

Salmon Springs Transmission Main Replacement

Habitat Management and Mitigation Plan

City of Sumner, Pierce County, Washington



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Puyallup, WA 98371

June 2015

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1.0 Introduction

This Habitat Management Plan has been prepared for the proposed Salmon Springs Water Transmission Main Replacement Project in accordance with Sumner Municipal Code (SMC) 16.56.080. The Code requires a management plan for any proposed development within 1,000 feet of fish and wildlife habitat areas. These fish and wildlife habitats include¹:

- A. Areas with which federally or state-listed endangered, threatened, or sensitive species of fish, wildlife, or plants have a primary association;
- B. Areas with habitats and species of local importance, including the following:
 - 1. Areas with which state-listed monitor or candidate species or federally listed candidate species have a primary association, and which, if altered, may reduce the likelihood that the species will maintain and reproduce over the long term;
 - 2. Special habitat areas which may provide specific habitats which certain animals and plants require such as breeding habitat, winter range, and movement corridors;
- C. Naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish and wildlife habitat;
- D. Waters of the state, including all water bodies classified by the Washington State Department of Natural Resources water typing classification system as detailed in WAC 222-16-031;
- E. Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity;
- F. State natural area preserves and natural resource conservation areas. (Ord. 2071 § 34, 2003: Ord. 1546 § 1 (part), 1992)

As the proposed project will occur within the buffer of Salmon Tributary, a water of the state and listed spawning habitat for anadromous fish species, a habitat management plan is required. This habitat management plan contains provisions for implementation, monitoring, and maintenance of proposed mitigation commitments developed for the protection of fish and wildlife habitat.

¹ SMC 16.56.050 <http://www.codepublishing.com/wa/sumner/>

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2.0 Project Description

The City of Puyallup is proposing to replace the existing Salmon Springs Water Transmission Main from just below the existing concrete dam to the existing chlorination compound in the City of Sumner, Pierce County, WA. This transmission main is the oldest and most important piece of infrastructure in the City of Puyallup's water system. It was originally constructed in 1906, with the portion just below the concrete dam replaced in 1997. In 2013, Salmon Springs provided nearly 63% of the City's water. Due to the age and critical nature of this transmission main, the City is proposing to construct a new transmission main from the spring source to the existing chlorination compound. This will be accomplished by tying into the 16-inch ductile iron pipe south of the concrete dam that was replaced in 1997 and following the proposed alignment to the existing chlorination compound. The existing portion of the transmission main that will be bypassed will remain in place to maintain service during construction, to provide redundancy in case of a landslide or seismic event, and to minimize ground disturbance and vegetation removal in sensitive areas.

The project is located just north of the confluence of Salmon Tributary and Salmon Creek, starting at the existing chlorination compound approximately 0.1 mile upstream of this confluence. Salmon Tributary enters Salmon Creek at approximately river mile (RM) 0.5 of Salmon Creek. Salmon Tributary runs generally north to south through the project area. The proposed project is located just north of Downtown Sumner in Section 18 of Township 20N and Range 05E (Figures 1 and 2).

Out of the eight (8) alternative alignments analyzed for this project, the proposed alignment results in the least amount of environmental impact (Parametrix 2014). A majority of the new transmission main will be buried underground with only a small portion exposed for an elevated crossing of Salmon Tributary, a spring-fed creek that provides spawning and rearing habitat for anadromous fish species. The proposed alignment would require no in-water work and would not result in any impacts to the creek or the adjacent seepage slope wetland as the pipeline would be buried in a natural upland levee between Salmon Tributary and the adjacent wetland. A small bridge will also be constructed just upstream of the elevated stream crossing, with abutments outside the limits of the ordinary high water mark (OHWM) of Salmon Tributary, to provide construction and maintenance access.

Open trenching will be used for a majority of the proposed alignment. This trenching will result in temporary impacts to stream and wetland buffers, and up to 8 trees will need to be felled. After the new pipeline is constructed, the trench will be backfilled with native material and/or Washington State Department of Transportation (WSDOT) standard trench backfill to allow for movement of shallow groundwater that is often present in the project area. 8,133 sq. ft. (0.19 acre) of vegetated stream/wetland buffer will be permanently impacted due to the proposed anchor blocks for the elevated stream crossing of the pipeline, the proposed access bridge, and maintenance of a 12 ft. tree and shrub-free corridor along the alignment to allow for access to the new transmission main. 4,571 sq. ft. (0.10 acre) of vegetated stream/wetland buffer will be temporarily impacted due to clearing and grubbing.

Mitigation for the anticipated temporary and permanent impacts to stream and wetland buffers will include utilizing all felled trees as large woody debris (LWD) within or directly adjacent to disturbed areas and replanting all temporarily disturbed areas with native riparian plants. In addition, additional buffer will be enhanced or preserved just downstream of the project area. Enhancement would involve

1:1 enhancement to permanent buffer impacts and 0.5:1 enhancement to temporary buffer impacts. This would total 10,419 sq. ft. (0.24 acre) of buffer enhancement along Salmon Creek where the buffer is currently dominated by reed canarygrass (*Phalaris arundinacea*) with minimal native plant cover. Alternatively, preservation would involve preserving Salmon Creek buffer at a 9:1 ratio for permanent buffer impacts and a 4.5:1 ratio for temporary buffer impacts. This would total 93,767 sq. ft. (2.15 acres) of buffer preservation. Trees will be replaced at a rate of at least 3:1 within the buffer enhancement area along Salmon Creek or will be mitigated for by the preservation of 2.15 acres of Salmon Creek buffer, some of which will be forested. Additional trees may also be planted within the area of buffer preservation. With the exception of the buffer preservation option, planted areas will be monitored for a period of up to ten years to ensure compliance with the success standards established in this Habitat Management and Mitigation Plan.

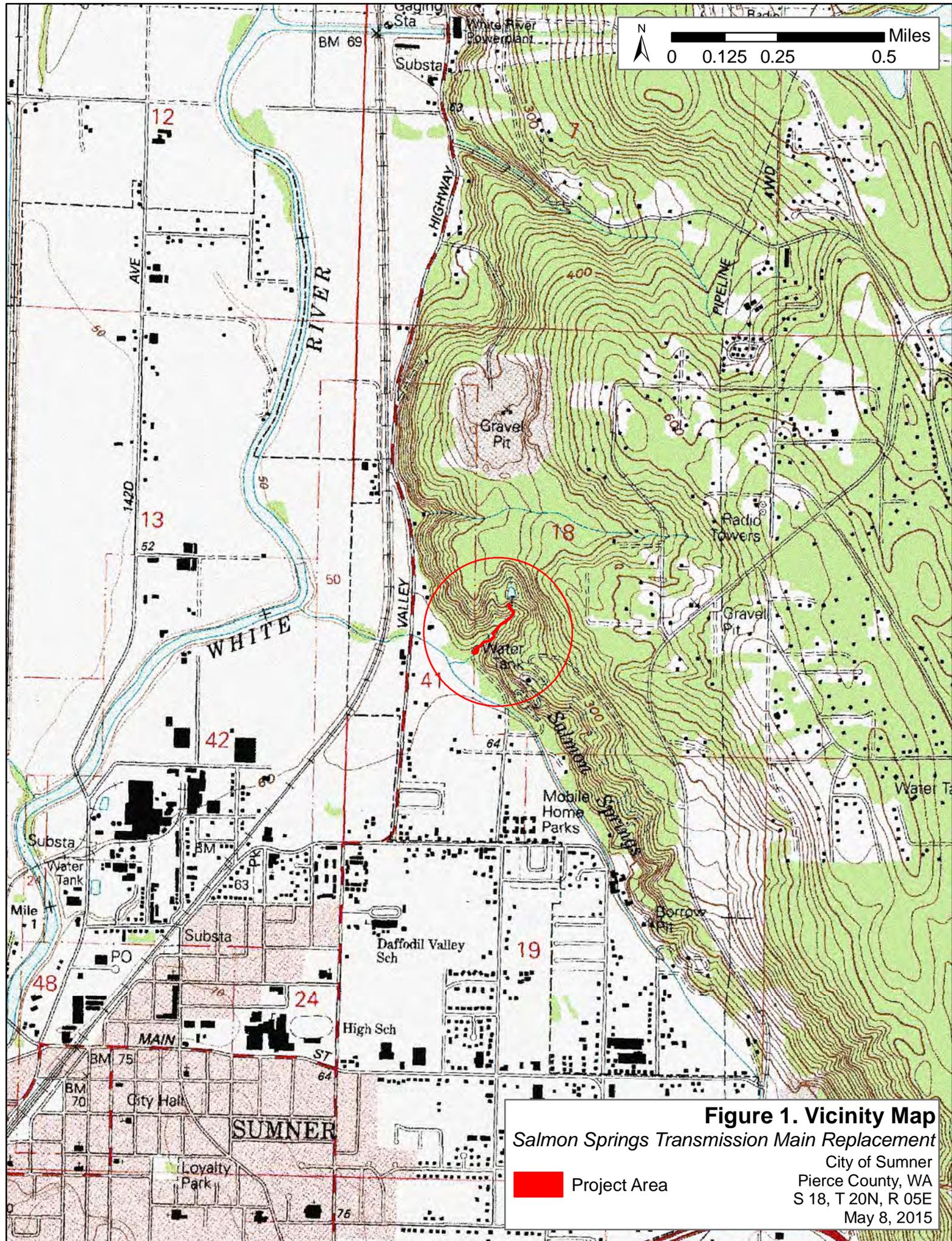
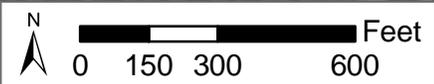


Figure 1. Vicinity Map
Salmon Springs Transmission Main Replacement
 City of Sumner
 Pierce County, WA
 S 18, T 20N, R 05E
 May 8, 2015

 Project Area

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E Valley Hwy

Parker Rd E

50th St E

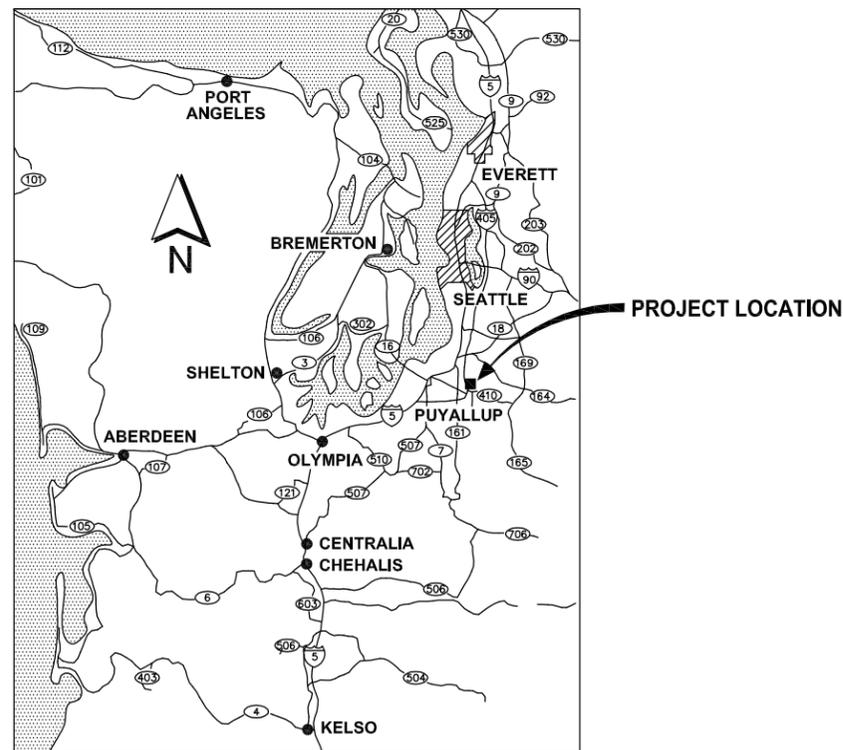
Figure 2. Project Area
Salmon Springs Transmission Main Replacement
City of Sumner
Pierce County, WA
S 18, T 20N, R 05E
May 28, 2015

 Project Area

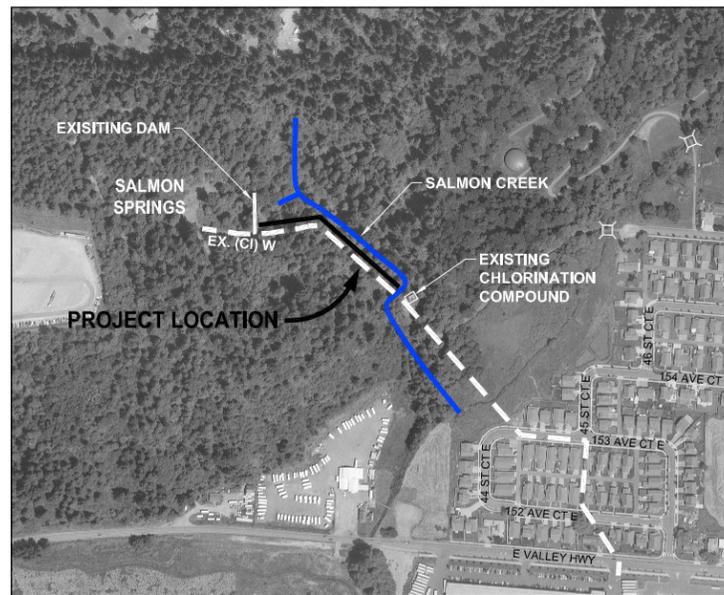
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SALMON SPRINGS TRANSMISSION MAIN REPLACEMENT

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PUYALLUP, WASHINGTON



VICINITY MAP
NO SCALE



LOCATION MAP
NO SCALE

INDEX TO DRAWINGS		
SHT NO.	DWG NO.	SHEET TITLE
GENERAL		
1	G1	TITLE SHEET, LOCATION, SITE, VICINITY MAPS AND INDEX TO DRAWINGS
2	G2	LEGEND, ABBREVIATIONS, AND NOTES (NOT INCLUDED)
3	G3	SURVEY CONTROL SHEET (NOT INCLUDED)
WATER		
4	C1	WATER PLAN AND PROFILE STA 10+00 TO STA 12+50
5	C2	WATER PLAN AND PROFILE STA 12+50 TO STA 15+40
6	C3	WATER PLAN AND PROFILE STA 15+40 TO STA 17+77.82
DETAILS		
7	DT1	MISCELLANEOUS DETAILS
8	DT2	MISCELLANEOUS DETAILS

APPROVED

BY _____
CITY OF PUYALLUP
ENGINEERING DEPARTMENT

DATE _____

NOTE:
This approval is void after 1 year from approval date.
The City will not be responsible for errors and/or omissions on these plans.
Field conditions may dictate changes to these plans as determined by the City Engineer.

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PATH: U:\PSD\Projects\Clients\1895-CityOfPuyallup\216-1895-065-Salmon_Springs\995ves\CADD\DWG\ LAYOUT_G1
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REVISIONS	DATE	BY	DESIGNED
			J. WRIGHT
			E. SOTO
			CHECKED
			APPROVED

**ONE INCH AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY**

FILE NAME
PS01895065-G
JOB No.
216-1895-065
DATE
DECEMBER 2014



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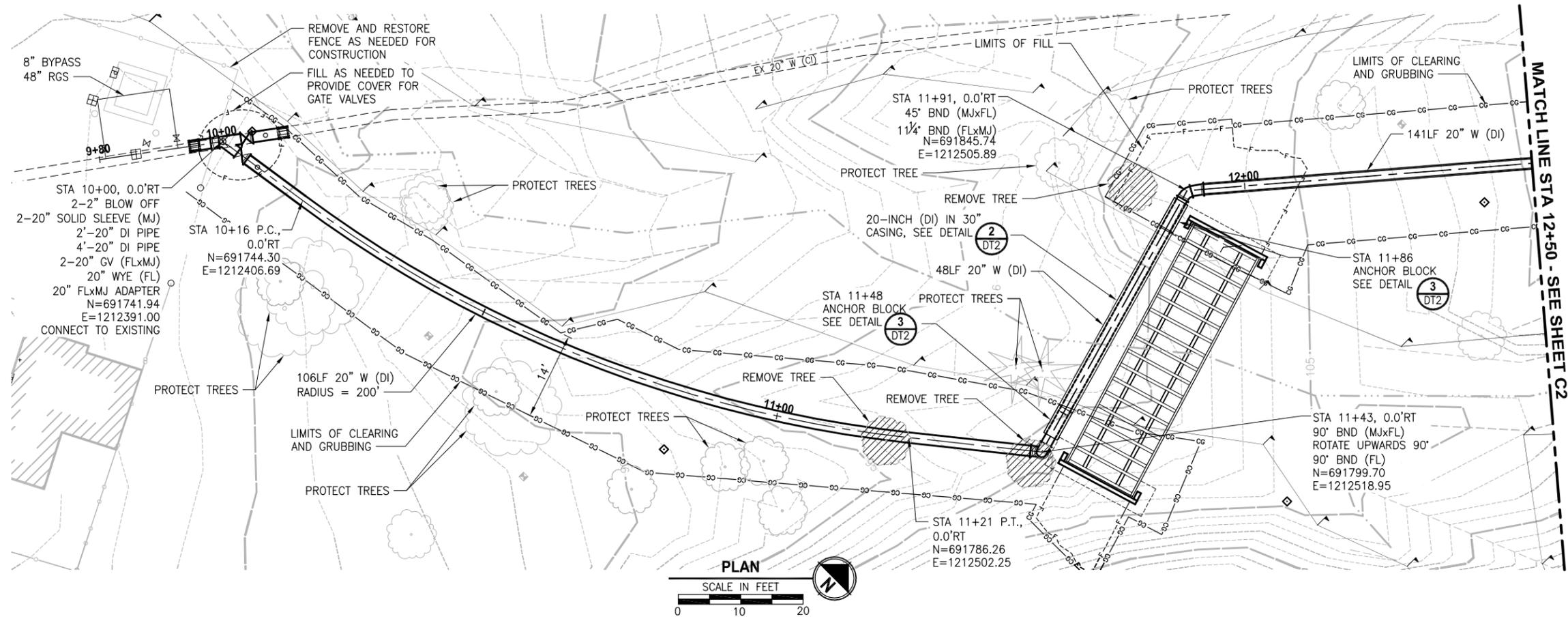
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PROJECT NAME
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REPLACEMENT**

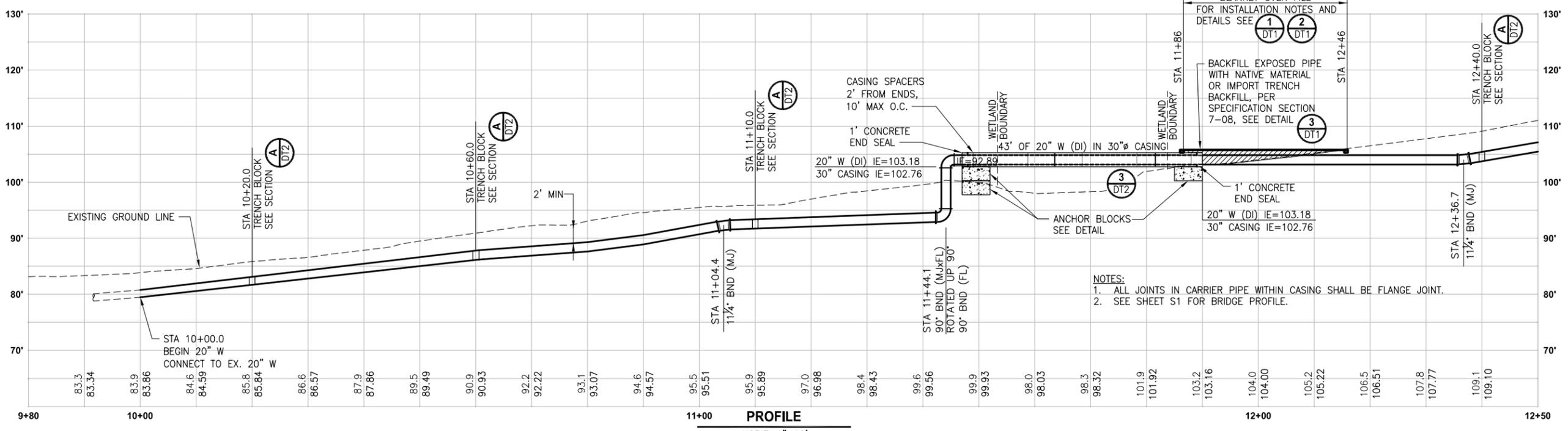
**TITE SHEET, LOCATION,
SITE, VICINITY MAPS,
AND INDEX TO DRAWINGS**

SHEET NO.
1 OF X
G1

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CONSTRUCTION NOTES:
 1. ALL PIPE AND FITTING JOINTS SHALL BE RESTRAINED. SEE SPECIFICATIONS.



NOTES:
 1. ALL JOINTS IN CARRIER PIPE WITHIN CASING SHALL BE FLANGE JOINT.
 2. SEE SHEET S1 FOR BRIDGE PROFILE.

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 NOT FOR CONSTRUCTION

REVISIONS	DATE	BY	DESIGNED
			R. HERMES
			C.D. CLARK
			CHECKED
			APPROVED

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 FILE NAME: PSO1895065-C1
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PRELIMINARY

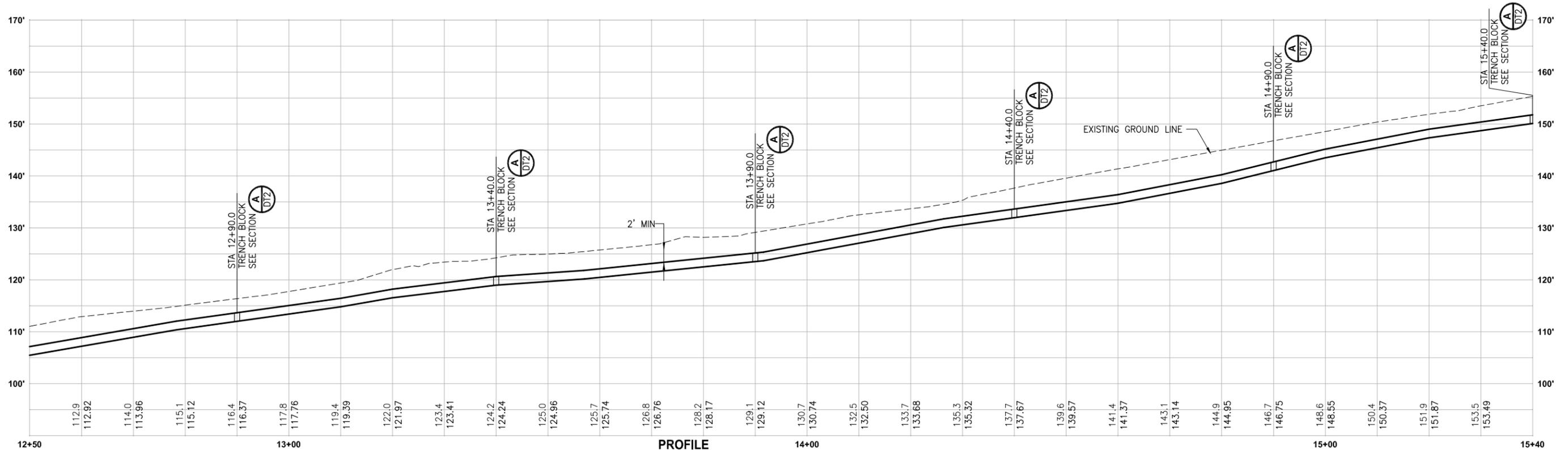
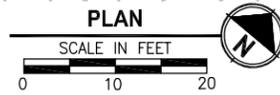
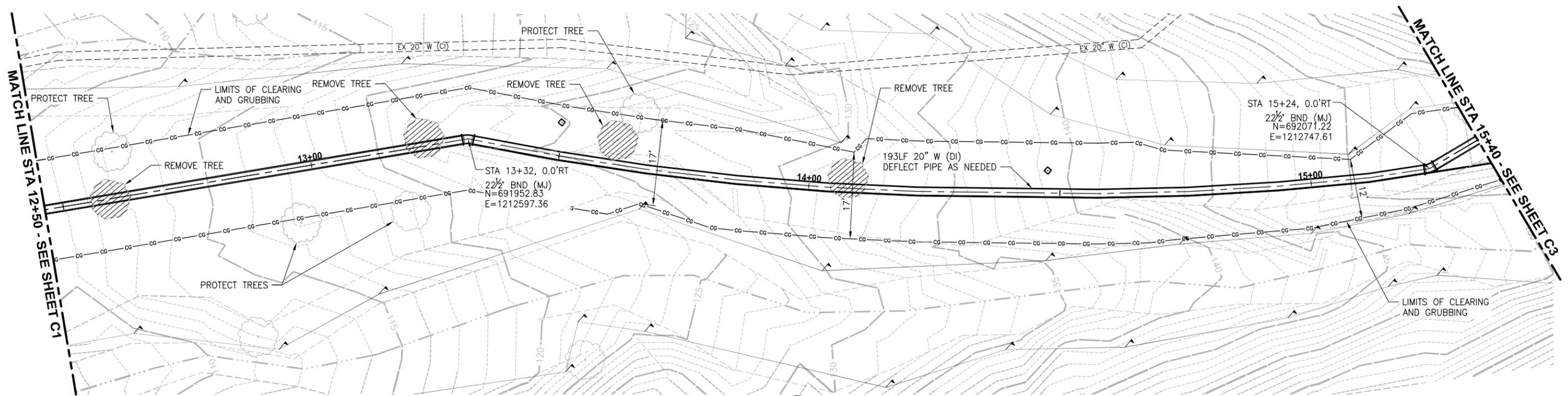
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PROJECT NAME
SALMON SPRINGS TRANSMISSION MAIN REPLACEMENT

SALMON SPRINGS WATER MAIN PLAN AND PROFILE
 STA 10+00 TO STA 12+50

SHEET NO. 4 OF X
C1

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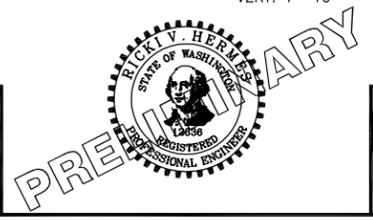


PROFILE
 HORIZ: 1"=10'
 VERT: 1"=10'

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REVISIONS	DATE	BY	DESIGNED
			R. HERMES
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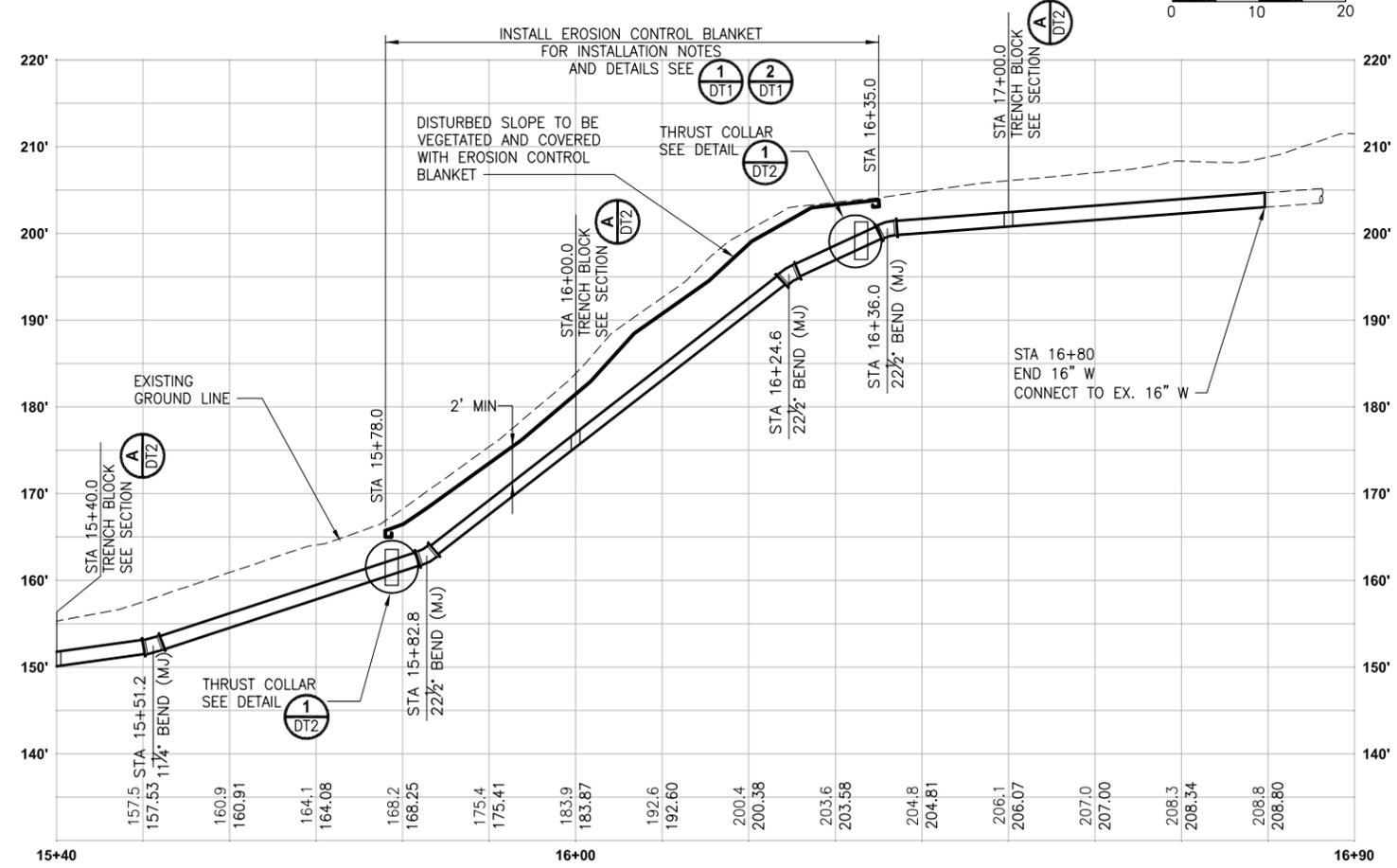
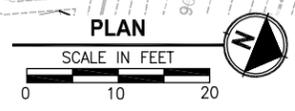
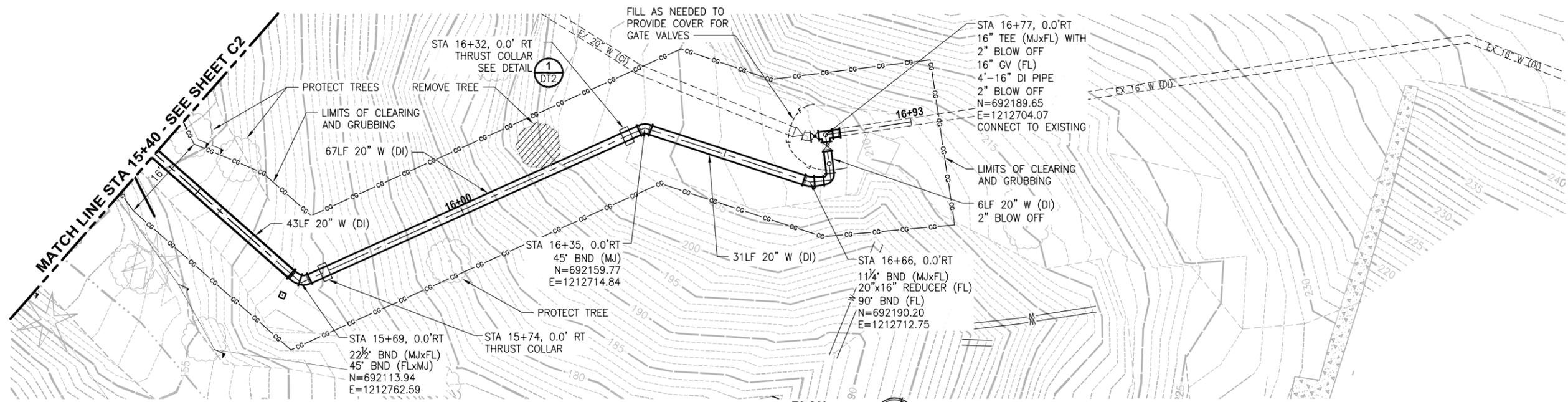
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PROJECT NAME
**SALMON SPRINGS
 TRANSMISSION MAIN
 REPLACEMENT**

**SALMON SPRINGS
 WATER MAIN PLAN AND PROFILE
 STA 12+40 TO STA 15+40**

SHEET NO.
 5 OF X
C2

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PROFILE
 HORIZ: 1"=10'
 VERT: 1"=10'

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			R. RAYMOND
			DRAWN C.D. CLARK
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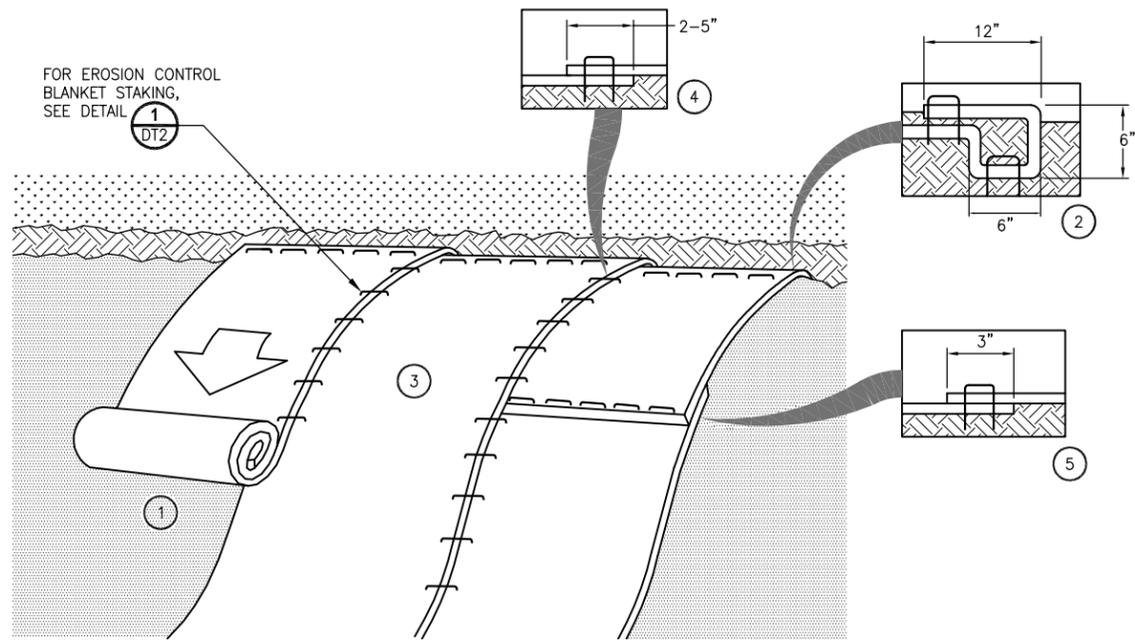
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 REPLACEMENT**

**SALMON SPRINGS
 WATER MAIN PLAN AND PROFILE
 STA 15+40 TO STA 17+77.82**

SHEET NO.
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C3

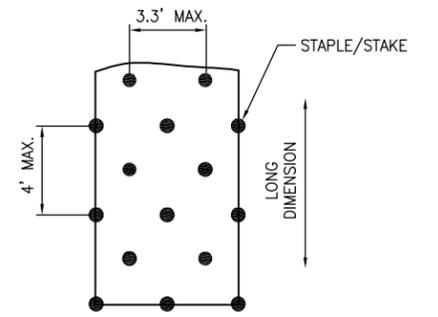
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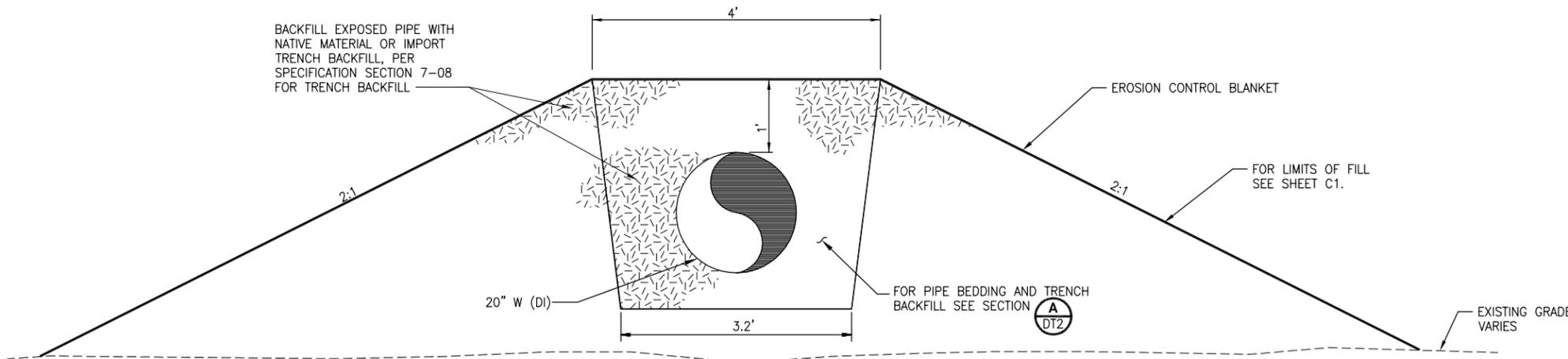
EROSION CONTROL BLANKET PLACEMENT
DETAIL 1
 NO SCALE TYP

EROSION CONTROL BLANKET INSTALLATION NOTES:

- 1 PLACEMENT OF TEMPORARY EROSION CONTROL BLANKET SHALL ONLY BE AFTER PLACEMENT OF SEED AND FERTILIZER. PLACEMENT SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
- 2 TEMPORARY EROSION CONTROL BLANKET SHALL BE INSTALLED FROM TOP OF SLOPE DOWN BY ANCHORING THE BLANKET IN A 6 INCH DEEP BY SIX INCH WIDE TRENCH WITH TWELVE INCHES OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. BLANKET SHALL BE ANCHORED WITH A ROW OF STAPLES/STAKES TWELVE INCHES APART IN THE BOTTOM OF THE TRENCH. TRENCH SHALL BE BACKFILLED AND COMPACTED AFTER STAPLING. SEED SHALL BE APPLIED TO COMPACTED SOIL AND REMAINING TWELVE INCH PORTION OF BLANKET SHALL BE FOLDED BACK OVER SEED AND COMPACTED SOIL. BLANKET SHALL BE SECURED OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED TWELVE INCHES APART ACROSS THE WIDTH OF THE BLANKET.
- 3 BLANKETS SHALL BE ROLLED DOWN THE SLOPE. ALL BLANKETS SHALL BE SECURELY FASTENED TO THE SOIL SURFACE BY PLACING STAPLES/STAKES IN LOCATIONS AS SHOWN IN DETAIL 2.
- 4 THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH A MINIMUM OF 6 INCHES OF OVERLAP OR AS RECOMMENDED BY MANUFACTURER.
- 5 CONSECUTIVE BLANKETS SHALL BE SPLICED END OVER END (SHINGLE STYLE) WITH A MINIMUM OF 6 INCHES OF OVERLAP. STAPLES SHALL BE PLACED THROUGH OVERLAPPED AREA AT A TWELVE INCH SPACING ACROSS THE ENTIRE BLANKET WIDTH.
- 6 IN FIRM SOIL CONDITIONS, STAPLES OR STAKES SHALL BE A MINIMUM OF SIX INCHES IN LENGTH. IN LOOSE SOIL CONDITIONS, STAPLES OR STAKES SHALL BE A MINIMUM OF 12 INCHES IN LENGTH OR AS NECESSARY TO PROPERLY SECURE THE BLANKETS.
- 7 WIDTH OF EROSION CONTROL BLANKET IS WIDTH OF DISTURBED SLOPE (~20').



EROSION CONTROL BLANKET STAKING
DETAIL 2
 NO SCALE



EXPOSED PIPE BACKFILL
DETAIL 3
 NO SCALE TYP

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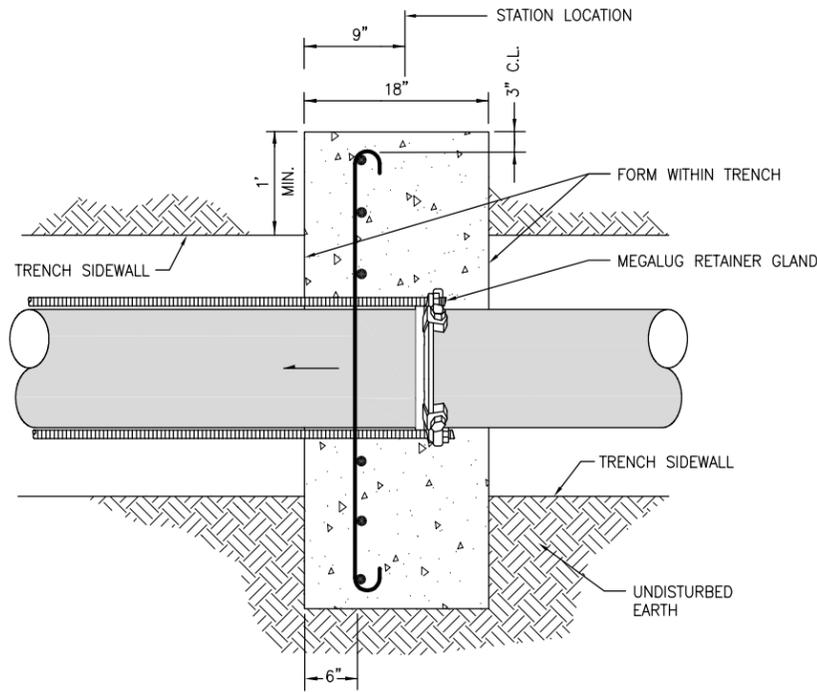
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PROJECT NAME
SALMON SPRINGS TRANSMISSION MAIN REPLACEMENT

MISCELLANEOUS DETAILS

SHEET NO.
 7 OF X
DT1

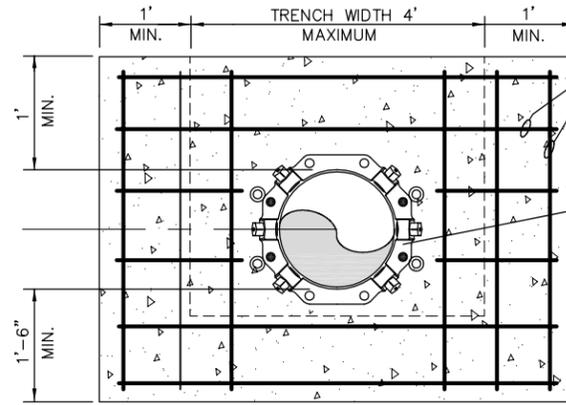
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TOP SECTION VIEW
NOT TO SCALE

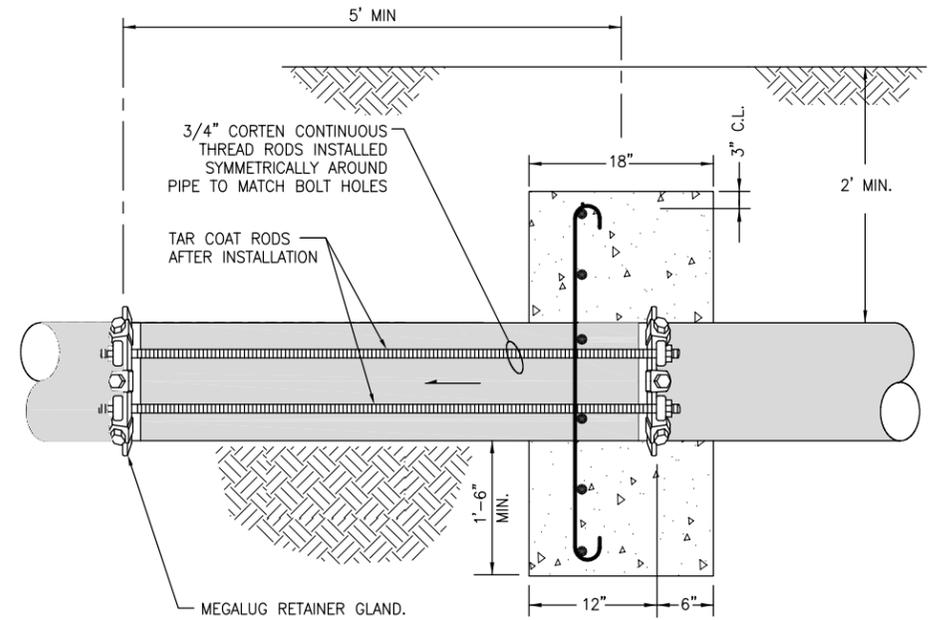
THRUST COLLAR NOTES:

1. CONCRETE SHALL BE 3000 PS COMMERCIAL CONCRETE.
2. REINFORCING BARS SHALL BE DEFORMED BARS AND TIED TOGETHER.
3. PLACE THRUST COLLAR ON ONE FULL JOINT OF PIPE.
4. FORMWORK AT FACE OF ANCHOR WALLS MUST BE REMOVED. BACKFILL AT FACE OF ANCHOR WALL MUST BE COMPACTED TO 95% MAX DRY DENSITY BASED ASTM D1557 PRIOR TO REINSTATING SERVICE OF THE WATER MAIN.



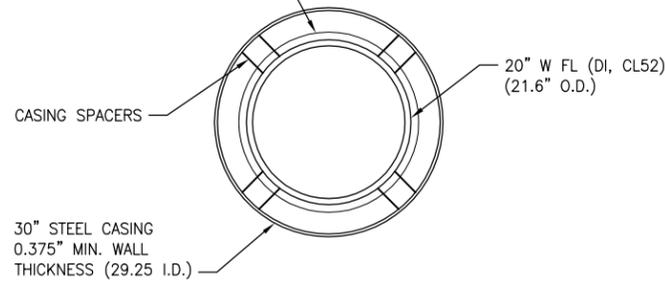
ELEVATION VIEW
NOT TO SCALE

THRUST COLLAR & BLOCKING WITH MEGALUG RETAINER GLAND
DETAIL 1
NO SCALE



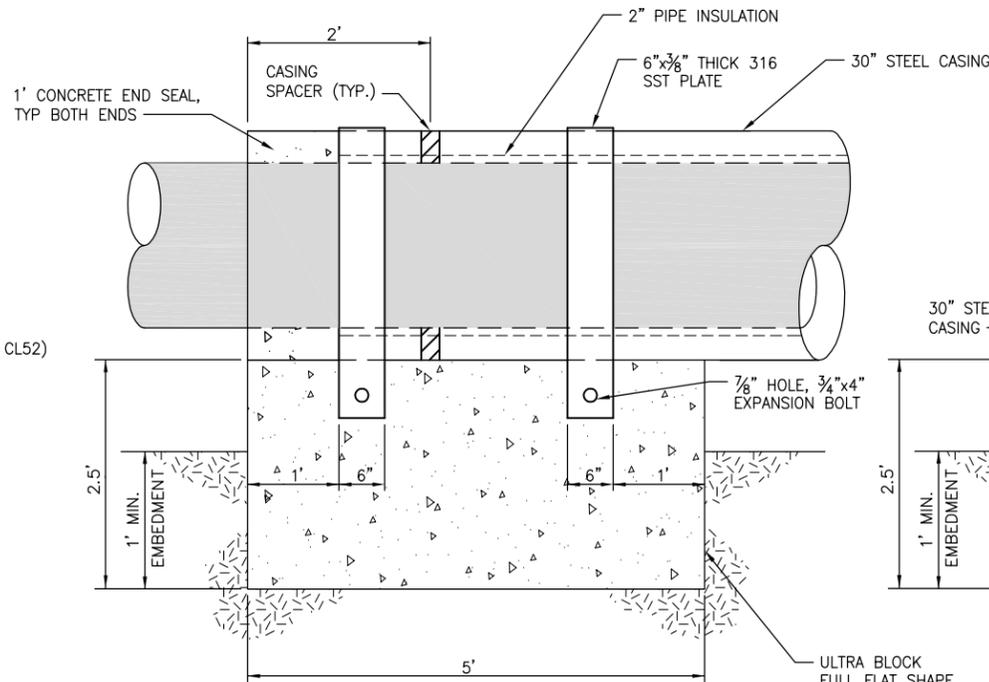
SIDE SECTION VIEW
NOT TO SCALE

2" PIPE INSULATION WITH ALUMINUM JACKETING, (FLG'S EXCLUDED). ATTACH WITH STAINLESS STEEL BAND 1' O.C. PROVIDE STAINLESS STEEL PIPE INSULATION PROTECTION SHIELD WHENEVER PIPE CROSSES A SUPPORTING MEMBER.



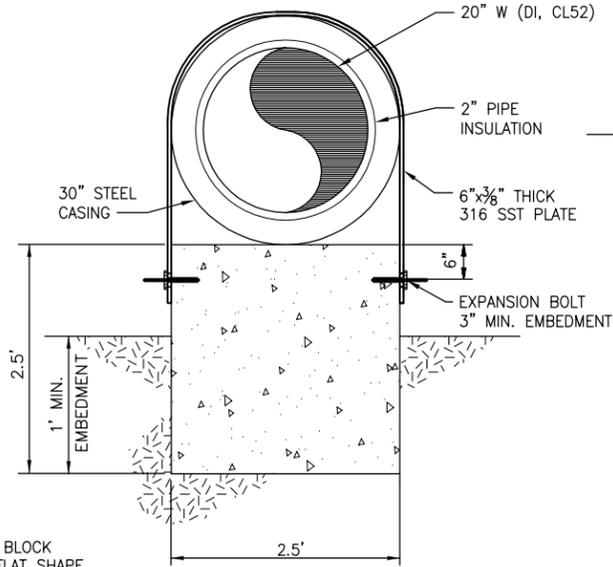
20" W (DI) IN 30" STEEL CASING
DETAIL 2
1"=1'-0" TYP

NOTE:
ALL PIPE JOINTS IN CASING SHALL BE FLANGE JOINT.

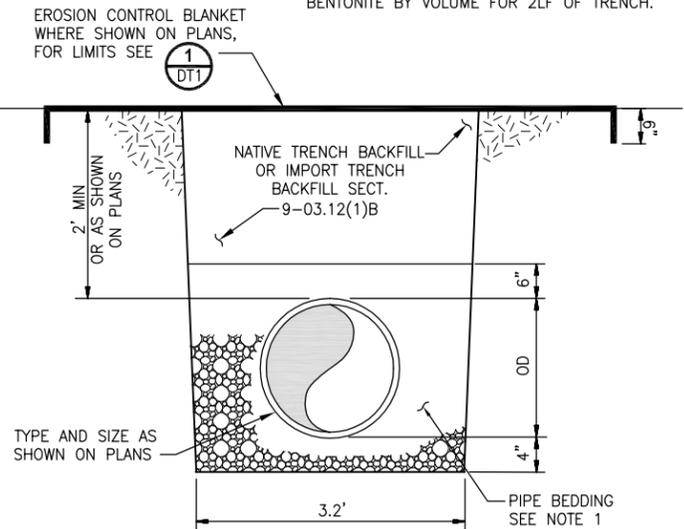


SIDE SECTION VIEW
NOT TO SCALE

ULTRA BLOCK-FULL FLAT ANCHOR BLOCK
DETAIL 3
NO SCALE



ELEVATION VIEW
NOT TO SCALE



TYPICAL WATER TRENCH BACKFILL SECTION
A
NO SCALE TYP

TRENCH BACKFILL NOTES:

1. SELECT NATIVE MATERIAL (1" MINUS) OR CSTC PER SPECIFICATION SECTION 9-03.9(3).
2. FOR TRENCH BLOCK, PLACE BEDDING AMENDED WITH 10% POWDERED SODIUM BENTONITE BY VOLUME FOR 2LF OF TRENCH.

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			DRAWN C.D. CLARK
			CHECKED
			APPROVED

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PROJECT NAME
SALMON SPRINGS TRANSMISSION MAIN REPLACEMENT

MISCELLANEOUS DETAILS

SHEET NO.
8 OF X
DT2

3.0 Existing Environmental Conditions

The proposed project is located adjacent to and over Salmon Tributary, a spring-fed tributary of Salmon Creek. This tributary enters Salmon Creek at RM 0.5 of Salmon Creek, approximately 0.1 mile south of the existing chlorination compound. All of the proposed project occurs within the limits of property owned by the City of Puyallup; however, the project is within the city limits of the City of Sumner and is therefore subject to the City of Sumner's critical areas regulations. According to City of Sumner mapping, the project area is within parcels zoned as Low Density Residential 12000 (LDR-12) and within an area designated as Public-Private Utilities & Facilities according to the City of Sumner's Comprehensive Plan (City of Sumner 2014a, 2014b).

The proposed project area is located within the steep west-facing slope situated between Lake Tapps and the Kent-Auburn Valley. Elevation of the site varies from 80 ft. at the existing chlorination compound to 210 ft. just below the existing concrete dam. Soils within the proposed project area are mapped completely as Xerochrepts, 45 to 70% slopes. This soil type is characterized by deep gravelly sandy loam that formed from sandy and gravelly outwash and/or glacial till on valley sides (NRCS 2013). The upper layer of soil contains a significant amount of loose gravel and stream cobbles.

Much of the project vicinity is characterized by shallow groundwater that is the results of groundwater seeps in the area. In addition to the ordinary high water (OHW) of Salmon Tributary, there is a large seepage wetland that has been delineated adjacent to the proposed transmission main alignment. A natural upland levee separates most of this wetland from the OHW of Salmon Tributary. The proposed alignment will follow this levee in order to avoid impacts to the creek or the adjacent wetland.

The proposed project area is located within the western hemlock (*Tsuga heterophylla*) major vegetation zone (Franklin and Dyrness 1973). The project area is characterized by an overstory of red alder (*Alnus rubra*), western red cedar (*Thuja plicata*), and bigleaf maple (*Acer macrophyllum*) with a shrub layer dominated by Indian plum (*Oemleria cerasiformis*), salmonberry (*Rubus spectabilis*), Himalayan blackberry (*Rubus armeniacus*), red osier dogwood (*Cornus sericea*), vine maple (*Acer circinatum*), English holly (*Ilex aquifolium*), red elderberry (*Sambucus racemosa*), and devil's club (*Oplopanax horridus*). The herbaceous layer within the upland levee and surrounding upland slopes is dominated by pacific waterleaf (*Hydrophyllum tenuipes*), pacific bleeding heart (*Dicentra formosa*), stinging nettle (*Urtica dioica*), and western sword fern (*Polystichum munitum*) while the herbaceous layer within the delineated seepage wetland is dominated by watercress (*Nasturtium officinale*), water parsley (*Oenanthe sarmentosa*), lady fern (*Athyrium filix-femina*), horsetail (*equisetum spp.*), creeping buttercup (*Ranunculus repens*), reed canarygrass (*Phalaris arundinacea*), and skunk cabbage (*Lysichiton americanus*).

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Photo 1. Salmon Tributary at proposed elevated stream crossing and access bridge location



Photo 2. Upland levee proposed for open trenching of the new transmission main

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Photo 3. Salmon Tributary adjacent to the northern corner of the existing chlorination compound



Photo 4. Delineated seepage wetland north and west of Salmon Tributary and the upland levee

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4.0 Species and Habitat Presence

Habitat within 1,000 feet of the project area includes Salmon Tributary and the adjacent forested riparian habitat on both sides of the creek. There is also a seepage wetland adjacent to the proposed project area that drains to Salmon Tributary just west of the existing chlorination plant.

4.1 Salmon Tributary

Salmon Tributary is a small perennial spring-fed creek that is a right bank tributary to Salmon Creek. It originates from Salmon Springs and other adjacent groundwater seeps where it flows through a relatively steep ravine. Salmon Tributary is located within the Puyallup-White River Watershed (WRIA 10). It flows into Salmon Creek at approximately RM 0.5 of Salmon Creek. From this confluence, Salmon Creek flows approximately 0.5 miles west to the White River. Salmon Tributary is not listed by the Washington State Department of Ecology (WSDOE) for impaired water quality. However, the reach of Salmon Creek at the confluence of Salmon Tributary is 303(d) listed as a Category 5 water for Fecal Coliform (WSDOE 2012).

The lower 700 ft. of the creek above the confluence with Salmon Creek has been described as highly productive spawning habitat for anadromous fish species due to the abundance of spawning gravels, low stream gradient, and groundwater influence (Marks et al. 2014). Trees within the riparian area of the creek consist primarily of red alders with a few western red cedars and English hollies. Shrubby vegetation along the banks consists primarily of red osier dogwood, red elderberry, salmonberry, vine maple, Indian plum, and devil's club. Recruitment of large woody debris (LWD) within the creek is generally limited and undersized (Marks et al. 2014).

According to the Washington Department of Fish and Wildlife (WDFW), Salmon Tributary may be utilized by pink salmon (odd year), coho salmon, fall chinook salmon, fall chum, and winter steelhead (WDFW 2015a, 2015b). Chum are the most abundant species to spawn in the creek, with some Coho also using the lower 250 feet of the creek to spawn (Marks et al. 2014). Of the species potentially occurring in Salmon Tributary, Chinook salmon (Puget Sound ESU), and steelhead (Puget Sound DPS) are listed as threatened under the Endangered Species Act. Critical habitat for Chinook salmon and steelhead has not been designated within Salmon Tributary or Salmon Creek (NMFS 2015). The riparian buffer of Salmon Tributary provides habitat for an array of small mammals, amphibians, and birds.

Any anadromous fish that may utilize Salmon Tributary likely only occur in the lower gradient portion of the creek below the existing chlorination compound. Above the chlorination compound, starting at approximately RM 0.13, the stream gradient increases significantly and there are several cascades that are barriers to fish passage. WDFW data only shows documented or modeled anadromous fish occurrence in approximately the lower 400 ft. of the creek, while the Puyallup Tribal Fisheries' Annual Salmon, Steelhead, and Bull Trout Report for the Puyallup/White River Watershed (2013-2014) mentions that the flow in Salmon Tributary is likely too low to provide spawning access to Chinook salmon and steelhead. However, Chinook salmon have been documented spawning at the mouth of Salmon Tributary (Marks et al. 2014).

No work is proposed below the OHWM of Salmon Tributary. There is one proposed elevated stream crossing just upstream of the existing chlorination compound. In addition, there is a small bridge proposed just upstream of the elevated stream crossing to provide construction and maintenance

access. Anchor blocks for the stream crossing and the bridge approaches/abutments will be located completely outside the limits of the OHWM and temporary erosion and sediment control (TESC) best management practices (BMPs) will be installed prior to ground disturbance and maintained throughout construction to avoid any impacts to Salmon Tributary. An environmental inspector will also be on site during all work within the buffer of Salmon Tributary and the adjacent seepage wetland to ensure that there are no aquatic impacts during construction.

According to the Washington Department of Natural Resources (DNR) water typing map and the City of Sumner's Fish and Wildlife Habitat Area Map, Salmon Tributary is listed as a Type 5 non-fish bearing water (formerly type N) (DNR 2007, City of Sumner 2003). However, data from WDFW and Puyallup Tribal Fisheries suggest that anadromous fish utilize up to the lower 700-foot reach of the creek (WDFW 2015a, Marks et al. 2014). Therefore, Salmon Tributary would be more appropriately classified as a Type 3 fish-bearing water within the lower 700 feet of the creek where the gradient is low enough to allow spawning access. Above this point, the creek would more appropriately be classified as a Type 4 water as it has perennial flow (WAC 222-16-031). According to Sumner Municipal Code (SMC) 16.56.100, Type 4 waters have a standard regulated buffer of 50 feet while Type 3 waters have a standard regulated buffer width of 100 feet. As temporary and permanent vegetation removal is required within these regulated buffers to construct along the proposed alignment, restoration of temporarily disturbed stream buffer and enhancement/preservation of additional buffer along Salmon Creek, just downstream of the project area, is proposed in this Habitat Management and Mitigation Plan to mitigate for temporal and permanent loss of buffer functions in accordance with SMC 16.56.080.

4.2 Wetlands

One seepage wetland (Wetland A) was identified and delineated north and west of Salmon Tributary. This wetland corresponds to an area of wetland indicated on the City of Sumner's wetland inventory map (City of Sumner 2007). It is not indicated on the National Wetland Inventory (USFWS 2013). Wetland A drains directly to Salmon Tributary, just west of the existing chlorination compound. As this wetland has a significant nexus with Salmon Tributary, and Salmon Tributary eventually contributes to the White River approximately 0.6 miles west of the project site, Wetland A is regulated as a "Water of the U.S." by the U.S. Army Corps of Engineers (Corps) under the Clean Water Act. As a Category III wetland, Wetland A has a standard regulated buffer width of 75 feet (SMC 16.46.150(A)). Wetland A and its buffer provide habitat for an array of small mammals, amphibians, and birds.

5.0 Project Effects on Fish and Wildlife Habitat

The proposed project will not require any in-water work to avoid potential impacts to anadromous fish or their habitat. Anchor blocks for the proposed elevated stream crossing and approaches/abutments for the proposed access bridge will be constructed outside the limits of the delineated OHWM of Salmon Tributary. Appropriate TESC BMPs will be utilized during construction to prevent impacts to Salmon Tributary.

As there will be no work within the wetted channel of the creek, construction will likely not result in temporary increases in sedimentation/turbidity. Any incidental increases in sedimentation/turbidity should not exceed 200 feet in extent, which is within the limits set forth in the *Water Quality Standards of Surface Waters of the State of Washington* and the NPDES permit issued by the WSDOE.

Up to 8 trees (all red alders) will be removed for open trenching of the proposed transmission main (Figure 4). All of these trees are within the regulated buffer of Salmon Tributary and Wetland A. This tree removal will result in a loss of shading above Salmon Tributary and the adjacent riparian habitat. However, a majority of trees along Salmon Tributary will be preserved during construction and all felled trees will be utilized as LWD within the riparian zone of Salmon Tributary to provide shade and organic input to the creek. No coniferous trees will be impacted by the proposed project. All trees to be felled are red alders which are already overly abundant within the project vicinity, and therefore there will be no loss of tree diversity. Felled trees will be replaced at a rate of at least 3:1 in the enhanced buffer of Salmon Creek that is currently dominated by reed canarygrass or will be mitigated for by the preservation of 2.15 acres of buffer along Salmon Creek, some of which will be forested habitat.

There will also be disturbance and/or removal of up to 12,704 sq. ft. (0.29 acre) of herbaceous and shrub-scrub vegetation due to clearing / grubbing for the proposed alignment (Figure 4). 8,133 sq. ft. (0.19 acre) of vegetated stream/wetland buffer will be permanently impacted due to the proposed anchor blocks for the elevated stream crossing of the pipeline, the proposed access bridge, and maintenance of a 12-foot tree and shrub-free corridor along the alignment to allow for maintenance access to the new transmission main. An additional 4,571 sq. ft. (0.10 acre) of vegetated stream/wetland buffer will be temporarily impacted due to clearing and grubbing.

The temporarily impacted stream/wetland buffers will be replanted with native shrub and herbaceous plants immediately following pipeline construction. The 12-foot tree and shrub-free corridor will also be covered with erosion control blankets and seeded with a native seed mix immediately following pipeline construction. 10,419 sq. ft. (0.24 acre) of Salmon Creek buffer may also be enhanced just downstream of the project area. This riparian buffer is currently dominated by reed canarygrass and Salmon Creek is 303(d) listed for fecal coliform. Conversion of this buffer to a diversity of native tree, shrub, and herbaceous plant species would improve wildlife habitat within the local subwatershed. Alternatively, 2.15 acres of buffer along Salmon Creek may be purchased and placed in a conservation easement to mitigate for the proposed permanent and temporary buffer impacts.

Long-term impacts to wildlife and habitat will be minimized by undergrounding the proposed transmission main. This will preserve wildlife movement within the riparian buffer of Salmon Tributary. In addition, by avoiding impacts to Salmon Tributary and the adjacent seepage wetland, potential fish and amphibian breeding habitat will be preserved.

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-  Proposed Transmission Main Centerline
-  Clearing and Grubbing Limits
-  Existing Gravel
-  Existing Concrete
-  Existing Building
-  Chainlink Fence
-  Deciduous Tree
-  Coniferous Tree
-  Wetland A
-  Wetland A Buffer
-  Salmon Tributary OHW
-  Salmon Tributary Buffer
-  Permanent Stream Buffer Impact (8058 sq. ft.)
-  Temporary Stream Buffer Impact (4476 sq. ft.)
-  Permanent Wetland Buffer Impact (75 sq. ft.)
-  Temporary Wetland Buffer Impact (95 sq. ft.)
-  Trees to be Removed

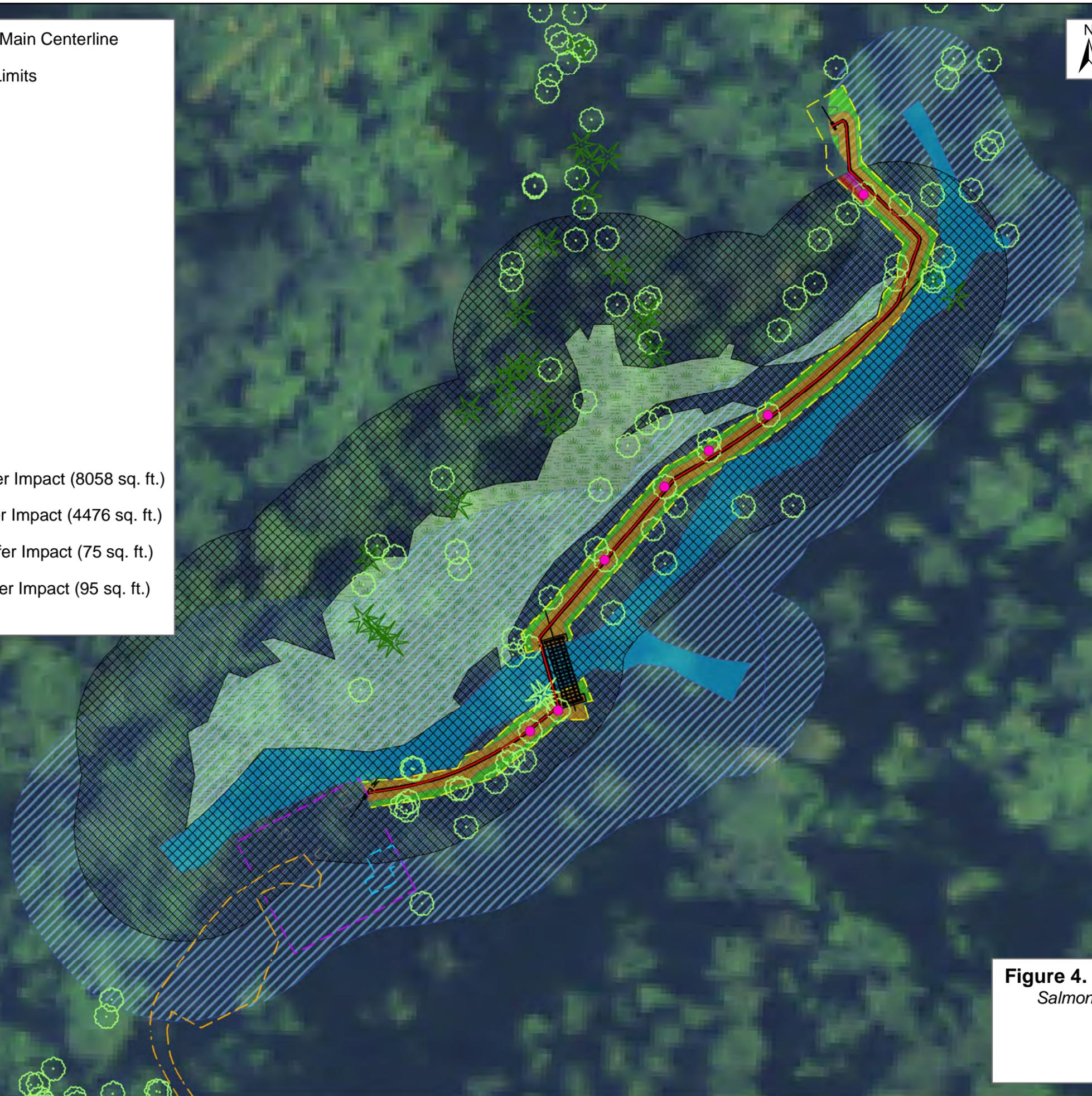
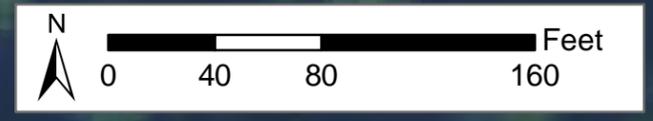


Figure 4. Buffer Impacts and Tree Removal
Salmon Springs Transmission Main Replacement
 City of Sumner
 Pierce County, WA
 S 18, T 20N, R 05E
 June 5, 2015

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6.0 Minimization and Mitigation Measures

6.1 Minimization/Avoidance of Impacts

Of the eight alternatives analyzed for this project, the proposed alignment results in the least amount of environmental impacts (Parametrix 2014). The proposed transmission main will only cross Salmon Tributary once and construction of the elevated crossing will result in avoidance of impacts to Salmon Tributary. The proposed access bridge will also prevent impacts to Salmon Tributary as it will eliminate the need for equipment to enter the creek and it will be constructed of precast abutments and a prefabricated deck that will avoid any in-water work. All impacts to the adjacent seepage wetland will also be completely avoided by constructing the transmission main along a natural upland levee. Avoidance of stream and wetland buffers is not possible due to the steep ravine between Salmon Springs and the existing chlorination plant.

During the course of the entire project, standard best management practices (BMPs) and other minimization measures will be implemented prior to, and maintained throughout, construction in order to avoid or reduce impacts to fish and wildlife habitat. These BMPs and minimization measures include, but are not limited to:

- Installation of appropriate sediment and erosion control devices where appropriate, including:
 - Silt fencing
 - Straw wattle
 - Covering unworked and unstabilized areas
 - Hydroseeding
 - Erosion control blankets
- Timing over-water work during an approved work window to minimize potential inadvertent impact to fish and/or fish habitat
- Limiting ground disturbance to the minimum amount necessary and marking clearing limits with high visibility fencing and/or silt fencing
- Protecting all trees that will not be felled throughout construction
- Implementation of a Spill Prevention, Control and Countermeasures (SPCC) plan to ensure that all potential contaminants are properly contained and handled
- Implementation of a Stormwater Pollution Prevention Plan (SWPPP) and monitoring requirements in accordance with the NPDES permit
- Preventing equipment from entering the water
- Containing and properly disposing of all waste materials in accordance with federal, state, and local laws
- Having an environmental inspector on site during all work within critical areas to ensure that there are no impacts to Salmon Creek or the adjacent wetland

6.2 Mitigation for Temporary and Permanent Impacts

To mitigate for temporary loss of vegetation within the regulated buffers of Salmon Tributary and Wetland A outside of the 12-foot tree and shrub-free corridor, these temporarily disturbed areas will be seeded and planted with native shrub and herbaceous species. Clearing and grubbing for the proposed

project should eliminate most noxious weeds within the proposed restoration areas on either side of the transmission main alignment. Additional spot control may be needed prior to planting. If limited chemical application is deemed necessary, weeds will be sprayed with an herbicide approved by the WSDOE for aquatic use and will be applied by a licensed applicator.

All bare areas will be hydro-seeded with native herbaceous species as soon as possible after ground disturbance is complete in a given area. Refer to Table 1 for seeding specifications. Native species were chosen based on their suitability for the project area and their wildlife value.

Table 1: Buffer Restoration Seed Mix

Scientific Name	Common Name	Indicator Status	# PLS/ acre
<i>Agrostis exarata</i>	Spike Bentgrass	FACW	5
<i>Calamagrostis canadensis</i>	Canada Reed	FACW	5
<i>Danthonia californica</i>	California Oatgrass	FACU	10
<i>Deschampsia cespitosa</i>	Tufted Hairgrass	FACW	10
<i>Elymus glaucus</i>	Blue Wildrye	FACU	35
<i>Festuca rubra</i>	Native Red Fescue	FAC	35

Native shrubs and herbaceous species will also be planted within the 4,571 sq. ft. (0.10 acre) temporarily-impacted buffer. Shrubs will be planted on 5 ft. centers and herbaceous plants will be planted on 3 ft. centers. Species were chosen based on their occurrence within the existing buffer of Salmon Tributary as well as their value to wildlife. Refer to Table 2 for planting specifications.

Table 2: Buffer Restoration Planting

Scientific Name	Common Name	Indicator Status	Planting Density	Proportion of Planting in Strata (%)	Size of Plants
<u>Shrubs:</u>					
<i>Rubus spectabilis</i>	Salmonberry	FAC	5' on center	25	1 gallon
<i>Sambucus racemosa</i>	Red Elderberry	FACU	5' on center	25	1 gallon
<i>Acer circinatum</i>	Vine Maple	FAC	5' on center	25	1 gallon
<i>Oemleria cerasiformis</i>	Indian Plum	FACU	5' on center	25	1 gallon
<u>Herbs:</u>					
<i>Polystichum munitum</i>	Sword Fern	FACU	3' on center	100	1 gallon

In accordance with SMC 16.20.090, all planted shrubs will be at least 18 inches in height. 3-inch deep, 3-foot diameter mulch rings will be added around all planted shrubs. Herbivory guards will be installed

around larger shrubs as well. An irrigation system will be installed and implemented to ensure survival of restoration plantings if necessary.

Removed trees will be utilized as LWD along the wetted channel of Salmon Tributary as deemed suitable. This will provide improved habitat conditions in the form of cover, pools, and prey sources. The installation of LWD and native plantings will provide increased opportunity for LWD recruitment, natural shading, organic litter input, bank stabilization, and wildlife habitat. Those trees that are not used as LWD along the wetted channel will be used as LWD within the restored or enhanced buffer areas.

While the 12-foot corridor along the proposed alignment will be stabilized with erosion control blankets and seeded with a native seed mix (Table 1), no shrubs or trees will be planted to preserve maintenance access to the new transmission main. As such, 8,133 sq. ft. (0.19 acre) of vegetated stream/wetland buffer will be considered permanently impacted by the proposed project. In order to mitigate for these permanent impacts along with the loss of trees within the temporarily-disturbed buffer, additional buffer will be enhanced or preserved just downstream of the project area.

Enhancement would involve 1:1 enhancement to permanent buffer impacts and 0.5:1 enhancement to temporary buffer impacts. This would total 10,419 sq. ft. (0.24 acre) of buffer enhancement along Salmon Creek, approximately 0.1 mile south of the project area, where the buffer is currently dominated by reed canarygrass (*Phalaris arundinacea*) with minimal native plant cover. Preservation would involve preserving Salmon Creek buffer at a 9:1 ratio for permanent buffer impacts and a 4.5:1 ratio for temporary buffer impacts. This would total 93,767 sq. ft. (2.15 acres) of buffer preservation. Trees will be replaced at a rate of at least 3:1 within the buffer enhancement area along Salmon Creek or will be mitigated for by the preservation of 2.15 acres of Salmon Creek buffer, some of which will be forested. Additional tree planting may be done in the area of preserved buffer to provide additional mitigation for lost trees within the buffer of Salmon Tributary.

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6.3 Monitoring and Maintenance

All restoration and/or enhancement areas will be monitored for a period of ten years, or until success standards have been met. This is in accordance with the requirements of SMC 16.16.060(I)(10). Upon project completion, an “As Built” report will be submitted to the City of Sumner documenting the final design of the restoration and/or enhancement areas. This report will include both the proposed planting plan and the “As Built” planting plan showing densities, sizes, and locations of planted vegetation as well as which nurseries supplied the plants, the time of plantings, locations of reference points established as photo points, and sampling plot locations. It will also provide an analysis of any changes to the mitigation plan that occurred during construction.

Approval of the “As Built” report will establish the beginning of the monitoring period. A site visit will be made the summer after planting and survival rates of plantings will be assessed. Formal monitoring procedures will be performed in years one, two, three, five, seven and ten after initial acceptance of the “As Built” report. Successful mitigation will be measured by attainment of the performance standards described in this habitat management plan document.

The variables that will be measured during each monitoring year include stem density of woody plants and percent cover of herbaceous, shrub, and tree strata within each established sampling plot. Photo points will also be established to create a representative view of the entire planted restoration area. Coordinates for these photo points will be provided in the “As Built” report. Photos will be taken at every photo point in each cardinal direction (N, S, E, and W) during each monitoring year. Panoramic photos will also be created showing as much of the restoration/enhancement areas as possible. These photos will be submitted with each monitoring report.

Sampling plots will be randomly established throughout the restoration/enhancement areas. Coordinates for these sampling plots will be provided in the “As Built” report. Three plots will be randomly established in the proposed buffer restoration area, with three additional plots established in the enhancement area if enhancement is chosen over preservation as compensation for temporary and permanent buffer impacts. These sampling plots will be 10 feet by 10 feet square plots demarcated in the field with a steel post as the center of the plot. Some of the plot centers will likely be used as photo points.

Formal monitoring will be performed during the growing season in years one, two, three, five, seven, and ten after approval of the “As Built” report. Monitoring reports will be submitted to the City of Sumner before the end of each monitoring year. Monitoring reports will be prepared as described in SMC 16.16.060(I)(10).

The City of Puyallup will be responsible for the long-term maintenance of the restoration and/or enhancement sites after the monitoring period has concluded. Site inspections will occur every 8 years at the same time the City of Sumner completes required Growth Management Act (GMA) updates per RCW 36.70A.130(5)a. Management/maintenance activities will include the inspection of mitigation site planting areas to assess plant survival with replacement as necessary. Pierce County listed noxious weeds will also be assessed and controlled as necessary. Trash will also be removed, vandalism will be repaired, and signage/fencing will be repaired/replaced as necessary. Long-term maintenance and management will be funded by the City of Puyallup.

6.4 Performance Standards and Contingency Plan

6.4.1 Performance Standards

The following performance standards provide quantifiable standards to measure mitigation success. Mitigation will be deemed successful when the restoration areas exhibit all of the Year 10 performance standards (success standards) below. In accordance with SMC 16.20.090, during monitoring years 1 and 2 all planted trees and shrubs will exhibit 100% survival. The contractor will be responsible for replacing any dead plants during these first two years. Herbaceous cover will also have attained complete coverage within one growing season. If not, any areas of bare soil will be reseeded with appropriate native species. The following performance standards will be met during each respective monitoring year:

Year 1 Performance Standards

- 100% plant survival
- 100% coverage of herbaceous groundcover
- Less than 20% aerial coverage of all noxious weeds, 0% coverage of Class A noxious weeds
- Installed habitat features secure and functioning

Year 2 Performance Standards

- 100% plant survival
- Less than 20% aerial coverage of noxious weeds, 0% coverage of Class A noxious weeds
- Installed habitat features secure and functioning

Year 3 Performance Standards

- 5 woody stems per 100 sq. ft.
- Less than 20% aerial coverage of noxious weeds, 0% coverage of Class A noxious weeds
- Installed habitat features secure and functioning

Year 5 Performance Standards

- 35% aerial coverage of woody plants
- Less than 20% aerial coverage of noxious weeds, 0% coverage of Class A noxious weeds
- Installed habitat features secure and functioning

Year 7 Performance Standards

- 50% aerial coverage of woody plants
- Less than 20% aerial coverage of noxious weeds, 0% coverage of Class A noxious weeds
- Installed habitat features secure and functioning

Year 10 Performance Standards/Success Standards

- 70% aerial coverage of woody plants
- Less than 20% aerial coverage of noxious weeds, 0% coverage of Class A noxious weeds
- Installed habitat features secure and functioning

6.4.2 Contingency Plan

The following contingency actions may occur if deemed necessary to promote successful development of the site:

Failure to meet a 100 percent survival rate at any of the aforementioned sites within two years after planting will result in the following contingency actions:

Replanting will be conducted to replace all dead woody (tree/shrub) plantings.

Failure to meet the aforementioned aerial cover or stem density performance measures in a given year within planted areas will result in the following contingency actions:

A review of vegetation management will be conducted with the resource agencies and the City of Sumner to determine a corrective course of action if the aerial coverage or stem density performance measures are not met.

Failure to meet non-native invasive species performance measures and standards in a given year at a given site will result in the following contingency actions:

The area in question will receive biological and/or mechanical weed control and if deemed necessary. Chemical applications will be made by licensed applicators with a valid aquatic endorsement in accordance with Department of Ecology guidelines.

Significant mortality due to herbivory will result in the following contingency action:

Herbivory guards will be added to any new plantings.

Any revisions to the mitigation plan will be coordinated with and approved by the resource agencies and the City of Sumner prior to implementation.

7.0 Conclusion

While the proposed project is anticipated to have short-term impacts on wildlife habitat/buffer functions adjacent to Salmon Tributary, the minimization and mitigation strategies presented in this Habitat Management and Mitigation Plan should result in no long-term net loss of habitat/buffer functions within and adjacent to the proposed project area. The buffer enhancement or preservation that will be used as compensatory mitigation for unavoidable temporary and permanent buffer impacts will result in long-term improved habitat along the Salmon Creek corridor. No temporary or permanent in-water structures are being proposed; however, there will be some work over Salmon Tributary during construction of the proposed elevated stream crossing and access bridge. There are listed fish species that could potentially be present within the lower portion of the project area; therefore above-water work will only occur during approved work windows and various minimization measures have been incorporated into the project to avoid impacts to aquatic habitat.

There are no sensitive terrestrial species known to occupy the area within 1,000 feet of the project. While there is one Category III seepage wetland adjacent to the project area, the project has been designed to not impact this wetland. Appropriate temporary sediment and erosion control BMPs and construction measures will be implemented and maintained throughout construction to minimize/prevent impacts to Salmon Tributary and the adjacent wetland. Temporarily disturbed areas will be restored upon project completion by replanting native shrubs and herbaceous plant species. In addition, 0.24 acre of Salmon Creek buffer will be enhanced or 2.15 acres of Salmon Creek buffer will be preserved to provide compensatory mitigation for the loss of vegetation within the buffers of Salmon Tributary and the adjacent wetland. Habitat value will be preserved with the planting of a variety of site-appropriate native shrubs, planting of native grass species, the removal of noxious weeds, and the installation of large woody debris.

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