West Sound Partners for Ecosystem Recovery

619 Division Street, MS-35
Port Orchard, WA 98366
Cell 360-509-9941
West Sound Partners for Ecosystem Recovery

WSPER TAG
Meeting Agenda
January 18, 2022
9:30 am to 12:30 pm

Virtual Zoom Link:
https://us06web.zoom.us/j/88056112367?pwd=Sk5sUTZHTlR3TnVWRDNzcjRQWVNUdz09
Meeting ID: 880 5611 2367 Phone: +1 253 215 8782 Passcode: 828872
One tap mobile: +12532158782,,88056112367#,,,,*828872#

Objectives:

- Evaluate letters of intent for alignment with local recovery strategies and plans
- Decide which projects progress to full application (advise project sponsors by Jan 21)

Time	Topic	Lead	Materials
9:30	Welcome and Introductions • Introductions • Review meeting objectives and agenda • Review November Working Group meeting notes • TAG Chair nomination	Chair Renee	Agenda & November meeting notes
9:40	Overview of grant round schedule	Renee	Grant Round Schedule
9:45	Review letters of intent, maps, and photos. Project sponsors have 6-8 minutes each + Q&A. PPT presentation not required. Order follows meeting packet.	Chair & Project Sponsors	Meeting packet
11:00	Break		
11:15	Continue reviewing letters of intent; decide which should move forward with a full application.	Chair & Project Sponsors	Meeting packet
12:15	Discuss projects with potential Estuary Salmon Recovery Program (ESRP) and Brian Abbot Fish Barrier Removal Board (FBRB) funding support	Project Sponsors	
12:25	Action Items and next steps	Chair/New Chair/ Renee	
12:30	Adjourn		

Project	Which Grant	Total Cost	Grant Request	Match
DeMolay Sandspit Bulkhead Removal Final Design & Implementation	PSAR	$694,290.00	$506,792.00	$187,498.00
Finn Creek Estuary Restoration Project	SRFB, PSAR	$647,000.00	$506,792.00	$187,498.00
Cooper Creek Culvert Restoration	SRFB, PSAR	$933,205.00	$793,224.23	$139,980.77
Harper Estuary Barrier Correction (Harper Estuary Bridge)	PSAR, FBRB	$5,825,131	$5,825,131	0
Rose Point Embayment Restoration	SRFB, PSAR	$500,000	$418,375	$81,625
McNeil Island Estuary Restoration - Bodley Creek & Floyds Cove	TBD	$1,700,000	$495,250	$1,204,750
North Creek/Donkey Creek Salmon Habitat Protection	SRFB, PSAR	$12,000,000	$6,000,000	$6,000,000
North Creek/Donkey Creek Culvert Replacement Project at Harborview	SRFB, PSAR, BAFBRB, PMEP	$10,000,000	$8,000,000	$2,000,000
Crescent Creek Culvert Replacement Project at Vernhardson Street	SRFB, PSAR	$9,000,000	$5,000,000	$4,000,000
Crabapple/Carpenter Creek Estuary Protection	SRFB, PSAR	$1,982,000	$482,000	$1,500,000
Salmonberry Creek Protection	SRFB, PSAR	$750,000	$467,000	$283,000
Washington Conservation Corps Crew for Riparian Restoration Projects	SRFB, PSAR	$230,000	$200,000	$30,000
Long Lake Predation Assessment	PSAR	$88,500	$75,000	$13,500
Long Lake Residential Riparian Enhancement	SRFB, PSAR	$77,000	$65,000	$12,000
Salmonberry Creek Outlet Stream Restoration Design	SRFB, PSAR	$80,000	$70,000	$10,000
Long Lake County Park Tributary Restoration Design	SRFB, PSAR	$80,000	$68,000	$12,000
Long Lake Tributary Restoration Design	SRFB, PSAR	$80,000	$68,000	$12,000
Salmonberry Creek Restoration Design	SRFB, PSAR	$80,000	$68,000	$12,000
Skunk Bay Armor Removal	SRFB	$50,000	$42,500	$7,500

Fletcher Bay Road Fish Passage Restoration	SRFB, PSAR	$1,500,000	$500,000	$1,000,000
Lower Manzanita Creek Restoration Design Project	SRFB, PSAR	$45,000.00	$35,000.00	$10,000.00
Barnabee Final Design and Stream Restoration Project	SRFB, PSAR	$375,109.00	$200,000.00	$175,109.00
Rekow Stream and Riparian Restoration	SRFB, PSAR	$34,450.00	$28,950.00	$5,500
		$46,751,685.00	$29,915,014.23	$16,883,960.77

November2021 WSPER Meeting Notes

2022 Grant Round PSAR and SRFB totaling ~$1,000,000

- SRFB money available July 2022; PSAR available July 2023 after legislative session,
- projects approved for funding that are below the line may be eligible for funding if funds become available.
- Call for letters of intent December 2021.
- January 2022 TAG meeting to review letters of intent; ensure they meet criteria.
- March 2022 score projects (scoring criteria is all on our website or will be).

FBRB Grants

- Due January 13.
- Available July 2023.
- Marty is applying for Schoolhouse Creek. Has designs and is ready for construction.
- Culvert removal at Bjorgen Creek is FBRB.

Legacy Salmon Habitat Project List

- Subcommittee meeting yielded 18 projects.
- Core list from LE needs to be fleshed out.

Priority Watershed Discussion

- LE should discuss how FBRB and WDFW can work together and look at watersheds that span multiple jurisdictions.
- Bjorgen is high priority because all other barriers have been replaced and this is the lowest one in the system.
- Curley, Purdy, Minter, and Huge Creeks (Marty)
- ECB Meeting
- How to better integrate salmon recovery into planning.
- Prioritize projects – should be part of programming at public works.
- Integrate salmon and ecosystem recovery priorities into Public Works and Stormwater process.

Executive Committee

- Wants to work on integration issue. There is a legacy issue of disconnect between our LE processes and priorities in various public works departments.
- Could integrate into comprehensive planning county wide.
- Need to work on additional capacity with fish passage with money coming our way soon.

AD Hoc Committee needs

- Interest in having a simple culvert list for each major watershed and rank them regardless of ownership. Marty and Zack volunteered to help assemble a list and work in a temporary subgroup.

Attendees
Zack Holt

Tom Ostrom
Brenda Padgham
Steve Todd
Doris Small (McNeal)
Island Aaron Bartleson
Christina Kereki
Deb Rudnick
Christopner Dwight DFW
Erik Steffens
Rebecca Hollender
Jamie Glasgow
Jasmin Ka
Kathy Peters
Darric Lowery (DFW)
Marty Ereth
Sarah Wilson
Scott Steltzner
Monica Shoemaker (DNR)
Steve Todd
Juliana Tadano

2022 Salmon Recovery Grant Opportunity in West Sound

West Sound Partners for Ecosystem Recovery (WSPER) is announcing a call for salmon habitat projects. WSPER coordinates the solicitation and ranking of salmon habitat projects as the lead entity for east Water Resources Inventory Area (WRIA) 15. Interested project sponsors must submit a Letter of Intent to the lead entity by **January 10, 2022.** **Submit your Letter of Intent here.**

Funding Information

Funding is available for habitat protection or restoration projects aligned with the recovery strategies for local salmon and steelhead populations. WSPER is soliciting projects for review by the Salmon Recovery Funding Board (SRFB). Funding for approved projects will be available after the SRFB meeting in September 2022.

Eligible Applicants

- Cities
- Counties
- Native American Tribes
- Conservation districts
- Non-profit organizations
- Regional fisheries enhancement groups
- Special purpose districts
- Private landowners
- State agencies (with local partner)

Eligible Projects

- Acquisition
- Restoration
- Planning (Designs, Assessments and Inventories)
- Combination projects (Acquisition and Restoration, Acquisition and Planning)

Submission Information

Interested project applicants must submit a Letter of Intent form by **January 10, 2022**. The WSPER technical advisory group will screen all Letters of Intent to determine consistency with local salmon recovery strategies and priorities. Project sponsors will be notified by January 21, 2022 if their project is consistent with local salmon recovery strategies and should move forward in the 2022 grant cycle. A project site visit is required and will be scheduled in Mid-March of 2022.

Interested applicants with projects not identified on the Planned Projects Forecast List 2021 and 2022 are encouraged to contact Renee Johnson, Coordinator, to get more information about salmon recovery strategies, watershed recovery plans, and the application process. Call 360-509-9941 or email rkjohnso@co.kitsap.wa.us.

For information about West Sound salmon recovery, see WSPER Recovery Plans and Strategies.
For information about Salmon Recovery Grants see RCO Website.

Criteria for Scoring *(Criteria are meant to be a guide for scoring, not finite)*

Project implements a recovery strategy and/or on the Planned Project Forecast List 2021/2022

- If yes, then rank
- If no, then not eligible

Scope and cost/budget of project (10 points)

- Is scope of project appropriate? Could the project be phased?
- Is the budget consistent with expected benefits and with projects of similar scale?

Benefits to fish (20 points)

- Restoration project addresses high priority habitat, watershed processes, or nearshore processes that will have a demonstrable effect on salmon productivity
- Restoration and/or acquisition project targets high priority watershed (refugia with source populations and relatively high abundance and productivity)
- Acquisition project targets high habitat function, low site disturbance, and intact processes
- Acquisition project is necessary to carryout high priority restoration project
- Tier 1 projects per Nearshore integration and synthesis tool

Certainty of success (15 points)

- Experience of sponsor in implementing similar projects
- Restoration approach is well established with predictable outcomes
- Restoration project restores ecosystem processes versus simply making structural modifications
- Stewardship/maintenance for restoration and/or acquisition projects
    - Stewardship plan? Actions self-sustaining or low maintenance? Funds for monitoring/stewardship?
- Benefits realized immediately versus long term and are independent of other restoration/acquisition projects
- Benefits of acquisition not dependent on future restoration actions

2022 Salmon Recovery Grant Round Schedule

Date	Action	Description
November 9	TAG meeting	Discuss approach, set call for projects
December 1	Release call for projects	Call for projects, scoring criteria, & Letter of Intent
December 14	Working Group meeting	
January 10	Letters of Intent Due	
January 18	TAG meeting	Review and screen Letters of Intent
January 21	Inform sponsors	Sponsors informed about TAG determination; Project numbers created in PRSIM
Jan 21 – March 1	Project development	Sponsors develop project applications in PRISM
February 8	Working Group Meeting	
March 17, 18	Site visits (TBD if in person)	Site visit with SRFB review panel and TAG
March 22	TAG meeting	Review projects and provide comments to sponsors
March 23	*SRFB review panel meeting*	*Target date for answering all comments/questions from review panel and TAG*
April 1	*SRFB Review Panel comment form released*	*Identifies projects as "Clear," "Conditioned," "Needs more information," or "Project of Concern"*
April 12, 13	1-hour conference call (optional) with SRFB Panel	Discuss "Need More Information," "Project of Concern," or "Conditioned" projects
April-May	TAG scores projects	TAG members evaluate and score projects
April 12	Joint TAG and Working Group meeting	Discuss project updates and responses to SRFB Review Panel and TAG comments
May 10	TAG meeting	Develop ranked salmon habitat project list
June 14	Working Group meeting	Review ranked list
June 27	Final applications due	Final revised project application due in PRISM
July 21	*Final comment form received*	*Final SRFB comment received identifying projects as "Clear," "Conditioned," or "Project of Concern"*
July 26	TAG Meeting	If needed
Early August	Executive Committee meeting	Approve ranked list
August 12	Final SRFB list due	Final ranked list due in PRSIM

2022 Grant Schedule

Salmon Grants

Please obtain the lead entity's schedule from the lead entity coordinator.

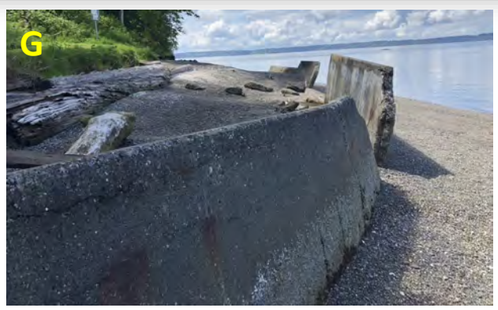
Date	Action	Description
January to April	Submit complete project application materials at least 2 weeks before site visit **(required)**	**At least 2 weeks before the site visit,** applicants for all projects, including regional monitoring projects, must submit a complete application in PRISM (See Application Checklist). The lead entity provides applicants with a project number **before** work can begin in PRISM.
Track 1 February 1 to March 18 Or **Track 2** April 4 to May 13	Site visits **(required)**	RCO screens all applications for completeness and eligibility. The SRFB Review Panel evaluates projects using Manual 18, Appendix F criteria. RCO staff and review panel members attend lead entity-organized site visits. Site visits may be virtual.
March 23	SRFB Review Panel meeting	Track 1: SRFB Review Panel and RCO staff meet to discuss projects and complete comment forms for projects visited in February and March.
April 1	**First comment form** for February and March site visits	Track 1: Applicants receive SRFB Review Panel comments identifying projects as *Clear*, *Conditioned*, *Needs More Information*, or *Project of Concern*. RCO staff accepts *Clear* applications and returns *Conditioned*, *Needs More Information*, and *Project of Concern* applications so applicants may update and respond to comments. The Monitoring Panel will provide comments for monitoring projects.

Date	Action	Description
April 12-13	Conference call (Optional)	Track 1: Lead entities may schedule a 1-hour conference call with project applicants, RCO staff, and one SRFB Review Panel member to discuss *Needs More Information*, *Project of Concern*, or *Conditioned* projects in their lead entities.
May 18	SRFB Review Panel meeting	Track 2: SRFB Review Panel and RCO staff meet to discuss projects and complete comment forms for projects visited in April and May.
May 25	**First comment form** for April and May site visits	Track 2: Applicants receive SRFB Review Panel comments identifying projects as *Clear*, *Conditioned*, *Needs More Information*, or *Project of Concern*. RCO staff accepts *Clear* applications and returns *Conditioned*, *Needs More Information*, and *Project of Concern* applications so applicants may update and respond to comments. The Monitoring Panel will provide comments for monitoring projects.
June 7-8	Conference call (Optional)	Track 2: Lead entities may schedule a 1-hour conference call with project applicants, RCO staff, and one SRFB Review Panel member to discuss *Needs More Information*, *Project of Concern*, or *Conditioned* projects in their lead entities.
June 27, Noon	**Due Date:** Applications due	Applicants submit final revised application materials in PRISM. All projects, including monitoring and targeted investment, must be submitted by this date. See Application Checklist.
July 13-14	SRFB Review Panel meeting	SRFB Review Panel and RCO staff meet to discuss projects and complete comments. SRFB Review Panel will score targeted investment projects.
July 21	**Final comment form**	Applicants receive the final SRFB Review Panel comments, identifying projects as *Clear*, *Conditioned*, or *Project of Concern*. The Monitoring Panel will provide final comments for monitoring projects.

Date	Action	Description
August 8	**Due Date:** Accept SRFB Review Panel condition	Applicants with *Conditioned* projects must indicate whether they accept the conditions or will withdraw their projects.
August 12	**Due Date:** Lead entity ranked list	Lead entities submit ranked lists via PRISM.
August 19	**Due Date:** Regional submittal	Regional organizations submit their Regional Area Summary and Project Matrix.
September 7	Final grant report available for public review	The final funding recommendation report is available online for SRFB members and public review.
September 21-22	Board funding meeting	SRFB awards grants. Public comment period available.

Shoreline Armor (Photos by PCD Staff 2020)

Tacoma DeMolay Sandspit Nature Preserve (Bulkhead), Pierce Conservation District



LEGEND

Project Worksite: DeMolay Sandspit Nature Preserve

LEGEND

Project Worksite: DeMolay Sandspit Nature Preserve

Bulkhead to be removed

Debris to be removed

DeMolay Sandspit Nature Preserve
Bulkhead Removal: Vicitinty Map

ORGANIZATION: Pierce Conservation District

CARTOGRAPHER: MaryK
DATE: 4/10/2020

PIERCE CONSERVATION DISTRICT
Over 70 Years of Conservation

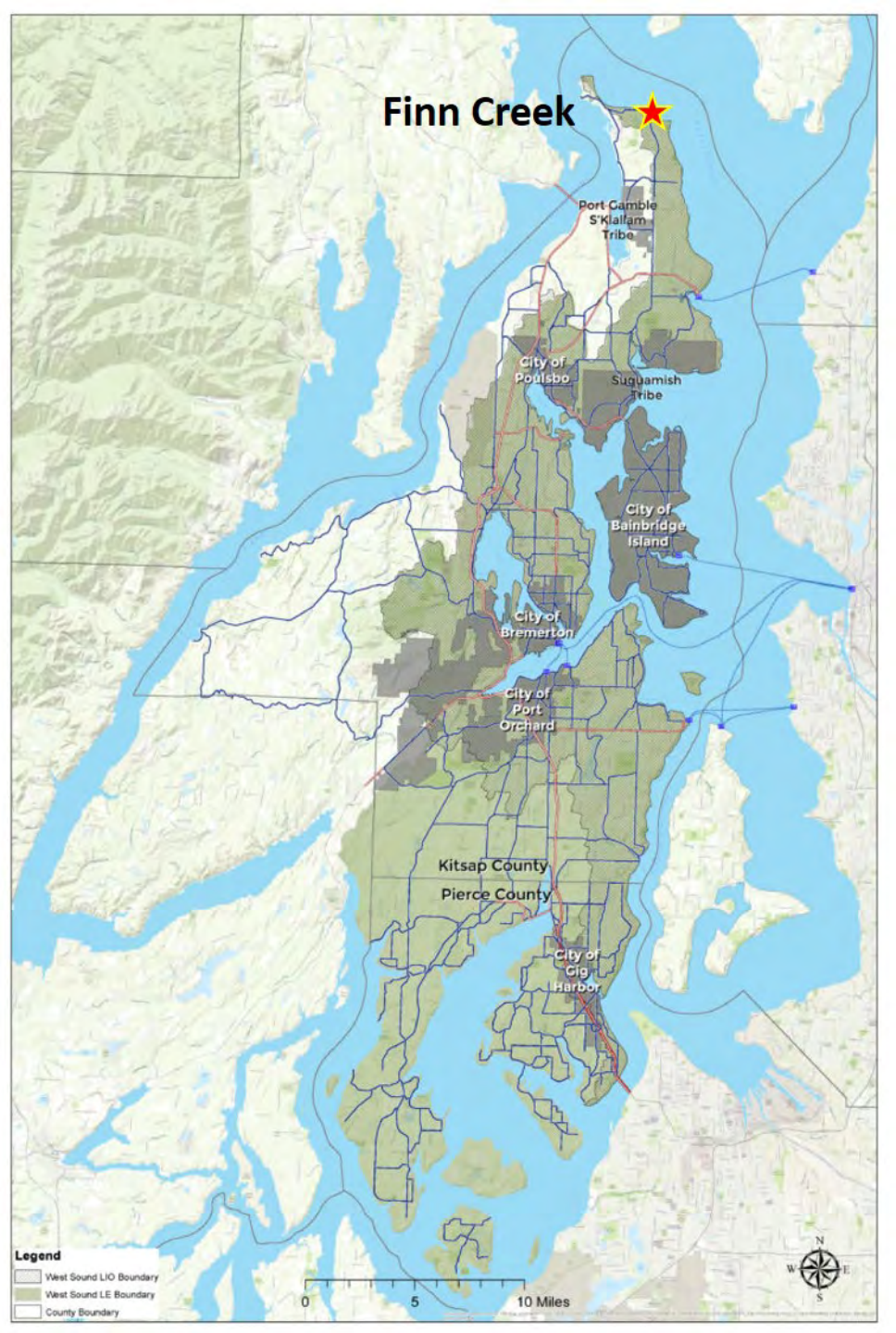
0 1 2 Miles

N

Project Name	DeMolay Sandspit Bulkhead Removal Final Design & Implementation
Enter your project summary. Include your goals and objectives.	Pierce Conservation District aims to remove up to 600 feet of shoreline armor and concrete debris from the Tacoma DeMolay Sandspit Nature Preserve. Armor removal will restore natural sediment processes, reconnect existing marine riparian vegetations, and improve public beach access. Removal of this armor is identified as a priority nearshore project by the West Sound Lead Entity to support priority species including juvenile Puget Sound Chinook and forage fish. The Preserve, located at the northern tip of Fox Island in Pierce County, was acquired by PenMet Parks in 2013 for public marine shoreline access and habitat protection. The Preserve encompasses over 2,000 feet of marine shoreline, approximately 600 feet of which is armored with failing concrete bulkheads and concrete debris. Important habitat features at the site include eelgrass beds and documented surf smelt spawning habitat along the entirety of the Preserve (WDFW 2013). The project will also act as a demonstration site for the Shore Friendly program in Pierce County, which engages residential shoreline landowners in shoreline stewardship and restoration. The implementation phase will incorporate public outreach and engagement of adjacent Fox Island landowners and video products to capture the implementation process. As a demonstration site, the project will offer Pierce County residents a local example of multi-benefit nearshore restoration. As of December 2021, we have completed a draft feasibility report and developed conceptual design alternatives, produced by Blue Coast Engineering, with funding from the Pierce County Flood Control Zone District. The project is funded through preliminary design under an ESRP project (2021-2023). This SRFB/PSAR application will advance the project to final design and implementation.
Category	Restoration
Please list all other related projects.	PRISM # 10-1271 A DeMolay Property Acquisition (Peninsula Metropolitan Park) PRISM # 20-1510 DeMolay Sandspit Bulkhead Removal Design (Pierce Co Conservation District)
Is this project identified in a salmon or steelhead recovery plan, watershed assessment and restoration plan, nearshore recovery plan, or recovery strategy?	Yes
Please identify which and explain.	Removal of shoreline armor was identified under Goal WC.3B in the West Sound Lead Entity (WRIA 15) Ecosystem Recovery Plan published in 2016. This project site was identified in a 2011 report prepared for the West Sound Lead Entity (WRIA 15) which evaluated

	nearshore restoration opportunities and ranked them on benefit to salmonids: Williamson, K., J. Walley, K. Brakensiek. (2011) Strategic Identification of Areas and Projects for Nearshore Restoration throughout Key Peninsula-Gig Harbor-Islands Watershed, WRIA 15, Washington (https://westsoundwatersheds.org/pdfs/KGI%20Strategic%20ID%20of%20Nearshore%20Restoration%20Projects.pdf). This project site appears in Appendix A, page 93, Project ID 68. The report identifies areas for nearshore restoration using model scores for "Fry Migrant Chinook Benefit" and "All Salmonid Habitat Benefit". Our proposed project site scored: Fry Migrant Chinook Benefit = 20 All Salmonid Habitat Benefit =16 Mean across all assessed project areas: Fry Migrant Chinook Benefit = 20.3 All Salmonid Habitat Benefit = 15.1
Has the landowner acknowledged the project?	Yes
Explain your answer here	The property owner, Peninsula Metropolitan Park District (PenMet Parks), signed a Landowner Acknowledgement form for the design phase (PRISM # 20-1510 DeMolay Sandspit Bulkhead Removal Design, Pierce Co Conservation District). PenMet Parks leadership participated in the first community and stakeholder meeting held for the planning phase in April 2021. We are working with PenMet Parks staff to continue to collaborate on this project.
Which species will benefit from this project?	Puget Sound Chinook, Forage Fish
Describe the limiting factors and/or ecological concerns that your project will address (e.g., issues related to fish passage, riparian conditions, water quality and quantity, and climate change).	This project aims to remove up to 600 feet of shoreline armor (including over 200 feet on mapped feeder bluff) and concrete debris which are currently interrupting natural sediment processes and covering the upper beach in documented forage fish spawning habitat. Removal will reconnect existing marine riparian vegetation to provide shade to the upper beach. Conceptual designs include beach nourishment to restart sediment drift at the site and improve upper beach habitat.
Project Sponsor	Pierce Conservation District
Primary Contact	Mary Krauszer
Is this project on the Salmon Recovery Portal (formerly known as Habitat Work Schedule)?	Yes
Is this project on	Yes

West Sound Partners for Ecosystem Recovery's 2021-2022 Planned Project Forecast List (PPFL)?	
For which grants are you applying?	Puget Sound Acquisition and Restoration Fund (tentatively available July 2023)
What is the total cost of the project?	$694,290.00
What is the total request of the grant?	$506,792.00
What are the available matching funds?	$187,498.00


Finn Creek
Port Gamble S'Klallam Tribe
City of Poulsbo
Suquamish Tribe
City of Bainbridge Island
City of Bremerton
City of Port Orchard
Kitsap County
Pierce County
City of Gig Harbor
Legend
West Sound LIO Boundary
West Sound LE Boundary
County Boundary
0
5
10 Miles
N
W
E
S

Wild Fish Conservancy

NORTHWEST

Jamie Glasgow, Director of Science

Finn Creek Restoration Project

PROJECT GOAL

Restore natural watershed / estuarine / nearshore processes in a N. Kitsap watershed with excellent public outreach opportunities

Finn Creek Restoration Project

Phase I: OBJECTIVES (completed)

Identify constraints

Develop and evaluate restoration alternatives

Recommend approach

Finn Creek Restoration Project

Phase II: OBJECTIVES

Address remaining data gaps

Final designs and permits

Acquisition purchase or option agreement

Shovel-ready for next phase


HANSVILLE RD NE
NE HUNT CLUB LN
NE IDLENOT LN
NE BUCK LAKE RD
AT 18.1
AT 18
NE BUCK LAKE RD
BAKER LN
HANSVILLE DR NE
HANSVILLE RD NE

300 foot long failing culvert and tide gate

300 foot long failing culvert and tide gate


900 foot long
ditched channel
along Hansville Rd.

Specific project **DESIGN** elements include:

1. Remove the full barrier culvert / tide gate at the stream mouth, restoring fish access to almost two miles of habitat and addressing longshore sediment obstruction on the beach;
2. Restore saltmarsh/tidal estuary at the stream mouth;
3. Improve stream + estuarine habitat through Norwegian Point County Park – add sinuosity, large woody debris, and a native riparian corridor;
4. Enhance public experience at Norwegian Point County Park: habitat restoration interpretive trail;
5. Complement adjacent Park / Hansville features

Aquatic Lands Enhancement Acct

WASHINGTON STATE Recreation and Conservation Office

Project Snapshot
PRISM Project #04-1484 (Completed)

Norwegian Point Acquisition Phase 1

Project Details

Kitsap County Parks and Rec: Norwegian Point Acquisition Phase 1 (#04-1484) Attachment #176201, Inspection Pic 2013 - Beach

Project Status: Closed Completed since 01/27/2009

Project Type: Acquisition
Project Sponsor: Kitsap County Parks and Recreation
Funding Board: Recreation and Conservation Funding Board

Funding

Aquatic Lands Enhancement Acct:	$530,424
Total RCO Grant:	$530,424 (47%)
Sponsor Match:	$601,456 (53%)
Total Agreement:	$1,131,879 (100%)

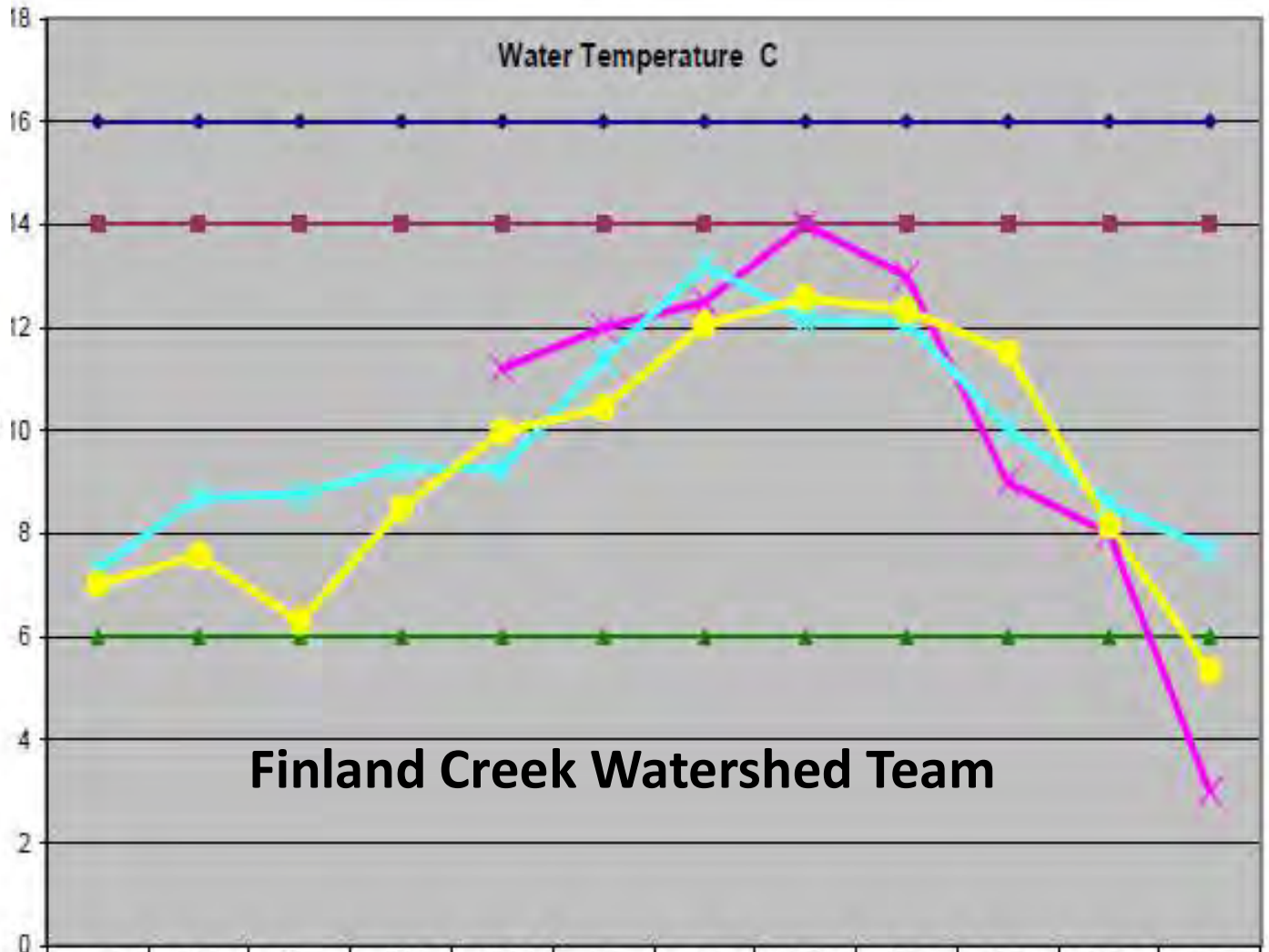
Links

"…The stream and wetlands on this site would also be restored to enhance their habitat value."

Finland Creek Stream monitoring Program
2011
Annual report

SSWM

HANSVILLE GREENWAY



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
State Standard high	16	16	16	16	16	16	16	16	16	16	16	16
Expected high value	14	14	14	14	14	14	14	14	14	14	14	14
Expected low value	6	6	6	6	6	6	6	6	6	6	6	6
2009					11.2	12	12.5	14	13	9	8	3
2010	7.3	8.7	8.76	9.3	9.26	11.36	13.22	12.14	12.1	10.03	8.59	7.67
2011	7.02	7.58	6.3	8.49	9.99	10.45	12.06	12.58	12.33	11.52	8.16	5.34


10
20
30
40
50
60
70
80
90
photarium
a product of Wild Fish Conservancy
for information: 425-788-1167
photarium@wildfishconservancy.org

WILD FISH CONSERVANCY

SCALE - 1:1,800
0 75 150 300 Feet
N

nhc northwest hydraulic consultants

Coordinate System: NAD 1983 HARN STATEPLANE WASHINGTON SOUTH FIPS 4602 FEET

Job: 2001973 | Date: February 2018

DRAFT

FINN CREEK HYDRAULIC MODELING RESULTS
2 YEAR FLOWS (19 CFS)
MEAN HIGHER HIGH TIDE

FIGURE 1

FINN CREEK RESTORATION DESIGN PROJECT

TECHNICAL REPORT

Prepared for:

Wild Fish Conservancy

December 6, 2018

NHC Ref. No. 2001973

nhc
northwest hydraulic consultants
water resource specialists

WILD FISH CONSERVANCY

SCALE - 1:1,800
0 75 150 300 Feet
N

nhc northwest hydraulic consultants

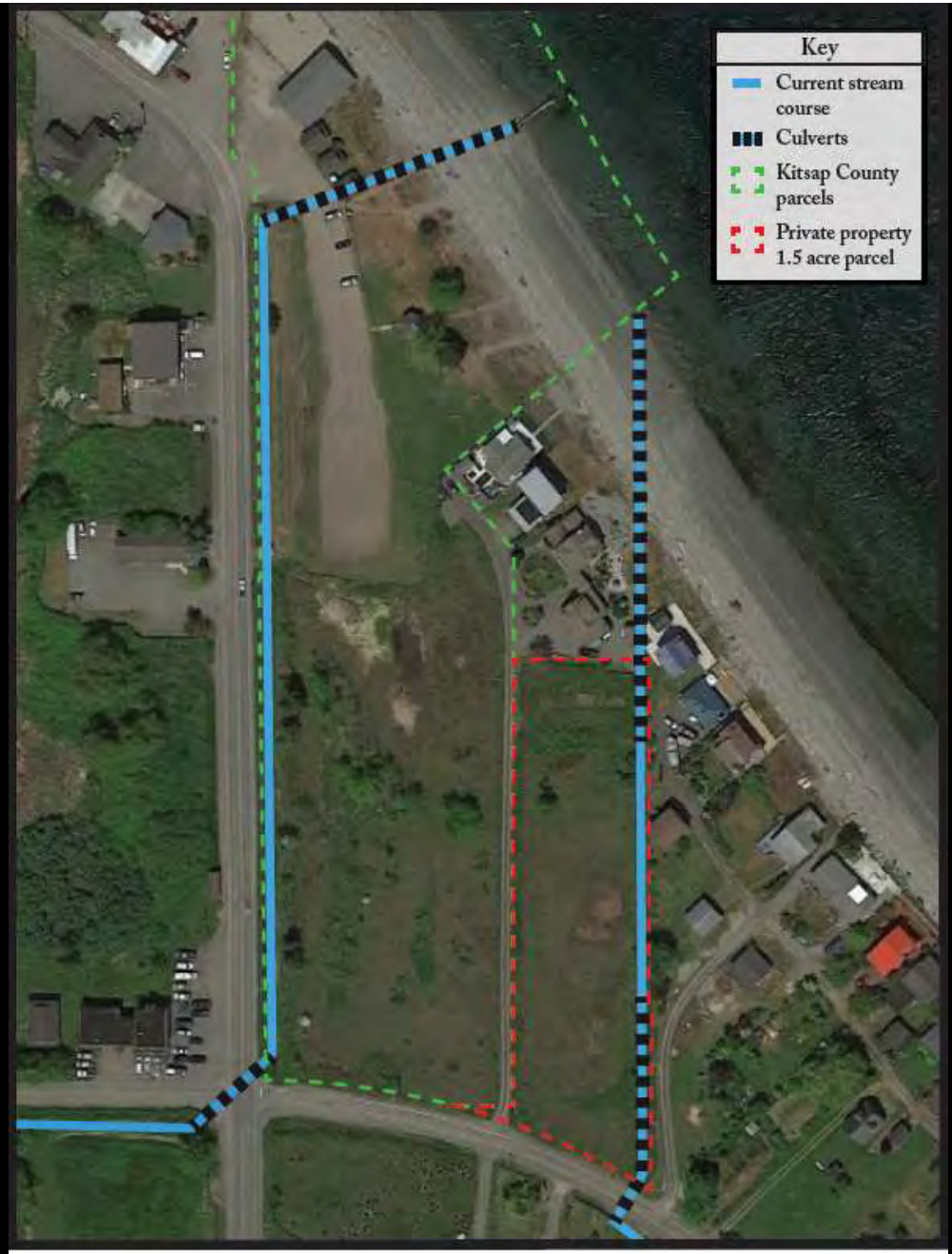
Coordinate System: NAD 1983 HARN STATEPLANE WASHINGTON SOUTH FIPS 4602 FEET

Job: 2001973 | Date: February 2018

DRAFT

FINN CREEK HYDRAULIC MODELING RESULTS
2 YEAR FLOWS (19 CFS)
ANNUAL HIGH TIDE

FIGURE 2


Key
Current stream course
Culverts
Kitsap County parcels
Private property 1.5 acre parcel
Finn Creek
Existing Conditions
0 100 200 300 400 ft.
N

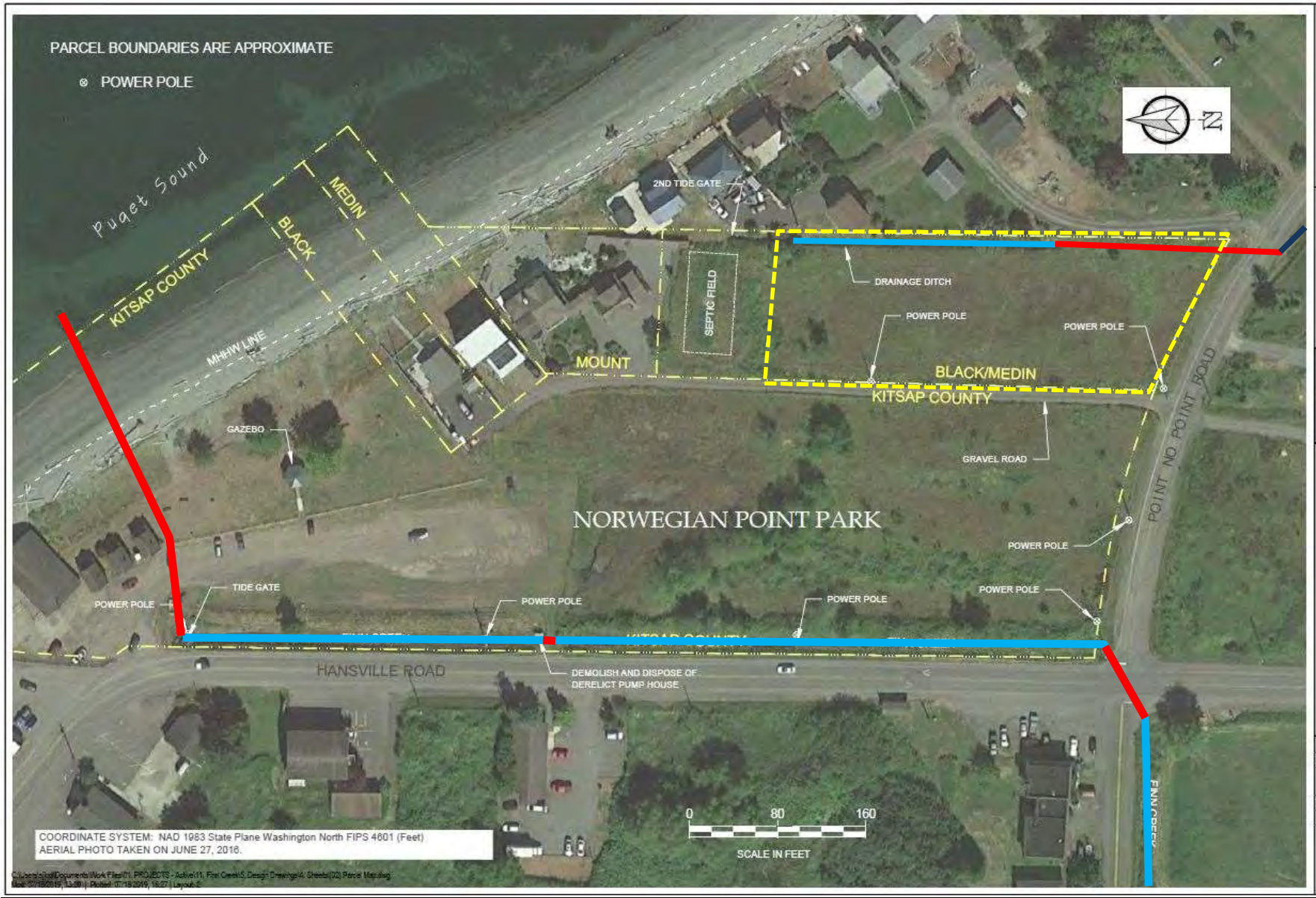

Key
Native shrubs
Native trees
Existing trees
Interpretive trail on top of flood protection berm
Private property 1.5 acre parcel
Historic building locations
Relocate gazebo
Angle-in parking
Observation platform
New driveway access
Install LWD
Finn Creek Low Tide
0 100 200 300 400 ft.
N


Key
Native shrubs
Native trees
Existing trees
Interpretive trail on top of flood protection berm
Private property 1.5 acre parcel
Historic building locations
Relocate gazebo
Angle-in parking
Observation platform
New driveway access
Install LWD
Finn Creek High Tide
0
100
200
300
400 ft.
N

GeoTech Assessment – Test Pits

Project costs α materials imported / exported

Apr. 2019



WILD FISH CONSERVANCY NORTHWEST
15629 Main Street NE
P.O. Box 402
Duvall, WA 98019

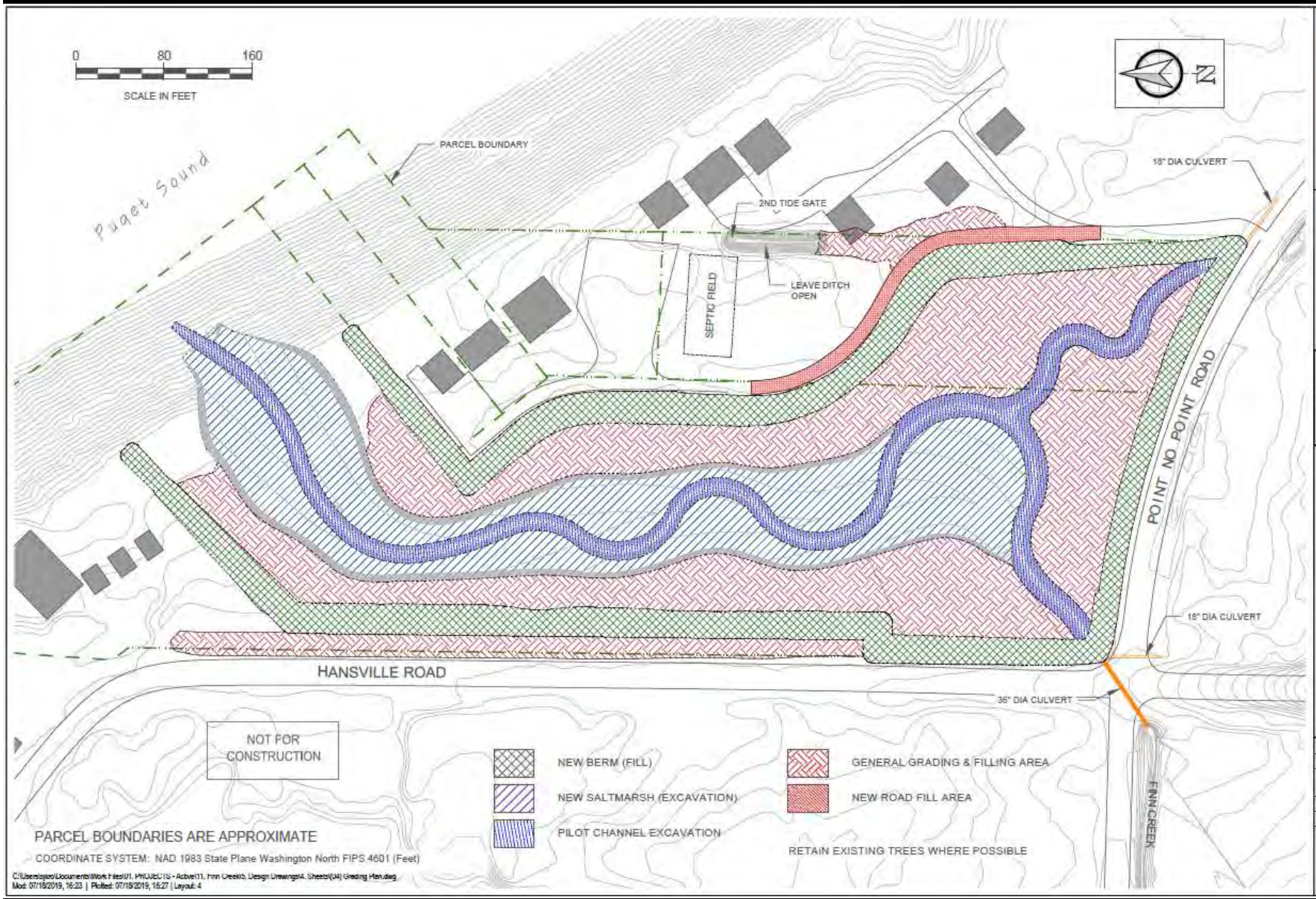
SEAL

PARCEL MAP

FINN CREEK RESTORATION

HANSVILLE, WA

DATE: 07-16-2019
DRAWN BY: S. KROPP
DESIGNED BY: A. STONKUS
S. KROPP
SCALE: 1" = 80'
JOB NO.:
SHEET NO.
2



C:\Users\jake\Documents\Work Files\01. PROJECTS - Active\11. Finn Creek\3. Design Drawings\A. Sheets\[04] Grading Plan.dwg
Mod: 07/18/2019, 16:23 | Plotted: 07/18/2019, 16:27 | Layout: 4

WILD FISH CONSERVANCY NORTHWEST
15629 Main Street NE
P.O. Box 402
Duvall, WA 98019

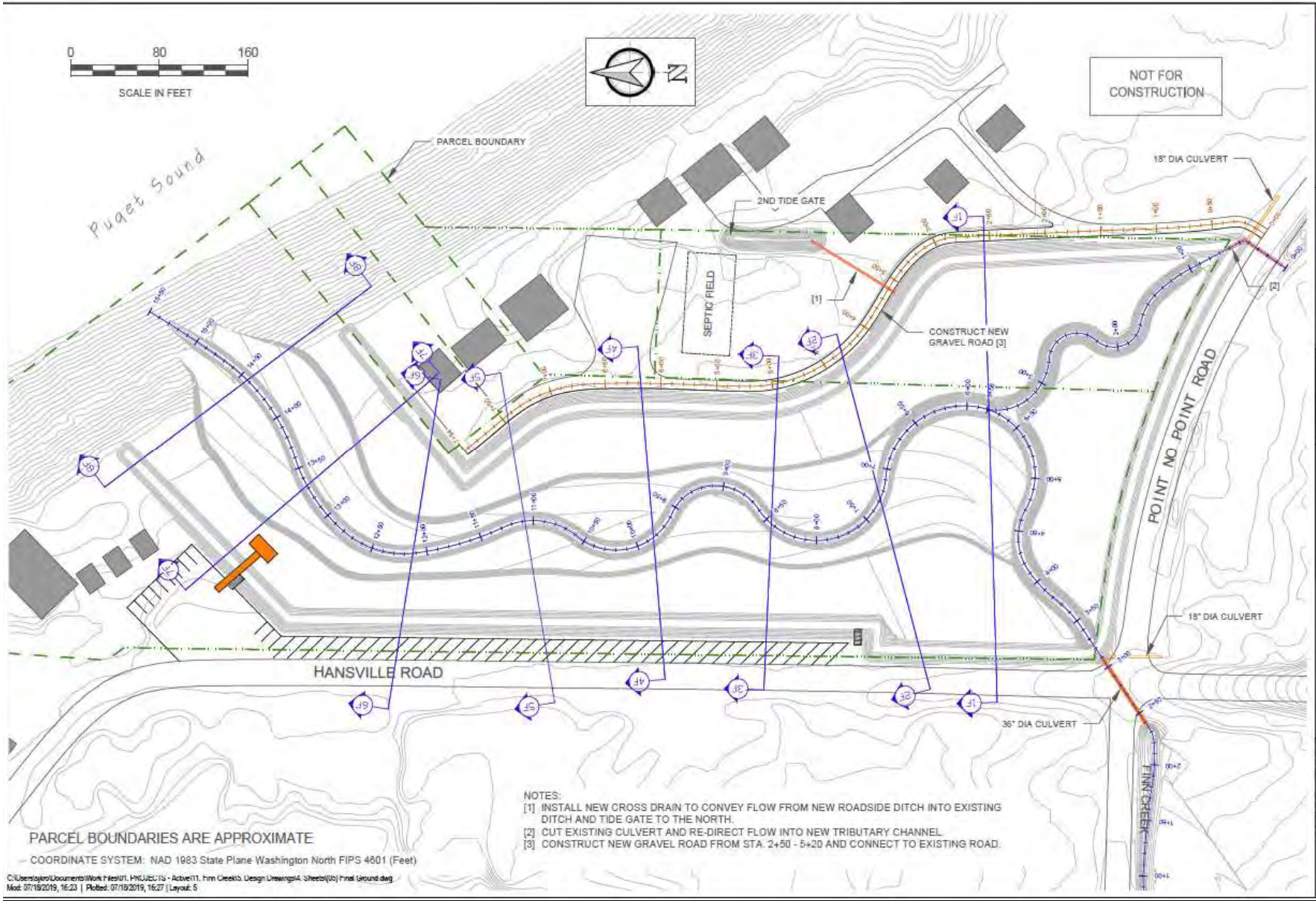
SEAL

GRADING PLAN

FINN CREEK RESTORATION

HANSVILLE, WA

DATE: 07-18-2019
DRAWN BY: S. KROPP
DESIGNED BY: A. STONKUS
S. KROPP
SCALE: 1" = 80'
JOB NO.:
SHEET NO.
4



NOTES:
[1] INSTALL NEW CROSS DRAIN TO CONVEY FLOW FROM NEW ROADSIDE DITCH INTO EXISTING DITCH AND TIDE GATE TO THE NORTH.
[2] CUT EXISTING CULVERT AND RE-DIRECT FLOW INTO NEW TRIBUTARY CHANNEL.
[3] CONSTRUCT NEW GRAVEL ROAD FROM STA. 2+50 - 5+20 AND CONNECT TO EXISTING ROAD.

PARCEL BOUNDARIES ARE APPROXIMATE

COORDINATE SYSTEM: NAD 1983 State Plane Washington North FIPS 4601 (Feet)

C:\Users\jpro\Documents\Work Files\01. PROJECTS - Active\11. Finn Creek\3. Design Drawings\4. Sheets\05 Final Ground.dwg
Mod: 07/19/2019, 16:23 | Plotted: 07/19/2019, 16:27 | Layout: 5

WILD FISH CONSERVANCY NORTHWEST
15629 Main Street NE
P.O. Box 402
Duvall, WA 98019

SEAL

FINAL GROUND

FINN CREEK RESTORATION

HANSVILLE, WA

DATE: 07-19-2019
DRAWN BY: S. KROPP
DESIGNED BY: A. STONKUS
S. KROPP
SCALE: 1" = 80'
JOB NO.:
SHEET NO.
5

PARCEL BOUNDARIES ARE APPROXIMATE

COORDINATE SYSTEM: NAD 1983 State Plane Washington North FIPS 4601 (Feet)

C:\Users\jajor\Documents\Work Files\01. PROJECTS - Active\11. Finn Creek\b. Design Drawings\4. Sheets\[06] Restoration Plan.dwg
Mod: 07/18/2019, 16:24 | Plotted: 07/19/2019, 16:27 | Layout: 6

WILD FISH CONSERVANCY NORTHWEST
15629 Main Street NE
P.O. Box 402
Duvall, WA 98019

SEAL

RESTORATION PLAN

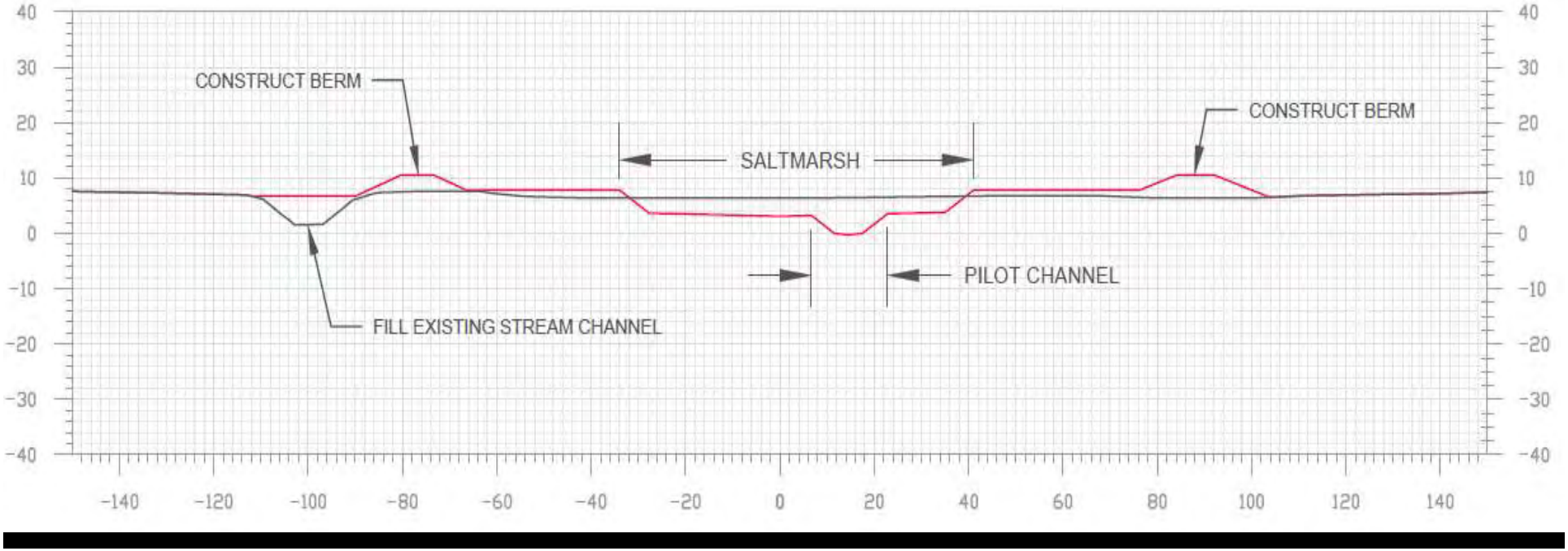
FINN CREEK RESTORATION

HANSVILLE, WA

DATE: 07-18-2019
DRAWN BY: S. KROPP
DESIGNED BY: A. STONKUS
S. KROPP
SCALE: 1" = 80'
JOB NO.:
SHEET NO.
6


SEPTIC FIELD
NEW CROSS DRAIN
MHHW LINE
POINT NO POINT ROAD
WALKING TRAIL
15" DIA CULVERT
PROVIDE RAMP TO OBSERVATION DECK
SEAL
RESTORATION PLAN
HANSVILLE, WA

SECTION 5F


CONSTRUCT BERM
SALTMARSH
CONSTRUCT BERM
PILOT CHANNEL
FILL EXISTING STREAM CHANNEL
40
30
20
10
0
-10
-20
-30
-40
-140
-120
-100
-80
-60
-40
-20
0
20
40
60
80
100
120
140

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)	Cohesion Type
Levee Embankment Fill		120	Mohr-Coulomb	50	34	
Existing Fill		115	Mohr-Coulomb	25	32	
Older Topsoil Horizon		100	Mohr-Coulomb	0	29	
Beach Deposits (Fully Liquefied)		110	Undrained	100		FDepth

PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

Norwegian Point Park Ring Levee
Kitsap County, Washington

Prepared for: Wild Fish Conservancy

Project No. 190092 • July 15, 2019 Final

Aspect Consulting, LLC

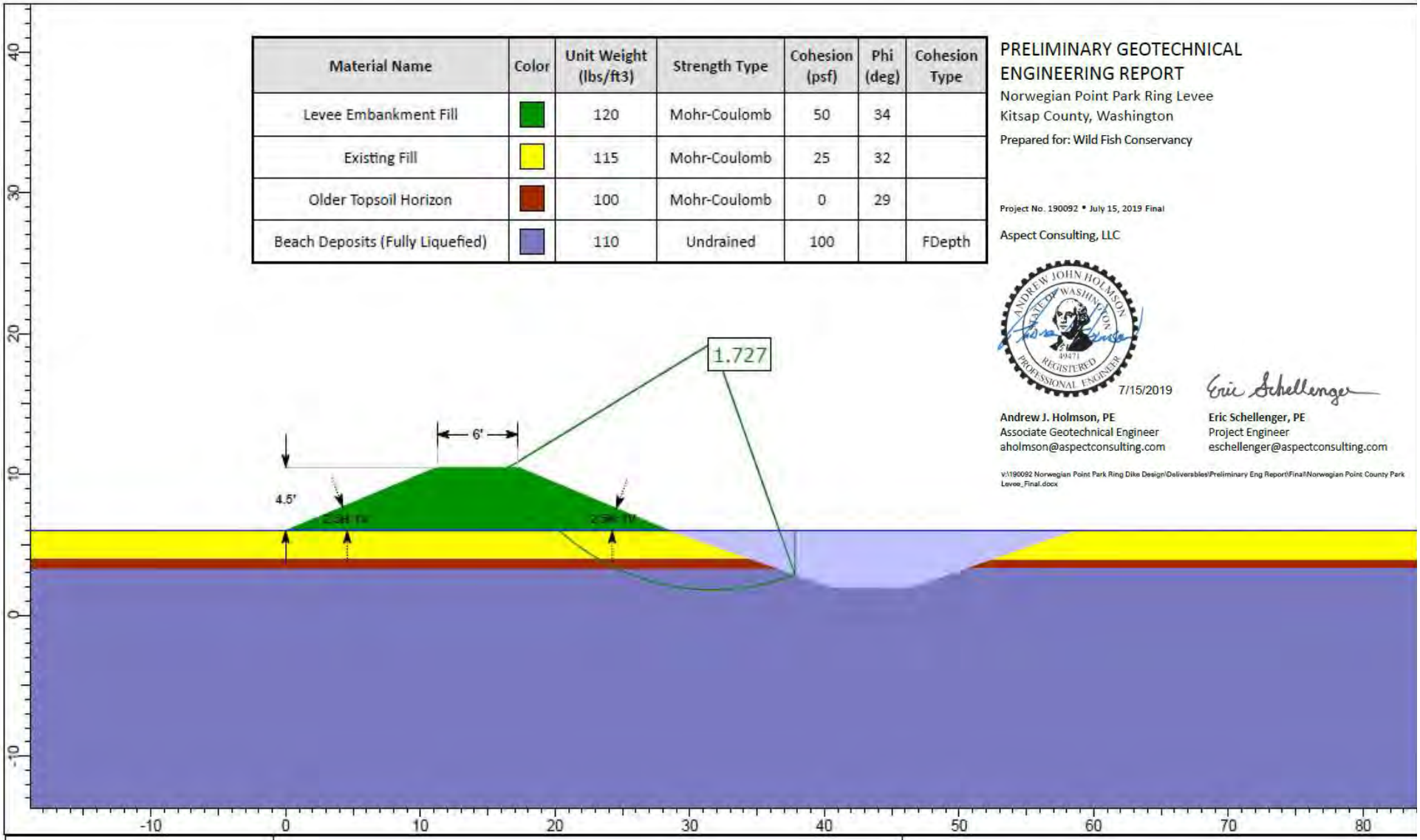
ANDREW JOHN HOLMSON
STATE OF WASHINGTON
49471
REGISTERED
PROFESSIONAL ENGINEER

7/15/2019

Andrew J. Holmson, PE
Associate Geotechnical Engineer
aholmson@aspectconsulting.com

Eric Schellenger, PE
Project Engineer
eschellenger@aspectconsulting.com

v:\190092 Norwegian Point Park Ring Dike Design\Deliverables\Preliminary Eng Report\Final\Norwegian Point County Park Levee_Final.docx



Levee at TP-1 - Baseflow Conditions Static Analysis

Slope Stability Analysis

Norwegian Point Park Ring Levee
Kitsap County, Washington

SLIDEINTERPRET 8.022	SCALE: 1":10' O:\Portland_Projects\190000_Projects\190092_Norwegian Point Park Ring Dike\Data\Analyses\Seepage and SSA\Base-Flow Stability - Waterside.slmd	Aspect CONSULTING	6/20/2019 PROJECT NO. 190092	BY ECS REVIEWED BY AJH	APPENDIX: C-1

Task 1. HEC-RAS modeling; coastal process and sediment transport analyses. [*Blue Coast*]

Task 2. Groundwater analyses [*Aspect Env*.]

Task 3. Draft final designs, specifications, and costs.

Task 4. Permitting

Task 5. Acquisition negotiations, prepare purchase or option agreement.

Scope and cost/budget of project

- Phased approach (Feas., Design, Construct) to address uncertainty
- Building off of SRFB Preliminary Design Project

Benefits to fish

- Fish passage, estuarine restoration, and nearshore project.
- Tier 1 project in Nearshore Integration Tool (top 50 of 420 nearshore projects).
- Acquisition to expand park footprint and daylight estuarine tributary

Certainty of success

- Experienced sponsor and strong partners
- Kitsap County support
- Restoring self-sustaining processes
- County Park will coordinate stewardship plan
- Immediate benefits – restoring access to 2+ miles of stream habitat

Questions?

Jamie Glasgow, Director of Science and Research

206/310-9302, jamie@wildfishconservancy.org

www.wildfishconservancy.org

Project Name	Finn Creek Estuary Restoration Project
Enter your project summary. Include your goals and objectives.	The project team developed preliminary designs (16-1596) and is now finalizing designs and permits (20-1018); we seek funding to implement the Finn Creek estuary restoration project. Project goals include: 1. Restore the natural processes in lower Finn Creek that create and sustain habitats used by wild fish populations, while meeting County (landowner) and community flood objectives. These natural processes include fish passage; sediment sorting, scour, delivery, and longshore drift; riparian shading, filtering, and bank stability; and large wood recruitment. 2. Provide a demonstration project in Norwegian Point County Park to inform the public about the importance of protecting and restoring watersheds in a wild salmon recovery context. This Project's design elements include: - Remove a full barrier culvert and tide gate at the mouth of Finn Creek, and a partial barrier culvert 500 feet upstream. - Restore tidal inundation and saltmarsh habitats at the stream mouth within the County park - Naturalize the ditched reach through Norwegian Point County Park by adding sinuosity, large woody debris, and a native riparian corridor to improve estuarine and nearshore nursery conditions for salmon and other species. - Incorporate interpretive signs within the Norwegian Point County Park to explain what was done, and why.
Category	Restoration
Please list all other related projects.	10-1878: West Sound Water Type Assessment Phase II 16-1596: Finn Creek Restoration Prelim. Design 20-1018: Finn Creek Design and Permit
Is this project identified in a salmon or steelhead recovery plan, watershed assessment and restoration plan, nearshore recovery plan, or recovery strategy?	Yes
Please identify which and explain.	This project was identified as a high priority restoration opportunity in the West Sound Watersheds Phase II Watertype Assessment (October 2014). It is also identified as a Tier 1 project in the West Sound Nearshore Integration and Synthesis (2016).
Has the landowner	Yes

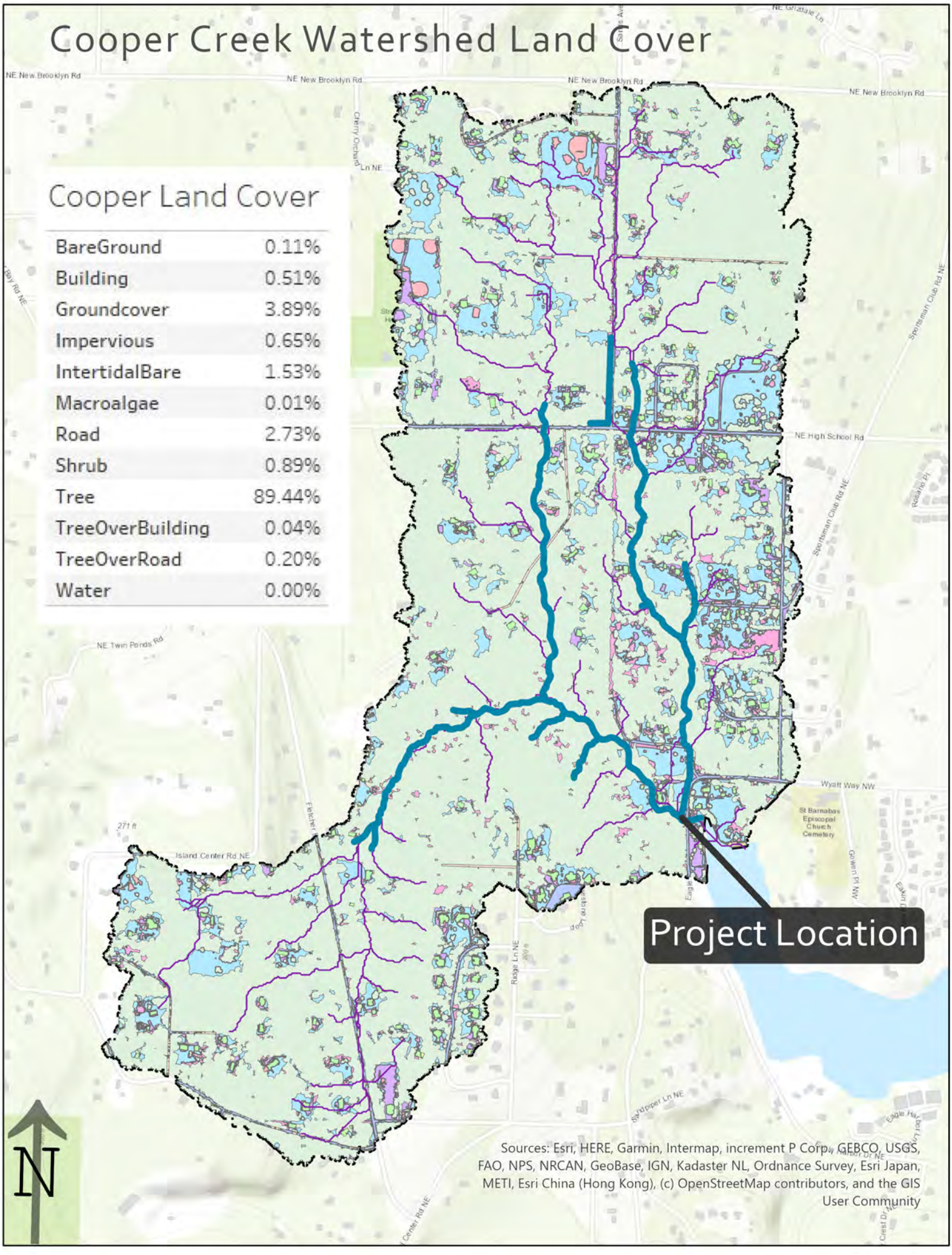
acknowledged the project?	
Explain your answer here	Kitsap County Parks has acknowledged the project and has been a partner since WFC began designing the project in 2016. Park-adjacent landowners are extremely supportive.
Which species will benefit from this project?	This project will restore natural processes to benefit salmon (Chinook, coho, chum, and pink.), coastal cutthroat trout, and innumerable native non-salmonid species.
Describe the limiting factors and/or ecological concerns that your project will address (e.g., issues related to fish passage, riparian conditions, water quality and quantity, and climate change).	The following limiting factors will be addressed: Fish Passage: remove a full and a partial barrier to fish passage within the project reach to restore anadromous fish access to the watershed. Riparian condition: restore historical saltmarsh conditions and associated upland riparia. Water quality: buffer streamflow from roadside runoff by naturalizing Finn Cr. where it is currently ditched alongside Hansville Rd.; restore native riparian community where it has been removed within the project reach. Instream habitat quality: restore estuarine and stream processes to increase the quality and quantity of complex fish habitats.
Project Sponsor	Wild Fish Conservancy
Primary Contact	Jamie Glasgow
Is this project on the Salmon Recovery Portal (formerly known as Habitat Work Schedule)?	Yes
Is this project on West Sound Partners for Ecosystem Recovery's 2021-2022 Planned Project Forecast List (PPFL)?	Yes
For which grants are you applying?	Salmon Recovery Funding Board (available September 2022) Puget Sound Acquisition and Restoration Fund (tentatively available July 2023)
What is the total cost of the project?	$647,000.00
What is the total request of the grant?	$550,000.00

What are the available matching funds?	$97,000.00

Cooper Creek Watershed Land Cover

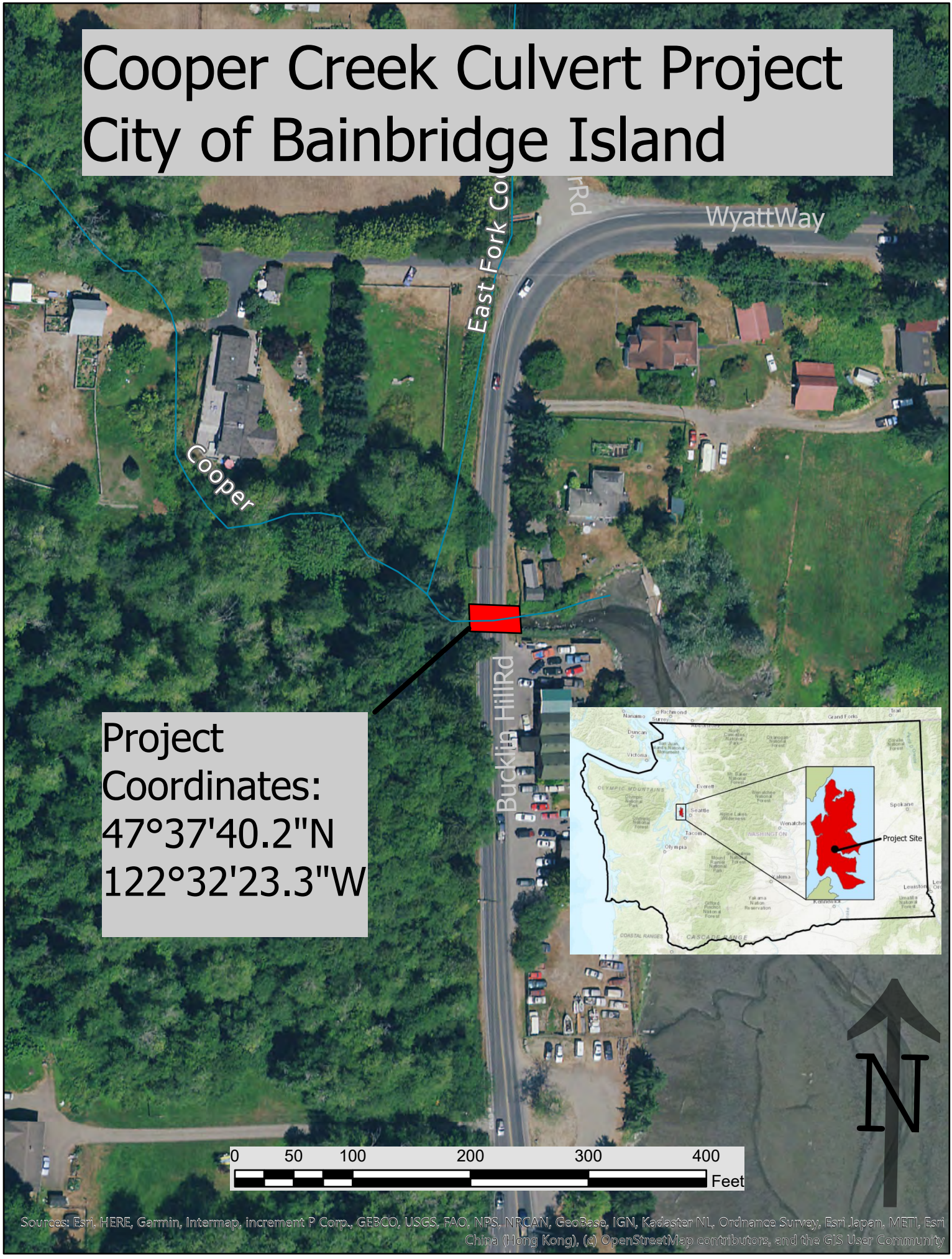
Cooper Land Cover

BareGround	0.11%
Building	0.51%
Groundcover	3.89%
Impervious	0.65%
IntertidalBare	1.53%
Macroalgae	0.01%
Road	2.73%
Shrub	0.89%
Tree	89.44%
TreeOverBuilding	0.04%
TreeOverRoad	0.20%
Water	0.00%

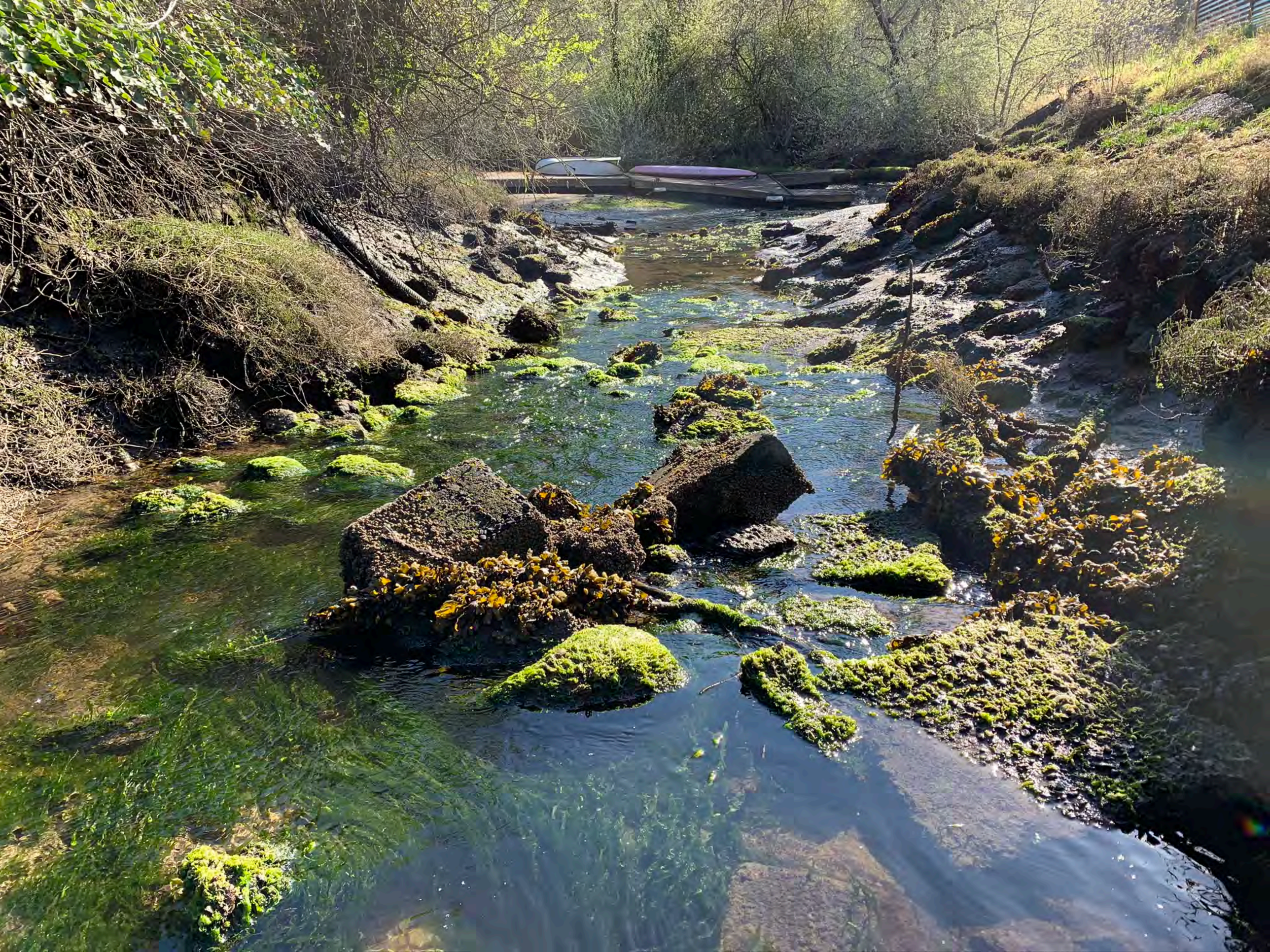


Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Cooper Creek Culvert Project
City of Bainbridge Island



Project Coordinates:
47°37'40.2"N
122°32'23.3"W



Title	Cooper Creek
Project Name	Cooper Creek Culvert Restoration
Enter your project summary. Include your goals and objectives.	The City of Bainbridge Island is proposing to construct a new fish passage culvert on Cooper Creek with no downstream barriers. There is currently a 30-inch round concrete culvert, but it has been determined that increasing the size of this culvert would help to perpetuate and recover salmonid population and benefit ecosystem processes in the nearshore environment.
Category	Restoration
Please list all other related projects.	NA
Is this project identified in a salmon or steelhead recovery plan, watershed assessment and restoration plan, nearshore recovery plan, or recovery strategy?	Yes
Please identify which and explain.	The West Sound Nearshore Integration and Synthesis of Chinook Salmon Recovery Priorities report (2017) identified this project as the 6th highest ranked fish passage restoration project in the lead entity region (west side of the Puget Sound). This project will completely remove the barrier to fish passage and fulfill the identified project.
Has the landowner acknowledged the project?	Yes
Explain your answer here	The project is within City ROW
Which species will benefit from this project?	Coho, Chinook
Describe the limiting factors and/or ecological concerns that your project will address (e.g., issues related to fish passage, riparian conditions, water quality and quantity, and	Replacing this undersized culvert with a large bottomless box culvert will allow for fish passage at all tidal levels and provide more regular and natural flow to the estuarine environment upstream of the road. The structure will also be more resilient in regard to sea level rise predictions and stormwater from the adjacent road will be treated by a new treatment unit.

climate change).	
Project Sponsor	City of Bainbridge Island
Primary Contact	Christian Berg
Is this project on the Salmon Recovery Portal (formerly known as Habitat Work Schedule)?	Yes
Is this project on West Sound Partners for Ecosystem Recovery's 2021-2022 Planned Project Forecast List (PPFL)?	Yes
For which grants are you applying?	Salmon Recovery Funding Board (available September 2022) Puget Sound Acquisition and Restoration Fund (tentatively available July 2023)
What is the total cost of the project?	$933,205.00
What is the total request of the grant?	$793,224.23
What are the available matching funds?	$139,980.77

CITY OF BAINBRIDGE ISLAND

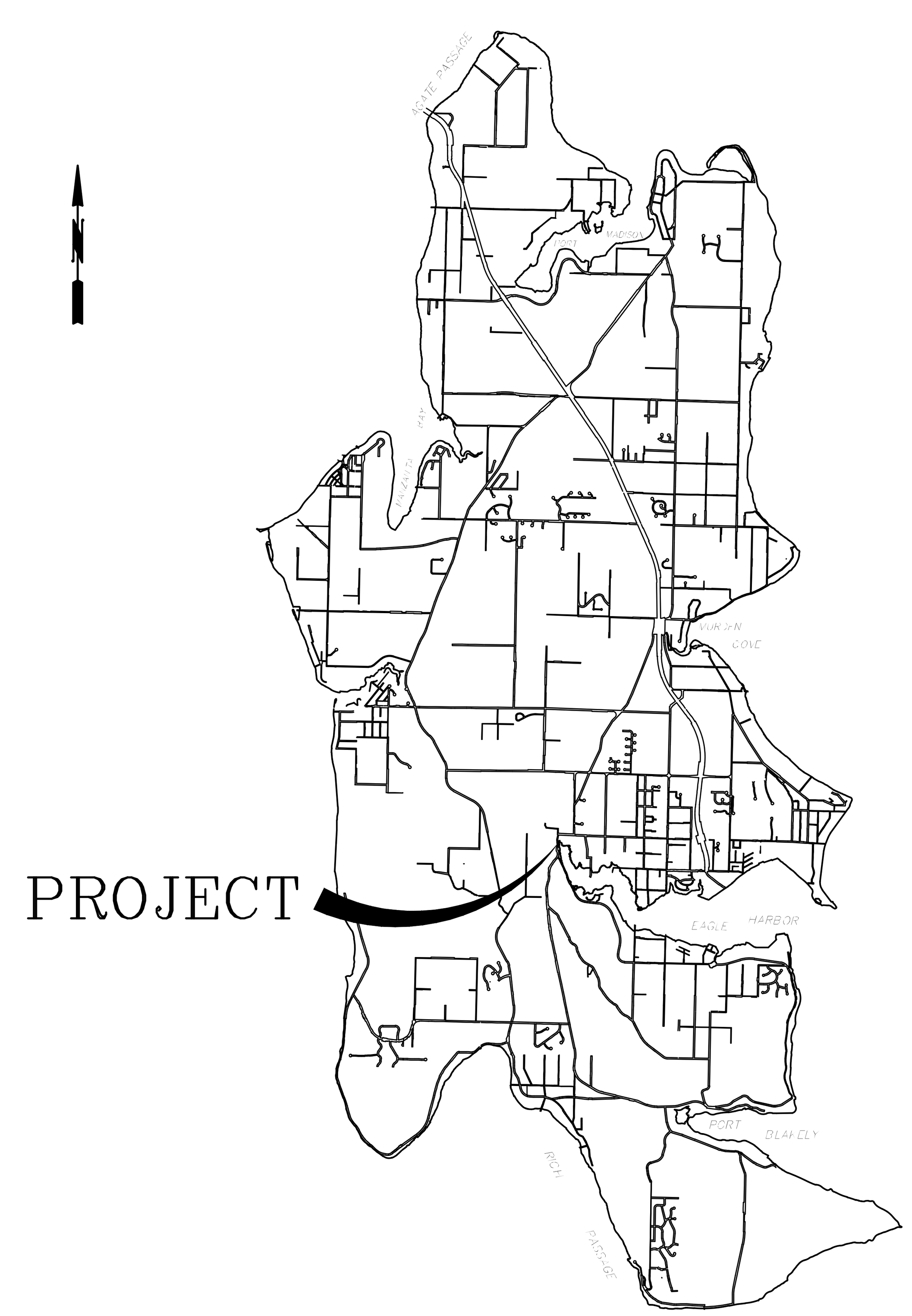
CITY OF
BAINBRIDGE ISLAND

PUBLIC WORKS ENGINEERING DEPARTMENT

COOPER CREEK FISH PASSAGE IMPOVEMENTS
PRELIMINARY DESIGN PLANS
C.I.P. NO. 00968

Sheet List Table	
Sheet Number	Sheet Title
C1	COOPER CREEK COVER
C2	LEGEND & ABBREVIATIONS
C3	EXISTING CONDITIONS
C4	TESC PLAN
C5	BYPASS PLAN
C6	PLAN AND PROFILE
C7	SECTIONS
C8	WALL PROFILES
C9	STORM DRAIN PROFILE
C10	DETAILS
C11	WSDOT BOX CULVERT GUARDRAIL DETAIL
C12	WSDOT TYPE 31 GUARDRAIL
C13	WSDOT TYPE 31 GUARDRAIL TRANSITION
C14	WSDOT RETAINING WALL DETAIL
C15	WSDOT RETAINING WALL DETAIL CONTINUED

PRELIMINARY DESIGN SUBMITTAL



VICINITY MAP

CITY OFFICIALS:

MAYOR:

LESLIE SCHNEIDER

COUNCIL MEMBERS:

MICHAEL POLLOCK
KOL MEDINA
KRISTEN HYTOPOULOS
RASHAM NASSAR
LESLIE SCHNEIDER
JOE DEETS
CHRISTY CARR

PUBLIC WORKS DIRECTOR:

CHRIS WIERZBICKI

RECOMMENDED FOR APPROVAL BY: ____________
EMILY CADY
ENGINEER 1

APPROVED BY: ____________
CHRIS WIERZBICKI, PE
PUBLIC WORKS DIRECTOR

5/29/2020

BROWNE • WHEELER
ENGINEERS, INC
241 ERICKSEN AVENUE NE
BAINBRIDGE ISLAND, WA 98110
P 206.842.0605 INFO@BrowneWheeler.COM

ADAM E. WHEELER
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER

Z:\AAAPROJECTS\ACTIVE\COBI COOPER CR REMOVAL\SHEET SET\YEOMALT COVER.DWG <<COOPER CREEK COVER>> May 27, 2020 1:48:00 PM

Filename:	Section: __S__ __T2__ R__E	Surveyed By:	Control Monument:	Recorded Survey Kitsap County Auditor AF– Vol/Bk Page	Constructed By:
Drawn By: NDW		Date:	Field Bk/Pg:		Date:

PLANS LAYOUT SYMBOLS AND CALLOUTS

NOTE CALLOUTS

SYMBOL	DESCRIPTION (ABBR)
2	POLE NOTE
5	STANDARD CONSTRUCTION NOTE ON PLAN SHEET
P4	STRIPING NOTE
4	CONDUIT NOTE
27	SIGN NOTE
P4VHM	CABLE TRACE NO.
1	CABLE TRACE NO.

SCALE

20 10 0 20 40

FEET

USGS 1982

VIEW CALLOUTS

PLAN

SCALE: 1"=?_'

PROFILE

SCALE: HORZ: 1"=?_'
VERT: 1"=?_'

DETAIL, SECTION & ELEVATION CALLOUTS

SITE SPECIFIC

DETAIL

AS SHOWN ON PLAN SHEET

1 D1 T2

SHEET WHERE SHOWN (TYP)
DESCRIPTION (TYP)
D3 BRACKET
C6 SCALE: N.T.S.
DETAIL NUMBER
SHEET WHERE CONSTRUCTED OR CUT (TYP)

SECTION / ELEVATION

A C5 C2 A
E D1 C3 E
C D4 C6 C
B D4 C7 B

SECTION/ELEVATION CALLOUT

A D1 C8 BRACKET
SCALE: 1"=1'
SECTION/ELEVATION LETTER

PROJECT SPECIFIC

DETAIL

AS SHOWN ON PLAN SHEET

1 C11 ASPHALT PAVEMENT

PROJECT DETAIL #
1 C11 ASPHALT PAVEMENT
NO SCALE
SHEET WHERE SHOW (TYP)

SECTION / ELEVATION

AS SHOWN ON PLAN SHEET

A C4

PROJECT DETAIL #
A C4 ROAD SECTION STA
NO SCALE
SHEET WHERE SHOW (TYP)

CITY OF BAINBRIDGE ISLAND STANDARD DETAIL

AS SHOWN ON PLAN SHEET

506A

310A TYPE A CURB RAMP
SCALE: N.T.S.
COBI STANDARD DETAIL NO.

PRELIMINARY NOT FOR CONSTRUCTION

BASE MAP SYMBOLS

SURVEY & CONTROL

MONUMENTS & POINTS

- ANGLE POINT (W/ N & E)
- BENCH MARK (W/ BN#, N, E & EL) REBAR/IRON PIPE (W/ N & E)
- MONUMENT IN CASE (W/ #, N, E & EL)
- MONUMENT SURFACE (W/ #, N, E & EL)
- SURVEY POINT (PK NAIL, SHINER, TACK ETC)
- SPOT ELEVATION (W/ ELEV)

SECTION DATA

- SECTION CENTER (W/ DNR#, N & E)
- SECTION CORNER (W/ DNR#, N, E, SEC#'S)
- QUARTER CORNER (W/ DNR#, N, E & SEC#'S)
- SIXTEENTH CORNER (#, N & E)
- CLOSING CORNER (W/ DNR#, N, E & SEC#'S)
- MEANDER CORNER (W/ DNR#, N, E & SEC#) MC

PLAT DATA

- A — PLAT BLOCK NO (W/ #)
- TAX LOT OWNERSHIP TIE
- ?_____ — TAX LOT / PARCEL NUMBER (W/ #)

TOPOGRAPHIC & UTILITY

PIPING

- CAP/PLUG
- GUARD POST (BOLLARD)
- REDUCER
- THRUST BLOCK
- WATER METER
- FIRE HYDRANT
- FIRE DEP. CONNECTION
- AIR RELIEF
- BLOW-OFF
- VALVE (TYPE=G, W, PIV)
- P.R.V.
- BENDS (11-1/4', 22-1/2', 45', OR 90')
- FLANGE CONNECTION
- MECHANICAL CONNECTION
- COUPLING
- TEE
- WYE
- CROSS

TYP CALLOUTS

8"x6"TEE (FxMJ)
3" 22 1/2" BEND (ALL F)
8" GV (F)

SS AND SD

- SAN. SEWER CLEAN OUT (NORMAL & IN PAVEMENT)
- MANHOLE (TYPE 1 & 2)
- CATCHBASIN TYPE 2 (GRATE, ROUND, SOLID)
- CATCHBASIN TYP A (GRATE, SOLID)
- CATCHBASIN TYP B (GRATE, SOLID)
- STORM DRAIN INLET
- STORM DRAIN CULVERT
- CULVERT TRASH RACK OR OPEN END

VAULTS

- UG VAULTS (TYPE 444LA & 504LA,)
- TY? UTILITY VAULT (TEL, TLM, SIG, WTR, GAS ETC)

ELECTRICAL

- JUNCTION BOX (TYPE 1, 2, 3 & SPECIAL)
- PAD MOUNTED TRANSFORMER
- TRANSMISSION TOWER
- UTILITY POLE
- UTILITY POLE W/RISER
- UTILITY POLE ANCHOR
- UTILITY POLE SIDEWALK ANCHOR
- STREET LIGHT ON UTILITY POLE
- STREET LIGHT ON SEPARATE POLE
- TELEPHONE RISER
- TELEPHONE RISER
- YARD LIGHT
- DECORATIVE STREET LIGHT
- ELECTRICAL SERVICE CABINET

SIGNAL

6' SQ 6' DIA

- DIPOLE DETECTOR
- DIPOLE DETECTOR (6' x VAR')
- DIPOLE DETECTOR (6' x VAR')
- QUADRUPOLE DETECTOR (6' x VAR')
- BICYCLE DET LOOPS (2' x 12')
- EVP INDICATOR LIGH
- OPTICOM SENSOR
- SONIC DETECTOR
- PEDESTRIAN SIGNAL HEAD (TYPE E, B & C)
- R/R CROSSING GATE
- CONTROLLER (TYPE 30,332,336,G,M & P)
- TELEMETRY CABINET (24"Wx46"Hx10"D) SERVICE CABINETS (ON FOUNDATION OR POLE)
- TRAFFIC SIGNAL POLE (TYPE 2)
- SIGNAL POLE W/LUM (TYPE 3)
- SIGNAL POLE (TYPE 1)
- SIGNAL STRAIN POLE (TYPE 4) (STL OR WOOD)
- PEDESTRIAN POLES (TYPE PPB & PS)
- VEHICLE SIGNAL HEAD
- VEHICLE SIGNAL HEAD W/ARROW INDICATOR
- 4 WAY FLASHER

GEO TECHNICAL

- B# SOIL BORING
- TP# SOIL TEST PIT
- #— PAVEMENT CORING
- NO MONITORING WELL (TYPE, TOP, DEPTH)

LANDSCAPING

- ROCKERY
- HEDGE
- SHRUB
- BUSH
- TREE (Conifer) W/ & W/O 10'DIA DRIP LINE
- TREE (Deciduous) W/ & W/O 10'DIA DRIP LINE

MISCELLANEOUS

BUS SHELTER

- BUS STOP
- MAIL BOX
- TELEPHONE BOOTH
- EMBANKMENT
- RIP RAP

PAVEMENT MARKINGS

- BIKE PATH
- DISABLED SYMBOL
- H.O.V. LANE SYMBOL
- ONLY! ONLY LEGEND
- STOP SCHOOL STOP LEGEND
- SCHOOL LEGEND
- RAILROAD CROSSING
- STRAIGHT ARROW
- LT.RT.STR.ARROW
- LEFT-STRAIGHT ARROW
- RIGHT-STRAIGHT ARROW
- LEFT-RIGHT ARROW
- 2-WAY LEFT TURN
- LEFT TURN ARROW
- RIGHT TURN ARROW

STOP LINES

- COE (2' x 10')
- DOT
- SNO CTY

RAISED PAVEMENT MARKERS: (RPM)

- LANE MARKERS TYPE I
- LANE MARKERS TYPE II

SIGNS

- ILLUMINATED MASTARM SIGN
- MASTARM ST NAME SIGN
- MASTARM MOUNTED SIGN
- SIGN W/ & W/O SINGLE POST
- SIGN W/TWO POSTS
- SIGN ON SN BRIDGE
- ST NAME INTX SIGN
- TYPE 1, 2 OR BARRICADE
- SINGLE OR DOUBLE SIDED
- TEMP W/ BASE

TEXT SYMBOLS

ø	PHASE, DIAMETER
&	AND
'	FEET, MINUTES
"	INCHES, SECONDS
°	DEGREE

A

AB	ANCHOR BOLT
ABBRV	ABBREVIATION
ABAN	ABANDONED
ABUT	ABUTMENT
ACT	ACTUAL
ADDM	ADDENDUM, ADDITION
ADJ	ADJUST
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
ALT	ALTERNATE
ALY	ALLEY
AMEND	AMENDMENT
AP	ANGLE POINT
APPROX	APPROXIMATELY
APWA	AMERICAN PUBLIC WORKS ASSOC
ARCH	ARCHITECTURE
ARV	AIR RELIEF VALVE
ASPH	ASPHALT
AUX	AUXILIARY
AVE	AVENUE
AVAR	AIR VACUUM, AIR RELEASE
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE RD

B

B	BLACK
BC	BLOCK CORNER
BITUM	BITUMINOUS
BK	BACK
BL	BASELINE, BUILDING LINE,BLUE
BLDG	BUILDING
BLVD	BOULEVARD
BLK	BLOCK
BOC	BACK OF CURB
BOW	BACK OF WALK
BOL	BOLLARD
BM	BENCH MARK
BOC	BACK OF CURB
BOL	BOLLARD
BOT	BOTTOM
BOW	BACK OF WALK
BRDG	BRIDGE
BRG	BEARING
BRK	BREAK
BTWN	BETWEEN

C

C	CONDUCTOR
CAP	CAPACITY
CB	CATCH BASIN, CABLE
CB1	CATCH BASIN TYPE 1
CB2	CATCH BASIN TYPE 2
CC	CLOSING CORNER
CCb	COAXIAL CABLE
CCd	CONTROL CONDUIT
CCG	CONCRETE CURB & GUTTER
CCL	CREEK CENTER LINE
CND	CONDUIT
C&G	CURB & GUTTER
CHG	CHANGE
CHK	CHECK
CI	CAST IRON, CURB INLET
CICL	CAST IRON CONCRETE LINED
CIP	CAST IN PLACE
CIR	CIRCUIT, CIRCLE
CJ	CONSTRUCTION JOINT
CLY	CLAY
CLF	CHAIN LINK FENCE
C/L, CL	CENTERLINE
CLR	CLEARANCE, CLEAR
CLS	CLASS, CHLORINE SOLUTION
CMP	CORRUGATED METAL PIPE CONC
CMU	MASONRY UNIT
CNR	CORNER
CNTY	COUNTY
CO	CLEAN OUT
COBI	CITY OF BAINBRIDGE ISLAND
COL	COLUMN
COM	COMMON
COMM	COMMUNICATE
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCT
CONT	CONTINUED, CONTINUOUS
COORD	COORDINATE
COP	COPPER
CNR	CORNER
CORR	CORRUGATED
CPSP	CORRUGATED POLYETHYLENE PIPE
CRN	CROWN OF ROAD
CS	COMBINED SS & SD SYSTEM
CT	COURT
CTR	CENTER, CONTOUR
CU	CUBIC
CULV	CULVERT
CYL	CYLINDER

D

D	DEPTH, DIPOLE
DB	DIRECT BURIAL CABLE
DBL	DOUBLE
DCL	DITCH CENTERLINE
DE	DE ENERGIZE
DEG	DEGREE
DET	DETAIL
DIP	DUCTILE IRON PIPE
DIA	DIAMETER
DIAPH	DIAPHRAGM
DIR	DIRECTION
DN	DOWN
DR	DRAIN, DRIVE
D/L	DAYLIGHT
DW, DWY	DRIVEWAY
DWG	DRAWING

E

E	EAST, ELECTRICAL
EA	EACH
ECb	ELECTRICAL CABLE
ECC	ECCENTRIC
EF	EACH FACE
EL	EASEMENT LINE
ELB	ELBOW
ELJB	ELECTRICAL JB
ELEV	ELEVATION
EMH	ELECTRICAL MH
ENCL	ENCLOSE
ENG	ENGINE
ENGR	ENGINEER
EMB	EMBANKMENT
EO	EDGE OF
EOA	EDGE OF ASPHALT
EOC	EDGE OF CONCRETE
EOD	EDGE OF DIRT
EOG	EDGE OF GRAVEL
EP	EDGE OF PAVEMENT
EQ	EQUAL
EQUIP	EQUIPMENT
EV	ELECTRICAL VAULT
EVP	EMERGENCY VEH PRE-EMPTION
EW	EACH WAY
EX, EXIST	EXCHANGE
EXC	EXCAVATION
EXT	EXTERIOR, EXTRUDED
EXTN	EXTENSION

F

F, FLG	FLANGE
FAB	FABRICATE
FDTN	FOUNDATION
FF	FAR FACE, FIN FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FIG	FIGURE
FIN	FINISH, FINISHED
FL	FOG LINE
FLD	FIELD
FLTR	FILTER
FLEX	FLEXIBLE
FM	FROM, FORCE MAIN
FNC,FN	FENCE
FOC	FACE OF CURB
FOG	FOG LINE
FOW	FACE OF WALL
FP	FULL PENETRATION, FLAG POLE
FT	FEET/FOOT
FTG	FOOTING
FWD	FORWARD
FWPS	FINISHED WATER PUMP STATION
FWY	FREEWAY

G

G	GAS LINE, GREEN
GA	GAUGE
GALV	GALVANIZED
GAR	GARAGE
GB	GREEN W/BLACK TRACER
GDWY	GRAVEL DRIVEWAY
GE	GRATE ELEVATION
GEN	GENERATOR
GI	GALV IRON
GM	GAS METER
GL	GUTTER LINE, GLASS
GLV	GLOBE VALVE
GM	GAS METER
GDR	GUARD RAIL
GRD	GROUND
GV	GAS VALVE
GVL	GRAVEL
GVT	GAS VAULT

H

H	HEIGHT
H-T	HUB & TACK
HAP	HORIZONTAL ANGLE POINT
HD	HEAD
HCP	HANDICAP SYM
HDG	HOT DIPPED GALV
HI	HEIGHT OF INSTRUMENT
HORIZ	HORIZONTAL
HPS	HIGH PRESSURE SODIUM
HSB	HIGH STRENGTH BOLT
HSE	HOUSE
HT	HEIGHT OF TARGET
HTS	HEIGHTS
HW	HOT WATER
HWY	HIGHWAY
HYDR	HYDRAULIC

I

I	IRON
ID	INSIDE DIAMETER
IDENT	IDENTIFICATION
IE	INVERT ELEV
IF	INSIDE FACE
IL	INLET
ILLUM	ILLUMINATE
IMSA	INTERNATIONAL MUNICIPAL SIGNAL ASSOC.
IN	INCH/INCHES
INCL	INCLUDE
INCR	INCREASE
IND	INDICATOR
INDUCT	INDUCTANCE
INST	INSTALL, INSTRUMENT
INSUL	INSULATION
INT	INTERSECTION, INTERNAL
INV	INVERT, INVERSE
IP	IRON PIPE
IS	ISLAND
ITE	INSTITUTE OF TRANSPORTATION ENGINEERING

J

JNX	JUNCTION
JB	JUNCTION BOX
JCT	JUNCTION
JT	JOINT

K

KG	KILOGRAM
KHZ	KILOHERTZ
KM	KILOMETER
KV	KILOVOLT
KW	KILOWATT
KWH	KILOWATT HOUR

L

L	LENGTH OF ARC, TRAFFIC DETECTION LOOP
LAB	LABORATORY
LAT	LATERAL, LATITUDE
LBS	POUNDS
LF	LINEAL FOOT/FEET
LIM	LIMIT
LK	LAKE
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL, LONGITUDE
LP	LIGHT POLE, LAMP
LT	LEFT
LUMIN	LUMINAIRE
LWR	LOWER

M

M	METER
MA	TRAFFIC DETECTION MAGNETOMETER MACHINE
MACH	MAINTENANCE
MAINT	MATERIAL
MATL	MAXIMUM
MAX	MAILBOX
MB	MEANDER CORNER
MC	MECHANICAL
MECH	MEDIUM
MED	MERIDIAN
MFR	MANUFACTURE
MFR	MANHOLE
MH	MEAN HIGHER HIGH WATER
MHHW	MEAN HIGH TIDE
MHT	MEAN HIGH WATER
MHW	MONUMENT IN CASE
MIC	MIDDLE
MID	MILITARY
MIL	MINIMUM, MINUTE MISCELLANEOUS
MIN	MECHANICAL JOINT
MISC	MARKER
MJ	MATCH LINE
MKR	MEAN LOWER LOW WATER
ML	MEAN LOW TIDE
MLLW	MEAN LOW WATER
MLT	MODIFICATION
MLW	MONUMENT LINE
MOD	MORTAR LINED AND COATED STEEL PIPE
MLCSP	MORTAR LINED TAPE COATED STEEL PIPE
MLTCS	MORTAR LINED EPOXY COATED STEEL PIPE
MLECSP	MONUMENT MIDPOINT ON CURVE
MON	MASONRY
MPOC	MEAN TIDE
MSNRY	MANUAL ON UNIFORM TR CONTROL
MUTCD	DEVICES

N

N	NORTH
NA	NOT APPLICABLE
NEG	NEGATIVE
NAUT	NAUTICAL
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOC
NEUT	NEUTRAL
NF	NEAR FACE
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
NO	NUMBER

O

O	ORANGE
OB	ORANGE W/BLACK TRACER
O-XING	OVERHEAD CROSSING
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OH	OVERHEAD
OHP	OVERHEAD POWER
OHW	ORDINARY HIGH WATER
OL	OVERLAP PHASE
OPNG	OPENING
OPP	OPPOSITE
OPR	OPERATE
OPT	OPTIC
OT	OVERHEAD TELEPHONE
OZ	OUNCE

P

P	POLE, POWER
PAR	PARALLEL
PC	POINT OF CURVATURE
PCC	PT OF COMPOUND CURVE
PD	PERFORATED DRAIN LINE
PE	PLAIN END
PED	PEDESTRIAN
PERM	PERMANENT
PERP	PERPENDICULAR
PH	PHASE
PI	POINT OF INTERSECTION
PKWY	PARKWAY
PL	PLASTIC, PLATE, PLACE
POA	POLE ORIENTATION ANGLE
POC	POINT ON CURVE
POS	POSITIVE, POSITION
PPB	PEDESTRIAN PUSH BUTTON
PPBP	PEDESTRIAN PUSH BUTTON POST
PR	PAIR
PRC	PT OF REVERSE CURVE
PROJ	PROJECT
PROP	PROPERTY
PRV	PRES REDUCING VALVE
PSI	POUNDS PER SQ. IN.
PT	POINT OF TANGENCY, PT
PUD	PUBLIC UTILITY DISTRICT NO.1 OF SNOHOMISH CNTY
PV	POWER VAULT
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PVT	POINT OF VERTICAL TANGENT
P/C	PRECAST
P/L	PROPERTY LINE
P/S	PRESTRESSED
P/T	POST-TENSIONED
PWR	POWER

Q

Q	QUADRUPOLE
QC	QUARTER CORNER
QT	QUART
QTR	QUARTER
QTY	QUANTITY
QUAD	QUADRANT, QUADRANGLE
QUAL	QUALITY

R

R	RADIUS, RED, RIVER
RA	RAISED
R-C	REBAR & CAP
RC	REINF CONC
RCKY	ROCKERY
RCP	REINF CONC PIPE
RB	RED W/ BLACK TRACER
RD	ROAD, ROUND
RECD	RECEIVED
RECT	RECTANGLE
REF	REFERENCE
REG	REGULAR
REINF	REINFORCED
REM	REMOVE, REMOVED
REPL	REPLACE, REPLACED
REQ	REQUIRED
RET	RETAINING
RETW	RETAINING WALL
RIV	RIVER
RLD	ROLLED
RMC	RIGID METAL CD
RPT	REPORT
RR	RAILROAD
RRCS	RR CROSSING SIG
RRG	RR CROSSING GATE
RRC	RR CROSSING
RT	RIGHT
R/W	RIGHT OF WAY

S

S	SOUTH, SLOPE
SAN	SANITARY
SB	SOIL BORING, SOUTH BOUND
SC	SECTION CORNER
SCb	SHIELDED CABLE
SCC	CLOSE CORNER
SCCP	STEEL CONCRETE CYLINDER PIPE
SCEM	CENTER OF SECTION
SCHED	SCHEDULE
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SE	SPOT EL/SOUTHEAST
SEC	SECOND
SECT	SECTION
SEG	SEGMENT
SEP	SEPARATE
SERV	SERVICE
SEW	SEWAGE
SHLD	SHIELDED
SHLDR	SHOULDER
SHT	SHEET
SIG	SIGNAL
SIM	SIMILAR
SL	SPAN LENGTH, SECTION LINE
S/L	SURVEY LINE
SLJB	STREET LIGHTING JB
SLP	SLOPE
SLS	STAINLESS STEEL
SLV	SLEEVE
SM	SMALL
SN	SIGN
SOV	SHUT-OFF VALVE
SP	SINGLE SHIELDED PAIR
SPA	SPACE, SPACES
SPC	SINGLE SHIELDED TWISTED PAIR CABLE
SPCb	PAIRS IN SINGLE CABLE
SPEC	SPECIFICATIONS
SR	STATE ROUTE
SQ	SQUARE
SS	SANITARY SEWER, STAINLESS STEEL
SSCO	SS CLEANOUT
SSMH	SS MANHOLE
ST	STREET
STA	STATION
STD	STANDARD, HERRINGBONE GRATE
STIR	STIRRUP
STN, STL	STAINLESS STEEL
STPS	STEPS
STR	STREAM
STL	STEEL
SUB	SUBSTITUTE
SUR	SURFACE
SURV	SURVEY
SVL	SURVEY LINE
SW, S/W	SIDEWALK
SYM	SYMBOL, SYMMETRICAL
SYS	SYSTEM

T

T	TOP, TAN, TOPO
TB	THRUST BLOCK
TAN	TANGENT
T&B	TOP & BOTTOM
TBM	TEMP. BENCH MARK
TCb	BURIED TELEPHONE CABLE
TEBO	TELEPHONE BOOTH
TEL	TELEPHONE
TEMP	TEMPORARY
TESC	TEMP EROSION & SEDIMENTATION CONTROL
TJB	TELEPHONE JB
TK	THICKNESS
TMH	TELEPHONE MH
TOC	TOP OF CURB
TOE	CONCAVE SLOPE BREAK
TOP	CONVEX SLOPE BREAK
TOPO	TOPOGRAPHY
TOS	TOP OF SLAB
TOW	TOP OF WALL
TP	TWISTED PAIRS, TEST PIT
TPOL	TRAFFIC SIGNAL POLE
TRAN	TRANSITION
TR	TRAFFIC, TELEPHONE RISER
TRJB	TRAFFIC SIGNAL JB
TS	TEST STATION
TSD	TRAFFIC SN DOUBLE POST
TSS	TRAFFIC SN SINGLE POST
TUN	TUNNEL
TV	TELEVISION
TWST	TWISTED
TYP	TYPICAL

U

UDS	UTILITY DUCT SYSTEM
UNGD	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UTIL	UTILITY
UG	UNDERGROUND
UP	UTILITY POLE
UPA	UTILITY POLE ANCHOR

V

V	VALVE
VANED	VANED GRATE
VAR	VARIES
VB	VALVE BOX, VAPOR BARRIER
VEH	VEHICLE
VERT	VERTICAL
VLT	VAULT
VP	VENT PIPE
VPC	VERTICAL CURVE PC
VPCC	VERTICAL CURVE PCC
VPI	VERTICAL CURVE PI
VPRC	VERTICAL CURVE PRC
VPT	VERTICAL CURVE PT

W

W	WEST, WATER LINE, WALK, & WHITE
W/	WITH
WB	WHITE W/BLACK TRACER
WC	WITNESS CORNER
WCR	WHEEL CHAIR RAMP
WFP	WATER FILTRATION PLANT
WGV	WATER GATE VALVE
WHSE	WAREHOUSE
WK	WALK
WM	WATER METER, WATERMAIN
W/O	WITHOUT
WO	WORK ORDER
WP	WORK POINT
WS	WATER SURFACE
WSDOT	WA DEPT OF TRANS
WT	WATTS, WEIGHT
WV	WATER VALVE
WW	WING WALL
WWM	WELDED WIRE MESH

X

X-BM	CROSS BEAM
X-RD	CROSS ROAD

Y

Y	YELLOW
YD	YARD

NO.	DATE	BY	REVISION

ADAM E. WHEELER — STATE OF WASHINGTON — 40430 — REGISTERED PROFESSIONAL ENGINEER

Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

CITY OF BAINBRIDGE ISLAND

CITY OF BAINBRIDGE ISLAND
PUBLIC WORKS ENGINEERING DEPARTMENT

COOPER CREEK FISH PASSAGE IMPROVEMENTS

BROWNE • WHEELER ENGINEERS, INC
241 ERICKSEN AVENUE NE
BAINBRIDGE ISLAND, WA 98110
P 206.842.0605 INFO@BrowneWheeler.COM

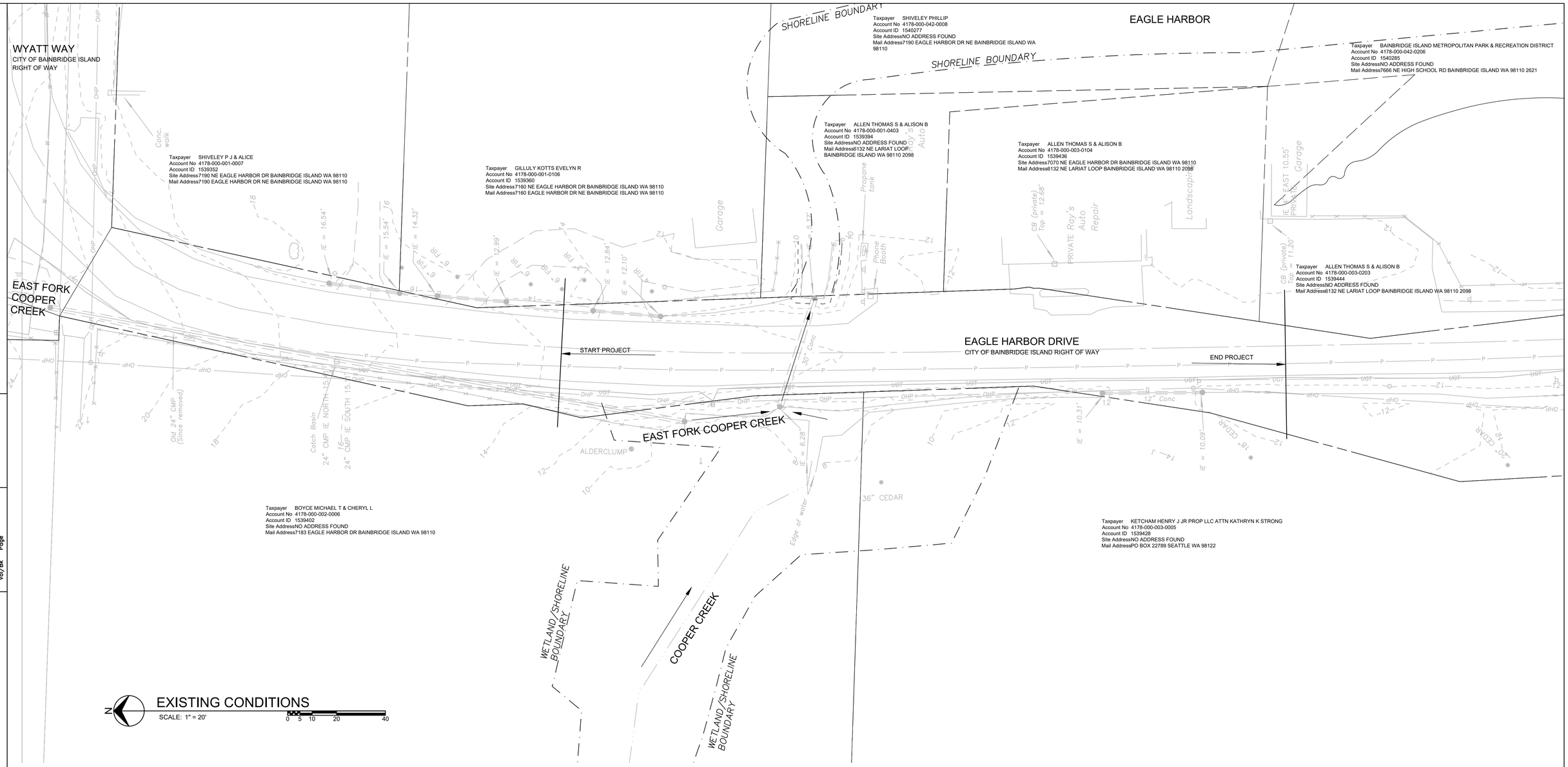
LEGEND & ABBREVIATIONS

PRELIMINARY DESIGN PLANS

C2

2 OF 15

Constructed By:
Date:
Recorded Survey
Kitsap County Auditor
AF-
Vol/Bk Page
Control Monument:
Field Bk/Pg:
Surveyed By:
Date:
Section: S T N R E
Drawn By: NDW
Checked By: AEW
C2 LEGEND & ABBREVIATIONS
XREF Filename:



Recorded Survey
Kitsap County Auditor
AF–
Vol/Bk Page

Control Monument:
Field Bk/Pg:

Surveyed By:
Date:

Section: ___S–___T_N–R_E

Drawn By: NDW
Checked By: AEW

Filename: C3 EXISTING CONDITIONS
XREF Filename:

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

ADAM E. WHEELER — STATE OF WASHINGTON — 40430 — REGISTERED PROFESSIONAL ENGINEER

Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

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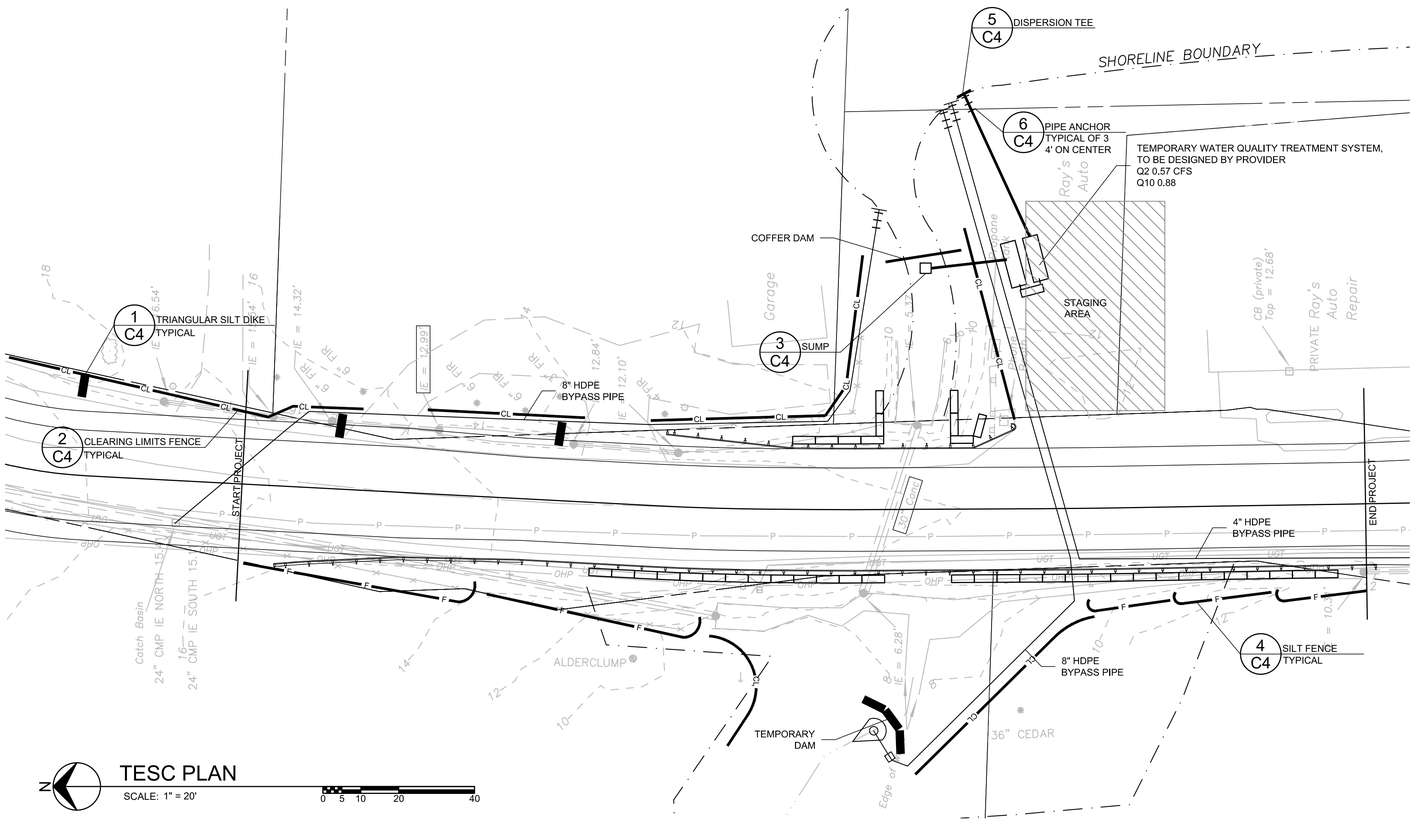
EXISTING CONDITIONS
PRELIMINARY DESIGN PLANS

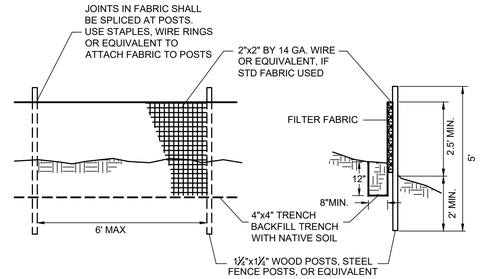
C3



TESC PLAN

SCALE: 1" = 20'

0 5 10 20 40



NOTES:
1. MAXIMIZE DETENTION OF STORMWATER BY PLACING FENCE AS FAR AWAY FROM TOE OF SLOPE AS POSSIBLE WITHOUT ENCROACHING ON SENSITIVE AREAS OR OUTSIDE CLEARING BOUNDARIES.

2. INSTALL SILT FENCING ALONG CONTOURS.

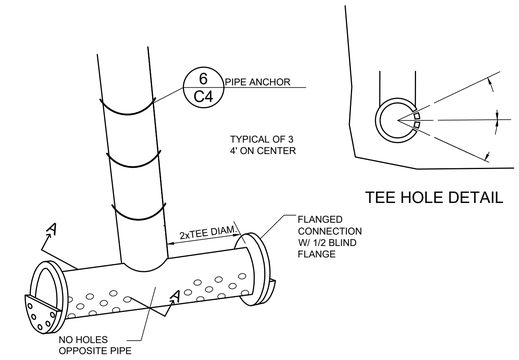
3. INSTALL THE ENDS OF THE SILT FENCE TO POINT SLIGHTLY UP-SLOPE TO PREVENT SEDIMENT FROM FLOWING AROUND THE ENDS OF THE FENCE.

4. PERFORM MAINTENANCE IN ACCORDANCE WITH STANDARD SPECIFICATIONS 8.01.3(9)A AND 8.01.3(15).

5. FILTER FABRIC SHALL MEET WSDOT 9-33.2(1) TABLE 6.

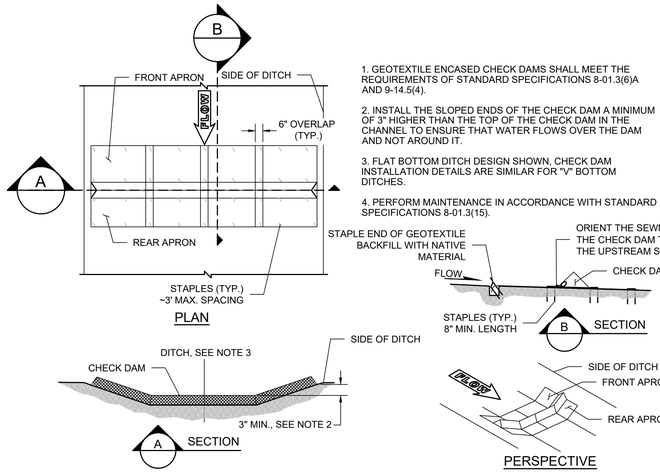
4 C4 SILT FENCE

NO SCALE



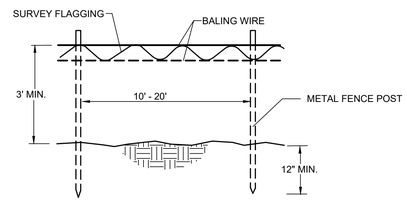
5 C4 DISPERSION TEE

NO SCALE



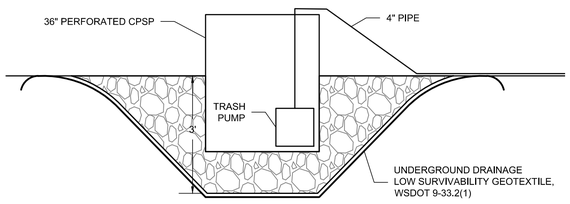
1 C4 TRIANGULAR SILT DIKE

NO SCALE



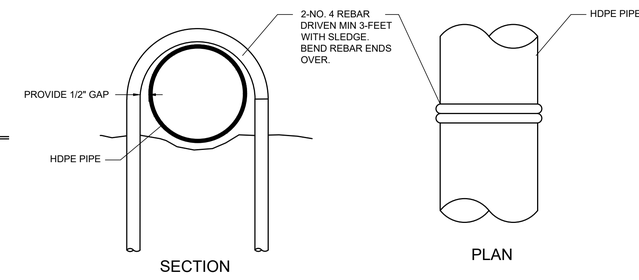
2 C4 CLEARING LIMITS FENCE

NO SCALE



3 C4 SUMP

NO SCALE



6 C4 PIPE ANCHOR

NO SCALE

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

ADAM E. WHEELER — STATE OF WASHINGTON — 40430 — REGISTERED PROFESSIONAL ENGINEER

Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

CITY OF BAINBRIDGE ISLAND

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PUBLIC WORKS ENGINEERING DEPARTMENT

COOPER CREEK FISH PASSAGE IMPROVEMENTS

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P 206.842.0605 INFO@BrowneWheeler.COM

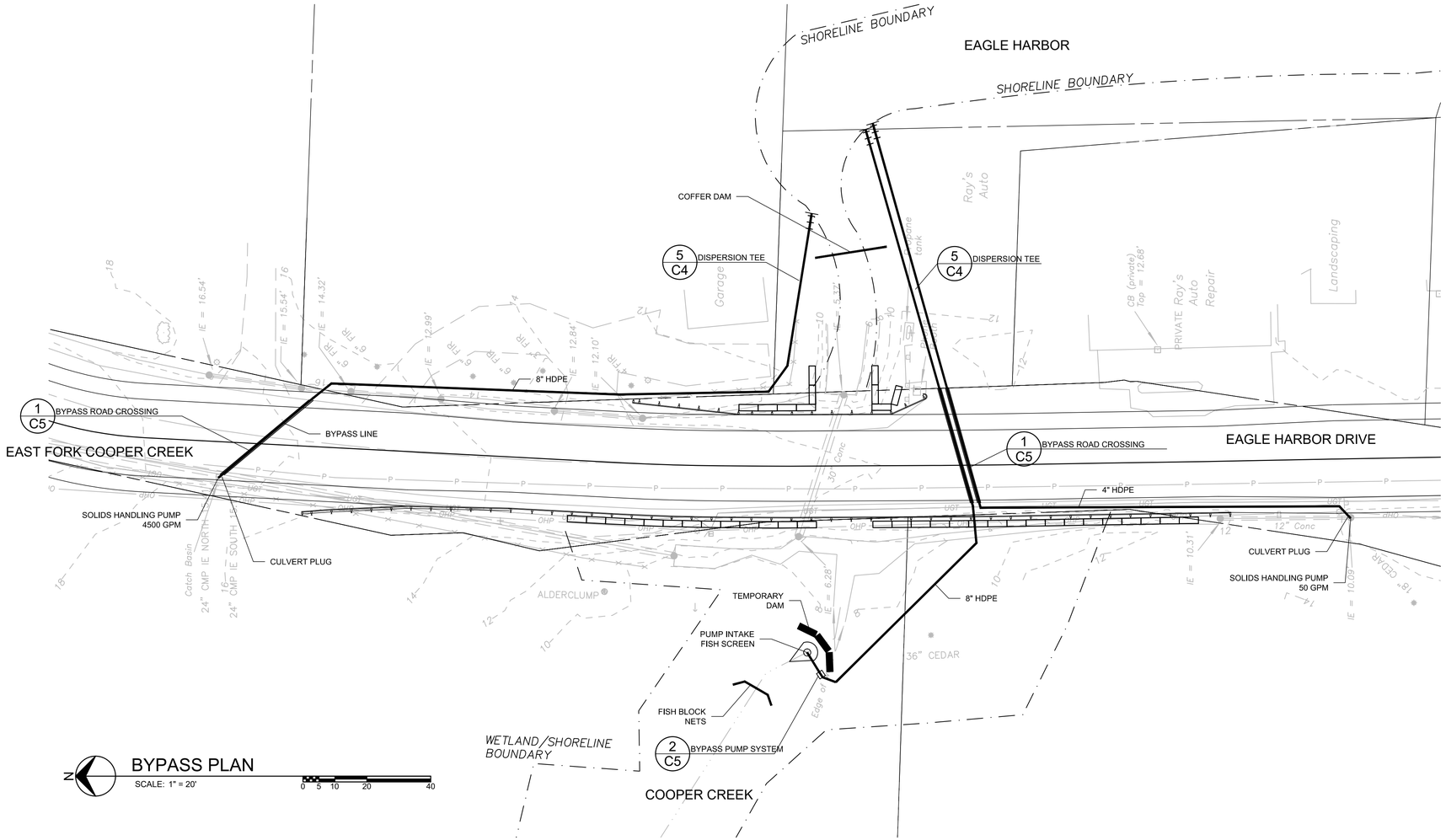
TESC PLAN

PRELIMINARY DESIGN PLANS

C4

4 OF 15

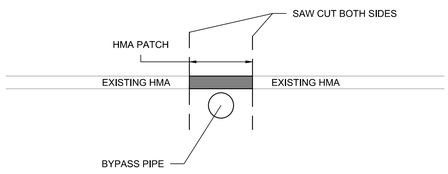
Filename: C4 TESC PLAN
XREF Filename:
Drawn By: NDW
Checked By: AEW
Section: ___-S-___ T_N-R_E
Surveyed By: Date:
Control Monument: Field Bk/Pg:
Recorded Survey Kitsap County Auditor AF_ _ Vol/Bk Page
Constructed By: Date:



BYPASS PLAN

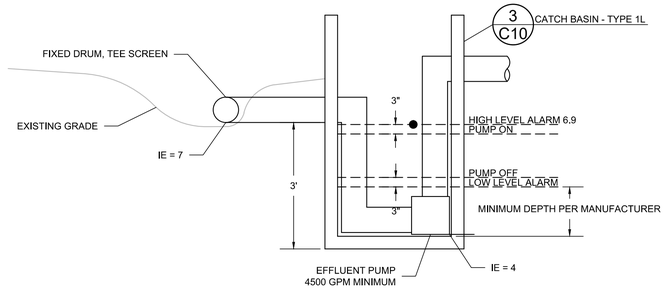
SCALE: 1" = 20'

0 5 10 20 40



1 C5 BYPASS ROAD CROSSING

NO SCALE



2 C5 BYPASS PUMP SYSTEM

NO SCALE

BYPASS FLOWS		
	Q 2yr	TDH
NORTH PYPASS	8.42 CFS	33'
WEST BYPASS	8.00 CFS	26'
SOUTH BYPASS	0.50CFS	2'

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

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W.O. No.:
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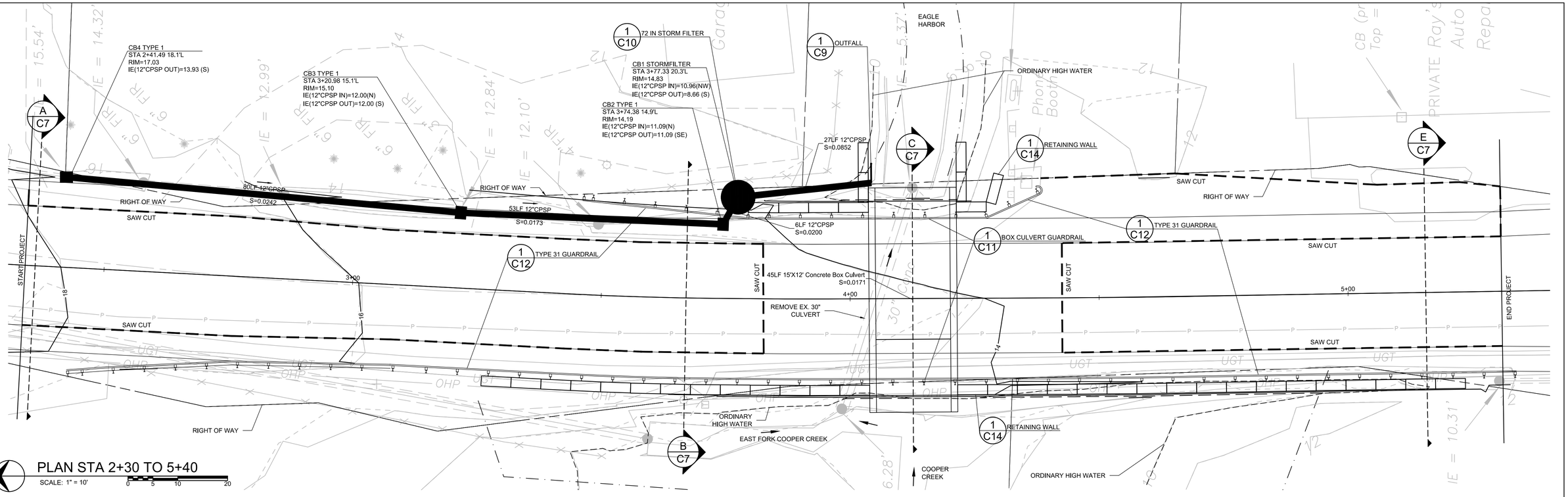
BYPASS PLAN

PRELIMINARY DESIGN PLANS

C5

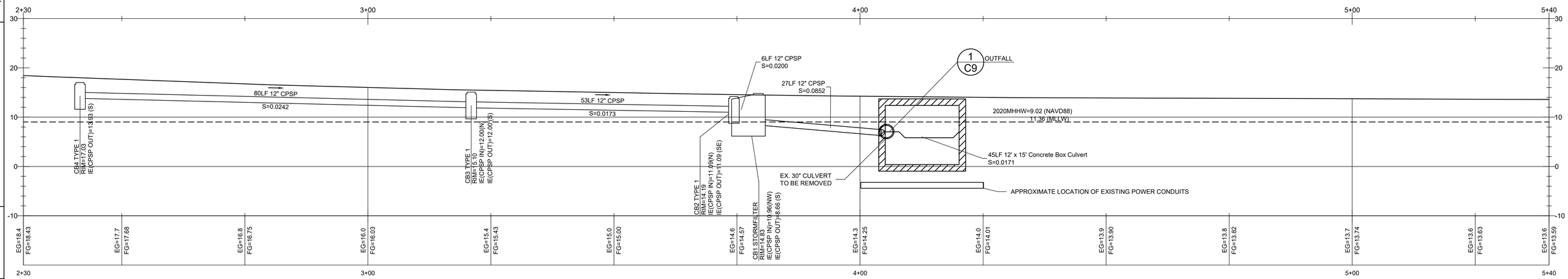
5 OF 15

Filename: C5 BYPASS PLAN
XREF Filename:
Drawn By: NDW
Checked By: AEW
Section: —S—T—N—R—E
Surveyed By:
Date:
Control Monument:
Field Bk/Pg:
Recorded Survey
Kitsap County Auditor
AF#—
Vol/Bk —Page
Constructed By:
Date:



PLAN STA 2+30 TO 5+40

SCALE: 1" = 10'



PROFILE STA 2+30 TO 5+40

SCALE: 1" = 10'

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

ADAM E. WHEELER — STATE OF WASHINGTON — 40430 — REGISTERED PROFESSIONAL ENGINEER

Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

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PLAN AND PROFILE

PRELIMINARY DESIGN PLANS

C6

6 OF 15

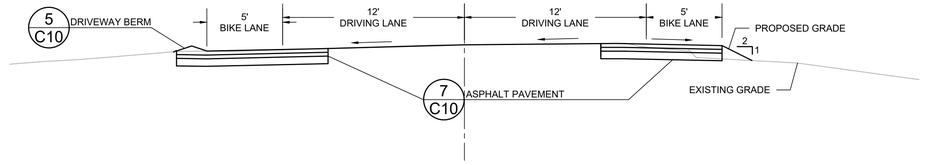
Filename: C6 PLAN AND PROFILE
XREF Filename:

Drawn By: NDW
Checked By: AEW

Section: ___-S-___-T_N-R_E
Surveyed By:
Date:
Control Monument:
Field Bk./Pg:

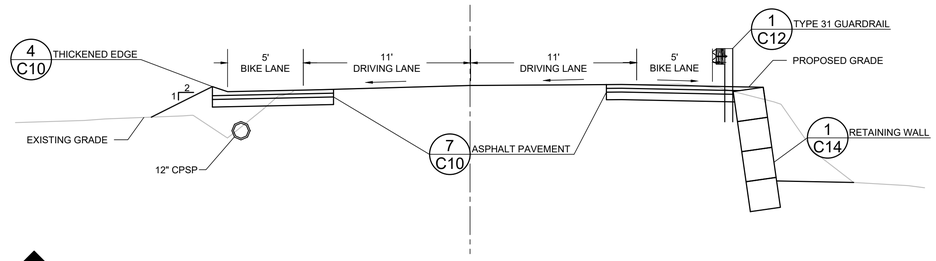
Recorded Survey
Kitsap County Auditor
AF#_____
Vol/Bk _____ Page

Constructed By:
Date:



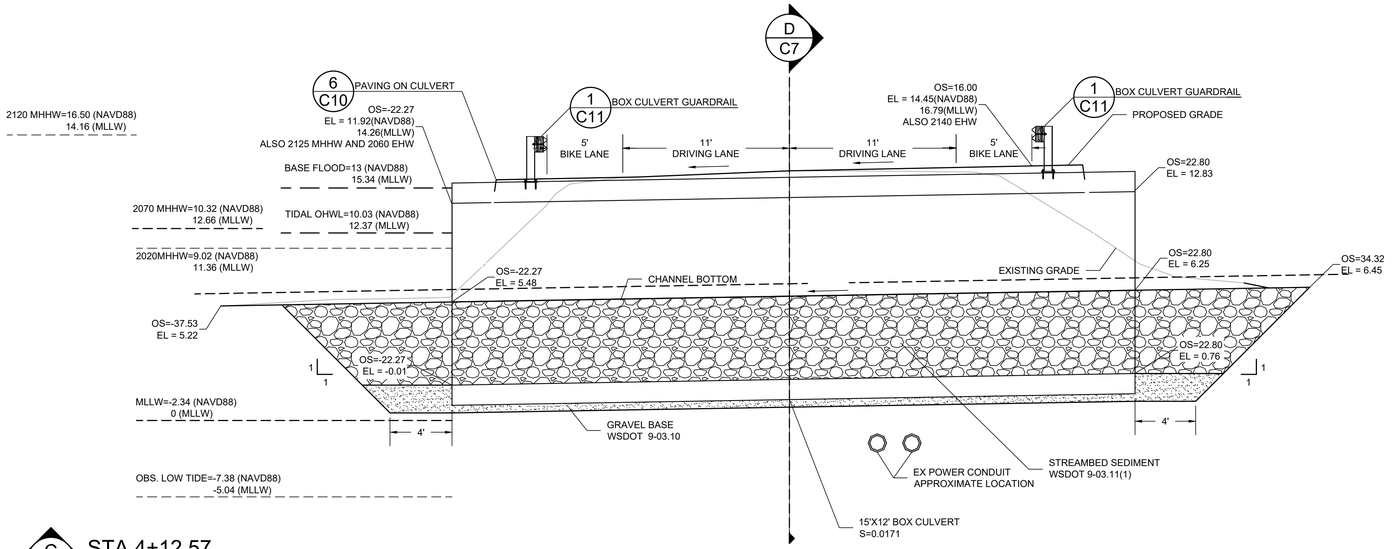
A C7 STA 2+36.15

SCALE: 1" = 5'



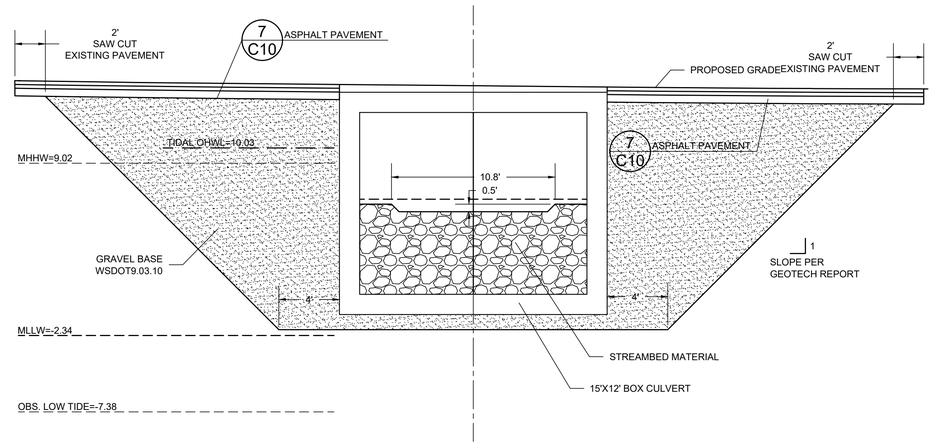
B C7 STA 3+67.05

SCALE: 1" = 5'



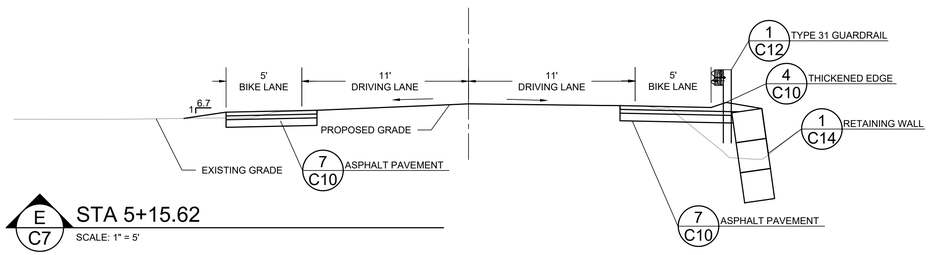
C C7 STA 4+12.57

SCALE: 1" = 5'



D C7 CULVERT

SCALE: 1" = 5'



E C7 STA 5+15.62

SCALE: 1" = 5'

NOTE:

1. SEA LEVEL RISE BASED ON 50% PROBABILITY OF EXCEEDANCE AND REPRESENTATIVE CONCENTRATION PATHWAY OF 8.5.

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

NOAH E. WHEELER — STATE OF WASHINGTON — 40430 — REGISTERED PROFESSIONAL ENGINEER

Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

CITY OF BAINBRIDGE ISLAND

CITY OF BAINBRIDGE ISLAND
PUBLIC WORKS ENGINEERING DEPARTMENT

COOPER CREEK FISH PASSAGE IMPROVEMENTS

BROWNE • WHEELER ENGINEERS, INC
241 ERICKSEN AVENUE NE
BAINBRIDGE ISLAND, WA 98110
P 206.842.0605 INFO@BrowneWheeler.COM

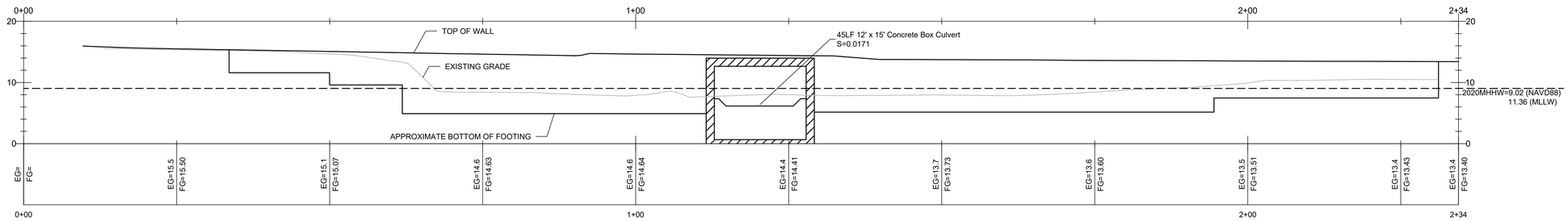
SECTIONS

PRELIMINARY DESIGN PLANS

C7

7 OF 15

Filename: C7 SECTIONS
XREF Filename:
Drawn By: NDW
Checked By: AEW
Section: —S— T_N— R_E
Surveyed By: Date:
Control Monument: Field Bk/Pg:
Recorded Survey
Kitsap County Auditor
AF_ _
Vol/Bk Page
Constructed By: Date:



WEST WALL PROFILE

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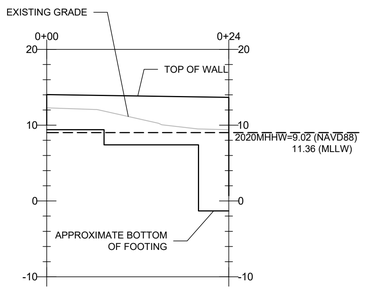

NE WALL

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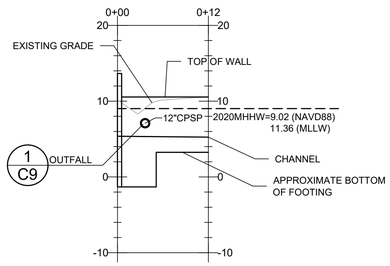

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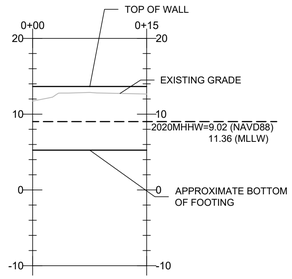

SE WALL

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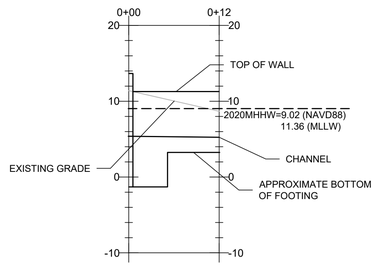

SE WING

SCALE: 1" = 10'

Constructed By:
Date:

Recorded Survey
Kitsap County Auditor
AF#_____
Vol/Bk_____Page_____

Control Monument:
Surveyed By:
Date:
Field Bk/Pg:

Section:
___-S-___-T_N-R_E

Drawn By: NDW
Checked By: AEW

Filename: C8 WALL PROFILES
XREF Filename:

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

ADAM E. WHEELER
STATE OF WASHINGTON
40430
REGISTERED
PROFESSIONAL ENGINEER

Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

CITY OF BAINBRIDGE ISLAND

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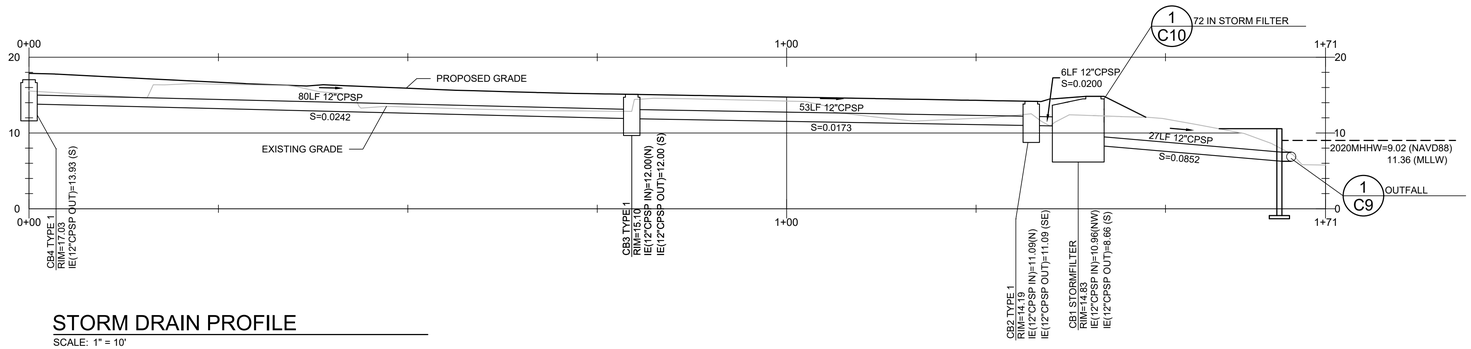
BAINBRIDGE ISLAND, WA 98110
P 206.842.0605 INFO@BrowneWheeler.COM

WALL PROFILES

PRELIMINARY DESIGN PLANS

C8



STORM DRAIN PROFILE

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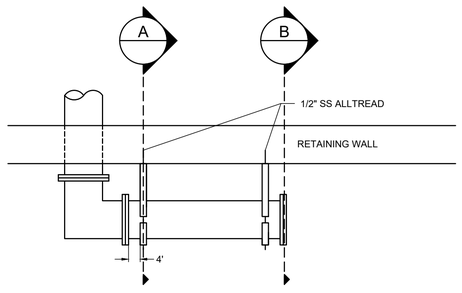
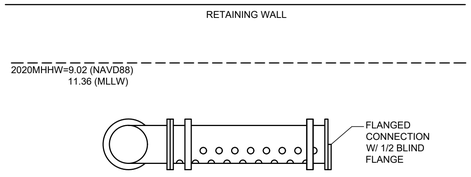
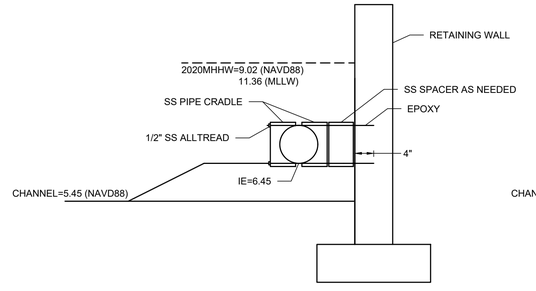


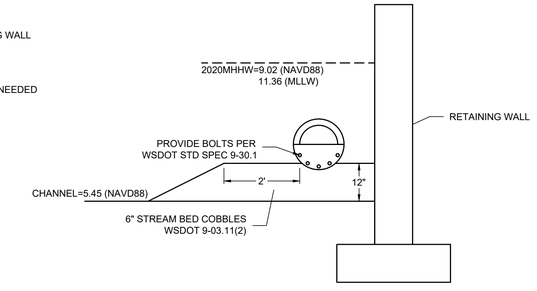
PLAN



ELEVATION



SECTION A



SECTION B

1/C9 OUTFALL

NO SCALE

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

ADAM E. WHEELER — STATE OF WASHINGTON — 40430 — REGISTERED PROFESSIONAL ENGINEER

Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

CITY OF BAINBRIDGE ISLAND

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STORM DRAIN PROFILE

PRELIMINARY DESIGN PLANS

C9

9 OF 15

Filename: C9 STORM DRAIN PROFILE
XREF Filename:
Drawn By: NDW
Checked By: AEW
Section: —S— T —N— R —E
Surveyed By: Date:
Control Monument: Field Bk/Pg:
Recorded Survey
Kitsap County Auditor
AF#— Vol/Bk Page —
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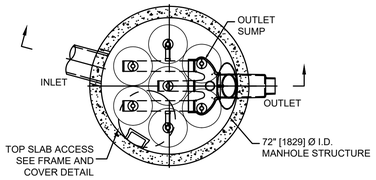
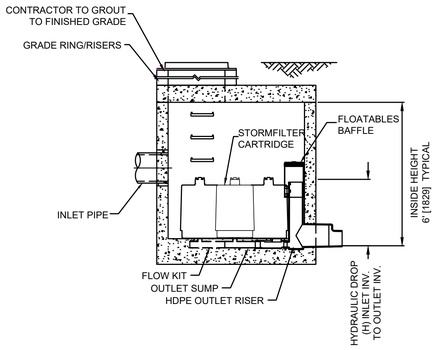




1 / C10 — 72 IN STORM FILTER

NO SCALE

STORMFILTER DESIGN NOTES

- STORMFILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCALLY APPROVED SURFACE AREA SPECIFIC FLOW RATE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD
- A STANDARD 72" [1829] Ø MANHOLE STYLE STORMFILTER IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (3)
- A VOLUME SYSTEM IS ALSO AVAILABLE WITH 3 CARTRIDGES, MAXIMUM
- ALL PARTS AND INTERNAL ASSEMBLY PROVIDED BY CONTECH UNLESS OTHERWISE NOTED

CARTRIDGE SIZE (in. [mm])	27 [686]			18 [457]			LOW DROP		
RECOMMENDED MINIMUM HYDRAULIC DROP (H) (ft. [mm])	3.05 [930]			2.3 [701]			1.8 [549]		
SPECIFIC FLOW RATE (gpm/sf [L/s/m²])	2 [1.36]	1.67* [1.13]*	1 [0.68]	2 [1.36]	1.67* [1.13]*	1 [0.68]	2 [1.36]	1.67* [1.13]*	1 [0.68]
CARTRIDGE FLOW RATE (gpm [L/s])	22.5 [1.42]	18.79 [1.19]	11.25 [0.71]	15 [0.95]	12.53 [0.79]	7.5 [0.47]	10 [0.63]	8.35 [0.53]	5 [0.32]

* 1.67 gpm/sf [1.13 L/s/m²] SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	CB1
WATER QUALITY FLOW RATE (cfs [L/s])	0.1169
PEAK FLOW RATE (cfs [L/s])	0.9221
RETURN PERIOD OF PEAK FLOW (yrs)	100
CARTRIDGE SIZE (SEE TABLE ABOVE)	18"
CARTRIDGE FLOW RATE	7.5
MEDIA TYPE (PERLITE, ZPG, PSORB)	ZPG
NUMBER OF CARTRIDGES REQUIRED	7

PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1	10.96	CPSP	12"
INLET PIPE 2			
OUTLET PIPE	8.66	CPSP	12"

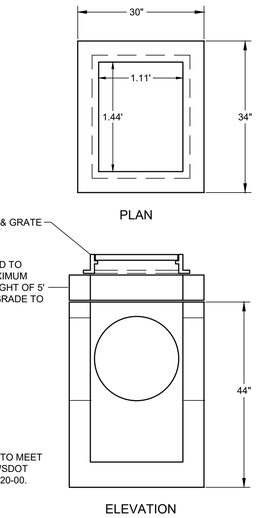
NOTES/SPECIAL REQUIREMENTS:
PROVIDE ANTI-FLOTATION BALLAST ASSUMING WATER LEVEL IS AT RIM ELEVAITON

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' [610] AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7" [178]. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) [L/s] DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft)[m^2].
8. STORMFILTER STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
9. ALTERNATE UNITS ARE IN MILLIMETERS [mm], UNLESS NOTED OTHERWISE.

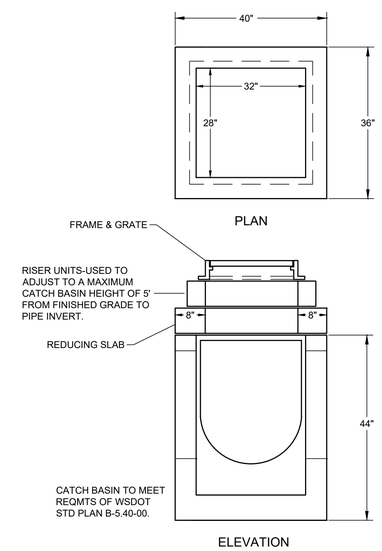
INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET PIPE(S).
E. CONTRACTOR TO PROVIDE AND INSTALL CONNECTOR TO THE OUTLET RISER STUB. STORMFILTER EQUIPPED WITH A DUAL DIAMETER HDPE OUTLET STUB AND SAND COLLAR. IF OUTLET PIPE IS LARGER THAN 8" [200], CONTRACTOR TO REMOVE THE 8" [200] OUTLET STUB AT MOLDED-IN CUT LINE. COUPLING BY FERNCO OR EQUAL AND PROVIDED BY CONTRACTOR.
F. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.



2 / C10 — CATH BASIN - TYPE 1

NO SCALE



3 / C10 — CATCH BASIN - TYPE 1L

NO SCALE

GENERAL NOTES

1. UNLESS OTHERWISE SPECIFIED, MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENTLY ADOPTED EDITION OF "STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION", APWA/WSDOT EXCEPT AS MODIFIED BY THE CITY OF BAINBRIDGE ISLAND IN THE CURRENT EDITION OF "DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS"

2. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES AND OTHER FEATURES ON THE PLAN ARE APPROXIMATE AND MAY NOT BE COMPLETE. ACTUAL LOCATIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR AS REQUIRED.

3. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR WORKER SAFETY. ALL TRENCHING AND OTHER ACTIVITIES SHALL BE IN ACCORDANCE WITH STATE AND LOCAL SAFETY REGULATIONS AND REQUIREMENTS.

4. A COPY OF THE APPROVED PLANS AND OTHER APPLICABLE SPECIFICATIONS AND DRAWINGS SHALL BE ONSITE DURING CONSTRUCTION.

5. CONTRACTOR SHALL OBTAIN AN UNDERGROUND UTILITIES LOCATE PRIOR TO BEGINNING CONSTRUCTION (UNDERGROUND UTILITIES LOCATION SERVICE, 1-800-424-5555).

6. CONTRACTOR SHALL INSTALL, REPLACE OR RELOCATE ALL SIGNS AND OTHER FEATURES AFFECTED BY CONSTRUCTION.

7. CONTRACTOR SHALL APPLY FOR AND OBTAIN AN APPROVED PERMIT FOR WORK IN THE RIGHT OF WAY PRIOR TO ANY WORK IN THE RIGHT OF WAY.

8. CONTRACTOR SHALL SCHEDULE AND ATTEND A PRE-CONSTRUCTION CONFERENCE WITH CITY STAFF PRIOR TO ANY WORK ON CITY RIGHTS-OF-WAY.

9. ANY REVISIONS TO THE PLANS SHALL BE REVIEWED AND APPROVED BY THE BAINBRIDGE ISLAND ENGINEERING DEPARTMENT PRIOR TO IMPLEMENTATION IN THE FIELD.

10. SIGNING, FLAGGING AND TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE WSDOT TRAFFIC MANUAL AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. THE PLAN SHALL BE PROVIDED TO THE CITY FOR APPROVAL IF APPLICABLE.

11. ALL PIPE AND OTHER MATERIAL STORED ALONG CITY RIGHT-OF-WAY MUST BE PLACED AT A SAFE DISTANCE FROM THE TRAVELED ROADWAY IN SUCH A MANNER AS TO AVOID FALLING ONTO THE ROADWAY.

12. MAXIMUM LENGTH OF OPEN TRENCH ON STREETS SHALL BE 400 FEET. AT THE END OF EACH DAY, ALL TRENCHES MUST BE BACKFILLED OR COVERED WITH STEEL PLATES OR BARRICADED WITH FLASHING WARNING LIGHTS.

13. ALL PIPE TRENCH BACKFILL SHALL BE IN ACCORDANCE WITH THE WSDOT/APWA SPECIFICATIONS FOR PIPE BEDDING AND BANK RUN GRAVEL IF PROPER COMPACTION CANNOT BE OBTAINED USING NATIVE SOIL, EXCEPT AS NOTED ON PLAN.

14. POWER, TELEVISION CABLE, AND COMMUNICATIONS LINES SHALL BE INSTALLED WITH A MINIMUM OF FIVE FEET HORIZONTAL SEPARATION FROM PUBLIC WATER, SEWER AND STORM DRAINAGE FACILITIES.

EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL APPLY ALL MEASURES NECESSARY TO PREVENT THE DISCHARGE OF SEDIMENT-LADEN WATER OFF THE PROJECT SITE. FACILITIES SHOWN ON THE PLANS ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS.

2. THE CONTRACTOR SHALL INSPECT AND MAINTAIN ALL EROSION CONTROL FACILITIES REGULARLY, PARTICULARLY DURING AND FOLLOWING LARGE STORMS.

3. ALL STREETS ADJACENT TO THIS PROJECT SHALL BE KEPT CLEAN OF ALL MATERIAL DEPOSITS RESULTING FROM CONSTRUCTION.

4. SITE WORK SHALL BE SCHEDULED TO MINIMIZE THE EXPOSURE OF DISTURBED SOILS. 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 THROUGH APRIL 30, NO SOILS SHALL REMAIN EXPOSED FOR MORE THAN 2 DAYS. FROM MAY 1 THROUGH SEPTEMBER 30, NO SOILS SHALL REMAIN EXPOSED FOR MORE THAN 7 DAYS.

5. CARE SHALL BE TAKEN TO PREVENT ANY DISCHARGE OF SEDIMENT-LADEN WATER INTO THE STORMWATER DISPERSION SYSTEMS. ANY INLETS WHICH RECEIVE RUNOFF SHOULD BE PROTECTED WITH SEDIMENT FILTERS.

6. PETROLEUM PRODUCTS AND OTHER POTENTIAL POLLUTANTS SHALL BE PROTECTED TO PREVENT THEIR INTRODUCTION INTO SITE RUNOFF OR THE STORM DRAINAGE SYSTEM.

7. DEWATERING WATER SHALL BE FILTERED TO REMOVE SEDIMENT AND DISCHARGED IN A MANNER TO AVOID DOWNSTREAM IMPACTS.

8. CLEARING LIMITS, IF SHOWN, SHALL BE CLEARLY FLAGGED PRIOR TO ANY CLEARING OR CONSTRUCTION ON THE SITE. DURING CONSTRUCTION, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL ALL CONSTRUCTION IS APPROVED.

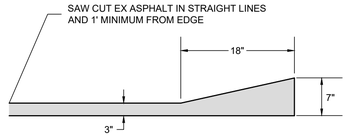
9. ALL TEMPORARY EROSION CONTROL FACILITIES, INCLUDING PERIMETER CONTROLS, SHALL REMAIN IN PLACE UNTIL FINAL SITE CONSTRUCTION IS COMPLETE AND APPROVAL HAS BEEN RECEIVED FROM THE CITY.

STORM DRAINAGE

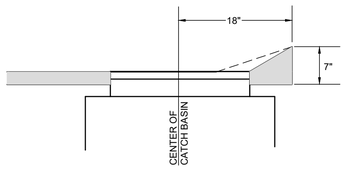
1. STORM DRAINS SHALL BE SMOOTH INTERIOR CORRUGATED POLYETHYLENE (ADS N12 OR EQUIVALENT) OR PVC (ASTM D3034, SDR 35) UNLESS OTHERWISE NOTED.

2. PRIOR TO FINAL INSPECTION AND ACCEPTANCE OF STORM DRAINAGE WORK, PIPES AND STORM DRAIN STRUCTURES SHALL BE CLEANED AND FLUSHED. ANY OBSTRUCTIONS WITHIN THE STORM DRAIN SYSTEM SHALL BE REMOVED AND WASH WATER OF ANY SORT SHALL NOT BE DISCHARGED TO THE STORM DRAIN SYSTEM OR SURFACE WATERS.

3. ALL MANHOLES AND CATCH BASINS IN PUBLIC RIGHTS-OF-WAY SHALL BE ADJUSTED TO FINAL GRADE PRIOR TO FINAL PAVING.



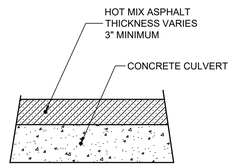
RAISED EDGE



RAISED EDGE W/ CATCH BASIN

4 / C10 — THICKENED EDGE

NO SCALE



6 / C10 — PAVING ON CULVERT

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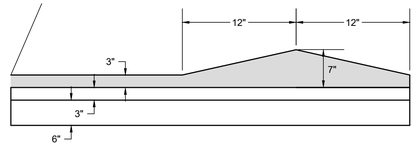

5 / C10 — DRIVEWAY BERM

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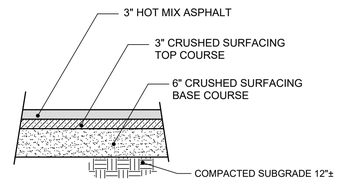

ALL MATERIALS SHALL BE COMPACTED TO 95% MAX. DENSITY (MODIFIED PROCTOR)

REMOVE AND REPLACE UNSUITABLE MATERIAL AS DIRECTED BY GEOTECHNICAL ENGINEER.

7 / C10 — ASPHALT PAVEMENT

NO SCALE

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

ADAM E. WHEELER — STATE OF WASHINGTON — 40430 — REGISTERED PROFESSIONAL ENGINEER

Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

CITY OF BAINBRIDGE ISLAND

CITY OF BAINBRIDGE ISLAND
PUBLIC WORKS ENGINEERING DEPARTMENT

COOPER CREEK FISH PASSAGE IMPROVEMENTS

BROWNE • WHEELER ENGINEERS, INC
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BAINBRIDGE ISLAND, WA 98110
P 206.842.0605 INFO@BrowneWheeler.COM

DETAILS

PRELIMINARY DESIGN PLANS

C10

10 OF 15

Constructed By: Date:

Recorded Survey
Kitsap County Auditor
AF#_____ Vol/Bk_____ Page_____

Control Monument: Field Bk/Pg:

Surveyed By: Date:

Section: ___S___ T___N___R___E

Drawn By: NDW
Checked By: AEW

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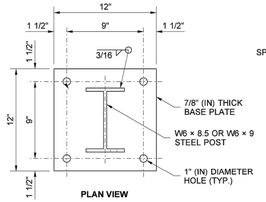
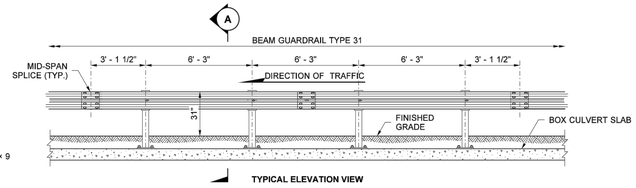


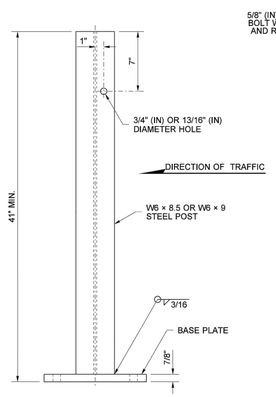
PLAN VIEW



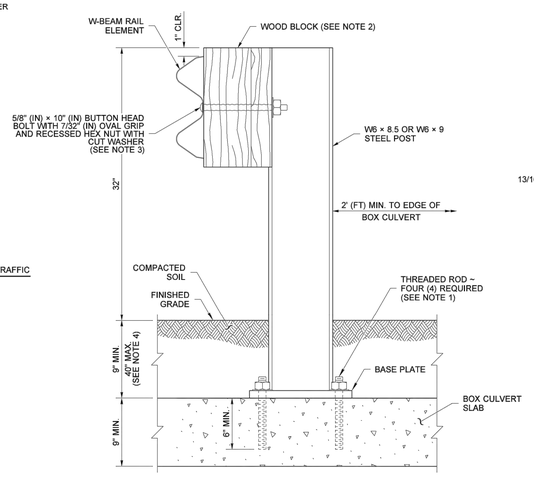
TYPICAL ELEVATION VIEW

NOTES

1. Attach Guardrail Post to Box Culvert with 7/8" (in) diameter high-strength threaded rods 8 1/2" (in) in length with resin-bonded anchors.
2. Wood blocks are shown. Blocks of an approved alternative may be used. See **Standard Specification, Section 9-16.3(2)**.
3. Attach blockouts to steel posts using bolt holes on approaching traffic side of post web.
4. For fill depths greater than 40 inches, drive standard guardrail posts and install guardrail per **Standard Plan C-20.10**.

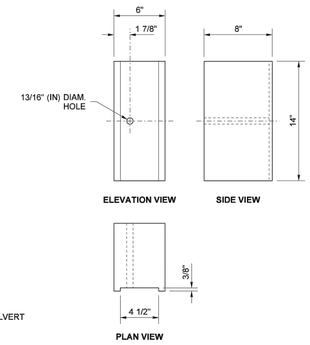


BOX CULVERT POST
ELEVATION VIEW



SECTION (A)

BOX CULVERT GUARDRAIL STEEL POST TYPE 31



ELEVATION VIEW **SIDE VIEW**

PLAN VIEW

WOOD BLOCKOUT
(SEE NOTE 2)

STATE OF WASHINGTON · JOHN PATRICK DONAHUE · 19027 · REGISTERED PROFESSIONAL ENGINEER

Donahue, John
Aug 10 2019 1:57 PM

BOX CULVERT GUARDRAIL STEEL POST ~ TYPE 31
STANDARD PLAN C-20.41-02

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Roark, Steve
Aug 12 2019 11:51 AM
STATE DESIGN ENGINEER
Washington State Department of Transportation

1
C11

BOX CULVERT GUARDRAIL

NO SCALE

Recorded Survey
Kitsap County Auditor
AF#_____
Vol/Bk_____ Page_____

Control Monument:
Field Bk/Pg:

Surveyed By:
Date:

Section: __S__T__N__R__E

Drawn By: DETAIL
Checked By: AEW

Filename: C11 WSDOT BOX CULVERT GUARDRAIL DETAIL
XREF Filename:

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

ADAM E. WHEELER · STATE OF WASHINGTON · 40430 · REGISTERED PROFESSIONAL ENGINEER

Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

CITY OF BAINBRIDGE ISLAND

CITY OF BAINBRIDGE ISLAND
PUBLIC WORKS ENGINEERING DEPARTMENT

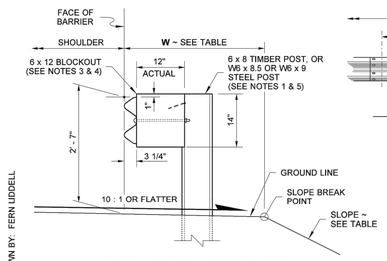
COOPER CREEK FISH PASSAGE IMPROVEMENTS

BROWNE • WHEELER ENGINEERS, INC
241 ERICKSEN AVENUE NE
BAINBRIDGE ISLAND, WA 98110
P 206.842.0605 INFO@BrowneWheeler.COM

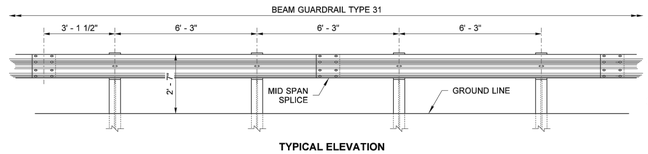
WSDOT BOX CULVERT GUARDRAIL DETAIL PRELIMINARY DESIGN PLANS

C11

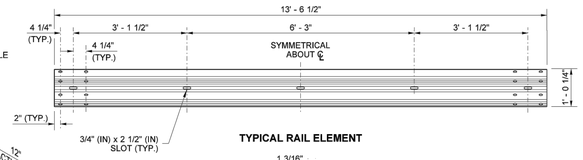
11 OF 15



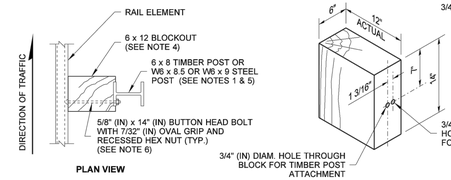
TYPICAL SECTION ~ WITHOUT CURB
(6' - 0" POSTS)



TYPICAL ELEVATION

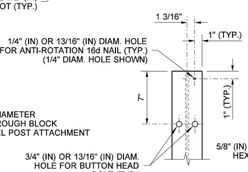


TYPICAL RAIL ELEMENT

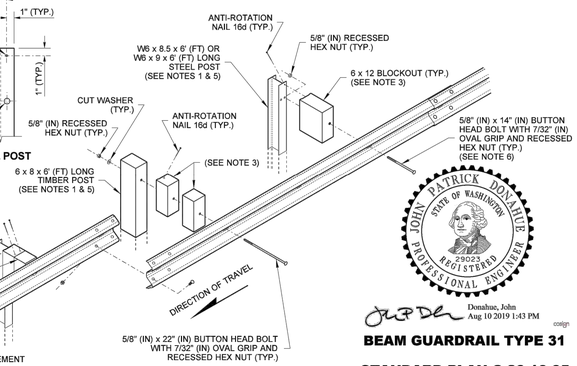


PLAN VIEW

WOOD BLOCK



STEEL POST



ISOMETRIC VIEW

ELEVATION VIEW

TYPICAL SECTION ~ WITH CURB
(6' - 0" LONG POSTS)

SLOPE \ EMBANKMENT TABLE
FOR STD. 6' POSTS

SLOPE	W (FT)
2H : 1V OR FLATTER	2.5' MIN.
STEEPER THAN 2H : 1V BUT NOT STEEPER THAN 1H : 1V	4.0' MIN.

NOTES

1. Refer to **Standard Plan C-1b** and **C-20.11** for additional details not shown on this plan.
2. Extend shoulder pavement to provide a base for the extruded curb. See Contract Plans for exceptions to distances shown.
3. Use a single block or combination of blocks (no more than two (2) to achieve the actual 12" (in) offset. See **Standard Specification, Section 9-16.3(2)**. Wood blocks shall be secured to the posts with anti-rotation nails. If combination blocks are used, the adjacent blocks shall be toenailed with two 16d galvanized nails to prevent block rotation.
4. Wood blocks are shown. Blocks of an approved alternative material may be used. See **Standard Specification, Section 9-16.3(2).**
5. All posts for any standard barrier run shall be of the same type: timber or steel.
6. Attach blockouts to steel posts using bolt holes on approaching traffic side of post web.

JOHN PATRICK DONAHUE — STATE OF WASHINGTON — 28023 — REGISTERED PROFESSIONAL ENGINEER

Donahue, John
Aug 10 2019 1:43 PM

BEAM GUARDRAIL TYPE 31

STANDARD PLAN C-20.10-05

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Roark, Steve
Aug 12 2019 11:48 AM
STATE DESIGN ENGINEER
Washington State Department of Transportation

1 / C12 TYPE 31 GUARDRAIL
NO SCALE

Constructed By: Date:

Recorded Survey
Kitsap County Auditor
AF– – Vol/Bk: Page

Control Monument:
Surveyed By: Date: Field Bk/Pg:

Section: —S— T N— R E

Drawn By: NDW Checked By: AEW

Filename: C12 WSDOT TYPE 31 GUARDRAIL
XREF Filename:

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

ADAM E. WHEELER — STATE OF WASHINGTON — 40430 — REGISTERED PROFESSIONAL ENGINEER

Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

CITY OF BAINBRIDGE ISLAND

CITY OF BAINBRIDGE ISLAND
PUBLIC WORKS ENGINEERING DEPARTMENT

COOPER CREEK FISH PASSAGE IMPROVEMENTS

BROWNE • WHEELER ENGINEERS, INC
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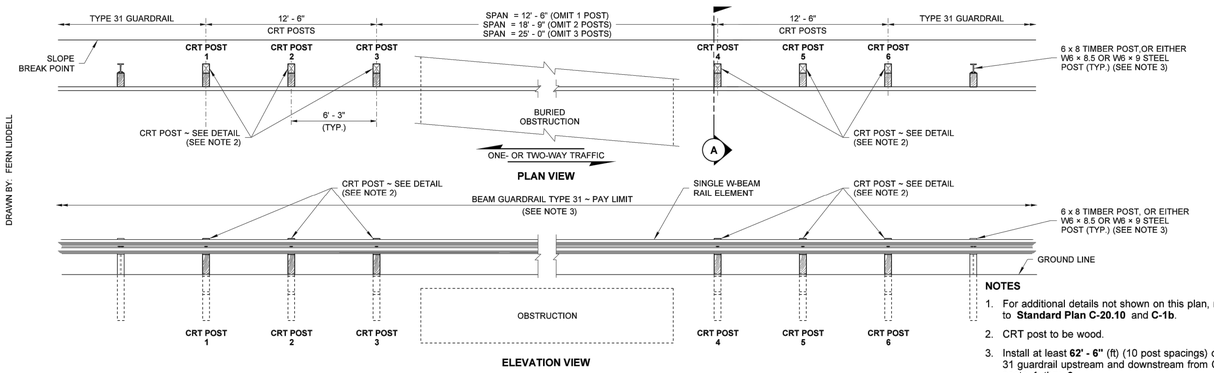
BAINBRIDGE ISLAND, WA 98110
P 206.842.0605 INFO@BrowneWheeler.COM

WSDOT TYPE 31 GUARDRAIL DETAIL
PRELIMINARY DESIGN PLANS

C12

12 OF 15



NOTES

1. For additional details not shown on this plan, refer to **Standard Plan C-20.10** and **C-1b**.
2. CRT post to be wood.
3. Install at least **62' - 6"** (ft) (10 post spacings) of Type 31 guardrail upstream and downstream from CRT posts **1** thru **6**.
4. Grading requirements for spans without headwalls must begin at least **43.75'** (ft) (7 posts spacings) before CRT post **3**, extend thru the obstruction area, and end at least **43.75'** (ft) (7 post spacings) after CRT post **4**.
5. Grading requirements for spans w/ headwalls must extend **43.75'** (ft) (7 post spacings) minimum up stream and down-stream from CRT posts **3** and **4**.

JOHN PATRICK DONAHUE — STATE OF WASHINGTON — 29023 — REGISTERED PROFESSIONAL ENGINEER

Donahue, John
Aug 10 2019 1:56 PM

BEAM GUARDRAIL TYPE 31 PLACEMENT 12'- 6", 18' - 9", OR 25' - 0" SPAN
STANDARD PLAN C-20.40-07

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Roark, Steve
Aug 12 2019 11:30 AM
STATE DESIGN ENGINEER
Washington State Department of Transportation

1 / C13 TYPE 31 GUARDRAIL TRANSITION
NO SCALE

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

JOHN P. WHEELER — STATE OF WASHINGTON — 40430 — REGISTERED PROFESSIONAL ENGINEER

Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

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PUBLIC WORKS ENGINEERING DEPARTMENT

COOPER CREEK FISH PASSAGE IMPROVEMENTS

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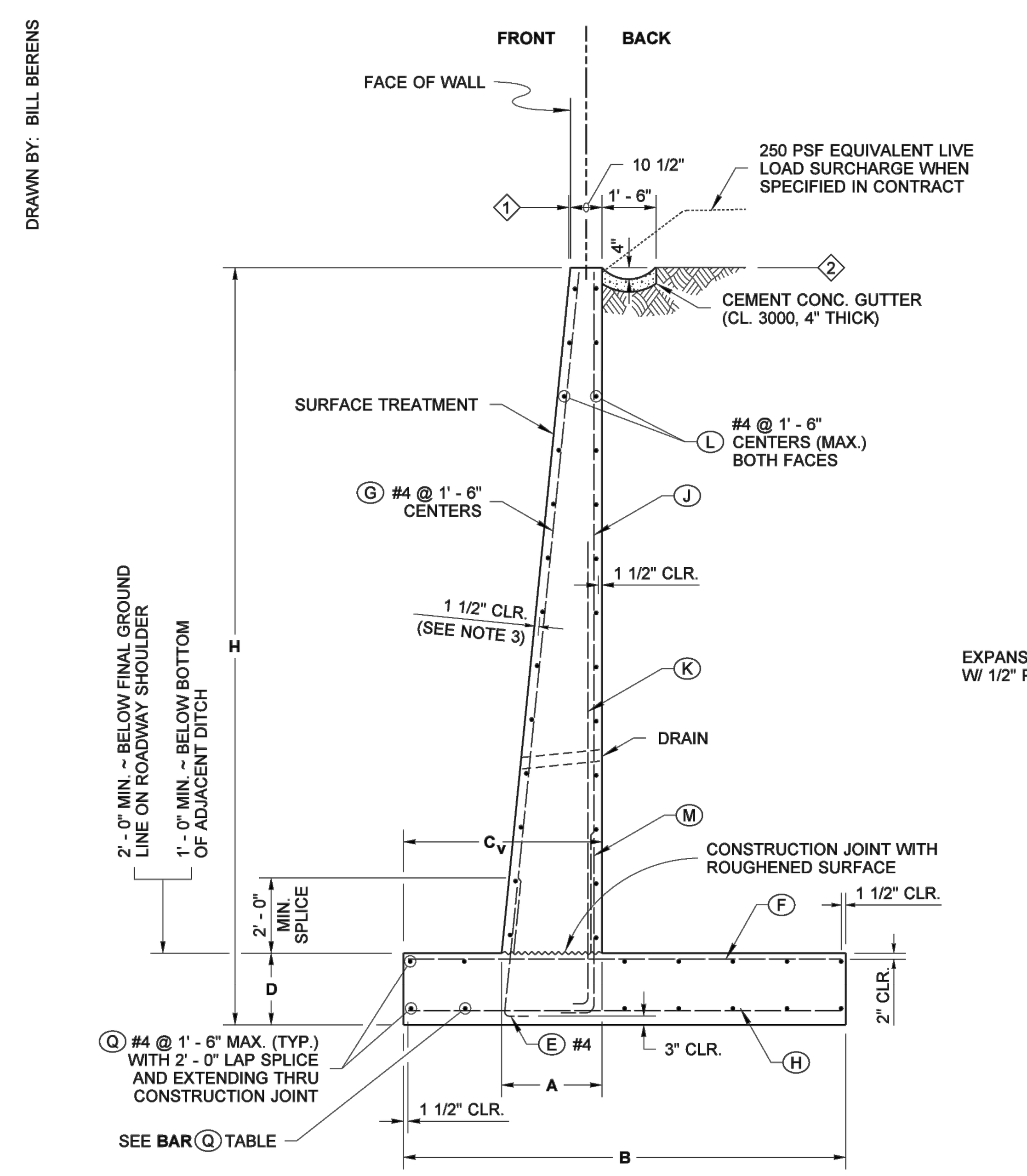
P 206.842.0605 INFO@BrowneWheeler.COM

WSDOT TYPE 31 GUARDRAIL TRANSITION DETAIL
PRELIMINARY DESIGN PLANS

C13
13 OF 15

Filename: C13 WSDOT TYPE 31 GUARDRAIL TRANSITION
XREF Filename:
Drawn By: AEW
Checked By: AEW
Section: __S-__T__N-R__E
Surveyed By: Date:
Control Monument: Field Bk./Pg:
Recorded Survey Kitsap County Auditor AF-_ Vol/Bk _ Page
Constructed By: Date:

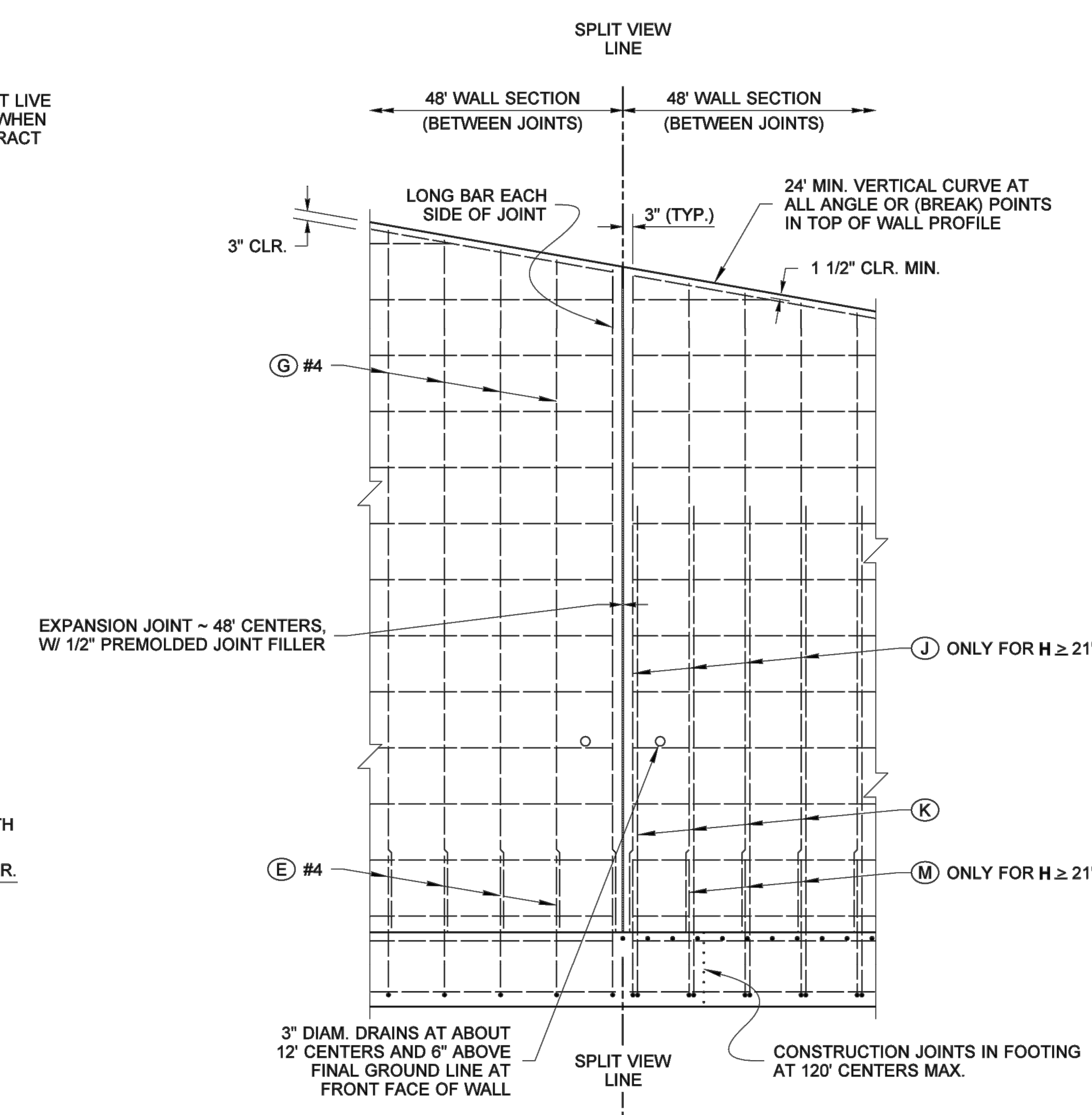


TYPICAL SECTION

BAR (Q) #4		
LOCATION	WALL HEIGHT (H)	QTY.
TOP OF FOOTING	≤ 12'	5
	13' ≤ 16'	6
	17' ≤ 22'	7
	23' ≤ 28'	9
	29' ≤ 35'	11
BOTTOM OF FOOTING	≤ 12'	5
	13' ≤ 16'	6
	17' ≤ 22'	7
	23' ≤ 28'	9
	29' ≤ 35'	11

◇1 OFFSET ~ SET TOP OF WALL BACK:
H ≤ 20' .... OFFSET = 1/2"
H ≥ 20' .... OFFSET (inches) = $\frac{H(ft)}{8} - 2$

◇2 WHEN THE CONTRACT SPECIFIES CABLE FENCE, BACKFILL AND THE CEMENT CONCRETE GUTTER SHALL BE PLACED 6" MIN. FROM THE TOP OF THE WALL



SPLIT ELEVATION VIEW
(SHOWING SEPARATE REBAR LAYERS)

NOTES

1. All concrete shall be Class 4000, except as noted.
2. For backfill requirements, see Standard Plan D-4.
3. When Wall Type 2SW (saltwater) is specified, the concrete cover over steel in the front face and the total wall thickness shall be increased by 1".
4. When Wall Type 2SW (saltwater) is specified, concrete in the table column "Material Quantity" shall be increased by (0.003 x H) CY/LF.
5. Concrete in the 48 foot wall sections shall be placed separately between expansion joints with a minimum 24 hour period before placing concrete in the adjacent section.
6. This wall has been designed in accordance with the requirements of the AASHTO LRFD Bridge Design Specifications 4th Edition 2007 and interims through 2008. The seismic design of these walls has been completed using an effective PGA of 0.51 g.
7. If Traffic Barriers are required, see Standard Plans D-15.10, D-15.20 and D-15.30.

SLOPING FACE WALL DESIGN WITH A 250 PSF SURCHARGE OR TRAFFIC BARRIER

BIJAN KHALEGHI · STATE OF WASHINGTON · 27695 · STRUCTURAL ENGINEER · PROFESSIONAL ENGINEER

REINFORCED CONCRETE RETAINING WALL TYPE 2 AND 2SW
STANDARD PLAN D-10.15-01

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION
Pasco Bakotich III 12-02-08
STATE DESIGN ENGINEER DATE
Washington State Department of Transportation

1 / C14 RETAINING WALL SHEET 1
NO SCALE

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

ADAM E. WHEELER · STATE OF WASHINGTON · 40430 · REGISTERED PROFESSIONAL ENGINEER

Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

CITY OF BAINBRIDGE ISLAND

CITY OF BAINBRIDGE ISLAND
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241 ERICKSEN AVENUE NE BAINBRIDGE ISLAND, WA 98110
P 206.842.0605 INFO@BrowneWheeler.COM

WSDOT RETAINING WALL DETAIL
PRELIMINARY DESIGN PLANS

C14

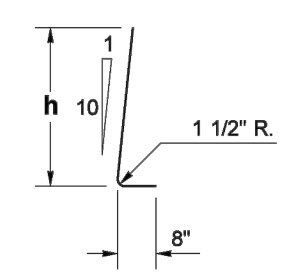
Constructed By: Date:
Recorded Survey: Kitsap County Auditor AF— Vol/Bk Page
Control Monument: Field Bk/Pg:
Surveyed By: Date:
Section: —S— T—N—R—E
Drawn By: NDW Checked By: AEW
Filename: C14 WSDOT RETAINING WALL DETAIL XREF Filename:

WALL HT H	DIMENSIONS				FOOTING REINFORCEMENT																		STEM REINFORCEMENT				MATERIAL QUANTITY		MAXIMUM SOIL PRESSURE (PSF)			
					BAR (E) #4		BAR (F)			BAR (H)			BAR (K)					BAR (M)					BAR (J)			(G) #4						
	B	C_V	D	A	LENGTH	h	SIZE	SPA.	LENGTH	SIZE	SPA.	LENGTH	SIZE	SPA.	LENGTH	h	b	SIZE	SPA.	LENGTH	h	b	SIZE	SPA.	LENGTH	LENGTH	CONC. CY / LF	STEEL LBS / LF	SERVICE	STRENGTH	EXTREME EVENT 1	EXTREME EVENT 2
5'	6' - 9"	3' - 0"	1' - 0"	1' - 4"	2' - 7"	2' - 0"	#4	1' - 6"	6' - 6"	#4	1' - 6"	6' - 6"	#4	1' - 6"	5' - 2"	4' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3' - 10 1/2"	0.41	23.8	900	1244	1163	1620
6'	6' - 9"	3' - 0"	1' - 0"	1' - 5 1/2"	2' - 7"	2' - 0"	#4	1' - 6"	6' - 6"	#4	1' - 6"	6' - 6"	#4	1' - 6"	6' - 2"	5' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4' - 10 1/2"	0.46	26.3	987	1351	1380	1878
7'	7' - 0"	3' - 3"	1' - 0"	1' - 6 1/2"	2' - 7"	2' - 0"	#4	1' - 6"	6' - 9"	#4	1' - 6"	6' - 9"	#4	1' - 6"	7' - 2"	6' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5' - 10 1/2"	0.53	28.9	1076	1476	1548	2006
8'	7' - 0"	3' - 3"	1' - 0"	1' - 7 1/2"	2' - 7"	2' - 0"	#4	1' - 0"	6' - 9"	#4	1' - 6"	6' - 9"	#4	1' - 0"	8' - 2"	7' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6' - 10 1/2"	0.58	34.7	1225	1687	1837	2332
9'	7' - 3"	3' - 6"	1' - 0"	1' - 9"	2' - 7"	2' - 0"	#4	1' - 0"	7' - 0"	#4	1' - 6"	7' - 0"	#4	1' - 0"	9' - 2"	8' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7' - 10 1/2"	0.65	37.7	1325	1833	2043	2486
10'	7' - 6"	3' - 6"	1' - 0"	1' - 10"	2' - 7"	2' - 0"	#4	9"	7' - 3"	#4	1' - 6"	7' - 3"	#4	1' - 0"	10' - 2"	9' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8' - 10 1/2"	0.73	42.2	1493	2075	2385	2744
11'	7' - 9"	3' - 6"	1' - 0"	1' - 11 1/2"	2' - 7"	2' - 0"	#4	7"	7' - 6"	#4	1' - 6"	7' - 6"	#4	10"	11' - 2"	10' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9' - 10 1/2"	0.81	48.6	1677	2341	2780	3027
12'	8' - 0"	3' - 9"	1' - 0"	2' - 0 1/2"	2' - 7"	2' - 0"	#5	9"	7' - 9"	#4	1' - 6"	7' - 9"	#4	9"	12' - 2"	11' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10' - 11"	0.89	53.8	1797	2522	3066	3221
13'	8' - 3"	3' - 9"	1' - 0"	2' - 1 1/2"	2' - 7"	2' - 0"	#5	7"	8' - 0"	#4	1' - 6"	8' - 0"	#4	8"	13' - 2"	12' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11' - 11"	0.97	62.7	2004	2826	3563	3545
14'	8' - 9"	3' - 9"	1' - 0"	2' - 3"	2' - 7"	2' - 0"	#5	5"	8' - 6"	#4	1' - 6"	8' - 6"	#4	7"	14' - 2"	13' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12' - 11"	1.07	74.4	2190	3089	3977	3706
15'	9' - 6"	3' - 9"	1' - 3"	2' - 4"	2' - 10"	2' - 3"	#5	5"	9' - 3"	#4	1' - 6"	9' - 3"	#4	7"	15' - 2"	14' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13' - 8"	1.25	80.4	2359	3313	4280	3766
16'	10' - 0"	4' - 0"	1' - 3"	2' - 5"	2' - 10"	2' - 3"	#6	6"	9' - 9"	#4	1' - 6"	9' - 9"	#4	6"	16' - 2"	15' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14' - 8"	1.36	95.6	2459	3455	4496	3845
17'	10' - 6"	4' - 3"	1' - 6"	2' - 6"	3' - 1"	2' - 6"	#6	6"	10' - 3"	#4	1' - 6"	10' - 3"	#4	5"	17' - 2"	16' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15' - 5"	1.55	103.9	2572	3615	4733	3951
18'	11' - 0"	4' - 6"	1' - 6"	2' - 7"	3' - 1"	2' - 6"	#6	5"	10' - 9"	#4	1' - 0"	10' - 9"	#5	7"	18' - 3"	17' - 7"	10"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16' - 5"	1.67	121.6	2671	3756	4951	4047
19'	11' - 6"	5' - 0"	1' - 9"	2' - 8"	3' - 4"	2' - 9"	#6	6"	11' - 3"	#4	1' - 0"	11' - 3"	#5	6"	19' - 3"	18' - 7"	10"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17' - 2"	1.87	126.5	2701	3800	4989	4051
20'	12' - 3"	5' - 0"	1' - 9"	2' - 9 1/2"	3' - 4"	2' - 9"	#6	5"	12' - 0"	#4	1' - 0"	12' - 0"	#5	5"	20' - 3"	19' - 7"	10"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18' - 2"	2.02	149.0	2855	4005	5275	4186
21'	12' - 9"	5' - 6"	2' - 0"	2' - 10"	3' - 7"	3' - 0"	#7	7"	12' - 6"	#4	11"	12' - 6"	#6	1' - 4"	10' - 4 1/2"	9' - 7"	12"	#6	1' - 4"	5' - 2"	4' - 4"	11"	#6	1' - 4"	19' - 4"	18' - 11 1/2"	2.25	141.1	2888	4052	5322	4207
22'	13' - 3"	5' - 9"	2' - 0"	2' - 11 1/2"	3' - 7"	3' - 0"	#7	6"	13' - 0"	#4	10"	13' - 0"	#6	1' - 4"	11' - 5"	10' - 7 1/2"	12"	#6	1' - 4"	5' - 2"	4' - 4"	11"	#6	1' - 4"	20' - 4"	19' - 11 1/2"	2.39	157.4	2987	4193	5540	4323
23'	13' - 9"	6' - 0"	2' - 3"	3' - 0 1/2"	3' - 10"	3' - 3"	#7	6"	13' - 6"	#4	10"	13' - 6"	#6	1' - 4"	12' - 6 1/2"	11' - 9"	12"	#6	1' - 4"	5' - 5"	4' - 7"	11"	#6	1' - 4"	21' - 1"	20' - 8 1/2"	2.64	164.2	3103	4356	5786	4462
24'	14' - 3"	6' - 3"	2' - 3"	3' - 1 1/2"	3' - 10"	3' - 3"	#7	6"	14' - 0"	#4	8"	14' - 0"	#6	1' - 4"	13' - 7"	12' - 9 1/2"	12"	#6	1' - 4"	5' - 5"	4' - 7"	11"	#6	1' - 4"	22' - 1"	21' - 8 1/2"	2.79	175.1	3202	4497	6004	4582
25'	14' - 9"	6' - 6"	2' - 6"	3' - 2 1/2"	4' - 1"	3' - 6"	#7	6"	14' - 6"	#4	8"	14' - 6"	#6	1' - 4"	14' - 8"	13' - 10 1/2"	12"	#6	1' - 4"	5' - 8"	4' - 10"	11"	#6	1' - 4"	22' - 10"	22' - 5 1/2"	3.06	180.6	3318	4660	6252	4725
26'	15' - 6"	6' - 9"	2' - 6"	3' - 3 1/2"	4' - 1"	3' - 6"	#8	7"	15' - 3"	#4	7"	15' - 3"	#6	1' - 4"	15' - 8 1/2"	14' - 11"	12"	#6	1' - 4"	5' - 8"	4' - 10"	11"	#6	1' - 4"	23' - 10"	23' - 5 1/2"	3.24	198.4	3391	4753	6346	4785
27'	16' - 0"	7' - 0"	2' - 9"	3' - 4 1/2"	4' - 4"	3' - 9"	#8	7"	15' - 9"	#4	7"	15' - 9"	#6	1' - 2"	16' - 9 1/2"	16' - 0"	12"	#6	1' - 2"	5' - 11"	5' - 1"	11"	#6	1' - 2"	24' - 7"	24' - 2 1/2"	3.53	214.5	3508	4916	6593	4933
28'	16' - 6"	7' - 3"	3' - 0"	3' - 5 1/2"	4' - 7"	4' - 0"	#8	7"	16' - 3"	#4	7"	16' - 3"	#6	10"	15' - 11"	15' - 1 1/2"	12"	#6	10"	6' - 2"	5' - 4"	11"	#6	10"	25' - 4"	24' - 11 1/2"	3.83	243.9	3626	5079	6842	5082
29'	17' - 0"	7' - 6"	3' - 3"	3' - 6 1/2"	4' - 10"	4' - 3"	#8	7"	16' - 9"	#4	6"	16' - 9"	#8	1' - 4"	16' - 0"	15' - 0"	1' - 3"	#8	1' - 4"	8' - 4"	7' - 2"	1' - 3"	#8	1' - 4"	26' - 1"	25' - 8 1/2"	4.14	267.4	3743	5243	7092	5232
30'	17' - 6"	8' - 0"	3' - 3"	3' - 7 1/2"	4' - 10"	4' - 3"	#8	6"	17' - 3"	#5	9"	17' - 3"	#8	1' - 4"	17' - 0 1/2"	16' - 0"	1' - 3"	#8	1' - 4"	8' - 4"	7' - 2"	1' - 3"	#8	1' - 4"	27' - 1"	26' - 9"	4.33	290.5	3765	5279	7128	5258
31'	18' - 0"	8' - 3"	3' - 6"	3' - 8 1/2"	5' - 1"	4' - 6"	#8	6"	17' - 9"	#5	8"	17' - 9"	#8	1' - 4"	18' - 1 1/2"	17' - 1"	1' - 3"	#8	1' - 4"	8' - 7"	7' - 5 1/2"	1' - 3"	#8	1' - 4"	27' - 10"	27' - 6"	4.65	303.1	3883	5444	7379	5411
32'	18' - 9"	8' - 6"	3' - 9"	3' - 9 1/2"	5' - 4"	4' - 9"	#8	6"	18' - 6"	#5	8"	18' - 6"	#8	1' - 2"	19' - 2 1/2"	18' - 2"	1' - 3"	#8	1' - 2"	8' - 10"	7' - 8"	1' - 3"	#8	1' - 2"	28' - 7"	28' - 3"	5.03	330.6	3978	5563	7509	5512
33'	19' - 3"	8' - 9"	4' - 0"	3' - 10"	5' - 7"	5' - 0"	#8	6"	19' - 0"	#5	8"	19' - 0"	#8	1' - 0"	19' - 2"	18' - 1 1/2"	1' - 3"	#8	1' - 0"	9' - 1"	7' - 11"	1' - 3"	#8	1' - 0"	29' - 4"	29' - 0"	5.38	361.5	4096	5727	7760	5667
34'	19' - 9"	9' - 0"	4' - 3"	3' - 11"	5' - 10"	5' - 3"	#8	6"	19' - 6"	#5	7"	19' - 6"	#9	10"	17' - 4 1/2"	16' - 1 1/2"	1' - 6"	#9	10"	10' - 8"	9' - 3 1/2"	1' - 6"	#9	10"	30' - 1"	29' - 9"	5.74	454.5	4214	5892	8012	5822
35'	20' - 3"	9' - 3"	4' - 6"	4' - 0"	6' - 1"	5' - 6"	#8	6"	20' - 0"	#5	7"	20' - 0"	#10	1' - 0"	18' - 9"	17' - 4 1/2"	1' - 8"	#10	1' - 0"	12' - 3 1/2"	10' - 9 1/2"	1' - 8"	#10	1' - 0"	30' - 10"	30' - 6"	6.12	487.8	4332	6057	8265	5978

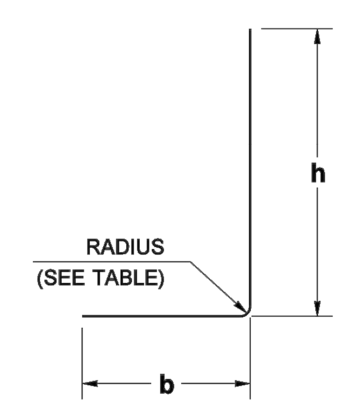
REINFORCEMENT NOTES

(1) IF TRAFFIC BARRIER IS USED, ADD 0.110 CY OF CONCRETE CLASS 4000 FOR BARRIER ALTERNATE 1. ADD 0.152 CY/LF OF CONCRETE CLASS 4000 FOR BARRIER ALTERNATE 2. SEE STANDARD PLAN D-15.10

(2) ADD 16 LB/LF OF REINFORCING STEEL FOR BARRIER ALTERNATE 1 OR 23 LB/LF OF REINFORCING STEEL FOR BARRIER ALTERNATE 2. SEE STANDARD PLAN D-15.10



BAR (E)
@ 1' - 6" CENTERS



BAR	RADIUS
#4	1 1/2"
#5	1 7/8"
#6	2 1/4"
#7	2 5/8"
#8	3"
#9	4 3/4"
#10	5 3/8"
#11	6"

BARS (K) AND (M)

BAR	MIN. SPLICE
#4	2' - 0"
#5	2' - 0"
#6	2' - 0"
#7	2' - 6"
#8	3' - 3"
#9	4' - 2"
#10	5' - 3"

SLOPING FACE WALL DESIGN WITH A 250 PSF SURCHARGE

BIJAN KHALEGHI, STATE OF WASHINGTON, 27695, STRUCTURAL ENGINEER, PROFESSIONAL ENGINEER

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION. A COPY MAY BE OBTAINED UPON REQUEST.

REINFORCED CONCRETE RETAINING WALL TYPE 2 AND 2SW STANDARD PLAN D-10.15-01

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION
Pasco Bakotich III — STATE DESIGN ENGINEER — *12-02-08* DATE
Washington State Department of Transportation

DRAWN BY: BILL BERENS

1 / C15 RETAINING WALL SHEET 2
NO SCALE

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

Scale:
Horiz:
Vert:
Designed By: AEW
Inspected By:
W.O. No.:
Date: 5/29/2020

ADAM E. WHEELER, STATE OF WASHINGTON, 40430, REGISTERED PROFESSIONAL ENGINEER

CITY OF BAINBRIDGE ISLAND

CITY OF BAINBRIDGE ISLAND
PUBLIC WORKS ENGINEERING DEPARTMENT

COOPER CREEK FISH PASSAGE IMPROVEMENTS

BROWNE • WHEELER ENGINEERS, INC
241 ERICKSEN AVENUE NE BAINBRIDGE ISLAND, WA 98110
P 206.842.0605 INFO@BrowneWheeler.COM

WSDOT RETAINING WALL DETAIL CONTINUED PRELIMINARY DESIGN PLANS

C15

Filename: C15 WSDOT RETAINING WALL DETAIL CONTINUED
XREF Filename:
Drawn By: Checked By: AEW
Section: __S__T_N–R_E
Surveyed By: Date:
Control Monument: Field Bk/Pg:
Recorded Survey Kitsap County Auditor AF– Vol/Bk Page
Constructed By: Date:

Cooper Creek Stream Crossing Improvements
Utility Report
Bainbridge Island, Washington 98110

Owner

City of Bainbridge Island
c/o
Chris Wierzbicki
City Engineer
280 Madison Avenue. N
Bainbridge Island, WA

Prepared by

Browne Wheeler Engineers, Inc.
241 Ericksen Avenue
Bainbridge Island, WA 98110

(206) 842-0605

DRAFT

5/29/20

INTRODUCTION

Cooper Creek is located at the west end of Eagle Harbor on Bainbridge Island. The City of Bainbridge Island is proposing to replace the existing fish barrier culvert with a new fish passage culvert. The replacement will increase the access of approximately 6,000 linear feet of fish-bearing stream channel to Eagle Harbor. The proposed culvert will enhance the quality of flow though the culvert and provide stream bed sediment in accordance with WDFW standards to provide an open, gradually sloped, and balanced nutrient rich crossing meeting the needs of the local fish species.

This project was precipitated by a proposed non-motorized improvement project on Wyatt Way and Eagle Harbor Drive. Included in the project is a water quality treatment system to reduce the pollutant load to Eagle Harbor.

EXISTING CONDITIONS

The existing fish barrier culvert consists of 30 inch concrete culvert that is approximately 47 feet long. The culvert is located under Eagle Harbor Drive. The existing culvert is currently submerged by mean higher high water by 1.15 feet. This makes passage especially restrictive to small fish that tend to reside near the surface of the water (Barnard et al 2013). Staff from WDFW determined that the culvert was a 66% barrier to fish.

The drainage basin feeding the Cooper Creek system consists of approximately 0.83 square miles of relatively undeveloped forest. Long term monitoring by the City of Bainbridge Island has shown that the mature, forested, headwater wetlands continue to supply this stream with water exhibiting exceptional quality. The steady, perennial flow continues to meet state standards for temperature, dissolved oxygen, bacteria and nutrients. We are confident that this trend will continue since a large portion of the uplands are owned and maintained by the City of Bainbridge Island and the remainder of the watershed is rural zoned (1 unit/2.5 acres) and heavily forested.

An intertidal wetland (over 9000 sq. ft.) with robust overhanging vegetation and large woody debris is located to the west of the crossing and has been impacted by the reduced tidal exchange by the existing 30-inch culvert. This habitat would benefit by more regular and natural tidal water exchange, increasing the salinity and restoring estuarine plant species composition. Along with restored plant composition will come important refuge and rearing habitat for forage fish.

Furthermore, the stream benefited from a 2009 restocking effort organized by the Bainbridge Island Watershed Council and the Suquamish Tribe. Through countless volunteer hours chum salmon were reintroduced to the stream following the removal of another full barrier structure (upstream of this project) in 2001. The existing 30 inch culvert is hampering the efforts to perpetuate and recover salmonid population in this area by impacting ecosystem processes in the nearshore environment.

The culvert crossing is located at the joining of East Fork Cooper Creek and Cooper Creek. The bank full width of the main channel west of East Fork Cooper Creek found that the bank full width to be 8 feet (8 measurements over 450 feet upstream). East Fork Cooper Creek is restrained in a storm drain system that outlets approximately 40 feet north of the culvert crossing. The bank full width of this channel is 4 feet.

PRELIMINARY DESIGN ALTERNATIVES

This alternative analysis studied the various options regarding replacement of the existing 30 inch concrete culvert that conveys Cooper Creek across Eagle Harbor Drive on Bainbridge Island. A summary of the conditions and constraints are as follows:

- The City of Bainbridge Island is currently designing non-motorized improvements to this corridor that will widen the road by at least 10 feet, 5 feet on each side. Since this is just a shoulder improvement the elevation of the road will not be changed. The widened shoulders will cause the existing culvert crossing to become obstructed and will need to be removed and replaced.
- In addition, this crossing is tidally influenced and the City understands the need to provide a crossing that allows as much free board to allow free movement of the water.
- Another constraint on the project is the wetlands that are adjacent to the west side of the crossing.
- The downstream channel is confined to 15 feet wide by fill slopes and structures.

Project Goals
The goals of the project are as follows:

- Provide increased fish passage to Cooper Creek by removing the fish barrier and providing an open gradually sloped and balanced nutrient rich crossing that meets the needs of the local fish species.
- Increase the ability for tidal exchange to improve the function of the estuary on the west side of the crossing.
- Provide the least cost alternative in both construction length and monetary expenditure
- Minimize right of way and easement acquisitions
- Provide sea level rise flexibility caused by climate change, subsidence and potential earthquakes.
- Reduce pollutants entering the bay by providing a stormwater filter to remove pollutants.

We evaluated three alternatives to provide the necessary crossing width of 15 feet. All alternatives consist of installing a new stream crossing and abandoning the existing crossing. In addition, all alternatives have the same elevation to the bottom of structure or crown of pipe. The alternatives include:

Alternative 1 – 4-sided Box Culvert ($613,000)
This alternative consists of installing an embedded 4-sided box culvert to replace the crossing. The culvert will be 15 feet wide and 12 feet tall. The culvert will be embedded approximately 50%.

Positives
- Lowest overall project cost
- Shortest construction time in channel and overall.
- Provides sea level rise flexibility with current road elevation.
- Does not require additional property to be acquired.
- Simple construction.

Negatives
- None.

Alternative 2 – Bottomless Arch Culvert ($630,000)
This alternative consists of constructing a bottomless arch culvert. The arch consists of a 6 foot by 15 foot metal plate culvert. The culvert will be constructed on top of stem walls to provide the necessary depth for the footing to not be susceptible to exposure.

Positives

- Second fastest in channel and overall construction time.
- Increase in road elevation makes the road less susceptible to sea level rise outside of the bounds of the arch culvert. The top of the arch culvert is at the same elevation as the top of the box culvert and the bottom of the bridge structure in the other two options.

Negatives

- Minimum cover requires road to be raised increasing cost and overall project construction time.
- Requires wall to be constructed on face of culvert increasing cost and overall project constructing time.
- Limited space on the boundary of the culvert to account for changes in sea level rise.
- Requires additional work on adjacent properties to accommodate the increased elevation of the roadway. This will increase the amount of right of way that is required and may precipitate the purchase of multiple properties including an establishment that has a long history within the community.

Alternative 3 – Cast in Place Bridge ($719,000)
This alternative consists of the construction of a cast in place concrete bridge to provide a 15 foot clear span.

Positives

- Increase in road elevation makes the road less susceptible to sea level rise outside of the bounds of the bridge. The bottom of the bridge structure is at the same elevation as the top of the culverts in the other two options.

Negatives

- 30 inch structure thickness requires road elevation to be increased.
- Most expensive overall project cost.
- Longest construction time
- Requires additional work on adjacent properties to accommodate the increased elevation of the roadway. This will increase the amount of right of way that is required and may precipitate the purchase of multiple properties including an establishment that has a long history within the community.

PREFERRED ALTERNATIVE

The preferred alternative that meets all of the goals of the project while minimizing the project cost and construction length is the 4-sided box culvert. This type of culvert is straight forward to construct. It also allows for the most room to accommodate future sea level rise without changing the elevation of the roadway. In addition, the vertical sidewalls of the culvert ensure that there will not be a decrease in flow capacity compared to the arch culvert alternative. This alternative will also minimize the amount of easement and/or right of way that needs to be obtained since the roadway will not need to be raised.

The other alternatives would require extensive work to the existing roadway and on the adjacent properties. We believe that this may lead to public skepticism and reduce community buy in to the project.

DESIGN CONSIDERATIONS AND PRELIMINARY ANALYSES

The design follows the 2013 Water Crossing Design Guidelines by Washington State Department of Fish and Wildlife. Since this is a crossing replacement project there is little flexibility in the location of the crossing. The outlet of the existing culvert is a narrow straight section of channel before reaching the shore. In addition, there are existing fill slopes and structures on each side of the downstream channel. This restricts the width for a culvert crossing without purchasing the adjacent properties.

We collected and analyzed the following data:

- Bank Full Width (stream simulation culvert)
  - Upstream
    - Cooper Creek – 8' (small stream)
    - North Fork Cooper Creek – 4' (small stream)
  - Downstream
    - Cooper Creek – 10' (medium stream)
- Longitudinal Profile (low slope channel – Stream Simulation)
  - Upstream and Downstream
    - 1.45% slope
- Floodplain Utilization (Unconfined/Confined Channel)
  - Upstream
    - Cooper Creek (FUR=40/8=5)
    - North Fork Cooper Creek (Constrained on east side, FUR=20/4=5)
  - Downstream
    - Cooper Creek (FUR=15/10=1.5)
- Unstable Channel (Steam Simulation)
    - Tidal influence, confined downstream channel and low lying wetland area has created a system that is fairly stable with little channel migration.
- Debris Prone (No-slope)
  - Upstream
    - Cooper Creek (light)
    - North Fork Cooper Creek (light)
- Constraints (Some – Stream Simulation)
  - Property Ownership
  - Existing adjacent structures
  - Existing Crossing
- 100 year flow
  - 55.6 cubic feet per second.

The project site meets the majority of the criteria for the use of a stream simulation approach for the crossing design. It should be noted that the tidal influence on the crossing will also be addressed in the design.

Stream Simulation Culvert

Criteria:

- Bank Full Width (BFW) = <15ft
- Culvert Length to Width < 10
- Culvert Bed Slope Ratio < 1.25 x Upstream Channel Slope
- Bed Width = 1.2 x BFW + 2ft
- Scenerio 1 Channel Slope < 4%
    - Countersunk Culvert 30-50% of its rise
    - Pool riffle bed morphology
- Bed Material
    - Similar to natural channel but coarser
    - Well graded non-porous, 5-10% fines
    - WSDOT streambed sediment is suitable
- Debris Passage
    - 100 year water surface + 2 feet minimum.

Proposed Design:

- 15ft x 12ft x 45ft four sided box culvert
- Bank Full Width = 10.8ft
- Culvert Width = 1.2 x BFW + 2 = 15ft
- Culvert Length to Width = 45/12 = 3
- Slope Ratio = Sculv/Sch = 1.71%/1.45% = 1.18 <1.25
- Countersunk culvert 49%
- WSDOT streambed sediment specified.
- Pool-riffle bed morphology.
- Freeboard from 100 year water surface = 5.69 feet (Appendix A)

The proposed culvert will be 45 feet long and be located in line with the main Cooper Creek channel. This will place the crossing in a more natural location. As mentioned, the current channel is tidally influenced. The proposed box culvert will allow mean higher high water to rise approximately 2.9 feet (14.26 MLLW datum) before the crossing becomes submerged during these times. We estimate that this will occur in 2125. During extreme high water the culvert outlet will become submerged on 2060. It should be noted that the adjacent roadway and structures at this time will be in jeopardy. The lowest elevation of these adjacent facilities is approximately the same elevation as the crown of the proposed culvert.

We also evaluated the performance of the culvert to convey the runoff from the basin. We utilized the USGS's Streamstats program to develop the 100 year recurrence interval flow (55.6-cubic feet per second) to the culvert. Then using this value and the geometry of the channel the depth of flow in the channel was determined to be 0.82 feet. Based on this the freeboard in the culvert during a 100 year flow is 5.69 feet. This is substantially greater space than is recommended for a culvert with a light debris load.
In addition, the extra freeboard allows the stream to increase in elevation that maybe caused by an increase in sedimentation from sea level rise. The proposed crossing can elevate by 3.69 feet before reaching the minimum freeboard of 2 feet. The 15 foot culvert also allows the maximum width afforded by the constrained downstream channel for tidal exchange. This will allow the estuarian habitat to the west to function more naturally.

Temporary Erosion and Sedimentation Control

The Contractor will be responsible for maintaining erosion control facilities on the site during construction and for ensuring that sediment does not leave the site. The general principles of construction pollution prevention are:

- Retain native vegetation
- Prevent erosion rather than treat sediment-laden water.
- Employ site specific BMPs
- Divert upslope runoff around disturbed areas
- Phase construction operations to reduce the total amount of disturbance at one time
- Amend soils before seeding
- Minimize the slope lengths and steepness of disturbed areas
- Reduce runoff velocities
- Prevent the tracking of sediment off site
- Employ BMPs that address not only erosion but also other potential pollutants.

The plan shows a number of BMPs which we believe are the minimum required to prevent erosion. It should be noted that other measures may be needed to minimize the movement of sediment and shall be put in place as needed. To prevent erosion the contractor should take special care to ensure that exposed soils are covered in accordance with the plans and specifications. Clearing limits are shown on the plan with clearing limits fence and silt fence. The contractor should install and maintain fencing along these limits and ensure that disturbance outside of these limits does not occur unless needed. If the contractor needs to employ additional BMPs, they should reference the *SWMMWW*, 2014 edition for additional information.

The sedimentation control system will be designed by the contractor utilizing the values given in Appendix B. We have assumed that a chitosan filtration system will be required to remove sediment for the

Bypass System

The proposed bypass system consists of three division; East Fork Cooper Creek, Cooper Creek Main Channel and the drainage ditch on the west side of Eagle Harbor Drive to the south of the crossing. East Fork Cooper Creek is contained in a storm drain pipe system to the north of the crossing. The bypass system in this area will consist of a temporary plug in the outlet of the last catch basin, a pump located in the catch basin and then a bypass line from the catch basin to Eagle Harbor that terminates in a dispersion tee at the shoreline.

A similar system will be installed at the drainage ditch to divert this water to Eagle Harbor.

The system for the main channel of Cooper Creek will start at a temporary dam uphill of the fish passage improvement project. A fixed drum tee screen will be installed in the channel to collect the water. Appendix C summarizes the design values for the systems for use by the contractor.

Water Quality Treatment

The project will include a water quality treatment system to mitigate the impact from the proposed bicycle lanes. Because of the distributed nature of the bicycle lanes we propose to treat the runoff from a larger area of existing pollution generating impervious surface. There is a drainage system on the south side of Wyatt Way and the east side of Eagle Harbor Drive that

collects approximately 25,660 square feet of impervious area. We propose to connect to that drainage system and route it to a Stormfilter Cartridge Filter system. The treatment system was designed to provide treatment of over 91% of the runoff from this area (see Appendix D). The treatment system will overflow to a new outfall located to the east of the proposed box culvert on the north side of the channel.

CONSTRUCTION QUANTITIES AND PRELIMINARY CONSTRUCTION COST ESTIMATE

We have prepared a preliminary estimate of the material quantities for the construction of the proposed project. In addition, we have estimated the construction cost including permit and consultant fee to develop a project cost estimate, see Appendix E

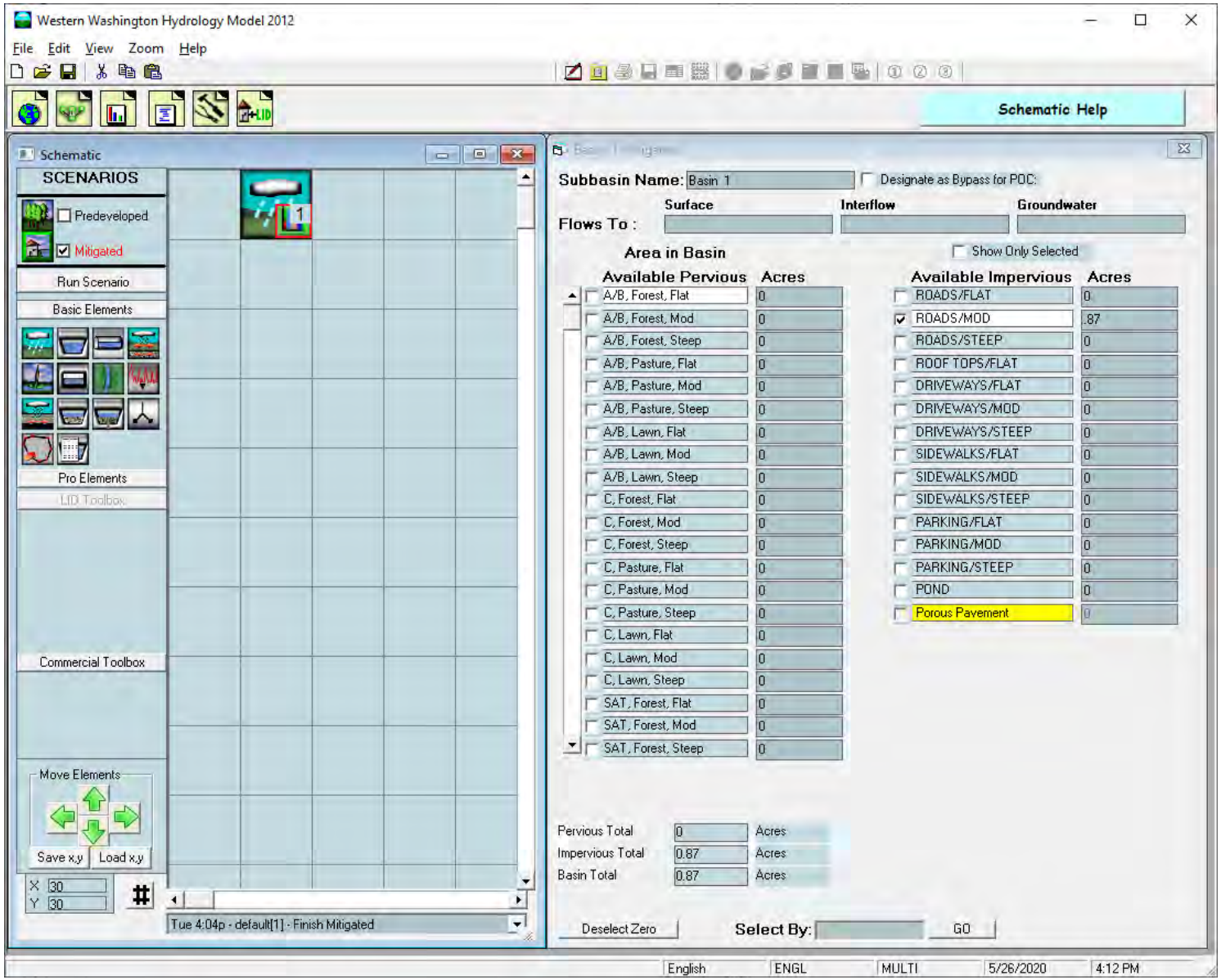
APPENDIX A
TESC Flows

Cooper Creek Fish Passage Improvements
TESC

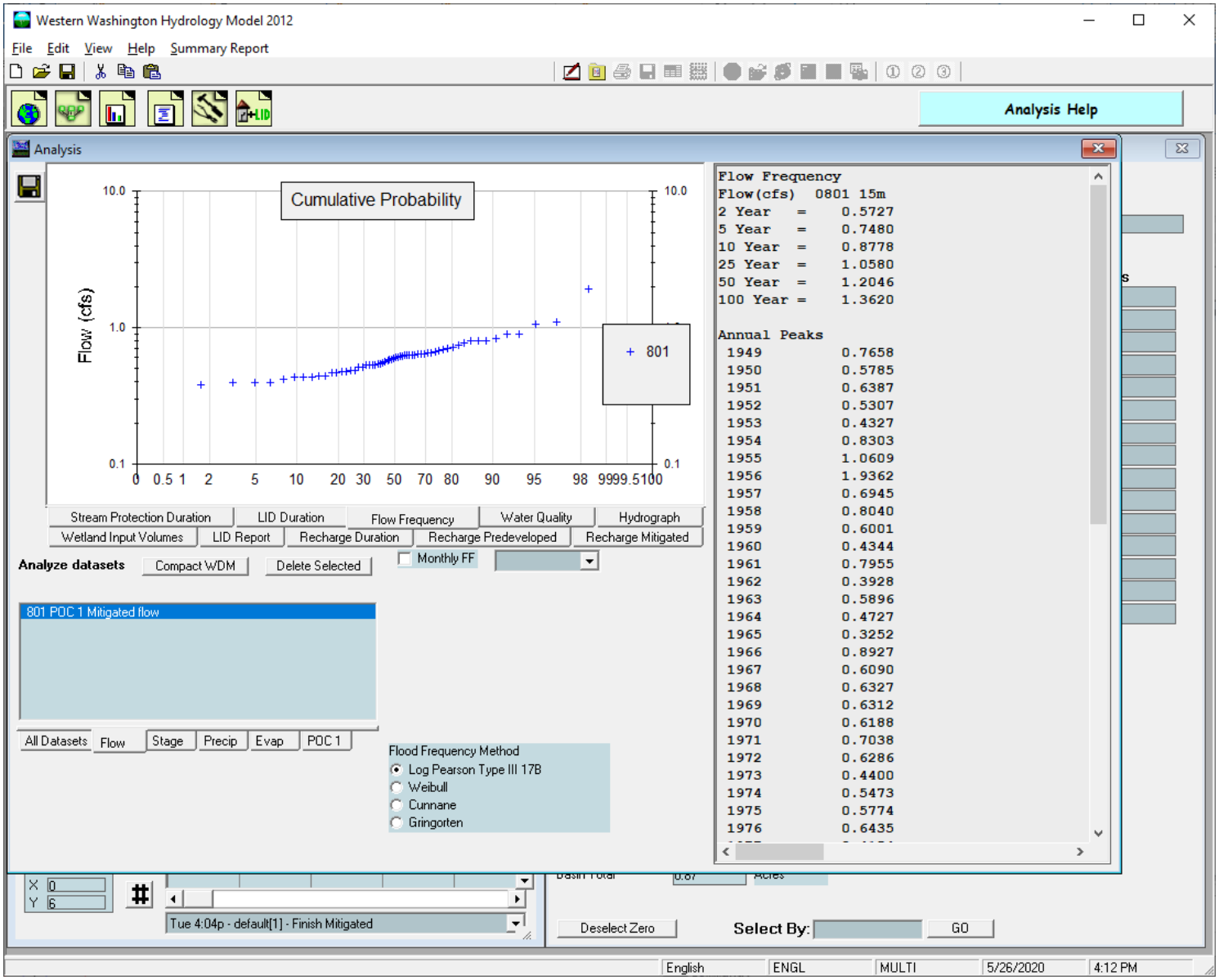
Total Area	37903	sf	0.87	ac

FLOWS		
Q2	0.57	cfs
Q10	0.88	cfs

TESC Drainage Basin



TESC Flows


Western Washington Hydrology Model 2012
File Edit View Help Summary Report
Analysis Help
Analysis
Cumulative Probability
Flow (cfs)
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1.0
0.1
0 0.5 1 2 5 10 20 30 50 70 80 90 95 98 9999.5100
801
Stream Protection Duration
LID Duration
Flow Frequency
Water Quality
Hydrograph
Wetland Input Volumes
LID Report
Recharge Duration
Recharge Predeveloped
Recharge Mitigated
Analyze datasets
Compact WDM
Delete Selected
Monthly FF
801 POC 1 Mitigated flow
All Datasets
Flow
Stage
Precip
Evap
POC 1
Flood Frequency Method
Log Pearson Type III 17B
Weibull
Cunnane
Gringorten
Flow Frequency
Flow(cfs) 0801 15m
2 Year = 0.5727
5 Year = 0.7480
10 Year = 0.8778
25 Year = 1.0580
50 Year = 1.2046
100 Year = 1.3620
Annual Peaks
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1950 0.5785
1951 0.6387
1952 0.5307
1953 0.4327
1954 0.8303
1955 1.0609
1956 1.9362
1957 0.6945
1958 0.8040
1959 0.6001
1960 0.4344
1961 0.7955
1962 0.3928
1963 0.5896
1964 0.4727
1965 0.3252
1966 0.8927
1967 0.6090
1968 0.6327
1969 0.6312
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1971 0.7038
1972 0.6286
1973 0.4400
1974 0.5473
1975 0.5774
1976 0.6435
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Deselect Zero
Select By:
GO
English
ENGL
MULTI
5/26/2020
4:12 PM

APPENDIX B
Bypass Flows

N

BASIN MAP

COOPER CREEK

SCALE: 1" = 1,000' 0 500 1000 2000

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BAINBRIDGE ISLAND, WA 98110
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FILE NAME: BASIN ANALYSIS.DWG PLOT DATE: 5/20/2020 1:22 PM PLOT DEVICE: DWG TO PDF.PC3 PAGE SETUP: ---- PLOTTED BY: BRYAN

Cooper Creek Stream Crossing Improvements
Bypass System

Basin	Q2yr (cfs)	(gpm)	IE In	IE Out	Length	Diameter	Area	Velocity	c	hf/100'	hf	TDH
North	8.42	3779	15.11	5.4	220	8	0.349	24.1	140	19.0	41.9	32.1
West	8	3590	4	5.4	143	8	0.349	22.9	140	17.3	24.7	26.1
South	0.5	224	9	5.4	189	4	0.087	5.7	140	3.0	5.6	2.0

StreamStats Report

Region ID: WA
Workspace ID: WA20200521235518985000
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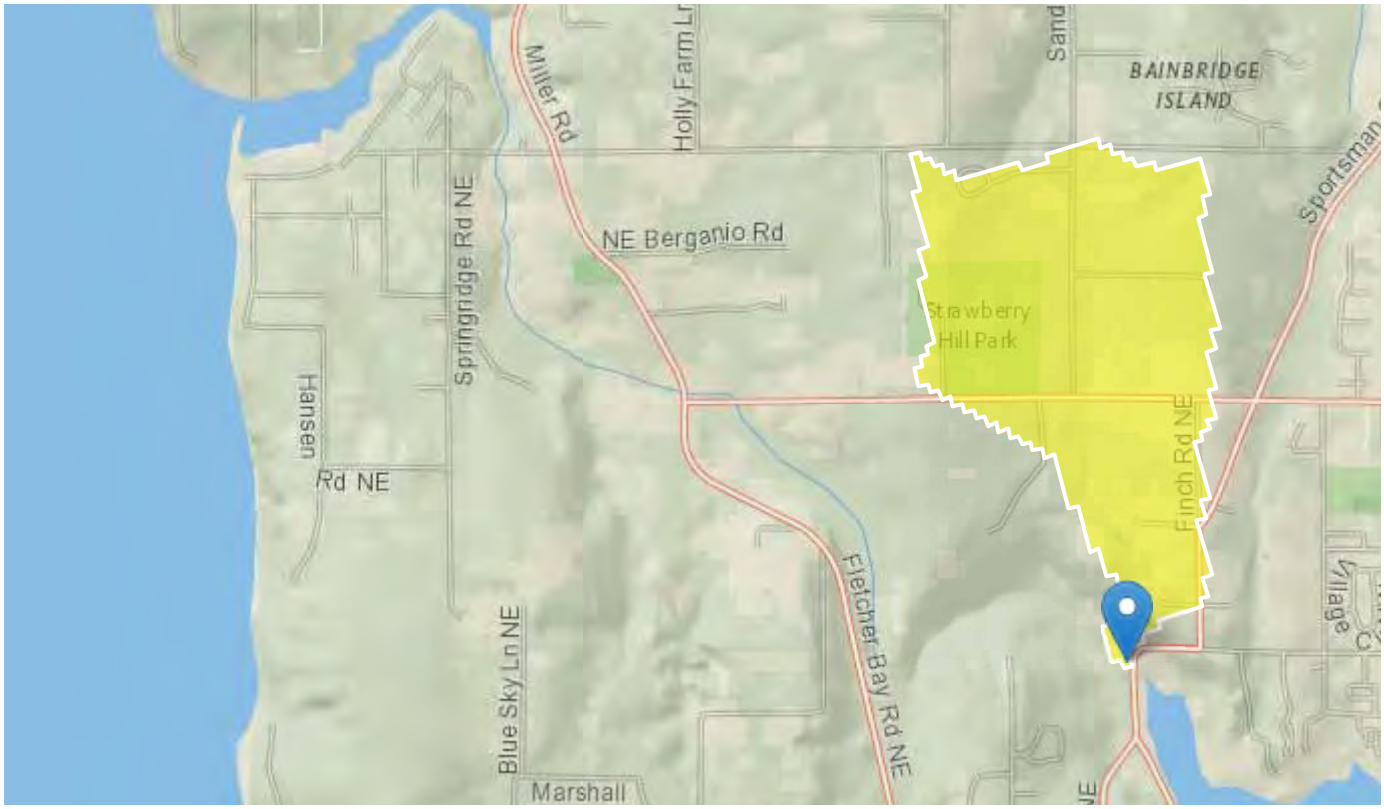
Time: 2020-05-21 16:55:39 -0700



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.4	square miles
PRECPRIS10	Basin average mean annual precipitation for 1981 to 2010 from PRISM	40.6	inches

Peak-Flow Statistics Parameters[Peak Region 3 2016 5118]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.4	square miles	0.08	2610
PRECPRIS10	Mean Annual Precip PRISM 1981 2010	40.6	inches	33.2	168

Peak-Flow Statistics Flow Report[Peak Region 3 2016 5118]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu	SEp
2 Year Peak Flood	8.42	ft^3/s	4.19	16.9	43.2
5 Year Peak Flood	13.5	ft^3/s	6.56	27.8	44.4
10 Year Peak Flood	17	ft^3/s	8.14	35.4	45.6
25 Year Peak Flood	21.5	ft^3/s	9.88	46.8	48.1
50 Year Peak Flood	24.9	ft^3/s	11.1	55.8	50.5
100 Year Peak Flood	28.5	ft^3/s	12.5	65.4	51.8
200 Year Peak Flood	32.2	ft^3/s	13.5	76.6	54.2
500 Year Peak Flood	37.2	ft^3/s	14.9	92.8	57.7

Peak-Flow Statistics Citations

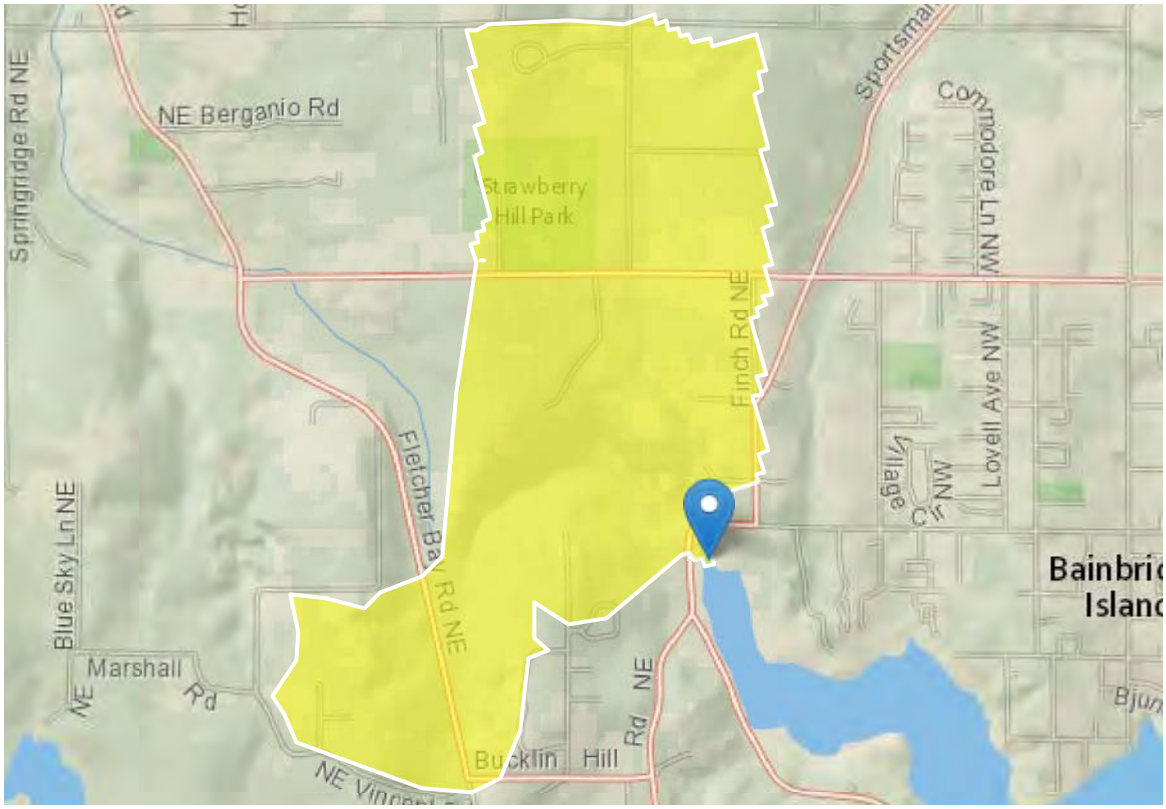
Mastin, M.C., Konrad, C.P., Veilleux, A.G., and Tecca, A.E.,2016, Magnitude, frequency, and trends of floods at gaged and ungaged sites in Washington, based on data through water year 2014 (ver 1.1, October 2016): U.S. Geological Survey Scientific Investigations Report 2016–5118, 70 p. (http://dx.doi.org/10.3133/sir20165118)

USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.3.11

StreamStats Report

Region ID: WA
Workspace ID: WA20200521152546522000
Clicked Point (Latitude, Longitude): 47.62766, -122.53901
Time: 2020-05-21 08:26:15 -0700



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.83	square miles
PRECPRIS10	Basin average mean annual precipitation for 1981 to 2010 from PRISM	40.9	inches

General Disclaimers

This watershed has been edited, computed flows may not apply.

Peak-Flow Statistics Parameters[Peak Region 3 2016 5118]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.83	square miles	0.08	2610
PRECPRIS10	Mean Annual Precip PRISM 1981 2010	40.9	inches	33.2	168

Peak-Flow Statistics Flow Report[Peak Region 3 2016 5118]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu	SEp
2 Year Peak Flood	16.4	ft^3/s	8.21	32.9	43.2
5 Year Peak Flood	26.3	ft^3/s	12.8	53.9	44.4
10 Year Peak Flood	33	ft^3/s	15.9	68.6	45.6
25 Year Peak Flood	41.9	ft^3/s	19.3	90.7	48.1
50 Year Peak Flood	48.4	ft^3/s	21.7	108	50.5
100 Year Peak Flood	55.6	ft^3/s	24.4	127	51.8
200 Year Peak Flood	62.7	ft^3/s	26.5	149	54.2
500 Year Peak Flood	72.6	ft^3/s	29.3	180	57.7

Peak-Flow Statistics Citations

Mastin, M.C., Konrad, C.P., Veilleux, A.G., and Tecca, A.E.,2016, Magnitude, frequency, and trends of floods at gaged and ungaged sites in Washington, based on data through water year 2014 (ver 1.1, October 2016): U.S. Geological Survey Scientific Investigations Report 2016–5118, 70 p. (http://dx.doi.org/10.3133/sir20165118)

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Application Version: 4.3.11

APPENDIX C
100 year flow in culvert

Cooper Creek Fish Passage Improvements
100 year Stage in Culvert

Q100yr	55.6	cfs	per Stream Stats Report

Channel Dimensions		
Bed Width	9.8	FT
Bank Full Width	10.8	FT
Bank Full Depth	0.5	FT
Flood Plain in Culvert	4.2	FT
Top of culvert	12.46	FT NAVD88
Bed Elevation	5.95	FT NAVD88
IE of Culvert	0.46	FT NAVD88

Embedment	49.6	%
Stage 100yr	0.82	FT
Freeboard	5.69	FT

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Friday, May 22 2020

<Name>

User-defined

Invert Elev (ft)	= 5.95
Slope (%)	= 1.71
N-Value	= 0.025

Calculations

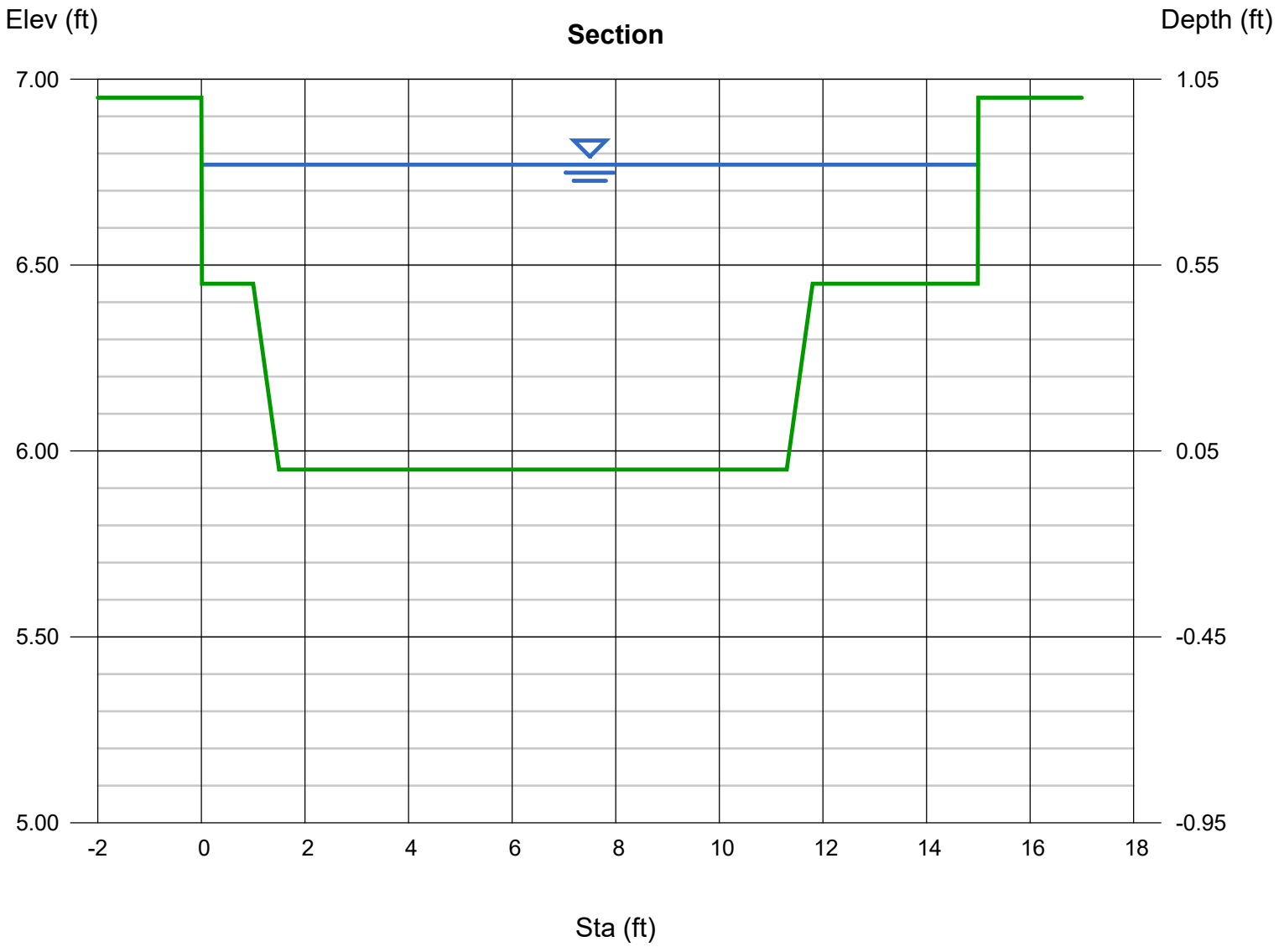
Compute by:	Known Q
Known Q (cfs)	= 55.60

Highlighted

Depth (ft)	= 0.82
Q (cfs)	= 55.60
Area (sqft)	= 9.95
Velocity (ft/s)	= 5.59
Wetted Perim (ft)	= 16.03
Crit Depth, Yc (ft)	= 0.92
Top Width (ft)	= 14.99
EGL (ft)	= 1.31

(Sta, El, n)-(Sta, El, n)...

(0.00, 6.95)-(0.01, 6.45, 0.025)-(1.00, 6.45, 0.025)-(1.50, 5.95, 0.025)-(11.30, 5.95, 0.025)-(11.80, 6.45, 0.025)-(14.99, 6.45, 0.025)
-(15.00, 6.95, 0.025)

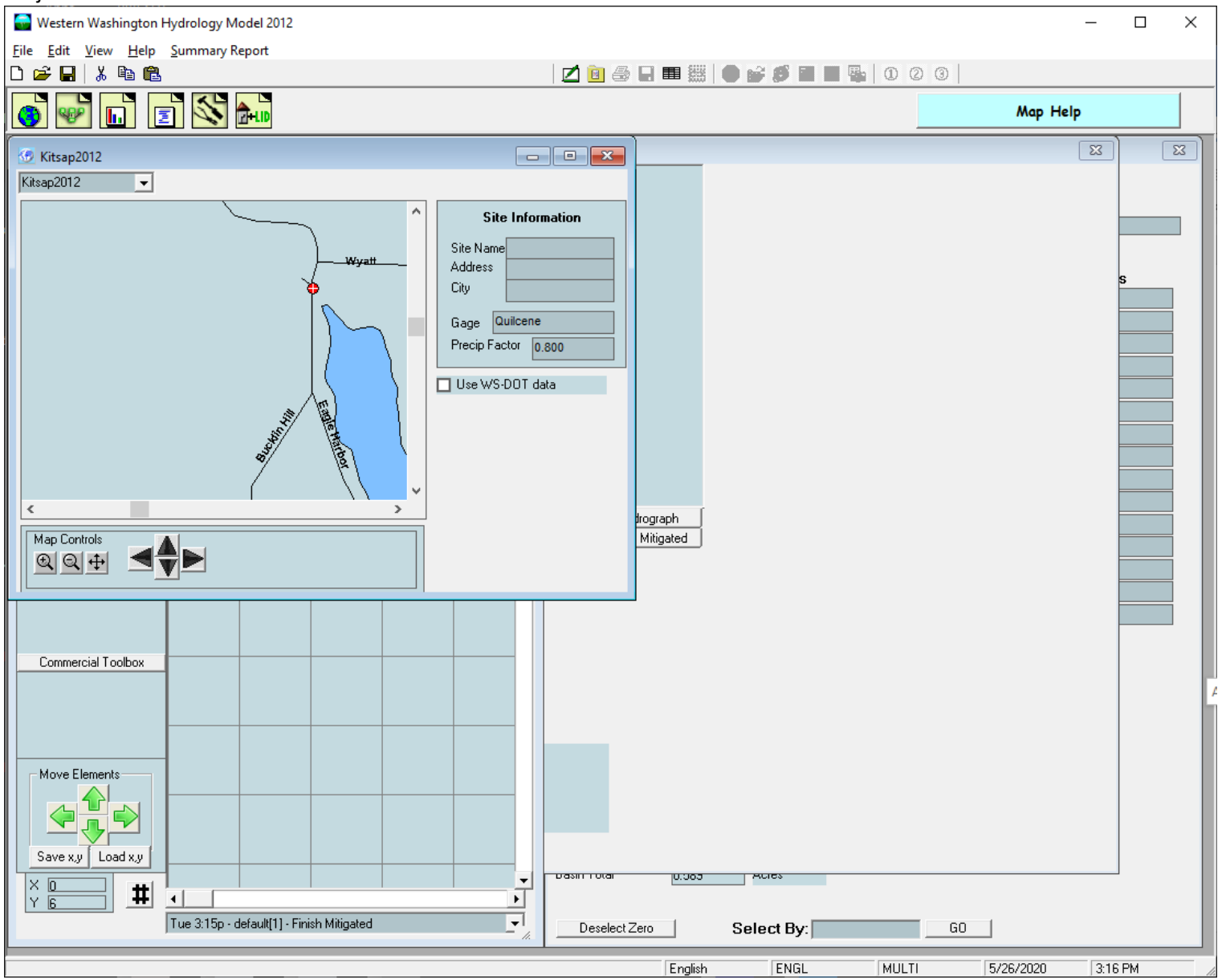


APPENDIX D
Water Quality Treatment Design

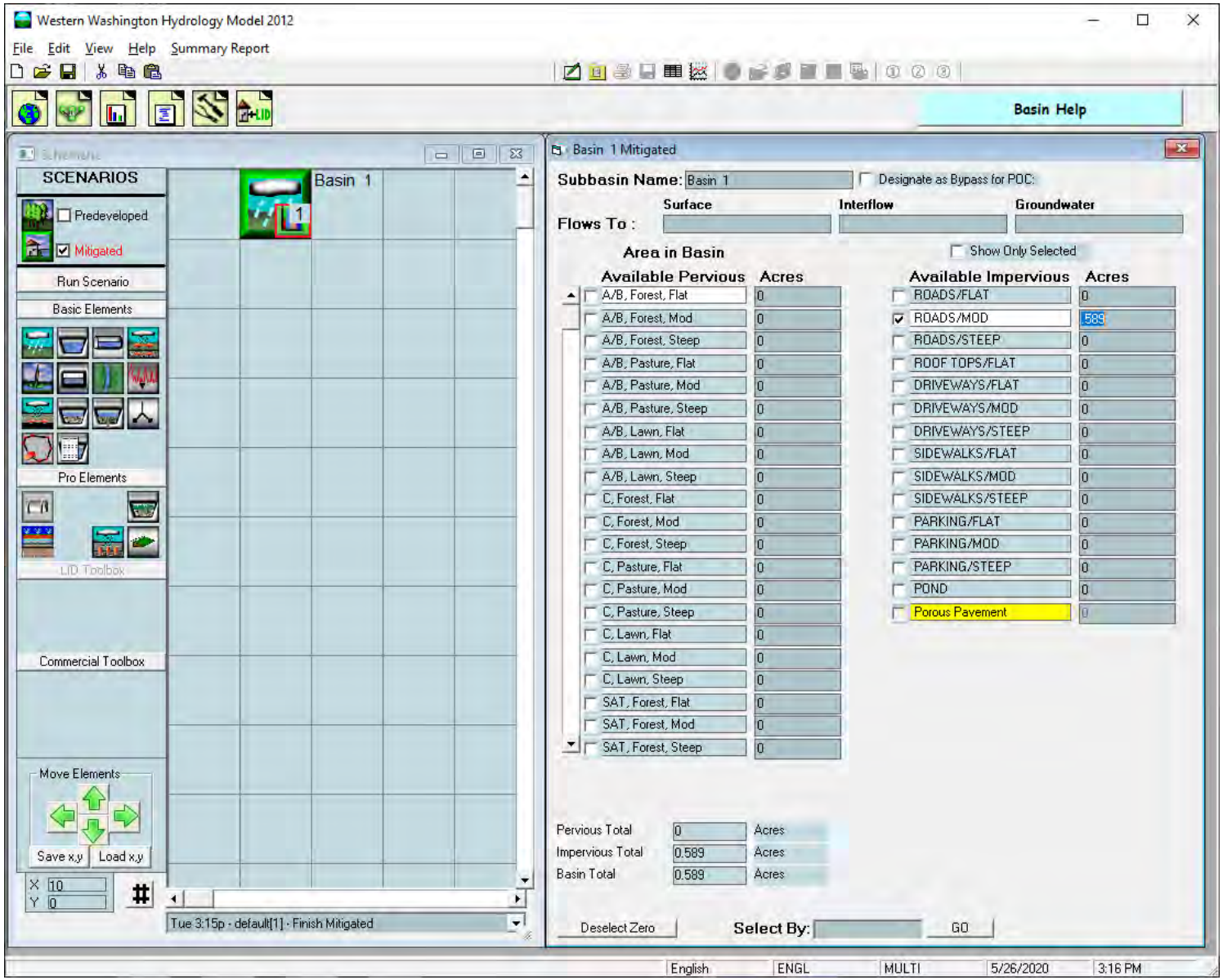
Cooper Creek Fish Barrier Removal
WQ Treatment

Drainage Area	25655	sf	0.59	ac
Qwq	0.1169	cfs		
Qcartridge	7.5	gpm	0.0167	cfs
#Cartridges	7			

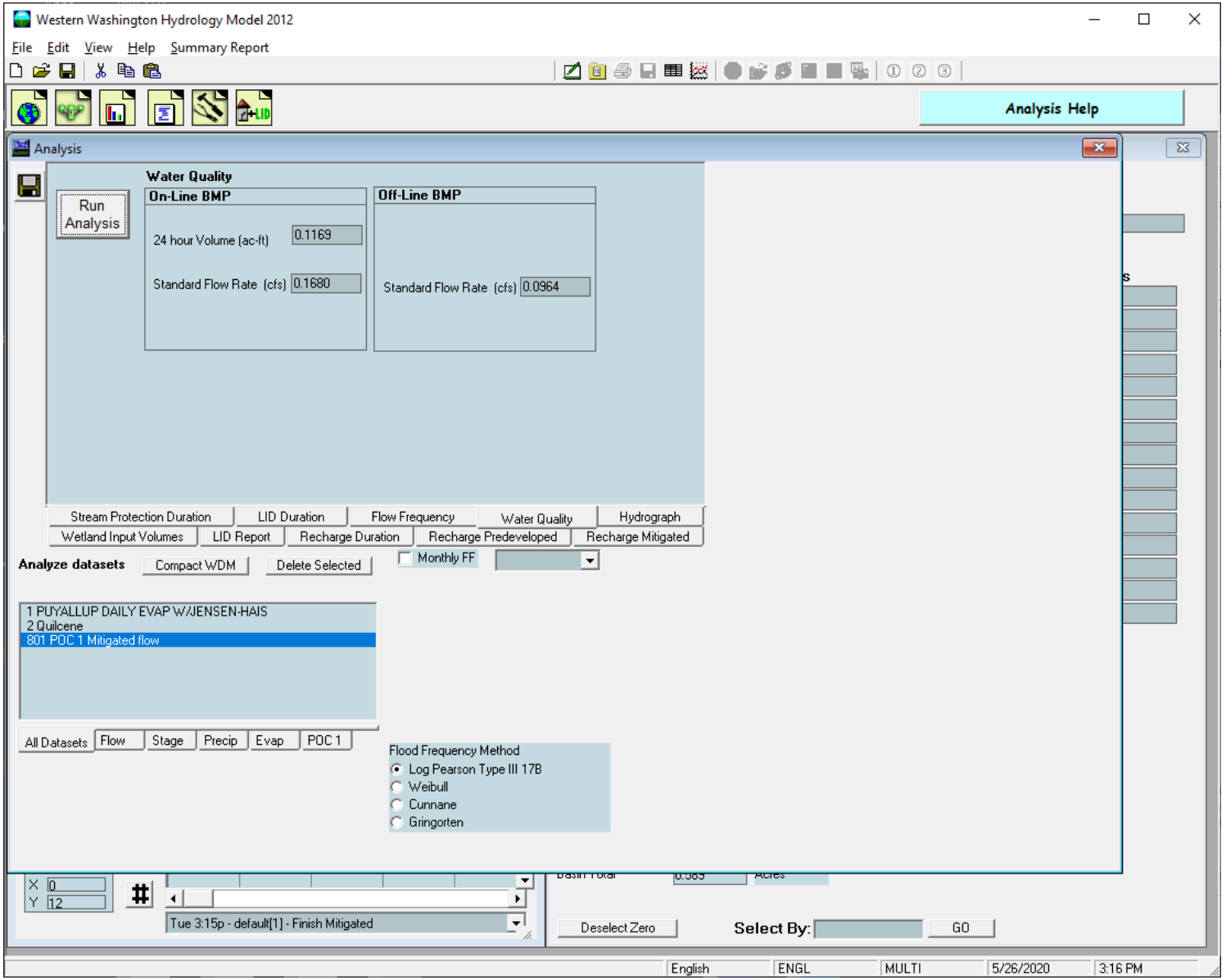
Project Location



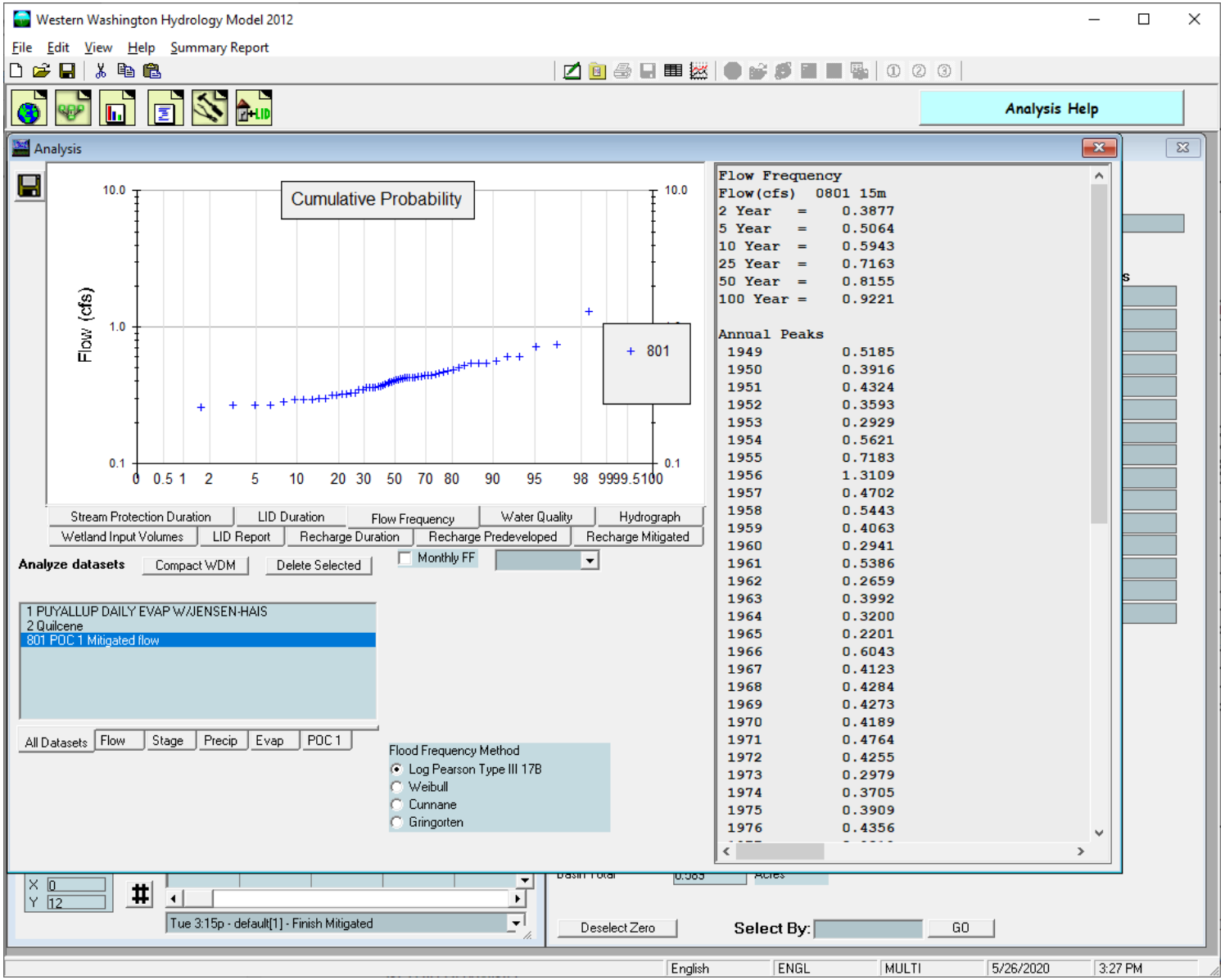
Water Quality Drainage Basin



Water Quality Flow



Peak Flow


Western Washington Hydrology Model 2012
File Edit View Help Summary Report
Analysis Help
Analysis
Cumulative Probability
Flow (cfs)
10.0
1.0
0.1
0 0.5 1 2 5 10 20 30 50 70 80 90 95 98 99 99.5 100
801
Stream Protection Duration
LID Duration
Flow Frequency
Water Quality
Hydrograph
Wetland Input Volumes
LID Report
Recharge Duration
Recharge Predeveloped
Recharge Mitigated
Analyze datasets
Compact WDM
Delete Selected
Monthly FF
1 PUYALLUP DAILY EVAP WJENSEN-HAIS
2 Quilcene
801 POC 1 Mitigated flow
All Datasets
Flow
Stage
Precip
Evap
POC 1
Flood Frequency Method
Log Pearson Type III 17B
Weibull
Cunnane
Gringorten
Flow Frequency
Flow(cfs) 0801 15m
2 Year = 0.3877
5 Year = 0.5064
10 Year = 0.5943
25 Year = 0.7163
50 Year = 0.8155
100 Year = 0.9221
Annual Peaks
1949 0.5185
1950 0.3916
1951 0.4324
1952 0.3593
1953 0.2929
1954 0.5621
1955 0.7183
1956 1.3109
1957 0.4702
1958 0.5443
1959 0.4063
1960 0.2941
1961 0.5386
1962 0.2659
1963 0.3992
1964 0.3200
1965 0.2201
1966 0.6043
1967 0.4123
1968 0.4284
1969 0.4273
1970 0.4189
1971 0.4764
1972 0.4255
1973 0.2979
1974 0.3705
1975 0.3909
1976 0.4356
X 0
Y 12
Tue 3:15p - default[1] - Finish Mitigated
Deselect Zero
Select By:
GO
English
ENGL
MULTI
5/26/2020
3:27 PM

APPENDIX E
Estimated Quantities and Cost

City of Bainbridge Island
Cooper Creek Fish Barrier Removal
Construction Cost Estimate

Restoration Costs

Item	Description	Qty.	Unit	Unit Price	Extended Amount
1	Mobilization	1	LS	$ 50,000.00	$ 50,000.00
2	Record Drawing	1	LS	$ 1,000.00	$ 1,000.00
3	SPCC Plan	1	LS	$ 500.00	$ 500.00
4	Fugitive Dust Plan	1	LS	$ 500.00	$ 500.00
5	Project Temporary Traffic Control	1	LS	$ 25,000.00	$ 25,000.00
6	Roadway Surveying	1	LS	$ 3,000.00	$ 3,000.00
7	Clearing and Grubbing	1	LS	$ 3,000.00	$ 3,000.00
8	Sawcutting	128	LF	$ 3.75	$ 480.00
9	Asphalt Removal Incl. Haul	89	SY	$ 10.00	$ 890.00
10	Structure Excavation Class A Incl. Haul	908	CY	$ 25.00	$ 22,700.00
11	Gravel Base	562	CY	$ 30.00	$ 16,860.00
12	Streambed Gravel	193	CY	$ 45.00	$ 8,685.00
13	Ditch Excavation Including Haul	5	CY	$ 31.00	$ 155.00
14	HMA Cl. 1/2" PG 58H-22	40	TN	$ 101.00	$ 4,040.00
15	Crushed Surfacing Top Course	14	CY	$ 55.00	$ 770.00
16	Crushed Surfacing Base Course	43	CY	$ 55.00	$ 2,365.00
17	15'x12' Precast Concrete Culvert	202	TN	$ 550.00	$ 111,100.00
18	CIP Retaining Wall	1371	SF	$ 60.00	$ 82,260.00
19	Gravel Backfill For Walls	102	CY	$ 50.00	$ 5,077.78
20	Corrugated Polyethylene Storm Sewer Pipe 12 In. Diam.	85	LF	$ 60.00	$ 5,100.00
21	Catch Basin Type 1	2	EA	$ 1,700.00	$ 3,400.00
22	Water Quality Treatment Unit	1	LS	$ 60,000.00	$ 60,000.00
23	Erosion Control and Water Pollution Control	1	LS	$ 5,000.00	$ 5,000.00
24	Stream Bypass System	1	LS	$ 54,975.00	$ 54,975.00
25	Beam Guardrail Type 31	107	LF	$ 34.00	$ 3,638.00
26	Beam Guardrail Type 31 Transition	1	EA	$ 4,400.00	$ 4,400.00
27	Beam Guardrail Terminal	1	EA	$ 2,200.00	$ 2,200.00
28	Cultural Resources	1	LS	$ 5,000.00	$ 5,000.00
29	Signage	1	LS	$ 2,000.00	$ 2,000.00
30	Striping	180	LF	$ 2.00	$ 360.00
31	Site Restoration	1	LS	$ 10,000.00	$ 10,000.00
	Subtotal				$ 494,455.78
32	Permits				$ 16,383.00
	Total				$ 510,838.78
	Contingency @ 20%				$ 102,167.76
	Estimated Restoration Cost				**$ 613,007**

Browne Wheeler Engineers, Inc. 241 Ericksen Avenue NE Bainbridge Island, WA 98110
phone (206) 842-0605 fax (206) 780-9322

City of Bainbridge Island
Cooper Creek Fish Barrier Removal

Permit Fee Estimate

Item	Description	Fee	
1	Preapplication Conference	$	1,500
2	Shoreline Substantial Development Permit (SSDP) with SEPA	$	6,869
3	Shoreline Variance	$	8,014
	Total Estimated Permit Fees	**$**	**16,383**

City of Bainbridge Island
Cooper Creek Fish Barrier Removal
Design/Administrative Services

Design Services Estimated Costs

Item	Description	Extended Amount	
1	Surveying	$	15,000
2	Geotechincal Engineer	$	15,000
3	Structural Engineer	$	3,000
4	Habitat Biologist	$	8,000
5	Civil Engineer	$	25,000
	Estimate Design Cost	**$**	**66,000**

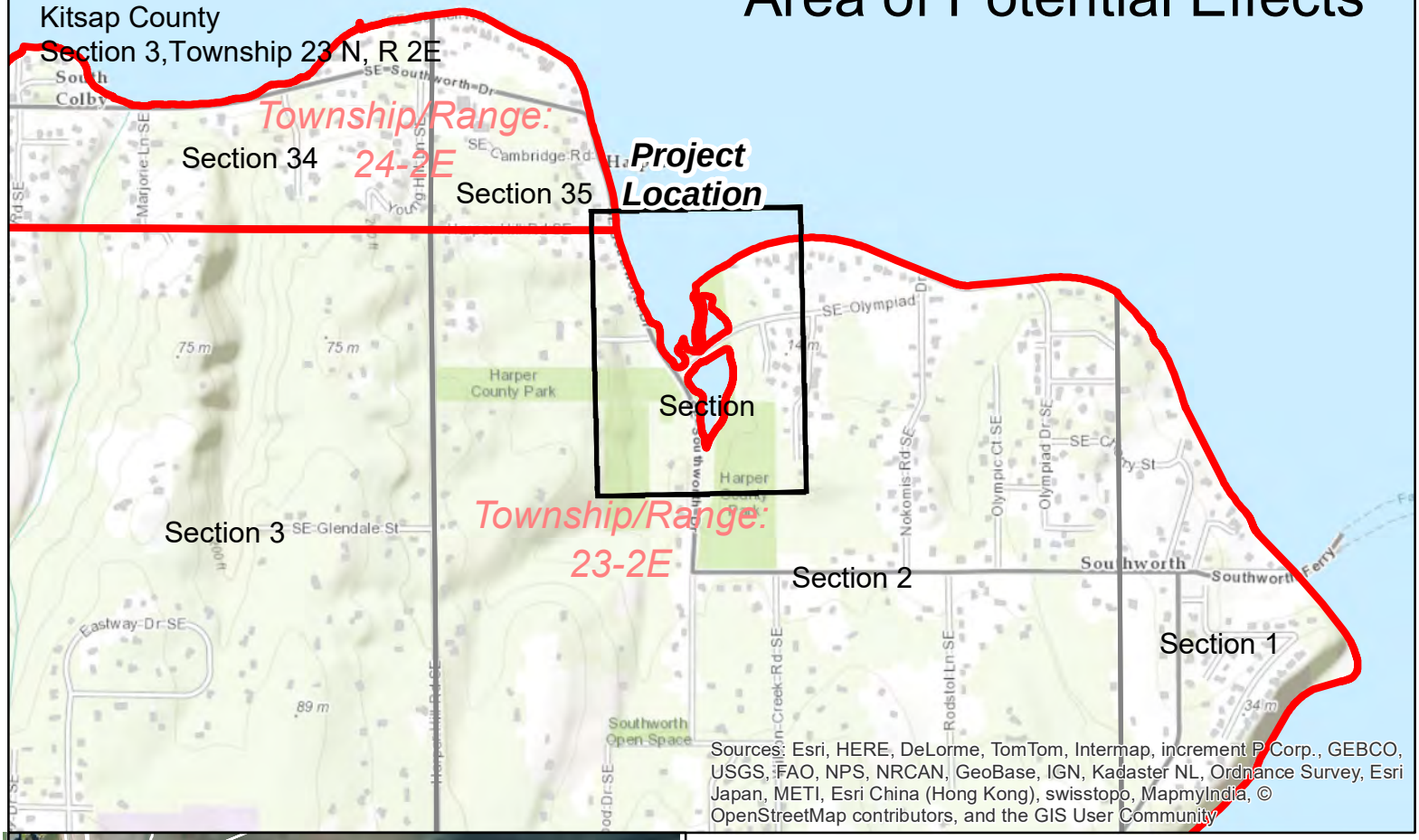
Administrative Services Estimated Costs

Item	Description	Extended Amount	
1	Architectural and Engineering Services	$	66,000
2	Bidding	$	550
3	Construction Supervision	$	15,000
4	Environmental Site Planning	$	3,600
5	Project Administration	$	800
6	Project Closeout	$	250
	Total	**$**	**86,200**
	Grand Total		**$699,207**
	Amount Requesting		$594,326
	City Contribution		$104,881
	Grand Total		**$699,207**

Browne Wheeler Engineers, Inc. 241 Ericksen Avenue NE Bainbridge Island, WA 98110
phone (206) 842-0605 fax (206) 780-9322

RCO Project 20-1608 R, Harper Estuary Culvert Removal and Bridge
Kitsap County
Section 3,Township 23 N, R 2E

Area of Potential Effects



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Township/Range Sections

SE Olympiad Drive

This map is a snapshot of the data indicated on the Published Date. The information on this map may have been collected from various sources and can change over time without notice. While great care was taken in making this map, there is no guarantee or warranty of its accuracy as to labeling, placement or location of any geographic features present. This map is intended for informational purposes only and is not a substitute for a field survey.
Kitsap County and its officials and employees assume no responsibility or legal liability for the accuracy, completeness, reliability, or timeliness of any information on this map.(3/31/2015)

KITSAP COUNTY 18 57 WASHINGTON

N W E S

Kitsap County of; Harper Estuary Barrier Correction (#21-1422)

Attachment #426390, Olympiad Drive culvert outlet.jpg

Restoring Harper Estuary
Where the Tide Meets the Stream...
The mixing of salty ocean water and freshwater from rivers or streams creates an estuary. Estuaries are some of the most productive natural habitats in the world.
Many species of fish, birds, mammals, and plants depend on the sheltered water of estuaries for food, shelter, and reproduction. Often referred to as "nurseries of the sea", estuaries provide vital habitat for nesting, spawning and growth of many important species such as salmon.
A History of Impacts...
The late 1800s brought booming growth to Seattle and Tacoma. An abundance of natural resources drew new industries to the area. With new industries came drastic changes to this natural setting.
Forests were logged and a mill and brick factory were built. Later, the factory was bulldozed into the estuary, roads were paved, and culverts were constructed. These changes restricted tidal flow and sediment exchange, which nearly eliminated the natural nursery habitat.
Turning the Tides...
Harper Estuary has important value for fish and wildlife, recreation, and local history. A project to restore the Estuary's natural functions is coordinated and managed by Kitsap County, in partnership with the Washington Departments of Ecology, Fish and Wildlife, Natural Resources, and the Suquamish Tribe.
The restoration of Harper Estuary aims to reestablish tidal influence and estuarine habitat for salmon and other species that rely on the estuary. Once tidal waters move freely again, salmon will have greater access to the estuary.
An Abundance of Natural Resources
The early attraction and development of the Kitsap Peninsula
Tribal and European settlements were drawn to the natural resource wealth of the northwest. Interest in the fisheries and forest for lumber grew exponentially during the 1800s to early 1900s. The abundance of easily extracted resources spurred the growth of seaports, towns, and industries.
People of the Clear Salt Water... the Suquamish...
From the Forest
Due to its vast forests of old-growth trees and number of convenient harbors for transportation, the Kitsap Peninsula was very attractive for the timber industry. Looking for new timber sources to support booming growth, people came from San Francisco and beyond to take advantage of the Northwest's rich forests. Mill sites were established at Port Gamble, Port Orchard, Seabeck, Port Blakely, and Port Madison – providing numerous jobs and turning these areas into populated communities and political centers. The first voting precincts were at Port Gamble, Port Orchard, and Port Madison – and the first County Commissioners were mill owners.
Log dump at Harper Estuary, circa 1940
From the Sound
The Pacific Northwest has long been known for its large salmon populations. In the early 1800s, some estimates put total salmon populations in the millions. Seeing opportunity in the Northwest, many fishermen relocated looking to capitalize on these historic runs as salmon populations were depleted in California and the Atlantic. Competition was fierce and fishermen utilized new technologies to get a leg up on their competition. Fish runs began to decline in the late 1890s due to overfishing, habitat loss, and other factors. Restoring habitat and fish populations is a focus of Puget Sound restoration efforts today.
Fishermen in Puget Sound, circa 1917

Kitsap County of; Harper Estuary Barrier Correction (#21-1422)

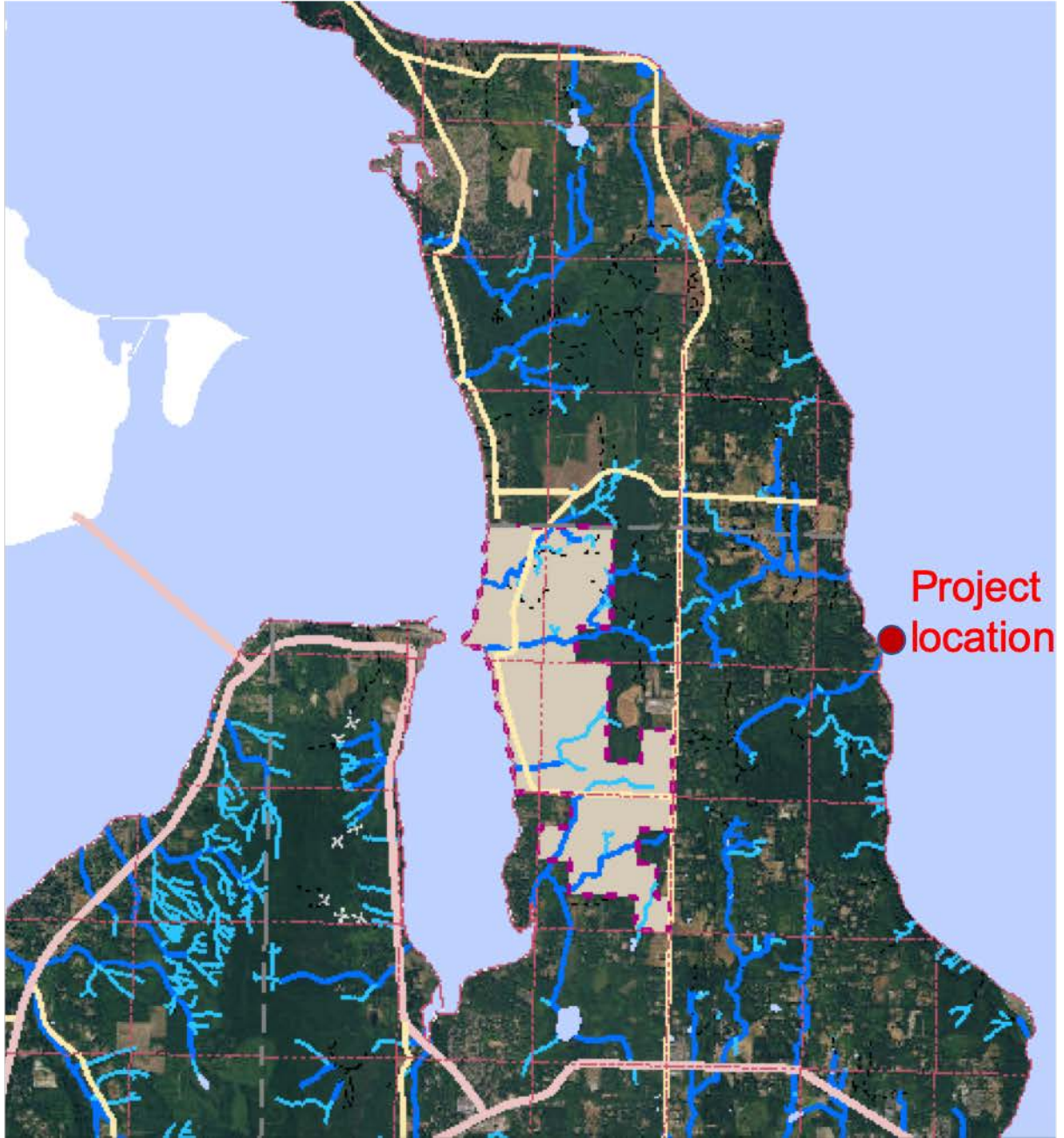
Attachment #426396, Inner estuary scour hole and culvert.jpg

Project Name	Harper Estuary Barrier Correction (Harper Estuary Bridge)
Enter your project summary. Include your goals and objectives.	Harper Estuary is a small but significant pocket estuary with salt marsh fringe, mud flats and small freshwater streams, surrounded by lowland forests. The estuary is bisected by SE Olympiad Drive and tidal exchange is limited by a 36-inch diameter culvert . Kitsap County proposes to remove the 33% passable culvert on SE Olympiad Drive where it bisects Harper Estuary and replace it with a 120-foot bridge to allow full tidal exchange and unimpeded fish passage. This restoration project also includes removing road fill and associated shoreline armor, building a pedestrian pathway and upgrading associated stormwater treatment. This project's goals are to restore tidal habitat connectivity to intertidal habitat important for juvenile salmonid rearing, restore habitat processes (e.g. sediment transport, tidal flow) and allow unimpeded fish access to estuarine and stream habitat upstream of the barrier. This project will complete the final piece of a large, multi-agency restoration effort. Priority species to benefit are Chinook. For over 15 years, Kitsap County, WA Departments of Fish and Wildlife, Ecology, Natural Resources, and the Suquamish Tribe have worked together to engage the community and restore the estuary. The first phase removed historic bricks and fill, replaced a small barrier culvert on NE Southworth Dr. and completed the bridge analysis and 100% design. Constructing the designed bridge will complete the final component of the restoration, restoring nearshore and estuarine habitat processes.
Category	Restoration
Please list all other related projects.	Related projects in the watershed include: -Replaced a barrier culvert with a box culvert on SE Southworth Dr. at the outlet of Harper Creek (WDFW Site Id 932932, 2017) -Removed barrier on a small tributary of Harper Creek and the culvert was replaced with a footbridge in 2021 (WDFW Site Id 602657). This action was funded by Ecology. -East of Harper Estuary on SE Olympiad Dr., barrier culvert (WDFW Site Id 420199) is scheduled for replacement in 2022 through the County 2022-27 Transportation Improvement Plan. -Additionally, WSDOT has identified an uncorrected barrier under Sedgewick Rd. subject to the injunction, at the headwaters of the unnamed creek that drains into Harper Estuary (ID 996955). This correction together with replacing the restricted Harper Estuary intertidal culvert would remove all fish passage barriers in the watershed.
Is this project identified in a salmon or steelhead recovery plan, watershed assessment and restoration plan, nearshore recovery	Yes

plan, or recovery strategy?	
Please identify which and explain.	This restoration project in the Harper Creek watershed is identified as a priority action that aligns with local and regional recovery strategies. The project is identified as a priority near term action in the current Puget Sound Action Agenda. The West Sound Nearshore Integration and Synthesis Report (a SRFB funded project) identified this project as a Tier 1, high priority. The West Sound Partners for Ecosystem Recovery Lead Entity recognizes the project as an important nearshore restoration project. The project was also identified in the Puget Sound Nearshore Ecosystem Project in 2002 by the US Army Corps of Engineers and Washington Department of Fish and Wildlife as a high priority. Both the East Kitsap Chapter and the Nearshore Chapter of the Puget Sound Salmon Recovery Plan (NOAA, 2005) highlight nearshore actions such as estuarine and fish passage restoration. The project was also ranked within the top five restoration actions for Chinook salmon recovery within this East Kitsap Chapter. The project is on the 4-year work plan.
Has the landowner acknowledged the project?	Yes
Explain your answer here	Both landowners Kitsap County and Washington State (Department of Natural Resources) are supportive of the project and have signed landowner acknowledgment forms from Manual 22, Fish Barrier Removal Program (2021). Both the County and state Department of Natural Resources have been working in partnership on previous grants related to the restoration of the estuary and teeing up the bridge project.
Which species will benefit from this project?	Species to benefit are Chinook, chum, coho and coastal cutthroat trout especially in rearing and juvenile life stages.
Describe the limiting factors and/or ecological concerns that your project will address (e.g., issues related to fish passage, riparian conditions, water quality and quantity, and climate change).	The Harper bridge project will remove a partial fish barrier (33% passable), restore full tidal exchange to Harper Estuary and improve fish access to the estuary, Harper Creek and the watershed. The estuary would support Chinook and Chum juveniles in highest numbers, along with other salmonid and estuarine fish. The project will result in increased tidal estuarine area and habitat quality for juvenile salmonid rearing. Salt marsh and riparian habitats provide food sources for juvenile Chinook during early life history, while the shallow waters also provide refuge from predation and osmoregulatory benefits. In addition, providing fish passage at Olympiad Drive would allow adult salmon to spawn in Harper Creek. Coho were observed spawning in Harper Creek immediately after the Southworth Drive culvert was replaced in 2016. The large bridge span (120 feet) and raised height above base flood elevation will allow the system to be more resilient against climate change impacts, like sea level rise, and heavy rain and storm events. Currently, the roadway floods in winter months with King tides and storms. The bridge and its associated, upgraded stormwater treatment installation will also improve water

	quality and decrease roadway pollutants from entering the sound.
Project Sponsor	Kitsap County
Primary Contact	Christina Kereki
Is this project on the Salmon Recovery Portal (formerly known as Habitat Work Schedule)?	No
Is this project on West Sound Partners for Ecosystem Recovery's 2021-2022 Planned Project Forecast List (PPFL)?	No
For which grants are you applying?	Puget Sound Acquisition and Restoration Fund (tentatively available July 2023) FBRB
What is the total cost of the project?	$5,825,131
What is the total request of the grant?	$5,825,131
What are the available matching funds?	0


Hansville
Puget Sound
104
Project location
Eglon
Rose Point
Port Gamble
3
Four Corners
Lofall
104
Breidablick
Kingston


Project location

Property Parcels

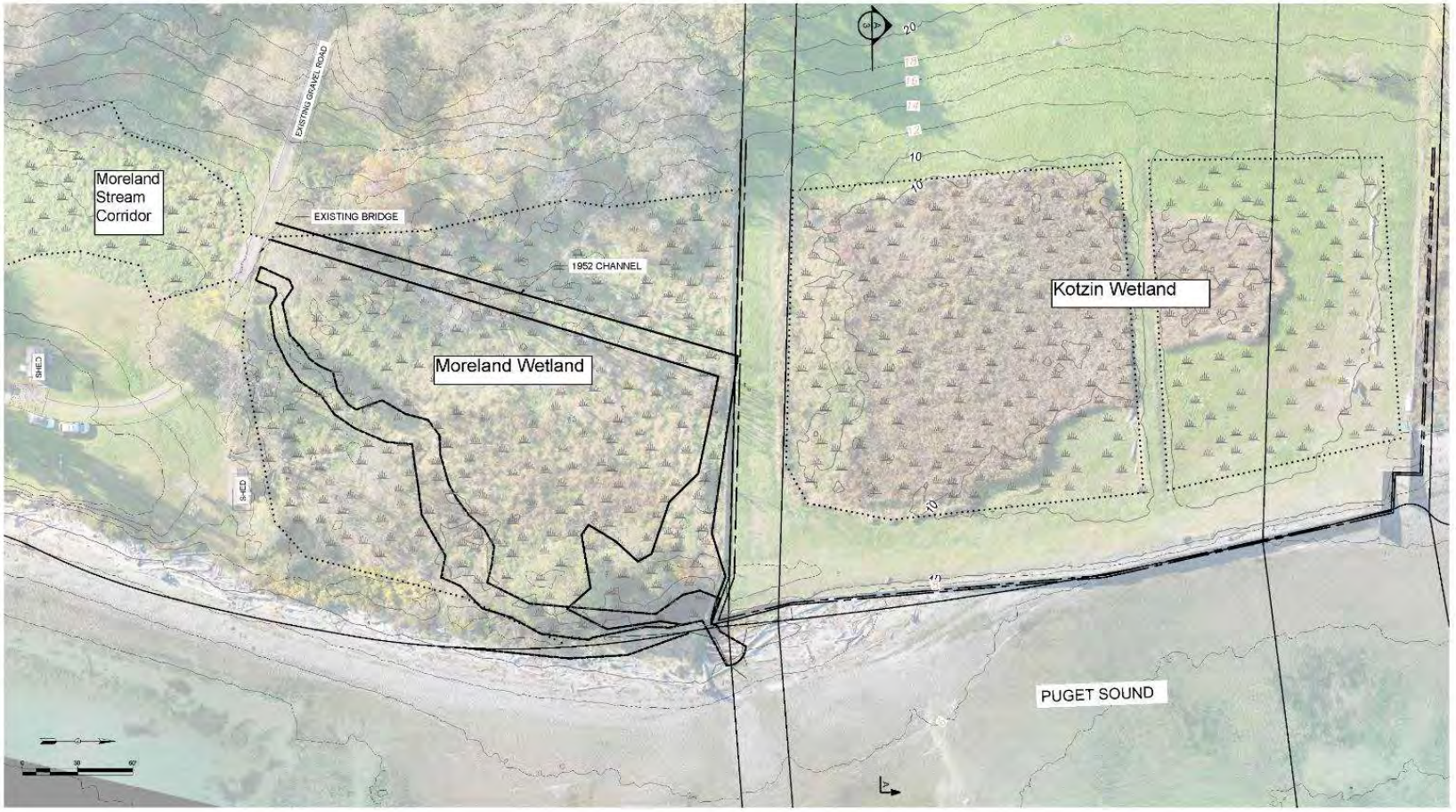
- Creek Bank as Surveyed
- Inside Toe of Structure
- Creek (WDFW)
- Property Parcels

BLUE COAST ENGINEERING

N

0 20 40 80 120 160 Meters

0 37.575 150 225 300 Feet



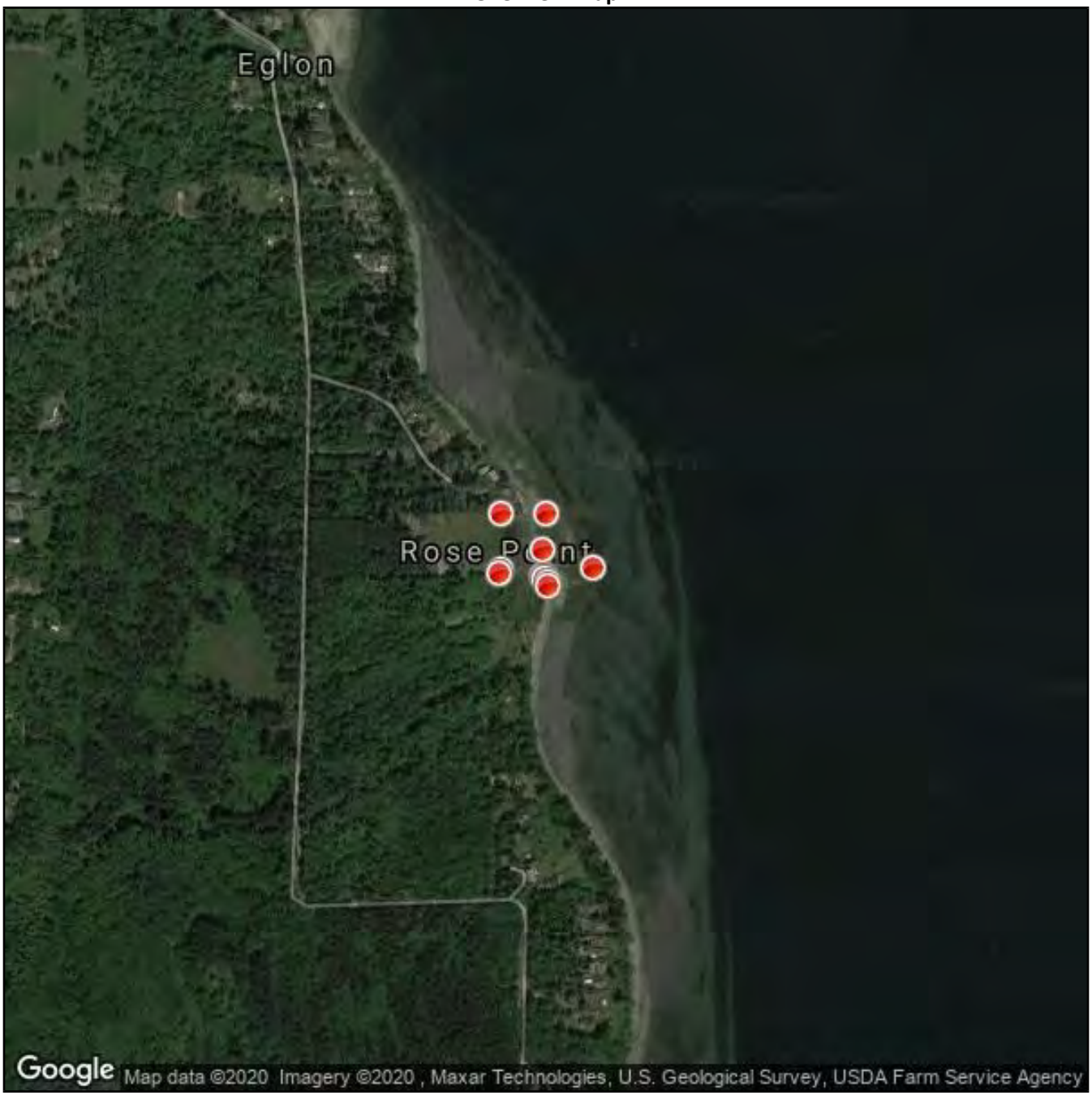
NOTES:
1. OCTOBER 2020 AERIAL DRONE IMAGERY
2. 2018 LIDAR TOPOGRAPHY, VERTICAL DATUM = NAVD88

Rose Point - Eglon

Estuary Restoration

BLUE COAST ENGINEERING

Overview Map




Historic Estuary
BLUE COAST
ENGINEERING
N 47° 51' 16.19"
W 122° 30' 34.10"
Eglon - Rose Point
5:12:23 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_[1].jpg
Latitude	N 47° 51' 16.19"
Longitude	W 122° 30' 34.10"
Time Stamp	5:12:23 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
What am I looking at	
What am I looking at	Historic Estuary


Bulkhead on South Side of Property
Looking Towards Water
BLUE COAST
ENGINEERING
N 47° 51' 16.05"
W 122° 30' 34.20"
Eglon - Rose Point
5:13:00 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_Looking Towards Water.jpg
Latitude	N 47° 51' 16.05"
Longitude	W 122° 30' 34.20"
Time Stamp	5:13:00 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
Additional Comment	Looking Towards Water
What am I looking at	Bulkhead on South Side of Property


Utilities
BLUE COAST ENGINEERING
N 47° 51' 16.05"
W 122° 30' 34.20"
Eglon - Rose Point
5:13:00 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_Utilities.jpg
Latitude	N 47° 51' 16.05"
Longitude	W 122° 30' 34.20"
Time Stamp	5:13:00 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
What am I looking at	Utilities
Additional Comment	


Looking Towards the South
Unnamed Creek South of Property
BLUE COAST
N 47° 51' 15.89"
W 122° 30' 30.43"
Eglon - Rose Point
5:19:36 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_Unnamed Creek South of Property.jpg
Latitude	N 47° 51' 15.89"
Longitude	W 122° 30' 30.43"
Time Stamp	5:19:36 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
What am I looking at	Unnamed Creek South of Property
Additional Comment	Looking Towards the South


From Southern Corner of Property
Creek Outflow
BLUE COAST
ENGINEERING
N 47° 51' 15.91"
W 122° 30' 30.50"
Eglon - Rose Point
5:19:51 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_Creek Outflow.jpg
Latitude	N 47° 51' 15.91"
Longitude	W 122° 30' 30.50"
Time Stamp	5:19:51 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
What am I looking at	Creek Outflow
Additional Comment	From Southern Corner of Property


South Corner of Property Monument
BLUE COAST ENGINEERING
N 47° 51' 15.75"
W 122° 30' 30.52"
Eglon - Rose Point
5:20:13 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_Monument .jpg
Latitude	N 47° 51' 15.75"
Longitude	W 122° 30' 30.52"
Time Stamp	5:20:13 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
What am I looking at	Monument
Additional Comment	South Corner of Property


Looking Towards Boat Ramp
Bulkhead on North Side of Property
BLUE COAST
ENGINEERING
N 47° 51' 19.49"
W 122° 30' 34.13"
Eglon - Rose Point
5:26:04 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_Bulkhead on North Side of Property.jpg
Latitude	N 47° 51' 19.49"
Longitude	W 122° 30' 34.13"
Time Stamp	5:26:04 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
What am I looking at	Bulkhead on North Side of Property
Additional Comment	Looking Towards Boat Ramp


Property From Water
On Northern Boundary of Property
BLUE COAST
ENGINEERING
N 47° 51' 19.48"
W 122° 30' 30.25"
Eglon - Rose Point
5:26:38 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_On Northern Boundary of Property.jpg
Latitude	N 47° 51' 19.48"
Longitude	W 122° 30' 30.25"
Time Stamp	5:26:38 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
Additional Comment	On Northern Boundary of Property
What am I looking at	Property From Water


Boat Ramp and North of Property
BLUE COAST
ENGINEERING
N 47° 51' 19.48"
W 122° 30' 30.25"
Eglon - Rose Point
5:35:47 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_[2].jpg
Latitude	N 47° 51' 19.48"
Longitude	W 122° 30' 30.25"
Time Stamp	5:35:47 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
Additional Comment	
What am I looking at	Boat Ramp and North of Property


Driftwood and Sediment Accumulation
South Side of Property
BLUE COAST
ENGINEERING
N 47° 51' 17.42"
W 122° 30' 30.64"
Eglon - Rose Point
5:35:47 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_South Side of Property.jpg
Latitude	N 47° 51' 17.42"
Longitude	W 122° 30' 30.64"
Time Stamp	5:35:47 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
Additional Comment	South Side of Property
What am I looking at	Driftwood and Sediment Accumulation


Ponding at Southeastern Corner of Property
Unnamed Creek
BLUE COAST
ENGINEERING
N 47° 51' 15.65"
W 122° 30' 30.47"
Eglon - Rose Point
5:45:21 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_Unnamed Creek[1].jpg
Latitude	N 47° 51' 15.65"
Longitude	W 122° 30' 30.47"
Time Stamp	5:45:21 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
What am I looking at	Unnamed Creek
Additional Comment	Ponding at Southeastern Corner of Property


Outflow
Unnamed Creek
BLUE COAST
ENGINEERING
N 47° 51' 15.68"
W 122° 30' 30.48"
Eglon - Rose Point
5:45:35 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_Unnamed Creek[2].jpg
Latitude	N 47° 51' 15.68"
Longitude	W 122° 30' 30.48"
Time Stamp	5:45:35 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
What am I looking at	Unnamed Creek
Additional Comment	Outflow


Derelict Material
Unnamed Creek
BLUE COAST
N 47° 51' 15.68"
W 122° 30' 30.48"
Eglon - Rose Point
5:45:47 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_Unnamed Creek.jpg
Latitude	N 47° 51' 15.68"
Longitude	W 122° 30' 30.48"
Time Stamp	5:45:47 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
What am I looking at	Unnamed Creek
Additional Comment	Derelict Material


Property to South of Study Parcel
BLUE COAST
ENGINEERING
N 47° 51' 15.46"
W 122° 30' 30.00"
Eglon - Rose Point
5:51:21 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_[5].jpg
Latitude	N 47° 51' 15.46"
Longitude	W 122° 30' 30.00"
Time Stamp	5:51:21 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
What am I looking at	
What am I looking at	Property to South of Study Parcel


Property to South of Study Parcel
BLUE COAST
ENGINEERING
N 47° 51' 15.31"
W 122° 30' 29.91"
Eglon - Rose Point
5:51:23 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_.jpg
Latitude	N 47° 51' 15.31"
Longitude	W 122° 30' 29.91"
Time Stamp	5:51:23 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
What am I looking at	
What am I looking at	Property to South of Study Parcel


Unnamed Creek
Outflow into Puget Sound
BLUE COAST
ENGINEERING
N 47° 51' 16.31"
W 122° 30' 26.17"
Eglon - Rose Point
5:55:54 PM
2/4/2020


Google
Technologies, U.S. Geological Survey, USDA Farm Service Agency


Google
Map data ©2020

Attributes	
File Name	Eglon - Rose Point_Outflow into Puget Sound.jpg
Latitude	N 47° 51' 16.31"
Longitude	W 122° 30' 26.17"
Time Stamp	5:55:54 PM
Date Stamp	2/4/2020
Site Name	Eglon - Rose Point
Additional Comment	Outflow into Puget Sound
What am I looking at	Unnamed Creek

Project Name	Rose Point Embayment Restoration
Enter your project summary. Include your goals and objectives.	This project will restore a historic barrier embayment estuary connected to a small perennial stream at Rose Point near Eglon in North Kitsap County. The project occurs on two adjacent private properties with supportive and engaged landowners. Specific project elements include the removal of 770 feet of creosote piling bulkhead; the restoration of approximately 2 acres of salt marsh/ embayment estuary by removing berms and fill, re-creating two barrier spits including sand and some habitat forming wood, and reconnecting the stream to the salt marsh; replacement of an undersized bridge that poses a barrier to fish passage; restoring about 500 ft of channelized stream upstream of the bridge; and replanting native riparian vegetation along the stream and shoreline adjacent to the restored estuary. The project will benefit juvenile Chinook salmon as they outmigrate from Puget Sound in the spring and summer as well as provide the potential to restart a small coho and chum run in the freshwater stream with adults returning in the fall and juveniles outmigrating in the late winter, spring and summer. This project was originally identified in Kitsap County's 2016 assessment of priority nearshore salmon habitat projects as a top tier restoration project and will contribute to a larger regional effort to restore a series of barrier embayment estuary habitats for migrating juvenile salmon in Puget Sound.
Category	Restoration
Please list all other related projects.	20-1525 Rose Point Embayment Restoration (ESRP); 20-1016 Rose Point Nearshore & Estuary Restoration Design (PSAR/ESRP); 18-1837 Kitsap Nearshore Armor Removal Design & Readiness (PSAR); Rose Point Embayment Restoration - PMEP/USFWS
Is this project identified in a salmon or steelhead recovery plan, watershed assessment and restoration plan, nearshore recovery plan, or recovery strategy?	Yes
Please identify which and explain.	West Sound Nearshore Integration and Synthesis of Chinook Salmon Recovery Priorities (2016) - Tier 1 project, ranked #10 for tidal flow restoration projects and #25 overall (out of 420 projects scored and ranked).

Has the landowner acknowledged the project?	Yes
Explain your answer here	The project involves two landowners who are supportive and engaged in the project.
Which species will benefit from this project?	Chinook, coho, chum, cutthroat
Describe the limiting factors and/or ecological concerns that your project will address (e.g., issues related to fish passage, riparian conditions, water quality and quantity, and climate change).	This project will remove 770 ft of creosote timber bulkhead and create 2 acres of barrier estuary salt marsh for outmigrating juvenile Chinook salmon from multiple Puget Sound natal rivers at a critical point in their outward journey. Early marine survival is a significant limiting factor to successful recovery of Puget Sound Chinook salmon. There are a number of factors that affect juvenile Chinook survival, including the availability of estuary and nearshore rearing habitats. This project will improve nearshore rearing conditions by removing shoreline armoring and restoring a historic barrier (pocket) estuary. Other limiting factors to be addressed include fish passage barriers, in-stream habitat , riparian conditions, floodplain connectivity, and sediment transport. In addition the local chapter of the Puget Sound Anglers is currently discussing with the Washington Department of Fish and Wildlife the potential of restarting a small run of chum and coho in the stream through the placement of egg boxes. WDFW has indicated to the group that the stream and outlet need to be restored to support better habitat for the fish before they would be willing to support the placement of egg boxes. This project will help advance that need.
Project Sponsor	Mid Puget Sound Fisheries Enhancement Group
Primary Contact	Sarah Heerhartz
Is this project on the Salmon Recovery Portal (formerly known as Habitat Work Schedule)?	Yes
Is this project on West Sound Partners for Ecosystem Recovery's 2021-2022 Planned	Yes

Project Forecast List (PPFL)?	
For which grants are you applying?	Salmon Recovery Funding Board (available September 2022) Puget Sound Acquisition and Restoration Fund (tentatively available July 2023)
What is the total cost of the project?	$50,0000
What is the total request of the grant?	$41,8375
What are the available matching funds?	$8,1625

McNeil Island Marine Shoreline Restoration

Washington Department of FISH and WILDLIFE

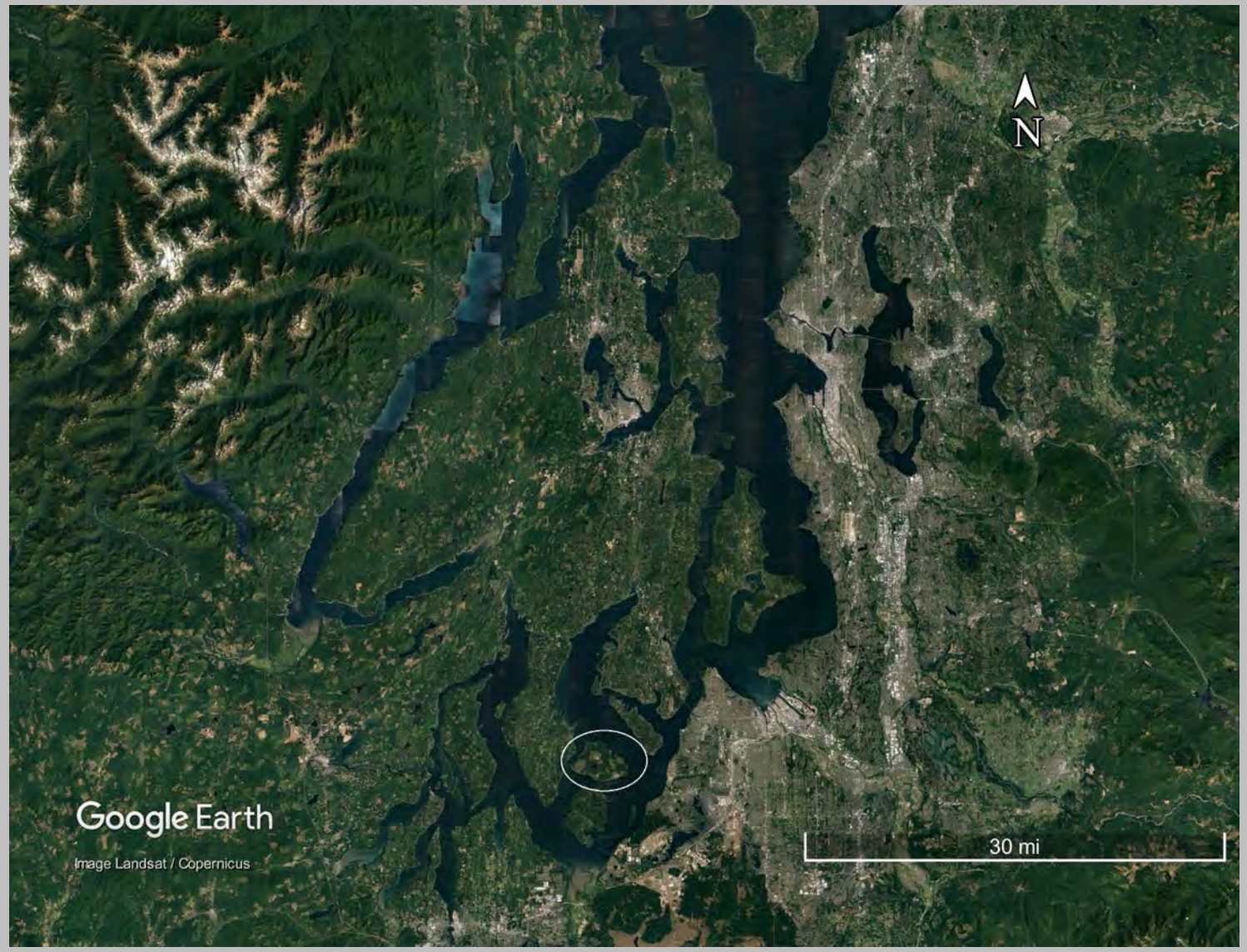
Doris Small, Habitat Restoration Coordinator
Corey Morss, P.E., Habitat Engineer
Darric Lowery, SPS Wildlife Area Manager
Chris Dwight, Habitat Biologist

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

Monica Shoemaker & Chris Robertson
DNR Aquatic Restoration

Department of Corrections WASHINGTON STATE

Henry Mack & Natasha Holt
DOC Marine Operations



McNeil Island

- 4400 acres
- 12 miles shoreline

- West Sound LE
- Alliance for a Healthy South Sound LIO
- Nearshore Chinook Chapter – South Sound
- Tribal – Squaxin, Nisqually & Puyallup
- Pierce County

- WDFW South Puget Sound Wildlife Area
- WDNR Nisqually Aquatic Reserve & SOAL

1875 – 1934 Federal acquisition of the island
1875 – 1981 Federal penitentiary operated
1981 - 2011 State penitentiary operated
Up to 1500 inmates & island residents

McNeil Island Management

1984 Land ownership transfer conditions:

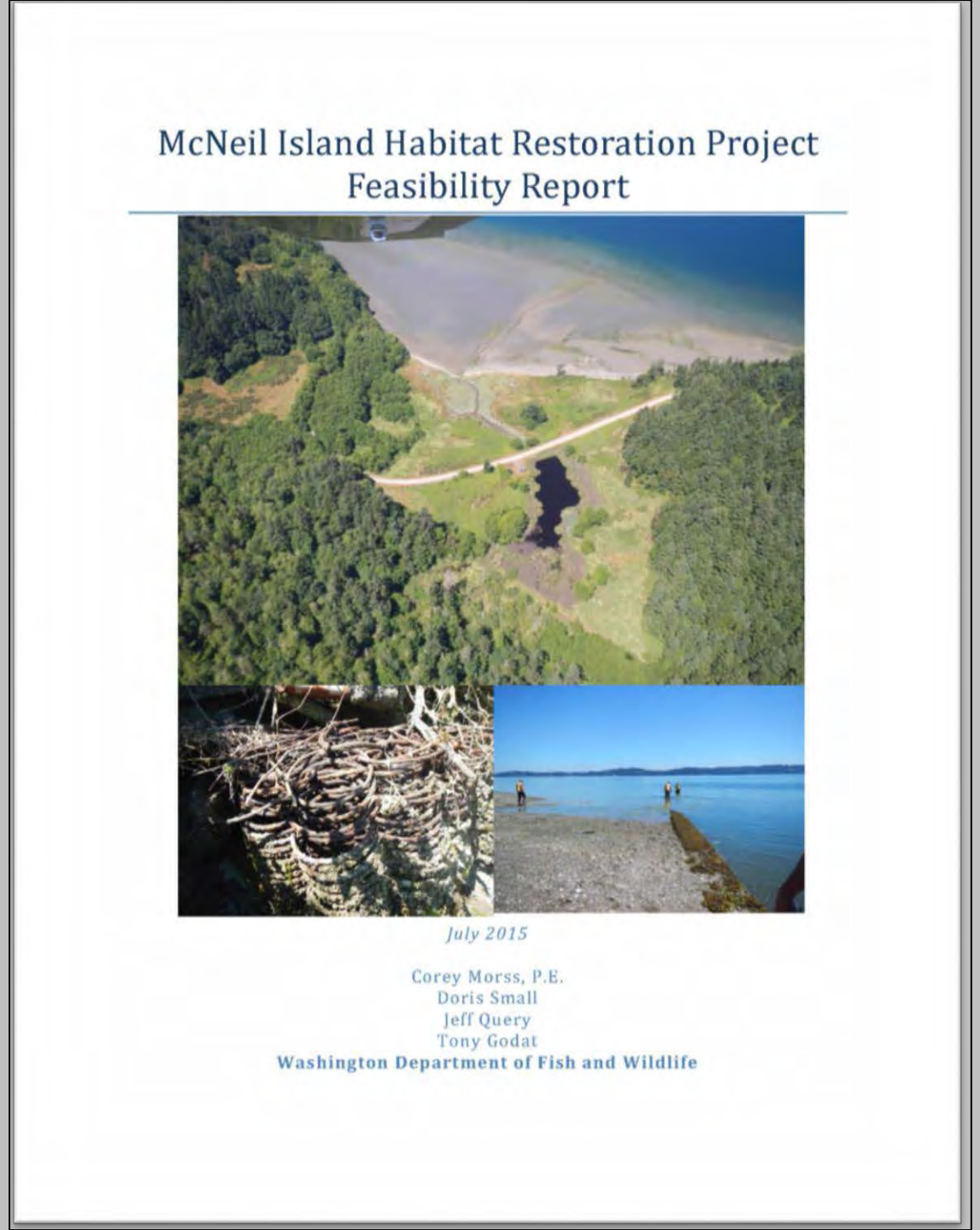
- **Correctional use limited to designated parcels**
- **Remainder of island is for wildlife conservation**
- **Wherever possible, decommission infrastructure**
- **Protective of cultural resources & Gertrude Island**
- **No public access**

Source: BERK 2012

Shoreline debris

Impounded former embayments

WWII Torpedo netting as shoreline armor



Identified two near-term projects

- Barge Landing debris removal
- Shoreline debris removal (10 sites)

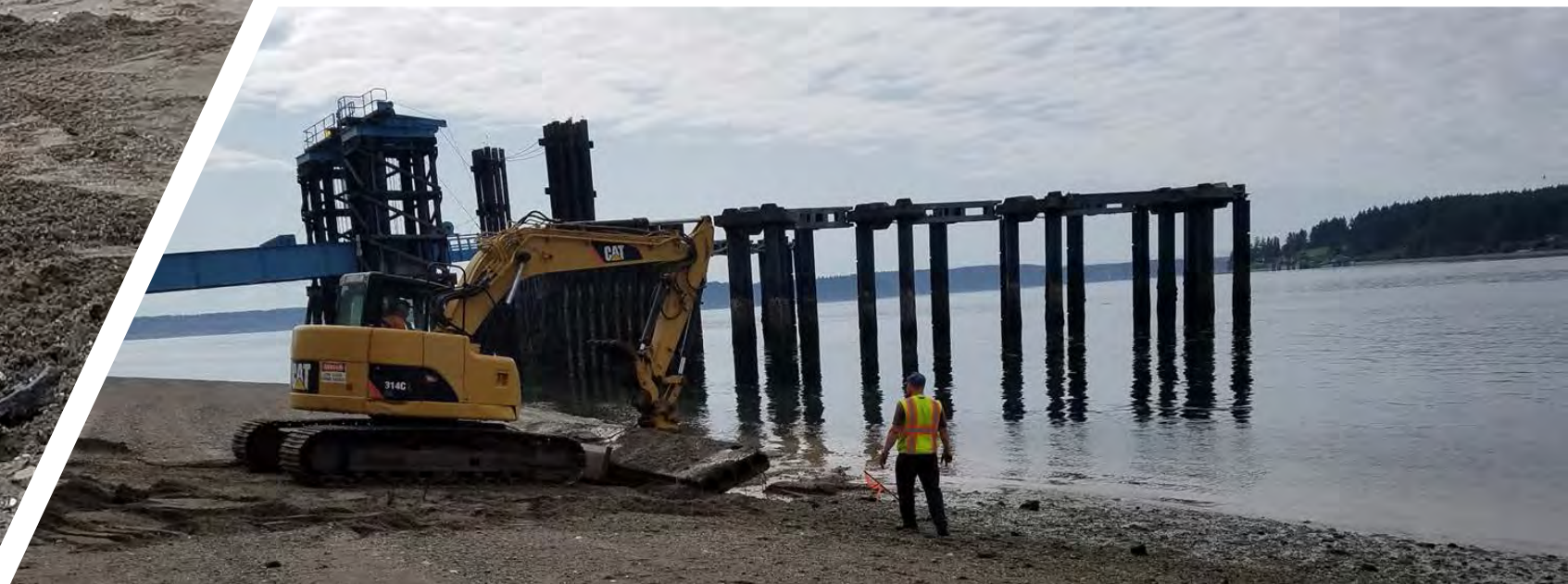
Three additional projects for further study

- Milewa Creek Estuary
- Bodley/Bradley Creek Estuary
- Floyds Cove


Bodley/Bradley Creek
Milewa Creek Estuary
Floyds Cove
Luhr Creek culvert
Still Harbor
McNeil Island
Butterworth Reservoir
Eden Cr dam
Barge Landing
Google Earth
N


McNeil Island - Barge Landing Site
Google earth
200 ft
N


CAT


CAT
CAT
314C

Completed July 2018

- 61 ecology blocks
- 24 concrete voided slab sections
- 33 creosote piling
- Approximately 200 cy crushed gravel

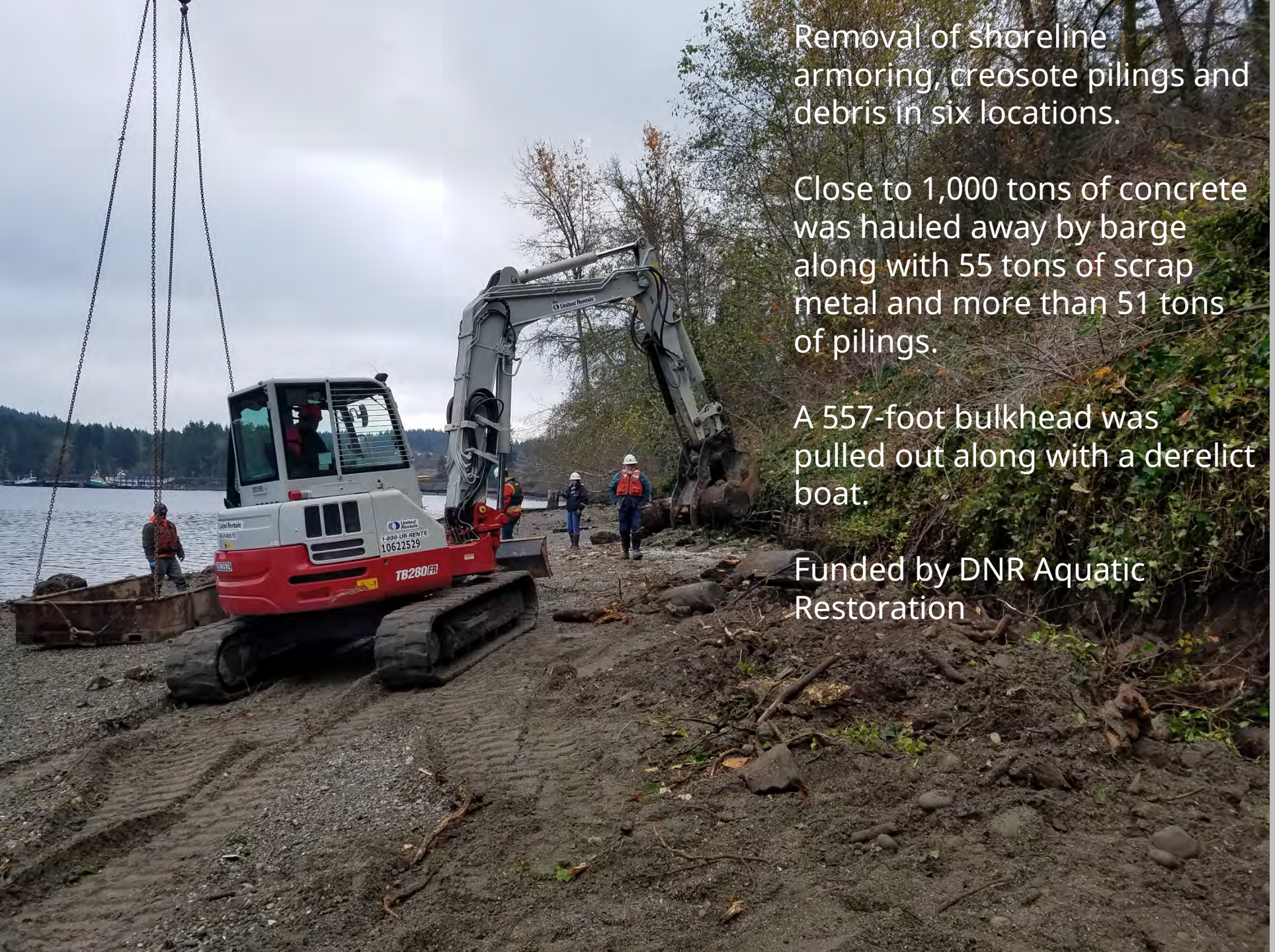
https://www.kuow.org/stories/homeowners-keep-building-walls-around-puget-sound-but-biologists-are-taking-out-more

2018/2019 Island Wide Restoration

- **Removal of shoreline armoring, creosote pilings and debris in six locations.**
- **Close to 1,000 tons of concrete was hauled away by barge along with 55 tons of scrap metal and more than 51 tons of pilings.**
- **557-foot bulkhead was pulled out along with a derelict boat.**

https://pugetsoundblogs.com/waterways/2018/12/06/mcneil-island-becoming-known-for-fish-and-wildlife-not-just-prison/

https://www.king5.com/article/news/local/state-cleaning-100-year-old-debris-from-south-puget-sound-island/281-620466240



Removal of shoreline armoring, creosote pilings and debris in six locations.

Close to 1,000 tons of concrete was hauled away by barge along with 55 tons of scrap metal and more than 51 tons of pilings.

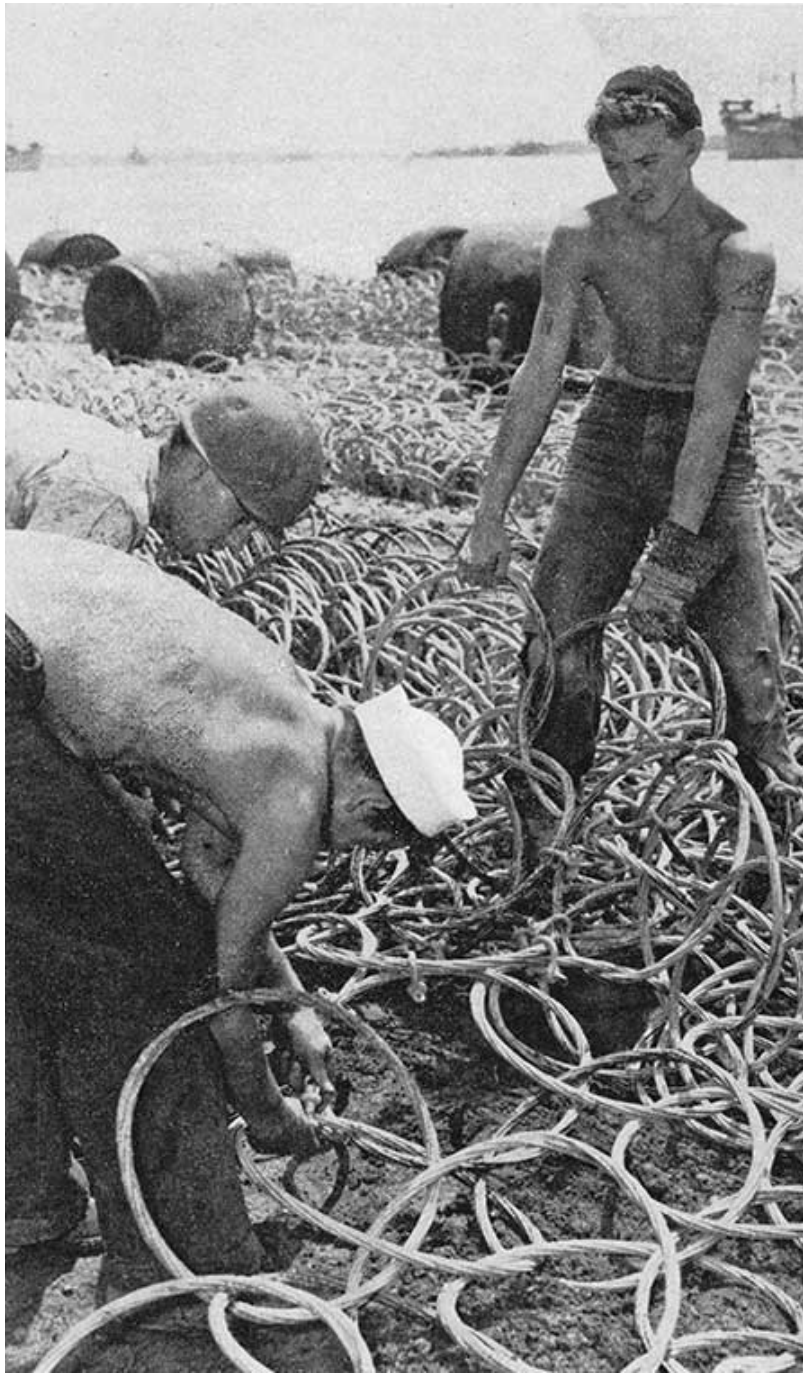
A 557-foot bulkhead was pulled out along with a derelict boat.

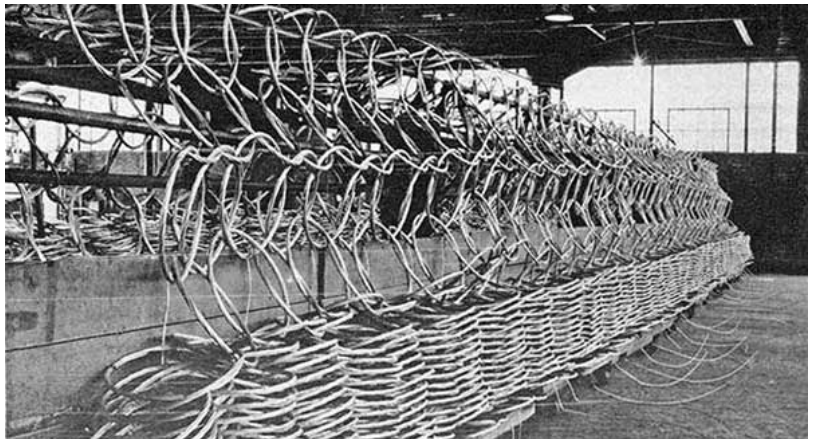
Funded by DNR Aquatic Restoration

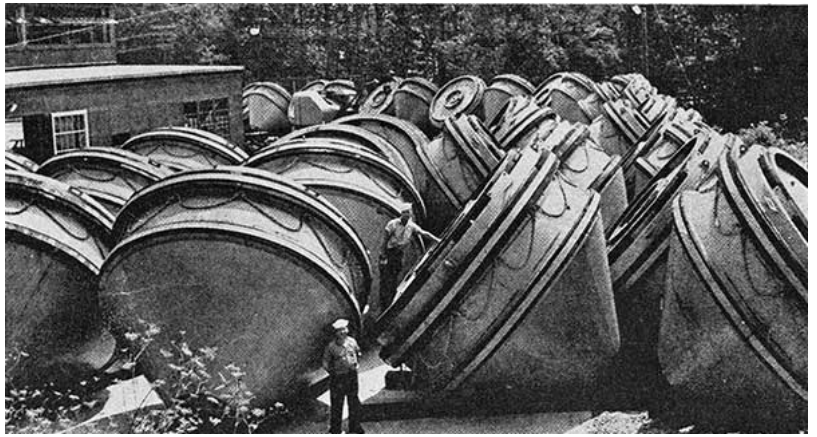
https://www.dnr.wa.gov/mcneil-island-shoreline-restoration

https://www.king5.com/article/news/local/state-cleaning-100-year-old-debris-from-south-puget-sound-island/281-620466240

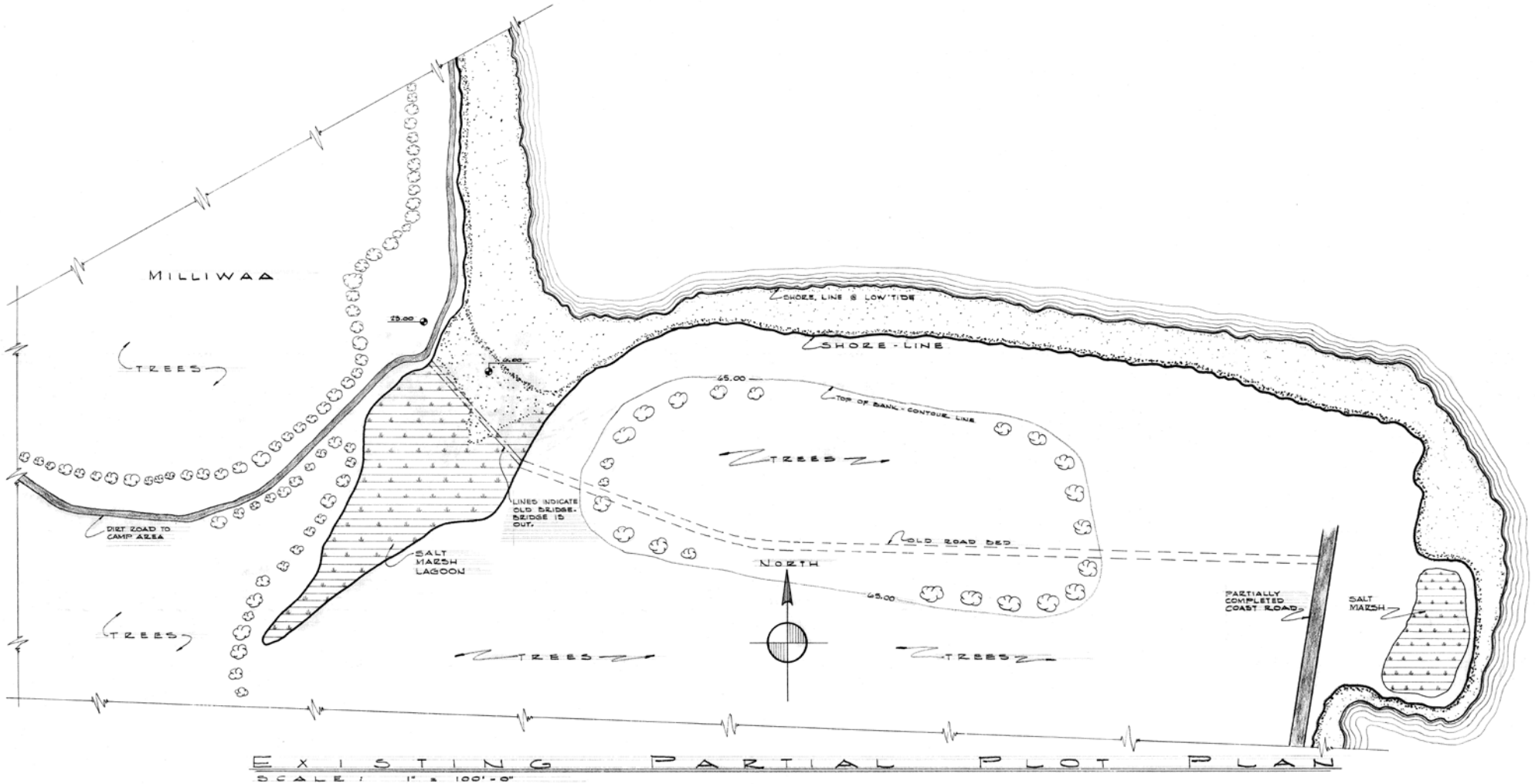
https://pugetsoundblogs.com/waterways/2018/12/06/mcneil-island-becoming-known-for-fish-and-wildlife-not-just-prison/








Milewa Creek Estuary



EXISTING PARTIAL PLOT PLAN

SCALE: 1" = 100'-0"

A PROPOSAL FOR LAND RECLAIMATION IN CONJUNCTION WITH THE COAST ROAD CONSTRUCTION BY MEANS OF A NEW SEAWALL AT EXISTING LAGOON NEAR MILLIWAA. APPROXIMATELY 9.20 ACRES OF LAND WILL BE RECLAIMED FOR FUTURE BEEF PASTURE & HAY FIELD.

PROPOSED & DRAWN BY TRUITT, #28299 & PHILLIPS, #30799

U. S. PENITENTIARY McNEIL ISLAND, WASH.

Drawn By PHILLIPS	PROPOSED SEAWALL AT MILLIWAA	Drawing No. 17
Checked By		Date SEPT 14, 1966
Scale AS NOTED		File No. 69
Sheet 1 of 2		Drawer / Folder / Cabinet

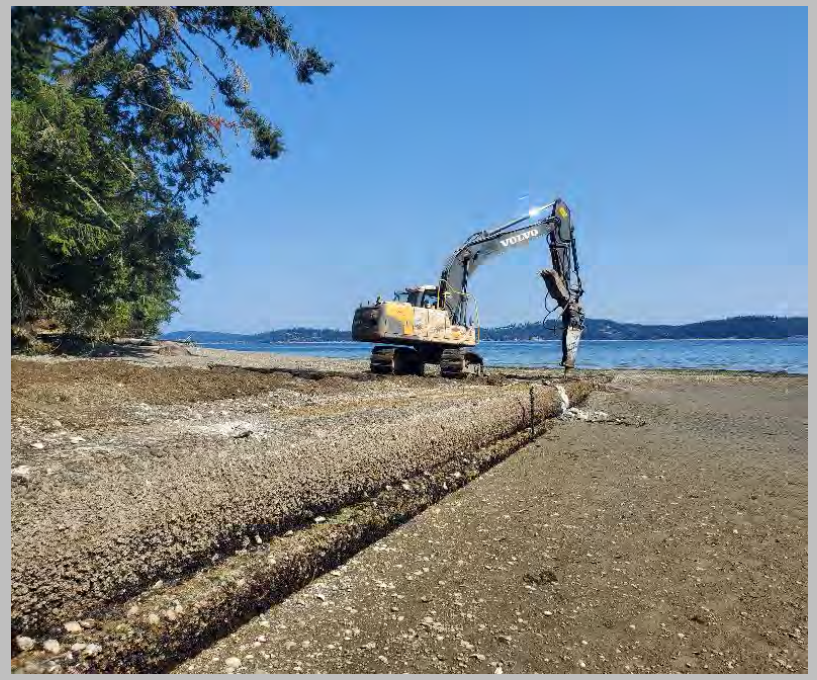
APPROVED

BUILDING & GROUNDS MANAGER WARDEN

REVISIONS	PRINTS

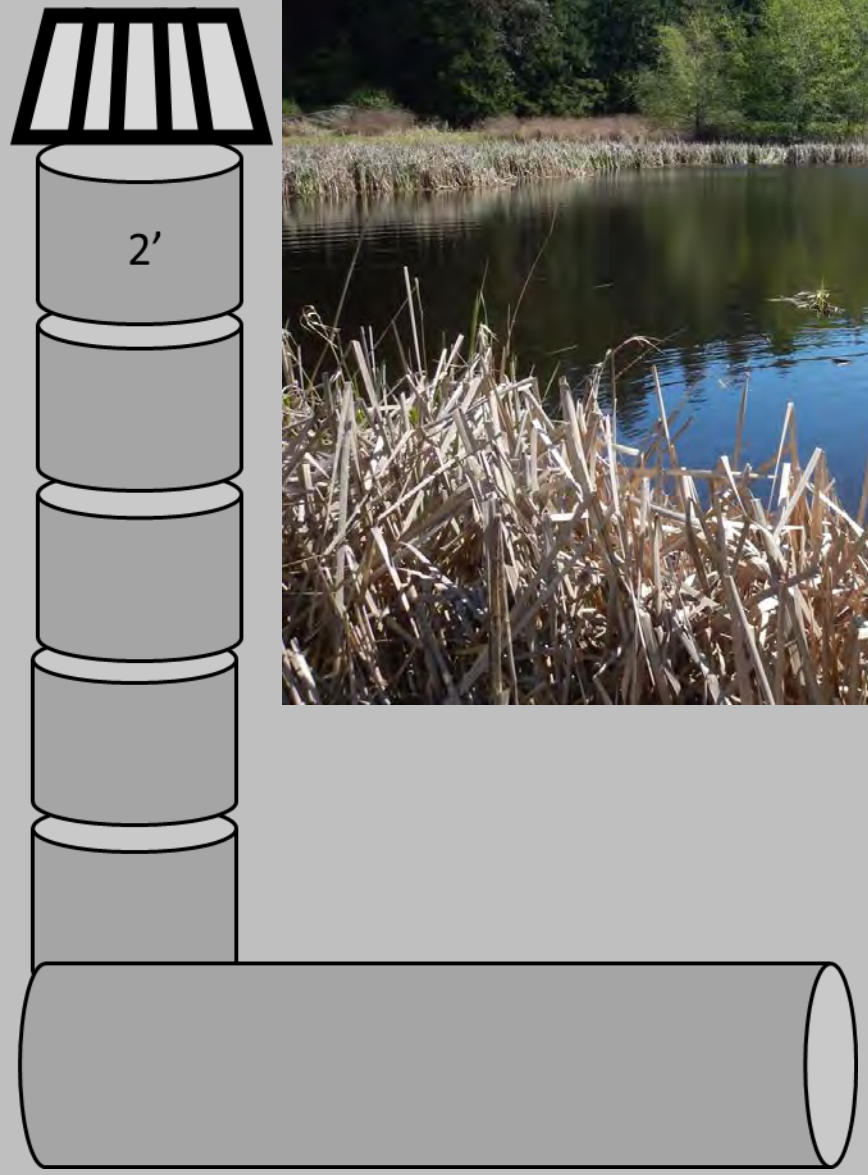
Alternatives at Milewa Estuary:

1) *Remove culvert & rebuild 100’ bridge*
2) *Remove culvert & build bypass road at head of estuary*
3) *Remove culvert & use existing road for bypass*


VOLVO


VOLVO
VOLVO

Bodley Creek (Bradley Cr)

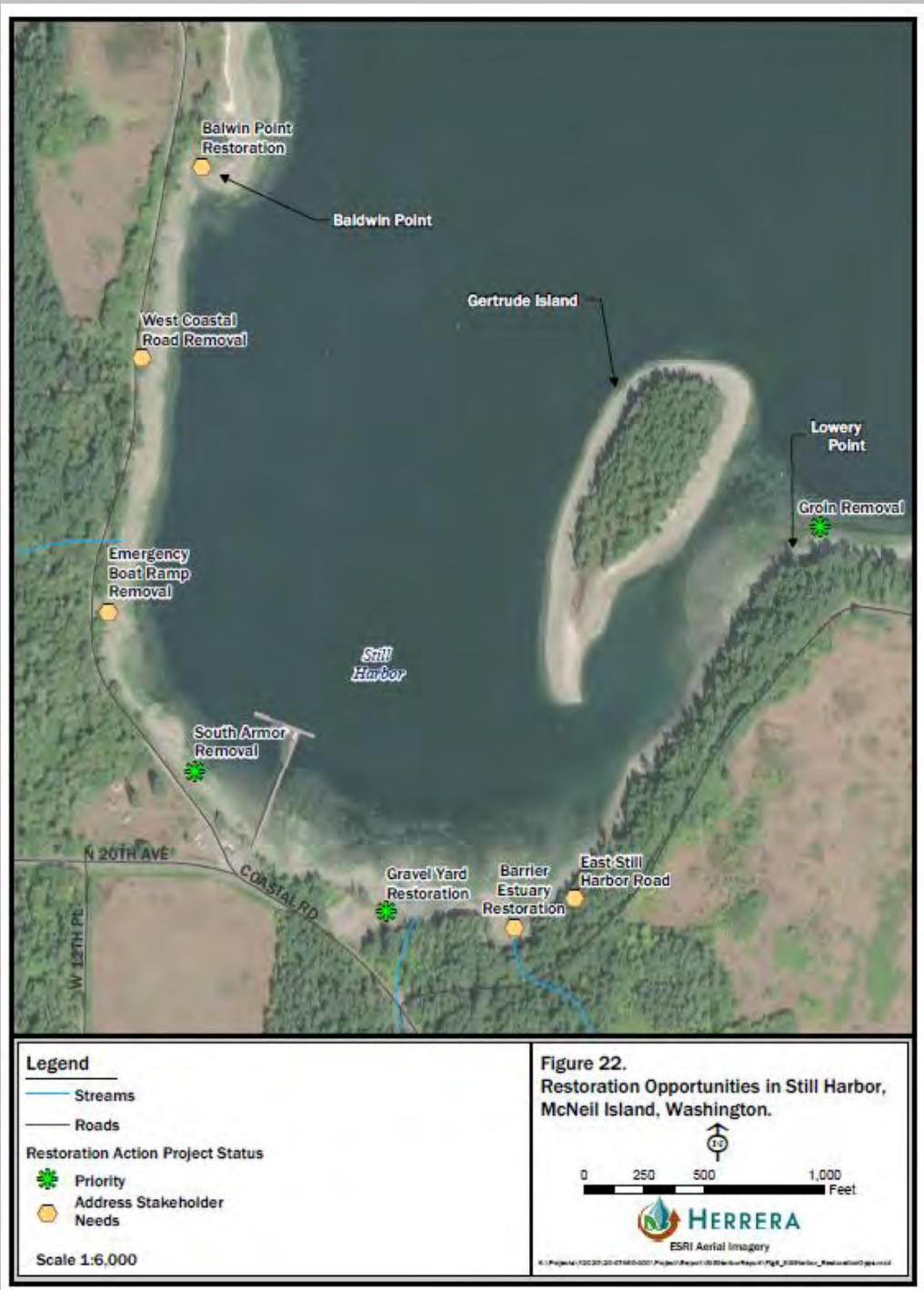

2’

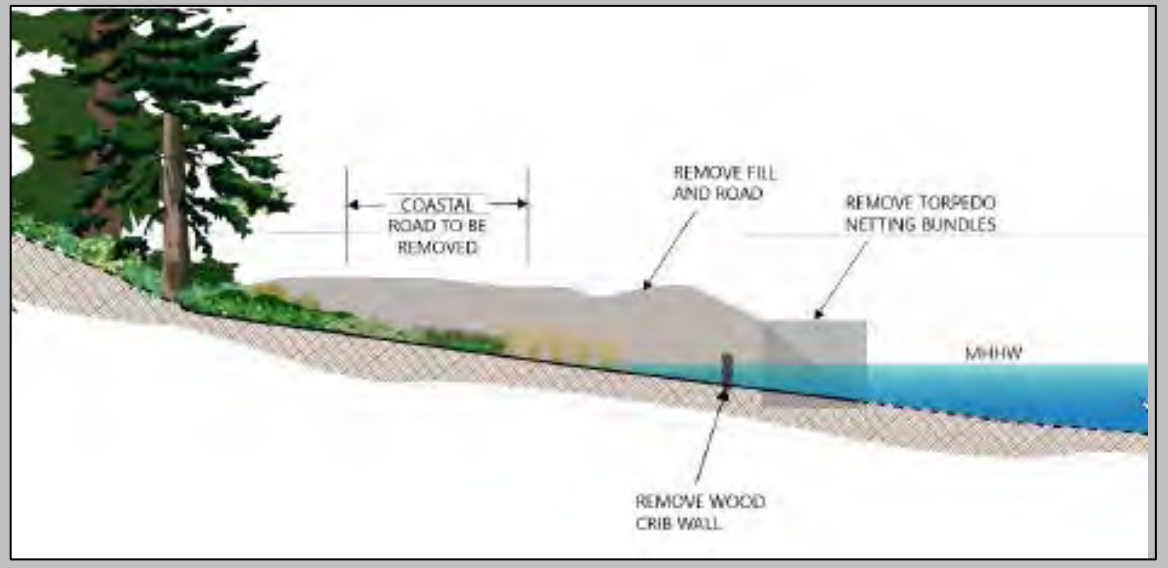
Bodley Creek: Beaver assisted restoration

- Plant beaver-enticing vegetation
- Remove standpipe in sections
- Install BDAs
- Replace culvert when funding available
- Keep planting


8/04/2016 3:24 PM
Floyds Cove

Still Harbor Feasibility




COASTAL
ROAD TO BE
REMOVED
REMOVE FILL
AND ROAD
REMOVE TORPEDO
NETTING BUNDLES
MHHW
REMOVE WOOD
CRIB WALL

Still Harbor Shoreline Monitoring

- Forage Fish Surveys
- Beach Profile
- Sediment Size
- Beach Wrack
- Logs and Riparian Vegetation

- **McNeil Island is part of your LE**
  - *Significant restoration work has been happening there*
- **We're looking to gain partners & continue momentum**
  - *Include McNeil Island restoration on LE project list?*
- **When is the field trip?**

Thanks for your interest!

PROPOSED STREAMBED CHANNEL
RESTORATION (~160 C.Y. STREAMBED MIX).

96 LF Ex. XX-inch
Concrete Culvert
@ 0.00%
US IE
DS IE 97.09

BODLEY'S POND

Coastal Road

EXISTING PILINGS
TO BE REMOVED
5 PILINGS TOTAL.

PROPOSED 80'x 20' BOX CULVERT

PROPOSED 100' x 16' ROAD RESTORATION
(~50 C.Y. CRUSHED SURFACING).

NOTE:
ALL CONSTRUCTION SPOILS (~700 C.Y.)
TO BE HAULED OFFSITE TO A DESIGNATED
DISPOSAL SITE ON McNEIL ISLAND.

EXISTING CULVERT AND
OUTLET RISER TO BE REMOVED.

REMOVE EXISTING BUILDING.

PERFERRED ALTERNATIVE, BOX CULVERT

Scale: 1" = 40'

VERTICAL DATUM
ASSUMED

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

COREY MATTHEW MORSS
STATE OF WASHINGTON
52875
REGISTERED
PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

NOT FOR CONSTRUCTION

0 —— 1"
BAR MEASURES
ONE INCH ON
ORIGINAL DRAWINGS

DESIGNED BY C. MORSS
CHECKED BY D. PONDER
DRAWN BY T. GODAT
DATE 7-22-2020

McNEIL ISLAND; BODLEY CREEK
CULVERT REMOVAL AND HABITAT RESTORATION
PERFERRED ALTERNATIVE SITE PLAN
BOX CULVERT

PROJECT NO.

SHEET 1 OF 1


SURVEY DISCLAIMER
THIS IS NOT A BOUNDARY SURVEY. ELEVATIONS SHOWN ARE BASED ON AN ASSUMED DATUM. TOPOGRAPHIC INFORMATION WAS GATHERED UNDER DIRECTION OF THE ENGINEER FOR THE SOLE PURPOSE OF DESIGN AND CONSTRUCTION OF THIS PROJECT. PROPERTY LINES, EASEMENTS, AND RIGHT OF WAY LOCATIONS DISPLAYED ARE APPROXIMATE BASED ON INFORMATION OBTAINED FROM RECORDED DOCUMENTS, FOR REFERENCE PURPOSES ONLY.
CONSTRUCT ~350 LF STACKED ROCK RETAINING WALL REVETMENT ALONG SEAWARD SIDE OF ROAD.
EXIST. LARGE RIPRAP ARMORING TO BE REMOVED
WDFW CONTROL POINT HUB–2 EL=99.74 ASSUMED
EXIST. METAL SUB CABLE (3700 CF ±) TO BE REMOVED
EXIST. WOOD PILING SHORELINE ARMOR (60 LF±) TO BE REMOVED
WDFW CONTROL POINT HUB–3 EL=85.24 ASSUMED
EXIST. BOULDER PILE TO BE REMOVED
NORTH
SCALE: 1" = 30'
EXCAVATE EXCESS ROAD FILL SPOILS ON BEACH (~700 CY), REGRADE AND RESTORE BEACH WITH BEACH NOURISHMENT GRAVEL–SAND MIX (~300 CY)
~ PITT PASSAGE ~
EXISTING CONTOUR TYP.
PROPOSED CONTOUR TYP.
PROPOSED 100' X 16' WIDE WITH SHALLOW SPREAD FOOTINGS PENDING GEOTECH EVALUATION AND DESIGN. DECK ELEVATION = 100.0
~ EXIST. BEACH ~
COASTAL ROAD
20'
TO BODLEY CREEK
TO BALDWIN POINT
60 LF EXIST. 24" CONC. CULVERT USIE 96.12 DSIE 90.64 OUTLET END BROKEN TO BE REMOVED
NOTE: SPOILS TO BE HAULED OFFSITE TO A DESIGNATED DISPOSAL SITE ON MCNEIL ISLAND
WDFW CONTROL POINT HUB–1 EL=100.00 ASSUMED
REGRADE/RESURFACE ~300 LF OF ROAD TO FINISH ELEVATION 99 (~600 CY CUT, ~200 CY FILL)
EXIST. DITCH
~ FLOYDS COVE POND ~
~ EXIST. TREES / VEG ~
EXIST. CONC WALL & EXIST. BUIDING TO BE REMOVED
~ EXIST. TREES / VEG ~

VERTICAL DATUM
LOCAL ASSUMED

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER .... DATE: ....
PROGRAM .... DATE: ....

0 —— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY COREY MORSS, P.E.
CHECKED BY
DRAWN BY K.CORWIN
DATE 4–22–20

MCNEIL ISLAND – FLOYDS COVE
FISH PASSAGE AND HABITAT RESTORATION PROJECT
CULVERT AND BERM REMOVAL PLAN
PREFERRED ALTERNATIVE SITE PLAN

PROJECT NO.

SHEET 1 OF 1

Project Name	McNeil Island Estuary Restoration - Bodley Creek & Floyds Cove
Enter your project summary. Include your goals and objectives.	In this project, we will restore full tidal exchange and tidal connectivity to Bodley Creek and Floyds Cove on McNeil Island. In focusing on restoration of habitat processes, the project will also provide full fish passage and improved habitat conditions within the estuary. Floyds Cove is a former pocket estuary that was impacted by road construction prior to 1956. Pre-development Floyds Cove was an open estuary with a barrier beach extending to the south from the northern shoreline. Four small streams flow into Floyds Cove. The embankment that impounds the existing pond was constructed to help provide freshwater to Butterworth Reservoir, similar to the Bodley Creek site. There is an existing pump house and diversion that are inoperable currently. Additionally, the shoreline is heavily armored with a combination of riprap, piling, and submarine cable bulkheads. Bodley Creek is tidal marsh bisected by a road. The 36" culvert is fitted with a 10' standpipe, completely disconnecting the extensive freshwater wetlands with the tidal marsh. Beaver use in the freshwater wetland is evident, although they may not be present at this time due to lack of appropriate vegetation. The work will be phased as funding becomes available. In the first phase we will improve the habitat for beaver use and reduce the impoundment. We will be planting the site this month with native plants such as willows and cottonwoods, including some in exclusion areas to allow the plants to establish. If permits are available in summer, we will gradually remove the standpipe to lower the impoundment and construct beaver dam analogs as the water drops. At Floyds Cove, the culvert will be replaced with a 80-100' bridge at the opposite end (as shown in the T-sheet) to allow full tidal exchange. In addition, shoreline armor will

	be removed and replaced, where necessary, using soft-shore techniques wherever practical. With existing funding and this award, we expect to be able to complete the beaver-assisted Bodley Creek preliminary work and the Floyds Cove culvert replacement and shoreline modifications. The final phase of this work will replace the Bodley Creek culvert with a fish-passable structure (80' x 20') that also restores full tidal connectivity.
Category	Restoration
Please list all other related projects.	We have been working toward marine shoreline restoration at McNeil Island in partnership with DNR & Dept of Corrections since 2014. In 2015, WDFW & DNR developed a marine habitat restoration feasibility study (available on request) to identify projects for development and implementation. WDFW completed the Barge Landing project in 2018, using funds from Dept of Ecology through the Asarco settlement. DNR completed a marine shoreline debris removal in 2018 using DNR Aquatic Restoration funds. WDFW completed the Milewa Estuary Restoration Project in 2021 using funding from DOE Asarco settlement and ESRP (PRISM 18-2072). WDFW is currently working on design and permitting for Bodley Creek and Floyds Cove with remaining ESRP funds (including 21-1456 in progress). DNR is continuing work on Still Harbor restoration projects using DNR Aquatic Restoration funds. We provided a general overview of restoration work at McNeil Island during a November 2021 TAG meeting and can provide more information on these projects as needed.
Is this project identified in a salmon or steelhead recovery plan, watershed assessment and restoration plan, nearshore recovery plan, or recovery strategy?	Yes
Please identify which and explain.	McNeil Island has not had a high profile in salmon recovery or watershed plans, often due to limited access to the island. While the streams are short-run and would likely support limited salmon use, the nearshore habitat is documented for use by juvenile

	salmon and forage fish. McNeil Island is approximately 5.5 miles north of the Nisqually River delta. The Nisqually Indian Tribe Department of Natural Resources conducted a delta fish ecology assessment around McNeil Island between 2010 and 2015. The results of this work show that the highest number of hatchery Chinook salmon (50%) caught along the McNeil shoreline during this sampling period were from the Nisqually Basin. This study found the highest number of salmon that used the nearshore of McNeil Island were pink, chum, and Chinook (2010-2015 Juvenile Fish Ecology in the Nisqually River Delta and Nisqually Reach Aquatic Reserve). Bodley Creek culvert replacement was identified in the KGI Nearshore Restoration Plan (2011) as Project 50 and in the Nearshore Chapter of the Puget Sound Chinook recovery plan (2005) as Not Properly Functioning pocket estuaries (McNeil Island -17, 18 & 19) with potential feeding benefits for Chinook. The estuary restoration projects are identified in the updated WDFW South Puget Sound Wildlife Area Plan.
Has the landowner acknowledged the project?	Yes
Explain your answer here	WDFW is the landowner for the proposed projects. WDFW is working in partnership with DNR and DOC, adjacent landowners.
Which species will benefit from this project?	Juvenile Chinook salmon, chum salmon, coho salmon, pink salmon, surf smelt, Pacific sand lance and estuarine fish species (e.g. flatfish, perch).
Describe the limiting factors and/or ecological concerns that your project will address (e.g., issues related to fish passage, riparian conditions, water quality and quantity, and climate change).	Bodley Creek and Floyds Cove project objectives are to restore full tidal exchange and tidal connectivity to the sites. At this time, fish passage is fully blocked by undersized culverts and standpipes. Our proposal will allow habitat transition from saltwater to freshwater habitats, provide fish passage and improve habitat conditions to support juvenile salmon that use estuarine habitats. In addition, shoreline armor at Floyds Cove will be removed and shoreline protection, where needed, will be improved to use soft shore techniques wherever possible.

	In the Salmon Recovery Portal, I checked NO because only the Bodley Creek project was identified (SS McNeil 11-50) and not the Floyds Cove project. The Bodley Creek project needs to be updated. It would also be good to add or update the projects we've completed recently. For the project list, I checked NO because the projects are not currently there. However, DNR & DFW submitted the list during the transitional period, so it's likely that it's in progress and doesn't indicate lack of support.
Project Sponsor	Washington Department of Fish and Wildlife
Primary Contact	Doris Small
Is this project on the Salmon Recovery Portal (formerly known as Habitat Work Schedule)?	No
Is this project on West Sound Partners for Ecosystem Recovery's 2021-2022 Planned Project Forecast List (PPFL)?	No
For which grants are you applying?	TBD
What is the total cost of the project?	$1,700,000
What is the total request of the grant?	$495,250
What are the available matching funds?	$1,204,750

North Creek/Donkey Creek Salmon Habitat Protection Project

Key Peninsula-Gig Harbor-Islands Watershed
Location Map At Watershed Scale

CITY OF GIG HARBOR

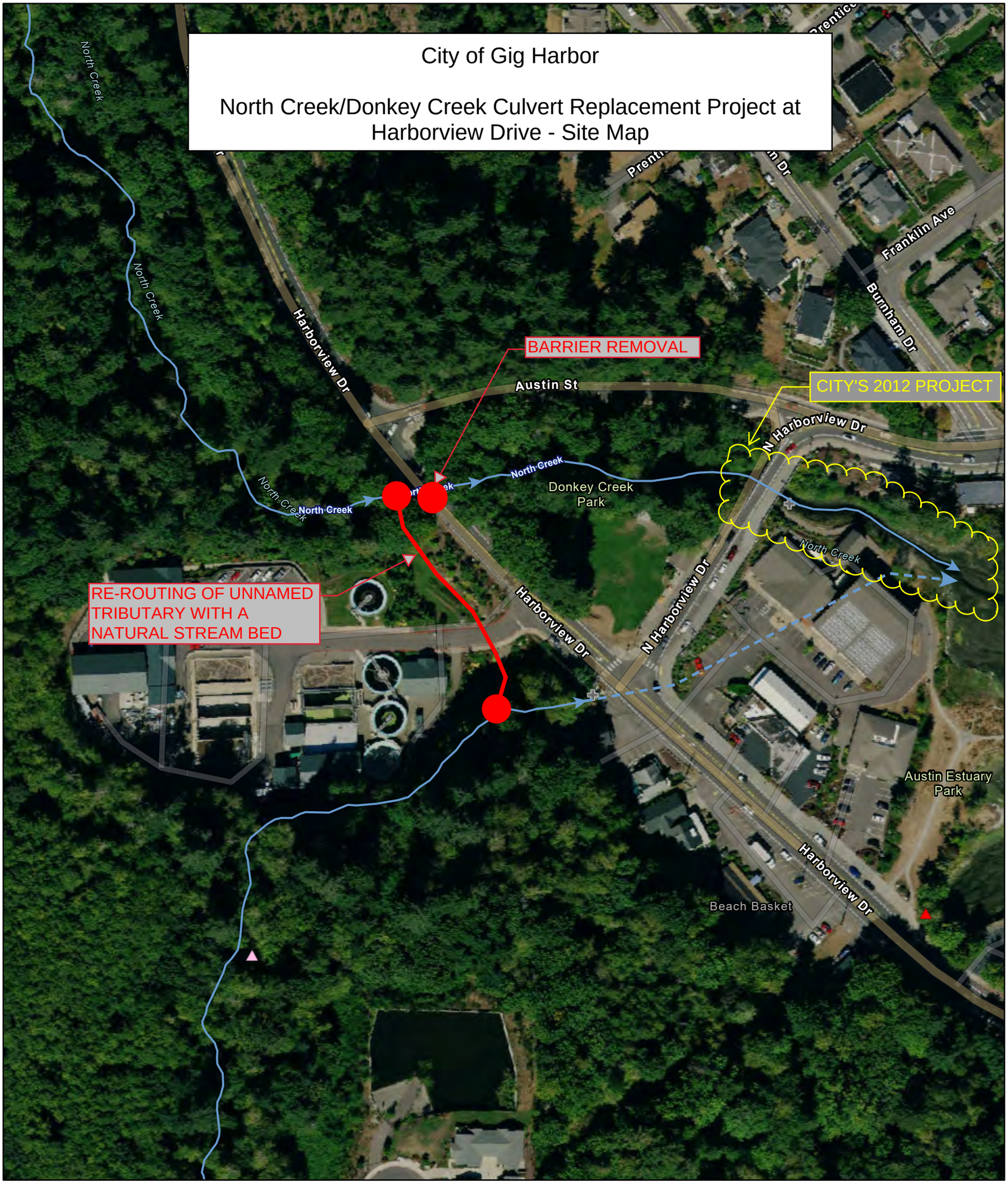
NORTH CREEK SALMON HABITAT PROTECTION SITE MAP

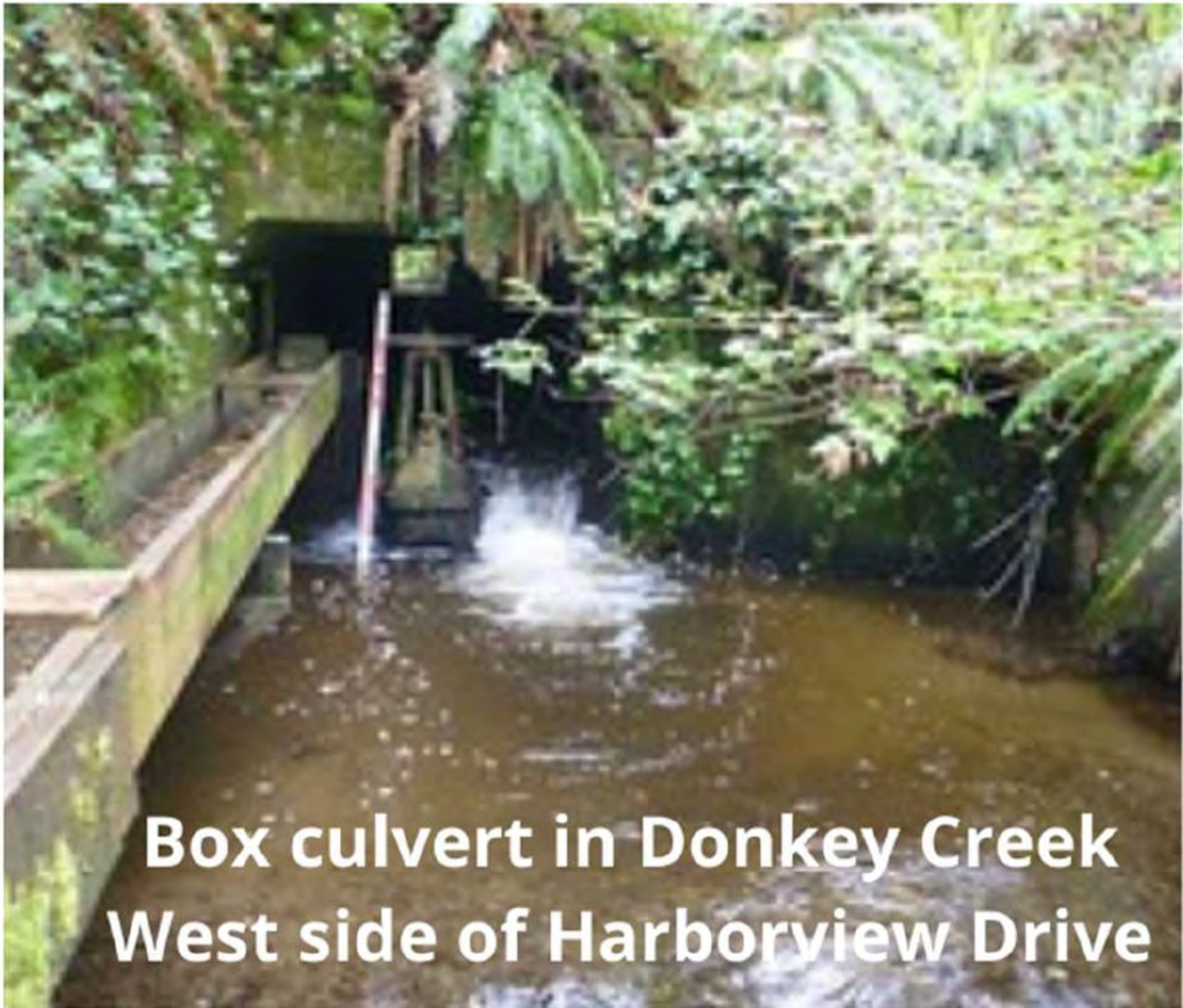
Project Name	North Creek/Donkey Creek Salmon Habitat Protection
Enter your project summary. Include your goals and objectives.	The City recognizes that the properties along North Creek immediately upstream of the mouth of the Creek remain mostly undeveloped and in a natural state with native trees and a mature understory. A majority of these properties include critical areas such as highly rated wetlands, associated wetland buffers, and steep slopes. The City has begun the process of working with some owners of these properties to acquire the land for conservation purposes. With the planned removal of a second partial fish barrier in 2024, the reaches of North Creek within and adjacent to these properties will become even more accessible habitat for salmon. The goal of this project is to protect the valuable existing salmon habitat, which currently does not need expensive restoration but rather only protection of existing amenities and functions. The objectives include assessing key properties within the area of focus along North Creek to prioritize habitat protection thorough either purchasing conservation easements or the purchasing the land for conservation purposes.
Category	Acquisition
Please list all other related projects.	North Creek/Donkey Creek Culvert Replacement Project at Harborview Drive (A WSPER letter of intent for this project will also be submitted.)
Is this project identified in a salmon or steelhead recovery plan, watershed assessment and restoration plan, nearshore recovery plan, or recovery strategy?	Yes
Please identify which and explain.	August 2005, Gig Harbor Basin Plan, Volume 1: Existing Conditions. Section 8.3 (Conceptual Solutions), Section 9.2 (Capital Improvements), and Measure PG-04.
Has the landowner acknowledged the project?	Yes
Explain your answer here	The City has previously approached some property owners in the area of focus. Each property owner the City has approached has acknowledged the project and is willing to consider conservation property acquisition by the City for salmon habitat protection.
Which species will benefit from this project?	Per WDFW reports, this habitat of North Creek and its unnamed tributary will support Chum salmon, Coho, Steelhead, Sea Run Cutthroat, and resident trout
Describe the limiting	Protecting salmon habitat through property acquisition for

factors and/or ecological concerns that your project will address (e.g., issues related to fish passage, riparian conditions, water quality and quantity, and climate change).	conservation purposes will serve to maintain a natural riparian zone which is critical to stream health. There are many mature trees and established under story which serves to shade the creek keeping temperatures low and is especially critical as climate change increases our summer temperatures. Healthy riparian zones prevent erosion and harmful runoff which degrades stream health. Prohibiting development near the stream will eliminate some of the non-point source pollution which plagues urban streams. Preserving riparian habitat has a cascading effect on all species, which will benefit not only salmonids, but the entire ecosystem.
Project Sponsor	City of Gig Harbor
Primary Contact	Jeff Langhelm, PE
Is this project on the Salmon Recovery Portal (formerly known as Habitat Work Schedule)?	No
Is this project on West Sound Partners for Ecosystem Recovery's 2021-2022 Planned Project Forecast List (PPFL)?	No
For which grants are you applying?	Salmon Recovery Funding Board (available September 2022) Puget Sound Acquisition and Restoration Fund (tentatively available July 2023)
What is the total cost of the project?	$12,000,000
What is the total request of the grant?	$6,000,000
What are the available matching funds?	$6,000,000

North Creek/Donkey Creek Culvert Replacement Project

Key Peninsula-Gig Harbor-Islands Watershed
Location Map At Watershed Scale


City of Gig Harbor
North Creek/Donkey Creek Culvert Replacement Project at Harborview Drive - Site Map
BARRIER REMOVAL
CITY'S 2012 PROJECT
RE-ROUTING OF UNNAMED TRIBUTARY WITH A NATURAL STREAM BED
North Creek
Harborview Dr
Austin St
N Harborview Dr
Franklin Ave
Burnham Dr
Donkey Creek Park
Austin Estuary Park
Beach Basket


Box culvert in Donkey Creek
West side of Harborview Drive

Title	North Creek Donkey Creek Culvert
Project Name	North Creek/Donkey Creek Culvert Replacement Project at Harborview Drive
Enter your project summary. Include your goals and objectives.	In 2012 the City of Gig Harbor removed a lengthy fish barrier at the mouth of the City's North Creek, (aka Donkey Creek) by removing a 36-inch dia. culvert and replacing it with natural streambed and a bridge for North Harborview Drive. The City's proposed North Creek/Donkey Creek Culvert Replacement Project at Harborview Drive project is located immediately upstream of the City's 2012 fish barrier removal project. The proposed project will continue to improve fish passage by removing the next fish barrier along North Creek and replacing it with a bridge at Harborview Drive. Available fish habitat upstream of this culvert includes both salmon spawning and rearing habitat. The proposed project would immediately restore full access to approximately 2,000 LF of quality fish habitat along North Creek upstream of this partial fish barrier. This project would also restore full access to approximately 1,000 LF of quality fish habitat along an unnamed tributary to North Creek by connecting the unnamed tributary directly to North Creek by way of re-routing the unnamed tributary along a more natural path through the City's wastewater treatment plant site. Currently this unnamed tributary discharges to Gig Harbor bay through 600 LF of 30-inch dia. culvert. The initial steps of this project in 2022 will engage community stakeholders and permitting agencies then initiate the design and permitting for this culvert replacement project.
Category	Restoration;#Phased
Please list all other related projects.	North Creek/Donkey Creek Salmon Habitat Protection Project (A WSPER letter of intent will be submitted also.)
Is this project identified in a salmon or steelhead recovery plan, watershed assessment and restoration plan, nearshore recovery plan, or recovery strategy?	Yes
Please identify which and explain.	August 2005: Gig Harbor Basin Plan, Volume 1: Existing Conditions. Section 4.18, including Capital Improvement Projects DK03, DK05,and DK06. March 2020: Wild Fish Conservancy Gig Harbor Peninsula Watertype Assessment Project Summary. Project F in Appendix A (Restoration and Protection Opportunities)

	April 2013: WDFW Fish Passage Report # 105 K053021a
Has the landowner acknowledged the project?	Yes
Explain your answer here	This project is fully within the control of the City of Gig Harbor, either within the City's transportation right of way or located on parcels of land owned by the City of Gig Harbor.
Which species will benefit from this project?	Per WDFW reports, this habitat of North Creek and its unnamed tributary will support Chum salmon, Coho, Steelhead, Sea Run Cutthroat, and resident trout.
Describe the limiting factors and/or ecological concerns that your project will address (e.g., issues related to fish passage, riparian conditions, water quality and quantity, and climate change).	This project serves to eliminate a box culvert and a round culvert with a series of catch basins. Any culvert can be a velocity barrier to salmon by increasing the velocity of the stream such that salmon must expend more energy than is necessary to reach their spawning grounds. We believe eliminating these culverts will allow salmon to use that wasted energy to reach their ideal spawning grounds upstream and may result in more successful spawning. High velocity can also be detrimental to fry migrating out of the creek. A return to natural bottomed stream, with resting pools and riffle sections will benefit all salmonids present. Additionally, the length, velocities, and hydraulic jumps within the of the round culvert and catch basins have caused the unnamed tributary to become a complete barrier for the century or more.
Project Sponsor	City of Gig Harbor
Primary Contact	Jeff Langhelm, PE
Is this project on the Salmon Recovery Portal (formerly known as Habitat Work Schedule)?	No
Is this project on West Sound Partners for Ecosystem Recovery's 2021-2022 Planned Project Forecast List (PPFL)?	No
For which grants are you applying?	Salmon Recovery Funding Board (available September 2022) Puget Sound Acquisition and Restoration Fund (tentatively available July 2023) Brian Abbot Fish Barrier Removal Board, Pacific Marine & Estuarine Fish Habitat Partnership
What is the total cost of the project?	$10,000,000
What is the total request of the grant?	$8,000,000

What are the available matching funds?	$2,000,000

Crescent Creek Culvert Replacement Project

Key Peninsula-Gig Harbor-Islands Watershed
Location Map At Watershed Scale

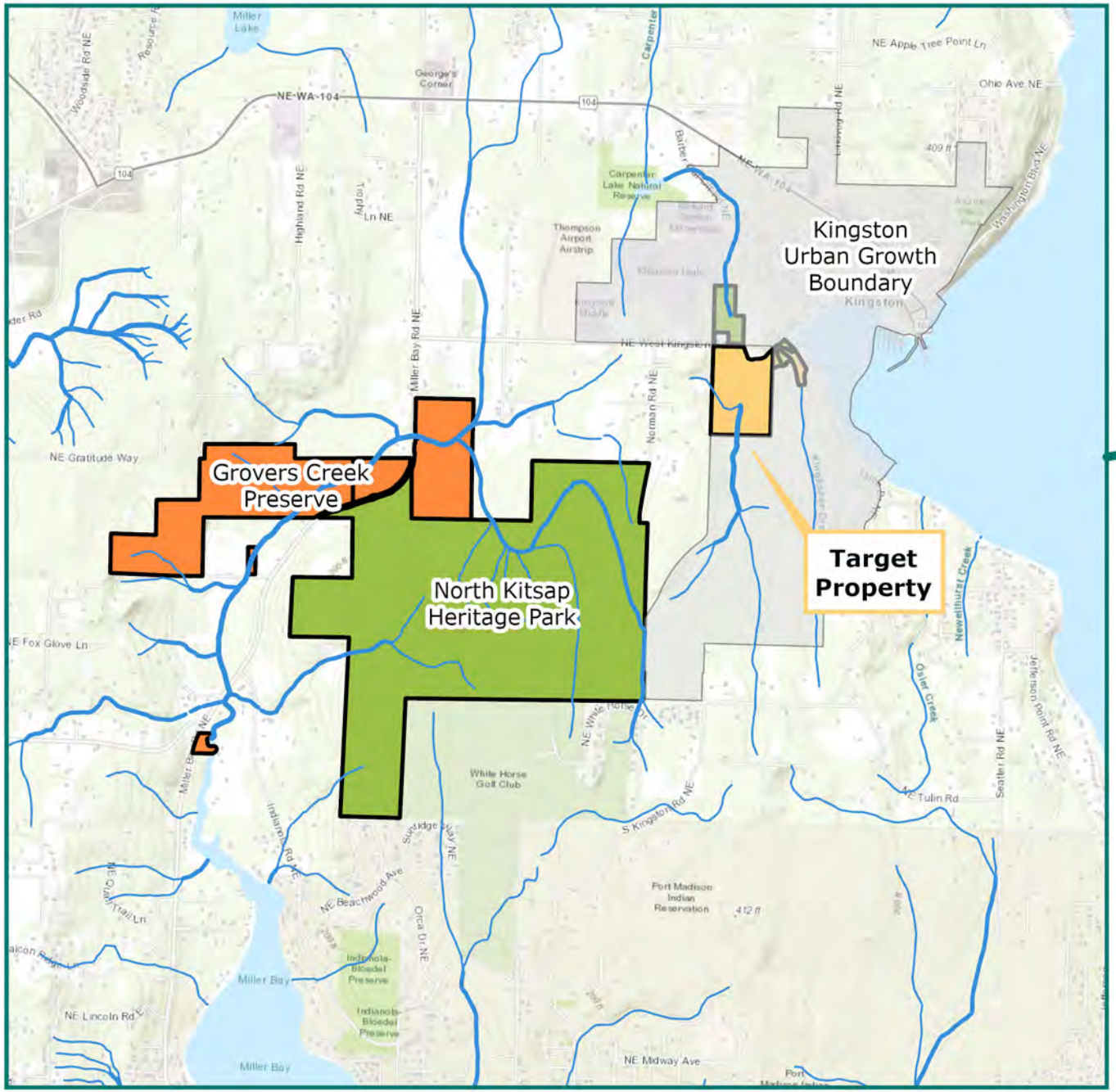

City of Gig Harbor
Crescent Creek Culvert Replacement Project at Vernhardson St - Site Map
0222323130
0222323019
0222323018
0222323131
0222323045
JACOBSEN LN
Crescent Creek
Project Location
HARDSON ST
96TH ST NW
RANDALL DR NW
0221056001
0221056030
0221056002
0221052040
0221056029
0221056003
0221056017
0221052043
0221052054

Title	Crescent Creek
Project Name	Crescent Creek Culvert Replacement Project at Vernhardson Street
Enter your project summary. Include your goals and objectives.	The City currently operates and maintains a six square foot concrete box culvert under Vernhardson Street that conveys Crescent Creek. This box culvert is the first fish barrier on Crescent Creek as fish leave Puget Sound and the proposed project will improve fish passage by removing the culvert and replacing it with a bridge at Vernhardson Street. The existing culvert is fairly unique because it is within the normal tidal range. However, during all tides below 6 ft MLLW, fish access is limited and stranded fish are vulnerable to fishing pressures and increased predation. This culvert also artificially impounds the Crescent Creek estuary, which has negatively affected the form and function of the estuary. The goals of this project are to improve fish passage and provide improved fish spawning and rearing habitat. These goals will be achieved by removing the culvert.
Category	Restoration
Please list all other related projects.	None.
Is this project identified in a salmon or steelhead recovery plan, watershed assessment and restoration plan, nearshore recovery plan, or recovery strategy?	Yes
Please identify which and explain.	August 2005: Gig Harbor Basin Plan, Volume 1. Existing Site Conditions Section 4.19 (Crescent Creek) April 2013: WDFW Fish Passage Report #105 K60620a August 2018: South Puget Sound Salmon Enhancement Group's Crescent Creek Feasibility Study, Project #15-1079
Has the landowner acknowledged the project?	Yes
Explain your answer here	This project is fully within the control of the City of Gig Harbor, either within the City's transportation right of way or located on parcels of land owned by the City of Gig Harbor.
Which species will benefit from this project?	Per WDFW reports, this habitat of Crescent Creek and its unnamed tributary will support Chum salmon, Coho, Steelhead, Sea Run Cutthroat, and resident trout.
Describe the limiting factors	This project will remove the box culvert through which Crescent Creek flows. This box culvert, when not fully submerged during a high tide

and/or ecological concerns that your project will address (e.g., issues related to fish passage, riparian conditions, water quality and quantity, and climate change).	cycles, can be a velocity barrier to salmon. The length of the box culvert increases the velocity of the stream such that salmon must expend more energy than is necessary to reach their spawning grounds. We believe eliminating this culvert will allow salmon to use that wasted energy to reach their ideal spawning grounds upstream and may result in more successful spawning. High velocity can also be detrimental to fry migrating out of the creek. A return to natural bottomed stream, with resting pools and riffle sections will benefit all salmonids present. Additionally, box culverts can negatively affect the natural flow and function of an estuary, which provide critical riparian conditions for spawning salmon and fry.
Project Sponsor	City of Gig Harbor
Primary Contact	Jeff Langhelm, PE
Is this project on the Salmon Recovery Portal (formerly known as Habitat Work Schedule)?	Yes
Is this project on West Sound Partners for Ecosystem Recovery's 2021-2022 Planned Project Forecast List (PPFL)?	Yes
For which grants are you applying?	Salmon Recovery Funding Board (available September 2022) Puget Sound Acquisition and Restoration Fund (tentatively available July 2023)
What is the total cost of the project?	$9,000,000
What is the total request of the grant?	$5,000,000
What are the available matching funds?	$4,000,000

Great Peninsula Conservancy

Carpenter Creek/Crabapple Creek Estuary Protection Watershed Context Map



Great Peninsula Conservancy, January 2022
NAD 1983 State Plane WA North FIPS 4601 Feet

Disclaimer: This map was created from existing map sources, and is not a substitute for a field survey. The user of this map assumes responsibility for determining its suitability for intended use.

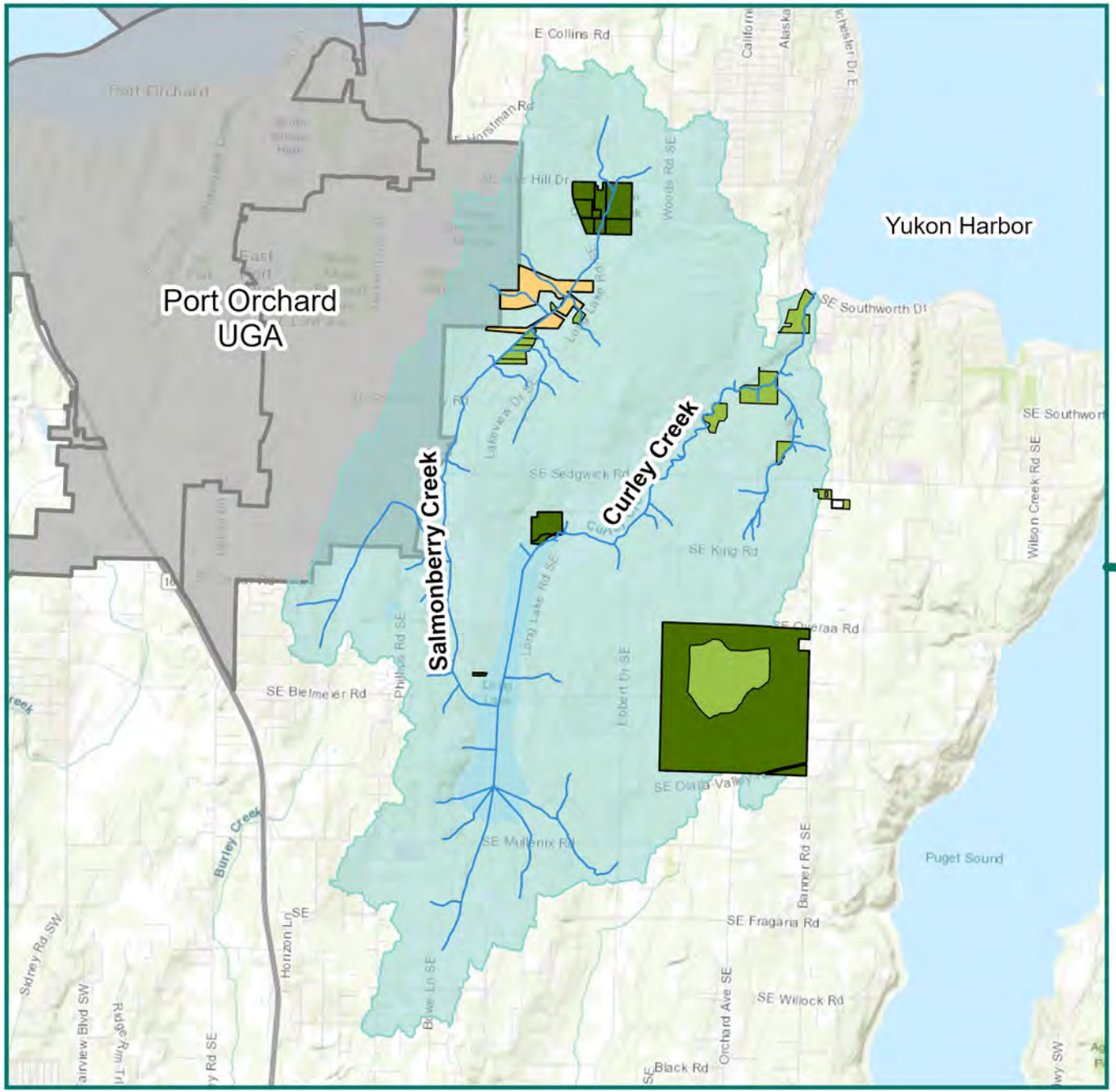
Title	Crabapple/Carpenter Creek Estuary Protection
Project Name	Crabapple/Carpenter Creek Estuary Protection
Enter your project summary. Include your goals and objectives.	The project will permanently protect 50 acres of prime estuary habitat and riparian forest in the Crabapple/Carpenter Creek Estuary in Kingston, Kitsap County. With high-quality salt marsh, tide flats, wetlands along Crabapple Creek and a remnant old growth Sitka spruce fringe, the project will protect a rare and important estuary system in Central Puget Sound. In addition to supporting natal chum, cutthroat and coho runs, the estuary's location and healthy condition make it regionally important habitat for out-migrating juvenile Puget Sound chinook salmon. The project will purchase fee simple title to 50 acres of property under single ownership, thus permanently protecting 3 acres of salt marsh, 20 acres of tide flats and 10 acres of freshwater wetland and riparian habitat along Crabapple Creek. Once purchased, GPC will explore enhancement activities including large wood placement and ecological forestry. The project area includes four additional properties as secondary targets totaling 8 acres (see map) that may be purchased if funding allows. The project also requires a Boundary Line Adjustment to exclude a ~7 acre parcel with one house that is currently part of the parcels of the project area.
Category	Acquisition
Please list all other related projects.	The project builds upon adjacent large culvert replacement projects that have enhanced tidal flow and natural processes within the estuarine system. The South Kingston Road culvert replacement project (10-1898) was completed by Kitsap County Roads Division with the construction of a 110-foot bridge in 2012. The West Kingston Road culvert on the north boundary of the property was also replaced with a 150' bridge enhancing fish passage and natural estuarine and sediment processes. The project was funded by the US Navy as mitigation for the Pier B activities. The Stillwaters Environmental Education Center lies adjacent to the northern end of the estuary. The Center conducts extensive monitoring within the estuary, and completed a Large Woody Debris placement project in 2008. The Cutthroats of Carpenter Creek, a community group coordinated by Stillwaters Environmental Center in Kingston, WA, formed in 1998 to protect water quality as well as fish and wildlife habitat in the Carpenter Creek sub-watershed. GPC was awarded a SRFB and ESRP grant to fund purchase of the project in 2013. The landowner decided not to sell. Life circumstances have changed and now the landowner is ready to fully divest ownership of the property.
Is this project identified in a salmon or	Yes

steelhead recovery plan, watershed assessment and restoration plan, nearshore recovery plan, or recovery strategy?	
Please identify which and explain.	The project is included in the West Sound Nearshore Integration and Synthesis of Chinook Salmon Recovery Priorities (project 1026 and 1027). Puget Sound Nearshore Strategy (Cereghino et al 2012) gave the Carpenter Creek Estuary a “restore high” score in its South Central Puget Sound coastal inlet recommended strategy section (Sheet 15; coastal inlet site #214).
Has the landowner acknowledged the project?	Yes
Explain your answer here	The landowner has expressed continued interest in protecting the estuary for over a decade and has signed a landowner acknowledgement form
Which species will benefit from this project?	Chinook, coho, chum, steelhead, cutthroat trout.
Describe the limiting factors and/or ecological concerns that your project will address (e.g., issues related to fish passage, riparian conditions, water quality and quantity, and climate change).	The project addresses the scarcity of high quality, functioning estuarine habitat in Puget Sound. The South Central Puget Sound sub-basin has experienced the largest overall losses in estuarine habitat in Puget Sound. This sub-basin has lost 46% of its non-delta “estuarine mixing” habitat, an increasingly rare habitat type this project protects and restores to its historical function (Simenstad et al 2011; p. 45). Carpenter Creek estuary offers nearly 30 acres of high quality estuarine habitat used by out-migrating juvenile salmon. The property encompasses the majority of Carpenter Creek estuary’s intact ecosystem located at a critical juncture for migrating salmon from river basins throughout Puget Sound, including ESA-listed Chinook, as well as chum and coho salmon, and steelhead and sea-run cutthroat trout. Even before the estuary restoration in 2011, commercial purse seine fisheries consistently encountered high rates of juvenile Chinook near the mouth of the estuary (Washington State Habitat Work Schedule– Carpenter Creek Estuary project description). It is the last significant, functioning estuary for migrating salmon exiting Puget Sound, and plays an important role in their life history

	The project encompasses the entire tidally influenced mouth of Crabapple Creek. It also has considerable upstream freshwater frontage to allow for estuary migration over time with sea level rise.
Project Sponsor	Great Peninsula Conservancy
Primary Contact	Erik Steffens
Is this project on the Salmon Recovery Portal (formerly known as Habitat Work Schedule)?	Yes
Is this project on West Sound Partners for Ecosystem Recovery's 2021-2022 Planned Project Forecast List (PPFL)?	No
For which grants are you applying?	Salmon Recovery Funding Board (available September 2022) Puget Sound Acquisition and Restoration Fund (tentatively available July 2023)
What is the total cost of the project?	$1,982,000
What is the total request of the grant?	$482,000
What are the available matching funds?	$1,500,000

Great Peninsula Conservancy

Salmonberry Creek Protection Watershed Context Map



- Proposed Conservation Easement Area
- Curley Creek Watershed
- Port Orchard Urban Growth Area
- Kitsap County Parks
- GPC Protected Lands

0 0.75 1.5 Miles

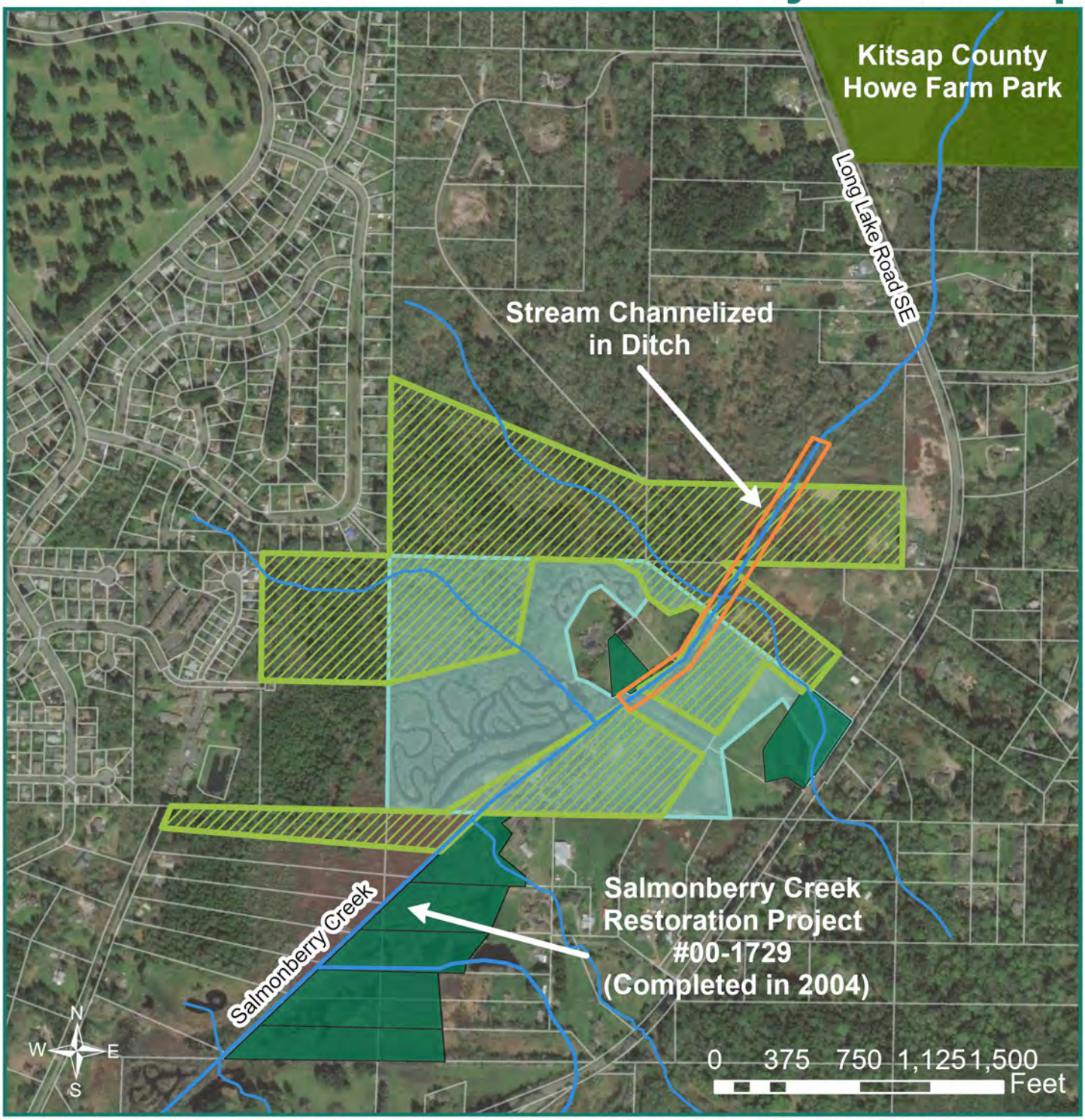
N W E S

Great Peninsula Conservancy, January 2022
NAD 1983 State Plane WA North FIPS 4601 Feet

Disclaimer: This map was created from existing map sources, and is not a substitute for a field survey. The user of this map assumes responsibility for determining its suitability for intended use.

Great Peninsula Conservancy

Salmonberry Creek Protection Project Site Map



Proposed Conservation Easement Area

Existing GPC Conservation Easements

Wetland Reserve Program Easement Area

Kitsap County Tax Parcels

Title	Salmonberry Creek Protection
Project Name	Salmonberry Creek Protection
Enter your project summary. Include your goals and objectives.	The Salmonberry Creek Protection project will permanently protect 77 acres of prime salmon habitat on Salmonberry Creek within the Curley Creek watershed. The primary goal of the project is protection of over a mile of Salmonberry Creek and tributaries, which are low gradient reaches heavily utilized by coho for spawning and rearing, and designated critical habitat of Puget Sound Steelhead. Salmonberry Creek is a critical component of the Curley Creek watershed and protection and future restoration of the site will have watershed-level benefits. Building on existing adjacent easements and restoration efforts, the project will purchase a ~77 acre conservation easement. The main target property is under single ownership with a supportive landowner who is willing to bargain sale 40% of the value of the easement. Immediate benefits include protection of a half mile of Salmonberry Creek and ~3,000' of high-quality tributaries, 35 acres of mature riparian forest and extinguishment of 6 development rights adjacent to the riparian areas. Protection also opens the opportunity for future restoration of the half mile of Salmonberry creek currently confined to a straight ditch, and reconnection to ~25 acres of floodplain. Protection and restoration of the project has watershed-level benefits to flow regimes through water storage, reducing peak winter floods, improving summer flow and improving prime coho spawning and rearing habitat.
Category	Acquisition
Please list all other related projects.	Kitsap Conservation District has assisted the landowner on riparian plantings as well as a culvert replacement on one of the tributaries heavily-utilized by coho for spawning and rearing. The project site is adjacent upstream to a SRFB-funded restoration project (00-1729) led by Mid Sound Fisheries Enhancement Group and GPC-held conservation easements on 22 acres. The project re-meandered the creek and created side ponds for high-water refuge habitat. About 27 acres of the project is located within a parcel which is under a permanent USDA Wetland Reserve Program easement. While the easement prohibits development and restricts certain uses of the parcel, it does allow the landowner to keep Salmonberry Creek in its channelized ditch, and the landowner to mow and hay a 10-acre field adjacent to the stream. The project will secure the right to future restoration on this 27 acres and add more protection beyond the existing WRP easement.
Is this project identified in a salmon or steelhead recovery plan, watershed	Yes

assessment and restoration plan, nearshore recovery plan, or recovery strategy?	
Please identify which and explain.	The project is identified as an important restoration project in the Curley Creek Watershed Assessment and Protection and Restoration Plan, completed in 2017 by the Suquamish Tribe. The broad valley bottom of Salmonberry Creek is noted as important for floodplain storage, which has been affected by historic logging, removal of wood jams from the channel, and construction of ditches to channelize streams. The project site is identified as recommended action 20 specifically to dedicate stream corridor for habitat protection, channel restoration, wood placement, and riparian restoration and management.
Has the landowner acknowledged the project?	Yes
Explain your answer here	The landowners have signed an acknowledgement form and are highly supportive of further protection and restoration efforts on their property. The landowners are willing to sell an easement on the project at the least at 40% lower than fair market value, thus substantially improving the cost benefit to SRFB and allowing for extinguishment of 6 development rights.
Which species will benefit from this project?	Primarily coho, steelhead, cutthroat trout. Watershed benefits also for chum and chinook
Describe the limiting factors and/or ecological concerns that your project will address (e.g., issues related to fish passage, riparian conditions, water quality and quantity, and climate change).	The Curley Creek Watershed Assessment and Protection and Restoration Plan identifies the project site as important in addressing a number of limiting factors. The broad valley bottom of Salmonberry Creek is noted as only one of two places in the watershed critical for floodplain storage. This is important to address the limiting factors and issues created from peak winter flows, scouring and sediment transport. Floodplain storage is also important to address issues around low summer flows and water temperature. Water storage is especially important given that the subbasin has 10% impervious surface due to high density residential development within the adjacent Urban Growth Boundary in the City of Port Orchard. The valley is also impacted by historic logging, removal of wood jams from the channel, and construction of ditches to channelize streams. The project therefore addresses these issues through protection of riparian forests, dedicating a protected stream corridor, and reducing development pressure. It also paves the way for future restoration actions including channel meander, wood placement, and riparian and floodplain reconnection.
Project Sponsor	Great Peninsula Conservancy
Primary Contact	Erik Steffens

Is this project on the Salmon Recovery Portal (formerly known as Habitat Work Schedule)?	No
Is this project on West Sound Partners for Ecosystem Recovery's 2021-2022 Planned Project Forecast List (PPFL)?	No
For which grants are you applying?	Salmon Recovery Funding Board (available September 2022) Puget Sound Acquisition and Restoration Fund (tentatively available July 2023)
Temp	
What is the total cost of the project?	$750,000
What is the total request of the grant?	$467,000
What are the available matching funds?	$283,000