



US Army Corps
of Engineers
Seattle District



WASHINGTON STATE
DEPARTMENT OF
E C O L O G Y

Joint Public Notice

Application for a Department of the Army Permit and a Washington Department of Ecology Water Quality Certification and/or Coastal Zone Management Consistency Concurrence – REVISION

US Army Corps of Engineers
Regulatory Branch
Post Office Box 3755
Seattle, WA 98124-3755
Telephone: (206) 764-6695
ATTN: Ms. Erin Legge,
Project Manager

WA Department of Ecology
SEA Program
Post Office Box 47600
Olympia, WA 98504-7600
Telephone: (360) 407-6068
ATTN: SEA Program,
Federal Permit Coordinator

Public Notice Date: May 7, 2015
Expiration Date: May 22, 2015

Reference No.: NWS-2014-183-WRD
Name: Snohomish County
Department of Public Works

REVISED PUBLIC NOTICE (15-DAY ONLY): Interested parties are hereby notified that the U.S. Army Corps of Engineers (Corps) and the Washington Department of Ecology (Ecology) received a revised application on April 3, 2015, to perform work in waters of the U.S. as described below and shown on the enclosed revised project drawings dated March 2015. This Public Notice supersedes the one issued on December 5, 2014.

The proposal has changed as follows: the drainage pond that was to be located in the northwest corner of the project site near Union Slough is proposed to be located further south in the center of the project area between the proposed dike and the west tidal channel. The west tidal channel would then connect to the drainage pond by two culverts with flap gates. The pond would discharge through a tide gate to Union Slough and discharge through a tide gate to the east tidal channel. The pump station would discharge near the waterward toe of the setback dike within the project restoration area instead of to Union Slough near the proposed tide gate. The drainage pond still provides approximately 36 acre-feet of live storage above the gravity pipe invert elevations (between elevations -2.14 and 3.0 feet NAVD88). To accommodate the drainage re-design and to provide access for maintenance, the proposed length of the dike and access roads increased. Approximately 2,000 linear feet of dike were realigned to the east, resulting in seven acres of impacts shifting from the waterward side of the dike to the landward side.

Additional changes to the project include the proposed dike being widened where it crosses over the existing Puget Sound Energy pipeline. Also, a fill bench would be placed along the backside of the proposed dike in the northwest corner of the project area to provide additional stability for the dike and protection against seepage. A buried riprap trench along the waterward toe of the dike is now proposed for additional protection against scour.

The proposed changes would occur within Category II wetlands and would result in an increase of seven acres of permanent wetland impacts (fill/excavation) as depicted in the following table:

Item Action	Change in Wetland Fill	Total Wetland Fill
Dike and Access Road	+3 acres	21 acres
Dike toe berm	+3 acres	3 acres
Pond area	+1 acre	10 acres
Total	+7 acres	34 acres

The Corps will review the work in accordance with Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Ecology will review the work pursuant to Section 401 of the CWA, with applicable provisions of State water pollution control laws and the Coastal Zone Management Act.

APPLICANT: Mr. Mark Stamey
Snohomish County Public Works
3000 Rockefeller Avenue, Mail Stop 607
Everett, Washington 98201
Telephone: (425) 388-3488

LOCATION: In unnamed sloughs and ditches, and wetlands adjacent or abutting Union Slough, the east tidal channel, and the west tidal channel (also referred to as Johnson Slough) on Smith Island near Everett, Snohomish County, Washington.

WORK: The proposed Smith Island Restoration Project would construct a dike at a new location and remove portions of an existing dike to create or enhance an estimated 400 acres of estuarine wetlands. Approximately 300 acres of freshwater wetlands and waters would be impacted permanently (filled/excavated and converted to estuarine marsh) and about 56 acres would be temporarily impacted during construction.

Additional project elements include the removal and installation of tide gates, construction of access roads, installation of a detention pond with a pump station, creation of a wetland berm over an existing buried pipeline and construction of a parking lot. Work will be accomplished using standard construction equipment such as excavators, dump trucks, and graders.

The first phase of the project would entail construction of the new dike, toe ditches, storage pond, and pump station. The second phase is associated with restoration activities such as filling ditches, digging starter channels, and the installation of large wood. During the third phase, accumulated sediment would be removed from the mouth of the east tidal channel and the existing dike would be removed; tide gates would then be removed/re-located and channels would be connected to Union Slough. Additional project details are listed below.

Dike Construction and Access Roads

A 5,600-foot section of dike would be constructed along the west tidal channel to an elevation of 15 feet NAVD88 with 3:1 slopes that would connect to the existing dike on Union Slough. The dike would connect with a 2,200-foot section of dike in the southern portion of the site constructed by the City of Everett.

A 30-foot-wide gravel road would parallel the new dike for maintenance access. The top of the dike would also contain a 15-foot-wide gravel road with 25-foot vehicle turnouts for maintenance access. Total fill for this work would permanently impact an estimated 19 acres of wetland.

Drainage Features

Drainage patterns impacted by the project would be managed by the construction of a new 9-acre, figure-eight shaped pond located along the west tidal channel designed to collect excess water. Toe ditch water would be directed to the storage pond through a culvert under the dike toe access road. The storage pond would discharge to Union Slough either via a tide gate by gravity during low water in Union Slough or pumped discharge during prolonged periods of high water in Union Slough.

Creation of the pond would result in the loss of nine acres of freshwater wetlands. The pond would include a 10-foot-diameter, 14-foot pump station housing three pumps, (one 300 gallons per minute (gpm) pump and two 1,935 gpm pumps), and a total pump station discharge capacity of 4,170 gpm (eight cfs). The pumps would

operate based on water elevation, turning on at -0.6 feet NAVD88 and turning off at -2.1 feet NAVD88. Utilities for the pump station would be buried under the road next to the toe ditch and buried at least six feet below grade. Total fill and excavation for this work would permanently impact an estimated nine acres of wetland.

Restoration Activities

Thousands of feet of drainage ditches, including the existing toe ditch, in the areas to be breached would be plugged with native material and starter tidal channels would be excavated. Starter channels would have 1:1 side slopes and would have bottom widths of 12 to two feet wide. At their connections with Union Slough, they would have 20 to 25 feet wide top widths and be five to seven feet deep. About seven large woody complexes (LWC) and two wood revetments are proposed for installation along the perimeter of the breached areas. LWC structures would be composed of salvaged tree trunks driven into the sediment so that at least one pile has a top elevation above 15 feet NAVD88 to provide bird habitat. Soils excavated from the pond will be spread waterward of the proposed dike to create topographic benches. This work would temporarily impact an estimated 33 acres of wetland (4.7 acres of ditch fill, 28 acres of topographic benches, and 1.2 acres of starter channel excavation). Following construction these areas should function as tidal estuarine wetlands.

Protection of Pipeline

The new dike would cross a Puget Sound Energy natural gas pipeline at the west end of 12th Street Northeast where it is buried about +/- 7 feet below grade. Post-construction, approximately 3,500 linear feet of the pipeline would be located waterward of the new dike. To protect the pipeline, fill material will be used to construct a shallow berm over it. The fill prism would be set at an elevation that allows for daily tidal inundation and the establishment of wetland vegetation. The berm may include buried rock to prevent structural damage to the pipe. This work would temporarily impact an estimated seven acres of wetland. Following construction these areas should function as estuarine wetlands.

Dike Removal, Tide Gates

Excess sediment would be removed at the mouth of the east tidal channel before dike removal. Two 2,000- to 2,500-foot sections of the existing dike along Union Slough would then be removed; one at the northern end and one at the eastern boundary. The 36-inch tide gate that connects the east tidal channel to Union Slough and the 18-inch tide gate that drains the eastern portion of the site would be removed; both of these would be relocated to service the landward side of the new dike. This work would temporarily impact an estimated 10.7 acres of wetland (this is the approximate area of wetlands landward of the dike where fill would be placed and does not include the existing dike footprint). Following construction an estimated 16.6 acres should function as tidal estuarine wetland (includes area of dike breaches and the 10.7 acres of fill that would be placed landward of the dike). An estimated 2.2 acres (this is the approximate area of the remnant dike remaining at 10 feet or higher NAVD88) would remain above the Ordinary High Water Mark and function as wetland buffer following construction. Following removal of the dikes an estimated 330 acres of existing fresh water wetlands would be converted to tidal estuarine wetlands (including areas temporarily impacted by project construction activities).

Parking Lot for Access to Adjacent Public Trail

The City of Everett's (City) dike-top trail network originates at nearby Langus Riverfront Park on the Snohomish River and winds around the southern portion of Smith Island. A new 140- by 40-foot parking lot is proposed on Snohomish County (County) property north of 12th Street Northeast to provide access to the trail on the City's section of the dike. The surface would be gravel except for one paved 20- by 28-foot parking space to meet requirements of the Americans with Disabilities Act. No other public access is proposed on the County's property. This work would permanently fill an estimated 0.3 of an acre of wetland.

PROJECT PURPOSE: The purpose of the Smith Island Restoration Project is to restore an estuarine tidal marsh ecosystem to enhance fish habitat for endangered Chinook salmon and other native fish and wildlife.

ADDITIONAL INFORMATION: The applicants propose to set aside approximately 75 acres of the restoration area for the compensatory wetland mitigation needs of other entities (in addition to the mitigation area for non-restoration project impacts that requires mitigation). These entities will remain the responsible party on their permits and for ensuring their respective mitigation requirements are fulfilled.

The wetland boundaries and/or location of the ordinary high water mark/line of mean high water/mean higher high water shown on the project drawings have not yet been verified by the Corps. If the Corps determines the boundaries of the wetland/waters are substantially inaccurate a new public notice may be published.

MITIGATION: On-site compensatory mitigation is proposed primarily through wetland establishment and enhancement by converting freshwater wetlands to estuarine wetland and establishing estuarine wetlands (across multiple properties). A final mitigation plan will be approved prior to permit issuance.

Despite proposing seven acres of additional wetland impacts, the applicants propose that mitigation for non-restoration activities will continue to be compensated through the final restoration project.

ENDANGERED SPECIES: The Endangered Species Act (ESA) requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and/or U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the ESA on all actions that may affect a species listed (or proposed for listing) under the ESA as threatened or endangered or any designated critical habitat.

Section 7 consultation was completed with the USFWS through use of the Corps' *2008 Fish Passage and Restoration Programmatic Consultation*. USFWS issued an electronic approval on August 18, 2014. Section 7 consultation with the NMFS is not required because the proposed project is consistent with the requirements of the NMFS' *Habitat Restoration Program, 4(d) Rule, Limit 8*.

ESSENTIAL FISH HABITAT: The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, requires all Federal agencies to consult with the NMFS on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH). The proposed action would impact EFH in the project area. The Corps has determined that the proposed action will not adversely affect designated EFH for federally managed fisheries in Washington waters. No further EFH consultation is necessary.

CULTURAL RESOURCES: The Corps has reviewed the latest published version of the National Register of Historic Places, lists of properties determined eligible and other sources of information. Historic properties investigations have been conducted within the permit area. No historic properties determined eligible for or listed in the National Register of Historic Places were found to exist within the permit area. The Corps invites responses to this public notice from Native American Tribes or tribal governments; Federal, State, and local agencies; historical and archeological societies; and other parties likely to have knowledge of or concerns regarding historic properties and sites of religious and cultural significance at or near the project area. After receipt of comments from this public notice, the Corps will evaluate potential impacts and consult with the State Historic Preservation Officer and Native American Tribes in accordance with Section 106 of the National Historic Preservation Act, as appropriate.

PUBLIC HEARING: Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing.

EVALUATION – CORPS: The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered, including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people.

The Corps is soliciting comments from the public; Native American Nations or tribal governments; Federal, State, and local agencies and officials; and other interested parties in order to consider and evaluate the impacts of this activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition or deny a permit for the work. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the activity.

Copies of this public notice which have been mailed or otherwise physically distributed feature project drawings in black and white. The electronic version features those drawings in color, which we think more accurately communicates the scope of project. To access the electronic version of this public notice, go to the Seattle District's web page at <http://www.nws.usace.army.mil/> and under the heading Open Public Comment Periods select Regulatory Public Notices. Recently-issued public notices are listed in chronological order of the date of issuance. Select and view the listing for this project.

The described discharge will be evaluated for compliance with guidelines promulgated by the Environmental Protection Agency under authority of Section 404(b)(1) of the CWA. These guidelines require an alternatives analysis for any proposed discharge of dredged or fill material into waters of the United States.

SOURCE OF FILL MATERIAL: Fill material will be imported from approved source and/or re-use of excavated material from the project site may be incorporated into the new dike.

EVALUATION – ECOLOGY: Ecology is currently reviewing the revised application and the Section 401 Water Quality Certification that Ecology issued on February 20, 2015, to determine the next steps regarding Section 401 of the CWA and the Coastal Zone Management Act. Ecology is soliciting comments from the public; Federal, Native American Nations or tribal governments, State, and local agencies and officials; and other interested parties in order to consider and evaluate the impacts of the revised project.

ADDITIONAL EVALUATION: This proposal is the subject of Shorelines Substantial Development Permit Number 13-107849 SM, being processed by Snohomish County Planning and Development Services.

COMMENT AND REVIEW PERIOD: Conventional mail or e-mail comments on this revised public notice will be accepted and made part of the record and will be considered in determining whether it would be in the public interest to authorize this proposal. In order to be accepted, e-mail comments must originate from the author's e-mail account and must include on the subject line of the e-mail message the permit applicant's name and reference number as shown below. Either conventional mail or e-mail comments must include the permit applicant's name and reference number, as shown below, and the commentator's name, address, and phone number. All comments whether conventional mail or e-mail must reach this office, no later than the expiration date of this public notice to ensure consideration.

NWS-2014-183-WRD

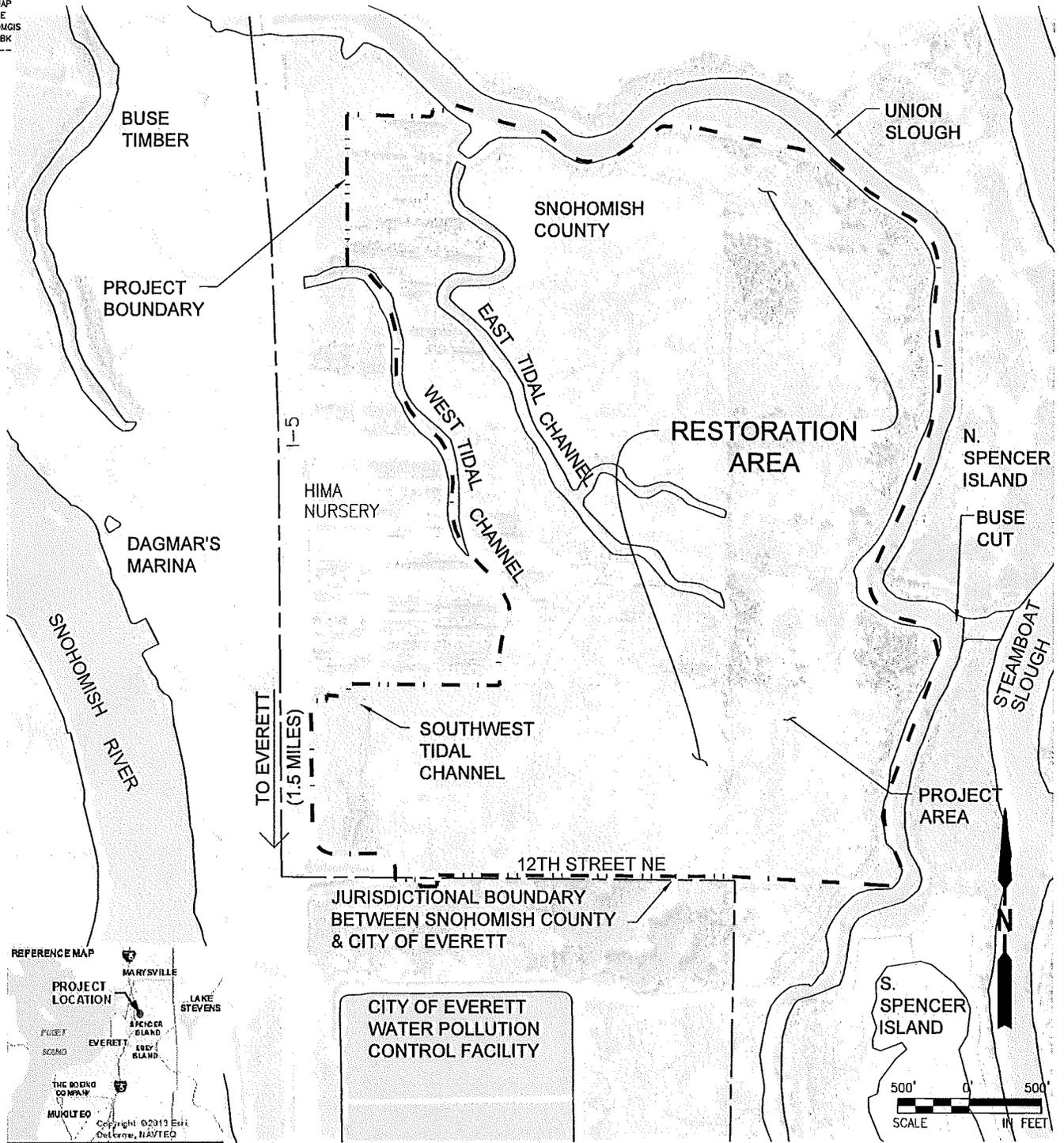
CORPS COMMENTS: All e-mail comments should be sent to erin.l.legge@usace.army.mil. Conventional mail comments should be sent to: U.S. Army Corps of Engineers, Regulatory Branch, Attention: Ms. Erin Legge, P.O. Box 3755, Seattle, Washington 98124-3755. All comments received will become part of the administrative record and are subject to public release under the Freedom of Information Act including any personally identifiable information such as names, phone numbers, and addresses.

ECOLOGY COMMENTS: Any person desiring to present views on the revised project pertaining to the water quality certification under Section 401 of the CWA and/or Coastal Zone Management consistency concurrence, may do so by submitting written comments to the following address: Washington State Department of Ecology, Attention: Federal Permit Coordinator, P.O. Box 47600, Olympia, Washington 98504-7600, or e-mail to ecyrefedpermits@ecy.wa.gov.

To ensure proper consideration of all comments, responders must include the following name and reference number in the text of their comments: Snohomish County Department of Public Works; NWS-2014-00183-WRD

Figures (30)

XREF LIST
 Ltscale: 1
 Resolved
 3784-AERIAL-2011
 VICINITY_MAP
 3784-BASE
 3784-FROMGIS
 JARPA TTLBK



Layout Name: 1

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Plotted: Mar 25, 2015 - 12:33pm
 ehmeck

PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
 LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY
 PUBLIC WORKS

VICINITY MAP
 SMITH ISLAND
 ESTUARY RESTORATION
 PROJECT

PROPOSED: ESTUARY RESTORATION/
 SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS
 SHEET 1 OF 30 DATE: MARCH 2015

Resolved ABBREVIATIONS

TLBLK	APPROX	- APPROXIMATELY
3784-FROMGIS	BTM	- BOTTOM
	C	- CURVE
	CB	- CATCH BASIN
	CONC	- CONCRETE
	CPEP	- CORRUGATED POLYETHYLENE PIPE
	CULV	- CULVERT
	B	- BREACH
	DBH	- DIAMETER AT BREAST HEIGHT
	DF	- DITCH FILL
	DIAM	- DIAMETER
	DIP	- DUCTILE IRON PIPE
	E	- EAST
	EA	- EACH
	EL	- ELEVATION
	ELEV	- ELEVATION
	EOP	- EDGE OF PAVEMENT
	EX	- EXISTING
	FM	- FORCE MAIN
	FT	- FEET
	HDPE	- HIGH DENSITY POLYETHYLENE PIPE
	IE	- INVERT ELEVATION
	JBOX	- JUNCTION BOX
	L	- LINE SEGMENT
	LF	- LINEAL FEET
	LT	- LEFT
	LUM	- LUMINAIRE
	MAX	- MAXIMUM
	MIC	- MONUMENT IN CASE
	MIN	- MINIMUM
	N	- NORTH
	NE	- NORTHEAST
	NTS	- NOT TO SCALE
	NW	- NORTHWEST
	OC	- ON CENTER
	OD	- OUTSIDE DIAMETER
	OHW	- ORDINARY HIGH WATER
	OHWM	- ORDINARY HIGH WATER MARK
	PC	- POINT OF CURVATURE
	PI	- POINT OF INTERSECTION
	PP	- PLAN AND PROFILE
	PP	- POWER POLE
	PT	- POINT OF TANGENCY
	R	- RADIUS
	R/W	- RIGHT OF WAY
	RT	- RIGHT
	SC	- STARTER CHANNEL
	SD	- STORM DRAIN
	SE	- SOUTHEAST
	SL	- SLOPE
	STA	- STATION
	STD	- STANDARD
	STR	- STRUCTURE
	SW	- SOUTHWEST
	SWPPP	- STORMWATER POLLUTION PREVENTION PLAN
	TESC	- TEMPORARY EROSION AND SEDIMENT CONTROL
	TYP	- TYPICAL
	W	- WEST
	WM	- WILLIAMETTE MERIDIAN
	Q	- FLOW

LEGEND CONTINUED

LINE TYPE	DESCRIPTION
	GRAVEL (EXISTING)
	CLEARING LIMITS
	CLEARING AND GRUBBING LIMITS
	SILT FENCE
	SILT CURTAIN
	HIGH VISIBILITY FENCE
	CONTOUR (MINOR-EXISTING)
	CONTOUR (MAJOR-EXISTING)
	CONTOUR (MINOR-PROPOSED)
	CONTOUR (MAJOR-PROPOSED)
	PROPERTY LINE
	RIGHT-OF-WAY (EXISTING)
	SECTION LINES
	QUARTER SECTION LINES
	PROJECT LIMITS
	JURISDICTIONAL BOUNDARY
	ORDINARY HIGH WATER LINE
	STORM DRAINAGE (STR TO STR)
	CULVERT (PROPOSED)
	FIBER OPTIC
	GAS LINE
	OVERHEAD POWER LINE
	BURIED POWER LINE

SYMBOL	EXIST.	PROPOSED	DESCRIPTION
			EMBANKMENT
		N/A	UTILITY POLE
		N/A	YARD LIGHT
		N/A	POTHOLE
		N/A	MONUMENT IN CASE
		N/A	TRAVERSE POINT
		N/A	SECTION CORNER
			STORM DRAIN CB TYPE 2
			STORM DRAIN (SIZED) CB TYPE 2
N/A			TEMPORARY GRAVEL BAG BERM
N/A			ASPHALT CONCRETE PAVEMENT
N/A			CONCRETE
N/A			GRAVEL FILTER
N/A			QUARRY SPALLS
N/A			RIPRAP
N/A			SAND FILTER
N/A			SUBGRADE/EARTH
N/A			TOP SOIL

LEGEND

LINETYPE	DESCRIPTION
	EDGE OF PAVEMENT (EXISTING)
	BUILDING LINE (EXISTING)
	CURB/CONCRETE EXISTING
	DITCH CENTERLINE (EXISTING)
	DITCH/SWALE CENTERLINE (PROPOSED)
	FENCE (EXISTING)
	FENCE (PROPOSED)

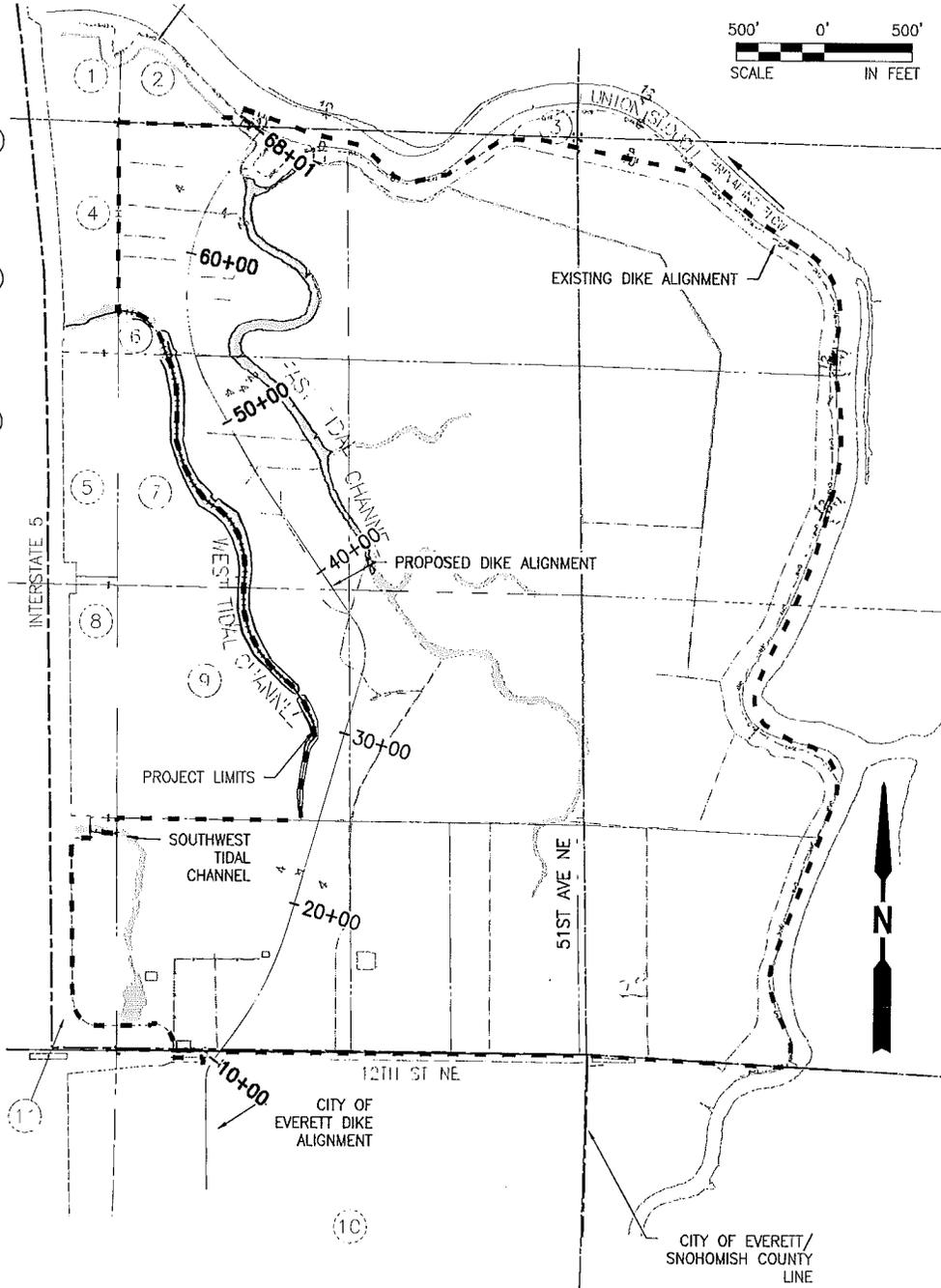
PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
 LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY
 PUBLIC WORKS

LEGEND
 SMITH ISLAND
 ESTUARY RESTORATION
 PROJECT

PROPOSED: ESTUARY RESTORATION/
 SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS
 SHEET 2 OF 30 DATE: MARCH 2015

XREF LIST
 Ltscale: 1
 Resolved
 3784-BASE
 TLBLX
 3784-TOPO
 3784-PR.L
 3784-DTCH
 3784-PDRN
 3784-PCHN
 3784-FROMGIS
 3784-SWLE
 Inresolved
 3781-GRID
 3784-PINK

- ① 29050400300900
(PROPERTY ADDRESS UNKNOWN)
UNKNOW
KISAN ENTERPRISES LLC
20607 SR 9 SE
SNOHOMISH, WA 98296
- ② 29050400400400
(PROPERTY ADDRESS UNKNOWN)
KISAN ENTERPRISES LLC
20607 SR 9 SE
SNOHOMISH, WA 98296
- ③ 29050400400600
(PROPERTY ADDRESS UNKNOWN)
JOHN ROONEY
8704 115TH AVE NE
LAKE STEVENS, WA 98258
- ④ 29050900201600
(PROPERTY ADDRESS UNKNOWN)
KISAN ENTERPRISES LLC
20607 SR 9 SE
SNOHOMISH, WA 98296
- ⑤ 29050900201300
4303 12TH STREET NE
EVERETT, WA 98201
IFF HOLDING LLC
20607 STATE ROUTE 9 SE
SNOHOMISH, WA 98296
- ⑥ 29050900100400
4303 12TH STREET NE
EVERETT, WA 98201
IFF HOLDING LLC
20607 STATE ROUTE 9 SE
SNOHOMISH, WA 98296
- ⑦ 29050900100600
4303 12TH STREET NE
EVERETT, WA 98201
IFF HOLDING LLC
20607 STATE ROUTE 9 SE
SNOHOMISH, WA 98296
- ⑧ 29050900201100
4303 12TH STREET NE
EVERETT, WA 98201
IFF HOLDING LLC
20607 STATE ROUTE 9 E
SNOHOMISH, WA 98296
- ⑨ 29050900400400
(PROPERTY ADDRESS UNKNOWN)
IFF HOLDING LLC
20607 STATE ROUTE 9 E
SNOHOMISH, WA 98296
- ⑩ 29051600100100
(PROPERTY ADDRESS UNKNOWN)
CITY OF EVERETT
3002 WETMORE AVENUE
EVERETT, WA 98201
- ⑪ 29050400301000
(PROPERTY ADDRESS UNKNOWN)
WSDOT
310 MAPLE PARK AVENUE SE
P.O. BOX 47300
OLYMPIA, WA 98504-7300



LEGEND

ⓧ PROPERTY NUMBER

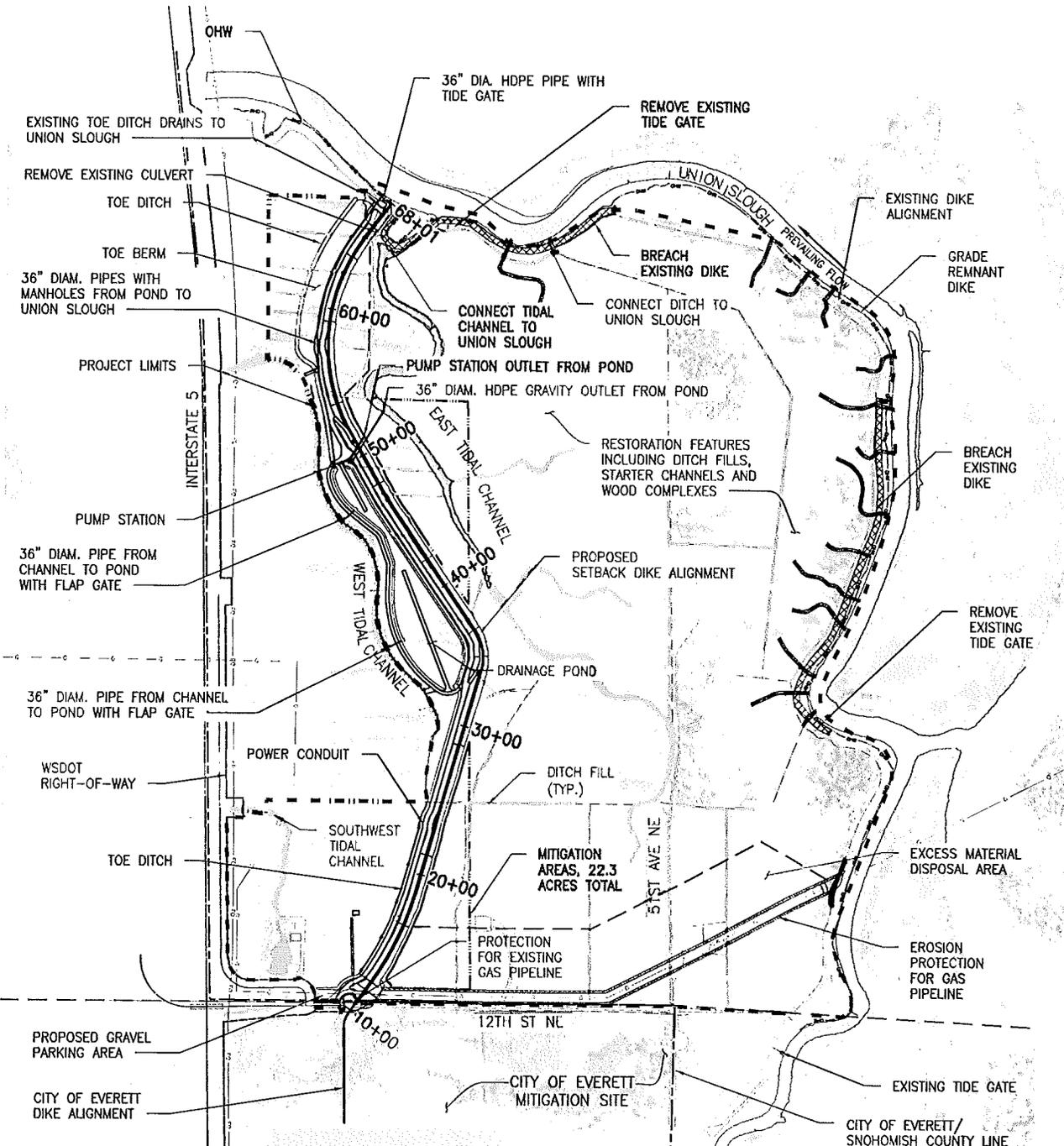
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 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS
 SHEET 3 OF 30 DATE: MARCH 2015

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Plotted: Mar 26, 2015 - 10:39am shomongr K:\project\31800\31852A\Draw\EXHIBIT\ARPA\4.dwg Layout Name: 4



LEGEND

BREACH EXISTING DIKE



PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
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 SNOHOMISH COUNTY
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ADJACENT PROPERTY OWNERS

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 3784-PCHN
 TLBLK
 3784-PDRN
 3784-PRJL
 3784-FROMGIS
 1754-DTCH
 3754-1010

EXCAVATION QUANTITIES WITHIN WETLANDS

	VOLUME (CY)	AREA (AC)
DRAINAGE POND	83,900	8.8
SETBACK DIKE TOPSOIL STRIP	28,200	18.3
RIPRAP TRENCH, DIKE TOE DITCH, AND POWER CONDUIT	31,800	2.3
RESTORATION AREA STARTER CHANNELS, TIDAL CHANNEL CONNECTION, AND LARGE WOOD COMPLEXES	25,700	5.0
OPTIONAL BURIED WINDROWS FOR EXISTING PIPELINE	16,600	2.5

FILL QUANTITIES WITHIN WETLANDS

	VOLUME (CY)	AREA (AC)
SETBACK DIKE INCLUDING TOPSOIL AND ARMORING	251,200	18.3
DITCH FILL	29,200	4.7
EROSION PROTECTION BERM FOR PIPELINE	26,600	9.4
ACCESS ROAD, TOE DITCH, AND DRAINAGE POND SURFACING	47,900	16.4
DIKE BREACHING AND REMNANT DIKE GRADING	38,800	5.8
TEMPORARY FILL FOR STAGING AREA	14,900	6.1

PROJECT PHASE LIMITS

PHASE 1 

PROJECT ELEMENTS INCLUDED:

- ACCESS AND STAGING
- SETBACK DIKE CONSTRUCTION
- TOE DITCH, POND AND PUMP STATION CONSTRUCTION

PHASE 2 

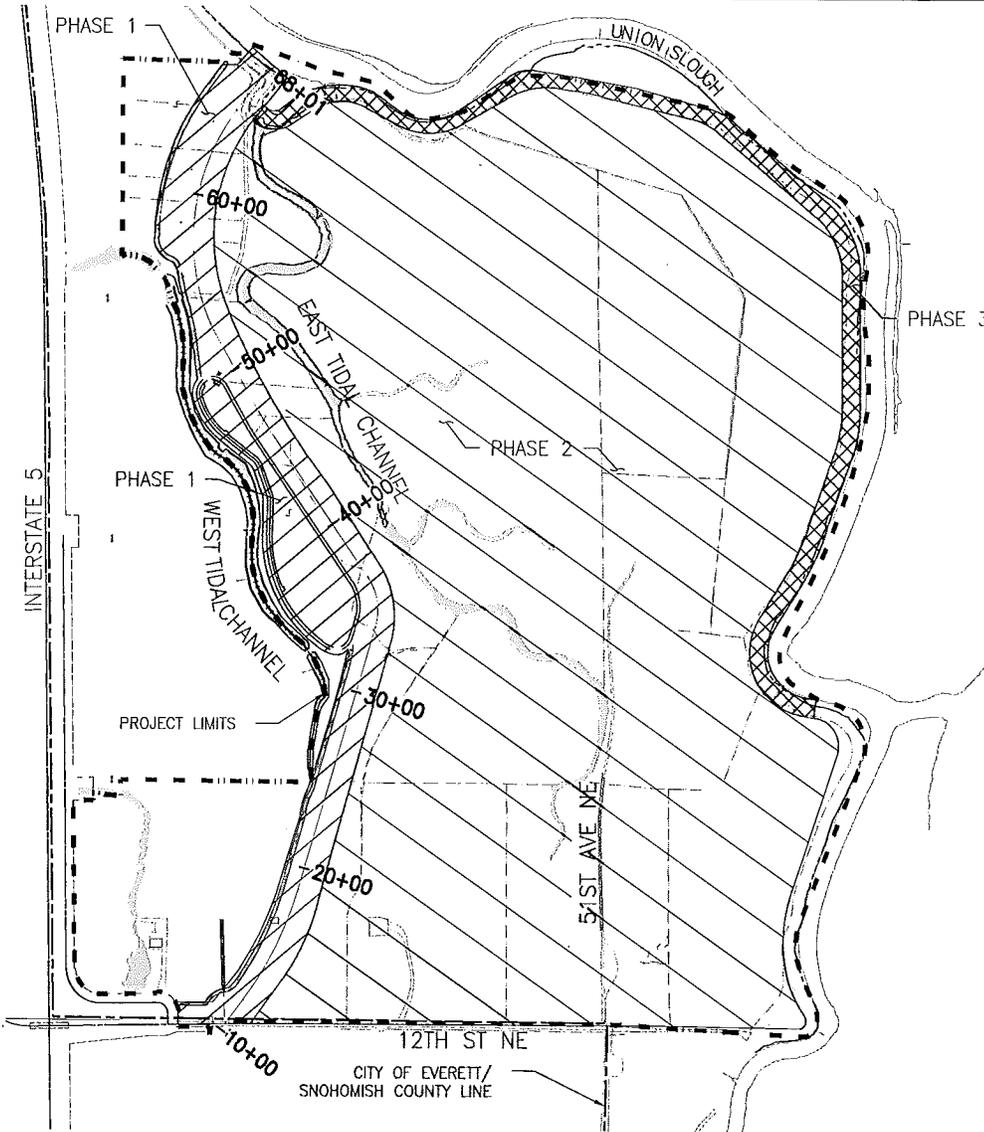
PROJECT ELEMENTS INCLUDED:

- DITCH FILL, AND SITE RESTORATION, MAY OCCUR CONCURRENTLY WITH PHASE 1.
- REMOVAL OF MATERIAL FROM EXISTING DIKE TO OCCUR AFTER CONSTRUCTION OF PROPOSED DIKE AND EXTENSION WITHIN THE CITY OF EVERETT

PHASE 3 

PROJECT ELEMENTS INCLUDED:

- DIKE BREACHING, AND REMNANT DIKE GRADING
- BREACHING AND GRADING TO OCCUR AFTER CONSTRUCTION OF DIKE EXTENSION WITHIN THE CITY OF EVERETT

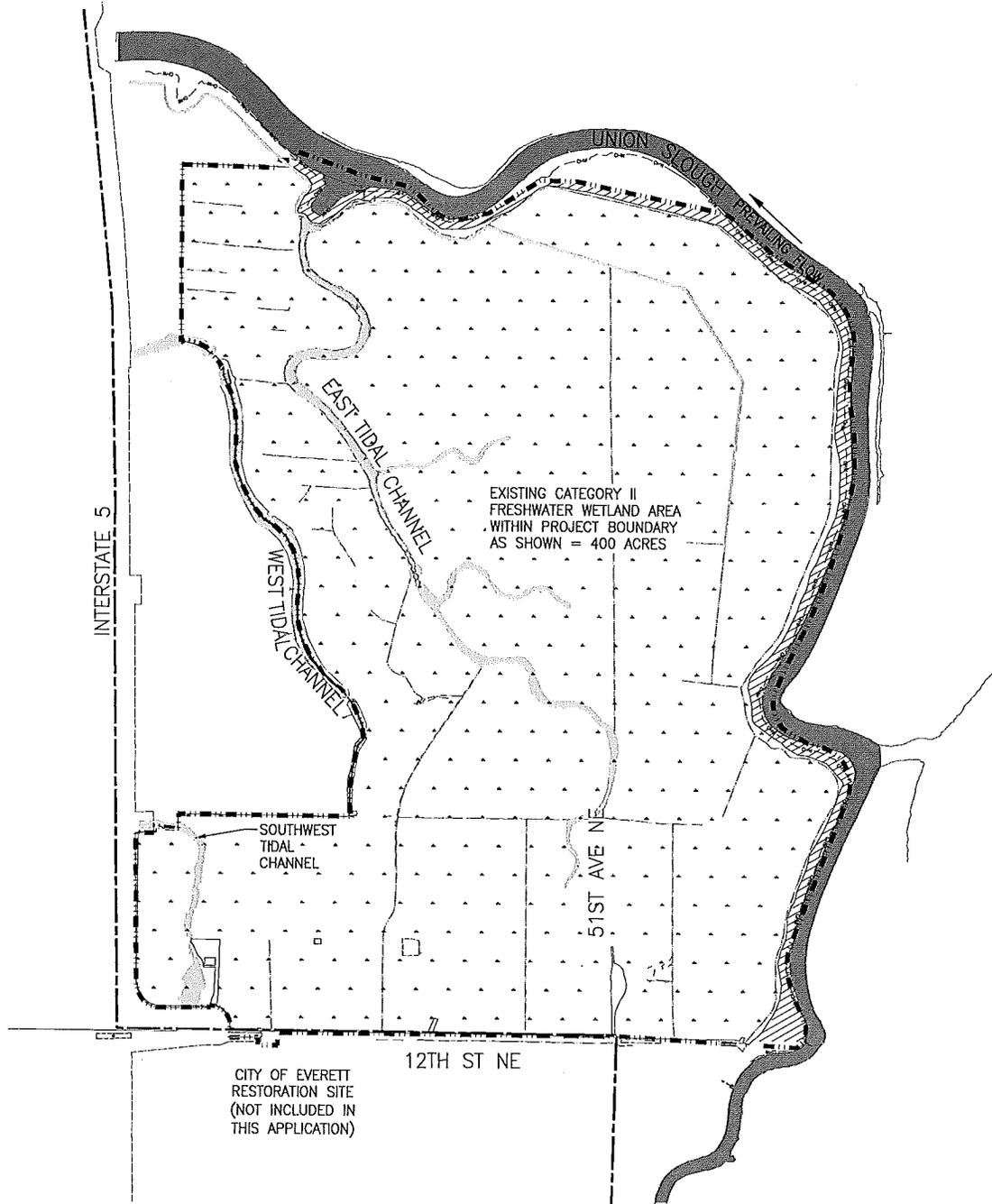


PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
 LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY
 PUBLIC WORKS

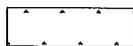
CONSTRUCTION SEQUENCING
 SMITH ISLAND
 ESTUARY RESTORATION
 PROJECT

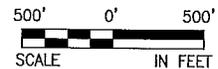
PROPOSED: ESTUARY RESTORATION/
 SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS
 SHEET 5 OF 30 DATE: MARCH 2015

XREF LIST
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 Resolved
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 3784-PRJL
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 3784-PCHN
 3784-FROMGIS
 3784-SWLE
 Unresolved
 3784-CRDG
 3784-PDKE



LEGEND

- | | | | |
|---|---|---|-----------------------------|
|  | EXISTING CATEGORY II FRESHWATER WETLAND |  | UPLAND BUFFER |
|  | TYPE F (NON-SALMONID) WATERBODY |  | TYPE S (SALMONID) WATERBODY |



CITY OF EVERETT RESTORATION SITE (NOT INCLUDED IN THIS APPLICATION)

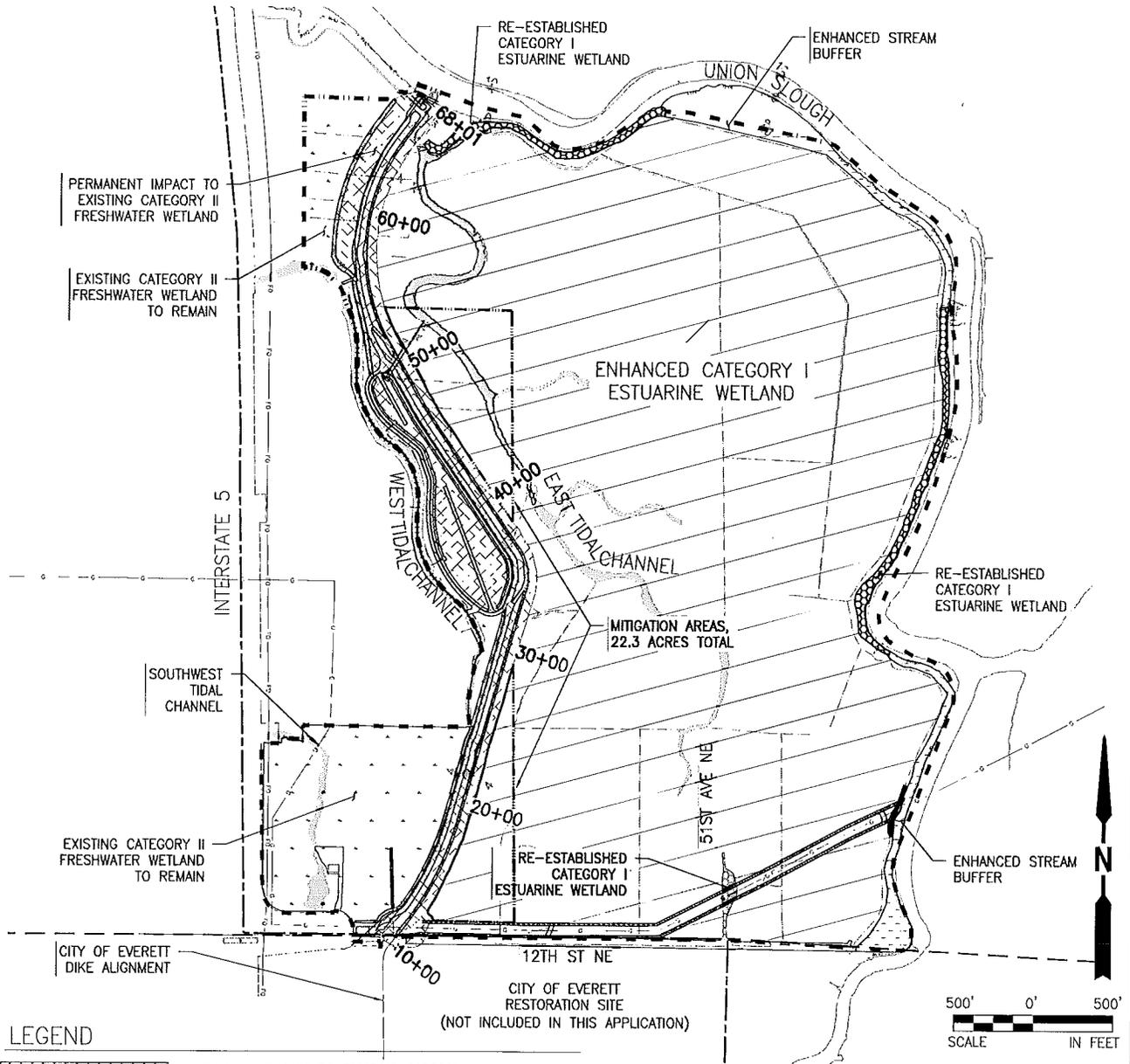
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PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
 LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY
 PUBLIC WORKS

EXISTING CRITICAL AREAS
 SMITH ISLAND
 ESTUARY RESTORATION
 PROJECT

PROPOSED: ESTUARY RESTORATION/
 SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS
 SHEET 6 OF 30 DATE: MARCH 2015

XREF LIST
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 3784-DTCH
 3784-PDRN
 3784-PCHN
 3784-FROMGIS
 3784-SWLE
 Unresolved
 3791-2RDG
 3794-2D1E



LEGEND

	PERMANENT IMPACT TO EXISTING CATEGORY II FRESHWATER WETLAND (34.0 ACRES)
	ENHANCED CATEGORY I ESTUARINE WETLAND (324.7 ACRES)
	RE-ESTABLISHED CATEGORY I ESTUARINE WETLAND (8.4 ACRES)
	ENHANCED STREAM BUFFER (7.0 ACRES)
	EXISTING CATEGORY II FRESHWATER WETLAND (36.5 ACRES)

TEMPORARY WETLAND IMPACTS

	AREA (AC)
DRAINAGE DITCH FILL	4.7
CONSTRUCTION OF RESTORATION ELEMENTS AND FILL FROM DIKE BREACHING	10.8
PIPELINE EROSION PROTECTION BERM	26.8
STAGING AREAS	6.1

PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
 LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY
 PUBLIC WORKS

CRITICAL AREA IMPACT
 AND MITIGATION
 SMITH ISLAND
 ESTUARY RESTORATION
 PROJECT

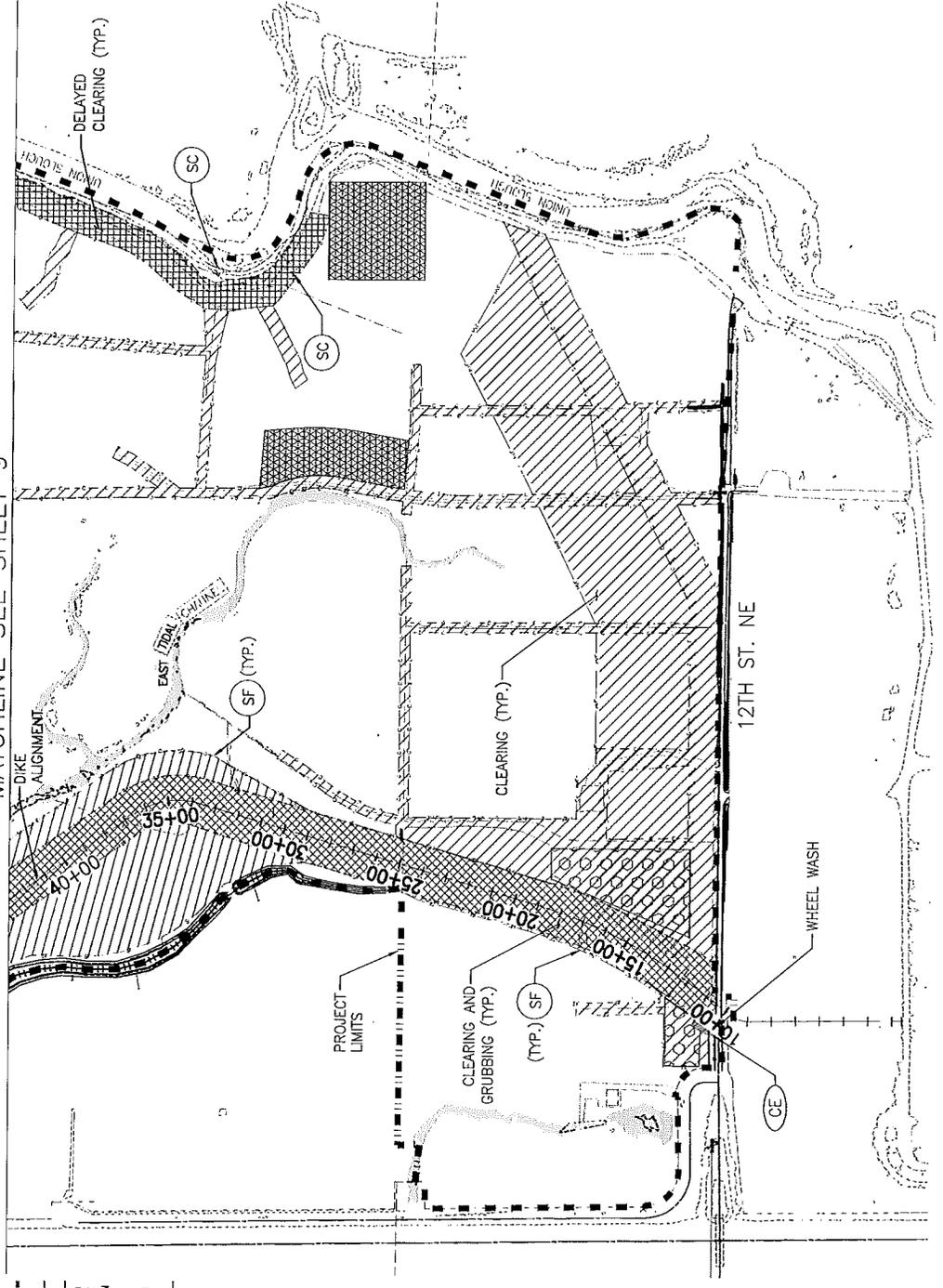
PROPOSED: ESTUARY RESTORATION/
 SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS
 SHEET 7 OF 30 DATE: MARCH 2015

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 Plotted: Mar 26, 2015 - 10:27am

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 GUSMACH
 3784-PROL

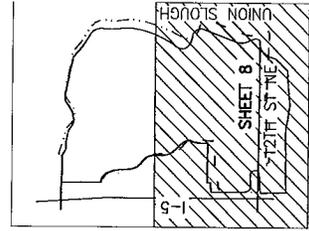
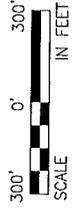
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 Layout Name: 8

MATCHLINE SEE SHEET 9



LEGEND

- PROJECT LIMITS
- CLEARING LIMITS
- CLEARING AND GRUBBING LIMITS
- HIGH VISIBILITY FENCE
- CLEARING AND GRUBBING
- CLEARING
- DELAYED CLEARING
- CONSTRUCTION STAGING AREA
- SELECTIVE LOGGING AREA
- CE STABILIZED CONSTRUCTION ENTRANCE
- SF SILT FENCE
- SC SILT CURTAIN



PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LON:122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

TEMPORARY EROSION AND
 SEDIMENT CONTROL PLAN
 (1 OF 2)

SMITH ISLAND
 ESTUARY RESTORATION PROJECT

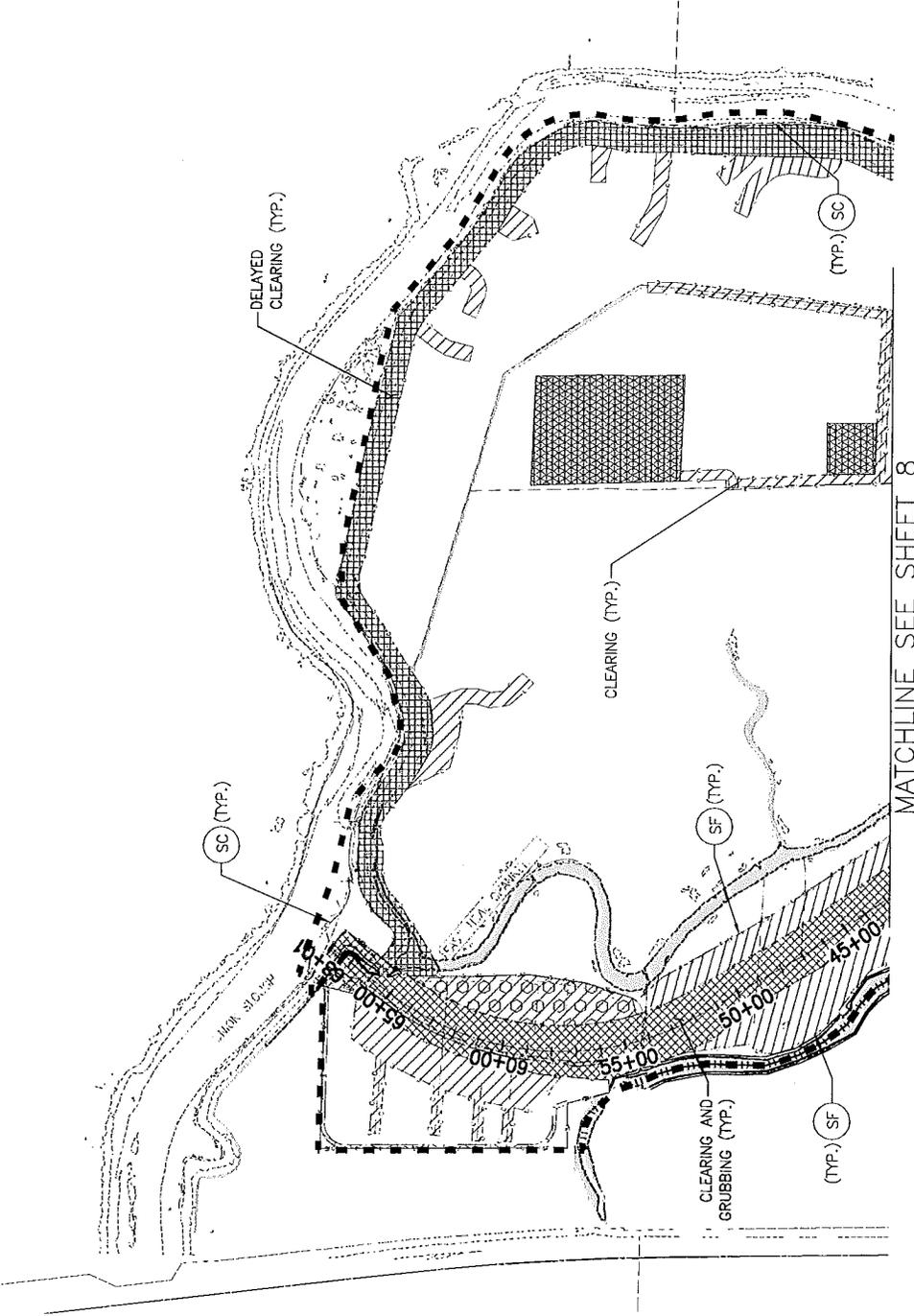
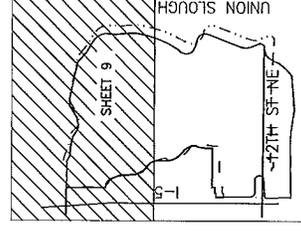
PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS

SHEET 8 OF 30

DATE: MARCH 2015

LEGEND

- PROJECT LIMITS
- CLEARING LIMITS
- CLEARING AND GRUBBING LIMITS
- HIGH VISIBILITY FENCE
- CLEARING AND GRUBBING
- CLEARING
- DELAYED CLEARING
- CONSTRUCTION STAGING AREA
- SELECTIVE LOGGING AREA
- CE STABILIZED CONSTRUCTION ENTRANCE
- SF SILT FENCE
- SC SILT CURTAIN



MATCHLINE SEE SHEET 8

PURPOSE: ESTUARY RESTORATION

DATUM: NAD83/91 AND NAVD 88

LAT: 48°00'54.18"N LON:122°09'48.39"W

PROPERTY OWNERS:
SNOHOMISH COUNTY PUBLIC WORKS

TEMPORARY EROSION AND
SEDIMENT CONTROL PLAN
(2 OF 2)

SMITH ISLAND

ESTUARY RESTORATION PROJECT

PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE

NEAR: CITY OF EVERETT

AT: 12TH ST NE

SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.

COUNTY OF: SNOHOMISH

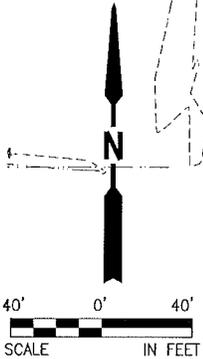
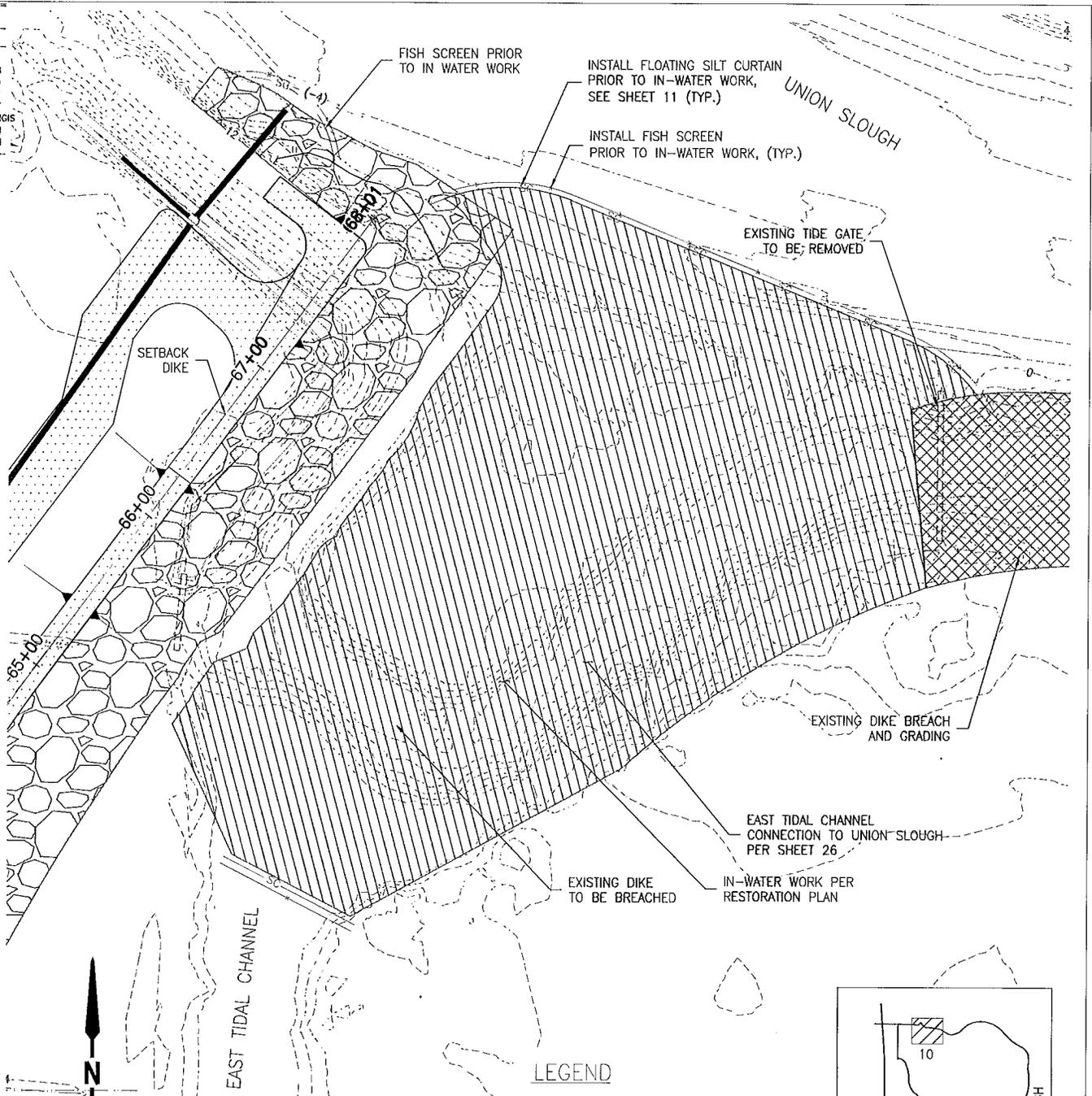
STATE: WASHINGTON

APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS

SHEET 9 OF 30

DATE: MARCH 2015

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 3784-FRONGIS
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 3784-PCHN

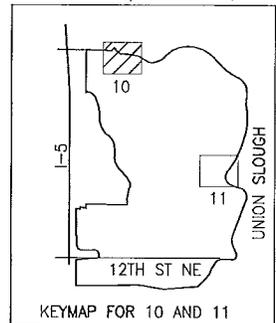


NOTES

1. INSTALL FISH SCREENS AT LOCATIONS SHOWN AND WHEN NEEDED AS DETERMINED BY USFWS.
2. REMOVE FISH FROM THE ISOLATED WORK AREA USING AN APPROVED WDFW METHOD.

LEGEND

- FISH SCREEN
- FLOATING SILT CURTAIN
- DIKE BREACH AREA
- IN-WATER WORK

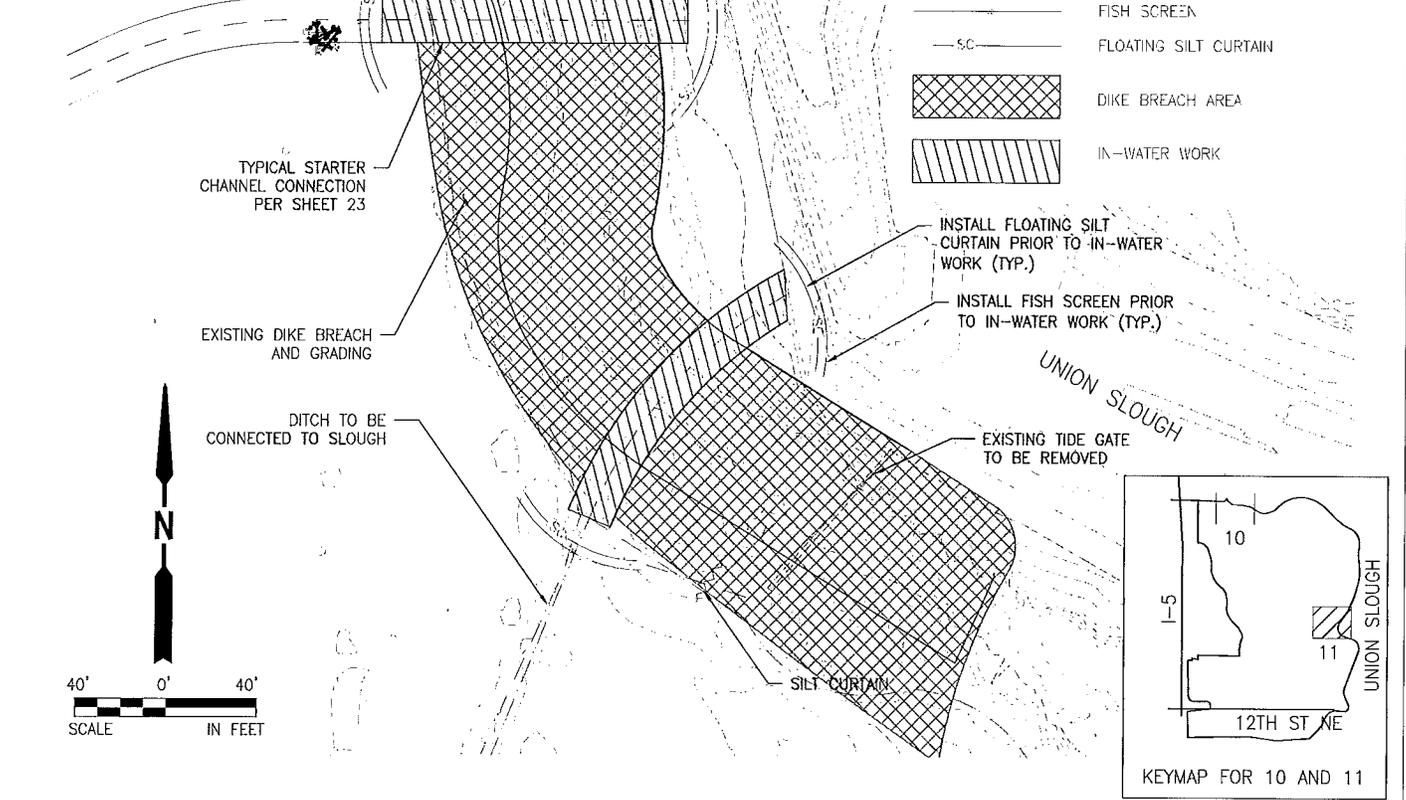


PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
 LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY
 PUBLIC WORKS

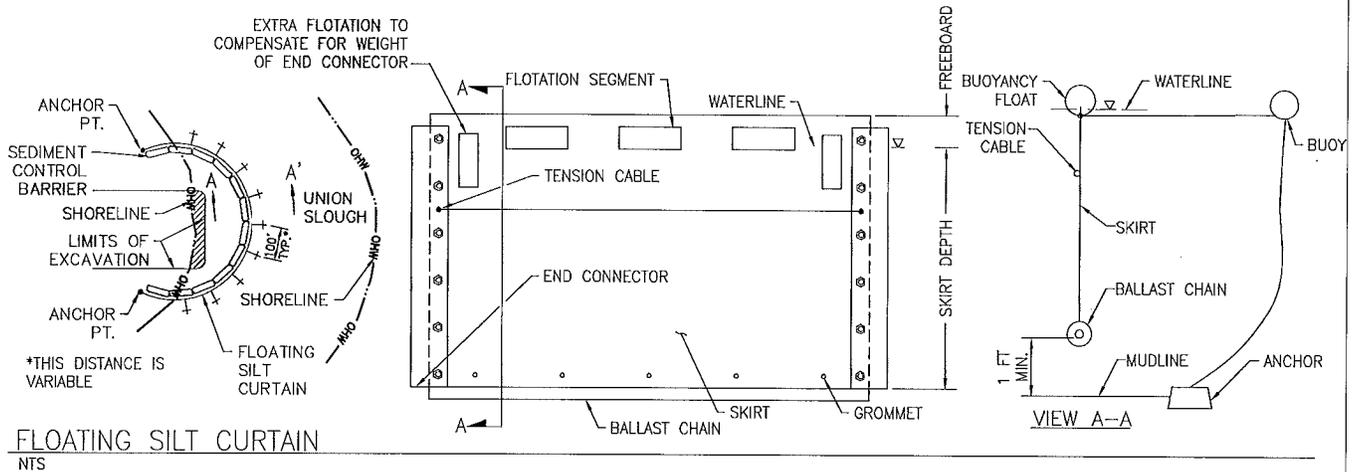
FISH EXCLUSION PLAN
 (1 OF 2)
 SMITH ISLAND
 ESTUARY RESTORATION
 PROJECT

PROPOSED: ESTUARY RESTORATION/
 SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS
 SHEET 10 OF 30 DATE: MARCH 2015

XREF LIST
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 3784--PCHN



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PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
 LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY
 PUBLIC WORKS

FISH EXCLUSION PLAN
 (2 OF 2)
 SMITH ISLAND
 ESTUARY RESTORATION
 PROJECT

PROPOSED: ESTUARY RESTORATION/
 SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS
 SHEET 11 OF 30 DATE: MARCH 2015

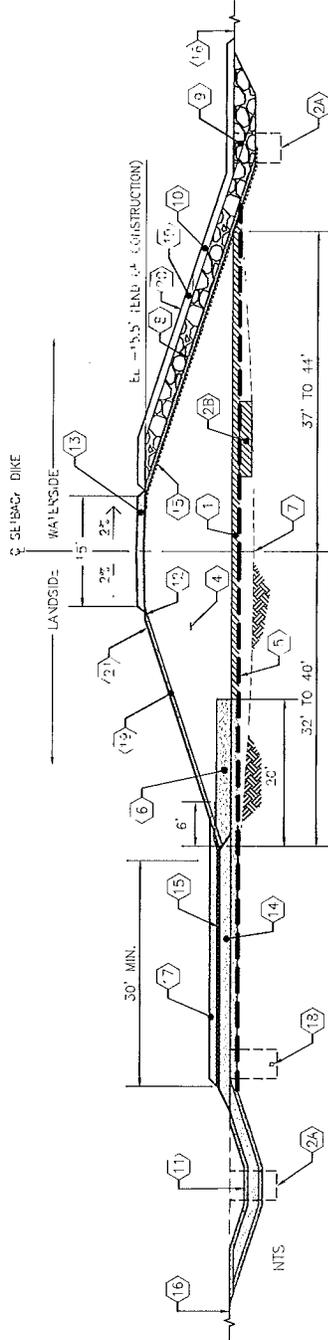
CONSTRUCTION NOTES:

- 1) STRIP BELOW SETBACK DIKE AND LANDSIDE HAUL ROAD/ PERMANENT ACCESS ROAD (APPROX. 10 INCHES).
- 2A) CONSTRUCT TEMPORARY OBSERVATION TRENCH PER DETAIL ON SHEET G002.
- 2B) SUBSURFACE REPAIR AT LOCATIONS IDENTIFIED BY ENGINEER.
- 3) NOT USED.

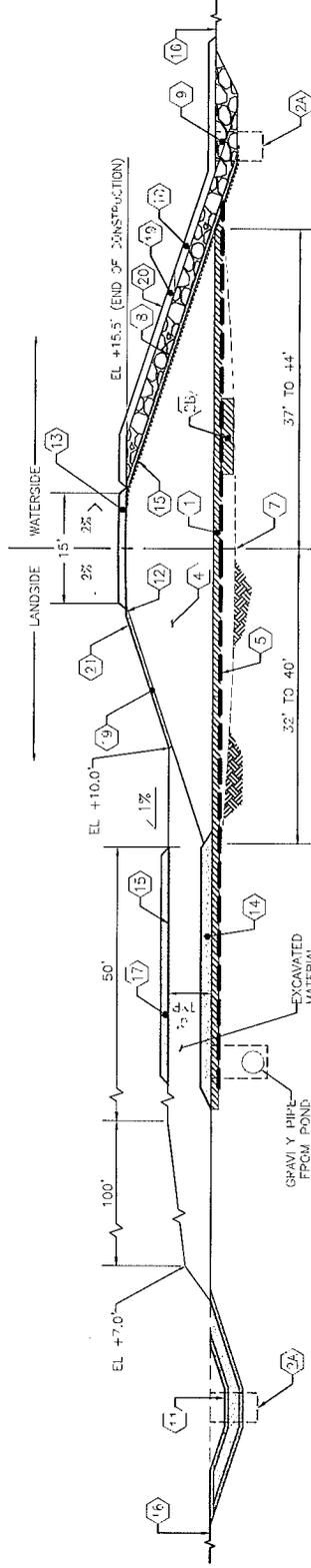
- 4) DIKE CORE SELECT BORROW MATERIAL.
- 5) INSTALL GEOSYNTHETIC REINFORCEMENT.
- 6) INSTALL HORIZONTAL DRAINAGE LAYER SAND FILTER MATERIAL (THICKNESS = 2 FT. PLUS STRIPPING DEPTH).
- 7) DIKE CORE SELECT BORROW MATERIAL EXPECTED TO CONSOLIDATE NATIVE SOILS BY A DEPTH OF UP TO 3 FT AT DIKE CENTERLINE.

- 8) INSTALL FILTER BLANKET (1.0 FT THICK).
- 9) CONSTRUCT RIPRAP TRENCH OR RIPRAP BURIED TOE PER DETAIL, THIS SHEET.
- 10) TOPSOIL TYPE D (EXCAVATED MATERIAL) BELOW ELEV 9 FT ON WATERSIDE (1 FT MIN. COMPACTED AND FINISHED DEPTH).
- 11) CONSTRUCT TOE DITCH PER DETAIL, SHEET 13.

- 12) DIKE FILL FINAL GRADE.
- 13) CONSTRUCT TOP OF DIKE ROAD SURFACING WITH GRAVEL FILTER MATERIAL (0.5 FT MIN COMPACTED AND FINISHED DEPTH).
- 14) CONSTRUCT LANDSIDE HAUL ROAD WITH GRAVEL FILTER MATERIAL (1.5 FT MIN. COMPACTED AND FINISHED DEPTH).
- 15) INSTALL GEOTEXTILE.
- 16) EXISTING GRADE.
- 17) CONSTRUCT PERMANENT ACCESS ROAD WITH GRAVEL FILTER MATERIAL (1.0 FT MIN. COMPACTED AND FINISHED DEPTH).
- 18) INSTALL POWER CONDUIT PER SHEET G002.
- 19) TOPSOIL TYPE C (1 FT MIN COMPACTED AND FINISHED DEPTH).
- 20) SEED WITH LOWLAND MIX ON WATERSIDE.
- 21) SEED WITH PROPERTY RESTORATION MIX ON LANDSIDE.



TYPICAL SETBACK DIKE SECTION - STA 10+00 TO STA 57+00



TYPICAL SETBACK DIKE WITH EXCAVATED MATERIAL 3RM SECTION - STA 57+00 TO STA 68+00

PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LON:122°09'48.39"W

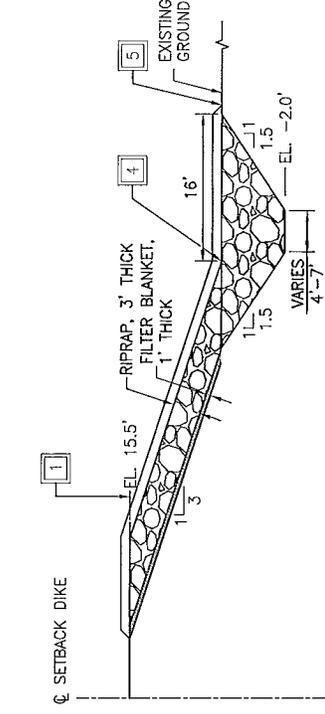
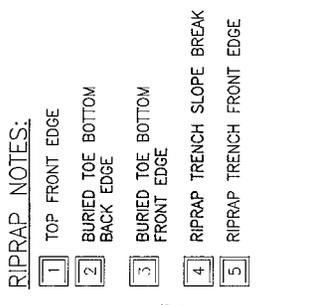
PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS

SMITH ISLAND
 ESTUARY RESTORATION PROJECT

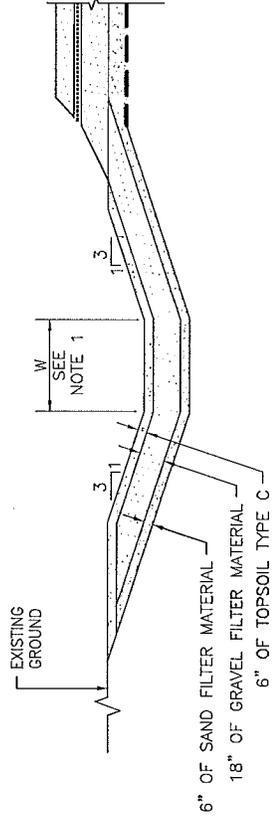
SHEET 12 OF 30

DATE: MARCH 2015



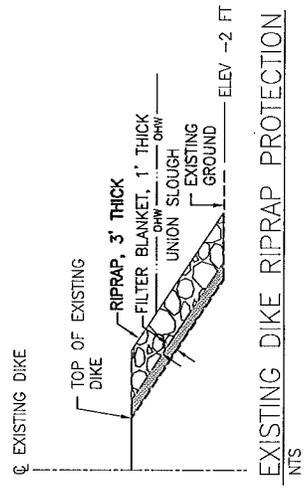
RIPRAP BURIED TOE — STA 10+00 TO STA 48+00

RIPRAP EROSION PROTECTION
NTS



TOE DITCH
NTS

- NOTES**
- DITCH WIDTH (W) IS BOTTOM WIDTH OF DITCH. DITCH BOTTOM FINISHED GRADE SHALL BE AT ELEV +2.0 FEET. DITCH WIDTH SHALL BE AS FOLLOWS:
 - A. 5 FT BOTTOM WIDTH BETWEEN STATIONS 10+65 AND 32+00.
 - B. 9 FT BOTTOM WIDTH BETWEEN STATIONS 50+00 AND 68+00.



EXISTING DIKE RIPRAP PROTECTION
NTS

PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

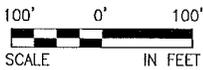
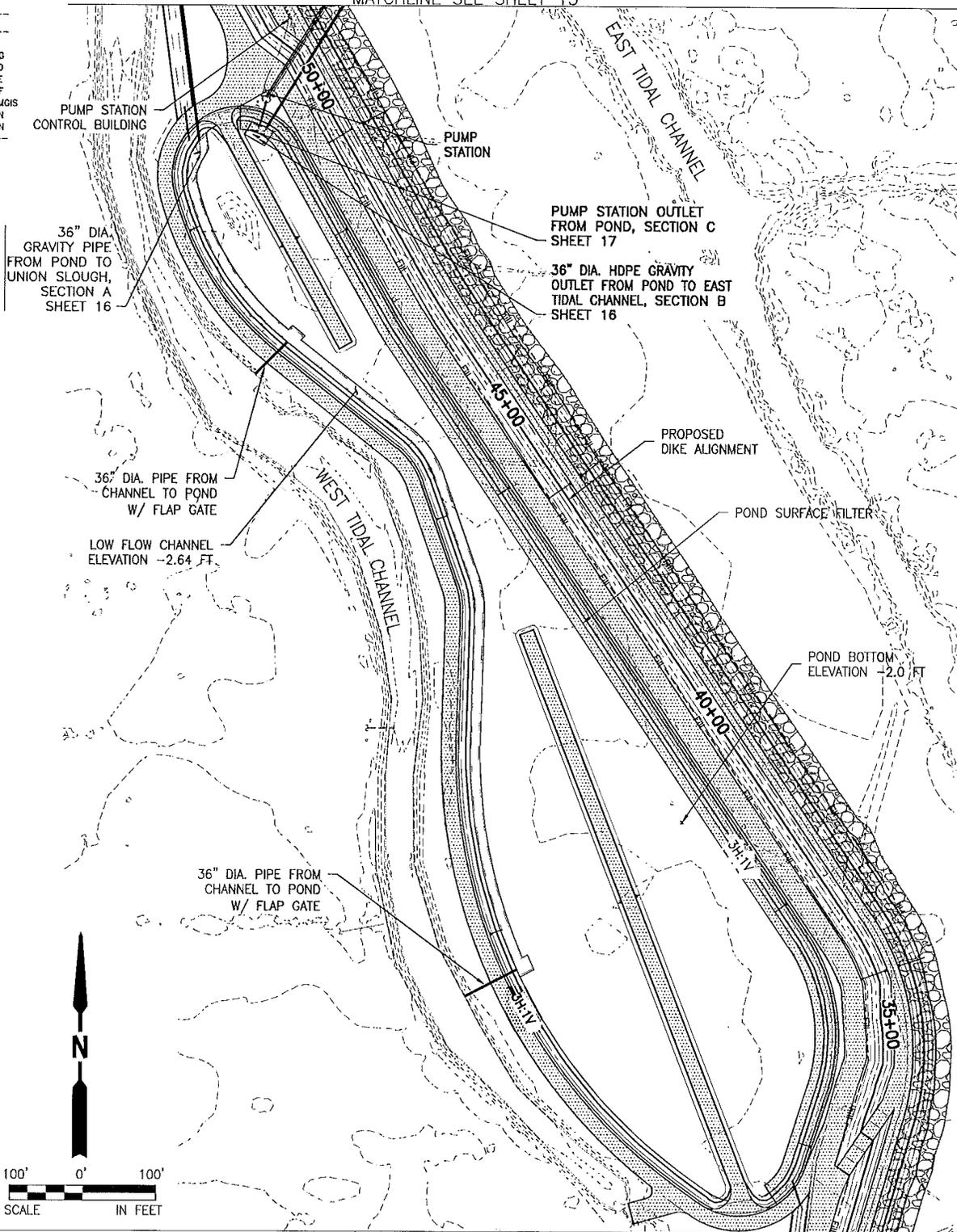
TYPICAL DIKE SECTIONS
 SMITH ISLAND
 ESTUARY RESTORATION PROJECT

PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS

SHEET 13 OF 30
 DATE: MARCH 2015

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MATCHLINE SEE SHEET 15



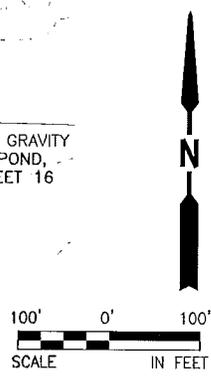
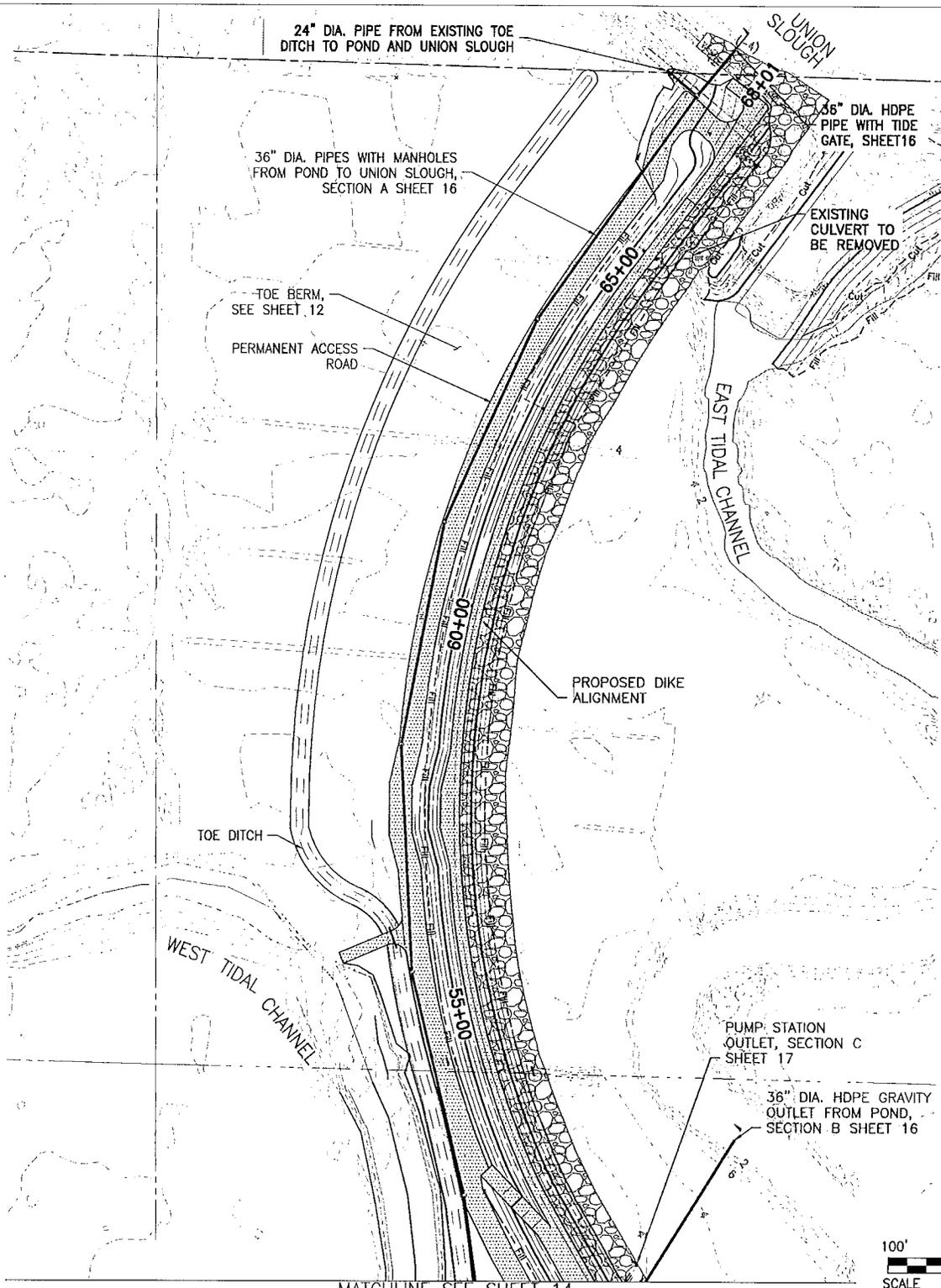
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PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
 LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY
 PUBLIC WORKS

DRAINAGE PLAN
 SMITH ISLAND
 ESTUARY RESTORATION
 PROJECT

PROPOSED: ESTUARY RESTORATION/
 SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS
 SHEET 14 OF 30 DATE: MARCH 2015

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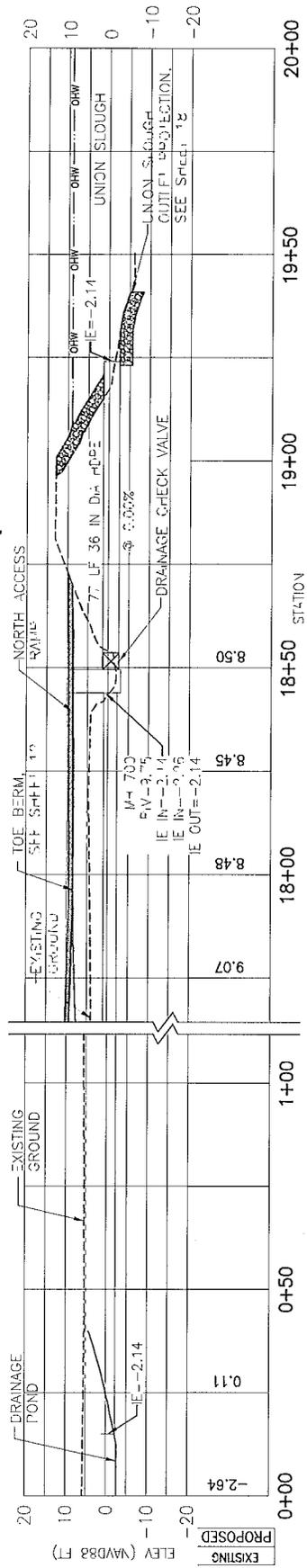


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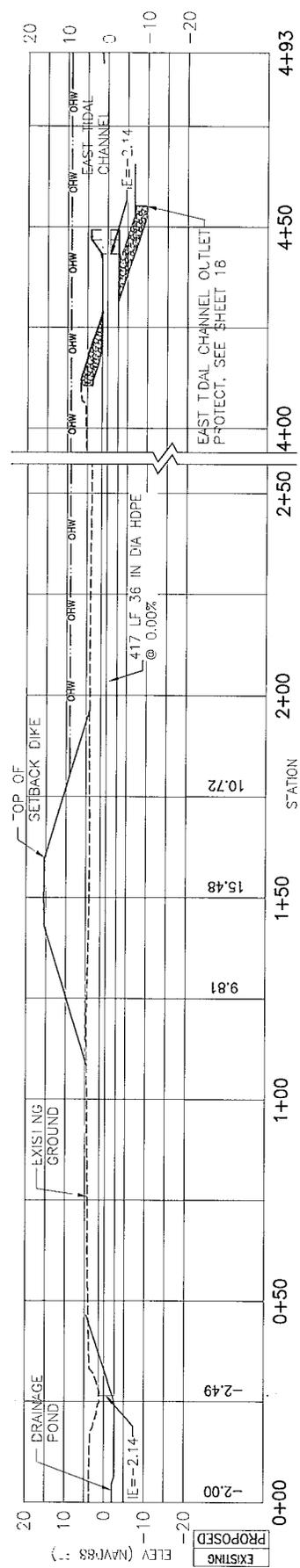
PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
 LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY
 PUBLIC WORKS

DRAINAGE PLAN
 SMITH ISLAND
 ESTUARY RESTORATION
 PROJECT

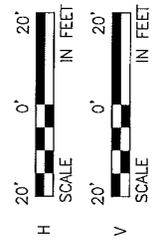
PROPOSED: ESTUARY RESTORATION/
 SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS
 SHEET 15 OF 30 DATE: MARCH 2015



PIPE FROM POND TO UNION SLOUGH - SECTION A



PIPE FROM POND TO EAST TIDAL CHANNEL - SECTION B



PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LON: 122°09'48.39"W

DRAINAGE SECTIONS

PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

SMITH ISLAND
 ESTUARY RESTORATION PROJECT

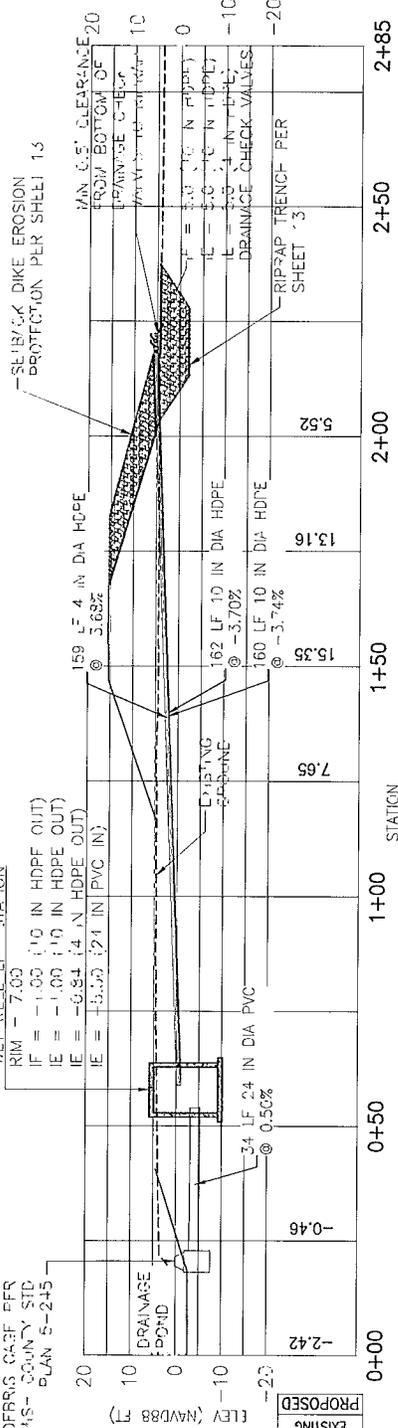
PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS

SHEET 16 OF 30

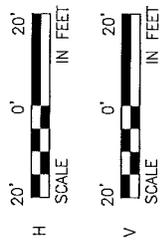
DATE: MARCH 2015

CB, 100
 RIM = -2.14
 E, OUT = -3.00
 OVERFLOW STRUCTURE WITH
 DFRBS GASF PER
 SNOHOMISH COUNTY STD
 PLAN 5-245

WET WELL PUMP STATION
 RIM = 7.00
 IF = -1.00 (10 IN HDPE OUT)
 IE = -1.00 (10 IN HDPE OUT)
 IE = -0.84 (4 IN HDPE OUT)
 IE = -3.50 (24 IN PVC IN)



PUMP STATION INTAKE TO EAST TIDAL CHANNEL - SECTION C



PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LON: 122°09'48.39"W

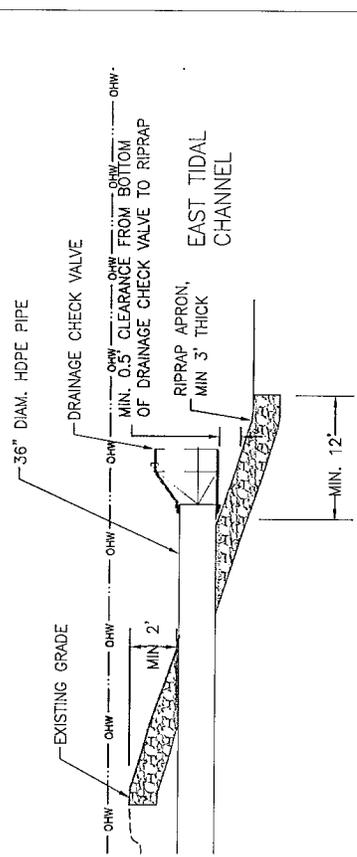
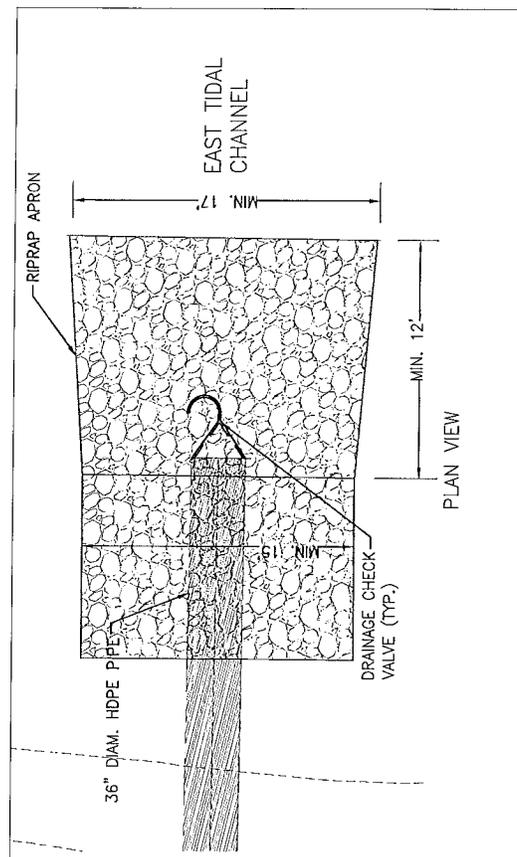
PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

DRAINAGE SECTIONS

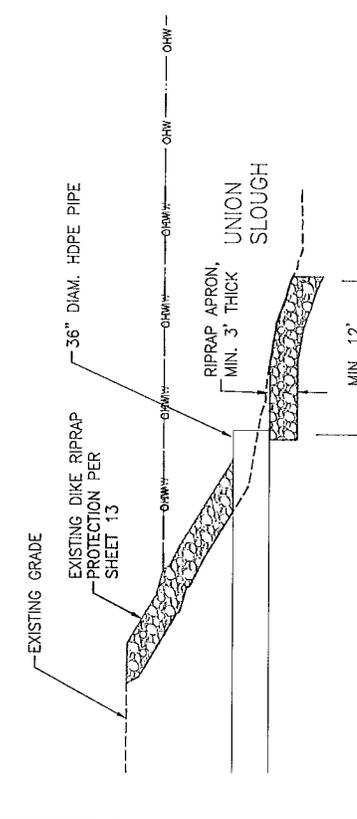
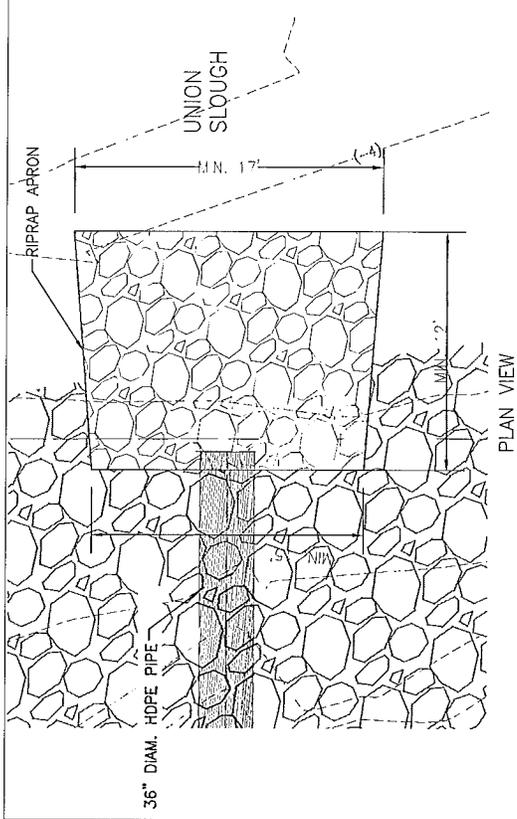
SMITH ISLAND
 ESTUARY RESTORATION PROJECT

PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS

SHEET 17 OF 30 DATE: MARCH 2015



EAST TIDAL CHANNEL OUTLET PROTECTION
NTS



UNION SLOUGH OUTLET PROTECTION
NTS

PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS

SHEET 18 OF 30 DATE: MARCH 2015

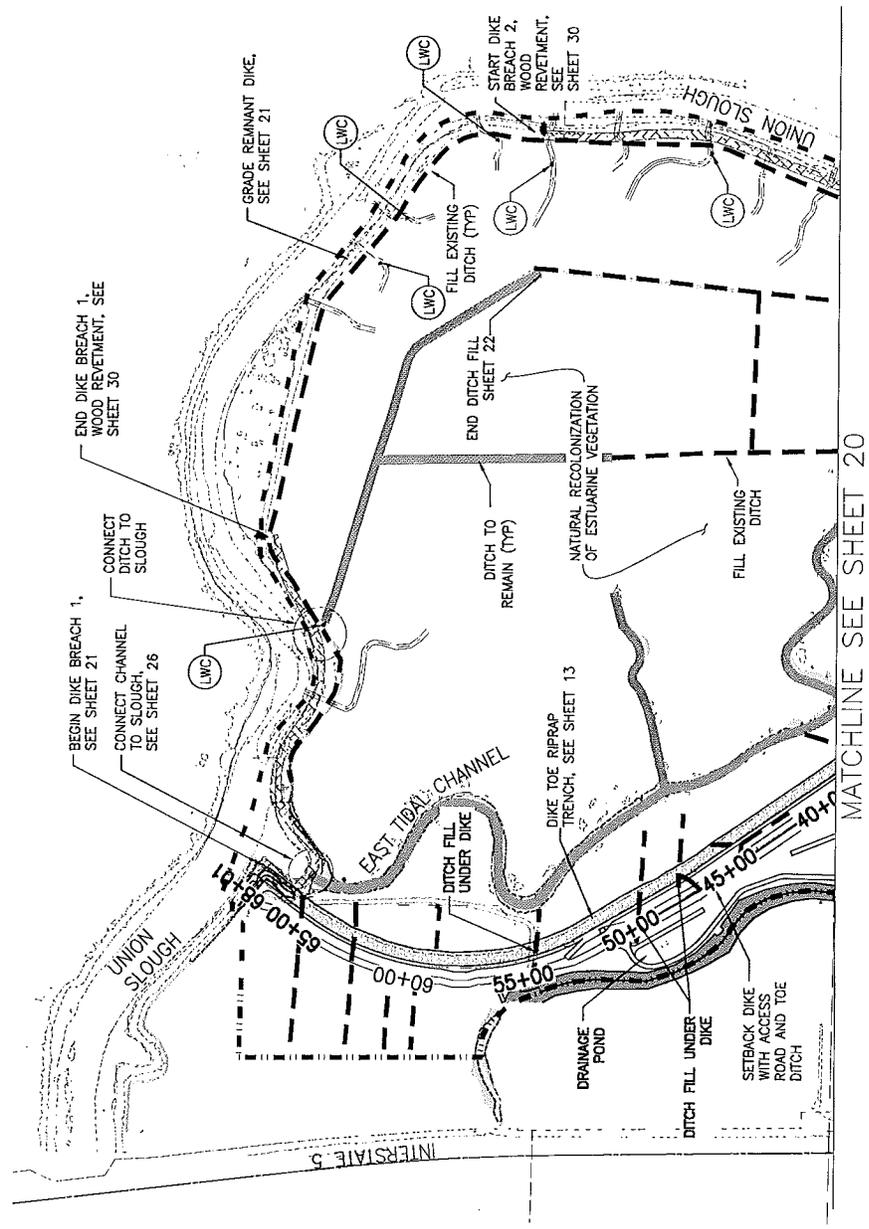
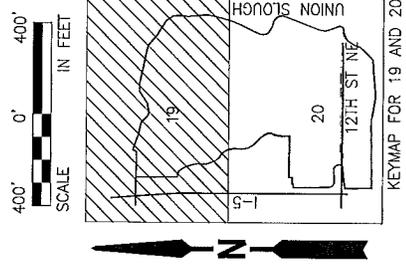
DRAINAGE DETAILS

SMITH ISLAND
 ESTUARY RESTORATION PROJECT

PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LONG: 122°09'48.39"W

PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

- LEGEND**
- PROJECT LIMITS
 - - - DITCH FILL
 - EXISTING CHANNEL OR DITCH TO REMAIN
 - STARTER CHANNEL, SHEET 20
 - LWC
 - LARGE WOOD COMPLEX, SHEET 28 AND 29
 - PIPELINE EROSION PROTECTION
 - DIKE BREACH AREA, SHEET 21



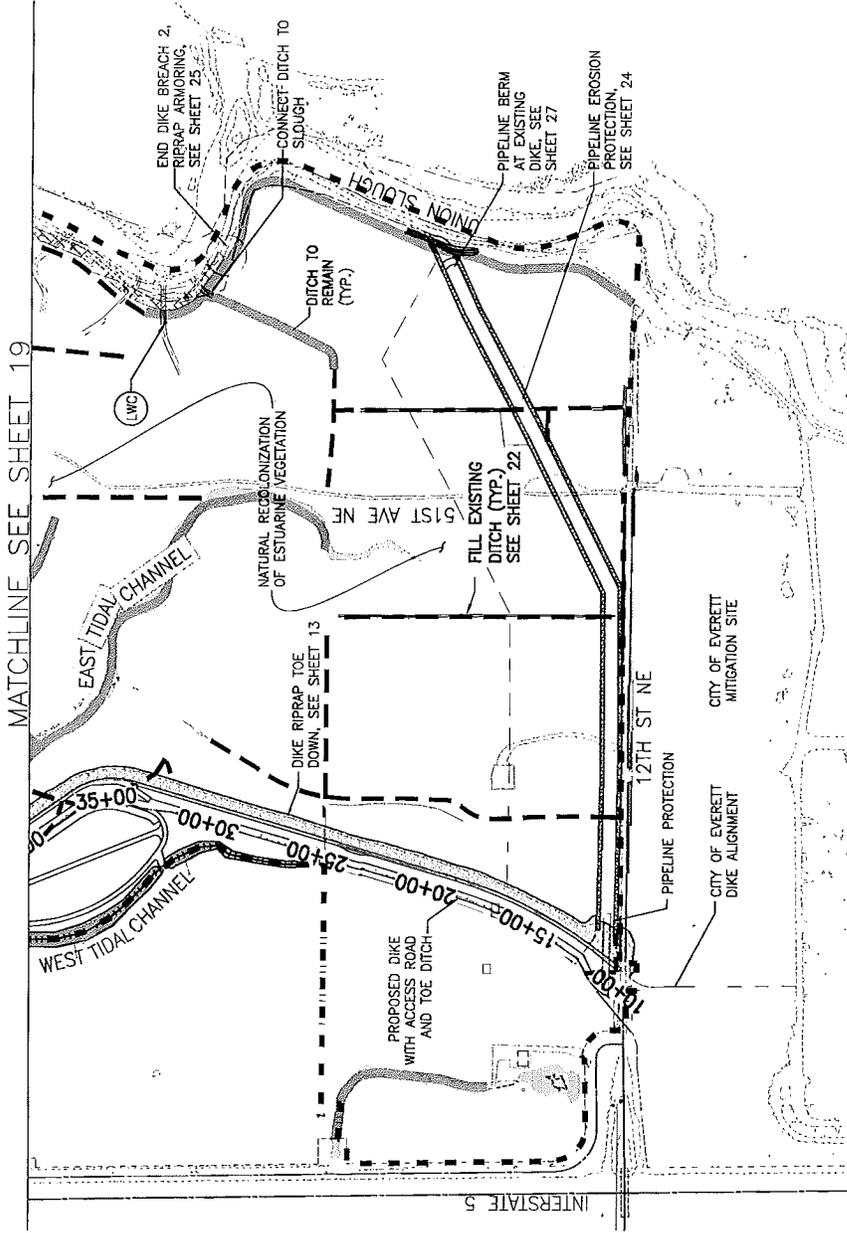
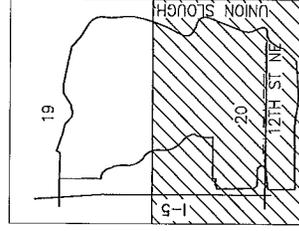
PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS
 SHEET 19 OF 30 DATE: MARCH 2015

RESTORATION PLAN
 (1 OF 2)
 SMITH ISLAND
 ESTUARY RESTORATION PROJECT

PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LON:122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

LEGEND

- PROJECT LIMITS
- - - DITCH FILL
- EXISTING CHANNEL OR DITCH TO REMAIN
- STARTER CHANNEL, SHEET 23
- (LWC) LARGE WOOD COMPLEX, SHEET 28 AND 29
- PIPELINE EROSION PROTECTION
- DIKE BREACH AREA, SHEET 21



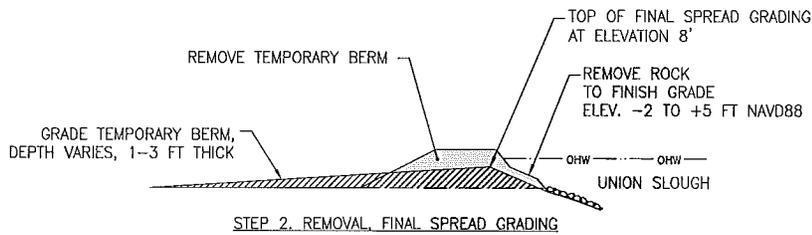
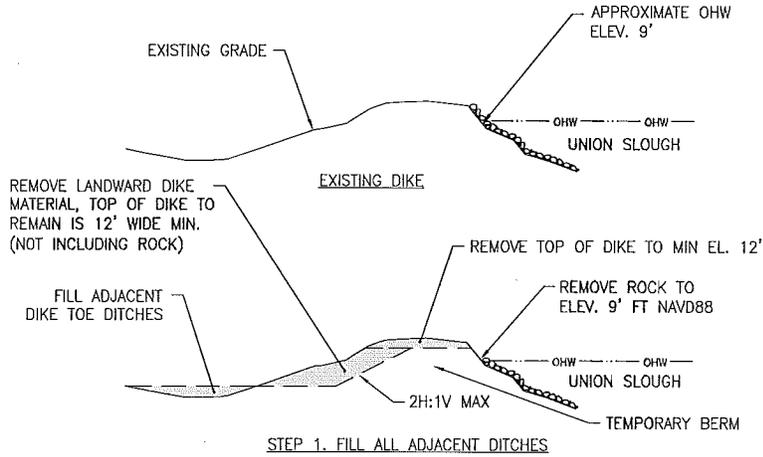
PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

RESTORATION PLAN
 (2 OF 2)
 SMITH ISLAND
 ESTUARY RESTORATION PROJECT

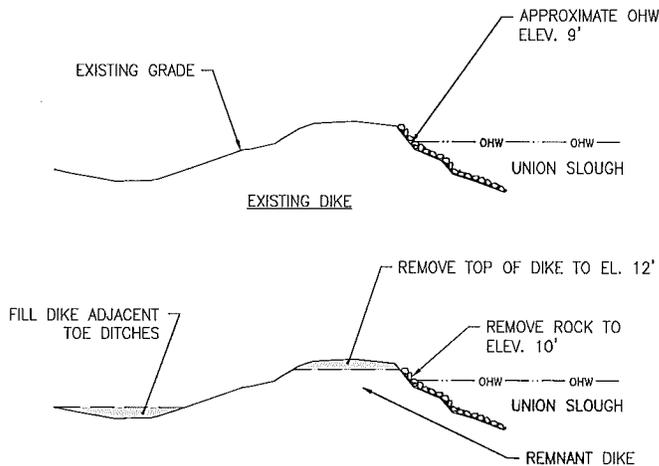
PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS
 SHEET 20 OF 30

DATE: MARCH 2015

XREF LIST
 Ltscale: 1
 Resolved
 TTLBLK
 GSLSEAL



TYPICAL DIKE BREACH
 NTS



TYPICAL REMNANT DIKE
 NTS

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 Plotted: Mar 25, 2015 - 2:02pm
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PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
 LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY
 PUBLIC WORKS

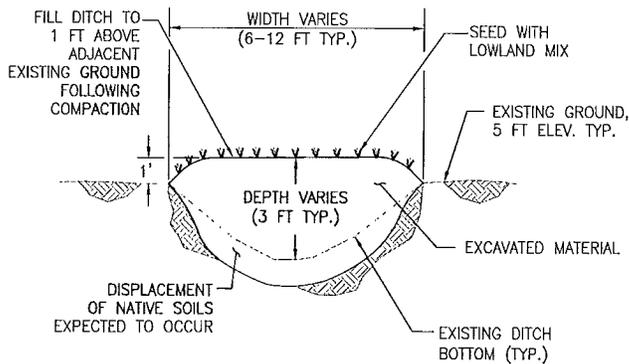
RESTORATION AND
 GRADING DETAILS

SMITH ISLAND
 ESTUARY RESTORATION
 PROJECT

PROPOSED: ESTUARY RESTORATION/
 SETBACK DIKE

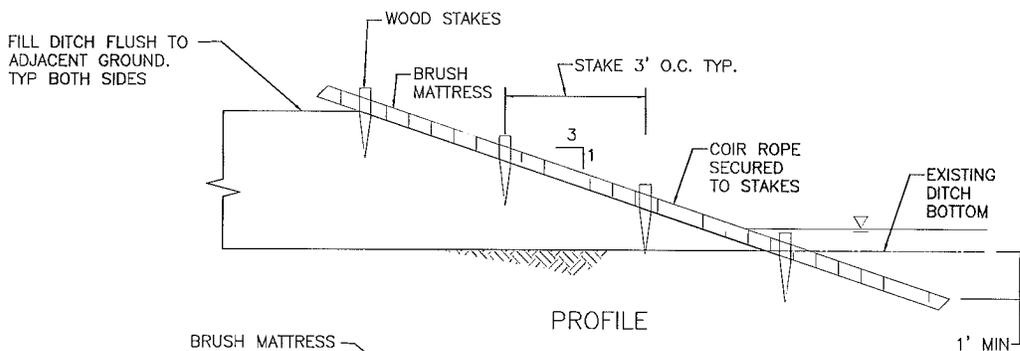
NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS

SHEET 21 OF 30 DATE: MARCH 2015

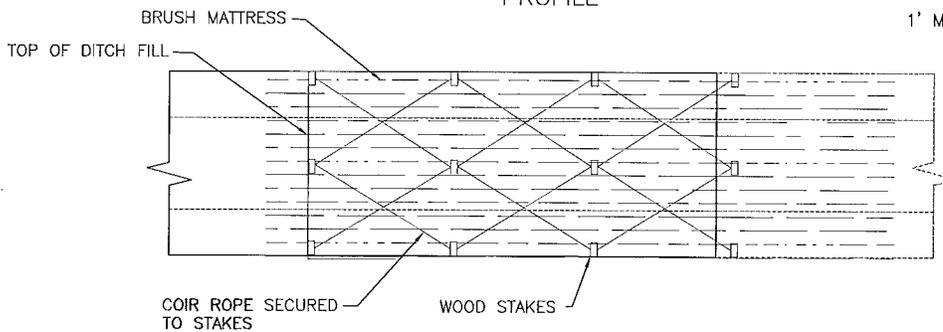


DITCH FILL

NTS



PROFILE



PLAN

NOTES

1. BRUSH MATTRESS SHALL BE CONSTRUCTED WITH LIVE BRANCHES 1/2 TO 1 INCH IN DIAMETER.
2. LIVE BRANCHES SHALL BE OVERLAPPED SO THAT THE BRUSH MATTRESS HAS A MINIMUM THICKNESS OF 6 INCHES.
3. LOOSE SOIL SHALL BE WASHED INTO THE BRUSH MATTRESS, SO THAT HALF OF THE DEPTH IS COVERED WITH SOIL.

END DITCH FILL DETAIL

NTS

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PURPOSE: ESTUARY RESTORATION DATUM: NAD83/91 AND NAVD 88 LAT: 48°00'54.18"N LON: 122°09'48.39"W PROPERTY OWNERS: SNOHOMISH COUNTY PUBLIC WORKS	RESTORATION AND GRADING DETAILS SMITH ISLAND ESTUARY RESTORATION PROJECT	PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE NEAR: CITY OF EVERETT AT: 12TH ST NE SEC. 9,10,15 & 16 T. 29N, R.5E, W.M. COUNTY OF: SNOHOMISH STATE: WASHINGTON APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS SHEET 22 OF 30 DATE: MARCH 2015
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3-PILE OR 5-PILE WOOD COMPLEX.
SEE DETAIL ON SHEET 28 AND 29

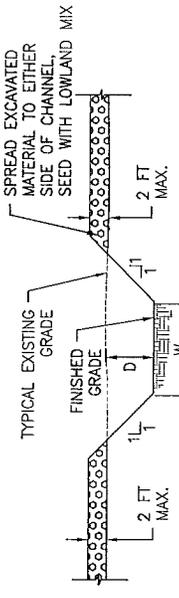
GENERAL NOTES
1. APPROXIMATE LOCATIONS AND EXTENT OF STARTER CHANNELS SHOWN ON PLAN. FINAL LOCATIONS TO BE DIRECTED IN THE FIELD BY THE ENGINEER PER THE CHANNEL EXCAVATION BID ITEM.

STARTER CHANNEL TYPICAL DIMENSIONS			
CROSS SECTION TYPE	BOTTOM WIDTH, W (FT)	DEPTH, D (FT)	
CHANNEL CONNECTION TO UNION SLOUGH	12	10-16	
A	12	6-10	
B	5	3-6	
C	2	0-3	

SPREAD EXCAVATED MATERIAL BESIDE CHANNELS

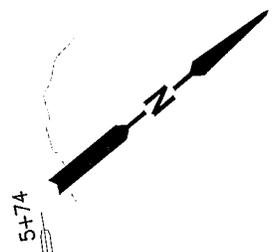
STARTER CHANNEL ALIGNMENT TO BE DIRECTED IN THE FIELD BY THE ENGINEER

CONSTRUCT CHANNEL CONNECTION THROUGH DIKE BREACH AREA TO UNION SLOUGH AT ELEVATION -2 FT



DIKE BREACH AREA
PLAN VIEW

UNION SLOUGH

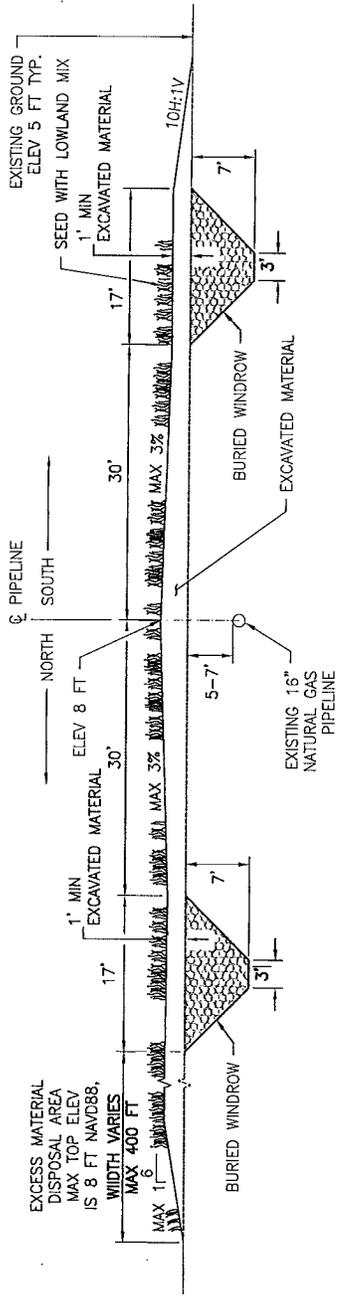


TYPICAL STARTER CHANNEL

PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LON:122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

RESTORATION AND GRADING DETAILS
 SMITH ISLAND
 ESTUARY RESTORATION PROJECT

PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS
 SHEET 23 OF 30 DATE: MARCH 2015



PIPELINE EROSION PROTECTION DETAIL

NTS

PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

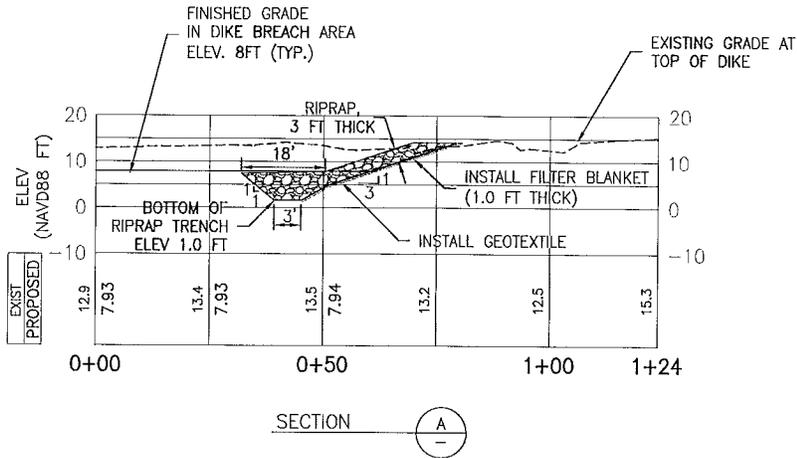
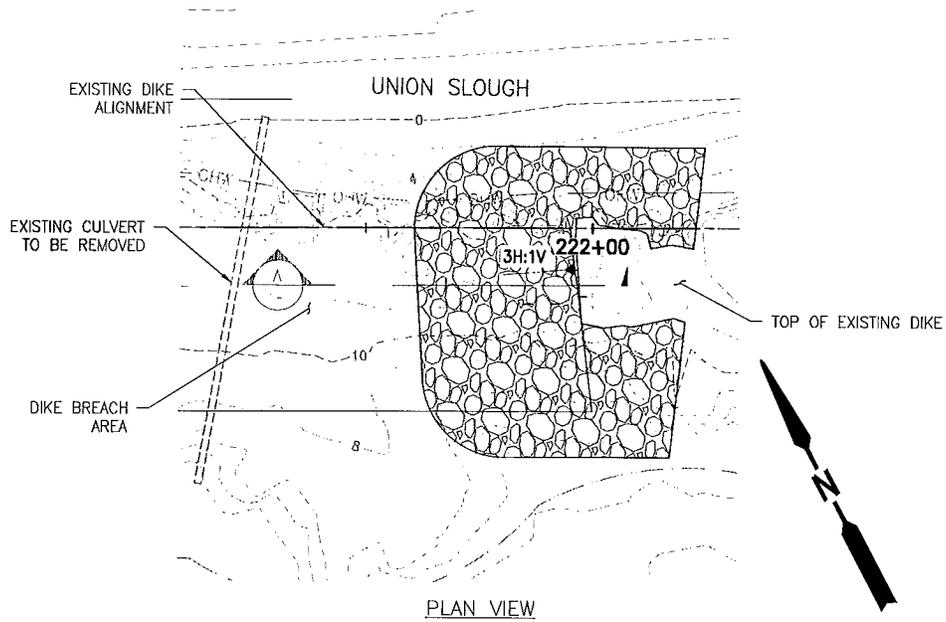
RESTORATION AND
 GRADING DETAILS

SMITH ISLAND
 ESTUARY RESTORATION PROJECT

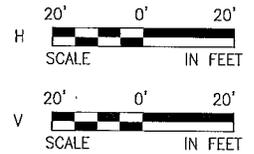
PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS

SHEET 24 OF 30 DATE: MARCH 2015

XREF LIST
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 Resolved
 TTLBLK
 GSLSEAL



DIKE BREACH RIPRAP ARMOR DETAIL



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 Mar 25, 2015

PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
 LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY
 PUBLIC WORKS

RESTORATION AND
 GRADING DETAILS
 SMITH ISLAND
 ESTUARY RESTORATION
 PROJECT

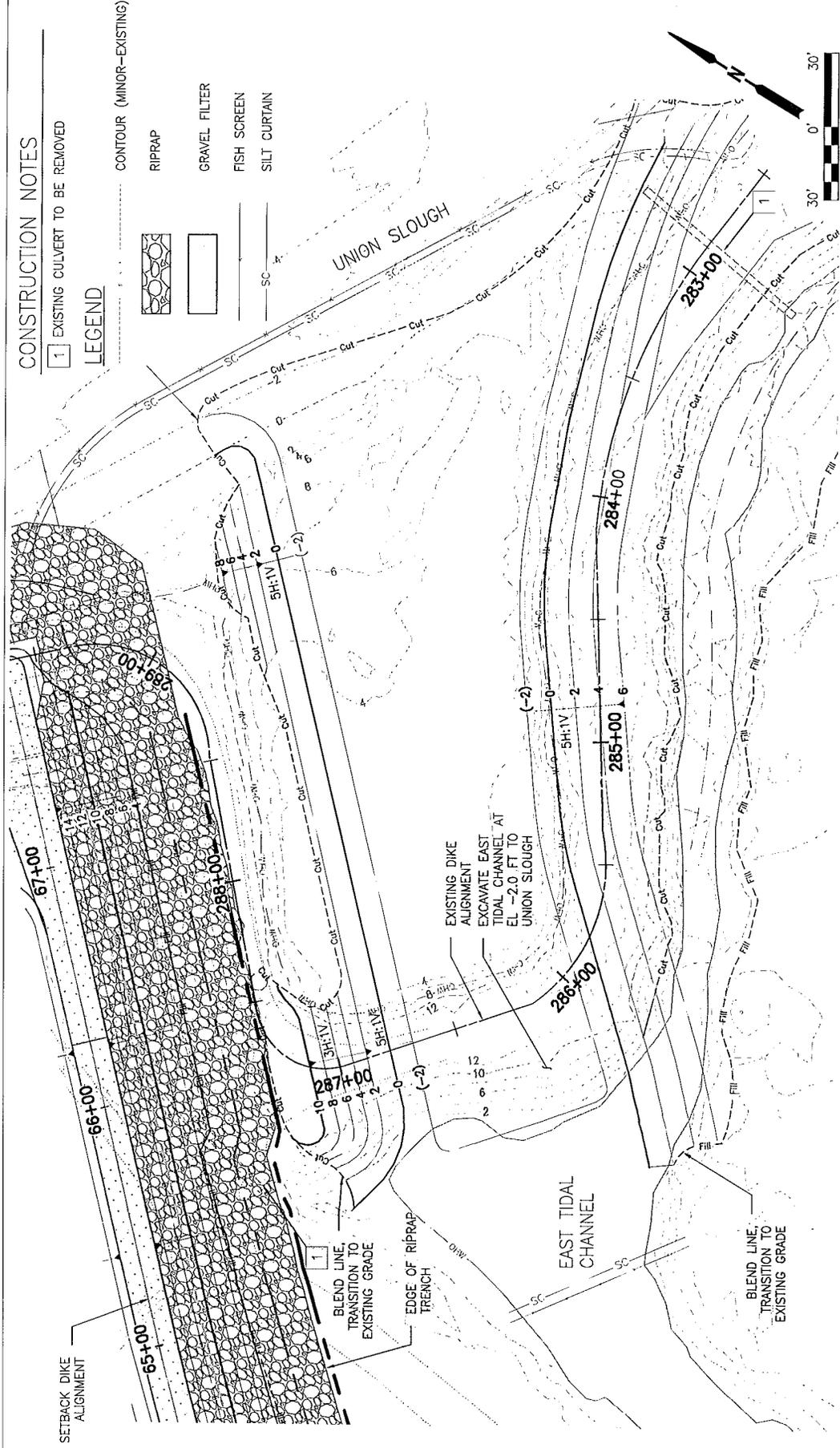
PROPOSED: ESTUARY RESTORATION/
 SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS
 SHEET 25 OF 30 DATE: MARCH 2015

CONSTRUCTION NOTES

1 EXISTING CULVERT TO BE REMOVED

LEGEND

- CONTOUR (MINOR-EXISTING)
- RIPRAP
- GRAVEL FILTER
- FISH SCREEN
- SILT CURTAIN
- SC



PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LON:122°09'48.39"W

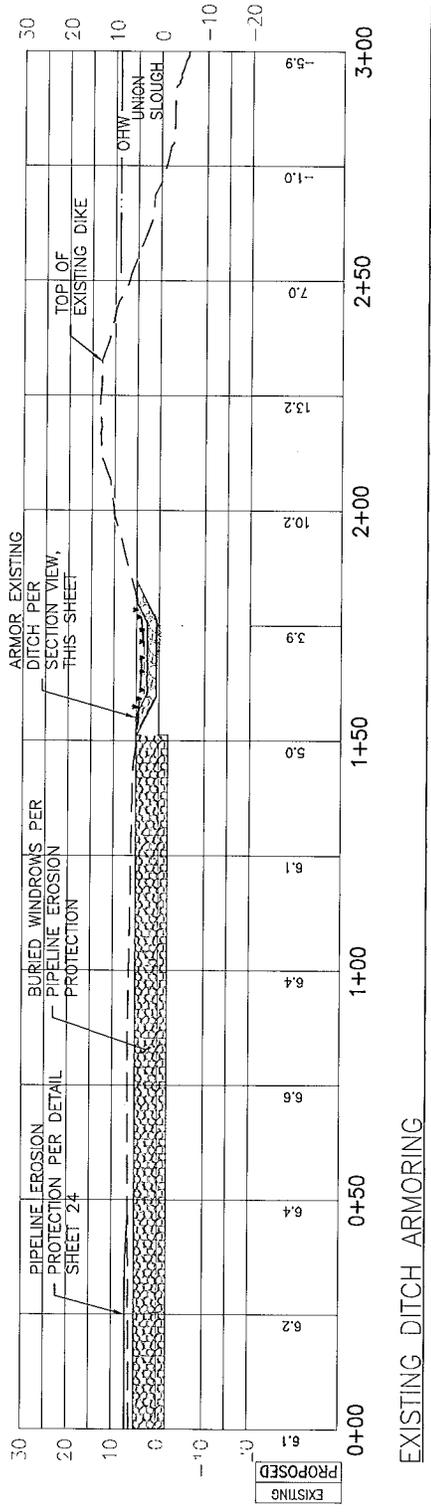
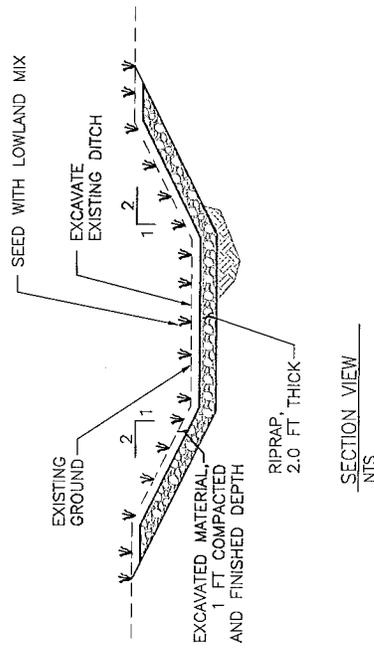
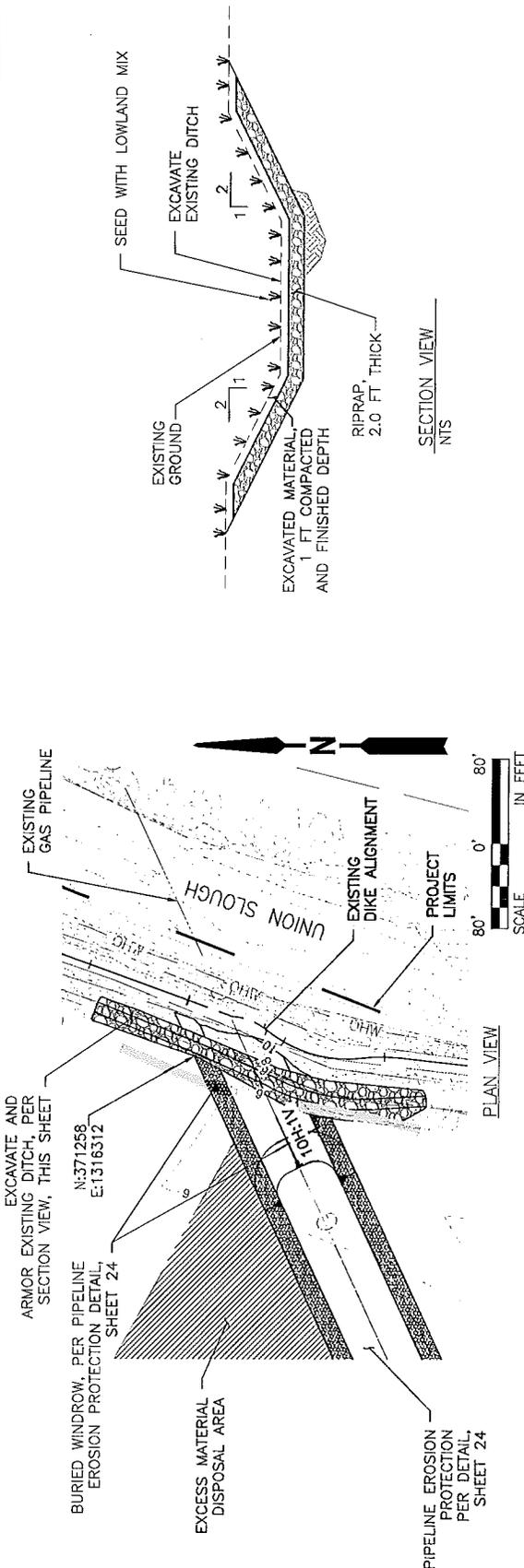
PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

RESTORATION AND
 GRADING DETAILS

SMITH ISLAND
 ESTUARY RESTORATION PROJECT

PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
 NEAR: CITY OF EVERETT
 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS

SHEET 26 OF 30 DATE: MARCH 2015



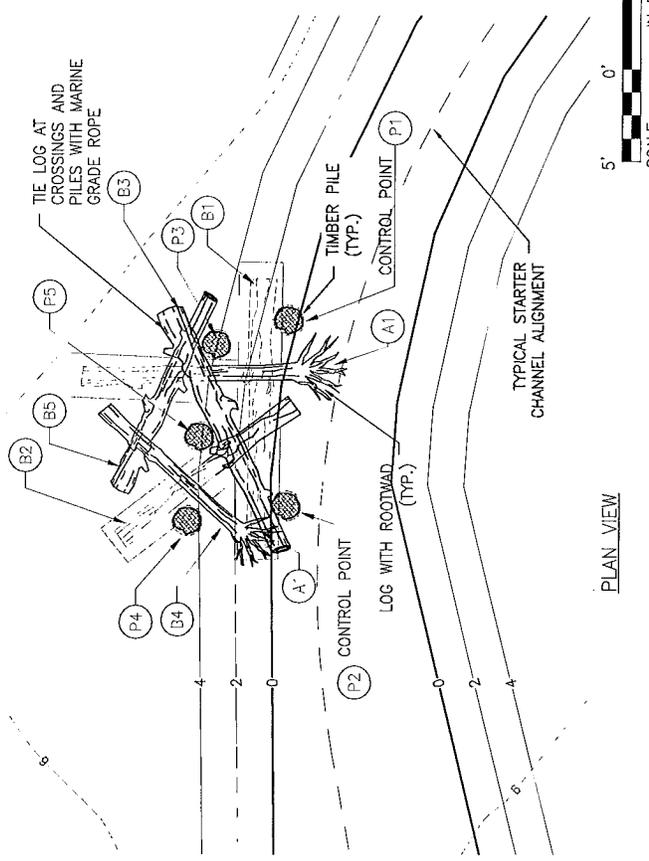
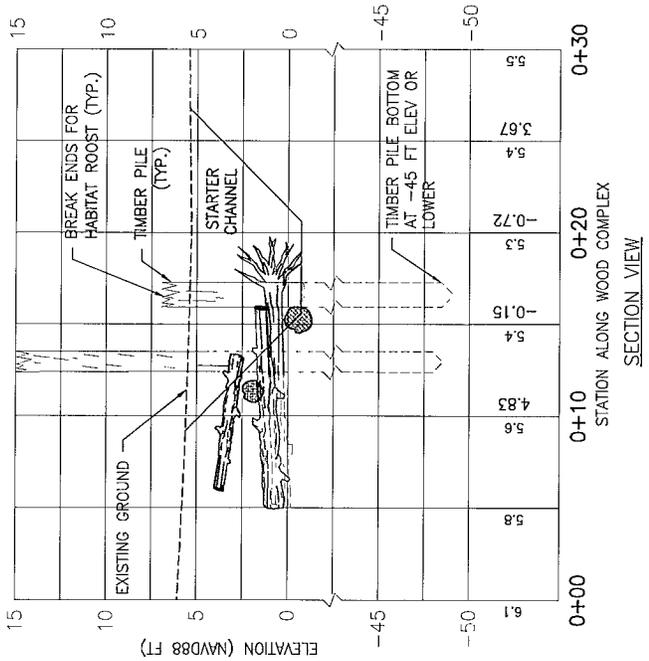
EXISTING DITCH ARMORING

PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LON:122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

RESTORATION AND
 GRADING DETAILS
 SMITH ISLAND
 ESTUARY RESTORATION PROJECT

PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
 NEAR: CITY OF EVERETT
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 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS

SHEET 27 OF 30
 DATE: MARCH 2015



TYPICAL 5-PILE WOOD COMPLEX

GENERAL NOTES

- TYPE A AND B LOG MATERIALS
- THE LOG DIAMETER AT BREST HEIGHT (DBH) SHALL BE MEASURED 4.5 FEET FROM THE BASE END OF THE LOG. LOG DBH FOR SIZE A SHALL MEASURE 18 TO 46 INCHES AND SIZE B SHALL MEASURE 12 TO 18 INCHES.

LEGEND

- (P#) TIMBER PILE
- (A#) TYPE A LOG
- (B#) TYPE B LOG

5-PILE WOOD COMPLEX NOTES

1. INSTALL TIMBER PILES BY VIBRATION. TIMBER PILES SHALL BE EMBEDDED TO ELEV -45 FT NAVD88 OR LOWER. TOP ELEVATIONS WITHIN WOOD COMPLEXES SHALL VARY. ONE TIMBER PILE PER WOOD COMPLEX SHALL HAVE A MINIMUM TOP ELEVATION OF 15.0 FT NAVD88.
2. TRENCH AND INSTALL LOG B1, TRENCH AND INSTALL LOG A1 AND B2 FIRMLY ON LOG B1 AND TIE WITH MARINE GRADE ROPE AT PILES AND LOG CROSSINGS.
3. PLACE LOG B3, B4, AND B5 FIRMLY ON LOWER LOGS, TIE WITH MARINE GRADE ROPE AT PILES AND LOG CROSSINGS, AND BACKFILL.

PURPOSE: ESTUARY RESTORATION

DATUM: NAD83/91 AND NAVD 88

LAT: 48°00'54.18"N LON: 122°09'48.39"W

PROPERTY OWNERS:
SNOHOMISH COUNTY PUBLIC WORKS

RESTORATION AND
GRADING DETAILS

SMITH ISLAND

ESTUARY RESTORATION PROJECT

PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE

NEAR: CITY OF EVERETT

AT: 12TH ST NE

SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.

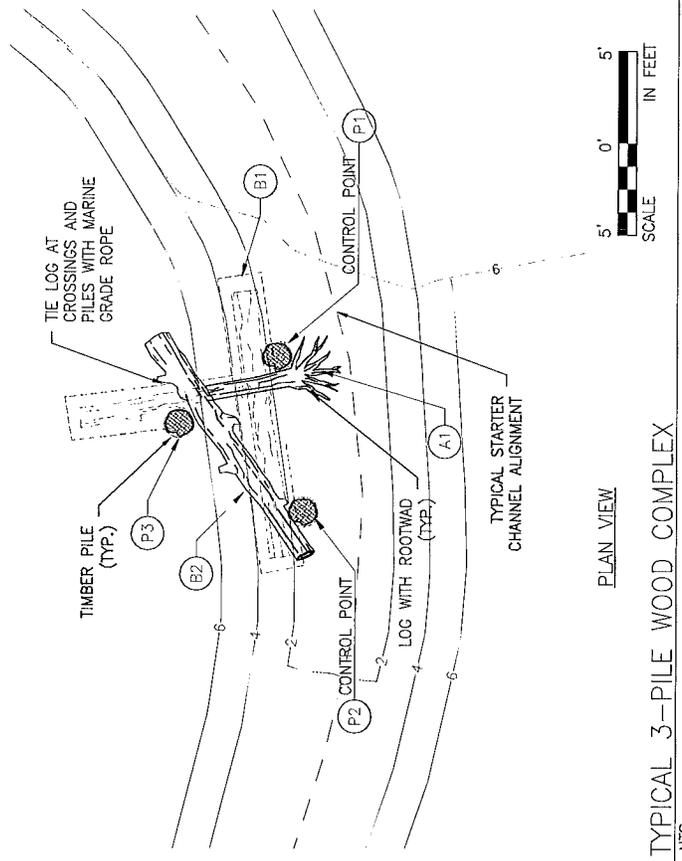
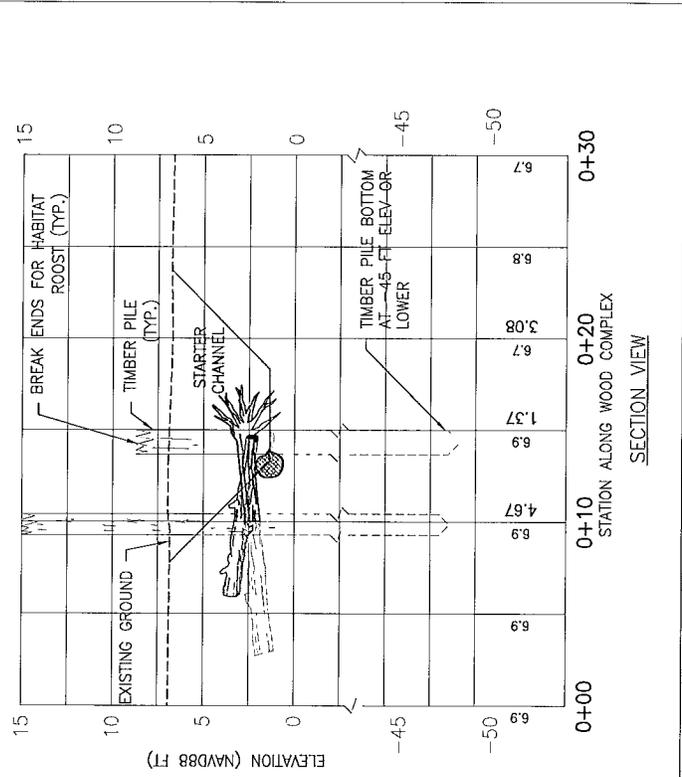
COUNTY OF: SNOHOMISH

STATE: WASHINGTON

APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS

SHEET 28 OF 30

DATE: MARCH 2015



TYPICAL 3-PILE WOOD COMPLEX
 NTS

GENERAL NOTES

- TYPE A AND B LOG MATERIALS
- THE LOG DIAMETER AT BREAST HEIGHT (DBH) SHALL BE MEASURED 4.5 FEET FROM THE BASE END OF THE LOG. LOG DBH FOR SIZE A SHALL MEASURE 18 TO 46 INCHES AND SIZE B SHALL MEASURE 12 TO 18 INCHES.

LEGEND

- (C#) TIMBER PILE
- (A#) TYPE A LOG
- (B#) TYPE B LOG

3-PILE WOOD COMPLEX NOTES

1. INSTALL TIMBER PILES BY VIBRATION. TIMBER PILES SHALL BE EMBEDDED TO ELEV -45 FT NAVD88 OR LOWER. TOP ELEVATIONS WITHIN WOOD COMPLEXES SHALL VARY ONE TIMBER PILE PER WOOD COMPLEX SHALL HAVE A MINIMUM TOP ELEVATION OF 15.0 FT NAVD88.
2. TRENCH AND INSTALL LOG B1. TRENCH AND INSTALL LOG A1 FIRMLY ON LOG B1. AND TIE WITH MARINE GRADE ROPE AT PILES AND LOG CROSSINGS.
3. PLACE B2 FIRMLY ON LOGS A1 AND B1. TIE WITH MARINE GRADE ROPE AT PILES AND LOG CROSSINGS AND BACKFILL TRENCHES WITH EXCAVATED MATERIAL.

PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N LON: 122°09'48.39"W

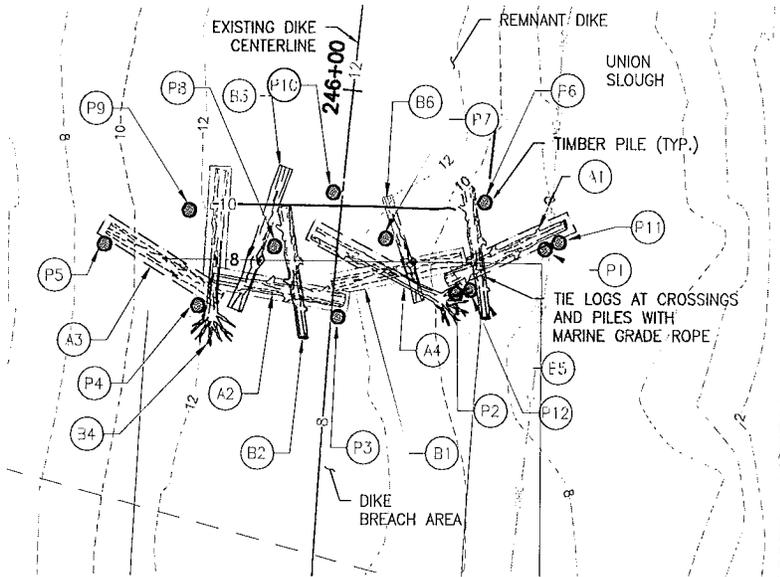
PROPERTY OWNERS:
 SNOHOMISH COUNTY PUBLIC WORKS

RESTORATION AND
 GRADING DETAILS
 SMITH ISLAND
 ESTUARY RESTORATION PROJECT

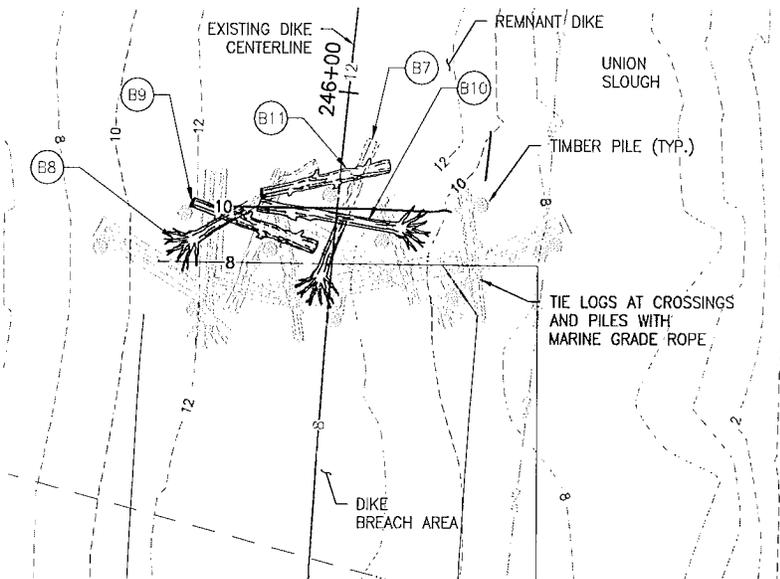
PROPOSED: ESTUARY RESTORATION/ SETBACK DIKE
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 AT: 12TH ST NE
 SEC. 9,10,15 & 16 T. 29N, R.5E, W.M.
 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY PUBLIC WORKS

SHEET 29 OF 30

DATE: MARCH 2015



STEP 1



STEP 2

TYPICAL WOOD REVETMENT DETAIL

GENERAL NOTES

TYPE A AND B LOG MATERIALS

THE LOG DIAMETER AT BREAST HEIGHT (DBH) SHALL BE MEASURED 4.5 FEET FROM THE BASE END OF THE LOG. LOG DBH FOR SIZE A SHALL MEASURE 18 UP TO 46 INCHES AND SIZE B SHALL MEASURE 12 TO 18 INCHES.

EAST WOOD REVETMENT NOTES

STEP 1

1. INSTALL TIMBER PILES P1-P10 BY VIBRATION. TIMBER PILES SHALL BE EMBEDDED TO ELEV -45 FT NAVD88 OR LOWER. TOP ELEVATIONS OF PILES SHALL VARY. ONE PILE PER WOOD REVETMENT SHALL HAVE A MIN. TOP ELEV OF 15 FT NAVD88. BREAK TOPS OF PILES FOR HABITAT ROOSTS.
2. TRENCH AND INSTALL LOGS A1, B1, A2, AND A3. TIE LOGS WITH MARINE GRADE ROPE AS FIELD DIRECTED BY THE ENGINEER.
3. TRENCH AND INSTALL LOGS B2-B6, AND A4 FIRMLY ON TOP OF LOWER LOGS. TIE LOGS WITH MARINE GRADE ROPE. BACK FILL TRENCHES WITH COMMON BORROW.

STEP 2

1. TRENCH AND INSTALL LOGS B7-B8 BY RESTING FIRMLY ON LOWER LOGS. TIE LOGS WITH MARINE GRADE ROPE. BACK FILL TRENCHES WITH EXCAVATED MATERIAL.
2. PLACE LOGS B9-B11 FIRMLY ON LOWER LOGS. TIE WITH MARINE GRADE ROPE AS FIELD DIRECTED BY THE ENGINEER.

LEGEND

- (A#) TYPE A LOG
- (B#) TYPE B LOG



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 ahmedk

PURPOSE: ESTUARY RESTORATION
 DATUM: NAD83/91 AND NAVD 88
 LAT: 48°00'54.18"N
 LON: 122°09'48.39"W
 PROPERTY OWNERS:
 SNOHOMISH COUNTY
 PUBLIC WORKS

RESTORATION AND
 GRADING DETAILS
 SMITH ISLAND
 ESTUARY RESTORATION
 PROJECT

PROPOSED: ESTUARY RESTORATION/
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 NEAR: CITY OF EVERETT
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 COUNTY OF: SNOHOMISH
 STATE: WASHINGTON
 APPLICATION BY: SNOHOMISH COUNTY
 PUBLIC WORKS
 SHEET 30 OF 30 DATE: MARCH 2015