.06

CENTERLINE MONUMENT
STA=6+53.99

DEER WOMAN ROAD NE

153+42

5' WIDE CEMENT CONCRETE CONCRETE SIDEWALK PER WSDOT PLAN F–30.10–04 (TYP.)

CEMENT CONCRETE TRAFFIC CURB AND GUTTER PER WSDOT PLAN F–10.12–04 (TYP.)

HOOD CANAL DRIVE NE

SEE SITE PLAN – SHEET C–5.06

20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

NORTH

DETAIL
SCALE: 1" = 10'

18" THERMO–PLASTIC STOP BAR

SINGLE DIRECTION CURB RAMP PER WSDOT STANDARD PLAN F–40.12–03

R1–1 (30"x30")
STOP
STA=100+24.7, 20.3' L

D3–1 STREET NAME SIGN (4" MIN. LETTERING HEIGHT)
CATTAIL MAT LOOP RD
STA=100+38.2, 32.0' R

EX. BOOSTER STATION

25.2'

12.2'

7.1'

PARALLEL CURB RAMP w/ DETECTABLE WARNING PER WSDOT STANDARD PLAN F–40.12–03

CROSSWALK LAYOUT PER WSDOT STANDARD PLAN M–15.10–02

DEPRESSED CURB AND GUTTER PER WSDOT STANDARD PLAN F–10.12–04

SINGLE DIRECTION CURB RAMP PER WSDOT STANDARD PLAN F–40.12–03

PARALLEL CURB RAMP w/ DETECTABLE WARNING PER WSDOT STANDARD PLAN F–40.12–03

CENTERLINE MONUMENT
STA=6+53.99

CENTERLINE MONUMENT
STA=5+76.96

25.0' | 10.0'

R35' | R25'

100+00 | 125+00

STOP

PLAT OF RACCOON TOWN

SITE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

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C - 5.04

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	10 OF 74

LOT 19

LOT 20

LOT 21

LOT 12

LOT 13

LOT 14

LOT 32

LOT 39

SEE SITE PLAN – SHEET C-5.03

5' SIDEWALK

1.5' ROLLED CURB

12' LANE WIDTH

12' LANE WIDTH

1.5' ROLLED CURB

ROLLED CURB

VERTICAL CURB

1.5' VERTICAL CURB

VERTICAL CURB TO ROLLED CURB TRANSITION – SEE DETAIL

116+00

117+00

100

100 LF ~ BEAM GUARD RAIL w/ 6' POSTS – SEE DETAIL

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

NORTH

R1-1 (30"x30")

STOP

STA=120+52.0, 23.8' L

AHEAD

3

SEE DETAIL SHEET C-6.16

STA=120+38.2, 18.5' L

1

SEE DETAIL SHEET C-6.16

STA=118+99.0, 19.0' R

STOP HERE FOR

2

SEE DETAIL SHEET C-6.16

STA=118+69.0, 19.0' R

AHEAD

3

SEE DETAIL SHEET C-6.16

STA=117+60.1, 19.0' R

24.5' VERTICAL CURB w/ ROLLED CURB TRANSITIONS – SEE DETAIL

B

SEE C-5.07

SEE SITE PLAN – SHEET C-5.04

CATTAIL MAT LOOP RD

RAISED CROSSWALK SEE DETAIL–BELOW

DETECTABLE WARNING SURFACE

100+50

100+00

120+76

120+00

119+00

118+00

109'

25'

100'

R25'

STOP

5' SIDEWALK

EX. BOOSTER STATION

R2-1 (18"x24")

SPEED LIMIT 25

STA=119+96.4, 27.5' L

STOP HERE FOR

2

SEE DETAIL SHEET C-6.16

STA=119+29.0, 28.0' L

B

SEE C-5.07

SEE SHEET C-6.11 FOR PARK TRACT PLAN

1

SEE DETAIL SHEET C-6.16

STA=118+99.0, 27.0' L

1

SEE DETAIL SHEET C-6.16

STA=3+10.1, 20.0' R

STOP HERE FOR

2

SEE DETAIL SHEET C-6.16

STA=2+81.1, 20.0' R

AHEAD

3

SEE DETAIL SHEET C-6.16

STA=1+81.1, 20.0' R

A

SEE C-5.07

A

SEE C-5.07

PARALLEL CROSSWALK w/ DETECTABLE WARNING PER WSDOT STANDARD PLAN F-45.10-02

CEMENT CONCRETE TRAFFIC CURB AND GUTTER PER WSDOT PLAN F-10.12-04 (TYP.)

THERMO-PLASTIC CROSSWALK

EX. BUS STOP SHELTER

1+00

0+00

HOOD CANAL DRIVE NE

24.5'

LITTLE BOSTON ROAD NE

PLAT OF RACCOON TOWN

DETECTABLE WARNING SURFACE

THERMOPLASTIC CROSSWALK SEE GRADING DETAIL SHEET C-6.16

TYPE 1 REMOVABLE BOLLARD @ 5' O/C

DETECTABLE WARNING SURFACE

3+00

25'

100'

4+00

5+00

6+00

100+00

R25'

STOP

18" THERMO-PLASTIC STOP BAR

DEER WOMAN ROAD NE

135+00

R1-1 (30"x30")

STOP

STA=135+49.8, 33.0' R

R2-1 (18"x24")

SPEED LIMIT 25

STA=134+75.0, 15.0' L

SEE SITE PLAN – SHEET C-5.06

AHEAD

3

SEE DETAIL SHEET C-6.16

STA=4+39.1, 16.0' L

STOP HERE FOR

2

SEE DETAIL SHEET C-6.16

STA=3+39.1, 16.0' L

1

SEE DETAIL SHEET C-6.16

STA=3+10.1, 22.0' L

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1-5-26

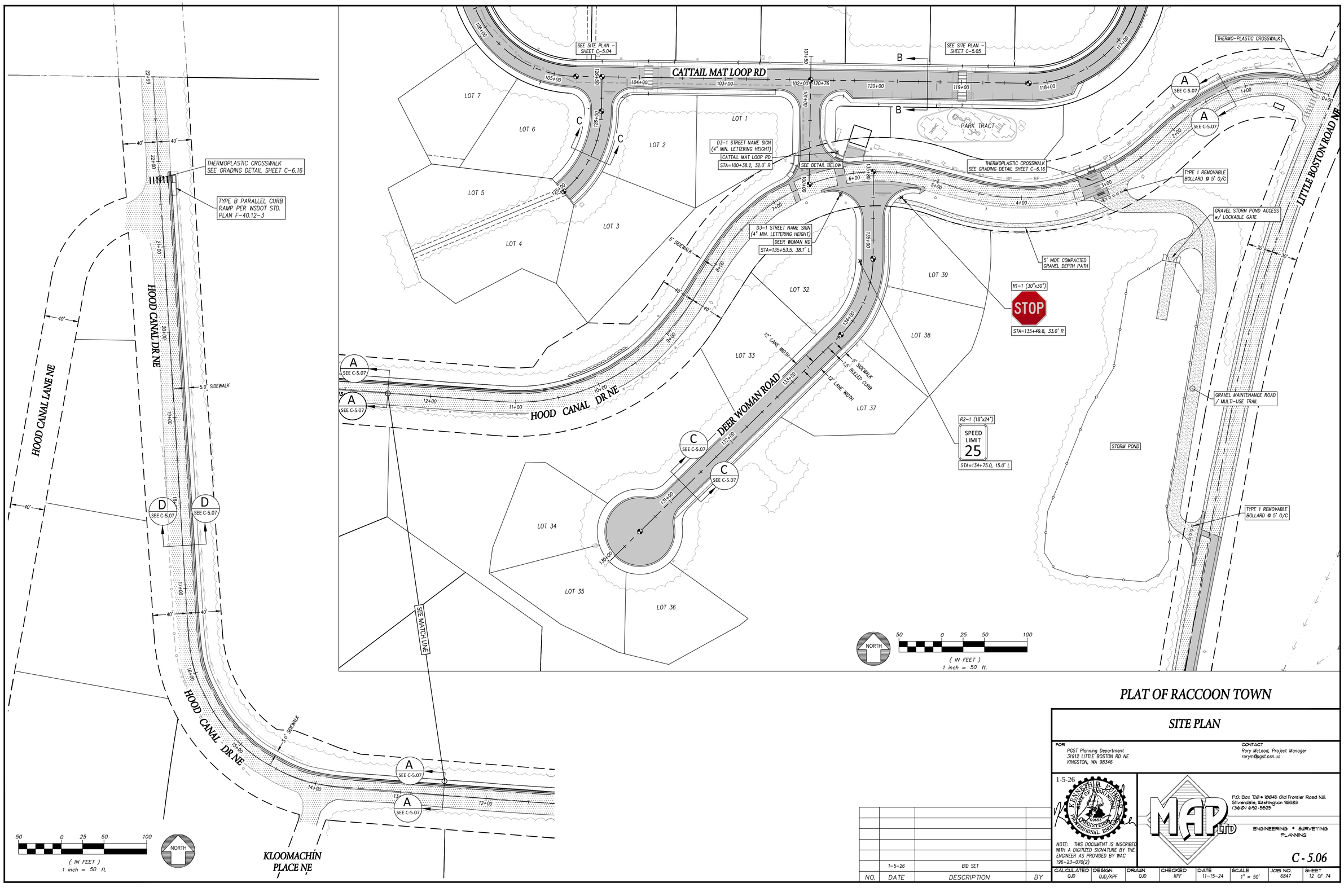
KENNETH P. FRENCH
STATE OF WASHINGTON
23552
REGISTERED
PROFESSIONAL ENGINEER

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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	11 OF 74



PLAT OF RACCOON TOWN

SITE PLAN

FOR
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31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. PATTERSON — STATE OF WASHINGTON — 22855 — REGISTERED PROFESSIONAL ENGINEER

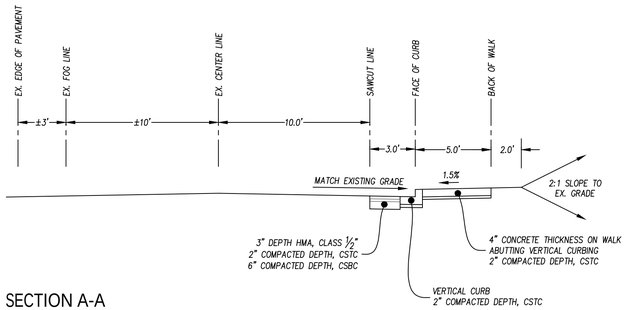
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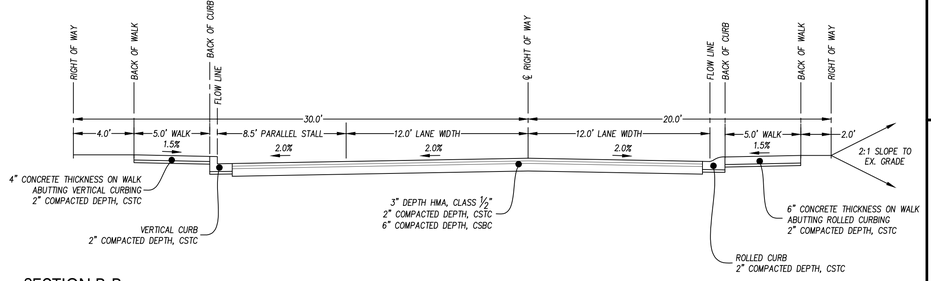
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	1-5-26	BID SET	

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
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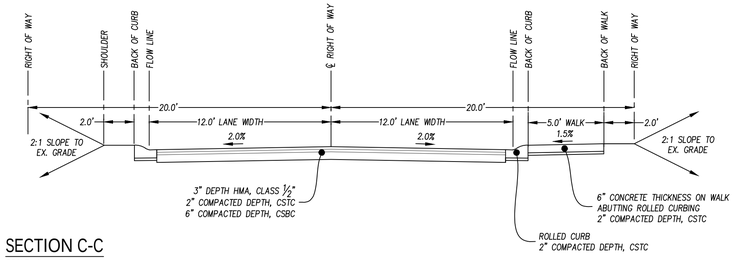
SECTION A-A

SCALE: 1" = 5'



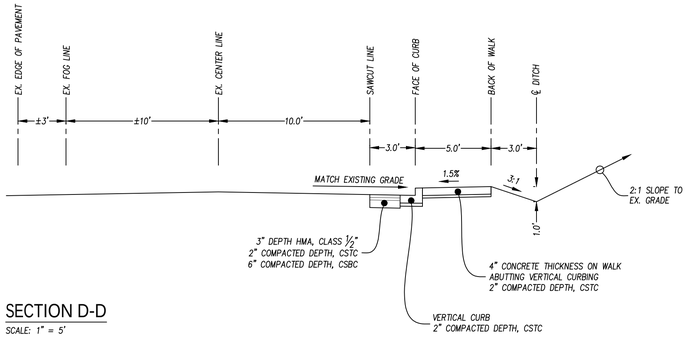
SECTION B-B

SCALE: 1" = 5'



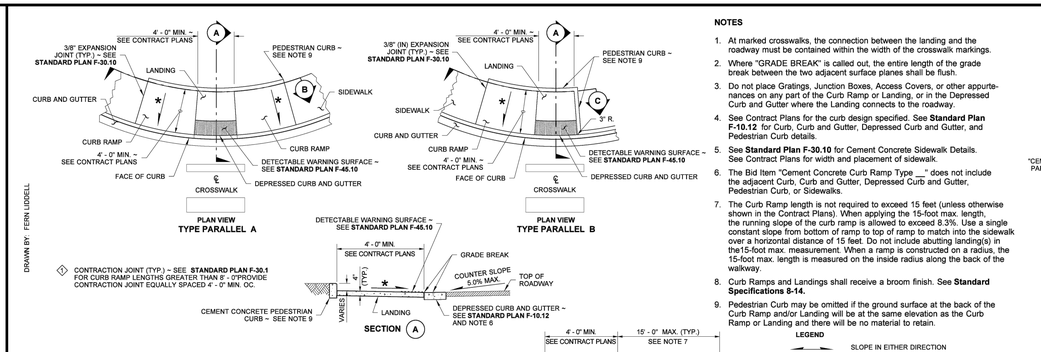
SECTION C-C

SCALE: 1" = 5'



SECTION D-D

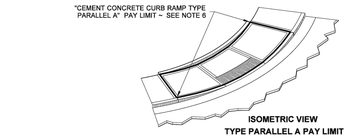
SCALE: 1" = 5'



NOTES

1. At marked crosswalks, the connection between the landing and the roadway must be contained within the width of the crosswalk markings.
2. Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
3. Do not place Gratings, Junction Boxes, Access Covers, or other appurtenances on any part of the Curb Ramp or Landing, or in the Depressed Curb and Gutter where the Landing connects to the roadway.
4. See Contract Plans for the curb design specified. See **Standard Plan F-10.12** for Curb, Curb and Gutter, Depressed Curb and Gutter, and Pedestrian Curb details.
5. See **Standard Plan F-30.10** for Cement Concrete Sidewalk Details. See Contract Plans for width and placement of sidewalk.
6. The Bid Item "Cement Concrete Curb Ramp Type ___" does not include the adjacent Curb, Curb and Gutter, Depressed Curb and Gutter, Pedestrian Curb, or Sidewalks.
7. The Curb Ramp length is not required to exceed 15 feet (unless otherwise shown in the Contract Plans). When applying the 15-foot max. length, the running slope of the curb ramp is allowed to exceed 8.3%. Use a single constant slope from bottom of ramp to top of ramp to match into the sidewalk over a horizontal distance of 15 feet. Do not include abutting landing(s) in the15-foot max. measurement. When a ramp is constructed on a radius, the 15-foot max. length is measured on the inside radius along the back of the walkway.
8. Curb Ramps and Landings shall receive a broom finish. See **Standard Specifications 8-14.**
9. Pedestrian Curb may be omitted if the ground surface at the back of the Curb Ramp and/or Landing will be at the same elevation as the Curb Ramp or Landing and there will be no material to retain.

LEGEND
- SLOPE IN EITHER DIRECTION
- ★ 1.5% OR FLATTER RECOMMENDED FOR DESIGN/FORMWORK (2% MAX.)
- ★★ 7.5% OR FLATTER RECOMMENDED FOR DESIGN/FORMWORK (8.3% MAX.) ~ SEE NOTE 7



R. SCOTT ZELLER — STATE OF WASHINGTON — 29680 — REGISTERED PROFESSIONAL ENGINEER

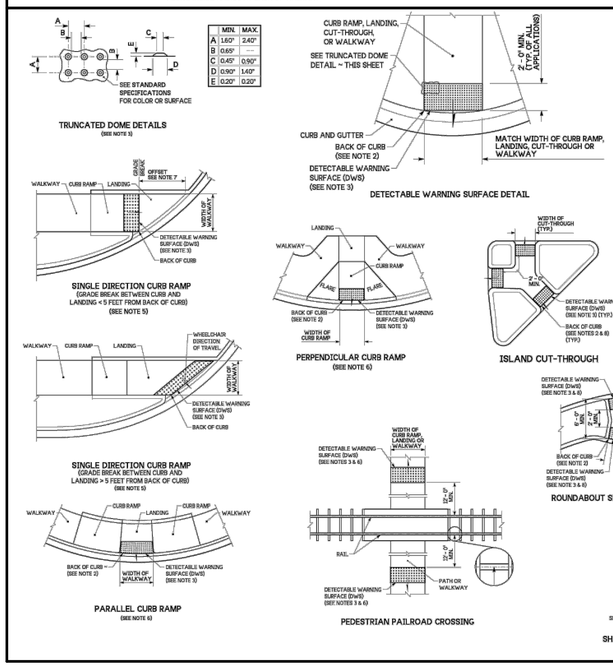
Zeller, Scott
Jun 24 2016 7:19 AM

PARALLEL CURB RAMP

STANDARD PLAN F-40.12-03

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Carpenter, Jeff
Jun 29 2016 2:27 PM
STATE DESIGN ENGINEER
Washington State Department of Transportation



NOTES:

1. Permanent Detectable Warning Surfaces (DWS) shall extend the full width of the curb ramp, landing, or other roadway entrance as applicable. Exception: If the manufacturer of the DWS requires a concrete border around the DWS, a variance of up to 2" (in) on each side of the DWS is permitted.
2. Permanent Detectable Warning Surfaces (DWS) shall be placed on a minimum 4" (in) thick concrete pad. The DWS panel shall be placed adjacent to the back of the curb and with no more than a 2" (in) gap between the DWS and the back of the curb measured at the center of the DWS panel. Exception: If the Manufacturer of the selected DWS requires a concrete border around the DWS, a variance of up to 2" (in) from the back of the curb is permitted (measured at the leading corners of the DWS panel).
3. The rows of truncated domes shall be aligned to be parallel to the direction of travel, and perpendicular to the grade break at the back of curb.
4. If curb and gutter are not present, such as a shared-use path connection, the Detectable Warning Surface shall be placed at the pavement edge.
5. See **Standard Plans** for sidewalk and curb ramp details.
6. If a curb ramp is required, the location of the Detectable Warning Surface must be at the bottom of the ramp and within the required distance from the rail crossing.
7. When the grade break between the curb ramp and the landing is less than or equal to 5 feet from the back of curb at all points, place the Detectable Warning Surface on the bottom of the curb ramp directly above the grade break.
8. Glued or stick down Detectable Warning Surfaces are allowed only for temporary work zone applications.

LEGEND
- DIRECTION OF TRAVEL

JOANNA W. LOUGHLIN — STATE OF WASHINGTON — 42055 — REGISTERED PROFESSIONAL ENGINEER

Jun 4, 2024

DETECTABLE WARNING SURFACE

STANDARD PLAN F-45.10-05

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Mark O. Reams
Jun 4, 2024
STATE DESIGN ENGINEER
Washington State Department of Transportation

PLAT OF RACCOON TOWN

SITE NOTES & DETAILS

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. FUHRMAN — STATE OF WASHINGTON — 42053 — REGISTERED PROFESSIONAL ENGINEER

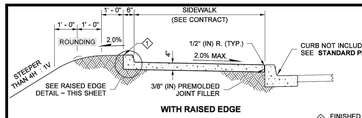
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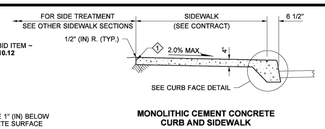
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NO.	DATE	DESCRIPTION	BY
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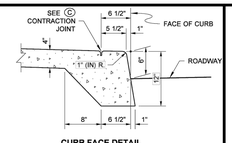
CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	-	6847	13 OF 74



WITH RAISED EDGE



MONOLITHIC CEMENT CONCRETE CURB AND SIDEWALK



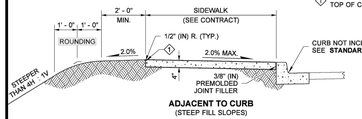
CURB FACE DETAIL

EXTEND SIDEWALK TRANSVERSE EXPANSION JOINTS TO INCLUDE CURB (FULL DEPTH)

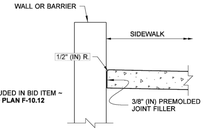
1 FINISHED GRADE 1" (IN) BELOW TOP OF CONCRETE SURFACE

NOTE

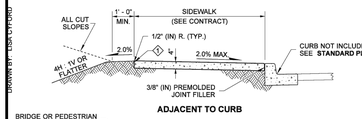
1. Gratings, Access Covers, Junction Boxes, Cable Vaults, Pull Boxes and other appurtenances within the sidewalk must have slip resistant surfaces, be flush with surface, and match grade of the sidewalk.



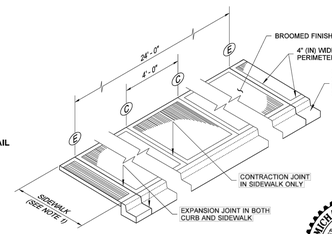
ADJACENT TO CURB
(STEEP FILL SLOPES)



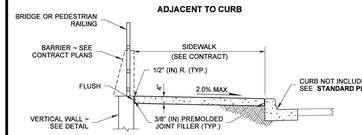
SIDEWALK ADJACENT TO WALL DETAIL



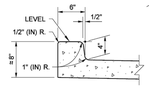
ADJACENT TO CURB



ISOMETRIC VIEW
JOINT AND FINISH DETAIL

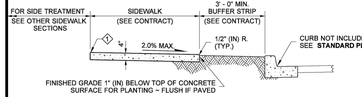


ADJACENT TO CURB AND RAILING OR WALL

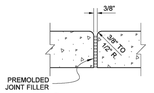


RAISED EDGE DETAIL

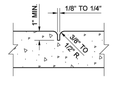
EXTEND SIDEWALK TRANSVERSE JOINTS TO INCLUDE RAISED EDGE



ADJACENT TO BUFFER STRIP



(E) EXPANSION JOINT



(C) CONTRACTION JOINT

NOTE:

2" OF CSTC COMPACTED TO FIRM AND UNYIELDING CONDITION UNDER ALL SIDEWALKS.

SIDEWALKS ABUTTING ROLLED CURBING TO BE 6" MINIMUM CONCRETE THICKNESS.

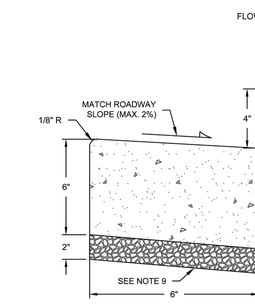
Michael S Fleming
Digitally signed by Michael S Fleming
Date: 2020.09.24 07:40:16 -07'00'

CEMENT CONCRETE SIDEWALK

STANDARD PLAN F-30.10-04

SHEET 1 OF 1 SHEET

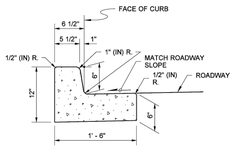
APPROVED FOR PUBLICATION
Date: 2020.09.25
15:43:50 -07'00'
STATE DESIGN ENGINEER
Washington State Department of Transportation



NOTES:

1. FORMS SHALL BE TRUE TO LINE AND GRADE AND SECURELY STAKED.
2. EXPANSION JOINTS SHALL BE PLACED ADJACENT TO CATCH BASINS, INLETS, CURB RETURNS, ALLEYS, OR A MAXIMUM SPACING OF 20 FEET. EXPANSION JOINTS SHALL ALSO BE PLACED BETWEEN CURB AND GUTTER AND SIDEWALK.
3. THRU JOINTS SHALL BE 3/8" WIDE PRE-MOLDED JOINT FILLER.
4. ALL JOINTS SHALL BE CLEANED AND EDGED.
5. CONCRETE SHALL HAVE A COMPRESSION STRENGTH OF 4,000 PSI.
6. STEEL FORMS ONLY MAY BE USED ON TANGENT SECTIONS, WOOD FORMS MAY BE USED ON CURVED SECTIONS.
7. FINISH SHALL BE LIGHT BROOM FINISH, PERPENDICULAR TO CURB FACE.
8. THE FINISHED CONCRETE SHALL BE COVERED BY CURING COMPOUND. WATERPROOF PAPER OR PLASTIC SHEETING IN THE EVENT OF RAIN OR OTHER INCLEMENT WEATHER. CURING TIME SHALL BE AS SPECIFIED.
9. 2" OF CRUSHED SURFACING TOP COURSE COMPACTED TO FIRM AND UNYIELDING CONDITION.
10. ALL SIDEWALKS POURED BEHIND ROLLED CURB IN RESIDENTIAL APPLICATIONS SHALL BE AN INCREASED DEPTH OF SIX INCHES (6") THICK.

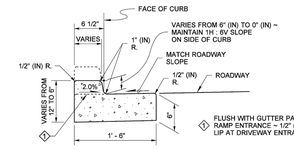
CONCRETE ROLLED CURB AND GUTTER



CEMENT CONCRETE TRAFFIC CURB AND GUTTER

NOTE

1. See **Standard Plan F-30.10** for Curb Expansion and Contraction Joint spacing. See **Standard Specification, Sections 8-04 and 9-04** for additional requirements.



DEPRESSED CURB AND GUTTER SECTION
AT CURB RAMPS AND

NOTE:
2" OF CSTC COMPACTED TO FIRM AND UNYIELDING CONDITION UNDER ALL CURBING

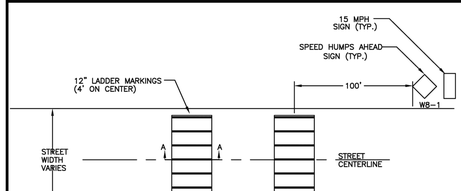
Michael S Fleming
Digitally signed by Michael S Fleming
Date: 2020.09.24 07:39:36 -07'00'

CEMENT CONCRETE CURBS

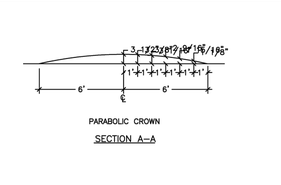
STANDARD PLAN F-10.12-04

SHEET 1 OF 1 SHEET

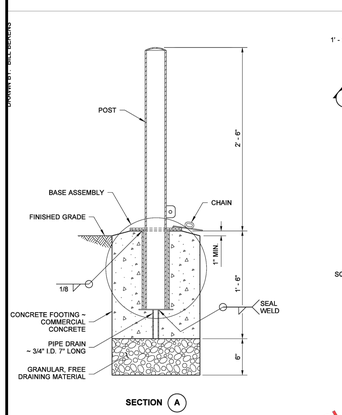
APPROVED FOR PUBLICATION
Date: 2020.09.24
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STATE DESIGN ENGINEER
Washington State Department of Transportation



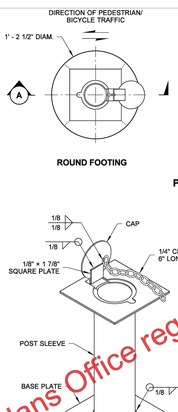
TRAFFIC CALMING SPEED HUMP



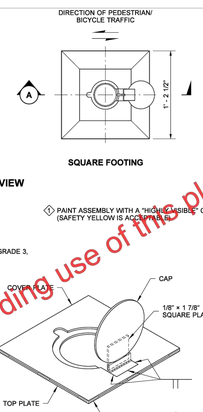
SPEED HUMP DETAIL
N.T.S.



SECTION (A)

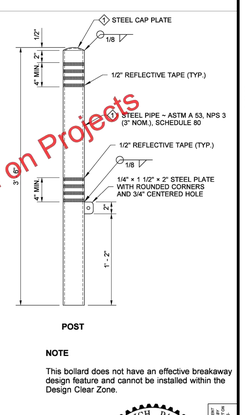


ROUND FOOTING



SQUARE FOOTING

PLAN VIEW



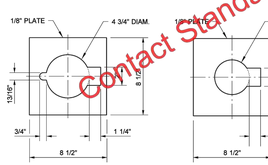
POST

NOTE

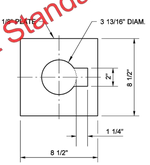
This bollard does not have an effective breakaway design feature and cannot be installed within the Design Clear Zone.

1 PAINT ASSEMBLY WITH A "HIGHLY VISIBLE" COLOR. (SAFETY YELLOW IS ACCEPTABLE.)

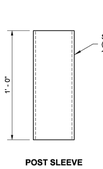
1 **BASE ASSEMBLY**



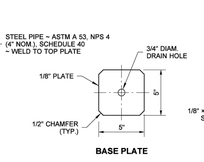
COVER PLATE



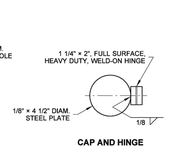
TOP PLATE



POST SLEEVE



BASE PLATE



CAP AND HINGE

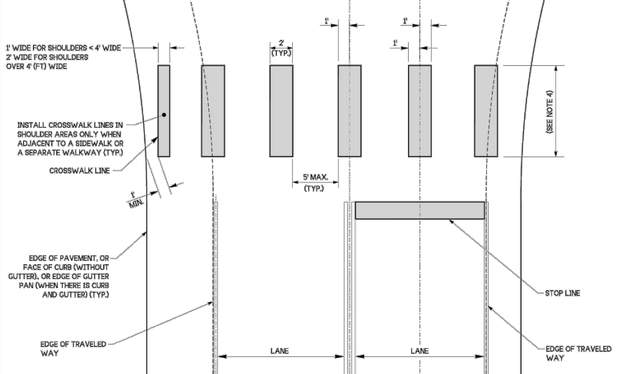
Michael S Fleming
Digitally signed by Michael S Fleming
Date: 2020.09.24 07:40:16 -07'00'

BOLLARD TYPE 1

STANDARD PLAN H-60.10-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Pasco Bakotich III 07-03-08
STATE DESIGN ENGINEER DATE
Washington State Department of Transportation



NOTES:

1. See Contract Plans for crosswalk locations.
2. To the maximum extent possible, curb ramp centerline should be perpendicular to the crosswalk centerline.
3. To the maximum extent possible, crosswalks should be perpendicular to the traveled way centerline.
4. See Contract plans for crosswalk width.
5. To maximin extent possible, place crosswalk bars out of the wheel paths.

CROSSWALK DETAIL

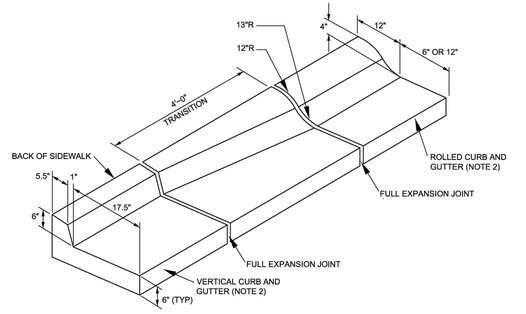
Jul 17, 2023

CROSSWALK LAYOUT

STANDARD PLAN M-15.10-02

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Jul 17, 2023
STATE DESIGN ENGINEER
Washington State Department of Transportation



NOTES

1. ALIGN BACK OF VERTICAL, TRANSITION, AND ROLLED CURB PARALLEL TO FRONT OF SIDEWALK.

VERTICAL CURB TO ROLLED CURB TRANSITION

Contact Standard Plans Office regarding use of this plan on Projects

PLAT OF RACCOON TOWN

SITE NOTES & DETAILS

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. PETERSEN
STATE OF WASHINGTON
21853
REGISTERED
PROFESSIONAL ENGINEER

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C - 5.08

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	–	6847	14 OF 74

GENERAL NOTES

1. ALL CONSTRUCTION SHALL FOLLOW THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL INVESTIGATION REPORT PREPARED FOR THIS PROJECT BY KRAZAN AND ASSOCIATES DATED OCTOBER 2, 2023.

2. POST-CONSTRUCTION SOILS AMENDMENT (BMP T5.13) WILL BE APPLIED TO EACH LOT AFTER THE FUTURE HOME CONSTRUCTION.

GRADING NOTES

THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN THE EVENT OR DISCOVERY OF POOR SOILS, GROUNDWATER OR DISCREPANCIES IN THE EXISTING CONDITIONS AS NOTED ON THE PLANS.

1. MAXIMUM SLOPE STEEPNESS SHALL BE 2:1 (HORIZONTAL TO VERTICAL) FOR CUT AND FILL SLOPES.

2. UNLESS OTHERWISE SPECIFIED, ALL EMBANKMENTS IN THE PLAN SET SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 2-03.3(14)B OF THE WSDOT STANDARD SPECIFICATIONS. EMBANKMENT COMPACTIONS SHALL CONFORM TO SECTION 2-03.3(14)C, METHOD B OF SAID STANDARD SPECIFICATIONS.

3. EMBANKMENTS DESIGNED TO IMPOUND WATER SHALL BE COMPACTED TO 95% MAXIMUM DENSITY PER SECTION 2-03.3(14)C, METHOD C OF WSDOT STANDARD SPECIFICATIONS.

4. ALL AREAS RECEIVING FILL MATERIAL SHALL BE PREPARED BY REMOVING VEGETATION, NON-COMPLYING FILL, TOPSOIL AND OTHER UNSUITABLE MATERIAL BY SCARIFYING THE SURFACE TO PROVIDE A BOND WITH THE NEW FILL, AND WHERE SLOPES ARE STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL AND THE HEIGHT IS GREATER THAN 5 FT., BY BENCHING INTO SOUND COMPETENT MATERIAL AS DETERMINED BY A SOILS ENGINEER.

NATIVE VEGETATION TO REMAIN-50' WILDLIFE CORRIDOR

NATIVE VEGETATION TO REMAIN-50' WILDLIFE CORRIDOR

NATIVE VEGETATION TO REMAIN

CATTAIL MAT LOOP RD

CATTAIL MAT LOOP RD

COMB COURT

HOOD CANAL DR NE

LITTLE BOSTON RD NE

WOMAN RD

PLAT OF RACCOON TOWN

LOT 1 10,900 sf
LOT 2 10,895 sf
LOT 3 14,720 sf
LOT 4 12,590 sf
LOT 5 11,750 sf
LOT 6 10,890 sf
LOT 7 10,890 sf
LOT 8 11,420 sf
LOT 9 10,890 sf
LOT 10 10,890 sf
LOT 11 10,890 sf
LOT 12 10,890 sf
LOT 13 10,890 sf
LOT 14 11,420 sf
LOT 15 11,420 sf
LOT 16 10,890 sf
LOT 17 10,890 sf
LOT 18 10,890 sf
LOT 19 10,890 sf
LOT 20 10,890 sf
LOT 21 11,420 sf
LOT 22 11,560 sf
LOT 23 11,255 sf
LOT 24 10,905 sf
LOT 25 10,905 sf
LOT 26 10,905 sf
LOT 27 10,905 sf
LOT 28 11,330 sf
LOT 29 13,960 sf
LOT 30 16,350 sf
LOT 31 12,200 sf
LOT 32 11,005 sf
LOT 33 11,040 sf
LOT 38 10,930 sf
LOT 39 10,895 sf

PARK TRACT

FOR PARK GRADING & SITE PLAN SEE SHEET C-6.11

FOR CROSSWALK GRADING DETAIL #3 SEE SHEET C-6.16

FOR INTERSECTION GRADING DETAIL #2 SEE SHEET C-6.16

GRADING SHEETS (NORTH)

C-6.03 CATTAIL MAT LOOP ROAD STATION 100+00 - 101+50 ..... Sheet 17 of 72
C-6.03 CATTAIL MAT LOOP ROAD STATION 102+00 - 105+25 ..... Sheet 18 of 72
C-6.04 CATTAIL MAT LOOP ROAD STATION 105+25 - 109+75 ..... Sheet 19 of 72
C-6.05 CATTAIL MAT LOOP ROAD STATION 109+75 - 114+00 ..... Sheet 20 of 72
C-6.06 CATTAIL MAT LOOP ROAD STATION 114+00 - 117+75 ..... Sheet 21 of 72
C-6.07 CATTAIL MAT LOOP ROAD STATION 117+75 - 120+76 ..... Sheet 22 of 72
C-6.08 COMB COURT STATION 125+00 - 126+50 ..... Sheet 23 of 72

40 0 20 40 80
(IN FEET)
1 inch = 40 ft.

NORTH

OVERALL GRADING - NORTH

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

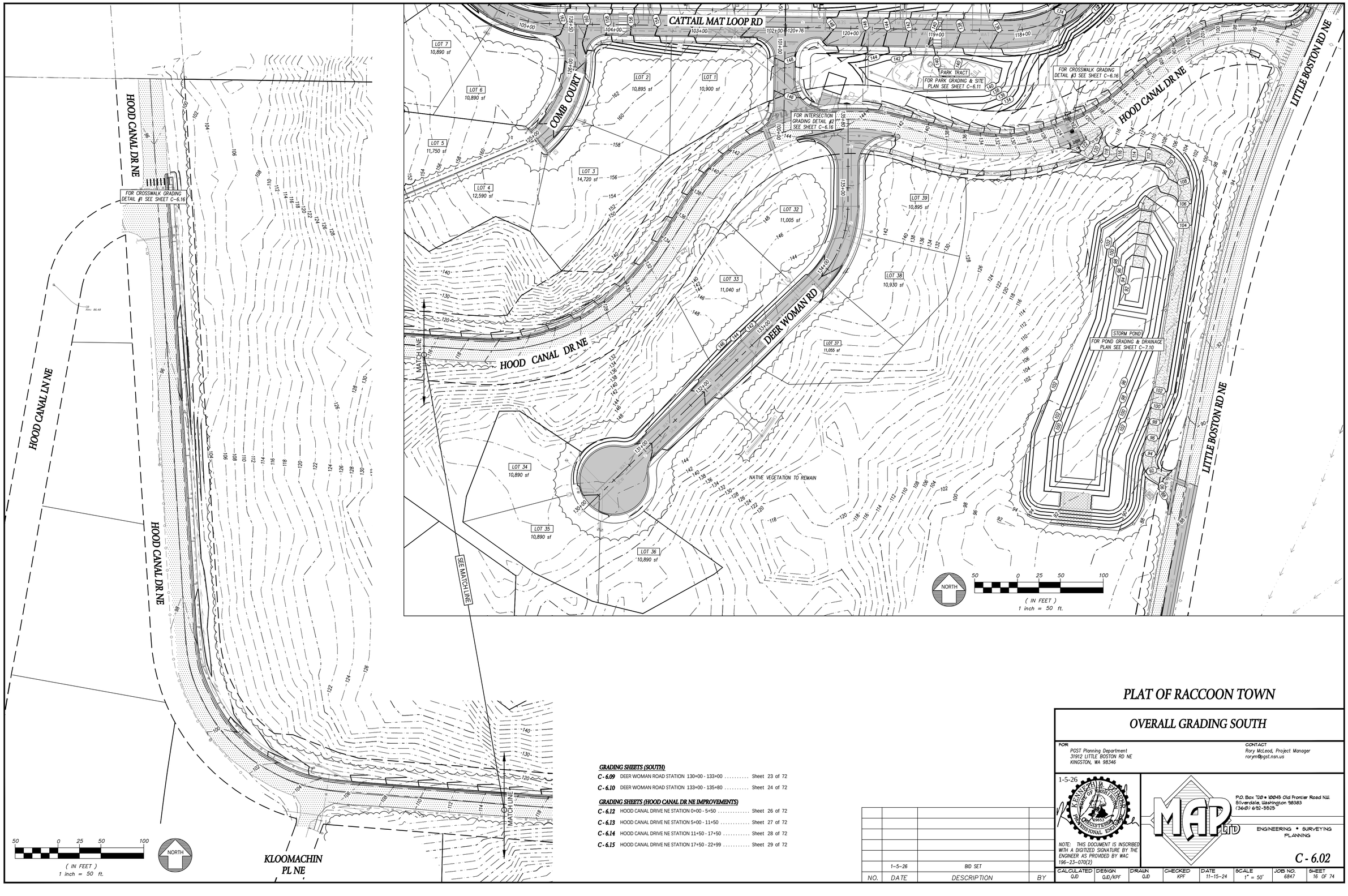
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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 40'	6847	15 OF 74



GRADING SHEETS (SOUTH)

C-6.09 DEER WOMAN ROAD STATION 130+00 - 133+00 ..... Sheet 23 of 72

C-6.10 DEER WOMAN ROAD STATION 133+00 - 135+80 ..... Sheet 24 of 72

GRADING SHEETS (HOOD CANAL DR NE IMPROVEMENTS)

C-6.12 HOOD CANAL DRIVE NE STATION 0+00 - 5+50 ..... Sheet 26 of 72

C-6.13 HOOD CANAL DRIVE NE STATION 5+00 - 11+50 ..... Sheet 27 of 72

C-6.14 HOOD CANAL DRIVE NE STATION 11+50 - 17+50 ..... Sheet 28 of 72

C-6.15 HOOD CANAL DRIVE NE STATION 17+50 - 22+99 ..... Sheet 29 of 72

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

OVERALL GRADING SOUTH

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

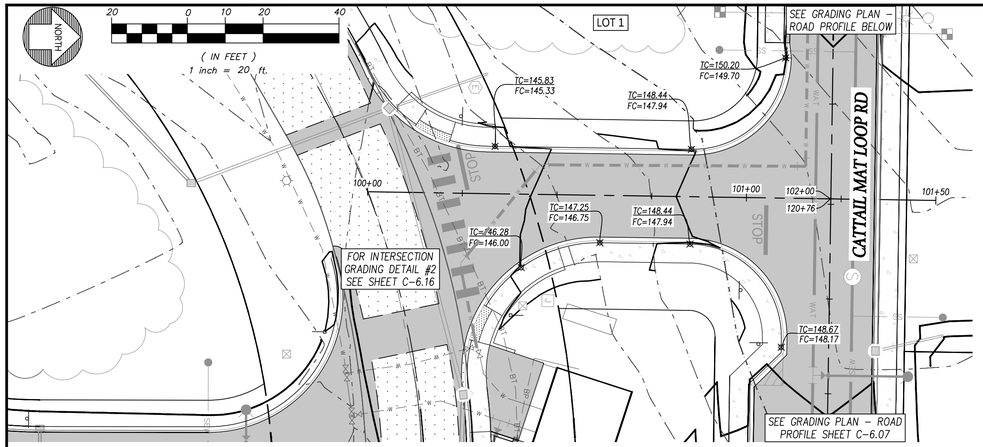
KENNETH P. FRENCH — STATE OF WASHINGTON — 43553 — REGISTERED PROFESSIONAL ENGINEER

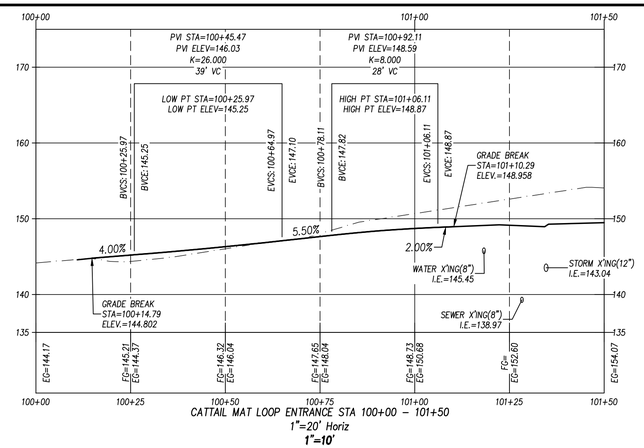
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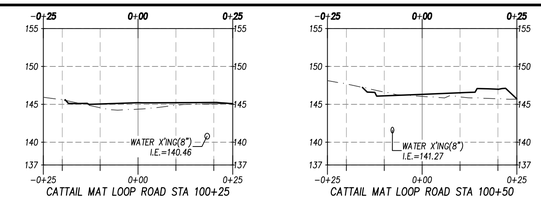
C - 6.02

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
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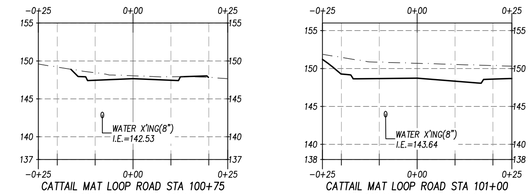


CATTAIL MAT LOOP ENTRANCE STA 100+00 – 101+50
1"=20' Horiz
1"=10'



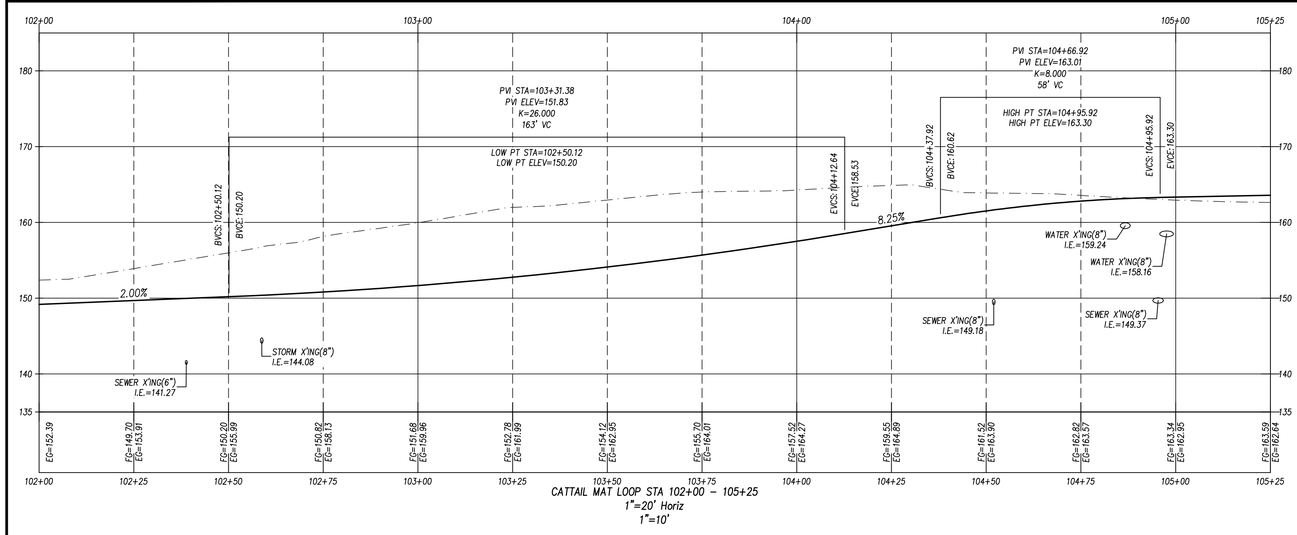
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1"=20' Horiz 1"=10' Vert

CATTAIL MAT LOOP ROAD STA 100+50
1"=20' Horiz 1"=10' Vert

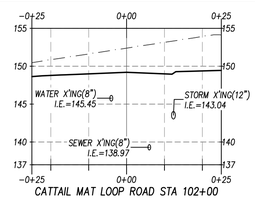


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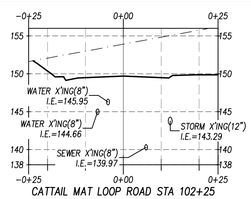
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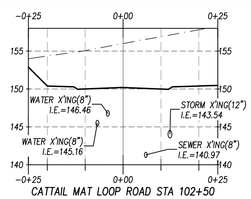
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1"=10'



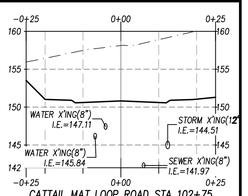
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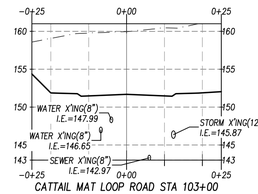
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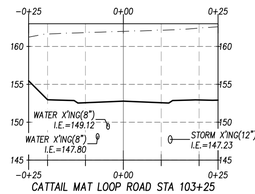
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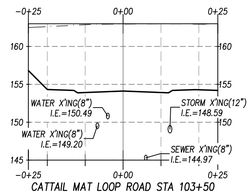
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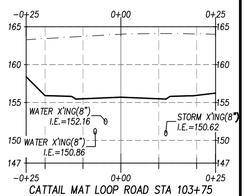
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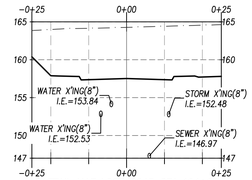
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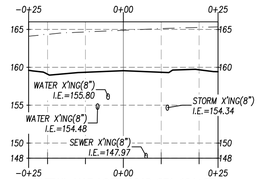
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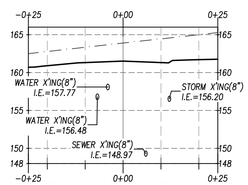
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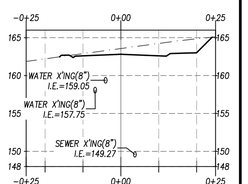
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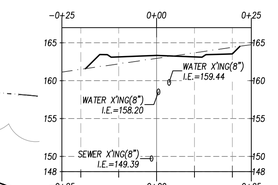
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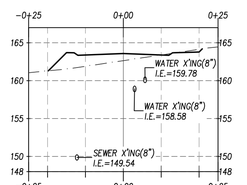
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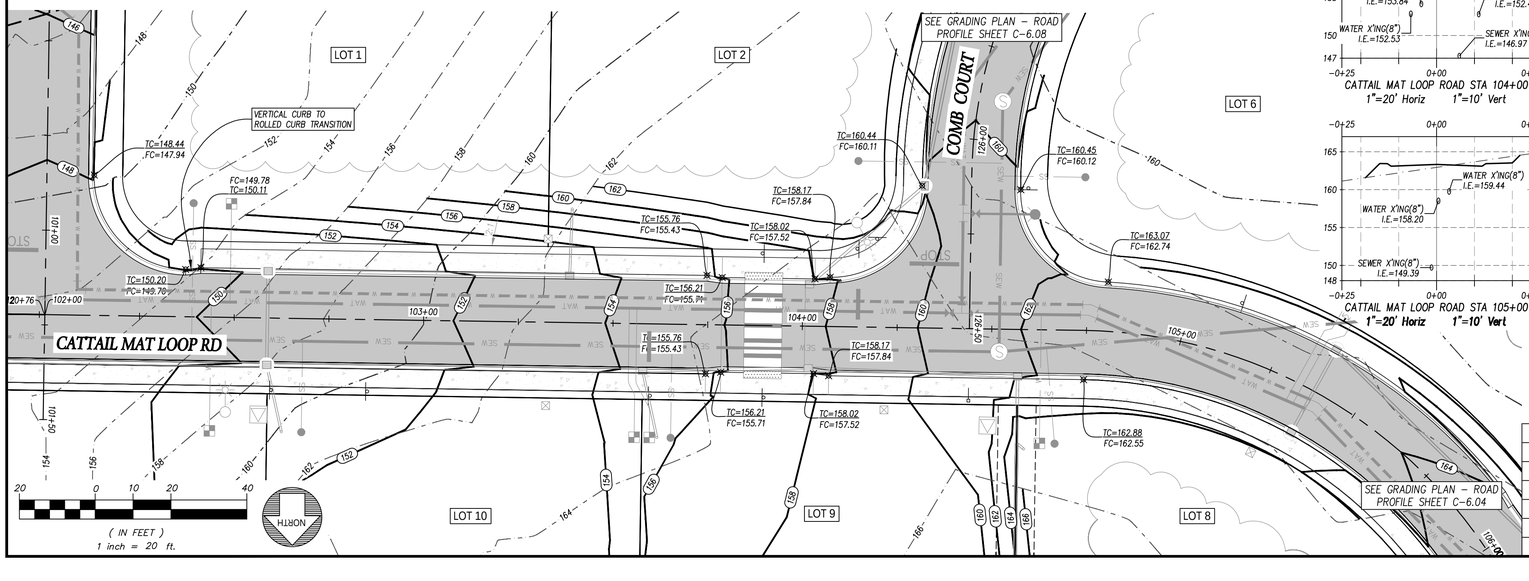
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1"=20' Horiz 1"=10' Vert



CATTAIL MAT LOOP ROAD STA 105+00
1"=20' Horiz 1"=10' Vert



CATTAIL MAT LOOP ROAD STA 105+25
1"=20' Horiz 1"=10' Vert



PLAT OF RACCOON TOWN

GRADING PLAN - ROAD PROFILES

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. EDISON
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

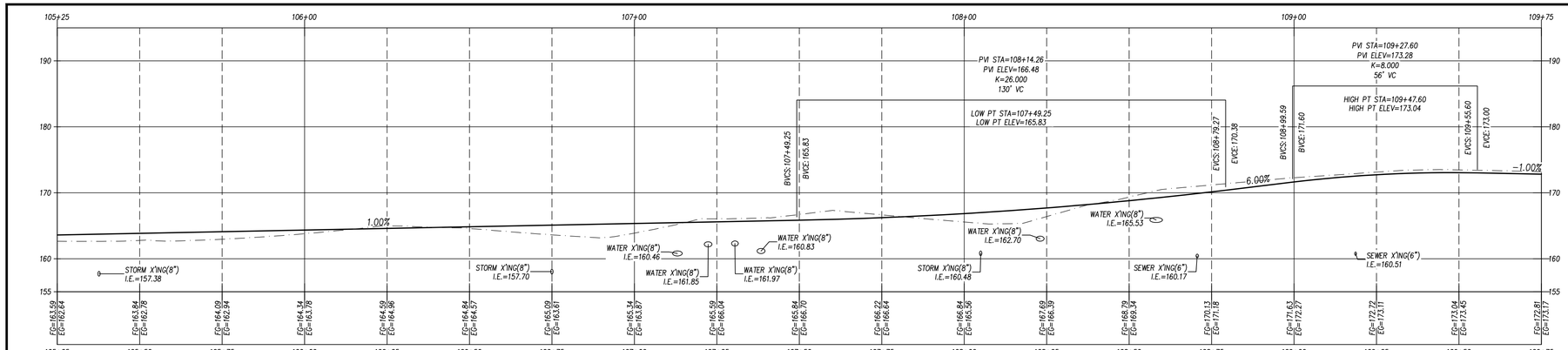
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NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

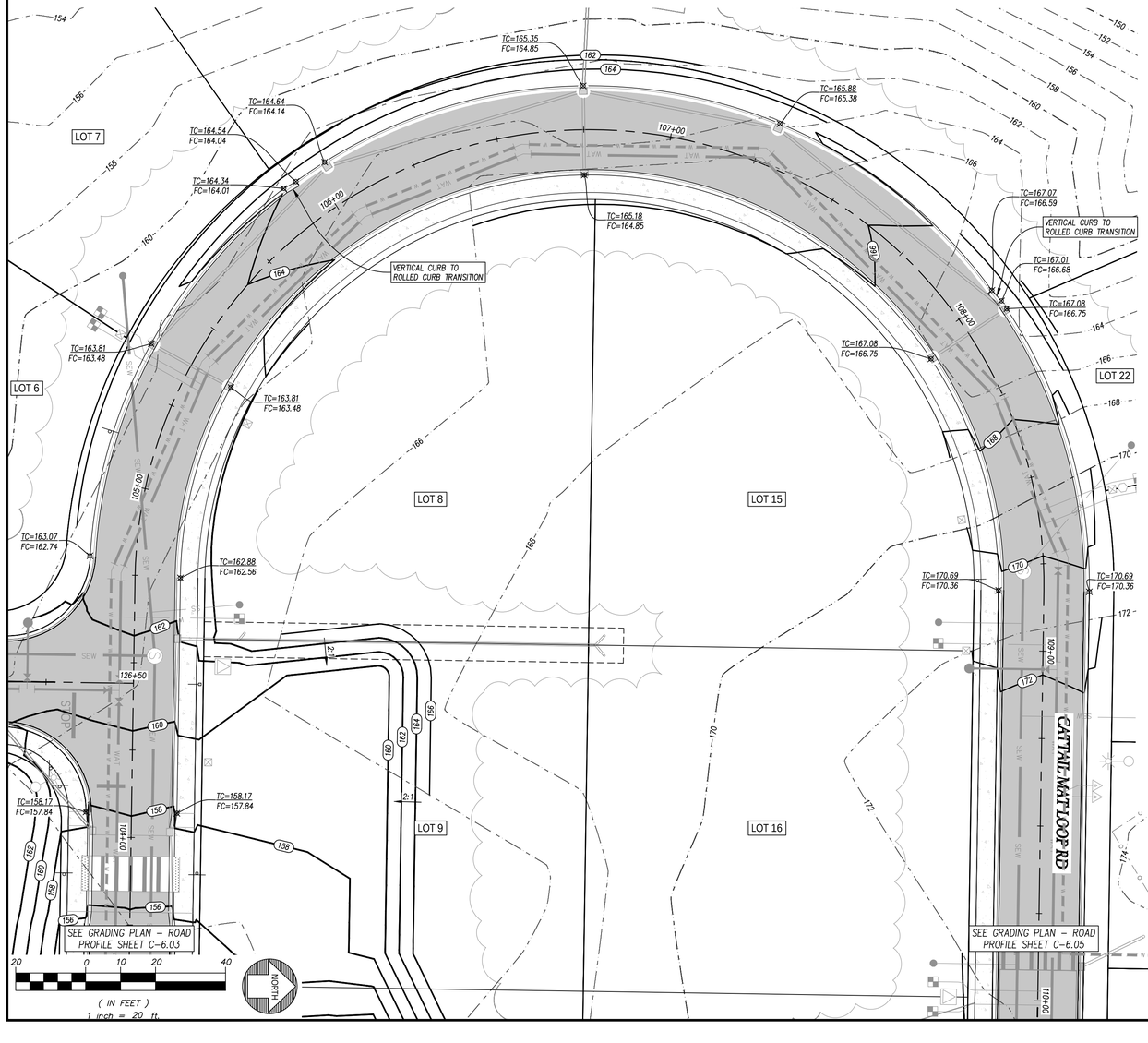
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(360) 692-5525
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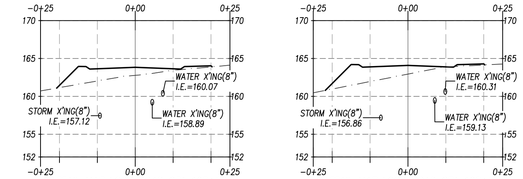
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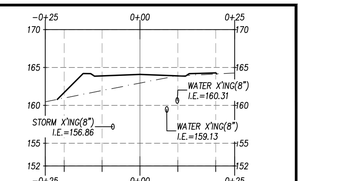


CATTAIL MAT LOOP STA 105+25 – 109+75
1"=20' Horiz
1"=10'

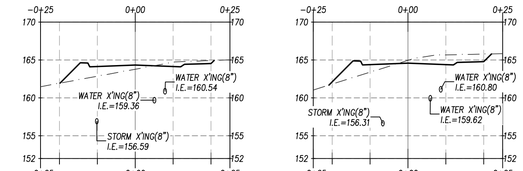




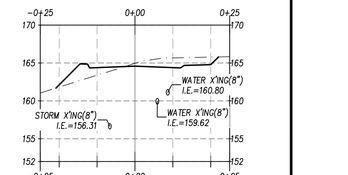
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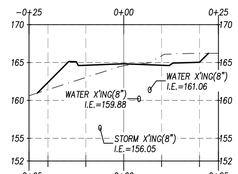
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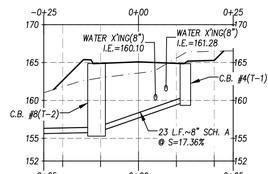
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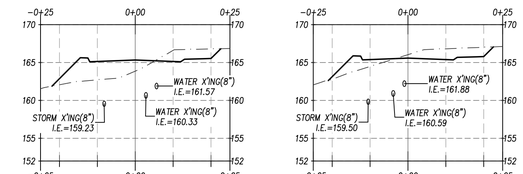
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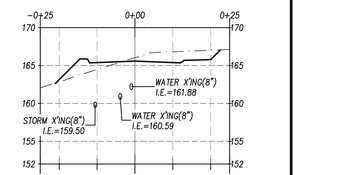
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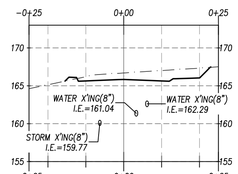
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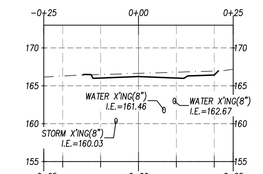
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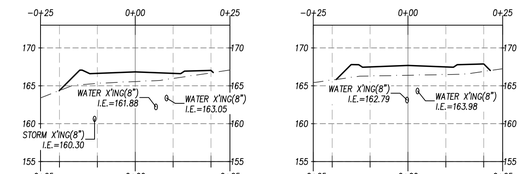
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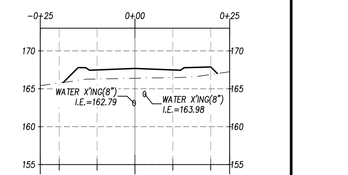
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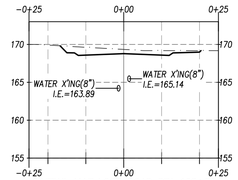
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1"=20' Horiz 1"=10' Vert



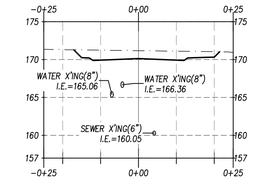
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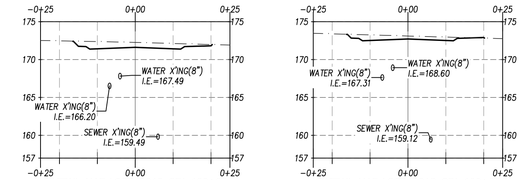
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1"=20' Horiz 1"=10' Vert



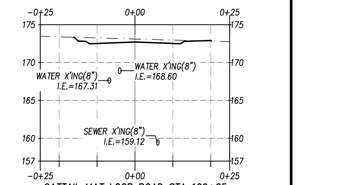
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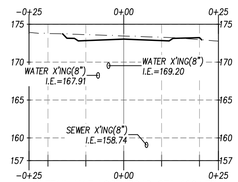
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1"=20' Horiz 1"=10' Vert



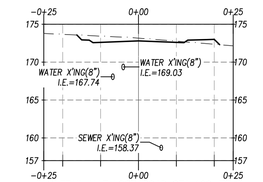
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1"=20' Horiz 1"=10' Vert



CATTAIL MAT LOOP ROAD STA 109+25
1"=20' Horiz 1"=10' Vert



CATTAIL MAT LOOP ROAD STA 109+50
1"=20' Horiz 1"=10' Vert



CATTAIL MAT LOOP ROAD STA 109+75
1"=20' Horiz 1"=10' Vert

PLAT OF RACCOON TOWN

GRADING PLAN - ROAD PROFILES

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. PARSONS
STATE OF WASHINGTON
23653
REGISTERED
PROFESSIONAL ENGINEER

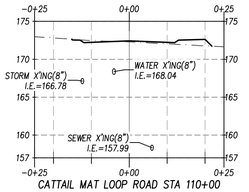
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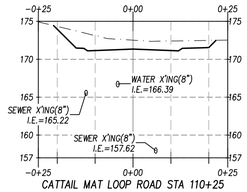
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NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

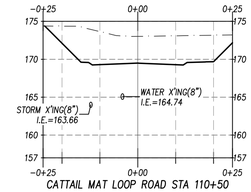
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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	18 OF 74



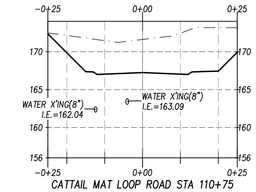
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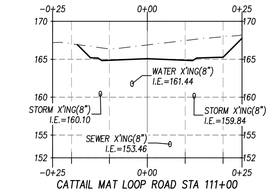
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1"=20' Horiz 1"=10' Vert



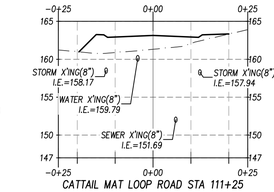
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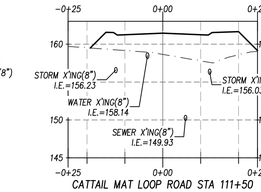
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1"=20' Horiz 1"=10' Vert



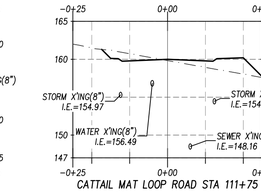
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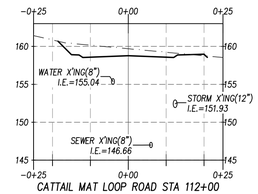
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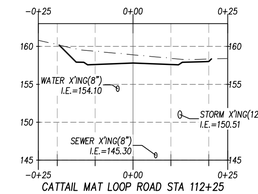
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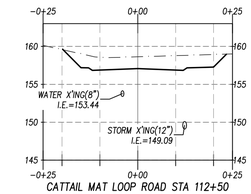
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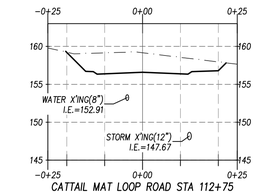
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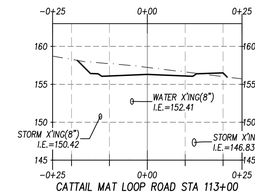
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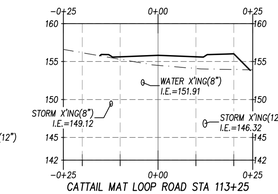
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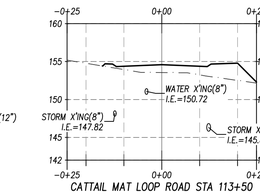
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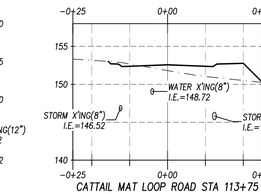
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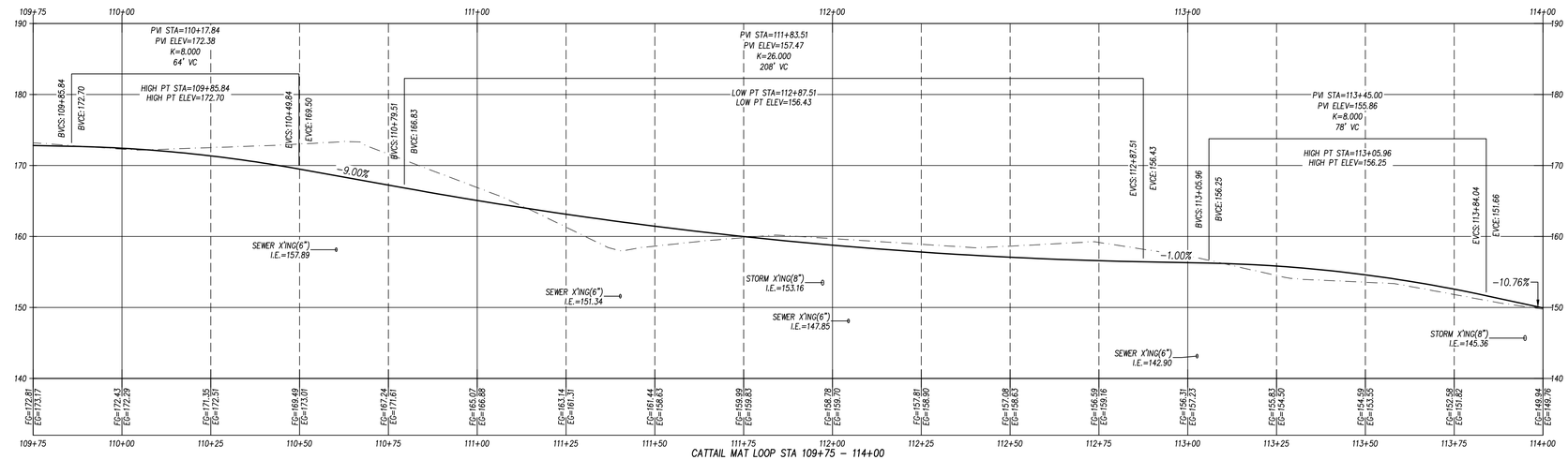
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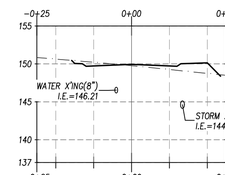
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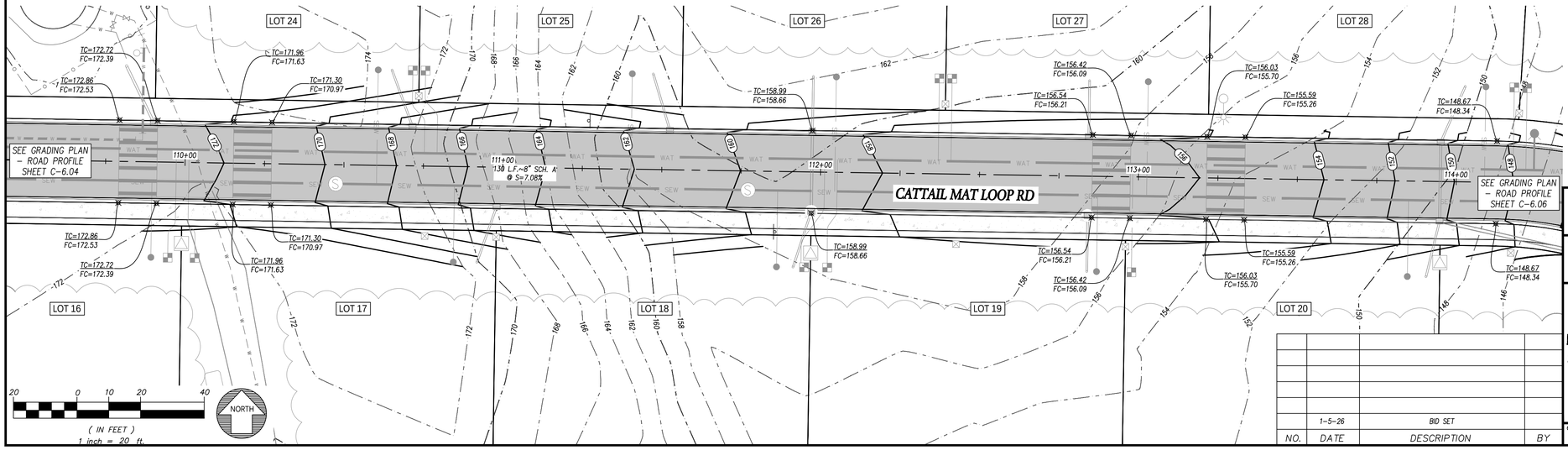
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1"=20' Horiz 1"=10' Vert



CATTAIL MAT LOOP STA 109+75 – 114+00
1"=20' Horiz
1"=10'



CATTAIL MAT LOOP ROAD STA 114+00
1"=20' Horiz 1"=10' Vert



PLAT OF RACCOON TOWN

GRADING PLAN - ROAD PROFILES

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

FOR
POST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

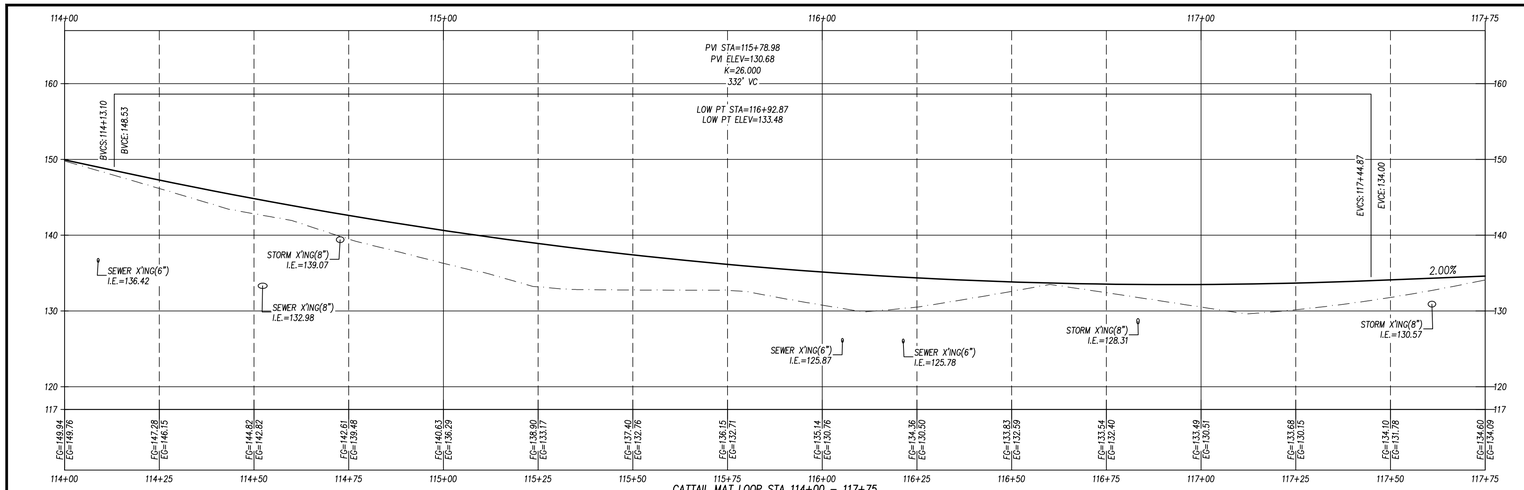
1-5-26
REGISTERED PROFESSIONAL ENGINEER
KENNETH P. FINNEY
STATE OF WASHINGTON
20653

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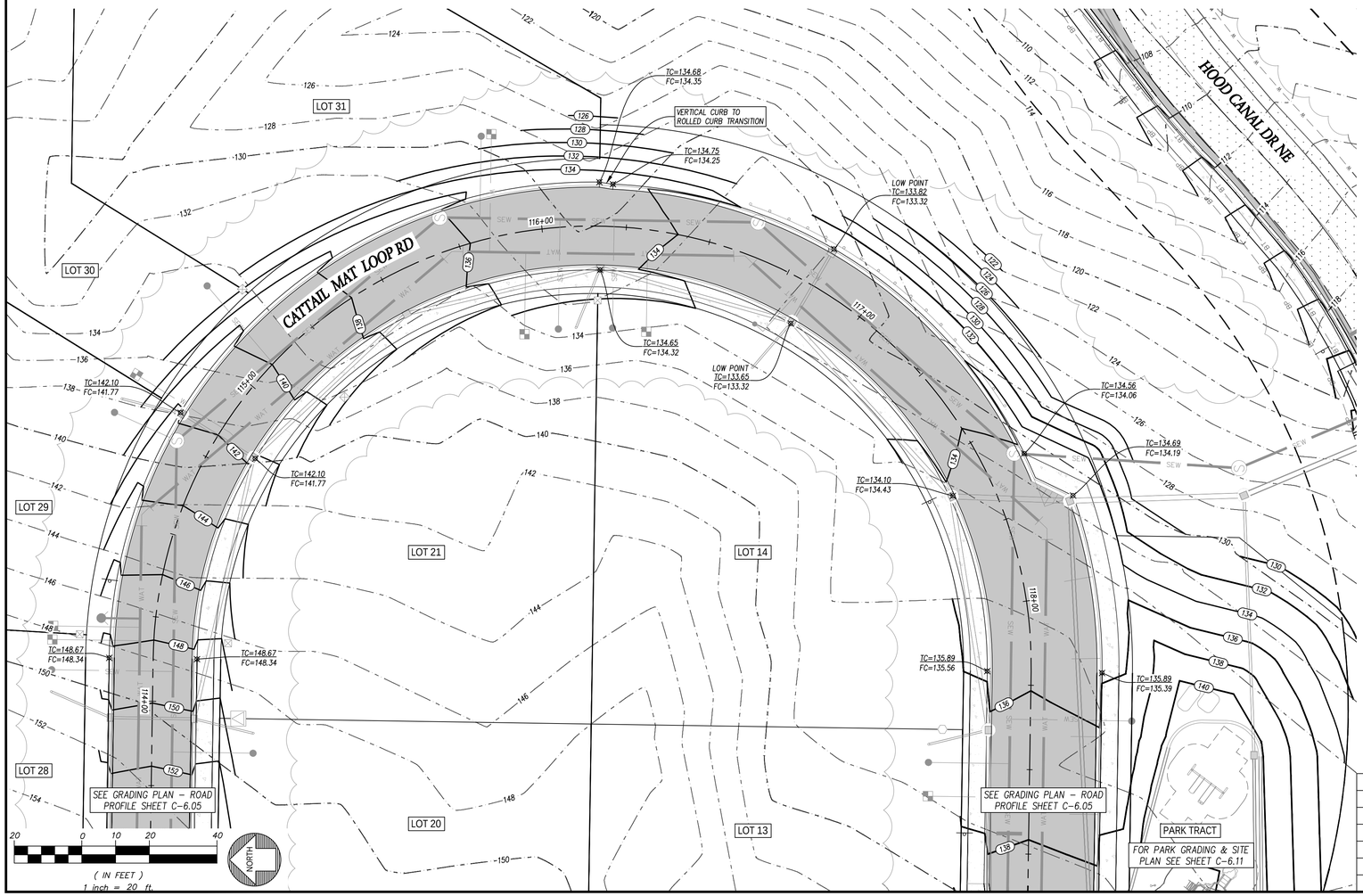
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Silverdale, Washington 98383
(360) 692-5525
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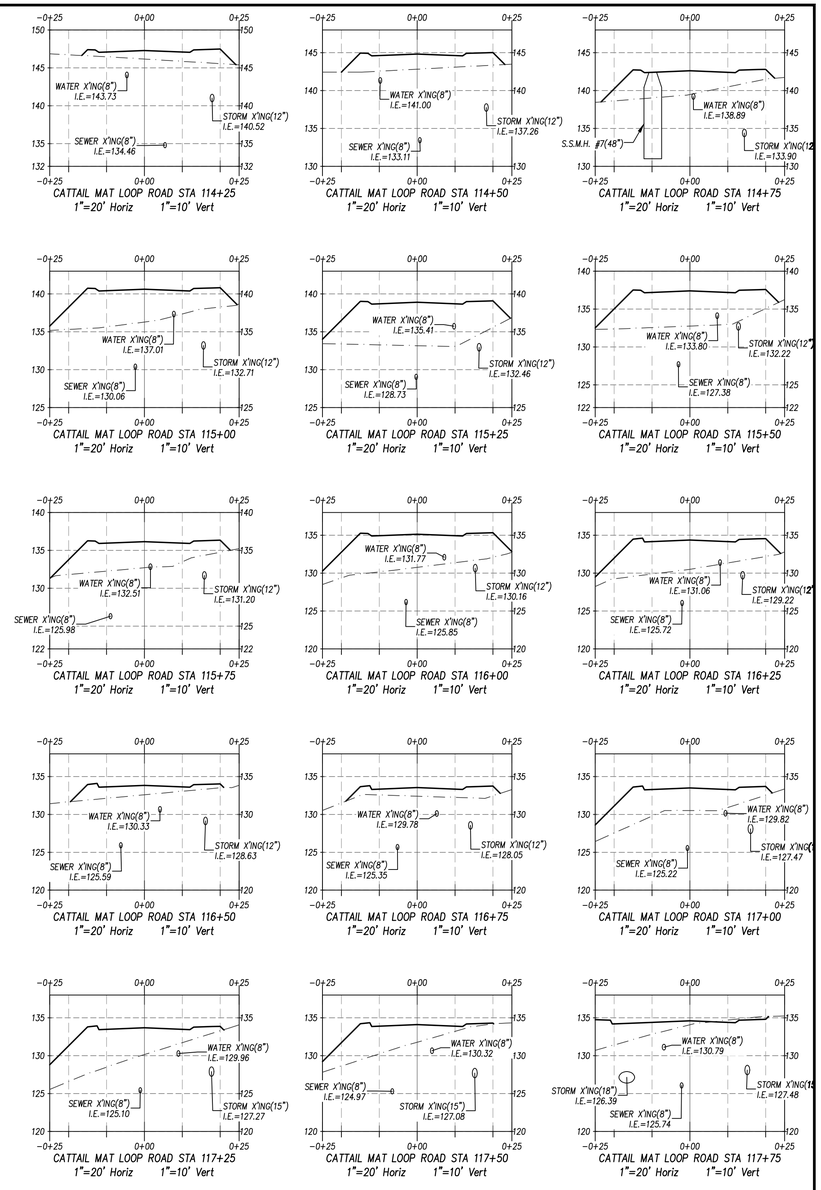
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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	19 OF 74



CATTAIL MAT LOOP STA 114+00 – 117+75
1"=20' Horiz
1"=10'





PLAT OF RACCOON TOWN

GRADING PLAN - ROAD PROFILES

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

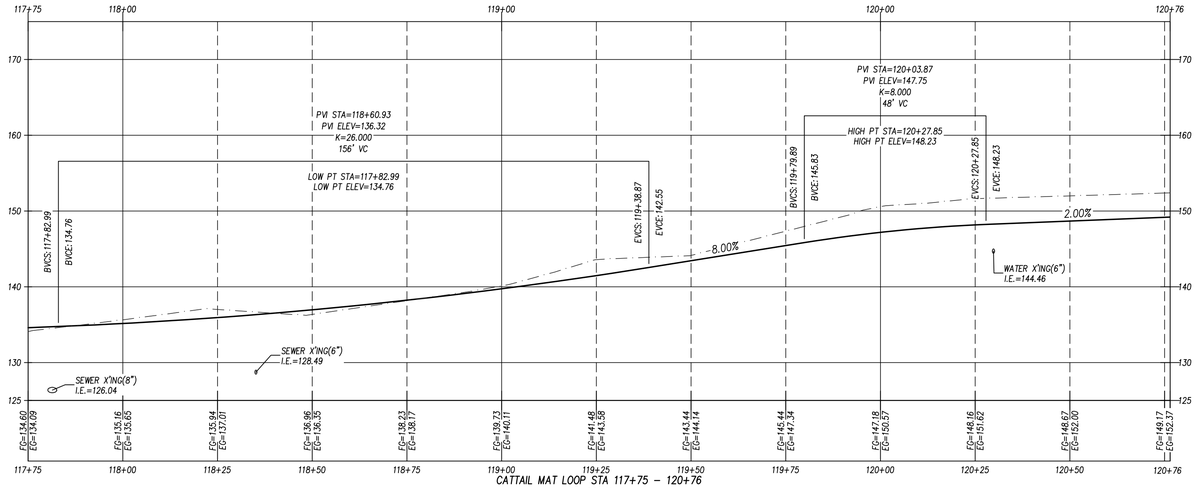
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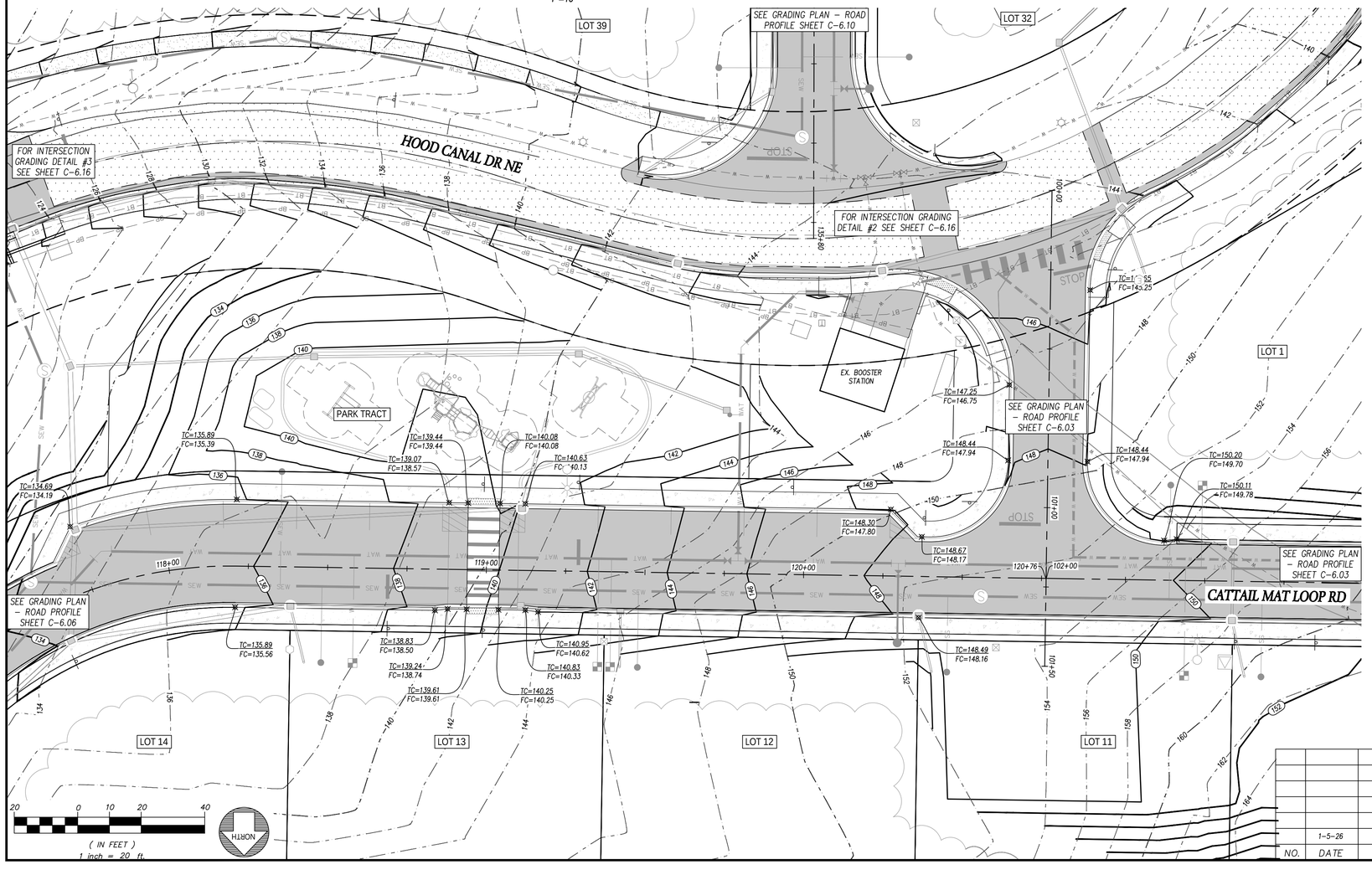
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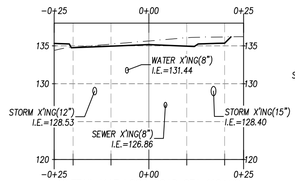
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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	20 OF 74

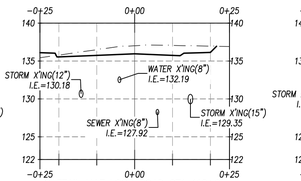


CATTAIL MAT LOOP STA 117+75 – 120+76
1"=20' Horiz
1"=10'

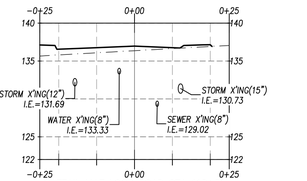




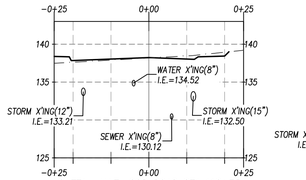
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1"=20' Horiz 1"=10' Vert



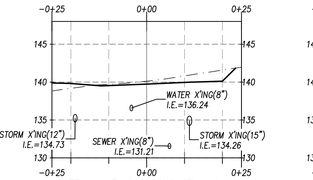
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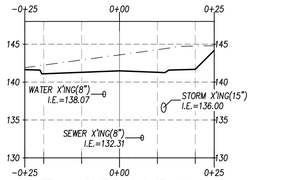
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1"=20' Horiz 1"=10' Vert



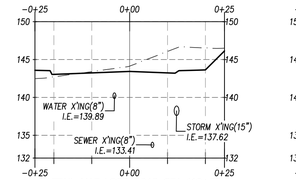
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1"=20' Horiz 1"=10' Vert



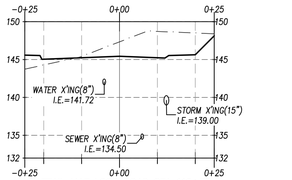
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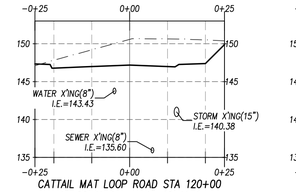
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1"=20' Horiz 1"=10' Vert



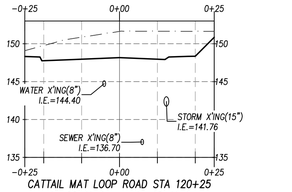
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1"=20' Horiz 1"=10' Vert



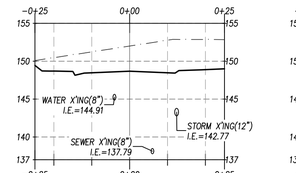
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1"=20' Horiz 1"=10' Vert



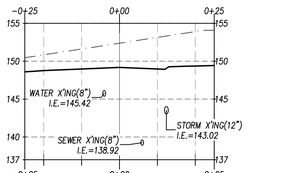
CATTAIL MAT LOOP ROAD STA 120+00
1"=20' Horiz 1"=10' Vert



CATTAIL MAT LOOP ROAD STA 120+25
1"=20' Horiz 1"=10' Vert



CATTAIL MAT LOOP ROAD STA 120+50
1"=20' Horiz 1"=10' Vert



CATTAIL MAT LOOP ROAD STA 120+75
1"=20' Horiz 1"=10' Vert

PLAT OF RACCOON TOWN

GRADING PLAN - ROAD PROFILES

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

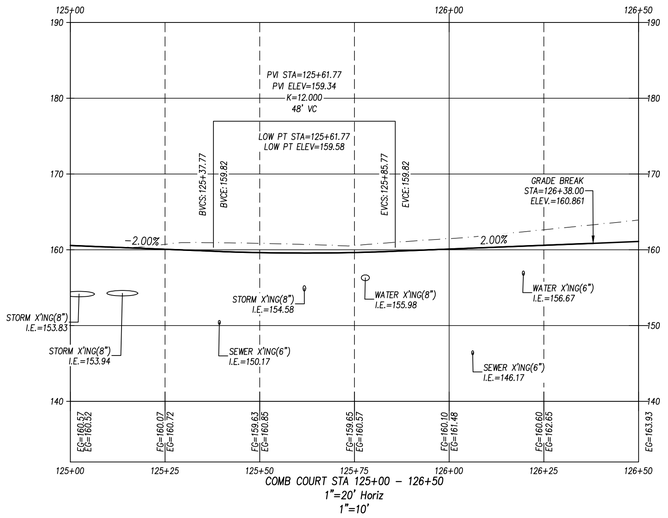
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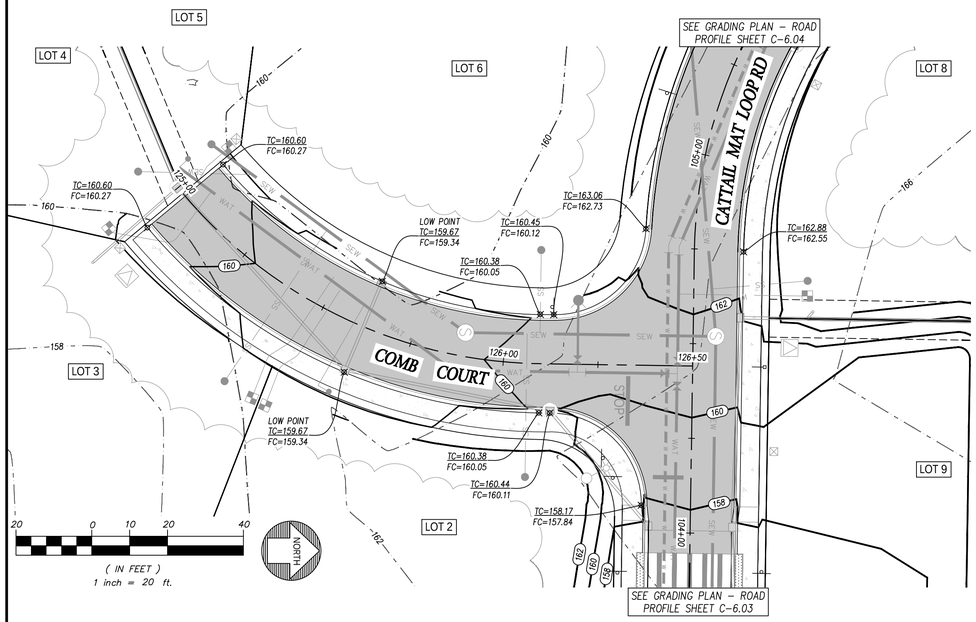
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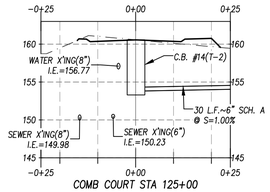
NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	21 OF 74

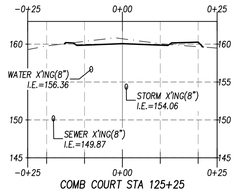


COMB COURT STA 125+00 – 126+50
1"=20' Horiz
1"=10'

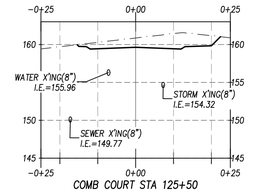




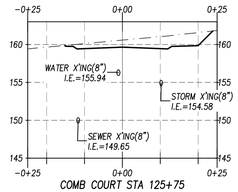
COMB COURT STA 125+00
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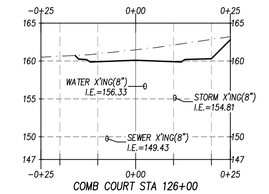
COMB COURT STA 125+25
1"=20' Horiz 1"=10' Vert



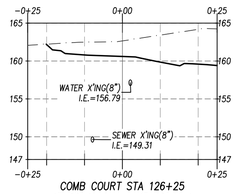
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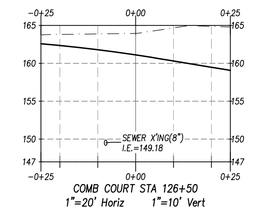
COMB COURT STA 125+75
1"=20' Horiz 1"=10' Vert



COMB COURT STA 126+00
1"=20' Horiz 1"=10' Vert



COMB COURT STA 126+25
1"=20' Horiz 1"=10' Vert



COMB COURT STA 126+50
1"=20' Horiz 1"=10' Vert

PLAT OF RACCOON TOWN

GRADING PLAN - ROAD PROFILES

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. FARR
STATE OF WASHINGTON
22853
REGISTERED
PROFESSIONAL ENGINEER

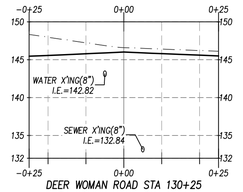
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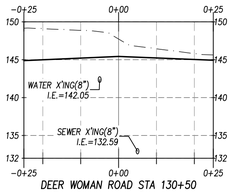
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NO.	DATE	DESCRIPTION	BY
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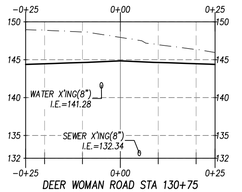
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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	22 OF 74



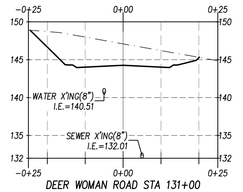
DEER WOMAN ROAD STA 130+25
1"=20' Horiz 1"=10' Vert



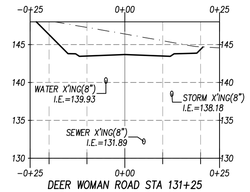
DEER WOMAN ROAD STA 130+50
1"=20' Horiz 1"=10' Vert



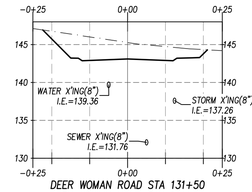
DEER WOMAN ROAD STA 130+75
1"=20' Horiz 1"=10' Vert



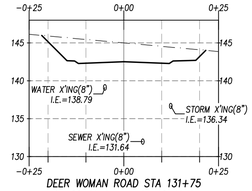
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1"=20' Horiz 1"=10' Vert



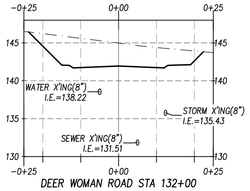
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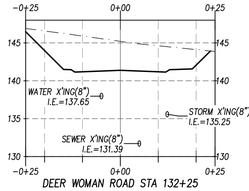
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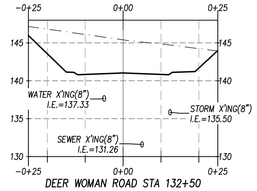
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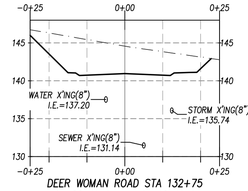
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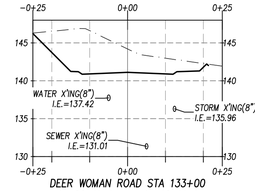
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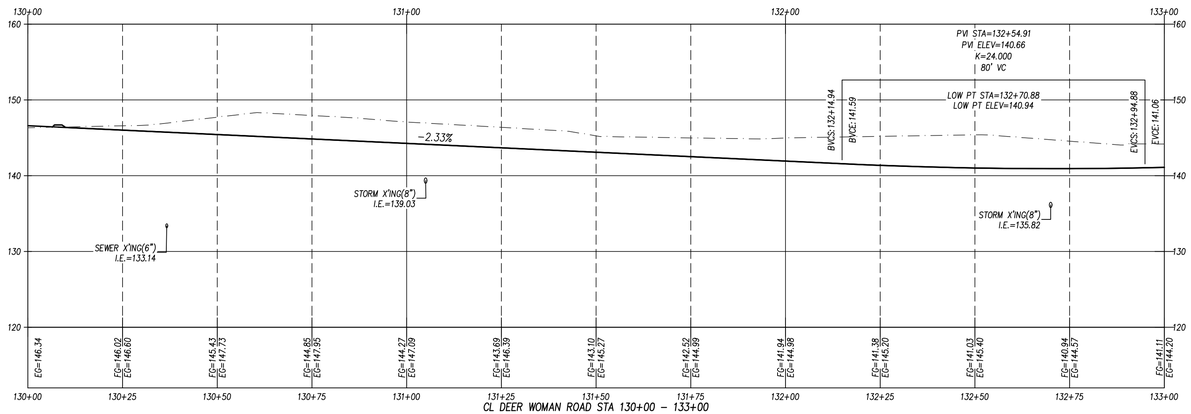
DEER WOMAN ROAD STA 132+50
1"=20' Horiz 1"=10' Vert



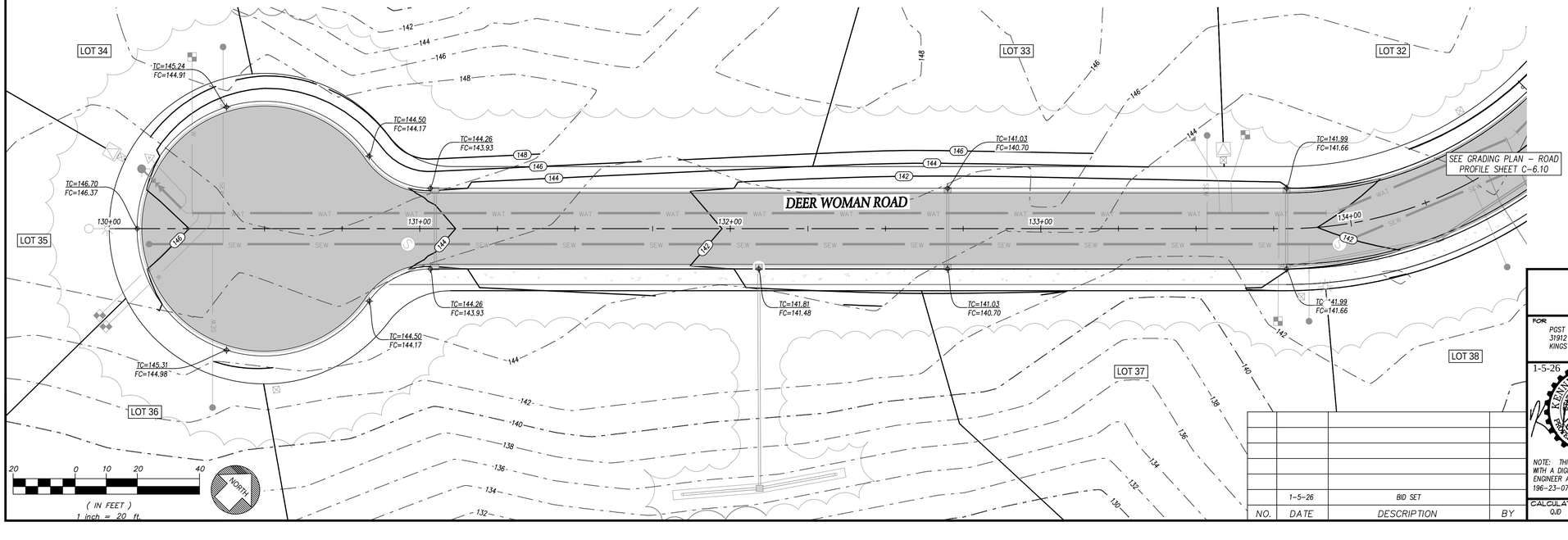
DEER WOMAN ROAD STA 132+75
1"=20' Horiz 1"=10' Vert



DEER WOMAN ROAD STA 133+00
1"=20' Horiz 1"=10' Vert



CL DEER WOMAN ROAD STA 130+00 – 133+00
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

GRADING PLAN - ROAD PROFILES

FOR
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CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. FRANCIS
STATE OF WASHINGTON
19853
REGISTERED
PROFESSIONAL ENGINEER

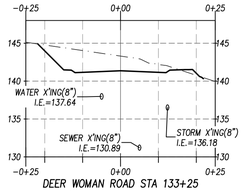
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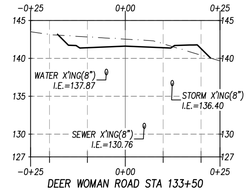
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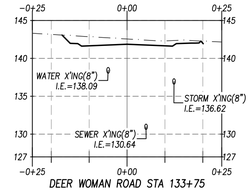
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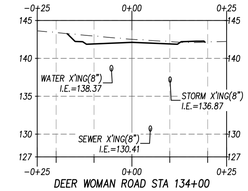
DEER WOMAN ROAD STA 133+25
1"=20' Horiz 1"=10' Vert



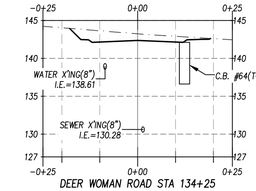
DEER WOMAN ROAD STA 133+50
1"=20' Horiz 1"=10' Vert



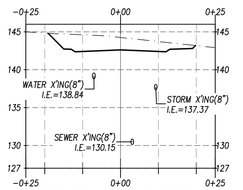
DEER WOMAN ROAD STA 133+75
1"=20' Horiz 1"=10' Vert



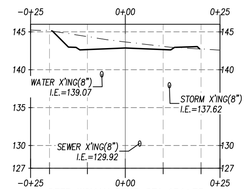
DEER WOMAN ROAD STA 134+00
1"=20' Horiz 1"=10' Vert



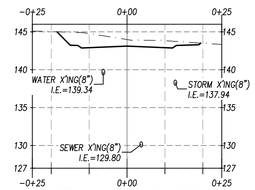
DEER WOMAN ROAD STA 134+25
1"=20' Horiz 1"=10' Vert



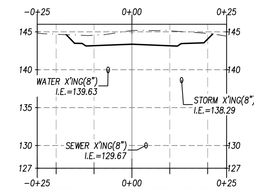
DEER WOMAN ROAD STA 134+50
1"=20' Horiz 1"=10' Vert



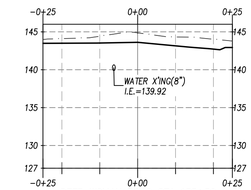
DEER WOMAN ROAD STA 134+75
1"=20' Horiz 1"=10' Vert



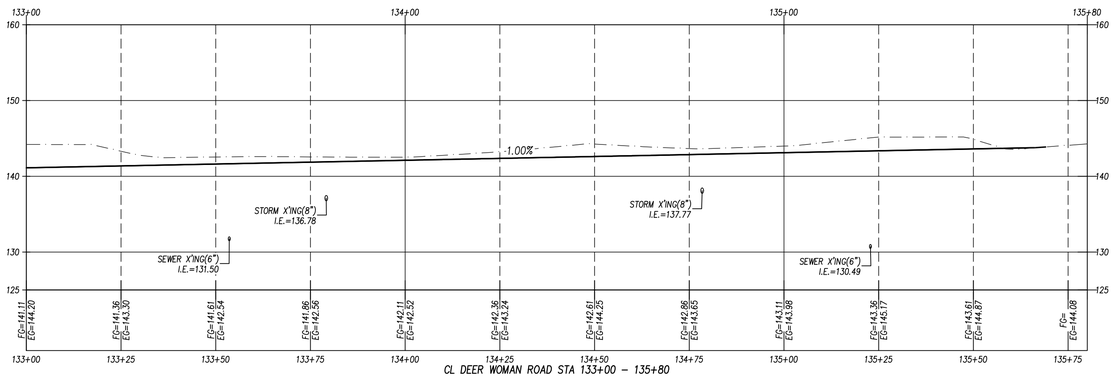
DEER WOMAN ROAD STA 135+00
1"=20' Horiz 1"=10' Vert



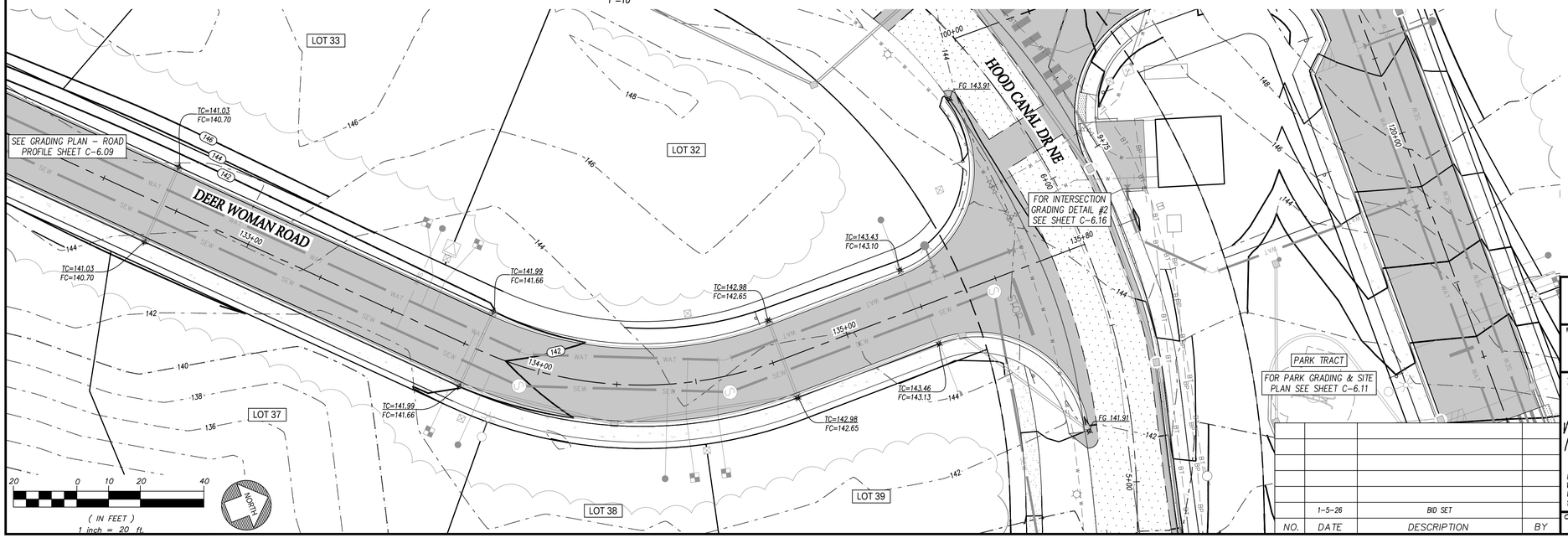
DEER WOMAN ROAD STA 135+25
1"=20' Horiz 1"=10' Vert



DEER WOMAN ROAD STA 135+50
1"=20' Horiz 1"=10' Vert



CL DEER WOMAN ROAD STA 133+00 – 135+80
1"=20' Horiz
1"=10'



NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

GRADING PLAN - ROAD PROFILES

FOR:
POST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. FRANCIS
STATE OF WASHINGTON
19853
REGISTERED
PROFESSIONAL ENGINEER

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(360) 692-5525
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C - 6.10

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	24 OF 74

LOT 11

LOT 12

LOT 13

LOT 14

CATTAIL MAT LOOP ROAD

ROLLED CURB & GUTTER

ROLLED CURB & GUTTER

4" S.W. NO PARKING STRIPE

4" S.W. NO PARKING STRIPE

4" S.W. NO PARKING STRIPE

RAISED CROSSWALK

RAISED CROSSWALK

12.0'

12.0'

8.5' (TYP.)

8.5'

115.0' ~ 5 PARALLEL STALLS

23.0' (TYP.)

69.0' ~ 3 PARALLEL STALLS

2 PARALLEL STALLS

23.0'

23.0'

VERTICAL CURB & GUTTER

5.0' CONC. SIDEWALK

STREET SIGN

STREET SIGN

22.0'

R5.0'

R5.0'

PARK TRACT

AT GRADE CONCRETE LANDSCAPE CURB

AT GRADE CONCRETE LANDSCAPE CURB

CANYON COLLECTION CLIMBING STRUCTURE

"OODLE" SWING

R13.0'

5" ARCH SWING FRAME

R10.0'

R10.0'

CLEAR ZONE

RELOCATED BOULDER 8' x 4' x 4'

RELOCATED BOULDER 6' x 5' x 3'

COMMERCIAL PLAYGROUND EQUIPMENT BY LANDSCAPE STRUCTURES, INC. OR EQUAL

EX. BOOSTER STATION

LIMITS OF HOG FUEL CHIPS INSIDE CONCRETE LANDSCAPE CURB, 4" MIN. THICKNESS. HYDRO-SEED ALL ELSE

FOR INTERSECTION GRADING DETAIL #2 SEE SHEET C-6.16

HOOD CANAL DR NE

STOP

PLAT OF RACCOON TOWN

C.B. #45 (T-2)
STA 117+75.99, -19.58 L
RIM=134.20
I.E.(IN 12")=126.86
I.E.(IN 18")=126.36
I.E.(OUT 18")=126.36
W/STD. FRAME & GRATE

C.B. #83 (T-1)
STA 5+53.98, 54.96 R
RIM=140.07
I.E.(OUT 8")=137.33
W/STD. FRAME & GRATE

C.B. #84 (T-1)
STA 5+14.06, 45.39 R
RIM=140.55
I.E.(IN 8")=136.83
I.E.(OUT 8")=136.83
W/STD. FRAME & GRATE

C.B. #85 (T-1)
STA 4+21.03, 67.37 R
RIM=140.15
I.E.(IN 8")=136.00
I.E.(OUT 8")=136.00
W/STD. FRAME & GRATE

C.B. #46 (T-2)
STA 5+16.05, 59.22 R
RIM=127.02
I.E.(IN 18")=122.02
I.E.(IN 8")=122.85
I.E.(OUT 18")=122.02
w/ SOLID LID

C.B. #44 (T-2)
STA 119+10.99, -19.58 L
RIM=140.05
I.E.(IN 12")=135.39
I.E.(OUT 12")=135.39
W/STD. FRAME & GRATE

50 L.F.~8" SCH. A @ S=1.00%

83 L.F.~8" SCH. A @ S=1.00%

77 L.F.~8" SCH. A @ S=17.09%

52 L.F.~18" SCH. A @ S=8.41%

TC=140.25
FC=140.25

TC=139.61
FC=139.61

TC=140.66
FC=140.16

TC=139.24
FC=138.74

TC=140.95
FC=140.62

TC=138.83
FC=138.50

TC=148.67
FC=148.17

TC=148.30
FC=147.80

TC=140.49
FC=139.99

TC=140.08
FC=140.08

TC=139.44
FC=139.44

TC=139.07
FC=138.57

TC=135.89
FC=135.39

TC=134.69
FC=134.19

FG 148.80

FG 148.45

FG 141.65

FG 140.49

FG 139.40

FG 137.60

FG 136.68

FG 135.96

FG 141.00

FG 140.50

FG 140.00

FG 140.68

FG 140.54

FG 140.50

FG 140.43

FG 140.00

FG 140.14

6%

16%

16%

4%

4:1

4:1

4:1

4:1

4:1

4:1

2:1

NORTH

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PARK TRACT GRADING & SITE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

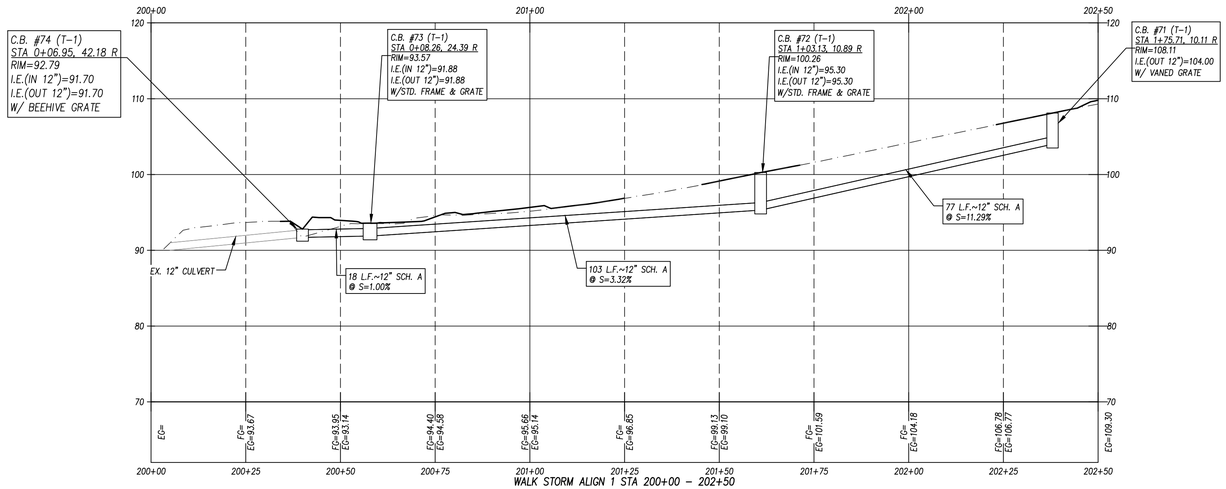
KENNETH P. PATRICK — STATE OF WASHINGTON — 22855 — REGISTERED PROFESSIONAL ENGINEER

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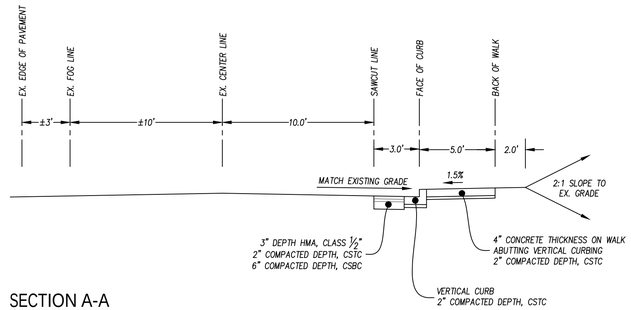
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C - 6.11

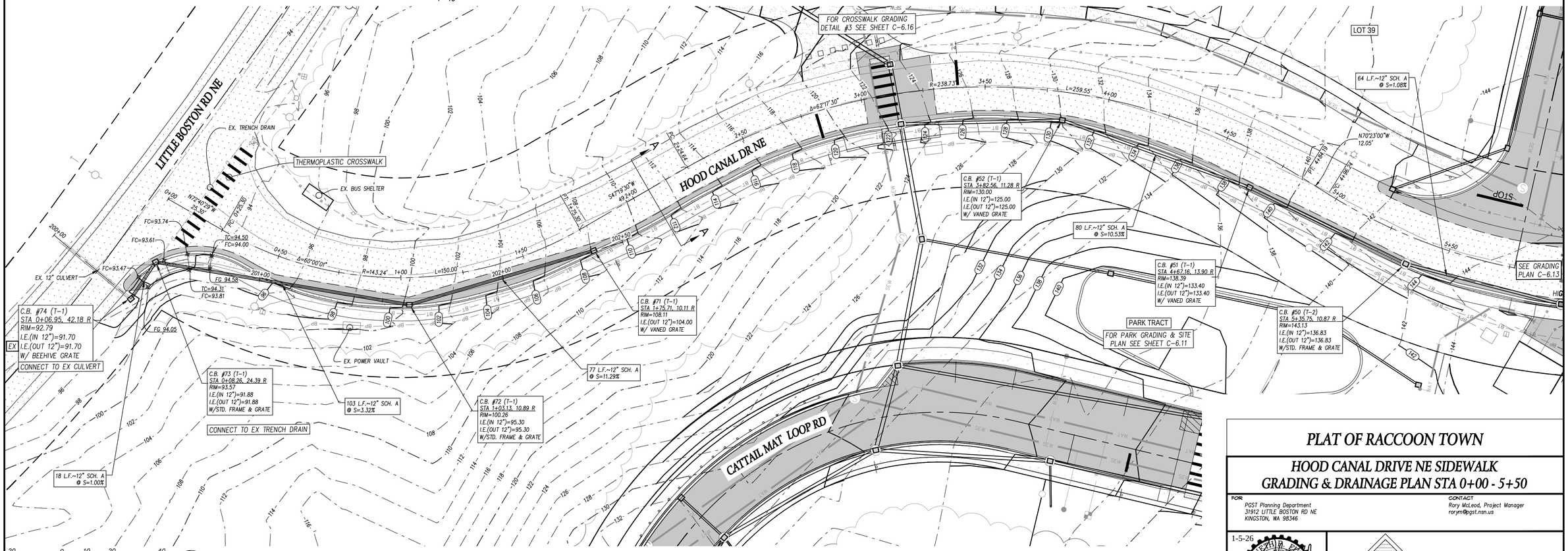
CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	25 OF 74



WALK STORM ALIGN 1 STA 200+00 – 202+50
1"=20' Horiz
1"=10'



SECTION A-A
SCALE: 1" = 5'



PLAT OF RACCOON TOWN

HOOD CANAL DRIVE NE SIDEWALK GRADING & DRAINAGE PLAN STA 0+00 - 5+50

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. FEARN — STATE OF WASHINGTON — 19853 — REGISTERED PROFESSIONAL ENGINEER

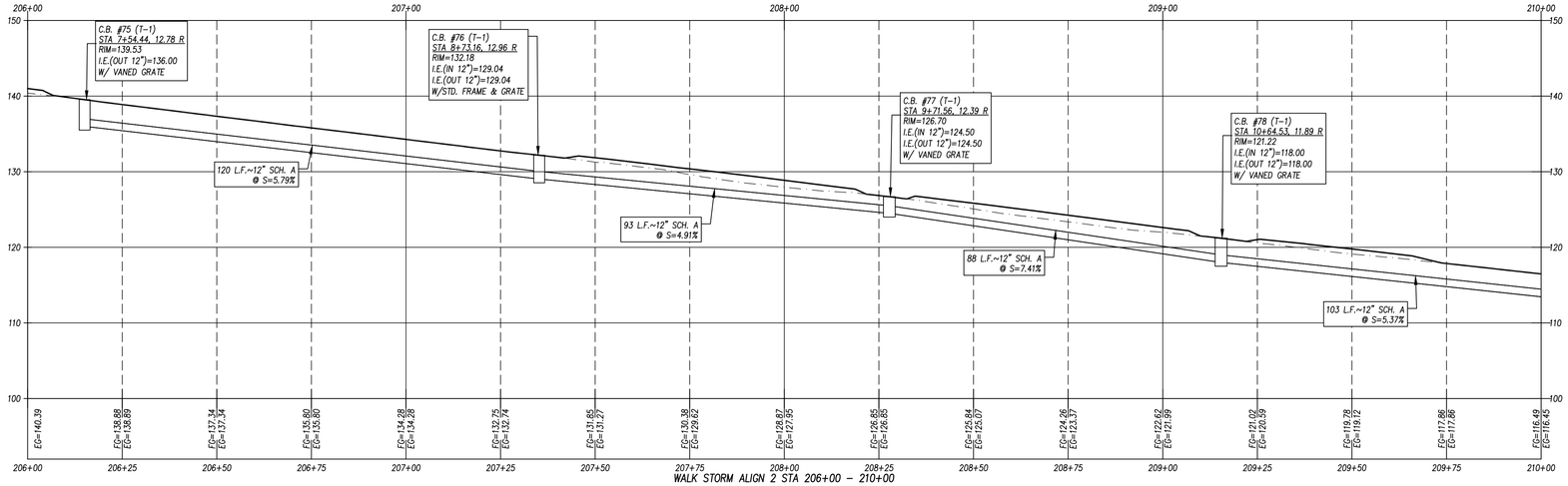
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NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

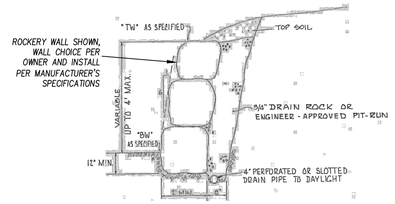
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C - 6.12

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	26 OF 74



WALK STORM ALIGN 2 STA 206+00 – 210+00
1"=20' Horiz
1"=10'

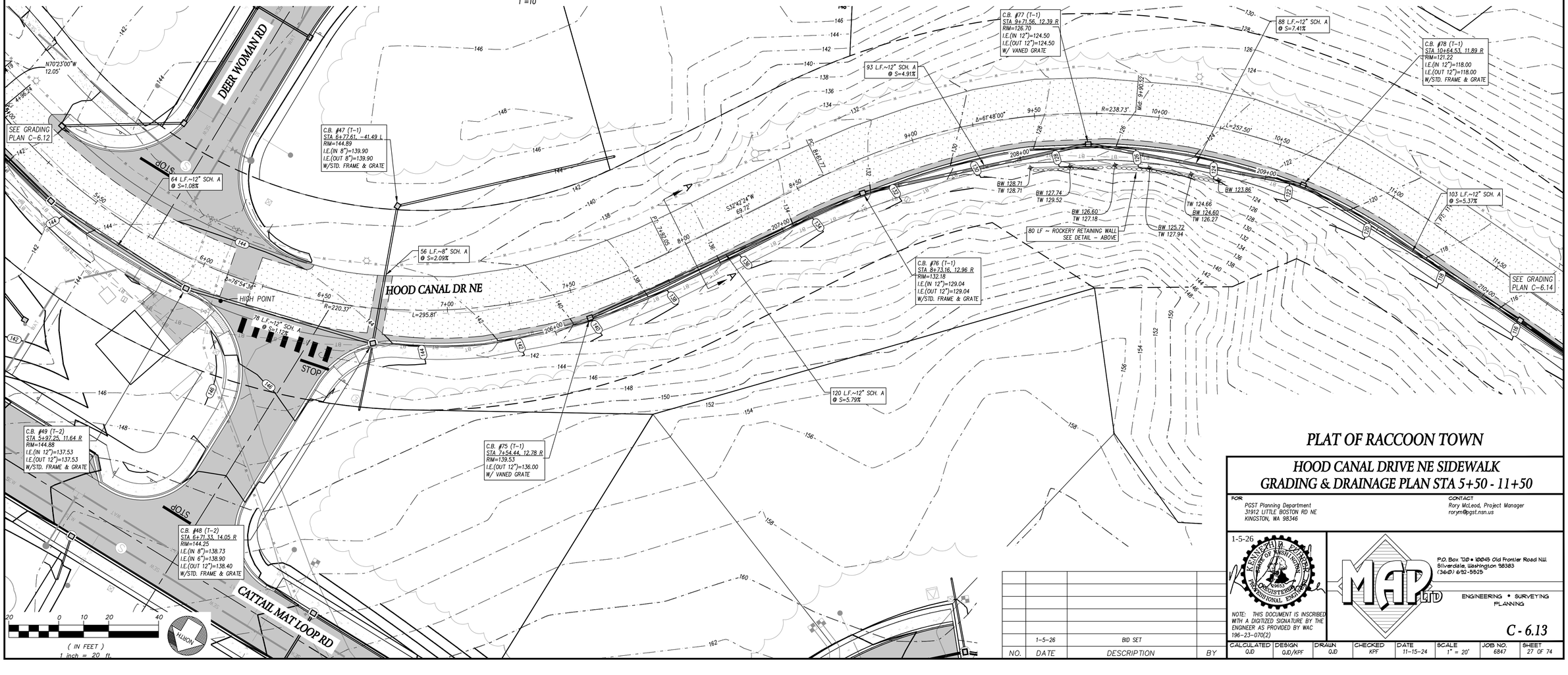


1. THE WALLS SHALL BE CONSTRUCTED OF SOUND QUARRY ROCKS AND SHALL PRESENT A SOLID ROCK FACE, CONSTRUCTED WITH WELL-ANCHORED ROCKS OF VARIOUS SIZES AND SHAPES. THE ROCK SHALL BE SOUND QUARRIED ROCK HAVING A WEIGHT OF NOT LESS THAN 155 POUNDS PER CUBIC FOOT. THE ROCK SHALL BE DURABLE, FREE OF CRACKS, SEAMS AND OTHER NATURAL DEFECTS.
2. THE MINIMUM WEIGHT OF THE ROCKS USED IN THE WALL SHALL BE AS LISTED BELOW:

WALL HEIGHT	BOTTOM LAYER	TOP LAYER
0 FEET TO 4 FEET	800 POUNDS	200 POUNDS

3. THE LAYERS BETWEEN THE BOTTOM AND TOP SHALL BE GRADED UNIFORMLY BETWEEN THE WEIGHTS GIVEN ABOVE.
4. THE SUB-GRADE SHALL BE COMPACTED TO A FIRM UNYIELDING SURFACE TO THE SATISFACTION OF THE ENGINEER.
5. THE WALL SHALL BE CONSTRUCTED BY PLACING ROCKS WHEREBY ONE ROCK IS IN CONTRACT WITH TWO OTHERS WITH A MINIMUM OF THREE BEARING SURFACES PER ROCK.
6. THE ROCKS SHALL BE PLACED BY A COMBINATION OF MACHINE AND MANUAL METHODS WITH ROCKS BEING SELECTED TO PRODUCE A UNIFORM ROCK FACE. THE ROCKS SHALL BE KEYED IN PLACE AND BACKFILLED AROUND AND BEHIND WITH THE APPROVED BACKFILL MATERIAL. THE BACKFILL MATERIAL SHALL BE THOROUGHLY TAMPED BEFORE THE NEXT COURSE OF ROCK IS PLACED.

ROCK RETAINING WALL
N.T.S.



PLAT OF RACCOON TOWN

HOOD CANAL DRIVE NE SIDEWALK
GRADING & DRAINAGE PLAN STA 5+50 - 11+50

FOR
POST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. FRANCIS
STATE OF WASHINGTON
18853
REGISTERED
PROFESSIONAL ENGINEER

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C - 6.13

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	27 OF 74

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

KLOOMACHIN PLACE NE

HOOD CANAL DR NE

N85°29'36"W

Δ=81°52'09"
R=190.99'
L=272.90'

CURB INLET – SEE DETAIL SHEET C-6.15 (TYPICAL)

FC=101.74
FC=100.17
FC=98.93
FC=98.21
FC=97.74
FC=97.38
FC=97.14

50' O/C

PT: 16+46.13

C.B. #80 (T-1)
STA 13+54.18, 10.82 R
RIM=105.62
I.E.(IN 12")=102.79
I.E.(OUT 12")=102.79
W/STD. FRAME & GRATE

C.B. #81 (T-1)
STA 13+99.71, 27.30 R
RIM=106.76
I.E.(IN 12")=102.34
I.E.(OUT 12")=102.34
W/ SOLID LID

DITCH OUTLET
STA 14+37.71, 21.47 R
I.E.(IN 12")=102.00

34 L.F.~12" SCH. A
@ S=1.00%

45 L.F.~12" SCH. A
@ S=1.00%

103 L.F.~12" SCH. A
@ S=5.37%

C.B. #79 (T-1)
STA 11+20.03, 11.63 R
RIM=115.51
I.E.(IN 12")=112.50
I.E.(OUT 12")=112.50
W/ VANED GRATE

C.B. #78 (T-1)
STA 10+64.53, 11.89 R
RIM=121.22
I.E.(IN 12")=118.00
I.E.(OUT 12")=118.00
W/ VANED GRATE

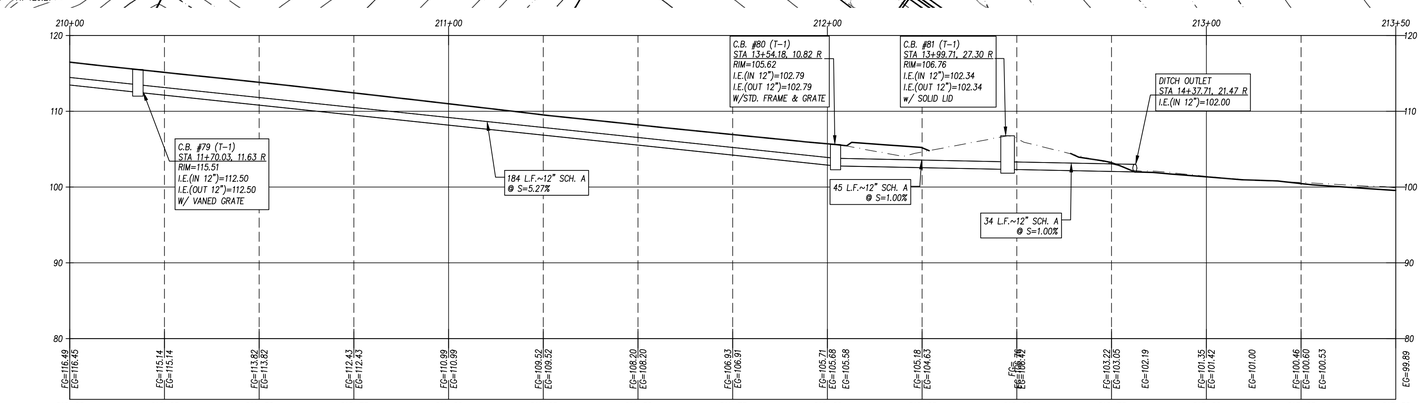
SEE GRADING PLAN C-6.13

SEE GRADING PLAN C-6.15

RW 123.38

RW 123.86
TW 124.66

RW 124.60
TW 126.27



WALK STORM ALIGN 2 STA 210+00 – 213+50
1"=20' Horiz
1"=10'

PLAT OF RACCOON TOWN

HOOD CANAL DRIVE NE SIDEWALK GRADING & DRAINAGE PLAN STA 11+50 - 17+50

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KRISTOPHER D. PETERSEN
STATE OF WASHINGTON
23855
REGISTERED PROFESSIONAL ENGINEER

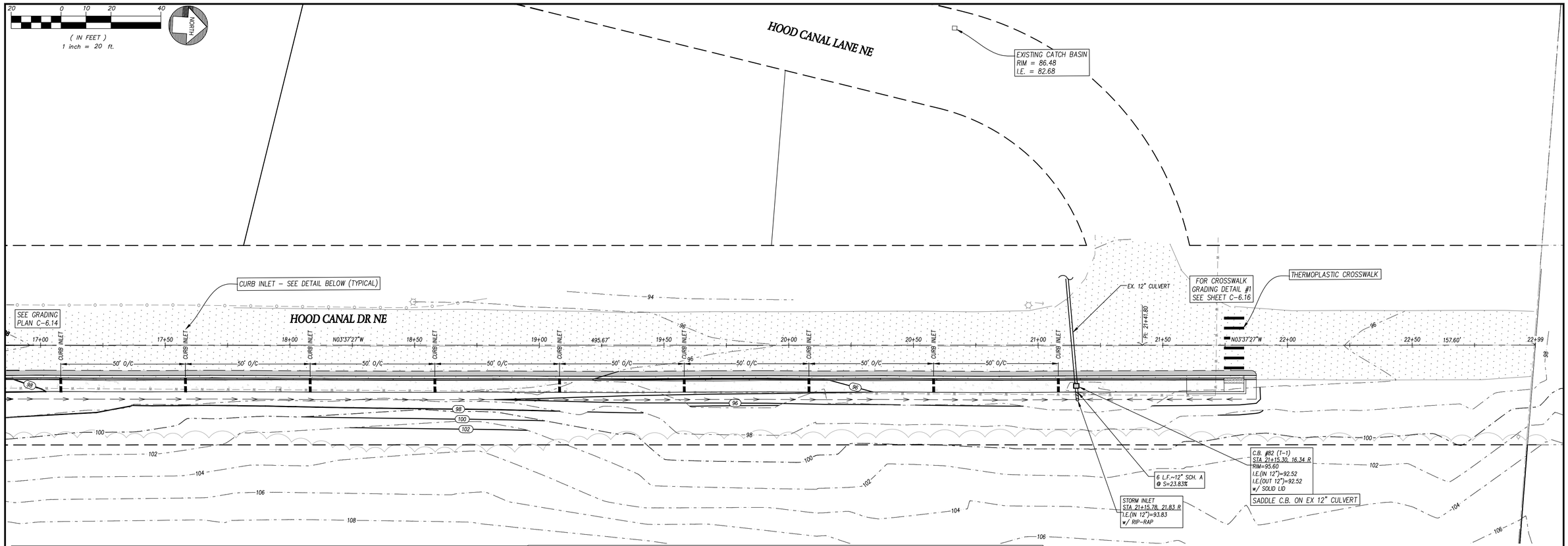
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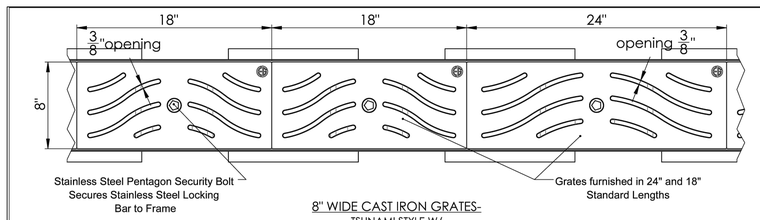
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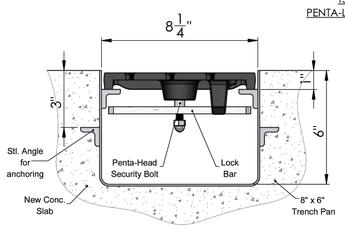
C - 6.14

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	28 OF 74





8" WIDE CAST IRON GRATES-
TSUNAMI STYLE W/
PENTA-LOCK CHANNEL FRAME
SCALE 1 : 7



CROSS SECTION
SCALE 1 : 4



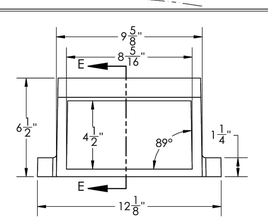
PERSPECTIVE OF ASSEMBLY
N.T.S.

Product No. : T-08C Tsunami

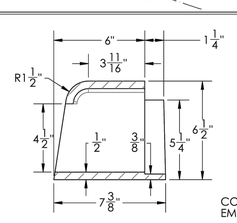
Grate Material: ASTM-A48 Class 308 Cast Iron
Frame Material: Plain Steel
Load Rating: Non-Traffic (Pedestrain)
Made in USA

Grate + Frame Weight: 22.77 lbs./LF.
8"x18" Frame Openings: 16"sq.in.
8"x24" Frame Openings: 22"sq.in.

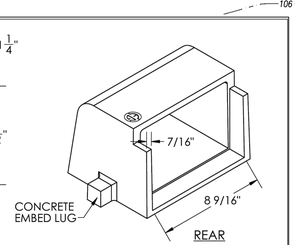
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FRONT
SCALE 1 : 4



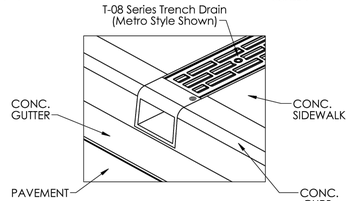
SECTION E-E
SCALE 1 : 4



REAR
SCALE 1 : 4



PERSPECTIVE OF C-846T
N.T.S.



INSTALLATION DETAIL
SCALE 1 : 12

Product No. : C-846T

Material: ASTM-A48 Class 308 Gray Iron
Weight: 28.5 lbs. ea.
Made in USA

EVERGRATE
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PLAT OF RACCOON TOWN

HOOD CANAL DRIVE NE SIDEWALK
GRADING & DRAINAGE PLAN STA 17+50 - 22+99

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. PEARCE
STATE OF WASHINGTON
22855
REGISTERED
PROFESSIONAL ENGINEER

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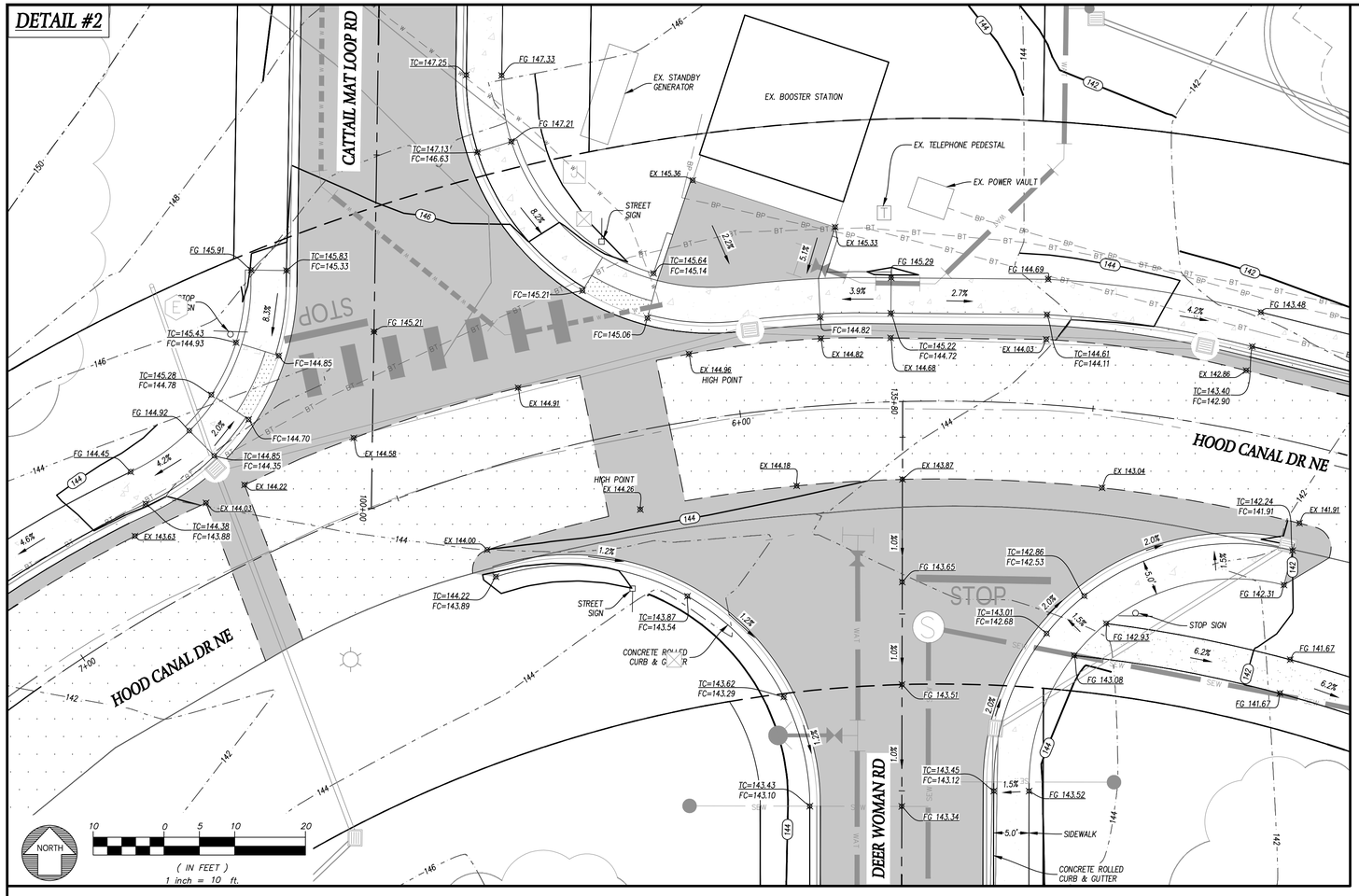
NO.	DATE	DESCRIPTION	BY
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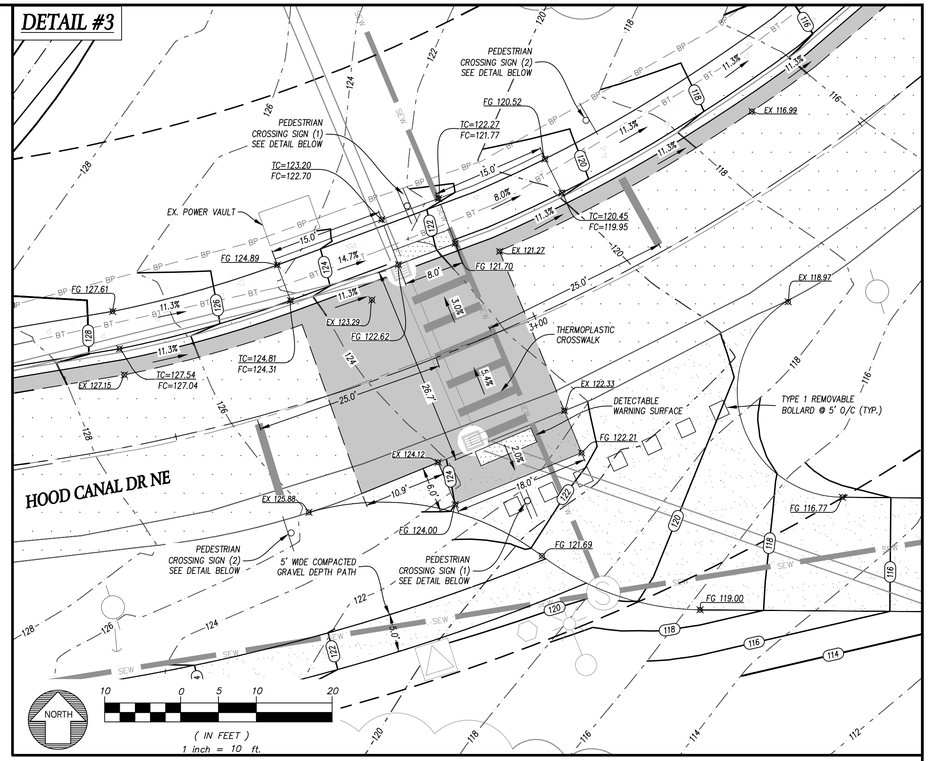
C - 6.15

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	29 OF 74

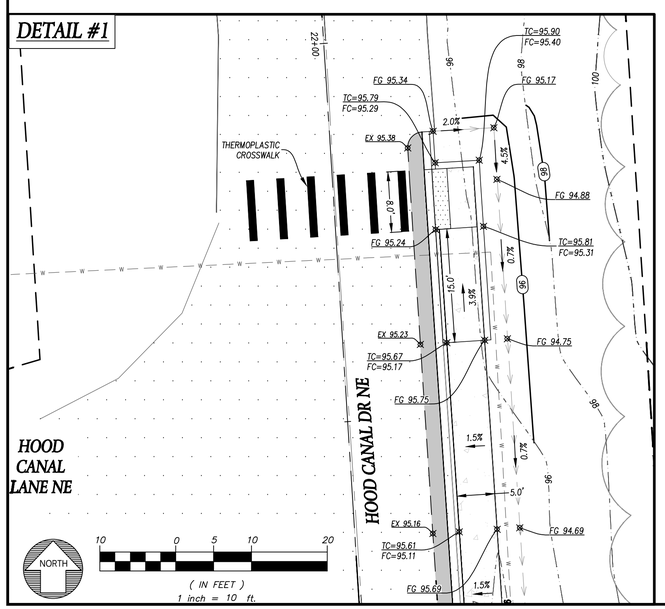
DETAIL #2



DETAIL #3

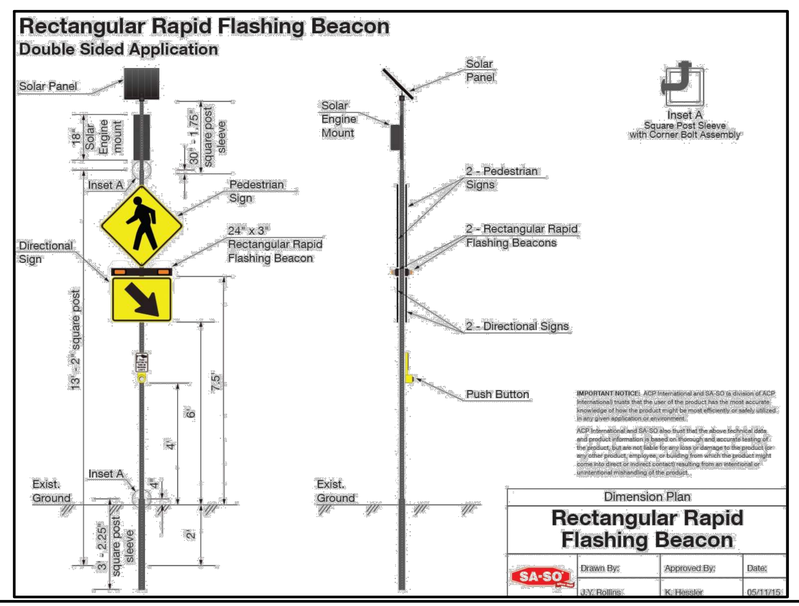


DETAIL #1



Rectangular Rapid Flashing Beacon

Double Sided Application



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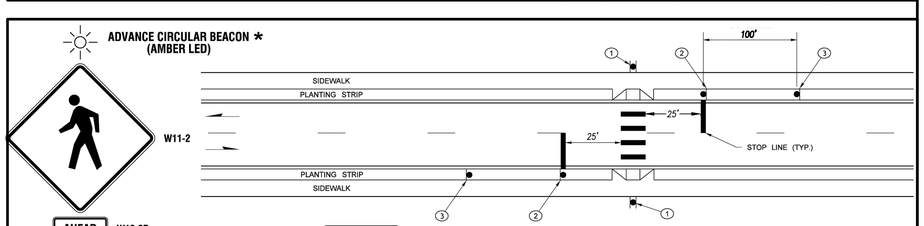
ACP International and SA-SO also trust that the above technical data and product information is based on thorough and accurate testing of the product, but are not liable for any loss or damage to the product or any other product, employee, or building from which the product might come into direct or indirect contact resulting from an intentional or unintentional mishandling of the product.

Dimension Plan

Rectangular Rapid Flashing Beacon

SA-SO

Drawn By:	Approved By:	Date:
JJV Rollins	K. Hessler	05/17/19



Washington State Department of Transportation

PEDESTRIAN CROSSING DETAILS

Plot 5 | PLAN REF NO IS-23 | SHEET 5 OF X SHEETS

PLAT OF RACCOON TOWN

INTERSECTIONS AND CROSSWALK GRADING & DETAILS - HOOD CANAL DRIVE

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

1-5-26

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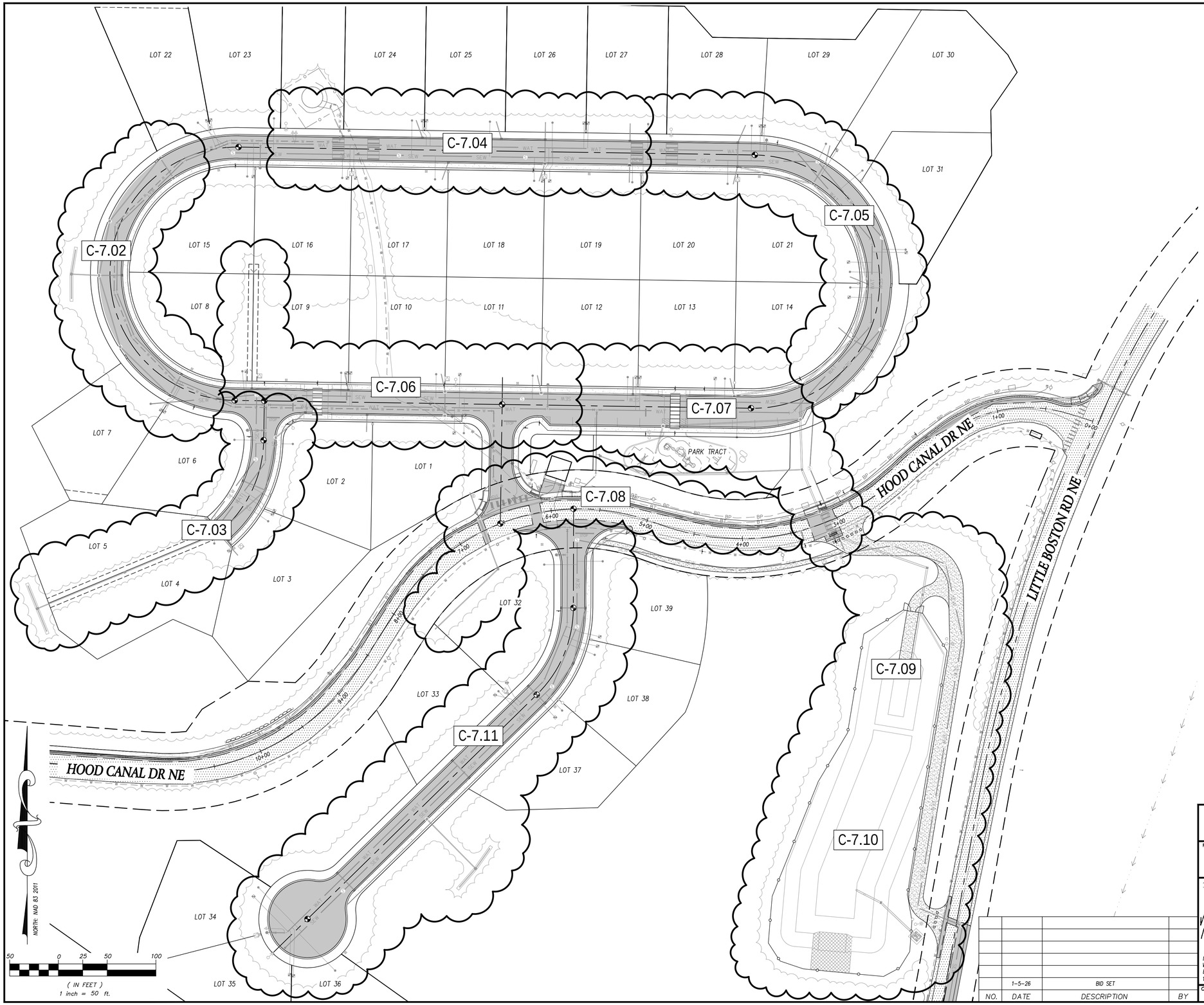
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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 10'	6847	30 OF 74

NOTE:

FOR HOOD CANAL DRIVE NE DRAINAGE PLAN SEE SHEETS C-6.12, C-6.13, C-6.14 and C-6.15

DRAINAGE NOTES

1. THE CONTRACTOR SHALL ENSURE THAT THE DRAINAGE IS INSTALLED AND OPERATIONAL PRIOR TO COMMENCEMENT OF PAVING WORK.
2. ALL STEEL PIPE AND PARTS SHALL BE GALVANIZED. ALL SUBMERGED STEEL PIPES AND PARTS SHALL BE GALVANIZED AND HAVE ASPHALT TREATMENT #1 OR BETTER.
3. DRAINAGE STUBOUTS ON INDIVIDUAL LOTS SHALL BE LOCATED WITH A FIVE FOOT HIGH 2" X 4" STAKE MARKED "STORM". THE STUBOUT SHALL EXTEND ABOVE SURFACE LEVEL AND BE SECURED TO THE STAKE.
4. ALLOWABLE PIPE MATERIALS PER WSDOT STD. SPEC, 7-02, 7-03 & 7-04.
5. REFER TO WSDOT STD. SPEC. 7-02.2 FOR SCHEDULE "A" PIPE AS CALLED OUT ON THESE PLANS.



NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

OVERALL STORM DRAINAGE PLAN

FOR
POST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

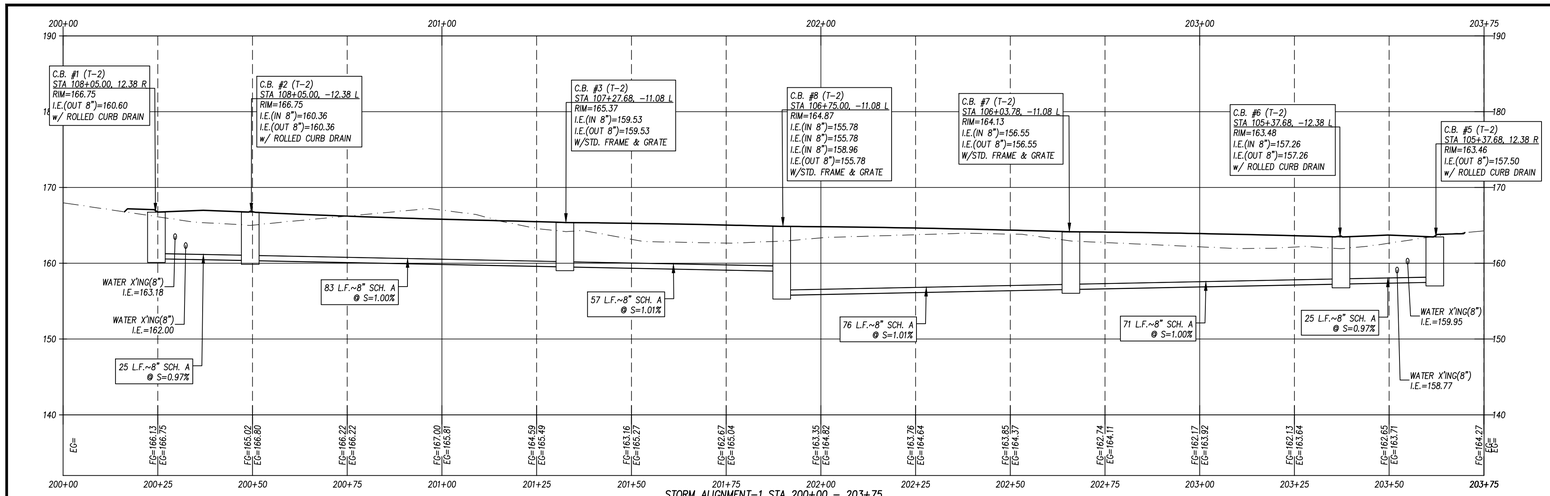
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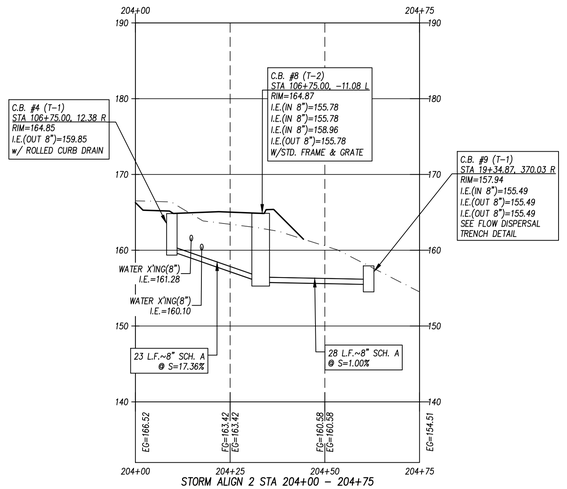
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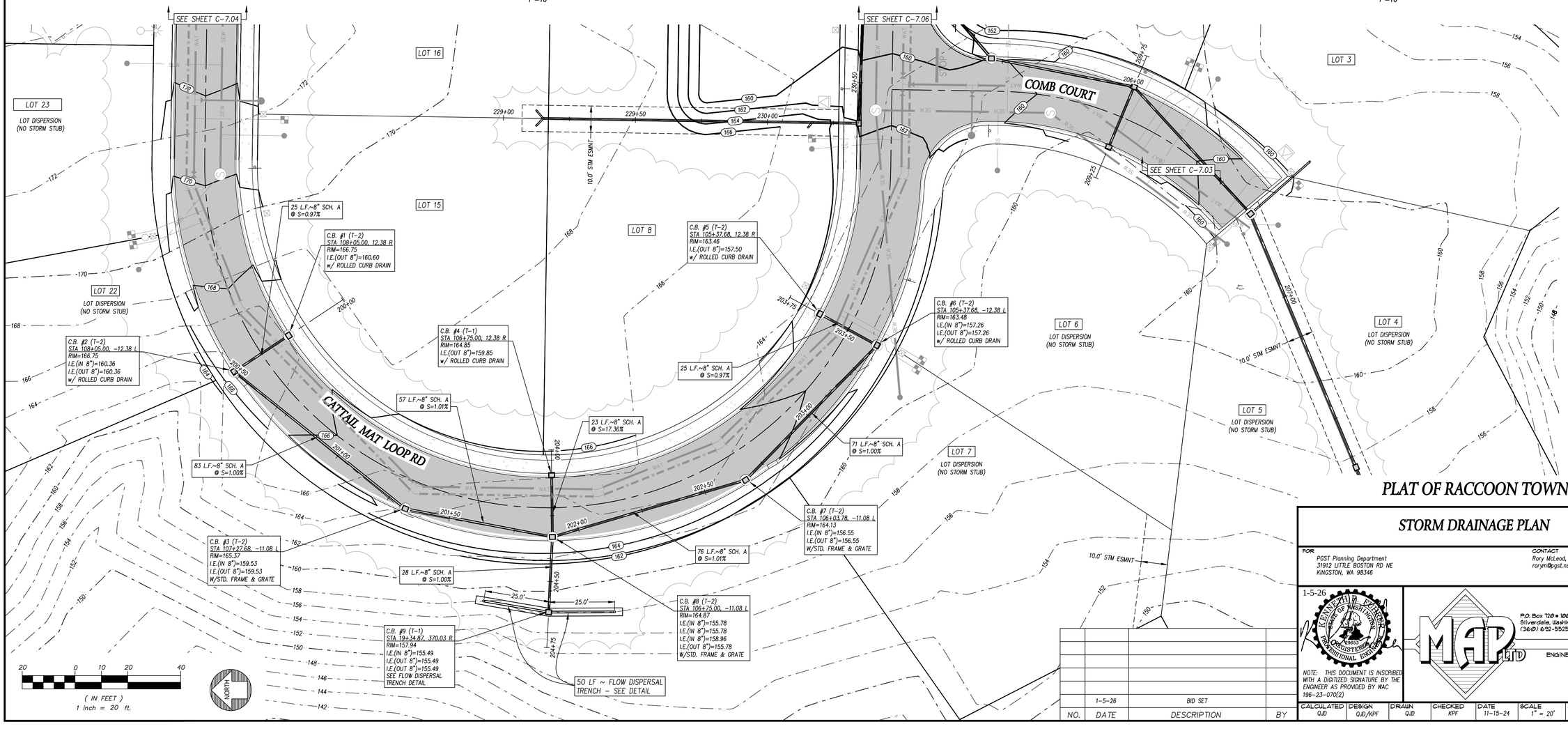
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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 50'	6847	31 OF 74



STORM ALIGNMENT-1 STA 200+00 – 203+75
1"=20' Horiz
1"=10'



STORM ALIGN 2 STA 204+00 – 204+75
1"=20' Horiz
1"=10'



20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

NORTH

PLAT OF RACCOON TOWN

STORM DRAINAGE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. FRANK
STATE OF WASHINGTON
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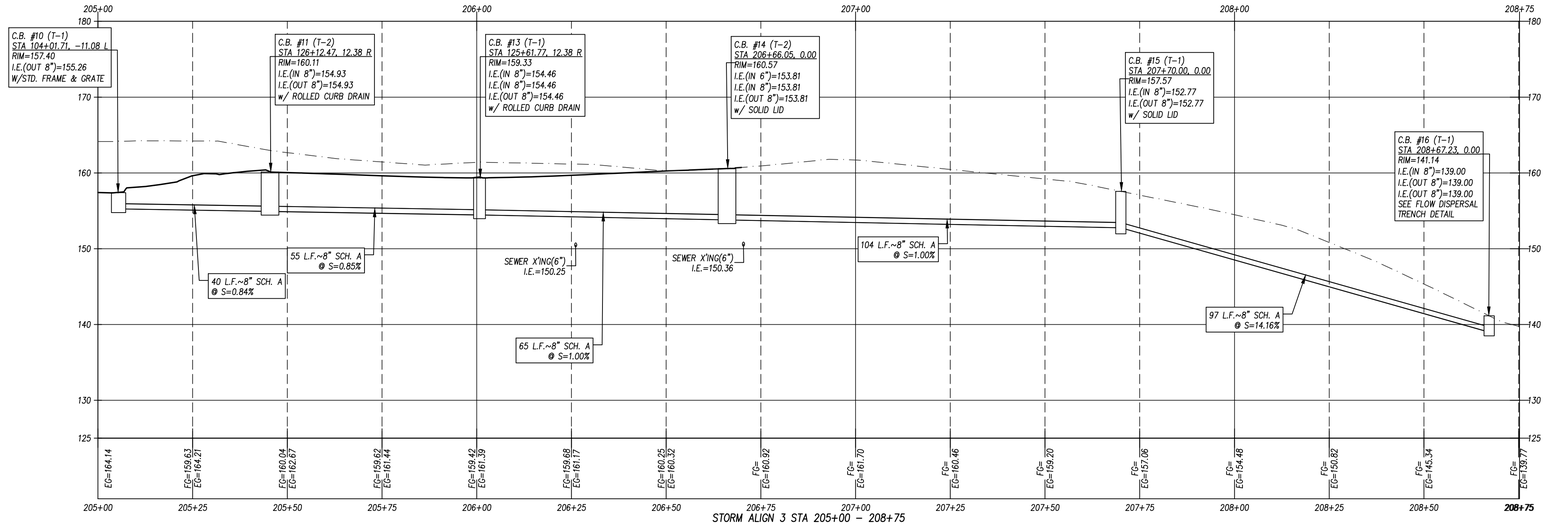
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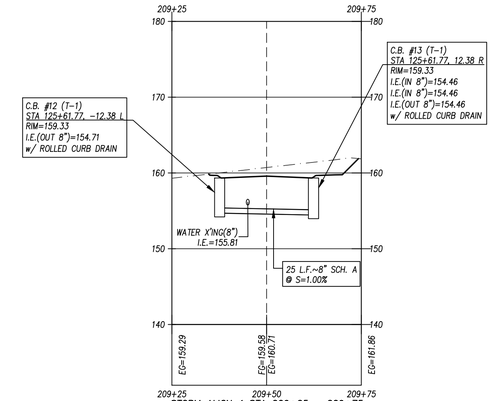
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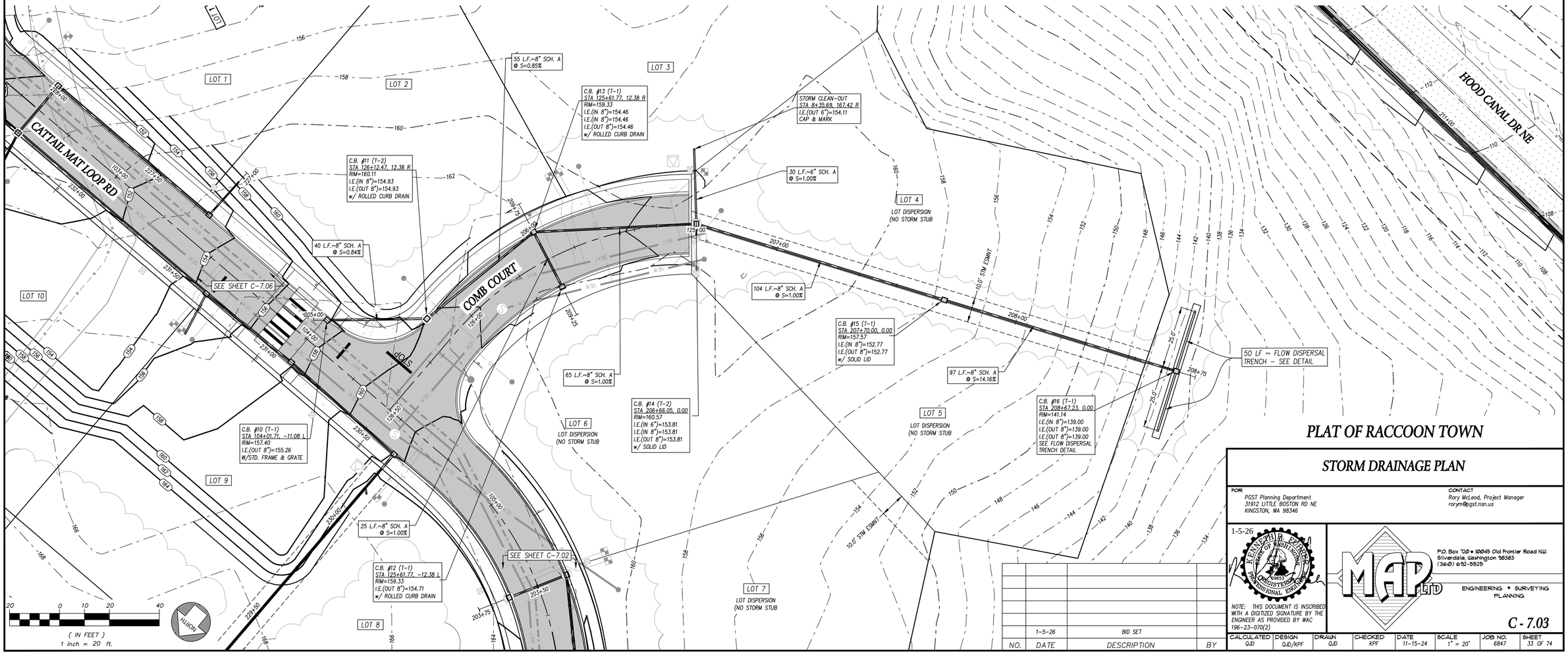
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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	32 OF 74



STORM ALIGN 3 STA 205+00 – 208+75
1"=20' Horiz
1"=10'



STORM ALIGN 4 STA 209+25 – 209+75
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

STORM DRAINAGE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

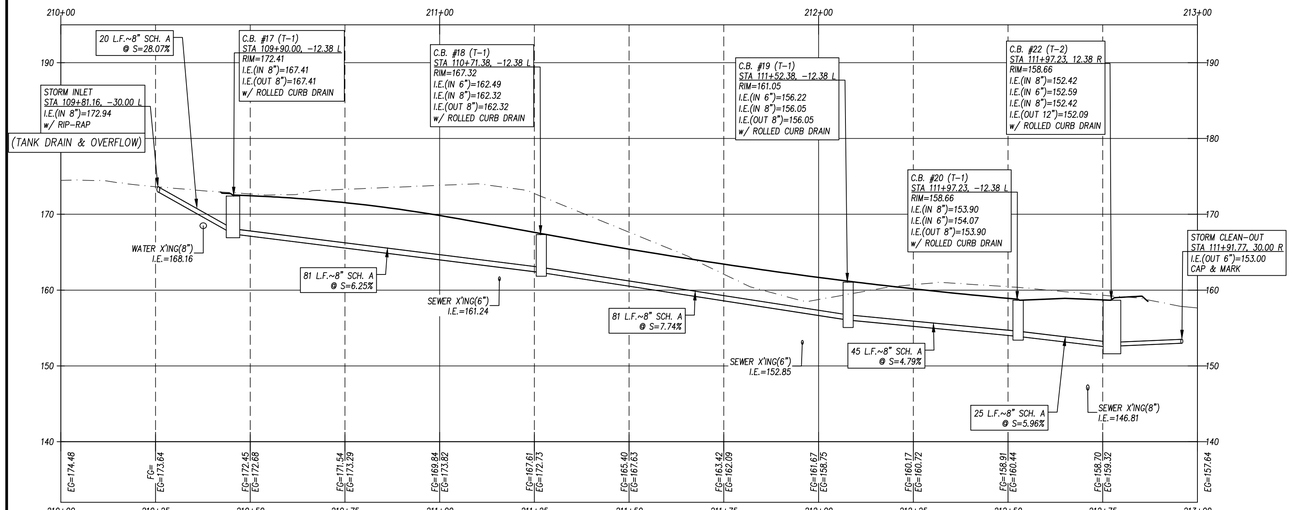
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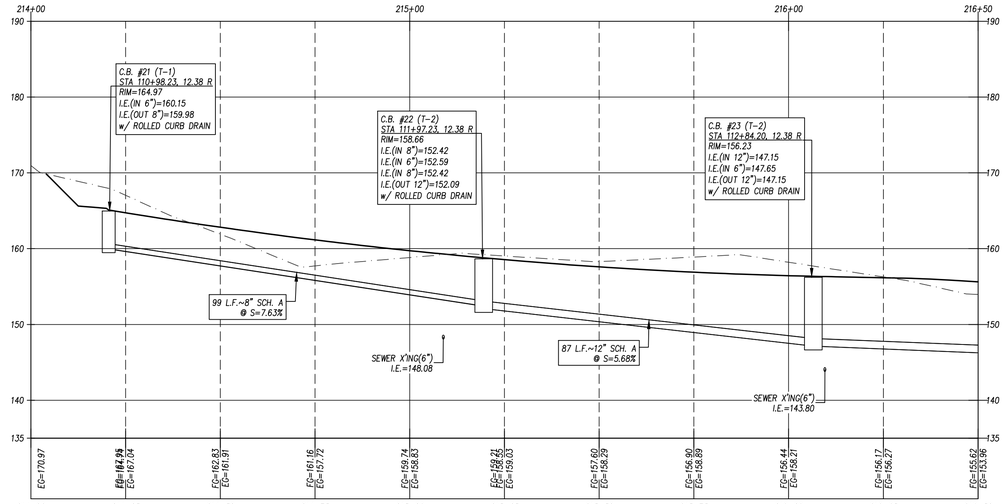
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NO.	DATE	DESCRIPTION	BY
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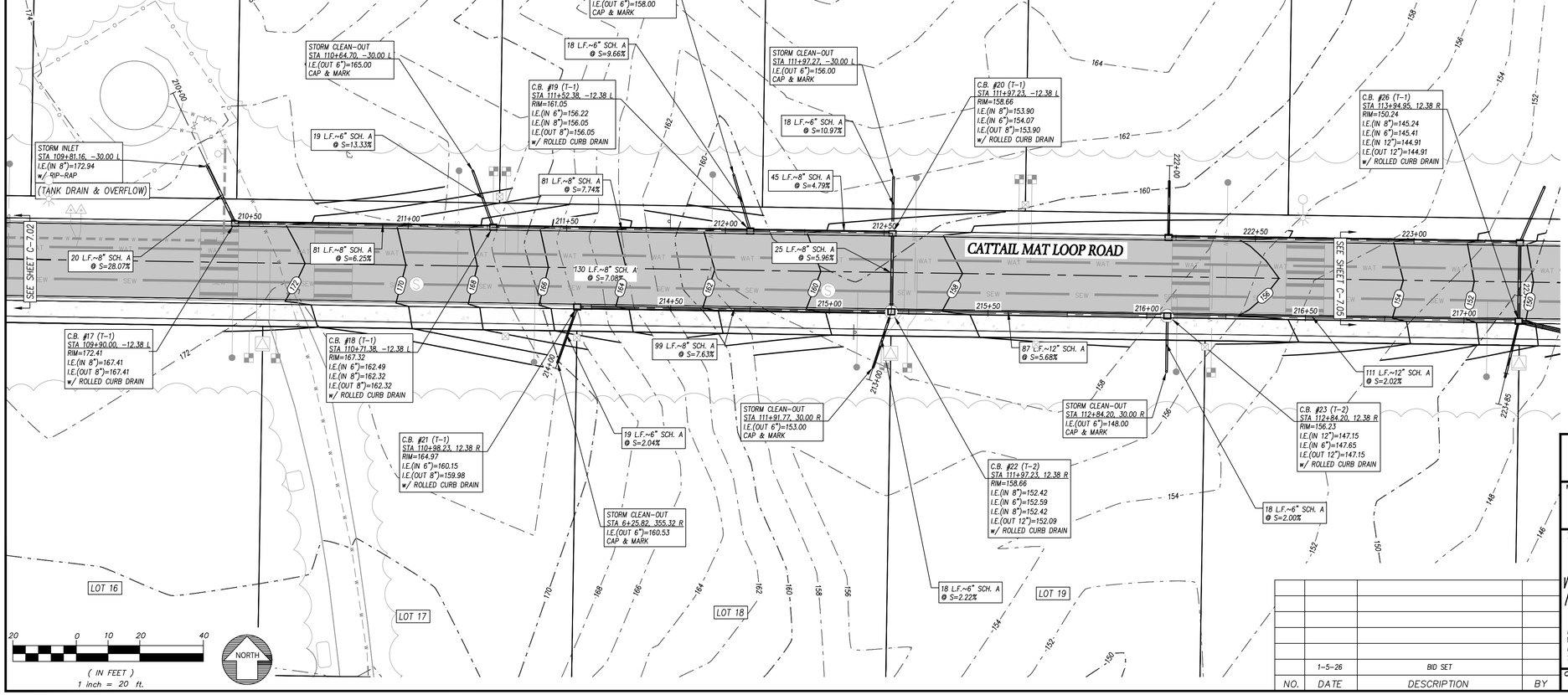
CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	33 OF 74



STORM ALIGN 5 STA 210+00 – 213+00
1"=20' Horiz
1"=10'



STORM ALIGN 6 STA 214+00 – 216+50
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

STORM DRAINAGE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

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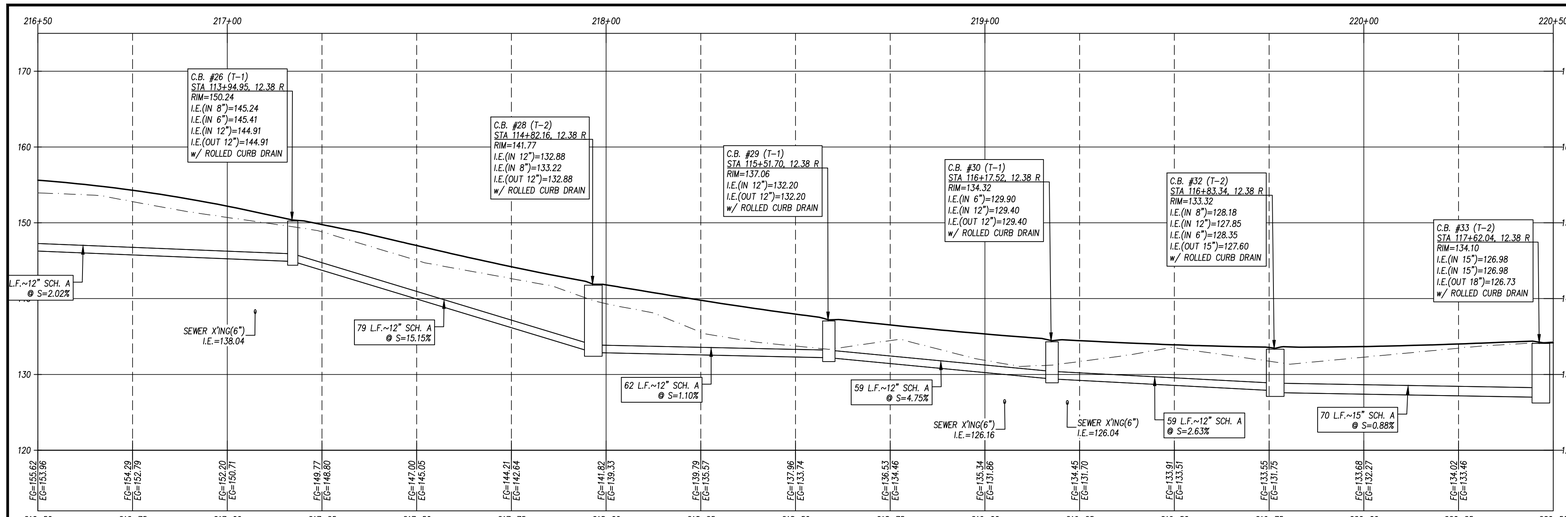
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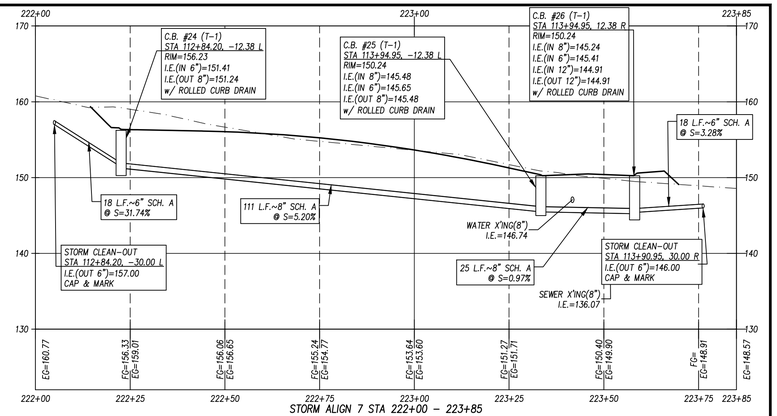
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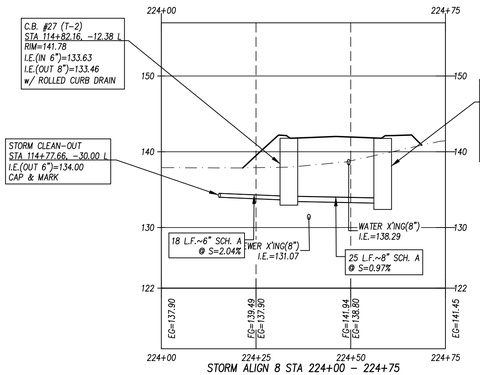
CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	34 OF 74



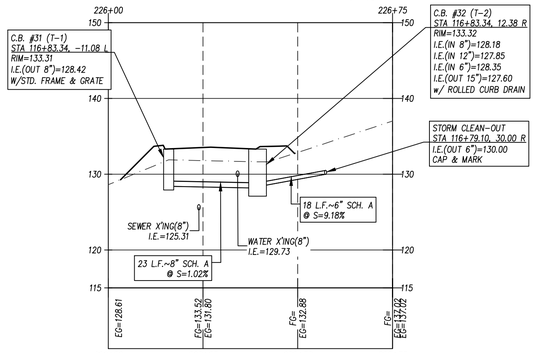
STORM ALIGN 6 STA 216+50 – 220+50
1"=20' Horiz
1"=10'



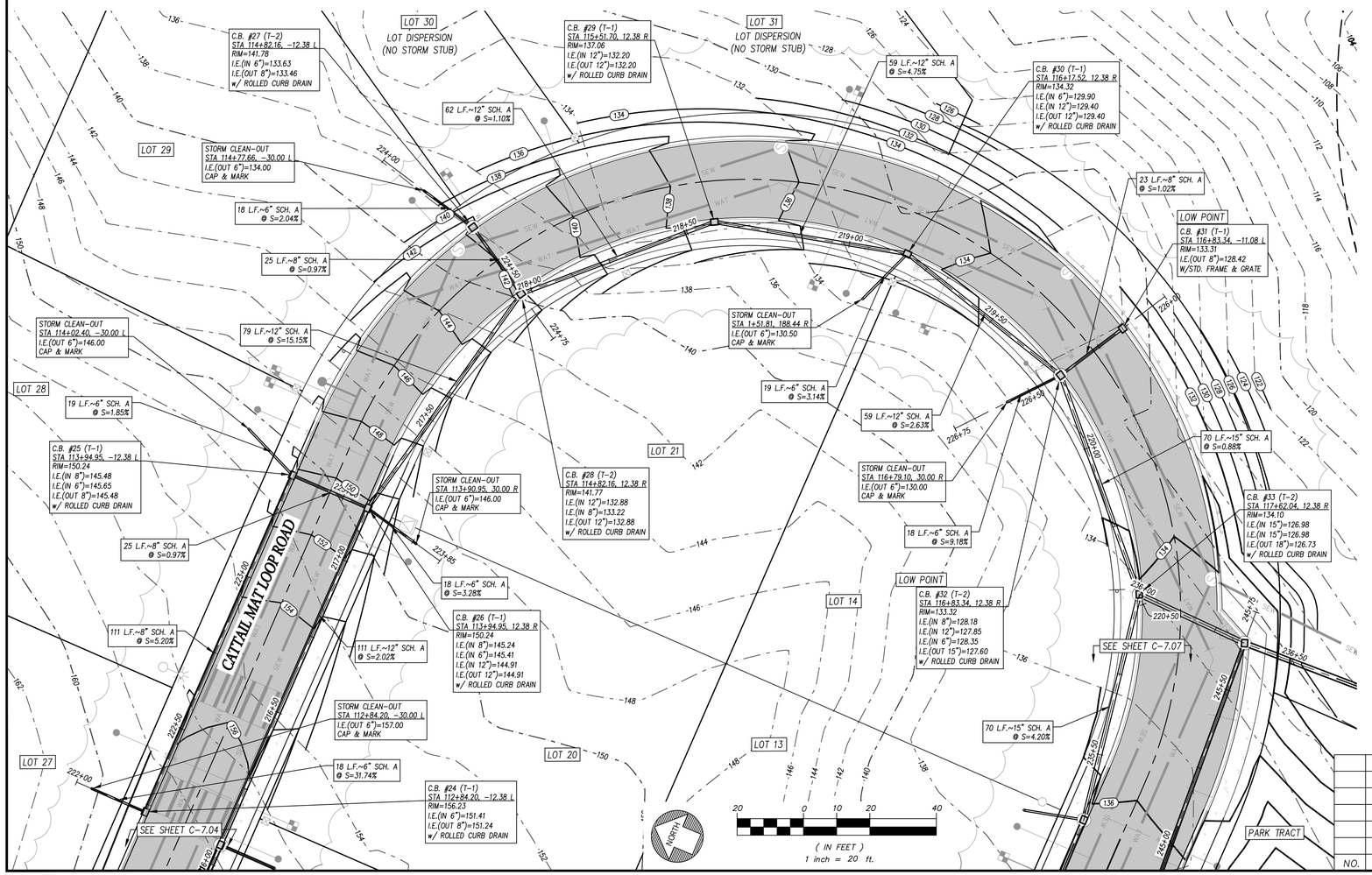
STORM ALIGN 7 STA 222+00 – 223+85
1"=20' Horiz
1"=10'



STORM ALIGN 8 STA 224+00 – 224+75
1"=20' Horiz
1"=10'



STORM ALIGN 9 STA 226+00 – 226+75
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

STORM DRAINAGE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

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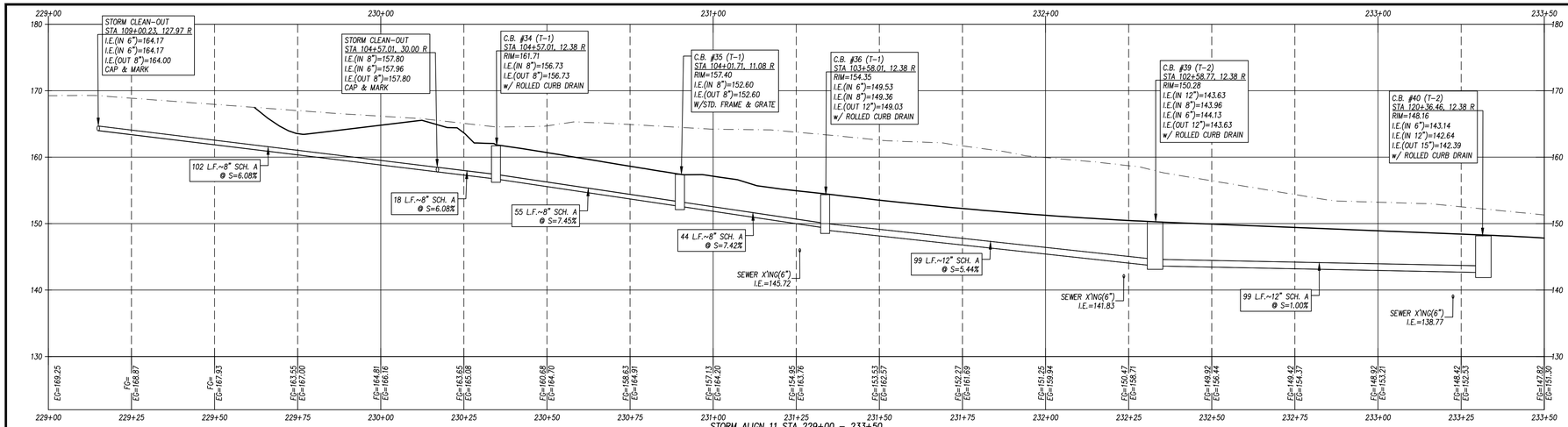
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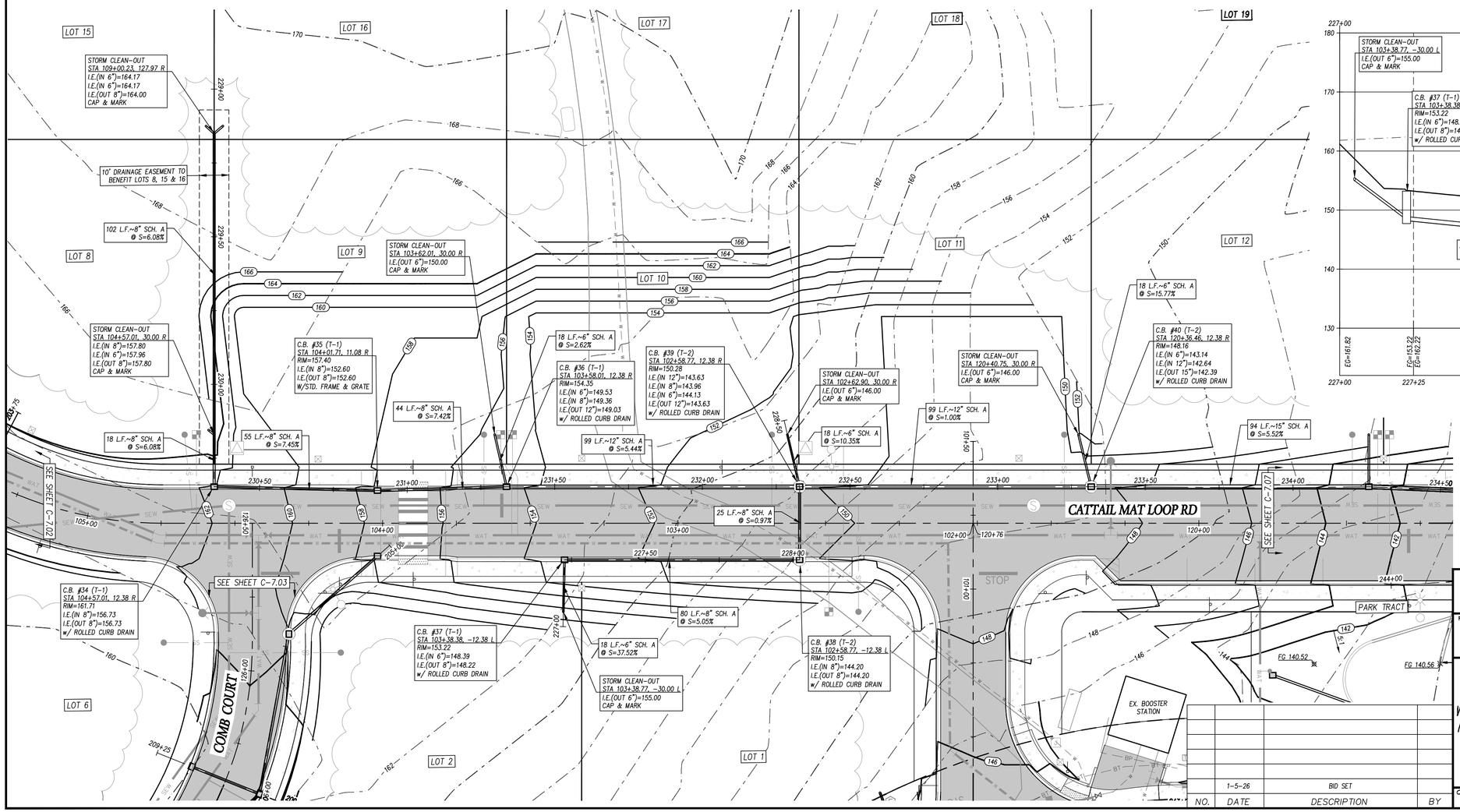
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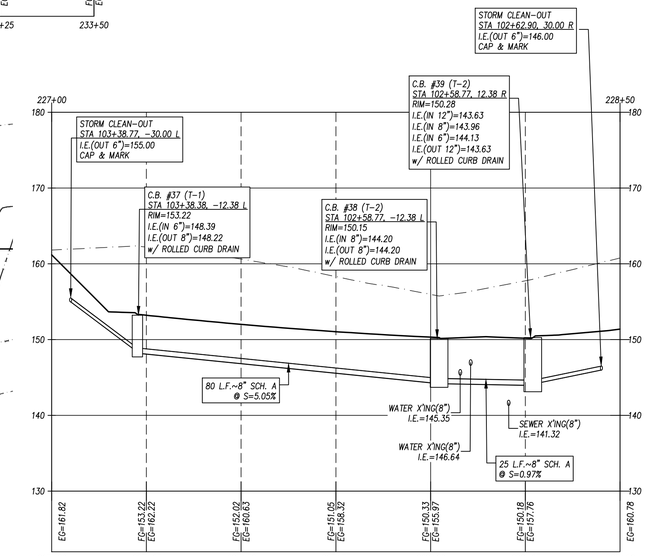
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STORM ALIGN 11 STA 229+00 – 233+50
1"=20' Horiz
1"=10'





STORM ALIGN 10 STA 227+00 – 228+50
1"=20' Horiz
1"=10'

PLAT OF RACCOON TOWN

STORM DRAINAGE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

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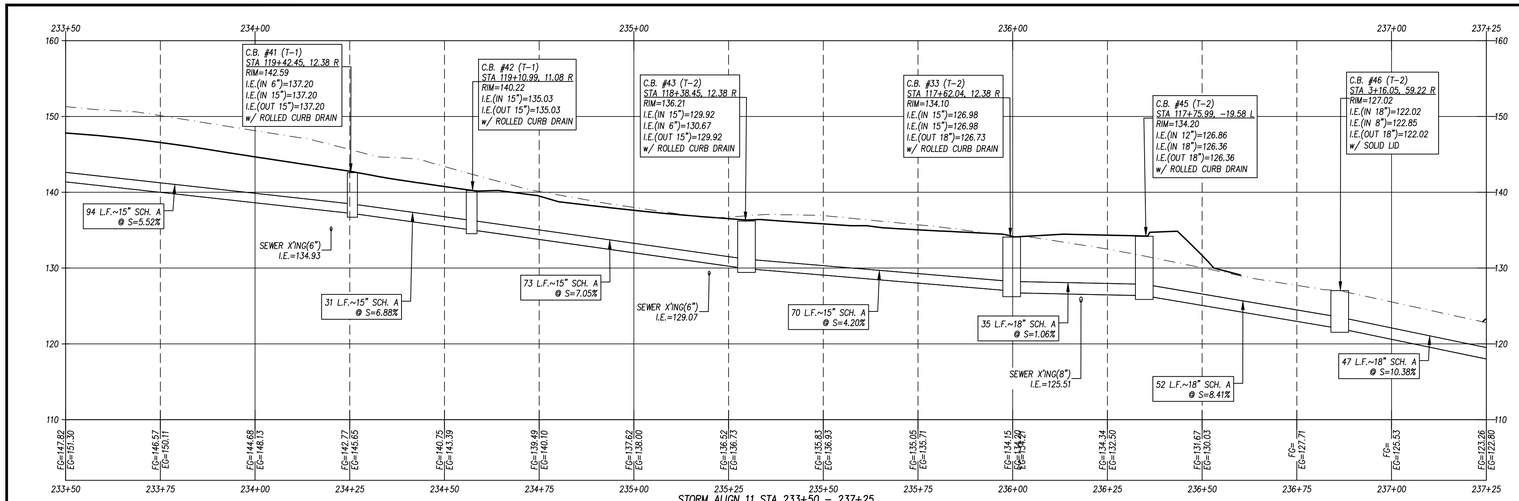
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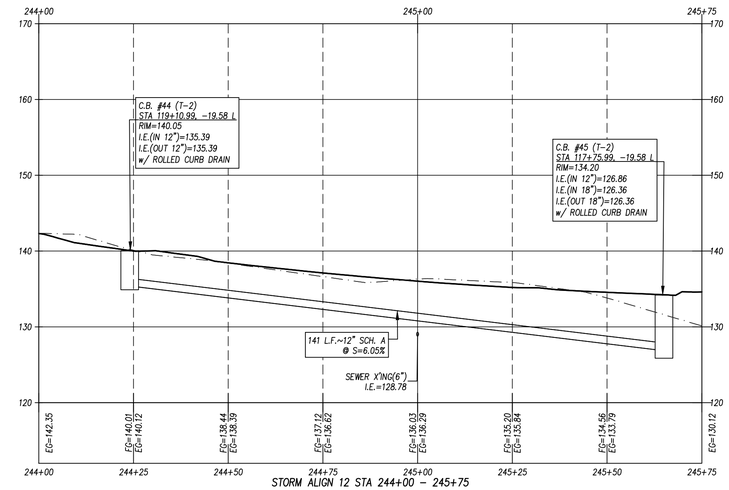
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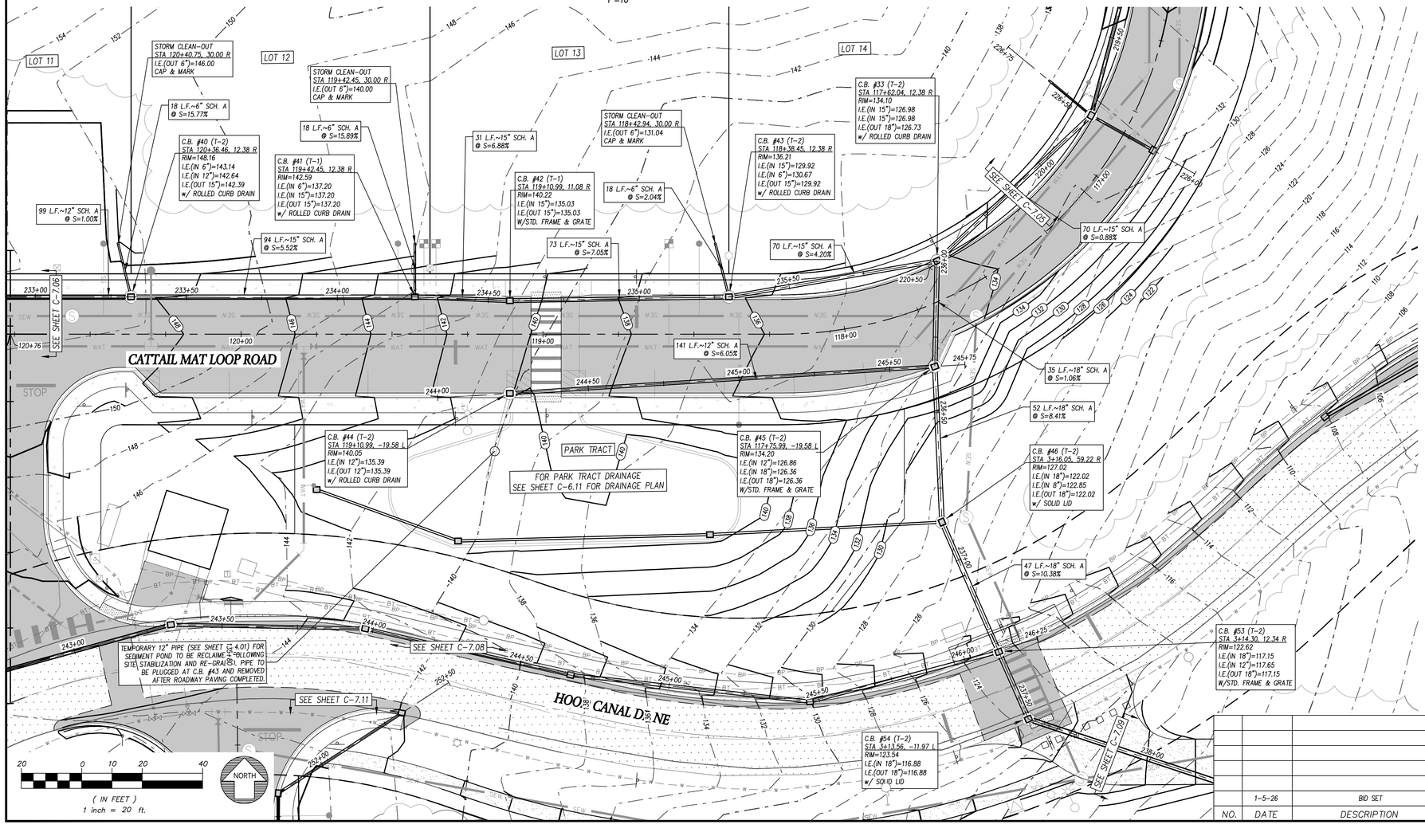
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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	36 OF 74



STORM ALIGN 11 STA 233+50 – 237+25
1"=20' Horiz
1"=10'



STORM ALIGN 12 STA 244+00 – 245+75
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

STORM DRAINAGE PLAN

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

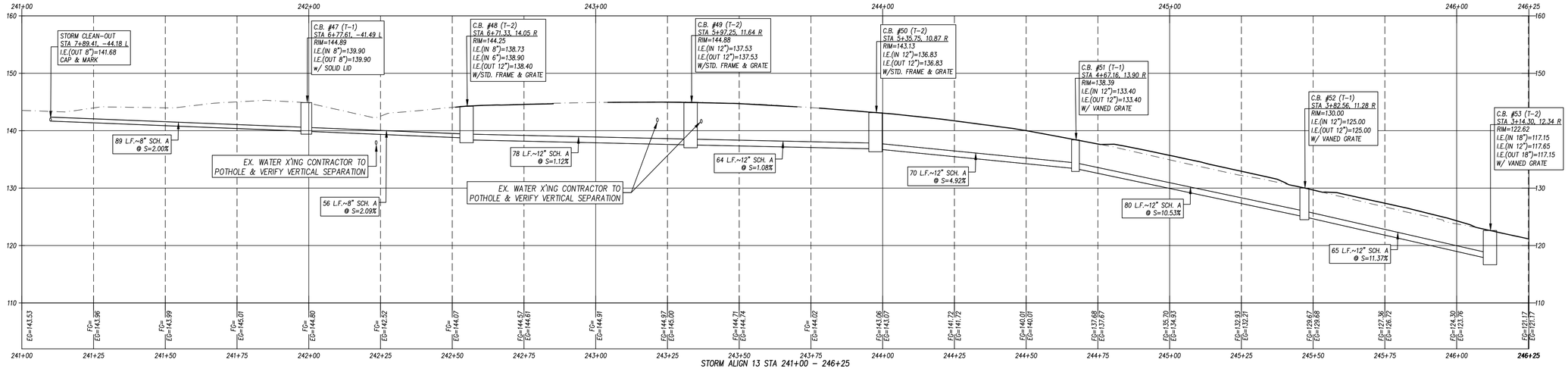
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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	37 OF 74



STORM ALIGN 13 STA 241+00 – 246+25
1"=20' Horiz
1"=10'

PLAT OF RACCOON TOWN

STORM DRAINAGE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
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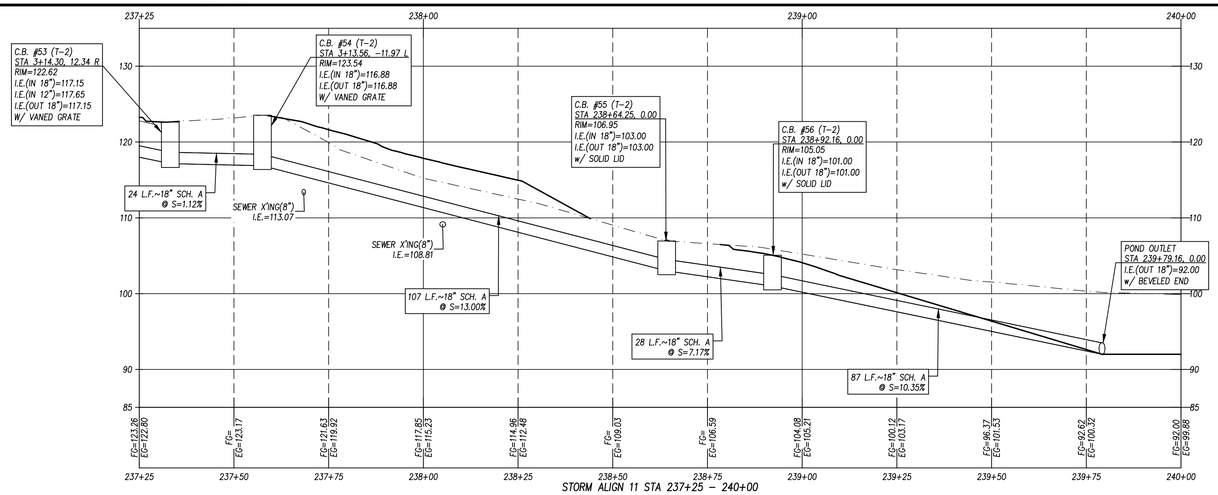
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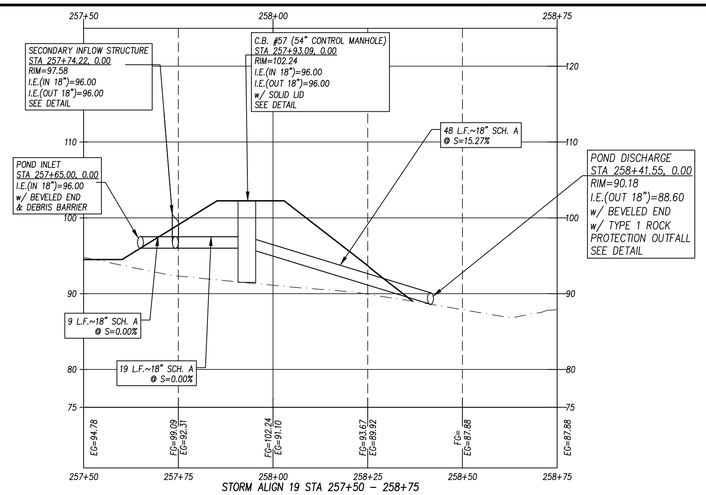
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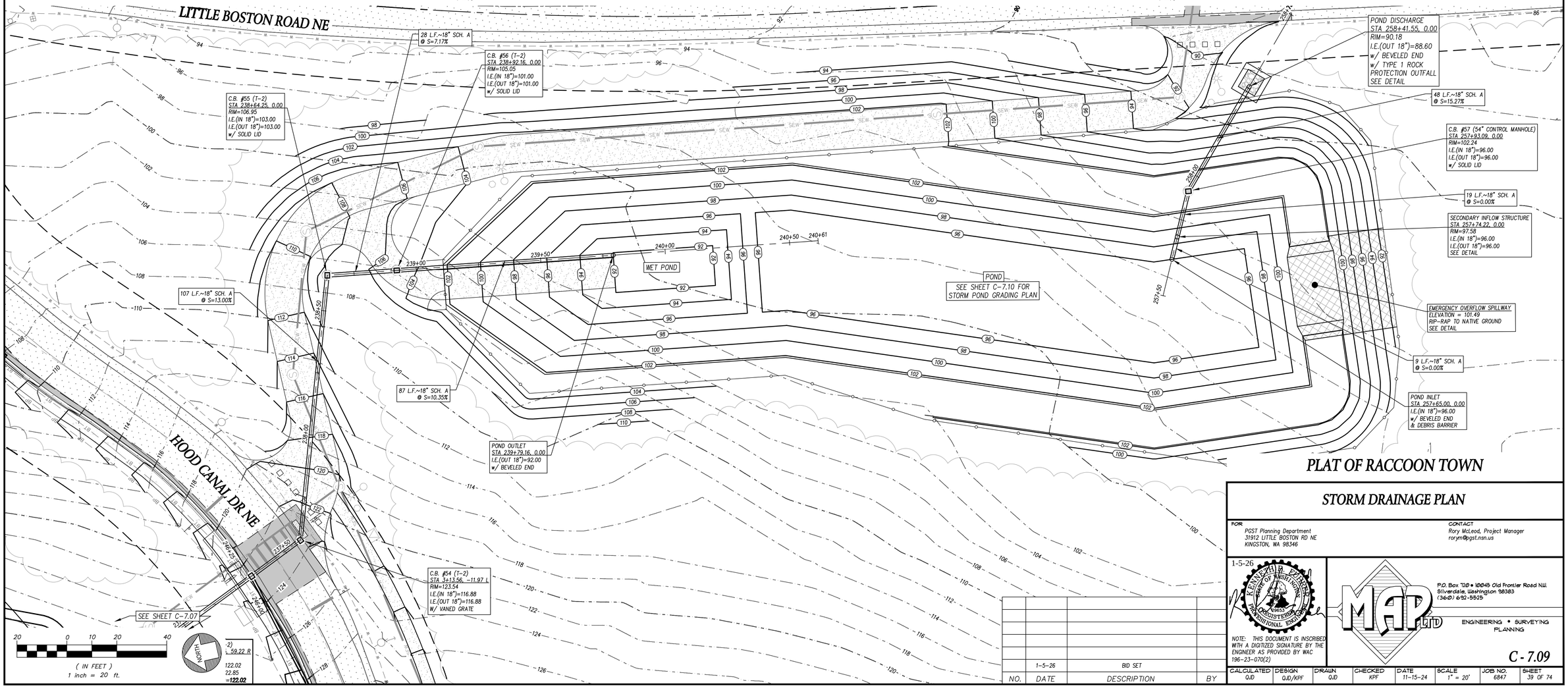
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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	38 OF 74



STORM ALIGN 11 STA 237+25 – 240+00
1"=20' Horiz
1"=10'



STORM ALIGN 19 STA 257+50 – 258+75
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

STORM DRAINAGE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

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rorym@pgst.nsn.us

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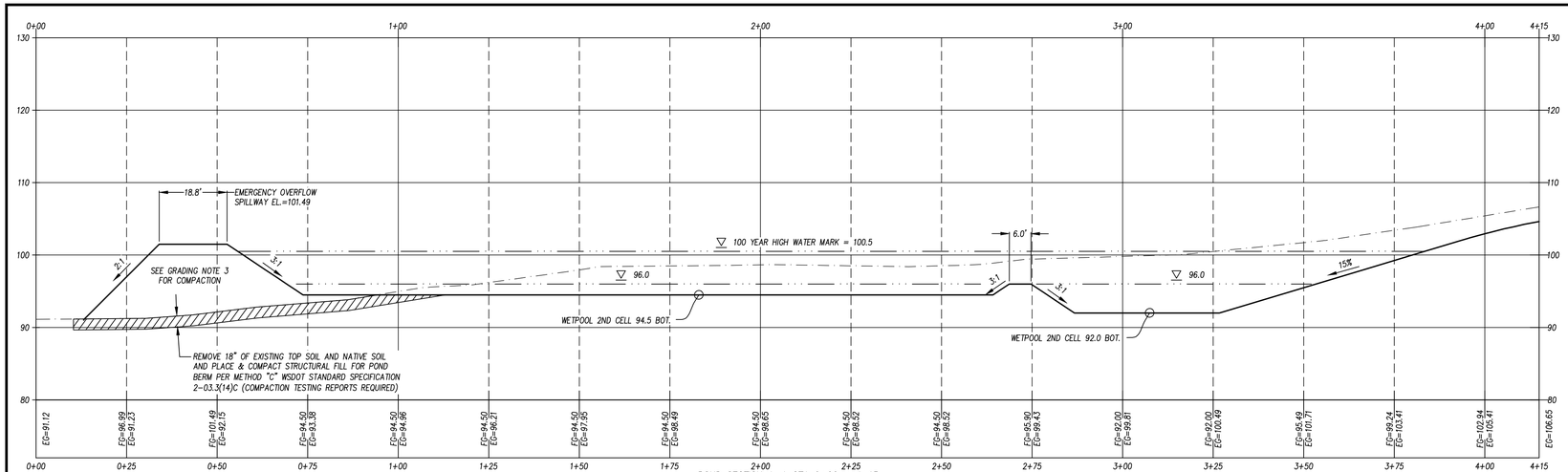
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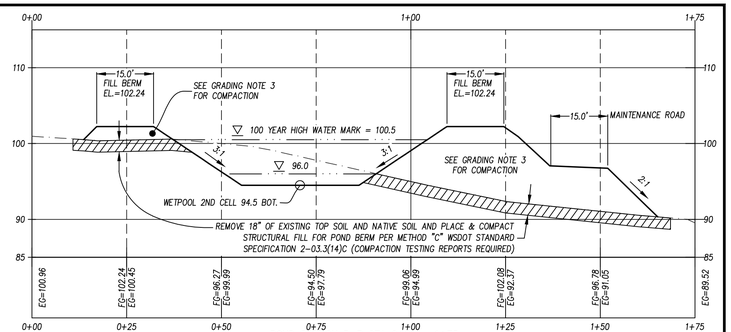
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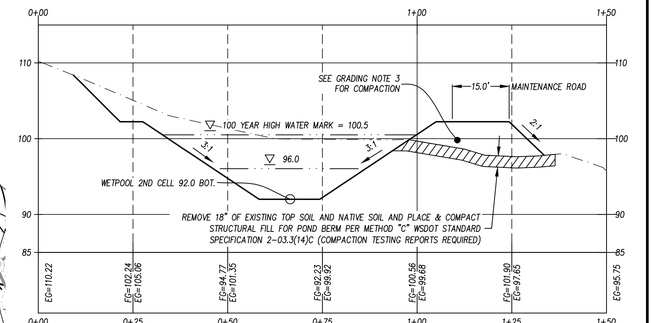
CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	39 OF 74



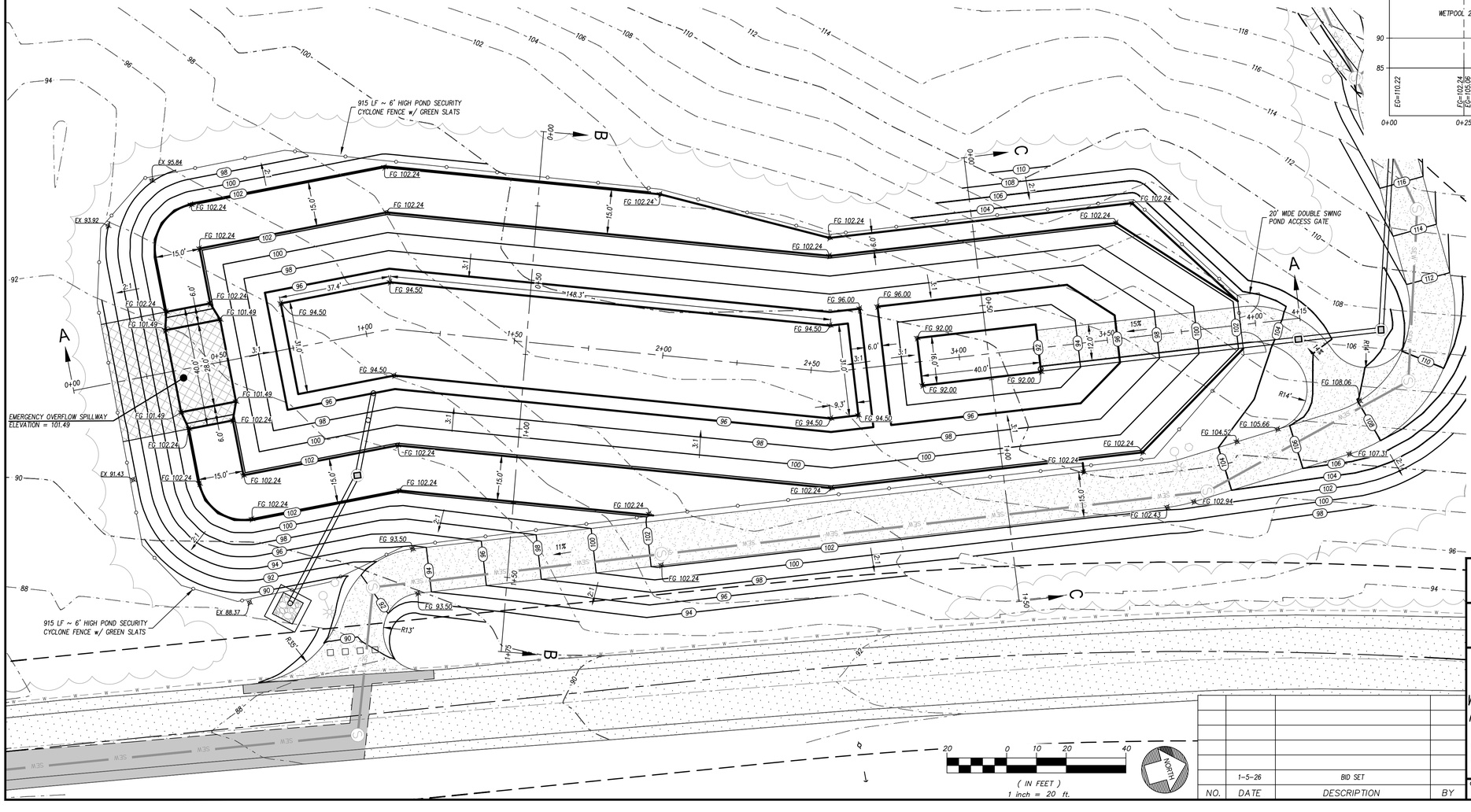
POND SECTION A–A STA 0+00 – 4+15
1"=20' Horiz
1"=10'



POND SECTION B–B STA 0+00 – 1+75
1"=20' Horiz
1"=10'



POND SECTION C–C STA 0+00 – 1+50
1"=20' Horiz
1"=10'



GENERAL NOTES

1. ALL CONSTRUCTION SHALL FOLLOW THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL INVESTIGATION REPORT PREPARED FOR THIS PROJECT BY KRAZAN AND ASSOCIATES DATED OCTOBER 2, 2023.
2. POST-CONSTRUCTION SOILS AMENDMENT (BMP T5.13) WILL BE APPLIED TO EACH LOT AFTER THE FUTURE HOME CONSTRUCTION.

GRADING NOTES

THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN THE EVENT OR DISCOVERY OF POOR SOILS, GROUNDWATER OR DISCREPANCIES IN THE EXISTING CONDITIONS AS NOTED ON THE PLANS.

1. MAXIMUM SLOPE STEEPNESS SHALL BE 2:1 (HORIZONTAL TO VERTICAL) FOR CUT AND FILL SLOPES.
2. UNLESS OTHERWISE SPECIFIED, ALL EMBANKMENTS IN THE PLAN SET SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 2-03.3(14)B OF THE WSDOT STANDARD SPECIFICATIONS. EMBANKMENT COMPACTIONS SHALL CONFORM TO SECTION 2-03.3(14)C, METHOD B OF SAID STANDARD SPECIFICATIONS.
3. EMBANKMENTS DESIGNED TO IMPOUND WATER SHALL BE COMPACTED TO 9% MAXIMUM DENSITY PER SECTION 2-03.3(14)C, METHOD C OF WSDOT STANDARD SPECIFICATIONS.
4. ALL AREAS RECEIVING FILL MATERIAL SHALL BE PREPARED BY REMOVING VEGETATION, NON-COMPLYING FILL, TOPSOIL AND OTHER UNSUITABLE MATERIAL BY SCARIFYING THE SURFACE TO PROVIDE A BOND WITH THE NEW FILL, AND WHERE SLOPES ARE STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL AND THE HEIGHT IS GREATER THAN 5 FT., BY BENCHING INTO SOUND COMPETENT MATERIAL AS DETERMINED BY A SOILS ENGINEER.

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

STORM DRAINAGE POND & GRADING PLAN

FOR
POST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

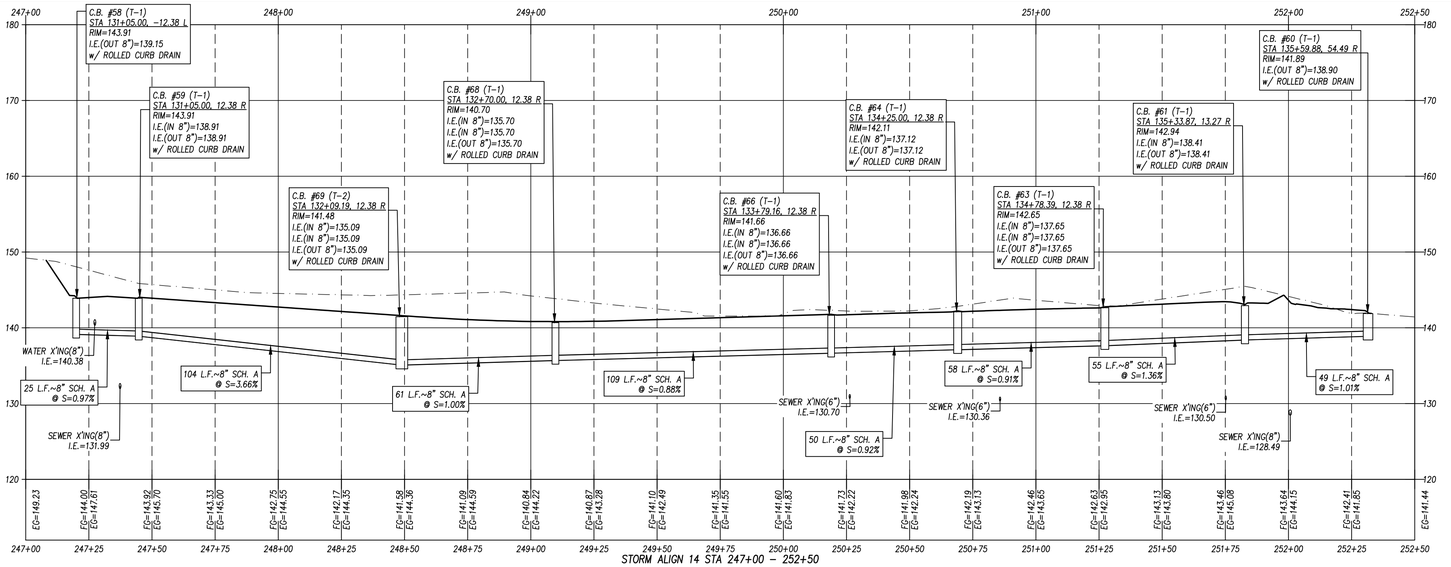
1-5-26

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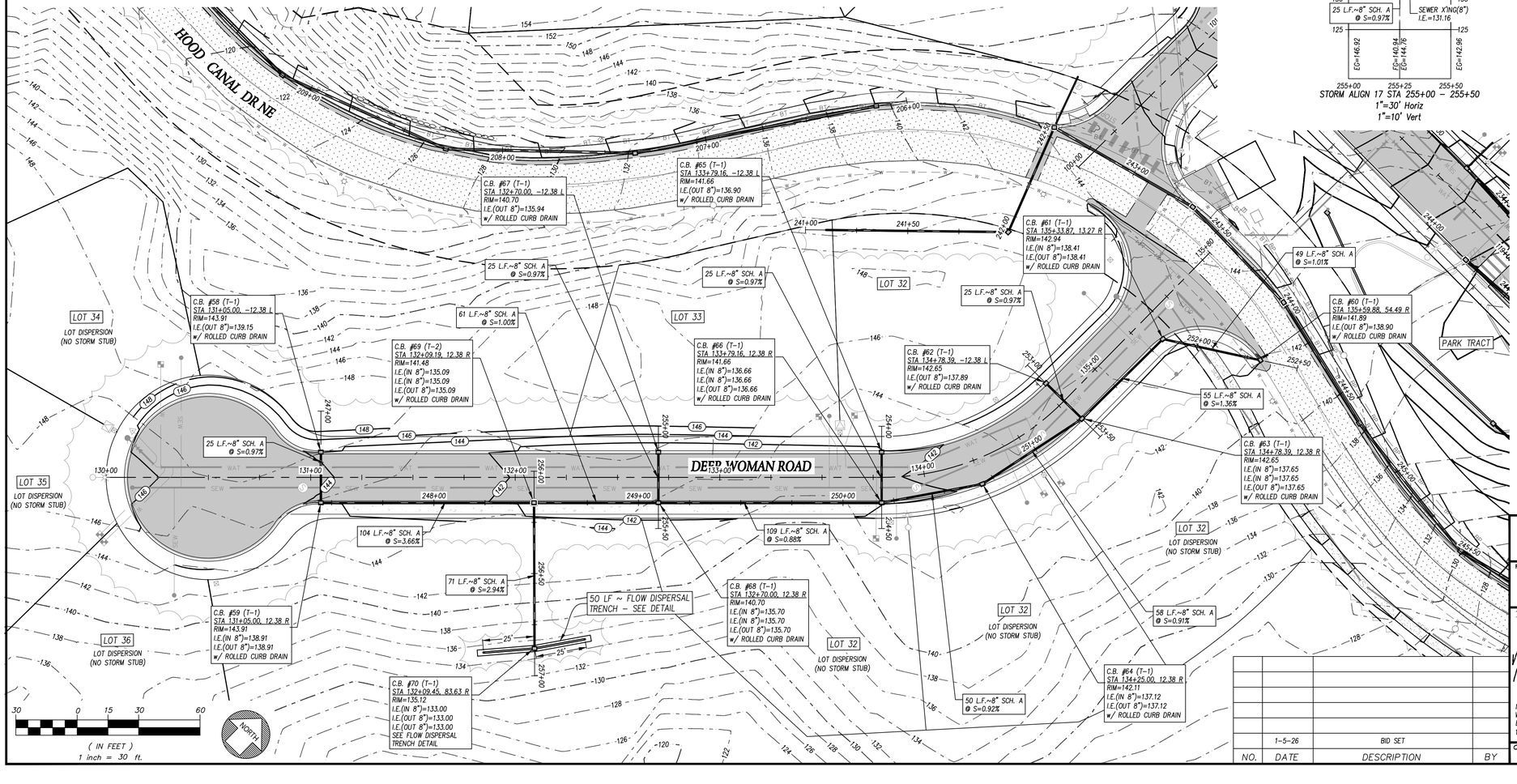
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Silverdale, Washington 98383
(360) 692-5525
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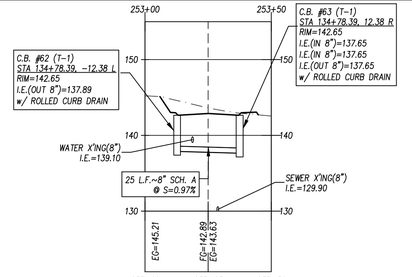
C - 7.10

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
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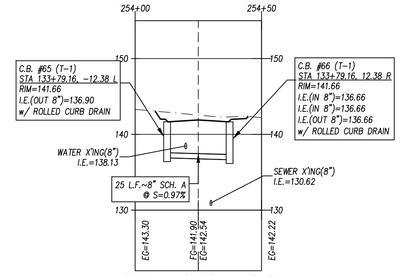


STORM ALIGN 14 STA 247+00 – 252+50
1"=30' Horiz
1"=10' Vert

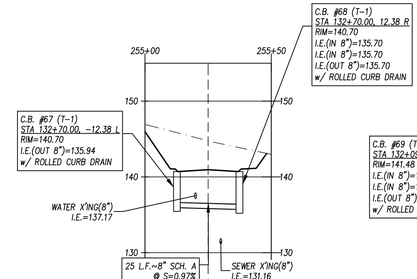




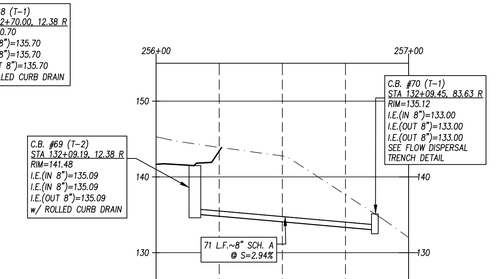
STORM ALIGN 15 STA 253+00 – 253+50
1"=30' Horiz
1"=10' Vert



STORM ALIGN 16 STA 254+00 – 254+50
1"=30' Horiz
1"=10' Vert



STORM ALIGN 17 STA 255+00 – 255+50
1"=30' Horiz
1"=10' Vert



STORM ALIGN 18 STA 256+00 – 257+00
1"=30' Horiz
1"=10' Vert

PLAT OF RACCOON TOWN

STORM DRAINAGE PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH H. PEARSON
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER

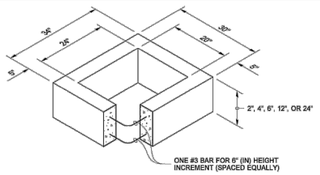
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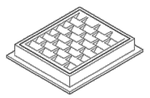
C - 7.11

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 30'	6847	41 OF 74



RECTANGULAR ADJUSTMENT SECTION



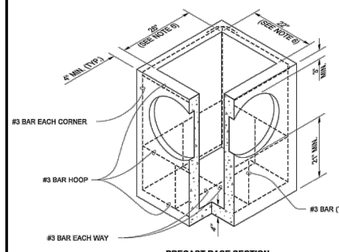
FRAME AND VANED GRATE

PIPE ALLOWANCES	
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER (INCHES)
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
CPSSP ★ (STD. SPEC, SECT, 9-05.20)	12"
SOLID WALL PVC (STD. SPEC. SECT. 9-05.12(1))	15"
PROFILE WALL PVC (STD. SPEC. SECT. 9-05.12(2))	15"

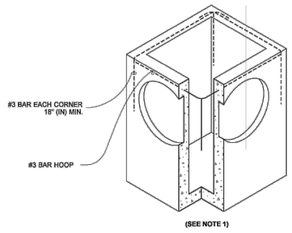
★ CORRUGATED POLYETHYLENE STORM SEWER PIPE

NOTES

1. As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the **ALTERNATIVE PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.
2. The knockout diameter shall not be greater than 20" (in). Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification Section 9-04.3**.
3. The maximum depth from the finished grade to the lowest pipe invert shall be 5' (ft).
4. The frame and grate may be installed with the flange down, or integrally cast into the adjustment section with flange up.
5. The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1 : 24 or steeper.
6. The opening shall be measured at the top of the **Precast Base Section**.
7. All pickup holes shall be grouted full after the basin has been placed.



PRECAST BASE SECTION



ALTERNATIVE PRECAST BASE SECTION

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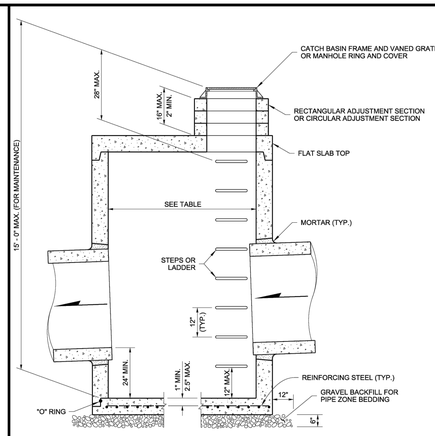
Julie Heilman
2020.09.01 07:52:50 -07'00'

CATCH BASIN TYPE 1

STANDARD PLAN B-5.20-03

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Roark, Steve — Digitally signed by Roark, Steve; Date: 2020.09.09 09:45:23 -07'00'
STATE DESIGN ENGINEER
Washington State Department of Transportation



SEPARATE BASE PRECAST

INTEGRAL BASE PRECAST WITH RISER (48" (IN) - 72" (IN) ONLY)

CATCH BASIN DIMENSIONS				
CATCH BASIN DIAMETER	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS
48"	4"	6"	36"	8"
54"	4.5"	8"	42"	8"
60"	5"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	96"	12"
144"	12"	12"	108"	12"

PIPE ALLOWANCES					
CATCH BASIN DIAMETER	PIPE MATERIAL WITH MAXIMUM INSIDE DIAMETER				
	CONCRETE	ALL METAL	CPSSP ① PP ④	SOLID WALL PVC ②	PROFILE WALL PVC ③
48"	24"	30"	24"	30"	30"
54"	30"	36"	30"	36"	36"
60"	36"	42"	36"	42"	42"
72"	42"	54"	42"	48"	48"
84"	54"	60"	54"	48"	48"
96"	60"	72"	60"	48"	48"
120"	66"	84"	60"	48"	48"
144"	78"	96"	60"	48"	48"

① Corrugated Polyethylene Storm Sewer Pipe (See **Standard Specification Section 9-05.20**)
② (See **Standard Specification Section 9-05.12(1)**)
③ (See **Standard Specification Section 9-05.12(2)**)
④ Polypropylene Pipe (See **Standard Specification Section 9-05.24**)

NOTES

1. No steps are required when height is 4' or less.
2. The bottom of the precast catch basin may be sloped to facilitate cleaning.
3. The rectangular frame and grate may be installed with the flange up or down. The frame may be cast into the adjustment section.
4. Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification Section 9-04.3.**

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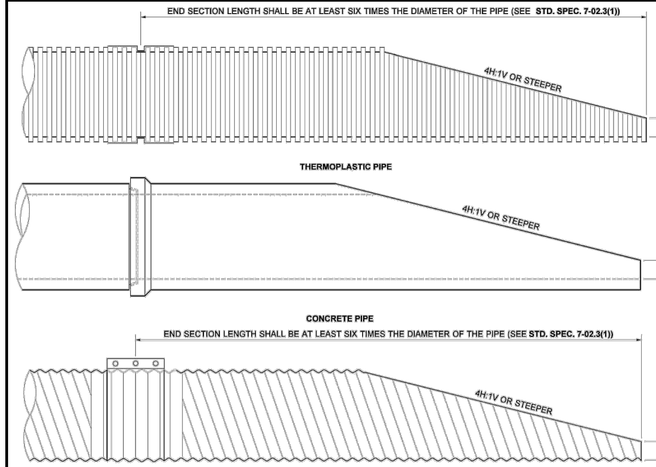
Julie Heilman
Feb 20 2018 12:49 PM

CATCH BASIN TYPE 2

STANDARD PLAN B-10.20-02

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Engineer, Jeff — Feb 27 2018 8:41 AM
STATE DESIGN ENGINEER
Washington State Department of Transportation



NOTES

1. The culvert ends shall be mitered to match the embankment or ditch slope and shall not be mitered flatter than 4H : 1V. When slopes are between 4H :1 V and 6H :1 V, shape the slope in the vicinity of the culvert end to ensure that no part of the culvert protrudes more than 4" (in) above the ground line.
2. Field cutting of culvert ends is permitted when approved by the Engineer. All field-cut culvert pipe shall be treated with treatment as shown in the Standard Specifications or General Special Provisions.

FOR CULVERTS 30" (IN) DIAMETER OR LESS

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Julie Heilman
2020.09.01 07:51:27 -07'00'

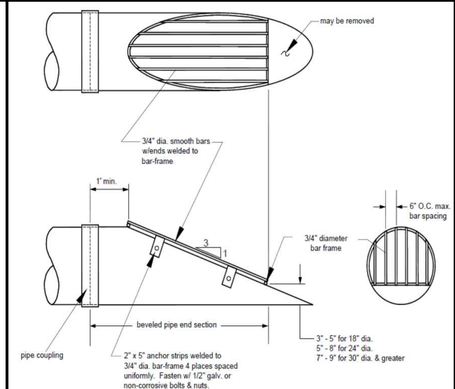
Mar 14, 2022

MITERED END SECTIONS

STANDARD PLAN B-70.20-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Mark Gaines — Mar 15, 2022
STATE DESIGN ENGINEER
Washington State Department of Transportation



NOTES:
1. CMP or LCPE pipe end-section shown; for concrete pipe beveled end section, see KCRS drawing No. 2-001.
2. All steel parts must be galvanized and asphalt coated (treatment 1 or better).

DEBRIS BARRIER
N.T.S.

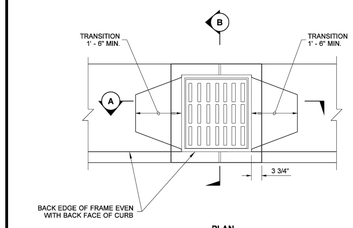
Table II-4.4. Rock Protection at Outfalls.

Discharge Velocity at Design Flow (fps)		Required Protection Minimum Dimensions[a]				
Greater Than	Less Than or Equal to	Type	Thickness	Width	Length	Height
0	5	Rock lining[b]	1 foot	Diameter + 6 feet	8 feet or 4x diameter, whichever is greater	Crown + 1 foot
5	10	Riprap[c,d]	2 feet	Diameter + 6 feet or 3x diameter, whichever is greater	12 feet or 4x diameter, whichever is greater	Crown + 1 foot
10	20	Gabion Outfall	As required	As required	As required	Crown + 1 foot
20	N/A	Engineered energy dissipator required				

Notes:
a. These sizes assume that erosion is dominated by outfall energy. In many cases sizing will be governed by conditions in the receiving waters.
b. Rock lining shall be quarry spalls with gradation as follows:
   - Passing 8-inch square sieve: 100%
   - Passing 3-inch square sieve: 40 to 60% maximum
   - Passing 3/4-inch square sieve: 0 to 10% maximum
c. Riprap shall be reasonably well graded with gradation as follows:
   - Maximum stone size: 24 inches (nominal diameter)
   - Median stone size: 16 inches
   - Minimum stone size: 4 inches
d. Riprap sizing is governed by side slopes on outlet channel, assumed to be approximately 3H:1V.

Culvert Pipe Schedules					
Schedule (Fill Height)	Diameter in Inches	Concrete	Steel 2½" x ½"	Aluminum 2½" x ½"	Thermoplastic PE[1], PVC[2], or PP[3]
A 2' - 15'	12, 18, 24	Plain or Cl. IV	.064" (16 Ga.)	.060" (16 Ga.)	PE, PVC, or PP
	30, 36	Class III	.064" (16 Ga.)	.075" (14 Ga.)	PE, PVC, or PP
	42, 48	Class III	.064" (16 Ga.)	.105" (12 Ga.)	PE, PVC, or PP
B 15' - 25'	12, 18, 24	Class V	.064" (16 Ga.)	.060" (16 Ga.)	PE, PVC, or PP
	30, 36	Class V	.064" (16 Ga.)	.075" (14 Ga.)	PE, PVC, or PP
	42, 48	Class V	.064" (16 Ga.)	.105" (12 Ga.)	PE, PVC, or PP
C 25' - 40'	12, 18, 24	None	.064" (16 Ga.)	.060" (16 Ga.)	None
	30, 36	None	.064" (16 Ga.)	.075" (14 Ga.)	None
	42, 48	None	.064" (16 Ga.)	.105" (12 Ga.)	None
D 40' - 60'	12, 18	None	.064" (16 Ga.)	.060" (16 Ga.)	None
	24	None	.064" (16 Ga.)	.075" (14 Ga.)	None
	30, 36	None	.064" (16 Ga.)	.105" (12 Ga.)	None
	42, 48	None	.079" (14 Ga.)	.135" (10 Ga.)	None

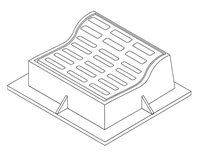
[1]Corrugated polyethylene pipe.
[2]Polyvinyl chloride pipe. Solid wall or profile wall for diameters through 27 inches Profile wall for diameters larger than 27 inches.
[3]Polypropylene pipe, 12 inch to 30 inch diameters approved for Schedule A and Schedule B, and 36 inch to 60 inch diameters approved for Schedule A only.



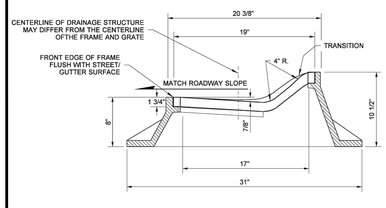
PLAN
ROLLED INLET

NOTES

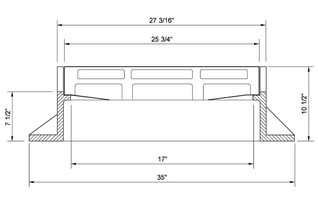
1. Bolt down capability is required on all frames, grates, and covers, unless specified otherwise in the contract. Provide 2 holes in the frame that are vertically aligned with the grate or cover slots. The frame shall accept the 304 Stainless Steel (S.S.) 5/8" (in) - 11 NC x 2" allen head cap screw by being tapped, or other approved mechanism. Location of bolt-down holes varies by manufacturer.
2. Refer to **Standard Specification, Section 9-05.15** and **9-05.15(2)** for additional requirements.
3. For Adjustment Section Details ~ See **Standard Plan B-30.90**.
4. Size and dimensions of drains vary by Manufacturer, but open area shall be 1.5 square feet minimum.



ISOMETRIC VIEW



SECTION (A)



SECTION (B)

JULIE HEILMAN STATE OF WASHINGTON 41810 REGISTERED PROFESSIONAL ENGINEER

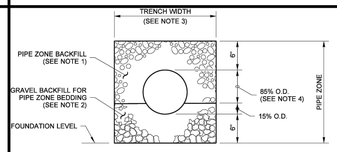
Julie Heilman
2020.09.01 07:51:27 -07'00'

ROLLED CURB DRAIN

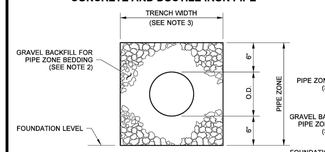
STANDARD PLAN B-30.05-00

SHEET 1 OF 1 SHEET

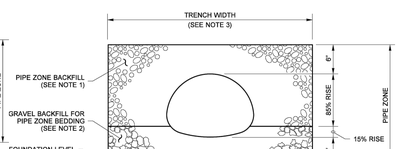
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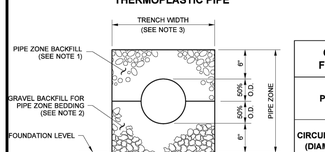
CONCRETE AND DUCTILE IRON PIPE



THERMOPLASTIC PIPE



PIPE ARCHES



METAL AND STEEL RIB REINFORCED POLYETHYLENE PIPE

CLEARANCE BETWEEN PIPES FOR MULTIPLE INSTALLATIONS		
PIPE	SIZE	MINIMUM DISTANCE BETWEEN BARRELS
CIRCULAR PIPE (DIAMETER)	UP TO 48"	24"
METAL PIPE ARCH (SPAN)	48" AND LARGER	DIAMETER/2 OR 36" WHICHEVER IS LESS

NOTES

1. See **Standard Specifications Section 7-08.3(3)** for Pipe Zone Backfill.
2. See **Standard Specifications Section 9-03.12(3)** for Gravel Backfill for Pipe Zone Bedding.
3. See **Standard Specifications Section 2-09.4** for Measurement of Trench Width.
4. For sanitary sewer installation, concrete pipe shall be bedded to spring line.

JULIE HEILMAN STATE OF WASHINGTON 41810 REGISTERED PROFESSIONAL ENGINEER

Heilman, Julie
Feb 20 2018 12:56 PM

PIPE ZONE BEDDING AND BACKFILL

STANDARD PLAN B-55.20-02

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Engineer, Jeff — Feb 27 2018 8:41 AM
STATE DESIGN ENGINEER
Washington State Department of Transportation

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

STORM DRAINAGE NOTES & DETAILS

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

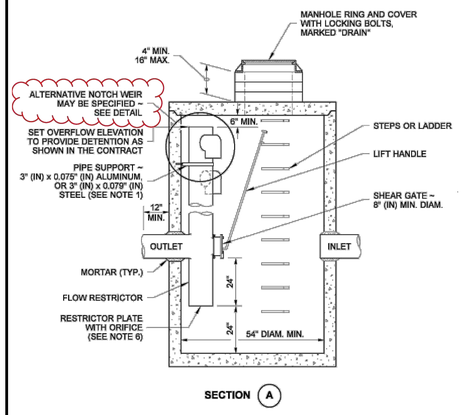
KENNETH P. FRENCH STATE OF WASHINGTON 22553 REGISTERED PROFESSIONAL ENGINEER

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C - 7.12

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	–	6847	42 OF 74

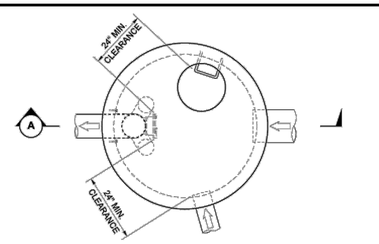


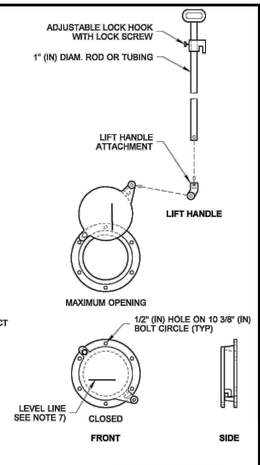
C.B. #60 (54" CONTROL MANHOLE DETAIL)

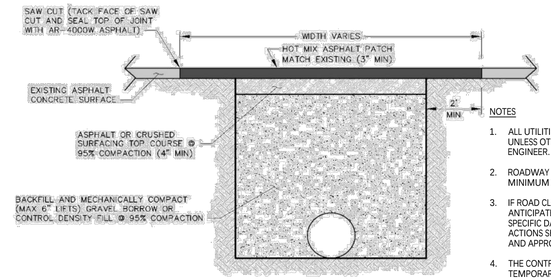
N.T.S.

NOTES

1. The pipe supports and the flow restrictor shall be constructed of the same material and be anchored at a maximum spacing of 36" (in). Attach the pipe supports to the manhole with 5/8" (in) stainless steel expansion bolts or embed the supports into the manhole wall 2" (in).
2. The vertical riser stem of the flow restrictor shall be the same diameter as the horizontal outlet pipe with a minimum diameter of 12" (in).
3. The flow restrictor shall be fabricated from one of the following materials:
   0.060" (in) Corrugated Aluminum Alloy Drain Pipe
   0.064" (in) Corrugated Galvanized Steel Drain Pipe with Treatment 1
   0.064" (in) Corrugated Aluminized Steel Drain Pipe
   0.060" (in) Aluminum alloy flat sheet, in accordance with **ASTM B 209, 5052 H32 or EPS** High Density Polyethylene Storm Sewer Pipe
4. The frame and ladder or steps are to be offset so that: the shear gate is visible from the top; the climb-down space is clear of the riser and gate; the frame is clear of the curb.
5. The multi-orifice elbows may be located as shown, or all placed on one side of the riser to assure ladder clearance. The size of the elbows and their placement shall be specified in the Contract.
6. Restrictor plate with orifice as specified in the Contract. The opening is to be cut round and smooth.
7. The shear gate shall be made of aluminum alloy in accordance with **ASTM B 26 and ASTM B 275**, designation **ZG32A**; or cast iron in accordance with **ASTM A 48, Class 30B**.
   The lift handle shall be made of a similar metal to the gate (to prevent galvanic corrosion), it may be of solid rod or hollow tubing, with adjustable hook as required.
   A neoprene rubber gasket is required between the riser mounting flange and the gate flange.
   Install the gate so that the level-line mark is level when the gate is closed.
   The mating surfaces of the lid and the body shall be machined for proper fit.
   All shear gate bolts shall be stainless steel.
8. The shear gate maximum opening shall be controlled by limited hinge movement, a stop tab, or some other device.
9. Alternative shear gate designs are acceptable if material specifications are met.







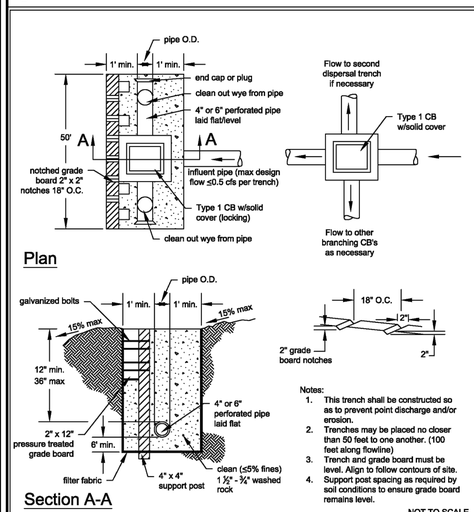
NOTES

1. ALL UTILITIES SHALL HAVE 36" MIN COVER UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. ROADWAY PUSHES & BORES SHALL HAVE 48" MINIMUM COVER.
3. IF ROAD CLOSURES OR DETOURS ARE ANTICIPATED, A TRAFFIC PLAN INCLUDING SPECIFIC DATES AND DURATIONS OF SUCH ACTIONS SHALL BE FILED WITH THE ENGINEER AND APPROVED 3 WEEKS PRIOR TO WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY AND PERMANENT PATCHING.
5. NO OPEN TRENCHES LEFT OVERNIGHT
6. CONTRACTOR IS RESPONSIBLE TO PROVIDE TRAFFIC CONTROL.

ROAD TRENCH AND RESTORATION DETAIL

NO SCALE

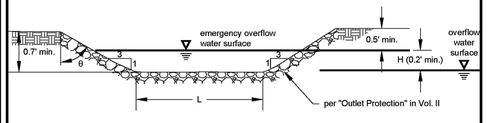
Figure V-4.5: Standard Dispersion Trench with Notched Grade Board



DEPARTMENT OF ECOLOGY
State of Washington

Standard Dispersion Trench with Notched Grade Board

Revised May 2019

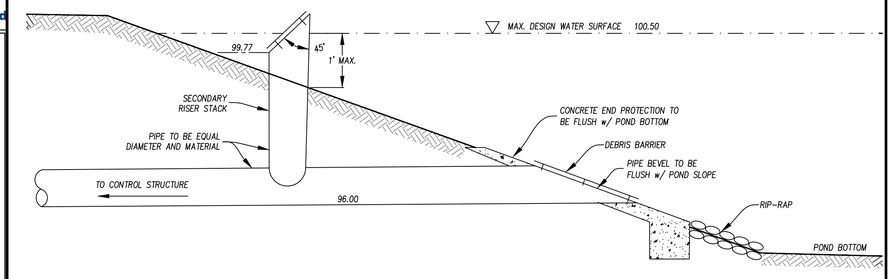


DEPARTMENT OF ECOLOGY
State of Washington

Weir Section for Emergency Overflow Spillway

Revised June 2016

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SECONDARY INFLOW STRUCTURE DETAIL

N.T.S.

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

STORM DRAINAGE NOTES & DETAILS

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON — 49853 — KENNETH P. PATRICK

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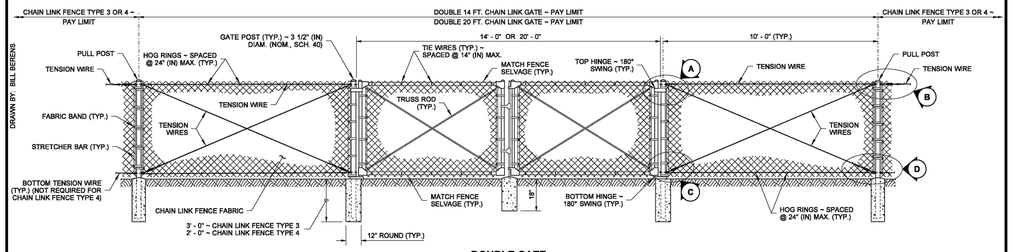
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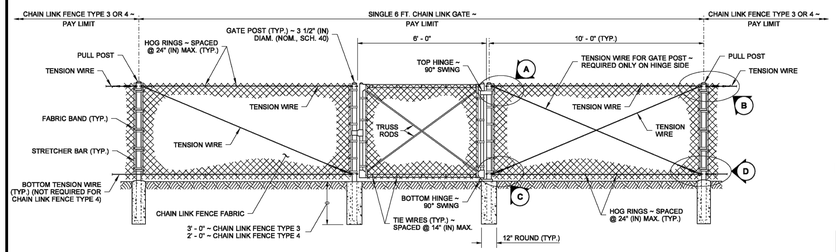
CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	–	6847	43 OF 74

NOTES

1. Materials shall meet the requirements of **Standard Specification 9-16**.



DOUBLE GATE



SINGLE GATE



Barry, Ed
May 6 2014 3:57 PM

CHAIN LINK GATE

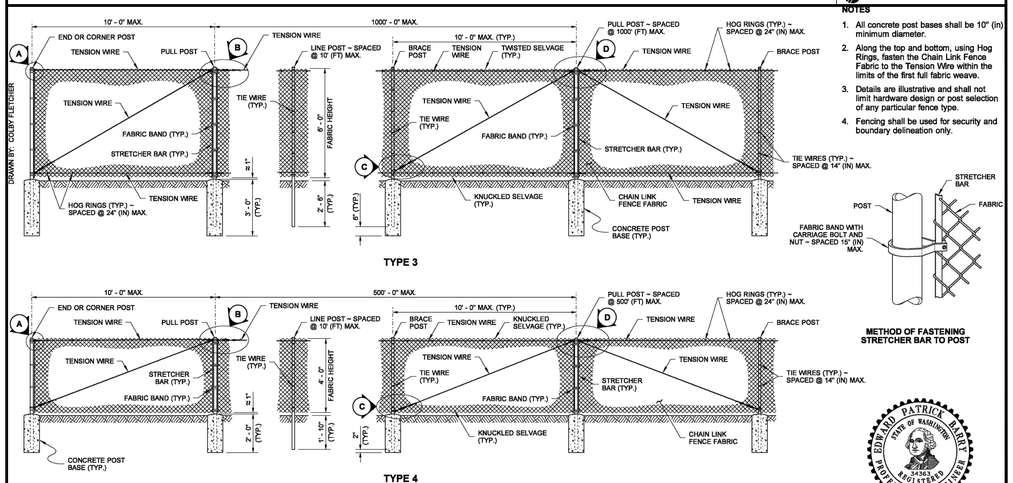
STANDARD PLAN L-30.10-02

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION
Babcock, Pasco
Jan 11 2014 1:40 PM
STATE DESIGN ENGINEER
Washington State Department of Transportation

NOTES

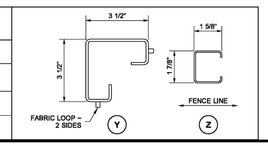
1. All concrete post bases shall be 10" (in) minimum diameter.
2. Along the top and bottom, using Hog Rings, fasten the Chain Link Fence Fabric to the Tension Wire within the limits of the first full fabric weave.
3. Details are illustrative and shall not limit hardware design or post selection of any particular fence type.
4. Fencing shall be used for security and boundary delineation only.

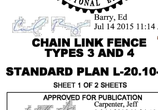


TYPE 3

TYPE 4

POST AND RAIL SPECIFICATIONS			
POST	PIPE	ROLL FORMED	
	NOM. SIZE (SCH. 40) I.D.	SECTION	WEIGHT (lb/ft)
END, CORNER, OR PULL POST	2 1/2" DIAM.	Y	5.10
LINE OR BRACE POST	2" DIAM.	Z	1.85





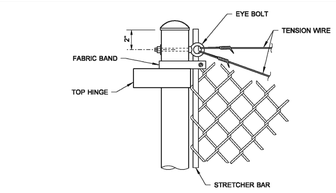
Barry, Ed
Jul 14 2015 11:14 AM

CHAIN LINK FENCE TYPES 3 AND 4

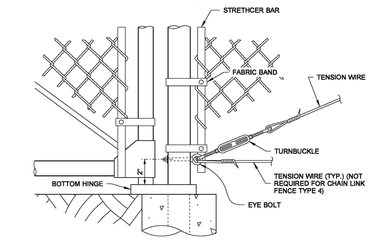
STANDARD PLAN L-20.10-03

SHEET 1 OF 2 SHEETS

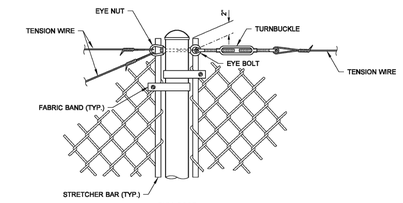
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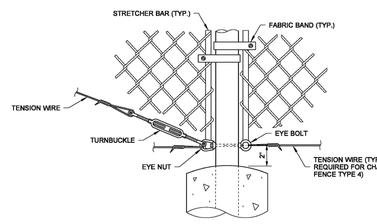
DETAIL (A)



DETAIL (C)



DETAIL (B)



DETAIL (D)

Barry, Ed
May 6 2014 3:58 PM

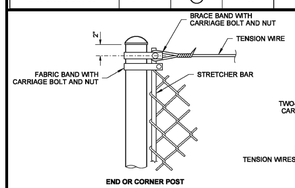
CHAIN LINK GATE

STANDARD PLAN L-30.10-02

SHEET 2 OF 2 SHEETS

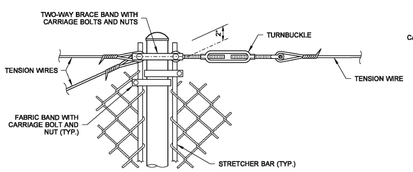
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METHOD OF FASTENING STRETCHER BAR TO POST



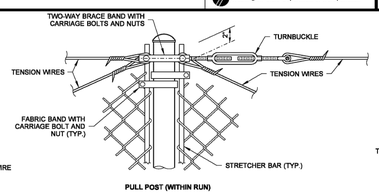
END OR CORNER POST

DETAIL (A)



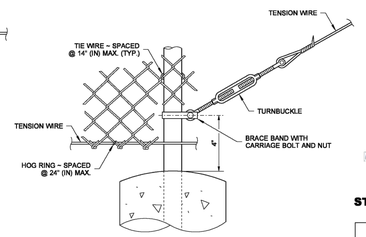
PULL POST (AT END OR CORNER)

DETAIL (B)



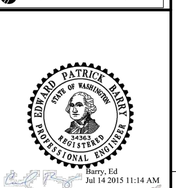
PULL POST (WITHIN RUN)

DETAIL (D)



BRACE POST

DETAIL (C)



Barry, Ed
Jul 14 2015 11:14 AM

CHAIN LINK FENCE TYPES 3 AND 4

STANDARD PLAN L-20.10-03

SHEET 2 OF 2 SHEETS

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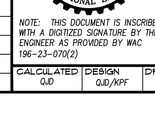
PLAT OF RACCOON TOWN

STORM DRAINAGE NOTES & DETAILS

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

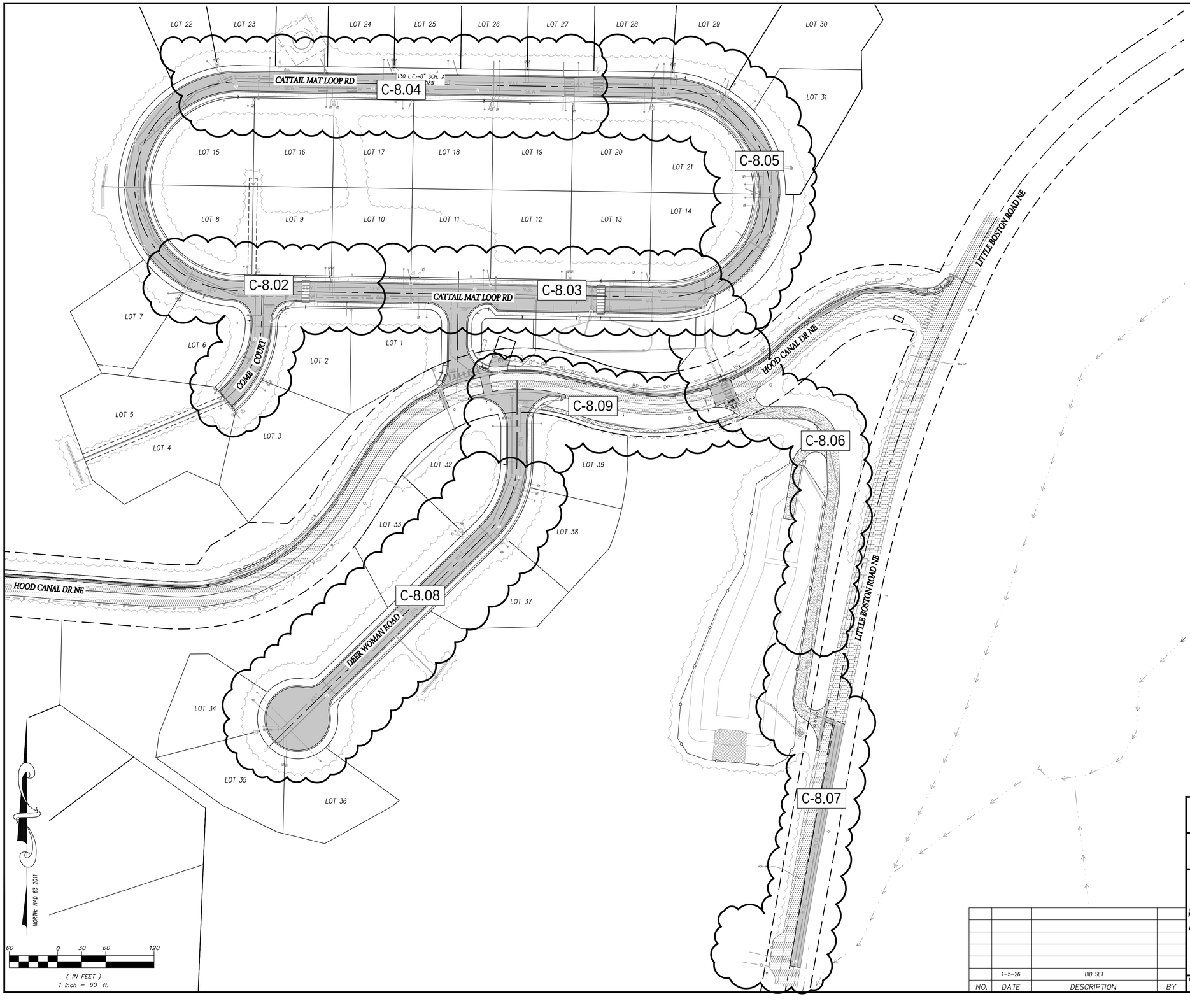


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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	–	6847	44 OF 74



GENERAL CONSTRUCTION NOTES

1. CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS OF THE MOST RECENT EDITION OF THE "THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION" PREPARED BY THE WASHINGTON STATE CHAPTER OF THE AMERICAN PUBLIC WORKS ASSOCIATION.
2. THE CONTRACTOR SHALL ARRANGE FOR A PRE-CONSTRUCTION CONFERENCE PRIOR TO COMMENCING CONSTRUCTION. THE TRIBAL ENGINEER AND THE PROJECT ENGINEER SHALL BE IN ATTENDANCE.
3. ALL SEWER INSTALLATION INSPECTIONS AND TEST OBSERVATIONS SHALL BE MADE BY THE TRIBAL ENGINEER AND/OR THE PROJECT ENGINEER. PRIOR TO FINAL ACCEPTANCE OF ALL INSTALLATIONS THE ENGINEER SHALL CONDUCT AN INSPECTION OF ALL MAIN LINES BY THE USE OF TELEVISION EQUIPMENT. FINAL ACCEPTANCE OF SEWER INSTALLATIONS WILL NOT BE MADE UNTIL TESTS AND INSPECTIONS ARE COMPLETE AND PROVE SATISFACTORY.
4. REQUIREMENTS FOR SEWER PIPE INSTALLATION TO MEET WSDOT STANDARD SPECIFICATION 7-17.
5. REFER TO WSDOT STANDARD B-55.10-00 FOR PIPE BEDDING.
6. REFER TO WSDOT STANDARD B-55.20-03 FOR PIPE BACKFILL AND COMPACTION REQUIREMENTS.
7. THE PHYSICAL CONNECTION TO AN EXISTING MANHOLE OR SEWER SHALL NOT BE MADE UNTIL AUTHORIZED BY THE ENGINEER. SUCH AUTHORIZATION WILL NOT BE GIVEN UNTIL ALL UPSTREAM LINES HAVE BEEN COMPLETELY CLEANED AND ALL DEBRIS REMOVED.
8. GRAVITY MAINS SHALL BE TESTED BY THE LOW PRESSURE AIR METHOD. PRESSURE MAINS SHALL BE TESTED BY THE HYDROSTATIC TEST METHOD. ALL TESTS SHALL BE MADE IN THE PRESENCE OF THE ENGINEER.
9. DROP MANHOLES SHALL, IN ALL RESPECTS, BE CONSTRUCTED AS A STANDARD MANHOLE WITH THE EXCEPTION OF THE OUTSIDE DROP CONNECTION AS SHOWN ON THE STANDARD PLAN "DROP MANHOLE CONNECTION".
10. MANHOLES SHALL BE PRECAST REINFORCED CONCRETE UNITS WITH ECCENTRIC CONES CONFORMING TO THE STANDARD PLAN "TYPE 1 MANHOLE". JOINTS BETWEEN PRECAST WALL SECTIONS SHALL BE CONFINED O-RING TYPE.
11. MANHOLE FAME AND COVERS SHALL BE CAST IRON, THREE BOLT LOCKING TYPE, OLYMPIC FOUNDRY TYPE MH30D/T, OR EQUAL. BOLTS SHALL BE 5/8" STAINLESS STEEL SOCKET HEAD, COUNTERSUNK. THE COVER SHALL HAVE THE WORD "SEWER" IN 2" RAISED LETTERS CAST IN IT.
12. CLEAN-OUT FRAME AND COVERS SHALL BE CAST IRON TWO BOLT LOCKING TYPE, OLYMPIC FOUNDRY TYPE M1025, OR EQUAL. BOLTS SHALL BE 5/8" STAINLESS STEEL SOCKET HEAD, COUNTERSUNK.
13. ALL SIDE SEWERS SHALL BE 6" DIAMETER MINIMUM AND LAID ON A MINIMUM SLOPE OF 2 PERCENT. ALL SIDE SEWERS SHALL BE PROVIDED WITH A CLEAN-OUT AND TEST TEES FOR EACH BUILDING TO BE SERVED.
14. CHECK DAMS SHALL BE PLACED AT 100 FOOT INTERVALS ON GRAVITY MAINS LAID ON 6 PERCENT OR GREATER SLOPES.
15. CONCRETE PIPE ANCHORS SHALL BE PLACED ON SEWER MAINS WHERE SLOPES EXCEED 20 PERCENT. ANCHORS SHALL BE PLACED ON 36 FOOT CENTERS FOR SLOPES 20 TO 35 PERCENT, ON 24 FOOT CENTERS FOR SLOPES 35 TO 50 PERCENT, AND ON 16 FOOT CENTERS FOR SLOPES 50 PERCENT AND GREATER.

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

OVERALL SANITARY SEWER PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

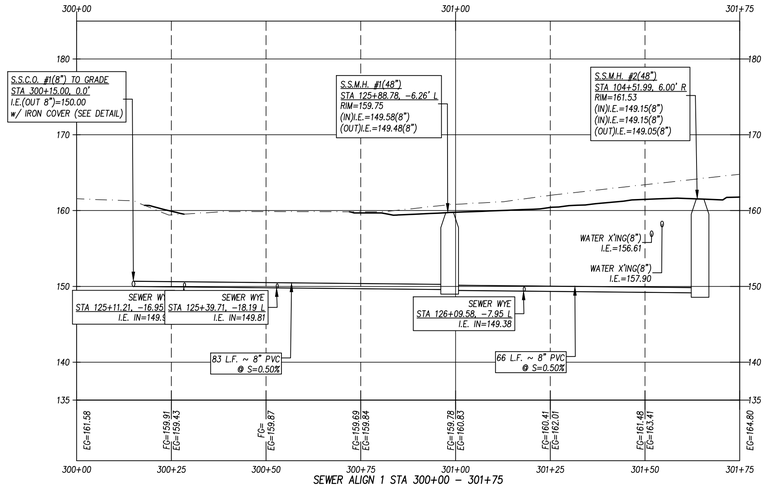
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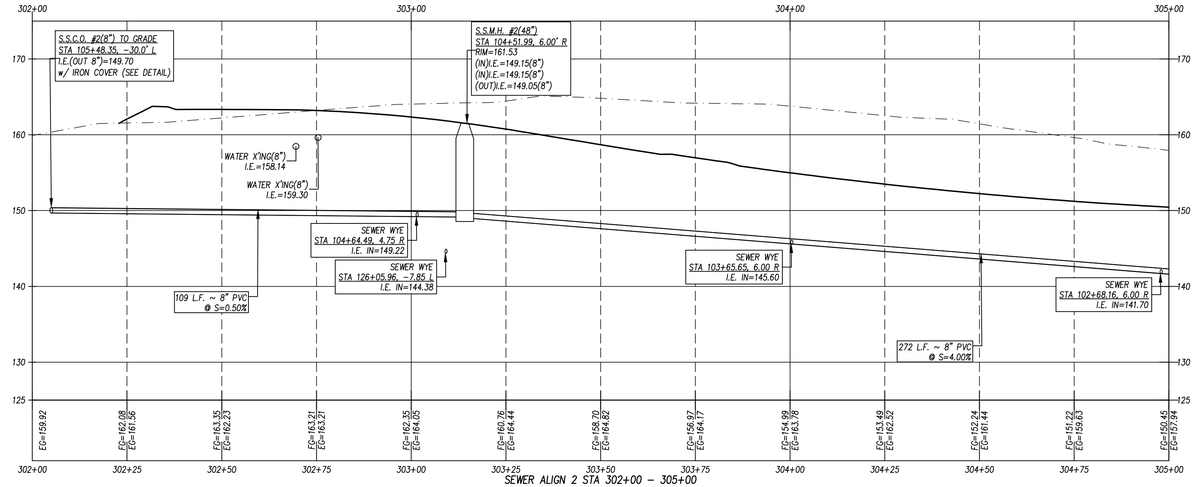
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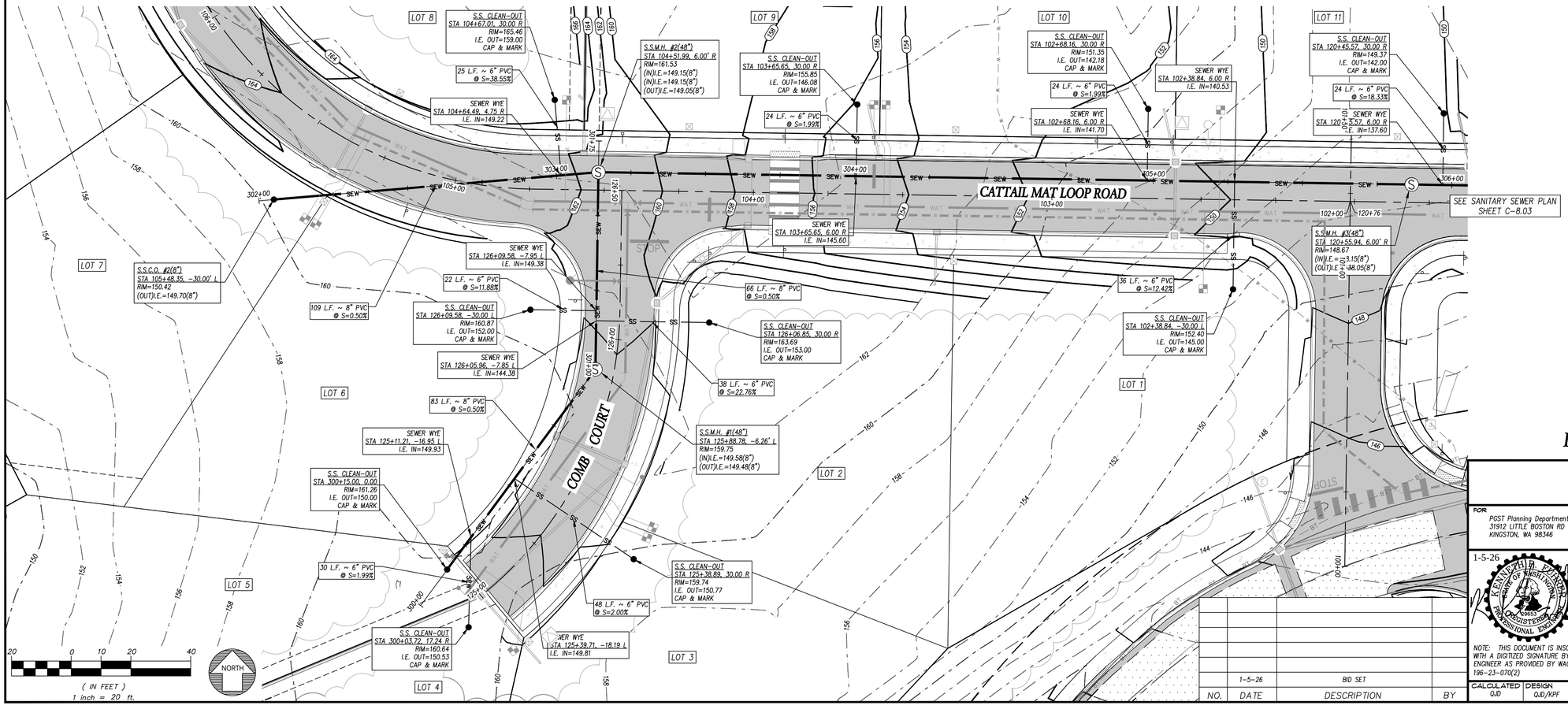
CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 60'	6847	45 OF 74



SEWER ALIGN 1 STA 300+00 – 301+75
1"=20' Horiz
1"=10'



SEWER ALIGN 2 STA 302+00 – 305+00
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

SANITARY SEWER PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. FARLEY
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER

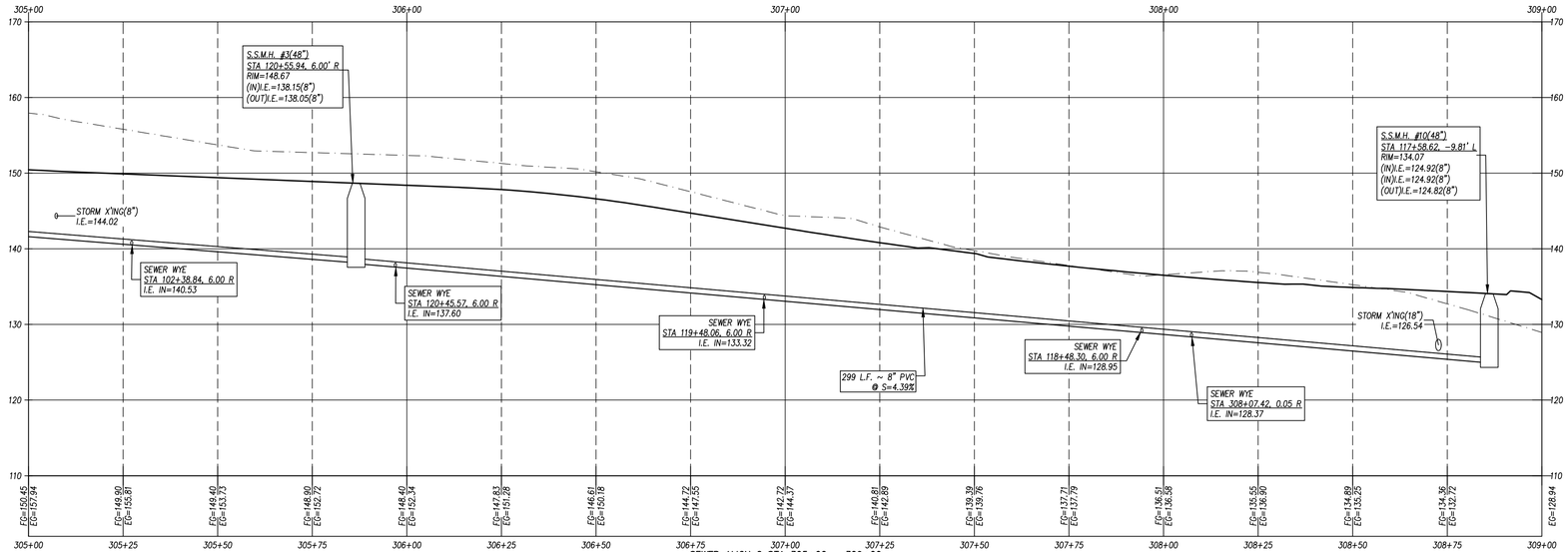
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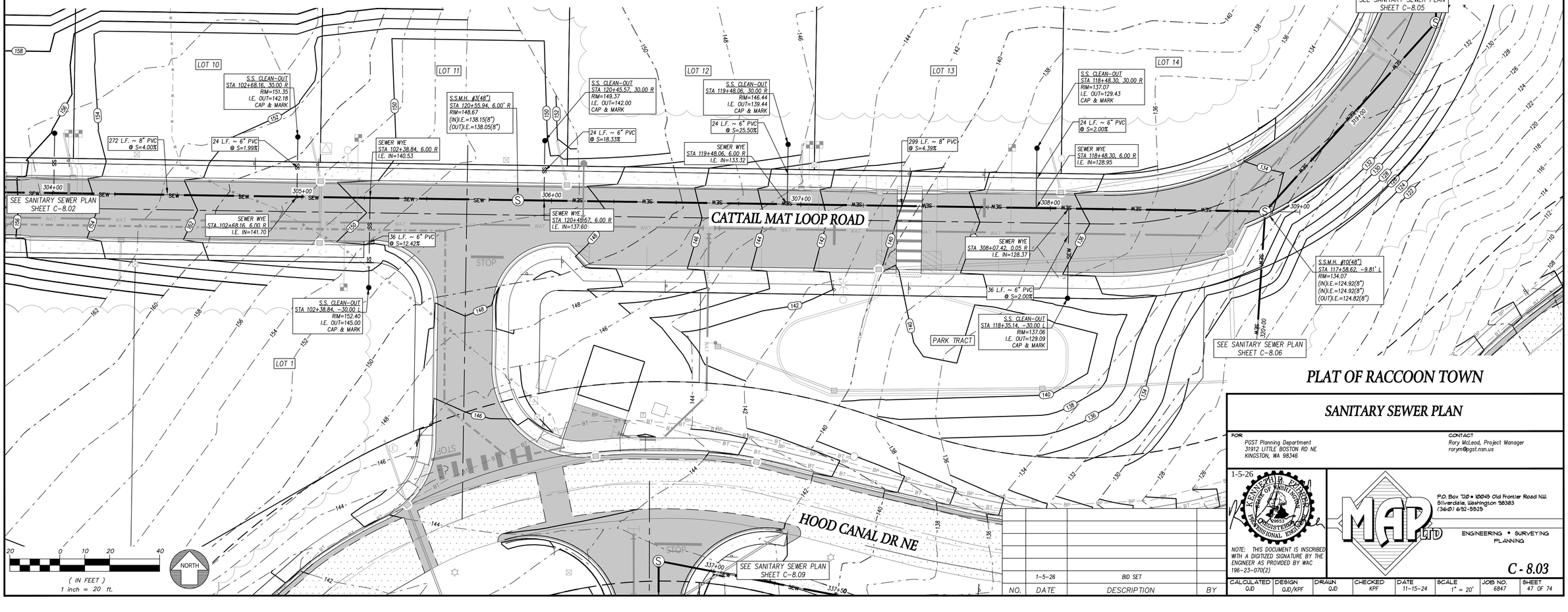
NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

C - 8.02

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	46 OF 74



SEWER ALIGN 2 STA 305+00 – 309+00
1"=20' Horiz
1"=10'



20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

NORTH

PLAT OF RACCOON TOWN

SANITARY SEWER PLAN

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

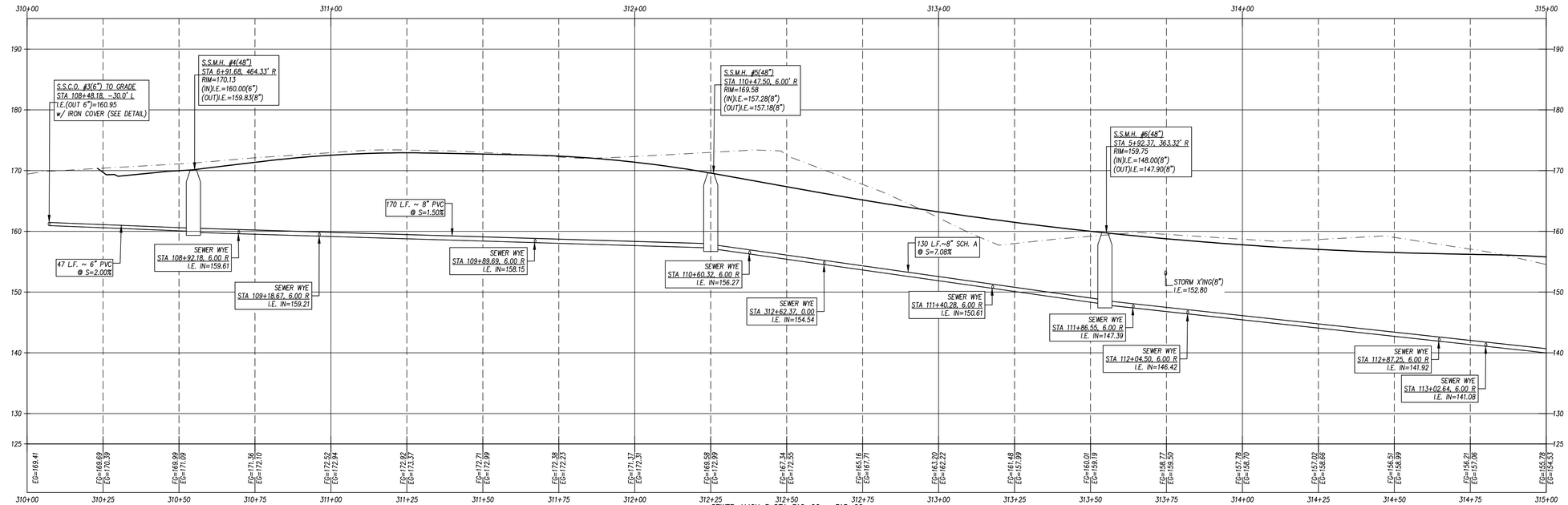
KENNETH P. PARKER — STATE OF WASHINGTON — 22653 — REGISTERED PROFESSIONAL ENGINEER

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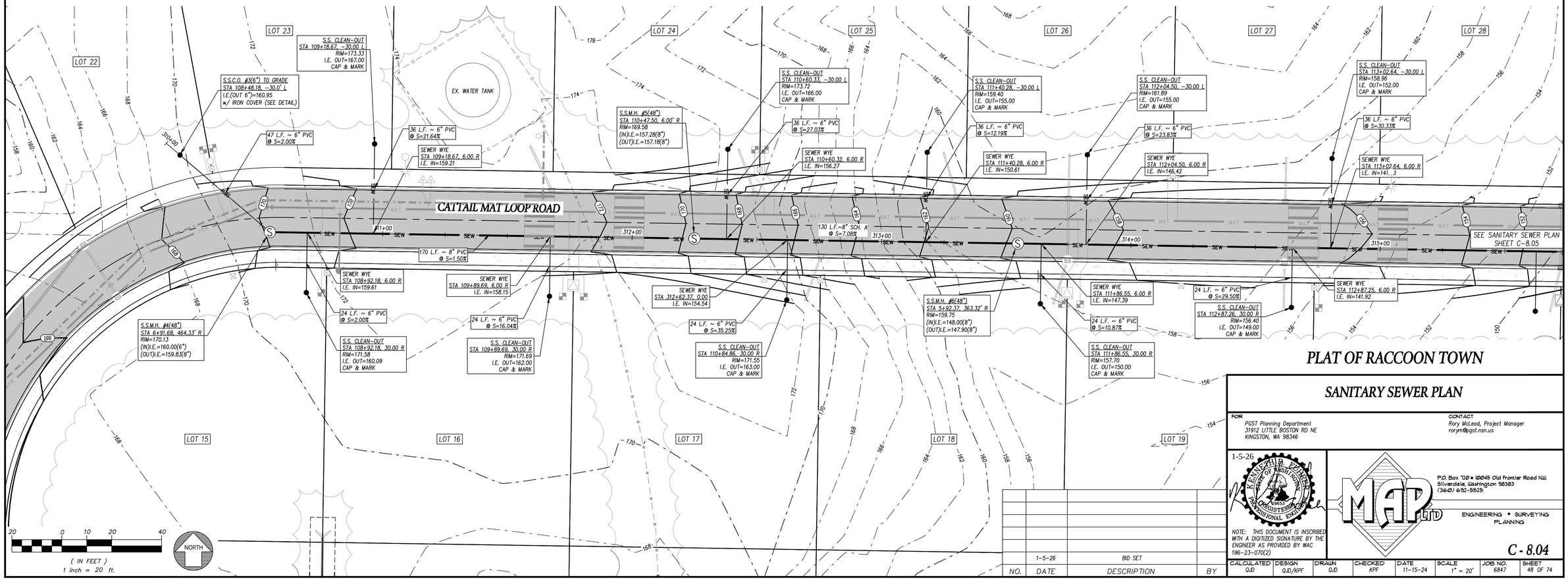
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C - 8.03

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	47 OF 74



SEWER ALIGN 3 STA 310+00 - 315+00
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

SANITARY SEWER PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

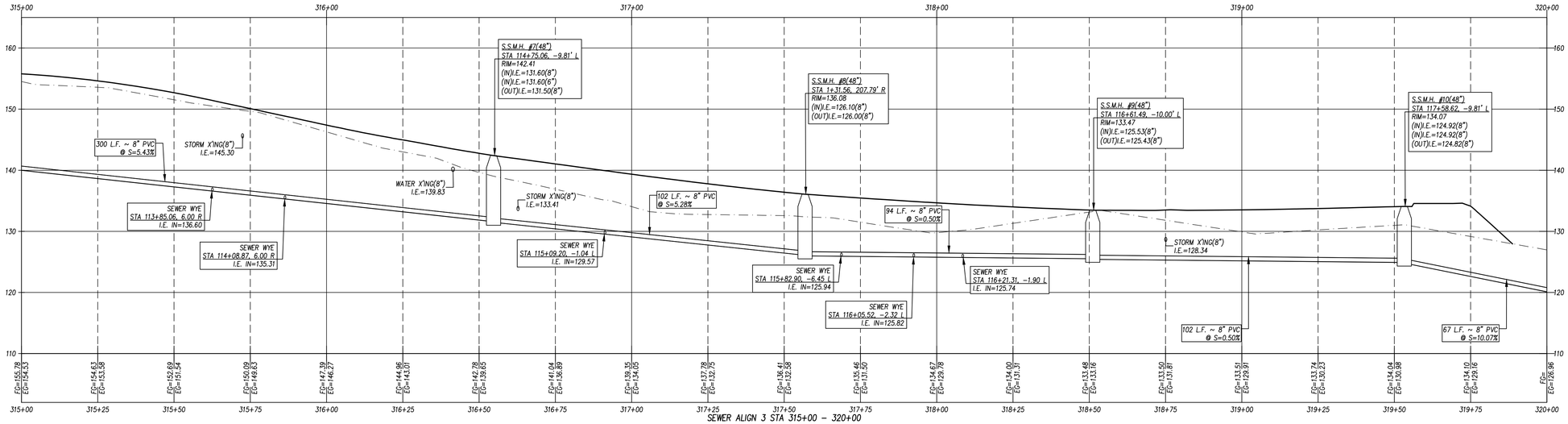
1-5-26
RANDOLPH K. PARKER STATE OF WASHINGTON 19853 REGISTERED PROFESSIONAL ENGINEER

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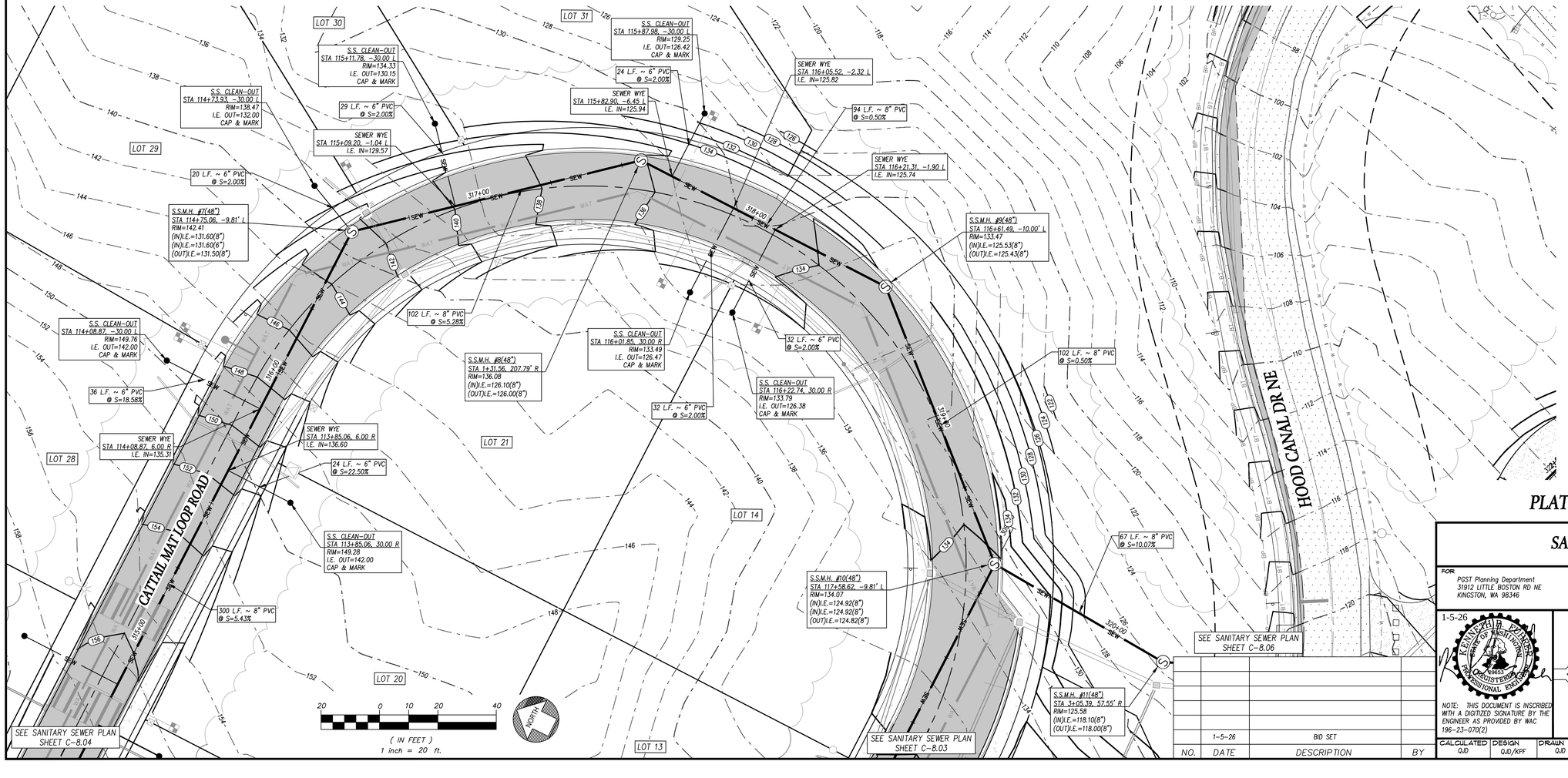
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C - 8.04

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	48 OF 74



SEWER ALIGN 3 STA 315+00 – 320+00
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

SANITARY SEWER PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

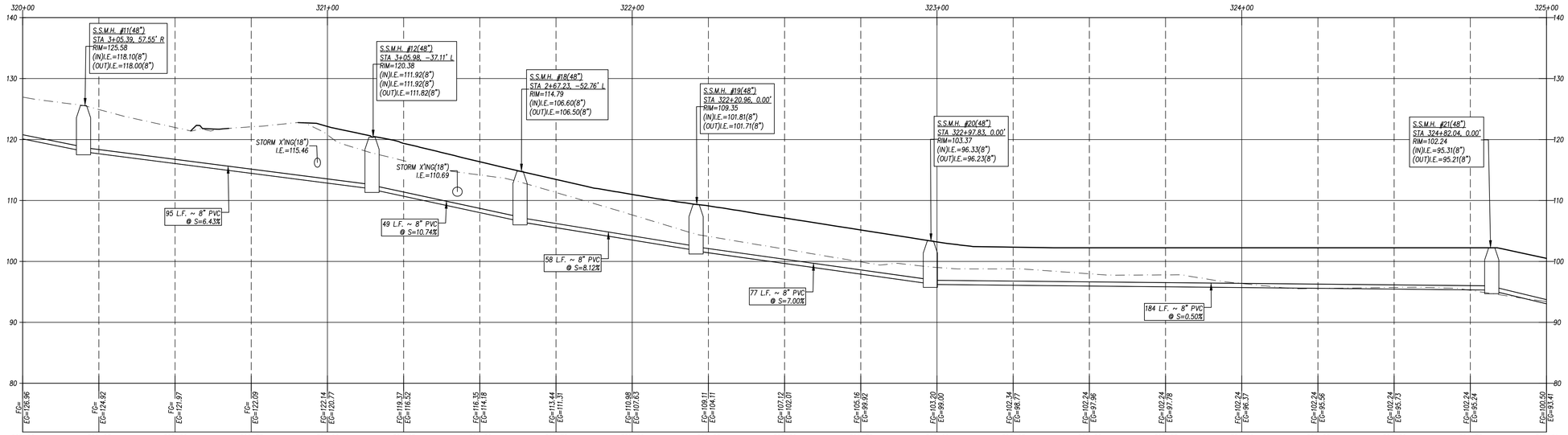
1-5-26
KENNETH P. KAPPE — STATE OF WASHINGTON — 19853 — REGISTERED PROFESSIONAL ENGINEER

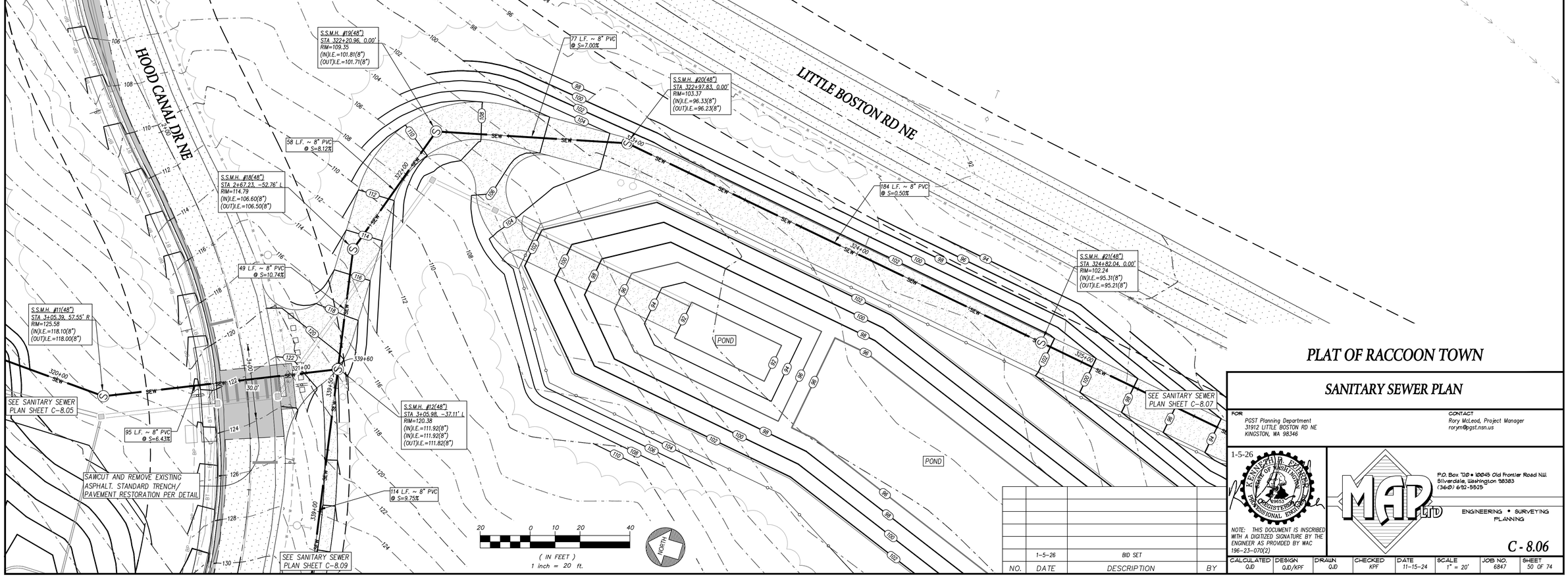
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C - 8.05

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	49 OF 74





PLAT OF RACCOON TOWN

SANITARY SEWER PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

1-5-26

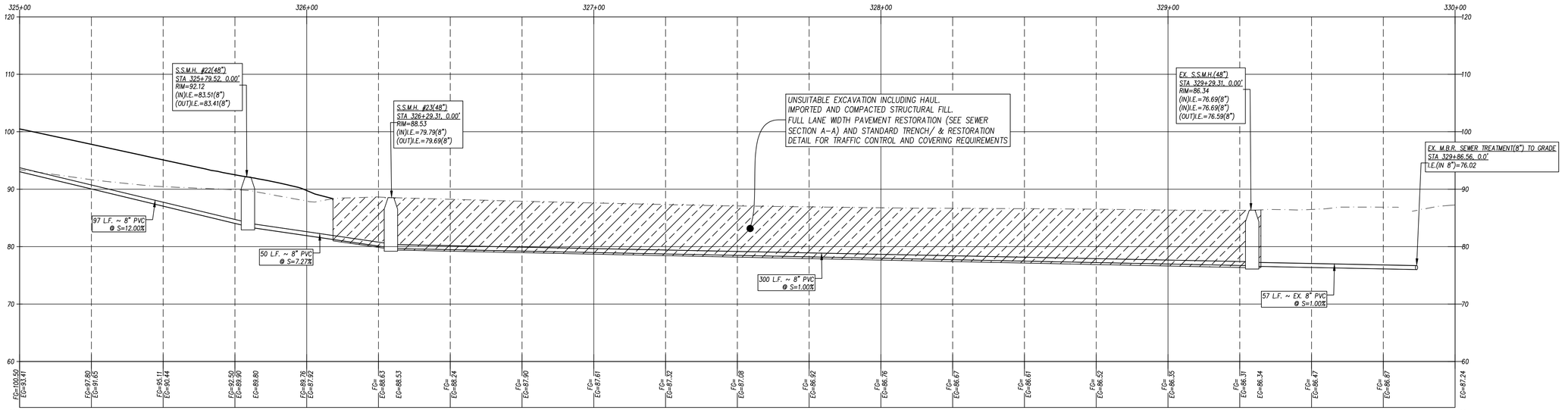
KENNETH P. PEARCH — STATE OF WASHINGTON — 19983 — REGISTERED PROFESSIONAL ENGINEER

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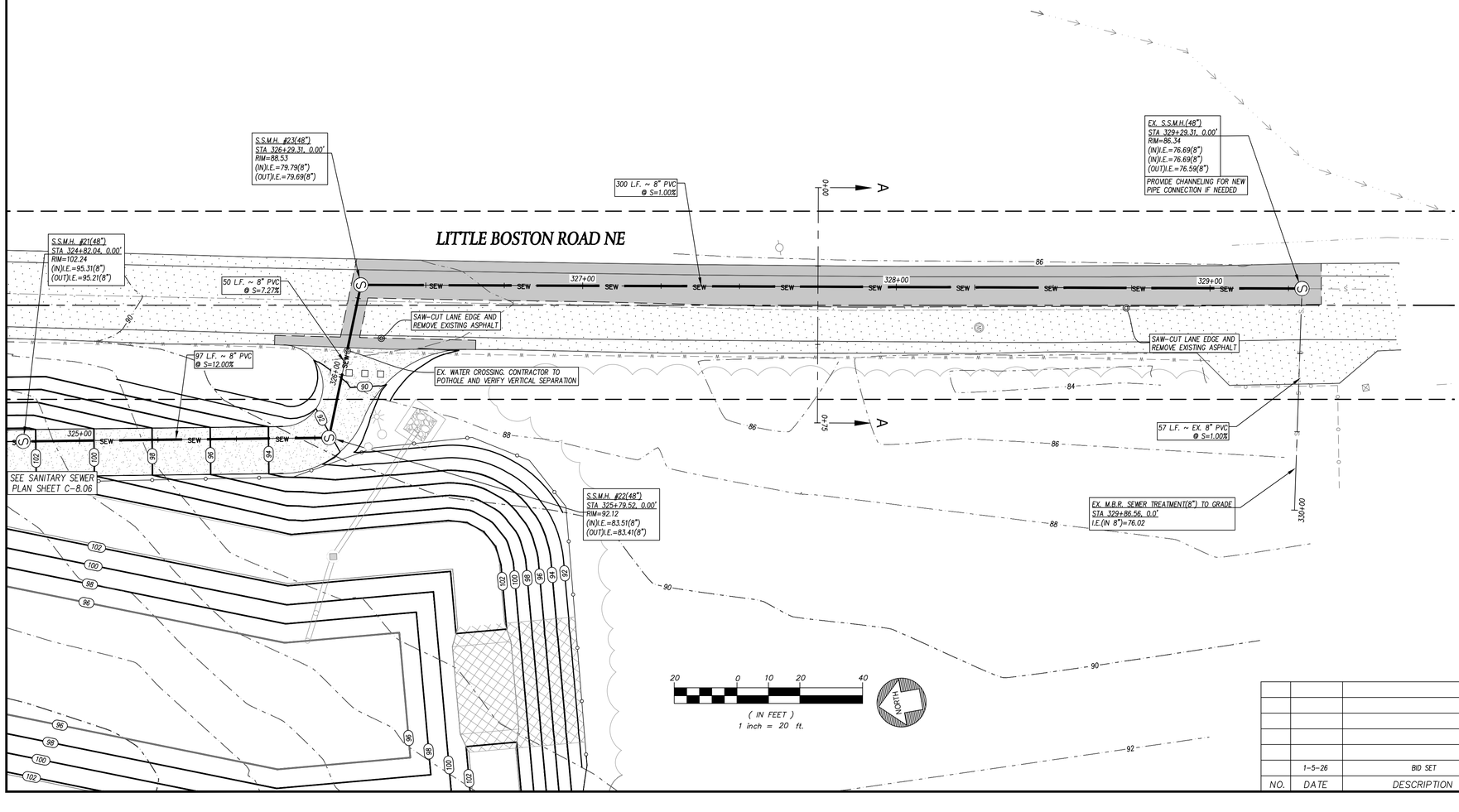
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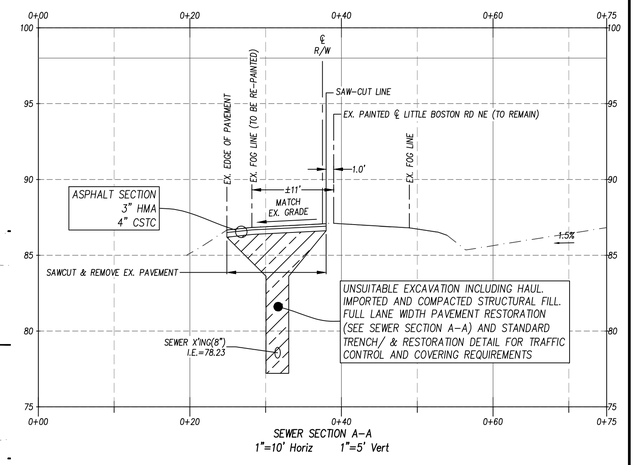
C - 8.06

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	50 OF 74



SEWER ALIGN 3 STA 325+00 – 330+00
1"=20' Horiz
1"=10'





SEWER SECTION A-A
1"=10' Horiz 1"=5' Vert

PLAT OF RACCOON TOWN

SANITARY SEWER PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. PETERSON — STATE OF WASHINGTON — 22855 — REGISTERED PROFESSIONAL ENGINEER

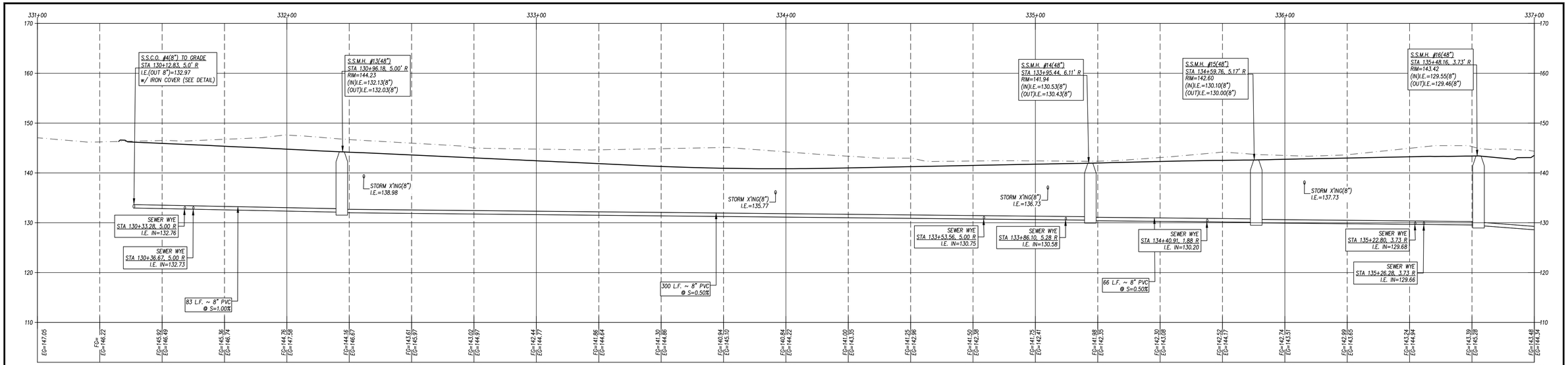
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NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

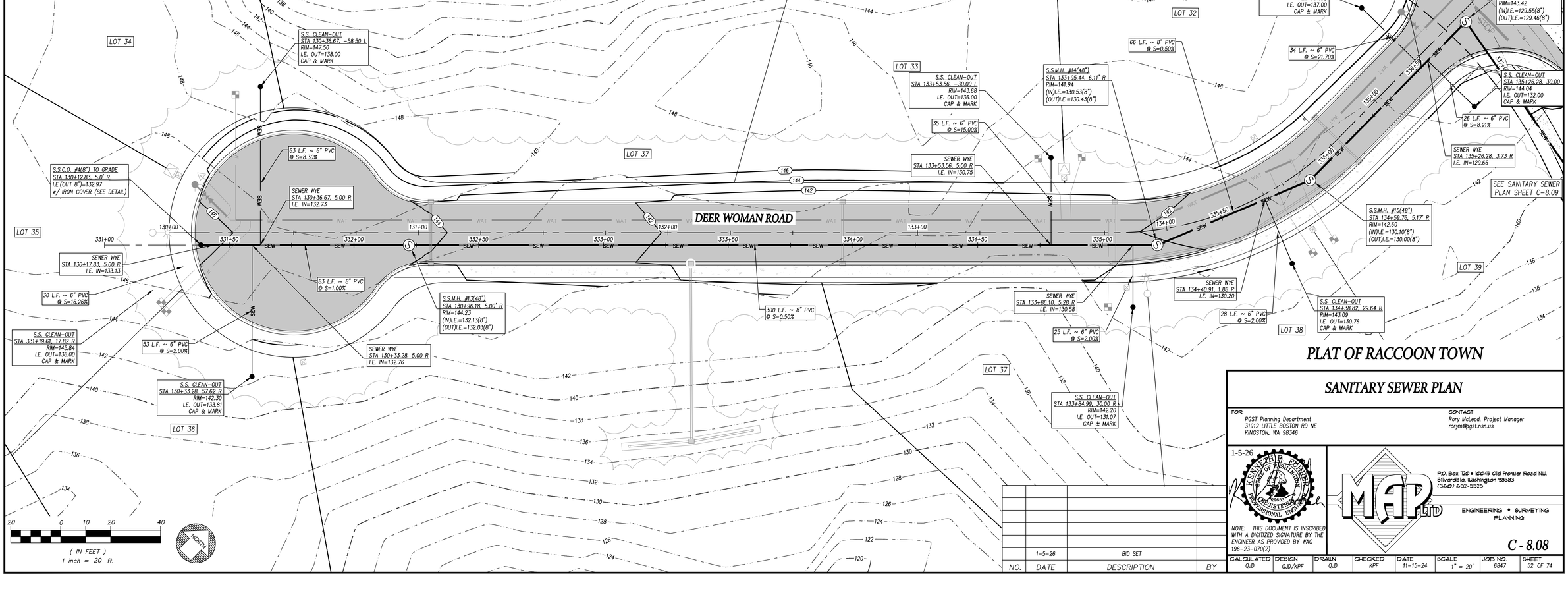
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C - 8.07

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	51 OF 74



SEWER ALIGN 4 STA 331+00 – 337+00
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

SANITARY SEWER PLAN

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

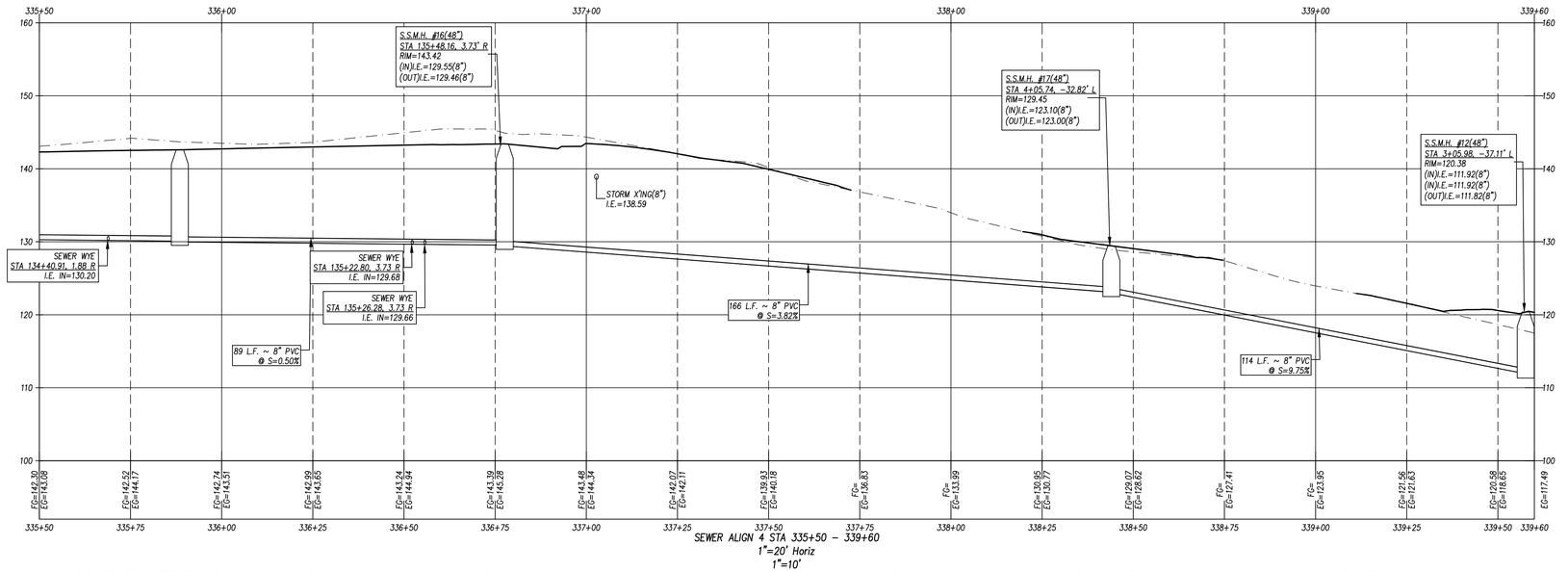
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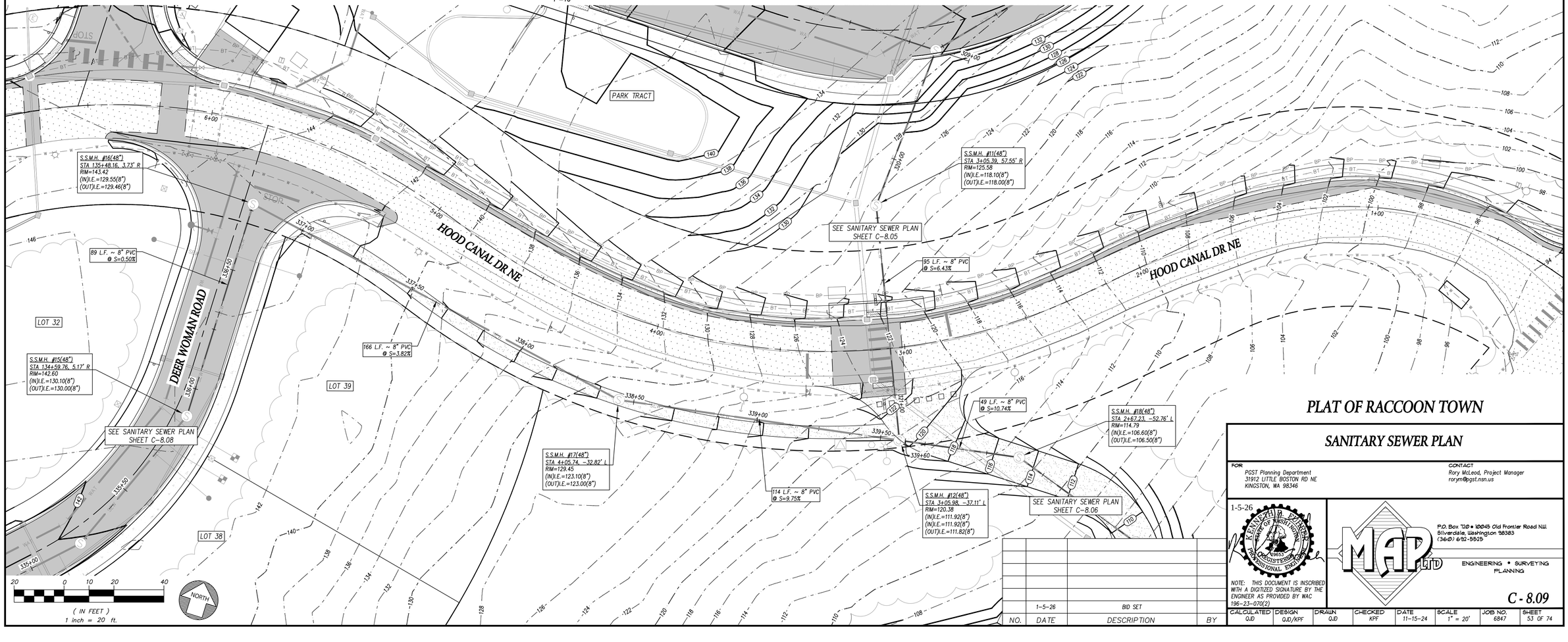
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C - 8.08

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	52 OF 74



SEWER ALIGN 4 STA 335+50 – 339+60
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

SANITARY SEWER PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. FRENCH
STATE OF WASHINGTON
EXPIRES
REGISTERED
PROFESSIONAL ENGINEER

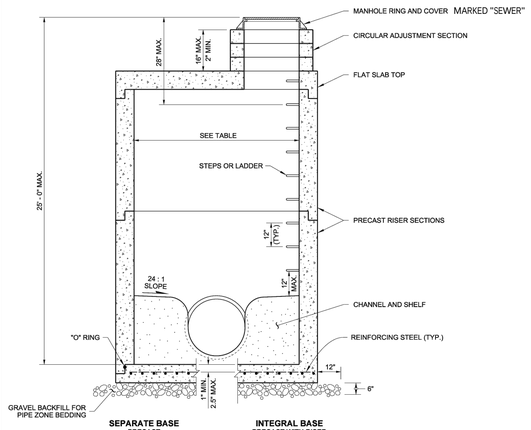
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C - 8.09

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	53 OF 74



NOTES

1. Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum.
2. For pipe allowances, see **Standard Plan B-10.20.**
3. No steps are required when height is 4' (ft) or less.

MANHOLE DIMENSION TABLE				
DIAM.	**MIN. WALL THICKNESS**	**MIN. BASE THICKNESS**	**MAXIMUM KNOCKOUT SIZE**	**MINIMUM DISTANCE BETWEEN KNOCKOUTS**
48"	**4"**	**6"**	**36"**	**8"**
54"	**4.5"**	**8"**	**42"**	**8"**
60"	**5"**	**8"**	**48"**	**8"**
72"	**6"**	**8"**	**60"**	**12"**
84"	**8"**	**12"**	**72"**	**12"**
96"	**8"**	**12"**	**84"**	**12"**
120"	**10"**	**12"**	**96"**	**12"**
144"	**12"**	**12"**	**108"**	**12"**

JULIE HEILMAN STATE OF WASHINGTON REGISTERED PROFESSIONAL ENGINEER

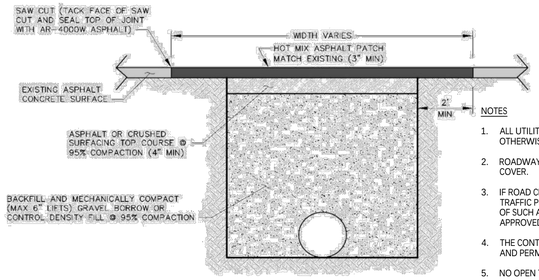
Julie Heilman
Heilman, Julie
Jan 25 2017 2:58 PM

MANHOLE TYPE 3

STANDARD PLAN B-15.60-02

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Carpenter, Jeff
Jan 26 2017 8:59 AM
STATE DESIGN ENGINEER
Washington State Department of Transportation

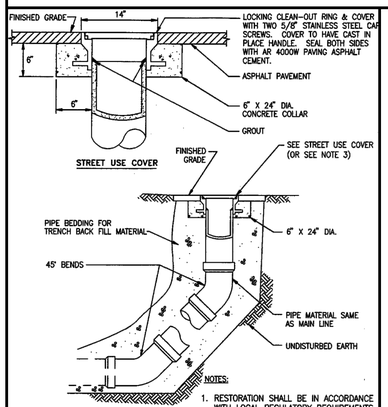


ROAD TRENCH AND RESTORATION DETAIL

NO SCALE

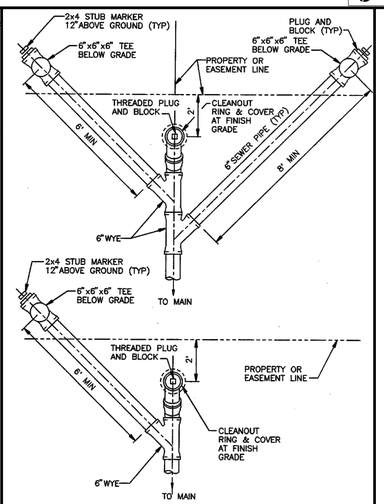
NOTES

1. ALL UTILITIES SHALL HAVE 36" MIN COVER UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. ROADWAY PUSHES & BORES SHALL HAVE 48" MINIMUM COVER.
3. IF ROAD CLOSURES OR DETOURS ARE ANTICIPATED, A TRAFFIC PLAN INCLUDING SPECIFIC DATES AND DURATIONS OF SUCH ACTIONS SHALL BE FILED WITH THE ENGINEER AND APPROVED 3 WEEKS PRIOR TO WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY AND PERMANENT PATCHING.
5. NO OPEN TRENCHES LEFT OVERNIGHT
6. CONTRACTOR IS RESPONSIBLE TO PROVIDE TRAFFIC CONTROL.



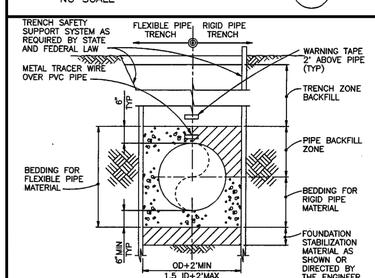
STREET CLEANOUT

NO SCALE



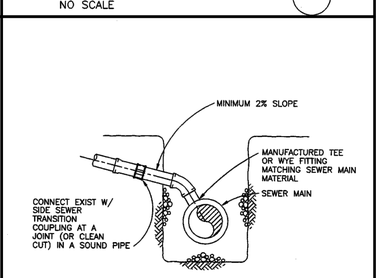
SIDE SEWER PLAN

NO SCALE



TYPICAL PIPE TRENCH

NO SCALE



SIDE SEWER CONNECTION

NO SCALE

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

SANITARY SEWER NOTES & DETAILS

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

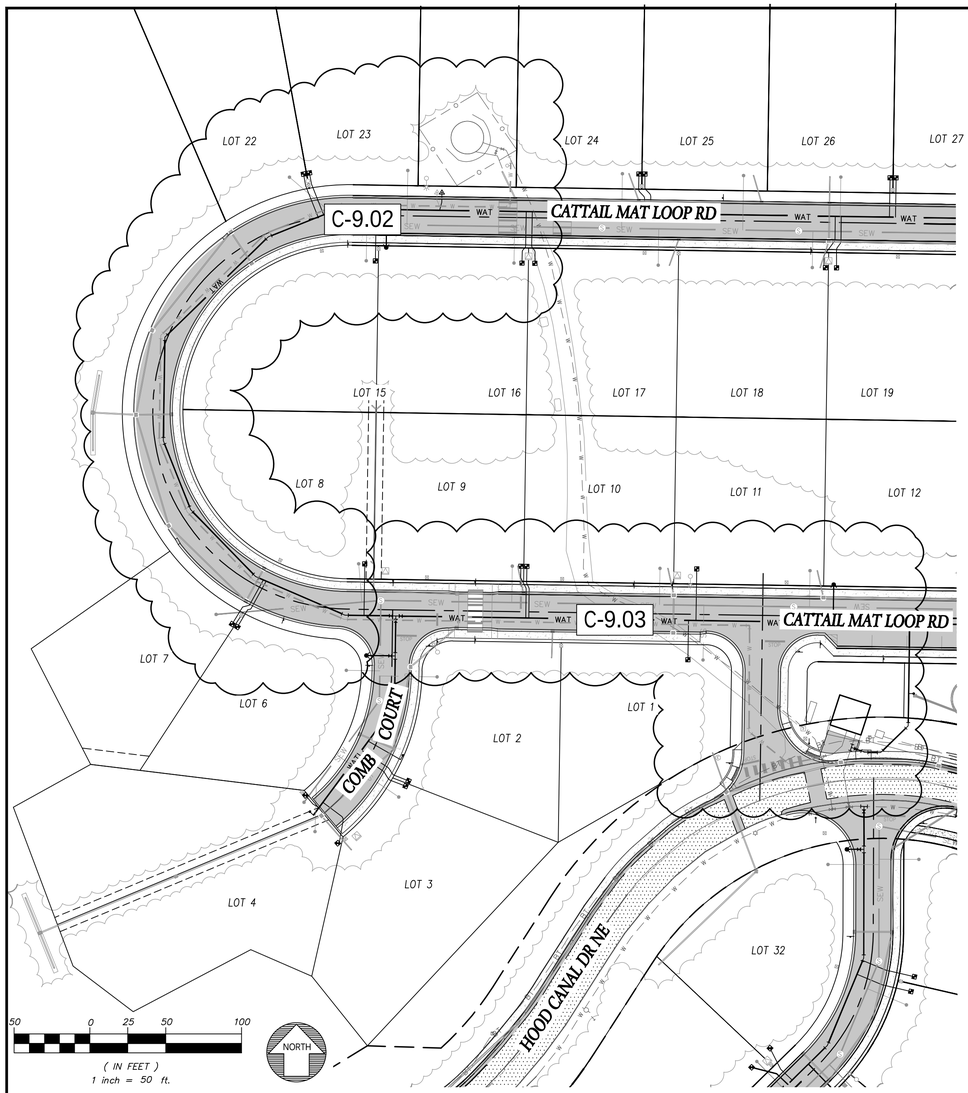
KENNETH P. FARRELL STATE OF WASHINGTON 23653 REGISTERED PROFESSIONAL ENGINEER

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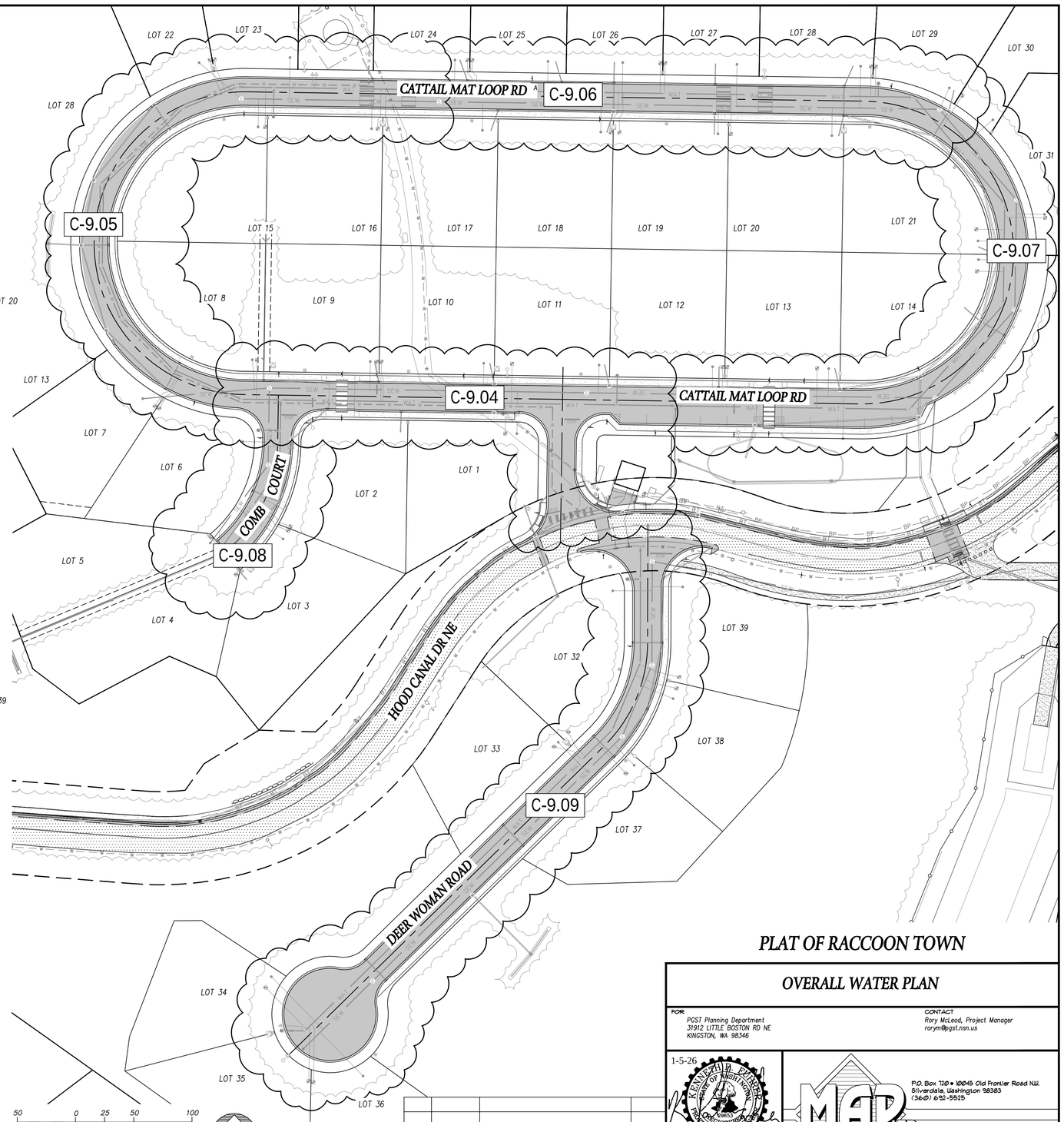
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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	–	6847	54 OF 74



WATER PLAN - RESERVOIR SUPPLY PIPE RE-ROUTE



WATER PLAN - SERVICE FOR PLAT

PLAT OF RACCOON TOWN

OVERALL WATER PLAN

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

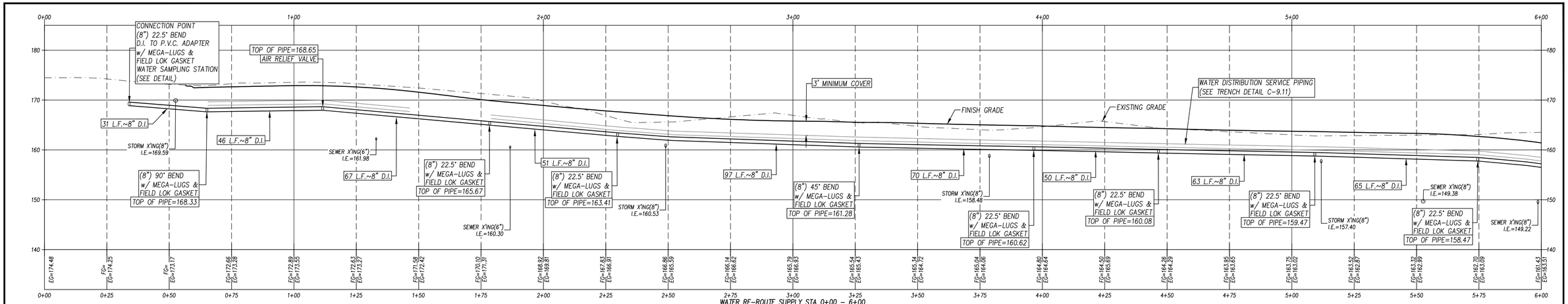
KRAMER, KYLE P. — STATE OF WASHINGTON — 43853 — REGISTERED PROFESSIONAL ENGINEER

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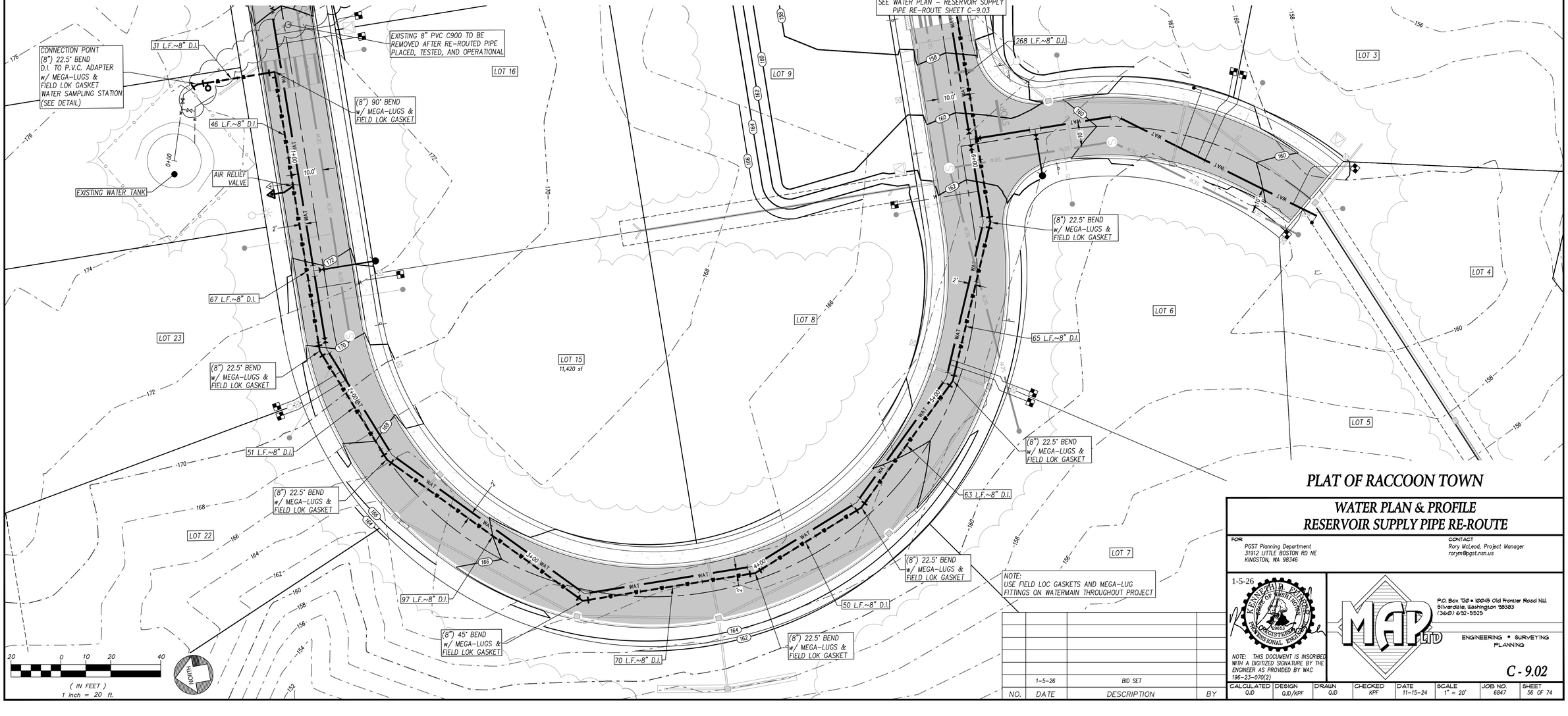
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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 50'	6847	55 OF 74



WATER RE-ROUTE SUPPLY STA 0+00 – 6+00
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

WATER PLAN & PROFILE
RESERVOIR SUPPLY PIPE RE-ROUTE

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

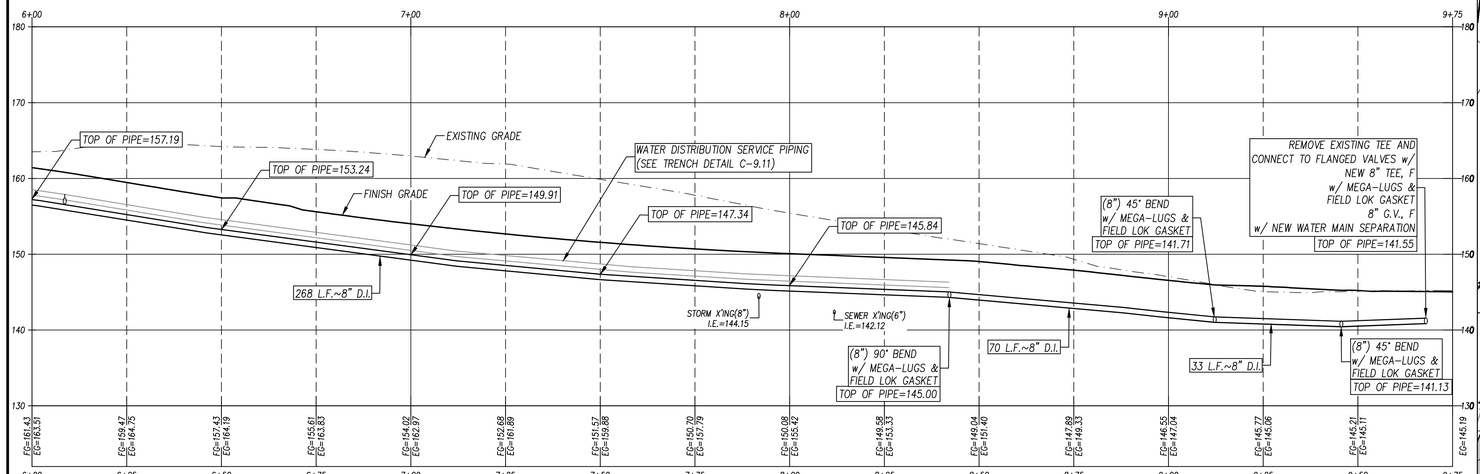
NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

1-5-26
KENNETH P. PATERSON — STATE OF WASHINGTON — 22000 — REGISTERED PROFESSIONAL ENGINEER
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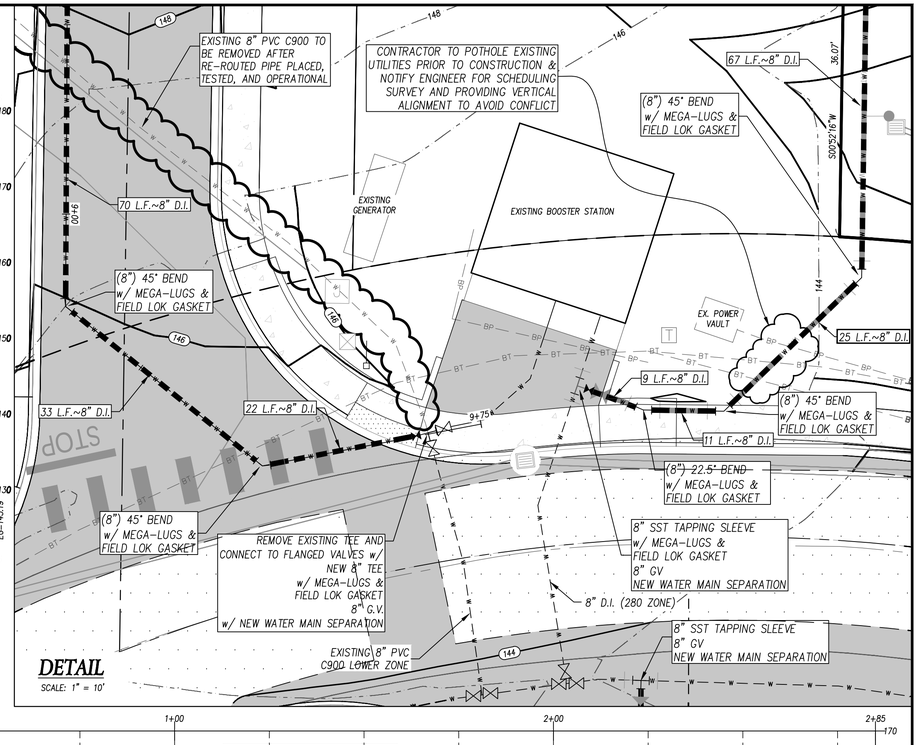
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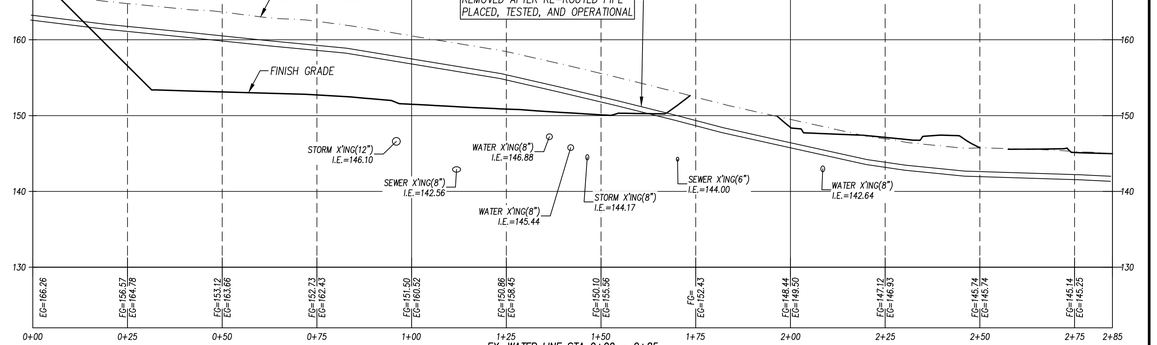
CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	56 OF 74



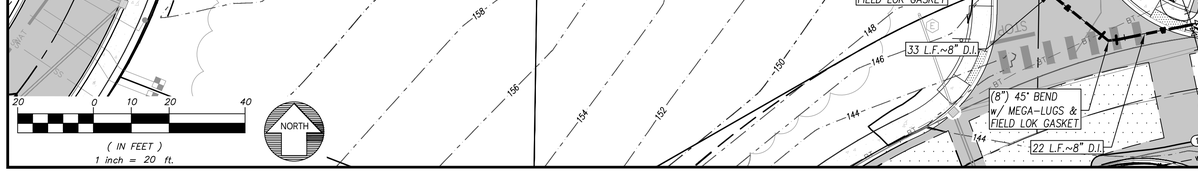
WATER RE-ROUTE SUPPLY STA 6+00 – 9+75
1"=20' Horiz
1"=10'

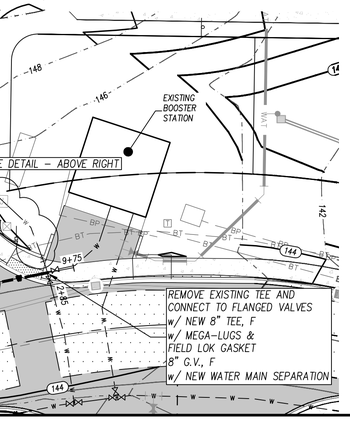


DETAIL
SCALE: 1" = 10'



EX. WATER LINE STA 0+00 – 2+85
1"=20' Horiz
1"=10'





NOTE:
USE FIELD LOC GASKETS AND MEGA-LUG FITTINGS ON WATERMAIN THROUGHOUT PROJECT

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

WATER PLAN & PROFILE
RESERVOIR SUPPLY PIPE RE-ROUTE

FOR
POST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

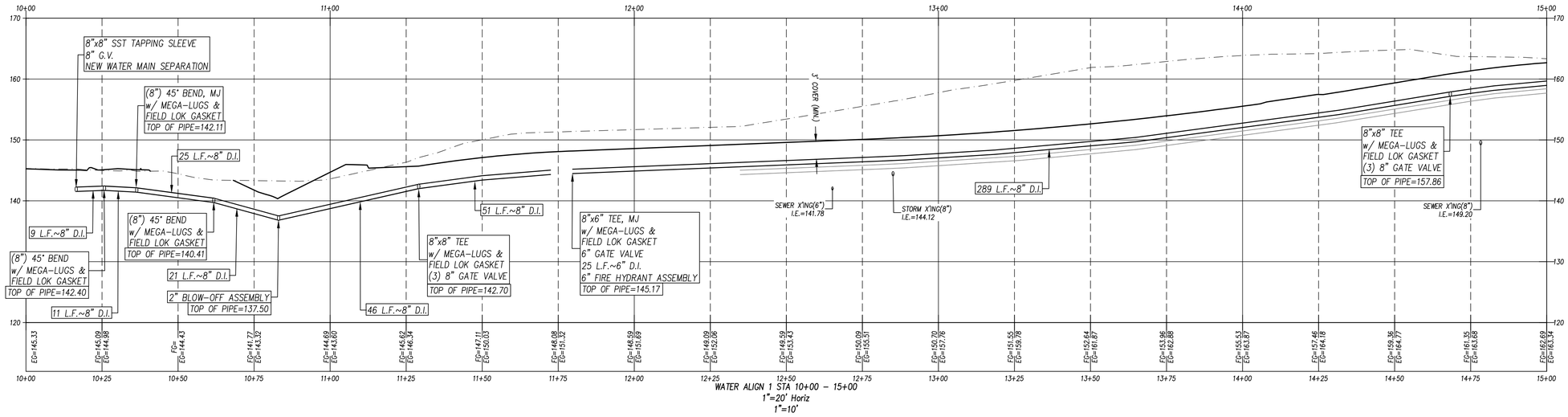
1-5-26

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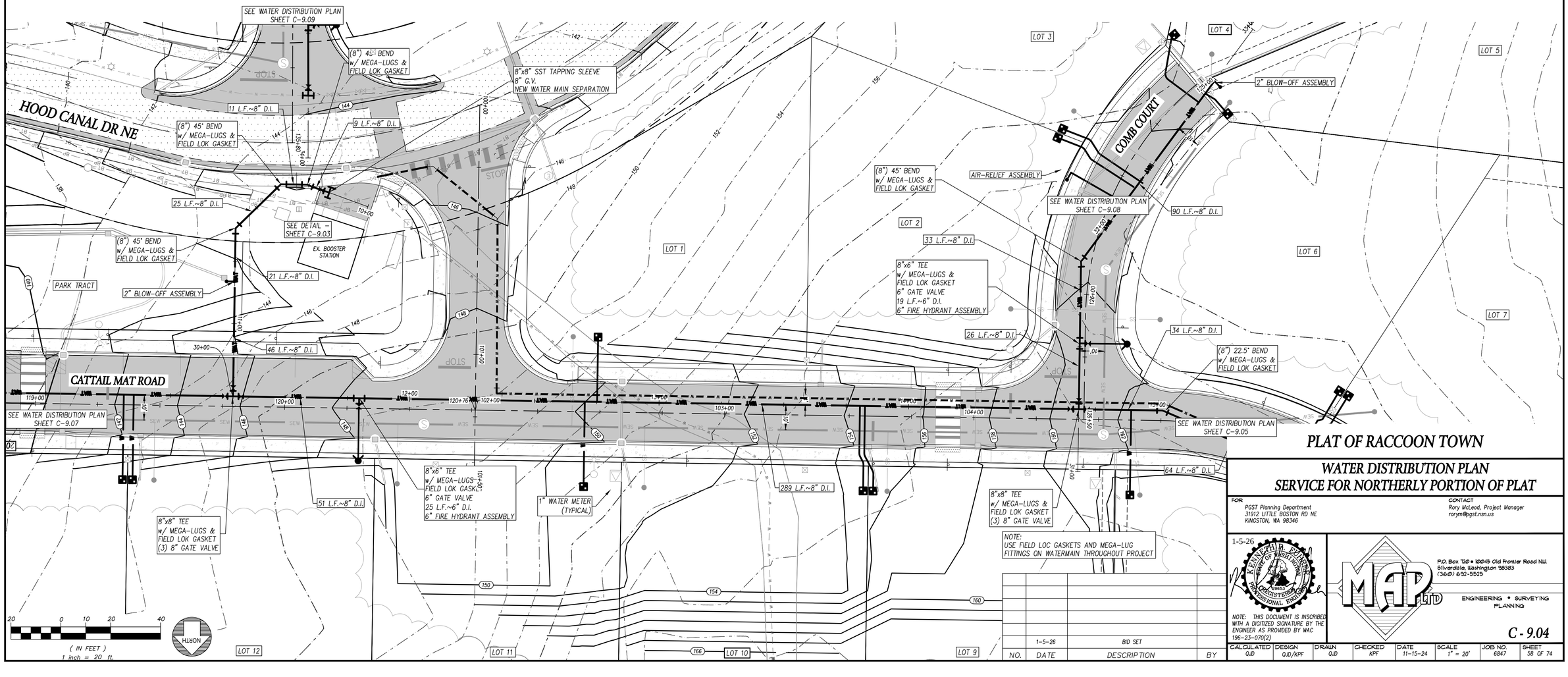
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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	57 OF 74



WATER ALIGN 1 STA 10+00 – 15+00
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

WATER DISTRIBUTION PLAN
SERVICE FOR NORTHERLY PORTION OF PLAT

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

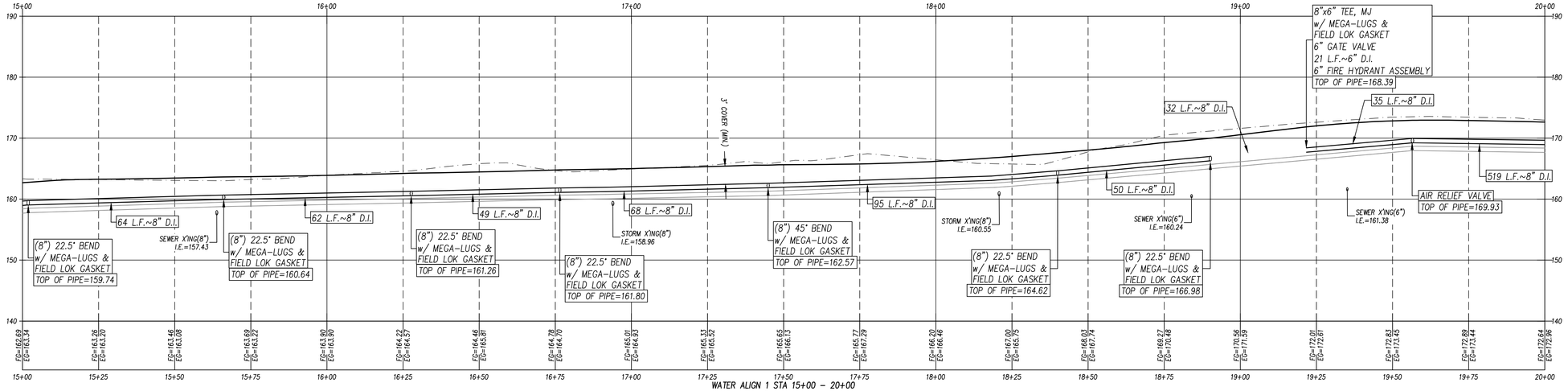
KENNETH P. VERSTEEG
STATE OF WASHINGTON
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PROFESSIONAL ENGINEER

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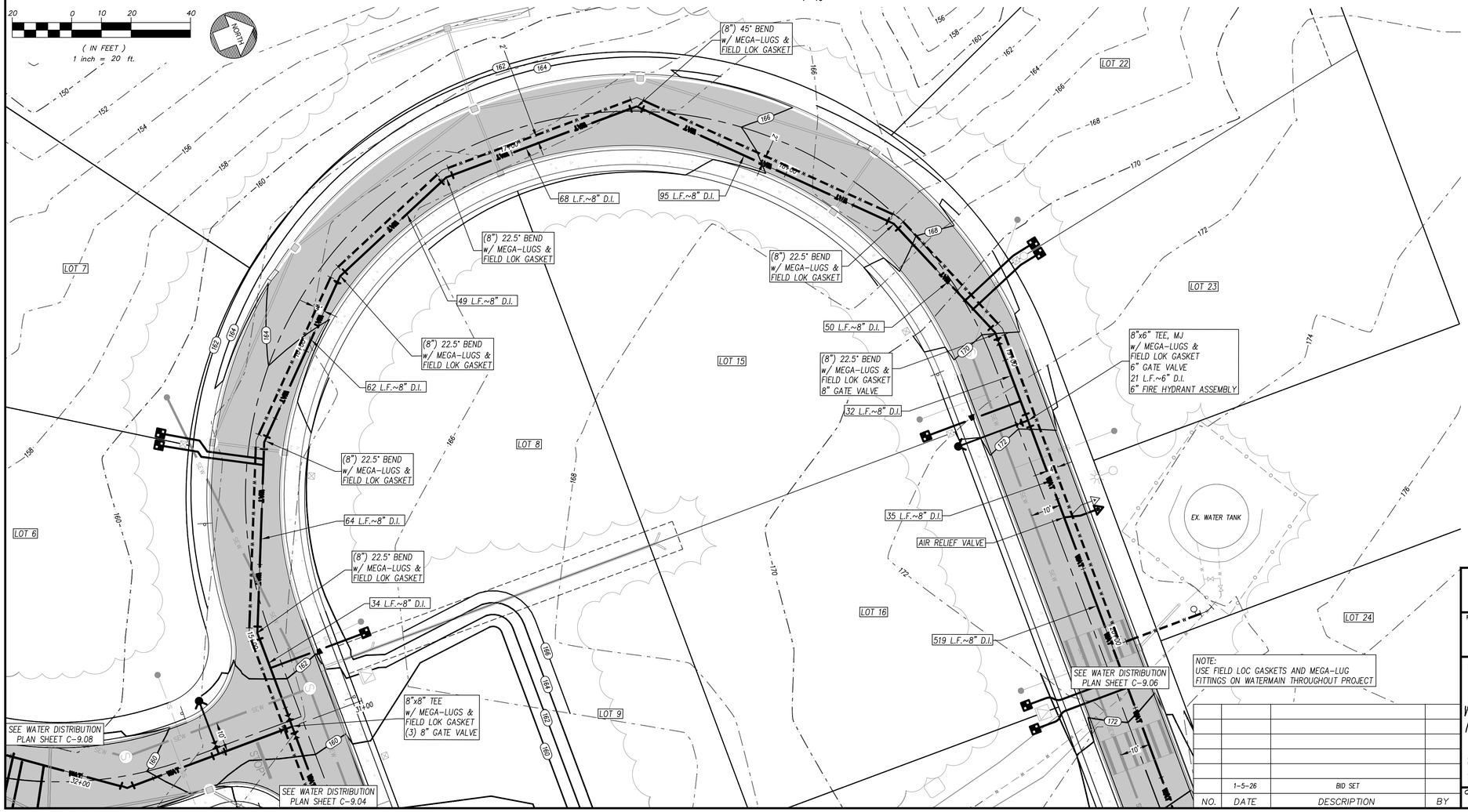
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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	58 OF 74



WATER ALIGN 1 STA 15+00 – 20+00
1"=20' Horiz
1"=10'



NOTE:
USE FIELD LOC GASKETS AND MEGA-LUG FITTINGS ON WATERMAIN THROUGHOUT PROJECT

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

WATER DISTRIBUTION PLAN
SERVICE FOR NORTHERLY PORTION OF PLAT

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

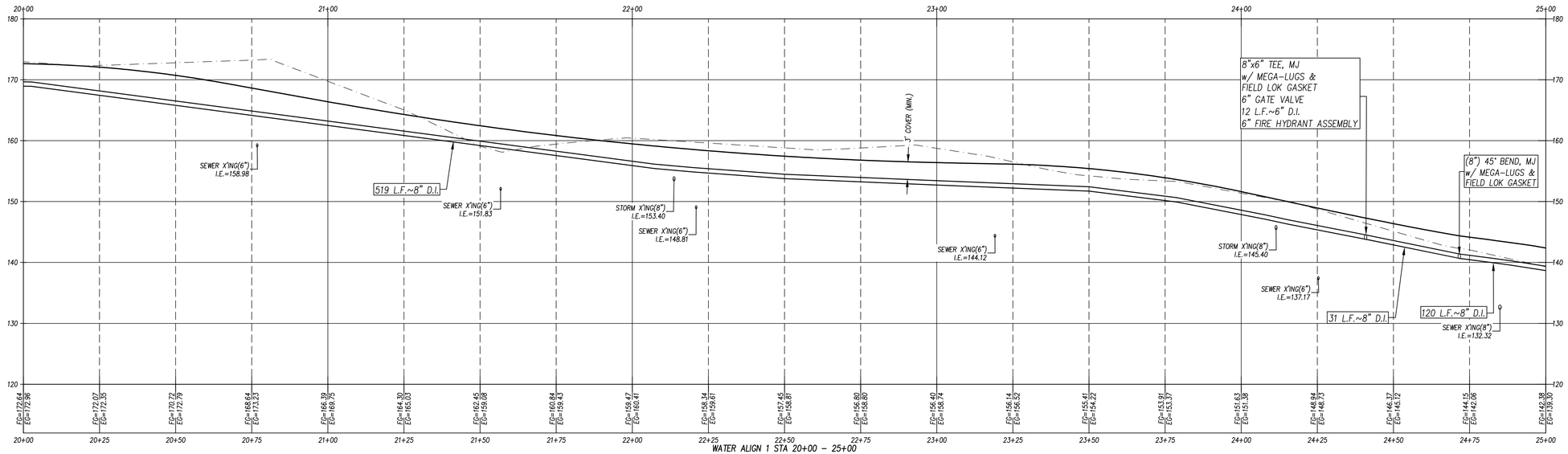
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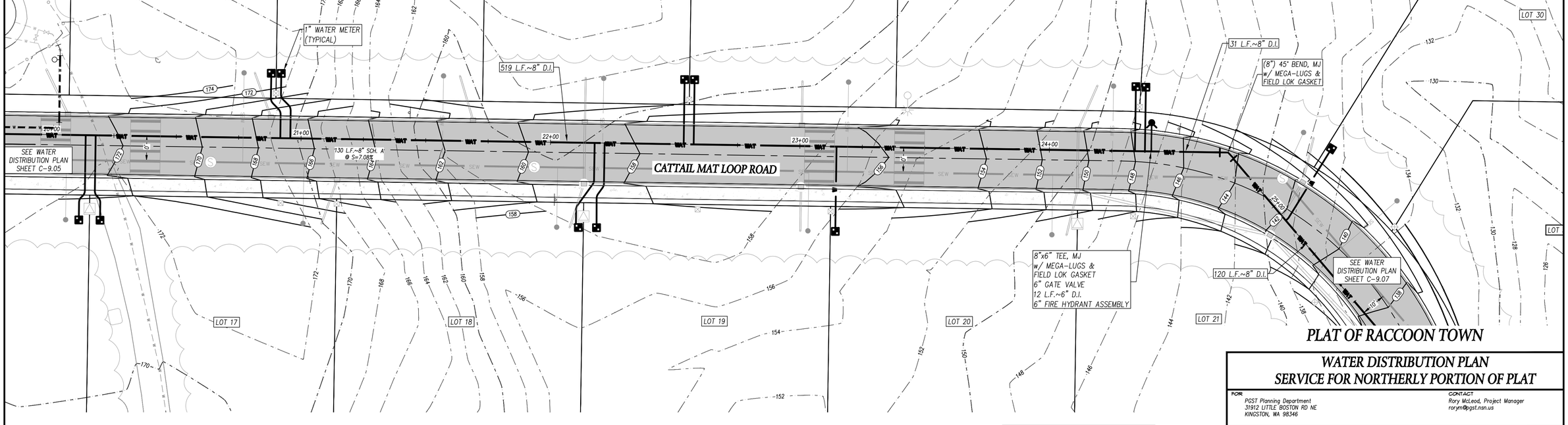
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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	59 OF 74



WATER ALIGN 1 STA 20+00 – 25+00
1"=20' Horiz
1"=10'



PLAT OF RACCOON TOWN

20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

NORTH

NOTE:
USE FIELD LOC GASKETS AND MEGA-LUG
FITTINGS ON WATERMAIN THROUGHOUT PROJECT

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

WATER DISTRIBUTION PLAN
SERVICE FOR NORTHERLY PORTION OF PLAT

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

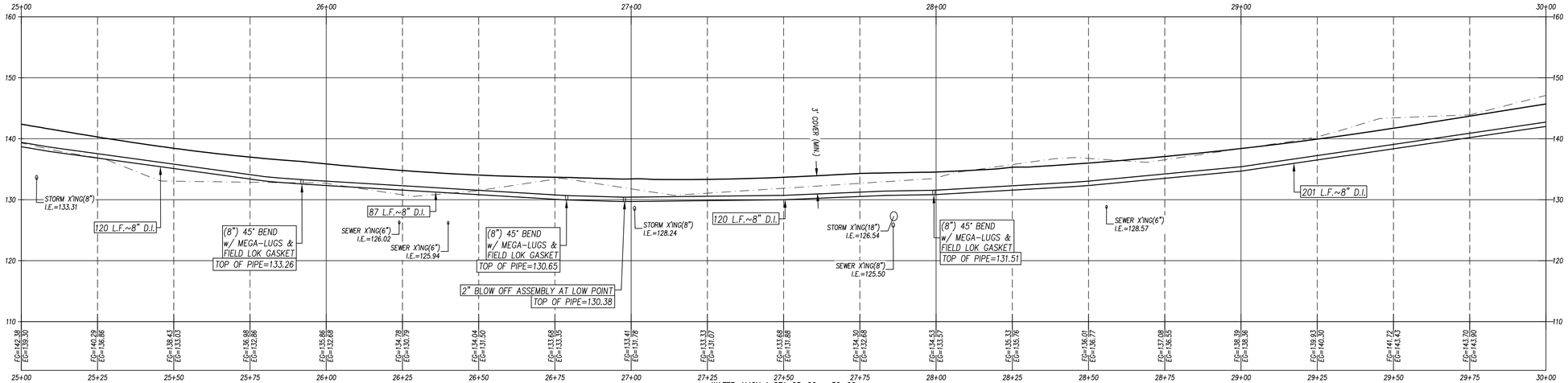
KENNETH P. FUTCH
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

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C - 9.06

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	60 OF 74



WATER ALIGN 1 STA 25+00 – 30+00
1"=20' Horiz
1"=10'

20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

NORTH

NOTE: USE FIELD LOC GASKETS AND MEGA-LUG FITTING ON WATERMAIN THROUGHOUT

(8") 45° BEND w/ MEGA-LUGS & FIELD LOK GASKET

2" BLOW OFF ASSEMBLY

87 L.F.~8" D.I.

120 L.F.~8" D.I.

(8") 45° BEND w/ MEGA-LUGS & FIELD LOK GASKET

(8") 45° BEND w/ MEGA-LUGS & FIELD LOK GASKET

LOT 31

LOT 14

LOT 21

LOT 13

PARK TRACT

CATTAIL MAT LOOP ROAD

201 L.F.~8" D.I.

25 L.F.~8" D.I.

(8") 45° BEND, MJ w/ MEGA-LUGS & FIELD LOK GASKET

2" BLOW OFF ASSEMBLY

EX. BOOSTER STATION

8"x8" TEE w/ MEGA-LUGS & FIELD LOK GASKET (3) 8" GATE VALVE

SEE WATER DISTRIBUTION PLAN SHEET C-9.04

(8") 45° BEND, MJ w/ MEGA-LUGS & FIELD LOK GASKET

SEE WATER DISTRIBUTION PLAN SHEET C-9.06

DEER WOMAN ROAD

SEE WATER DISTRIBUTION PLAN SHEET C-9.09

(8") 45° BEND, MJ w/ MEGA-LUGS & FIELD LOK GASKET

NOTE:
USE FIELD LOC GASKETS AND MEGA-LUG FITTINGS ON WATERMAIN THROUGHOUT PROJECT

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

WATER DISTRIBUTION PLAN
SERVICE FOR NORTHERLY PORTION OF PLAT

FOR
POST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

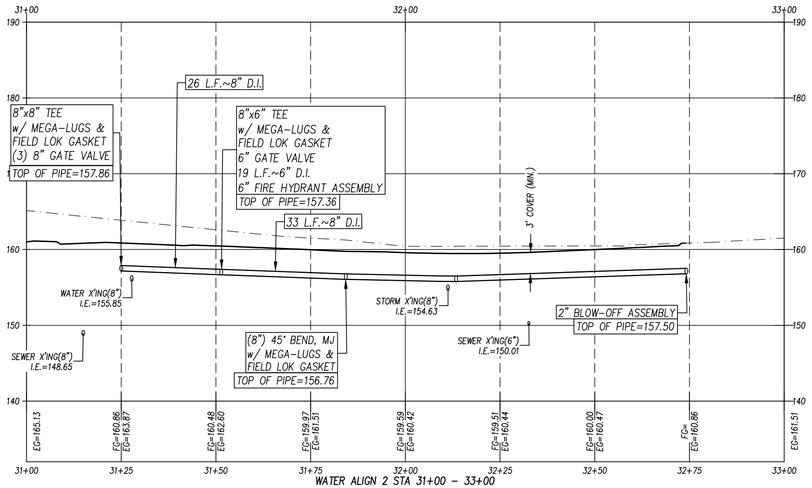
KENNETH P. FRIEDMAN
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21655
REGISTERED
PROFESSIONAL ENGINEER

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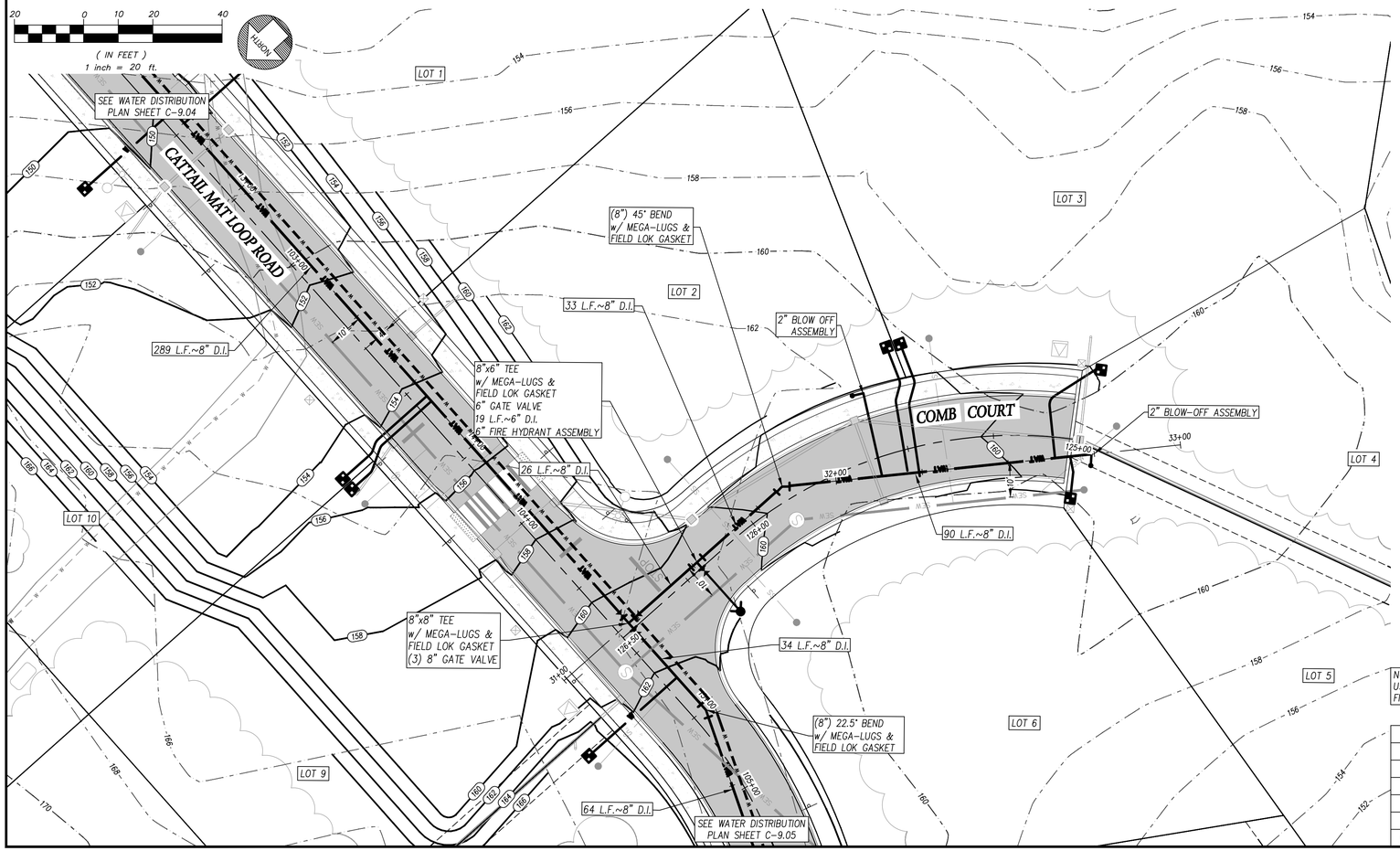
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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	61 OF 74



WATER ALIGN 2 STA 31+00 – 33+00
1"=20' Horiz
1"=10'



NOTE:
USE FIELD LOC GASKETS AND MEGA-LUG
FITTINGS ON WATERMAIN THROUGHOUT PROJECT

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

WATER DISTRIBUTION PLAN
SERVICE FOR NORTHERLY PORTION OF PLAT

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

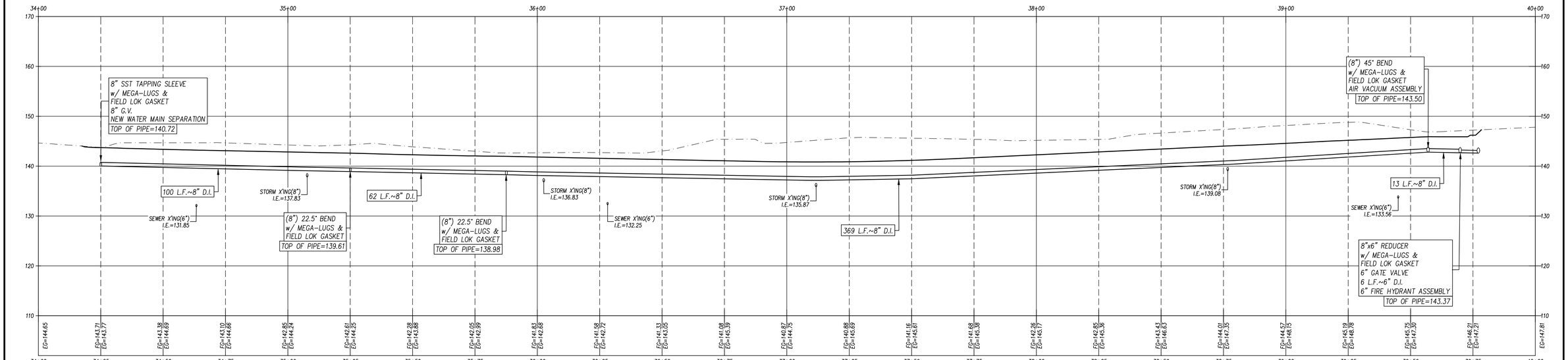
REGISTERED PROFESSIONAL ENGINEER
STATE OF WASHINGTON
KEITH P. VALEN
19453

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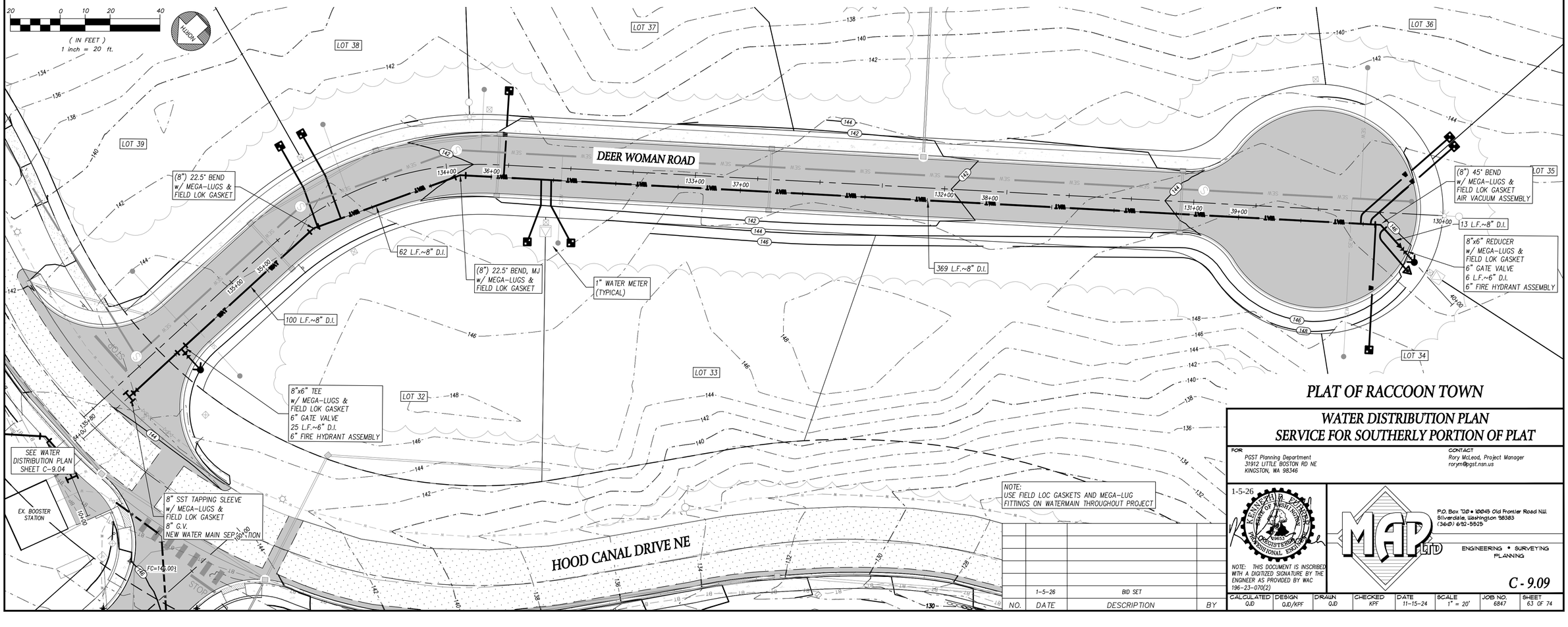
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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	62 OF 74



WATER ALIGN 3 STA 34+00 – 40+00
1"=20' Horiz
1"=10'



NOTE:
USE FIELD LOC GASKETS AND MEGA-LUG
FITTINGS ON WATERMAIN THROUGHOUT PROJECT

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

WATER DISTRIBUTION PLAN
SERVICE FOR SOUTHERLY PORTION OF PLAT

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. PATTON
STATE OF WASHINGTON
20883
REGISTERED
PROFESSIONAL ENGINEER

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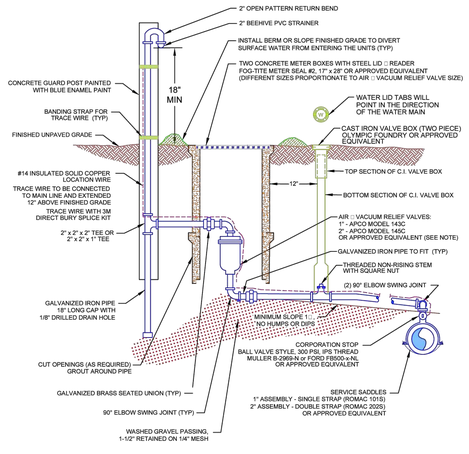
C - 9.09

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	63 OF 74

WATER DISTRIBUTION NOTES:

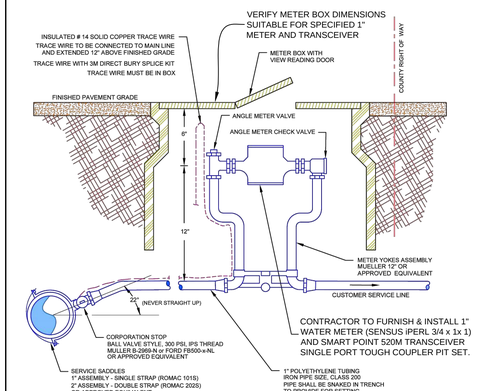
1. All Materials And Workmanship Shall Conform To The Requirements Of AWWA, APWA/WSDOT And The PGST.
   Flushing, Dechlorinating, Bacterial Testing And Hydrostatic Testing Are Required On All Installations Per Section 7-09 WSDOT Standard Specifications.
   All Materials Are To Be NSF/ANSI Standard 61 Certified. All chemicals intended for potable use shall be NSF/ANSI 60 certified.
2. All 3" And Larger Pipe Shall Be Ductile Iron Pipe Thickness Class 50 And Cement Lined. Class 52 Will Be Used When Conditions Require Thicker Wall Pipe. IE: In Casing Under A Road.
   Heavy Duty Polyethylene (HDPE) DR 9 Or DR 7 May Be Used Or Required By The Engineer. The HDPE Will Be Fused Or Electro Coupled Including Joints, Bends, Saddlers, Etc....
   All 2" Pipe, Shall Be Iron Pipe Size Polyethylene (HDPE), 200 PSI With Fused Joints Or Brass Compression Fittings With Stainless Steel Inserts.
3. The CONTRACTOR Shall Grade All Roads To Design Subgrade Elevation Before Installing Any Underground Utilities. If The CONTRACTOR Changes The Subgrade Elevation After Completing Construction On Of Any Underground Utilities, The CONTRACTOR Agrees To Raise Or Lower Subgrade Elevation, At No Cost To OWNER.
   The Minimum Cover For Water Mains Shall Be Three Feet And Shall Be Maintained At All Points.
4. Installation Of Water Mains And Service Lines Shall Include: Locator Wire And Water Marking Tape To Be Buried Along The Entire Length Of The Pipe.
   Warning Tape Shall Be Installed Approximately 18" Below Grade.
   Locator Wire Is To Be 14 Gauge Solid Core Neoprene Or Larger And Shall Be Run To 12" Above Grade At Each Gate Valve, Hydrant Flange, Air Vac, Blow Off And Meter Box.
   All Splices In The Locator Wire Shall Be Made Using Direct Bury Splice Kits, Equal To 3M #DBR.
5. All 2" To 12" Gate Valves Shall Be Resilient-seated Gate Valves, Conforming To AWWA C-509.
   Concrete Or Fiberglass Markers With "Water Stickers" With The Distance From Valve To Marker Written On The Back With Permanent Marker Are Required.
6. Services Shall Be (1" Minimum) 200 PSI Iron Pipe Size, Polyethylene Pipe Meeting ASTM D2737, Equal To Driscopipe 5100 And Shall Include A Corporation Stop On The Saddle At The Main.
7. The Contractor Shall Comply With All The Requirements Of The State And Local And Health Authorities.
8. A Pre-con Meeting Will Be Required.
9. PGST Staff Must Be Present For Any Wet Tap, Intertie, Final Connection, Etc....
   Contractor Shall Give A 48 Hour Notice In Writing Of Any Wet Tap, Intertie, Final Connection, Hydro Static Testing, Etc....
10. All Valves Connected Directly To EXISTING Infrastructure Shall Have A Locking Plug Installed And Can Only Be Operated By Staff.
11. The Contractor Is Prohibited From Operating Any Valve Connected Directly To Existing PGST Infrastructure.
    The Contractor May Operate Valves Within The Scope Of Their Work. IE: Contractor May Operate Valves On The Newly Installed System To Isolate Pipe Runs In Order To Find A Leak During Pressure Testing.
12. The Road And Structure Locations Shown Are Approximate And Intended To Show The Relative Location On The Proposed Water System Only.
13. All Locations Of Existing Utilities Are Approximate And It Shall Be The Responsibility Of The Contractor To Verify The Exact Location To Avoid Damage Or Disturbance.
    The Contractor Shall Call 811 For Underground Locates. Ground Will Not Be Broken Until All Underground Utilities Have Been Located. Then The Contractor Shall Pot Hole By Hand All Locate Utilities.
    The Contractor Is Required To Photograph The Locate Paint And The Actual Locations After Pot Holing And Shall Share These Photographs With PGST Staff When Requested.

NOTES:
1. AIR □ VACUUM RELIEF VALVE ASSEMBLY MUST BE INSTALLED AT HIGHEST POINT OF LINE. IF A HIGH POINT FALLS IN A LOCATION WHERE ASSEMBLY CANNOT BE INSTALLED, PROVIDE ADDITIONAL DEPTH OF LINE TO CREATE A HIGH POINT AT A LOCATION, WHERE ASSEMBLY CAN BE INSTALLED.
2. ALL PIPE AND FITTINGS SHALL BE GALVANIZED IRON.

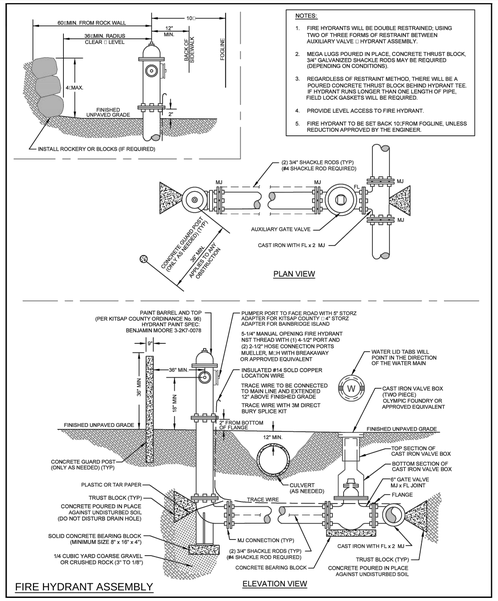


AIR-VACUUM RELIEF VALVE ASSEMBLY

NOTES:
1. THE DISTRICT'S RESPONSIBILITY "ENDS" AT THE METER BOX.
2. PROPERTIES THAT HAVE PLANS FOR HOUSE FIRE SPRINKLERS, MUST BE SINGLE SERVICE CONNECTIONS WITH 1" SETTERS.
3. TRAFFIC LOCATIONS:
   CARSON MSBCF 1118-12 PLASTIC BOX OR EQUIVALENT, DUCTILE IRON LID WITH VIEW READING DOOR FOR NON-PRV APPLICATIONS.
   CARSON MSBCF 1324-12 PLASTIC BOX OR EQUIVALENT, DUCTILE IRON LID WITH METER READING LID FOR PRV APPLICATIONS.
   METER BOXES MUST HAVE A 1-3/4" DRILLED HOLE IN A CORNER OR TOUCH PAD ADAPTOR (NOT TO INTERFERE WITH METER OR PRV).
4. NON-TRAFFIC LOCATIONS:
   CARSON 1419-12 PLASTIC BOX OR EQUIVALENT, PLASTIC LID WITH METER READING DOOR FOR PRV □ NON PRV APPLICATIONS.
   METER BOXES MUST HAVE A 1-3/4" DRILLED HOLE IN A CORNER OR TOUCH PAD ADAPTOR (NOT TO INTERFERE WITH METER OR PRV).



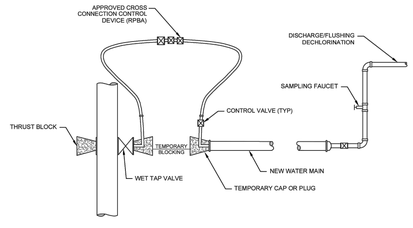
SINGLE SERVICE CONNECTION 5/8" - 1"



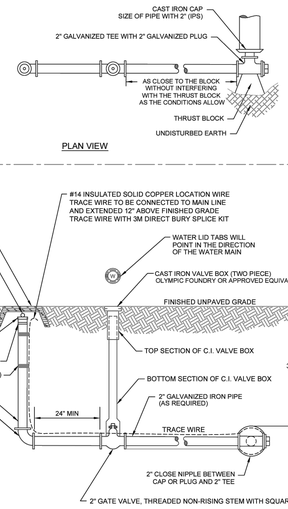
FIRE HYDRANT ASSEMBLY

NOTES:
1. FIRE HYDRANTS WILL BE DOUBLE RESTRAINED, USING TWO OF THREE FORMS OF RESTRAINT BETWEEN AUXILIARY VALVE □ HYDRANT ASSEMBLY.
2. MEGA LUGS POURED IN PLACE, CONCRETE THRUST BLOCK, 3/4" GALVANIZED SHACKLE RODS MAY BE REQUIRED (DEPENDING ON CONDITIONS).
3. REGARDLESS OF RESTRAINT METHOD, THERE WILL BE A POURED CONCRETE THRUST BLOCK BEHIND HYDRANT TEE. IF HYDRANT RUNS LONGER THAN ONE LENGTH OF PIPE, FIELD LOCK GASKETS WILL BE REQUIRED.
4. PROVIDE LEVEL ACCESS TO FIRE HYDRANT.
5. FIRE HYDRANT TO BE SET BACK 10.5'FROM FOGLINE, UNLESS REDUCTION APPROVED BY THE ENGINEER.

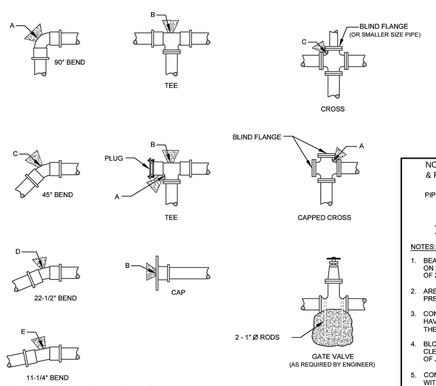
NOTES:
1. STAYING IN COMPLIANCE WITH D.O.H.S EMPHASIS ON CROSS CONNECTIONS, A PHYSICAL SEPARATION BETWEEN THE EXISTING WATER MAIN AND ANY NEW EXTENSIONS, WILL BE MAINTAINED DURING THE COURSE OF CONSTRUCTION. THE INITIAL FILLING AND FLUSHING, WILL BE DONE THROUGH A REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA).
2. PUT A BLIND FLANGE/CAP WITH A 2" TAP WITH A STANDPIPE.
3. 5□TO 8□FROM THE TAP VALVE, LAY THE FIRST PIPE WITH A BLIND FLANGE/CAP OR PLUG WITH A 2" TAP AND STANDPIPE.
4. WHEN THE CONSTRUCTION OF THE MAIN IS DONE, FILL THE NEW MAIN USING HOSES AND REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA).
5. FLUSH CHLORINATED WATER USING THE REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA).
6. BACTI SAMPLES
7. HYDROSTATIC TEST
8. MAKE FINAL CONNECTION, SWABBING ALL PARTS AND PIPE WITH CHLORINE SOLUTION. (□INSPECTOR MUST BE PRESENT□)
9. AFTER FINAL CONNECTION, PERFORM DEBRIS FLUSH.



NEW WATER MAIN SEPARATION



2" BLOW-OFF ASSEMBLY



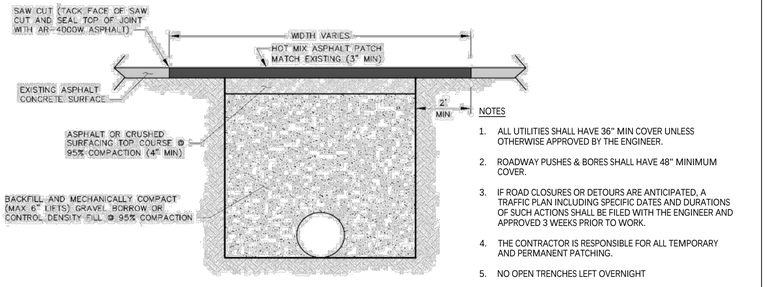
CONCRETE THRUST BLOCKING

NOT REQUIRED ON MEGA LUG & FIELD LOK JOINTED PIPE

UNDISTURBED SOIL

PIPE SIZE	A (FT²)	B (FT²)	C (FT²)	D (FT²)	E (FT²)
4"	3	1	1	1	1
6"	4	4	2	1	1
8"	7	6	4	2	1
10"	11	10	6	3	2
12"	16	14	9	5	3

NOTES:
1. BEARING AREA OF CONCRETE THRUST-BLOCK BASED ON 200 PSI PRESSURE AND SAFE SOIL BEARING LOAD OF 2000 POUNDS PER SQUARE FOOT.
2. AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZES, PRESSURES AND SOIL CONDITIONS.
3. CONCRETE BLOCKING SHALL BE CAST IN PLACE AND HAVE A MINIMUM OF 1/4 SQUARE FOOT BEARING AGAINST THE FITTING.
4. BLOCK SHALL BEAR AGAINST FITTINGS ONLY AND SHALL BE CLEAR OF JOINTS TO PERMIT TAKING UP OR DISMANTLING OF JOINT.
5. CONTRACTOR SHALL INSTALL BLOCKING ADEQUATE TO WITHSTAND OPERATION PRESSURE UNDER ALL CONDITIONS OF SERVICE.



ROAD TRENCH AND RESTORATION DETAIL

NO SCALE

NOTES
1. ALL UTILITIES SHALL HAVE 36" MIN COVER UNLESS OTHERWISE APPROVED BY THE ENGINEER.
2. ROADWAY PUSHES & BORES SHALL HAVE 48" MINIMUM COVER.
3. IF ROAD CLOSURES OR DETOURS ARE ANTICIPATED, A TRAFFIC PLAN INCLUDING SPECIFIC DATES AND DURATIONS OF SUCH ACTIONS SHALL BE FILED WITH THE ENGINEER AND APPROVED 3 WEEKS PRIOR TO WORK.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY AND PERMANENT PATCHING.
5. NO OPEN TRENCHES LEFT OVERNIGHT
6. CONTRACTOR IS RESPONSIBLE TO PROVIDE TRAFFIC CONTROL.

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

WATER NOTES & DETAILS

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. PETERSEN — STATE OF WASHINGTON — 22853 — REGISTERED PROFESSIONAL ENGINEER

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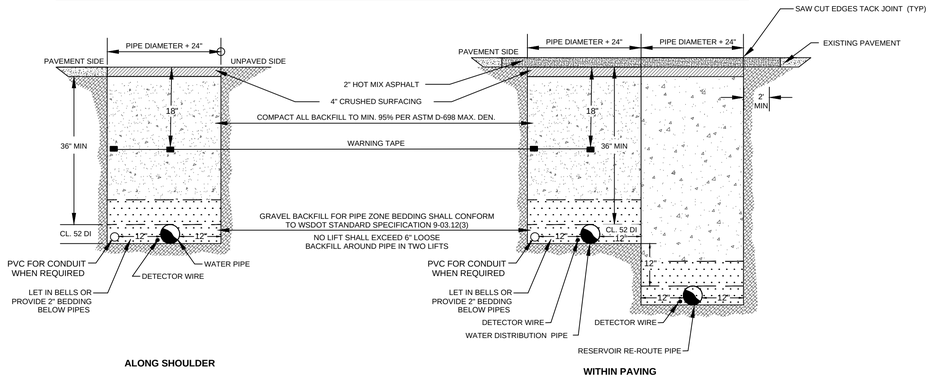
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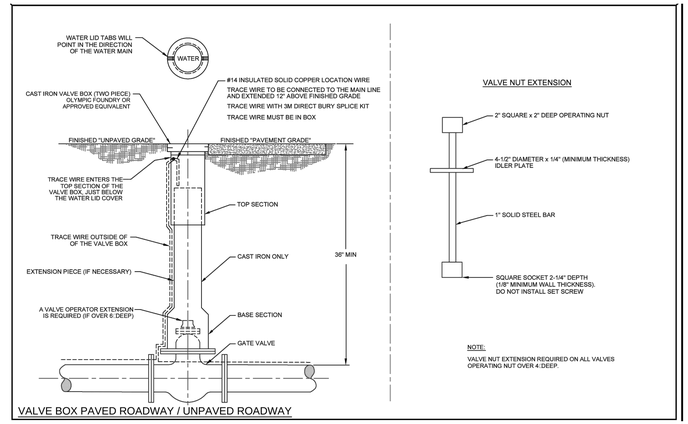
CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	-	6847	64 OF 74

NOTE:

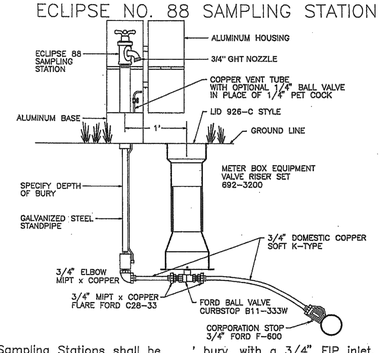
1. CONTRACTORS ARE REQUIRED TO MEET ALL WASHINGTON STATE DOT STANDARDS AND KITSAP COUNTY STANDARDS FOR TRENCH AND ASPHALT SURFACING.
2. ASPHALT CONCRETE MIX SHALL BE CLASS "B".
3. ALL UTILITIES SHALL HAVE 36" MIN. COVER UNLESS, OTHERWISE APPROVED BY THE COUNTY ENGINEER.
4. IF ROAD CLOSURES OR DETOURS ARE ANTICIPATED, A TRAFFIC PLAN INCLUDING; SPECIFIC DATES AND DURATIONS OF SUCH ACTIONS SHALL BE FILED WITH THE KITSAP COUNTY DEPARTMENT OF PUBLIC WORKS.
5. THE APPLICANT IS RESPONSIBLE FOR ALL TEMPORARY AND PERMANENT PATCHING.
6. NO OPEN TRENCHES LEFT OVERNIGHT.



TYPICAL STANDARD TRENCH
& PAVEMENT RESTORATION
WITH OR WITHOUT FIBER CONDUIT



ECLIPSE NO. 88 SAMPLING STATION



Sampling Stations shall be ' bury, with a 3/4" FIP inlet, and a (3/4" hose or unthreaded) nozzle.

All stations shall be enclosed in a lockable, nonremovable, aluminum-cast housing.

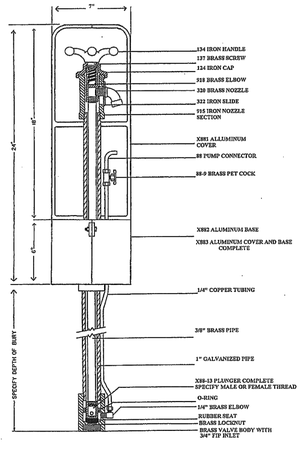
When opened, the station shall require no key for operation, and the water will flow in an all brass waterway.

All working parts will also be of brass and be removable from above ground with no digging. Exterior piping shall be galvanized steel (brass pipe also available).

A copper vent tube will enable each station to be pumped free of standing water to prevent freezing and to minimize bacteria growth.

Eclipse No. 88 Sampling Station shall be manufactured by Kupferle Foundry, St. Louis, MO 63102.

ECLIPSE # 88 SAMPLING STATION



PLAT OF RACCOON TOWN

WATER NOTES & DETAILS

FOR
PGST Planning Department
3912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

1-5-26

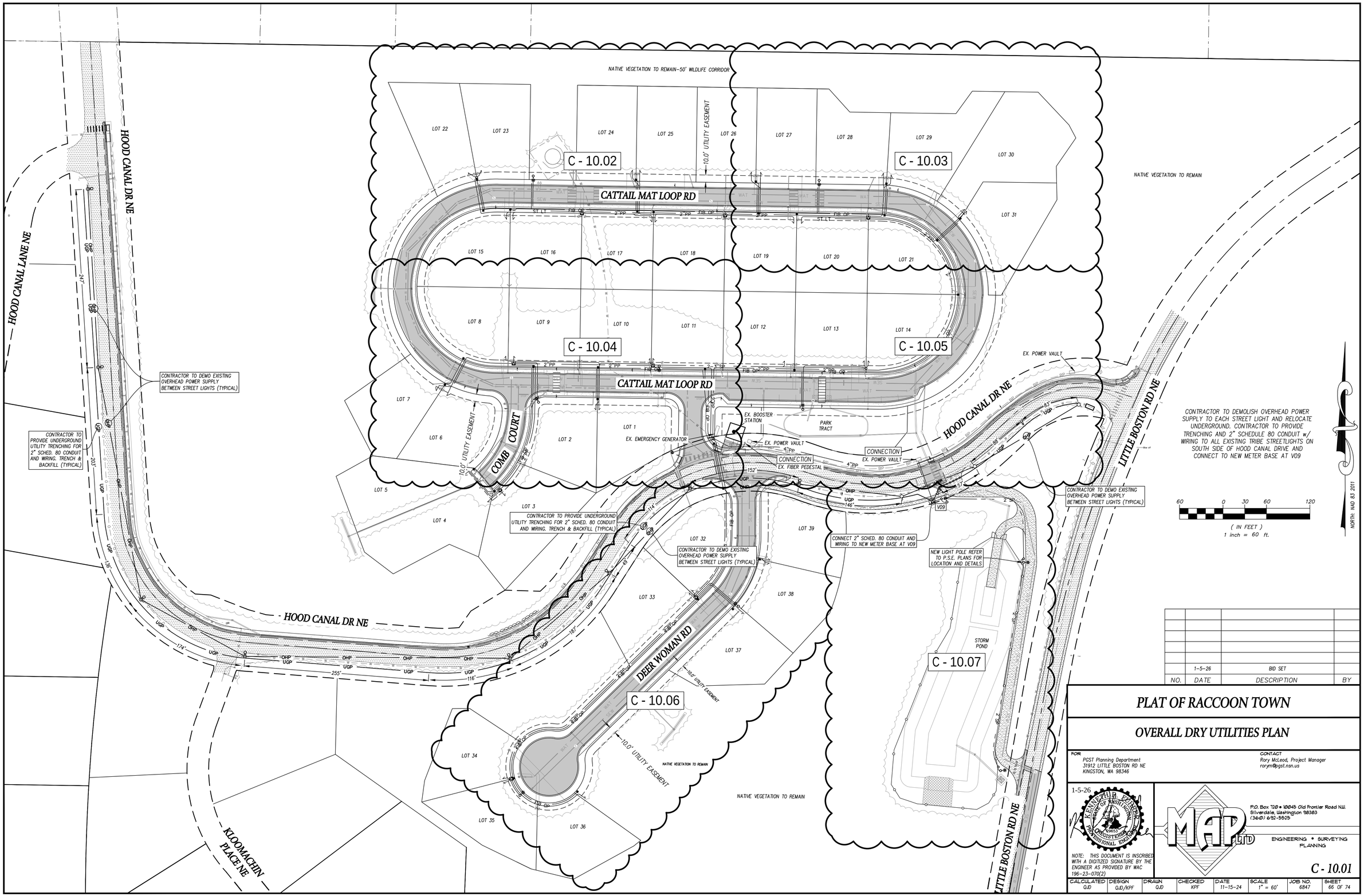
KENNETH P. PARKER — STATE OF WASHINGTON — 22855 — REGISTERED PROFESSIONAL ENGINEER

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C - 9.11

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	-	6847	65 OF 74



NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

OVERALL DRY UTILITIES PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. FRANDEN — STATE OF WASHINGTON — 20853 — REGISTERED PROFESSIONAL ENGINEER

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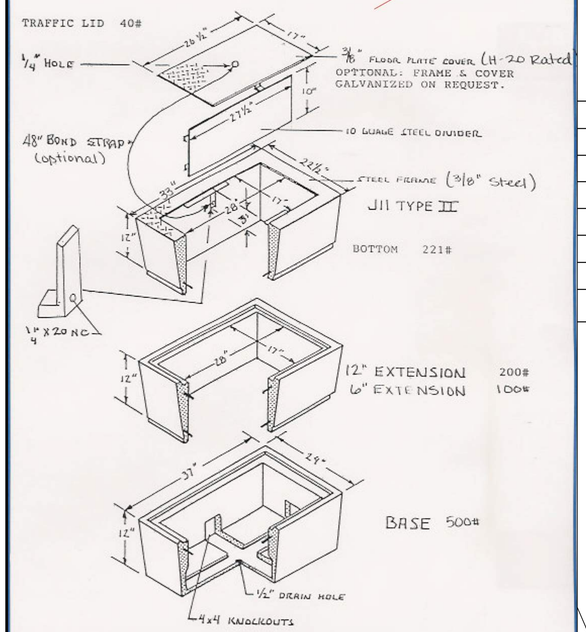
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CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 60'	6847	66 OF 74

FOG TITE
INCORPORATED

J11 TYPE 2



TYPE 2 FIBER OPTIC HANDHOLD DETAIL - CONTRACTOR PROVIDED

LEGEND

- POWER HANDHOLD (FOR FUTURE CONNECTION)
- POWER HANDHOLD
- POWER JUNCTION BOX
- POWER TRANSFORMER
- STREET LIGHT
- TYPE 2 FIBER OPTIC HANDHOLD
- ST LT — POWER FOR STREET LIGHT
- 2"SP — 2" SECONDARY POWER
- 1-3"SP — (1) 3" SECONDARY POWER
- 2-3"SP — (2) 3" SECONDARY POWER
- 3-3"SP — (3) 3" SECONDARY POWER
- 2"PP — 2" PRIMARY POWER
- 4"PP — 4" PRIMARY POWER
- FIB OP — 2" SCHED. 80 CONDUIT FOR FIBER OPTIC
- EC — EMPTY 2" SCHED. 80 AT ALL CROSSINGS SWEEP UP AND TAPE ABOVE FG

NATIVE VEGETATION TO REMAIN–50' WILDLIFE CORRIDOR

LOT 22
11,560 sf

LOT 23
11,255 sf

LIGHT STANDARD
STA=109+31.1, 25.0' L

LOT 24
10,905 sf

LOT 25
10,905 sf

LOT 26
10,905 sf

EX. BOOSTER STATION

H6A
STA=108+57.5, 25.0' L

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=108+57.5, 22.0' L

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=110+73.2, 22.0' L

CONTRACTOR PROVIDED 2" SCH. 80 PVC CONDUIT FOR FIBER OPTIC (TYP.)

10.0' UTILITY EASEMENT

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=112+38.9, 22.0' L

CATTAIL MAT LOOP RD

SEE DRY UTILITIES PLAN SHEET C-10.03

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=108+58.5, 22.0' R

POWER TRANSFORMER
STA=109+99.2, 25.5' R

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=110+75.7, 22.0' R

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=110+98.2, 22.0' R

POWER TRANSFORMER
STA=111+97.2, 25.5' R

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=109+00.2, 22.0' R

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=112+42.9, 22.0' R

LOT 15
11,420 sf

LOT 16
10,890 sf

LOT 17
10,890 sf

LOT 18
10,890 sf

LOT 19
10,890 sf

10.0' UTILITY EASEMENT

CONTRACTOR PROVIDED
PROPOSED UNDER GROUND UTILITIES TRENCH, COORDINATE WITH P.S.E. AND OTHERS
TRENCH & BACKFILL IN ACCORDANCE WITH P.S.E. REQUIREMENTS (TYPICAL)

NATIVE VEGETATION TO REMAIN

LOT 8
11,420 sf

LOT 9
10,890 sf

LOT 10

SEE DRY UTILITIES PLAN SHEET C-10.04

NOTE:
REFER TO FINAL PUGET SOUND ENERGY AND ALSO TO LIGHT INSTALLATION PLANS FOR ACTUAL LOCATION AND CONSTRUCTION REQUIREMENTS

CONTRACTOR TO PROVIDE ALL 2" SCH. 40 CONDUIT NECESSARY FOR FRONTAGE LIGHTING FL1/HH1 – FL3/HH3

NORTH

20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

CONTRAC	NO.	DATE	DESCRIPTION	BY
		1-5-26	BID SET	

PLAT OF RACCOON TOWN

DRY UTILITIES PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. HOLLAND — STATE OF WASHINGTON — 19853 — REGISTERED PROFESSIONAL ENGINEER

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C - 10.02

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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	67 OF 74

NATIVE VEGETATION TO REMAIN–50' WILDLIFE CORRIDOR

LOT 26
10,905 sf

LOT 27
10,905 sf

LOT 28
11,330 sf

LOT 29
13,960 sf

LOT 30
16,350 sf

LOT 31
12,200 sf

10.0' UTILITY EASEMENT

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C–10.02
STA=112+38.9, 22.0' L

CONTRACTOR PROVIDED 2" SCH. 80
PVC CONDUIT FOR FIBER OPTIC (TYP.)

LIGHT STANDARD
STA=113+26.4, 25.0' L

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C–10.02
STA=114+18.5, 22.0' L

CATTAIL MAT LOOP RD

SEE DRY UTILITIES PLAN
SHEET C–10.02

POWER TRANSFORMER
STA=111+97.2, 25.5' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C–10.02
STA=112+42.9, 22.0' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C–10.02
STA=112+96.2, 22.0' R

POWER TRANSFORMER
STA=113+95.2, 25.5' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C–10.02
STA=114+18.5, 22.0' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C–10.02
STA=115+17.4, 22.0' L

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C–10.02
STA=115+17.9, 22.0' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C–10.02
STA=116+16.8, 22.0' R

CONTRACTOR PROVIDED
PROPOSED UNDER GROUND UTILITIES TRENCH,
COORDINATE WITH P.S.E. AND OTHERS
TRENCH & BACKFILL IN ACCORDANCE
WITH P.S.E. REQUIREMENTS (TYPICAL)

LOT 19
10,890 sf

LOT 20
10,890 sf

LOT 21
11,420 sf

LOT 13
10,890 sf

LOT 14
11,420 sf

SEE DRY UTILITIES PLAN
SHEET C–10.05

NOTE:
REFER TO FINAL PUGET SOUND ENERGY AND ALSO TO LIGHT INSTALLATION PLANS FOR ACTUAL LOCATION AND CONSTRUCTION REQUIREMENTS

CONTRACTOR TO PROVIDE ALL 2" SCH. 40 CONDUIT NECESSARY FOR FRONTAGE LIGHTING FL1/HH1 – FL3/HH3

NORTH

20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

LEGEND

- POWER HANDHOLD (FOR FUTURE CONNECTION)
- POWER HANDHOLD
- POWER JUNCTION BOX
- POWER TRANSFORMER
- STREET LIGHT
- TYPE 2 FIBER OPTIC HANDHOLD
- ST LT — POWER FOR STREET LIGHT
- 2"SP — 2" SECONDARY POWER
- 1–3"SP — (1) 3" SECONDARY POWER
- 2–3"SP — (2) 3" SECONDARY POWER
- 3–3"SP — (3) 3" SECONDARY POWER
- 2"PP — 2" PRIMARY POWER
- 4"PP — 4" PRIMARY POWER
- FIB OP — 2" SCHED. 80 CONDUIT FOR FIBER OPTIC
- EC — EMPTY 2" SCHED. 80 AT ALL CROSSINGS SWEEP UP AND TAPE ABOVE FG

PLAT OF RACCOON TOWN

DRY UTILITIES PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
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KENNETH P. PARKER — STATE OF WASHINGTON — 19853 — REGISTERED PROFESSIONAL ENGINEER

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C - 10.03

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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	68 OF 74

NATIVE VEGETATION TO REMAIN

SEE DRY UTILITIES PLAN SHEET C-10.02

LOT 8
11,420 sf

LOT 9
10,890 sf

LOT 10
10,890 sf

LOT 11
10,890 sf

LOT 12
10,890 sf

POWER TRANSFORMER
STA=104+49.3, 25.5' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=104+21.8, 22.0' R

CONTRACTOR PROVIDED 2" SCH. 80 PVC CONDUIT FOR FIBER OPTIC (TYP.)

CONTRACTOR PROVIDED
PROPOSED UNDER GROUND UTILITIES TRENCH, COORDINATE WITH P.S.E. AND OTHERS
TRENCH & BACKFILL IN ACCORDANCE WITH P.S.E. REQUIREMENTS (TYPICAL)

POWER TRANSFORMER
STA=102+56.8, 25.5' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=105+29.5, 22.0' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=103+32.6, 22.0' R

LIGHT STANDARD
STA=102+48.0, 25.0' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=120+60.9, 22.0' R

10.0' UTILITY EASEMENT

NATIVE VEGETATION TO REMAIN

CATTAIL MAT LOOP RD

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=105+36.1, 22.0' L

LOT 7
10,890 sf

LIGHT STANDARD
STA=104+14.0, 27.5' L

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=103+32.6, 22.0' L

SEE DRY UTILITIES PLAN SHEET C-10.05

LOT 1
10,900 sf

10.0' UTILITY EASEMENT

J01
STA=100+48.0, 28.0' R

EX. EMERGENCY GENERATOR

CONNECT TO EX. FIBER PEDESTAL

EX. BOOSTER STATION

EX. POWER VAULT

ELECTRICAL BOX (FUTURE)
STA=100+28.0, 28.0' L

SAWCUT AND ASPHALT RESTORATION

LOT 6
10,890 sf

COMB COURT

LOT 2
10,895 sf

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=125+00.0, 20.0' L

LOT 5
11,750 sf

POWER TRANSFORMER
STA=125+08.0, 25.5' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=100+41.4, 29.5' R

EXISTING STREET LIGHT (TYPICAL)

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=125+02.4, 22.0' R

LOT 3
14,720 sf

LOT 4
12,590 sf

CONTRACTOR TO PROVIDE UNDERGROUND UTILITY TRENCHING FOR 2" SCHED. 80 CONDUIT AND WIRING. TRENCH & BACKFILL (TYPICAL) SEE SHEET C-10.01

CONTRACTOR TO DEMO EXISTING OVERHEAD POWER SUPPLY BETWEEN STREET LIGHTS (TYPICAL) SEE SHEET C-10.01

SEE DRY UTILITIES PLAN SHEET C-10.06

LEGEND

(E)	POWER HANDHOLD (FOR FUTURE CONNECTION)
⬡	POWER HANDHOLD
[J]	POWER JUNCTION BOX
△	POWER TRANSFORMER
○—✳	STREET LIGHT
⊠	TYPE 2 FIBER OPTIC HANDHOLD
ST LT	POWER FOR STREET LIGHT
2"SP	2" SECONDARY POWER
1-3"SP	(1) 3" SECONDARY POWER
2-3"SP	(2) 3" SECONDARY POWER
3-3"SP	(3) 3" SECONDARY POWER
2"PP	2" PRIMARY POWER
4"PP	4" PRIMARY POWER
FIB OP	2" SCHED. 80 CONDUIT FOR FIBER OPTIC
EC	EMPTY 2" SCHED. 80 AT ALL CROSSINGS SWEEP UP AND TAPE ABOVE FG

NOTE:
REFER TO FINAL PUGET SOUND ENERGY AND ALSO TO LIGHT INSTALLATION PLANS FOR ACTUAL LOCATION AND CONSTRUCTION REQUIREMENTS

CONTRACTOR TO PROVIDE ALL 2" SCH. 40 CONDUIT NECESSARY FOR FRONTAGE LIGHTING FL1/HH1 – FL3/HH3

NORTH

20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

PLAT OF RACCOON TOWN

DRY UTILITIES PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. PARSON — STATE OF WASHINGTON — 22951 — REGISTERED PROFESSIONAL ENGINEER

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C - 10.04

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	69 OF 74

LOT 18
10,890 sf

LOT 19
10,890 sf

LOT 20
10,890 sf

LOT 21
11,420 sf

LOT 31
12,200 sf

LOT 11
10,890 sf

LOT 12
10,890 sf

LOT 13
10,890 sf

LOT 14
11,420 sf

LOT 1
10,900 sf

LOT 39

SEE DRY UTILITIES PLAN SHEET C-10.03

SEE DRY UTILITIES PLAN SHEET C-10.04

SEE DRY UTILITIES PLAN SHEET C-10.06

SEE DRY UTILITIES PLAN SHEET C-10.07

CATTAIL MAT LOOP RD

HOOD CANAL DR NE

NATIVE VEGETATION TO REMAIN

PARK TRACT

STOP

10.0' UTILITY EASEMENT

POWER TRANSFORMER
STA=102+56.8, 25.5' R

LIGHT STANDARD
STA=102+48.0, 25.0' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=120+60.9, 22.0' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=119+37.4, 22.0' R

H1A
STA=118+38.4, 26.0' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=115+17.9, 22.0' R

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=116+16.8, 22.0' R

CONTRACTOR PROVIDED
PROPOSED UNDER GROUND UTILITIES TRENCH, COORDINATE WITH P.S.E. AND OTHERS
TRENCH & BACKFILL IN ACCORDANCE WITH P.S.E. REQUIREMENTS (TYPICAL)

CONTRACTOR PROVIDED 2" SCH. 80 PVC CONDUIT FOR FIBER OPTIC (TYP.)

LIGHT STANDARD
STA=119+25.0, 32.0' L

EX. EMERGENCY GENERATOR

CONNECT TO EX. FIBER PEDESTAL

EX. BOOSTER STATION

EX. POWER VAULT

CONNECT TO EX. POWER VAULT

J01
STA=100+48.0, 28.0' R

ELECTRICAL BOX (FUTURE)
STA=100+28.0, 28.0' L

SAWCUT AND ASPHALT RESTORATION

CONTRACTOR TO PROVIDE UNDERGROUND UTILITY TRENCHING FOR 2" SCHED. 80 CONDUIT AND WIRING. TRENCH & BACKFILL (TYPICAL) SEE SHEET C-10.01

TYPE 2 FIBER OPTIC HANDHOLD
SEE DETAIL SHEET C-10.02
STA=100+41.4, 29.5' R

EXISTING STREET LIGHT (TYPICAL)

CONTRACTOR TO DEMO EXISTING OVERHEAD POWER SUPPLY BETWEEN STREET LIGHTS (TYPICAL) SEE SHEET C-10.01

CONNECT 2" SCHED. 80 CONDUIT AND WIRING TO NEW METER BASE AT V09

HH1

FL1

V09

NOTE:
REFER TO FINAL PUGET SOUND ENERGY AND ALSO TO LIGHT INSTALLATION PLANS FOR ACTUAL LOCATION AND CONSTRUCTION REQUIREMENTS

CONTRACTOR TO PROVIDE ALL 2" SCH. 40 CONDUIT NECESSARY FOR FRONTAGE LIGHTING FL1/HH1 – FL3/HH3

NORTH

20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

LEGEND

- POWER HANDHOLD (FOR FUTURE CONNECTION)
- POWER HANDHOLD
- POWER JUNCTION BOX
- POWER TRANSFORMER
- STREET LIGHT
- TYPE 2 FIBER OPTIC HANDHOLD
- ST LT — POWER FOR STREET LIGHT
- 2"SP — 2" SECONDARY POWER
- 1-3"SP — (1) 3" SECONDARY POWER
- 2-3"SP — (2) 3" SECONDARY POWER
- 3-3"SP — (3) 3" SECONDARY POWER
- 2"PP — 2" PRIMARY POWER
- 4"PP — 4" PRIMARY POWER
- FIB OP — 2" SCHED. 80 CONDUIT FOR FIBER OPTIC
- EC — EMPTY 2" SCHED. 80 AT ALL CROSSINGS SWEEP UP AND TAPE ABOVE FG

PLAT OF RACCOON TOWN

DRY UTILITIES PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

NO.	DATE	DESCRIPTION	BY
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1-5-26
REGISTERED PROFESSIONAL ENGINEER
KENNETH P. FARRA
STATE OF WASHINGTON
29653

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QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	70 OF 74

LEGEND

- POWER HANDHOLD (FOR FUTURE CONNECTION)
- POWER HANDHOLD
- POWER JUNCTION BOX
- POWER TRANSFORMER
- STREET LIGHT
- TYPE 2 FIBER OPTIC HANDHOLD
- ST LT — POWER FOR STREET LIGHT
- 2"SP — 2" SECONDARY POWER
- 1-3"SP — (1) 3" SECONDARY POWER
- 2-3"SP — (2) 3" SECONDARY POWER
- 3-3"SP — (3) 3" SECONDARY POWER
- 2"PP — 2" PRIMARY POWER
- 4"PP — 4" PRIMARY POWER
- FIB OP — 2" SCHED. 80 CONDUIT FOR FIBER OPTIC
- EC — EMPTY 2" SCHED. 80 AT ALL CROSSINGS SWEEP UP AND TAPE ABOVE FG

CONTRACTOR TO DEMO EXISTING OVERHEAD POWER SUPPLY BETWEEN STREET LIGHTS (TYPICAL) SEE SHEET C-10.01

EXISTING STREET LIGHT (TYPICAL)

HOOD CANAL DR NE

CONTRACTOR TO PROVIDE UNDERGROUND UTILITY TRENCHING FOR 2" SCHED. 80 CONDUIT AND WIRING. TRENCH & BACKFILL (TYPICAL) SEE SHEET C-10.01

NATIVE VEGETATION TO REMAIN

CONTRACTOR PROVIDED PROPOSED UNDER GROUND UTILITIES TRENCH, COORDINATE WITH P.S.E. AND OTHERS TRENCH & BACKFILL IN ACCORDANCE WITH P.S.E. REQUIREMENTS (TYPICAL)

CONTRACTOR PROVIDED 2" SCH. 80 PVC CONDUIT FOR FIBER OPTIC (TYP.)

SAWCUT AND ASPHALT RESTORATION

EX. BOOSTER STATION

CONNECT TO EX. FIBER PEDESTAL

EX. POWER VAULT

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=135+43.5, 32.2' L

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=134+50.4, 21.6' L

POWER TRANSFORMER
STA=133+58.8, 25.5' L

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=134+50.4, 22.0' R

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=133+58.8, 22.0' L

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=133+83.2, 22.0' R

LIGHT STANDARD
STA=133+90.0, 25.0' R

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=130+03.9, 23.0' L

LIGHT STANDARD
STA=129+93.5, 0.0'

TYPE 2 FIBER OPTIC HANDHOLD SEE DETAIL SHEET C-10.02
STA=130+53.8, 51.9' R

DEER WOMAN RD

10.0' UTILITY EASEMENT

LOT 32 — 11,005 sf
LOT 33 — 11,040 sf
LOT 34 — 10,890 sf
LOT 35 — 10,890 sf
LOT 36 — 10,890 sf
LOT 37 — 11,055 sf
LOT 38 — 10,930 sf
LOT 39 — 10,895 sf

SEE DRY UTILITIES PLAN SHEET C-10.07

NOTE:
REFER TO FINAL PUGET SOUND ENERGY AND ALSO TO LIGHT INSTALLATION PLANS FOR ACTUAL LOCATION AND CONSTRUCTION REQUIREMENTS

CONTRACTOR TO PROVIDE ALL 2" SCH. 40 CONDUIT NECESSARY FOR FRONTAGE LIGHTING FL1/HH1 – FL3/HH3

NORTH

20 0 10 20 40
(IN FEET)
1 inch = 20 ft.

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

PLAT OF RACCOON TOWN

DRY UTILITIES PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KRISTOPHER P. PEARSON — STATE OF WASHINGTON — 22853 — REGISTERED PROFESSIONAL ENGINEER

NOTE: THIS DOCUMENT IS INSCRIBED WITH A DIGITIZED SIGNATURE BY THE ENGINEER AS PROVIDED BY WAC 196-23-070(2)

P.O. Box 720 • 10045 Old Frontier Road NW
Silverdale, Washington 98383
(360) 692-5525

MAP LTD
ENGINEERING • SURVEYING
PLANNING

C - 10.06

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	71 OF 74

LITTLE BOSTON RD NE

HOOD CANAL DR NE

LIGHT STANDARD FL2

HH2

CONTRACTOR TO PROVIDE 2" SCHED. 40 CONDUIT (V09/HH1/FL1 TO HH3/FL3)

HH3

LIGHT STANDARD FL3

LIGHT STANDARD FL1

STA=3+10.9, 45.0' L

HH1

V09

POWER TRANSFORMER

STA=3+26.5, 37.5' L

CONNECT 2" SCHED. 80 CONDUIT AND WIRING TO NEW METER BASE AT V09

SEE DRY UTILITIES PLAN SHEET C-10.05

CONNECT TO EX. POWER VAULT

CONTRACTOR TO PROVIDE UNDERGROUND UTILITY TRENCHING FOR 2" SCHED. 80 CONDUIT AND WIRING. TRENCH & BACKFILL (TYPICAL) SEE SHEET C-10.01

CONTRACTOR TO DEMO EXISTING OVERHEAD POWER SUPPLY BETWEEN STREET LIGHTS (TYPICAL) SEE SHEET C-10.01

LOT 39
10,895 sf

LOT 38
10,930 sf

LOT 37
11,055 sf

SEE DRY UTILITIES PLAN SHEET C-10.06

LEGEND

- POWER HANDHOLD (FOR FUTURE CONNECTION)
- POWER HANDHOLD
- POWER JUNCTION BOX
- POWER TRANSFORMER
- STREET LIGHT
- TYPE 2 FIBER OPTIC HANDHOLD
- ST LT — POWER FOR STREET LIGHT
- 2"SP — 2" SECONDARY POWER
- 1-3"SP — (1) 3" SECONDARY POWER
- 2-3"SP — (2) 3" SECONDARY POWER
- 3-3"SP — (3) 3" SECONDARY POWER
- 2"PP — 2" PRIMARY POWER
- 4"PP — 4" PRIMARY POWER
- FIB OP — 2" SCHED. 80 CONDUIT FOR FIBER OPTIC
- EC — EMPTY 2" SCHED. 80 AT ALL CROSSINGS SWEEP UP AND TAPE ABOVE FG

NOTE:
REFER TO FINAL PUGET SOUND ENERGY AND ALSO TO LIGHT INSTALLATION PLANS FOR ACTUAL LOCATION AND CONSTRUCTION REQUIREMENTS

CONTRACTOR TO PROVIDE ALL 2" SCH. 40 CONDUIT NECESSARY FOR FRONTAGE LIGHTING FL1/HH1 – FL3/HH3

NORTH

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

PLAT OF RACCOON TOWN

DRY UTILITIES PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

1-5-26

KENNETH P. PARKER — STATE OF WASHINGTON — 22683 — REGISTERED PROFESSIONAL ENGINEER

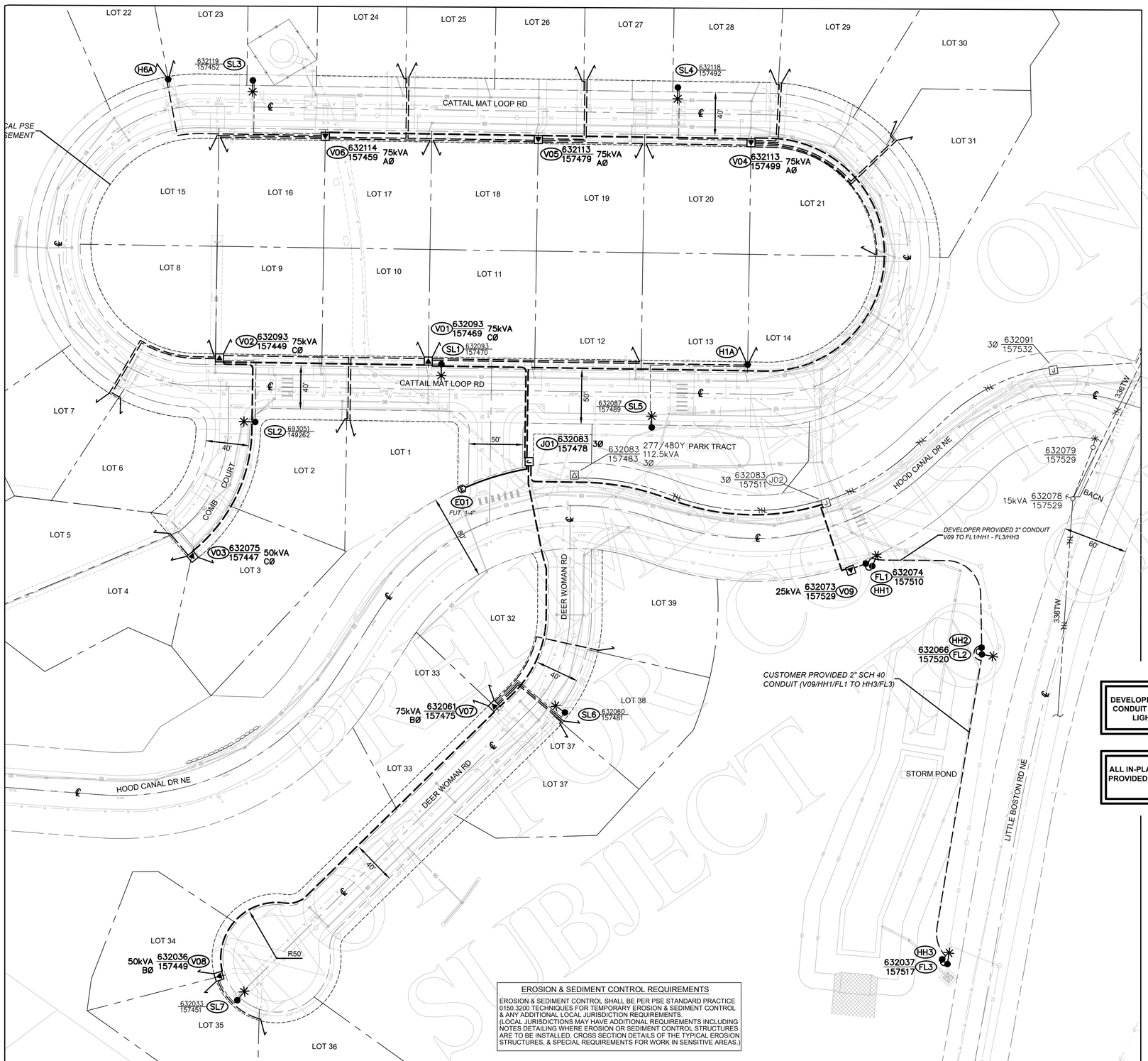
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MAP LTD
P.O. Box 720 • 10045 Old Frontier Road NW
Silverdale, Washington 98383
(360) 692-5525
ENGINEERING • SURVEYING
PLANNING

C - 10.07

NO.	DATE	DESCRIPTION	BY
	1-5-26	BID SET	

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	11-15-24	1" = 20'	6847	72 OF 74



SITE PLAN

SCALE: 1" = 50'

EROSION & SEDIMENT CONTROL REQUIREMENTS

EROSION & SEDIMENT CONTROL SHALL BE PER PSE STANDARD PRACTICE 0150.3200 TECHNIQUES FOR TEMPORARY EROSION & SEDIMENT CONTROL & ANY ADDITIONAL LOCAL JURISDICTION REQUIREMENTS. (LOCAL JURISDICTIONS MAY HAVE ADDITIONAL REQUIREMENTS INCLUDING NOTES DETAILING WHERE EROSION OR SEDIMENT CONTROL STRUCTURES ARE TO BE INSTALLED, CROSS SECTION DETAILS OF THE TYPICAL EROSION STRUCTURES, & SPECIAL REQUIREMENTS FOR WORK IN SENSITIVE AREAS.)

SITE SPECIFIC NOTES

SL1 - SL7
- INST NEW 25' MH CONCRETE OCTAGONAL GRAY MAST DIRECT POLES W/ NEW 8' ARMS
  CUSTOMER TO PROVIDE SONO-TUBES; SEE INSTALL TABLE AND DETAIL FOR DIMENSIONS (PG.2)
- INST NEW 39W LED 3000K TYPE 2 GRAY CHFL
- ORIENT OVER ROADWAY AS SHOWN
- INST SMART NODE AND SERIAL NUMBER
- INST STREET LIGHT TAG

FL1 - FL3
- INST NEW 25' MH CONCRETE OCTAGONAL GRAY MAST DIRECT POLES W/ NEW 8' ARMS
  CUSTOMER TO PROVIDE SONO-TUBES; SEE INSTALL TABLE AND DETAIL FOR DIMENSIONS (PG.2)
- INST NEW 39W LED 3000K TYPE 2 GRAY CHFL
- ORIENT AS SHOWN OVER WALKING PATH
- INST SMART NODE AND SERIAL NUMBER
- INST STREET LIGHT TAG

HH1 - HH3
- INST NEW STREET LIGHT HANDHOLE HHSL3, 3 - 3POS FARGOS

SPAN NOTES

V01/HH1/FL1 - HH3/FL3
- DEVELOPER TO PROVIDE/INSTALL 2" SCH40 CONDUIT, MULE TAPE & PULL ROPE
- POTELCO TO INSTALL #6 TPX SECONDARY CABLE
  SEE ONE-LINE AND CIRCUITRY TABLES

SL1 - SL7
- #6 CIC CIRCUITRY TO SL1 - SL7 PROVIDED AND INSTALLED BY PSE PLATS (PM: LOREN WEIR)
  SEE ONE-LINE AND CIRCUITRY TABLE

STREET LIGHT NOTES

POTELCO:

1. ALL STREET LIGHTING POLES ARE TO BE INSTALLED PER STANDARD 6375.4800 (PAGE #2) IN THE "LINE WORK PRACTICES MANUAL".
2. ALL POLES (WOOD, CONCRETE OR FIBERGLASS) ARE TO BE SET PLUMB AND EMBEDDED TO THE GROUND LINE MARKED ON THE POLE.
3. BACKFILL AROUND POLE WITH 5/8" MINUS GRAVEL AND COMPACT IN 6" LIFTS. (PEA GRAVEL AND NATIVE SOILS ARE NOT ACCEPTABLE.) APPROXIMATELY 1 CU. YD. OF 5/8" MINUS CRUSHED ROCK WILL BE REQUIRED.
4. IN ALL SHOEBOX AND COBRAHEAD INSTALLATIONS, THE LUMINAIRE MUST BE LEVELED.

DEVELOPER / CUSTOMER:

1. THE DEVELOPER IS REQUIRED TO SUPPLY AND INSTALL PLASTIC (NON PAPER) STREET LIGHT TUBES (MINIMUM 18" DIAMETER) TO AID IN THE INSTALLATION OF THE STREET LIGHTING POLES.
2. DEVELOPER MUST SUPPLY DURABLE LID/COVER AT EACH STREET LIGHT TUBE.
3. DEVELOPER TO PROVIDE ALL TRENCHING AND CONDUIT WITH PULL-STRINGS FOR STREET LIGHTING CIRCUITRY.
4. CONDUIT SHALL BE SCH 40 PVC, CONDUIT CROSSING ROADWAYS OR DRIVEWAYS SHALL BE SCH 80 PVC.

DEVELOPER TO PROVIDE ALL 2" SCH 40 CONDUIT NECESSARY FOR FRONTAGE LIGHTING FL1/HH1 - FL3/HH3

ALL IN-PLAT LIGHTING CIRCUITRY TO BE PROVIDED ON PLATS W/O#105106677; PM LOREN WEIR

FOREMAN (CHECK BOX WHEN COMPLETED)

- ☐ PSE Equipment LOCKED/SECURED & Work Area left in CLEAN/SAFE Condition.
- ☐ Grid, Cable, and Switch numbers INSTALLED & VERIFIED.
- ☐ Field Changes RED-LINED on As-built.
- ☐ Material VERIFIED and CHANGES noted on Paperwork.
- ☐ Total PRIMARY Cable noted on As-built.
- ☐ Company ID#'s RECORDED in correct location on As-built.
- ☐ Indicate correct FUSE SIZE on As-built & VERIFY proper PHASE.
- ☐ Deviations noted on the As-built and their reason.
- ☐ I certify that the work performed meets PSE's standards and procedures and that all quality requirements are met.

Foreman's Signature _____

Print Name _____ Date _____

Vicinity Map 47.8666, -122.5673



N/A

PROJECT PHASE		NOTIF#	ORDER#
PWR	Superior	515802193	105106885

Construction Manager Contact Information:

Manager: MIKE HAMMONS
Cell Phone: 425-765-1395
E-Mail: MIKE.HAMMONS@PSE.COM

Developer Locates Req'd	Yes
PSE Locates Req'd	No
Outages Req'd	No
Flagging Req'd	No

Owner / Developer Contact Info

Rory McLeod
N/A
N/A
ATTN: rorym@pgst.nsn.us 360-981-9614 office

For contacts below dial 1-888-CALL PSE (225-5773)

CALL (800) 424-5555
2 BUSINESS DAYS BEFORE YOU DIG

THIS SKETCH NOT TO BE RELIED UPON FOR EXACT LOCATION OF EXISTING FACILITIES

☒ NEW BUSINESS	☐ CORRECTIVE / 10 DAY WAIVED	REAL ESTATE/EASEMENT N/A	PERMIT N/A

REV#	DATE	BY	DESCRIPTION
3	N/A	N/A	N/A
2	N/A	N/A	N/A
1	N/A	N/A	N/A

COUNTY	Emer Sect	Gas Wk Ctr	POWER WK CTR
KITSAP	N/A	N/A	3515

1/4 SEC	OP MAP	PLAT MAP
05SE-T27N-R02E	N/A	N/A

U-MAP NO (POWER)	OH CKT MAP	UG CKT MAP	CIRCUIT NO
2702E020	2702E040	2702E017	PGA-13

FUNCTION	CONTACT	PHONE NO	DATE
ACCOUNT MGR	L. KINNEY	425.516.5432	
ENGR - POWER	R. HONEYSETT	206.552.4189	
ENGR - GAS	N/A	N/A	N/A
DRAWN BY	R. HONEYSETT	206.552.4189	
CHECKED BY			
APPROVED BY			
FOREMAN #1			
FOREMAN #2			
MAPPING			

JOINT FACILITIES ARRANGEMENTS

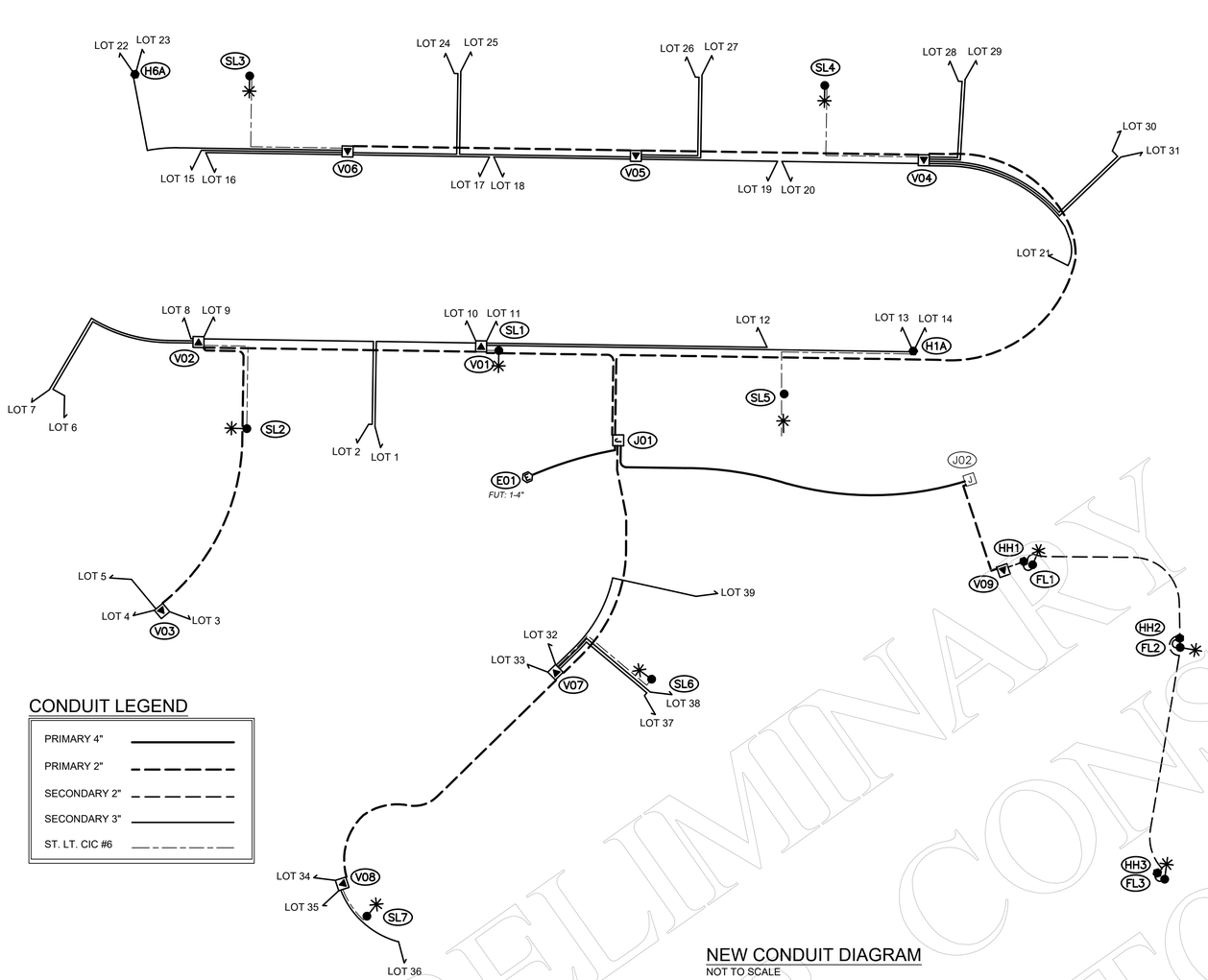
UTILITIES	N/A	N/A	N/A	N/A
CONTACT	N/A	N/A	N/A	N/A
PHONE#	N/A	N/A	N/A	N/A

PUGET SOUND ENERGY

RACOON TOWN
STREET LIGHT INSTALLS
31912 Little Boston Rd NE, Kingston, WA 98346

INCIDENT N/A	MAOP N/A
Gas Order N/A	Elect Order N/A
SCALE AS NOTED	PAGE 1/2

PRELIMINARY NOT FOR CONSTRUCTION SUBJECT TO CHANGE



CONDUIT LEGEND

PRIMARY 4"	———
PRIMARY 2"	– – – – –
SECONDARY 2"	– – – – –
SECONDARY 3"	———
ST. LT. CIC #6	___ _ ___ _ ___

NEW CONDUIT DIAGRAM
NOT TO SCALE

STREET LIGHT CIRCUITRY TABLE - IN PLAT - 105106677

SITE #	FROM	CABLE INFO TYPE	CABLE INFO LF	AS-BUILT TYPE	AS-BUILT LENGTH	REMARKS
SL1	V01	#6 CIC	10			
SL2	V02	#6 CIC	90			
SL3	V06	#6 CIC	115			
SL4	V04	#6 CIC	115			
SL5	H1A	#6 CIC	150			
SL6	V07	#6 CIC	90			
SL7	V08	#6 CIC	30			
	TOTAL FT =		600	TOTAL FT =		

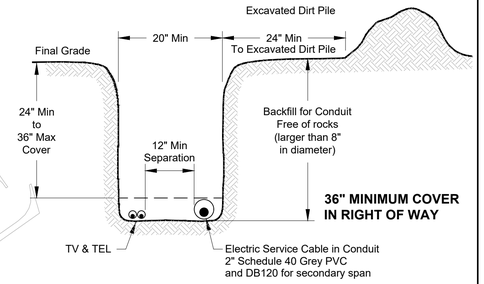
STREET LIGHT CIRCUITRY TABLE - FRONTAGE - 105106885

SITE #	FROM	CABLE INFO TYPE	CABLE INFO LF	AS-BUILT TYPE	AS-BUILT LENGTH	REMARKS
HH1	V09	#6 TPX	20			- BY POLE SERVICES
FL1	HH1	#6 TPX	15			- BY POLE SERVICES
HH2	HH1	#6 TPX	180			- BY POLE SERVICES
FL2	HH2	#6 TPX	15			- BY POLE SERVICES
HH2	HH3	#6 TPX	310			- BY POLE SERVICES
FL3	HH3	#6 TPX	15			- BY POLE SERVICES
	TOTAL FT =		555	TOTAL FT =		

STREET LIGHT HANDHOLE TABLE

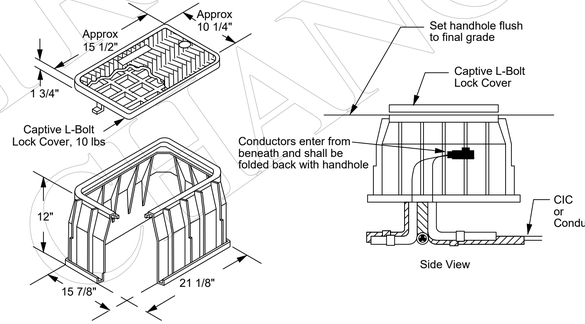
SITE	PEDESTAL OR HANDHOLE	NUMBER OF POSITIONS REQUIRED	REMARKS
HH1	HANDHOLE	3	
HH2	HANDHOLE	3	
HH3	HANDHOLE	3	

Backfill for In Conduit - The backfill layer shall be soil that is free from construction debris, glass, sharp rocks, frozen clods, and rocks larger than 8" in diameter.

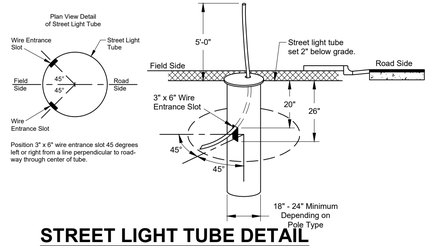


CUSTOMER-SUPPLIED JOINT TRENCH DETAIL

Electric Service Cable in Conduit (NTS)



STREETLIGHT HH @ HH1 - HH3
NOT TO SCALE



STREET LIGHT TUBE DETAIL

SCALE: NONE

STREET LIGHT TABLE - IN PLAT (105106677)

SITE #	GRID #	INTOLIGHT TAG #	POLE TYPE	POLE MTG HT.	POLE ARM	LUMINAIRE WATTS	LUMINAIRE STYLE	TUBE LENGTH	TUBE DIAMETER	POLE BASE TYPE (Direct Buried or Basemount)	WO # (INTOLIGHT)	BILLING SCH.	TOTAL CONN LOAD	SMART STREET LIGHT NODE	NOTES
SL1	632093 157470		CONC. OCT. GRAY	25'	8'	39W	LED 3000K TYPE 2	5'	18"	DIRECT BURIED	105106885	51	120/240		
SL2	632051 157470		CONC. OCT. GRAY	25'	8'	39W	LED 3000K TYPE 2	5'	18"	DIRECT BURIED	105106885	51	120/240		
SL3	632119 157452		CONC. OCT. GRAY	25'	8'	39W	LED 3000K TYPE 2	5'	18"	DIRECT BURIED	105106885	51	120/240		
SL4	632118 157492		CONC. OCT. GRAY	25'	8'	39W	LED 3000K TYPE 2	5'	18"	DIRECT BURIED	105106885	51	120/240		
SL5	632087 157489		CONC. OCT. GRAY	25'	8'	39W	LED 3000K TYPE 2	5'	18"	DIRECT BURIED	105106885	51	120/240		
SL6	632060 157481		CONC. OCT. GRAY	25'	8'	39W	LED 3000K TYPE 2	5'	18"	DIRECT BURIED	105106885	51	120/240		
SL7	632033 157451		CONC. OCT. GRAY	25'	8'	39W	LED 3000K TYPE 2	5'	18"	DIRECT BURIED	105106885	51	120/240		

STREET LIGHT TABLE - FRONTAGE (105106885)

SITE #	GRID #	INTOLIGHT TAG #	POLE TYPE	POLE MTG HT.	POLE ARM	LUMINAIRE WATTS	LUMINAIRE STYLE	TUBE LENGTH	TUBE DIAMETER	POLE BASE TYPE (Direct Buried or Basemount)	WO # (INTOLIGHT)	BILLING SCH.	TOTAL CONN LOAD	SMART STREET LIGHT NODE	NOTES
FL1	632074 157510		CONC. OCT. GRAY	25'	8'	39W	LED 3000K TYPE 2	5'	18"	DIRECT BURIED	105106885	51	120/240		
FL2	632066 157520		CONC. OCT. GRAY	25'	8'	39W	LED 3000K TYPE 2	5'	18"	DIRECT BURIED	105106885	51	120/240		
FL3	632037 157517		CONC. OCT. GRAY	25'	8'	39W	LED 3000K TYPE 2	5'	18"	DIRECT BURIED	105106885	51	120/240		

PRELIMINARY NOT FOR CONSTRUCTION
NOT SUBJECT TO CHANGE

EROSION & SEDIMENT CONTROL REQUIREMENTS

EROSION & SEDIMENT CONTROL SHALL BE PER PSE STANDARD PRACTICE 0150.3200 TECHNIQUES FOR TEMPORARY EROSION & SEDIMENT CONTROL & ANY ADDITIONAL LOCAL JURISDICTION REQUIREMENTS.
(LOCAL JURISDICTIONS MAY HAVE ADDITIONAL REQUIREMENTS INCLUDING NOTES DETAILING WHERE EROSION OR SEDIMENT CONTROL STRUCTURES ARE TO BE INSTALLED, CROSS SECTION DETAILS OF THE TYPICAL EROSION STRUCTURES, & SPECIAL REQUIREMENTS FOR WORK IN SENSITIVE AREAS.)

☒ NEW BUSINESS			☐ CORRECTIVE / 10 DAY WAIVED			REAL ESTATE/EASEMENT N/A		PERMIT N/A	
3	N/A	N/A	N/A			FUNCTION	CONTACT	PHONE NO	DATE
2	N/A	N/A	N/A			ACCOUNT MGR	L. KINNEY	425.516.5432	
1	N/A	N/A	N/A			ENGR - POWER	R. HONEYSETT	206.552.4189	
REV#	DATE	BY	DESCRIPTION			ENGR - GAS	N/A	N/A	N/A
COUNTY		Emer Sect	Gas Wk Ctr	POWER WK CTR		DRAWN BY	R. HONEYSETT	206.552.4189	
KITSAP		N/A	N/A	3515		CHECKED BY			
1/4 SEC		OP MAP		PLAT MAP		APPROVED BY			
05SE-T27N-R02E		N/A		N/A		FOREMAN #1			
U-MAP NO (POWER)		OH CKT MAP	UG CKT MAP	CIRCUIT NO		FOREMAN #2			
2702E020		2702E040	2702E017	PGA-13		MAPPING			
JOINT FACILITIES ARRANGEMENTS									
UTILITIES		N/A		N/A		N/A		N/A	
CONTACT		N/A		N/A		N/A		N/A	
PHONE#		N/A		N/A		N/A		N/A	

PUGET SOUND ENERGY

RACOON TOWN
STREET LIGHT INSTALLS
31912 Little Boston Rd NE, Kingston, WA 98346

INCIDENT N/A	MAOP N/A
Gas Order N/A	Elect Order N/A
SCALE AS NOTED	PAGE 2/2

EARTHWORK SERVICES, INC.
PO Box 640
1116 1st St.
Cosmopolis, WA 98537
Phone: (360) 533-2007 Fax: (360) 533-1618
Email: earthwork@earthworkservices.com
Web: www.earthworkservices.com

November 19, 2024 Earthwork Services Job# 47314

Pat Fuhrer
MAP, Ltd.
P.O. Box 720
Silverdale, WA 98383

RE: Plat of Raccoon Town

Dear Pat,

Enclosed please find grid elevation, cut/fill graphics, and volumes for this project, which was calculated using the average end area method and the following assumptions:

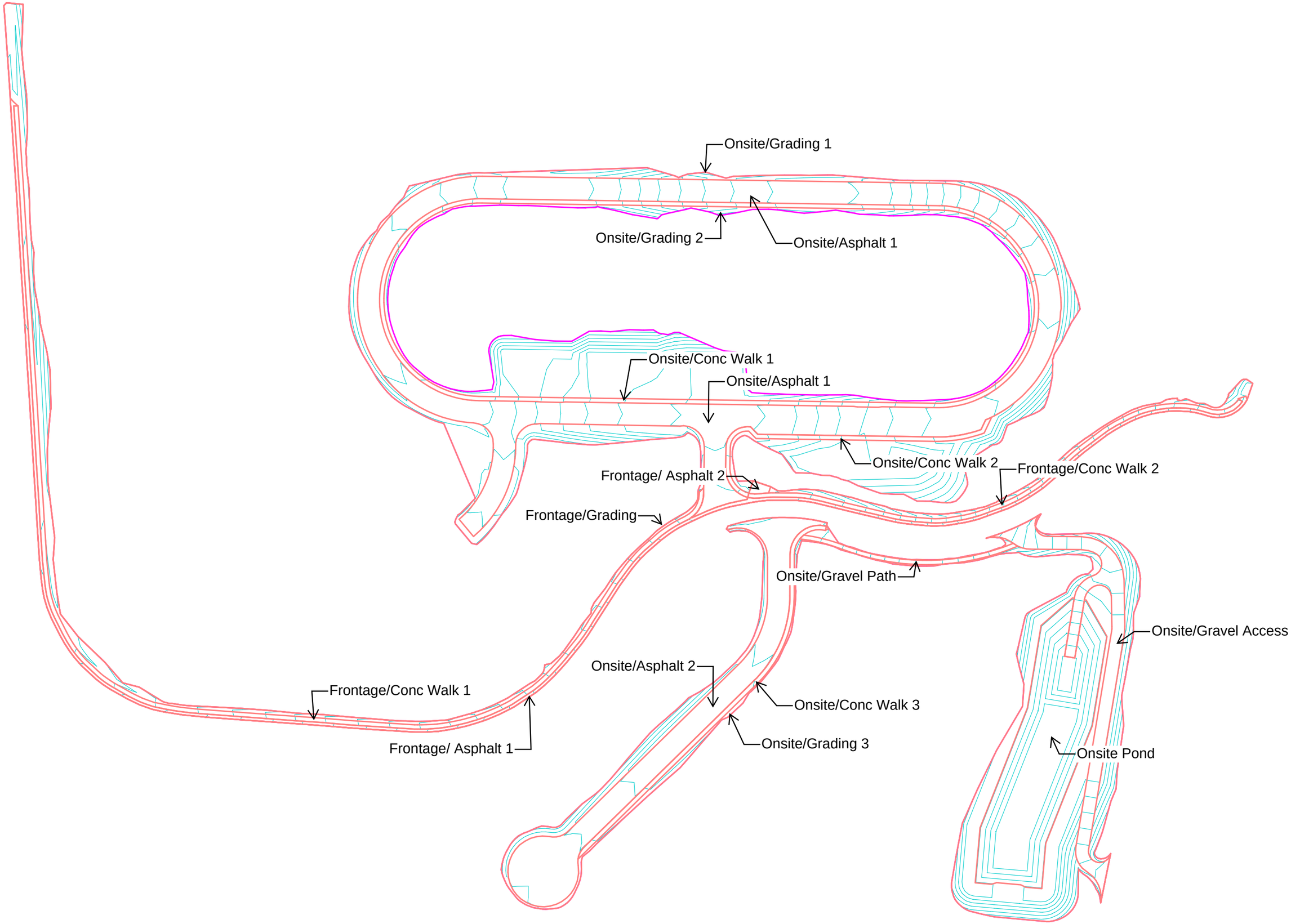
1. A **stripping** depth of **18"** was applied to the **existing onsite pond overex.**
2. A **stripping** depth of **12"** was applied to the **rest of site.**
3. A depth of **11"** from design elevations to subgrade in the **frontage concrete walks** and **asphalt.**
4. A depth of **6"** from design elevations to subgrade in the **onsite concrete walks, onsite gravel access,** and **onsite gravel path.**
5. A depth of **0"** from design elevations to subgrade in the **grading** and **onsite pond.**

TOTAL RAW VOLUMES IN PLACE
(Volumes are in Cubic Yards)

Activity	Area *(ft^2)*	Cut Volume	Fill Volume	Strip Volume
Frontage	33,385	31	981	1,264
Onsite	219,873	12,278	13,005	8,701
TOTAL SITE	**253,258**	**12,309**	**13,986**	**9,965**

Please call after you have reviewed this information if you have any questions.

* Raw volumes are calculated after existing terrain has been stripped, thus creating less cut and more fill of suitable material. Raw volumes have not been adjusted to reflect shrink or swell for compaction and expansion and are volumetric areas only.


Onsite/Grading 1
Onsite/Grading 2
Onsite/Asphalt 1
Onsite/Conc Walk 1
Onsite/Asphalt 1
Onsite/Conc Walk 2
Frontage/Conc Walk 2
Frontage/ Asphalt 2
Frontage/Grading
Onsite/Gravel Path
Onsite/Gravel Access
Onsite/Asphalt 2
Onsite/Conc Walk 3
Frontage/Conc Walk 1
Onsite/Grading 3
Frontage/ Asphalt 1
Onsite Pond

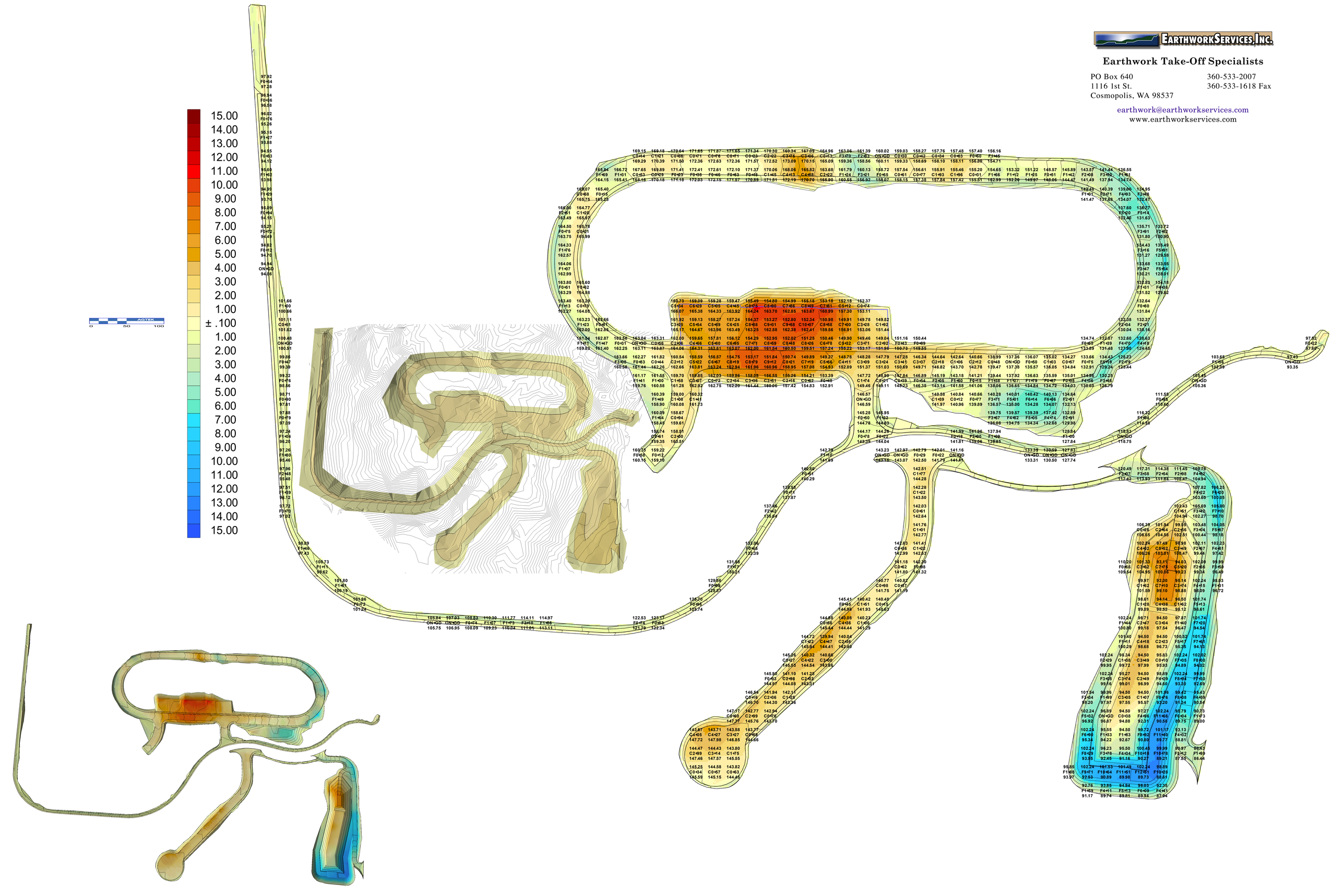
EARTHWORK SERVICES, INC.

Earthwork Take-Off Specialists

PO Box 640
1116 1st St.
Cosmopolis, WA 98537

360-533-2007
360-533-1618 Fax

earthwork@earthworkservices.com
www.earthworkservices.com



Volume Report
Subgrade vs. Stripped

	Area				Volume		Comp/Ratio		Compact		Export	Change
	Total	Cut	Fill	OnGrade	Cut	Fill	Cut	Fill	Cut	Fill	-Import	Per .1 Ft
Frontage/ Asphalt 1	7,807	0	1,966	5,841	0	30	1.00	1.00	0	30	-30	29
Frontage/ Asphalt 2	257	0	121	136	0	1	1.00	1.00	0	1	-1	1
Frontage/ Sub:	**8,064**	**0**	**2,087**	**5,977**	**0**	**31**			**0**	**31**	**-31**	**30**
Frontage/Conc Walk 1	7,549	23	7,428	98	0	230	1.00	1.00	0	230	-230	28
Frontage/Conc Walk 2	3,082	35	2,979	68	1	82	1.00	1.00	1	82	-81	11
Frontage/Conc Sub:	**10,631**	**58**	**10,407**	**166**	**1**	**312**			**1**	**312**	**-311**	**39**
Frontage/Grading	14,690	1,647	12,390	653	30	638	1.00	1.00	30	638	-608	54
Onsite Pond	24,627	13,989	10,326	312	1,632	1,550	1.00	1.00	1,632	1,550	82	91
Onsite/Asphalt 1	57,427	31,613	23,271	2,543	2,977	1,559	1.00	1.00	2,977	1,559	1,418	213
Onsite/Asphalt 2	18,938	17,810	417	711	1,372	5	1.00	1.00	1,372	5	1,367	70
Onsite/Asphalt Sub:	**76,365**	**49,423**	**23,688**	**3,254**	**4,349**	**1,564**			**4,349**	**1,564**	**2,785**	**283**
Onsite/Conc Walk 1	8,924	4,338	4,240	346	495	253	1.00	1.00	495	253	242	33
Onsite/Conc Walk 2	1,971	311	1,613	47	11	92	1.00	1.00	11	92	-81	7
Onsite/Conc Walk 3	2,508	1,487	887	134	61	18	1.00	1.00	61	18	43	9
Onsite/Conc Sub:	**13,403**	**6,136**	**6,740**	**527**	**567**	**363**			**567**	**363**	**204**	**49**
Onsite/Grading 1	34,042	6,320	27,087	635	631	2,657	1.00	1.00	631	2,657	-2,026	126
Onsite/Grading 2	27,971	21,859	5,604	508	4,517	313	1.00	1.00	4,517	313	4,204	104
Onsite/Grading 3	32,261	5,756	25,858	647	423	5,035	1.00	1.00	423	5,035	-4,612	119
Onsite/Grading Sub:	**94,274**	**33,935**	**58,549**	**1,790**	**5,571**	**8,005**			**5,571**	**8,005**	**-2,434**	**349**
Onsite/Gravel Access	9,933	1,092	8,789	52	159	1,491	1.00	1.00	159	1,491	-1,332	37
Onsite/Gravel Path	1,271	37	1,180	54	0	32	1.00	1.00	0	32	-32	5
Onsite/Gravel Sub:	**11,204**	**1,129**	**9,969**	**106**	**159**	**1,523**			**159**	**1,523**	**-1,364**	**42**
Regions Total	**253,258**	**106,317**	**134,156**	**12,785**	**12,309**	**13,986**			**12,309**	**13,986**	**-1,677**	**937**

Stripping Qtys	Plane Area	Slope Area	Depth	Volume
Frontage/Stripping	33,385	34,129	1.000	1,264
Onsite/Pond Over-ex	27,481	27,568	1.500	1,532
Onsite/Stripping 1	130,332	131,127	1.000	4,857
Onsite/Stripping 2	62,056	62,423	1.000	2,312
Onsite/Stripping Sub:	**192,388**	**193,550**		**7,169**
Stripping Total	**253,254**	**255,247**		**9,965**

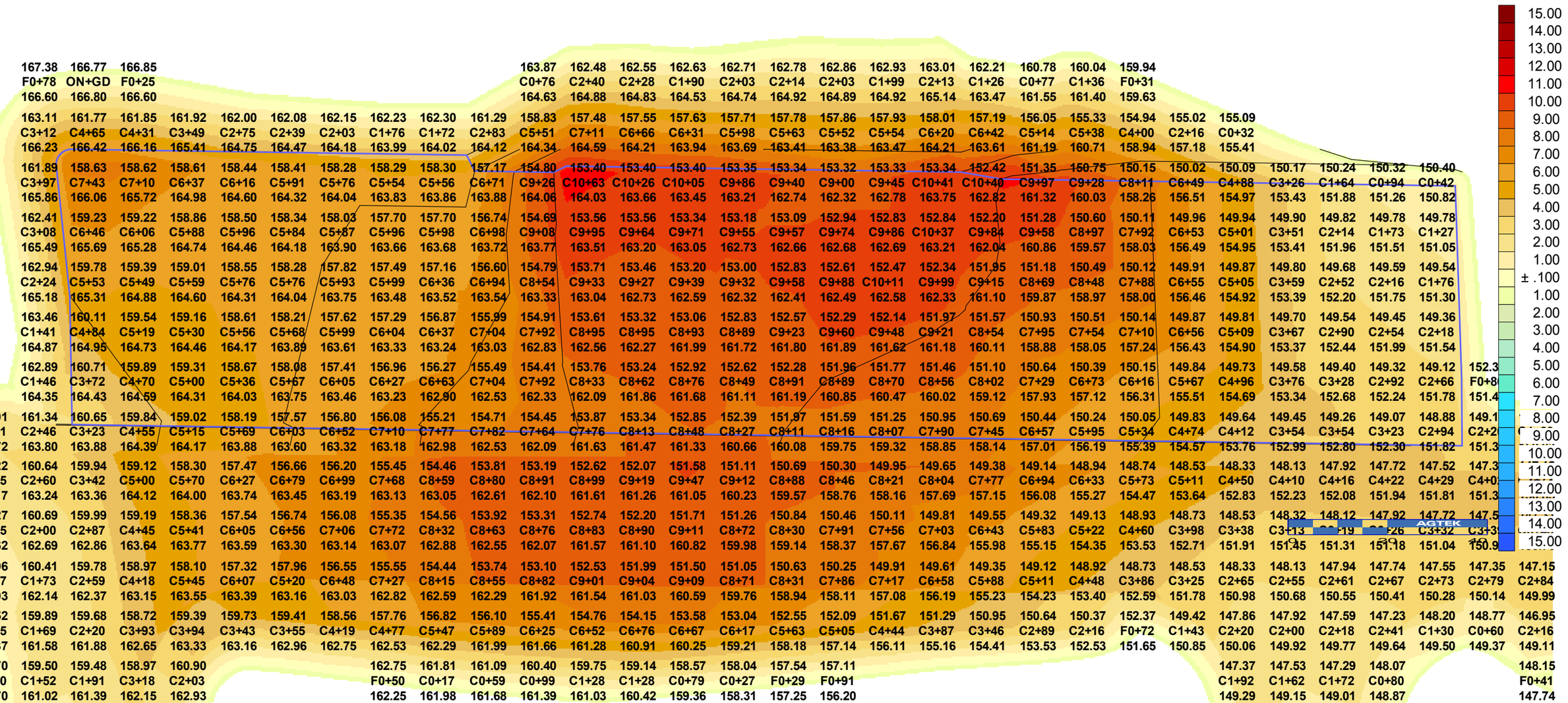
Sectional Qtys	Plane Area	Slope Area	Depth	Volume
Frontage/ Asphalt 1	7,807	8,243	0.917	280
Frontage/ Asphalt 2	257	258	0.917	9
Frontage/ Sub:	**8,064**	**8,501**		**289**
Frontage/Conc Walk 1	7,549	7,568	0.917	257
Frontage/Conc Walk 2	3,082	3,096	0.917	105
Frontage/Conc Sub:	**10,631**	**10,664**		**362**
Frontage/Grading	14,690	15,734	0.000	0
Onsite Pond	24,627	25,525	0.000	0
Onsite/Asphalt 1	57,427	57,851	0.917	1,965

Sectional Qtys	Plane Area	Slope Area	Depth	Volume
Onsite/Asphalt 2	18,938	19,011	0.917	646
Onsite/Asphalt Sub:	**76,365**	**76,862**		**2,611**
Onsite/Conc Walk 1	8,924	8,938	0.500	166
Onsite/Conc Walk 2	1,971	1,982	0.500	37
Onsite/Conc Walk 3	2,508	2,508	0.500	46
Onsite/Conc Sub:	**13,403**	**13,428**		**249**
Onsite/Grading 1	34,042	35,781	0.000	0
Onsite/Grading 2	27,971	29,261	0.000	0
Onsite/Grading 3	32,261	34,580	0.000	0
Onsite/Grading Sub:	**94,274**	**99,622**		**0**
Onsite/Gravel Access	9,932	10,002	0.500	185
Onsite/Gravel Path	1,271	1,277	0.500	24
Onsite/Gravel Sub:	**11,203**	**11,279**		**209**
Sectional Total	**253,257**	**261,615**		**3,720**

Job: Plat of Raccoon Town
Units: Ft-CY
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Haul Report
Subgrade vs. Stripped

	Total	Area Cut	Area Fill	Area OnGrade	Volume Cut	Volume Fill	Fill Factor	Haul Distance	Average Slope	Export -Import
Lots 9-11	14,859	14,859	0	0	3,734	0	1.00	0	0.0%	3,734



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PORT GAMBLE S'KLALLAM TRIBE

FINAL ENGINEERING DESIGN REPORT

Plat of Raccoon Town

November 14, 2024

Prepared for:

Port Gamble S'Klallam Tribe
3192 Little Boston Road NE
Kingston, WA 98392

Prepared by:

MAP, Ltd.
10045 Old Frontier Road NW
P.O. Box 720
Silverdale, WA 98383
(360) 692-5525

Project Number 6847

11-14-24



NOTE: THIS DOCUMENT IS INSCRIBED WITH A DIGITIZED SIGNATURE BY THE ENGINEER AS PROVIDED BY WAC 196-23-070(2)

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REFERENCES

Kitsap County Code. Kitsap County , 2023

Stormwater Management Manual for Western Washington. Washington State Department of Ecology, 2019

Western Washington Hydrology Model (WWHMc2012). Clear Creek Solutions and Washington State Department of Ecology, 2023

Standard Specifications for Road, Bridge and Municipal Construction. Washington State Department of Transportation , 2023

Standard Plans. Washington State Department of Transportation , 2023

I. INTRODUCTION

This Engineering Design Report is prepared for the Plat of Raccoon Town, formerly known as North Kloomachin. The Construction Stormwater Pollution Prevention Plan represents a compilation of ideas and strategies for controlling stormwater on the site during the construction of the project prior to site stabilization.. This report includes strategies for controlling stormwater for the project through Best Management Practices to be employed during construction to control erosion and sediment from leaving the site, and also stormwater management of the developed site through strategies designed to provide water quality treatment mitigation and flood control.

This Design Report also includes a summary of all the utilities and construction drawings supporting the development, along with the Trip Generation for the project and Sight Distance Analysis.

The proposed project is physically located west of Little Boston Road NE, along Hood Canal Drive NE. There are thirty-one lots north of Hood Canal Drive NE, and 8 lots south of Hood Canal Drive N.E. The site is located in the north half of Section 5, Township 27 North, Range 2 East, W.M., Kitsap County, Washington. A Vicinity Map is attached as Figure 1-1.

II. CONSTRUCTION PLAN SUMMARY

Please refer to the 90% Completion Bid Set plans dated 7-12-24 for the project. Further discussion of the Drainage Analysis is included under the Drainage Design Calculations included in this report. Plans included in the civil design are:

A. SUBDIVISION PLAN

The Subdivision Plan provides dimensional data for the thirty-nine proposed single-family residential lots, roadway improvements, drainage area and a park tract.

B. EXISTING CONDITIONS PLAN

An Existing Conditions Plan will be provided to demonstrate the existing features on the site. The site is separated north from south by Hood Canal Drive NE. There is an existing gravel driveway from Hool Canal Drive NE to the north central portion of the property leading to an existing fenced water reservoir tank located served from the Booster Pump Station off Hood Canal Drive NE, along with power and telephone utilities. The water then runs along the south side of Hood Canal Drive NE, to the west to Kloomachin Place NE, and also to the east to Little Boston Road NE.

C. STORM WATER POLLUTION PREVENTION PLANS

A Stormwater Pollution Prevention Plan is provided in the plan set to provide details for management of construction to prevent any silt laden runoff from leaving the site. A Stormwater Pollution Narrative is also included with this Design Report.

D. Site Plan

The Site Plan provides an overview of the Civil site improvements proposed for site development, with details and specifications included in the Construction planset. Improvements include: asphalt paving of all access roads, concrete curb and gutter will be provided for in the new roadway, with sidewalk along the inside (lot side) of the looped road in the north. The paved cul-de-sac in the south will also have concrete curb and gutter with sidewalk placed along the west side of the road. Signage and channelization are also specified on the Site Plans, as well as proposed pedestrian crosswalk facilities and Traffic Calming Speed Humps. Roadway centerline survey monuments are specified at the PC/PT's and intersection of the centerlines of the proposed roads. A new sidewalk is specified along the north and east sides of Hood Canal Drive NE as well to provide pedestrian connectivity for both this project and the other existing neighborhoods. A neighborhood park is also proposed with amenities specified.

E. Road Plans, Profiles and Sections

Road Plans, Profiles and Sections will be provided for all proposed roadway improvements. The road plans, profiles and sections, provide stationing and grading for the roadways, with the profiles to demonstrate vertical alignment of the proposed road grades. The plan provides spot elevations with the face of curb and top of curb information. This plan also includes the typical road section that provides specifications for the pavement section depths, curb, gutter and sidewalk construction.

F. Grading Plans

The grading plans demonstrate the overall grading of the site, including wetpool/detention pond. Lots 9, 10 and 11 will be cleared and pre-graded to provide daylight basements on those lots to better fit the proposed roadway grades fronting those lots.

G. Drainage Plans

Drainage Plans provide all information for construction of all proposed storm drainage improvements for this project. A demonstration and summary of compliance with the DOE Stormwater Minimum Requirements is also included herein.
The drainage plans and profile sheets provide construction specifications for all stormwater conveyance systems, including roadway, stub outs for lots, proposed lots with flow dispersion systems, and roadway flow dispersion systems, along with the wetpool/detention pond. Specifications, details, and notes for all drainage features are included

H. Pond Details and Notes

These sheets provides enlarged details, and sections of the wetpool/detention pond, including dimensions, elevations and control structure riser information, pond overflow channel, and pond maintenance access and security fencing.

I. Sewer Plans

The Sanitary Sewer plans and details included in the Racoon Town project design and specifications include the gravity conveyance sewage collection system from the proposed lots to

the existing sewer manhole in Little Boston Road NE that was installed for the East Salmonberries project that connects to the existing lift station. Approximately 300 feet of Little Boston Road will need to be over-excavated and structural fill placed and one lane replaced for this work. The existing sewage system for the part of the Port Gamble S'Klallam community utilizes clean effluent treated by septic tank at each citizen's residence. Some citizens will need to also install a pump tank whare connection by gravity means to the proposed street is no possible.

J. Water Plan

Water construction plans, profiles, and details for the project include the relocation of the existing on-site reservoir supply water piping and separate water distribution piping from the Booster Pump Station to supply the proposed lots with potable water and fire flow from site fire hydrants. Water service to the Plat was part of the original design of the Booster Pump Station done for the East Salmonberries project previously.

K. Dry Utilities Plan

Schematic Dry Utility trenching plans and details were provided with the 90% complete plans package for primary and secondary trenching and backfilling to provide a placeholder for bidding purposes since it is likely the final design of the power and street lighting will not be available at the time of bid closing and award.

L. Responsibility

The Port Gamble S'Klallam Tribe is the responsible entity, with the Tribe's contact to be Rory McLeod, Project Manager, Planning Department.

III. PROJECT AREA

The Plat of Raccoon Town includes the development of 39 residential lots. Construction includes all infrastructure required to provide access and utilities for the site. The average lot size is 11,481 square feet. The minimum lot area is 10,890 square feet and the maximum lot area is 16,350 square feet. The project area is approximately 33.4 acres. Several areas of native vegetation will be maintained, including the west third of the site, the easterly portion of the site, and an area along the north portion of the site totaling 13.8 acres or 41% of the proposed developed area.

IV. CRITICAL AREAS

According to the Kitsap County GIS system, there are areas of erosion hazards. Erosion Hazards were addressed in the Geotechnical Report prepared for the project, and recommendations made for setbacks from slopes greater than 40%.

A Biological Assessment, and a Cultural Resources Assessment were prepared for this project and are attached in the appendices.

V. SOILS

The United States Department of Agriculture Soil Survey of Kitsap County identified soils in the west basin TDA as Poulsbo gravelly sandy loam which can be classified as Hydrologic Class C soils. These soils have a moderate potential for runoff. The soils in the east basin TDA are classified as Poulsbo-Ragnar complex. These soils are classified as Hydrologic Class C/B. The Geotechnical Engineering investigation concluded that infiltration of stormwater was not feasible for the project, and is also the opinion of the Project Engineer.

VI. EROSION HAZARD AREAS

Although there were areas of erosion hazard listed on Kitsap County GIS website, and discussed in the biological assessment and the Geotechnical Report and recommendations, it is not anticipated that erosion will occur with the development of the site. The roadways, utilities and stormwater management will be placed during the initial phase of development. Other than three lots along the south end of the looped road that will be cleared for development with daylight basements, the remaining lots will not be cleared until building permit applications for the lots. The vegetation on the steeper-sloped areas of the project were left in a natural state to avoid potential erosion risks during construction.

VII. BASIN ANALYSIS

The project has two drainage basins or Threshold Discharge Areas (TDA), and although both TDA's discharge to Hood Canal to the west of the site, there is greater than a quarter mile between discharge areas. The west half of the site drains to the roadside runoff along the north and east side of Hood Canal Drive NE. The east half of the site drains toward an existing drainage system along the west side of Little Boston Road NE that ultimately drains toward Hood Canal via a stream south of the project. A Downstream Analysis is included in Appendix A with this Design Report.

VIII. FLOW DISPERSION

The maximum roadway flow allowed to be dispersed in a single flow dispersion system is 0.5 cfs in accordance with the 2019 DOE SSWWMM. Based on the hydrologic analysis using WWHM2012 computer model, a roadway area of 0.7 acres with the proposed cross-sectional area specified will result in a developed 100-year flow of 0.4996 cfs ≈0.5 cfs. All roadway flow dispersion systems will be fifty feet in length with a catch basin and perforated pipe and a grade board for even flow dispersal in the downstream flow path through native vegetation.

A. DISPERSION AREA MAP

NATIVE VEGETATION TO REMAIN

NATIVE VEGETATION TO REMAIN

NATIVE VEGETATION TO REMAIN

ROADWAY DISPERSION AREA = 0.50 ACRES + LOT 3 ROOFTOP (5,000 S.F.) = 0.61 ACRES

TOTAL LOT AREA TO BE DISBURSED = 4.07 ACRES

ROAD DISPERSION #1

NATIVE VEGETATION TO REMAIN

NATIVE VEGETATION TO REMAIN

ROAD DISPERSION #2

ROADWAY DISPERSION AREA = 0.58 ACRES

NATIVE VEGETATION TO REMAIN

GRAPHIC SCALE

120 0 60 120 240 480

(IN FEET)
1 inch = 120 ft.

B. FLOW DISPERSION WWHM2012 REPORT

WWHM2012
PROJECT REPORT

Project Name: 6847 road dispersion
Site Name: 6847 plat
Site Address: Little Boston
City : Port Gamble S'Klallam
Report Date: 1/4/2024
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 0.80
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Mod	.7
Pervious Total	**0.7**

Impervious Land Use	acre
Impervious Total	**0**
Basin Total	**0.7**

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	acre
Pervious Total	**0**

Impervious Land Use	acre
ROADS MOD	0.7
Impervious Total	0.7
Basin Total	0.7

Element Flows To:

Surface	Interflow	Groundwater

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:0.7
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:0
Total Impervious Area:0.7

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.011969
5 year	0.019902
10 year	0.024409
25 year	0.029111
50 year	0.031955
100 year	0.034318

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.239221
5 year	0.303224
10 year	0.347723
25 year	0.406499
50 year	0.452209
100 year	0.499627

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C. Roadway Flow dispersion area #1

The area from the loop roadway within the west basin TDA will be directed to a flow dispersion system, west of Lot 4. The area draining to this system from road Sta 110+20 to STA 104+16 is 0.50 acres and will be less than the maximum of 0.70 acre for 0.5 cfs draining to the flow dispersion system. A second dispersion system is planned for this portion of the roadway to provide further dispersion into the native vegetation area to remain.

D. Roadway Flow dispersion area #2

The roadway terminating in the cul-de-sac will be directed to a flow dispersion system, east of the cul-de-sac roadway. The area draining to this system from is 0.48 acres and will be less than the 0.70 acre for the maximum 0.5 cfs draining to the flow dispersion system.

IX. WETPOOL/DETENTION POND DESIGN

The wetpool/detention pond is located in the eastern TDA. The developed area not being directed to flow dispersal systems is directed to the wetpool/detention pond includes area from both the east and west TDA's, while the allowable release rate is based on the pre-developed area of the east TDA. The pre-developed area of the east TDA draining to the wetpool/detention pond is 6.68 acres. The total area draining to the wetpool/detention pond is 7.80 acres. The individual lots are based on a conservative assumption of an impervious area of 5,000 square feet per lot.

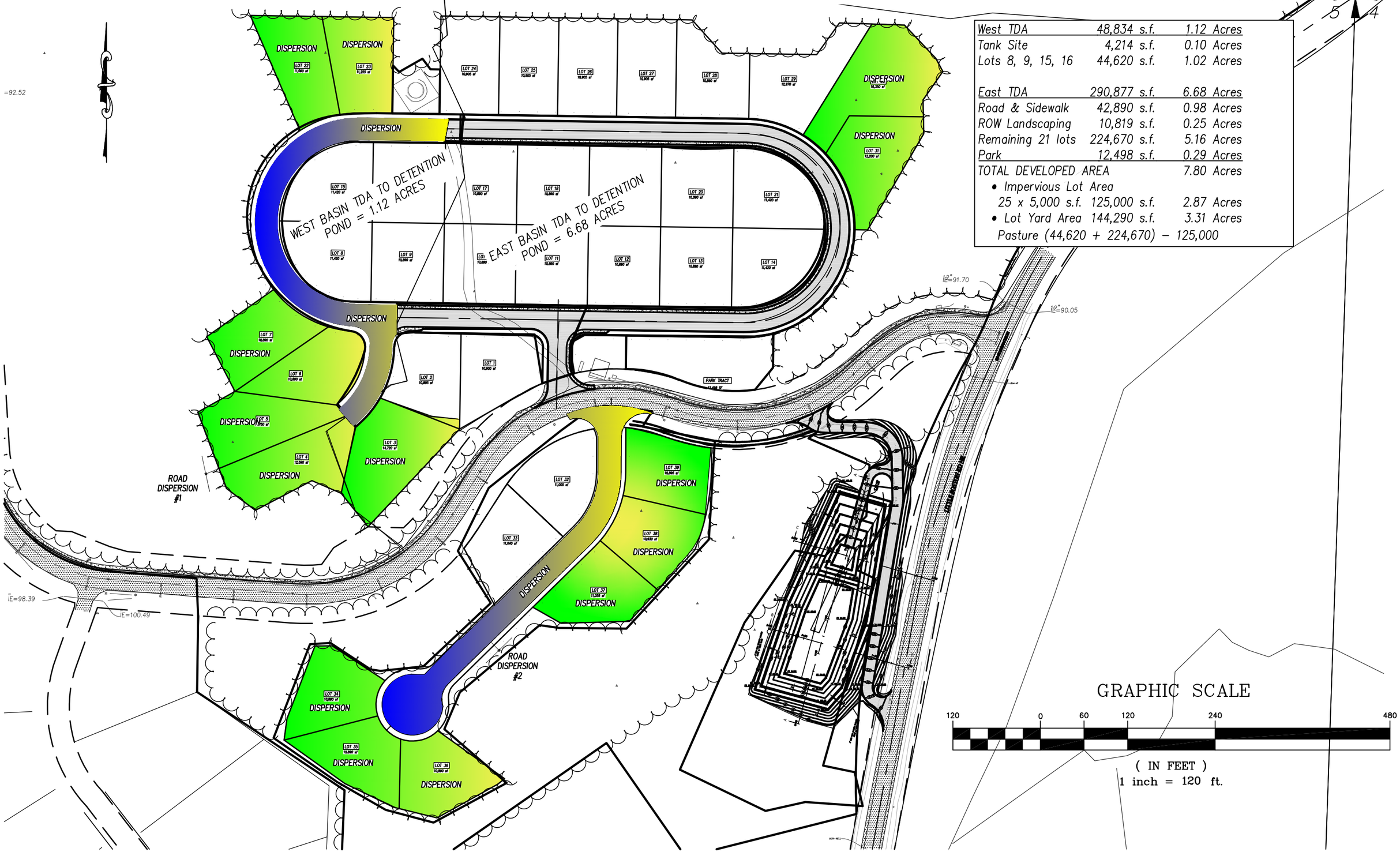
A. Area tabulation of developed area draining to wetpool/detention pond

West TDA	**48,834 s.f.**	**1.12 Acres**
Tank Site	4,214 s.f.	0.10 Acres
Lots 8, 9, 15, 16	44,620 s.f.	1.02 Acres
East TDA	**290,877 s.f.**	**6.68 Acres**
Road & Sidewalk	42,890 s.f.	0.98 Acres
ROW Landscaping	10,819 s.f.	0.25 Acres
Remaining 21 lots	224,670 s.f.	5.16 Acres
Park	12,498 s.f.	0.29 Acres
TOTAL DEVELOPED AREA		**7.80 Acres**

- Impervious Lot Area
  25 x 5,000 s.f. 125,000 s.f. 2.87 Acres
- Lot Yard Area 144,290 s.f. 3.31 Acres
  (Modeled as Pasture (44,620 + 224,670) – 125,000 = 144,290 s.f.)

B. DEVELOPED BASIN MAP

West TDA	48,834 s.f.	1.12 Acres
Tank Site	4,214 s.f.	0.10 Acres
Lots 8, 9, 15, 16	44,620 s.f.	1.02 Acres
East TDA	290,877 s.f.	6.68 Acres
Road & Sidewalk	42,890 s.f.	0.98 Acres
ROW Landscaping	10,819 s.f.	0.25 Acres
Remaining 21 lots	224,670 s.f.	5.16 Acres
Park	12,498 s.f.	0.29 Acres
TOTAL DEVELOPED AREA		7.80 Acres
• Impervious Lot Area		
25 x 5,000 s.f.	125,000 s.f.	2.87 Acres
• Lot Yard Area	144,290 s.f.	3.31 Acres
Pasture (44,620 + 224,670) – 125,000		



C. WETPOOL/DETENTION POND WWHM2012 REPORT

WWHM2012
PROJECT REPORT

Project Name: 6847 DETENTION POND REV 3.19.24.
Site Name: 6847 KLOOMACHIN
Site Address: HOOD CANAL
City : PORT GAMBLE S'KLALLAM
Report Date: 4/16/2024
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 0.80
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Mod	6.68
Pervious Total	6.68

Impervious Land Use	acre
Impervious Total	0
Basin Total	6.68

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Pasture, Mod	3.85
C, Lawn, Mod	.09

Pervious Total **3.94**

Impervious Land Use	**acre**
ROADS MOD	**0.98**
ROOF TOPS FLAT	**2.88**

Impervious Total **3.86**

Basin Total **7.8**

Element Flows To:

Surface	**Interflow**	**Groundwater**
Trapezoidal Pond 1	Trapezoidal Pond 1	

Name : Trapezoidal Pond 1
Bottom Length: 300.00 ft.
Bottom Width: 36.00 ft.
Depth: 6 ft.
Volume at riser head: 1.8526 acre-feet.
Side slope 1: 3 To 1
Side slope 2: 3 To 1
Side slope 3: 3 To 1
Side slope 4: 3 To 1
Discharge Structure
Riser Height: 5 ft.
Riser Diameter: 18 in.
Notch Type: Rectangular
Notch Width: 0.059 ft.
Notch Height: 1.304 ft.
Orifice 1 Diameter: 1.056 in. **Elevation:** 0 ft.

Element Flows To:

Outlet 1	**Outlet 2**

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.247	0.000	0.000	0.000
0.0667	0.251	0.016	0.007	0.000
0.1333	0.254	0.033	0.011	0.000
0.2000	0.257	0.050	0.013	0.000
0.2667	0.260	0.067	0.015	0.000
0.3333	0.263	0.085	0.017	0.000
0.4000	0.266	0.102	0.019	0.000
0.4667	0.269	0.120	0.020	0.000
0.5333	0.272	0.138	0.022	0.000
0.6000	0.276	0.157	0.023	0.000
0.6667	0.279	0.175	0.024	0.000
0.7333	0.282	0.194	0.025	0.000
0.8000	0.285	0.213	0.027	0.000
0.8667	0.288	0.232	0.028	0.000

0.9333	0.291	0.251	0.029	0.000
1.0000	0.295	0.271	0.030	0.000
1.0667	0.298	0.291	0.031	0.000
1.1333	0.301	0.311	0.032	0.000
1.2000	0.304	0.331	0.033	0.000
1.2667	0.307	0.351	0.034	0.000
1.3333	0.311	0.372	0.034	0.000
1.4000	0.314	0.393	0.035	0.000
1.4667	0.317	0.414	0.036	0.000
1.5333	0.320	0.435	0.037	0.000
1.6000	0.324	0.457	0.038	0.000
1.6667	0.327	0.478	0.039	0.000
1.7333	0.330	0.500	0.039	0.000
1.8000	0.333	0.522	0.040	0.000
1.8667	0.337	0.545	0.041	0.000
1.9333	0.340	0.567	0.042	0.000
2.0000	0.343	0.590	0.042	0.000
2.0667	0.347	0.613	0.043	0.000
2.1333	0.350	0.636	0.044	0.000
2.2000	0.353	0.660	0.044	0.000
2.2667	0.357	0.684	0.045	0.000
2.3333	0.360	0.708	0.046	0.000
2.4000	0.363	0.732	0.046	0.000
2.4667	0.367	0.756	0.047	0.000
2.5333	0.370	0.781	0.048	0.000
2.6000	0.373	0.805	0.048	0.000
2.6667	0.377	0.830	0.049	0.000
2.7333	0.380	0.856	0.050	0.000
2.8000	0.384	0.881	0.050	0.000
2.8667	0.387	0.907	0.051	0.000
2.9333	0.390	0.933	0.051	0.000
3.0000	0.394	0.959	0.052	0.000
3.0667	0.397	0.985	0.053	0.000
3.1333	0.401	1.012	0.053	0.000
3.2000	0.404	1.039	0.054	0.000
3.2667	0.407	1.066	0.054	0.000
3.3333	0.411	1.093	0.055	0.000
3.4000	0.414	1.121	0.055	0.000
3.4667	0.418	1.149	0.056	0.000
3.5333	0.421	1.177	0.056	0.000
3.6000	0.425	1.205	0.057	0.000
3.6667	0.428	1.233	0.057	0.000
3.7333	0.432	1.262	0.059	0.000
3.8000	0.435	1.291	0.065	0.000
3.8667	0.439	1.320	0.072	0.000
3.9333	0.442	1.350	0.081	0.000
4.0000	0.446	1.379	0.091	0.000
4.0667	0.449	1.409	0.101	0.000
4.1333	0.453	1.439	0.113	0.000
4.2000	0.456	1.469	0.124	0.000
4.2667	0.460	1.500	0.137	0.000

4.3333	0.464	1.531	0.149	0.000
4.4000	0.467	1.562	0.162	0.000
4.4667	0.471	1.593	0.175	0.000
4.5333	0.474	1.625	0.188	0.000
4.6000	0.478	1.657	0.202	0.000
4.6667	0.481	1.689	0.215	0.000
4.7333	0.485	1.721	0.230	0.000
4.8000	0.489	1.753	0.247	0.000
4.8667	0.492	1.786	0.264	0.000
4.9333	0.496	1.819	0.281	0.000
5.0000	0.500	1.852	0.300	0.000
5.0667	0.503	1.886	0.574	0.000
5.1333	0.507	1.919	1.072	0.000
5.2000	0.510	1.953	1.705	0.000
5.2667	0.514	1.987	2.425	0.000
5.3333	0.518	2.022	3.184	0.000
5.4000	0.522	2.057	3.934	0.000
5.4667	0.525	2.091	4.629	0.000
5.5333	0.529	2.127	5.227	0.000
5.6000	0.533	2.162	5.705	0.000
5.6667	0.536	2.198	6.058	0.000
5.7333	0.540	2.234	6.318	0.000
5.8000	0.544	2.270	6.643	0.000
5.8667	0.547	2.306	6.902	0.000
5.9333	0.551	2.343	7.152	0.000
6.0000	0.555	2.380	7.393	0.000
6.0667	0.559	2.417	7.625	0.000

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:6.68
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:3.94
Total Impervious Area:3.86

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.114219
5 year	0.189925
10 year	0.23293
25 year	0.277801
50 year	0.304939
100 year	0.327495

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)

2 year	0.06413
5 year	0.104912
10 year	0.140912
25 year	0.198832
50 year	0.252549
100 year	0.316759

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.131	0.051
1950	0.165	0.071
1951	0.307	0.282
1952	0.083	0.046
1953	0.065	0.071
1954	0.110	0.053
1955	0.182	0.050
1956	0.147	0.177
1957	0.085	0.052
1958	0.119	0.054
1959	0.109	0.052
1960	0.159	0.106
1961	0.112	0.061
1962	0.053	0.042
1963	0.068	0.054
1964	0.117	0.056
1965	0.067	0.058
1966	0.078	0.053
1967	0.167	0.058
1968	0.109	0.052
1969	0.098	0.054
1970	0.074	0.057
1971	0.073	0.051
1972	0.228	0.241
1973	0.091	0.086
1974	0.098	0.055
1975	0.123	0.050
1976	0.094	0.051
1977	0.006	0.042
1978	0.081	0.056
1979	0.041	0.040
1980	0.119	0.190
1981	0.065	0.053
1982	0.082	0.058
1983	0.129	0.054
1984	0.073	0.044
1985	0.041	0.042
1986	0.227	0.057
1987	0.169	0.098
1988	0.057	0.045
1989	0.050	0.042

1990	0.242	0.102
1991	0.261	0.123
1992	0.077	0.056
1993	0.087	0.043
1994	0.018	0.037
1995	0.148	0.061
1996	0.306	0.248
1997	0.249	0.264
1998	0.053	0.048
1999	0.164	0.144
2000	0.096	0.050
2001	0.010	0.035
2002	0.106	0.055
2003	0.112	0.046
2004	0.130	0.116
2005	0.100	0.050
2006	0.161	0.134
2007	0.302	0.186
2008	0.352	0.155
2009	0.195	0.059

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.3518	0.2818
2	0.3070	0.2635
3	0.3064	0.2480
4	0.3022	0.2412
5	0.2610	0.1903
6	0.2485	0.1859
7	0.2418	0.1774
8	0.2284	0.1553
9	0.2270	0.1435
10	0.1951	0.1337
11	0.1816	0.1234
12	0.1687	0.1156
13	0.1667	0.1063
14	0.1649	0.1021
15	0.1644	0.0981
16	0.1610	0.0861
17	0.1586	0.0712
18	0.1477	0.0706
19	0.1470	0.0613
20	0.1314	0.0612
21	0.1301	0.0595
22	0.1292	0.0583
23	0.1225	0.0577
24	0.1193	0.0576
25	0.1193	0.0570
26	0.1169	0.0567
27	0.1125	0.0565

28	0.1124	0.0561
29	0.1097	0.0557
30	0.1093	0.0551
31	0.1093	0.0549
32	0.1059	0.0542
33	0.1003	0.0541
34	0.0985	0.0541
35	0.0976	0.0540
36	0.0962	0.0535
37	0.0942	0.0532
38	0.0914	0.0528
39	0.0867	0.0524
40	0.0846	0.0522
41	0.0830	0.0518
42	0.0817	0.0512
43	0.0813	0.0511
44	0.0782	0.0506
45	0.0771	0.0502
46	0.0743	0.0500
47	0.0731	0.0496
48	0.0730	0.0495
49	0.0676	0.0477
50	0.0673	0.0458
51	0.0650	0.0456
52	0.0646	0.0447
53	0.0567	0.0437
54	0.0535	0.0433
55	0.0526	0.0419
56	0.0505	0.0418
57	0.0412	0.0417
58	0.0408	0.0415
59	0.0177	0.0399
60	0.0100	0.0370
61	0.0061	0.0348

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0571	18266	16942	92	Pass
0.0596	16705	11387	68	Pass
0.0621	15323	10252	66	Pass
0.0646	14078	9321	66	Pass
0.0671	12996	8583	66	Pass
0.0696	12044	7984	66	Pass
0.0721	11195	7441	66	Pass
0.0746	10386	7013	67	Pass
0.0771	9676	6635	68	Pass

0.0796	9035	6327	70	Pass
0.0821	8434	5987	70	Pass
0.0846	7920	5713	72	Pass
0.0871	7473	5428	72	Pass
0.0897	7069	5129	72	Pass
0.0922	6646	4825	72	Pass
0.0947	6241	4528	72	Pass
0.0972	5852	4194	71	Pass
0.0997	5454	3899	71	Pass
0.1022	5144	3632	70	Pass
0.1047	4836	3412	70	Pass
0.1072	4537	3195	70	Pass
0.1097	4269	2994	70	Pass
0.1122	4040	2817	69	Pass
0.1147	3831	2652	69	Pass
0.1172	3617	2511	69	Pass
0.1197	3407	2363	69	Pass
0.1222	3236	2244	69	Pass
0.1247	3084	2108	68	Pass
0.1272	2928	2019	68	Pass
0.1297	2763	1927	69	Pass
0.1322	2601	1819	69	Pass
0.1347	2462	1717	69	Pass
0.1372	2338	1644	70	Pass
0.1397	2229	1565	70	Pass
0.1422	2111	1503	71	Pass
0.1447	2014	1434	71	Pass
0.1472	1908	1360	71	Pass
0.1497	1812	1295	71	Pass
0.1522	1728	1234	71	Pass
0.1547	1625	1170	72	Pass
0.1572	1509	1119	74	Pass
0.1597	1411	1077	76	Pass
0.1622	1332	1022	76	Pass
0.1648	1252	966	77	Pass
0.1673	1194	932	78	Pass
0.1698	1133	896	79	Pass
0.1723	1084	853	78	Pass
0.1748	1035	815	78	Pass
0.1773	983	769	78	Pass
0.1798	936	697	74	Pass
0.1823	895	652	72	Pass
0.1848	857	600	70	Pass
0.1873	823	546	66	Pass
0.1898	788	513	65	Pass
0.1923	748	476	63	Pass
0.1948	716	453	63	Pass
0.1973	682	429	62	Pass
0.1998	644	406	63	Pass
0.2023	615	387	62	Pass
0.2048	582	377	64	Pass

0.2073	552	363	65	Pass
0.2098	532	351	65	Pass
0.2123	499	336	67	Pass
0.2148	478	321	67	Pass
0.2173	440	307	69	Pass
0.2198	407	292	71	Pass
0.2223	378	265	70	Pass
0.2248	342	243	71	Pass
0.2273	315	220	69	Pass
0.2298	289	203	70	Pass
0.2323	263	188	71	Pass
0.2348	243	172	70	Pass
0.2373	221	155	70	Pass
0.2399	202	139	68	Pass
0.2424	188	118	62	Pass
0.2449	175	106	60	Pass
0.2474	166	89	53	Pass
0.2499	150	70	46	Pass
0.2524	144	64	44	Pass
0.2549	131	57	43	Pass
0.2574	116	51	43	Pass
0.2599	101	45	44	Pass
0.2624	90	39	43	Pass
0.2649	83	31	37	Pass
0.2674	80	29	36	Pass
0.2699	75	25	33	Pass
0.2724	66	22	33	Pass
0.2749	60	18	30	Pass
0.2774	53	14	26	Pass
0.2799	45	9	20	Pass
0.2824	39	0	0	Pass
0.2849	34	0	0	Pass
0.2874	28	0	0	Pass
0.2899	21	0	0	Pass
0.2924	17	0	0	Pass
0.2949	14	0	0	Pass
0.2974	12	0	0	Pass
0.2999	11	0	0	Pass
0.3024	8	0	0	Pass
0.3049	5	0	0	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0.1056 **acre-feet**
On-line facility target flow: 0.0532 **cfs.**
Adjusted for 15 min: 0.0532 **cfs.**
Off-line facility target flow: 0.0367 **cfs.**
Adjusted for 15 min: 0.0367 **cfs.**

LID Report

LID Technique	Used for Water Quality	Total Volume Percent Treatment?	Volume Needs	Infiltration Through	Cumulative Volume	Comment

```
Volume                    Water Quality
                                  Treatment      Facility  (ac-ft.)       Infiltration
Infiltrated               Treated
                                  (ac-ft)        (ac-ft)                 Credit
-----------------------------------------------------------------------------------
Trapezoidal Pond  1 POC           N      527.65                                    N
0.00
Total Volume Infiltrated                 527.65         0.00      0.00
0.00        0.00          0%           No Treat. Credit
Compliance with LID Standard 8
Duration Analysis Result = Failed
```

Perlnd and Implnd Changes

No changes have been made.

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X. TEMPORARY EROSION CONTROL

The site will be developed to provide the Erosion Control Best Management Practices to ensure the site is stabilized during and after construction. The owner intends to construct the infrastructure and to leave the majority of the lot area as native vegetation until the future individual lots are developed to minimize the erosion control risk.

There will be stabilized construction access for both the north and south access roads from Hood Canal Drive NE. Silt fence and siltation control ditches will be provided as needed. There will also be two temporary sediment ponds for the site. The larger sediment pond #1 will be constructed where the proposed wetpool/detention will be placed. The area of the temporary sediment pond will provide mitigation for 1.5 acres of roadway and 0.54 acres of cleared lot area that is modeled as grass. The smaller sediment pond #2 will be in the park area and will provide siltation control for 0.58 acres of roadway.

The temporary sediment ponds are based on the formula: 2080 x Q_2 . The resulting area is used to determine pond bottom dimension footprint with a minimum length/width ratio of 3:1.

A. SEDIMENT POND #1 HYDROGRAPH REPORT

WWHM2012
PROJECT REPORT

Project Name: 6847 SEDPOND 1
Site Name: N KLOOMACHIN
Site Address: Little Boston
City :

Report Date: 4/22/2024
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 0.80
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Mod	2.04
Pervious Total	2.04

Impervious Land Use	acre
Impervious Total	0
Basin Total	2.04

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Lawn, Mod	.54
Pervious Total	0.54

Impervious Land Use	acre
ROADS MOD	1.5
Impervious Total	1.5
Basin Total	2.04

Element Flows To:
Surface **Interflow** **Groundwater**

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:2.04
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:0.54
Total Impervious Area:1.5

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.034881
5 year	0.058001
10 year	0.071134
25 year	0.084837
50 year	0.093125
100 year	0.100013

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.531664
5 year	0.675053
10 year	0.772866
25 year	0.900144
50 year	0.997827
100 year	1.0981

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B. Sediment Pond #2 Hydrograph Report

WWHM2012
PROJECT REPORT

Project Name: 6847 SEDPOND 2
Site Name: N KLOOMACHIN
Site Address: Little Boston
City :
Report Date: 12/27/2023

Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 0.80
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Mod	.58
Pervious Total	**0.58**

Impervious Land Use	acre
Impervious Total	**0**
Basin Total	**0.58**

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 1
Bypass: No

GroundWater: No

Pervious Land Use	acre
Pervious Total	**0**

Impervious Land Use	acre
ROADS MOD	0.58
Impervious Total	**0.58**
Basin Total	**0.58**

Element Flows To:

Surface **Interflow** **Groundwater**

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:0.58
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:0
Total Impervious Area:0.58

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.0099
5 year	0.016462
10 year	0.02019
25 year	0.024079
50 year	0.026431
100 year	0.028386

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.19787
5 year	0.250809
10 year	0.287617
25 year	0.336233
50 year	0.374042
100 year	0.413263

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C. Sediment Pond Calculations

Based on the two year flow for the cleared areas, Sediment Pond #1 has a calculated minimum surface area of 1,102 square feet. The Sediment Pond will be placed in the forebay of the proposed pond (wetpool area). It is anticipated that the proposed detention/wetpond will be constructed as part of the initial site infrastructure development. If the pond is not constructed, it is anticipated that the temporary sediment pond will have a surface area of 4,388 square feet, which exceeds the minimum surface area required.

Sediment Pond #2 has a calculated minimum surface area of 416 square feet. The proposed sediment pond will have a surface area of 3,800 square feet.

D. Sediment Pond Orifice Calculations

MAP, LTD.
P.O. Box 720
SILVERDALE, WASHINGTON 98383
(360) 692-5525 FAX (360) 698-0546

JOB KLOOMACHIN
SHEET NO. 1 OF 1
CALCULATED BY ____ DATE ____
CHECKED BY ____ DATE ____
SCALE ____

SEDIMENT POND ORIFICE SIZING:

ORIFICE EQUATION: $A_o = \frac{A_s \sqrt{2H}}{0.6 \times 3600 \times T \times \sqrt{g}}$

A_o = orifice size
H = 3.5'
T = 24 hours
g = 32.2 ft/s²
$A_s = 2080 \times Q_2$

SEDIMENT POND 1

$Q_2 = 0.53$ cfs

$A_s = 2080 \times 0.53 = 1,102$ ft² min. req, $A_o = 4,388$ (per plan)

$D = 13.54 \sqrt{A_o}$

$A_o = \frac{4,388\sqrt{2 \times 3.5}}{0.6 \times 3600 \times 24 \times \sqrt{32.2}} = 0.04$ s.f.

$D = 13.54 \times \sqrt{0.04} = 2.69''\ \phi$ <

SEDIMENT POND 2

$Q_2 = 0.20$ cfs

$A_s = 2080 \times 0.2 = 416$ min. req, $A_o = 3,800$ (per plan)

$A_o = \frac{3,800\sqrt{2 \times 3.5}}{0.6 \times 3600 \times 24 \times \sqrt{32.2}} = 0.03$ ft²

$D = 13.54 \sqrt{0.03} = 2.50''\ \phi$ <

XI. CONSTRUCTION SCHEDULE

It is anticipated that the site development improvements will take begin in the summer of 2025. Lot development and occupancy is not known at this time.

XII. OWNERSHIP

The property is located on the northern end the Port Gamble S'Klallam Tribe Reservation. The owner's representative for the project is:

Rory McLeod, Project Manager
Department of Community Development
Port Gamble S'Klallam Tribe
3192 Little Boston Road NE
Kingston, Washington 98392
rorym@pgst.nsn.us

XIII. STORMWATER MINIMUM REQUIREMENTS

The stormwater minimum requirements are determined according to Flow Chart for New Development. According to the Flow Chart, all minimum requirements #1-#9 apply to the new and replaced hard surfaces and converted vegetation areas for this project.

1. Minimum Requirement #1: Preparation of Stormwater Site Plans

The stormwater site plan for this project includes Stormwater Pollution Prevention, grading, drainage, and utility improvements. Included with the site plan is this Drainage Report. The drainage report discusses the existing and proposed site conditions, as well as supporting documentation for site drainage design.

2. Minimum Requirement #2: Construction Stormwater Pollution Prevention (SWPP)

Approximately 15 acres will be disturbed for development of this site as proposed. (this includes the ultimate clearing of lots.) Silt and erosion control measures include 2 temporary sediment ponds, along with silt fencing and siltation control ditching. The contractor will also have either straw mulch or plastic sheeting to cover exposed soils during inclement weather. Following site development, and prior to building permit application, all cleared areas and sloped areas will receive temporary hydroseeding and jute matting.

3. Minimum Requirement #3: Source Control of Pollution

Source control of pollution primarily deals with construction stormwater measures, both structural and operational during and after construction, and are measures that prevent source pollution runoff from leaving the site. These measures will be addressed in MR #2 above for source control during construction, and no structural sources of pollution are anticipated in the long-term use of the site as residential housing. Additionally, an Operation and Maintenance Manual will be provided for the site with the Applicable Operational Source Control BMP's per Volume IV, Section 2.1 of the WSDOE SWMMWW, to be maintained by the Owner.

4. Minimum Requirement #4: Preservation of Natural Drainage Systems and Outfalls

The site will discharge to the natural drainage courses within the two TDA's, including limiting detention pond discharge to the east basin area draining to the pond as the pre-developed allowable release rate. Six of the ten lots in the west TDA will disperse to the west, as does the loop road within the west TDA. Four lots in the west TDA will be collected and directed to the stormwater detention pond in the east TDA with the other developed areas of the west TDA not being dispersed (the cul-de-sac road and 8 lots).

5. Minimum Requirement #5: On-site Stormwater Management

The BMP's to be considered for this site are determined for Feasibility determined by evaluation against: Design criteria, limitations and infeasibility criteria identified in each BMP in the 2019 WSDOE Manual; and Competing Needs Criteria listed WSDOE Manual.

Table I-3.2: The List Approach for MR5 Compliance

List #1 (For MR #1 - #5 Projects That Are Not Flow Control Exempt)	List #2 (For MR #1 - #9 Projects That Are Not Flow Control Exempt)	List #3 (For Flow Control Exempt Projects)
Surface Type: Lawn and Landscaped Areas		
BMP T5.13: Post-Construction Soil Quality and Depth	BMP T5.13: Post-Construction Soil Quality and Depth	BMP T5.13: Post-Construction Soil Quality and Depth
Surface Type: Roofs		
1. BMP T5.30: Full Dispersion or BMP T5.10A: Downspout Full Infiltration	1. BMP T5.30: Full Dispersion or BMP T5.10A: Downspout Full Infiltration	1. BMP T5.10A: Downspout Full Infiltration
2. BMP T5.14: Rain Gardens or BMP T7.30: Bioretention	2. BMP T7.30: Bioretention	2. BMP T5.10B: Downspout Dispersion Systems
3. BMP T5.10B: Downspout Dispersion Systems	3. BMP T5.10B: Downspout Dispersion Systems	3. BMP T5.10C: Perforated Stub-out Connections
4. BMP T5.10C: Perforated Stub-out Connections	4. BMP T5.10C: Perforated Stub-out Connections	
Surface Type: Other Hard Surfaces		
1. BMP T5.30: Full Dispersion	1. BMP T5.30: Full Dispersion	BMP T5.12: Sheet Flow Dispersion or BMP T5.11: Concentrated Flow Dispersion
2. BMP T5.15: Permeable Pavements or BMP T5.14: Rain Gardens or BMP T7.30: Bioretention	2. BMP T5.15: Permeable Pavements	
3. BMP T5.12: Sheet Flow Dispersion or BMP T5.11: Concentrated Flow Dispersion	3. BMP T7.30: Bioretention	
	4. BMP T5.12: Sheet Flow Dispersion or BMP T5.11: Concentrated Flow Dispersion	
Notes for using the List Approach: 1. Size BMP T5.14: Rain Gardens and BMP T7.30: Bioretention used in the List Approach to have a minimum horizontal projected surface area below the overflow which is at least 5% of the area drain-		

Table I-3.2: The List Approach for MR5 Compliance (continued)

List #1 (For MR #1 - #5 Projects That Are Not Flow Control Exempt)	List #2 (For MR #1 - #9 Projects That Are Not Flow Control Exempt)	List #3 (For Flow Control Exempt Projects)
ing to it. 2. When the designer encounters BMP T5.15: Permeable Pavements in the List Approach, it is not a requirement to pave these surfaces. Where pavement is proposed, it must be permeable to the extent feasible unless BMP T5.30: Full Dispersion is employed.		

Objective

The objective of On-Site Stormwater Management is to use practices distributed across a development that reduce the amount of disruption of the natural hydrologic characteristics of the site.

Competing Needs Criteria

LID BMPs can be superseded or restricted where they are in conflict with:

- Requirements of the following federal or state laws, rules, and standards:
  - Historic Preservation Laws and Archaeology Laws as listed at https://dahp.wa.gov/project-review/preservation-laws,
  - Federal Superfund or Washington State Model Toxics Control Act,
  - Federal Aviation Administration requirements for airports,
  - Americans with Disabilities Act.
- When an LID requirement has been found to be in conflict with special zoning district design criteria adopted and being implemented pursuant to a community planning process. The existing local codes may supersede or reduce the LID requirement.
- Public health and safety standards (e.g. active zone of a skate park, bike park, or sport court where permeable pavement violates safety standards).
- Transportation regulations to maintain the option for future expansion or multi-modal use of public rights-of-way.
- A local Critical Area Ordinance that provides protection of tree species.
- A local code or rule adopted as part of a Wellhead Protection Program established under the Federal Safe Drinking Water Act; or adopted to protect a Critical Aquifer Recharge Area established under the State Growth Management Act.

Supplemental Guidelines

In order to meet the LID Performance Standard, designers may use any Flow Control BMP in the SWMMWW. There are no specific Flow Control BMPs that must be used to meet the LID Performance Standard.

- Lawn and Landscaped areas:
  - Post-Construction Soil Quality and Depth in Accordance with BMP T5.13 of Volume 5

Areas graded at 3H:1V or flatter will receive soil amendment prior to planting. Areas graded at steeper than that will receive permanent hydroseed and jute matting.

- Roofs:
  - *Full dispersion:* 14 of the Lots will be dispersed.
  - *Rain Gardens:* Rain gardens for rooftop areas cannot be reasonably designed to place raingarden cells in areas less than 8% in slope and infiltration is not feasible based on the Geotechnical Engineering Report recommendations.
  - *Downspout dispersion*: Downspout dispersion will be determined at the time of Building Permit application for the 14 lots proposed to be dispersed.
  - *Perforated stub-out connections:* Perforated stub-out connections are not appropriate as there are no downstream connection points and could cause downstream flooding and erosion on adjacent lots.
- Other Hard Surfaces
  - *Full Dispersion:* A portion of the roadways will be directed to dispersion systems, including the loop road in the west basin TDA and the road with the cul-de-sac in the east basin TDA.
  - *Rain Gardens:* Rain gardens are infeasible due slopes of existing ground greater than 8% and infeasibility of infiltration based on the Geotechnical Engineering Report recommendations.
  - *Permeable pavement:* Permeable pavement is not feasible due to the soils and grades with infiltration infeasibility being determined by the Geotechnical Engineering Report recommendations,
  - *Sheet flow dispersion:* Sheet flow dispersion is impractical due to area limitations and slopes.

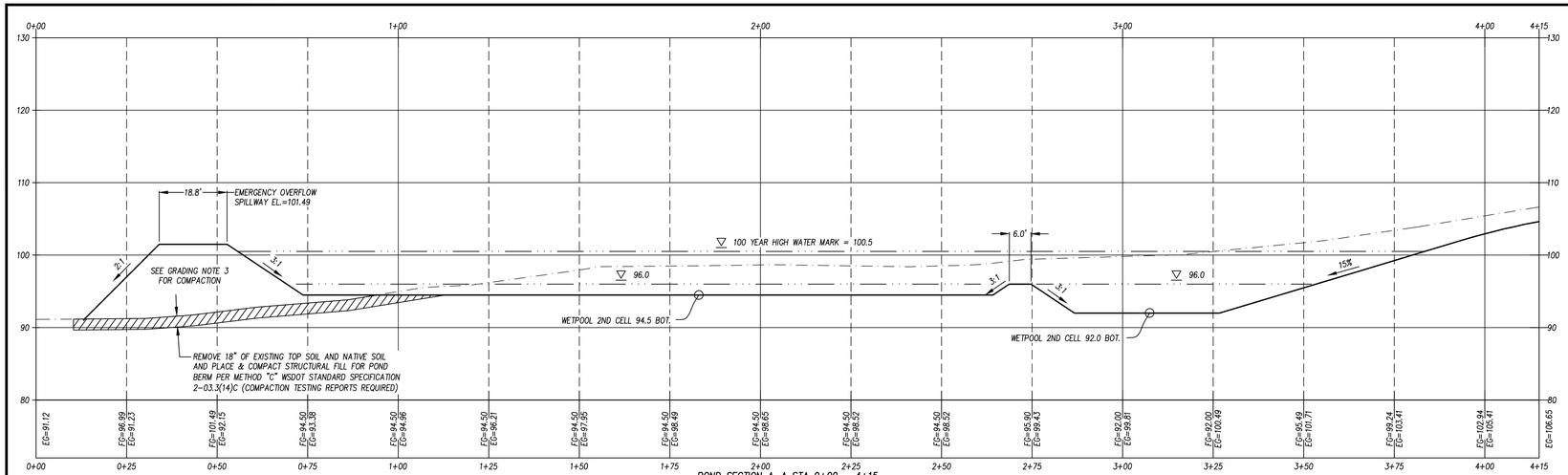
Minimum requirement #5 has been met.

6. Minimum Requirement #6: Runoff Treatment

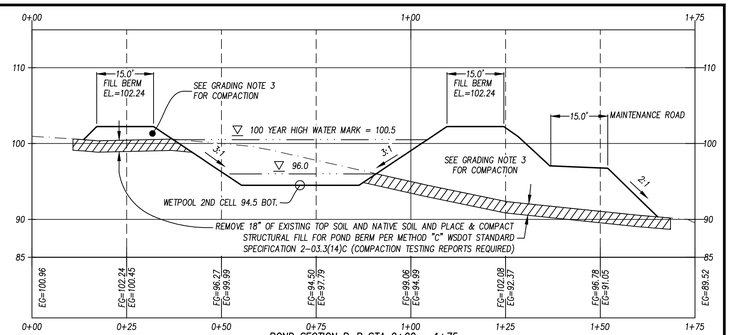
Runoff treatment for the developed site will be provided by a wet pool volume located below the outlet elevation of the proposed wetpool/detention pond. The total water quality volume required is 0.105 acre-feet or 4,573 cubic feet. The first wet pool is where the pipes from the drainage system discharge. It is 4 feet in depth and provides 3,900 cubic-feet. The first cell will spill over into the second cell of the pond. The wet pool is 1.5-feet deep and is under the detention pond. This wet pool provides 6,800 cubic-feet. A total of 10,700 cubic-feet is provided that exceeds the minimum volume required. (See wetpool/detention pond exhibit on next page)

Minimum Requirement #6 has been satisfied.

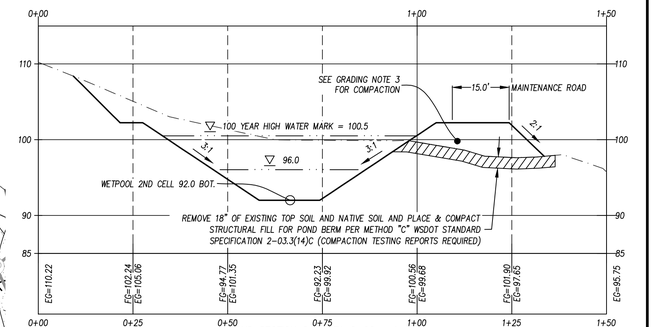
INSERT WETPOOL POND EXHIBIT HERE



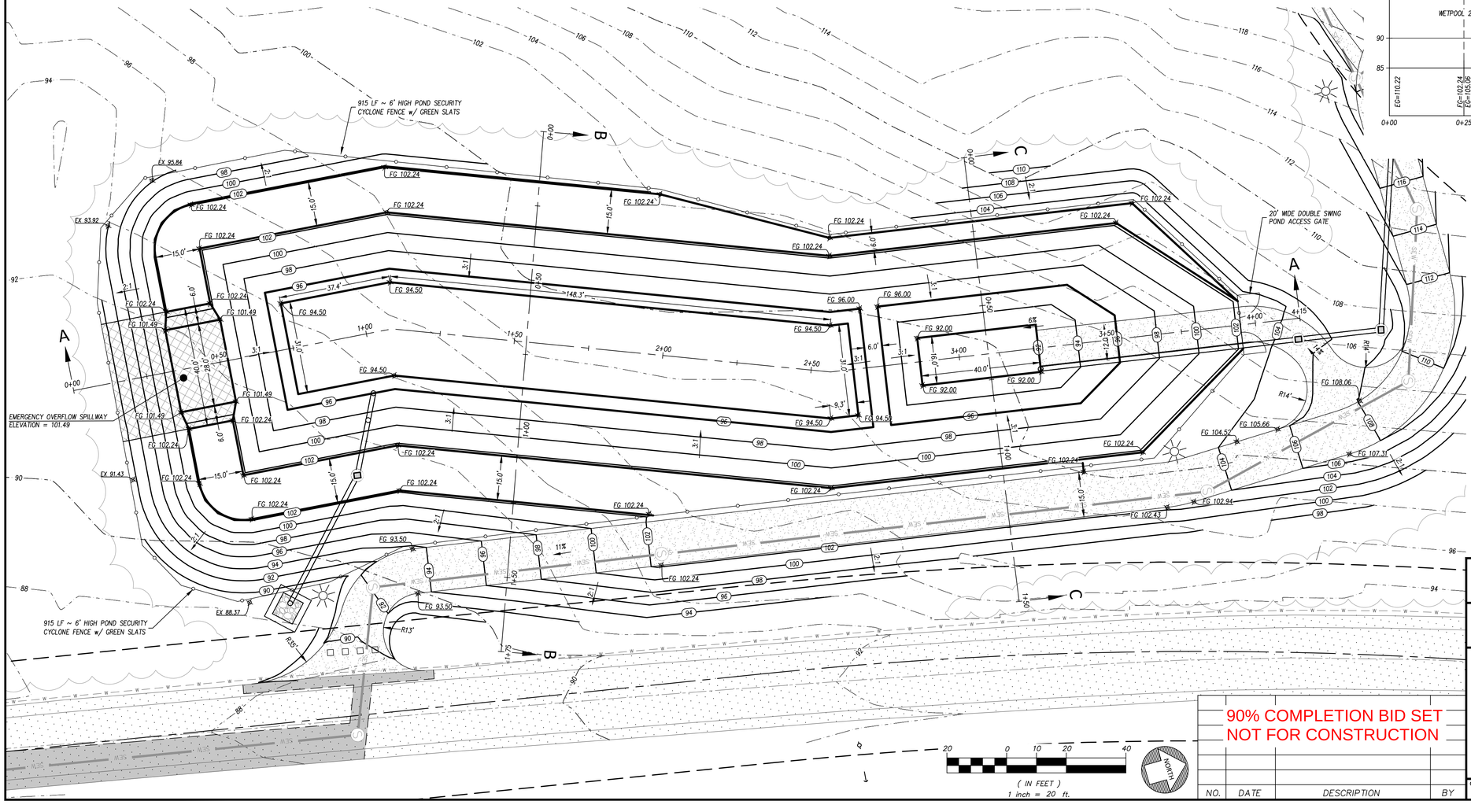
POND SECTION A–A STA 0+00 – 4+15
1"=20' Horiz
1"=10'



POND SECTION B–B STA 0+00 – 1+75
1"=20' Horiz
1"=10'



POND SECTION C–C STA 0+00 – 1+50
1"=20' Horiz
1"=10'



GENERAL NOTES

1. ALL CONSTRUCTION SHALL FOLLOW THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL INVESTIGATION REPORT PREPARED FOR THIS PROJECT BY KRAZAN AND ASSOCIATES DATED OCTOBER 2, 2023.
2. POST-CONSTRUCTION SOILS AMENDMENT (BMP T5.13) WILL BE APPLIED TO EACH LOT AFTER THE FUTURE HOME CONSTRUCTION.

GRADING NOTES

THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN THE EVENT OR DISCOVERY OF POOR SOILS, GROUNDWATER OR DISCREPANCIES IN THE EXISTING CONDITIONS AS NOTED ON THE PLANS.

1. MAXIMUM SLOPE STEEPNESS SHALL BE 2:1 (HORIZONTAL TO VERTICAL) FOR CUT AND FILL SLOPES.
2. UNLESS OTHERWISE SPECIFIED, ALL EMBANKMENTS IN THE PLAN SET SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 2-03.3(14)B OF THE WSDOT STANDARD SPECIFICATIONS. EMBANKMENT COMPACTIONS SHALL CONFORM TO SECTION 2-03.3(14)C, METHOD B OF SAID STANDARD SPECIFICATIONS.
3. EMBANKMENTS DESIGNED TO IMPOUND WATER SHALL BE COMPACTED TO 9% MAXIMUM DENSITY PER SECTION 2-03.3(14)C, METHOD C OF WSDOT STANDARD SPECIFICATIONS.
4. ALL AREAS RECEIVING FILL MATERIAL SHALL BE PREPARED BY REMOVING VEGETATION, NON-COMPLYING FILL, TOPSOIL AND OTHER UNSUITABLE MATERIAL BY SCARIFYING THE SURFACE TO PROVIDE A BOND WITH THE NEW FILL, AND WHERE SLOPES ARE STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL AND THE HEIGHT IS GREATER THAN 5 FT., BY BENCHING INTO SOUND COMPETENT MATERIAL AS DETERMINED BY A SOILS ENGINEER.

90% COMPLETION BID SET
NOT FOR CONSTRUCTION

NO.	DATE	DESCRIPTION	BY

PLAT OF RACCOON TOWN

STORM DRAINAGE POND & GRADING PLAN

FOR
PGST Planning Department
31912 LITTLE BOSTON RD NE
KINGSTON, WA 98346

CONTACT
Rory McLeod, Project Manager
rorym@pgst.nsn.us

P.O. Box 720 • 10045 Old Frontier Road NW
Silverdale, Washington 98383
(360) 692-5525
ENGINEERING • SURVEYING
PLANNING

C - 7.10

CALCULATED	DESIGN	DRAWN	CHECKED	DATE	SCALE	JOB NO.	SHEET
QJD	QJD/KPF	QJD	KPF	7-12-24	1" = 20'	6847	34 OF 61

7. Minimum Requirement: #7: Flow Control

Projects must provide flow control to reduce the impacts to downstream properties and waters of stormwater runoff from hard surfaces and land cover conversions. The requirement below applies to projects that discharge stormwater directly, or indirectly, through a conveyance system into a freshwater body.
Areas of the site that are proposed to meet the Full Dispersion criteria are considered zero-effective impervious and meet the flow control requirements of MR #7. Flow control for areas not being dispersed will be provided in the wetpool/detention pond.

Minimum requirement #7 has been satisfied.

8. Minimum Requirement #8 Wetland Protection

This proposal does not discharge stormwater directly to a wetland through a conveyance system.

Minimum requirement #8 has been satisfied.

9. Minimum Requirement #9: Operation & Maintenance

An Operation and Maintenance Manual with a Maintenance Schedule will be provided at the time of completion of construction of the project site.
Minimum Requirement #9 will be met.

E. MONITORING

The site will be monitored by a Certified Erosion and Sediment Control Lead (CESCL). The CESCL will be responsible for monitoring and inspection throughout construction. Visual observation should be made after each major storm or at a minimum once per week during construction. The BMPs shall be inspected after each major rainstorm or at minimum once a week. Repair and corrective action will be made as directed by the CESCL and Owner.

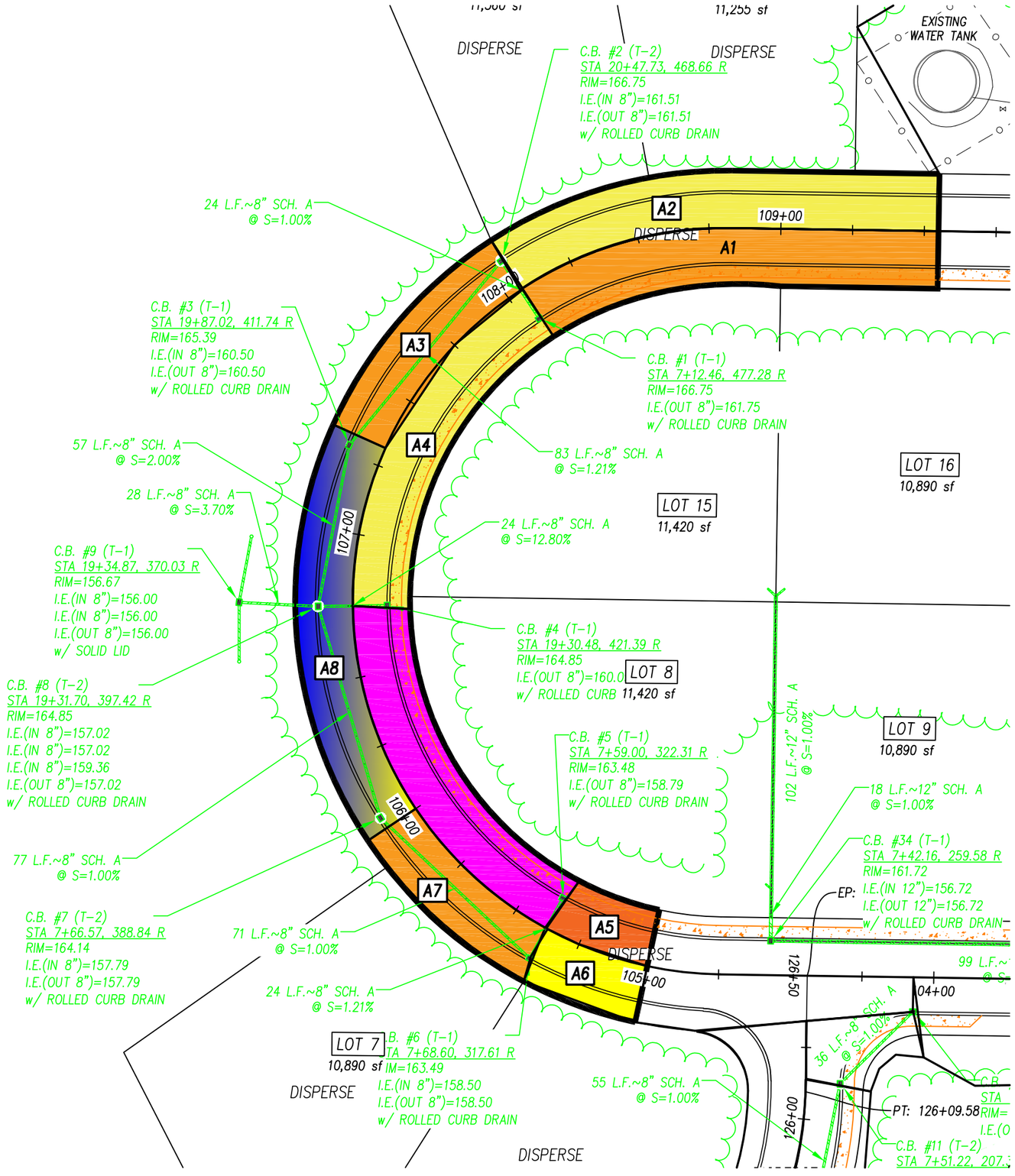
APPENDIX A CONVEYANCE CALCULATIONS

Conveyance piping was sized utilizing the Rational Method. The 100 yr. Intensity-Duration-Frequency curve for Bremerton was used to calculate rainfall intensities.

LOCATION: **LOOP ROAD (DISPERSION)** STORM SEWER DESIGN CALCULATIONS J#: **6847**

DATE: **4.3.24**

FROM	TO	L	V	T_n	T_o	T_c	CN	I_{100}	ΔAREA	ΣAREA	Q_{100}	PIPEϕ	S_{pipe}	Q_{pipe}	COMMENTS
															A8"=0.35 sf
															V=Q/A
Area #1	C.B. #1	150	4.8	0.5	5	5.5	0.80	3.6	0.07		0.20	8"	1.0	1.3	Tpipe=L/(60*V)
Area #2	C.B. #2						0.71		0.07						
							0.76	3.6		0.14	0.38	8	1.21	1.5	Tpipe= 1.3 min
Area #3	C.B. #3						0.58		0.04						
				5.5	1.3	6.8	0.72	3.4		0.18	0.44	8	2.00	1.9	Tpipe=0.8 min
Area #4-a	C.B. #4			6.8	7.6		0.80	3.2	0.06	0.06					
Area #5	C.B. #5			0	5	5	0.9	3.7	0.02		0.07		1.00		
Area #6	C.B. #6						0.87	3.7	0.02						
Area #7	C.B. #7						0.89	3.7	0.02	0.06	0.20	8"	1.00	1.3	
Area #4-b	C.B. #4						0.79		0.06	0.06					
Combined Area	C.B. #4						0.77	3.2		0.36	0.89		12.80	>4.2	
Area #8	C.B. #8						0.71		0.07						
Combined Area	C.B. #8						0.76	3.2		0.43	1.05	8"	3.69	2.5	



WEST LOOP ROAD
DISPERSION
AREA = 0.42 ACRES

LOCATION:
SPUR ROAD (DISPERSION)

STORM SEWER DESIGN CALCULATIONS

J#: **6847**

DATE: **4.3.24**

FROM	TO	L	V	T_n	T_o	T_c	CN	I_{100}	ΔAREA	ΣAREA	Q_{100}	PIPEϕ	S_{pipe}	Q_{pipe}	COMMENTS
Area #10	C.B. #10	94	5.5	0.3	5	5.3	0.91	3.6	0.04		0.12	8	1.00	1.3	
Area #11	C.B. #11					5.3	0.82		0.02						
						5.3	0.88	3.6		0.06	0.19	8"	1.00	1.3	Tp= 1.7 min
Area #12	C.B. #12			1.7	5.3	7.0	0.68	3.3	0.03		0.06	8"	10.03		
Area 13	C.B. #13						0.98		0.03						
						7.0	0.86	3.3		0.12	0.34	8"	1.00	1.3	Tp=1.1
Lot #3	Storm						0.48	3.5	0.34		0.57	6"	2.00	0.85	
Area #14	C. B. #14						0.74		0.06						
				1.1	7.0	8.1	0.50	3.2		0.52	0.83	8"	6.11	3.2	

SPUR ROAD DISPERSION
AREA = 0.52 ACRES

C.B. #7 (T-2)
STA 7+66.57, 388.84 R
RIM=164.14
I.E.(IN 8")=157.79
I.E.(OUT 8")=157.79
w/ ROLLED CURB DRAIN

71 L.F.~8" SCH. A
@ S=1.00%

24 L.F.~8" SCH. A
@ S=1.21%

DISPERSE

105+00

126+50

104+00

A10

99 L.F.~12" SCH. A
@ S=7.43%

LOT 7
10,890 sf

C.B. #6 (T-1)
STA 7+68.60, 317.61 R
RIM=163.49
I.E.(IN 8")=158.50
I.E.(OUT 8")=158.50
w/ ROLLED CURB DRAIN

A11

55 L.F.~8" SCH. A
@ S=1.00%

C.B. #10 (T-1)
STA 7+32.83, 207.65 R
RIM=157.84
I.E.(OUT 8")=-5.79
w/ ROLLED CURB DRAIN

36 L.F.~8" SCH. A
@ S=1.00%

126+00

A13

C.B. #11 (T-2)
STA 7+51.22, 207.35 R
RIM=160.11
I.E.(IN 8")=-6.15
I.E.(OUT 8")=-477.39
w/ ROLLED CURB DRAIN

LOT 2
10,895 sf

DISPERSE

A12

DISPERSE

24 L.F.~8" SCH. A
@ S=1.00%

LOT 6
10,890 sf

C.B. #12 (T-1)
STA 7+79.83, 204.24 R
RIM=159.34
I.E.(OUT 8")=-323.42
w/ ROLLED CURB DRAIN

C.B. #13 (T-2)
STA 7+76.84, 180.90 R
RIM=159.34
I.E.(IN 8")=-323.66
I.E.(IN 8")=-477.94
I.E.(OUT 8")=-4.29
w/ ROLLED CURB DRAIN

A14

65 L.F.~8" SCH. A
@ S=1.00%

DISPERSE

125+00

C.B. #14 (T-2)
STA 8+27.51, 196.18 R
RIM=151.80
I.E.(IN 6")=151.28
I.E.(IN 8")=-4.95
I.E.(OUT 8")=-9.58
W/STD. FRAME & VANED GRATE

LOT 5
11,750 sf

C.B. #15 (T-1)
STA 12+44.96, 157.83 R
RIM=137.53
I.E.(IN 8")=-11.59
I.E.(IN 8")=139.00
I.E.(IN 8")=139.00

29 L.F.~6" SCH. A
@ S=2.00%

201 L.F.~8" SCH. A
@ S=1.00%

DISPERSE

LOT 3
14,720 sf

DISPERSE

LOT 4
12,590 sf

BT

BT

BT

OOD CANAL DR

LOCATION:
CUL-DE-SAC ROAD (DISPERSION)

STORM SEWER DESIGN CALCULATIONS

J#: **6847**

DATE: **4-4-24**

FROM	TO	L	V	T_n	T_o	T_c	CN	I_{100}	ΔAREA	ΣAREA	Q_{100}	PIPEϕ	S_{pipe}	Q_{pipe}	COMMENTS
Area #63	C.B. #63	73	2.7	0.5	5	5.5	0.9	3.6	0.04		0.13	8"	1.36	1.5	
Area #64	C.B. #64						0.68		0.03						
						5.5	0.80	3.6		0.07	0.20	8"	0.99	1.3	
Area #65	C.B. #65						0.9	3.6	0.03						
							0.83	3.6		0.10	0.30	8"	0.92	1.2	
Area #67	C.B. #67						0.74	3.7	0.04			8	1.0	1.3	
Area #68	C.B. #68						0.90		0.05						
							0.83	3.6		0.19	0.57	8"	0.88	1.2	
Area #69	C.B. #69						0.64	3.6	0.05		0.12	8"	100	1.3	
Area #60	C.B. #60	104	2.7	0.7	5	5.7	0.65	3.5	0.17		0.39	8"	1.00	1.3	
Area #61	C.B. #61						0.65		0.14						
						5.7	0.65	3.5		0.36	0.82	8"	2.33	2.0	
Area #72	C.B. #72						0.70		0.03						
							0.71	3.5		0.58	1.44	8"	5.45	3.0	

CUL-DE-SAC
AREA = 0.58 ACRES

HOOD CANAL DR NE

LIGHT POLE

UTILITY POLE

I.E.(OUT 8")=-4.29
w/ ROLLED CURB DRAIN

C.B. #14 (T-2)
STA 8+27.51, 196.18 R
RIM=151.80
I.E.(IN 6")=151.28
I.E.(IN 8")=-4.95
I.E.(OUT 8")=-9.58

LOT 3
14,720 sf

C.B. #46 (T-1)
STA 6+77.61, -41.49 L
RIM=141.78
I.E.(IN 6")=139.90
I.E.(OUT 8")=139.7
w/ ROLLED CURB DRAIN

DISPERSE

I.E.(IN 8")=138.73
I.E.(IN 6")=138.73
I.E.(OUT 12")=138.23
w/ ROLLED CURB DRAIN

STORM CLEANOUT
STA 7+89.41, -44.18 L
RIM=142.23
I.E.(OUT 6")=141.68
CAP & MARK

C.B. #69 (T-1)
STA 8+82.55, -133.50 L
RIM=140.70
I.E.(OUT 8")=135.94
w/ ROLLED CURB DRAIN

C.B. #71 (T-1)
STA 9+21.31, -154.07 L
RIM=141.48
I.E.(IN 8")=136.48
I.E.(IN 12")=136.48
I.E.(OUT 8")=136.48
w/ ROLLED CURB DRAIN

C.B. #60 (T-1)
STA 9+86.96, -147.10 L
RIM=143.91
I.E.(OUT 8")=139.15
w/ ROLLED CURB DRAIN

24 L.F.~8" SCH. A
@ S=1.00%

89 L.F.~6" SCH. A
@ S=2.00%

56 L.F.~8" SCH. A
@ S=1.36%

C.B. #64 (T-1)
STA 6+04.10, -100.40 L
RIM=142.68
I.E.(OUT 8")=137.90
w/ ROLLED CURB DRAIN

LOT 32
11,005 sf

24 L.F.~8" SCH. A
@ S=0.99%

C.B. #67 (T-1)
STA 7+77.16, -156.32 L
RIM=141.66
I.E.(OUT 8")=136.90
w/ ROLLED CURB DRAIN

LOT 33
11,040 sf

24 L.F.~8" SCH. A
@ S=1.00%

24 L.F.~8" SCH. A
@ S=1.00%

104 L.F.~8" SCH. A
@ S=2.33%

C.B. #61 (T-1)
STA 9+82.83, -170.09 L
RIM=143.91
I.E.(IN 8")=138.91
I.E.(OUT 8")=138.91
w/ ROLLED CURB DRAIN

NATIVE VEGETATION TO REMAIN

23 L.F.~8" SCH. A
@ S=5.45%

C.B. #72 (T-1)
STA 9+20.94, -177.35 L
RIM=138.42
I.E.(IN 8")=137.75
I.E.(IN 8")=137.75
I.E.(OUT 8")=137.75
w/ SOLID LID

C.B. #70 (T-1)
STA 8+84.54, -157.28 L
RIM=140.70
I.E.(IN 8")=135.70
I.E.(IN 8")=135.70
I.E.(OUT 12")=135.70
w/ ROLLED CURB DRAIN

109 L.F.~8" SCH. A
@ S=0.88%

LOT 37
11,055 sf

50 L.F.~12" SCH. A
@ S=0.92%

C.B. #68 (T-1)
STA 7+93.08, -179.86 L
RIM=141.66
I.E.(IN 8")=136.66
I.E.(IN 12")=136.66
I.E.(OUT 8")=136.66
w/ ROLLED CURB DRAIN

C.B. #66 (T-1)
STA 5+92.70, -158.19 L
RIM=142.12
I.E.(IN 8")=137.12
I.E.(OUT 12")=137.12
w/ ROLLED CURB DRAIN

58 L.F.~8" SCH. A
@ S=0.92%

LOT 38
10,930 sf

C.B. #65 (T-1)
STA 5+59.60, -101.57 L
RIM=142.65
I.E.(IN 8")=137.65
I.E.(IN 8")=137.65
I.E.(OUT 8")=137.65
w/ ROLLED CURB DRAIN

49 L.F.~8" SCH. A
@ S=1.00%

LOT 39
10,895 sf

C.B. #63 (T-1)
STA 5+62.17, -46.03 L
RIM=143.04
I.E.(OUT 8")=138.41
w/ ROLLED CURB DRAIN
I.E.(OUT 8")=138.41
w/ ROLLED CURB DRAIN

C.B. #62 (T-1)
STA 5+18.57, -14.01 L
RIM=141.93
I.E.(IN 8")=138.90

C.B. #53 (T-2)
STA 3+13.77, -12.88 L
RIM=124.99
I.E.(IN 18")=117.13
I.E.(OUT 18")=117.13
w/ ROLLED CURB DRAIN

I.E.(IN 18")=117.65
I.E.(IN 12")=117.65
I.E.(OUT 18")=117.65
w/ ROLLED CURB DRA

C.B. #58 (T-1L)
STA 2+58.56, -85.28 L
RIM=112.83
I.E.(IN 18")=104.76
I.E.(OUT 18")=104.76

C.B. #59 (T-1L)
STA 2+92.29, -128.14 L
RIM=108.53
I.E.(IN 18")=104.11
I.E.(OUT 18")=104.11

71 L.F.~18" SCH. A
@ S=16.34%

A63 A64 A65 A67 A68 A69 A70 A71 A72 A60 A61

135+50 135+00 134+50 134+00 133+50 133+00 132+50 132+00 131+50 131+00 130+50 130+00

STA=7+00 STA=8+00 STA=9+00 STA=10+00 STA=5+00

LINE STORAGE-ELEV BOTTOM-96.00

94 96 98 100 102

15' W BENCH
ELEV...

LOCATION: **LOOP ROAD**

STORM SEWER DESIGN CALCULATIONS

J#: **6847**

DATE: **4.3.24**

FROM	TO	L	V	T_n	T_o	T_c	CN	I_{100}	ΔAREA	ΣAREA	Q_{100}	PIPEϕ	S_{pipe}	Q_{pipe}	COMMENTS
water tank	stub					5.0	0.32	3.7	0.08		0.10	6"	1% min	0.6	
Area #16	C.B. #16	67	1.8	0.6	5.0	5.6	0.38	3.6		0.09	0.12	8"	6.25	3.4	Tp=3.9 min
Lot 24	stub	140	2.0	1.2	5.0	6.2	0.57	3.4	0.25		0.48	6"	1% min		
Area #17	C.B. #17						0.82		0.04						
				3.9	6.2	10.1	0.54	2.8		0.38	0.57	8"	7.74	3.8	Tp=0.8 min
Lot 25	stub						0.54		0.25			6"	1% min		
Area #18	C.B. #18						0.67		0.04						
				0.1	10.1	10.2	0.55	2.8		0.67	1.03		4.05	2.7	Tp=0.3min
Lot 26	stub						0.54		0.25						
Area #19	C.B. #19						0.58	2.8	0.02						
				0.3	10.2	10.5	0.55	2.8		0.94	1.45	8"	7.54	3.6	
Lot #17	stub						0.54		0.25						
Area #20	C.B. #20					5.6	0.80	3.6	0.07						
							0.60	3.6		0.32	0.69	8"	4.8		
Lot #18	stub						0.54		0.25						
Area #21	C.B. #21						0.80		0.07						
							0.57	2.8		1.58	2.52	8"	1.00	2.2	Tp=0.4 min
Lot #27	stub						0.54		0.25						
Area #23	C.B. #23						0.64		0.05						
							0.56	3.6		0.30	0.60	8"	5.63	3.02	Tp=0.2 min
Lot #28	stub						0.53		0.26						
Area #24	C.B. #24						0.74		0.04						
				0.2	5.6	5.8	0.56	3.5		0.30	0.59	8"	1.0	1.3	
Lot #19	stub						0.54		0.25						
Area #22	C.B. #22						0.77		0.05						

LOCATION: **LOOP ROAD**

STORM SEWER DESIGN CALCULATIONS

J#: **6847**

DATE: **4.3.24**

FROM	TO	L	V	T_n	T_o	T_c	CN	I_{100}	ΔAREA	ΣAREA	Q_{100}	PIPEϕ	S_{pipe}	Q_{pipe}	COMMENTS
Lot 28	stub						0.53		0.26						
Area #24	C.B. #24						0.74		0.04						
Lot #20	stub						0.54		0.25				-		
Area #25	C.B. #25						0.77		0.05						
							0.71	2.8		2.48	4.93	12"	8.0	10.1	
Lot #29	stub						0.47		0.32						
Area #27	C.B. #27						0.74		0.08						
							0.68	2.8		2.88	5.49	12"	4.11	8.0	
Lot #21	stub						0.53		0.26						
Area #30	C.B. #30						74		0.12						
				0.2	10.5	10.7	0.67	2.6		3.26					
Area #31	C.B. #31					10.7	0.68	2.6	0.06		0.11	8"	1.03	1.3	
Lot #14	stub						0.53		0.26						
Area #32	C.B. #32						0.74		0.07						
							0.66	2.6		3.65	6.26	15"	1.00	7.0	
Lot #15 & 16	stub						0.53	3.4	0.51		0.92	8"	1.00	1.3	
Lot #8	stub						0.54	3.4	0.25	0.76	1.39	8"	1.00		
Lot #9	stub						0.54		0.25						
Area #35	C.B. #35						0.9		0.05						Tp=2.9 min
				2.9	5.6	8.5	0.56	3.2		1.06	1.96	12"	1.00	3.8	
Lot #2	stub						0.54		0.25						
Area #36	C.B. #36						0.58	3.2	0.06						
							0.55	3.2		0.31	0.55	8"	1.00	1.3	

LOCATION: **LOOP ROAD**

STORM SEWER DESIGN CALCULATIONS

J#: **6847**

DATE: **4.3.24**

FROM	TO	L	V	T_n	T_o	T_c	CN	I_{100}	ΔAREA	ΣAREA	Q_{100}	PIPEϕ	S_{pipe}	Q_{pipe}	COMMENTS
Area #37	C.B. #37						0.58		0.06						
							0.56	3.6		0.37	0.75	8"	1.0	1.3	
Area #38	C.B. #38						0.77		0.05						
							0.56	3.2		1.79	3.21	12"	1.00	3.8	
Lot #11	stub						0.54		0.25						
Area #39	C.B. #39						0.92	3.2	0.05						
							0.57	3.2		2.09	3.81	15"	1.00	7.0	Tp=0.5 min
Lot #12	stub						0.54		0.25						
Area #40	C.B. #40						0.77		0.05						
							0.58	3.0		2.34	4.07	15"	7.28	19.0	
Lot #13	stub						0.54	0.77	0.25						
Area #41	C.B. #41								0.09						
				0.5	8.5	9.0	0.63	2.6		6.27	10.27	18"	2.0	10.6	
Area #42	C.B. #42						0.9	3.6	0.07		0.23	8"	7.47	3.6	
Park Area	Inlet	70	1.5	0.8	5	5.8	0.25	3.5	0.29		0.25	8"	4.92	2.8	
Area #43	C.B. #43						0.74		0.04						
							0.31	3.5		0.33	0.36	8"	10.36	4.2	
Area #44							0.71		0.10						
							0.62	2.5		6.70	10.39	18"	5.25	25.0	

: CORRIDOR

LOOP ROAD NORTH

NATIVE VEGETATION TO REMAIN–50' WILDLIFE CORRIDOR

20 L.F.~8" SCH. A
@ S=12.92%

C.B. #16 (T–1)
STA 6+55.80, 428.28 R
RIM=172.41
I.E.(IN 8")=167.41
I.E.(OUT 8")=167.41
w/ ROLLED CURB DR

C.B. #17 (T–1)
STA 6+29.14, 401.36 R
RIM=167.32
I.E.(IN 6")=162.49
I.E.(IN 8")=162.32
I.E.(OUT 8")=162.32
w/ ROLLED CURB DRAIN

C.B. #18 (T–1)
STA 6+00.66, 384.34 R
RIM=157.24
I.E.(IN 6")=156.22
I.E.(IN 8")=156.05
I.E.(OUT 8")=156.05
w/ ROLLED CURB DRAIN

45 L.F.~8" SCH. A
@ S=4.05%

C.B. #23 (T–1)
STA 5+41.35, 382.36 R
RIM=152.26
I.E.(IN 6")=151.24
I.E.(OUT 8")=151.07
w/ ROLLED CURB DRAIN

C.B. #24 (T–1)
STA 1+57.65, 366.98 R
RIM=150.21
I.E.(IN 8")=145.81
I.E.(IN 6")=145.98
I.E.(OUT 8")=145.48
w/ ROLLED CURB DRAIN

LOT 24
10,905 sf

LOT 25
10,905 sf

LOT 26
10,905 sf

LOT 27
10,905 sf

LOT 28
11,330 sf

LOT 29
13,060 sf

LOT 30
16,350 sf

EXISTING WATER TANK

81 L.F.~8" SCH. A
@ S=6.25%

81 L.F.~8" SCH. A
@ S=7.74%

C.B. #19 (T–1)
STA 5+84.34, 379.43 R
RIM=158.66
I.E.(IN 8")=154.23
I.E.(IN 6")=154.40
I.E.(OUT 8")=153.90
w/ ROLLED CURB DRAIN

81 L.F.~8" SCH. A
@ S=6.51%

24 L.F.~8" SCH. A
@ S=1.00%

80 L.F.~12" SCH. A
@ S=12.98%

DISPERSE

C.B. #26 (T–2)
STA 1+38.15, 301.76 R
RIM=141.79
I.E.(IN 6")=135.94
I.E.(OUT 8")=135.77
w/ ROLLED CURB DRAIN

+00

A16

110+00

A17

111+00

A18

A19

112+00

A23

113+00

A24

114+00

A26

A20

A21

A22

A25

A27

115+00

A29

A28

24 L.F.~8" SCH. A
@ S=0.39%

LOT 31
12,200 sf

DISPERSE

C.B. #28 (T–1)
STA 1+30.48, 217.16 R
RIM=136.47
I.E.(OUT 8")=131.87
w/ ROLLED CURB DRAIN

NATIVE VEGETATION

24 L.F.~8" SCH. A
@ S=1.00%

47 L.F.~12" SCH. A
@ S=4.42%

A30

116+00

24 L.F.~12" SCH. A
@ S=2.53%

28 R

DRAIN

LOT 16
10,890 sf

LOT 17
10,890 sf

20 L.F.~8" SCH. A
@ S=7.63%

C.B. #20 (T–1)
STA 6+21.95, 371.27 R
RIM=165.90
I.E.(IN 6")=164.89
I.E.(OUT 8")=159.98
w/ ROLLED CURB DRAIN

LOT 18
10,890 sf

24 L.F.~8" SCH. A
@ S=7.54%

C.B. #21 (T–2)
STA 5+85.01, 355.50 R
RIM=158.66
I.E.(IN 8")=152.09
I.E.(IN 6")=152.59
I.E.(IN 8")=152.42
I.E.(OUT 12")=152.09
w/ ROLLED CURB DRAIN

99 L.F.~12" SCH. A
@ S=1.00%

LOT 19
10,890 sf

C.B. #22 (T–1)
STA 5+47.11, 356.52 R
RIM=156.10
I.E.(IN 12")=151.10
I.E.(IN 6")=151.60
I.E.(OUT 12")=151.10
w/ ROLLED CURB DRAIN

99 L.F.~12" SCH. A
@ S=5.31%

LOT 20
10,890 sf

C.B. #25 (T–1)
STA 1+61.88, 348.06 R
RIM=150.24
I.E.(IN 8")=145.24
I.E.(IN 6")=146.36
I.E.(IN 12")=145.86
I.E.(OUT 12")=145.86
w/ ROLLED CURB DRAIN

C.B. #27 (T–2)
STA 1+44.98, 290.01 R
RIM=141.78
I.E.(IN 12")=135.53
I.E.(IN 8")=135.86
I.E.(OUT 12")=135.53
w/ ROLLED CURB DRAIN

73 L.F.~12" SCH. A
@ S=5.61%

LOT 21
11,420 sf

C.B. #29 (T–1)
STA 1+39.97, 218.81 R
RIM=136.46
I.E.(IN 12")=131.46
I.E.(IN 8")=131.63
I.E.(OUT 12")=131.46

C.B. #30 (T–1)
STA 1+46.20, 174.63 R
RIM=134.40
I.E.(IN 6")=129.90
I.E.(IN 12")=129.40
I.E.(OUT

AIN

LOT 9
10,890 sf

LOT 10
10,890 sf

LOT 11
10,890 sf

LOT 12
10,890 sf

LOT 13

LOT 14

LOOP ROAD SOUTH

DISPERSE

109+00 110+00 111+00 112+00 113+00 114+00 115+00 116+00 117+00 118+00 119+00 120+00 120+76 121+00 102+00 103+00 104+00 105+00 126+00 125+00 135+80 135+50 135+00 100+00 101+00

A16 A17 A18 A19 A20 A21 A22 A23 A24 A25 A26 A27 A28 A29 A30 A31 A32 A33 A34 A35 A36 A37 A38 A39 A40 A41 A42 A43 A44

LOT 1 10,900 sf
LOT 2 10,895 sf
LOT 3 14,720 sf
LOT 4 0 sf
LOT 8 11,420 sf
LOT 9 10,890 sf
LOT 10 10,890 sf
LOT 11 10,890 sf
LOT 12 10,890 sf
LOT 13 10,890 sf
LOT 14 11,420 sf
LOT 15 11,420 sf
LOT 16 10,890 sf
LOT 17 10,890 sf
LOT 18 10,890 sf
LOT 19 10,890 sf
LOT 20 10,890 sf
LOT 21 11,420 sf
LOT 31 12,200 sf
LOT 39 10,895 sf

C.B. #1 (T-1)
STA 7+12.46, 477.28 R
RIM=166.75
I.E.(OUT 8")=161.75
w/ ROLLED CURB DRAIN

83 L.F.~8" SCH. A @ S=1.21%

24 L.F.~8" SCH. A @ S=12.80%

C.B. #4 (T-1)
STA 19+30.48, 421.39 R
RIM=164.85
I.E.(OUT 8")=160.09
w/ ROLLED CURB DRAIN

C.B. #5 (T-1)
STA 7+59.00, 322.31 R
RIM=163.48
I.E.(OUT 8")=158.79
w/ ROLLED CURB DRAIN

102 L.F.~12" SCH. A @ S=1.00%

18 L.F.~12" SCH. A @ S=1.00%

C.B. #34 (T-1)
STA 7+42.16, 259.58 R
RIM=161.72
I.E.(IN 12")=156.72
I.E.(OUT 12")=156.72
w/ ROLLED CURB DRAIN

C.B. #20 (T-1)
STA 6+21.95, 371.27 R
RIM=165.90
I.E.(IN 6")=164.89
I.E.(OUT 8")=159.98
w/ ROLLED CURB DRAIN

99 L.F.~8" SCH. A @ S=7.63%

99 L.F.~12" SCH. A @ S=7.43%

C.B. #35 (T-1)
STA 7+04.99, 195.23 R
RIM=154.36
I.E.(IN 6")=149.86
I.E.(IN 12")=149.36
I.E.(OUT 12")=149.36
w/ ROLLED CURB DRAIN

99 L.F.~12" SCH. A @ S=3.91%

24 L.F.~8" SCH. A @ S=1.00%

79 L.F.~8" SCH. A @ S=2.94%

C.B. #36 (T-1)
STA 7+03.83, 164.30 R
RIM=153.22
I.E.(IN 6")=148.39
I.E.(OUT 8")=148.22
w/ ROLLED CURB DRAIN

C.B. #10 (T-1)
STA 7+32.83, 207.65 R
RIM=157.84
I.E.(OUT 8")=-5.79
w/ ROLLED CURB DRAIN

55 L.F.~8" SCH. A @ S=1.00%

36 L.F.~8" SCH. A @ S=1.00%

C.B. #11 (T-2)
STA 7+51.22, 207.35 R
RIM=160.11
I.E.(IN 8")=-6.15
I.E.(OUT 8")=-477.39
w/ ROLLED CURB DRAIN

C.B. #12 (T-1)
STA 7+79.83, 204.24 R
RIM=159.34
I.E.(OUT 8")=-323.42
w/ ROLLED CURB DRAIN

C.B. #13 (T-2)
STA 7+76.84, 180.90 R
RIM=159.34
I.E.(IN 8")=-323.66
I.E.(IN 8")=-477.94
I.E.(OUT 8")=-4.29
w/ ROLLED CURB DRAIN

C.B. #14 (T-2)
STA 8+27.51, 196.18 R
RIM=151.80
I.E.(IN 6")=151.28
I.E.(IN 8")=-4.95
I.E.(OUT 8")=-9.58
w/ FLAT GRATE FRAME

C.B. #46 (T-1)
STA 6+77.61, -41.49 L
RIM=141.78
I.E.(IN 6")=139.90
I.E.(OUT 8")=139.73
w/ ROLLED CURB DRAIN

C.B. #38 (T-1)
STA 6+56.09, 146.56 R
RIM=150.15
I.E.(IN 12")=145.48
I.E.(IN 8")=145.65
I.E.(IN 6")=145.98
I.E.(OUT 12")=145.48
w/ ROLLED CURB DRAIN

99 L.F.~12" SCH. A @ S=1.59%

C.B. #64 (T-1)
STA 6+04.10, -100.40 L
RIM=142.68
I.E.(OUT 8")=137.89

89 L.F.~6" SCH. A @ S=2.00%

56 L.F.~8" SCH. A @ S=1.36%

C.B. #39 (T-1)
STA 5+96.55, 120.64 R
RIM=148.16
I.E.(IN 6")=144.41
I.E.(IN 12")=143.91
I.E.(OUT 15")=143.66
w/ ROLLED CURB DRAIN

99 L.F.~15" SCH. A @ S=7.28%

C.B. #37 (T-1)
STA 6+62.18, 124.66 R
RIM=150.16
I.E.(IN 8")=145.89
I.E.(OUT 8")=145.89
w/ ROLLED CURB DRAIN

C.B. #42 (T-1)
STA 5+55.78, 94.36 R
RIM=145.20
I.E.(OUT 8")=140.20
w/ ROLLED CURB DRAIN

84 L.F.~8" SCH. A @ S=7.47%

C.B. #43 (T-1)
STA 4+99.14, 109.99 R
RIM=138.92
I.E.(IN 8")=133.92
I.E.(IN 8")=133.92
I.E.(OUT 8")=133.92
w/ ROLLED CURB DRAIN

C.B. #47 (T-2)
STA 6+68.35, 16.20 R
RIM=144.45
I.E.(IN 8")=138.73
I.E.(IN 6")=138.73
I.E.(OUT 12")=138.23
w/ ROLLED CURB DRAIN

70 L.F.~12" SCH. A @ S=1.00%

C.B. #62 (T-1)
STA 5+18.57, -14.01 L
RIM=141.93
I.E.(IN 8")=138.90

99 L.F.~12" SCH. A @ S=1.00%

99 L.F.~12" SCH. A @ S=5.31%

C.B. #40 (T-1)
STA 5+32.51, 122.37 R
RIM=142.20
I.E.(IN 6")=137.20
I.E.(IN 15")=136.45
I.E.(OUT 12")=136.70
w/ ROLLED CURB DRAIN

99 L.F.~12" SCH. A @ S=10.36%

70 L.F.~8" SCH. A @ S=10.36%

29 L.F.~8" SCH. A @ S=4.92%

C.B. #44 (T-2)
STA 3+78.62, 121.35 R
RIM=135.56
I.E.(IN 8")=126.69
I.E.(IN 18")=125.85
I.E.(OUT 18")=125.85
w/ ROLLED CURB DRAIN

11 L.F.~8" SCH. A @ S=5.24%

46 L.F.~18" SCH. A @ S=9.51%

C.B. #41 (T-2)
STA 4+17.60, 145.97 R
RIM=136.22
I.E.(IN 15")=126.20
I.E.(IN 12")=126.44
I.E.(IN 6")=126.94
I.E.(OUT 18")=126.44
w/ ROLLED CURB DRAIN

79 L.F.~15" SCH. A @ S=1.00%

30 L.F.~18" SCH. A @ S=2.00%

C.B. #53 (T-2)
STA 3+13.27, -12.88 L
RIM=124.99
I.E.(IN 18")=117.13
I.E.(OUT 18")=117.13
w/ ROLLED CURB DRAIN

26 L.F.~18" SCH. A @ S=1.99%

49 L.F.~8" SCH. A @ S=1.00%

81 L.F.~8" SCH. A @ S=7.74%

24 L.F.~8" SCH. A @ S=7.54%

C.B. #21 (T-2)
STA 5+85.01, 355.50 R
RIM=158.66
I.E.(IN 8")=152.09
I.E.(IN 6")=152.59
I.E.(IN 8")=152.42
I.E.(OUT 12")=152.09
w/ ROLLED CURB DRAIN

C.B. #22 (T-1)
STA 5+47.11, 356.52 R
RIM=156.10
I.E.(IN 12")=151.10
I.E.(IN 6")=151.60
I.E.(OUT 12")=151.10
w/ ROLLED CURB DRAIN

C.B. #25 (T-1)
STA 1+61.88, 348.06 R
RIM=150.24
I.E.(IN 8")=145.24
I.E.(IN 6")=146.36
I.E.(OUT 12")=145.86
w/ ROLLED CURB DRAIN

81 L.F.~8" SCH. A @ S=6.51%

I.E.(IN 8")=154.23
I.E.(IN 6")=154.40
I.E.(OUT 8")=153.90
w/ ROLLED CURB DRAIN

80 L.F.~12" SCH. A @ S=12.98%

C.B. #27 (T-2)
STA 1+44.98, 290.01 R
RIM=141.78
I.E.(IN 12")=135.53
I.E.(IN 8")=135.86
I.E.(OUT 12")=135.53
w/ ROLLED CURB DRAIN

73 L.F.~12" SCH. A @ S=5.61%

C.B. #29 (T-1)
STA 1+39.97, 218.81 R
RIM=136.46
I.E.(IN 12")=131.46
I.E.(IN 8")=131.63
I.E.(OUT 12")=131.46
w/ ROLLED CURB DRAIN

C.B. #30 (T-1)
STA 1+46.20, 174.63 R
RIM=134.40
I.E.(IN 6")=129.90
I.E.(IN 12")=129.40
I.E.(OUT 12")=129.40
w/ ROLLED CURB DRAIN

61 L.F.~12" SCH. A @ S=2.53%

C.B. #32 (T-2)
STA 1+68.99, 135.70 R
RIM=133.32
I.E.(IN 8")=128.18
I.E.(IN 12")=127.85
I.E.(IN 6")=128.35
I.E.(OUT 15")=127.60
w/ ROLLED CURB DRAIN

C.B. #26 (T-2)
STA 1+39.15, 301.76 R
RIM=141.79
I.E.(IN 6")=135.94
I.E.(OUT 8")=135.77
w/ ROLLED CURB DRAIN

24 L.F.~8" SCH. A @ S=0.39%

C.B. #28 (T-1)
STA 1+30.48, 217.16 R
RIM=136.47
I.E.(OUT 8")=131.87
w/ ROLLED CURB DRAIN

24 L.F.~8" SCH. A @ S=1.00%

47 L.F.~12" SCH. A @ S=4.42%

C.B. #31 (T-1)
STA 1+64.48, 113.23 R
RIM=133.33
I.E.(OUT 8")=128.43
w/ ROLLED CURB DRAIN

24 L.F.~8" SCH. A @ S=1.03%

62 L.F.~15" SCH. A @ S=1.00%

C.B. #33 (T-2)
STA 2+24.90, 133.31 R
RIM=133.90
I.E.(IN 15")=126.98
I.E.(OUT 15")=126.98
w/ ROLLED CURB DRAIN

C.B. #45 (T-1L)
STA 3+16.05, 59.22 R
RIM=132.44
I.E.(IN 18")=122.02
I.E.(IN 8")=122.02
I.E.(OUT 18")=122.02
w/ ROLLED CURB DRAIN

C.B. #52 (T-1L)
STA 3+14.53, 13.26 R
RIM=122.65
I.E.(IN 18")=117.65
I.E.(IN 12")=117.65
I.E.(OUT 18")=117.65
w/ ROLLED CURB DRAIN

98 L.F.~18" SCH. A @ S=12.64%

C.B. #58 (T-1L)
STA 2+56.56, -85.28 L
RIM=112.83
I.E.(IN 18")=104.76
I.E.(OUT 18")=104.76
w/ ROLLED CURB DRAIN

65 L.F.~18" SCH. A @ S=1.00%

C.B. #59 (T-1L)

CROSSWALK w/ FLASHING WARNING SIGNS

LIGHT POLE

UTILITY POLE

DISPERSE

APPENDIX B DOWNSTREAM ANAYSIS

☒ Define and physically verify the study area. The upstream portion of the study area shall encompass the entire tributary drainage area (the area that drains to the proposed project site). The remaining portion of the study area shall extend downstream of the proposed project discharge location to a point on the drainage system where the proposed project site constitutes 15 percent or less of the total tributary area, but in no event less than ¼ mile.

This project has two separate basins or Threshold Discharge Areas (TDA). They both discharge into Hood Canal located west of the site via a stream south of the site, but they have discharge points that are greater than a quarter mile from each other. It should be noted that this 35-acre project is part of the 289 acre tribal property and is 12% of the overall property. Additionally, 13.8 acres of the project area will be maintained as native vegetation.

☒ Review all available resource information regarding existing and potential water quality, runoff volumes and rates, flooding and streambank erosion problems within the study area.

There has been no evidence of flooding or streambank erosion in the downstream drainage course. With a wetpool/detention pond that will retain water in the wetpool for water quality mitigation, and the detention pond designed to release flows at the allowable pre-developed rate, there are no potential problems in the downstream drainage course due to this development. Additionally, 5.15 acres of the developed site will be dispersed.

☒ Physically inspect the existing on-site and off-site drainage system problems reported in the resources.

There are no drainage system problems anticipated with this project.

☒ On a map (minimum USGS 1:24000 Quadrangle Topographic Map) delineate the study area, together with the drainage system onto and from the proposed site.

Please refer to the Kitsap County GIS/LIDAR map attached to this analysis.

☒ Describe in a narrative form observations regarding the makeup and general condition of the drainage system.

The west basin TDA drains to the west as sheet flow towards Hood Canal Drive NE west of the site and then to Hood Canal Lane NE. The drainage system in the roadway drains to the south for approximately a half mile, before draining to the stream to the south. . The stream then discharges into Hood Canal 500 feet west.

The east basin TDA drains along the west margin of Little Boston Road NE for approximately 500 feet south of the site to the stream that drains to Hood Canal approximately one-half mile.

☒ Include such information as pipe sizes, channel characteristics, and stormwater facilities.

There is a 12" culvert in the west side of Little Boston Road NE south of the site. There is no other pipe size information available from Hood Canal Lane NE.

CANAL

S'KLALLAM

PROJECT SITE

NE

HOOD CANAL DRIVE NE

HOOD CANAL LANE NE

INDIAN

RESERVATION

KLOOMACKIN PLACE NE

SALMON BERRIES LANE NE

LITTLE BOSTON ROAD NE

OLD RED CEDAR LOOP NE

ROAD DRAWN FROM ROAD NAME DOCS PROVIDED BY DCD CS 11/12/2020

APPENDIX C SIGHT DISTANCE ANALYSIS

SIGHT DISTANCE ANALYSIS
N. Kloomachin

1. REFERENCES

A Policy On Geometric Design of Highways and Streets . American Association of State Highway and Transportation Officials, 2018,7th edition, second printing,Section 9.5

2. CONDITIONS OF PROPOSED INTERSECTION

North Kloomachin & Hood Canal Drive NE (NORTH ENTRY)

POSTED SPEED LIMIT =	25	mph
DESIGN SPEED =	25	mph
NUMBER OF LANES	2	

3. SUMMARY OF REQUIRED SIGHT DISTANCES

CASE B1 - LEFT TURNS FROM MINOR ROAD

Required Sight Distance =	276	feet
Available Sight Distance =	276	feet

CASE B2 - RIGHT TURNS FROM MINOR ROAD

Required Sight Distance =	239	feet
Available Sight Distance =	239	feet

CASE F - LEFT TURNS FROM THE MAJOR ROAD

Required Sight Distance =	**202**	feet
Available Sight Distance =	202	feet

4. ADDITIONAL COMMENTS

Case B1 - LEFT TURNS FROM MINOR ROAD requires 276 feet . The sight distance is met. Case B2 RIGHT TURNS FROM MINOR ROAD requires 239 feet. This minimum sight distance is met. Case F LEFT TURN FROM MAJOR ROAD requires 202 feet of sight distance. The sight disance for a left turn from Hood Canal Drive NE into the north entry would also be met.

CASE B1 - LEFT TURNS FROM MINOR ROAD

SIGHT DISTANCE ANALYSIS
N. Kloomachin

REQUIRED SIGHT DISTANCE

$ISD = 1.47 V_{major}\, t_g$ (Eq. for calculating minimum required sight dista

ISD = Intersection sight distance
V_{major} = Design speed of major road, mph
t_g =Time gap for minor road vehicle to enter the major road

t_g=	7.5	seconds (Ex. 9-54, pg. 664)
ISD =	275.6	feet
Minimum Sight Distance =	**276**	**feet**

CASE B2 - RIGHT TURNS FROM MINOR ROAD

REQUIRED SIGHT DISTANCE

$ISD = 1.47 V_{major}\, t_g$ (Eq. for calculating minimum required sight dista

ISD = Intersection sight distance
V_{major} = Design speed of major road, mph
t_g =Time gap for minor road vehicle to enter the major road

t_g=	6.5	seconds (Ex. 9-57, pg. 668)
ISD =	238.9	feet
Minimum Sight Distance =	**239**	**feet**

CASE F - LEFT TURNS FROM THE MAJOR ROAD

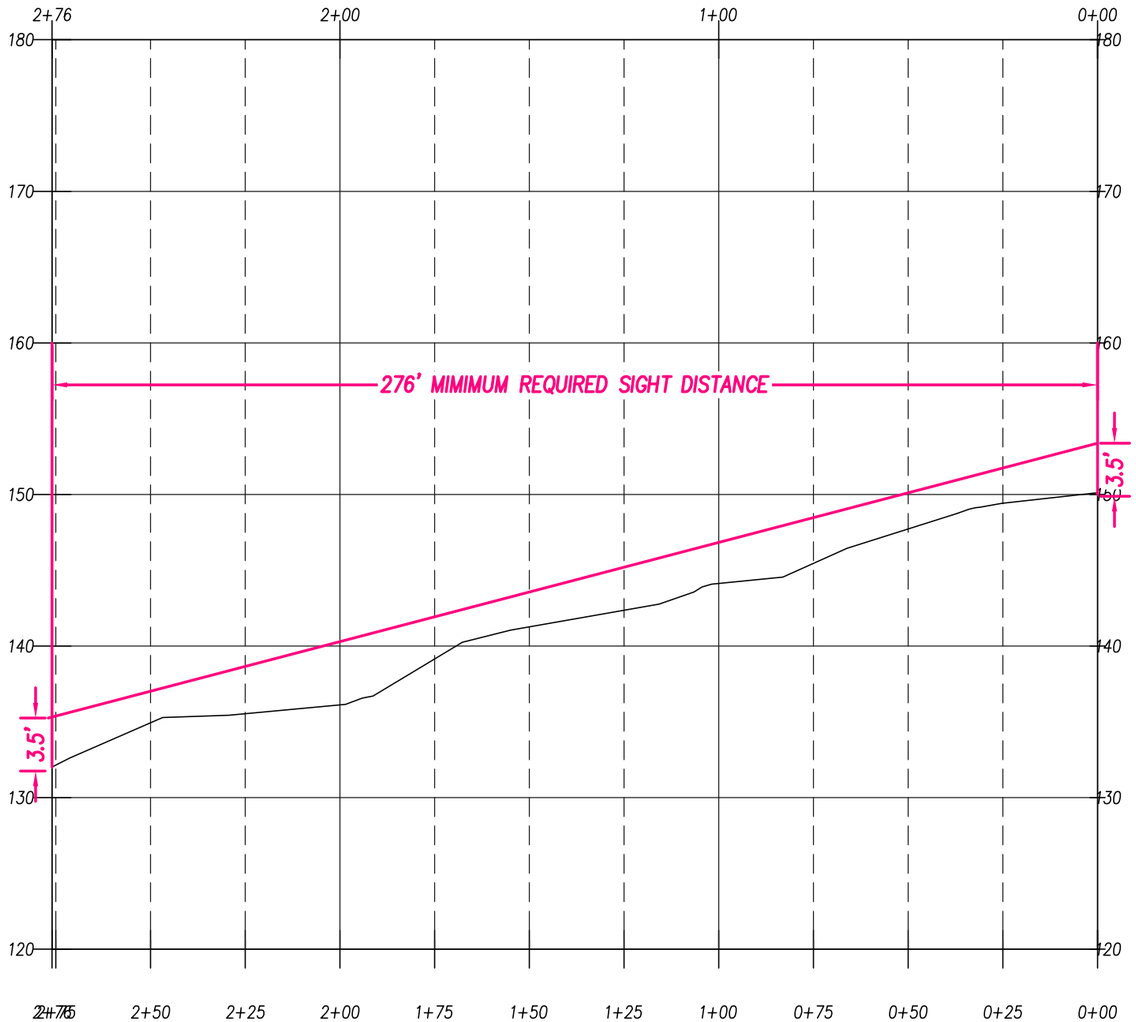
REQUIRED SIGHT DISTANCE

$ISD = 1.47 V_{major}\, t_g$ (Eq. for calculating minimum required sight dista

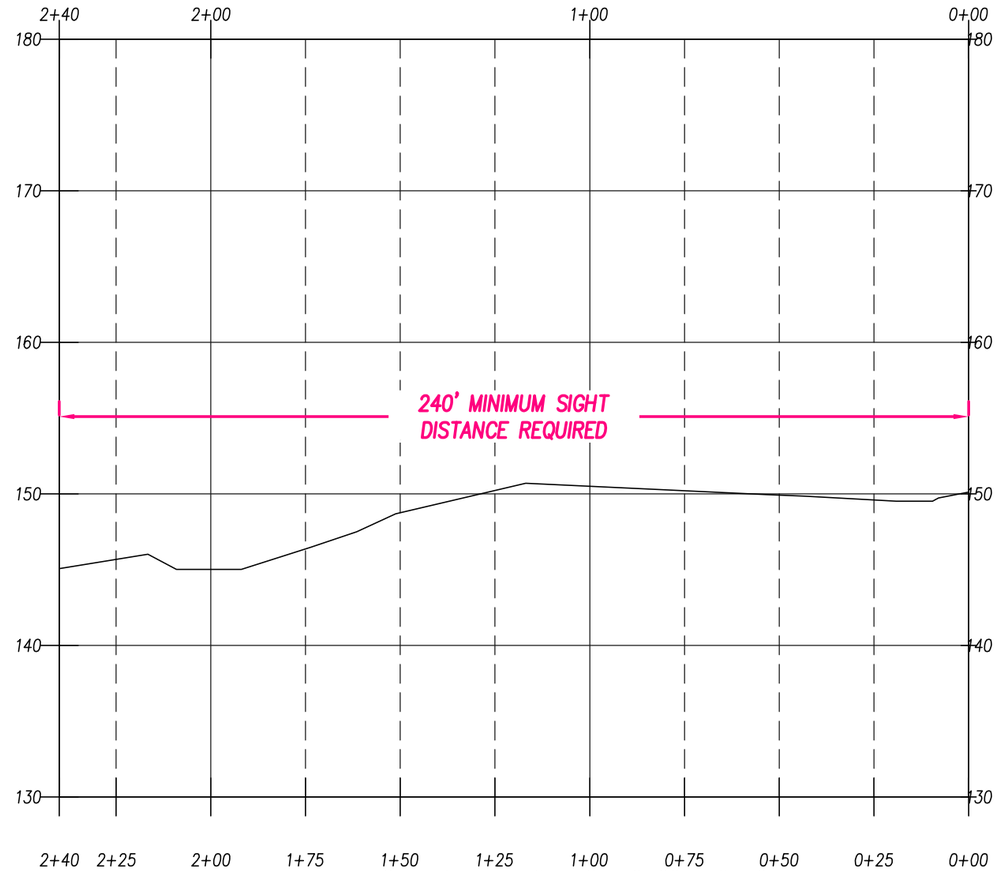
SIGHT DISTANCE ANALYSIS
N. Kloomachin

ISD = Intersection sight distance
V_{major} = Design speed of major road, mph
t_g =Time gap for major road vehicle to enter the minor road

t_g =	5.5	seconds	(Ex. 9-66, pg. 678)
ISD =	202.1	feet	
Minimum Sight Distance =	**202**	**feet**	



North Entry Sight Distance Left STA 0+00 – 2+76
1"=40' Horiz
1"=10' Vert



North Entry Sight Distance Right STA 0+00 – 2+40
1"=40' Horiz
1"=10' Vert

SIGHT VISIBILITY ANALYSIS
N. Kloomachin

1. REFERENCES

A Policy On Geometric Design of Highways and Streets . American Association of State Highway and Transportation Officials, 2018,7th edition, second printing,Section 9.5

2. CONDITIONS OF PROPOSED INTERSECTION

North Kloomachin & Hood Canal Drive NE (SOUTH ENTRY)

POSTED SPEED LIMIT =	25	mph
DESIGN SPEED =	25	mph
NUMBER OF LANES	2	

3. SUMMARY OF REQUIRED SIGHT DISTANCES

CASE B1 - LEFT TURNS FROM MINOR ROAD

Required Sight Distance =	276	feet
Available Sight Distance =	276	feet

CASE B2 - RIGHT TURNS FROM MINOR ROAD

Required Sight Distance =	239	feet
Available Sight Distance =	239	feet

CASE F - LEFT TURNS FROM THE MAJOR ROAD

Required Sight Distance =	202	feet
Available Sight Distance =	202	feet

4. ADDITIONAL COMMENTS

Case B1 - LEFT TURNS FROM MINOR ROAD requires 276 feet . A portion of Lot 32 will need to be cleared and planted with low vegetation to maintain the minimum sight distance. If this is maintained, the minimum sight distance for this case is met. Case B2 RIGHT TURNS FROM MINOR ROAD requires 239 feet. The minimum sight distance is met. Case F LEFT TURN FROM MAJOR ROAD requires 202 feet of sight distance. The sight disance for a left turn from Hood Canal Drive NE into the south entry would be met.

SIGHT VISIBILITY ANALYSIS
N. Kloomachin

CASE B1 - LEFT TURNS FROM MINOR ROAD

REQUIRED SIGHT DISTANCE

$$\mathbf{ISD = 1.47V_{major}\,t_g}$$ (Eq. for calculating minimum required sight distance)

ISD = Intersection sight distance
V_{major} = Design speed of major road, mph
t_g =Time gap for minor road vehicle to enter the major road

t_g=	7.5	seconds (Ex. 9-54, pg. 664)
ISD =	275.6	feet
Minimum Sight Distance =	**276**	**feet**

CASE B2 - RIGHT TURNS FROM MINOR ROAD

REQUIRED SIGHT DISTANCE

$$\mathbf{ISD = 1.47V_{major}\,t_g}$$ (Eq. for calculating minimum required sight distance)

ISD = Intersection sight distance
V_{major} = Design speed of major road, mph
t_g =Time gap for minor road vehicle to enter the major road

t_g=	6.5	seconds (Ex. 9-57, pg. 668)
ISD =	238.9	feet
Minimum Sight Distance =	**239**	**feet**

SIGHT VISIBILITY ANALYSIS
N. Kloomachin

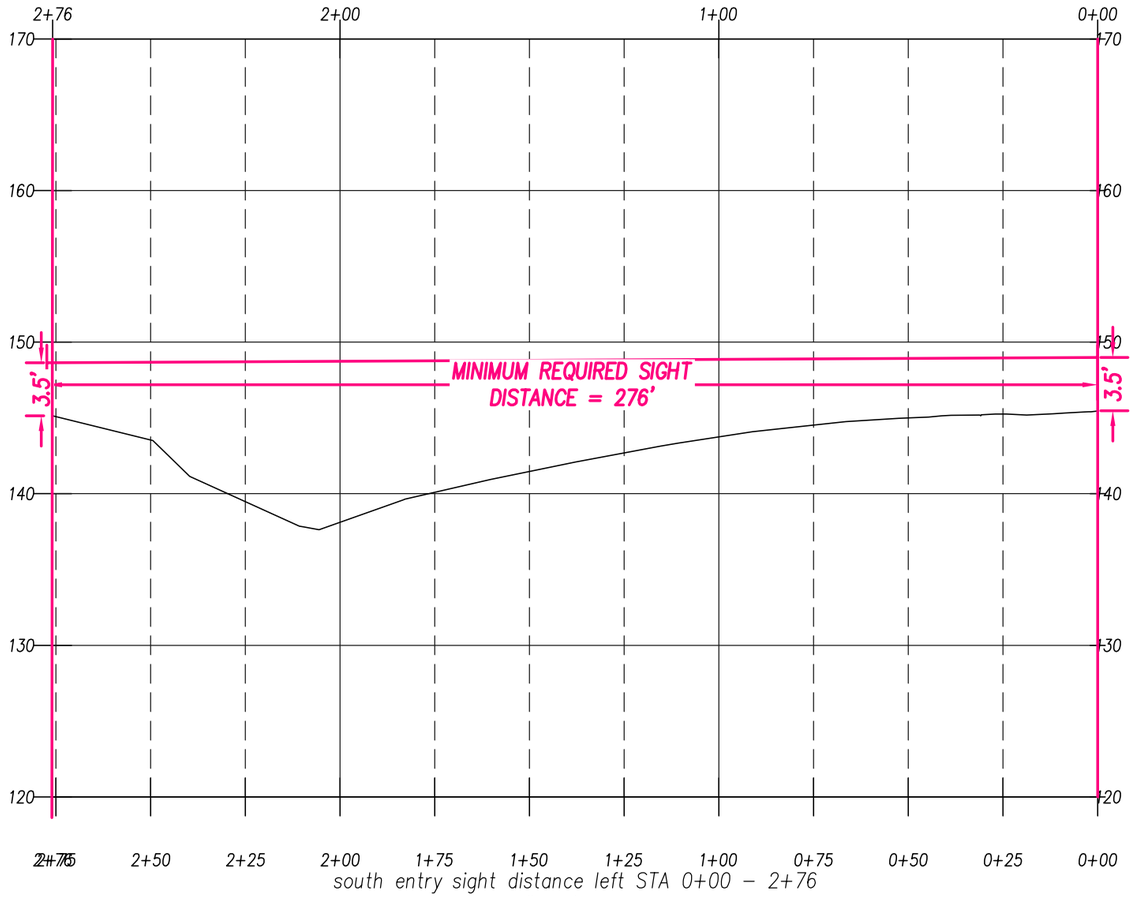
CASE F - LEFT TURNS FROM THE MAJOR ROAD

REQUIRED SIGHT DISTANCE

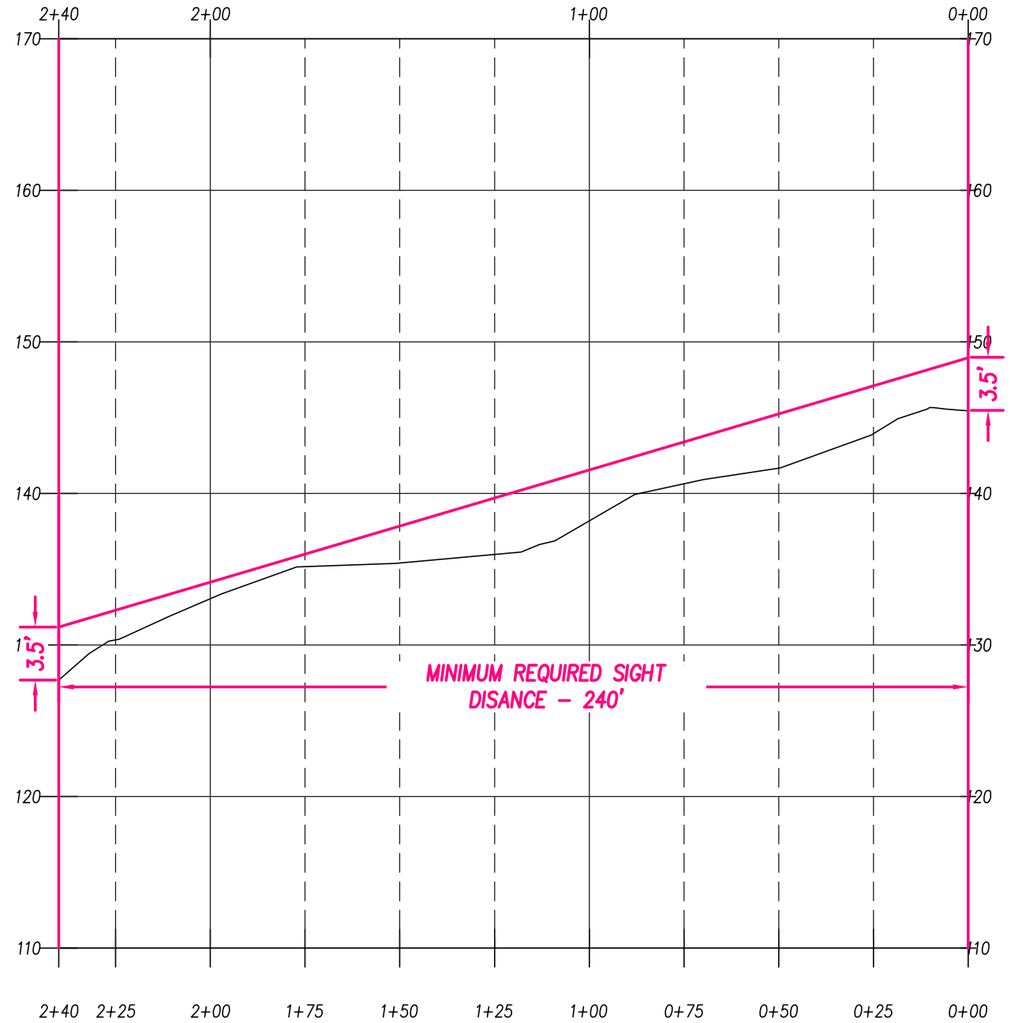
$\mathbf{ISD = 1.47V_{major}\, t_g}$ (Eq. for calculating minimum required sight distance)

ISD = Intersection sight distance
V_{major} = Design speed of major road, mph
t_g =Time gap for major road vehicle to enter the minor road

t_g =	5.5	seconds (Ex. 9-66, pg. 678)
ISD =	202.1	feet
Minimum Sight Distance =	**202**	**feet**



south entry sight distance left STA 0+00 – 2+76
1"=40' Horiz
1"=10' Vert



South Entry Sight Distance Right STA 0+00 – 2+40
1"=40' Horiz
1"=10' Vert

LOT 1
10,900 sf

LOT 2
10,895 sf

LOT 3
14,720 sf

LOT 32
11,005 sf

LOT 33
11,040 sf

LOT 37
11,0[illegible] sf

LOT 38
10,930 sf

LOT 39
10,895 sf

PARK TRACT
12,498 SF

THIS AREA OF LOT 32 TO BE CLEARED OF TREES AND MAINTAINED WITH LOW VEGETATION TO MAINTAIN SIGHT DISTANCE.

NORTH ENTRY MINIMUM SIGHT DISTANCE LEFT – 276'

SOUTH ENTRY MINIMUM SIGHT DISTANCE RIGHT–240'

NORTH ENTRY MINIMUM SIGHT DISTANCE RIGHT –240'

SOUTH ENTRY MINIMUM SIGHT DISTANCE LEFT–276'

14'

14'

16'

138'

BT

BP

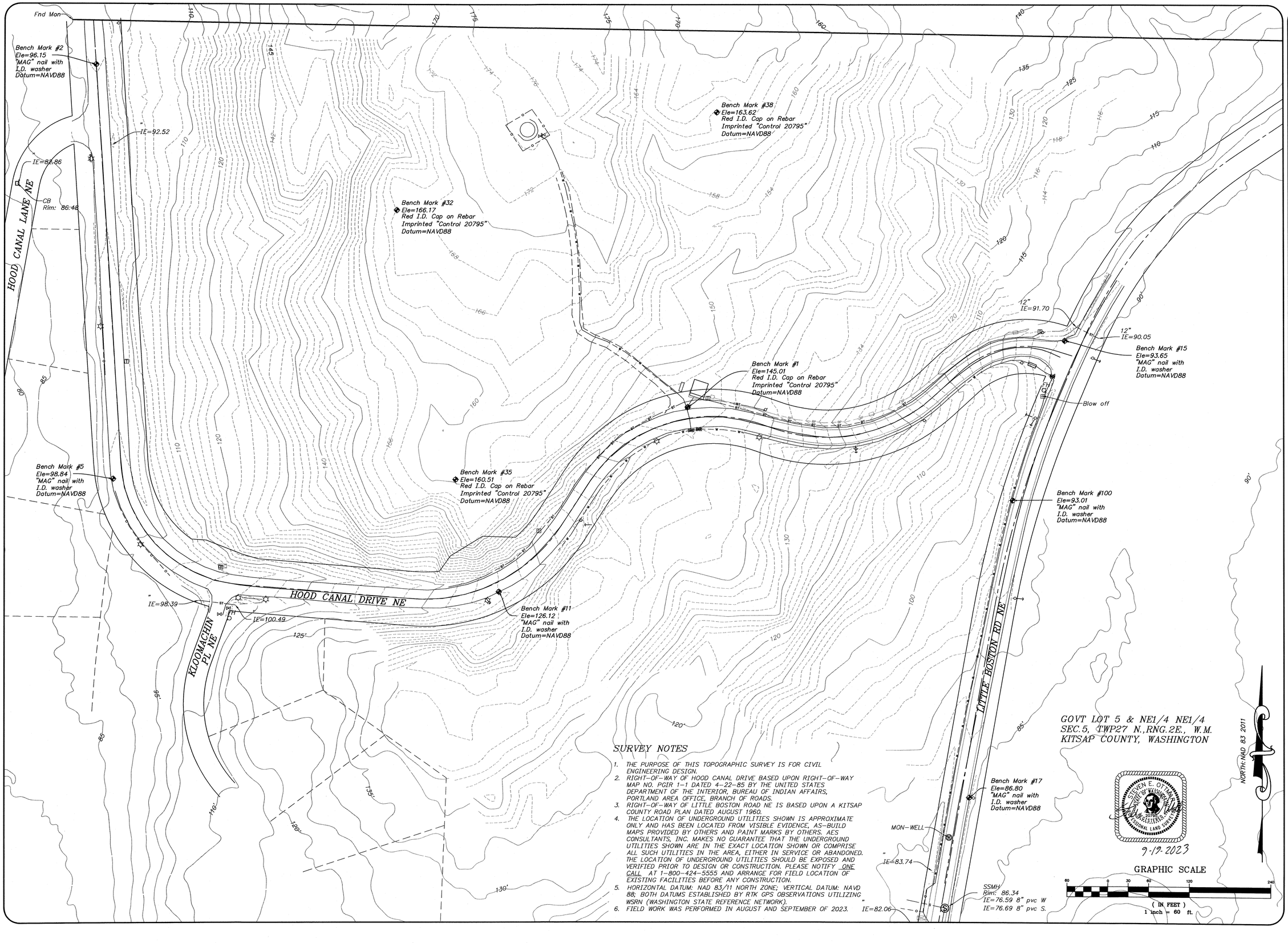
APPENDIX D TRIP GENERATION

According to the Institute of Transportation Engineers (ITE) 10th edition for Classification 210 SINGLE FAMILY RESIDENTIAL the peak traffic generated per day is 9.44 vehicle trip ends per dwelling unit. This project consists of 39 lots and will generate 368 vehicle trip ends per day.

The traffic rate generated during the peak hour between 7 am to 9 am is 0.74 Vehicle Trip Ends (VTE) per dwelling unit. The traffic generated by this 39-lot plat during the a.m. peak hour is 29 VTE with 25% entering (7 VTE) and 75% exiting (22 VTE).

The traffic rate generated during the peak hour between 4pm to 6pm is 0.99 Vehicle Trip Ends (VTE) per dwelling unit. The traffic generated by this 39-lot plat during the peak p.m. hour is 39 VTE with 63% entering (25 VTE) and 37% exiting (14 VTE).

APPENDIX E TOPOGRAPHIC SURVEY



SURVEY NOTES

1. THE PURPOSE OF THIS TOPOGRAPHIC SURVEY IS FOR CIVIL ENGINEERING DESIGN.
2. RIGHT-OF-WAY OF HOOD CANAL DRIVE BASED UPON RIGHT-OF-WAY MAP NO. PGIR 1-1 DATED 4-22-85 BY THE UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF INDIAN AFFAIRS, PORTLAND AREA OFFICE, BRANCH OF ROADS.
3. RIGHT-OF-WAY OF LITTLE BOSTON ROAD NE IS BASED UPON A KITSAP COUNTY ROAD PLAN DATED AUGUST 1960.
4. THE LOCATION OF UNDERGROUND UTILITIES SHOWN IS APPROXIMATE ONLY AND HAS BEEN LOCATED FROM VISIBLE EVIDENCE, AS-BUILD MAPS PROVIDED BY OTHERS AND PAINT MARKS BY OTHERS. AES CONSULTANTS, INC. MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION SHOWN OR COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE LOCATION OF UNDERGROUND UTILITIES SHOULD BE EXPOSED AND VERIFIED PRIOR TO DESIGN OR CONSTRUCTION. PLEASE NOTIFY ONE CALL AT 1-800-424-5555 AND ARRANGE FOR FIELD LOCATION OF EXISTING FACILITIES BEFORE ANY CONSTRUCTION.
5. HORIZONTAL DATUM: NAD 83/11 NORTH ZONE; VERTICAL DATUM: NAVD 88; BOTH DATUMS ESTABLISHED BY RTK GPS OBSERVATIONS UTILIZING WSRN (WASHINGTON STATE REFERENCE NETWORK).
6. FIELD WORK WAS PERFORMED IN AUGUST AND SEPTEMBER OF 2023.

REV.	DATE	BY	DESCRIPTION

DATE 9/19/23
DRAWN B.J.M.
CHECKED S.E.O.
DWG. FILE BASE

TOPOGRAPHY MAP

KLOOMACHIN NORTH
For: PORT GAMBLES'KLALLAM TRIBE.

© AESCS, INC. These drawings were prepared for this project only and are not intended for use on any other project.

AES CONSULTANTS, INC.
P.O. BOX 930 / 3472 N.W. LOWELL • SILVERDALE, WA. 98383 • (360)692-6400

JOB NO.
8056

SHEET
1/1

APPENDIX F GEOTECHNICAL ENGINEERING REPORT

GEOTECHNICAL ENGINEERING INVESTIGATION
NORTH KLOOMACHIN SUBDIVISION
PORT GAMBLE S'KLALLAM TRIBE
HOOD CANAL DRIVE NE
KINGSTON, WASHINGTON

PROJECT NO. 102-23017
OCTOBER 2, 2023

Prepared for:

MAP LTD.
P.O. BOX 720
SILVERDALE, WASHINGTON 98383

Prepared by:

KRAZAN & ASSOCIATES, INC.
GEOTECHNICAL ENGINEERING DIVISION
1230 FINN HILL RD. NW, SUITE A
POULSBO, WASHINGTON 98370
(360) 598-2126

Krazan & ASSOCIATES, INC.

GEOTECHNICAL ENGINEERING • ENVIRONMENTAL ENGINEERING
CONSTRUCTION TESTING & INSPECTION

October 2, 2023 KA Project No. 102-23017

MAP Ltd.
P.O. Box 720
Silverdale, Washington 98383

Attn: Mr. Pat Fuhrer
Email: patf@map-limited.com
Tel: 360-692-5525

Reference: **Geotechnical Engineering Investigation**
North Kloomachin Subdivision
Port Gamble S'Klallam Tribe
Hood Canal Drive NE
Kingston, Washington

Dear Mr. Fuhrer

In accordance with your request, we have completed a Geotechnical Engineering Investigation for the referenced site. The results of our investigation are presented in the attached report.

If you have any questions, or if we can be of further assistance, please do not hesitate to contact our office.

Respectfully submitted,
KRAZAN & ASSOCIATES, INC.



Vijay Chaudhary, P.E.
Project Engineer

AG:EA:VC

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October 2, 2023 KA Project No. 102-23017

GEOTECHNICAL ENGINEERING INVESTIGATION
NORTH KLOOMACHIN SUBDIVISION
PORT GAMBLE S'KLALLAM TRIBE
HOOD CANAL DRIVE NE
KINGSTON, WASHINGTON

INTRODUCTION.

This report presents the results of our geotechnical engineering investigation for the proposed North Kloomachin Subdivision project located on the Port Gamble S'Klallam Reservation on Hood Canal Drive NE in Kingston, Washington, as shown on the Vicinity Map in Figure 1. Discussions regarding site conditions and geological hazards are presented in this report, together with conclusions and recommendations pertaining to site preparation, excavations, structural fill, utility trench backfill, foundations, pavement design, stormwater infiltration, drainage, and erosion control.

The approximate locations of the explorations are presented following the text of this report on the Site Plan in Figure 2. A description of the field investigation and laboratory testing as well as the exploration logs are presented in Appendix A. Appendix B contains a guide to aid in the development of earthwork specifications. Pavement design guidelines are presented in Appendix C. The recommendations in the main text of the report have precedence over the more general specifications in the appendices. For our use in preparing this report, we were provided and have reviewed the following documents:

- A topographic map with survey points, prepared by AES Consultants Inc., dated August 7, 2023
- North Kloomachin Feasibility, pages 1 through 3, prepared by MAP Ltd., dated April 21, 2022.
- Initial Assessment Report for North Kloomachin Subdivision, prepared by Port Gamble S'Klallam Tribe Natural Resources Department, dated November 22, 2022.

PURPOSE AND SCOPE.

This investigation was conducted to evaluate the subsurface soil and groundwater conditions at the subject property, to develop geotechnical engineering recommendations for use in the design of specific construction elements, and to provide criteria for site preparation and earthwork construction.

Our scope of services was performed in general accordance with our proposal for this project, dated May 1, 2023 (Proposal Number G23024WAP) and included the following:

- Exploration of the subsurface soil and groundwater conditions by conducting fourteen (14) geotechnical test pits to depths ranging from 4.5 feet to 10.0 feet below existing ground surface (bgs) using a subcontracted excavator and operator;
- Exploration of the subsurface soil and groundwater conditions by conducting two (2) geotechnical borings, both to depths of 91.5 feet bgs using a subcontracted track mounted drill rig and operator;
- Prepare a site plan showing the locations of the test pits and soil borings;
- Prepare comprehensive exploration logs including soil stratification and classification, and groundwater levels where applicable;
- Provide geotechnical engineering evaluation and opinions regarding slope stability and structure setback distance from the western steep slopes;
- Provide shallow foundation recommendations for the proposed structures including allowable bearing pressure, anticipated settlements (both total and differential), coefficient of horizontal friction, and frost penetration depth;
- Provide recommendations for seismic design considerations including site coefficient and ground acceleration based on the 2018 IBC.
- Provide soil parameters for the design of slab-on-grade, as well as subgrade preparation, slab drainage, capillary break, and/or moisture barriers ;
- Provide recommendations for retaining wall design including lateral earth pressures (active and passive);
- Discuss construction and excavation considerations, topsoil/unsuitable soil stripping depth, identification of potentially problematic soils or groundwater conditions, and depth of over-excavation if required;
- Provide recommendations for structural fill materials, placement, and compaction;
- Provide recommendations regarding the suitability of on-site soils as structural fill;
- Provide recommendations for temporary excavations;
- Provide recommendations for site drainage and erosion control;
- Provide recommendations for the pavement design.

Environmental services, such as chemical analysis of soil and groundwater for possible environmental contaminants, are not included in our scope of services for this project

PROPOSED DEVELOPMENT

Based on our communications with the project civil engineer (MAP Ltd.) and our review of the available plan sheets, we understand that the site development will include design and construction of approximately 50 single-family residential lots. We understand that development will also consist of design and construction of associated roads, utilities, and landscape areas. We also understand that onsite stormwater management is being considered to manage the runoff from the proposed impervious areas.

SITE DESCRIPTION AND SURFACE CONDITIONS

The project site is located on the northern-most end of the Port Gamble S'Klallam Reservation (APN: 052702-1-001-2005) and covers an area of approximately 40 acres. The site can be accessed from Hood Canal Drive NE. The site is bounded by Little Boston Road to the east and by Hood Canal Drive Northeast to the west, which also crosses the south-central portion of the site as shown on Figures 1 & 2 attached to this report. The site can be access via gravel service road on the north side of Hood Canal Drive Northeast.

The planned development is on upland areas overlooking a west descending slope down to the entrance to Hood Canal, and the southeast descending slope of a ravine draining southwest to Hood Canal. The highest elevation of the site is in the north-central portion at 184 feet. The lowest elevation of the site is in the southeast portion at 90 feet. The western-portion of the site generally slopes to the west at an inclination of approximately 7.5 degrees (13 percent), from an elevation of approximately 170 to 95 feet. The eastern-portion of the site generally slopes to the southeast at an inclination of approximately 5 degrees (9 percent), from an elevation of approximately 170 to 90 feet. Moderate to steep south-southwest descending slopes located in the west-central portion of the site as well as a southeast descending slope in the east-central portion of the site have inclinations of up to about 24 degrees (45 percent). These slopes are addressed in the Geologic Hazards section of this report. Generally, the site is moderately to heavily vegetated with mature trees and underbrush

GEOLOGIC SETTING

The site lies within the central Puget Lowland. The lowland is part of a regional north-south trending trough that extends from southwestern British Columbia to near Eugene, Oregon. North of Olympia, Washington, this lowland is glacially carved, with a depositional and erosional history including at least four separate glacial advances/retreats. The Puget Lowland is bounded to the west by the Olympic Mountains and to the east by the Cascade Range. The lowland is filled with glacial and nonglacial sediments.

The Geologic Map Units of Kitsap County Washington, (DNR, April 2017), indicates that the site vicinity is underlain between Pleistocene continental glacial till and undifferentiated outwash. Glacial till is a compact deposit of clay, silt, sand, gravel, cobbles, and boulders deposited at the base of the continental

glacier. Undifferentiated outwash consists of proglacial stratified sand, gravel, and cobbles with minor silt and clays deposited in meltwater and stream environments.

FIELD INVESTIGATION

Soil Borings: Two (2) exploratory soil borings were completed to evaluate the subsurface soil and groundwater conditions at the site. The soil borings were completed on August 7th and August 8th, 2023 with a subcontracted drill rig. Both of the soil borings were advanced to a depth of 91.5 feet bgs.

Test Pits: Fourteen (14) exploratory test pits were completed in order to evaluate the subsurface soil and groundwater conditions at the site. The test pits were completed on August 7th and August 8th, 2023 with a subcontracted excavator and operator. The test pits were excavated to depths ranging from approximately 4.5 feet to 10.0 feet bgs.

A geologist from Krazan and Associates was present during the exploration, examined the soil and geologic conditions encountered, obtained samples of the different soil types, and maintained logs of the explorations. Representative samples of the subsurface soils encountered in the geotechnical explorations were collected and sealed in plastic bags. The soils encountered in the exploration were visually classified in general accordance with the Unified Soil Classification System (USCS). These samples were transported to our laboratory for further examination and testing. The approximate locations of the explorations are shown on the Site Plan in Figure 2.

SOIL PROFILE AND SUBSURFACE CONDITIONS

This section of the report is intended to provide a general description of the subsurface conditions. Detailed descriptions of the soils exposed in each of the explorations are presented in the exploration logs in Appendix A.

Organic Topsoil: Our borings and test pits exposed a surficial layer of about 0.2 to 0.5 feet of organic topsoil.

Native Glacial Soils: Underlaying the organic topsoil, our explorations of the site generally encountered/exposed unstratified, moist, medium dense to very dense, light brown to gray silty sand with gravel and cobbles, extending to the explored depths ranging from 4.5 to 91.5 feet bgs. Test pits TP-7 and TP-9 exposed stratified layers of moist, medium dense and very stiff to hard, gray silt, sand, and gravel. We interpreted these soils to be native glacial deposits.

Groundwater Observations: The soil borings and test pits were checked for the presence of groundwater during drilling operations. Groundwater seepage was not observed. However, it is our opinion that perched groundwater could occur at shallow depths on this property, especially during and after prolonged periods of wet weather.

Perched water occurs when surface water infiltrates through less dense, more permeable soils and accumulates on top of a relatively low permeability soil layer. Perched water does not represent a regional groundwater "table" within the upper soil horizons. Perched water tends to vary spatially and is dependent upon the amount of rainfall. We would expect the amount of perched water to decrease during drier times of the year and increase during wetter periods.

Note: Undocumented fill, loose/soft and organic soils were not encountered/exposed in our explorations , but may be present in the unexplored areas of the site.

GEOLOGIC HAZARDS

Erosion Concern/Hazard

The Natural Resources Conservation Services (NRCS) map for the Kitsap County Area, Washington (WA635), classifies the site area as following:

- Poulsbo gravelly sandy loam (0 to 6 percent slopes), Hydrologic soil group B/D;
- Poulsbo-Ragnar complex (0 to 6% slopes), Hydrologic soil group B/D;
- Poulsbo-Ragnar complex (6 to 15% slopes), Hydrologic soil group B/D;

Hydrologic group B/D soils have variable erosion dependent on local groundwater conditions; however, disturbed soil on steep slopes may erode rapidly if water is allowed to concentrate on slopes.

We have reviewed the Kitsap County Critical Areas map, in which the western slopes as well as slopes south adjacent to Hood Canal Drive Northeast in the west-central portion of the site are mapped as moderate erosion hazards. These slopes are mapped as moderate erosion hazard by Kitsap County because they are steeper than 15 percent with “erodible soils” as classified by the NRCS. During our site visit, we did not see any evidence of significant erosion or accumulation of surface water. Our exploration generally exposed/encountered medium dense to very dense and very stiff to hard native glacial soils. Based on our exploration, it is our opinion that the proposed development should not increase the erosion hazard, provided that our recommendations are followed for the design and construction.

It has been our experience that soil erosion due to wind can be minimized by limiting the amount of stripped soil areas exposed during construction activities, frequently wetting the surface soils during construction, and with proper landscaping of the site following completion of construction. Typically, erosion of exposed soils will be most noticeable during periods of rainfall. The potential for erosion may be mitigated by the use of temporary erosion control measures, such as silt fences, hay bales, straw wattles, mulching, control ditches or diversion trenching, and contour furrowing. The walls of excavations should be covered with plastic sheeting, or other erosion control surfacing during periods of rainfall. Erosion control measures should be in place before the onset of wet weather. To minimize erosion concerns, the Erosion and Sediment Control section of this report should be followed. Stormwater runoff should not be allowed to flow over or concentrate on the moderate to steep slopes.

Landslide Hazard

We have reviewed the Kitsap County Critical Areas map, in which the south-southwest descending slopes in the west-central portion of the site as well as a southeast descending slope in the east-central portion of the site have been mapped as moderate landslide hazard areas.

A visual surficial reconnaissance was performed during our site visits on August 7 and 8, 2023. The west-central steep slope overlooks Hood Canal Drive Northeast. The south-southwest descending slope ranges from about 118 to 170 feet in elevation, and has an inclination of about 24 degrees (45 percent). The slope was heavily vegetated with thick brambles, brush, and mature trees.

The east-central steep slope is a road cut on the north side of Hood Canal Drive Northeast. The southeast descending slope ranges from about 104 to 122 feet in elevation, and has an inclination of about 32 degrees (63 percent). The slope was lightly vegetated with grasses, brush, and immature trees.

During our site visit we did not observe signs of recent slide scarps, tension cracks, or slumps within the site that would indicate current deep-seated instability on the steep slopes within the property. Signs of shallow soil movement and soil creep, such as curved tree trunks, were not observed on the slopes of the property. However, it should be noted that soil creep is the gradual, imperceptible downslope movement of surficial soils under the effect of gravity, and is typical on steep slopes. Additionally, our exploration generally exposed/encountered medium dense to very dense native glacial soils, which form the core of the site slopes and are considered to have good shear strength.

The grading plan was not available at the time this report was prepared, however, based on the feasibility plan provided to us, we understand that the existing steep slopes and associated vegetation will not be disturbed during or after construction. Based on our exploration, and our review of the available data, and provided that the recommendations of this report is followed for design and construction, it is our opinion that the proposed development will not adversely impact the site slopes or vice versa.

The slope stability and setbacks are further discussed in the Slope Stability Section of this report.

Seismic Hazard

The 2018 International Building Code (IBC), Section 1613.2.2, refers to Chapter 20 of ASCE 7-16 for seismic Site Class Definitions. It is our opinion that the overall soil profile corresponds to Site Class C as defined by Table 20.3-1 "Site Class Definitions," according to the ASCE 7-16 Standard. Site Class C applies to a "very dense soil and soft rock" profile. The seismic site class is based on a soil profile extending to a depth of 100 feet. The soil explorations on this site extended to a maximum depth of 91.5 feet and this seismic site class designation is based on the assumption that medium dense to very dense, and stiff to hard conditions continue below the depth explored.

We referred to the Applied Technology Council (ATC) website and 2018 IBC to obtain values for S_S, S_{MS}, S_{DS}, S_1, S_{M1}, S_{D1}, F_a, *and* F_v. The ATC website utilizes the most updated published data on seismic

conditions from the United States Geological Survey. The seismic design parameters for this site are presented in the following table:

Seismic Design Parameters
(Reference: 2018 IBC Section 1613.2.2, ASCE 7-16, and ATC)

Seismic Item	Value
Site Coefficient F_a	1.200
S_s	1.302
S_{MS}	1.562
S_{DS}	1.041
Site Coefficient F_v	1.500
S_1	0.462
S_{M1}	0.693
S_{D1}	0.462

Additional seismic considerations include liquefaction potential and amplification of ground motions by soft soil deposits. The liquefaction potential is highest for loose sand with a high groundwater table. The native soils primarily consisting of medium dense to very dense granular soils interpreted to underlie the site are considered to have a low potential for liquefaction and amplification of ground motion.

The Liquefaction Susceptibility Map of Kitsap County, Washington, by Stephen Palmer, et al. (WADNR, September 2004) indicates that the subject site is mapped as an area of very low to low liquefaction susceptibility. Based on our explorations and review of the above-mentioned map, it is our opinion that the site has low liquefaction hazard, and the proposed development should not increase the liquefaction hazard provided that our recommendations are followed for both design and construction.

CONCLUSIONS AND RECOMMENDATIONS

General

It is our opinion from a geotechnical standpoint that the site is compatible with the planned development, provided that the geotechnical engineering recommendations presented in this report are included in the project design and implemented during construction. We recommended that Krazan review the development plans.

Soil Conditions: Our soil explorations generally encountered competent native glacial soils underlying organic topsoil, extending to the maximum depths explored, which ranged from 4.5 to 91.5 feet bgs. Organic debris was encountered at a depth of about 2.0 feet in test pit TP-6. Loose/soft soils, organic debris, or undocumented fill were not encountered below the topsoil in the other explorations. However, there may be layers of loose/soft soils, organic materials, or undocumented fill in unexplored areas of the site.

Cobbles were encountered during our exploration. Glacial till deposits often include cobbles and boulders, which may present some difficulties for excavation and grading on this site.

Generally, the soils exposed/encountered at this site are considered moisture-sensitive and will be easily disturbed and difficult to compact when wet. We recommend that construction take place during extended periods of dry weather in the summer months, if possible. If construction is to take place during wet weather, additional expenses and delays should be expected due to the wet conditions. Additional expenses could include the need for placing a blanket of rock spalls to protect exposed subgrades and construction traffic areas. The on-site granular soils may be suitable for use as structural fill material, provided the moisture content is near optimum and the soil could be suitably compacted to specifications. *This will depend on the moisture content of the soils at the time of construction.* Krazan and Associates should be retained to determine if the on-site soils can be used as structural fill material at the time of construction.

Foundations: Based on our explorations, conventional spread footings supported on medium dense/stiff or firmer native soil, or on structural fill extending to medium dense/stiff or firmer native soil, should provide adequate support for the proposed structures. Detailed geotechnical engineering recommendations for foundation design are presented in this report.

Stormwater Drainage: Proper site grading and drainage should help maintain current stability conditions. A comprehensive drainage plan will be an important part of a successful development project at this site. Surface water runoff should not be allowed to develop concentrated flow over the steep slopes on this property during or after construction. Proper grading and functional drainage systems are important for maintaining the current stable condition of the site slopes.

We understand that onsite stormwater management systems/ponds are also being considered in the northwest and southeast portions of the site. We conducted test pits TP-14 and TP-12 in the proposed stormwater management areas. However, shallow exposure of very low permeability very dense silty sand in TP-14 and very stiff to hard cohesive soils in TP-12, indicate that onsite stormwater infiltration is not feasible.

Site Preparation

In general site clearing should include removal of any vegetation and associated root systems; wood; abandoned utilities; structures including foundations, rubble; and rubbish. After stripping of organic topsoil is completed, the building pad and pavement areas should be proof-rolled with a loaded tandem-axle dump truck and be visually inspected to identify any loose/soft areas.

Subgrade Preparation: In the planned structural areas, organic soil and loose/soft soils should be excavated to expose the underlying firm native soils. The resulting excavations should be filled to the planned bottom of the structure's subgrade elevations with suitable soils as per the **Structural Fill** section of this report. Based on our soil explorations, we interpret the medium dense/stiff or firmer native load

bearing soils at this site to be about 1 to 2 feet bgs. There may be thicker layers of loose/soft soils, organic materials, or undocumented fill in unexplored areas of the site.

During wet weather conditions, which typically occur from October through May, subgrade stability problems and grading difficulties may develop due to excess moisture, disturbance of moisture sensitive soils and/or the presence of perched groundwater. Earthwork construction during extended periods of wet weather could create the need to remove wet disturbed soils if they cannot be suitably compacted due to elevated moisture contents. The soils exposed/encountered at the site are considered moisture-sensitive. If over-excavation is necessary, it should be confirmed through continuous monitoring and testing by a qualified geotechnical engineer or geologist. Soils that have become unstable may require drying to near their optimal moisture content before compaction is feasible. Selective drying may be accomplished by scarifying or windrowing surficial material during extended periods of dry, warm weather (typically during the summer months). If the soils cannot be dried back to a workable moisture condition, remedial measures may be required. Preparation of the site for wet weather conditions may consist of the placement of a layer of aggregate base for the protection of exposed soils during construction.

It should be understood that even if Best Management Practices (BMPs) for soil protection are implemented for the wet season, there is a significant chance that additional soil mitigation work will be needed.

Any buried structures encountered during construction should be completely removed and backfilled with structural fill. Excavations, depressions, or soft and pliant areas extending below the planned subgrade elevations should be excavated to expose medium dense or firmer soil, and be backfilled with structural fill. In general, any septic tanks, underground storage tanks, debris pits, cesspools, or similar structures and deleterious materials should be completely removed. Any concrete footings encountered in the planned foundation area should be removed to depth of at least 3 feet below proposed footing elevations or as recommended by the geotechnical engineer. The resulting excavations should be backfilled with structural fill.

All fill on the sloping areas should be placed as structural fill. Where fills greater than 8 feet are to be constructed on original ground that slopes at inclinations steeper than 6:1 (horizontal to vertical), benches should be cut into the existing slope as the filling operations proceed. Each bench should consist of a level terrace, a minimum of 4 to 8 feet wide (based on the width of the equipment utilized), with the rise to the next bench held to 4 feet or less. Where fills of comparable height will be constructed on ground that slopes at an inclination steeper than 4:1 (horizontal to vertical), a keyway should be provided along the toe of the fill slope in addition to the benches. Each keyway should consist of a level trench at least 8 feet wide and at least 2 feet deep, with side slopes not exceeding 1:1 (horizontal to vertical), cut into the existing slope.

Permanent fill slopes should be no steeper than 2 to 1 (horizontal to vertical). Fill materials should not be placed in any section of the slope until the subgrade for that section has been suitably prepared and evaluated by a representative of the geotechnical engineer. Brush, roots, sod or any other organic, perishable or unsuitable material should not be placed in the fill slope.

Site grading near the crowns of the reconstructed slopes should be accomplished, such that, excessive sheet run-off is prevented. The completed slopes should be seeded or otherwise vegetated to protect from future erosion. Well vegetated slopes at the recommended configuration should be reasonably protected from typical erosional effects. However, vegetation on the slopes may not provide protection from unusual flow conditions, such as flood events or concentrations of stormwater runoff occurring on the slopes.

A representative of our firm should be available on request during all grading operations to observe, test and evaluate earthwork construction. These testing and observation processes are an integral part of our service, as acceptance of earthwork construction is dependent upon compaction and stability of the material. The geotechnical engineer may reject any material that does not meet compaction and stability requirements. Further recommendations, contained in this report, are predicated upon the assumption that earthwork construction will conform to the recommendations set forth in this section and in the Structural Fill section of this report.

Structural Fill

Fill placed beneath foundations or other settlement-sensitive structures should be placed as structural fill. Structural fill, by definition, is placed in accordance with prescribed methods and standards, and is monitored by an experienced geotechnical professional. Field monitoring procedures would include the performance of a representative number of in-place density tests to document the attainment of the desired degree of relative compaction. A representative of the geotechnical engineer should evaluate the subgrade prior to structural fill placement.

BMP's should be followed when considering the suitability of the existing materials for use as structural fill. The native granular soils may be suitable for reuse as structural fill, provided the soil is free of organic material and debris, and it is within ± 2 percent of the optimum moisture content. Laboratory testing of some of the on-site soils indicated percentage of silt and clay (passing no. 200 sieve) to be greater than 5. It should be noted that the on-site soils with silt and clay content greater than 5 percent will be difficult to compact during the wet weather. Cobbles and boulders were noted at the time of our exploration. C*obbles and boulders should be screened from the soil prior to use as structural fill.* If the on-site soils are stockpiled for later use as structural fill, the stockpiles should be covered to protect the soil from wet weather conditions. We recommend that a representative of Krazan & Associates be on site during the excavation work to determine which soils are suitable for placement as structural fill.

Imported, all weather granular structural fill material should consist of well-graded gravel or a sand and gravel mixture with a maximum grain size of 3 inches and less than 5 percent fines (material passing the U.S. Standard No. 200 Sieve). Structural fill can also consist crushed rock, rock spalls and controlled density fill (CDF). All structural fill material should be submitted for approval to the geotechnical engineer at least 48 hours prior to delivery to the site.

Structural fill soils should be placed in horizontal lifts not exceeding 8 inches in thickness prior to compaction, moisture-conditioned as necessary, (moisture content of soil shall not vary by more than ±2

percent of optimum moisture) and the material should be compacted to at least 95 percent of the maximum dry density based on ASTM D1557 Test Method. In-place density tests should be performed on all structural fill to document proper moisture content and adequate compaction. Additional lifts should not be placed if the previous lift did not meet the compaction requirements or if soil conditions are not considered stable.

Temporary Excavations

The on-site soils have variable cohesion strengths, therefore the safe angles to which these materials may be cut for temporary excavations is limited, as the soils may be prone to caving and slope failures in temporary excavations deeper than 4 feet. Temporary excavations in the existing materials should be sloped no steeper than 1H:1V where room permits. Flatter inclinations may be necessary where caving conditions, and groundwater seepage are encountered. Steeper cuts up to ½H:1V may be feasible in the very dense glacial soil.

All temporary cuts should be in accordance with Washington Administrative Code (WAC) Part N, Excavation, Trenching, and Shoring. The temporary slope cuts should be visually inspected daily by a qualified person during construction work activities and the results of the inspections should be included in daily reports. The contractor is responsible for maintaining the stability of the temporary cut slopes and minimizing slope erosion during construction. The temporary cut slopes should be covered with plastic sheeting to help minimize erosion during wet weather and the slopes should be closely monitored until the permanent retaining systems are complete. Materials should not be stored and equipment operated within 10 feet of the top of any temporary cut slope.

A Krazan & Associates geologist or geotechnical engineer should observe the temporary cut slopes, at least periodically, during the excavation work. The reason for this is that all soil conditions may not be fully delineated by the limited sampling of the site from the geotechnical explorations. In the case of temporary slope cuts, the existing soil conditions may not be fully revealed until the excavation work exposes the soil. Typically, as excavation work progresses the maximum inclination of the temporary slope will need to be evaluated by the geotechnical engineer so that supplemental recommendations can be made. Soil and groundwater conditions can be highly variable. Scheduling for soil work will need to be adjustable, to deal with unanticipated conditions, so that the project can proceed smoothly and required deadlines can be met. If any variations or undesirable conditions are encountered during construction, Krazan & Associates should be notified so that supplemental recommendations can be made.

Slope Stability Analysis

Slope stability analyses were performed using the commercially available GeoStudio Slope/W computer program. Soil strength parameters for each layer used in our analyses were **estimated** based on the results of our exploratory borings, WADNR published geologic maps, and published soil parameter correlations, and are presented in the table below.

Soil Parameters for Slope Stability Analysis

Soil Type	Soil Frictional Angle (degrees)	Soil Cohesion (psf)	Soil Moist Unit Weight (pcf)
Very dense silty sand (native glacial soils)	38	200	132

The pseudo-static method was used for the slope stability analyses to estimate the Factor of Safety (FS) under seismic conditions. The seismic coefficient used in a pseudo-static analysis is typically taken to be 1/2 of the peak ground acceleration (PGA), which was 0.26g in this case.

The results of slope stability analyses are expressed as a Factor of Safety, FS, against displacement failure. The FS is the ratio of resisting forces to driving forces acting on the slope. A FS of 1.0 represents an equilibrium state, i.e. resisting forces are equal to driving forces in the modelled slope. A FS of less than 1.0 indicates failure of the modelled slope. Typically, a minimum FS of 1.5 for static conditions and 1.1 for seismic (pseudo-static) conditions are considered adequate in local standard engineering practice. A FS between 1.0 and 1.5 under static conditions or less than 1.1 under seismic conditions are not adequate due to the uncertainties in the modeling process.

The results of the slope stability analyses for the static and seismic conditions are presented in the following table. A graphical presentation of the results of the static and seismic slope stability analyses are presented in the attached Figures 3 through 6

Slope Stability Results

	Calculated FS
Static Global Stability Section AA’	2.39
Seismic Global Stability Section AA’	1.37
Static Global Stability Section BB’	3.38
Seismic Global Stability Section BB’	1.76

Uncertainties related to building along the top of steep slopes are typically addressed by the use of building setbacks. The purpose of the setback is to establish a “buffer zone” between the structure and the top of the slope so that ample room is allowed for normal slope recession during a reasonable life span of the

structure. In a general sense, the greater the setback, the lower the risk of slope failures to impact the structure. From a geological standpoint, the setback dimension is based on the slope's physical characteristics, such as slope height, surface angle, material composition, and hydrology. Other factors such as historical slope activity, rate of regression, and the type and desired life span of the development are important considerations as well.

Based on our exploration, slope stability analysis, and our review of the available data and the proposed development, it is our opinion that the proposed development will not adversely impact the site slopes or vice-versa. A **10-foot setback** from a minimum of **25-foot buffer** from 40 percent or greater steep slopes will be adequate.

This buffer should not to be disturbed or modified through placement of any fill or removal of the existing vegetation. No material of any kind should be placed on the buffer or slope or be allowed to reach the slope, such as excavation spoils, lawn clippings and other yard waste, trash, and soil stockpiles. Replacement of vegetation in the undisturbed buffer area should be performed in accordance with the Kitsap County code. Any proposed development within the setback area should be the subject of a specific geotechnical evaluation. Under no circumstances should water be allowed to concentrate on the steep slopes. Any sloping areas disturbed during construction should be planted with vegetation as soon as practical to reduce the potential for erosion.

Shallow Foundations

General: The proposed structures may be supported on a conventional spread foundation system bearing on the medium dense/stiff or firmer native soils or on structural fill including granular soils, rock spalls or CDF extending to the medium dense/stiff or firmer native soils. Based on our soil explorations, we interpreted the medium dense/stiff or firmer native load bearing soils at this site to be approximately one to two feet bgs. For the bearing capacity and settlement analyses, we have assumed following structural loads:

- Floor Loads: 100 to 200 pounds per square foot (psf)
- Column Loads: 50,000 to 75,000 pounds
- Wall Loads: 2,500 pounds per lineal foot

Soil Bearing: Footings supported as mentioned-above, may be designed using an allowable soil bearing pressure of **2,500 pounds per square foot (psf)** for dead plus live loads. This value may be increased by 1/3 for short duration loads such as wind or seismic loading. A representative of Krazan and Associates should evaluate the foundation bearing soil and observe structural fill placement, where utilized.

For frost protection and bearing capacity considerations, exterior footings should have a minimum embedment depth of 18 inches below pad subgrade (soil grade) or adjacent exterior grade, whichever is lower. Footing widths should be based on the anticipated loads and allowable soil bearing pressure. Footings should have a minimum width of at least 12 inches regardless of load. Water should not be allowed

to accumulate in footing trenches. All loose or disturbed soils should be removed from the foundation excavations prior to placing concrete.

Structural Fill in Footing Areas: Structural fill placed for foundation support should follow these recommendations. If structural fill consisting of granular soils or rock spalls are used, then the foundation excavations would need to be widened on both sides of the footing a distance equal to one-half of the depth of the over-excavation below the bottom of the footing. Structural fill consisting of granular soils should be compacted to at least 95 percent of the maximum dry density based on ASTM Test Method D1557. To reduce the volume of extra excavation needed for the footing trenches and to simplify structural fill placement, it may be practical to place CDF to fill the deeper footing trenches to the planned footing subgrade elevations. If CDF is used, the trench may be excavated only slightly wider (6 inches wider on each side) than the footing.

Potential Foundation Settlement: For foundations constructed as recommended, the total settlement is not expected to exceed 1-inch. Differential settlement should be less than ½-inch. Most settlement is expected to occur during construction, as the loads are applied. However, additional post-construction settlement may occur if the foundation soils are flooded or saturated. It should be noted that the risk of liquefaction is considered low, given the composition and density of the native glacial soils.

Design Parameters – Lateral Resistance: Resistance to lateral displacement can be computed using an allowable friction factor of 0.40 acting between the bases of foundations and the supporting subgrade soil. Lateral resistance for footings can alternatively be developed using an allowable equivalent fluid passive pressure of 300 pounds per cubic foot (pcf) acting against the appropriate vertical footing faces (neglecting the upper 12 inches). The allowable friction factor and allowable equivalent fluid passive pressure values include a factor of safety of 1.5. The frictional and passive resistance of the soil may be combined without reduction in determining the total lateral resistance.

Foundation Drainage: Seasonal rainfall, water run-off, and the normal practice of watering trees and landscaping areas around the proposed structures, should not be permitted to flood and/or saturate foundation subgrade soils. To reduce the buildup of water within the footing areas, continuous footing drains (with cleanouts) should be provided at the bases of the footings. The footing drains should consist of a minimum 4-inch diameter rigid perforated PVC pipe, sloped to drain, with perforations placed near the bottom and enveloped in all directions by washed rock and wrapped with filter fabric to limit the migration of silt and clay into the drain.

Floor Slabs and Exterior Flatwork

The floor slab and exterior flatwork subgrade should be prepared in accordance with the recommendations presented in the **Site Preparation** section of this report, and may be designed using a modulus of subgrade reaction value of k = 200 pounds per cubic inch (pci).

In areas where it is desired to reduce floor dampness, such as areas covered with moisture sensitive floor coverings, we recommend that concrete slab-on-grade floors be underlain by a water vapor retardant system. The system should consist of a vapor retardant sheeting underlain by a capillary break consisting of a minimum of 4-inches of compacted clean (less than 5 percent passing the U.S. Standard No. 200 Sieve), open-graded coarse rock of ¾-inch maximum size. The vapor retardant sheeting should be protected from puncture damage. In addition, ventilation of the structure may be prudent to reduce the accumulation of interior moisture.

The exterior flatwork should be placed separately in order to act independently of the walls and foundation system.

Lateral Earth Pressures and Retaining Walls

We have developed criteria for the design of retaining or below grade walls. Our design parameters are based on retention of the native soils or structural fill. The parameters are also based on level, well-drained wall backfill conditions. Walls may be designed as "restrained" retaining walls based on "at-rest" earth pressures, plus any surcharge on top of the walls as described below, if the walls are braced to restrain movement and/or movement is not acceptable. Unrestrained walls may be designed based on "active" earth pressure, if the walls are not part of the buildings and some movement of the retaining walls is acceptable. Acceptable lateral movement equal to at least 0.2 percent of the wall height would warrant the use of "active" earth pressure values for design. The following table, titled **Wall Design Criteria**, presents the recommended soil related design parameters for retaining walls with well-drained level backfill.

Wall Design Criteria	
"At-rest" Conditions (Lateral Earth Pressure)	55 pcf (Equivalent Fluid Density) (Triangular Distribution)
"Active" Conditions (Lateral Earth Pressure)	35 pcf (Equivalent Fluid Density) (Triangular Distribution)
Seismic Increase for "Active" Conditions (Lateral Earth Pressure)	10 psf x H (Uniform Distribution) Where H is the height of the wall in feet
Passive Earth Pressure on Low Side of Wall (includes factor of safety of 1.5)	Neglect upper 1-foot, then 300 pcf (Equivalent Fluid Density)
Soil-Footing Coefficient of Sliding Friction (includes factor of safety of 1.5)	0.40

If vehicular loads are expected to act behind the wall within a horizontal distance of less than or equal to one-half of the wall height, then a live load surcharge should be applied for the design. In this case, we recommend the addition of vehicle surcharges of 70 psf and 100 psf to the active and at-rest earth pressures, respectively.

The stated lateral earth pressures **do not** include the effects of hydrostatic pressure generated by water accumulation behind the retaining walls or loads imposed by construction equipment, foundations or roadways adjacent to the wall (surcharge loads). To minimize the lateral earth pressure and reduce the buildup of water pressure against the walls, continuous footing drains (with cleanouts) should be provided at the bases of the walls. The footing drains should consist of a minimum 4-inch diameter rigid PVC perforated pipe, sloped to drain, with perforations placed near the bottom. The drainpipe should be enveloped by 6 inches of washed gravel in all directions wrapped in filter fabric to prevent the migration of silt and clay into the drain.

The wall fills adjacent to and extending a lateral distance of at least 2 feet behind the walls should consist of free-draining granular material. All free-draining backfill should contain less than 3 percent fines (passing the U.S. Standard No. 200 Sieve) based upon the fraction passing the U.S. Standard No. 4 Sieve with at least 30 percent of the material being retained on the U.S. Standard No. 4 Sieve. **Alternatively,** a drainage composite may be used. It should be realized that the primary purpose of the free-draining material is the reduction of hydrostatic pressure. Some potential for the moisture to contact the back face of the wall may exist, even with treatment, which may require that more extensive waterproofing be specified for walls, which require interior moisture sensitive finishes.

We recommend that the wall fill be compacted to at least 95 percent of the maximum dry density based on ASTM D1557 Test Method. In-place density tests should be performed to verify adequate compaction. Soil compactors place transient surcharges on the backfill. Consequently, only light hand operated equipment is recommended for fill compaction within 3 feet of walls so that excessive stress is not imposed on the walls.

Erosion and Sediment Control

Erosion and sediment control (ESC) is used to minimize the transportation of sediment to wetlands, streams, lakes, drainage systems, and adjacent properties. Erosion and sediment control measures should be taken and these measures should be in general accordance with local regulations. At a minimum, the following basic recommendations should be incorporated into the design of the erosion and sediment control features of the site:

1) Phase the soil, foundation, utility, and other work, requiring excavation or the disturbance of the site soils, to take place during the dry season (generally May through September). However, provided precautions are taken using Best Management Practices (BMPs), grading activities can be undertaken during the wet season (generally October through April). It should be noted that this typically increases the overall project cost.

2) All site work should be completed and stabilized as quickly as possible.

3) Additional perimeter erosion and sediment control features may be required to reduce the possibility of sediment entering the surface water. This may include additional silt fences, silt

fences with a lower Apparent Opening Size (AOS), construction of a berm, or other filtration systems.

4) Any runoff generated by dewatering discharge should be treated through construction of a sediment trap if there is sufficient space. If space is limited other filtration methods will need to be incorporated.

5) Surface water runoff should not be allowed to develop concentrated flow over the steep slopes on this property during or after construction.

Groundwater Influence on Structures and Earthwork Construction

Groundwater seepage was not encountered in our test pits or soil borings at the time of our exploration. It should be recognized that groundwater elevations may fluctuate with time. The groundwater level will be dependent upon seasonal precipitation, irrigation, land use, and climatic conditions, as well as other factors. Therefore, groundwater levels at the time of the field investigation may be different from those encountered during the construction phase of the project. The evaluation of such factors is beyond the scope of this report.

If groundwater seepage is encountered during construction, we should observe the conditions to determine if dewatering will be needed. Design of temporary dewatering systems to remove groundwater should be the responsibility of the contractor. If earthwork is performed during or soon after periods of precipitation, the subgrade soils may become saturated. These soils may "pump," and the materials may not respond to densification techniques. Typical remedial measures include: disking and aerating the soil during dry weather; mixing the soil with drier materials; removing and replacing the soil with an approved fill material. A qualified geotechnical engineering firm should be consulted prior to implementing remedial measures to observe the unstable subgrade conditions and provide appropriate recommendations.

Drainage and Landscape

Special attention to the drainage and irrigation adjacent to the buildings is recommended. Grading should establish drainage away from the structures and this drainage pattern should be maintained. Water should not be allowed to collect adjacent to the structures. Excessive irrigation within landscaped areas adjacent to the structure should not be allowed to occur.

Surface water runoff should not be allowed to develop concentrated flow over the steep slopes on this property during or after construction. Proper grading and functional drainage systems are important for maintaining the currently stable condition of the site slopes.

The ground surface should slope away from building pads and pavement areas, toward appropriate drop inlets or other surface drainage devices. It is recommended that adjacent exterior grades be sloped a minimum of 2 percent for a minimum distance of 5 feet away from structures. Roof drains should be tightlined away from foundations. Roof drains should not be connected to the footing drains.

Pavement areas should be inclined at a minimum of 1 percent and drainage gradients should be maintained to carry all surface water to collection facilities, and suitable outlets. These grades should be maintained for the life of the project.

Utility Trench Backfill

We recommend that utility trench backfill be placed in general accordance with typical recommendations for structural fill placement. A firm and unyielding subgrade should allow for the proper placement of subsurface utilities. This could include the placement of geotextile and quarry rock in the bottom of utility trenches prior to placement of pipe bedding, utilities and trench backfill.

Utility trenches should be excavated according to accepted engineering practices following OSHA (Occupational Safety and Health Administration) standards, by a contractor experienced in such work. The responsibility for the safety of open trenches should be borne by the contractor. Traffic and vibration adjacent to trench walls should be minimized; cyclic wetting and drying of excavation side slopes should be avoided. Depending upon the location and depth of some utility trenches, groundwater flow into open excavations could be experienced, especially during or shortly following periods of precipitation.

All utility trench backfill for this project should follow the recommendation as per the Structural Fill section of this report. Utility trench backfill placed in or adjacent to buildings and exterior slabs should be compacted to at least 95 percent of the maximum dry density based on ASTM Test Method D1557. The upper 5 feet of utility trench backfill placed in pavement areas should be compacted to at least 95 percent of the maximum dry density based on ASTM Test Method D1557. Below 5 feet, utility trench backfill in pavement areas should be compacted to at least 90 percent of the maximum dry density based on ASTM Test Method D1557.

Pipe bedding should be in accordance with the pipe manufacturer's recommendations. The contractor is responsible for removing all water-sensitive soils from the trenches regardless of the backfill location and compaction requirements. The contractor should use appropriate equipment and methods to avoid damage to the utilities and/or structures during fill placement and compaction.

Pavement Design

The pavement subgrade should be prepared in accordance with the recommendations presented in the **Site Preparation** section of this report. It should be noted that subgrade soils that have relatively high silt contents may be highly sensitive to moisture conditions. The subgrade strength and performance characteristics of a silty subgrade material may be dramatically reduced if it becomes wet. Therefore, we recommend that the pavement subgrade not be exposed for long periods, especially during wet weather.

Traffic loads were not provided, however, based on our knowledge of the proposed project, we expect the traffic to range from light duty (passenger automobiles) to heavy duty (firetrucks). The following tables show the minimum recommended pavement sections for both light duty and heavy-duty traffic loads.

ASPHALTIC CONCRETE (FLEXIBLE) PAVEMENT
LIGHT DUTY

Asphaltic Concrete	Aggregate Base*
3.0 in.	6.0 in.

HEAVY DUTY

Asphaltic Concrete	Aggregate Base*
4.0 in.	6.0 in.

PORTLAND CEMENT CONCRETE (RIGID) PAVEMENT
LIGHT DUTY

Min. PCC Depth	Aggregate Base*
6.0 in.	6.0 in.

HEAVY DUTY

Min. PCC Depth	Aggregate Base*
8.0 in.	6.0 in.

** 95% compaction based on ASTM Test Method D1557*

The pavement specification in Appendix C provides additional recommendations. The asphaltic concrete depth in the flexible pavement tables should be a surface course type asphalt, such as Washington Department of Transportation (WSDOT) ½ inch HMA. The rigid pavement design is based on a Portland Cement Concrete (PCC) mix that has a 28-day compressive strength of 4,000 pounds per square inch (psi) with a fiber mesh. The design is also based on a concrete flexural strength or modulus of rupture of 575 psi.

Testing and Inspection

A representative of Krazan & Associates, Inc. should be present at the site during the earthwork activities to confirm that actual subsurface conditions, including foundation bearing soils, are consistent with those exposed during our exploratory field work. This activity is an integral part of our services as acceptance of earthwork construction is dependent upon compaction testing and stability of the material. This representative can also verify that the intent of our recommendations has been incorporated into the project design and construction. Krazan & Associates, Inc. will not be responsible for grades or staking, since this

is the responsibility of the Prime Contractor. Furthermore, Krazan & Associates is not responsible for the contractor's procedures, methods, scheduling, or management of the work site.

LIMITATIONS

This report has been prepared for the exclusive use of MAP Ltd. and their assigns, for the specific application to the subject site. Geotechnical engineering is one of the newest divisions of Civil Engineering. This branch of Civil Engineering is constantly improving as new technologies and understanding of earth sciences improves. Although your site was analyzed using the most appropriate current techniques and methods, undoubtedly there will be substantial future improvements in this branch of engineering. In addition to improvements in the field of geotechnical engineering, physical changes in the site either due to excavation or fill placement, new agency regulations, or possible changes in the proposed structure after the time of completion of the soils report may require the soils report to be professionally reviewed. In light of this, the owner should be aware that there is a practical limit to the usefulness of this report without critical review. Although the time limit for this review is strictly arbitrary, it is suggested that three years be considered a reasonable time for the usefulness of this report.

Foundation and earthwork construction are characterized by the presence of a calculated risk that soil and groundwater conditions have been fully revealed by the original geotechnical investigation. This risk is derived from the practical necessity of basing interpretations and design conclusions on limited sampling of the earth. Our report, design conclusions, and interpretations should not be construed as a warranty of the subsurface conditions. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report.

The recommendations made in this report are based on the assumption that soil conditions do not vary significantly from those encountered during our field investigation. The findings and conclusions of this report can be affected by the passage of time, seasonal weather conditions, manmade influences such as construction on or adjacent to the site, and natural events such as earthquakes, slope instability, flooding, or groundwater fluctuations. If any variations or undesirable conditions are encountered during construction, the geotechnical engineer should be notified so that supplemental recommendations can be made.

The conclusions of this report are based on the information provided regarding the proposed construction. If the proposed construction is relocated or redesigned, the conclusions in this report may not be valid. The geotechnical engineer should be notified of any changes so that the recommendations can be reviewed and re-evaluated.

Misinterpretations of this report by other design team members can result in project delays and cost over-runs. These risks can be reduced by having Krazan & Associates, Inc. involved in the design team's meetings and discussions prior to and following submission of the geotechnical report. Krazan & Associates, Inc. should also be retained to review pertinent elements of the design team's plans and specifications. To reduce the risk of contractors misinterpreting the recommendations of this report, Krazan

& Associates should participate in pre-bid and preconstruction meetings, and provide construction observations and testing during the site work.

This report is a geotechnical engineering investigation with the purpose of evaluating the soil conditions in terms of foundation design. The scope of our geotechnical engineering services did not include any environmental site assessment for the presence or absence of hazardous and/or toxic materials in the soil, groundwater or atmosphere, or the presence of wetlands. Any statements, or absence of statements, in this report or on any boring log regarding odors, unusual or suspicious items, or conditions observed are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous and/or toxic assessments.

The geotechnical information presented herein is based upon professional interpretation utilizing standard engineering practices and a degree of conservatism deemed proper for this project. It is not warranted that such information and interpretation cannot be superseded by future geotechnical developments. We emphasize that this report is valid for this project as outlined above, and should not be used for any other site. Our report is prepared for the exclusive use of our client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (360) 598-2126.

Respectfully submitted,

KRAZAN & ASSOCIATES, INC.

Erliana Acob
Staff Geologist

Andrew Glenn
Staff Geologist

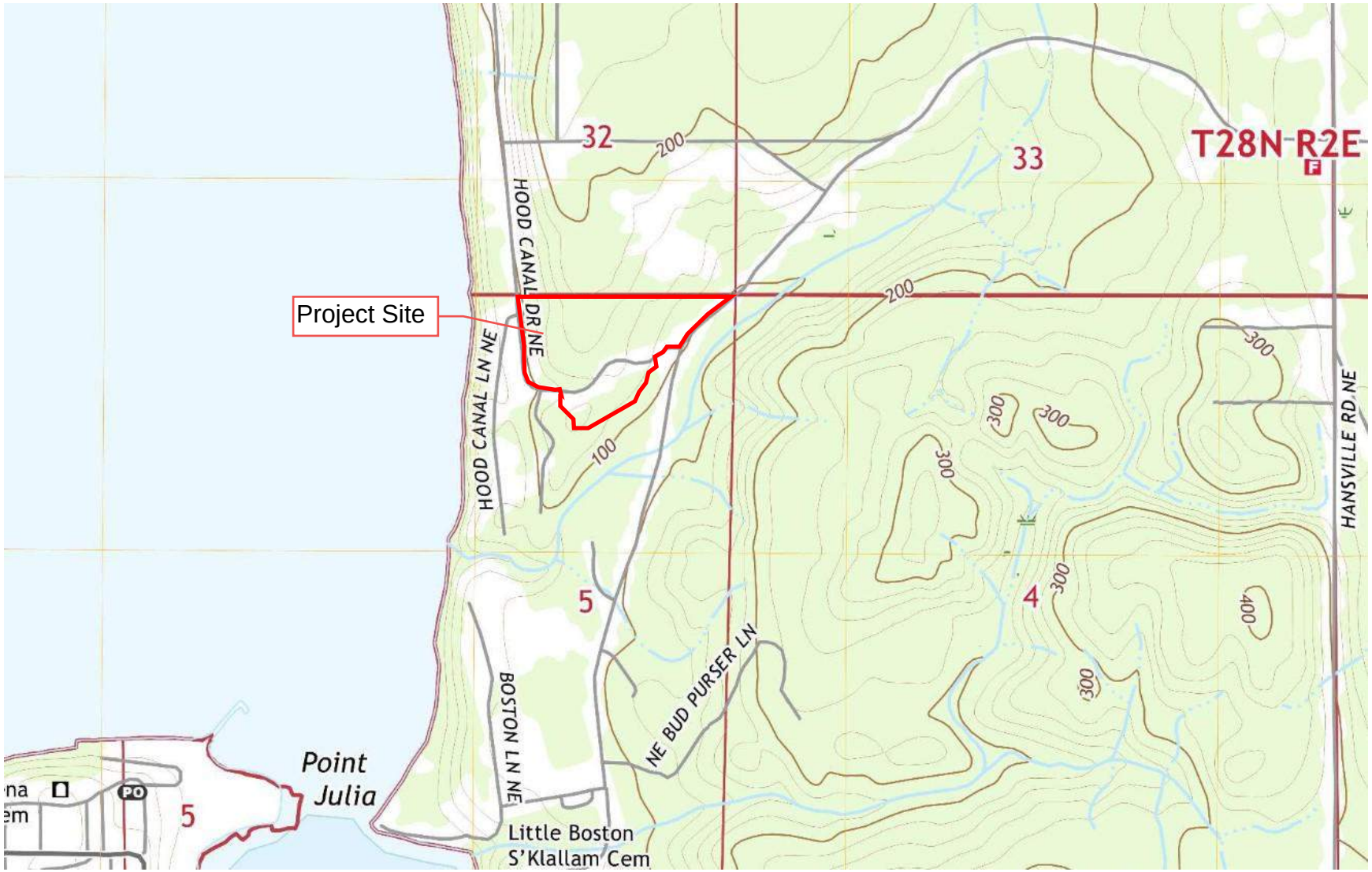
10/2/23



Vijay Chaudhary, P.E.
Project Engineer

AG:EA:VC

Vicinity Map



N

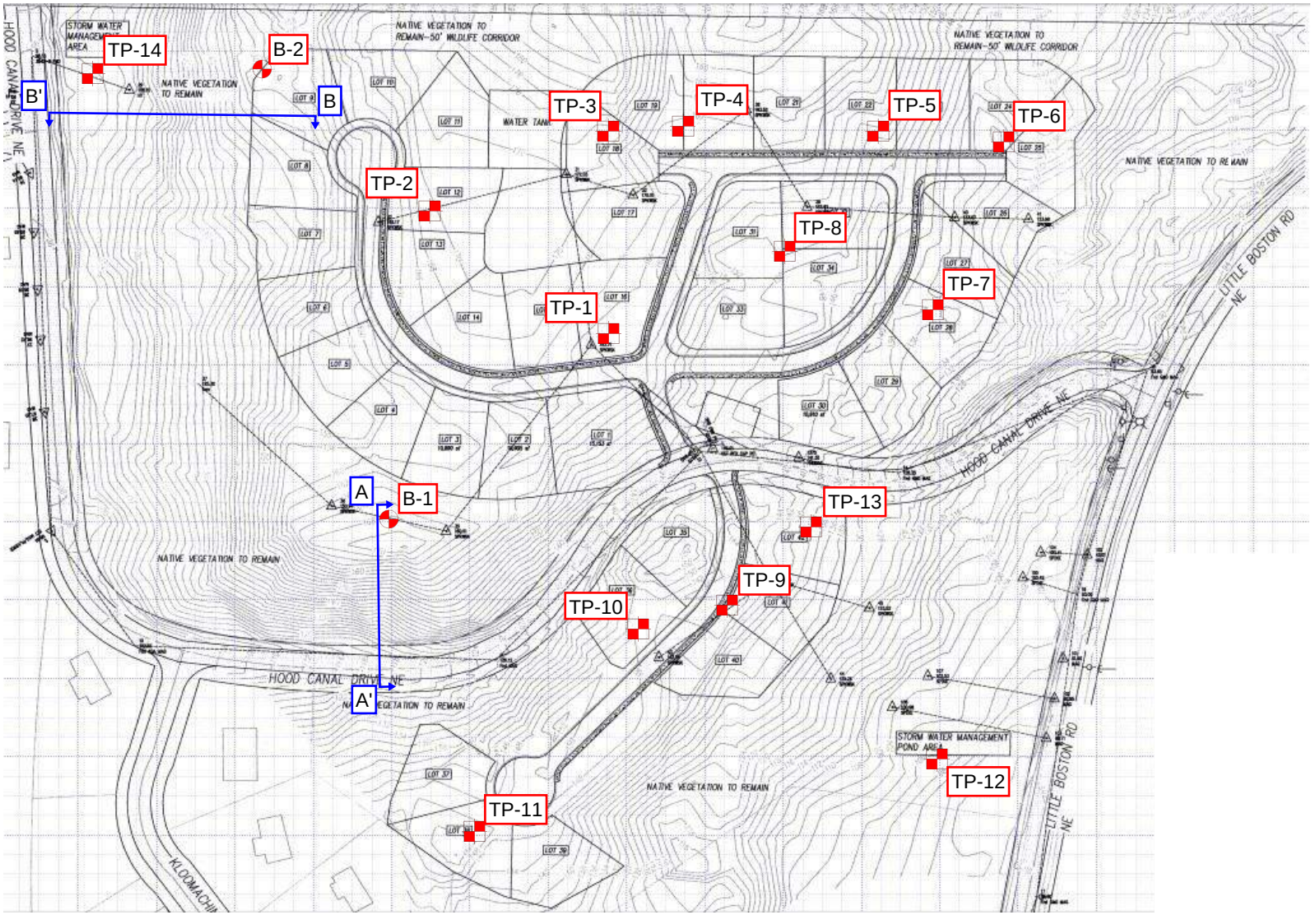
Reference: USGS topographic map titled "Port Gamble Quadrangle, Washington, 7.5 Minute Series", dated 2020

Krazan

North Kloomachin Subdivision

Date: August 2023	Project Number: 102-23017	
Drawn By: AG	Figure: 1	Not To Scale

Site Plan



TP-1 Test Pit Number and Approximate Location

B-1 Boring Number and Approximate Location

N

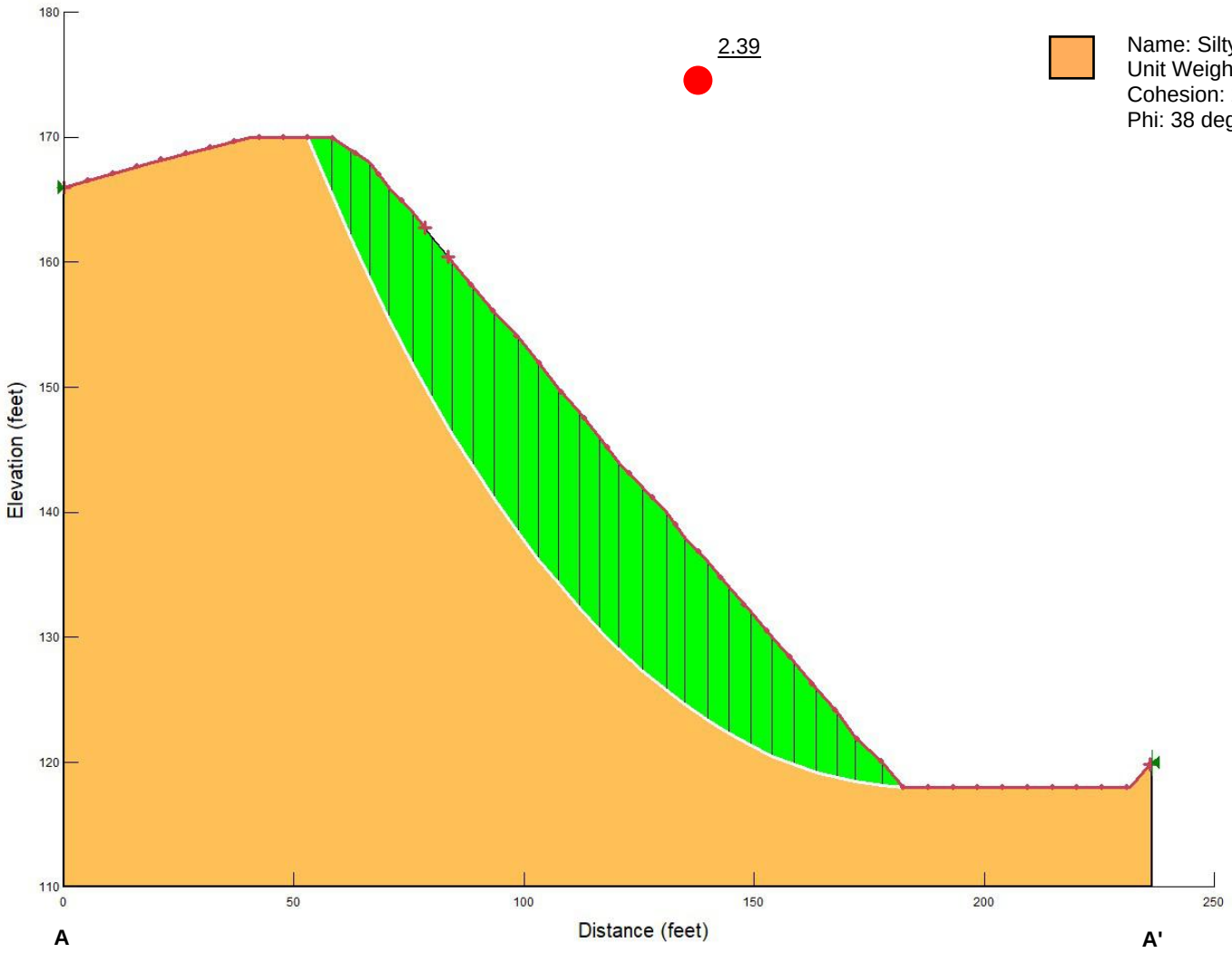
Reference:Survey Point Map, created by AES Consultants Inc., dated August 7, 2023.

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North Kloomachin Subdivision

Date: August 2023	Project Number: 102-23017	
Drawn By: AG	Figure: 2	Not To Scale

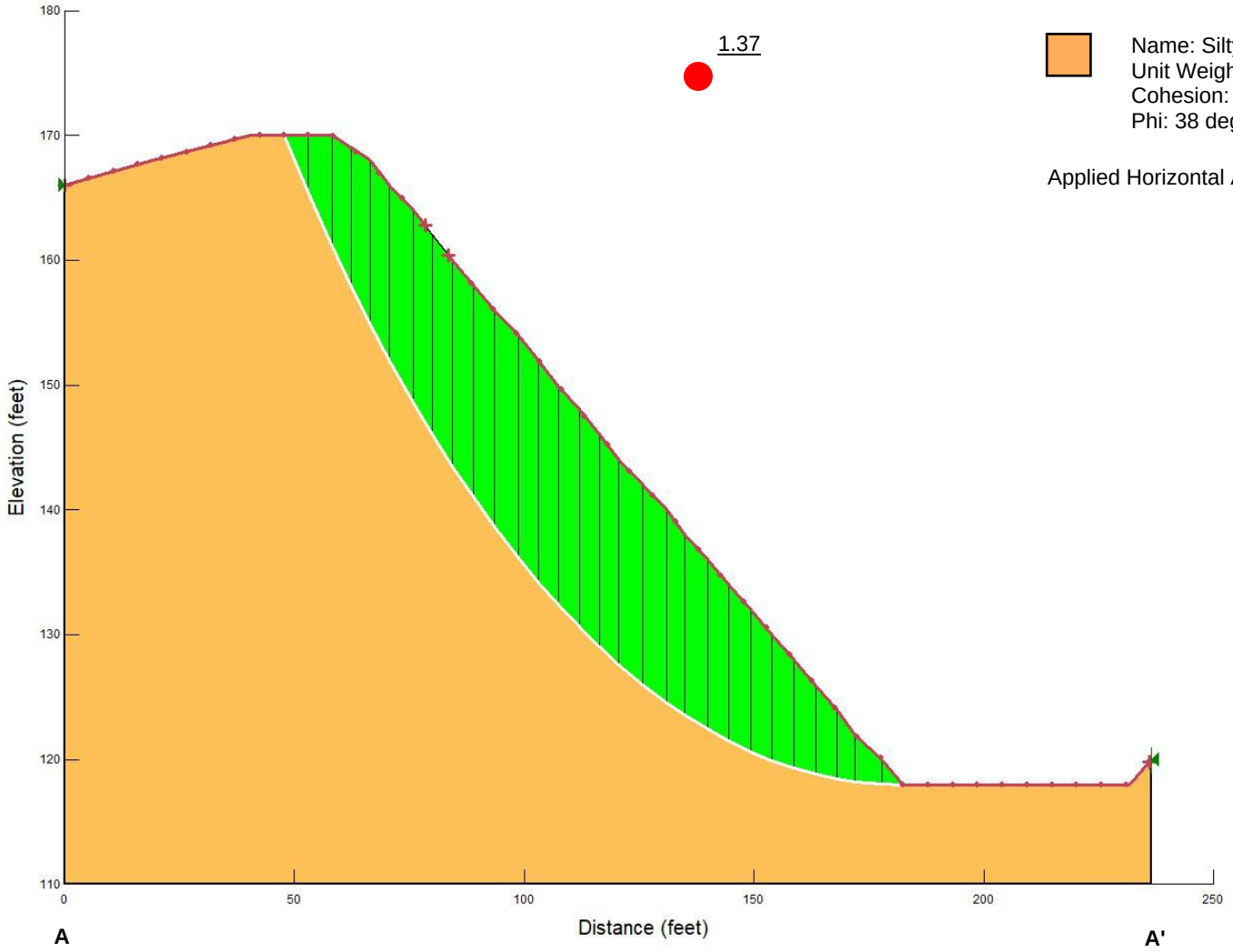
Section AA' Slope Stability Analysis (Static Condition)



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North Kloomachin Subdivision		
Date: August 2023	Project Number: 102-23017	
Drawn By: AG	Figure: 3	NTS

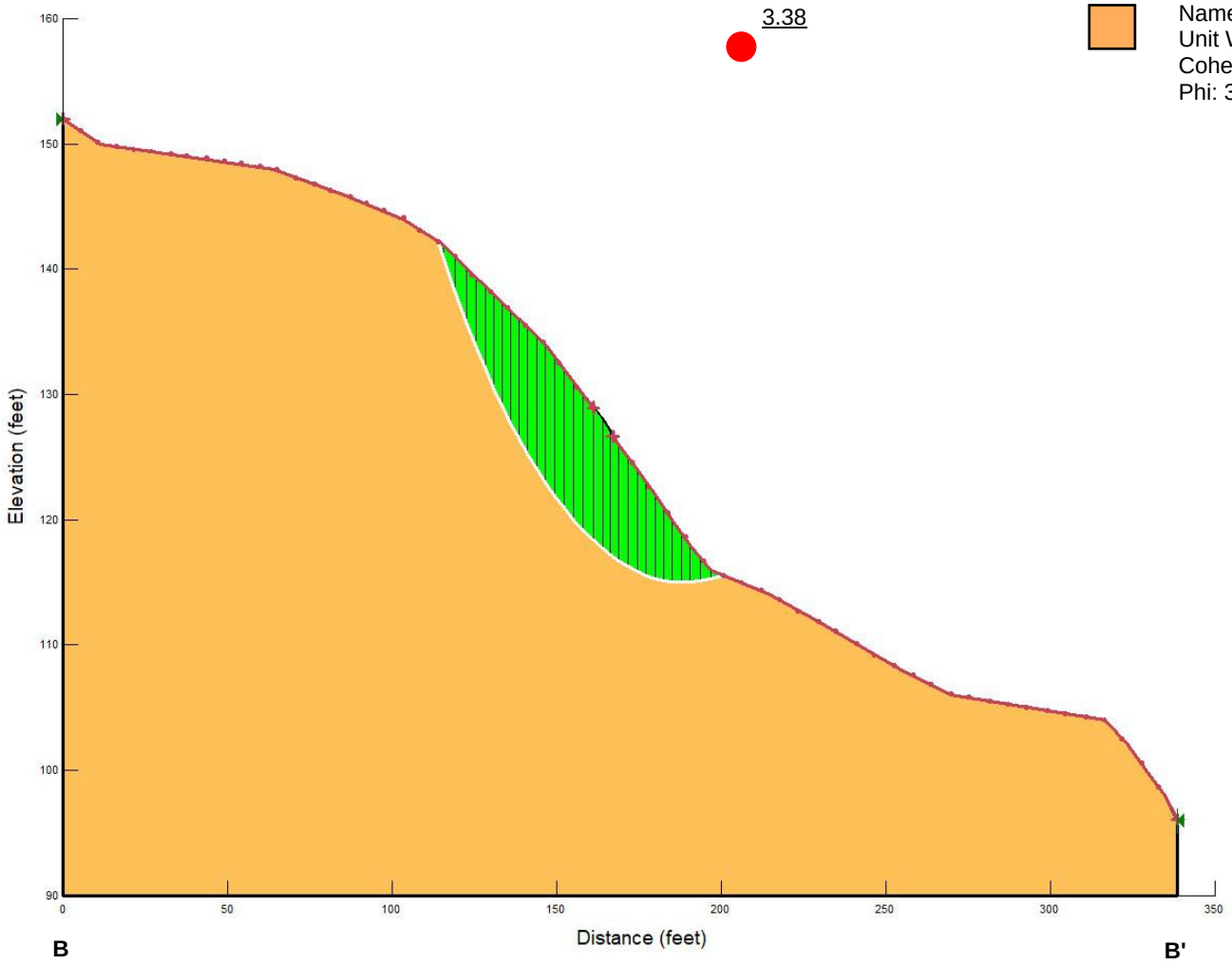
Section AA' Slope Stability Analysis (Seismic Condition)



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North Kloomachin Subdivision		
Date: August 2023	Project Number: 102-23017	
Drawn By: AG	Figure: 4	NTS

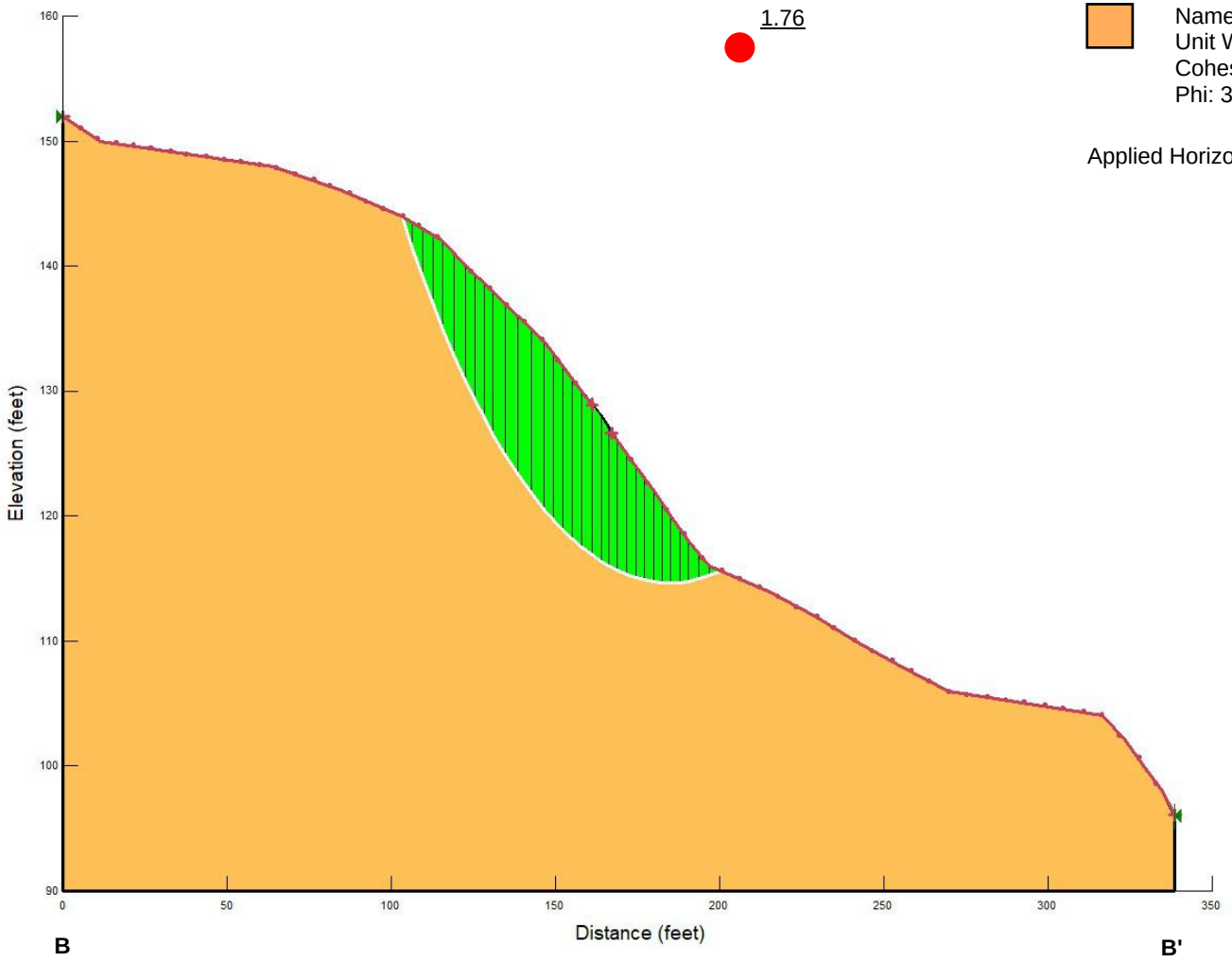
Section BB' Slope Stability Analysis (Static Condition)



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North Kloomachin Subdivision		
Date: August 2023	Project Number: 102-23017	
Drawn By: AG	Figure: 5	NTS

Section BB' Slope Stability Analysis (Seismic Condition)



Krazan

North Kloomachin Subdivision		
Date: August 2023	Project Number: 102-23017	
Drawn By: AG	Figure: 6	NTS

APPENDIX A

FIELD INVESTIGATION AND LABORATORY TESTING

Field Investigation

The field investigation consisted of a surface reconnaissance and a subsurface exploration program. Two (2) geotechnical soil borings and fourteen (14) test pits were conducted and sampled on August 7th and 8th, 2023 to evaluate the subsurface soil and groundwater conditions at the project site. The soil borings, designated B-1 and B-2, were advanced to a depth of 91.5 feet bgs using a subcontracted drill rig and operator under the direction of a Krazan field geologist.. The test pits were excavated on August 7th and 8th, to depths ranging from 4.5 to 10.0 feet bgs. The approximate boring and test pit locations are shown on the Site Plan (Figure 2). The depths shown on the attached boring and test pit logs are from the existing ground surface at the time of our exploration.

Soil boring samples were obtained by using the Standard Penetration Test (SPT) as described in ASTM Test Method D1586. The Standard Penetration Test and sampling method consists of driving a standard 2-inch outside-diameter, split barrel sampler into the subsoil with a 140-pound hammer free falling a vertical distance of 30 inches. The summation of hammer-blows required to drive the sampler the final 12-inches of an 18-inch sample interval is defined as the Standard Penetration Resistance, or N-value. The blow count is presented graphically on the boring log in this appendix. The resistance, or "N" value, provides a measure of the relative density of granular soils or of the relative consistency of cohesive soils.

A field geologist from Krazan and Associates was present during the explorations, continuously examined and visually classified the soils in general accordance with the Unified Soil Classification System (USCS), and maintained logs of the explorations, which are presented in this appendix. Representative samples of the soils encountered in the geotechnical explorations were collected and transported to our laboratory for further examination and testing.

Laboratory Testing

The laboratory testing program was developed primarily to determine the index properties of the soils. Test results were used for soil classification and as criteria for determining the engineering suitability of the surface and subsurface materials encountered. Sieve analysis and natural moisture content tests were performed on selected samples. The laboratory test results are included in this appendix.

Soil Classification

USCS Soil Classification				
Major Division			Group Description	
Coarse-Grained Soils < 50% passes #200 sieve	Gravel and Gravelly Soils < 50% coarse fraction passes #4 sieve	Gravel (with little or no fines)	GW	Well-Graded Gravel
			GP	Poorly Graded Gravel
		Gravel (with > 12% fines)	GM	Silty Gravel
			GC	Clayey Gravel
	Sand and Sandy Soils > 50% coarse fraction passes #4 sieve	Sand (with little or no fines)	SW	Well-Graded Sand
			SP	Poorly Graded Sand
		Sand (with > 12% fines)	SM	Silty Sand
			SC	Clayey Sand
Fine-Grained Soils > 50% passes #200 sieve	Silt and Clay Liquid Limit < 50		ML	Silt
			CL	Lean Clay
			OL	Organic Silt and Clay (Low Plasticity)
	Silt and Clay Liquid Limit > 50		MH	Inorganic Silt
			CH	Inorganic Clay
			OH	Organic Clay and Silt (Med. to High Plasticity)
Highly Organic Soils			PT	Peat

Relative Density with Respect to SPT N-Value			
Coarse-Grained Soils		Fine-Grained Soils	
Density	N-Value (Blows/Ft)	Density	N-Value (Blows/Ft)
Very Loose	0 - 4	Very Soft	0 - 1
Loose	5 -10	Soft	2 - 4
Medium Dense	11 - 30	Medium Stiff	5 - 8
Dense	31 - 50	Stiff	9 - 15
Very Dense	> 50	Very Stiff	16 - 30
		Hard	> 30

Krazan & ASSOCIATES, INC.

North Kloomachin Subdivision

Date: August 2023 | References: USCS

Drawn By: AG | | Project Number: 102-23017

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-1

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~163 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
0			Organic topsoil			
	SM		Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
2				S1	G	
			-Becomes gray.			
3			-Becomes very dense.			
4				S2	G	
5			-Becomes dense.	S3	G	
6						
7			-Becomes very dense.			
8						
9			-Refusal.	S4	G	
			End of Exploratory Test Pit			
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered.

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-2

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~169 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
			Organic topsoil			
			Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
1						
			-Becomes dense.			
2				S1	G	
			-Becomes gray and very dense.			
3						
4						
			-Becomes dense.	S2	G	
5						
6						
7						
			-Becomes very dense.			
			-Refusal.	S3	G	
8			End of Exploratory Test Pit			
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-3

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~173 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
			Organic topsoil			
			Light brown to gray, silty sand with gravel (SM) (moist, medium dense to very dense)			
1						
2						
3			-Becomes gray and dense.			
			-Becomes very dense.			
4				S1	G	
5						
6						
7			-Refusal.	S2	G	
			End of Exploratory Test Pit			
8						
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-4

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~162 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
			Organic topsoil			
			Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
1				S1	G	
2						
3						
			-Becomes gray and very dense.	S2	G	
4						
5						
6						
7			-Refusal.	S3	G	
			End of Exploratory Test Pit			
8						
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-5

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~152 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits (10 20 30 40 50 60 70 80)
0			Organic topsoil			
			Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
2				S1	G	
3			-Becomes gray and dense.			
4			-Becomes very dense.			
5			-Becomes dense.	S2	G	
9			-Becomes very dense. -Refusal.	S3	G	
			End of Exploratory Test Pit			

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-6

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~132 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits (10 20 30 40 50 60 70 80)
0			Organic topsoil			
1	SM		Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
2			-Large wood/bark debris was encountered.			
3			-Becomes gray and dense.			
4			-Becomes very dense.			
5			-Refusal.			
6						
7						
8						
9						
10			End of Exploratory Test Pit			

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-7

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~136 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
			Organic topsoil			
1			Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense) -Boulders were encountered to 1.0 ft.	S1	G	
2			-Becomes gray and dense.	S2	G	
3						
4						
5			-Becomes light brown and gray. Becomes medium dense.	S3	G	
6			Gray, sand (SP) (moist, medium dense)	S4	G	
7						
8			Gray, sandy gravel (GP) (moist, medium dense)	S5	G	
9			-Cobbles were encountered.			
10				S6	G	
			End of Exploratory Test Pit			

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-8

PROJECT: N. Kloomachin Subdivision **DATE: August 7, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~152 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
			Organic topsoil			
1			Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
2			-Becomes gray.			
3			-Becomes dense.			
4				S1	G	
5						
6						
7			-Hard, sandy silt lense encountered from 7.4 ft. to 8.0 ft.	S2	G	
8			-Becomes very dense.	S3	G	
			-Refusal.			
9			End of Exploratory Test Pit			
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-9

PROJECT: N. Kloomachin Subdivision **DATE: August 8, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~147 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits (10 20 30 40 50 60 70 80)
0			Organic topsoil			
			Light brown, silty sand with gravel and cobbles (SM) (moist, medium dense)			
3.5			Light brown and gray to gray, gravelly sand with silt (SP-SM) (moist, dense to very dense)	S1		
5			-Becomes gray sand with silt and gravel.	S2		
7.5			-Becomes very dense.	S3		
9.5			-Refusal.	S4		
9.5			End of Exploratory Test Pit			

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-10

PROJECT: N. Kloomachin Subdivision **DATE: August 8, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~146 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
0			Organic topsoil			
	SM		Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to dense)			
1						
2						
3			-Becomes gray and dense.			
4						
5			-Becomes very dense.	S1	G	
6						
7				S2	G	
			-Refusal.			
8			End of Exploratory Test Pit			
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-11

PROJECT: N. Kloomachin Subdivision **DATE: August 8, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~147 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
0			Organic topsoil			
	SM		Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense)			
1						
2			-Becomes gray and dense.	S1	G	
3						
4						
5				S2	G	
6						
7			-Becomes very dense.			
8						
			-Refusal.			
9			End of Exploratory Test Pit			
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-12

PROJECT: N. Kloomachin Subdivision **DATE: August 8, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~100 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
0			Organic topsoil			
			Brown, silty sand with gravel and cobbles (SM) (moist, medium dense)	S1	G	
2			Gray, sandy silt (ML) (moist, very stiff to hard) -Mottling was observed from 2.0 ft. to approximatly 4.0 ft.	S2	G	
3				S3	G	
4				S4	G	
5			-Brown and gray sand lense was encountered from 5.0 ft. to 6.0 ft.	S5	G	
6			-Becomes hard.			
7			-Refusal	S6	G	
			End of Exploratory Test Pit			
8						
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-13

PROJECT: N. Kloomachin Subdivision **DATE: August 8, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~138 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits 10 20 30 40 50 60 70 80
			Organic topsoil			
1			Light brown to gray, silty sand with gravel and cobbles (SM) (moist, medium dense to very dense) -Boulders were encountered from 0.3 ft. to 2.5 feet.			
				S1	G	
2			-Becomes light brown and gray.			
3						
				S2	G	
4						
5			-Becomes gray and very dense.	S3	G	
6						
7			-Refusal.	S4	G	
			End of Exploratory Test Pit			
8						
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

KRAZAN AND ASSOCIATES, INC.

LOG OF EXPLORATORY TEST PIT TP-14

PROJECT: N. Kloomachin Subdivision **DATE: August 8, 2023**
PROJECT NO.: 102-23017 **PAGE: 1 of 1**
CONTRACTOR: Northwest Excavating **SURFACE ELEV.: ~107 ft.**
SAMPLE METHOD: Grab **LOCATION: Kingston, WA**

DEPTH (ft)	USC SYMBOL	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE No.	SAMPLE TYPE	Moisture Content and Atterberg Limits (10 20 30 40 50 60 70 80)
0			Organic topsoil			
			Brown, silty sand with gravel (SM) (moist, medium dense)			
1			Reddish brown, sand with gravel and cobbles (SP) (moist, medium dense)	S1	G	
2			Gray, silty sand with gravel (SM) (moist, dense to very dense)			
			-Iron oxide staining was observed at 2.5 ft.			
			-Becomes very dense.			
3				S2	G	
4			-Refusal.	S3	G	
			End of Exploratory Test Pit			
5						
6						
7						
8						
9						
10						

Water Level Initial: ▽ Final: ▼

Water Observations: Groundwater was not encountered

Notes: Caving was not observed.

Logged By: AG

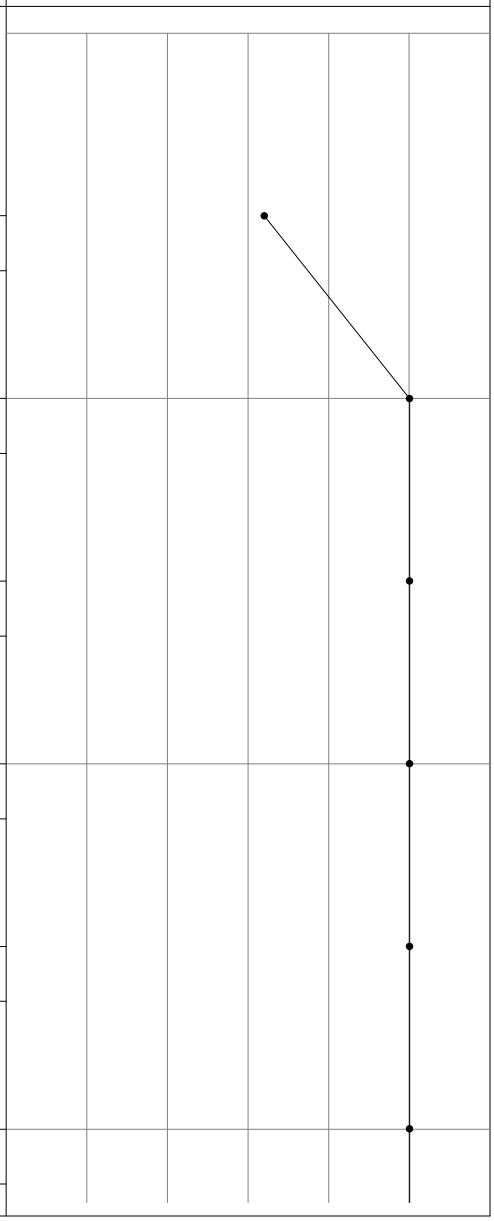
Krazan & Associates, Inc.

LOG OF BORING No. B-1

Date Drilled: 8/7/23	**Project: North Kloomachin Subdivision**	**Notes:**
Location: Kingston, WA	**Ground Elevation: ~170 ft.**	**Logged By: EA**
Hammer Type: Manual ☐ Automatic ☑ Other ☐		
Water Level: No groundwater encountered.	**Drilling Method: HSA**	

Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample No. /Type	1st 6"	2nd 6"	3rd 6"	N Value
	Ground Surface						
0	Brown to gray, silty sand with gravel (SM) (moist, dense to very dense)						
5			S1	6	13	19	32
10	-Becomes very dense.		S2	50/1"			50+
15	-Becomes gray.		S3	28	50/4"		50+
20			S4	38	50/3"		50+
25			S5	50/3"			50+
30			S6	40	50/4"		50+
32							

N VALUE GRAPH (Last 12")



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings-	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	D C - Driving Casing	

Krazan & Associates, Inc.

LOG OF BORING No. B-1

Date Drilled: 8/7/23	**Project: North Kloomachin Subdivision**		**Notes:**
Location: Kingston, WA	**Ground Elevation: ~170 ft.**	**Logged By: EA**	
Hammer Type: Manual ☐ Automatic ☑ Other ☐			
Water Level: No groundwater encountered.	**Drilling Method: HSA**		

Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample No. /Type	1st 6"	2nd 6"	3rd 6"	N Value
33							
34							
35	-Sand with gravel lens noted from 35 ft. to 37 ft.						
36			S7	35	50/5"		50+
37							
38							
39							
40			S8	50/4"			50+
41							
42							
43							
44							
45			S9	50/3"			50+
46							
47							
48							
49							
50			S10	31	50/5"		50+
51							
52							
53							
54							
55			S11	35	50/3"		50+
56							
57							
58							
59							
60	-4" silt lens noted at 60 ft.		S12	50/5"			50+
61							
62							
63							
64							

N VALUE GRAPH (Last 12")

10 20 30 40 50

LEGEND

SAMPLER TYPE				DRILLING METHOD			
SS	- Split Spoon	NQ	- Rock Core, 1-7/8"	HSA	- Hollow Stem Auger	RW	- Rotary Wash
ST	- Shelby Tube	CU	- Cuttings-	CFA	- Continuous Flight Augers	RC	- Rock Core
AWG	- Rock Core, 1-1/8"	CT	- Continuous Tube	D C	- Driving Casing		

Krazan & Associates, Inc.

LOG OF BORING No. B-1

Date Drilled: 8/7/23	**Project: North Kloomachin Subdivision**	**Notes:**
Location: Kingston, WA	**Ground Elevation: ~170 ft.**	**Logged By: EA**
Hammer Type: Manual ☐ Automatic ☑ Other ☐		
Water Level: No groundwater encountered.	**Drilling Method: HSA**	

Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample No. /Type	1st 6"	2nd 6"	3rd 6"	N Value
65	-4" sand lens noted at 65 ft.						
66			S13	50/6"			50+
67							
68							
69							
70	-1" sand lens noted at 70 ft.						
71			S14	50/5"			50+
72							
73							
74							
75			S15	50/6"			50+
76							
77							
78							
79							
80			S16	50/4"			50+
81							
82							
83							
84							
85			S17	50/6"			50+
86							
87							
88							
89							
90			-	50/2"			50+
91							
92	End of Exploratory Boring						
93							
94							
95							
96							

N VALUE GRAPH (Last 12")

10 20 30 40 50

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings-	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	D C - Driving Casing	

Krazan & Associates, Inc.

LOG OF BORING No. B-2

Date Drilled: 8/7/23	**Project: North Kloomachin Subdivision**	**Notes:**
Location: Kingston, WA	**Ground Elevation: ~200 ft.**	**Logged By: EA**
Hammer Type: Manual ☐ Automatic ☑ Other ☐		
Water Level: No groundwater encountered.	**Drilling Method: HSA**	

Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample No. /Type	1st 6"	2nd 6"	3rd 6"	N Value
	Ground Surface						
0	Brown to gray, silty sand with gravel (SM) (moist, very dense)						
5			S1	13	26	30	50+
10	-Becomes gray.		S2	19	50/6"		50+
15			S3	30	50/5.5"		50+
20			S4	50/5"			50+
25			S5	50/4"			50+
30			S6	35	50/3"		50+
32							

N VALUE GRAPH (Last 12")

10 20 30 40 50

LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings-	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	D C - Driving Casing	

Krazan & Associates, Inc.

LOG OF BORING No. B-2

Date Drilled: 8/7/23	**Project: North Kloomachin Subdivision**	**Notes:**
Location: Kingston, WA	**Ground Elevation: ~200 ft.**	**Logged By: EA**
Hammer Type: Manual ☐ Automatic ☑ Other ☐		
Water Level: No groundwater encountered.	**Drilling Method: HSA**	

Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample No. /Type	1st 6"	2nd 6"	3rd 6"	N Value	N VALUE GRAPH (Last 12") 10 20 30 40 50
33								
34								
35								
36			S7	50/6"			50+	
37								
38								
39								
40								
41			S8	50/5"			50+	
42								
43								
44								
45								
46			S9	38	50/5"		50+	
47								
48								
49								
50								
51			S10	50/4"			50+	
52								
53								
54								
55								
56			S11	50/6"			50+	
57								
58								
59								
60								
61			S12	50/3"			50+	
62								
63								
64								

LEGEND

SAMPLER TYPE				DRILLING METHOD			
SS	- Split Spoon	NQ	- Rock Core, 1-7/8"	HSA	- Hollow Stem Auger	RW	- Rotary Wash
ST	- Shelby Tube	CU	- Cuttings-	CFA	- Continuous Flight Augers	RC	- Rock Core
AWG	- Rock Core, 1-1/8"	CT	- Continuous Tube	D C	- Driving Casing		

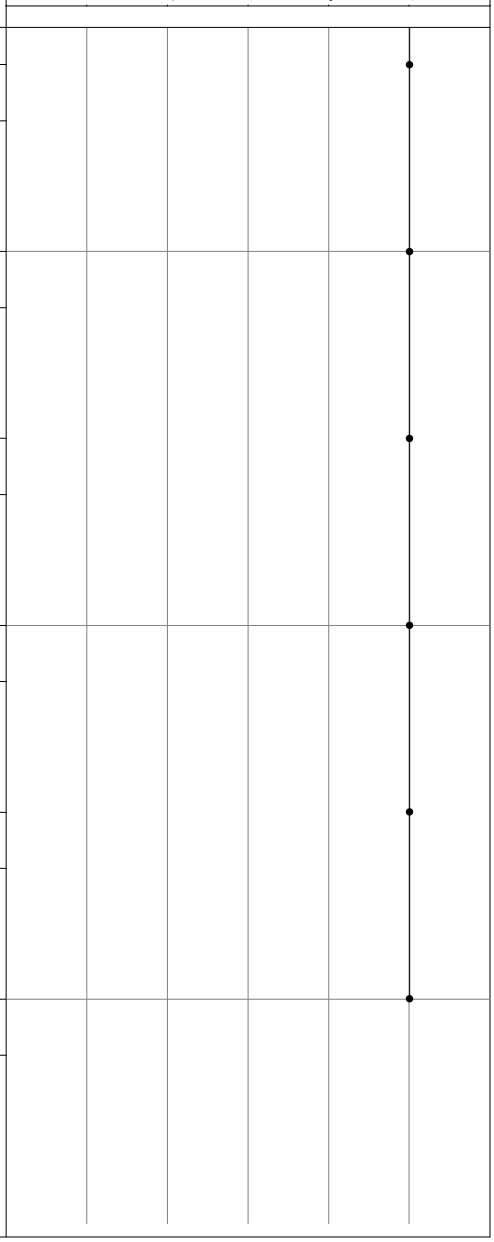
Krazan & Associates, Inc.

LOG OF BORING No. B-2

Date Drilled: 8/7/23	**Project: North Kloomachin Subdivision**		**Notes:**
Location: Kingston, WA	**Ground Elevation: ~200 ft.**	**Logged By: EA**	
Hammer Type: Manual ☐ Automatic ☑ Other ☐			
Water Level: No groundwater encountered.	**Drilling Method: HSA**		

Depth (ft)	MATERIAL DESCRIPTION	Graphic Log	Sample No. /Type	1st 6"	2nd 6"	3rd 6"	N Value
65							
66			S13	50/3"			50+
67							
68							
69							
70	-2" sand lens noted at 70 ft.		S14	50/3"			50+
71							
72							
73							
74							
75			S15	50/3"			50+
76							
77							
78							
79							
80			S16	50/2"			50+
81							
82							
83							
84							
85			S17	50/3"			50+
86							
87							
88							
89							
90			S18	50/4"			50+
91							
92	End of Exploratory Boring						
93							
94							
95							
96							

N VALUE GRAPH (Last 12")



LEGEND

SAMPLER TYPE		DRILLING METHOD	
SS - Split Spoon	NQ - Rock Core, 1-7/8"	HSA - Hollow Stem Auger	RW - Rotary Wash
ST - Shelby Tube	CU - Cuttings-	CFA - Continuous Flight Augers	RC - Rock Core
AWG - Rock Core, 1-1/8"	CT - Continuous Tube	D C - Driving Casing	

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	7	4	13	40	36	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
.75	100		
.5	98		
.375	97		
#4	93		
#10	89		
#20	86		
#40	76		
#60	60		
#100	42		
#200	36		

* (no specification provided)

Material Description

Gray Silty Sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 2.3518 D_{85}= 0.7702 D_{60}= 0.2493
D_{50}= 0.1922 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample Location: B1-S3
Moisture Content: 7.5%

Date Received: 8/14/23 **Date Tested:** 8/16/23

Tested By: AC

Checked By: Aaron CLyde

Title: Laboratory Manager

Source of Sample: B-1 **Depth:** 15.0'
Sample Number: 1020 **Date Sampled:** 8/7/23

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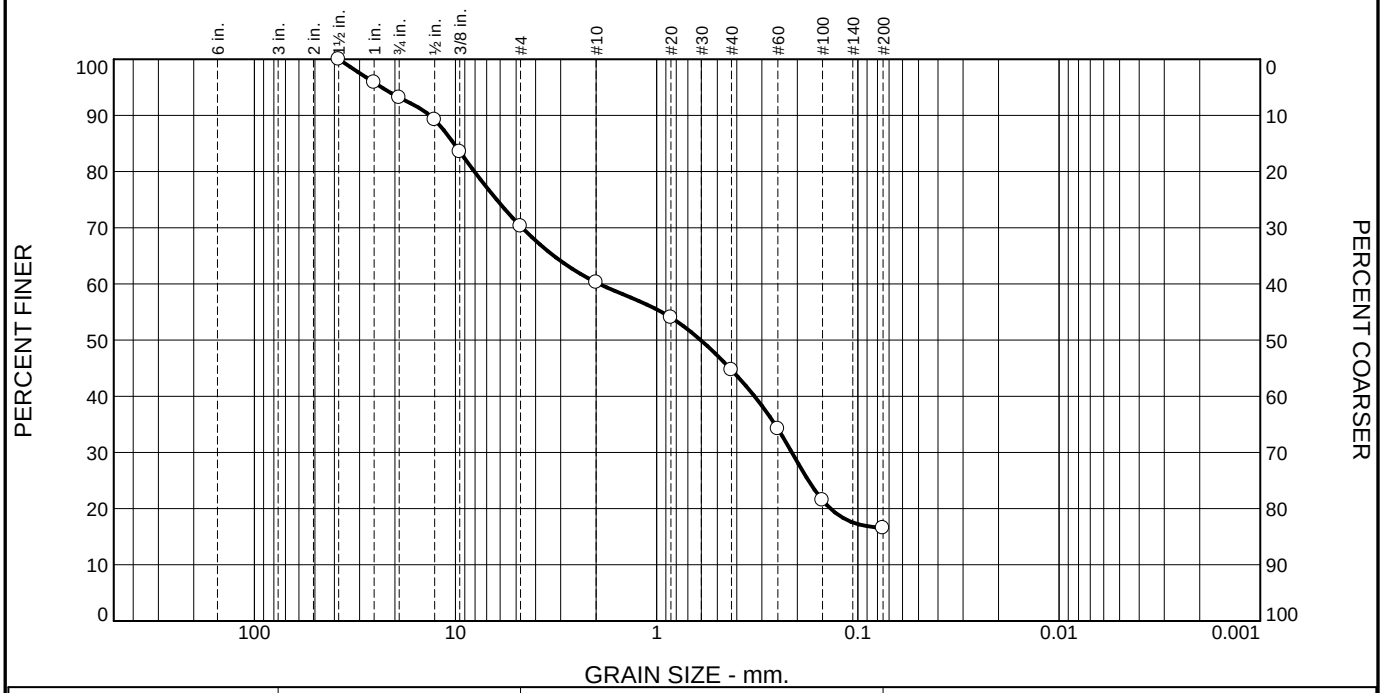
Client: Map Limited
Project: North Kloomachin Subdivision

Project No: 10223017 **Figure**

North Kloomachin Subdivision, 102-23017, August 15, 2023

Sample ID	Location	Elev/Depth	Moist Specimen (g)	Dry Specimen (g)	Mass Water (g)	% Moisture
1021	B1-S6	30’ 00”	954.95	886.42	68.53	7.7
1022	B1-S9	45’ 00”	771.24	722.75	48.49	6.7
1023	B2-S5	25’ 00”	1057.55	977.77	79.78	8.2
1024	B2-S9	45’ 00”	1129.9	1042.29	87.61	8.4
1025	B2-S11	55’ 00”	1101.02	1029.21	71.81	6.9
1026	B2-S13	65’ 00”	1019.65	962.46	57.19	5.9
1027	B1-S14	70’ 00”	823.93	705.21	118.72	16.8
1035	B2-S17	85’ 00”	1186.3	1112.89	73.41	6.5
1036	B1-S16	80’ 00”	1057.45	983.45	74.00	7.5
1037	B2-S15	75’ 00”	703.9	652.35	51.55	7.9

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	7	23	10	15	28	17	

Test Results (ASTM D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5	100		
1	96		
.75	93		
.5	89		
.375	84		
#4	70		
#10	60		
#20	54		
#40	45		
#60	34		
#100	21		
#200	17		

* (no specification provided)

Material Description

Gray Silty Sand with Gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-1-b

Coefficients

D_{90}= 13.4107 D_{85}= 10.1903 D_{60}= 1.9275
D_{50}= 0.6045 D_{30}= 0.2130 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample Location: TP1-S2
Moisture Content: 4.2%

Date Received: 8/14/23 **Date Tested:** 8/16/23

Tested By: AC

Checked By: Aaron Clyde

Title: Laboratory Manager

Source of Sample: TP-1 **Depth:** 3.5'
Sample Number: 1031

Date Sampled: 8/7/23

Krazan

Client: Map Limited
Project: North Kloomachin Subdivision

Project No: 10223017 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	9	12	5	15	36	23	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5	100		
1	93		
.75	91		
.5	87		
.375	85		
#4	79		
#10	74		
#20	70		
#40	59		
#60	45		
#100	29		
#200	23		

* (no specification provided)

Material Description

Gray Silty Sand with Gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 17.6922 D_{85}= 9.6663 D_{60}= 0.4376
D_{50}= 0.2920 D_{30}= 0.1577 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample Location: TP1-S3
Moisture Content: 5.2%

Date Received: 8/14/23 **Date Tested:** 8/16/23

Tested By: AC

Checked By: Aaron Clyde

Title: Laboratory Manager

Source of Sample: TP-1 **Depth:** 5.0'
Sample Number: 1032

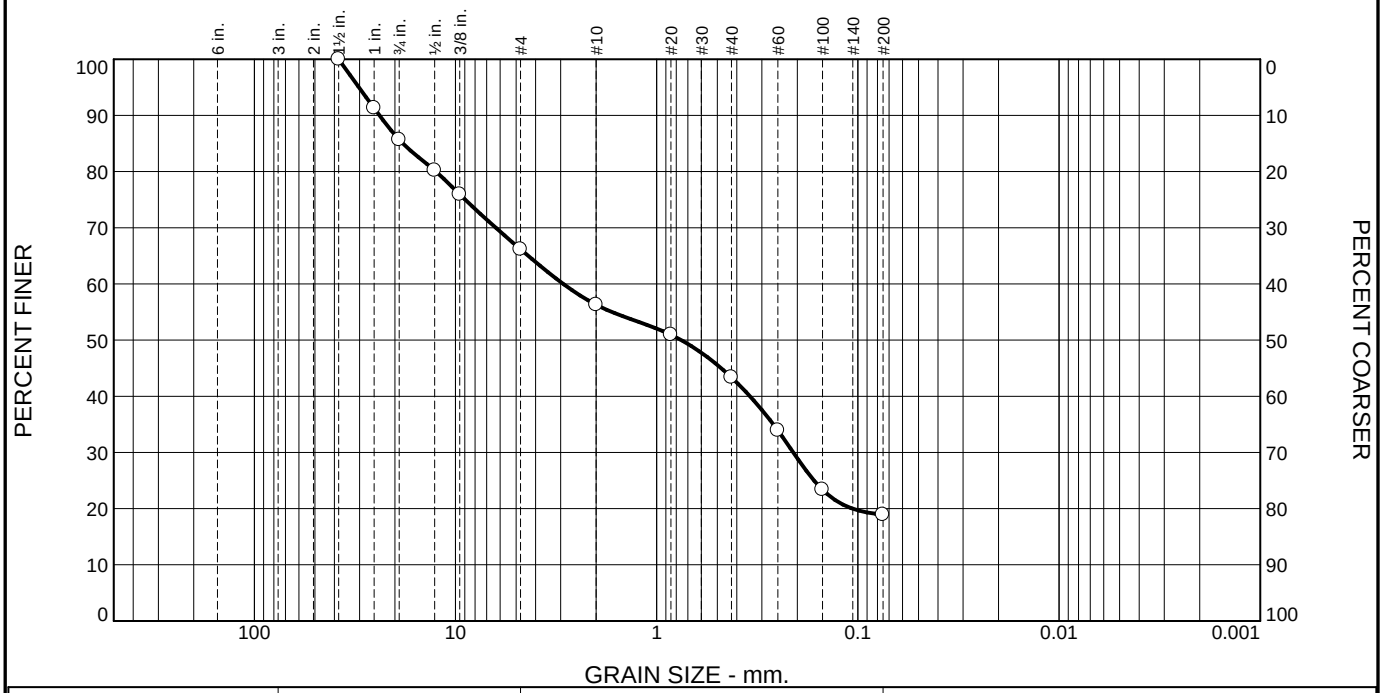
Date Sampled: 8/7/23

Krazan

Client: Map Limited
Project: North Kloomachin Subdivision

Project No: 10223017 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	14	20	10	13	24	19	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5	100		
1	91		
.75	86		
.5	80		
.375	76		
#4	66		
#10	56		
#20	51		
#40	43		
#60	34		
#100	23		
#200	19		

* (no specification provided)

Material Description

Light Brown Silty Sand with Gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-1-b

Coefficients

D_{90}= 23.8779 D_{85}= 18.2547 D_{60}= 2.9133
D_{50}= 0.7555 D_{30}= 0.2095 D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample Location: TP4-S1
Moisture Content: 19.4%

Date Received: 8/14/23 **Date Tested:** 8/16/23

Tested By: AC

Checked By: Aaron Clyde

Title: Laboratory Manager

Source of Sample: TP-4 **Depth:** 1.0'
Sample Number: 1033

Date Sampled: 8/7/23

Krazan

Client: Map Limited
Project: North Kloomachin Subdivision

Project No: 10223017 **Figure**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	4	15	7	21	39	14	

Test Results (ASTM D 6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5	100		
1	98		
.75	96		
.5	92		
.375	88		
#4	81		
#10	74		
#20	67		
#40	53		
#60	37		
#100	20		
#200	14		

* (no specification provided)

Material Description

Gray Silty Sand with Gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 11.1573 D_{85}= 7.3477 D_{60}= 0.5715
D_{50}= 0.3773 D_{30}= 0.2051 D_{15}= 0.1108
D_{10}= C_u= C_c=

Remarks

Sample Location: TP8 S1
Moisture Content: 1.1%

Date Received: 8/14/23 **Date Tested:** 8/16/23

Tested By: AC

Checked By: Aaron Clyde

Title: Laboratory Manager

Source of Sample: TP-8 **Depth:** 4.5'
Sample Number: 1034

Date Sampled: 8/7/23

Krazan

Client: Map Limited
Project: North Kloomachin Subdivision

Project No: 10223017 **Figure**

APPENDIX B

EARTHWORK SPECIFICATIONS

GENERAL

When the text of the report conflicts with the general specifications in this appendix, the recommendations in the report have precedence.

SCOPE OF WORK: These specifications and applicable plans pertain to and include all earthwork associated with the site rough grading, including but not limited to the furnishing of all labor, tools, and equipment necessary for site clearing and grubbing, stripping, preparation of foundation materials for receiving fill, excavation, processing, placement and compaction of fill and backfill materials to the lines and grades shown on the project grading plans, and disposal of excess materials.

PERFORMANCE: The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications. This work shall be inspected and tested by a representative of Krazan and Associates, Inc., hereinafter known as the Geotechnical Engineer and/or Testing Agency. Attainment of design grades when achieved shall be certified to by the project Civil Engineer. Both the Geotechnical Engineer and Civil Engineer are the Owner's representatives. If the contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory as determined by both the Geotechnical Engineer and Civil Engineer. No deviation from these specifications shall be made except upon written approval of the Geotechnical Engineer, Civil Engineer or project Architect.

No earthwork shall be performed without the physical presence or approval of the Geotechnical Engineer. The Contractor shall notify the Geotechnical Engineer at least 2 working days prior to the commencement of any aspect of the site earthwork.

The Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineers harmless from any and all liability, real or alleged, in connection with the performance of work on this project, except for liability arising from the sole negligence of the Owner of the Engineers.

TECHNICAL REQUIREMENTS: All compacted materials shall be densified to a density not less than 95 percent of maximum dry density as determined by ASTM Test Method D1557 as specified in the technical portion of the Geotechnical Engineering Report. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work will be judged by the Geotechnical Engineer.

SOIL AND FOUNDATION CONDITIONS: The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the contents of the data presented in the soil report. The Contractor shall make his own interpretation of the data contained in said report, and the Contractor shall not be relieved of liability under the contractor for any loss sustained as a result of any variance between conditions indicated by or deduced from said report and the actual conditions encountered during the progress of the work.

DUST CONTROL: The work includes dust control as required for the alleviation or prevention of any dust nuisance on or about the site or the borrow area, or off-site if caused by the Contractor's operation either during the performance of the earthwork or resulting from the conditions in which the Contractor leaves the site. The Contractor shall assume all liability, including Court costs of codefendants, for all claims related to dust or windblown materials attributable to his work.

SITE PREPARATION

Site preparation shall consist of site clearing and grubbing and preparations of foundation materials for receiving fill.

CLEARING AND GRUBBING: The Contractor shall accept the site in this present condition and shall demolish and/or remove from the area of designated project earthwork all structures, both surface and subsurface, trees, brush, roots, debris, organic matter, and all other matter determined by the Geotechnical Engineer to be deleterious. Such materials shall become the property of the Contractor and shall be removed from the site.

Tree root systems in proposed building areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots larger than 1 inch. Tree root removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill or tree root excavation should not be permitted until all exposed surfaces have been inspected and the Geotechnical Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

SUBGRADE PREPARATION: Subgrade should be prepared as described in our site preparation section of this report.

EXCAVATION: All excavation shall be accomplished to the tolerance normally defined by the Civil Engineer as shown on the project grading plans. All over excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the applicable technical requirements.

FILL AND BACKFILL MATERIAL: No material shall be moved or compacted without the presence of the Geotechnical Engineer. Material from the required site excavation may be utilized for construction site fills provided prior approval is given by the Geotechnical Engineer. All materials utilized for constructing site fills shall be free from vegetable or other deleterious matter as determined by the Geotechnical Engineer.

PLACEMENT, SPREADING AND COMPACTION: The placement and spreading of approved fill materials and the processing and compaction of approved fill and native materials shall be the responsibility of the Contractor. However, compaction of fill materials by flooding, ponding, or jetting shall not be permitted unless specifically approved by local code, as well as the Geotechnical Engineer.

Both cut and fill shall be surface compacted to the satisfaction of the Geotechnical Engineer prior to final acceptance.

SEASONAL LIMITS: No fill material shall be placed, spread, or rolled while it is frozen or thawing or during unfavorable wet weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until the Geotechnical Engineer indicates that the moisture content and density of previously placed fill are as specified.

APPENDIX C

PAVEMENT SPECIFICATIONS

1. DEFINITIONS – The term "pavement" shall include asphalt concrete surfacing, untreated aggregate base, and aggregate subbase. The term "subgrade" is that portion of the area on which surfacing, base, or subbase is to be placed.

2. SCOPE OF WORK – This portion of the work shall include all labor, materials, tools and equipment necessary for and reasonable incidental to the completion of the pavement shown on the plans and as herein specified, except work specifically noted as "Work Not Included."

3. PREPARATION OF THE SUBGRADE – The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans and as per the pavement design section of this report. The upper 12 inches of the soil subgrade beneath the pavement section shall be compacted to a minimum compaction of 95 percent of maximum dry density as determined by test method ASTM D1557. The finished subgrades shall be tested and approved by the Geotechnical Engineer prior to the placement of additional pavement of additional pavement courses.

4. AGGREGATE BASE – The aggregate base shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate base should conform to WSDOT Standard Specification for Crushed Surfacing Base Course or Top Course (Item 9-03.9(3)). The base material shall be compacted to a minimum compaction of 95 percent as determined by ASTM D1557. Each layer of subbase shall be tested and approved by the Geotechnical Engineer prior to the placement of successive layers.

5. ASPHALTIC CONCRETE SURFACING – Asphaltic concrete surfacing shall consist of a mixture of mineral aggregate and paving grade asphalt, mixed at central mixing plant and spread and compacted on a prepared base in conformity with the lines, grades, and dimensions shown on the plans. The drying, proportioning, and mixing of the materials shall conform to WSDOT Specifications.

The prime coat, spreading and compacting equipment, and spreading and compacting the mixture shall conform to WSDOT Specifications, with the exception that no surface course shall be placed when the atmospheric temperature is below 50 degrees F. The surfacing shall be rolled with combination steel-wheel and pneumatic rollers, as described in WSDOT Specifications. The surface course shall be placed with an approved self-propelled mechanical spreading and finishing machine.

6. TACK COAT – The tack (mixing type asphaltic emulsion) shall conform to and be applied in accordance with the requirements of WSDOT Specifications.

APPENDIX G CULTURAL RESOURCES ASSESSMENT

WILLAMETTE
CULTURAL RESOURCES ASSOCIATES, LTD.



Cultural Resources Assessment for the North Kloomachin Subdivision Project, Port Gamble S'Klallam Tribe, Kingston, Washington

Cultural Resources Assessment for the North Kloomachin Subdivision Project, Port Gamble S'Klallam Tribe, Kingston, Washington

Prepared by
Robert Kopperl, Ph.D., R.P.A.
F. Scott Pierson

September 11, 2023

WillametteCRA Report No. 23-108
Seattle, Washington

Prepared for
MAP, Ltd.
Silverdale, Washington

and

Port Gamble S'Klallam Tribe
Kingston, Washington



WILLAMETTE
CULTURAL RESOURCES ASSOCIATES, LTD.

Report Details

Project Name:	North Kloomachin Subdivision
Agency:	Port Gamble S'Klallam Tribe
Client/Owner:	MAP, Ltd. / Port Gamble S'Klallam Tribe
Project Undertaking:	Residential Subdivision Development on Indian Reservation
Regulatory Framework:	Tribal Environmental Permitting Process (Title 24)
County(ies):	Kitsap
Legal Description:	Township 27N, Range 2E, Section 5
USGS Quad(s):	*Port Gamble, WA* 7.5-minute
Project Acreage:	~40 (Total parcel area)
Survey Acreage:	~20 (Portion proposed for subdivision, utilities, and development)
Field Note Location:	WillametteCRA, Seattle Office
Fieldwork Type:	Pedestrian Survey, Shovel Probes
Fieldwork Dates:	August 9, 2023
Field Personnel:	F. Scott Pierson, Althea Fitzpow, Breann Stoner
Findings:	No cultural resources identified
Recommendations:	Implement an Inadvertent Discovery Plan during construction.

Executive Summary

The Port Gamble S'Klallam Tribe (PGST) seeks to build a residential subdivision on 40 acres of currently undeveloped land near the north edge of the Port Gamble Reservation (Project). A cultural resources assessment was requested by PGST along with several other discipline reports as part of its Title 24 environmental process, given the general archaeological sensitivity of the Project vicinity and its proximity to their ancestral village of Little Boston. MAP, Ltd., is facilitating the various Project environmental reviews and subcontracted with Willamette Cultural Resources Associates, Ltd. (WillametteCRA) to complete this assessment with the goal of identifying and assessing the potential historic significance of cultural resources that may be impacted by the Project.

WillametteCRA completed background research on the natural and cultural setting of the Project, conducted a review of previous cultural resource studies in the area, and completed a thorough surface and subsurface archaeological survey of the Project limits. The Port Gamble Reservation has been an important place for traditional S'Klallam land use since time immemorial. The Project is located on nearby bluffs northeast of the historic village of Little Boston on Point Julia and southwest of an historic Indian Shaker Church cemetery. Twentieth century activity in and near the Project has generally been limited to several episodes of clearcut logging.

No significant cultural resources or places of elevated archaeological sensitivity were identified within the Project limits during this assessment, either from archival research, from our archaeological field survey that included pedestrian survey and excavation of 29 shovel probes within the ~20-acre portion of the Project where development is planned, or in our review of Project geotechnical data. However, culturally important places on the Reservation landscape are situated nearby, most notably the cemetery to the northeast and Point Julia to the southwest.

Historic clearcut logging episodes atop this geologically old surface composed of sterile glacial sediments indicates the likelihood of archaeological resources or other remains of traditional land use to be very low within the Project limits. No further identification efforts or other archaeological measures are recommended for completion of the Project as designed. We do recommend, however, an Inadvertent Discovery Plan (IDP) to be implemented by PGST and its construction contractors during all ground disturbing activities associated with this Project. The IDP should have clear procedures and protocols to be followed in the event, however unlikely, that significant archaeological resource or human skeletal remains are encountered during construction.

Acknowledgments

We wish to thank PGST for giving us another opportunity to assist them with the growth of their community and improvements to Reservation infrastructure. In particular, Misty Ives (Cultural Resources) and Abby Welch (Planning) are PGST staff who patiently answered our questions about the Project area and its natural and cultural history. We thank Pat Fuhrer at MAP, Ltd., for inviting us to be part of the consultant team, and Andrew Glenn at Krazan & Associates, Inc. for providing the geotechnical data for our review. Finally, we acknowledge our field technicians Althea Fitzpow and Breann Stoner for their hard work in the rare summer rain shower that greeted us during our fieldwork.

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Introduction

The Port Gamble S'Klallam Tribe (PGST) seeks to build a residential subdivision on 40 acres of currently undeveloped land near the north edge of the Port Gamble Reservation (Project). A cultural resources assessment was requested by PGST along with several other discipline reports as part of its Title 24 environmental process, given the general archaeological sensitivity of the Project vicinity and its proximity to their ancestral village of Little Boston. MAP, Ltd., is facilitating the various Project environmental reviews and subcontracted with Willamette Cultural Resources Associates, Ltd. (WillametteCRA) to complete this assessment with the goal of identifying and assessing the potential historic significance of cultural resources that may be impacted by the Project.

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No significant cultural resources or places of elevated archaeological sensitivity were identified within the Project limits during this assessment, either from archival research, from our archaeological field survey, or in our review of Project geotechnical data. However, culturally important places on the Reservation landscape are situated nearby, most notably the cemetery to the northeast and Point Julia to the southwest. Because of this, we recommend PGST implements an Inadvertent Discovery Plan during construction in the event that any archaeological resources, human remains, or any other cultural resources are encountered.

Project Location and Description

The Project is on approximately 40 acres of undeveloped land near the north end of the Reservation, Township 27N, Range 2E, Section 5 (Figure 1). This land is situated on a bluff drained by Shipbuilder's Creek above Hood Canal north of Point Julia, with portions planned for development on both the north and south sides of Hood Canal Drive NE west of Little Boston Road NE (Figure 2). Only about half of the ~40-acre Project area is planned for development, including preliminary subdivision of 50 lots, construction of access roads and cul-de-sacs, and installation of stormwater facilities in up to two non-contiguous locations as well as other utilities. The other half of the Project area is on steep slopes, hosts critical plant and wildlife habitats, or is otherwise not planned for development.



Figure 1. Project location.

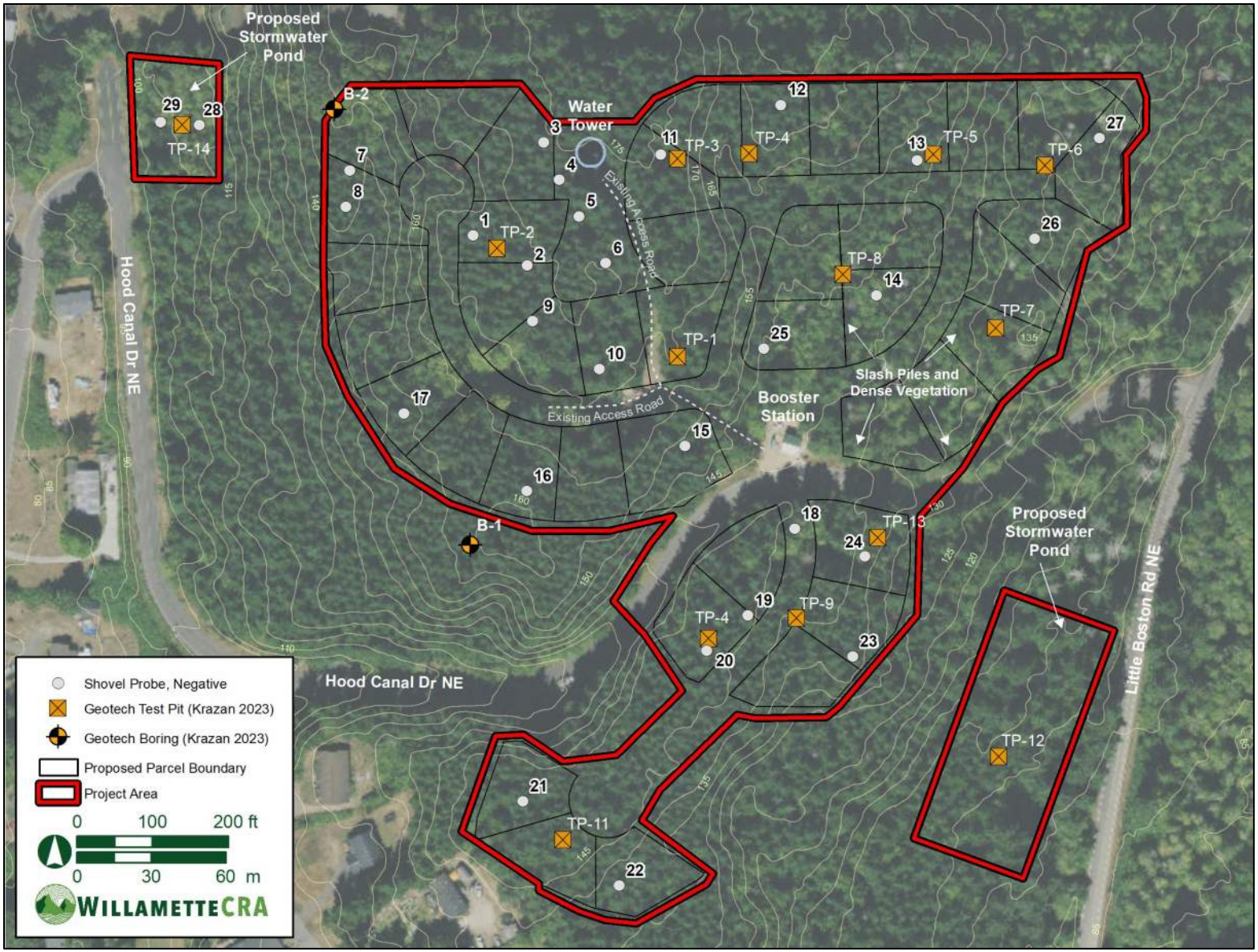


Figure 2. Project design, archaeological shovel probes, and geotechnical study locations.

Regulatory Context

This project was undertaken at the request of the PGST for an internal due diligence cultural resources review under the Tribe's general Title 24 environmental review process. As there is no outside funding or permitting requiring compliance with the National Environmental Policy Act or Section 106 of the National Historic Preservation Act, and the project is not within a known archaeological site, there are no applicable federal historic preservation regulation requirements. If such a federal nexus occurs later during the Project, this report is written to Washington State Department of Archaeology and Historic Preservation (DAHP) standards and can be used as documentation in support of Section 106 compliance and state and/or federal environmental permitting requirements.

Natural Setting

The modern landscape of western Washington is diverse and characterized by landforms and sediments produced across multiple spatial and temporal scales in glacial, deglacial, and non-glacial environments—many of which are found in the vicinity of Port Gamble. Some of the physical features associated with earlier glacial and deglacial conditions are still readily visible in this modern landscape; other landscape features are the products of much more recent Holocene geomorphic and anthropogenic processes.

Geology and Geomorphology

The modern topography and surficial geology of the Salish Sea region is the result of multiple widespread continental glaciations that extended southward from British Columbia into the northern lowland, along the western flanks of the Cascade Range and eastern flanks of the Olympic Mountains, and along the north margin of the Olympic Peninsula. Originating in the mountains of southwestern British Columbia, thick lobes of ice advanced southward several times during the Pleistocene Epoch between 1.8 million years ago and the beginning of the Holocene about 10,000 years ago. The latest glacial maximum, known in this region as the Vashon Stade of the Fraser glaciation, began about 17,000–18,000 years ago and ended abruptly with the onset of climatic warming about 14,000 years ago (Easterbrook 1993, 2003a).

The outwash deposited during the southward advance of the Puget Lobe of the Cordilleran ice sheet filled the Salish Sea basin, forming an extensive low-lying area bounded on the west by the Olympic Mountains and the Cascade Range on the east. Sometimes called the "great Lowland Fill", the surface of this fill rarely rises above 500 feet elevation (Booth and Goldstein 1994). Subglacial incision when the ice sheet overrode the advance outwash, and subglacial incision during the maximum extent and subsequent retreat of the ice sheet, created numerous large deep troughs and meltwater channels. As a result, the regional geomorphology is now dominated by well-defined north-to-south trending troughs separated by extensive drift uplands. At the regional scale, marine waters and freshwater lakes now occupy the larger Pleistocene

glacial troughs. The largest of these bodies of water include the south Salish Sea and its present-day marine embayments, both large (e.g., Puget Sound and Hood Canal) and small (e.g., Port Gamble, Liberty Bay, and Dyes Inlet).

Deglaciation of the Cordilleran ice sheet at the end of the Pleistocene was rapid and accompanied by the formation of a complex succession of meltwater channels and ice-marginal lakes behind the retreating ice. During the early stages of retreat, the meltwater trapped behind the retreating ice sheet formed proglacial lakes that overflowed south across the outwash plain and drained through the Chehalis Valley. Glacial Lake Russell, the first lake formed south of the north-retreating ice front, continually enlarged northward as ice-retreat continued. As the ice continued to retreat other independent ice-marginal lakes merged with Glacial Lake Russell to form Glacial Lake Bretz (Waitt and Thorson 1983). By about 13,000 years ago, during the later stages of deglaciation when the ice sheet retreated north of Port Gamble and reached the vicinity of Whidbey Island, the southern outlet through the Black Hills was abandoned and the lake drained northwestward along the western margin of the ice sheet into the Strait of Juan de Fuca through the Chimacum valley (Dethier et al. 1995; Easterbrook 1994, 2003a, 2003b; Haugerud 2004).

With the rapid melting of the ice sheets at the end of the Pleistocene, global sea level rose rapidly from 390 feet below present sea level (bpsl) at the time of maximum glacial extent and was 30 feet bpsl by 7,000 years ago. By about 5,700 years ago, global sea level was 16 feet bpsl but continued to rise, albeit more slowly until about 3,000 years ago. At the same time global sea levels were rising, land formerly depressed under the weight of the ice experienced uplift as local isostatic rebound raised land levels as high or higher than 200 feet above modern sea level throughout the south Salish Sea lowlands. Uplift due to rebound appears to have finished by 9,000 years ago, and the rapidly rising global sea-level rise began to drown the early Holocene shorelines (Dethier et al. 1995; Dragovich et al. 1994; Thorson 1989).

The mapped surface geology of the project vicinity reflects this history extending back into the last great Ice Age. Visible on LiDAR imagery (Figure 3), the bluff-top landform on which the project area is situated has been mapped as a Late Pleistocene glacial surface characterized by irregular pits, lumps, and fluting typical of Vashon stade recessional outwash surfaces (Haugerud 2009; Yount et al. 1993). This indicates that archaeological material, if deposited within the Project area, would be very close to the surface where natural ground surfaces in the project area remain and not buried at greater depths. Soil formation processes have weathered this old surface during the course of the Holocene. The soils within the project area are mapped primarily as Poulsbo and Poulsbo-Ragnar series, with a smaller area at the west edge of the overall Project area not planned for development as Ragnar series soil (McMurphy 1980). These soils form shallow forest soil A horizons on the often-sloped surfaces of glacial outwash and till parent material.

Krazan & Associates (Krazan) conducted a geotechnical study for the Project that included excavation of 14 mechanical test pits (TPs) to depths between about 6 and 10 feet below surface (fbs) and two hollow stem auger boreholes to depths of 91.5 fbs (see Figure 2) to characterize geological conditions (Krazan 2023). These tests corroborated the local Project conditions with the broader soil and surface geology efforts noted above, encountering thin forest topsoil that has formed on the surface of glacial deposits.

Biota

Climate in the Salish Sea lowlands was much cooler and drier than today at the end of the Pleistocene (Barnosky 1984; Barnosky et al. 1987; Brubaker 1991; Whitlock 1992). This influenced the species of plants that would inhabit the newly deglaciated surfaces across the Puget Lowland, such as lodgepole pine and bracken fern with scattered Douglas fir, white pine, spruce, and alder. The climate warmed at the onset of the Holocene. As the climate continued to dry during the warmer early Holocene, species like grasses, fir, alder, and oak replaced those that preferred a colder, wetter climate. By about 6,000 years ago, the regional climate had returned to cool and moist conditions that are comparable to the modern maritime regime, producing the western hemlock (*Tsuga heterophylla*) vegetation zone (Franklin and Dyrness 1988). The western hemlock zone is historically characterized by a high proportion of western hemlock and western redcedar, relative to the once dominant Douglas fir, red alder, and various grasses. Climate and vegetation have remained generally stable since the mid-Holocene when the closed-canopy forest typical of western Washington was established (Whitlock 1992).

As a focus of the early commercial logging industry in western Washington near some of the first sawmills in the region, the bluffs above Point Julia saw clearcut timber harvest that removed old-growth forest. A succession of harvests throughout what would become the Port Gamble Indian Reservation has left a mosaic of forest stands of various ages. PGST planning documents (PGST Natural Resources Department 2022; Welch 2022) note a second growth Douglas fir monoculture now dominates the Project area, and that the oldest forest stands within the Project area are over 50 years old along the east edge of the overall Project area but outside areas planned for subdivision and development. The remainder of the Project area is covered by forest stands that were last logged at least 30–40 years ago.

The Salish Sea lowlands historically supported substantial populations of large and small mammals including black-tailed deer, elk, black bear, rabbit, fox, wolf, mountain lion, muskrat, and beaver (Ingles 1965; Larrison 1970). Freshwater fish, both native and introduced, are resident in the streams and lakes of northern Kitsap County (Wydoski and Whitney 2003). Anadromous salmonids historically used the small streams that drain into Port Gamble to spawn at different times during the year. These include presumed runs of coho up Little Boston Creek, fall chinook and pink salmon up Gamble Creek, and winter steelhead up Martha John Creek, as

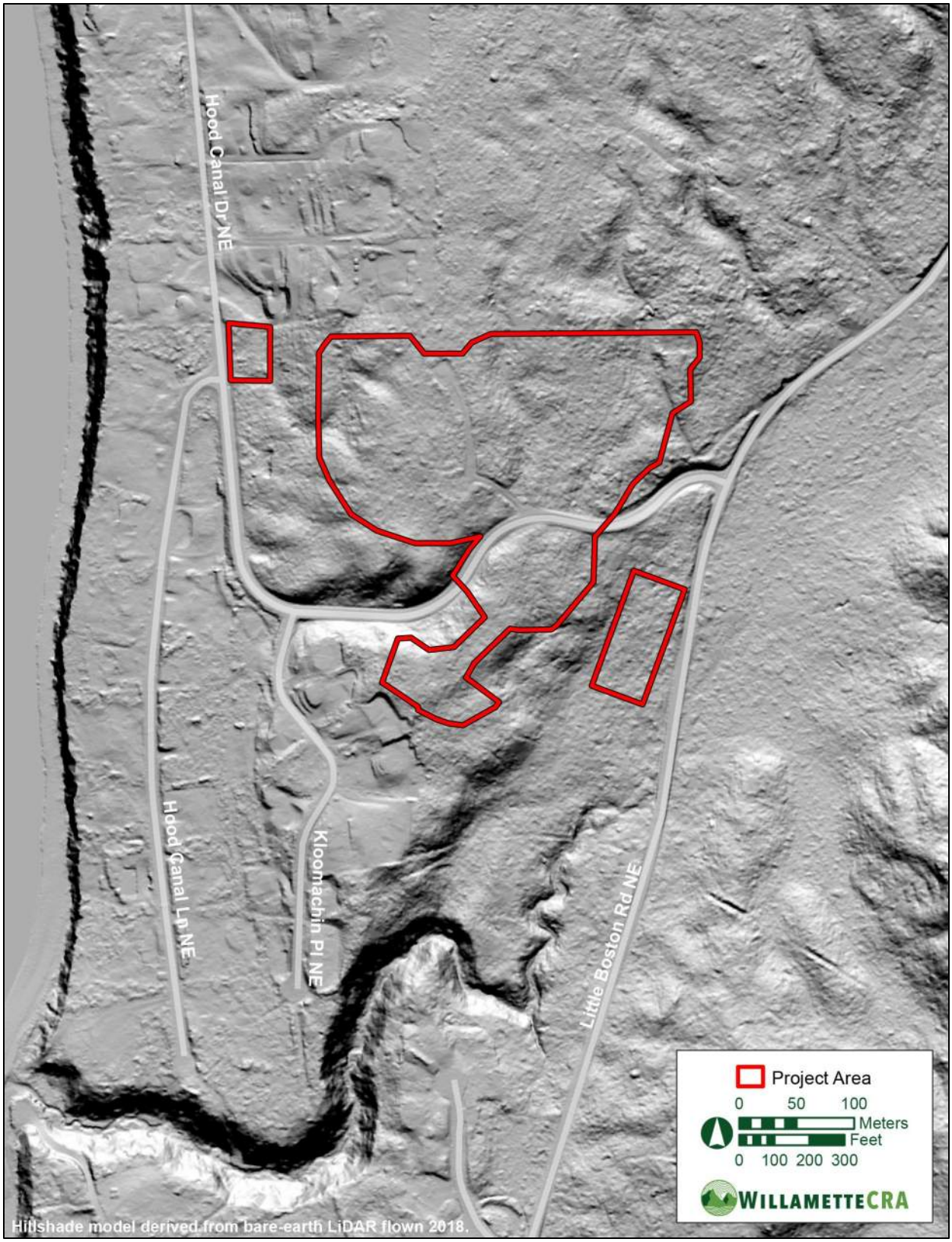


Figure 3. LiDAR imagery of the Project vicinity.

well as cutthroat trout up many of these creeks (Kuttel 2003). Shipbuilder Creek is one of several small streams in the area that support coho and fall chum salmon as well as cutthroat trout (May and Peterson 2003). Ducks, geese, and swans are seasonally abundant, as are resident birds (Angell and Balcomb 1982; Wahl and Paulson 1991).

Cultural Setting

Archaeological, ethnographic, and historical information about the region and the Project vicinity reflects land use of this area for well over 10,000 years. The history of Native American settlement and subsistence in the nearby uplands, river valleys, and tidewater both before and after European American contact also reveals important patterns that speak to the potential for archaeological resources and culturally important places.

Precontact Culture History

Little archaeological evidence has been found so far associated with Late Pleistocene and early Holocene human occupation of the Salish Sea lowlands, although investigation at the Bear Creek site (45KI839), about 25 miles southeast of Port Gamble near the north end of Lake Sammamish, has contributed a substantial amount of data from intact archaeological deposits dating between about 10,000 and 12,500 years ago (e.g., Kopperl et al. 2015). Aside from the Bear Creek site, knowledge of this period in the region is limited to several isolated finds of artifacts diagnostic to this time, but sparsely distributed across the region and lacking context. More common are Olcott sites, named after the type-site in Snohomish County and found mostly on glacial outwash surfaces in the Puget Lowland and inland foothill valleys (e.g., Chatters et al. 2020). The distinctive Olcott stone tool assemblage consists of large, leaf-shaped and stemmed points and flake tools manufactured from locally available cobbles. Several sites on the east and northeast side of the Olympic Peninsula are inferred to be contemporaneous with the Olcott tradition (e.g., Gallison 1994; Kiers and Feathers 2010). Assemblages of the Olcott tradition are usually interpreted as evidence of an early, highly mobile hunting and gathering adaptation. This pattern may have persisted for over 6,000 years and near its end it is marked by increasing reliance on marine and riverine resources.

After about 5,000 years ago, relative sea level stabilized and larger human populations in the Salish Sea lowlands organized in more complex ways to utilize a wide range of locally available resources including large and small mammals, shellfish, fish, berries, roots, and bulbs. An increasing emphasis on salmon over time is inferred as well. Shell middens containing large quantities of shellfish remains and marine fish and mammal bone are common on the saltwater shoreline. Ground stone, bone, antler, and shell tools became increasingly common and more diversified through time. Full-scale development of marine-oriented cultures on the coast and inland hunting, gathering, and riverine fishing traditions as represented in the ethnographic record are apparent after about 2500 before present (BP). Large semi-sedentary populations occupied cedar plank houses located at river mouths and confluences and on protected

shorelines. Artifacts made of both local and imported materials occur, indicating complex and diversified technologies for fishing, hunting, food processing, and storage. Wealth-status objects, status differentiation in burials, and artistic expression on ornamental items are also represented during this period (e.g., Ames and Maschner 1999; Moss 2011).

Large shell midden complexes such as the one at Point Julia nearby to the southwest of the Project have been found, and in some cases intensively studied, elsewhere along south Salish Sea shorelines. The similar geomorphological setting of Point Elliott at Mukilteo, for example, hosts an extensive complex of shell midden deposits with substantial place-to-place variability. Thicker deposits with the oldest cultural remains tend to be found near the base of the spit landform, and more recent archaeological remains found farther away from the base of the spit, horizontally correlating with the age of the spit as it developed over time. Such spits served as ideal platforms for both winter village occupations and base camps for seasonal harvest of marine resources, especially over the past two millennia (e.g., Kopperl 2020a, 2020b; Miss et al. 2013).

Native Peoples and Port Gamble History

The Project is in the traditional territory and on the Reservation lands of the Port Gamble S'Klallam. This Salish-speaking group, also called *Nux Sklai Yem* or "Strong People," lived much of the year in villages and smaller seasonal encampments on the northern Kitsap Peninsula and surrounding shores (e.g., Beckwith et al. 2015; Charles 2012). The Project is on a bluff above the landform on which their ancestral village was situated near several ethnographically recorded landscape features. It is north of the contemporary PGST administrative headquarters and historic Tribal cemetery, and southwest of the Indian Shaker Church cemetery.

Like other Native American groups in the region, the Port Gamble S'Klallam traditionally followed a seasonal round that was tied to available resources. During the winter, people lived in villages of cedar plank houses where social activities, religious ceremonies, and manufacture and maintenance of material items occurred. Much of the winter subsistence consisted of preserved and stored foods, especially salmon dried after harvest earlier in the year. At the end of winter, people dispersed to hunt, fish, and gather seasonally available resources. Salmon, berries, shellfish, and other resources collected throughout the spring, summer, and fall were dried and brought back to the winter villages (Haeberlin and Gunther 1930; Mansfield and Charles 2012). Point Julia was a place with resources available at different seasons year-round.

Several traditional place names near the Project were recorded by ethnographers in the early twentieth century, including James P. Harrington (Brooks 1997) and T. T. Waterman (Waterman et al. 2001). Harrington recorded place names in the traditional S'Klallam and Chemakum languages by his informants during the spring of 1942. The S'Klallam name for the settlement that became Little Boston was *nəxwq'ít*, meaning "land of the noon-day sun" (Brooks 1997; Stormy Purser, personal communication, 2020). The S'Klallam had traditional names for other

nearby places as well, including marshes, ponds, and creeks that fringed Port Gamble Bay (Brooks 1997:181).

The Port Gamble embayment was used by S'Klallam groups and their neighbors for millennia, as attested by the large shell midden at the sand spit of Point Julia, although as in other areas of the Pacific Northwest, increasing Euroamerican presence subjected the local inhabitants to the pressures of disease and changing lifeways (e.g., Boyd 1999). Totten Point—the spit opposite Point Julia at the entrance to Port Gamble—was an important, well-developed settlement for the Port Gamble S'Klallam at the time the founders of the Puget Mill Company arrived in 1853. The founders, William Talbot and Andrew Pope, claimed the land and established their mill on this western spit. Following negotiations between the S'Klallam and the mill owners, their village was moved across the bay entrance to Point Julia (Lawson 1856).

In 1855, the governor of Washington Territory, Isaac Stevens, sanctioned the Point-No-Point Treaty that extinguished Indian land title and assigned the S'Klallam to the Skokomish Reservation. However, most S'Klallam living around Port Gamble chose to stay in the village at Point Julia, eventually called Little Boston, and work for the mill across the bay on Totten Point (Beckwith et al. 2015). The S'Klallam at Little Boston quickly became, and remained, the backbone of labor at the mill well into the twentieth century (Charles 2012).

Before the S'Klallam moved from Totten Point on the west side of the bay to Point Julia on the east side of the Bay, the upland backing the east shoreline had undergone land claims by Euroamericans. By 1860, Job Drew and Gordon Thomas held land in the south-central portion of Section 5 that included the uplands east of Point Julia. The land was patented to them in 1862 under the Scrip Warrant Act of 1855 along with other land of theirs that would eventually become the PGST reservation (Bureau of Land Management 2023). A General Land Office (GLO) map of lands surveyed in 1860 (General Land Office 1860) shows burgeoning mill development on the west spit but no features of development on the east side at or near Point Julia. A more detailed coastal survey map from four years earlier; however, does show the "Indian Village" at Point Julia (Figure 4).

Over the subsequent decades, most of the land on the east side of Port Gamble was logged and sold. In 1934, passage of the Indian Reorganization Act (Wheeler-Howard Act) authorized the federal government to acquire land for tribes. In 1938, the area surrounding Point Julia was purchased from the Puget Mill Company and other owners to become a reservation for the PGST. Although maps dated as late as 1940 still showed the Native village at New Boston, new homes were being built on the heavily logged bluff above Port Gamble Bay in anticipation of reorganization, in an upland area called "Coontown" (Mansfield 2012a:130; Port Gamble S'Klallam Tribal Oral History Project 2007). A Shaker church and cemetery were established on the east side of Port Gamble in Coontown northeast of the Project area, from land deeded between 1913 and 1916 by the Andersons—the first and only S'Klallam family to formally homestead in the area (Mansfield 2012b:92–93, 112).



Figure 4. Project Area on a U.S. Coast and Geodetic Survey Topographic Sheet from 1856.

The S'Klallam sought to utilize funding from several of the New Deal programs prompted by the Great Depression to construct these new homes, but often encountered bureaucratic red tape. When the S'Klallam applied to the Works Progress Administration for labor funding to build the homes, they were denied since no S'Klallam men had received federal relief from May through November of the prior year. During this period S'Klallam families were gathering, fishing, and shellfishing at nearby locations, such as Foulweather Bluff and Skunk Bay, rather than receiving federal relief (Charles 2012). Following a visit from Eleanor Roosevelt, the S'Klallam were able to acquire funding for housing to be built on the blufftop (Charles 2012).

The original Little Boston houses on the spit were burned in 1940, an echo of the removal of the S'Klallam from their village at Port Townsend and its subsequent burning to clear the way for European American development (Beckwith et al. 2015; Charles 2012). The Indian Shaker Church cemetery was preserved through these times of profound reorganization of S'Klallam society and redrawing of property and Reservation boundaries on maps. At least 13 S'Klallam individuals have been interred at the cemetery, with records indicating burials as early as the 1920s that include a Tribal chief's burial. The early legal property history of the cemetery, adjacent to but off the Reservation (Figure 5), is somewhat unclear, except that the property was retained into the late 1970s by Catherine Shields, the daughter of Joseph Anderson, who owned the land on which the cemetery is situated and sold the remainder of his land in 1938 with a clause in his conveyance agreement with the church that it would revert back to his heirs if it was no longer used for church purposes; clarity on the legal ownership was lacking at that time. In the early 2000s, then-owner Pope Resources worked with PGST to exclude the cemetery and path leading to it from a proposed harvest (Misty Ives, personal communication, 2023). The Tribe now owns this land around the cemetery.

Mid-twentieth century historic maps and aerial imagery show the 1940s-era homes along the edge of the bluff west of the Project, and by the mid-1950s Hood Canal Drive was in its present configuration bisecting the Project area. As noted above and by Welch (2022), clearcut harvests began near the Project by the early twentieth century. Historic aerial imagery shows this sequence. Figure 6 is imagery from 1941 that shows Hood Canal Drive and Little Boston Road roughly aligned with their current configurations along and within the Project area. The entire Project vicinity appears to have been recently clearcut with patchy regrowth visible in some areas; the Shaker cemetery and the path leading to it from Little Boston Road does not appear to have been disturbed. Figure 7, imagery from a decade later, shows much of the Project area forest in a state of regrowth without any additional developments. Figures 8 and 9 are oblique-view aerial photographs of the Project area in 1977 and 2016, respectively. Another round of clearcut harvest across most of the Project area occurred in the 1980s (PGST Natural Resources Department 2022:3–4), but the land remained undeveloped except for the concrete water tank that was built ca. 2008.

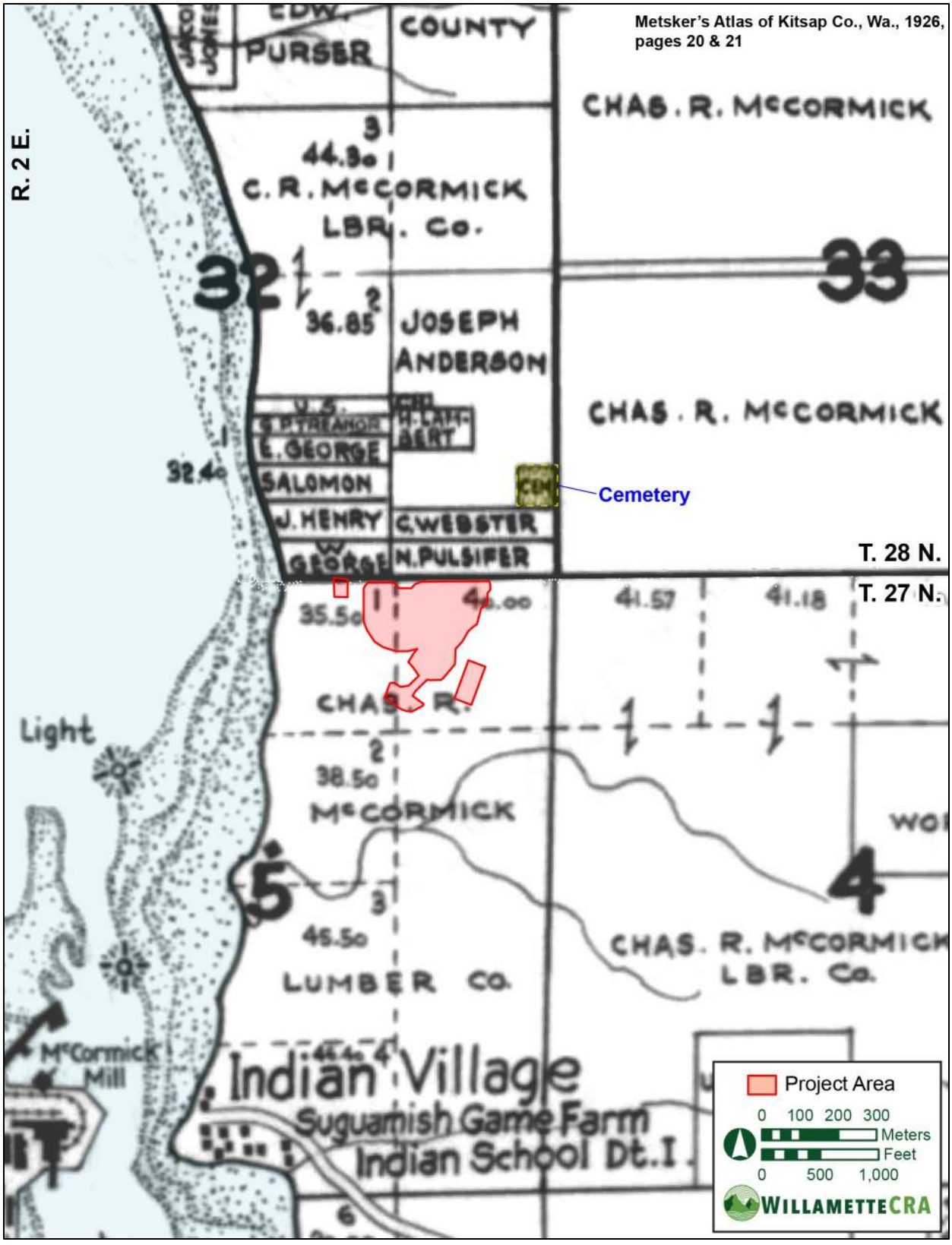


Figure 5. Composite 1926 Metsker showing Indian Shaker cemetery in relation to Project.

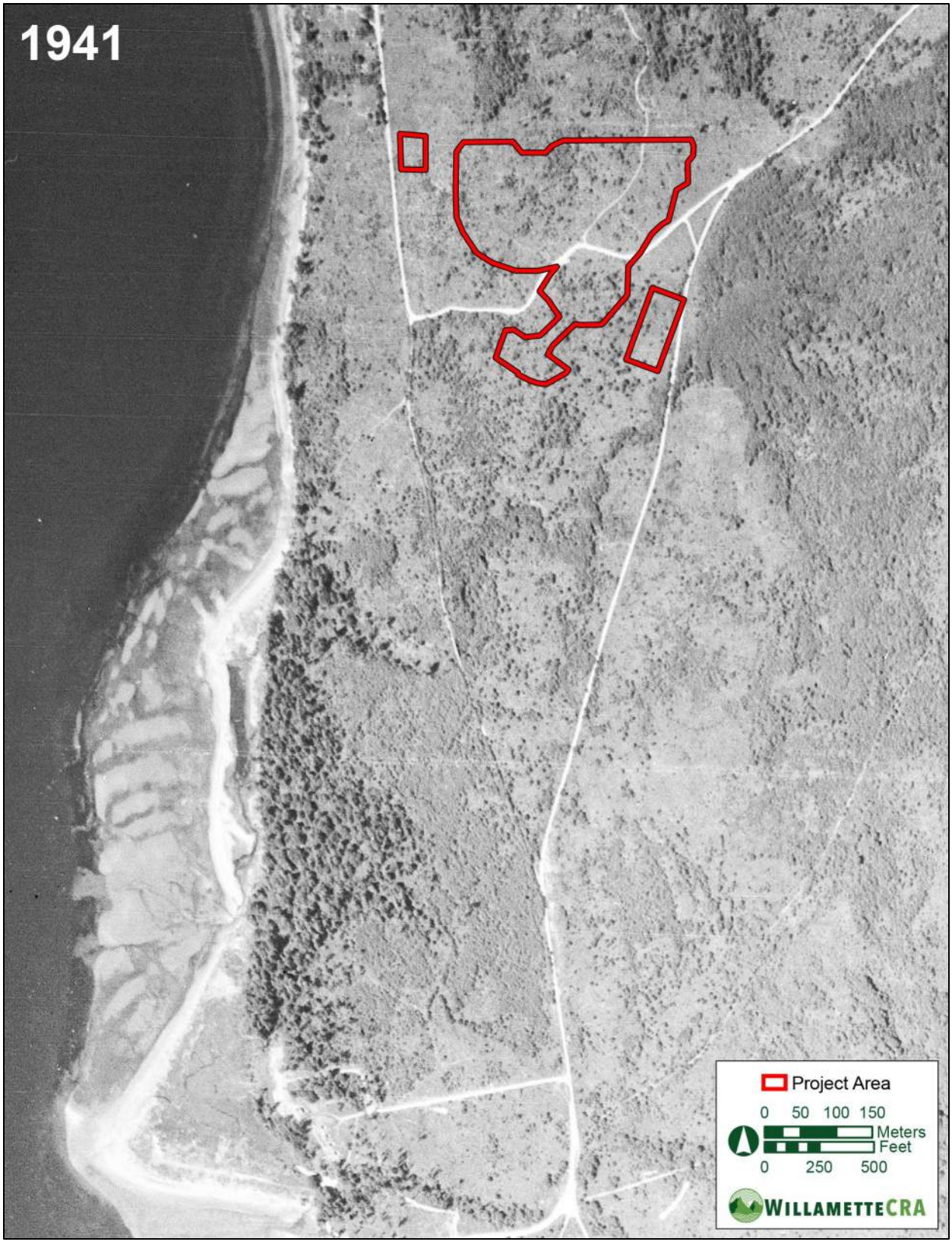


Figure 6. 1941 Aerial imagery of Project vicinity.

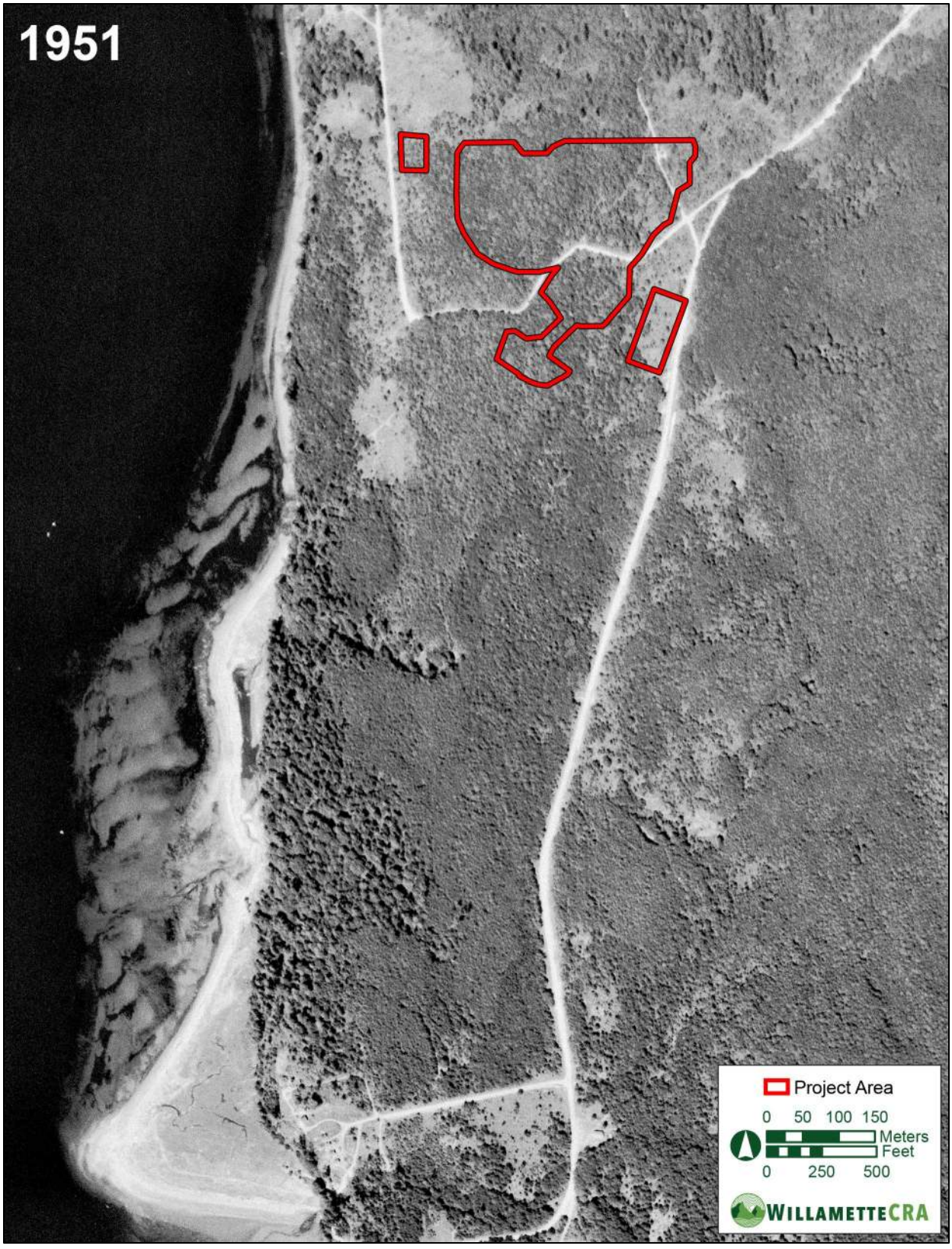


Figure 7. 1951 Aerial imagery of Project vicinity.

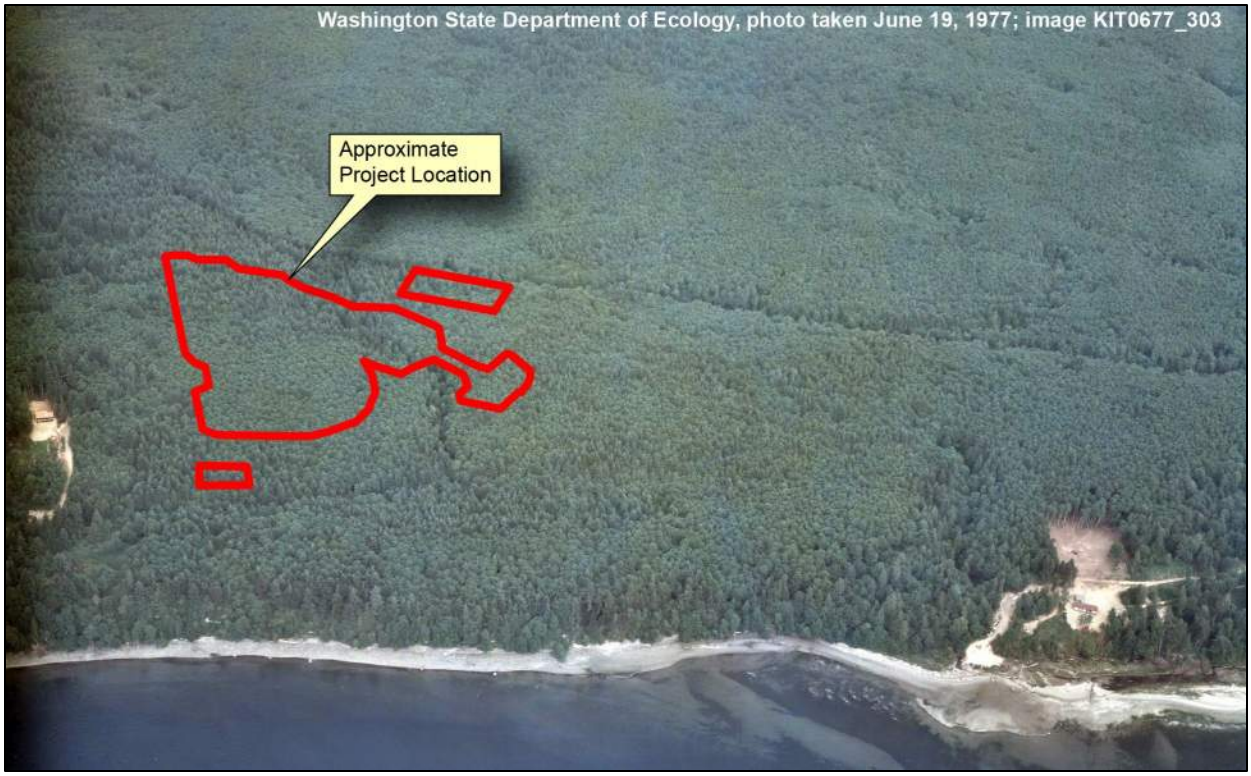


Figure 8. 1977 Oblique Aerial imagery of Project vicinity.



Figure 9. 2016 Oblique Aerial imagery of Project vicinity.

Previous Cultural Resources Studies

Numerous reports have been written of previous cultural resources investigations within 1 mile of the Project on the east side of Port Gamble Bay and Hood Canal (Table 1). The first recorded archaeological study on the Reservation was in 1982, when Richard Daugherty investigated Point Julia using pedestrian and shovel probe survey (Daugherty 1982a). Rick Oswald and, later, Astrida Blukis Onat expanded on Daugherty's work at Point Julia in conjunction with PGST road improvements, resulting in a more research-oriented archaeological excavation (Oswald 1986). Daugherty, Oswald, and Blukis Onat identified three discrete archaeological site areas near the project, 45KP21, 45KP22, and 45KP23 (Daugherty 1982a; Hess 1991a, 1991b; Oswald 1986). Their work also included a literature review and interviews with Tribal elders, and additional archaeological fieldwork to define site boundaries and classify the identified cultural materials.

Several other cultural resources investigations have since been completed on the east side of Port Gamble Bay south of the project, including trail installation (Roush and Kopperl 2022a), one for a flagpole installation at Jake Jones Park (Roush and Kopperl 2022b), one investigation carried out for Tribal housing development (Schumacher and Montgomery 2011), one study undertaken for removal of debris from the Bay (Wisniewski 2014), one survey for the PGST Wastewater Treatment Plant (Rinck 2015), and two surveys for Tribal public works projects (Bangs et al. 2017; Kopperl 2017). Assessments for a proposed expansion of the south boat ramp, fish hatchery, and multi-use shelters on Point Julia were recently completed (Kopperl 2020a, 2020b) and completion of the more intensive archaeological analysis for those projects is currently in progress. Wisniewski's (2014) report emphasizes Port Gamble Bay as an important traditional cultural place with many unique cultural features.

Several cultural resources have been previously identified near the project on the east side of Port Gamble Bay as a result of the cultural resources investigations described above (Table 2). The most substantial and well-studied of these is 45KP21, the ancestral village of Little Boston on Point Julia (Daugherty 1982a, 1982b; Hess 1991a, 1991b; Kopperl 2022a, 2022b). Much of the site as previously recorded consists of precontact or contact-era shell midden, while the historic component includes the burned remains of the Little Boston S'Klallam village occupied from 1856 to 1938. 45KP21 was formally evaluated as an archaeological site and a traditional cultural property in 1991 when surface exposures of midden were examined, and 41 auger holes were excavated to define the site boundaries. The site was later determined eligible for listing in the NRHP (Hess 1991b). Those excavations also included test units that explored intact midden almost two feet thick; midden was composed of clams—mainly horse, littleneck, and butter clams—as well as mussels. Abundant historical items were also found, such as glass, ceramic, bone artifacts, and wood posts where structural elements once stood. A charcoal sample from the middle of the underlying midden layer recovered near the shelter utility alignment produced a radiocarbon date of 680±90 radiocarbon years BP. Recently, the shovel and auger probe survey for the proposed south boat ramp expansion (Kopperl 2020a)

and shovel testing for a proposed multi-use shelter and hatchery improvements (Kopperl 2020b) identified intact shell midden deposits of varying thickness throughout the site.

Site 45KP23, the Little Boston Creek site, is on an upland terrace edge on the south side of the mouth of Little Boston Creek in an area that is now the Little Boston Tribal cemetery (Daugherty 1982a, 1982c). Shell, fire modified rock (FMR), bone, flaked cobble tools, and an antler wedge were identified in surface disturbances at 45KP23, but no formal excavations have been undertaken at this site. The Tribal cemetery and the Indian Shaker Church cemetery (assigned trinomial number 45KP182) are also recorded to the Department of Archaeology and Historic Preservation (DAHP) cemetery database on their online Washington Information System for Architectural and Archaeological Records Data (WISAARD).

One other precontact archaeological site has been recorded near the project but was poorly documented and remains unnumbered. It is a precontact lithic scatter identified by Hess (1991a). This lithic scatter was composed of several basalt cobble flakes found in the gravel on both sides of the mouth of Shipbuilder Creek (Hess 1991a), about one-third mile southwest of the Project.

Table 1. Reports of Previous Cultural Resources Investigations Within Approx. 1 Mile.

Report Reference	Type of Investigation and Project	Relation to Project Area	Cultural Resources
Schumacher and Montgomery 2011	Cultural Resources Assessment for The Port Gamble S'Klallam Housing Development And Access Road (BIA Route 40) Project, Kingston, Kitsap County, WA	0.2 mile SE	None
Bangs et al. 2017	Archaeological Resources Assessment for the Port Gamble S'Klallam Tribe East Salmonberries Subdivision Sewer and Water Project, Kitsap County, Washington	0.4 mile S	None
Roush and Kopperl 2022b	Cultural Resources Assessment for the Jake Jones Flagpoles Project, Port Gamble S'Klallam Tribe, Kitsap County, Washington	0.7 mile S	None
Wisniewski 2014	Cultural Resource Report for The Port Gamble Bay Derelict Debris Removal, Kitsap County Washington	0.9 mile S	None
Kopperl 2020a	Cultural Resources Assessment for The Point Julia South Boat Ramp Expansion Project, Port Gamble Indian Reservation, Kitsap County	0.8 mile SW	45KP21
Kopperl 2020b	Washington Cultural Resources Assessment for The Point Julia Multi-Use Shelter And Hatchery Improvement Projects, Port Gamble Indian Reservation, Kitsap County, Washington	0.8 mile S-SW	45KP21
Daugherty 1982a	A Cultural Resource Survey of the Proposed Port Gamble Indian Reservation Solid Waste Disposal Facility	0.8 mile S-SW	45KP21; 45KP22; 45KP23
Oswald 1986	A Cultural Resource Assessment of Road Improvements, Port Gamble Indian Reservation, Kitsap County, Washington	0.8 mile S-SW	45KP21; 45KP22; 45KP23
Kopperl 2017	Archaeological Resources Assessment for The Port Gamble S'Klallam Tribe Administration Campus Phase II Outfall Pond Project, Kitsap County, Washington	0.8 mile S	None
Roush and Kopperl 2022a	Cultural Resources Assessment for the Little Boston Road Pedestrian Trail Project, Port Gamble S'Klallam Tribe, Kitsap County, Washington	1.0 mile S	None

Table 2 . Previously Identified Archaeological Sites Within Approx. 1 Mile.

Site No.	Site Name	Site Type	Relation to Survey Area	Significance/Eligibility Recommendation
45KP21	Little Boston Archaeological Site	Historic Village of the Port Gamble S'Klallam Tribe	0.8 mile S-SW	Determined Eligible for Listing in the NRHP
45KP23	Little Boston Cemetery	Historic Cemetery Used by the Port Gamble S'Klallam Tribe	0.9 mile S	Determined Eligible for listing in the NRHP
45KP182	Indian Shaker Church Cemetery	Historic Cemetery Used by the Port Gamble S'Klallam Tribe	0.1 mile NE	Unevaluated
Unnumbered	Unnamed	Precontact Lithic Scatter	0.3 mile SW	Undocumented; Unevaluated

Expectations for Cultural Resources

Prior to fieldwork, the Project was considered to have a moderate to moderately low sensitivity for buried precontact archaeological resources. This was based on the surface geology of the Project, the logging history of the property, the results of nearby previous archaeological investigations and known archaeological deposits, the proximity of the Indian Shaker Church cemetery to the Project, and oral tradition and ethnographic information indicating long-term and continued S'Klallam use of this area. The DAHP WISAARD predictive model layer, based on environmental variables such as slope and proximity to water as well as distance to known archaeological resources, notes the entire vicinity as being moderate to highly sensitive for archaeological resources.

Expectation for archaeological resources specifically within the Project limits were tempered to some extent by the fact that the landform on which it is situated is an uneven surface. In many places the surface is steeply sloped to an extent that would limit the kind and intensity of human activity that tend to cause an accumulation of archaeological deposits, and these surfaces are not conducive for preservation of archaeological remains once deposited. In addition, the Project vicinity was clearcut on multiple occasions since the late nineteenth century to supply lumber to the mill across the bay, which would have potentially disturbed earlier precontact Native archaeological remains on this kind of geological landform that would have hosted those remains, if present, at shallow depths. Living cultural resources such as culturally modified trees (CMTs) that are also a common cultural resource reflecting traditional land use practices (e.g., Deur and QIN 2022) would likely have been removed during previous logging episodes. The field methods, detailed below, were tailored to these expectations and the existing conditions of the project area, with subsurface sampling to depths considered useful for detecting the potential for intact archaeological deposits.

Field Methods

WillametteCRA archaeologists F. Scott Pierson, Althea Fitzpow, and Breann Stoner conducted pedestrian and subsurface archaeological survey of the Project area on August 8 and 9, 2023. The pedestrian survey consisted of systematically walking over the Project area in transects to inspect for any surface or aboveground cultural resources and to identify areas with high potential for yielding subsurface cultural resources. The transects focused on the ~20 acres proposed for development, along with the proposed stormwater treatment area in the northwest corner of the property. Transects were walked with 10-meter interval spacing where possible, with meandering and less systematic transects in areas where consistent spacing was infeasible.

Shovel probes (SPs) were placed in areas determined to have the greatest sensitivity for encountering buried archaeological resources in the proposed areas of development within the

overall Project area. The immediate vicinity around each of the 14 geotechnical TPs dug shortly before our field survey was avoided to provide complementary spatial coverage for subsurface point data. The SPs measured 40–50 centimeters (cm) in diameter with a target depth of 100 cm below ground surface (cmbs). However, probes were terminated prior to reaching the target depth when boulders and dense cobbles prevented further excavation or when unweathered parent material was encountered. All excavated sediment was screened through ¼-inch mesh.

The findings of each probe were recorded on standard shovel probe forms that included information regarding sediment color, texture, composition, and observed cultural materials. Probes were backfilled after the excavation and appropriate documentation was completed. A GPS unit was used to collect coordinates of each shovel probe location. Digital photographs were taken of shovel probe locations and profiles. Overview photographs were taken of the general project area to help characterize the natural and cultural setting of the Project Area; all associated information was recorded on a standard photo log. Daily work records, field notes, and digital photographs are on file at the WillametteCRA office in Seattle.

Results

Areas proposed for development and ground-disturbing activity within the overall Project limits were thoroughly surveyed by pedestrian survey transects and excavation of 29 SPs that complemented the geotechnical TPs and boreholes (see Figure 2). The weather was warm with light rain showers during the investigation. *No archaeological material or other cultural resources were identified during the fieldwork.*

Overviews of the existing conditions of the mature secondary forest that characterizes the Project area are shown on Figures 10 and 11. The observed overstory was composed primarily of Douglas fir, with a few stands of western redcedar in the southern portion of the site and red alder and big leaf maple within the proposed stormwater pond area (Figure 12). The understory consisted of sword fern, salal, Oregon grape, stinging nettles, and pacific blackberry. Dense stands of Himalayan blackberry were present along the western edge of the Project area.

Two standing structures were observed within the project area: the fenced-in concrete water tank in the north-central portion of the Project area, and a booster station on the northern edge of Hood Canal Drive NE. Large and disbursed slash piles measuring up to 8 feet tall were observed over an approximately two-acre area northeast of the booster station. The slash piles were covered with salal, nettles, and blackberry, making traditional, linear pedestrian survey transects impractical in that area (Figure 13). Two meandering transects were conducted across the slash pile area, although ground surface visibility was extremely limited in this area.

A machine frame likely associated with past logging activity was observed near the slash piles (Figure 14). The exterior of the frame was rusted; however, a steering column and wires covered with intact thermoplastic were observed underneath the frame, somewhat protected

from the elements. No serial number could be found. Given the materials that compose the electrical components of the machinery, it is likely associated to the most recent timber harvest (ca. 1980s) and not considered an historic archaeological resource. The few other cultural materials observed in other portions of the survey area were also not old enough to be considered archaeological resources. These included a spear gun, a hunting vest, carbon fiber arrows, and two stuffed animals. Most of the Project geotechnical TPs were located during the pedestrian survey. Although they had been backfilled, the exposed sediments were carefully observed for evidence of precontact materials (Figure 15).

Following the pedestrian survey, 29 subsurface SPs were excavated across the Project. Each probe was placed at the discretion of the field director in relatively level areas, avoiding slopes in excess of 20 degrees. An attempt was made to get relatively uniform probe coverage across the Project, avoiding geotechnical TP locations. However, subsurface probing within the slash area was largely impractical and potentially hazardous, so no SPs were placed northeast of the booster station. Two shovel probes were placed within the proposed stormwater pond area on either side of a geotechnical borehole. Summaries of the content and stratigraphy of the SPs are provided in the Appendix.

Near-surface sediments within the Project area as observed in the SPs were relatively uniform, consisting of glacial deposits with thin forest soil A horizons formed at the top of the stratigraphic sequence under 5–15 cm of forest duff. Beneath the duff the typical probe stratigraphy consisted of a 5–10 cm thick layer of yellowish-brown to gray-brown silty very fine sand with very few small pebbles, representing the A horizon. Underneath was a light yellowish-gray fine sand with common subrounded to subangular small to very large pebbles, representing the B horizon (Figure 16). The B horizon also contained 20–40% rounded, small pebble-sized concretions. These concretions were very hard and could not be pushed through the screen (Figure 17). The B horizon was observed underlain by an extremely compact pale olive gray fine very fine to medium sand. This layer was interpreted as unweathered glacial till parent material (soil C horizon) during the field investigation.



Figure 10. Overview of the northwestern portion of the Project area. View northwest.



Figure 11. Overview of the southern portion of the Project area near SPs 19 and 20. View south.



Figure 12. Overview of SP 28 within the proposed stormwater pond area. View northwest.



Figure 13. Slash covered with thick vegetation northeast of the booster station. View north.



Figure 14. Abandoned machinery frame within slash-covered area northeast of booster station.



Figure 15. Backfilled geotechnical TP, flagged as “TP-5.” View northwest.

Conclusions and Recommendations

WillametteCRA completed the cultural resources assessment for the proposed North Kloomachin Subdivision Project as part of the PGST Title 24 environmental review process. This effort involved background research and surface and subsurface survey coverage within the Project area that integrated geotechnical data generated for this same project. Our assessment did not identify any disturbed or intact archaeological deposits or artifacts or any surface or above-ground historical or cultural resources. Historic clearcut logging episodes atop this geologically old surface composed of sterile glacial sediments indicates the likelihood of archaeological resources or other remains of traditional land use to be very low within the Project limits.

No further identification efforts or other archaeological measures are recommended for completion of the Project as designed. We do recommend, however, an Inadvertent Discovery Plan (IDP) to be implemented by PGST and its construction contractors during all ground-disturbing activities associated with this Project. The IDP should have clear procedures and protocols to be followed in the event, however unlikely, that significant archaeological resource or human skeletal remains are encountered during construction.



Figure 16. Profile of SP 10, typical stratigraphy observed within the Project area.



Figure 17. Sample of silty sandy concretions observed in the B horizon across the Project area.

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Appendix:
Tabulated Summary of Shovel Probes

Table. Summary of Shovel Probe Results.

SP #	Depth (cmbs)	Sediment Characteristics	Soil Horizon	Cultural Materials
1	0–26	Brownish-yellow silty sand; common subangular to subrounded granules to cobbles; many fine rootlets; surface duff from 0 to 6 cmbs; clear lower boundary	O/A	None
	26–72	Light grayish-yellow silty sand; common subangular to subrounded granules to cobbles; common fine rootlets; gradual lower boundary	B	None
	72–80	Light gray silty sand; common subangular to subrounded granules to cobbles; notably more large cobbles; terminated at parent material	C	None
2	0–30	Brownish-yellow silty sand; common subangular to subrounded granules to cobbles; many fine rootlets; trace charcoal; surface duff from 0 to 9 cmbs; clear lower boundary	O/A	None
	30–78	Light grayish-yellow silty sand; common subangular to subrounded granules to cobbles; common fine to medium roots; gradual lower boundary	B	None
	78–85	Light gray silty sand; common subangular to subrounded granules to cobbles; silty concretions present; terminated at parent material	C	None
3	0–25	Brownish-yellow medium to fine sands; common subrounded to rounded granules; surface duff from 0 to 10 cmbs; common very fine to fine roots; gradual lower boundary	O/A	None
	25–65	Yellow-gray fine sand; common subrounded to rounded granules to pebbles; common fine roots; few silty concretions; diffuse lower boundary	B1	None
	65–80	Pale olive-gray medium to very fine sand; common subangular to subrounded granules to cobbles; light compaction; terminated at parent material	B2	None
4	0–30	Brownish-yellow silty fine sand; common angular to rounded granules to cobbles; surface duff from 0 to 9 cmbs; very fine to fine roots; trace charcoal; clear lower boundary	O/A	None
	30–70	Light grayish-yellow silty sand; common subangular to subrounded granules to cobbles; common fine rootlets; gradual lower boundary	B	None
	70–100	Light gray silty sand; common subangular to subrounded granules to cobbles; fine to medium roots; terminated at parent material	C	None
5	0–10	Pale gray medium fine sand; trace granules; common organics; 15 cm of duff on surface; abrupt lower boundary	O/E	None
	10–50	Brownish-yellow fine sand; common subrounded to rounded granules to pebbles; many fine roots; few silty concretions; clear lower boundary	A/B1	None
	50–75	Pale yellow-gray very fine sand; many subrounded to rounded granules to pebbles; lens of organics and roots at upper boundary; few silty concretions; diffuse lower boundary	B2	None
	75–90	Pale olive-gray medium to very fine sand; common subangular to subrounded granules to pebbles; light compaction; terminated at parent material	C	None

Table. Summary of Shovel Probe Results (Cont.).

SP #	Depth (cmbs)	Sediment Characteristics	Soil Horizon	Cultural Materials
6	0–22	Brownish-yellow silty fine sand; common angular to rounded granules to cobbles; surface duff from 0 to 8 cmbs; very fine to fine roots; trace charcoal near surface; clear lower boundary	O/A	None
	22–60	Light grayish-yellow fine to medium sand; common subangular to subrounded granules to cobbles; common fine to medium roots; terminated at root obstruction	B	None
7	0–30	Brownish-yellow silty sand; common subangular to subrounded granules to cobbles; many fine rootlets; surface duff from 0 to 5 cmbs; clear lower boundary	O/A	None
	30–48	Light grayish-yellow silty sand; common subangular to subrounded granules to cobbles; common fine to medium roots; clear lower boundary	B	None
	48–50	Light gray silty sand; common subangular to subrounded granules to cobbles, predominantly cobbles; highly compact; terminated at parent material	C	None
8	0–28	Brownish-yellow silty fine sand; common angular to rounded granules to cobbles; surface duff from 0 to 5 cmbs; very fine to fine roots; trace charcoal near surface; clear lower boundary	O/A	None
	28–55	Light grayish-yellow silty sand; common subangular to subrounded granules to cobbles; common fine roots; clear lower boundary	B	None
	55–60	Light gray silty sand, ashy texture; common subangular to subrounded granules to cobbles; highly compact; terminated at parent material	C	None
9	0–32	Brownish-yellow silty fine sand; common subangular to subrounded granules to cobbles; duff and thin A horizon from 0 to 8 cmbs; common roots; trace charcoal; clear lower boundary	O/A/B	None
	32–57	Light grayish-yellow silty fine sand; common subangular to subrounded granules to cobbles; common roots; clear lower boundary	B	None
	57–70	Light gray silty fine sand; common subangular to subrounded granules to cobbles; highly compact; terminated at parent material	C	None
10	0–10	Brownish-yellow medium to fine sands; few subangular to rounded granules; surface duff from 0 to 5 cmbs; abrupt lower boundary	O/E	None
	10–50	Dark yellowish-gray fine sand; common subangular to subrounded granules to pebbles; trace rootlets; few silty concretions; highly compact; clear lower boundary	A/B1	None
	50–65	Pale olive-gray medium to fine sand; common subangular to rounded granules to cobbles; moderately compact; terminated at parent material	B2	None

Table. Summary of Shovel Probe Results (Cont.).

SP #	Depth (cmbs)	Sediment Characteristics	Soil Horizon	Cultural Materials
11	0–40	Brownish-yellow medium to very fine sand; few subrounded to rounded granules to pebbles; 0–20 surface duff and decomposing log; common very fine to fine roots; gradual lower boundary	O/A	None
	40–70	Light yellowish-gray fine sand; common subangular to rounded granules to cobbles; few silty concretions; gradual lower boundary	B1	None
	70–80	Pale olive-gray very fine to medium sand; many angular to rounded granules to cobbles; light compaction; terminated at parent material	B2	None
12	0–35	Brownish-yellow medium to fine sand; common subrounded to rounded granules to pebbles; 0–5 cm of duff on surface; common very fine to fine roots; clear lower boundary	O/A	None
	35–55	Light yellowish-gray fine sand; many angular to rounded granules to pebbles; trace rootlets; few silty concretions; gradual lower boundary	B1	None
	55–70	Pale olive very fine to medium fine sand; many angular to rounded granules to pebbles; light compaction; few concretions; terminated in parent material	B2	None
13	0–40	Dark yellow-gray medium fine sand; common subrounded to rounded granules to cobbles; many very fine to fine roots; duff from 0 to 10 cmbs; gradual lower boundary	O/A	None
	50–65	Light yellow-gray fine sand; common subrounded to rounded granules to pebbles; common very fine roots; diffuse lower boundary	B	None
	65–70	Pale olive-gray medium to fine sand; common subrounded to rounded granules to pebbles; light compaction; terminated in parent material	C	None
14	0–12	Dark grayish-brown very fine sandy silt; very few subangular to subrounded granules; many very fine to fine roots; surface duff; clear lower boundary	O/A	None
	12–35	Yellowish-brown silty very fine sand; common subrounded to rounded granules to cobbles; many very fine to fine roots; common silty concretions; clear lower boundary	B1	None
	35–60	Pale olive-gray silty very fine sand; many subangular to subrounded granules to cobbles; few fine roots; terminated in compacted parent material at base of layer	B2	None
15	0–14	Dark grayish-brown very fine sandy silt; few subrounded pebbles; many fine roots; 5cm of duff on surface; clear lower boundary	O/A	None
	14–55	Light yellowish-brown very fine sandy silt; few subrounded granules to cobbles; many fine roots; predominant pea sized silt peds; terminated at boulder impasse	B	None

Table. Summary of Shovel Probe Results (Cont.).

SP #	Depth (cmbs)	Sediment Characteristics	Soil Horizon	Cultural Materials
16	0–30	Light yellowish-brown very fine sandy silt; no gravels; many fine roots; 5 cm of duff on surface; many pea sized silty concretions; gradual lower boundary	O/A	None
	30–60	Very light yellowish-brown silty very fine sand; common subrounded granules; many fine roots; clear lower boundary	B	None
	60–65	Pale olive-brown very fine sandy silt; common subrounded granules to cobbles; few coarse roots; extremely compact	C	None
17	0–16	Light grayish-brown ashy very fine sandy silt; very few subangular to subrounded granules; many fine to coarse roots; abrupt lower boundary	O/A	None
	16–40	Dark yellowish-brown very fine sandy silt; common subangular to subrounded granules to pebbles; common very fine roots; many pea sized silty concretions; gradual lower boundary	B	None
	40–50	Pale olive-brown very fine sandy silt; many subangular to subrounded granules to cobbles; few fine roots; extremely compact; common silty concretions	C	None
18	0–10	Yellowish-brown silty very fine sand; common subangular to subrounded granules to pebbles; common very fine roots; 5cm duff on surface; abrupt lower boundary	O/A	Amber glass, n=1, 0–10 cmbs
	10–20	Light grayish-yellow silty very fine sand; few subangular to subrounded granules to pebbles; highly compact, possible hard pan; abrupt lower boundary	B?	Amber glass n=2, colorless glass, n=1, 10–15 cmbs
	20–65	Light brown silty very fine sand; common subangular to subrounded granules to pebbles; root mass in west wall; common very fine to fine roots; terminated due to diminishing returns	C?	None
19	0–25	Yellowish-brown silty very fine sand; no gravels; 10 cm of duff on surface; few very fine roots; clear lower boundary	O/A	None
	25–70	Dark yellowish-brown medium to fine sands; common subangular to subrounded granules to pebbles; very few very fine roots; light compaction; common silty concretions; gradual lower boundary;	B	None
	70–85	Pale olive-gray medium to fine sand, ashy texture; many subangular to subrounded granules to cobbles; light compaction; terminated in parent material	C	None
20	0–15	Brown fine sand; few subangular to subrounded granules to pebbles; 5 cm of duff on surface; large charcoal chunks on surface; many fine roots; abrupt lower boundary	O/A	None
	15–45	Light brownish-yellow silty fine sand; common subangular to subrounded granules to cobbles; few fine roots; clear lower boundary; slopes down in south half of unit	B	None
	45–60	Light olive-gray silty fine sand, ashy texture; few subangular to subrounded granules to pebbles; highly compact; terminated in parent material	C	None

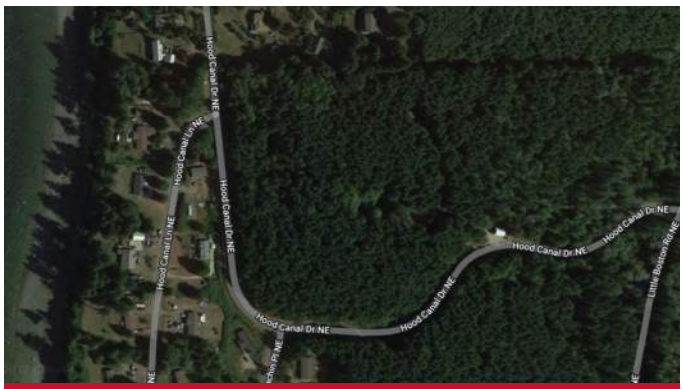
Table. Summary of Shovel Probe Results (Cont.).

SP #	Depth (cmbs)	Sediment Characteristics	Soil Horizon	Cultural Materials
21	0–25	Yellowish-brown silty very fine sand; common subrounded to rounded granules to pebbles; 10 cm of duff on surface; common very fine to fine roots; clear lower boundary	E/A	None
	25–45	Dark yellowish-gray fine sand; common subangular to rounded granules to pebbles; common very fine roots; gradual lower boundary	B1	None
	45–80	Pale olive-gray very fine to medium sands; many subangular to subrounded granules to cobbles; few medium roots; common silty concretions; light compaction; clear lower boundary; terminated in compacted parent material at base of layer	B2/C	None
22	0–15	Gray sandy duff, no gravels; abrupt lower boundary	O/E	None
	15–45	Brownish-yellow very fine sand; few subrounded to rounded granules; many very fine to fine roots, one very coarse root at 35 cmbs; gradual lower boundary	A/B1	None
	45–80	Light yellowish-gray fine sand; many subangular to rounded granules to pebbles; common very fine roots; abrupt lower boundary	B2	None
	80–90	Olive coarse to fine sands; many subangular to rounded granules to cobbles; light compaction; terminated at parent material	C	None
23	0–25	Brownish-yellow very fine sand; common subangular to subrounded granules to cobbles; 5 cm of duff on surface; common very fine roots; very thin layer of brown sand under duff; clear lower boundary;	O/A	None
	25–65	Light grayish-yellow silty very fine sand; common subangular to rounded granules to cobbles, mostly cobbles; common very fine roots; terminated at cobble impasse	B	None
24	0–14	Brown silty fine sand; common subangular to subrounded granules to cobbles; 5 cm of duff on surface; many very fine to fine roots; clear lower boundary	O/A	None
	14–47	Light grayish-yellow silty very fine sand; common subangular to subrounded granules to cobbles; common very fine roots; clear lower boundary	B	None
	47–85	Light gray silty fine sand; common subangular to subrounded granules to pebbles; highly compact; terminated at parent material	C	None
25	0–10	Dark grayish-brown very fine sandy silt; few subangular to subrounded granules to pebbles; 5 cm of duff on surface; many very fine to fine roots; abrupt lower boundary	O/A	None
	10–33	Light yellowish-brown very fine sandy silt; common subangular to subrounded granules to pebbles; common silty concretions; clear lower boundary	B	None
	33–40	Yellowish-brown silty fine to medium sand; common subangular to subrounded granules to cobbles; common silty concretions; extremely compact; terminated at parent material	B/C	None

Table. Summary of Shovel Probe Results (Cont.).

SP #	Depth (cmbs)	Sediment Characteristics	Soil Horizon	Cultural Materials
26	0–15	Light grayish-brown very fine sandy silt; few subangular to subrounded granules to pebbles; 5 cm of duff on surface; many very fine to fine roots; clear lower boundary	O/A	None
	15–35	Light yellowish-brown very fine sandy silt; common subangular to subrounded granules to pebbles; common silty concretions; clear lower boundary	B1	None
	35–60	Yellowish-brown silty fine to medium sand; many subangular to subrounded granules to cobbles; common silty concretions; extremely compact; terminated at parent material	B2	None
27	0–12	Light grayish-brown very fine sandy silt; few subangular to subrounded granules to pebbles; 5 cm of duff on surface; many very fine to fine roots; clear lower boundary	O/A	None
	12–40	Light yellowish-brown very fine sandy silt; common subangular to subrounded granules to pebbles; common silty concretions; clear lower boundary	B1	None
	40–80	Pale brown fine sand; common subangular to subrounded granules to cobbles; few fine roots; few silty concretions; terminated at cobble impasse	B2	None
28	0–15	Dark gray-brown fine sand; common subangular to rounded granules to pebbles; thin layer of duff on surface; common very fine to fine roots; abrupt lower boundary	A/E	None
	15–35	Dark yellow silty very fine sand, pockets of pale olive-gray sand; common subrounded to rounded granules to cobbles; few very fine roots; highly compact; terminated due to compact ground	B/C	None
29	0–20	Light grayish-brown silty very fine sand; common subrounded to rounded granules to cobbles; many very fine to fine roots; clear lower boundary	A/E	None
	20–35	Dark yellowish-brown silty fine to medium sand; many subrounded to rounded granules to cobbles; common fine roots; terminated at cobble impasse	B/C	None

APPENDIX H BIOLOGICAL ASSESSMENT



Biological Assessment

Port Gamble S'Klallam Tribe

North Kloomachin Site development project

November 23, 2022

Prepared by:
Abigail Welch-Project Manager/Planner
Port Gamble S'Klallam Tribe
31912 Little Boston Rd NE, Kingston WA
(360) 621-2323

Executive Summary

The Port Gamble S'Klallam Reservation consists of approximately 1,700 acres of land held in trust by the federal government. There is no private land ownership on the reservation. Most of the land is in forestry with residential, business, and office areas. As of 2022 there are 1321 enrolled tribal

members with over half of tribal members residing on the reservation with many others off reservation. Due to the limited availability of housing, homes on the reservation then to have more persons living in them than homes compared to Kitsap County and Washington State (CLUP 2003). Many homes have several generations of families living in them.

The Port Gamble S'Klallam Tribe maintains a waiting list of persons interested in rental housing, as well as home buyer housing on the reservation. There are currently 194 names on the list, with application dates going back to 1997. There is a need for more housing on the reservation to reduce overcrowding and meet the demands of the growing population.

Over half of the Tribe's reservation is managed as long-term productive timberlands. Forests are composed of Douglas-Fir, cedar, hemlock, alder, and maple. Most forest stands are young and offer limited opportunities for commercial timber harvest. However, the Tribe's forestlands are an important cultural resource to the community as an area for berry and brush picking, firewood cutting, recreation and spiritual practice.

In 2003, the Comprehensive Land Use Plan (CLUP) identified a 40-acre parcel northwest of Hood Canal Drive NE that is prime for housing, it has isolated forests, surrounded by roads with good views to west and good utility access (CLUP 2003).

The development of this parcel has been discussed since 2003. Sixteen additional homes were discussed for this west side of the proposed 40 acres. In 2007 a conceptual master plan increased the home development site to 49 homes throughout the 40 acres.

The Port Gamble S'Klallam Tribe is proposing converting 19.8 of the 40 acres of reservation land into 51 residential lots known as North Kloomachin located on Hood Canal Dr NE in Kingston, Washington. Of the 40 acres, 19.8 acres is developable (if all lots would be cleared). The stormwater management area consists of 2.4 acres with the water tower and booster station consuming 0.5 acres. The overall density of the project is 1.7 units per acre. The remaining 15.6 acres will stay as native vegetation. A 50-foot wildlife corridor is included in the initial design, runs along the reservation boundary north of the proposed lot sites.

The North Kloomachin parcel has a water booster building constructed on Hood Canal drive that will supply all water needed for the site. A sewer lift station on Little Boston Road was designed to support this development as well.

The PGST Tribe requires a Title 24-Environmental review on any new construction. With the potential to disrupt important habitat, the developer; the PGST Planning department; is required to analyze the effects of its actions on species listed under the Endangered Species Act (ESA), of 1973, as amended. This biological assessment (BA) documents PGSTs Planning Department's evaluation of the effects of the North Kloomachin development on United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Services (NMFS) regulated ESA-listed species that have the potential to occur in the action area and their critical habitats, as applicable. In addition, rare plants, culturally significant species, and Washington State listed species will also be assessed.

The proposed action does not have any identified fish bearing streams and will not impact aquatic habitat or riparian vegetation adjacent to fish-bearing streams. No culverts will be constructed or replaced as part of the proposed action. Therefore, the proposed action will have no effect on any aquatic species including ESA-listed Bull Trout/Dolly Varden (*Salvelinus confluentus*) and Bull Trout/Dolly Varden critical habitat.

The Marbled Murrelet (*Braychyramphus marmoratus*) forage areas are found near marine waters and nest in mature and old-growth conifer forests. With the proposed action areas proximity to the shoreline, it may affect but is not likely to adversely affect Marbled Murrelet due to the forest being predominantly second growth monoculture forest. The proposed action may affect but is not likely to effect on Marbled Murrelet critical habitat.

Although the yellow-billed cuckoo (*Coccyzus americanus*) is not documented to occur in the action area and presumed breeding in the region ended over a century ago, suitable foraging and nesting habitat is present in the project area. Therefore, the Proposed Action may affect, but is not likely to adversely affect yellow-billed cuckoo. The proposed action will have no effect on yellow-billed cuckoo critical habitat.

Due to the lack of suitable habitat and no recent history of use or presence within the action area or vicinity, the proposed action will have no effect on the Monarch Butterfly (*Danaus plexippus*).

Considered a culturally important species, the Common Raven is one of the most widespread birds in Washington state. The proposed action areas proximity to the shoreline, it may affect but is not likely to adversely affect common Raven. There is no critical habitat designated for Ravens.

Another culturally important species, the Bald Eagle, is found only in North America, generally in coastal areas or near large inland lakes and rivers abundant with fish and shores with large trees. They nest in large, varied trees near shorelines, and prey on fish, waterfowl, small mammals, or scavenge. With the proposed action areas proximity to the shoreline, it may affect but is not likely to adversely affect Bald Eagles due to the forest being predominantly second growth monoculture forest. There is no designated critical habitat for Bald Eagles.

The recommended effect determinations for ESA-listed species and their critical habitat are summarized in Table ES-1.

Table ES-1. Summary of Effect Determinations

Federally Recognized Species	Listing Status	Critical Habitat	Effect Determination
Marbled Murrelet *(Brachyramphus marmoratus)*	Threatened	None designated	May affect, not likely to adversely affect
Yellow-billed Cuckoo (*Coccyzus americanus)*	Threatened	None designated	May affect, not likely to adversely affect
Bull Trout/Dolly Varden (Salvelinus confluentus)	Threatened	None designated	No effect
Monarch Butterfly (Danaus plexippus)	Candidate	None designated	No effect

Culturally Important Species as directed by PGST Cultural Dept	Listing Status	Critical Habitat	Effect Determination
Common Raven *(Corvus corax)*	None	None designated; Present all year	May affect, not likely to adversely affect
Bald Eagle (*Haliaeetus leucocephalus*)	None/Recovered	None designated	May affect, not likely to adversely affect

1 Introduction

Port Gamble S'Klallam Tribe (PGST) is a federally recognized Tribe that resides on a 1,700-acre parcel of land held in trust with the federal government located in Kingston, Washington. For the last 20 years, PGST has been developing plans to increase the on-reservation housing opportunities for Tribal members. In 2003, the CLUP defined the following goals and policies to follow when creating new housing developments:

Housing Development Goals and Policies:

1. Housing development on the reservation should occur in planned communities of ten or more homes.
2. Lot sizes for should be quarter acre in size to ensure adequate land is available for future generations
3. Housing should be prohibited in forest areas identified as important to wildlife, habitat, cultural and recreational activities.
4. Tribal members who have half an acre or more should have the option of building a mother-in-law. Unit to care for an elderly family member or another family member in need.
5. Roads within and between subdivisions should be carefully planned and rerouted so as not to interfere with important forest lands or animal habitat.
6. Safety designs should be incorporated into new housing developments such as sidewalks, bicycle paths, speed bumps, winding roads, cul-de-sacs, and traffic circles.
7. New housing developments should retrain existing trees wherever possible.

The Port Gamble S'Klallam Tribe is proposing converting 19.8 of the 40 acres of reservation land into 51 residential lots known as North Kloomachin located on Hood Canal Dr NE in Kingston, Washington. The proposed action will require an internal PGST Title 24 review, the Planning department will comply with applicable federal laws, including the Endangered Species Act (ESA) of 1973, as amended. Under Section 7 of the ESA, the PD will consult with PGST Natural Resources (NR) to evaluate the effect of the Proposed Action on species listed or proposed for listing under the ESA, as well as effects on their designated critical habitats. This biological assessment (BA) documents the PD's evaluation of the effects of the Proposed Action on ESA-listed species regulated by the USFWS and their critical habitats, as required under the ESA.

1.1 Project Purpose and Need

The Port Gamble S'Klallam Tribe maintains a waiting list of persons interested in rental housing, as well as home buyer housing on the reservation. There are currently 194 names on the list, with application dates going back to 1997. There is a need for more housing on the reservation to reduce overcrowding and meet the demands of the growing population.

1.2 Project Location

The Proposed Action will take place on north of Hood Canal Road and bounded East by Little Boston Rd NE. This site is in Kitsap County, Washington and on PGST trust land. The site falls within the Water Resource Inventory Area (WRIA) 15, however no streams or creeks fall within the project area. No wetlands have been inventoried within the Proposed Action site (Soundview 2021).

Consultation History

A chronological list of communications related to the consultation history for the Proposed Action is provided below.

- March 9, 2022, Planning Department meeting with NR staff
- May 17, 2022, Planning Department meeting with NR, Utilities, and Cultural Departments.
- In April 2022, North Kloomachin Feasibility Plans
- In April 2022, Civil Engineering Scope, and Fee Estimate
- Site Visit August 15, 2022- NR department and PD
- October 5, 2022, Planning Department meeting with NR, Utilities, and Cultural Departments.
- October 8, 2022, follow up email to Cultural Department regarding culturally important species.

1.3 Listed Species Addressed in This BA

A list of federally threatened and endangered species with potential to occur in the action area is provided below, along with a list of designated critical habitats in the action area (Table 1-1).

Table 1-1. Federal listed Species with Potential to Occur in the Action Area

Species	Listing Status	Listing Notice	Critical Habitat	Critical Habitat Listing Notice
Mammals				
None	NA	NA	NA	NA
Birds				

Species	Listing Status	Listing Notice	Critical Habitat	Critical Habitat Listing Notice
Marbled Murrelet *(Brachyramphus marmoratus)*	Threatened	10/1/1992 57 FR 45328	No critical habitat proposed or designated	11/4/2011 81 FR 51348
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	10/03/2013 79 FR 59992	No critical habitat proposed or designated	5/21/2021 86 FR 20798
Fish				
Bull Trout/Dolly Varden (*Salvelinus confluentus*)	Threatened	6/10/1998 63 FR 31647	No critical habitat proposed or designated	NA
Flowering Plants				
Golden paintbrush *(Castilleja levisecta)*	Threatened	6/11/1997 62 FR 31740	No critical habitat proposed or designated	NA
Note: FR = *Federal Register*, NA = not applicable.				

A list of Washington State listed species of concern with potential to occur in the action area is provided below. Critical habitats are not established for these species but can be found in Kitsap County (WDFW 2022b). (Table.1.2)

Table 1-2. State Listed Species with Potential to Occur in the Action Area

Species	State Status	Federal status
Western Toad	Candidate	None
Western Pond Turtle	Endangered	None
Common Loon	Sensitive	None
Western Grebe	Candidate	None
Marbled Murrelet	Threatened	Threatened
Yellow-billed cuckoo	Endangered	Threatened
Townsend's Big-eared Bat	Candidate	None
Keen's Myotis Bat	Candidate	None
Western Bumble Bee	Candidate	None
Puget Blue Butterfly	Candidate	None

Figure 1.1 Project Vicinity



2 Environmental Setting

In October 2022, the PD conducted a baseline habitat survey within the site location to collect sufficient information to characterize the affected environment for culturally sensitive, federal, and state listed wildlife, rare plants, and their habitats. The baseline habitat study, comprised of desktop analysis and field surveys within the site and was completed by qualified biologists in support of permitting activities and to provide information to avoid and minimize impacts to listed species and their habitats, to the extent practicable.

Within the site is a Water tank with a drainage basin line that extends to Hood Canal Drive NE. A booster station is located adjacent NW to the Hood Canal Dr NE. Just north of the site is a historical Shaker cemetery but is not within the bounds of this project site.

South of the site and outside of the project boundary is Shipbuilder's creek. The Proposed Action is outside of the 150 foot buffer as directed in PGST's Title 24 environmental Code.

Based on ground cover observations collected during baseline habitat surveys, the Project is dominated by second growth monoculture forest (Figure 2-1). Biologists documented dominant ground cover within proposed work areas where ground disturbance may occur as designed, including housing sites, roads, sidewalks, and temporary work areas.

Majority of the surveyed areas contained Douglas fir trees (*Pseudotsuga menziesii*) and common understory consisting of sword fern (*Polystichum munitum*), Oregon grape (*Mahonia aquifolium*), Trailing blackberry (*Rubus ursinus*). Along the perimeter of the forest, were Himalayan blackberry (*Rubus armeniacus*) and Salal (*Gaultheria shallon*). A few madrone trees (*Arbutus menziesii*) were found throughout the site, and a patch of Cedar trees (Thuja plicata) were present in the southern section of the site.



Figure 2-1. Forest and understory observed in proposed work areas





3 Proposed Action

Elements of the proposed action are described in detail below. A range of likely and feasible means and methods is considered for each element. If any project element is constructed or implemented in a manner not considered in this assessment and for which effects on listed species or critical habitats are not commensurate with those described in this assessment, PD will coordinate with NR to ensure that coverage is provided for ESA-listed species and their critical habitats.

3.1 Elements of the Proposed Action

The North Kloomachin site is located on Hood Canal Road within the PGST trust lands. The proposed action includes the following elements:

- Assumes the combined clearing of 19.8 acres of the North Kloomachin site to accommodate 51 lots for PGST tribal members.
- Tribal members that clear their lots are not bound to the construction best management practices as described in this BA.
- The only construction that will occur with the PD under this BA is establishing the necessary roads, sidewalks, and utility connections.
    - Install storm water management pond areas and rain gardens as needed
    - Additional sidewalk from the main entrance east to Little Boston Rd.

This BA considers the most extreme scenario in which all lots would be cleared. Current codes allow individuals given the lots have the sole discretion of how their own lots are cleared.

Elements of the Proposed Action are summarized in Table 3-1 and described in further detail below.

Table 3-1. Proposed Action Elements

Proposed Action Component	Quantity
Site Development & Vegetation removal	
Total area cleared	19.8 acres
Overall density (51 lots)	1.7 units/acre
Net Density (51 lots)	3.6 units/acre

3.1.1 Wildlife Corridor

To support the connectivity of the shoreline to forest, the wildlife corridor/buffer was increased from 25 feet to 50 feet. The wildlife corridor also serves as a buffer between the residents of N. Kloomachin and those living on Hood Canal Drive NE.

3.1.2 Material Storage

One laydown yard is required that would be used to provide material storage, construction equipment access. The laydown yard would be approximately 0.5 acres within an existing cleared area.

3.1.3 Construction Equipment and Material Disposal

Construction vehicles required for the Proposed Action could include a bucket truck, a dump truck, an excavator. Equipment used for access road work would include dump trucks, rollers, graders, bulldozers, and excavators.

Any materials removed during construction will be trucked off site for recycling or disposal at an appropriate facility.

3.1.4 Construction Schedule

The schedule for construction of the Proposed Action depends on the completion and outcome of the environmental review process, including the duration of PGST department reviews and timing of Title-24 permit approvals.

Impact Minimization Measures

Under the Proposed Action, PD will implement numerous impact minimization measures to avoid or reduce the potential for adverse effects upon the natural environment, including ESA-listed species and their habitat. Construction will be completed in accordance with Washington Water Quality Standards (Chapter 173-201A Washington Administrative Code). The following measures are considered part of the Proposed Action.

3.1.5 Soils and Erosion Best Management Practices

The Proposed Action will employ typical construction best management practices (BMPs) to stabilize soils and reduce erosion during construction, particularly during access road work. Impact minimization measures include the following:

- Stabilize permanent disturbance areas by applying a weed-free gravel (if available) top layer to the roadways.
- Conduct Project construction, including vegetation removal, during the dry season when rainfall, runoff, and stream flow are low to minimize erosion, compaction, and sedimentation, to the extent practicable.
- Install appropriate erosion-control devices where needed to minimize soil transport.
- Retain vegetative buffers where possible to prevent sediments from entering waterbodies.
- Include water control structures on improved access roads using low grades, water bars, and drain dips to help control runoff and prevent erosion.
- Apply water from water trucks on an as-needed basis to minimize dust and reduce erosion due to wind.
- Revegetate disturbed areas to help stabilize soils as soon as work in that area is completed and appropriate environmental conditions exist, such as moderate temperatures and adequate soil moisture.
- Inspect revegetated areas to verify adequate growth and implement contingency measures as needed.
- Inspect and maintain access roads and cross-drains to ensure proper function and nominal erosion levels after construction.

3.1.6 Vegetation Management

The Proposed Action will require removal of trees for clearing work areas as well as for road construction. No riparian vegetation will be removed. In addition, several measures have been incorporated into the Proposed Action to minimize vegetation removal, minimize the spread of noxious weeds, and revegetate temporarily impacted areas. These measures include:

- Minimize the construction area and disturbance to vegetation to the extent practicable.
- Locate materials storage and staging areas in previously disturbed areas, where feasible.
- Conduct as much work as possible, including tree removal during the dry season to minimize erosion and soil compaction.
- Conduct vegetation removal in a manner that minimizes disruption to remaining trees and shrubs.
- Revegetate disturbed areas with hydroseed to ensure appropriate vegetation coverage and soil stabilization prior to rainy season (November 1).

- Conduct post-construction site restoration monitoring once a month until site stabilization is achieved.
- Prior to construction, identify noxious weed infestation areas for avoidance (as practicable).

3.1.7 Aquatic Resource Impact Minimization Measures

The Proposed Action does not include any work within the ordinary high-water mark (OHWM) or bank full areas of any streams, waterbodies, or wetlands. No culverts will be constructed or replaced as part of the Proposed Action. The Proposed Action will employ typical construction BMPs to reduce impacts from runoff or sedimentation to aquatic resources, including streams, wetlands, and floodplains. Impact minimization measures include the following:

- Conduct soil-disturbing activities during the dry season, where possible.
- Return temporary disturbance areas for access road work to pre-construction contours and mulch, seed, and plant as per plans and specifications.
- Restrict construction vehicles and equipment to access roads and designated work areas.
- Store, fuel, and maintain all vehicles and other heavy equipment (when not in use) in a designated upland staging area located a minimum of 150 feet away from any stream, waterbody, or wetland or where any spilled material cannot enter natural or manmade drainage conveyances.
- Dispose of waste material generated from access road work in a stable upland site (in gentle terrain more than 200 feet from waterbodies or wetlands).
- Develop and implement a spill prevention and spill response plan.
- Confirm equipment is clean (e.g., power-washed) and that it does not have fluid leaks prior to contractor mobilization of heavy equipment to site; inspect equipment and tanks for drips or leaks daily and make necessary repairs within 24 hours.
- Contain petroleum product spills immediately, eliminate the source, deploy appropriate measures to clean and dispose of spilled materials in accordance with federal, state, and local regulations, and contact the PD project manager.
- Maintain emergency spill control materials, such as oil booms and spill response kits, on-site at all times and ready for immediate deployment.
- Revegetate disturbed areas using a slow-release fertilizer.
- Prepare and implement a storm water pollution prevention plan including installing basic stormwater ponds (PMPT10.10)(2001 SMMWA).
- Use existing roads to access structure locations, where feasible.
- Remove any temporary equipment mats and revegetate following temporary disturbance.

3.1.8 Terrestrial Wildlife Impact Minimization Measures

Several measures have been incorporated into the Proposed Action to minimize and prevent impacts to terrestrial wildlife and their habitat, including ESA-listed species. Remove all food scraps and food

packaging of any kind from the project sites and transport off-site after each workday; food cannot be left exposed and unattended for any amount of time; no food may be fed to or left for wildlife.

- Locate staging areas as close to construction sites as practicable to minimize driving distances between staging areas and construction sites.
- Locate staging areas in previously disturbed or graveled areas to minimize soil and vegetation disturbance where practicable.
- Due to the potential impact to nesting season for marbled murrelets, bald eagles, and common ravens, it will be conservatively assumed that individuals of this species may be present during project activities. The planning department proposes restricting construction activities to begin two hours after sunrise and end two hours before sunset between the dates of April 15 and August 15. To project Bald Eagles, PD proposed to have a Bald Eagle nesting survey done prior to construction activities and follow the guidelines of the National Bald Eagle Management Guidelines. If a nest is found and construction activity is visible from the nesting site and within 660 feet of the nest and/or if a nest is found but the construction site is not visible from the nest but within 330 feet of the nest, PD recommends that construction should be avoided between Feb 15 and July 30 (USFWS 2007).

4 Noise Disturbance

The action area is defined as the area to be affected directly or indirectly by the federal action (50 Code of Federal Regulations [CFR] § 402.02). It considers all consequences of the action and includes the geographic extent of the effects on the environment from the Proposed Action. Elements of the Proposed Action that may affect the environment include increased in-air (terrestrial) noise levels and terrestrial habitat modification. Thus, the action area includes:

1. Project footprint: i.e., the physical envelope of project disturbance.
2. Extent of in-air noise during the loudest noise-producing activity associated with the Proposed Action.

The Proposed Action will not impact riparian vegetation adjacent to fish-bearing streams and no culverts will be constructed or replaced. Activities associated with the Proposed Action, including access road work and materials staging, should not result in the discharge of sediment-laden runoff or construction materials into aquatic areas. Therefore, the action area is defined by the area of ground disturbance within the project footprint and the geographic extent of noise-related disturbance associated with the project. The action area includes all potential construction and staging areas.

Noise from construction activities along North Kloomachin is based on reference data from the *WSDOT Biological Assessment Preparation Manual* (WSDOT 2020). The loudest noise-producing equipment anticipated to be used on site, measured 50 feet from the point source, include a dump truck (91 dB), an excavator (87 dB), and a front-end loader (71 to 81 dB). Using the manual's rules for decibel addition, the maximum combined noise level from the construction equipment will be 91 dB at 50 feet.

The project area for the North Kloomachin site is characterized by forest, soft dirt, and grave road, and is adjacent to developed parcels within the residential homes to the west and north; this area is

considered to be a “soft site” for noise attenuation. Therefore, a noise transmission loss of 7.5 dB per doubling distance was used for noise attenuation on the terrestrial portion of the project site.

As the project will occur within the reservation boundaries, the background noise level is estimated to be 45 dB, based on the population density. Using a point source sound attenuation calculation and soft site characteristics for the landward portion of the project site, temporary construction noise should attenuate to ambient in-air noise levels approximately 3,459 feet (0.66 miles) from the project site.

5 Status of Federally Listed Species and Designated Critical Habitat in the Action Area

Lists of federally threatened and endangered species in the action area were obtained from the following sources:

- USFWS (2022a) Information for Planning and resource report (Appendix A).
- WDFW Priority Habitats and Species (PHS) on the web (2022a).

The USFWS species list was accessed in October 2022 specific to the action area were compared to the USFWS listings. Species that could potentially occur in the proposed action area are listed in Table 5-1.

Table 5-1. Federally Listed Species That May Occur in the Action Area

Species	DPS	Listing Status	Critical Habitat
Mammals			
None	NA	NA	NA
Birds			
Marbled Murrelet *(Brachyramphus marmoratus)*	NA	Threatened	Designated but not in action area
Yellow-billed cuckoo (*Coccyzus americanus*)	Western DPS	Threatened	Designated but not in action area
Fish			
Bull Trout (*Salvelinus confluentus*)	Coterminous United States	Threatened	Designated but not in action area
Flowering Plants			
Golden paintbrush *(Castilleja levisecta)*	NA	Threatened	No critical habitat proposed or designated

Note: DPS = Distinct Population Segment; NA = not applicable.

5.1 Presence of Federally Listed Species and Critical Habitat in the Action Area

The following sections describe the USFWS ESA-listed species and their potential to occur in the action area. The listing status, life history, and habitat requirements are described for each species. Critical habitat for each listed species in the action area, as applicable, is also discussed.

5.1.1 Marbled Murrelet

Listing Status and Distribution

The marbled murrelet is a small, robin-sized, diving seabird that spends majority of its time on the ocean (more than 90%) resting and feeding, but flies inland to nest in old growth forest stands. The USFWS listed the Washington, Oregon, and California population as a threatened species under the ESA in 1992 (57 FR 45328).

General Life History and Habitat Requirements

The range of the marbled murrelet is defined by breeding and wintering areas that extend from the northern terminus of Bristol Bay, Alaska, to the southern terminus of Monterey Bay in central California. In Washington, this species occurs in the greatest numbers in the Puget Sound and Strait of Juan de Fuca. Historical records and observations indicate that murrelets were common and regularly seen along Washington and Oregon coastlines (USFWS 1997). Marbled murrelets forage just beyond the breaker-line and along the sides of river mouths where greater upwelling and less turbulence occur. Murrelets fly between foraging areas off the coast and inland nesting habitat.

Marbled murrelets forage at sea, often along shorelines where prey may be concentrated by tides or river currents. Their prey primary includes small fish and zooplankton (The Cornell Lab 2019a). Although the marine environment is the murrelet's principal habitat, terrestrial habitat serves a vital function seasonally for nesting and reproduction. In their terrestrial environment, the presence of platforms (large branches or deformities) used for nesting is the most important characteristic of their nesting habitat. Camouflaged adults nest on mossy-limbed branches of large conifers such as coast redwood (*Sequoia sempervirens*), western hemlock (*Tsuga heterophylla*), Douglas fir (*Pseudotsuga menziesii*), and Sitka spruce (*Picea sitchensis*), in mainland mature stands typically located within 37 miles (60 kilometers) of marine waters (USFWS 2019). Murrelet habitat use during the breeding season is positively associated with the presence and abundance of mature and old-growth forests, large core areas of old-growth, low amounts of edge habitat, reduced habitat fragmentation, proximity to the marine environment, and forests that are increasing in stand age and height (USFWS 2019).

Suitable marbled murrelet nesting trees are mature conifers (more than 15 inches diameter at breast height (dbh)) situated in contiguous conifer-dominant (more than 60 percent conifer) stands (WSDOT Fish and Wildlife Program and FHWA 2015). These conifer-dominated stands may vary in size from several acres (at least 5 acres) to thousands of acres, with large unfragmented stands of old growth comprising the highest-quality habitat. Nests are not built, but rather the eggs are placed in small depressions or cups made in moss or other debris on the limb (ODFW 2017). A nesting platform can be composed of a wide bare branch, moss or lichen covering a branch, mistletoe, witches' brooms, or

other deformities (Evans Mack et al. 2003). During the nesting season (May through August), marbled murrelets fly inland from the coast, often using waterways as flight corridors to nesting areas.

Occurrence in Action Area

Occurrences of marbled murrelets have been reported in Jefferson County and areas around the Olympic Peninsula. Although WDFW reports no known nesting areas in the proposed action area (WDFW 2021a), however given their small size and the lack of protocol surveys completed for the area, it is common to lack detailed murrelet nest data.

The North Kloomachin Action Area contains second-growth conifer (the majority of which has been logged within the past 30 years). No potentially suitable nesting habitat was observed during field visits conducted in October 2022.

Critical Habitat

Critical habitat was designated for the marbled murrelet in 1996 and revised in October 2011 (76 FR 61599). The preservation of both marine foraging habitat and terrestrial nesting habitat is important to the recovery of the species; however, only terrestrial nesting habitat has been designated as critical habitat for the marbled murrelet and includes forested stands with trees generally more than 32 inches in diameter that have potential nesting platforms at least 33 feet above the forest floor (USFWS 1997).

Marbled murrelet critical habitat includes mature forest in the portions of Jefferson County but is not designated within the Action Area. The nearest block of designated critical habitat is located approximately 10 miles southwest of the project near Quilcene and Dabob Bay.

5.1.2 Yellow-billed Cuckoo

Listing Status and Distribution

On October 3, 2013, the Western DPS of the yellow-billed cuckoo (*Coccyzus americanus*) was proposed as a threatened species under the ESA and was subsequently listed on October 3, 2014 (79 FR 59992). The yellow-billed cuckoo is a slender, long-tailed passerine that formerly occurred on both sides of the Cascades in both Oregon and Washington but is a rare migrant in both states (Wiles and Kalasz 2017).

General Life History and Habitat Requirements

Yellow-billed cuckoos nest in deciduous habitats with clearings and dense, shrubby vegetation, especially those near rivers, streams, and wetlands (Wiles and Kalasz 2017). The species displays a strong preference for large (>40 hectares), wide (over 100 meters), continuous riparian zones dominated by cottonwoods (*Populus* spp.) and willows (*Salix* spp.) (WDFW 2022c; Wiles and Kalasz 2017). Canopy closure, interior foliage volume, and densities of small trees are also important characteristics of nest sites (Wiles and Kalasz 2017). Little is known about foraging and migrating habitat, but a high volume of cottonwoods appear important for foraging and a variety of riparian and coastal shrubs are used for migratory stopovers (USFWS 2015).

Occurrence in Action Area

The yellow-billed cuckoo is not documented to occur in the action area (WDFW 2022a). Currently, yellow-billed cuckoos are extremely rare summer visitors to Washington (Seattle Audubon Society 2022). In Washington, only 20 sightings have been reported since the 1950s, all or nearly all of which were likely non-breeding vagrants or migrants (Wiles and Kalasz 2017). Of the 20 sightings, 19 were recorded from 1974 to 2016, and 16 of the total sightings occurred in eastern Washington near the Cascades (Wiles and Kalasz 2017), well over 100 miles from the action area. Although historical observations of yellow-billed cuckoo occurred along the Columbia River in Clark County, WA, no detections have been documented in the county since 1937 (Wiles and Kalasz 2017). The timing of the cuckoo's decline throughout much of western Washington resembles similar declines in British Columbia and Oregon, where records of continuing presence and presumed breeding ended by the 1920s (Wiles and Kalasz 2017). However, due to a lack of surveys for the species and the presence of small areas of habitat in Washington, the possibility exists that this species may occasionally breed in the state (Wiles and Kalasz 2017).

Although the yellow-billed cuckoo is not documented to occur in the action area (WDFW 2022a) and breeding western yellow-billed cuckoos have not been confirmed for many decades in Oregon, Washington, or British Columbia, the action area is within the historic breeding range of the species and suitable foraging and nesting habitat is present on Hayden Island near Structure 5/1 through 5/3. Thus, the occurrence of yellow-billed cuckoo in the action area during summer months is possible, though highly unlikely.

Critical Habitat

Critical habitat was designated for the yellow-billed cuckoo on May 21, 2021; no critical habitat is designated in Washington or Oregon (86 FR 20798) because the species is considered extirpated as a breeder from these states since at least the 1940s (86 FR 20849).

5.1.3 Bull Trout

Listing Status and Distribution

In November 1999, the USFWS listed all populations of Bull Trout (*Salvelinus confluentus*) within the conterminous United States as a threatened species pursuant to the ESA (64 FR 58910). Bull Trout are native to Canada and the United States; the geographic range of the species is confined to northwestern North America from Alaska to northern California (USFWS 2022d). Bull Trout inhabit Arctic and Pacific waters and are usually found in mountain or coastal streams (USFWS 2022d).

General Life History and Habitat Requirements

Bull Trout express both resident and migratory life history strategies (Rieman and McIntyre 1993). Resident forms complete their entire life cycle in the tributary (or nearby) streams in which they spawn and rear. Migratory Bull Trout spawn in tributary streams, where juvenile fish rear for 1 to 4 years before migrating to either a lake (adfluvial form) (Downs et al. 2006) or a river (fluvial form) (Fraley and Shepard 1989) or, in certain coastal areas, to saltwater (amphidromous) (Brenkman and Corbett 2005).

Bull Trout have some of the most demanding habitat requirements of all salmonids (Rieman and McIntyre 1993). To successfully spawn and rear, Bull Trout need specific physical characteristics within watersheds, but those characteristics (e.g., appropriately sized, clean spawning gravels, cold water below 9 degrees Celsius; depths less than 1 meter; Fraley and Shepard 1989) are not necessarily present throughout watersheds even in pristine habitats (Rieman and McIntyre 1993; Watson and Hillman 1997).

Occurrence in Action Area

The shoreline along Dabob Bay in Jefferson county and the western shoreline of Hood Canal, Washington provides foraging, migration, and overwintering habitat for Bull Trout and is considered essential for maintaining connectivity for amphidromous and fluvial life histories (USFWS 2010a).

The Proposed Action is upland and will not impact aquatic habitat or riparian vegetation adjacent to fish-bearing streams. No culverts will be constructed or replaced as part of the Proposed Action.

Critical Habitat

Critical habitat for Bull Trout was revised in a final rule published on October 18, 2010 (75 FR 63898) and includes the Columbia River. In freshwater areas, Bull Trout critical habitat includes designated stream reaches and a lateral extent as defined by the bankfull elevation or the ordinary high water mark if bankfull elevation is not evident on either bank (USFWS 2010b).

The Proposed Action is upland and will not impact Bull Trout critical habitat.

5.1.4 Golden Paintbrush

Listing Status and Distribution

Golden paintbrush (*Castilleja levisecta*) was federally listed as threatened on June 11, 1997 (62 FR 31740). Historically, golden paintbrush was reported from more than 30 sites in the Puget Trough of Washington, in western British Columbia, and in the Willamette Valley of Oregon. Many populations have been extirpated due to agricultural, residential, and commercial development (USFWS 1997). Remaining habitat has been degraded by encroaching native and non-native vegetation that competes with golden paintbrush and creates shade, which the species does not tolerate (USFWS 2000).

General Life History and Habitat Requirements

Golden paintbrush is found in moist or wet meadows and prairies at low elevations west of the Cascade crest (Burke Museum Herbarium 2022a). The species occurs on generally flat grasslands, including some that are characterized by mounded topography, and on steep coastal bluffs that are grass-dominated (USFWS 2000). In Washington, mainland populations have been found in open, remnant prairies dominated by Roemer's fescue (*Festuca roemeri*) and red fescue (*F. rubra*) on gravelly or clayey glacial outwash (Washington Natural Heritage Program [WNHP] 2022).

Occurrence in Action Area

Golden paintbrush is unlikely to occur in the action area due to a lack of suitable habitat. There are no documented occurrences of this species in the action area (Burke Museum Herbarium 2022a;

WDFW 2022a; WDNR 2021). In Washington, the nearest documented population is in Thurston County over 100 miles north of the action area (Washington Department of Natural Resources [WDNR] 2021) and the nearest documented occurrence in Oregon is from an introduced population in Benton County, located approximately 100 miles south of the action area (Burke Museum Herbarium 2022a; ODA 2010).

Critical Habitat

No critical habitat has been designated for golden paintbrush (USFWS 2022e).

6 Presence of Washington State Listed Species and Priority Habitat in Action Area

Lists of Washington State listed threatened, endangered and candidate species in the action area were obtained from the following sources:

- WDFW – Species List (WDFW 2022b)

The WDFW species list specific to Kitsap County was accessed in November 2022. All project impacts will occur in forested upland areas with no expected impact to aquatic species, therefore fish and marine mammals are excluded from list. No priority habitat was identified within the action area for the species listed below. Species that could potentially occur in the proposed action area are listed in Table 9.1.

Table 9.1

Species	State Status	Federal status	Priority Habitat
Western Toad	Candidate	None	None
Western Pond Turtle	Endangered	None	None
Common Loon	Sensitive	None	None
Western Grebe	Candidate	None	None
Marbled Murrelet	Threatened	Threatened	None
Yellow-billed cuckoo	Endangered	Threatened	None
Townsend’s Big-eared Bat	Candidate	None	None
Keen’s Myotis Bat	Candidate	None	None
Western Bumble Bee	Candidate	None	None

Species	State Status	Federal status	Priority Habitat
Puget Blue Butterfly	Candidate	None	None

6.1 Amphibians and Reptiles

The Western Toad and Western Pond Turtle both require habitats that include wetlands and open water or ponds (WDFW 2022b). The Proposed Action has no wetlands or streams and will not impact aquatic habitat or riparian vegetation adjacent to streams. Due to the lack of suitable habitat, the Proposed Action area is not expected to have any impact on these species.

6.2 Birds

Both the Marbled Murrelet and the Yellow-Billed Cuckoo have been addressed in sections 5.1.1 and 5.1.2. The Common Loon has a small breeding population in Washington (between 20-50 breeding pairs) and utilize freshwater lakes and reservoirs for breeding areas. They can be found wintering in almost all nearshore marine habitat and larger freshwater bodies of water in Western Washington (WDFW 2022b).

The Western grebe can be found wintering throughout the Salish seas along the shorelines but prefer to nest more inland in Eastern Washington. Some non-breeding individuals have been found over-summer in marine waters (WDFW 2022b). Due to the lack of suitable habitat within the Proposed Action area, the project is not expected to have any impact on breeding areas for these species. However, activity that may occur in the winter months (which is expected to be limited) may impact their winter use of the shorelines.

6.3 Mammals

The Townsend's big-eared bats can be found in a variety of habitat's including westside lowland conifer-hardwood forest, ponderosa pine forest and woodlands, mixed highland conifer forest, eastside mixed conifer forest, shrubsteppe, and both eastside and westside riparian forest/wetlands and open fields. Many day and breeding roosts are in caves, abandoned mines, buildings, concrete bunkers, tunnels, and bridges. Old-growth trees with large basal hollows may have formerly been important roost type in the state. During the winter, caves, abandoned mines, tunnels, and concrete bunkers are commonly occupied by hibernating bats. These bats will also use caves, abandoned mines, tunnels, bridges, and buildings as night roosts, when they rest between foraging bouts (WDFW 2022b).

Keen's myotis bat species is closely associated with low elevation, moist, mature coastal conifer forests during the active season and may move to hibernacula in mid-elevation caves for winter. Summer roosts are in tree cavities, snags, rock crevices, small caves, and buildings. The few documented maternity sites have been found in caves and trees. Foraging occurs more frequently in mature and old growth forests than clearcuts or young forests; riparian areas are likely important foraging habitats (WDFW 2022b).

With the lack of suitable roosting and hibernacula sites available within the Action area, the project is not expected to have any impact on these species.

6.4 Invertebrates

Bumble bees depend on habitats with rich floral resources throughout the nesting season, and many species select specific suites of plants for obtaining nectar and pollen. They also select flowers based on their structure and the bee's tongue length. Bumble bees require above and below-ground micro-sites for overwintering and nesting, including logs, stumps, and abandoned rodent and ground-nesting bird nests (WDFW 2022b).

Bumble bee colonies are annual. In late-winter or early-spring, queens, which are the sole survivors from the previous year, emerge from their overwintering sites to feed on floral nectar, collect pollen, and search for suitable nest sites, which are often abandoned rodent holes. It is likely Bumble bees utilize the proposed Action area; however, the site has limited sources of floral nectar. Bumble Bees could utilize the perimeter of the site, where areas of non-native Himalayan blackberry can be found (WDFW 2022b).

The Puget blue inhabits low elevation grasslands in south Puget Sound, and sub-alpine meadows in the Olympic Mountains. The perennial sickle-keeled lupine is the larval host and primary adult nectar source for the Puget blue on two south Sound prairies. The butterfly's dependence on sickle-keeled lupine limits their habitat to areas and sites that support significant patches of this plant. The distribution of the Puget blue is limited in part by a combination of its dependence on rare hostplant occurrence within rare habitat types. In Washington, its distribution and abundance in Washington is characterized by small numbers of small, isolated populations (WDFW 2022b). Due to the lack of habitat and plant species required for the Puget blue, the action area will not have any impact on this species.

7 Presence of Culturally Significant Species

6.1.1 Common Raven

History and Distribution

Considered a culturally important species, the Common Raven (*Corvus corax*) is one of the most widespread birds in Washington state. For years, indigenous cultures around the world have revered ravens as spiritual figures. The Raven is known as a "trickster", being a symbol of change and transformation.

Common Ravens are commonly found and widespread through the year in non-urban areas of Washington. They are most common east of the Cascade Crest and are common along Washington's outer coast (Birdweb 2022).

General Life History and Habitat Requirements

Ravens can be found in every habitat except major metropolitan areas and high elevation glacial areas. Ravens prefer open and partially open areas. They avoid dense forests, where they are more vulnerable to predators. Ravens like to feed in open areas and are mainly scavengers. They generally roost on cliff ledgers or in large trees but also have established nests on powerlines, and billboards (NMP 2022).

Ravens form long-term pair bonds. Pairs typically stay together year-round, roosting historically on cliffs and trees, now power poles, and other manmade structures are commonly used. The nest usually consists of a base of large sticks woven into a bulky basket with smaller branches and twigs inside.

Occurrence in Action Area

Common Ravens have been documented in Kitsap County in Hansville and Kingston (Kitsap Audubon Society 2022). Once could be heard during the site visit in October.

Critical or Priority Habitat

This species is not at risk, therefore no critical or priority habitat has been designated for Common Raven.

6.1.2 Bald Eagle

History and Distribution

Considered a culturally important species, the Bald Eagle (*Haliaeetus leucocephalus*) is commonly found in Washington state. Eagles appear in many tribes' creation stories, and they are revered because of their strength, boldness, and courage to withstand any obstacles.

The Bald Eagle is found only in North America, generally in coastal areas or near large inland lakes and rivers abundant with fish and shores with large trees. They nest in large trees near shorelines, and prey on fish, waterfowl, small mammals, or scavenge.

General Life History and Habitat Requirements

Many birds that nest in Canada and Alaska migrate south to overwinter in Washington, concentrating with spawned-out salmon, especially chum. Winter roosts are usually located in varied aged patches of trees protected from the wind and inclement weather. Bald Eagles return to their breeding territories year after year and may use the same nest for successive years.

Breeding eagles require large trees near open water in locations with low levels of human activity. Nesting activities take place in January or February and disperse by late summer when many migrate north to coastal British Columbia and southeast Alaska (eopugetsound 2022).

Occurrence in Action Area

Bald Eagles have been documented in Kitsap County in Hansville and Kingston (Kitsap Audubon Society 2022).

Critical Habitat

This species is not at risk, therefore no critical or priority habitat has been designated for Bald Eagles.

8 Significant Populations of Non-Listed Species (deer, bear, cougar, etc.)

Animal trails were noted during the October site visit. With close vicinity to neighboring communities and roads, there was no evidence of denning sites or high use by a significant population of non-listed species. Deer, bear and couguars are commonly found within the region and any individuals found within this Action area would be considered transients.

9 Effects of the Proposed Action

Effects of the action entail all consequences to listed species or critical habitat that are caused by the Proposed Action, including the consequences of other activities that are caused by the Proposed Action. A consequence is caused by the Proposed Action if it would not occur but for the Proposed Action, and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (84 FR 45016).

As described in Section 4, the action area is defined by the area of ground disturbance and the geographic extent of noise-related disturbance associated with the project and includes construction and staging areas, and access roads. The project will result in permanent areas of ground disturbance to construct roads, sidewalks and utility connections. Some of these areas are located in places that have existing or previous ground disturbance and will not require tree clearing. Habitat quality in these work areas does not currently provide any suitable habitat for listed species. In particular, there are no suitable stands of old growth forest for marbled murrelets. Suitable habitat is also lacking for the listed plant species golden paintbrush as described in Section 5.1. For these reasons, the Proposed Action is not likely to adversely affect marbled murrelets and will not affect golden paintbrush or yellow-billed cuckoo.

The Proposed Action will not impact aquatic habitat or riparian vegetation adjacent to fish-bearing streams. PD will implement typical construction BMPs to avoid the discharge of sediment-laden runoff or construction materials into aquatic areas (Section 3.1.7). No culverts will be constructed or replaced as part of the Proposed Action. Therefore, no impacts to ESA-listed aquatic species (i.e., Bull Trout) will occur.

The main potential impact of the project on any individuals from listed species with potential to occur in the action area will be from elevated noise levels during construction activities. The elevated noise has the potential to cause temporary disturbance to individuals and may elicit a behavioral response

or cause them to alter their movements and avoid the area. Project construction activities will be conducted during daylight hours and noise disturbance will be limited to this time period and be temporary during the course of project activities.

The yellow-billed cuckoo is not documented to occur in the action area and presumed breeding in the region ended in the 1920s. Yellow-billed cuckoos are extremely rare visitors to Washington and the potential occurrence of the species in the action area is considered remote. In the exceedingly unlikely possibility that an individual is present in the action area during implementation of the Proposed Action, elevated noise associated with project construction may disturb individuals.

9.1 Cumulative Effects

Cumulative effects are those of future state or private activities, not involving activities of other federal agencies that are reasonably certain to occur within the area of the federal action subject to consultation (50 CFR 402.02 Definitions). Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA.

10 Effects Determinations on Federally Listed Species

This section presents the recommended effects determinations for each of the listed species with potential to occur in the action area and provides a summary of the factors that support each determination. Effects on critical habitat in the action area are also summarized. Table 10-1 summarizes effects determinations for each species and critical habitat.

Table 10-1. Summary of Recommended Effects Determinations

Species	DPS	Effect Determination	Critical Habitat
Marbled Murrelet	NA	NLAA	NE
Yellow-billed cuckoo	NA	NE	NE
Common Raven	NA	NLAA	NA
Bald Eagle	NA	NLAA	NA
Bull Trout	Coterminous United States	NE	NE
Golden paintbrush	NA	NE	NA
Note: DPS = Distinct Population Segment; NA = not applicable; NE = no effect; NLAA = not likely to adversely affect.			

10.1 Marbled Murrelet

As described in Section 5, marbled murrelets utilize old growth dense forests and forage primarily in the sea. Due to a lack of suitable habitat in the action area, the Proposed Action is ***not likely to adversely effect*** on marbled murrelets. Critical habitat has not been designated for marbled murrelet.

10.2 Yellow-Billed Cuckoo

As described in Section 5, although the yellow-billed cuckoo is not documented to occur in the action area or vicinity, the action area is within the historic breeding range of the species, however, suitable foraging and nesting habitat is not present in the Proposed Action area. In the exceedingly unlikely possibility that an individual is present in the action area during implementation of the Proposed Action, elevated noise associated may disturb individuals. However, yellow-billed cuckoos are extremely rare visitors to Washington and the potential occurrence of the species in the action area is considered remote, therefore the Proposed action will have ***no effect*** on the Yellow-Billed Cuckoo. Critical habitat has not been designated for yellow-billed cuckoo.

10.3 Common Raven

As described in Section 5, Common Raven utilize almost any habitat except for heavily populated regions. Due to a lack of suitable habitat in the action area, the Proposed Action is ***not likely to adversely effect*** on common raven. Critical habitat has not been designated for common raven.

10.4 Bald Eagle

As described in Section 5, bald eagles utilize varied aged forests and forage primarily in the sea. Due to a lack of suitable habitat in the action area, the Proposed Action is ***not likely to adversely effect*** bald eagles. Critical habitat has not been designated for bald eagles.

10.5 Bull Trout

The Proposed Action will not impact aquatic habitat or riparian vegetation adjacent to fish-bearing streams. No culverts will be constructed or replaced as part of the Proposed Action. Activities associated with the Proposed Action, including access road work and materials staging, will employ BMPs (Section 3.1.7) to avoid the discharge of sediment-laden runoff or construction materials into aquatic areas. For these reasons, the Proposed Action will have ***no effect*** on Bull Trout. Critical habitat has not been designated for Bull Trout.

10.6 Golden Paintbrush

Golden paintbrush is not documented to occur in the action area or vicinity; the nearest documented populations in Washington and Oregon are located over 100 miles north and approximately 100 miles south of the action area, respectively (Section 5.1.4). Due to a lack of suitable habitat in the action area and the distance to known populations (≥100 miles), the Proposed Action will have ***no effect*** on golden paintbrush. Critical habitat has not been designated for golden paintbrush.

11 References

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Appendix A: Information for Planning and Consultation (IPAC) List for Action Area

EXHIBIT 3
BID SUMMARY

The contractor is required to bid on all of the work specified in Exhibit 2 and complete Exhibit 3 Bid Summary and Bid Schedules. The contractor shall signify that the bid amount is correct below.

RACCOON TOWN HOUSING PROJECT		
	Description	**Amount ($)**
	SCHEDULE A: Sanitary Sewer and Water Distribution System	
	SCHEDULE B: Stormwater and Roadway Infrastructure	
	SCHEDULE C: All Other Infrastructure and Construction	
TOTAL	SCHEDULE A + SCHEDULE B + SCHEDULE C	

By signing this agreement Contractor represents, warrants and certifies that in submitting its bid that Contractor has not participated and agrees not to participate in any agreement, arrangement or collusion with any other person, entity, bidder, vendor or any subcontractor pertaining to receiving or giving certain benefits to Contractor or to any of these aforesaid parties, or made any promises of future benefit to anyone, or made any payment or gift to any TRIBAL agent, representative, employee or official. In addition, Contractor shall not make any payments or gifts to any TRIBAL official, employee or any Tribal member or Tribal agent as a result of or related to Contractor performing work pursuant to this Contact. Violation of this paragraph shall be grounds for immediate termination of consideration of this bid and shall bar the Contractor from future TRIBE contracts.

Name of Firm_____

_____
Authorized Official Signature Title

Business Physical Address:_____

_____
Mailing Address City State Zip Code

_____
Telephone Number Email

Washington State Contractor's License No._____

Date of Issue _____ Expiration Date _____

EXHIBIT 3 BID SCHEDULE A
SANITARY SEWER AND WATER DISTRIBUTION SYSTEM
RACCOON TOWN HOUSING PROJECT

WORK ITEM	Written	Dollars
On-site Sanitary Sewers including manholes, side sewers, and cleanouts		
Little Boston Road Off-site sewer extension/connection including Saw-Cut, Unsuitable Excavation & Haul, Excavation Safety System, Traffic Control, Testing, Imported/Compacted Roadway Gravel Borrow, and Paving		
Reservoir Watermain Fill Pipe Replacement, including Special Excavation, Existing Pipe Preservation, Sampling Tee, New Watermain Separation and Testing, Existing Pipe removal and disposal		
On-site watermain including hydrants, lot services, meters, meter boxes, blow-off and air-vac assemblies, and New watermain Separation and Testing		
TOTAL SCHEDULE A		

EXHIBIT 3 BID SCHEDULE B STORMWATER AND ROADWAY INFRASTRUCTURE RACCOON TOWN HOUSING PROJECT		
WORK ITEM	**Written**	**Dollars**
On-site Storm Drainage incl. Storm Pond and Appurtenances, Pond and Pedestrian Access Road and bollards, Dispersion Systems, Lot Connection Drains		
On-site Cement Concrete Curb & Gutter and Rolled Curb, curbing transitions, curb cuts & cement concrete ramps, signage, striping, and channelization		
Hood Canal Drive Frontage Work including Sawcutting, Clearing/Grubbing, Grading, Storm Drainage System, Concrete Curb and gutter, cement concrete ramps and driveway entrance, cement sidewalks, pavement section and pavement restoration, signage, crosswalk and warning system, traffic control		
On-site Cement Concrete Sidewalk		
Roadway Grading including CSTC & CSBC		
On-site Paving HMA including speed humps, raised crosswalk and pedestrian warning system, signage, and centerline monuments		
TOTAL SCHEDULE B		

EXHIBIT 3 BID SCHEDULE C
ALL OTHER INFRASTRUCTURE & CONSTRUCTION
RACCOON TOWN HOUSING PROJECT

WORK ITEM	Written	Dollars
Mobilization and Demobilization		
Minor Changes ALLOWANCE	Twenty-Five Thousand and 0/100 dollars	$25,000.00
Stormwater Pollution Prevention Plan including BMP installation and maintenance, seeding, jute mat		
Clearing & Grubbing including topsoil strip, stockpile, placement, and excess disposal		
Timber Harvest Firewood Sharing and Delivery		
Mass Grading incl. Excavation and Embankment Haul, Compaction & Import		
Dry Utility Trenching, Conduit & Backfill and Fiber Handholds(Power, New Street Lighting, Fiber)		
Hood Canal Drive Street Lighting overhead power demo/removal, trenching and backfill for conduit between existing light standards, 2” Sch 80 conduit, cable, re-connect street lights, energize at V-09		
Park Tract Amenities, including equipment purchase and install, curbing, boulder relocation ALLOWANCE	One Hundred Fifty-Thousand and 0/100 Dollars	$150,000.00
Final Cleanup		
TOTAL SCHEDULE C		

EXHIBIT 4
Davis Bacon
Construction Labor Rates 1/1/2025 – 12/31/2025

EXHIBIT 4 DAVIS-BACON WAGE RATES

"General Decision Number: WA20250001 09/26/2025

Superseded General Decision Number: WA20240001

State: Washington

Construction Type: Highway

Counties: Washington Statewide.

HIGHWAY (Excludes D.O.E. Hanford Site in Benton and Franklin Counties)

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least $17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2025
1	02/07/2025

2	03/21/2025
3	04/25/2025
4	05/30/2025
5	06/06/2025
6	06/27/2025
7	07/18/2025
8	08/08/2025
9	08/22/2025
10	08/29/2025
11	09/05/2025
12	09/12/2025
13	09/26/2025

* CARP0059-021 06/01/2025

ADAMS, ASOTIN, BENTON, CHELAN, COLUMBIA, DOUGLAS, FERRY, FRANKLIN, GARFIELD, GRANT, KITTITAS, LINCOLN, OKANOGAN, PEND OREILLE, SPOKANE, STEVENS, WALLA WALLA, WHITMAN, AND YAKIMA COUNTIES

	Rates	Fringes
CARPENTER		
Assistant Diver Tender, ROV Tender/Technician	$ 50.76	17.28
Bridge, Dock, and Wharf Carpenter	$ 48.21	17.28
Carpenter	$ 44.21	17.28
Diver Standby	$ 55.24	17.28
Diver Tender, Manifold Operator, ROV Operator	$ 54.24	17.28
Diver Wet	$ 110.48	17.28
Manifold Operator-Mixed Gas	$ 58.24	17.28
Piledriver: Includes driving, pulling, cutting, placing collars, setting, welding, or creosote treated material, on all piling	$ 49.76	17.28

CARP0096-002 06/01/2025

CLALLAM, GRAYS HARBOR, ISLAND, JEFFERSON, KING, KITSAP, LEWIS, MASON, PACIFIC (North of a straight line made by extending the north boundary line of Wahkiakum County west to the Pacific Ocean), PIERCE, SAN JUAN, SKAGIT, SNOHOMISH, THURSTON AND WHATCOM Counties

	Rates	Fringes
MILLWRIGHT	$ 55.39	22.38

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* CARP0096-007 06/01/2025

SOUTHWEST WASHINGTON: CLARK, COWLITZ, LEWIS (Piledriver only), PACIFIC (South of a straight line made by extending the north boundary line of Wahkiakum County west to Willapa Bay to the Pacific Ocean), SKAMANIA, and WAHKIAKUM Counties.

	Rates	Fringes
MILLWRIGHT	$ 59.35	22.38

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* CARP0196-004 06/01/2025

CLARK, COWLITZ, *PACIFIC, SKAMANIA, AND WAHKIAKUM COUNTIES
*PORTION OF PACIFIC COUNTY SOUTH OF A STRAIGHT LINE MADE BY EXTENDING THE NORTH BOUNDARY LINE OF WAHKIAKUM COUNTY WEST TO WILLAPA BAY TO THE PACIFIC OCEAN, AND THENCE NORTH THROUGH THE NATURAL WATERWAY TO THE PACIFIC OCEAN (THIS INCLUDES THE ENTIRE PENINSULA WEST OF WILLAPA BAY)

	Rates	Fringes
Piledriver	$ 56.06	16.81

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* CARP0196-006 06/01/2025

CLALLAM, GRAYS HARBOR, ISLAND, JEFFERSON, KING, KITSAP, LEWIS, MASON, *PACIFIC, PIERCE, SAN JUAN, SKAGIT, SNOHOMISH, THURSTON AND WHATCOM COUNTIES
* PORTION OF PACIFIC COUNTY NORTH OF A STRAIGHT LINE MADE BY EXTENDING THE NORTH BOUNDARY LINE OF WAHKIAKUM COUNTY WEST TO THE PACIFIC OCEAN COUNTIES OR PARTS OF COUNTIES EAST OF THE 120TH MERIDIAN

	Rates	Fringes
Piledriver	$ 65.53	19.13

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* CARP0206-009 06/01/2025

KING AND KITSAP COUNTIES

	Rates	Fringes
CARPENTER		
BRIDGE CARPENTER	$ 65.58	19.13
CARPENTER	$ 63.98	19.13
DIVER TENDER	$ 71.77	19.13
DIVER	$ 125.44	19.13

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* CARP0360-006 09/15/2025

PACIFIC COUNTY
PORTION OF PACIFIC COUNTY NORTH OF A STRAIGHT LINE MADE BY EXTENDING THE NORTH BOUNDARY LINE OF WAHKIAKUM COUNTY WEST TO THE PACIFIC OCEAN COUNTIES OR PARTS OF COUNTIES EAST OF THE 120TH MERIDIAN

	Rates	Fringes
Carpenters:		
Bridge Carpenter	$ 65.58	19.13
Carpenter/Drywall Hanger	$ 63.98	19.13
Diver Tender	$ 71.77	19.13
Diver	$ 125.44	19.13

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* CARP0360-007 06/01/2025

PACIFIC COUNTY
PORTION OF PACIFIC COUNTY SOUTH OF A STRAIGHT LINE MADE BY EXTENDING THE NORTH BOUNDARY LINE OF WAHKIAKUM COUNTY WEST TO WILLAPA BAY TO THE PACIFIC OCEAN, AND THENCE NORTH THROUGH THE

NATURAL WATERWAY TO THE PACIFIC OCEAN (THIS INCLUDES THE ENTIRE PENINSULA WEST OF WILLAPA BAY)

	Rates	Fringes
Carpenters:		
CARPENTERS	$ 54.69	16.81
DIVERS TENDERS	$ 64.32	16.81
DIVERS	$ 108.33	16.81
DRYWALL	$ 54.59	16.81

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* CARP0360-013 06/01/2025

GRAYS HARBOR, LEWIS, MASON, PIERCE, AND THURSTON COUNTIES

	Rates	Fringes
CARPENTER		
BRIDGE CARPENTER	$ 65.58	19.13
CARPENTER	$ 63.98	19.13
DIVER TENDER	$ 71.77	19.13
DIVER	$ 125.44	19.13

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* CARP0425-006 09/15/2025

CLALLAM, ISLAND, JEFFERSON, SAN JUAN, SKAGIT, SNOHOMISH, AND WHATCOM COUNTIES

	Rates	Fringes
CARPENTER		
BRIDGE CARPENTER	$ 65.58	19.13
CARPENTER	$ 63.98	19.13
DIVER TENDER	$ 71.77	19.13
DIVER	$ 125.44	19.13

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* CARP0503-021 06/01/2025

CLARK, COWLITZ, SKAMANIA, AND WAHKIAKUM COUNTIES

	Rates	Fringes
Carpenters:		
CARPENTERS	$ 54.69	16.81
DIVERS TENDERS	$ 64.32	16.81
DIVERS	$ 108.33	16.81
DRYWALL	$ 54.59	16.81

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* CARP1607-010 06/01/2025

ADAMS, ASOTIN, BENTON, CHELAN, COLUMBIA, DOUGLAS, FERRY, FRANKLIN, GARFIELD, GRANT, KLICKITAT, KITTITAS, LINCOLN, OKANOGAN, PEND OREILLE, SPOKANE, STEVENS, WALLA WALLA, WHITMAN, AND YAKIMA COUNTIES

	Rates	Fringes
MILLWRIGHT	$ 61.62	20.43

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* ELEC0046-001 08/04/2025

CALLAM, JEFFERSON, KING AND KITSAP COUNTIES

	Rates	Fringes
CABLE SPLICER	$ 83.56	33.71
ELECTRICIAN	$ 75.96	33.48

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* ELEC0048-003 01/01/2025

CLARK, KLICKITAT AND SKAMANIA COUNTIES

	Rates	Fringes
CABLE SPLICER	$ 44.22	21.50
ELECTRICIAN	$ 63.50	29.73

HOURLY ZONE PAY:

Hourly Zone Pay shall be paid on jobs located outside of the free zone computed from the city center of the following listed cities:

Portland, The Dalles, Hood River, Tillamook, Seaside and Astoria

Zone Pay:
Zone 1: 31-50 miles $1.50/hour
Zone 2: 51-70 miles $3.50/hour
Zone 3: 71-90 miles $5.50/hour
Zone 4: Beyond 90 miles $9.00/hour

*These are not miles driven. Zones are based on Delorrne Street Atlas USA 2006 plus.

ELEC0048-029 01/01/2025

COWLITZ AND WAHKIAKUM COUNTY

	Rates	Fringes
CABLE SPLICER	$ 44.22	21.50
ELECTRICIAN	$ 63.50	29.73

ELEC0073-001 07/01/2025

ADAMS, FERRY, LINCOLN, PEND OREILLE, SPOKANE, STEVENS, WHITMAN COUNTIES

	Rates	Fringes
CABLE SPLICER	$ 34.10	16.68
ELECTRICIAN	$ 49.55	19.09

ELEC0076-002 08/31/2025

GRAYS HARBOR, LEWIS, MASON, PACIFIC, PIERCE, AND THURSTON COUNTIES

	Rates	Fringes
CABLE SPLICER	$ 71.65	26.76
ELECTRICIAN	$ 65.14	26.56

ELEC0112-005 06/01/2025

ASOTIN, BENTON, COLUMBIA, FRANKLIN, GARFIELD, KITTITAS, WALLA WALLA, YAKIMA COUNTIES

	Rates	Fringes
CABLE SPLICER	$ 63.00	27.87
ELECTRICIAN	$ 60.00	27.78

ELEC0191-003 06/01/2022

ISLAND, SAN JUAN, SNOHOMISH, SKAGIT AND WHATCOM COUNTIES

	Rates	Fringes
CABLE SPLICER	$ 44.23	17.73
ELECTRICIAN	$ 53.20	27.51

ELEC0191-004 06/01/2018

CHELAN, DOUGLAS, GRANT AND OKANOGAN COUNTIES

	Rates	Fringes
CABLE SPLICER	$ 40.82	17.63
ELECTRICIAN	$ 42.45	21.34

ENGI0302-092 06/01/2025

KING AND SNOHOMISH COUNTIES

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1	$ 61.93	27.57
Group 1A	$ 62.85	27.57
Group 1AA	$ 63.75	27.57
Group 1AAA	$ 64.66	27.57
Group 2	$ 61.14	27.57
Group 3	$ 60.46	27.57
Group 4	$ 56.63	27.57

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

Group 1AAA
Cranes: 300 tons and over or 300? of boom including jib with attachments; Cranes Friction: 200 tons and over; Tower Cranes: over 250? in height from base to boom.

Group 1AA
Cranes: 200 tons- 299 tons, or 250? of boom including jib with attachments; Cranes: Friction cranes through 199 tons; Leverman; Shovel, Excavator, Backhoes: over 90 metric tons; Tower Crane: over 175? through 250? in height, base to boom.

Group 1A
Cranes: 100 tons through 199 tons, or 150? of boom (including jib with attachments); Drilling Machine; Overhead, bridge type: 100 tons and over; Tower Crane: up to 175? in height base to boom; Loader: Overhead 8 yards & over; Shovel, Excavator, Backhoes: over 50 metric tons and up to 90 metric tons; Mechanics.

Group 1
Asphalt plant Operators; Cableways; Concrete Pump: Truck mount with boom attachment over 42M; Cranes: 45 tons through 99 tons, under 150? of boom (including jib with attachments); Overhead, bridge type: 45 tons through 99 tons; Derricks: on building work; Hard Tail End Dump: articulating off-road equipment 45 yards & over; Loader: Overhead 6 yards but not including 8 yards; Motor Patrol Graders; Mucking Machine, Mole, Tunnel Drill, Boring, Road Header and/or Shield; Quad 9, HD 41, D10 and over; Remote Control Operator on rubber tired earth moving equipment; Rollagon; Scrapers, self-propelled: 45 yards and over; Spreader: Topsider & Screedman; Shovel, Excavator, Backhoe: over 30 metric tons and up to 50 metric tons; Slipform Pavers; Transporters: all track or truck type; Welder.

Group 2
Batch Plant Operator: concrete; Barrier Machine: (Zipper); Bump Cutter; Cranes: 20 tons through 44 tons with attachments; Overhead, bridge type Crane: 20 tons through 44 tons; Chipper; Concrete Pump: truck mount with boom attachment up to 42M; Crusher; Deck Engineer/Deck Winches (Power); Grade Engineer: using blue prints, cut sheets, etc.; -Finishing Machine: Bidwell and Gamaco & Similar Equipment; Guardrail Punch; Hard Tail End Dump: articulating off-road equipment under 45 yards; Horizontal/Directional Drill Operator; Loaders: Overhead under 6 yards; Loaders: Plant Feed; Locomotives: all; Material Transfer Device; Piledriver: (other than crane mount); Quick Tower: no cab, under 100 feet in height base to boom; Roto-Mill, Roto-Grinder; Shovel, Excavator, Backhoe, Tractor: 15 to 30 metric tons; Subgrader Trimmer; Scraper: self propelled under 45 yards; Truck Crane Oiler/Driver: 100 tons and over; Truck Mount Portable Conveyor; -Vac Truck (Vactor Guzzler, Hydro Excavator); Yo Yo Pay Dozer.

Group 3
Cranes: through 19 tons with attachments, A-frame over 10 tons; Concrete Pump: Mounted or trailer high pressure line pump, pump high pressure; Conveyors; Dozers: D-9 & under; Drill Oilers: auger type, truck or crane mount; Forklift: 3000 lbs and over with attachments; Horizontal/Directional Drill Locator; Outside Hoists (Elevators and Manlifts), Air Tuggers, Strato; Tower Bucket Elevators; Hydralifts/Boom trucks: over 10 tons; Loaders: elevating type belt; Plant Oiler: asphalt, crusher; Rigger/Signal Person, Bellman (Certified); Roller: plant mix or multi-lift materials; Saws: Concrete; Scrapers: concrete & carry all Service Engineers: equipment; Trenching Machines; Truck Crane Oiler/Driver: under 100 tons; Shovel, Excavator, Backhoe, Tractors: under 15 metric tons.

Group 4
Assistant Engineer; Bobcat; Brooms; Compressor; Concrete Finish Machine: Laser Screed; Cranes, A-frame: 10 tons and under; Elevator and man-lift: permanent and shaft type; Forklifts: under 3000 lbs. with attachments; Gradechecker/Stakeman; Hydralifts/Boom Trucks: 10 tons and under; Oil distributors, Blower Distribution & Mulch Seeding Operator; Pavement Breaker; Posthole Digger: mechanical; Power Plant; Pumps: water; -Rigger and Bellman; Roller: other than plant mix; Wheel Tractors: Farm all type; Shotcrete/Gunite Equipment; Brokk: Remote demolition equipment

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ENGI0302-093 06/01/2025

SKAGIT AND WHATCOM COUNTIES

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1	$ 61.47	27.57
Group 1A	$ 62.39	27.57
Group 1AA	$ 63.29	27.57
Group 1AAA	$ 64.19	27.57
Group 2	$ 60.69	27.57
Group 3	$ 60.02	27.57
Group 4	$ 56.19	27.57

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

Group 1AAA
Cranes: 300 tons and over or 300? of boom including jib with attachments; Cranes Friction: 200 tons and over; Tower Cranes: over 250? in height from base to boom.

Group 1AA
Cranes: 200 tons- 299 tons, or 250? of boom including jib with attachments; Cranes: Friction cranes through 199 tons; Leverman; Shovel, Excavator, Backhoes: over 90 metric tons; Tower Crane: over 175? through 250? in height, base to boom.

Group 1A
Cranes: 100 tons through 199 tons, or 150? of boom (including jib with attachments); Drilling Machine; Overhead, bridge type: 100 tons and over; Tower Crane: up to 175? in height base to boom; Loader: Overhead 8 yards & over; Shovel, Excavator, Backhoes: over 50 metric tons and up to 90 metric tons; Mechanics.

Group 1
Asphalt plant Operators; Cableways; Concrete Pump: Truck mount with boom attachment over 42M; Cranes: 45 tons through 99 tons, under 150? of boom (including jib with attachments); Overhead, bridge type: 45 tons through 99 tons; Derricks: on building work; Hard Tail End Dump: articulating off-road equipment 45 yards & over; Loader: Overhead 6 yards but not including 8 yards; Motor Patrol Graders; Mucking Machine, Mole, Tunnel Drill, Boring, Road Header and/or Shield; Quad 9, HD 41, D10 and over; Remote Control Operator on rubber tired earth moving equipment; Rollagon; Scrapers, self-propelled: 45 yards and over; Spreader: Topsider & Screedman; Shovel, Excavator, Backhoe: over 30 metric tons and up to 50 metric tons; Slipform Pavers; Transporters: all track or truck type; Welder.

Group 2
Batch Plant Operator: concrete; Barrier Machine: (Zipper); Bump Cutter; Cranes: 20 tons through 44 tons with attachments; Overhead, bridge type Crane: 20 tons through 44 tons; Chipper; Concrete Pump: truck mount with boom attachment up to 42M; Crusher; Deck Engineer/Deck Winches (Power); Grade Engineer: using blue prints, cut sheets, etc.; -Finishing Machine: Bidwell and Gamaco & Similar Equipment; Guardrail Punch; Hard Tail End Dump: articulating off-road equipment under 45 yards; Horizontal/Directional Drill Operator; Loaders: Overhead

under 6 yards; Loaders: Plant Feed; Locomotives: all; Material Transfer Device; Piledriver: (other than crane mount); Quick Tower: no cab, under 100 feet in height base to boom; Roto-Mill, Roto-Grinder; Shovel, Excavator, Backhoe, Tractor: 15 to 30 metric tons; Subgrader Trimmer; Scraper: self propelled under 45 yards; Truck Crane Oiler/Driver: 100 tons and over; Truck Mount Portable Conveyor; -Vac Truck (Vactor Guzzler, Hydro Excavator); Yo Yo Pay Dozer.

Group 3
Cranes: through 19 tons with attachments, A-frame over 10 tons; Concrete Pump: Mounted or trailer high pressure line pump, pump high pressure; Conveyors; Dozers: D-9 & under; Drill Oilers: auger type, truck or crane mount; Forklift: 3000 lbs and over with attachments; Horizontal/Directional Drill Locator; Outside Hoists (Elevators and Manlifts), Air Tuggers, Strato; Tower Bucket Elevators; Hydralifts/Boom trucks: over 10 tons; Loaders: elevating type belt; Plant Oiler: asphalt, crusher; Rigger/Signal Person, Bellman (Certified); Roller: plant mix or multi-lift materials; Saws: Concrete; Scrapers: concrete & carry all Service Engineers: equipment; Trenching Machines; Truck Crane Oiler/Driver: under 100 tons; Shovel, Excavator, Backhoe, Tractors: under 15 metric tons.

Group 4
Assistant Engineer; Bobcat; Brooms; Compressor; Concrete Finish Machine: Laser Screed; Cranes, A-frame: 10 tons and under; Elevator and man-lift: permanent and shaft type; Forklifts: under 3000 lbs. with attachments; Gradechecker/Stakeman; Hydralifts/Boom Trucks: 10 tons and under; Oil distributors, Blower Distribution & Mulch Seeding Operator; Pavement Breaker; Posthole Digger: mechanical; Power Plant; Pumps: water; -Rigger and Bellman; Roller: other than plant mix; Wheel Tractors: Farm all type; Shotcrete/Gunite Equipment; Brokk: Remote demolition equipment

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ENGI0302-094 06/01/2025

KITSAP COUNTY

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1	$ 60.93	27.57
Group 1A	$ 61.83	27.57
Group 1AA	$ 62.73	27.57
Group 1AAA	$ 63.62	27.57
Group 2	$ 60.14	27.57
Group 3	$ 59.49	27.57
Group 4	$ 55.68	27.57

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

Group 1AAA
Cranes: 300 tons and over or 300? of boom including jib with attachments; Cranes Friction: 200 tons and over; Tower Cranes: over 250? in height from base to boom.

Group 1AA
Cranes: 200 tons- 299 tons, or 250? of boom including jib with attachments; Cranes: Friction cranes through 199 tons;

Leverman; Shovel, Excavator, Backhoes: over 90 metric tons; Tower Crane: over 175? through 250? in height, base to boom.

Group 1A
Cranes: 100 tons through 199 tons, or 150? of boom (including jib with attachments); Drilling Machine; Overhead, bridge type: 100 tons and over; Tower Crane: up to 175? in height base to boom; Loader: Overhead 8 yards & over; Shovel, Excavator, Backhoes: over 50 metric tons and up to 90 metric tons; Mechanics.

Group 1
Asphalt plant Operators; Cableways; Concrete Pump: Truck mount with boom attachment over 42M; Cranes: 45 tons through 99 tons, under 150? of boom (including jib with attachments); Overhead, bridge type: 45 tons through 99 tons; Derricks: on building work; Hard Tail End Dump: articulating off-road equipment 45 yards & over; Loader: Overhead 6 yards but not including 8 yards; Motor Patrol Graders; Mucking Machine, Mole, Tunnel Drill, Boring, Road Header and/or Shield; Quad 9, HD 41, D10 and over; Remote Control Operator on rubber tired earth moving equipment; Rollagon; Scrapers, self-propelled: 45 yards and over; Spreader: Topsider & Screedman; Shovel, Excavator, Backhoe: over 30 metric tons and up to 50 metric tons; Slipform Pavers; Transporters: all track or truck type; Welder.

Group 2
Batch Plant Operator: concrete; Barrier Machine: (Zipper); Bump Cutter; Cranes: 20 tons through 44 tons with attachments; Overhead, bridge type Crane: 20 tons through 44 tons; Chipper; Concrete Pump: truck mount with boom attachment up to 42M; Crusher; Deck Engineer/Deck Winches (Power); Grade Engineer: using blue prints, cut sheets, etc.; -Finishing Machine: Bidwell and Gamaco & Similar Equipment; Guardrail Punch; Hard Tail End Dump: articulating off-road equipment under 45 yards; Horizontal/Directional Drill Operator; Loaders: Overhead under 6 yards; Loaders: Plant Feed; Locomotives: all; Material Transfer Device; Piledriver: (other than crane mount); Quick Tower: no cab, under 100 feet in height base to boom; Roto-Mill, Roto-Grinder; Shovel, Excavator, Backhoe, Tractor: 15 to 30 metric tons; Subgrader Trimmer; Scraper: self propelled under 45 yards; Truck Crane Oiler/Driver: 100 tons and over; Truck Mount Portable Conveyor; -Vac Truck (Vactor Guzzler, Hydro Excavator); Yo Yo Pay Dozer.

Group 3
Cranes: through 19 tons with attachments, A-frame over 10 tons; Concrete Pump: Mounted or trailer high pressure line pump, pump high pressure; Conveyors; Dozers: D-9 & under; Drill Oilers: auger type, truck or crane mount; Forklift: 3000 lbs and over with attachments; Horizontal/Directional Drill Locator; Outside Hoists (Elevators and Manlifts), Air Tuggers, Strato; Tower Bucket Elevators; Hydralifts/Boom trucks: over 10 tons; Loaders: elevating type belt; Plant Oiler: asphalt, crusher; Rigger/Signal Person, Bellman (Certified); Roller: plant mix or multi-lift materials; Saws: Concrete; Scrapers: concrete & carry all Service Engineers: equipment; Trenching Machines; Truck Crane Oiler/Driver: under 100 tons; Shovel, Excavator, Backhoe, Tractors: under 15 metric tons.

Group 4

Assistant Engineer; Bobcat; Brooms; Compressor; Concrete Finish Machine: Laser Screed; Cranes, A-frame: 10 tons and under; Elevator and man-lift: permanent and shaft type; Forklifts: under 3000 lbs. with attachments; Gradechecker/Stakeman; Hydralifts/Boom Trucks: 10 tons and under; Oil distributors, Blower Distribution & Mulch Seeding Operator; Pavement Breaker; Posthole Digger: mechanical; Power Plant; Pumps: water; -Rigger and Bellman; Roller: other than plant mix; Wheel Tractors: Farm all type; Shotcrete/Gunite Equipment; Brokk: Remote demolition equipment

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ENGI0302-095 06/01/2025

CHELAN(WEST OF THE 120TH MERIDIAN), CLALLAM, DOUGLAS(WEST OF THE 120TH MERIDIAN), GRAYS HARBOR, ISLAND, JEFFERSON, KITTITAS(WEST OF THE 120TH MERIDIAN), MASON, OKANOGAN(WEST OF THE 120TH MERIDIAN), SAN JUNA, AND YAKIMA(WEST OF THE 120TH MERIDIAN) COUNTIES

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
Group 1	$ 60.67	27.57
Group 1A	$ 61.56	27.57
Group 1AA	$ 62.47	27.57
Group 1AAA	$ 63.35	27.57
Group 2	$ 59.88	27.57
Group 3	$ 59.23	27.57
Group 4	$ 55.43	27.57

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

Group 1AAA
Cranes: 300 tons and over or 300? of boom including jib with attachments; Cranes Friction: 200 tons and over; Tower Cranes: over 250? in height from base to boom.

Group 1AA
Cranes: 200 tons- 299 tons, or 250? of boom including jib with attachments; Cranes: Friction cranes through 199 tons; Leverman; Shovel, Excavator, Backhoes: over 90 metric tons; Tower Crane: over 175? through 250? in height, base to boom.

Group 1A
Cranes: 100 tons through 199 tons, or 150? of boom (including jib with attachments); Drilling Machine; Overhead, bridge type: 100 tons and over; Tower Crane: up to 175? in height base to boom; Loader: Overhead 8 yards & over; Shovel, Excavator, Backhoes: over 50 metric tons and up to 90 metric tons; Mechanics.

Group 1
Asphalt plant Operators; Cableways; Concrete Pump: Truck mount with boom attachment over 42M; Cranes: 45 tons through 99 tons, under 150? of boom (including jib with attachments); Overhead, bridge type: 45 tons through 99 tons; Derricks: on building work; Hard Tail End Dump: articulating off-road equipment 45 yards & over; Loader: Overhead 6 yards but not including 8 yards; Motor Patrol Graders; Mucking Machine, Mole, Tunnel Drill, Boring, Road Header and/or Shield; Quad 9, HD 41, D10 and over; Remote Control Operator on rubber tired earth moving equipment;

Rollagon; Scrapers, self-propelled: 45 yards and over; Spreader: Topsider & Screedman; Shovel, Excavator, Backhoe: over 30 metric tons and up to 50 metric tons; Slipform Pavers; Transporters: all track or truck type; Welder.

Group 2
Batch Plant Operator: concrete; Barrier Machine: (Zipper); Bump Cutter; Cranes: 20 tons through 44 tons with attachments; Overhead, bridge type Crane: 20 tons through 44 tons; Chipper; Concrete Pump: truck mount with boom attachment up to 42M; Crusher; Deck Engineer/Deck Winches (Power); Grade Engineer: using blue prints, cut sheets, etc.; -Finishing Machine: Bidwell and Gamaco & Similar Equipment; Guardrail Punch; Hard Tail End Dump: articulating off-road equipment under 45 yards; Horizontal/Directional Drill Operator; Loaders: Overhead under 6 yards; Loaders: Plant Feed; Locomotives: all; Material Transfer Device; Piledriver: (other than crane mount); Quick Tower: no cab, under 100 feet in height base to boom; Roto-Mill, Roto-Grinder; Shovel, Excavator, Backhoe, Tractor: 15 to 30 metric tons; Subgrader Trimmer; Scraper: self propelled under 45 yards; Truck Crane Oiler/Driver: 100 tons and over; Truck Mount Portable Conveyor; -Vac Truck (Vactor Guzzler, Hydro Excavator); Yo Yo Pay Dozer.

Group 3
Cranes: through 19 tons with attachments, A-frame over 10 tons; Concrete Pump: Mounted or trailer high pressure line pump, pump high pressure; Conveyors; Dozers: D-9 & under; Drill Oilers: auger type, truck or crane mount; Forklift: 3000 lbs and over with attachments; Horizontal/Directional Drill Locator; Outside Hoists (Elevators and Manlifts), Air Tuggers, Strato; Tower Bucket Elevators; Hydralifts/Boom trucks: over 10 tons; Loaders: elevating type belt; Plant Oiler: asphalt, crusher; Rigger/Signal Person, Bellman (Certified); Roller: plant mix or multi-lift materials; Saws: Concrete; Scrapers: concrete & carry all Service Engineers: equipment; Trenching Machines; Truck Crane Oiler/Driver: under 100 tons; Shovel, Excavator, Backhoe, Tractors: under 15 metric tons.

Group 4
Assistant Engineer; Bobcat; Brooms; Compressor; Concrete Finish Machine: Laser Screed; Cranes, A-frame: 10 tons and under; Elevator and man-lift: permanent and shaft type; Forklifts: under 3000 lbs. with attachments; Gradechecker/Stakeman; Hydralifts/Boom Trucks: 10 tons and under; Oil distributors, Blower Distribution & Mulch Seeding Operator; Pavement Breaker; Posthole Digger: mechanical; Power Plant; Pumps: water; -Rigger and Bellman; Roller: other than plant mix; Wheel Tractors: Farm all type; Shotcrete/Gunite Equipment; Brokk: Remote demolition equipment

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ENGI0302-124 06/01/2024

ASOTIN, BENTON, FRANKLIN, GARFIELD, LINCOLN, SPOKANE, STEVENS, WALLA WALLA, AND WHITMAN

	Rates	Fringes
POWER EQUIPMENT OPERATOR		

GROUP 1	$ 35.91	22.45
GROUP 2	$ 36.28	22.45
GROUP 3	$ 36.99	22.45
GROUP 4	$ 37.18	22.45
GROUP 5	$ 37.37	22.45
GROUP 6	$ 37.69	22.45
GROUP 7	$ 38.01	22.45
GROUP 8	$ 39.88	22.45

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Bit Grinders; Bolt Threading Machine; Compressors (under 2000 CFM, gas, diesel, or electric power); Deck Hand; Fireman & Heater Tender; Hydro-seeder, Mulcher, Nozzleman; Oiler Driver, & Cable Tender, Mucking Machine; Pumpman; Rollers, all types on subgrade, including seal and chip coatings (farm type, Case, John Deere & similar, or Compacting Vibrator), except when pulled by Dozer with operable blade; Welding Machine; Crane Oiler-Driver (CLD required) & Cable Tender, Mucking Machine

GROUP 2: A-frame Truck (single drum); Assistant Refrigeration Plant (under 1000 ton); Assistant Plant Operator, Fireman or Pugmixer (asphalt); Bagley or Stationary Scraper; Belt Finishing Machine; Blower Operator (cement); Cement Hog; Compressor (2000 CFM or over, 2 or more, gas diesel or electric power); Concrete Saw (multiple cut); Distributor Leverman; Ditch Witch or similar; Elevator Hoisting Materials; Dope Pots (power agitated); Fork Lift or Lumber Stacker, hydra-lift & similar; Gin Trucks (pipeline); Hoist, single drum; Loaders (bucket elevators and conveyors); Longitudinal Float; Mixer (portable-concrete); Pavement Breaker, Hydra-Hammer & similar; Power Broom; Railroad Ballast Regulation Operator (self-propelled); Railroad Power Tamper Operator (self-propelled); Railroad Tamper Jack Operator (self-propelled; Spray Curing Machine (concrete); Spreader Box (self-propelled); Straddle Buggy (Ross & similar on construction job only); Tractor (Farm type R/T with attachment, except Backhoe); Tugger Operator

GROUP 3: A-frame Truck (2 or more drums); Assistant Refrigeration Plant & Chiller Operator (over 1000 ton); Backfillers (Cleveland & similar); Batch Plant & Wet Mix Operator, single unit (concrete); Belt-Crete Conveyors with power pack or similar; Belt Loader (Kocal or similar); Bending Machine; Bob Cat (Skid Steer); Boring Machine (earth); Boring Machine (rock under 8 inch bit) (Quarry Master, Joy or similar); Bump Cutter (Wayne, Saginau or similar); Canal Lining Machine (concrete); Chipper (without crane); Cleaning & Doping Machine (pipeline); Deck Engineer; Elevating Belt-type Loader (Euclid, Barber Green & similar); Elevating Grader-type Loader (Dumor, Adams or similar); Generator Plant Engineers (diesel or electric); Gunnite Combination Mixer & Compressor; Locomotive Engineer; Mixermobile; Mucking Machine; Posthole Auger or Punch; Pump (grout or jet); Soil Stabilizer (P & H or similar); Spreader Machine; Dozer/Tractor (up to D-6 or equivalent) and Traxcavator; Traverse Finish Machine; Turnhead Operator

GROUP 4: Concrete Pumps (squeeze-crete, flow-crete, pump-crete, Whitman & similar); Curb Extruder (asphalt or concrete); Drills (churn, core, calyx or diamond); Equipment Serviceman; Greaser & Oiler; Hoist (2 or more drums or Tower Hoist); Loaders (overhead & front-end, under

4 yds. R/T); Refrigeration Plant Engineer (under 1000 ton); Rubber-tired Skidders (R/T with or without attachments); Surface Heater & Plant Machine; Trenching Machines (under 7 ft. depth capacity); Turnhead (with re-screening); Vacuum Drill (reverse circulation drill under 8 inch bit)

GROUP 5: Backhoe (under 45,000 gw); Backhoe & Hoe Ram (under 3/4 yd.); Carrydeck & Boom Truck (under 25 tons); Cranes (25 tons & under), all attachments including clamshell, dragline; Derricks & Stifflegs (under 65 tons); Drilling Equipment(8 inch bit & over) (Robbins, reverse circulation & similar); Hoe Ram; Piledriving Engineers; Paving (dual drum); Railroad Track Liner Operaotr (self-propelled); Refrigeration Plant Engineer (1000 tons & over); Signalman (Whirleys, Highline Hammerheads or similar); Grade Checker

GROUP 6: Asphalt Plant Operator; Automatic Subgrader (Ditches & Trimmers)(Autograde, ABC, R.A. Hansen & similar on grade wire); Backhoe (45,000 gw and over to 110,000 gw); Backhoes & Hoe Ram (3/4 yd. to 3 yd.); Batch Plant (over 4 units); Batch & Wet Mix Operator (multiple units, 2 & incl. 4); Blade Operator (motor patrol & attachments); Cable Controller (dispatcher); Compactor (self-propelled with blade); Concrete Pump Boom Truck; Concrete Slip Form Paver; Cranes (over 25 tons, to and including 45 tons), all attachments including clamshell, dragline; Crusher, Grizzle & Screening Plant Operator; Dozer, 834 R/T & similar; Drill Doctor; Loader Operator (front-end & overhead, 4 yds. incl. 8 yds.); Multiple Dozer Units with single blade; Paving Machine (asphalt and concrete); Quad-Track or similar equipment; Rollerman (finishing asphalt pavement); Roto Mill (pavement grinder); Scrapers, all, rubber-tired; Screed Operator; Shovel(under 3 yds.); Trenching Machines (7 ft. depth & over); Tug Boat Operator Vactor guzzler, super sucker; Lime Batch Tank Operator (REcycle Train); Lime Brain Operator (Recycle Train); Mobile Crusher Operator (Recycle Train)

GROUP 7: Backhoe (over 110,000 gw); Backhoes & Hoe Ram (3 yds & over); Blade (finish & bluetop) Automatic, CMI, ABC, Finish Athey & Huber & similar when used as automatic; Cableway Operators; Concrete Cleaning/Decontamination machine operator; Cranes (over 45 tons to but not including 85 tons), all attachments including clamshell and dragine; Derricks & Stiffleys (65 tons & over); Elevating Belt (Holland type); Heavy equipment robotics operator; Loader (360 degrees revolving Koehring Scooper or similar); Loaders (overhead & front-end, over 8 yds. to 10 yds.); Rubber-tired Scrapers (multiple engine with three or more scrapers); Shovels (3 yds. & over); Whirleys & Hammerheads, ALL; H.D. Mechanic; H.D. Welder; Hydraulic Platform Trailers (Goldhofer, Shaurerly andSimilar); Ultra High Pressure Wateriet Cutting Tool System Operator (30,000 psi); Vacuum Blasting Machine Operator

GROUP 8: Cranes (85 tons and over, and all climbing, overhead,rail and tower), all attachments including clamshell, dragline; Loaders (overhead and front-end, 10 yards and over); Helicopter Pilot

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ENGI0302-125 06/01/2024

ADAMS, CHELAN (EAST OF THE 120TH MERIDIAN), COLUMBIA, DOUGLAS (EAST OF THE 120TH MERIDIAN), FERRY, GRANT, OKANOGAN (EAST OF

THE 120TH MERIDIAN), PEND OREILLE, STEVENS, AND YAKIMA (EAST OF THE 120TH MERIDIAN) COUNTIES

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1	$ 38.91	22.45
GROUP 2	$ 39.28	22.45
GROUP 3	$ 39.99	22.45
GROUP 4	$ 40.18	22.45
GROUP 5	$ 40.37	22.45
GROUP 6	$ 40.69	22.45
GROUP 7	$ 40.01	22.45
GROUP 8	$ 42.88	22.45

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Bit Grinders; Bolt Threading Machine; Compressors (under 2000 CFM, gas, diesel, or electric power); Deck Hand; Fireman & Heater Tender; Hydro-seeder, Mulcher, Nozzleman; Oiler Driver, & Cable Tender, Mucking Machine; Pumpman; Rollers, all types on subgrade, including seal and chip coatings (farm type, Case, John Deere & similar, or Compacting Vibrator), except when pulled by Dozer with operable blade; Welding Machine; Crane Oiler-Driver (CLD required) & Cable Tender, Mucking Machine

GROUP 2: A-frame Truck (single drum); Assistant Refrigeration Plant (under 1000 ton); Assistant Plant Operator, Fireman or Pugmixer (asphalt); Bagley or Stationary Scraper; Belt Finishing Machine; Blower Operator (cement); Cement Hog; Compressor (2000 CFM or over, 2 or more, gas diesel or electric power); Concrete Saw (multiple cut); Distributor Leverman; Ditch Witch or similar; Elevator Hoisting Materials; Dope Pots (power agitated); Fork Lift or Lumber Stacker, hydra-lift & similar; Gin Trucks (pipeline); Hoist, single drum; Loaders (bucket elevators and conveyors); Longitudinal Float; Mixer (portable-concrete); Pavement Breaker, Hydra-Hammer & similar; Power Broom; Railroad Ballast Regulation Operator (self-propelled); Railroad Power Tamper Operator (self-propelled); Railroad Tamper Jack Operator (self-propelled; Spray Curing Machine (concrete); Spreader Box (self-propelled); Straddle Buggy (Ross & similar on construction job only); Tractor (Farm type R/T with attachment, except Backhoe); Tugger Operator

GROUP 3: A-frame Truck (2 or more drums); Assistant Refrigeration Plant & Chiller Operator (over 1000 ton); Backfillers (Cleveland & similar); Batch Plant & Wet Mix Operator, single unit (concrete); Belt-Crete Conveyors with power pack or similar; Belt Loader (Kocal or similar); Bending Machine; Bob Cat (Skid Steer); Boring Machine (earth); Boring Machine (rock under 8 inch bit) (Quarry Master, Joy or similar); Bump Cutter (Wayne, Saginau or similar); Canal Lining Machine (concrete); Chipper (without crane); Cleaning & Doping Machine (pipeline); Deck Engineer; Elevating Belt-type Loader (Euclid, Barber Green & similar); Elevating Grader-type Loader (Dumor, Adams or similar); Generator Plant Engineers (diesel or electric); Gunnite Combination Mixer & Compressor; Locomotive Engineer; Mixermobile; Mucking Machine; Posthole Auger or Punch; Pump (grout or jet); Soil Stabilizer (P & H or similar); Spreader Machine; Dozer/Tractor (up to D-6 or equivalent) and Traxcavator; Traverse Finish Machine;

Turnhead Operator

GROUP 4: Concrete Pumps (squeeze-crete, flow-crete, pump-crete, Whitman & similar); Curb Extruder (asphalt or concrete); Drills (churn, core, calyx or diamond); Equipment Serviceman; Greaser & Oiler; Hoist (2 or more drums or Tower Hoist); Loaders (overhead & front-end, under 4 yds. R/T); Refrigeration Plant Engineer (under 1000 ton); Rubber-tired Skidders (R/T with or without attachments); Surface Heater & Plant Machine; Trenching Machines (under 7 ft. depth capacity); Turnhead (with re-screening); Vacuum Drill (reverse circulation drill under 8 inch bit)

GROUP 5: Backhoe (under 45,000 gw); Backhoe & Hoe Ram (under 3/4 yd.); Carrydeck & Boom Truck (under 25 tons); Cranes (25 tons & under), all attachments including clamshell, dragline; Derricks & Stifflegs (under 65 tons); Drilling Equipment(8 inch bit & over) (Robbins, reverse circulation & similar); Hoe Ram; Piledriving Engineers; Paving (dual drum); Railroad Track Liner Operaotr (self-propelled); Refrigeration Plant Engineer (1000 tons & over); Signalman (Whirleys, Highline Hammerheads or similar); Grade Checker

GROUP 6: Asphalt Plant Operator; Automatic Subgrader (Ditches & Trimmers)(Autograde, ABC, R.A. Hansen & similar on grade wire); Backhoe (45,000 gw and over to 110,000 gw); Backhoes & Hoe Ram (3/4 yd. to 3 yd.); Batch Plant (over 4 units); Batch & Wet Mix Operator (multiple units, 2 & incl. 4); Blade Operator (motor patrol & attachments); Cable Controller (dispatcher); Compactor (self-propelled with blade); Concrete Pump Boom Truck; Concrete Slip Form Paver; Cranes (over 25 tons, to and including 45 tons), all attachments including clamshell, dragline; Crusher, Grizzle & Screening Plant Operator; Dozer, 834 R/T & similar; Drill Doctor; Loader Operator (front-end & overhead, 4 yds. incl. 8 yds.); Multiple Dozer Units with single blade; Paving Machine (asphalt and concrete); Quad-Track or similar equipment; Rollerman (finishing asphalt pavement); Roto Mill (pavement grinder); Scrapers, all, rubber-tired; Screed Operator; Shovel(under 3 yds.); Trenching Machines (7 ft. depth & over); Tug Boat Operator Vactor guzzler, super sucker; Lime Batch Tank Operator (REcycle Train); Lime Brain Operator (Recycle Train); Mobile Crusher Operator (Recycle Train)

GROUP 7: Backhoe (over 110,000 gw); Backhoes & Hoe Ram (3 yds & over); Blade (finish & bluetop) Automatic, CMI, ABC, Finish Athey & Huber & similar when used as automatic; Cableway Operators; Concrete Cleaning/Decontamination machine operator; Cranes (over 45 tons to but not including 85 tons), all attachments including clamshell and dragine; Derricks & Stiffleys (65 tons & over); Elevating Belt (Holland type); Heavy equipment robotics operator; Loader (360 degrees revolving Koehring Scooper or similar); Loaders (overhead & front-end, over 8 yds. to 10 yds.); Rubber-tired Scrapers (multiple engine with three or more scrapers); Shovels (3 yds. & over); Whirleys & Hammerheads, ALL; H.D. Mechanic; H.D. Welder; Hydraulic Platform Trailers (Goldhofer, Shaurerly andSimilar); Ultra High Pressure Wateriet Cutting Tool System Operator (30,000 psi); Vacuum Blasting Machine Operator

GROUP 8: Cranes (85 tons and over, and all climbing, overhead,rail and tower), all attachments including clamshell, dragline; Loaders (overhead and front-end, 10

yards and over); Helicopter Pilot

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PIERCE County

ON PROJECTS DESCRIBED IN FOOTNOTE A BELOW, THE RATE FOR EACH GROUP SHALL BE 90% OF THE BASE RATE PLUS FULL FRINGE BENEFITS. ON ALL OTHER WORK, THE FOLLOWING RATES APPLY.

Zone 1 (0-25 radius miles):

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1A	$ 62.32	27.32
GROUP 1AA	$ 63.22	27.32
GROUP 1AAA	$ 64.11	27.32
GROUP 1	$ 61.41	27.32
GROUP 2	$ 60.63	27.32
GROUP 3	$ 59.96	27.32
GROUP 4	$ 56.15	27.32

Zone Differential (Add to Zone 1 rates):
Zone 2 (26-45 radius miles) = $1.00
Zone 3 (Over 45 radius miles) - $1.30

BASEPOINTS: CENTRALIA, OLYMPIA, TACOMA

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1 AAA - Cranes-over 300 tons or 300 ft of boom (including jib with attachments)

GROUP 1AA - Cranes- 200 tonsto 300 tons, or 250 ft of boom (including jib with attachments; Tower crane over 175 ft in height, bas to boom

GROUP 1A - Cranes, 100 tons thru 199 tons, or 150 ft of boom (including jib with attachments); Crane-overhead, bridge type, 100 tons and over; Tower crane up to 175 ft in height base to boom; Loaders-overhead, 8 yards and over; Shovels, excavator, backhoes-6 yards and over with attachments

GROUP 1 - Cableway; Cranes 45 tons thru 99 tons under 150 ft of boom (including jib with attachments); Crane-overhead, bridge type, 45 tons thru 99 tons; Derricks on building work; Excavator, shovel, backhoes over 3 yards and under 6 yards; Hard tail end dump articulating off-road equipment 45 yards and over; Loader- overhead, 6 yards to, but not including, 8 yards; Mucking machine, mole, tunnel, drill and/or shield; Quad 9 HD 41, D-10; Remote control operator on rubber tired earth moving equipment; Rollagon; Scrapers-self-propelled 45 yards and over; Slipform pavers; Transporters, all track or truck type

GROUP 2 - Barrier machine (zipper); Batch Plant Operator-concrete; Bump Cutter; Cranes, 20 tons thru 44 tons with attachments; Crane-Overhead, bridge type, 20 tons through 44 tons; Chipper; Concrete pump-truck mount with boom attachment; Crusher; Deck engineer/deck winches (power); Drilling machine; Excavator, shovel, backhoe-3 yards and under; Finishing machine, Bidwell, Gamaco and similar

equipment; Guardrail punch; Loaders, overhead under 6 yards; Loaders-plant feed; Locomotives-all; Mechanics- all; Mixers, asphalt plant; Motor patrol graders, finishing; Piledriver (other than crane mount); Roto-mill, roto-grinder; Screedman, spreader, topside operator-Blaw Knox, Cedar Rapids, Jaeger, Caterpillar, Barbar Green; Scraper-self- propelled, hard tail end dump, articulating off-road equipment- under 45 yards; Subgrader trimmer; Tractors, backhoe over 75 hp; Transfer material service machine-shuttle buggy, Blaw Knox- Roadtec; Truck Crane oiler/driver-100 tons and over; Truck Mount Portable Conveyor; Yo Yo pay

GROUP 3 - Conveyors; Cranes through 19 tons with attachments; Crane-A-frame over 10 tons; Drill oilers-auger type, truck or crane mount; Dozer-D-9 and under; Forklift-3000 lbs. and over with attachments; Horizontal/directional drill locator; Outside Hoists-(elevators and manlifts), air tuggers, strato tower bucket elevators; Hydralifts/boom trucks over 10 tons; Loaders-elevating type, belt; Motor patrol grader-nonfinishing; Plant oiler- asphalt, crusher; Pump-Concrete; Roller, plant mix or multi-lfit materials; Saws-concrete; Scrapers, concrete and carry all; Service engineers-equipment; Trenching machines; Truck crane oiler/driver under 100 tons; Tractors, backhoe under 75 hp

GROUP 4 - Assistant Engineer; Bobcat; Brooms; Compressor; Concrete Finish Machine-laser screed; Cranes A-frame 10 tons and under; Elevator and manlift (permanent and shaft type); Forklifts-under 3000 lbs. with attachments; Gradechecker, stakehop; Hydralifts/boom trucks, 10 tons and under; Oil distributors, blower distribution and mulch seeding operator; Pavement breaker; Posthole digger-mechanical; Power plant; Pumps-water; Rigger and Bellman; Roller-other than plant mix; Wheel Tractors, farmall type; Shotcrete/gunite equipment operator

FOOTNOTE A- Reduced rates may be paid on the following:

1. Projects involving work on structures such as buildings and bridges whose total value is less than $1.5 million excluding mechanical, electrical, and utility portions of the contract.

2. Projects of less than $1 million where no building is involved. Surfacing and paving included, but utilities excluded.

3. Marine projects (docks, wharfs, etc.) less than $150,000.

HANDLING OF HAZARDOUS WASTE MATERIALS: Personnel in all craft classifications subject to working inside a federally designated hazardous perimeter shall be elgible for compensation in accordance with the following group schedule relative to the level of hazardous waste as outlined in the specific hazardous waste project site safety plan.

H-1 Base wage rate when on a hazardous waste site when not outfitted with protective clothing, Class ""D"" Suit - Base wage rate plus $ .50 per hour.
H-2 Class ""C"" Suit - Base wage rate plus $1.00 per hour.
H-3 Class ""B"" Suit - Base wage rate plus $1.50 per hour.
H-4 Class ""A"" Suit - Base wage rate plus $2.00 per hour.

ENGI0612-008 06/01/2025

LEWIS AND PACIFIC (PORTION LYING NORTH OF A PARALLEL LINE EXTENDING WEST FROM THE NORTHERN BOUNDARY OF WAHKAIKUM COUNTY TO THE SEA) COUNTIES

ON PROJECTS DESCRIBED IN FOOTNOTE A BELOW, THE RATE FOR EACH GROUP SHALL BE 90% OF THE BASE RATE PLUS FULL FRINGE BENEFITS. ON ALL OTHER WORK, THE FOLLOWING RATES APPLY.

Zone 1 (0-25 radius miles):

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1A	$ 61.22	27.32
GROUP 1AA	$ 62.12	27.32
GROUP 1AAA	$ 62.99	27.32
GROUP 1	$ 60.32	27.32
GROUP 2	$ 59.56	27.32
GROUP 3	$ 58.89	27.32
GROUP 4	$ 55.13	27.32

Zone Differential (Add to Zone 1 rates):
Zone 2 (26-45 radius miles) = $1.00
Zone 3 (Over 45 radius miles) - $1.30

BASEPOINTS: CENTRALIA, OLYMPIA, TACOMA

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1 AAA - Cranes-over 300 tons or 300 ft of boom (including jib with attachments)

GROUP 1AA - Cranes- 200 tonsto 300 tons, or 250 ft of boom (including jib with attachments; Tower crane over 175 ft in height, bas to boom

GROUP 1A - Cranes, 100 tons thru 199 tons, or 150 ft of boom (including jib with attachments); Crane-overhead, bridge type, 100 tons and over; Tower crane up to 175 ft in height base to boom; Loaders-overhead, 8 yards and over; Shovels, excavator, backhoes-6 yards and over with attachments

GROUP 1 - Cableway; Cranes 45 tons thru 99 tons under 150 ft of boom (including jib with attachments); Crane-overhead, bridge type, 45 tons thru 99 tons; Derricks on building work; Excavator, shovel, backhoes over 3 yards and under 6 yards; Hard tail end dump articulating off-road equipment 45 yards and over; Loader- overhead, 6 yards to, but not including, 8 yards; Mucking machine, mole, tunnel, drill and/or shield; Quad 9 HD 41, D-10; Remote control operator on rubber tired earth moving equipment; Rollagon; Scrapers-self-propelled 45 yards and over; Slipform pavers; Transporters, all track or truck type

GROUP 2 - Barrier machine (zipper); Batch Plant Operator-concrete; Bump Cutter; Cranes, 20 tons thru 44 tons with attachments; Crane-Overhead, bridge type, 20 tons through 44 tons; Chipper; Concrete pump-truck mount with boom attachment; Crusher; Deck engineer/deck winches (power); Drilling machine; Excavator, shovel, backhoe-3 yards and under; Finishing machine, Bidwell, Gamaco and similar

equipment; Guardrail punch; Loaders, overhead under 6 yards; Loaders-plant feed; Locomotives-all; Mechanics- all; Mixers, asphalt plant; Motor patrol graders, finishing; Piledriver (other than crane mount); Roto-mill, roto-grinder; Screedman, spreader, topside operator-Blaw Knox, Cedar Rapids, Jaeger, Caterpillar, Barbar Green; Scraper-self- propelled, hard tail end dump, articulating off-road equipment- under 45 yards; Subgrader trimmer; Tractors, backhoe over 75 hp; Transfer material service machine-shuttle buggy, Blaw Knox- Roadtec; Truck Crane oiler/driver-100 tons and over; Truck Mount Portable Conveyor; Yo Yo pay

GROUP 3 - Conveyors; Cranes through 19 tons with attachments; Crane-A-frame over 10 tons; Drill oilers-auger type, truck or crane mount; Dozer-D-9 and under; Forklift-3000 lbs. and over with attachments; Horizontal/directional drill locator; Outside Hoists-(elevators and manlifts), air tuggers, strato tower bucket elevators; Hydralifts/boom trucks over 10 tons; Loaders-elevating type, belt; Motor patrol grader-nonfinishing; Plant oiler- asphalt, crusher; Pump-Concrete; Roller, plant mix or multi-lfit materials; Saws-concrete; Scrapers, concrete and carry all; Service engineers-equipment; Trenching machines; Truck crane oiler/driver under 100 tons; Tractors, backhoe under 75 hp

GROUP 4 - Assistant Engineer; Bobcat; Brooms; Compressor; Concrete Finish Machine-laser screed; Cranes A-frame 10 tons and under; Elevator and manlift (permanent and shaft type); Forklifts-under 3000 lbs. with attachments; Gradechecker, stakehop; Hydralifts/boom trucks, 10 tons and under; Oil distributors, blower distribution and mulch seeding operator; Pavement breaker; Posthole digger-mechanical; Power plant; Pumps-water; Rigger and Bellman; Roller-other than plant mix; Wheel Tractors, farmall type; Shotcrete/gunite equipment operator

FOOTNOTE A- Reduced rates may be paid on the following:

1. Projects involving work on structures such as buildings and bridges whose total value is less than $1.5 million excluding mechanical, electrical, and utility portions of the contract.

2. Projects of less than $1 million where no building is involved. Surfacing and paving included, but utilities excluded.

3. Marine projects (docks, wharfs, etc.) less than $150,000.

HANDLING OF HAZARDOUS WASTE MATERIALS: Personnel in all craft classifications subject to working inside a federally designated hazardous perimeter shall be elgible for compensation in accordance with the following group schedule relative to the level of hazardous waste as outlined in the specific hazardous waste project site safety plan.

H-1 Base wage rate when on a hazardous waste site when not outfitted with protective clothing, Class ""D"" Suit - Base wage rate plus $ .50 per hour.
H-2 Class ""C"" Suit - Base wage rate plus $1.00 per hour.
H-3 Class ""B"" Suit - Base wage rate plus $1.50 per hour.
H-4 Class ""A"" Suit - Base wage rate plus $2.00 per hour.

ENGI0612-012 06/01/2025

THURSTON COUNTY

ON PROJECTS DESCRIBED IN FOOTNOTE A BELOW, THE RATE FOR EACH GROUP SHALL BE 90% OF THE BASE RATE PLUS FULL FRINGE BENEFITS. ON ALL OTHER WORK, THE FOLLOWING RATES APPLY.

Zone 1 (0-25 radius miles):

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1A	$ 61.81	27.32
GROUP 1AA	$ 62.71	27.32
GROUP 1AAA	$ 63.59	27.32
GROUP 1	$ 60.91	27.32
GROUP 2	$ 60.14	27.32
GROUP 3	$ 59.46	27.32
GROUP 4	$ 55.68	27.32

Zone Differential (Add to Zone 1 rates):
Zone 2 (26-45 radius miles) = $1.00
Zone 3 (Over 45 radius miles) - $1.30

BASEPOINTS: CENTRALIA, OLYMPIA, TACOMA

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1 AAA - Cranes-over 300 tons or 300 ft of boom (including jib with attachments)

GROUP 1AA - Cranes- 200 tonsto 300 tons, or 250 ft of boom (including jib with attachments; Tower crane over 175 ft in height, bas to boom

GROUP 1A - Cranes, 100 tons thru 199 tons, or 150 ft of boom (including jib with attachments); Crane-overhead, bridge type, 100 tons and over; Tower crane up to 175 ft in height base to boom; Loaders-overhead, 8 yards and over; Shovels, excavator, backhoes-6 yards and over with attachments

GROUP 1 - Cableway; Cranes 45 tons thru 99 tons under 150 ft of boom (including jib with attachments); Crane-overhead, bridge type, 45 tons thru 99 tons; Derricks on building work; Excavator, shovel, backhoes over 3 yards and under 6 yards; Hard tail end dump articulating off-road equipment 45 yards and over; Loader- overhead, 6 yards to, but not including, 8 yards; Mucking machine, mole, tunnel, drill and/or shield; Quad 9 HD 41, D-10; Remote control operator on rubber tired earth moving equipment; Rollagon; Scrapers-self-propelled 45 yards and over; Slipform pavers; Transporters, all track or truck type

GROUP 2 - Barrier machine (zipper); Batch Plant Operator-concrete; Bump Cutter; Cranes, 20 tons thru 44 tons with attachments; Crane-Overhead, bridge type, 20 tons through 44 tons; Chipper; Concrete pump-truck mount with boom attachment; Crusher; Deck engineer/deck winches (power); Drilling machine; Excavator, shovel, backhoe-3 yards and under; Finishing machine, Bidwell, Gamaco and similar equipment; Guardrail punch; Loaders, overhead under 6 yards; Loaders-plant feed; Locomotives-all; Mechanics- all;

Mixers, asphalt plant; Motor patrol graders, finishing; Piledriver (other than crane mount); Roto-mill, roto-grinder; Screedman, spreader, topside operator-Blaw Knox, Cedar Rapids, Jaeger, Caterpillar, Barbar Green; Scraper-self- propelled, hard tail end dump, articulating off-road equipment- under 45 yards; Subgrader trimmer; Tractors, backhoe over 75 hp; Transfer material service machine-shuttle buggy, Blaw Knox- Roadtec; Truck Crane oiler/driver-100 tons and over; Truck Mount Portable Conveyor; Yo Yo pay

GROUP 3 - Conveyors; Cranes through 19 tons with attachments; Crane-A-frame over 10 tons; Drill oilers-auger type, truck or crane mount; Dozer-D-9 and under; Forklift-3000 lbs. and over with attachments; Horizontal/directional drill locator; Outside Hoists-(elevators and manlifts), air tuggers, strato tower bucket elevators; Hydralifts/boom trucks over 10 tons; Loaders-elevating type, belt; Motor patrol grader-nonfinishing; Plant oiler- asphalt, crusher; Pump-Concrete; Roller, plant mix or multi-lfit materials; Saws-concrete; Scrapers, concrete and carry all; Service engineers-equipment; Trenching machines; Truck crane oiler/driver under 100 tons; Tractors, backhoe under 75 hp

GROUP 4 - Assistant Engineer; Bobcat; Brooms; Compressor; Concrete Finish Machine-laser screed; Cranes A-frame 10 tons and under; Elevator and manlift (permanent and shaft type); Forklifts-under 3000 lbs. with attachments; Gradechecker, stakehop; Hydralifts/boom trucks, 10 tons and under; Oil distributors, blower distribution and mulch seeding operator; Pavement breaker; Posthole digger-mechanical; Power plant; Pumps-water; Rigger and Bellman; Roller-other than plant mix; Wheel Tractors, farmall type; Shotcrete/gunite equipment operator

FOOTNOTE A- Reduced rates may be paid on the following:

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2. Projects of less than $1 million where no building is involved. Surfacing and paving included, but utilities excluded.

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H-1 Base wage rate when on a hazardous waste site when not outfitted with protective clothing, Class ""D"" Suit - Base wage rate plus $ .50 per hour.
H-2 Class ""C"" Suit - Base wage rate plus $1.00 per hour.
H-3 Class ""B"" Suit - Base wage rate plus $1.50 per hour.
H-4 Class ""A"" Suit - Base wage rate plus $2.00 per hour.

CLARK, COWLITZ, KLICKKITAT, PACIFIC (SOUTH), SKAMANIA, AND
WAHKIAKUM COUNTIES

POWER RQUIPMENT OPERATORS: ZONE 1

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1	$ 58.94	17.15
GROUP 1A	$ 61.10	17.15
GROUP 1B	$ 63.26	17.15
GROUP 2	$ 57.03	17.15
GROUP 3	$ 55.88	17.15
GROUP 4	$ 52.55	17.15
GROUP 5	$ 51.31	17.15
GROUP 6	$ 48.09	17.15

Zone Differential (add to Zone 1 rates):
Zone 2 - $3.00
Zone 3 - $6.00

For the following metropolitan counties: MULTNOMAH; CLACKAMAS; MARION; WASHINGTON; YAMHILL; AND COLUMBIA; CLARK; AND COWLITZ COUNTY, WASHINGTON WITH MODIFICATIONS AS INDICATED:

All jobs or projects located in Multnomah, Clackamas and Marion Counties, West of the western boundary of Mt. Hood National Forest and West of Mile Post 30 on Interstate 84 and West of Mile Post 30 on State Highway 26 and West of Mile Post 30 on Highway 22 and all jobs or projects located in Yamhill County, Washington County and Columbia County and all jobs or porjects located in Clark & Cowlitz County, Washington except that portion of Cowlitz County in the Mt. St. Helens ""Blast Zone"" shall receive Zone I pay for all classifications.

All jobs or projects located in the area outside the identified boundary above, but less than 50 miles from the Portland City Hall shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the Portland City Hall, but outside the identified border above, shall receive Zone III pay for all classifications.

For the following cities: ALBANY; BEND; COOS BAY; EUGENE; GRANTS PASS; KLAMATH FALLS; MEDFORD; ROSEBURG

All jobs or projects located within 30 miles of the respective city hall of the above mentioned cities shall receive Zone I pay for all classifications.

All jobs or projects located more than 30 miles and less than 50 miles from the respective city hall of the above mentioned cities shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the respective city hall of the above mentioned cities shall receive Zone III pay for all classifications.

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

Group 1
Concrete Batch Plan and or Wet mix three (3) units or more; Crane, Floating one hundred and fifty (150) ton but less than two hundred and fifty (250) ton; Crane, two hundred (200) ton through two hundred ninety nine (299) ton with two hundred foot (200') boom or less (including jib, inserts and/or attachments); Crane, ninety (90) ton through one hundred ninety nine (199) ton with over two hundred (200') boom Including jib, inserts and/or attachments); Crane, Tower Crane with one hundred seventy five foot (175') tower or less and with less than two hundred foot (200') jib; Crane, Whirley ninety (90) ton and over; Helicopter when used in erecting work

Group 1A
Crane, floating two hundred fifty (250) ton and over; Crane, two hundred (200) ton through two hundred ninety nine (299) ton, with over two hundred foot (200') boom (including jib, inserts and/or attachments); Crane, three hundred (300) ton through three hundred ninety nine (399) ton; Crane, Tower Crane with over one hundred seventy five foot (175') tower or over two hundred foot (200') jib; Crane, tower Crane on rail system or 2nd tower or more in work radius

Group 1B

Crane, three hundred (300) ton through three hundred ninety nine (399) ton, with over two hundred foot (200') boom (including jib, inserts and/or attachments); Floating crane, three hundred fifty (350) ton and over; Crane, four hundred (400) ton and over

Group 2
Asphalt Plant (any type); Asphalt Roto-Mill, pavement profiler eight foot (8') lateral cut and over; Auto Grader or ""Trimmer""; Blade, Robotic; Bulldozer, Robotic Equipment (any type); Bulldozer, over one hundred twenty thousand (120,000) lbs. and above; Concrete Batch Plant and/or Wet Mix one (1) and two (2) drum; Concrete Diamond Head Profiler; Canal Trimmer; Concrete, Automatic Slip Form Paver (Assistant to the Operator required); Crane, Boom Truck fifty (50) ton and with over one hundred fifty foot (150') boom and over; Crane, Floating (derrick barge) thirty (30) ton but less than one hundred fifty (150) ton; Crane, Cableway twenty-five (25) ton and over; Crane, Floating Clamshell three (3) cu. Yds. And over; Crane, ninety (90) ton through one hundred ninety nine (199) ton up to and including two hundred foot (200') of boom (including jib inserts and/or attachments); Crane, fifty (50) ton through eighty nine (89) ton with over one hundred fifty foot (150') boom (including jib inserts and/or attachments); Crane, Whirley under ninety (90) ton; Crusher Plant; Excavator over one hundred thirty thousand (130,000) lbs.; Loader one hundred twenty thousand (120,000) lbs. and above; Remote Controlled Earth Moving Equipment; Shovel, Dragline, Clamshell, five (5) cu. Yds. And over; Underwater Equipment remote or otherwise, when used in construction work; Wheel Excavator any size

Group 3
Bulldozer, over seventy thousand (70,000) lbs. up to and including one hundred twenty thousand (120,000) lbs.; Crane, Boom Truck fifty (50) ton and over with less than

one hundred fifty foot (150') boom; Crane, fifty (50) ton through eighty nine (89) ton with one hundred fifty foot (150') boom or less (including jib inserts and/or attachments); Crane, Shovel, Dragline or Clamshell three (3) cu. yds. but less than five (5) cu. Yds.; Excavator over eighty thousand (80,000) lbs. through one hundred thirty thousand (130,000) lbs.; Loader sixty thousand (60,000) lbs. and less than one hundred twenty thousand (120,000) lbs.

Group 4

Asphalt, Screed; Asphalt Paver; Asphalt Roto-Mill, pavement profiler, under eight foot (8') lateral cut; Asphalt, Material Transfer Vehicle Operator; Back Filling Machine; Backhoe, Robotic, track and wheel type up to and including twenty thousand (20,000) lbs. with any attachments; Blade (any type); Boatman; Boring Machine; Bulldozer over twenty thousand (20,000) lbs. and more than one hundred (100) horse up to seventy thousand (70,000) lbs.; Cable-Plow (any type); Cableway up to twenty five (25) ton; Cat Drill (John Henry); Chippers; Compactor, multi-engine; Compactor, Robotic; Compactor with blade self-propelled; Concrete, Breaker; Concrete, Grout Plant; Concrete, Mixer Mobile; Concrete, Paving Road Mixer; Concrete, Reinforced Tank Banding Machine; Crane, Boom Truck twenty (20) ton and under fifty (50) ton; Crane, Bridge Locomotive, Gantry and Overhead; Crane, Carry Deck; Crane, Chicago Boom and similar types; Crane, Derrick Operator, under one hundred (100) ton; Crane, Floating Clamshell, Dragline, etc. Operator, under three (3) cu. yds. Or less than thirty (30) ton; Crane, under fifty (50) ton; Crane, Quick Tower under one hundred foot (100') in height and less than one hundred fifty foot (150') jib (on rail included); Diesel-Electric Engineer (Plant or Floating); Directional Drill over twenty thousand (20,000) lbs. pullback; Drill Cat Operator; Drill Doctor and/or Bit Grinder; Driller, Percussion, Diamond, Core, Cable, Rotary and similar type; Excavator Operator over twenty thousand (20,000) lbs. through eighty thousand (80,000) lbs.; Generator Operator; Grade-all; Guardrail Machines, i.e. punch, auger, etc.; Hammer Operator (Piledriver); Hoist, stiff leg, guy derrick or similar type, fifty (50) ton and over; Hoist, two (2) drums or more; Hydro Axe (loader mounted or similar type); Jack Operator, Elevating Barges, Barge Operator, self-unloading; Loader Operator, front end and overhead, twenty five thousand (25,000) lbs. and less than sixty thousand (60,000) lbs.; Log Skidders; Piledriver Operator (not crane type); Pipe, Bending, Cleaning, Doping and Wrapping Machines; Rail, Ballast Tamper Multi-Purpose; Rubber-tired Dozers and Pushers; Scraper, all types; Side-Boom; Skip Loader, Drag Box; Strump Grinder (loader mounted or similar type); Surface Heater and Planer; Tractor, rubber-tired, over fifty (50) HP Flywheel; Trenching Machine three foot (3') depth and deeper; Tub Grinder (used for wood debris); Tunnel Boring Machine Mechanic; Tunnel, Mucking Machine; Ultra High Pressure Water Jet Cutting Tool System Operator; Vacuum Blasting Machine Operator; Water pulls, Water wagons

Group 5

Asphalt, Extrusion Machine; Asphalt, Roller (any asphalt mix); Asphalt, Roto-Mill pavement profiler ground man; Bulldozer, twenty thousand (20,000) lbs. or less, or one hundred (100) horse or less; Cement Pump; Chip Spreading

Machine; Churn Drill and Earth Boring Machine; Compactor, self-propelled without blade; Compressor, (any power) one thousand two hundred fifty (1,250) cu. ft. and over, total capacity; Concrete, Batch Plant Quality control; Concrete, Combination Mixer and compressor operator, gunite work; Concrete, Curb Machine, Mechanical Berm, Curb and/or Curb and Gutter; Concrete, Finishing Machine; Concrete, Grouting Machine; Concrete, Internal Full Slab Vibrator Operator; Concrete, Joint Machine; Concrete, Mixer single drum, any capacity; Concrete, Paving Machine eight foot (8') or less; Concrete, Planer; Concrete, Pump; Concrete, Pump Truck; Concrete, Pumpcrete Operator (any type); Concrete, Slip Form Pumps, power driven hydraulic lifting device for concrete forms; Conveyored Material Hauler; Crane, Boom Truck under twenty (20) tons; Crane, Boom Type lifting device, five (5) ton capacity or less; Drill, Directional type less than twenty thousand (20,000) lbs. pullback; Fork Lift, over ten (10) ton or Robotic; Helicopter Hoist; Hoist Operator, single drum; Hydraulic Backhoe track type up to and including twenty thousand (20,000) lbs.; Hydraulic Backhoe wheel type (any make); Laser Screed; Loaders, rubber-tired type, less than twenty five thousand (25,000) lbs.; Pavement Grinder and/or Grooving Machine (riding type); Pipe, cast in place Pipe Laying Machine; Pulva-Mixer or similar types; Pump Operator, more than five (5) pumps (any size); Rail, Ballast Compactor, Regulator, or Tamper machines; Service Oiler (Greaser); Sweeper Self-Propelled; Tractor, Rubber-Tired, fifty (50) HP flywheel and under; Trenching Machine Operator, maximum digging capacity three foot (3') depth; Tunnel, Locomotive, Dinkey; Tunnel, Power Jumbo setting slip forms, etc.

Group 6

Asphalt, Pugmill (any type); Asphalt, Raker; Asphalt, Truck Mounted Asphalt Spreader, with Screed; Auger Oiler; Boatman; Bobcat, skid steed (less than one (1) yard); Broom, self-propelled; Compressor Operator (any power) under 1,250 cu. ft. total capacity; Concrete Curing Machine (riding type); Concrete Saw; Conveyor Operator or Assistant; Crane, Tugger; Crusher Feederman; Crusher Oiler; Deckhand; Drill, Directional Locator; Fork Lift; Grade Checker; Guardrail Punch Oiler; Hydrographic Seeder Machine, straw, pulp or seed; Hydrostatic Pump Operator; Mixer Box (CTB, dry batch, etc.); Oiler; Plant Oiler; Pump (any power); Rail, Brakeman, Switchman, Motorman; Rail, Tamping Machine, mechanical, self-propelled; Rigger; Roller grading (not asphalt); Truck, Crane Oiler-Driver

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IRON0014-005 07/07/2025

ADAMS, ASOTIN, BENTON, COLUMBIA, DOUGLAS, FERRY, FRANKLIN, GARFIELD, GRANT, LINCOLN, OKANOGAN, PEND ORIELLE, SPOKANE, STEVENS, WALLA WALLA AND WHITMAN COUNTIES

	Rates	Fringes
IRONWORKER	$ 43.40	32.77

IRON0029-002 07/07/2025

CLARK, COWLITZ, KLICKITAT, PACIFIC, SKAMANIA, AND WAHKAIKUM COUNTIES

	Rates	Fringes
IRONWORKER	$ 48.31	34.52

IRON0086-002 07/07/2025

YAKIMA, KITTITAS AND CHELAN COUNTIES

	Rates	Fringes
IRONWORKER	$ 43.40	32.77

IRON0086-004 07/07/2025

CLALLAM, GRAYS HARBOR, ISLAND, JEFFERSON, KING, KITSAP, LEWIS, MASON, PIERCE, SKAGIT, SNOHOMISH, THURSTON, AND WHATCOM COUNTIES

	Rates	Fringes
IRONWORKER	$ 57.94	34.52

* LABO0238-004 06/01/2025

A-1 AREA: ASOTIN, BENTON, FRANKLIN, GARFIELD, LINCOLN, SPOKANE, WALLA WALLA, AND WHITMAN COUNTIES
A-2 AREA: ADAMS,COLUMBIA,DOUGLAS (East of 120th Meridian), FERRY, GRANT, OKANOGAN, PEND OREILLE, AND STEVENS COUNTIES

	Rates	Fringes
LABORER (A-1)		
GROUP 1	$ 34.03	16.90
GROUP 2	$ 37.13	16.90
GROUP 3	$ 37.46	16.90
GROUP 4	$ 37.80	16.90
GROUP 5	$ 38.14	16.90
LABORER (A-2)		
GROUP 1	$ 37.03	16.90
GROUP 2	$ 40.13	16.90
GROUP 3	$ 40.46	16.90
GROUP 4	$ 40.80	16.90
GROUP 5	$ 41.14	16.90

LABORERS CLASSIFICATIONS

GROUP 1: Flagman; Landscape Laborer; Scaleman; Traffic Control Maintenance Laborer (to include erection and maintenance of barricades, signs and relief of flagperson); Window Washer/Cleaner (detail cleanup, such as, but not limited to cleaning floors, ceilings, walls, windows, etc. prior to final acceptance by the owner)

GROUP 2: Asbestos Abatement Worker; Brush Hog Feeder; Carpenter Tender; Cement Handler; Clean-up Laborer; Concrete Crewman (to include stripping of forms, hand operating jacks on slip form construction, application of concrete curing compounds, pumpcrete machine, signaling, handling the nozzle of squeezcrete or similar machine,6 inches and smaller); Confined Space Attendant; Concrete Signalman; Crusher Feeder; Demolition (to include clean-up, burning, loading, wrecking and salvage of all material);

Dumpman; Fence Erector; Firewatch; Form Cleaning Machine Feeder, Stacker; General Laborer; Grout Machine Header Tender; Guard Rail (to include guard rails, guide and reference posts, sign posts, and right-of-way markers); Hazardous Waste Worker, Level D (no respirator is used and skin protection is minimal); Miner, Class ""A"" (to include all bull gang, concrete crewman, dumpman and pumpcrete crewman, including distributing pipe, assembly & dismantle, and nipper); Nipper; Riprap Man; Sandblast Tailhoseman; Scaffold Erector (wood or steel); Stake Jumper; Structural Mover (to include separating foundation, preparation, cribbing, shoring, jacking and unloading of structures); Tailhoseman (water nozzle); Timber Bucker and Faller (by hand); Track Laborer (RR); Truck Loader; Well-Point Man; All Other Work Classifications Not Specially Listed Shall Be Classified As General Laborer

GROUP 3: Asphalt Roller, walking; Cement Finisher Tender; Concrete Saw, walking; Demolition Torch; Dope Pot Firemen, non-mechanical; Driller Tender (when required to move and position machine); Form Setter, Paving; Grade Checker using level; Hazardous Waste Worker, Level C (uses a chemical ""splash suit"" and air purifying respirator); Jackhammer Operator; Miner, Class ""B"" (to include brakeman, finisher, vibrator, form setter); Nozzleman (to include squeeze and flo-crete nozzle); Nozzleman, water, air or steam; Pavement Breaker (under 90 lbs.); Pipelayer, corrugated metal culvert; Pipelayer, multi- plate; Pot Tender; Power Buggy Operator; Power Tool Operator, gas, electric, pneumatic; Railroad Equipment, power driven, except dual mobile power spiker or puller; Railroad Power Spiker or Puller, dual mobile; Rodder and Spreader; Tamper (to include operation of Barco, Essex and similar tampers); Trencher, Shawnee; Tugger Operator; Wagon Drills; Water Pipe Liner; Wheelbarrow (power driven)

GROUP 4: Air and Hydraulic Track Drill; Aspahlt Raker;Brush Machine (to include horizontal construction joint cleanup brush machine, power propelled); Caisson Worker, free air; Chain Saw Operator and Faller; Concrete Stack (to include laborers when laborers working on free standing concrete stacks for smoke or fume control above 40 feet high); Gunite (to include operation of machine and nozzle); Hazardous Waste Worker, Level B (uses same respirator protection as Level A. A supplied air line is provided in conjunction with a chemical ""splash suit""); High Scaler; Laser Beam Operator (to include grade checker and elevation control); Miner, Class C (to include miner, nozzleman for concrete, laser beam operator and rigger on tunnels); Monitor Operator (air track or similar mounting); Mortar Mixer; Nozzleman (to include jet blasting nozzleman, over 1,200 lbs., jet blast machine power propelled, sandblast nozzle); Pavement Breaker (90 lbs. and over); Pipelayer (to include working topman, caulker, collarman, jointer, mortarman, rigger, jacker, shorer, valve or meter installer); Pipewrapper; Plasterer Tender; Vibrators (all)

GROUP 5 - Drills with Dual Masts; Hazardous Waste Worker, Level A (utilizes a fully encapsulated suit with a self-contained breathing apparatus or a supplied air line); Miner Class ""D"", (to include raise and shaft miner, laser beam operator on riases and shafts)

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* LABO0238-006 06/01/2025

COUNTIES EAST OF THE 120TH MERIDIAN: ADAMS, ASOTIN, BENTON, CHELAN, COLUMBIA, DOUGLAS, FERRY, FRANKLIN, GARFIELD, GRANT, LINCOLN, OKANOGAN, PEND OREILLE, STEVENS, SPOKANE, WALLA WALLA, WHITMAN

	Rates	Fringes
Hod Carrier	$ 38.05	16.75

LABO0242-003 06/01/2025

KING COUNTY

	Rates	Fringes
LABORER		
GROUP 1	$ 36.07	15.79
GROUP 2A	$ 40.88	16.72
GROUP 3	$ 50.38	16.96
GROUP 4	$ 51.52	16.99
GROUP 5	$ 52.31	17.01
GROUP 6	$ 53.99	17.05

BASE POINTS: BELLINGHAM, MT. VERNON, EVERETT, SEATTLE, KENT, TACOMA, OLYMPIA, CENTRALIA, ABERDEEN, SHELTON, PT. TOWNSEND, PT. ANGELES, AND BREMERTON

ZONE 1 - Projects within 25 radius miles of the respective city hall
ZONE 2 - More than 25 but less than 45 radius miles from the respective city hall
ZONE 3 - More than 45 radius miles from the respective city hall

ZONE DIFFERENTIAL (ADD TO ZONE 1 RATES):
ZONE 2 - $1.00
ZONE 3 - $1.30

BASE POINTS: CHELAN, SUNNYSIDE, WENATCHEE, AND YAKIMA

ZONE 1 - Projects within 25 radius miles of the respective city hall
ZONE 2 - More than 25 radius miles from the respective city hall

ZONE DIFFERENTIAL (ADD TO ZONE 1 RATES):
ZONE 2 - $2.25

LABORERS CLASSIFICATIONS

GROUP 1: Landscaping and Planting; Watchman; Window Washer/Cleaner (detail clean-up, such as but not limited to cleaning floors, ceilings, walls, windows, etc., prior to final acceptance by the owner)

GROUP 2A: Batch Weighman; Crusher Feeder; Fence Laborer; Flagman; Pilot Car

GROUP 3: General Laborer; Air, Gas, or Electric Vibrating Screed; Asbestos Abatement Laborer; Ballast Regulator Machine; Brush Cutter; Brush Hog Feeder; Burner; Carpenter Tender; Cement Finisher Tender; Change House or Dry Shack; Chipping Gun (under 30 lbs.); Choker Setter; Chuck Tender;

Clean-up Laborer; Concrete Form Stripper; Curing Laborer; Demolition (wrecking and moving including charred material); Ditch Digger; Dump Person; Fine Graders; Firewatch; Form Setter; Gabian Basket Builders; Grout Machine Tender; Grinders; Guardrail Erector; Hazardous Waste Worker (Level C: uses a chemical ""splash suit"" and air purifying respirator); Maintenance Person; Material Yard Person; Pot Tender; Rip Rap Person; Riggers; Scale Person; Sloper Sprayer; Signal Person; Stock Piler; Stake Hopper; Toolroom Man (at job site); Topper-Tailer; Track Laborer; Truck Spotter; Vinyl Seamer

GROUP 4: Cement Dumper-Paving; Chipping Gun (over 30 lbs.); Clary Power Spreader; Concrete Dumper/Chute Operator; Concrete Saw Operator; Drill Operator (hydraulic, diamond, aiartrac); Faller and Bucker Chain Saw; Grade Checker and Transit Person; Groutmen (pressure) including post tension beams; Hazardous Waste Worker (Level B: uses same respirator protection as Level A. A supplied air line is provided in conjunction with a chemical ""splash suit""); High Scaler; Jackhammer; Laserbeam Operator; Manhole Builder-Mudman; Nozzleman (concrete pump, green cutter when using combination of high pressure air and water on concrete and rock, sandblast, gunite, shotcrete, water blaster, vacuum blaster); Pavement Breaker; Pipe Layer and Caulker; Pipe Pot Tender; Pipe Reliner (not insert type); Pipe Wrapper; Power Jacks; Railroad Spike Puller-Power; Raker-Asphalt; Rivet Buster; Rodder; Sloper (over 20 ft); Spreader (concrete); Tamper and Similar electric, air and glas operated tool; Timber Person-sewer (lagger shorer and cribber); Track Liner Power; Tugger Operator; Vibrator; Well Point Laborer

GROUP 5: Caisson Worker; Mortarman and Hodcarrier; Powderman; Re-Timberman; Hazardous Waste Worker (Level A: utilizes a fully encapsulated suit with a self-contained breathing apparatus or a supplied air line).

Group 6: Miner

LABO0252-010 06/01/2025

CLALLAM, GRAYS HARBOR, JEFFERSON, KITSAP, LEWIS, MASON, PACIFIC (EXCLUDING SOUTHWEST), PIERCE, AND THURSTON COUNTIES

	Rates	Fringes
LABORER		
GROUP 1	$ 36.07	15.79
GROUP 2	$ 40.88	16.72
GROUP 3	$ 50.38	16.96
GROUP 4	$ 51.52	16.99
GROUP 5	$ 52.31	17.01

BASE POINTS: BELLINGHAM, MT. VERNON, EVERETT, SEATTLE, KENT, TACOMA, OLYMPIA, CENTRALIA, ABERDEEN, SHELTON, PT. TOWNSEND, PT. ANGELES, AND BREMERTON

ZONE 1 - Projects within 25 radius miles of the respective city hall
ZONE 2 - More than 25 but less than 45 radius miles from the respective city hall
ZONE 3 - More than 45 radius miles from the respective city

hall

ZONE DIFFERENTIAL (ADD TO ZONE 1 RATES):
ZONE 2 - $1.00
ZONE 3 - $1.30

BASE POINTS: CHELAN, SUNNYSIDE, WENATCHEE, AND YAKIMA

ZONE 1 - Projects within 25 radius miles of the respective city hall
ZONE 2 - More than 25 radius miles from the respective city hall

ZONE DIFFERENTIAL (ADD TO ZONE 1 RATES):
ZONE 2 - $2.25

LABORERS CLASSIFICATIONS

GROUP 1: Landscaping and Planting; Watchman; Window Washer/Cleaner (detail clean-up, such as but not limited to cleaning floors, ceilings, walls, windows, etc., prior to final acceptance by the owner)

GROUP 2: Batch Weighman; Crusher Feeder; Fence Laborer; Flagman; Pilot Car

GROUP 3: General Laborer; Air, Gas, or Electric Vibrating Screed; Asbestos Abatement Laborer; Ballast Regulator Machine; Brush Cutter; Brush Hog Feeder; Burner; Carpenter Tender; Cement Finisher Tender; Change House or Dry Shack; Chipping Gun (under 30 lbs.); Choker Setter; Chuck Tender; Clean-up Laborer; Concrete Form Stripper; Curing Laborer; Demolition (wrecking and moving including charred material); Ditch Digger; Dump Person; Fine Graders; Firewatch; Form Setter; Gabian Basket Builders; Grout Machine Tender; Grinders; Guardrail Erector; Hazardous Waste Worker (Level C: uses a chemical ""splash suit"" and air purifying respirator); Maintenance Person; Material Yard Person; Pot Tender; Rip Rap Person; Riggers; Scale Person; Sloper Sprayer; Signal Person; Stock Piler; Stake Hopper; Toolroom Man (at job site); Topper-Tailer; Track Laborer; Truck Spotter; Vinyl Seamer

GROUP 4: Cement Dumper-Paving; Chipping Gun (over 30 lbs.); Clary Power Spreader; Concrete Dumper/Chute Operator; Concrete Saw Operator; Drill Operator (hydraulic, diamond, aiartrac); Faller and Bucker Chain Saw; Groutmen (pressure) including post tension beams; Hazardous Waste Worker (Level B: uses same respirator protection as Level A. A supplied air line is provided in conjunction with a chemical ""splash suit""); Jackhammer; Laserbeam Operator; Manhole Builder-Mudman; Nozzleman (concrete pump, green cutter when using combination of high pressure air and water on concrete and rock, sandblast, gunite, shotcrete, water blaster, vacuum blaster); Pavement Breaker; Pipe Layer and Caulker; Pipe Pot Tender; Pipe Reliner (not insert type); Pipe Wrapper; Power Jacks; Railroad Spike Puller-Power; Raker-Asphalt; Rivet Buster; Rodder; Sloper (over 20 ft); Spreader (concrete); Tamper and Similar electric, air and glas operated tool; Timber Person-sewer (lagger shorer and cribber); Track Liner Power; Tugger Operator; Vibrator; Well Point Laborer

GROUP 5: Caisson Worker; Miner; Mortarman and Hodcarrier; Grade Checker and Transit Person; High Scaler; Powderman;

Re-Timberman; Hazardous Waste Worker (Level A: utilizes a fully encapsulated suit with a self-contained breathing apparatus or a supplied air line).

LABO0292-008 06/01/2025

ISLAND, SAN JUAN, SKAGIT, SNOHOMISH, AND WHATCOM COUNTIES

	Rates	Fringes
LABORER		
GROUP 1	$ 36.07	15.79
GROUP 2	$ 40.88	16.72
GROUP 3	$ 50.38	16.96
GROUP 4	$ 51.52	16.99
GROUP 5	$ 52.31	17.01

BASE POINTS: BELLINGHAM, MT. VERNON, EVERETT, SEATTLE, KENT, TACOMA, OLYMPIA, CENTRALIA, ABERDEEN, SHELTON, PT. TOWNSEND, PT. ANGELES, AND BREMERTON

ZONE 1 - Projects within 25 radius miles of the respective city hall
ZONE 2 - More than 25 but less than 45 radius miles from the respective city hall
ZONE 3 - More than 45 radius miles from the respective city hall

ZONE DIFFERENTIAL (ADD TO ZONE 1 RATES):
ZONE 2 - $1.00
ZONE 3 - $1.30

BASE POINTS: CHELAN, SUNNYSIDE, WENATCHEE, AND YAKIMA

ZONE 1 - Projects within 25 radius miles of the respective city hall
ZONE 2 - More than 25 radius miles from the respective city hall

ZONE DIFFERENTIAL (ADD TO ZONE 1 RATES):
ZONE 2 - $2.25

LABORERS CLASSIFICATIONS

GROUP 1: Landscaping and Planting; Watchman; Window Washer/Cleaner (detail clean-up, such as but not limited to cleaning floors, ceilings, walls, windows, etc., prior to final acceptance by the owner)

GROUP 2: Batch Weighman; Crusher Feeder; Fence Laborer; Flagman; Pilot Car

GROUP 3: General Laborer; Air, Gas, or Electric Vibrating Screed; Asbestos Abatement Laborer; Ballast Regulator Machine; Brush Cutter; Brush Hog Feeder; Burner; Carpenter Tender; Cement Finisher Tender; Change House or Dry Shack; Chipping Gun (under 30 lbs.); Choker Setter; Chuck Tender; Clean-up Laborer; Concrete Form Stripper; Curing Laborer; Demolition (wrecking and moving including charred material); Ditch Digger; Dump Person; Fine Graders; Firewatch; Form Setter; Gabian Basket Builders; Grout Machine Tender; Grinders; Guardrail Erector; Hazardous Waste Worker (Level C: uses a chemical ""splash suit"" and air purifying respirator); Maintenance Person; Material

Yard Person; Pot Tender; Rip Rap Person; Riggers; Scale Person; Sloper Sprayer; Signal Person; Stock Piler; Stake Hopper; Toolroom Man (at job site); Topper-Tailer; Track Laborer; Truck Spotter; Vinyl Seamer

GROUP 4: Cement Dumper-Paving; Chipping Gun (over 30 lbs.); Clary Power Spreader; Concrete Dumper/Chute Operator; Concrete Saw Operator; Drill Operator (hydraulic, diamond, aiartrac); Faller and Bucker Chain Saw; Grade Checker and Transit Person; Groutmen (pressure) including post tension beams; Hazardous Waste Worker (Level B: uses same respirator protection as Level A. A supplied air line is provided in conjunction with a chemical ""splash suit""); High Scaler; Jackhammer; Laserbeam Operator; Manhole Builder-Mudman; Nozzleman (concrete pump, green cutter when using combination of high pressure air and water on concrete and rock, sandblast, gunite, shotcrete, water blaster, vacuum blaster); Pavement Breaker; Pipe Layer and Caulker; Pipe Pot Tender; Pipe Reliner (not insert type); Pipe Wrapper; Power Jacks; Railroad Spike Puller-Power; Raker-Asphalt; Rivet Buster; Rodder; Sloper (over 20 ft); Spreader (concrete); Tamper and Similar electric, air and glas operated tool; Timber Person-sewer (lagger shorer and cribber); Track Liner Power; Tugger Operator; Vibrator; Well Point Laborer

GROUP 5: Caisson Worker; Miner; Mortarman and Hodcarrier; Powderman; Re-Timberman; Hazardous Waste Worker (Level A: utilizes a fully encapsulated suit with a self-contained breathing apparatus or a supplied air line).

LABO0335-022 06/01/2025

CLARK, COWLITZ, KLICKITAT, PACIFIC (SOUTH OF A STRAIGHT LINE MADE BY EXTENDING THE NORTH BOUNDARY LINE OF WAHKIAKUM COUNTY WEST TO THE PACIFIC OCEAN), SKAMANIA AND WAHKIAKUM COUNTIES

	Rates	Fringes
Laborers:		
GROUP 1	$ 32.67	15.60
GROUP 2	$ 40.56	15.60
GROUP 3	$ 44.06	15.60
GROUP 4	$ 44.90	15.60
GROUP 5	$ 45.54	15.60
GROUP 6	$ 46.08	15.60

LABORERS CLASSIFICATIONS

GROUP 1: Landscaping, and/or Planting Laborers

GROUP 2: Fence Builders and Traffic Flaggers

GROUP 3: Asphalt Plant Laborers; Asphalt Spreaders; Batch Weighman; Broomers; Brush Burners and Cutters; Car and Truck Loaders; Carpenter Tender; Change-House Man or Dry Shack Man; Choker Setter; Clean-up Laborers; Curing, Concrete; Demolition, Wrecking and Moving Laborers; Dumpers, road oiling crew; Dumpmen (for grading crew); Elevator Feeders; Median Rail Reference Post, Guide Post, Right of Way Marker; Fine Graders; Fire Watch; Form Strippers (not swinging stages); General Laborers; Hazardous Waste Worker; Hod Carrier; Leverman or Aggregate

Spreader (Flaherty and similar types); Loading Spotters; Material Yard Man (including electrical); Pittsburgh Chipper Operator or Similar Types; Railroad Track Laborers; Ribbon Setters (including steel forms); Rip Rap Man (hand placed); Road Pump Tender; Sewer Labor; Signalman; Skipman; Slopers; Spraymen; Stake Chaser; Stockpiler; Tie Back Shoring; Timber Faller and Bucker (hand labor); Toolroom Man (at job site); Tunnel Bullgang (above ground); Weight-Man- Crusher (aggregate when used)

GROUP 4: Applicator (including pot power tender for same), applying protective material by hand or nozzle on utility lines or storage tanks on project; Brush Cutters (power saw); Burners; Choker Splicer; Clary Power Spreader and similar types; Clean- up Nozzleman-Green Cutter (concrete, rock, etc.); Concrete Power Buggyman; Concrete Laborer; Crusher Feeder; Demolition and Wrecking Charred Materials; Gunite Nozzleman Tender; Gunite or Sand Blasting Pot Tender; Handlers or Mixers of all Materials of an irritating nature (including cement and lime); Tool Operators (includes but not limited to: Dry Pack Machine; Jackhammer; Chipping Guns; Paving Breakers); Pipe Doping and Wrapping; Post Hole Digger, air, gas or electric; Vibrating Screed; Tampers; Sand Blasting (Wet); Stake-Setter; Tunnel-Muckers, Brakemen, Concrete Crew, Bullgang (underground)

GROUP 5: Asbestos Removal; Bit Grinder; Drill Doctor; Drill Operators, air tracks, cat drills, wagon drills, rubber-mounted drills, and other similar types including at crusher plants; Gunite Nozzleman; High Scalers, Strippers and Drillers (covers work in swinging stages, chairs or belts, under extreme conditions unusual to normal drilling, blasting, barring-down, or sloping and stripping); Manhole Builder; Powdermen; Concrete Saw Operator; Pwdermen; Power Saw Operators (Bucking and Falling); Pumpcrete Nozzlemen; Sand Blasting (Dry); Sewer Timberman; Track Liners, Anchor Machines, Ballast Regulators, Multiple Tampers, Power Jacks, Tugger Operator; Tunnel-Chuck Tenders, Nippers and Timbermen; Vibrator; Water Blaster

GROUP 6: Asphalt Raker; Concrete Saw Operator (walls); Concrete Nozzelman; Grade Checker; Pipelayer; Laser Beam (pipelaying)-applicable when employee assigned to move, set up, align; Laser Beam; Tunnel Miners; Motorman-Dinky Locomotive-Tunnel; Powderman-Tunnel; Shield Operator-Tunnel

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LABO0348-003 06/01/2025

CHELAN, DOUGLAS (W OF 12TH MERIDIAN), KITTITAS, AND YAKIMA COUNTIES

	Rates	Fringes
LABORER		
GROUP 1	$ 31.19	16.48
GROUP 2	$ 35.34	16.59
GROUP 3	$ 38.40	16.66
GROUP 4	$ 39.26	16.68
GROUP 5	$ 39.89	16.70

BASE POINTS: BELLINGHAM, MT. VERNON, EVERETT, SEATTLE, KENT, TACOMA, OLYMPIA, CENTRALIA, ABERDEEN, SHELTON, PT.

TOWNSEND, PT. ANGELES, AND BREMERTON

ZONE 1 - Projects within 25 radius miles of the respective city hall
ZONE 2 - More than 25 but less than 45 radius miles from the respective city hall
ZONE 3 - More than 45 radius miles from the respective city hall

ZONE DIFFERENTIAL (ADD TO ZONE 1 RATES):
ZONE 2 - $1.00
ZONE 3 - $1.30

BASE POINTS: CHELAN, SUNNYSIDE, WENATCHEE, AND YAKIMA

ZONE 1 - Projects within 25 radius miles of the respective city hall
ZONE 2 - More than 25 radius miles from the respective city hall

ZONE DIFFERENTIAL (ADD TO ZONE 1 RATES):
ZONE 2 - $2.25

LABORERS CLASSIFICATIONS

GROUP 1: Landscaping and Planting; Watchman; Window Washer/Cleaner (detail clean-up, such as but not limited to cleaning floors, ceilings, walls, windows, etc., prior to final acceptance by the owner)

GROUP 2: Batch Weighman; Crusher Feeder; Fence Laborer; Flagman; Pilot Car

GROUP 3: General Laborer; Air, Gas, or Electric Vibrating Screed; Asbestos Abatement Laborer; Ballast Regulator Machine; Brush Cutter; Brush Hog Feeder; Burner; Carpenter Tender; Cement Finisher Tender; Change House or Dry Shack; Chipping Gun (under 30 lbs.); Choker Setter; Chuck Tender; Clean-up Laborer; Concrete Form Stripper; Curing Laborer; Demolition (wrecking and moving including charred material); Ditch Digger; Dump Person; Fine Graders; Firewatch; Form Setter; Gabian Basket Builders; Grout Machine Tender; Grinders; Guardrail Erector; Hazardous Waste Worker (Level C: uses a chemical ""splash suit"" and air purifying respirator); Maintenance Person; Material Yard Person; Pot Tender; Rip Rap Person; Riggers; Scale Person; Sloper Sprayer; Signal Person; Stock Piler; Stake Hopper; Toolroom Man (at job site); Topper-Tailer; Track Laborer; Truck Spotter; Vinyl Seamer

GROUP 4: Cement Dumper-Paving; Chipping Gun (over 30 lbs.); Clary Power Spreader; Concrete Dumper/Chute Operator; Concrete Saw Operator; Drill Operator (hydraulic, diamond, aiartrac); Faller and Bucker Chain Saw; Grade Checker and Transit Person; Groutmen (pressure) including post tension beams; Hazardous Waste Worker (Level B: uses same respirator protection as Level A. A supplied air line is provided in conjunction with a chemical ""splash suit""); High Scaler; Jackhammer; Laserbeam Operator; Manhole Builder-Mudman; Nozzleman (concrete pump, green cutter when using combination of high pressure air and water on concrete and rock, sandblast, gunite, shotcrete, water blaster, vacuum blaster); Pavement Breaker; Pipe Layer and Caulker; Pipe Pot Tender; Pipe Reliner (not insert type); Pipe Wrapper; Power Jacks; Railroad Spike Puller-Power;

Raker-Asphalt; Rivet Buster; Rodder; Sloper (over 20 ft); Spreader (concrete); Tamper and Similar electric, air and glas operated tool; Timber Person-sewer (lagger shorer and cribber); Track Liner Power; Tugger Operator; Vibrator; Well Point Laborer

GROUP 5: Caisson Worker; Miner; Mortarman and Hodcarrier; Powderman; Re-Timberman; Hazardous Waste Worker (Level A: utilizes a fully encapsulated suit with a self-contained breathing apparatus or a supplied air line).

PAIN0005-002 07/01/2025

STATEWIDE EXCEPT CLARK, COWLITZ, KLICKITAT, PACIFIC, SKAMANIA, AND WAHKIAKUM COUNTIES

	Rates	Fringes
Painters:		
STRIPERS	$ 41.80	20.85

PAIN0010-012 07/01/2025

CLARK, COWLITZ, KLICKITAT, PACIFIC, SKAMANIA, AND WAHKIAKUM COUNTIES

	Rates	Fringes
PAINTER (Brush, Roller, Spray & Sandblasting)	$ 39.94	16.68

PAIN0010-013 07/01/2025

CLARK, COWLITZ, KLICKITAT, PACIFIC, SKAMANIA and WAHKIAKUM COUNTIES

	Rates	Fringes
Painters:		
HIGHWAY & PARKING LOT STRIPER	$ 41.19	17.09

PAIN0300-007 07/01/2025

CLALLAM, GRAYS HARBOR, ISLAND, JEFFERSON, KING, KITSAP, LEWIS, MASON, PIERCE, SAN JUAN, SKAGIT, SNOHOMISH, THURSTON, AND WHATCOM COUNTIES

	Rates	Fringes
PAINTER	$ 41.24	14.70

PAIN0427-005 07/01/2025

ADAMS, ASOTIN; BENTON AND FRANKLIN (EXCEPT HANFORD SITE); CHELAN, COLUMBIA, DOUGLAS, FERRY, GARFIELD, GRANT, KITTITAS, LINCOLN, OKANOGAN, PEND OREILLE, SPOKANE, STEVENS, WALLA WALLA, WHITMAN, AND YAKIMA COUNTIES

	Rates	Fringes
PAINTER (Application of Cold Tar Products, Epoxies, Polyurethanes, Acids, Radiation Resistant Material, Water, Sandblasting, Over 30'/Swing Stage Work, Brush, Roller, Striping, Steam-cleaning, and Spray).....	$ 36.26	17.01

PLAS0072-004 06/01/2025

ADAMS, ASOTIN, BENTON, CHELAN, COLUMBIA, DOUGLAS, FERRY, FRANKLIN, GARFIELD, GRANT, KITTITAS, LINCOLN, OKANOGAN, PEND OREILLE, SPOKANE, STEVENS, WALLA WALLA, WHITMAN, AND YAKIMA COUNTIES

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER		
ZONE 1.....	$ 40.89	18.64

Zone Differential (Add to Zone 1 rate): Zone 2 - $3.00

BASE POINTS: Spokane, Pasco, Lewiston; Wenatchee
Zone 1: 0 - 45 radius miles from the main post office
Zone 2: Over 45 radius miles from the main post office

PLAS0528-001 06/01/2024

CLALLAM, COWLITZ, GRAYS HARBOR, ISLAND, JEFFERSON, KING, KITSAP, LEWIS, MASON, PACIFIC, PIERCE, SAN JUAN, SKAGIT, SNOHOMISH, THURSTON, WAHKIAKUM AND WHATCOM COUNTIES

	Rates	Fringes
CEMENT MASON		
CEMENT MASON.....	$ 54.16	21.27
COMPOSITION, TROWEL MACHINE, GRINDER, POWER TOOLS, GUNNITE NOZZLE.....	$ 54.66	21.27
TROWELING MACHINE OPERATOR ON COMPOSITION.....	$ 54.66	21.27

PLAS0555-002 06/01/2025

CLARK, KLICKITAT AND SKAMANIA COUNTIES

ZONE 1:

	Rates	Fringes
CEMENT MASON		
CEMENT MASONS DOING BOTH COMPOSITION/POWER MACHINERY AND SUSPENDED/HANGING SCAFFOLD..	$ 48.05	20.31
CEMENT MASONS ON SUSPENDED, SWINGING AND/OR HANGING SCAFFOLD.....	$ 47.09	20.31
CEMENT MASONS.....	$ 46.13	20.31

COMPOSITION WORKERS AND
POWER MACHINERY OPERATORS...$ 47.09 20.31

Zone Differential (Add To Zone 1 Rates):
Zone 2 - $0.65
Zone 3 - 1.15
Zone 4 - 1.70
Zone 5 - 3.00

BASE POINTS: BEND, CORVALLIS, EUGENE, MEDFORD, PORTLAND, SALEM, THE DALLES, VANCOUVER

ZONE 1: Projects within 30 miles of the respective city hall
ZONE 2: More than 30 miles but less than 40 miles from the respective city hall.
ZONE 3: More than 40 miles but less than 50 miles from the respective city hall.
ZONE 4: More than 50 miles but less than 80 miles from the respective city hall.
ZONE 5: More than 80 miles from the respective city hall

TEAM0037-002 06/01/2024

CLARK, COWLITZ, KLICKITAT, PACIFIC (South of a straight line made by extending the north boundary line of Wahkiakum County west to the Pacific Ocean), SKAMANIA, AND WAHKIAKUM COUNTIES

	Rates	Fringes
Truck drivers:		
ZONE 1		
GROUP 1	$ 33.09	17.63
GROUP 2	$ 33.24	17.63
GROUP 3	$ 33.40	17.63
GROUP 4	$ 33.72	17.63
GROUP 5	$ 33.97	17.63
GROUP 6	$ 34.18	17.63
GROUP 7	$ 34.42	17.63

Zone Differential (Add to Zone 1 Rates):
Zone 2 - $0.65
Zone 3 - 1.15
Zone 4 - 1.70
Zone 5 - 2.75

BASE POINTS: ASTORIA, THE DALLES, LONGVIEW AND VANCOUVER

ZONE 1: Projects within 30 miles of the respective city hall.

ZONE 2: More than 30 miles but less than 40 miles from the respective city hall.

ZONE 3: More than 40 miles but less than 50 miles from the respective city hall.

ZONE 4: More than 50 miles but less than 80 miles from the respective city hall.

ZONE 5: More than 80 miles from the respective city hall.

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1: A Frame or Hydra lifrt truck w/load bearing surface; Articulated Dump Truck; Battery Rebuilders; Bus or Manhaul Driver; Concrete Buggies (power operated); Concrete Pump Truck; Dump Trucks, side, end and bottom dumps, including Semi Trucks and Trains or combinations there of: up to and including 10 cu. yds.; Lift Jitneys, Fork Lifts (all sizes in loading, unloading and transporting material on job site); Loader and/or Leverman on Concrete Dry Batch Plant (manually operated); Pilot Car; Pickup Truck; Solo Flat Bed and misc. Body Trucks, 0-10 tons; Truck Tender; Truck Mechanic Tender; Water Wagons (rated capacity) up to 3,000 gallons; Transit Mix and Wet or Dry Mix - 5 cu. yds. and under; Lubrication Man, Fuel Truck Driver, Tireman, Wash Rack, Steam Cleaner or combinations; Team Driver; Slurry Truck Driver or Leverman; Tireman

GROUP 2: Boom Truck/Hydra-lift or Retracting Crane; Challenger; Dumpsters or similar equipment all sizes; Dump Trucks/Articulated Dumps 6 cu to 10 cu.; Flaherty Spreader Driver or Leverman; Lowbed Equipment, Flat Bed Semi-trailer or doubles transporting equipment or wet or dry materials; Lumber Carrier, Driver-Straddle Carrier (used in loading, unloading and transporting of materials on job site); Oil Distributor Driver or Leverman; Transit mix and wet or dry mix trcuks: over 5 cu. yds. and including 7 cu. yds.; Vacuum Trucks; Water truck/Wagons (rated capacity) over 3,000 to 5,000 gallons

GROUP 3: Ammonia Nitrate Distributor Driver; Dump trucks, side, end and bottom dumps, including Semi Trucks and Trains or combinations thereof: over 10 cu. yds. and including 30 cu. yds. includes Articulated Dump Trucks; Self-Propelled Street Sweeper; Transit mix and wet or dry mix truck: over 7 cu yds. and including 11 cu yds.; Truck Mechanic-Welder-Body Repairman; Utility and Clean-up Truck; Water Wagons (rated capacity) over 5,000 to 10,000 gallons

GROUP 4: Asphalt Burner; Dump Trucks, side, end and bottom cumps, including Semi-Trucks and Trains or combinations thereof: over 30 cu. yds. and including 50 cu. yds. includes Articulated Dump Trucks; Fire Guard; Transit Mix and Wet or Dry Mix Trucks, over 11 cu. yds. and including 15 cu. yds.; Water Wagon (rated capacity) over 10,000 gallons to 15,000 gallons

GROUP 5: Composite Crewman; Dump Trucks, side, end and bottom dumps, including Semi Trucks and Trains or combinations thereof: over 50 cu. yds. and including 60 cu. yds. includes Articulated Dump Trucks

GROUP 6: Bulk Cement Spreader w/o Auger; Dry Pre-Batch concrete Mix Trucks; Dump trucks, side, end and bottom dumps, including Semi Trucks and Trains of combinations thereof: over 60 cu. yds. and including 80 cu. yds., and includes Articulated Dump Trucks; Skid Truck

GROUP 7: Dump Trucks, side, end and bottom dumps, including Semi Trucks and Trains or combinations thereof: over 80 cu. yds. and including 100 cu. yds., includes Articulated Dump Trucks; Industrial Lift Truck (mechanical tailgate)

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* TEAM0174-001 06/01/2025

CLALLAM, GRAYS HARBOR, ISLAND, JEFFERSON, KING, KITSAP, LEWIS,

MASON, PACIFIC (North of a straight line made by extending the north boundary line of Wahkiakum County west to the Pacific Ocean), PIERCE, SAN JUAN, SKAGIT, SNOHOMISH, THURSTON AND WHATCOM COUNTIES

	Rates	Fringes
Truck drivers:		
ZONE A:		
GROUP 1:	$ 55.43	27.52
GROUP 2:	$ 54.59	27.52
GROUP 3:	$ 51.78	27.52
GROUP 4:	$ 46.81	27.52
GROUP 5:	$ 54.98	27.52

ZONE B (25-45 miles from center of listed cities*): Add $.70 per hour to Zone A rates.
ZONE C (over 45 miles from centr of listed cities*): Add $1.00 per hour to Zone A rates.

*Zone pay will be calculated from the city center of the following listed cities:

BELLINGHAM	CENTRALIA	RAYMOND	OLYMPIA
EVERETT	SHELTON	ANACORTES	BELLEVUE
SEATTLE	PORT ANGELES	MT. VERNON	KENT
TACOMA	PORT TOWNSEND	ABERDEEN	BREMERTON

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1 - ""A-frame or Hydralift"" trucks and Boom trucks or similar equipment when ""A"" frame or ""Hydralift"" and Boom truck or similar equipment is used; Buggymobile; Bulk Cement Tanker; Dumpsters and similar equipment, Tournorockers, Tournowagon, Tournotrailer, Cat DW series, Terra Cobra, Le Tourneau, Westinghouse, Athye Wagon, Euclid Two and Four-Wheeled power tractor with trailer and similar top-loaded equipment transporting material: Dump Trucks, side, end and bottom dump, including semi-trucks and trains or combinations thereof with 16 yards to 30 yards capacity: Over 30 yards $.15 per hour additional for each 10 yard increment; Explosive Truck (field mix) and similar equipment; Hyster Operators (handling bulk loose aggregates); Lowbed and Heavy Duty Trailer; Road Oil Distributor Driver; Spreader, Flaherty Transit mix used exclusively in heavy construction; Water Wagon and Tank Truck-3,000 gallons and over capacity

GROUP 2 - Bulllifts, or similar equipment used in loading or unloading trucks, transporting materials on job site; Dumpsters, and similar equipment, Tournorockers, Tournowagon, Turnotrailer, Cat. D.W. Series, Terra Cobra, Le Tourneau, Westinghouse, Athye wagon, Euclid two and four-wheeled power tractor with trailer and similar top-loaded equipment transporting material: Dump trucks, side, end and bottom dump, including semi-trucks and trains or combinations thereof with less than 16 yards capacity; Flatbed (Dual Rear Axle); Grease Truck, Fuel Truck, Greaser, Battery Service Man and/or Tire Service Man; Leverman and loader at bunkers and batch plants; Oil tank transport; Scissor truck; Slurry Truck; Sno-Go and similar equipment; Swampers; Straddler Carrier (Ross, Hyster) and similar equipment; Team Driver; Tractor (small, rubber-tired)(when used within Teamster jurisdiction);

Vacuum truck; Water Wagon and Tank trucks-less than 3,000 gallons capacity; Winch Truck; Wrecker, Tow truck and similar equipment

GROUP 3 - Flatbed (single rear axle); Pickup Sweeper; Pickup Truck. (Adjust Group 3 upward by $2.00 per hour for onsite work only)

GROUP 4 - Escort or Pilot Car

GROUP 5 - Mechanic

HAZMAT PROJECTS

Anyone working on a HAZMAT job, where HAZMAT certification is required, shall be compensated as a premium, in addition to the classification working in as follows:
LEVEL C: +$.25 per hour - This level uses an air purifying respirator or additional protective clothing.
LEVEL B: +$.50 per hour - Uses same respirator protection as Level A. Supplied air line is provided in conjunction with a chemical ""splash suit.""
LEVEL A: +$.75 per hour - This level utilizes a fully-encapsulated suit with a self-contained breathing apparatus or a supplied air line.

TEAM0690-004 06/01/2024

ADAMS, ASOTIN, BENTON, CHELAN, COLUMBIA, DOUGLAS, FERRY, FRANKLIN, GARFIELD, GRANT KITTITAS, LINCOLN, OKANOGAN, PEND OREILLE, SPOKANE, STEVENS, WALLA WALLA, WHITMAN AND YAKIMA COUNTIES

	Rates	Fringes
Truck drivers: (AREA 1: SPOKANE ZONE CENTER: Adams, Chelan, Douglas, Ferry, Grant, Kittitas, Lincoln, Okanogan, Pen Oreille, Spokane, Stevens, and Whitman Counties		
AREA 1: LEWISTON ZONE CENTER: Asotin, Columbia, and Garfield Counties		
AREA 2: PASCO ZONE CENTER: Benton, Franklin, Walla Walla and Yakima Counties)		
AREA 1:		
GROUP 1	$ 36.83	20.93
GROUP 2	$ 39.47	20.93
GROUP 3	$ 39.58	20.93
GROUP 4	$ 39.91	20.93
GROUP 5	$ 40.02	20.93
GROUP 6	$ 40.22	20.93
GROUP 7	$ 40.56	20.93
GROUP 8	$ 40.88	20.93
AREA 2:		
GROUP 1	$ 33.83	20.93
GROUP 2	$ 36.47	20.93
GROUP 3	$ 36.58	20.93

GROUP 4	$ 36.91	20.93
GROUP 5	$ 37.02	20.93
GROUP 6	$ 37.22	20.93
GROUP 7	$ 37.56	20.93
GROUP 8	$ 37.88	20.93

Zone Differential (Add to Zone 1 rate: Zone 1 + $2.00)

BASE POINTS: Spokane, Pasco, Lewiston
Zone 1: 0-45 radius miles from the main post office.
Zone 2: Outside 45 radius miles from the main post office

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1: Escort Driver or Pilot Car; Employee Haul; Power Boat Hauling Employees or Material

GROUP 2: Fish Truck; Flat Bed Truck; Fork Lift (3000 lbs. and under); Leverperson (loading trucks at bunkers); Trailer Mounted Hydro Seeder and Mulcher; Seeder & Mulcher; Stationary Fuel Operator; Tractor (small, rubber-tired, pulling trailer or similar equipment)

GROUP 3: Auto Crane (2000 lbs. capacity); Buggy Mobile & Similar; Bulk Cement Tanks & Spreader; Dumptor (6 yds. & under); Flat Bed Truck with Hydraullic System; Fork Lift (3001-16,000 lbs.); Fuel Truck Driver, Steamcleaner & Washer; Power Operated Sweeper; Rubber-tired Tunnel Jumbo; Scissors Truck; Slurry Truck Driver; Straddle Carrier (Ross, Hyster, & similar); Tireperson; Transit Mixers & Truck Hauling Concrete (3 yd. to & including 6 yds.); Trucks, side, end, bottom & articulated end dump (3 yards to and including 6 yds.); Warehouseperson (to include shipping & receiving); Wrecker & Tow Truck

GROUP 4: A-Frame; Burner, Cutter, & Welder; Service Greaser; Trucks, side, end, bottom & articulated end dump (over 6 yards to and including 12 yds.); Truck Mounted Hydro Seeder; Warehouseperson; Water Tank truck (0-8,000 gallons)

GROUP 5: Dumptor (over 6 yds.); Lowboy (50 tons & under); Self- loading Roll Off; Semi-Truck & Trailer; Tractor with Steer Trailer; Transit Mixers and Trucks Hauling Concrete (over 6 yds. to and including 10 yds.); Trucks, side, end, bottom and end dump (over 12 yds. to & including 20 yds.); Truck-Mounted Crane (with load bearing surface either mounted or pulled, up to 14 ton); Vacuum Truck (super sucker, guzzler, etc.)

GROUP 6: Flaherty Spreader Box Driver; Flowboys; Fork Lift (over 16,000 lbs.); Dumps (Semi-end); Mechanic (Field); Semi- end Dumps; Transfer Truck & Trailer; Transit Mixers & Trucks Hauling Concrete (over 10 yds. to & including 20 yds.); Trucks, side, end, bottom and articulated end dump (over 20 yds. to & including 40 yds.); Truck and Pup; Tournarocker, DWs & similar with 2 or more 4 wheel-power tractor with trailer, gallonage or yardage scale, whichever is greater Water Tank Truck (8,001- 14,000 gallons); Lowboy(over 50 tons)

GROUP 7: Oil Distributor Driver; Stringer Truck (cable oeprated trailer); Transit Mixers & Trucks Hauling Concrete (over 20 yds.); Truck, side, end, bottom end dump (over 40 yds. to & including 100 yds.); Truck Mounted Crane (with

load bearing surface either mounted or pulled (16 through 25 tons);

GROUP 8: Prime Movers and Stinger Truck; Trucks, side, end, bottom and articulated end dump (over 100 yds.); Helicopter Pilot Hauling Employees or Materials

Footnote A - Anyone working on a HAZMAT job, where HAZMAT certification is required, shall be compensated as a premium, in additon to the classification working in as follows:

LEVEL C-D: - $.50 PER HOUR (This is the lowest level of protection. This level may use an air purifying respirator or additional protective clothing.

LEVEL A-B: - $1.00 PER HOUR (Uses supplied air is conjunction with a chemical spash suit or fully encapsulated suit with a self-contained breathing apparatus.

Employees shall be paid Hazmat pay in increments of four(4) and eight(8) hours.

NOTE:
Trucks Pulling Equipment Trailers: shall receive $.15/hour over applicable truck rate

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical

order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that

the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

EXHIBIT 5
BID GUARANTEE

A bid guaranty in an amount of five percent (5%) of the total bid based upon the approximate estimate of quantities at the above prices and in a form as indicated below is attached hereto:

CASH in the amount of $_____

CASHIER'S CHECK for $_____dollars made payable to Port Gamble S'Klallam Tribe

CERTIFIED CHECK for $_____ dollars made payable to Port Gamble S'Klallam Tribe

Receipt is hereby acknowledged of addendum(s) no. (s)

_____, _____, _____

DATED this _____ day of _____, 2026

_____
Authorized Signature(s)

_____
Firm Name

_____
Address

_____
Contractor's License No.

_____
Phone Number

Subscribed and sworn to before me this ____ day of _____, 2026.

_____
Notary Public

My Commission expires on the ___ day of _____, _____.

EXHIBIT 6
NOTICE OF AWARD

The Port Gamble S'Klallam Tribe ("Tribe") represented by the undersigned has considered the Bid Proposal submitted by _____ for the construction of _____ in response to its Notice and Instructions to Bidders dated: _____.

The Tribe accepts your bid proposal for the _____dated _____ in the amount of

_____

$_____ . You are hereby notified that your Proposal has been accepted for all Bid schedules.

You are required by this Notice and Instructions to Bidders to furnish the required Contractor's Performance Bond, and Certificate of Insurance and execute the formal contract with the Tribe within 10 business days from the date of your receipt of this notice.

If you fail to execute said contract and to furnish said bond and insurance within ten business days from the date of delivery of this notice, said Tribe will be entitled to consider your Bid as abandoned, to retain as liquidated damages the cash, certified check, cashiers check or bid bond submitted with the bid proposal, and to award the work covered by your Bid to another qualified contractor or to re-advertise the work or otherwise dispose thereof as the Tribe may see fit.

Dated this _____ day of _____, 2026

Port Gamble S'Klallam Tribe

BY: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged

This _____ day of _____, 2025

BY: _____

TITLE: _____

EXHIBIT 7
PORT GAMBLE S'KLALLAM TRIBE
CONSTRUCTION CONTRACT

This agreement is entered into on the ___ day of _____, 2026, between the Port Gamble S'Klallam Tribe, P.O. Box 498, Kingston, WA 98346, a federally recognized Indian TRIBE ("TRIBE") and _____ ("Contractor") for the purpose of Contractor providing all labor, equipment and materials for the construction of infrastructure to support the 39-home Raccoon Town Development within the Port Gamble S'Klallam Indian Reservation ("Project"), under the terms and conditions stated below:

1. Term. The Work commenced approximately _____2026 upon a Notice to proceed issued by TRIBE and will be completed on or before _____ 2027.

2. Compensation. This contract is on a lump sum basis in the not to exceed amount of _____ to be paid in accordance the payment terms in Paragraph 13 below. The maximum amount allowable for this contract is _____. No money exceeding this amount shall be paid to Contractor absent a written change order as provided in Paragraph 26 below or a written consent of the Port Gamble S'Klallam Tribal Council.

3. Taxes and Fees: No allowance has been made in contract price for sales tax. TRIBE will furnish Contractor tax exemption documentation. No allowance has been made in contract price for any fees or permits that Contractor may need to obtain to perform this Work, and no state or local permits are necessary for performing this work on the Port Gamble S'Klallam Indian Reservation.

4. TRIBE's Representative, Project Manager, and Engineer. The TRIBE's representative, authorized to implement the terms and conditions of this agreement is Joe Sparr, Director of the Planning Department, or his successor. The TRIBE's Project Manager, also authorized to implement the terms and conditions of this agreement is Rory McLeod. The TRIBE's Engineer is Pat Fuhrer, MAP, LTD. Notification of any change in the TRIBE's representatives or the TRIBE's Engineer shall be given in writing by the TRIBE to the Contractor.

5. Contractor's Representative Contractor's representative and project manager for this Project is _____. Notification of any change in the Contractor's representative or project manager shall be given in writing by the Contractor to the TRIBE.

6. Scope of Work. Contractor shall provide all necessary labor, equipment and materials to perform the construction of infrastructure to support the 39-home Raccoon Town Development as set forth in the Contractor's Bid Proposal in Exhibit 1, awarded on _____, 2026 and in accordance with the TRIBE's bid plans and specifications provided in Exhibit 2.

7. Contractor's Duty to Examine. Contractor represents that it has examined the site of the Work and has compared the site with the Contract specifications, plans, drawings and other materials related to the Project. Contractor understands and is knowledgeable about the

facilities and any difficulties attending to the execution of this Contract. No allowance will be made by TRIBE on behalf of Contractor by reason of any error or neglect on Contractor's part regarding its site examination.

8. Building and Construction Standards. For the purposes of this contract, TRIBE does not adopt the laws or codes of any other jurisdiction. However, Contractor represents and warrants that the Work will be performed consistent with good construction industry standards. In the case of a conflict the WSDOT Standard Specifications, current edition will govern.

9. Materials/Approved Equals: All new materials shall be used for this project. Unless an item is indicated as "No substitute", special brands, when named, are intended to describe the standard of quality, performance or use desires. Equal items will be considered by TRIBE, provided that the Contractor has specified the substitute brand and model and provided all descriptive literature, independent test results, product samples, local servicing and part availability, at the time of contract execution. The decision of TRIBE as to what items are equal shall be final and conclusive. If TRIBE selects to use a brand that the Contractor represents as an equal, TRIBE's acceptance of the item is conditioned on TRIBE's inspection and testing after receipt. If TRIBE, in its sole judgment, determines the item is not an equal, the items shall be returned at Contractor's expense and Contractor shall install the item originally specified.

10. Performance Bond and Insurance. A 100% performance bond is required for this work.

11. Insurance. Contractor shall not commence work under this Contract until all required insurance has been obtained and approved by TRIBE. Contractor shall maintain all required insurance at all times any work, including guarantee work, is being performed by Contractor. The following insurance is required under this Agreement:

a. Workers' Compensation Insurance. . Contractor shall, during the life of this Contract, maintain and fully comply with all terms and conditions of the laws of the State of Washington pertaining to Workers' Compensation, together with any and all amendments and supplements thereto and any and all regulations promulgated thereunder. For purposes of this contract the TRIBE adopts the Washington State worker compensation laws (Title 51 RCW), but only to the limited extent that entitles a worker to receive benefits from the state for injuries a worker incurs while performing the subject work. TRIBE is not adopting any provisions of the said laws that could be interpreted to impose liability on TRIBE, and the TRIBE is not waiving sovereign immunity in this regard.

b. Public Liability and Property Damage Insurance. Contractor shall procure and maintain during the life of this Contract, a policy of comprehensive general liability insurance, with an insurance carrier authorized to do business in the State of Washington. The policy shall protect Contractor and TRIBE from liability imposed by law for damages suffered by any persons arising out of or resulting from acts or omissions in the performance of this Contract: (1) for bodily injury or death resulting from accidents or any act or omission by Contractor in the performance of this Contract, and (2) for injury to or destruction of any property, including TRIBE property, and including loss of use. The insurance policy shall include coverage for claims for damages because of bodily injury or death or property damage arising out of the

ownership, maintenance or use of any motor vehicle, including non-owned vehicles. TRIBE shall be designated in the insurance policy as a primary additional named insured and shall be provided thirty (30) calendar days written notice of cancellation, non-renewal, or material change in the coverage provided. The insurance shall be on an "occurrence basis" and shall be on a Comprehensive General Liability form with coverage to include Blanket Contractor, Broad Form Property Damage, Personal Injury, Protective Liability and Employers Liability. Limits shall be at $1,000,000.00 per occurrence, $2,000,000 aggregate. TRIBE's insurance shall be excess to any other collectible insurance. Contractor shall furnish evidence of the amount of any deductible or self-insured retention under the policy. Contractor shall be solely responsible to pay the amount of any deductible or self-insured retention towards the claim under the policy. TRIBE may require Contractor to furnish evidence of its ability to pay the amount of any deductible or self-insurance retention.

c. Contractor has the sole obligation to protect and insure itself from loss of its tools and equipment while at the work site.

12. Proof of Insurance. Contractor shall furnish to TRIBE a Certificate of Insurance coverage complying with Paragraph 11 above. An up-to-date certificate of insurance must be on file with TRIBE's Representative throughout the life of the Contract. TRIBE may, at any time, require the Contractor to furnish and file with TRIBE a certified true copy of any insurance policy together with a letter from the insurance carrier verifying that the premium has been paid for the period indicated. Contractor's failure to obtain or maintain the required insurance shall be grounds for immediate termination of this Contract. Nothing contained in this paragraph shall be construed as limiting the extent of Contractor' liability under this Contract.

13. Payment Terms TRIBE shall pay Contractor on the basis of monthly progress payment requests to the TRIBE's Project Manager by the tenth ($10^{th)}$ calendar day of each month. Each progress payment request shall state the date, identify this Project and include a brief description of the services performed in the preceding month. TRIBE will pay up to ninety percent (90%) of the actual work completed as identified in the request and approved by the TRIBE's Representative, with payment to be made within seven (7) calendar days of TRIBE approving the request. As to any part of the request TRIBE's Representative disapproves, TRIBE will request clarification or additional supporting documentation from Contactor and the parties will make a good faith effort to reconcile their differences. Upon resolution of disputed request amounts, any amounts found due shall be paid within seven (7) calendar days of the reconciliation. Progress payment requests received after the tenth (10^{th}) calendar day of the month may be processed by TRIBE with the following month's invoice. Payments made by TRIBE do not constitute a waiver of any claims by TRIBE against Contractor concerning or arising out of this Agreement. Contractor's acceptance of payment for particular services performed under the Agreement constitutes a waiver of all claims by Contractor for that portion of the Agreement. Acceptance by Contractor of the final payment under this Agreement constitutes a waiver of all claims under the Agreement. The making of any progress or final payment does not relieve Contractor from fully complying with the Contract.

14. Final Payment. Final payment of the retained ten percent (10%) of the Contract price will be approved and made immediately after TRIBE issues its letter of final acceptance of the

work. Before the final payment is released to Contractor, Contractor must provide to TRIBE:

a. A General Release of all claims to TRIBE, using an agreed upon form;

b. A General Release of all claims from all material suppliers and from any other person or entity who purports to make a claim against any monies retained by TRIBE; and

c. A letter from the State of Washington Department of Labor and Industries verifying that all industrial insurance and medical aid premiums have been paid.

15. Inspection of Work. All work performed pursuant to this contract shall be subject to inspection by TRIBE's Project Manager and Engineer. The TRIBE Project Manager and Engineer shall have access to Contractor's work where ever it is in progress or being performed and Contractor shall provide reasonable access for inspection at all times. No inspection by TRIBE shall relieve Contractor of its responsibility to perform the work correctly or utilizing competent labor and new materials in strict accordance with the Contract specifications. All materials or work approved and later found to be defective by TRIBE shall be replaced without cost to TRIBE.

16. Inspector's Authority. TRIBE Representative, Project Manager and Engineer shall have the power to reject materials or workmanship that does not fulfill the requirements of the Contract specifications. Where Contractor disputes the rejection, Contractor may appeal to the TRIBE's Executive Director, whose decision shall be final.

17. Equitable Deduction. If TRIBE deems it expedient not to correct work that fails to meet contract specifications, an equitable deduction from the Contract price shall be made.

18. Testing. Testing shall be performed on the water system and sewer system in accordance with construction codes and standards that are applicable to this type of work if such work is performed off an Indian Reservation in Washington state.

19. Contractor's License. Contractor represents that it is a licensed contractor with the Washington State Department of Labor and Industries, license number _____.

20. Independent Contractor. Contractor is an independent contractor, it being understood that TRIBE is interested solely in the results of this contract and is relying upon Contractor's own judgment and experience to select the means for its performance of this contract. Contractor and contractor's employees are not and shall not, under any circumstances, be deemed to be an employees of the TRIBE nor entitled to any benefits provided to TRIBE employees. Contractor understands it has no authority whatsoever to negotiate or enter into contracts for or on behalf of TRIBE.

21. Contractor's Employees. Contractor shall provide a competent supervisor to supervise Contractor's employees on the Project. Contractor shall employ only competent, skilled, faithful and orderly persons to perform work under this Contract.

22. Drug Free Workplace. TRIBE maintains Drug Free workplace requirements, policies and procedures applicable to all persons who provide services to the TRIBE. Contractor who contracts with TRIBE must comply with the Port Gamble S'Klallam TRIBE's Drug Free workplace requirements. A Contractor who maintains its own drug testing policies and who can assure TRIBE that it maintains a drug free workplace may be exempt from complying with the Tribal drug testing procedures. Contractor hereby warrants that any and all personnel performing work pursuant to this Contract will be drug and alcohol free and represents that it maintains a drug free workplace. Based on these representations, which the parties acknowledge TRIBE is expressly relying upon, TRIBE hereby waives the requirement that Contractor comply with TRIBE's drug testing policies and procedures. TRIBE reserves the right to immediately test at the Port Gamble S'Klallam TRIBE Wellness Clinic, at Contractor's cost, any of Contractor's employees or agent who, while working on the Port Gamble S'Klallam Indian Reservation, appears to be affected by or under the influence of drugs and/or alcohol. A breach of any portion of this paragraph is hereby deemed a material breach and is cause for immediate termination of this Contract.

23. Safety. Contractor shall, at all times, exercise adequate precautions for the safety of all persons, including its employees, in the performance of this Contract and shall comply with applicable safety laws and regulations. Contractor is solely responsible to furnish safety equipment to its workers. TRIBE's Representative, Project Manager, or Engineer may, but does not have any duty to, advise Contractor of a safety violation. Contractor is solely responsible to make necessary corrections of all safety violations. Failure to correct a safety violation is a breach of this Contract and is grounds for TRIBE to order Contractor to cease work until the unsafe condition is corrected. Time and wages lost due to such safety shutdowns shall not relieve Contractor of any provisions of this Contract and shall be at Contractor's sole cost and expense.

24. Cleaning Up of Work Site. Contactor shall at all times, at its sole expense, keep the work site from accumulation of waste materials and debris caused by the work. At the completion of its daily work, Contractor shall remove all of its waste materials from and about the site and all of its equipment and surplus materials. In the case of a dispute, TRIBE may remove the debris and charge such costs to Contractor. TRIBE will not pay for any material that is deposited at a place other than the storage area approved by TRIBE.

25. Changes in Plans or Quantities. TRIBE, without invalidating this Contract, may by written direction order extra work or make reasonable changes by altering, adding to or deducting from the materials, work or labor and the Contract sum shall be adjusted accordingly. All added work and labor shall be executed under the conditions of the original Contract except that any claim for extension of time caused thereby shall only be adjusted at the time of ordering such change. When work under the Contract is deducted, reduced or eliminated, no payment shall be made to Contractor for anticipated profits on such work.

26. Extra Work. Any claim or order for extra materials, work and labor made necessary by TRIBE's written request for alterations or additions to the Contract or by reason that no price is provided in the Contract, shall not be valid unless the parties have agreed on a price and such price is documented in a written change order executed prior to Contractor commencing such

extra work. If the total amount of change orders will exceed ten percent of the total contract price, then Tribal Council approval must be obtained before such additional amount exceeding ten percent becomes an obligation of the TRIBE.

27. Extension of Time to Perform. With the written approval of the TRIBE Representative, Contractor may be granted additional time to complete the work required under this Contract if, in the TRIBE Representative's opinion, the additional time requested arises from an unavoidable delay. Unavoidable delay in the performance of work shall mean and include only causes beyond the control of Contractor and which Contractor could not have avoided by the exercise of due care, prudence, foresight and diligence. Delays caused by a person other than Contractor will be considered an unavoidable delay insofar as the delay necessarily interferes with the Contractor's completion of the work and such delays are not part of this Contract.

28. Unavoidable Delays. Contractor shall be provided an extension of time for any work that is delayed through no cause of Contractor but due to poor weather conditions to properly perform the work. Contractor shall notify TRIBE's Representative in writing within 10 calendar days of any such delay and shall spell out the weather conditions that precluded performing the work.

29. Failure to Timely Complete Work. Should the completion of work required under the Contract be delayed beyond the expiration of the period set in the Contract for completion or beyond any time extension which had been allowed during the course of the Contract, in addition to its other remedies, there shall be deducted from the total Contract price of work, for each calendar day by which such completion was delayed, the sum of $250 per day. Such sum shall not be considered a penalty but the parties understand and acknowledge that such sum is deemed to be liquidated damages which TRIBE will suffer by reason of the Contractor's failure to timely perform the Contract. TRIBE may retain any money due or which becomes due to Contractor to cover its liquidated damages.

30. Assumption of Risk. Contractor has inspected the site of the Work and on its behalf and on behalf of its employees assumes all risks associated with working under these conditions and shall hold TRIBE harmless from all risk of loss, damage, liability, claim and lawsuits resulting from working under these site conditions.

31. Compliance with Laws. Contractor shall comply with all applicable laws and, before commencing work, shall obtain all required licenses and permits necessary to perform this agreement. Contractor is responsible to file all required tax returns and notices. When working on the Port Gamble S'Klallam Indian Reservation, Contractor and it's Sub-Contractors shall be subject to and comply with all Tribal laws and the jurisdiction of the Tribal Court. Contractor shall indemnify and hold TRIBE harmless from any and all costs, liabilities, or obligations by reason of the failure of Contractor to comply with any applicable law.

32. Equal Employment/Indian Preference. Contractor shall not discriminate against any employee or applicant for employment on the basis of race, color, ethnicity, religion, age, national origin, gender or disability, with regard to employment, promotion, demotion, transfer, recruitment, advertising, lay off, termination, rates of pay or other forms of compensation or selection for training. Non-discrimination requirements notwithstanding, in accordance with

Federal Indian preference laws, Contractor shall, in good faith, provide preference and opportunities for training and employment to Native Americans, including Port Gamble S'Klallam Tribal members.

33. Assignment/Subcontract of Contract. Contractor shall not assign or subcontract any work under this contract.

34. Indemnity. Contractor acknowledges that it is solely responsible for the safety of all persons and property in the performance of this Contract. Contractor assumes the risk of all damages, loss, costs, penalties and expenses and agrees to defend, indemnify and hold harmless TRIBE and its officials, employees, retained engineers and architects, against any and all loss, damage, liability or costs which may be sustained by TRIBE and/or any of the aforementioned parties, on a account of any claim, legal action or alternative dispute resolution for the injury or death of any person or damage to property arising out of and in connection with or incident to Contractor's performance of the Contract

35. Place of Contract/Consensual Contract. Contractor acknowledges and understands that the TRIBE is a federally recognized, sovereign Indian TRIBE. Contractor represents and states here that it voluntarily and knowingly enters into this consensual relationship with TRIBE. The negotiation and execution of this agreement is deemed by the parties to have occurred within the Port Gamble S'Klallam Indian Reservation. All work identified in this Agreement will be performed on the Port Gamble S'Klallam Indian Reservation.

36. Dispute Resolution/Choice of Law.

a. Purpose of Dispute Resolution Provisions. The parties intend to resolve their disputes through direct discussion and, if such is not possible, then through the dispute resolution framework established below. All stated time frames for resolving disputes may be lengthened by mutual consent.

b. Direct Discussions. To initiate dispute resolution under this Section, the complaining party will first submit a written complaint letter to the representative of the party (as identified in sections 4 and 4 of this Agreement) against whom a dispute is lodged, stating therein the nature of the dispute, the requested resolution, and the factual basis supporting the requested resolution. The responding party will, within ten (10) working days of receiving the complaint letter, provide a written response, stating its agreement or disagreement with the nature of the dispute and the requested resolution. If the responding party disagrees with the complaint or the proposed resolution, the written response must provide at least one alternate resolution and the factual basis supporting such resolution(s). Thereafter, the lead representatives of each party will, for fifteen (15) working days, make a good faith attempt to resolve the dispute through one or more direct discussions. If no mutually acceptable resolution is reached, the lead representatives will prepare a joint statement within 5 business days, which includes a chronology, a synopsis of the discussions which took place and the last stated positions of each party.

c. Mediation. If direct discussions between the parties fail to resolve the dispute, any participating party may, within five business days of completing the direct discussion process, make a written request for mediation to be conducted in Seattle, Washington or at another place as the parties may agree in writing. If all participating parties agree to engage in mediation, the parties shall seek a mutually acceptable mediator. If the parties cannot reach agreement on the selection of the mediator within fifteen (15) working days of the date the written mediation request letter was received by the other party or parties, the mediation will be administered by J.A.M.S., Seattle, Washington Office using a J.A.M.S. mediator and protocol. Enforcement of a mediation agreement reached shall be the same as enforcement of an arbitration decision as set forth herein. If a party objects to proceeding with mediation, then mediation may be bypassed, and the dispute resolved pursuant to arbitration as set forth herein.

d. Binding Arbitration in the Event of Unsuccessful Direct Discussions/Mediation. Should direct discussions prove unsuccessful in resolving the dispute, and either mediation is not requested, is bypassed, or is also unsuccessful, either the complaining or responding party may make a written demand for arbitration before a single arbitrator in Seattle, Washington or at another place as the parties may agree in writing. If the parties cannot reach agreement on the selection of the single arbitrator within fifteen (15) working days of the date the written demand letter was received, the arbitration will be administered by J.A.M.S., Seattle, Washington Office using a J.A.M.S. arbitrator. Any arbitrator selected must have a fundamental knowledge of and at least five (5) years' legal experience contract law and a working knowledge of Indian law. The arbitrator shall have the power to establish a schedule for the hearing which hearing shall be limited to no more than 2 consecutive business days to be equally divided between the parties, including preliminary discovery to the extent he or she deems necessary and proper under the circumstances and there shall not be more than 2 depositions allowed per party, to make reasonable rules and issue orders necessary for a fair and efficient conduct of the hearing, and to conduct the hearing and administer oaths and affirmations. The arbitrator's decision shall be accompanied by an explanation as to the basis for the award. Each party will pay for its own attorneys' fees. The substantially prevailing party shall be entitled to reimbursement from the other party of all moneys it paid to the arbitrator or J.A.M.S. related to the arbitration proceeding. All arbitration awards shall be binding upon the parties and non-appealable.

e. Enforcement of Arbitration Award. Upon the issuance of an arbitration award or mediation agreement, the prevailing party may seek the entry of judgment upon the award in any court of competent jurisdiction which for purposes of a party's enforcement against TRIBE means the Tribal Court, and for TRIBE's enforcement against Contractor means federal court based upon diversity jurisdiction or other jurisdiction. If federal court jurisdiction is not available, Contractor agrees to submit to Kitsap County Superior Court in Washington for enforcement of the award against Contractor. The court of competent jurisdiction shall enforce the decision of the arbitrator and shall not modify, correct, alter or vacate said decision in any way unless the court finds after notice and hearing upon application of a party to the arbitration, one or more of the following: (1) the arbitration decision was procured by corruption, fraud or undue means, (2) there was evident corruption in the arbitrator, or (3) the arbitrator was guilty of the specific misconduct of

refusing to hear evidence pertinent and material to the controversy which prejudiced the rights of a party. No court shall have jurisdiction to interfere in any way with any pending arbitration. No party may seek from such court any provisional remedy pending appointment of the arbitrator or the arbitrator's rendition of the award. If the court vacates the arbitration decision, then the court shall direct a rehearing either before the same arbitrator or before a new arbitrator to be chosen in the manner provided in this section.

f. Limited Waiver of Sovereign Immunity by the Port Gamble S'Klallam TRIBE. Except for the limited waiver of sovereign immunity provided in this Dispute Resolution Addendum, nothing in this Agreement shall be construed as a general or specific waiver of the TRIBE's sovereign immunity, which immunities are expressly asserted. The Port Gamble S'Klallam TRIBE hereby grants to Contractor a limited waiver of sovereign immunity solely for the purpose of dispute resolution as provided in this Addendum and such waiver shall not be extended to any other person, agency or entity ("Limited Waiver"). This Limited Waiver applies only to contractual claims arising out of or under this agreement and does not apply to any non-contractual claims or to claims under any other agreement between the TRIBE and Contractor. Furthermore, nothing contained in this Limited Waiver shall be construed to create a contractual relationship with or a cause of action in favor of any third party against the TRIBE. This Limited Waiver applies only to the enforcement of a mediation agreement or an arbitration award against the TRIBE, provided such mediation agreement or arbitration award has been secured in accordance with the provisions of this Agreement. Any monetary award by any arbitrator or any mediation agreement shall be limited to not exceed the total monetary amount under this Agreement. This limited waiver of sovereign immunity is not, and shall not be deemed to be, a consent by the TRIBE to the levy of any judgment, lien or attachment on any appropriations received from any of the TRIBE's governmental agencies and/or enterprises.

g. No Requirement of Exhaustion of Tribal Court Remedies. The parties acknowledge that under the limited waiver of sovereign immunity provided for herein, the assumption of jurisdiction by any arbitrator or court of competent jurisdiction shall not be delayed or curtailed by any doctrine requiring exhaustion of Tribal court remedies.

h. No Consent to State Court For Any Purpose. The TRIBE expressly states and the Contractor understands and acknowledges that the TRIBE does not consent to the jurisdiction of the Washington or any other state court for any purpose except if necessary to enforce an award against Contractor as set forth above.

37. Termination of Contract for Cause. If the Contractor files for bankruptcy, a general assignment for the benefit of creditors or a receiver appointed on account of Contractor's insolvency, or if the work is not being properly and diligently performed, TRIBE may serve written notice upon the Contractor and the Surety which executed the performance bond, of TRIBE's intent to terminate the Contract. Such notice will contain the general reasons for termination of the Contract and a demand that the Contractor cure of any alleged breach of contract to the satisfaction of TRIBE within ten (10) calendar days of receiving the Notice of Termination for Cause. In the event the Contractor is terminated for cause, any moneys then due but unpaid to the Contractor shall be set aside until the Project is complete. If the cost to

TRIBE to complete the contract is greater than the sums left to be paid the Contractor, TRIBE shall set off such sums against the costs to complete the Contact and Contractor shall pay TRIBE for the additional costs TRIBE incurred to complete the Contact. If the cost to complete the contract is less than the sum then owing to the Contractor, TRIBE shall release the unpaid sum to the Contractor upon closing of the Contract.

38. Termination for Convenience. Upon providing seven (7) calendar days' written notice, TRIBE may terminate this contract for its convenience. If the contract is terminated by TRIBE, Contractor will be entitled to receive payment, at a pro rata percent of the amount stated in paragraph 2 above, for all work completed or partially completed to the satisfaction of TRIBE prior to the termination date. Contractor shall not be entitled to any other compensation including anticipated profit.

39. Records. For three years after final payment, Contractor shall maintain for inspection by TRIBE all books, records, documents, and other evidence of Contractor's costs and expenses under this agreement, to the extent and in such detail as will properly reflect all costs which Contactor claimed as due under this agreement.

40. Notices. All notices required to be given in writing in this Contract shall be deemed to have been given on the date of delivery if: (1) sent by electronic mail that is confirmed by a written hard copy of the notice which is sent by first class, registered or certified mail, or (2) if personally delivered to the person, and on the third day after mailing if mailed to the person by first class mail, registered or certified, postage prepaid and addressed to TRIBE or to the address for each party stated above or another address designated in a notice given in the same manner.

41. TRIBE Right to Use Facilities Prior to Final Acceptance. TRIBE reserves the right to use the facilities prior to final acceptance under this Contract and such use shall not be construed as a waiver or relinquishment of any rights that TRIBE has under this Contract.

42. Guarantee. Contractor shall remedy any defects in the work and pay for any damages to other work resulting from the defects that appear within one year of the date of final acceptance of the work. Neither TRIBE's final payment nor partial or entire occupancy of the premises by TRIBE shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. TRIBE will exercise good faith efforts to give notice of observed defects with reasonable promptness. If a defect has been discovered before payment is required under the terms of this Contract, TRIBE has the right and may withhold payment until the defect is cured. In the case of a failure of any part of the work, materials, labor and equipment furnished by the Contractor, the Contractor shall make all corrections and repairs as may be necessary to fully meet all of the specification and requirements of the Contract. Such corrections and repairs shall be made at Contractor's sole cost and expense without delay and with the least inconvenience to TRIBE. Rejected material and equipment shall be removed from TRIBE's property by and at the expense of Contractor. It is understood and acknowledged that the guarantee period set forth in this paragraph does not bar TRIBE from pursuing negligence or breach of contract claim after the guarantee period expires,

however, Contractor and TRIBE hereby agree to a three year time limit on such claims that begin on the date TRIBE finally accepts Contractor's work. The Contract guarantee period shall be suspended from the time a significant defect is first documented by TRIBE until the work is corrected or equipment is repaired or replaced by Contractor and accepted by TRIBE. In addition, in the event that less than ninety (90) calendar days remain on the guarantee after any such recalculation, the guarantee period shall be extended to allow for the time needed to complete the work or replace or replace the equipment and have such work or equipment accepted by TRIBE.

43. Public Relations. Contractor agrees that its personnel and equipment shall at all times present a neat appearance. All work shall be done; all contacts with the public and all complaints shall be handled with regard for the TRIBE's public relations. Contractor agrees to notify the TRIBE of any complaints of any nature received from property owners, the public in general or public authorities and that all complaints shall receive immediate attention. Any such complaints shall be reported and approved by the TRIBE before any action is taken by the Contractor in connection with such complaints

44. No Collusion, Improper Payments or Gifts. All state and federal laws relating to prohibiting kick backs and/or collusion related to contracting are adopted herein by this reference. By signing this agreement Contractor represents, warrants and certifies that in submitting its proposal, bidding, negotiating, and/or executing or implementing this Contract, that Contractor has not participated and agrees not to participate in any agreement, arrangement or collusion with any other person, entity, bidder, vendor or any subcontractor pertaining to receiving or giving certain benefits to Contractor or to any of these aforesaid parties, or made any promises of future benefit to anyone, or made any payment or gift to any TRIBAL agent, representative, employee or official. In addition, Contractor shall not make any payments or gifts to any TRIBAL official, employee or any Tribal member or Tribal agent as a result of or related to Contractor performing work pursuant to this Contact. Violation of this paragraph shall be grounds for immediate termination of this Contract for cause and barring the Contractor from future TRIBE contracts. In addition Contractor is contractually obligated to reimburse TRIBE for any extra cost or expense TRIBE or TRIBE’s members incur as a result of violation of this provision or violation of any state or federal law that prohibits these types of activities.

45. No Waiver. Nothing whatsoever in this agreement constitutes or shall be construed as a waiver of the Port Gamble S’Klallam TRIBE's sovereign immunity.

46. Severability. If any provision of this Contract or the application of this Contract to any person or circumstance is determined to be invalid or unenforceable, the remainder of the Contract, or its application to other persons or circumstances, shall not be affected thereby and all remaining portions of the Contract shall be valid and enforceable.

47. Entire Agreement. This agreement represents the entire and complete agreement between the parties and supersedes all prior negotiations, representations or agreements, either written or oral, and may be amended or modified only in writing signed by both parties. This agreement shall not be valid unless each and every TRIBE signature designated below is affixed.

Signed and executed this ____ day of ____ 2026, by:

CONTRACTOR

_____

By: _____

WA Contractors License No.:
_____

Fed. Tax ID No: _____

PORT GAMBLE S'KLALLAM TRIBE

_____

_____
Amber Caldera, Tribal Council Chairwoman

Attested to by:

_____
, Secretary