



ENVIRONMENTAL ASSESSMENT

**Shoalwater Bay Indian Tribe RAISE Loop Project
Tokeland, Washington**

**Lead Agency: Federal Highways Administration, Tribal
Transportation Program**

**Cooperating Agencies: Bureau of Indian Affairs, Northwest Region
Shoalwater Bay Indian Tribe**

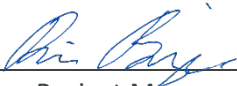
August 12, 2026

Prepared for

Red Plains Engineering

Environmental Assessment Shoalwater Bay Indian Tribe RAISE Loop Project Tokeland, Washington

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EXECUTIVE SUMMARY

This Environmental Assessment (EA) analyzes the potential impacts of the Shoalwater Bay Indian Tribe (SBIT) RAISE Loop Project (Proposed Action) in accordance with the National Environmental Policy Act (NEPA) and the requirements identified in 23 Code of Federal Regulations (CFR) 771. The Proposed Action includes a total of 3.15 miles of improvements to existing and new roadway, along with the construction of stormwater infrastructure, sidewalks, and various utilities.

The Proposed Action is located on Tribal and Tribal trust land in Sections 2, 3, and 4 Township 14N, Range 11W and Section 33, Township 15N, Range 11W in Pacific County, Washington. The Proposed Action is receiving funds from the Federal Highway Administration (FHWA), which will act as the lead agency for this NEPA review. As the Proposed Action occurs on Tribal Trust lands, the Bureau of Indian Affairs will be the cooperating agency in the NEPA review process.

The implementation of the Proposed Action using federal funding triggers FHWA's NEPA compliance review of the project (42 US Code § 4321- 4347) and associated regulations found in 40 CFR 1500-1508 (as amended) and 43 CFR 46. Funding for the Proposed Action has been granted through the US Department of Transportation: Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant program. Additional federal agency involvement is anticipated as the Proposed Action occurs primarily on Tribal trust land and may impact established rights-of-way, and from the US Army Corps of Engineers, which will issue the Clean Water Act Permits associated with Proposed Action activities.

The SBIT, as the co-lead agency; the FHWA, as the lead federal agency; and the BIA, as the cooperating agency have determined that this EA and the Proposed Action are in compliance with NEPA and all other applicable federal laws and regulations, and that with the prescribed mitigation, minimization, and best management practices detailed within this environmental review, there would be no significant impacts to the human environment that would require development of an Environmental Impact Statement.

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APPENDICES

Appendix	Title
A	RAISE Loop 90 Percent Plan Set
B	North Cove 90 Percent Plan Set
C	Culvert Basis of Design Memorandum
D	US Fish & Wildlife Service Section 107 Concurrence Letter
E	Bureau of Indian Affairs Section 106 Concurrence Letters

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LIST OF ABBREVIATIONS AND ACRONYMS

AWMS	Advanced Wetland Mitigation Site
BA	biological assessment
BIA	Bureau of Indian Affairs
BMP	best management practice
CAVFS	compost-amended vegetated filter strip
CFR	Code of Federal Regulations
CY	cubic yard
CZM	coastal zone management
CSZ	Cascadia Subduction Zone
DAHP	Washington State Department of Archaeology and Historic Preservation
DNR	Washington State Department of Natural Resources
Ecology	Washington State Department of Ecology
EFH	essential fish habitat
EPA	US Environmental Protection Agency
ESA	Endangered Species Act
FHWA	Federal Highway Administration
ft	feet/foot
HGM	hydrogeomorphic
Landau	Landau Associates, Inc.
LF	linear feet
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NWIFC	Northwest Indian Fisheries Commission
OHWM	ordinary high water mark
project	RAISE Loop project
project area	RAISE Loop Project Area
Proposed Action	RAISE Loop project
reservation	Shoalwater Bay Indian Reservation
SBIT	Shoalwater Bay Indian Tribe
SHPO	Washington’s State Historical Preservation Office
SWIFD	Statewide Washington Integrated Fish Distribution
USACE	US Army Corps of Engineers
USFWS	US Fish & Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish & Wildlife
WRIA	Water Resource Inventory Area

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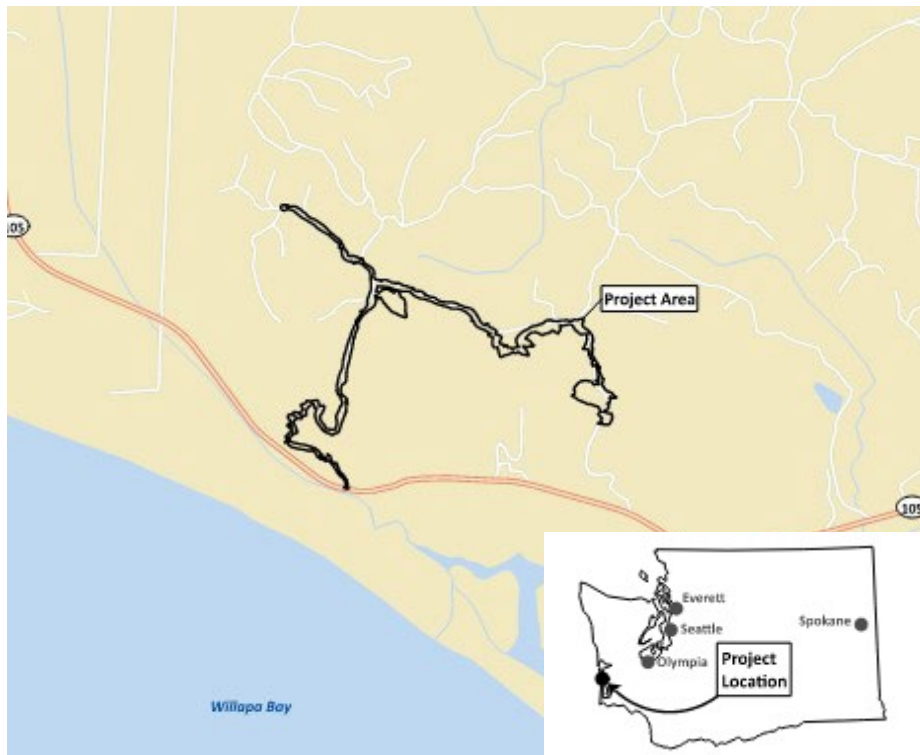
1.0 INTRODUCTION

The Shoalwater Bay Indian Tribe (SBIT) is proposing to construct the RAISE Loop project (Proposed Action; project), consisting of roadway improvements on forested Tribal land located north of Highway 105 near Tokeland, WA (Figure 1). The Proposed Action includes the North Cove Roadway project and the RAISE Loop Roadway project. These two projects were originally developed independently but were subsequently joined for funding, planning, permitting, and construction and are collectively now referred to as the RAISE Loop project. Landau Associates, Inc. (Landau) was retained to complete this Environmental Assessment (EA) for the SBIT to help facilitate the NEPA review process.

The project will create a safe and readily accessible tsunami evacuation route for Tribal and other community members. The project is the first step in a multi-phased master plan identified within the Shoalwater Bay Indian Tribe Rising: Master Plan (SBIT 2025). The goal of the master plan is to eventually relocate Tribal residences and critical facilities to upland locations that are not at risk of flooding, sea level rise, and earthquake-triggered tsunamis.

The project will involve the improvement of existing gravel service roads and the construction of 3.15 miles of a 24-foot (ft)-wide roadway. The roadway construction will provide a 5-ft-wide attached sidewalk and include the installation of utilities (electric, water, sewer, telecommunications, stormwater) to facilitate potential development in higher-elevation areas of the Shoalwater Bay Indian Reservation (reservation).

Figure 1. Project Vicinity Map



2.0 PURPOSE AND NEED

The following sections detail the purpose and need of the Proposed Action. While the current project is only the first phase of a larger development effort that will last decades, subsequent phases and developments are dependent on the completion of the currently proposed action. As such, the purpose and need discussions below are focused on both the current project and future phases that have yet to be designed.

2.1 Purpose

The purpose of the Proposed Action is to immediately provide a safe evacuation route for the Tribe and surrounding residents of Tokeland, Washington in the event of a tsunami or extensive flooding. In the event of an earthquake-triggered tsunami, there are minimal safe routes for residents to get above tsunami elevations. This project would allow for both automotive and foot traffic to move out of areas that will, according to computer models, be completely destroyed.

This project also serves as the first phase of a multi-decade plan to establish a safe, long-term, and resilient community location for the SBIT that permanently eliminates the immediate and escalating threats to public health, safety, and infrastructure posed at the existing reservation location. These risks include coastal erosion, flooding, sea-level rise, and earthquake-triggered tsunamis. As detailed within Shoalwater Bay Indian Tribe Rising: Master Plan, the project aims to provide a sustainable living environment that restores safe residential housing, administrative offices, community infrastructure, and essential public utilities outside of vulnerable hazard zones that cannot be easily mitigated.

2.2 Need

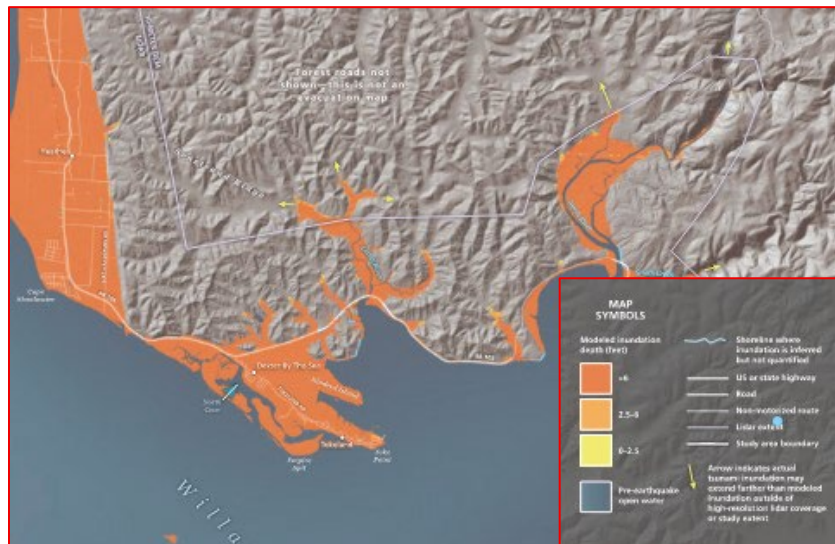
The need for emergency evacuation routes and eventual relocation is driven by increased risks associated with sea-level rise, chronic flooding, and the potential for catastrophic tsunami impacts generated by an earthquake along the Cascadia Subduction Zone (CSZ).

Sea-level rise and associated shoreline erosion have been persistent and well-documented challenges in the Willapa Bay area. Historically, Cape Shoalwater served as a natural barrier protecting the entrance to Willapa Bay; however, it has receded approximately 2.16 miles since 1876. A 2019 study conducted by the SBIT found that the mouth of Willapa Bay is experiencing one of the most rapid rates of erosion along the Pacific Coast (SBIT 2019). This ongoing erosion, combined with documented sea-level rise, poses a significant threat to the SBIT community, much of which is situated within the low-lying areas of the reservation.

The most critical driver for the project is the need to reduce the substantial risk to life, infrastructure, and cultural resources posed by tsunami hazards. In addition to tsunamis generated by distant seismic events, SBIT faces an acute threat from a potential CSZ earthquake occurring off the coasts of northern California, Oregon, and Washington. Physical scientists have predicted that there is up to a 25 percent chance that the CSZ will produce a magnitude 9 earthquake in the next 50 years (Chen et al. 2021). Numerous tsunami inundation models indicate the SBIT community could experience water depths ranging from 17 to 22 ft following a major CSZ event. Furthermore, the estimated time between the

onset of earthquake shaking and tsunami arrival is approximately 15 minutes, providing minimal time for evacuation (SBIT 2019).

Figure 2. Tsunami Inundation Map



The consequences of a CSZ-generated tsunami would be devastating to SBIT. In addition to the significant risk to human life, critical Tribal infrastructure, services, and economic resources would likely be destroyed. The earthquake is also anticipated to cause up to 8.5 feet of coastal subsidence. Given the existing elevations of Tribal residences and infrastructure, this level of subsidence would further increase long-term vulnerability to storm surge, tidal inundation, and chronic flooding that would likely make the current Tribal developments uninhabitable.

3.0 ALTERNATIVES

During a National Environmental Protection Act (NEPA) project kickoff meeting and subsequent follow-up emails with Federal Highway Administration (FHWA) staff, it was confirmed that a formal analysis of design alternatives was not required. This determination is likely based on the Bureau of Indian Affairs (BIA) NEPA Guidebook (BIA 2012), which indicates that only the Proposed Action needs to be considered when there are no unresolved conflicts regarding alternative uses of available resources. At this time, there are currently no unresolved conflicts regarding the utilization of existing Tribal resources for the proposed project, and alternatives are limited to the Proposed Action and No Action as described below.

3.1 Proposed Action

The Proposed Action consists of the following:

- 3.15 miles of paved, 2-lane roadway
- 2.29 miles of attached, 5-ft-wide sidewalk
- Total area within construction/grading limits = approximately 52 acres
- Approximately 695,000 cubic yards (CY) of cut and 653,000 CY of fill
- 11.90 acres of newly created impervious surface
- Washington Department of Ecology (Ecology)-compliant vegetative filter strips for stormwater treatment of new roads with no outfalls to surface waters
- Underground utilities within the roadway alignment including electricity, water, telecommunications, stormwater, and sewer
- 144 new light poles for roadway illumination
- Installation of four new and two replacement drainage culverts

The proposed project and associated actions are the only alternative that will meet the purpose of the project while also satisfying the primary criteria used in locating the project. These criteria include:

1. Land Ownership: The entire project is located on SBIT reservation land or Tribal trust land.
2. Existing Developments: The project is in close proximity to existing Tribal development and population centers.
3. Long-term Safety: The project area is located outside of tsunami impact zones and high-liquefaction, geologic hazard areas.
4. Cultural Significance: The project is in close proximity to culturally and historically significant areas and traditional hunting and fishing grounds.

Details of the Proposed Action are further described below.

3.1.1 Roadway Improvements

The proposed roadway improvements will include paving existing gravel roads and establishing a new road alignment in select areas. Project plans for the entirety of the project are presented in Appendices A and B. The topography of the project area ranges from nearly flat to very steep and follows a natural ridgeline. The project will construct a total of 3.15 miles of 2-lane asphalt road with a total width of 24 ft.

The road will have two different typical sections depending on location along the alignment. The primary difference in typical sections is the presence of a roadside ditch that will convey stormwater flows. Due to existing contours and elevations, the construction of roadside ditches will require greater amounts of fill in some areas, and stormwater will sheet-flow to the forest floor in these areas. The two typical sections are shown in Figures 3 and 4 below.

Figure 3. RAISE Loop Typical Section

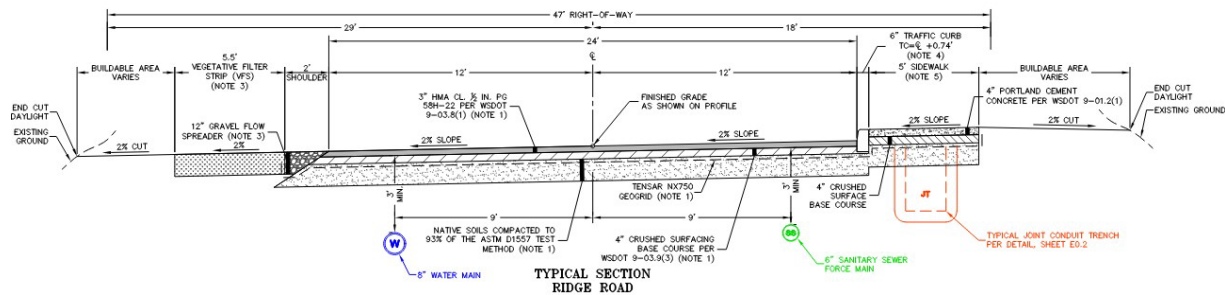
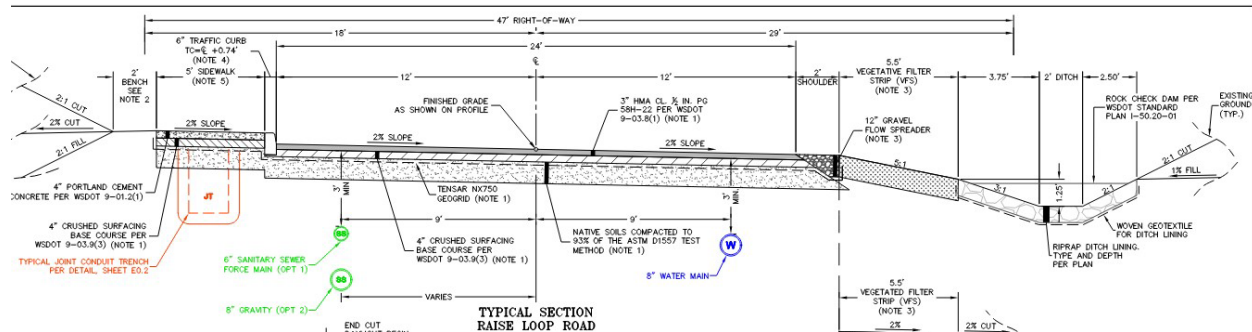


Figure 4. RAISE Loop Typical Section (with ditches)



3.1.2 Pedestrian Facilities

Pedestrian facilities are an important component to the RAISE Loop Project, as they will allow pedestrians to safely travel through the development corridor, encourage alternative modes of transportation, and allow for separated vehicle and pedestrian movement in the event of an emergency. The project will construct 2.29 miles of 5 ft-wide, curb-separated sidewalk. In order to provide a pedestrian and non-motorized evacuation route, sidewalks for the RAISE Loop Project will connect to planned sidewalks for the Eagle Hill project along Eagle Hill Road and extend all the way to the northern portions of the North Cove Road segments. Due to steep topography and likely evacuation route usage,

sidewalks along the southern extends of the North Cove Road segments were determined to be cost prohibitive.

3.1.3 Stormwater Management

Stormwater will be managed using vegetated filter strips to filter road runoff. Approximately 17,000 linear feet (LF) of 5.5-ft-wide, compost-amended vegetated filter strips (CAVFSs) will be constructed and vegetated with native grasses and forbs to maximize filtration. In most locations, stormwater will pass through the CAVFSs and outfall to roadside ditches. Approximately 2,500 LF of these ditches will be vegetated, and 9,500 LF of the ditches will be armored with rock to prevent erosion due to the slope of the ditches. The ditches will convey stormwater to one of 15 different outfalls that comprise level spreaders that outfall to the forest floor.

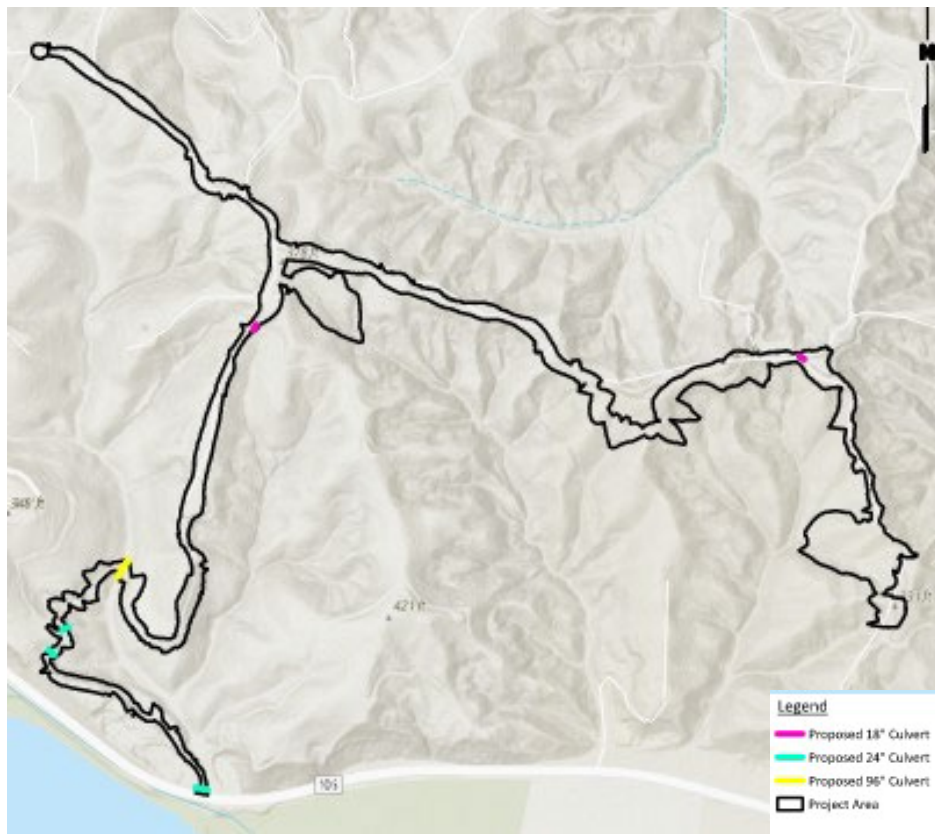
Stormwater runoff from portions of the road without roadside ditches will sheet-flow through CAVFS and the adjacent filter strips and outfall directly to adjacent vegetated areas. None of the stormwater produced by the project will be discharged directly into surface waters. This arrangement will avoid potential water quality degradation resulting from the discharge of stormwater emanating from pollution generating road surfaces stormwater from reaching surface waters.

3.1.4 Drainage Improvements

The proposed project will remove one existing culvert, replace two existing culverts, and install four new culverts to provide uninterrupted drainage of surface waters through the project (Figure 5). The two replacement culverts are in approximately the same location of existing culverts and will be upsized and lengthened to accommodate the proposed improvements. All of the culverts except one currently convey seasonal, non-fish-bearing streams or roadside runoff through the project area. Three of these culverts will be replaced with 24-inch-diameter culverts, and two will be replaced with 18-inch-diameter culverts.

The last culvert to be replaced is a 36-inch-diameter culvert located on a fish-bearing stream and will be replaced with a 96-inch-diameter culvert that is discussed further below.

Figure 5. Culvert Locations



The project will replace a non-fish-passable culvert that conveys the only fish-bearing stream within the project area under North Cove Road (Stream 6). This undersize culvert has a perched outfall and is too steep to provide fish passage at any flow condition. This 36-inch-diameter culvert is 78.3 ft long and will be replaced with a single 8-ft-diameter pipe that is 149 ft long (Figure 5). This culvert has a slope of 0.0249 feet per foot and has been modeled to provide fish passage up until flows reach the level of a 100-year event. Velocities during the 100-year event are too great to allow for fish passage, but the culvert will still convey these flows without overtopping. The hydraulic basis of design memorandum for the project is located in Appendix C.

The in-water work associated with the fish-bearing stream (Stream 6) will be completed within the US Army Corps of Engineers (USACE)-designated in-water work window of July 15 to October 15. The portions of the stream subject to in-water work will be isolated through the deployment of block nets to facilitate the collection and removal of fish and other aquatic organisms in accordance with the Washington State Department of Transportation Fish Exclusion Protocols and Standards. Following isolation and removal, stream flows will be diverted around the work area and released downstream. The work area will remain isolated until the culvert is fully installed and the stream flows are restored.

3.1.5 Utilities

The project will include the installation of utilities that will service future residential and institutional developments within the project corridor. The utilities will be installed within the roadbed or adjacent right-of way and will include:

- Underground electrical and street lighting
- Water
- Sewer
- Telecommunications and additional blank conduits for future needs

3.1.6 Construction

Construction is scheduled to begin in the first work window following project approval and is anticipated to begin in the spring of 2027. While certain aspects of the projects such as timber harvest, clearing and grubbing, and utility work can be conducted throughout the year, most of the earthwork will be conducted during the drier season, which lasts from April to October, in order to maintain soil integrity and reduce chances for erosion and sedimentation from occurring.

Year 1 will include timber harvest, clearing and grubbing, mass grading, and rocking of road alignment.

Year 2 will include adjustments to the road profile, installation of utilities, pouring of sidewalks, and paving of the road.

Construction of the project will follow the sequence presented below.

3.1.6.1 Timber Harvest

Prior to the start of clearing activities, timber harvest boundaries will be clearly marked in the field with staking, flagging, or paint. Special attention will be paid to wetlands and streams within the project area to prevent incidental impacts to these sensitive areas during clearing activities.

Timber will be harvested from the forested portions of the project area. The total area of timber harvest will equal approximately 40 acres. Approximately 85 percent of the 40 acres to be harvested is young coniferous forest that was planted in 2005, 2006, 2015, and 2018. These replanting times indicate that the oldest trees harvested from this area are 21 years old. The remaining 15 percent of timberland to be harvested exists as medium-aged coniferous forest that was replanted in 1974, 1977, and 1985, making these trees between 41 and 52 years old. Formal timber cruises have not been conducted within these areas, so the total number of trees to be harvested could not be determined.

Timber will be harvested using traditional harvest methods that may include yarding and skidding logs to established landing areas. The majority of the timber will not be required to be yarded due to the proximity of the trees to the road alignment. Harvest trees will be delimbed and stacked for eventual transport off site. Logs will be loaded and transported off site using existing gravel roads.

3.1.6.2 Erosion and Sediment Control Measures

Erosion and sediment control plans are included within the construction plans. Prior to initiating any earth-disturbing activities, wetlands, streams, and any sensitive habitats will be located and marked near the active project site. Areas not subject to the projects will be avoided to reduce the potential for unanticipated disturbance. Temporary erosion and sediment control measures will be installed prior to any earth-disturbing activities. Silt fencing, inlet protection, slope protection and matting, wheel washes, and rock construction entrances will be utilized to prevent offsite tracking of materials. Erosion control measures will be maintained throughout the project to limit stormwater runoff. These measures will be continually monitored, evaluated, and updated throughout the project.

3.1.6.3 Clearing and Grubbing

All brush and vegetation from the grading areas will be cleared using mechanical methods. This will most likely be a combination of brush mowers and excavator-mounted flail mowers. The upper 6 inches of soil on the site are not suitable for structural fill and will be stripped with common excavators and bulldozers. Stripping and subsequent grading will be phased to prevent exposed inactive areas from becoming a source of erosion. This material will be collected and transported to an approved upland disposal site via dump trucks. The disposal location has not been designated at this time, but this area will be an upland location that is subject to review and approval by Tribal staff prior to depositing spoil materials. Once areas have been sufficiently stripped, preliminary and final grading activities will commence.

3.1.6.4 Grading

Grading will be initiated once areas have been successfully brushed and stripped. The cut slopes will be surveyed and grade stakes installed to guide the removal and transport of material. Cutting will be facilitated with graders, excavators, and bulldozers as deemed appropriate by the contractor.

To the maximum extent possible, excavated material will be used as fill within the project area. Transportation of excavation spoils will be a combination of pushing material with bulldozers when the fill areas are close and loading and trucking spoils material with excavators and dump trucks when the fill areas are too far to effectively push material.

3.1.6.5 Utility Installation

Utilities will be installed below the roadbed alignment. Utility installation will likely occur during the second construction season after base rock has been placed within the road alignment to limit erosion. Utility installation will require excavation of the base rock layers and installation of water, stormwater, sewer, electric, and telecommunications. Utility installation will follow standard construction practices with pipes installed atop compacted gravels and backfilled. Utility manholes for maintenance and future access will be installed.

3.1.6.6 Paving and Concrete

Following preparation of the roadbed, the entire alignment will be paved with hot-mix asphalt. Asphalt will be applied with a standard dump truck and asphalt spreader combination and then compacted with a vibratory drum roller. Painting and stripping will be completed with a standard paint application truck.

All the proposed sidewalks and any transitions will be formed in place. Concrete will be poured, screed, and floated with a mixture of mechanical trowels and by hand. After proper concrete setup, forms will be pulled and disposed of off-site.

3.2 No Action Alternative

The no action alternative would not meet the goals of the project. No action would continue to leave the SBIT housing and cultural and administrative facilities at risk of flooding caused by sea-level rise and coastal erosion in addition to the risk of catastrophic loss of life and facilities in the event of a CSZ earthquake-generated tsunami. The no action alternative was not evaluated further.

4.0 AFFECTED ENVIRONMENT AND CONSEQUENCES

This section includes descriptions of the existing environmental conditions in the project area and an evaluation of impacts (i.e., consequences) as a result of the Proposed Action and No Action Alternative. The analysis of environmental consequences considers adverse and beneficial, direct and indirect, short-term (i.e., during construction), and long-term (i.e., operations) impacts. This section also discusses mitigation measures, as necessary, to address potential adverse environmental consequences. Environmental factors not addressed and the rationales are as follows:

- Floodplains: The proposed project is not located within a mapped floodplain.
- Coastal Zone Management Areas (CZM): There are no CZM within the project area.
- Geology/Soils: All construction activities within steep slopes will follow Geotech recommendations.
- Noise: There are no noise receptors within the project area.

4.1 Water Quality

The project is located within water quality resource area (WRIA) 24 (Willapa) and is located within the 12-digit hydrologic unit code 171001060203. There are no listed water bodies on the 303d list within the project area. Both Willapa Bay and Teal Slough, which are located in close proximity to the project, are currently on the state's 303d list for imperiled waters (Figure 6). Willapa Bay is listed for exceeding pH and dissolved oxygen parameters. Teal Slough is listed for exceeding PH, dissolved oxygen, and temperature standards. There is currently no Total Daily Maximum Load water quality program for WRIA 24.

Figure 6. Water Quality



4.1.1 Proposed Action

The project is not located within areas that drain to Teal Slough and will therefore have no effect on water quality within the slough.

Stormwater generated in the southwest portion of the project is anticipated to eventually reach Willapa Bay. While there are no direct discharges of stormwater to existing streams conveying surface water, increased runoff and discharges upslope of existing streams could result in a slight increase in downstream flow rates. In general, however, the lack of stormwater detention should not serve to impact adjacent waterbodies, as the current design allows stormwater to infiltrate.

In terms of water quality and potential impacts to Willapa Bay, the project will construct CAVFS to treat all stormwater prior to release to the surrounding environment. The proposed treatment systems should protect water quality through avoiding the discharge of untreated stormwater to the surrounding environment. Through the utilization of CAVFS to meet water quality parameters and the discharging to vegetated upland areas, the project is not anticipated to have a negative effect on Willapa Bay water quality. Differences in stream discharge rates from indirect discharge of stormwater without quantity controls should not serve to affect Willapa Bay due to its tidal nature.

4.1.2 No Action

The no action alternative would retain existing drainage and flow patterns within the project area. It would have no effect, either positive or negative.

4.2 Air Quality

The federal Clean Air Act classifies air quality within a given area according to three possible designations: attainment, meaning the area meets a particular air quality standard; nonattainment, meaning it does not; and unclassifiable, meaning there is insufficient information to determine whether the standard is being met. These designations are standard-specific, so an area can be in attainment for one pollutant standard while remaining in nonattainment or unclassifiable status for another. Where an area fails to meet a standard, a state implementation plan must be followed to bring the area back into compliance, and whenever the US Environmental Protection Agency (EPA) sets or revises an air quality standard, a determination must be made as to whether the area still meets that standard and whether its designation has changed as a result.

Based on information obtained from Ecology, the proposed project area is currently designated as an attainment area for all air contaminants. The nearest air quality monitoring station is located in Raymond, Washington, and no significant air quality issues have been recorded in the vicinity of the project area.

4.2.1 Proposed Action

Construction of the proposed project will likely result in minor, short-term increases in air pollutants that will be limited to diesel particulates from construction equipment and dust. Control methods to

limit grading-generated dust will be deployed as necessary to control dust generation. This will likely be limited to periodic watering of areas being actively graded.

Increases in diesel particulates will be minor and localized to those areas immediately surrounding the project site. The relatively small number of construction vehicles in operation is not anticipated to result in air pollution that would exceed regulatory air quality guidelines.

Long-term impacts to air quality are not anticipated to result from the project after completion due to the limited amount of roadway that will be constructed and the small population that it serves. Any increases in vehicle traffic will be minor and entirely discountable.

4.2.2 No Action

The no action alternative would have no effect on air quality parameters.

4.3 Wetlands and Other Waters of the US

A wetland delineation in accordance with the USACE's Wetland Delineation Manual (USACE 1987) and Regional Supplement to the USACE Wetland Delineation Manual Western Mountains, Valleys, and Coast Region (USACE 2010) was completed in the early spring of 2026 for the RAISE Loop project area.

Wetlands were classified according to the US Fish & Wildlife Service (USFWS) Cowardin classification system (Cowardin et al. 1979) and the USACE hydrogeomorphic (HGM) classification system (Brinson 1993). To determine approximate wetland functions and societal values, wetlands were subsequently rated in accordance with Ecology's 2014 Washington State Wetland Rating System for Western Washington (Ecology 2023) as revised.

A total of nine wetlands and six streams were identified and delineated within the project area (Figure 7). A summary of the wetlands and streams are provided in Tables 1 and 2 below.

Figure 7. Wetlands and Waters Overview

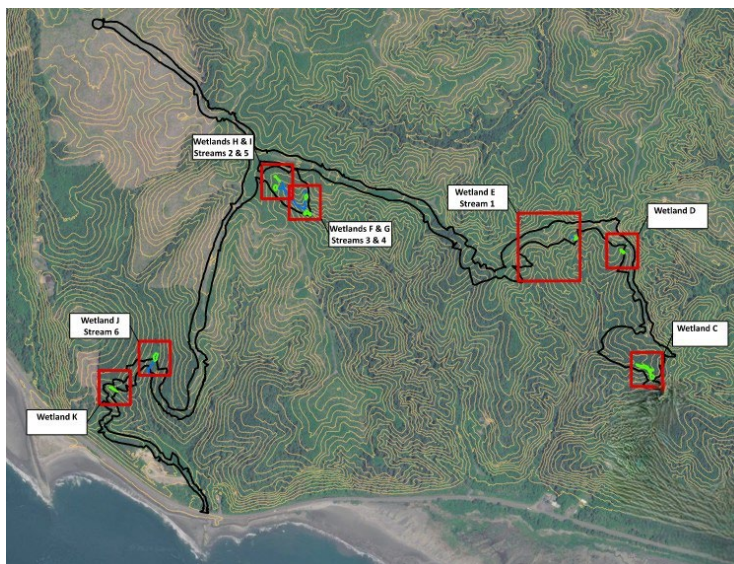


Table 1. RAISE Loop Wetlands

Feature Name	Size within Project Area (acres)	HGM/Cowardin Classification	Ecology Rating
Wetland C	0.13	Slope/PFO	Category IV
Wetland D	0.001	Slope/PFO	Category IV
Wetland E	0.02	Slope/PFO	Category IV
Wetland F	0.03	Slope/PFO	Category IV
Wetland G	0.05	Slope/PFO	Category IV
Wetland H	0.01	Slope/PFO	Category IV
Wetland I	0.04	Slope/PFO	Category IV
Wetland J	0.01	Slope/PFO	Category IV
Wetland K	0.02	Slope/PFO	Category IV

Abbreviations and Acronyms:

HGM = hydrogeomorphic
PFO = palustrine forested

All of the wetlands within the project area are extremely small (<0.13 acre), slope-class wetlands that are a result of the expression of subsurface water on steep hillsides. All of the wetlands are rated as Category IV wetlands, which is the lowest-quality tier in terms of functions that the wetlands provide and their need for conservation.

Table 2. RAISE Loop Streams

Feature Name	Approximate Bankfull Width (inches)	Gradient Accessible for Fish Access	Documented Fish Use	DNR Stream Type
Stream 1	10	No	No	Ns
Stream 2	18	No	No	Ns
Stream 3	20	No	No	Ns
Stream 4	21	No	No	Ns
Stream 5	14	No	No	Ns
Stream 6	28	Yes	Yes	F

Abbreviations and Acronyms:

DNR = Washington State Department of Natural Resources
WAC = Washington Administrative Code
Stream Types: F = fish-bearing, Ns= non-fish seasonal

Except for Stream 6, all of the streams within the project area are narrow, seasonal streams located in very steep environments. While these seasonal streams displayed an ordinary high-water mark, all of the streams have beds consisting of silt and clay and do not appear to support benthic macroinvertebrate populations. All the intermittent streams are too steep to provide habitat for resident or migratory fish. The primary function of these seasonal streams is support of downstream flows for the perennial streams located at lower elevations within the watershed.

Stream 6 is the only perennial, fish-bearing stream within the project area. The Statewide Integrated Fish Distribution (SWIFD) website has Stream 6 as being potentially accessible by coho salmon (*Oncorhynchus kisutch*) and winter steelhead (NWIFC; accessed May 7, 2026). Based on the width and slope, Stream 6 meets the physical criteria to be considered a Type F stream.

4.3.1 Proposed Action

The proposed grading activities will result in permanent impacts to both wetlands and streams. All of the proposed impacts will result from the importation and placement of fill material. There are no temporary impacts associated with the project. Wetland impacts are summarized in Table 3 below.

Table 3. Wetland Impact Summary

Wetland Name	Ecology Rating	Cowardin Classification	Impact (acres)
Wetland C	IV	Palustrine Forested	0.13
Wetland D	IV	Palustrine Forested	0.001
Wetland E	IV	Palustrine Forested	0.02
Wetland F	IV	Palustrine Forested	0.03
Wetland G	IV	Palustrine Forested	0.05
Wetland H	IV	Palustrine Forested	0.01
Wetland I	IV	Palustrine Forested	0.04
Wetland J	IV	Palustrine Forested	0.03
Wetland K	IV	Palustrine Forested	0.02
Total			0.331

The impacted wetlands provide minimal functions due to their small size and the slope HGM classification physical characteristics. Based on the characteristics of these wetlands, a small decrease in sediment sequestration, plant diversity, and wildlife habitat wetland functions is anticipated from the permanent impacts.

4.3.2 Stream Impacts

The proposed grading will result in the loss of 0.05 acres of stream habitat. This area of impact will result from the filling of 1,091 ft of intermittent, non-fish-bearing waters and 72 ft of perennial, fish-bearing stream. Stream impacts are summarized in Table 4 below.

Table 4. Stream Impact Summary

Stream	Ordinary High Water Mark Width (inches)	Stream Type	Impact Feet (acres)
Stream 1	10	Non-fish seasonal	84 (0.002)
Stream 2	18	Non-fish seasonal	118 (0.004)
Stream 3	22	Non-fish seasonal	213 (0.009)
Stream 4	16	Non-fish seasonal	510 (0.02)
Stream 5	14	Non-fish seasonal	82 (0.002)
Stream 6	28	Fish-Bearing	72 (0.008)

Total	1,079 (0.045)
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Due to the physical characteristics of the seasonal streams within the project area, the functions that these streams supply are severely limited and include support of downstream flows through the expression of groundwater, sediment export, and some degree of nutrient export. The proposed filling of stream sections will include the placement of drainage rock to ensure that groundwater flows and eventual expression continue following completion of the project. As a result, the primary functions that will be impacted by the seasonal stream impacts are a reduction in sediment and nutrient export.

Impacts to the perennial, fish-bearing stream (Stream 6) will result in a minor decrease in several stream functions. The decrease in functions will result from sections of the stream not receiving sunlight due to the extension of the culvert. This will result in decreases in primary productivity, food web support, nutrient export, and hyporheic exchange. However, the new culvert will result in an increase in fish habitat by means of allowing fish to access the portions of the stream above the culvert. The culvert replacement will provide fish access to approximately 1,700 LF of new habitat.

SBIT proposes to mitigate the loss of wetland and stream functions that will result from the project through the transfer of credits from the Tribally owned Ghost Dike Advanced Wetland Mitigation Site (AWMS) to compensate for the loss of palustrine wetlands and waters. The AWMS was completed to generate wetland mitigation credits that could be applied to SBIT-sponsored projects.

The AWMS covers 20.32 acres of Tribally owned land along the northern shoreline of Willapa Bay. The AWMS is located a short distance south and east of the project area.

The SBIT is proposing to transfer 0.50-acres of credits from the AWMS to offset the proposed impacts to wetlands and waters within the project area. The mitigation accounting for the project is presented in Table 5.

Table 5. Mitigation Accounting

Wetland Category	Impact Area (acres)	Credit Ratio	Credits Required
Category IV	0.331	1.25:1	0.41
Stream Impacts	0.05	(Category II) 1.75:1	0.09
Total Advanced Wetland Mitigation Site Credits Required			0.50

While the project will result in the permanent loss of wetlands and waters, these systems currently provide limited functions and values for the watershed. Utilization of credits generated from the AWMS should adequately compensate for the proposed impacts. Upon transfer of the credits, the project is not anticipated to result in an overall reduction in wetland and water functions or negative environmental consequences.

4.3.3 No Action

There would be no change to existing conditions, and this would result in no impacts to the wetlands or navigable waters of the US, as a result of the no action alternative.

4.4 Fish and Wildlife Resources Affected Environment

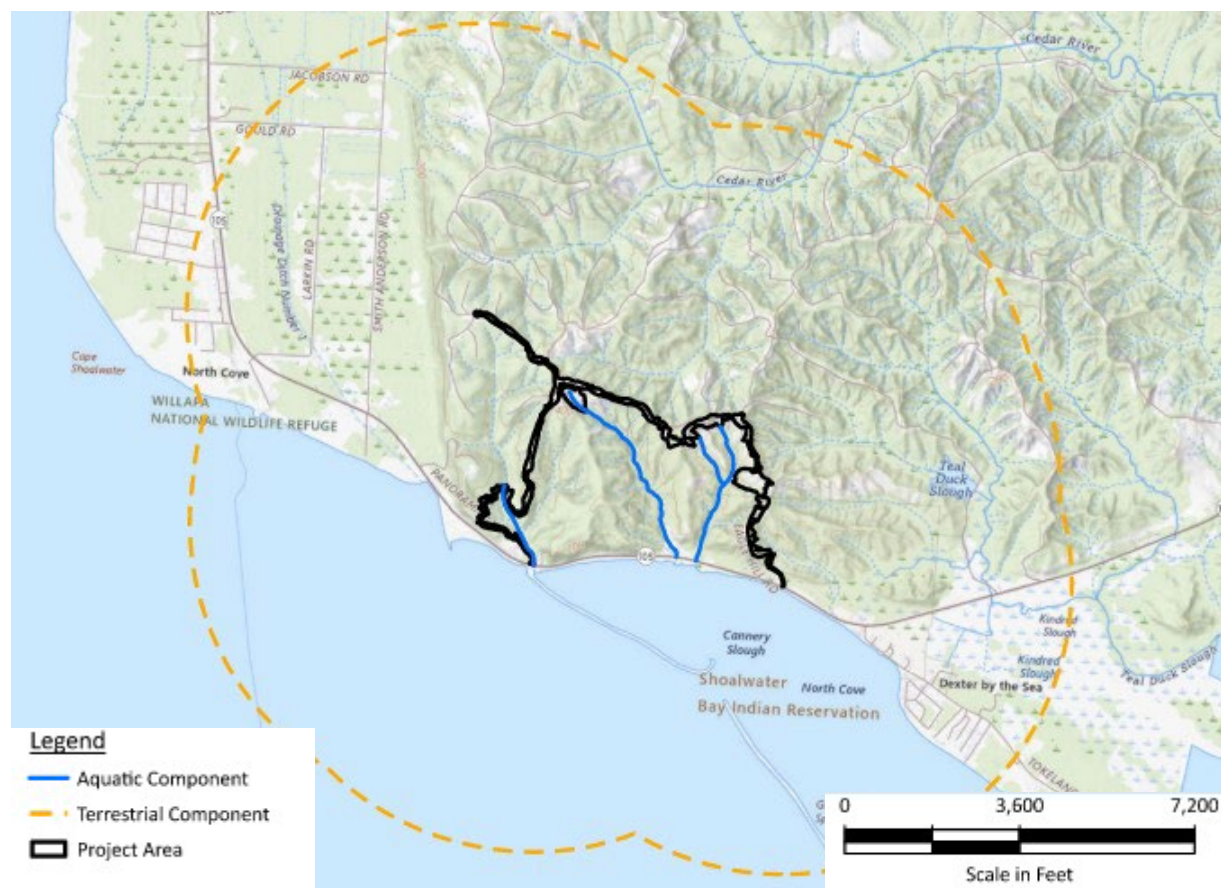
The project area is located within EPA’s 1b Coastal Uplands and 1a Coastal Lowlands Level IV ecoregions. This area is characterized by a temperate climate heavily influenced by the adjacent maritime environment. Annual rainfall is relatively high in this region, with average precipitation ranging from 60 to 78 inches per year. The area experiences moderate temperatures with average daily temperatures in the high 30s during the winter and summertime highs near 70 degrees Fahrenheit.

The coastal lowland areas are characterized by extensive wetlands, estuaries, beaches, and dunes. The coastal upland areas transition to coniferous forestland historically dominated by Sitka spruce (*Picea sitchensis*), western redcedar (*Thuja plicata*), evergreen huckleberry (*Vaccinium ovatum*), salal (*Gaultheria shallon*) and western sword fern (*Polystichum munitum*).

The entire project area currently exists as managed forestlands. The terrestrial action area for the biological assessment (BA) was determined by calculating the distance where construction-related noise will attenuate to background noise levels.

Since all of the drainage from the project will flow south toward Willapa Bay, the aquatic action area was determined to include the drainages that are located south of the project corridor. The aquatic and terrestrial action areas are shown on Figure 8 below.

Figure 8. Affected Environment



The action areas support a mix of habitat types that are largely dependent on the date of last timber harvest. Available habitats include previously harvested forested uplands, palustrine scrub-shrub, and forested and emergent wetlands. Because the project spans a relatively large geographic area and crosses the headwaters of several minor drainages, it encompasses a range of these conditions rather than a single uniform habitat type. On a landscape scale, the habitats within the immediate vicinity of the project comprise the southern extent of a large swath of forestland that extends to the north and east. This area that is essentially bound by Highways 105 and 101 totals over 120,000 acres of forestland that is essentially undeveloped except for logging roads. It is anticipated that wildlife would migrate into and out of the project area into this large reserve of undeveloped forestland.

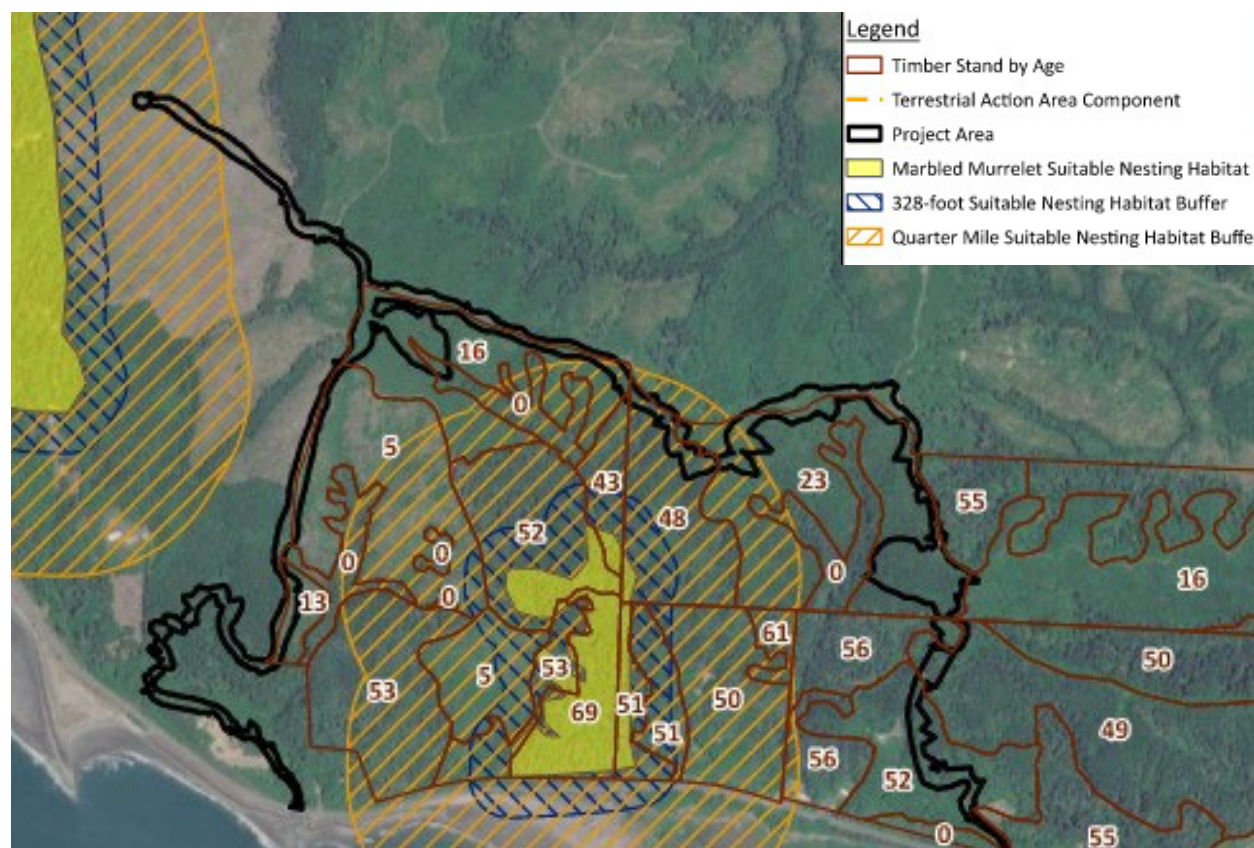
Vegetation across the project area is fairly homogeneous, dominated by conifer stands of western red cedar, western hemlock (*Tsuga heterophylla*), Douglas fir (*Pseudotsuga menziesii*), and Sitka spruce. Understory and shrub cover density varies and generally decreases with increased overstory age. Dominant understory species include red elderberry (*Sambucus racemosa*), salmonberry (*Rubus spectabilis*), red huckleberry (*Vaccinium parvifolium*), salal, and sword fern.

Wetland plant communities differ in composition: red alder (*Alnus rubra*), salmonberry and Douglas spirea (*Spirea douglasii*) dominate the tree/shrub layer, while western skunk cabbage (*Lysichiton americanus*) and slough sedge (*Carex obnupta*) dominate the herbaceous layer. Riparian areas, in turn,

support a greater proportion of deciduous vegetation, particularly red alder and big-leaf (*Acer macrophyllum*) in the overstory and salmonberry and red elderberry in the shrub layer.

The SBIT data on timber harvest within the project area was utilized to estimate the age of existing timber within the immediate area. Timber age details north of the project area was not available. Figure 9 below demonstrates that the majority of the timberland is less than 50 years old.

Figure 9. Timber Stand Age



Formal wildlife surveys of the action area have not been conducted. However, it is known that the terrestrial wildlife species in Table 6 are known to inhabit similar coastal forests in the region and likely occur within the action area. Threatened and endangered species that may inhabit the area are addressed in Section 4.5.

Table 6. Anticipated Wildlife Species

Common Name	Genus Species	Form	Abundance
Roosevelt elk	<i>Cervus canadensis roosevelti</i>	Mammal	Common
Black-tailed deer	<i>Odocoileus hemionus columbianus</i>	Mammal	Common
North American river otter	<i>Lontra canadensis</i>	Mammal	Common
Coyote	<i>Canis latrans</i>	Mammal	Common
Bobcat	<i>Lynx rufus</i>	Mammal	Uncommon
North American Beaver	<i>Castor canadensis</i>	Mammal	Uncommon
Cougar/Mountain lion	<i>Puma concolor</i>	Mammal	Uncommon

Common Name	Genus Species	Form	Abundance
Humbolt's flying squirrel	<i>Glaucomys oregonensis</i>	Mammal	Common
Silver-haired bat	<i>Lasionycteris noctivagans</i>	Mammal	Common
American black bear	<i>Ursus americanus</i>	Mammal	Common
Pacific tree frog	<i>Pseudacris regilla</i>	Amphibian	Common
Rough-skinned newt	<i>Taricha granulosa</i>	Amphibian	Common
Northern red-legged frog	<i>Rana aurora</i>	Amphibian	Common
Western toad	<i>Anaxyrus boreas</i>	Amphibian	Common
American bullfrog	<i>Lithobates catesbeianus</i>	Amphibian	Common
Northwestern salamander	<i>Ambystoma gracile</i>	Amphibian	Common
Long-toed salamander	<i>Ambystoma macrodactylum</i>	Amphibian	Common
Ensatina	<i>Ensatina eschscholtzii</i>	Amphibian	Common
Columbia torrent salamander	<i>Rhyacotriton kezeri</i>	Amphibian	Common

In addition to the above-listed terrestrial species, there are many resident and migratory birds that likely inhabit the area. These include raptors such as bald eagle (*Haliaeetus leucocephalus*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), great horned owl (*Bubo virginianus*), northern pygmy owl (*Glaucidium gnoma*), and a large variety of various songbirds.

Fish resources within the aquatic component of the action area are limited. The SWIFD website indicates the potential presence of coho salmon within Stream 6. Due to the size of the stream, it could likely support resident trout as well. Anadromous salmon utilizing Stream 6 are partially inhibited by the culvert at Highway 105 where the stream discharges to Willapa Bay. This culvert was surveyed by the WDFW and determined to only be 33 percent passable to salmonids. None of the other waterways within that action area are mapped within SWIFD. The Priority Habitat and Species maps do indicate riparian habitat associated with the various streams downslope from the project area, but there are no fish listings for any of these waterways.

4.4.1 Proposed Action

The construction of the proposed roadway will have both temporary and permanent effects on resident and migratory wildlife.

4.4.1.1 Temporary Impacts

Temporary impacts will be mostly limited to increases in noise levels. Construction activities and associated increases in noise levels and human presence may cause wildlife less accustomed to human presence to avoid the area during construction. There will be temporary impacts to aquatic organisms within Stream 6 when the existing culvert is replaced with a fish-passable structure. This portion of the project will be conducted during the WDFW-approved in-water work window. The work area will be isolated during construction to prevent impacts to aquatic organisms.

Temporary impacts should be minimal overall. Many of the mammals that are likely to be utilizing the area are likely accustomed to human activities and elevated noise levels. Construction activities will be conducted during the drier seasons between April and October. Grading and heavy equipment usage will be limited during the winter months when precipitation amounts increase the potential for erosion. In terms of seasonal wildlife disruptions, construction activities will not likely affect terrestrial wildlife

during the winter stress period when wildlife are the most vulnerable due to low availability of high-quality forage and caloric-intensive temperature regulation.

Animals avoiding the area would still have access to large tracts of habitat that are located north and east of the project area. The environmental consequences of the temporary impacts will be short, minimal, and discountable.

4.4.1.2 Permanent Impacts

The Proposed Action will result in the clearing and grading of approximately 52 acres of land. This land is entirely located along the natural ridgeline that serves to delineate the watershed. Commensurate with this clearing is the harvest of young to medium-aged timber (Figure 9) and native understory vegetation. This vegetation clearing will reduce the amount of available habitat for wildlife species, present an opportunity to allow non-native vegetation to become established, increase the amount of edge habitat that can negatively affect certain species, and potentially block daily or seasonal migration of wildlife between watersheds. The road will also present an opportunity for vehicle strikes, though this risk is fairly low due to the low anticipated speed limit (20 miles per hour). The last permanent impact will be the installation of street illumination. Realizing that street illumination can result in disturbances to the natural environment and wildlife, the project has adopted strategies to limit light pollution. These involve fixtures that will limit light spillage and timers/motion sensors that will illuminate the streets only when a car is approaching. This will greatly reduce the time when the corridor is illuminated.

The permanent impacts associated with the project will result in a permanent loss of upland, wetland, and riparian habitats. Mitigation for the riparian and wetland impacts will be offset through the transfer of wetland mitigation credits as well as project-specific construction methods such as the placement of drain rock within stream impact areas to maintain subsurface flows to downstream water bodies. The wetlands and streams that will be impacted are so small and dry out in early spring/summer that they are not likely to provide suitable habitat for amphibians. As a result, amphibian populations will not likely be affected by the proposed project.

While the construction of the road will result in a loss of habitat, it should not serve to entirely disconnect the habitats located north and south of the project. Mammalian species such as deer, elk, bear, coyote, and even cougar could maintain daily and seasonal migration patterns despite the presence of a low-traffic roads, as these species can become accustomed to low-level disturbances.

Limited illumination of the road corridor should not serve to impact most mammals utilizing the area, as they are most active during dawn and dusk. The streetlights could negatively impact nocturnal hunting species such as coyote and woodland bats, as they generally avoid highly lit corridors. Due to the motion-activated nature of the streetlamps, these impacts will be limited to nighttime hours when the population is active.

The permanent impacts associated with the road construction will likely result in some level of behavior modification of local wildlife due to the loss of habitat, increased human presence, and increased baseline noise levels. The severity of these effects depends on individual species' ability to adapt to modifications to their habitat. The majority of wildlife species that use this area will either become

accustomed to the disturbance or use other, similar habitats that are located north and east of the project area. Given the vast amount of wildlife resource within adjacent areas, the modification of habitats within the project area are anticipated to have minimal tangible effects on wildlife populations.

4.4.2 No Action

No impact to upland wildlife would occur as a result of the no action alternative, as there would be no reduction in available habitat and the existing road access and usage would not change.

4.5 Threatened, Endangered Species, and Critical Habitat

A BA was completed to determine the effects of the proposed project on species listed under the Endangered Species Act (ESA). The BA also evaluated potential effects on Essential Fish Habitat (EFH) as defined by the Magnuson-Stevens Fishery Conservation and Management Act and amended by the Sustainable Fisheries Act of 1996 (16 United States Code 1801 et seq.).

The action area for the proposed project is shown in Figure 8 above. The action area includes both terrestrial and aquatic habitats. There are no aquatic critical habitats or listed aquatic species within the action area. The list of ESA-listed species and critical habitats within the action area are provided in Table 7.

Table 7. Listed Species and Critical Habitats

Species	Species Listing Status	Critical Habitat	Consulting Agency
Marbled murrelet (<i>Brachyramphus marmoratus</i>)	Threatened	Designated, but not present in the action area	USFWS
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Threatened	Proposed, but not present in the action area	USFWS
Streaked horned lark (<i>Eremophila alpestris strigata</i>)	Threatened	Designated and present in the action area	USFWS
Western snowy plover (<i>Charadrius nivosus nivosus</i>)	Threatened	Designated and present in the action area	USFWS
Monarch butterfly (<i>Danaus plexippus</i>)	Proposed Threatened	None	USFWS
Suckley's cuckoo bumble bee (<i>Bombus suckleyi</i>)	Proposed Endangered	None	USFWS
Bull trout (<i>Salvelinus confluentus</i>)	Threatened	Designated, but not present in the action area	USFWS

Abbreviations and Acronyms:

USFWS = US Fish and Wildlife Service

Yellow-billed cuckoo, monarch butterfly, Suckley's cuckoo bumble bee, and bull trout do not occur within the action area. Marbled murrelet suitable habitat, snowy plover critical habitat, and streaked horned lark critical habitat do exist within the project area. These critical habitats and disturbance threshold distances are presented on Figures 10 through 12.

Figure 10. Marbled Murrelet Suitable Habitat

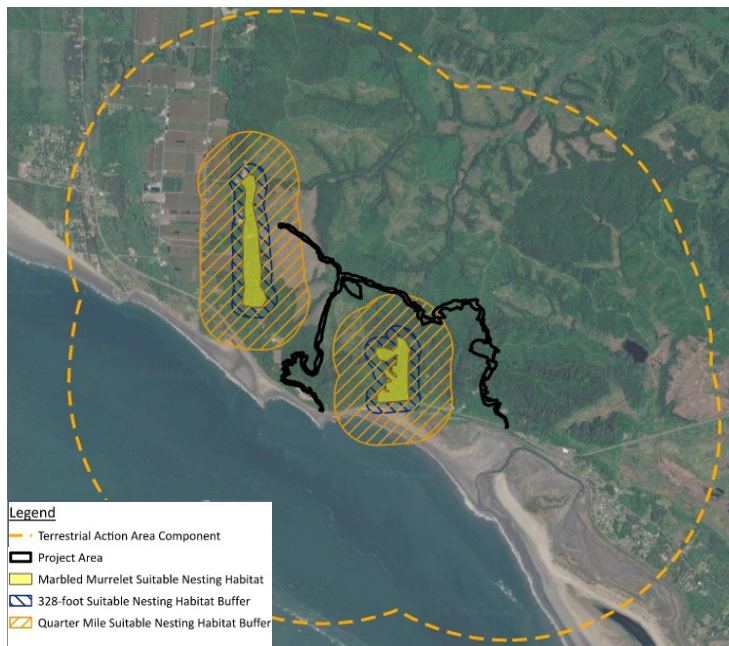


Figure 11. Snowy Plover Critical Habitat

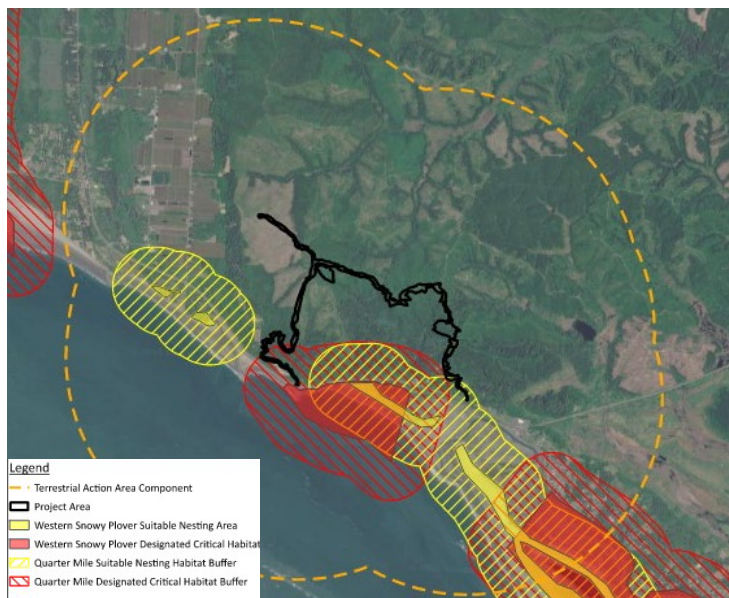
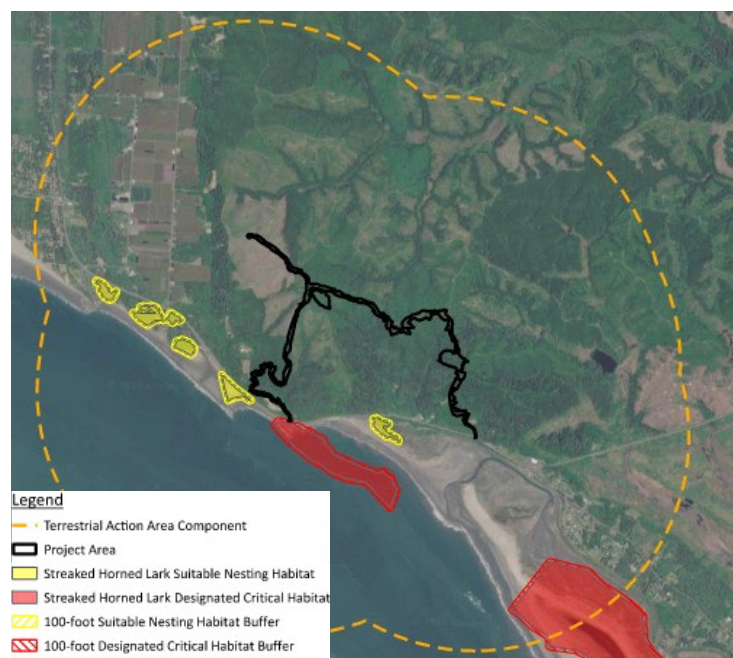


Figure 12. Streaked Horned Lark Critical Habitat



4.5.1 Proposed Action

Through the completion of the biological assessment, the effects determinations were made for listed species, and their critical habitats are summarized in Table 8.

Table 8. Effects Determinations for Endangered Species Act-Listed Species and Designated Critical Habitat

Species	Species Listing Status	Consulting Agency	Effects Determinations	
			Listed Species	Critical Habitat
Marbled murrelet (<i>Brachyramphus marmoratus</i>)	Threatened	USFWS	May affect, not likely to adversely affect	No effect
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Threatened	USFWS	No effect	No effect
Streaked horned lark (<i>Eremophila alpestris strigata</i>)	Threatened	USFWS	No effect	No effect
Western snowy plover (<i>Charadrius nivosus nivosus</i>)	Threatened	USFWS	May affect, not likely to adversely affect	May affect, not likely to adversely affect
Monarch butterfly (<i>Danaus plexippus</i>)	Proposed Threatened ^a	USFWS	No effect	No effect
Suckley's cuckoo bumble bee (<i>Bombus suckleyi</i>)	Proposed Endangered ^a	USFWS	No effect	No effect
Bull trout (<i>Salvelinus confluentus</i>)	Threatened	USFWS	No effect	No effect

Notes:

a. Provisional effect determination is provided for species with proposed listing status.

Abbreviations and Acronyms:

USFWS = US Fish and Wildlife Service.

It was determined that the project would not result in adverse impacts to Willapa Bay and therefore will have no adverse effects on Pacific salmon, groundfish, and coastal pelagic EFH. The proposed projects will have no adverse effects on highly migratory species' EFH.

The SBIT submitted the BA to the USFWS for informal consultation review. The USFWS concurred with the effects determinations within the BA (Appendix D). As per the BA and USFWS concurrence, the proposed project may affect, but is not likely to adversely affect, listed species and their critical habitats. The National Marine Fisheries Service was not consulted as there are no listed species under its jurisdiction within the Action Area, and the project will have no effect on EFH.

4.5.2 No Action

Under the no action alternative, no construction or improvements to the site would occur. As such, there would be no change to existing conditions, and this would result in no impacts to any endangered species or EFH.

4.6 Cultural and Historic Resources

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effects of their undertakings on historic properties. Under 36 Code of Federal Regulations 800.5(c), which details the BIA consulting process, BIA makes a finding (no historic properties affected, no adverse effect, or adverse effect) and provides supporting documentation to the Washington State Department of Archaeology and Historic Preservation (DAHP), which functions as Washington's State Historical Preservation Office (SHPO). DAHP and other consulting parties then have 30 days to respond. If DAHP or other consulting parties do not formally object to the findings within that review and comment window, the project may proceed.

Descendants of modern SBIT members and other local indigenous peoples used the Willapa Bay area for the past 2,000 years. The Shoalwater Bay Indians was a term to describe those of Lower Chinook and Lower Chehalis descent that made the area surrounding Willapa Bay their primary home.

Prior to European settlement, the villages used by SBIT descendants were concentrated in the flat areas adjacent to the shores of the bay. Use of the project area was likely limited to hunting for terrestrial wildlife and harvesting timber for home and canoe construction.

There are currently no known significant cultural resources within the project area.

4.6.1 Proposed Action

BIA made a determination of "no adverse effect" on historical properties on January 13, 2026. No comments were received from SHPO. The BIA effect letter and complete DAHP submittal are found in Appendix E.

4.6.2 No Action

Consultations under Section 106 of the NHPA would not be required as part of the no action alternative, as no federal action would occur.

4.7 Human Environment

4.7.1 Employment and Income

Based on information from Census Reporter (Census Reporter; accessed July 10, 2026), the per capita income for the SBIT Reservation is \$33,565, which is about $\frac{3}{4}$ of the average in the US. The median household income is \$78,125. Approximately 9.4 percent of residents are below the poverty line.

4.7.1.1 Proposed Action

The proposed project may provide seasonal employment opportunities during construction but is not anticipated to create permanent employment opportunities.

4.7.1.2 No Action

The no action alternative would eliminate the potential for seasonal employment in support of construction activities.

4.7.2 Demographics and Trends

SBIT has a total enrollment of approximately 387 citizens. Approximately 128 people currently reside on the SBIT reservation. The median age on the reservation is 36.5 years, and 63 percent of residents are male. Reported ethnicity on the reservation according to Census Reporter is 52 percent white, 44 percent native, and 5 percent black. While one of the smaller Tribes in the State of Washington, enrollment has been rapidly growing at a rate of approximately 3.5 percent per year. The number of residents on the reservation has experienced a lower annual growth of around 1.5 percent, which is due to a lack of housing opportunities.

4.7.2.1 Proposed Action

The proposed project will not immediately affect Tribal demographics or trends. The project will provide critical infrastructure for future projects that positively affect Tribal demographics.

4.7.2.2 No Action

The no action alternative could result in a much larger loss of life during a large tsunami due to the lack of accessible evacuation routes.

4.7.3 Lifestyle, Cultural Values, Attitudes and Expectations

SBIT has a rich culture that is intertwined with the surrounding environment. The culture today still emphasizes this connection with the land and subsistence lifestyle where traditional foods are harvested and grown on the reservation. The Tribe highly values their resourcefulness and resilience in the face of challenges. In the 2021 SBIT Resilience Plan, Tribal members chose 1) traditional foods, culture, health

and wellness; 2) healthy and resilient forests; and 3) infrastructure as the primary focus areas to build resilience. Based on the Tribal leaderships outreach and planning efforts, they have fostered an expectation among SBIT members that leadership will focus on delivering projects that provide for members and build resilience in the primary focus areas.

4.7.3.1 Proposed Action

The proposed project will positively affect attitudes and expectations by providing a safe evacuation route in the event of a tsunami. The proposed project would help increase the overall resilience of the SBIT by providing a method to avoid natural disaster.

4.7.3.2 No Action

In the event of a CSZ-triggered tsunami, the no action alternative would not provide an evacuation route. The inability of Tribal members to evacuate could result in large losses of life, infrastructure, and culture.

4.7.4 Community Infrastructure

The proposed project will result in an increase in community infrastructure in the form of expanding the existing road network. The project will include the installation of water, sewer, stormwater, and telecommunication utilities. Future infrastructure projects such as potable water systems and wastewater treatment plants will support the expansion of reservation living opportunities. The project will immediately increase the amount of community infrastructure and provide a safe evacuation route in the event of a tsunami.

4.7.4.1 Proposed Action

The proposed project will positively affect attitudes and expectations by providing a safe evacuation route in the event of a tsunami. The proposed project would help increase the overall resilience of the SBIT.

4.7.4.2 No Action

The no action alternative would have no effect on community infrastructure.

4.7.5 Public Health and Safety

Public health and safety are the principal tenants of the proposed project. The need to provide an immediate evacuation route during a tsunami event and eventually residences and services for Tribal members that are not at risk of environmental damage has been driving the relocation project for more than a decade. This project is a critical first step toward providing community members with resilient housing and services.

4.7.5.1 Proposed Action

The proposed project will dramatically increase public health and safety by providing a safe evacuation route in the event of a tsunami.

4.7.5.2 No Action

The no action alternative would result in Tribal members and the local community being at continued risk of flooding, sea-level rise, and tsunami-related injuries and loss of life and livelihood.

4.7.6 Proposed Action

The consequences of the proposed project are entirely beneficial. While the project will not provide local jobs or increase wages, it will provide several immediate key benefits. These include the following:

- Provide a readily accessible and safe evacuation route for tsunami and flooding events
- Increase the transportation network and provide access to forestlands for hunting, gathering, and cultural activities
- Foster positive attitudes of resiliency and hope for Tribal members through the implementation of the master plan.
- Lay the groundwork for future development and eventual relocation of Tribal facilities to safe upland locations.

4.7.7 No Action

The no action alternative would result in the SBIT and surrounding community being susceptible environmental hazards in the form of flooding, coastal erosion, sea-level rise, and tsunamis.

4.8 Indirect and Cumulative Impacts

Indirect effects are effects caused by an action that occur later in time or farther removed in distance from the initial activity but that are still reasonably foreseeable. They're distinguished from direct effects, which are caused by the action and occur at the same time and place. The indirect effects of the Proposed Action are limited to potential disruptions in wildlife behavior from increased human activity or improved access to hunting grounds.

Cumulative effects result from the incremental impact of the Proposed Action when added to reasonably foreseeable future actions. The geographic scope of this analysis extends beyond the immediate project footprint to encompass the broader area likely to be affected by the combined influence of the road project and future development the road may facilitate. Cumulative effects result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes those actions. The geographic scope of this analysis extends beyond the immediate project footprint to encompass the broader area likely to be affected by the combined influence of the road project and subsequent development it is designed to serve.

The proposed project has independent utility as a tsunami evacuation route, providing a critical life-safety function for the surrounding community regardless of whether future development phases proceed. Future residential development phases, while dependent on the access and capacity the road provides, are not the purpose of the road itself and are addressed here as a reasonably foreseeable

cumulative effect rather than as an action connected to and dependent upon the proposed action. Specific site plans, unit counts, and construction timelines for these future phases have not yet been finalized, but the general pattern of residential and community development (administration, school, police, hospital, fire, etc.) enabled by the roadway is reasonably foreseeable and is evaluated accordingly.

When considered together with this foreseeable residential development, the road project contributes to a cumulative increase in impervious surface within the watershed, with associated effects on stormwater runoff volume, water quality, and downstream hydrology. Incremental loss and fragmentation of wildlife habitat is also anticipated as forested areas are converted to residential use, potentially affecting local wildlife movement corridors and reducing the extent of contiguous habitat available to species dependent on the area. Cumulative increases in traffic volume, noise, and air emissions are also expected as residential build-out proceeds along the corridor.

These cumulative effects are considered in the context of other reasonably foreseeable actions in the vicinity, including increased local populations and resulting increases in demands for goods and services stemming from increased housing availability. Compensatory mitigation, stormwater management design, and applicable local land use controls associated with future development phases are expected to reduce, but not necessarily eliminate, the incremental cumulative effects described above. Furthermore, any future development of the project area would be contingent on the receipt of federal funding. This federal funding would necessitate a complete environmental review under the NEPA process and ensure that impacts are reduced as much as practicable.

5.0 COORDINATION AND PUBLIC INVOLVEMENT

SBIT functions with a robust community outreach and involvement program that keeps Tribal and other community members apprised of current and future events. Events are published on the SBIT website in addition to other community papers and informational flyers. As this project is part of the overall master plan, community members are well informed of the overall goal and have numerous opportunities to review plans and provide feedback. The following is a list of public meetings and events that have transpired in the past 2 years:

- Open House-Community engagement dinner; September 17, 2024 — This open house event included presentations, guest speakers, and formalized methods to receive community feedback.
- Open House-Community engagement dinner; November 14, 2024 — Same as above.
- Biannual General Council Tribal Presentation; September 23, 2024 — This biannual event was open to all Tribal members and was well attended. This event also included guest speakers, formal updates and progress reports, and avenues to provide feedback on Tribal projects.
- Biannual General Winter Council Presentation; January 25, 2025 — Same as above.
- Bi-annual General Council; August 2, 2025 — Same as above.
- Annual Partnership Gathering; February 11 to 13, 2025 — This multi-day event was intended to provide community members, stakeholders, local partners, government agencies, and the general public the opportunity to interact with Tribal planners, engineers, and other professionals to gain information about Tribal projects and provide informal feedback.
- Community Day; June 18, 2026 — This event was intended as a community outreach for the project and included information booths manned by Tribal employees, engineers, planners, and construction professionals to answer the public's questions about the project. All attendees were contacted after the event and given the opportunity to provide feedback.

5.1 Compliance with Other Laws and Regulations

SBIT will obtain all applicable federal permits and approvals before commencing the Proposed Action. Best management practices (BMPs) in these permits would be implemented during construction and operations that avoid or minimize the potential for adverse impacts on the environment. Mitigation beyond BMPs and design considerations includes the following permits and compliance to reduce or eliminate impacts.

5.1.1 Section 106 of the NHPA

The project has satisfied the requirement of Section 106 of the NHPA, and it was determined that the project would not result in adverse impacts. The appropriate notifications were sent to SHPO and regional Tribes, and no comments were received.

5.1.2 Section 404 and 401 of the Clean Water Act

SBIT has requested 404 permits from USACE. The permit applications are currently being reviewed. Mitigation will be required to satisfy the USACE 404 conditions. EPA is responsible for issuing a 401 water quality certification for the project if they determine it is necessary. EPA is currently reviewing the 401 water quality certification application.

5.1.3 Section 7 of the Endangered Species Act

The project is currently in compliance with ESA. SBIT completed a BA to determine potential effects of the project on ESA-listed species and habitats. SBIT initiated informal consultation with USFWS, which determined that the project may affect, but is unlikely to adversely affect, all species and critical habitats potentially located within the project area.

6.0 CONCLUSION

The Proposed Action incorporates mitigation through design considerations, BMPs, and additional mitigation required through agency consultations to avoid and minimize significant adverse impacts. This EA discusses the environmental issues and effects of the Proposed Action and specifies appropriate mitigation measures and standard conditions of approval in order to minimize environmental effects. A mitigated Finding of No Significant Impact on the Environment is an appropriate finding for this Proposed Action.

7.0 USE OF THIS REPORT

This report has been prepared for the exclusive use of Red Plains Professional and SBIT for specific application to the RAISE Loop project. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau.

Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau, shall be at the user's sole risk. Landau warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. Landau makes no other warranty, either express or implied.

8.0 REFERENCES

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RAISE Loop 90 Percent Plan Set

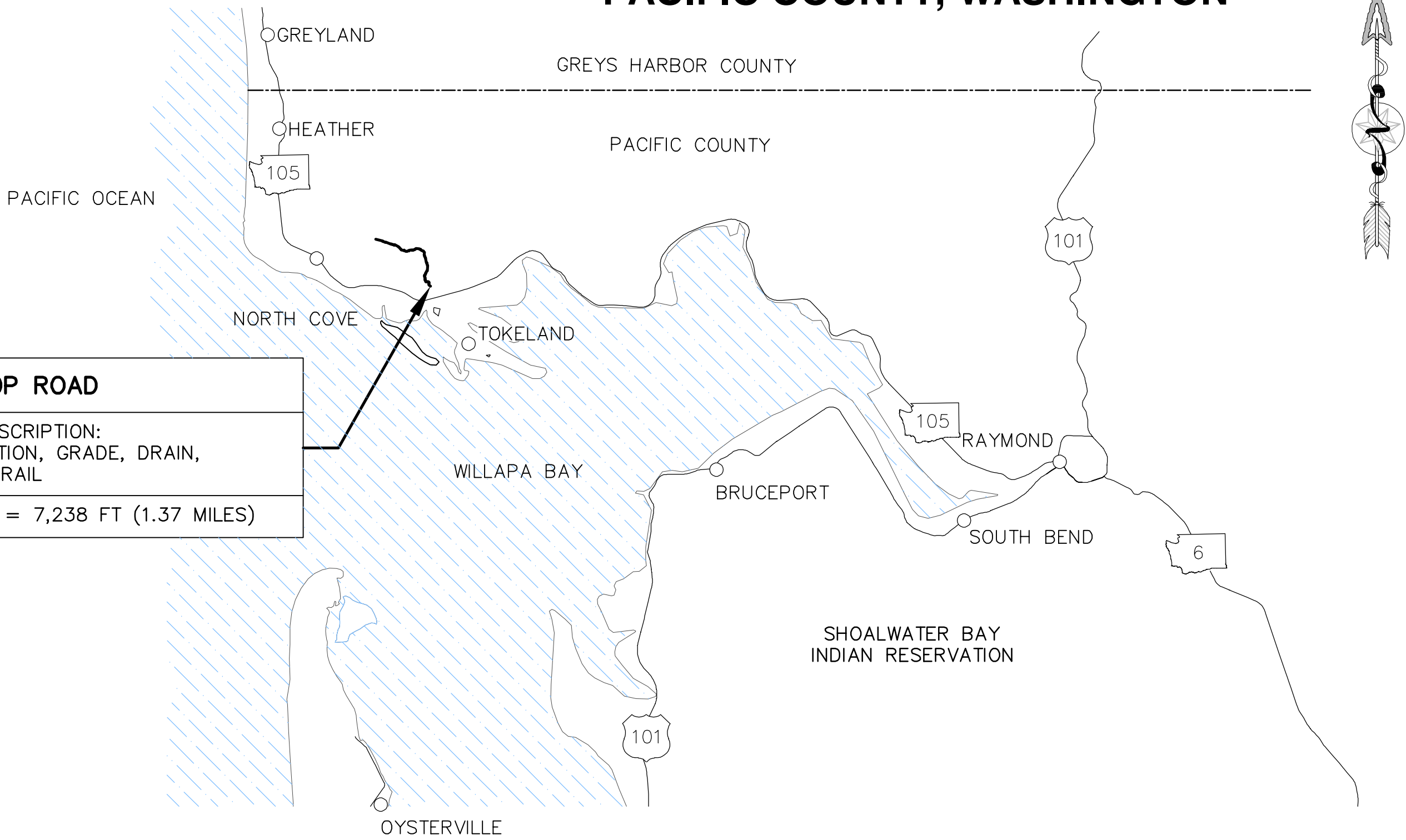


SHOALWATER BAY TRIBE
PLANS FOR PROJECT
TTP ROUTE 30 SECTION 10-30,
TTP ROUTE 34 SECTION 20-40,
TTP ROUTE 203 SECTION 10,
TTP ROUTE 205 SECTION 10
RAISE LOOP ROAD
LOCATED IN
S2 & S3 T14N R11W WM
SHOALWATER BAY INDIAN RESERVATION
PACIFIC COUNTY, WASHINGTON



PROJECT SHEET INDEX	
SHEET NO.	SHEET DESCRIPTION
1	COVER PAGE
2	PROJECT LOCATION MAP
3	GENERAL NOTES
4	ABBREVIATIONS AND LEGEND
5	SUMMARY OF QUANTITIES
6-7	QUANTITIES
8	ALTERNATE QUANTITIES
9	TYPICAL SECTIONS
10	PROJECT LAND TIES
11	PROJECT PLAN MAP
12-17	PLAN & PROFILE
18	GRADING PLAN
19-24	UTILITIES PLAN & PROFILE
25-30	GRAVITY SEWER (OPTION 2)
31-32	TEMPORARY EROSION & SEDIMENT CONTROL PLAN
33	APPROACH A DETAILS
34-39	WSDOT STANDARD PLANS
40-42	UTILITY DETAILS
X1-X20	CROSS SECTIONS
E0.1-E1.10	ELECTRICAL PLANS & DETAILS
E2-E5	STREET LIGHTING PLANS

RAISE LOOP ROAD
PROJECT DESCRIPTION: NEW ROAD CONSTRUCTION, GRADE, DRAIN, GUARDRAIL
RAISE LOOP ROAD LENGTH = 7,238 FT (1.37 MILES)



PROJECT CONTACT INFORMATION

OWNER:
NAME: SHOALWATER BAY TRIBE
ADDRESS: 2373 OLD TOKELAND ROAD
TOKELAND, WA 98590
PHONE: (360)267-8211 FAX: (360)267-6778

CONTACT: JESSE DOWNS
TRIBAL ADMINISTRATOR/ CEO (360)267-8154

ENGINEER:
NAME: RED PLAINS PROFESSIONAL INC.
ADDRESS: 2103 NE 129TH STREET STE. 201
VANCOUVER, WA 98686
PHONE: (360)448-7999 FAX: (360)258-0274

CONTACT: TIM SCOTT, P.E.

811 NOTICE !
TWO WORKING DAYS BEFORE
YOU DIG CALL **811**
WWW.BLUESTAKES.ORG

Know what's below.
Call before you dig.

EXISTING UTILITIES ARE SHOWN ON PLANS
FOR THE CONVENIENCE OF THE CONTRACTOR
ONLY. THE CONTRACTOR IS RESPONSIBLE FOR
THE PROTECTION OF ALL UTILITIES. THE
ENGINEER BEARS NO RESPONSIBILITY FOR
UTILITIES NOT SHOWN OR SHOWN
INCORRECTLY.

ROADWAY LEGEND	
	U.S. ROUTE MARKER
	STATE ROUTE MARKER

UTILITY CONTACTS		
UTILITY	COMPANY NAME	CONTACT
WATER	IHS	ROGER HARGROVE P.E.
SEWER	IHS	ROGER HARGROVE P.E.
POWER	GRAYS HARBOR PUD	PHIL BECKMAN (360)-538-6377
PHONE	CENTURYLINK	DEAN JACOBSEN (206)-733-5260

DESIGN CRITERIA (LOCAL ROADS & STREETS) A POLICY OF GEOMETRIC DESIGN OF VERY LOW-VOLUME LOCAL ROADS 2001										
RAISE LOOP ROAD	A.D.T.	DESIGN SPEED	MINIMUM WIDTH	MAX. GRADE	MINIMUM RADIUS	MINIMUM SIGHT DISTANCE		MINIMUM K VALUE		SUPERELEVATION MAXIMUM <i>e</i> (%)
		MPH	FT	%	FT	STOPPING	PASSING	CREST	SAG	
STA: 24+50-96+88	< 400	20	24	16%	89	90	400	4	17	N/A

90% PLANS

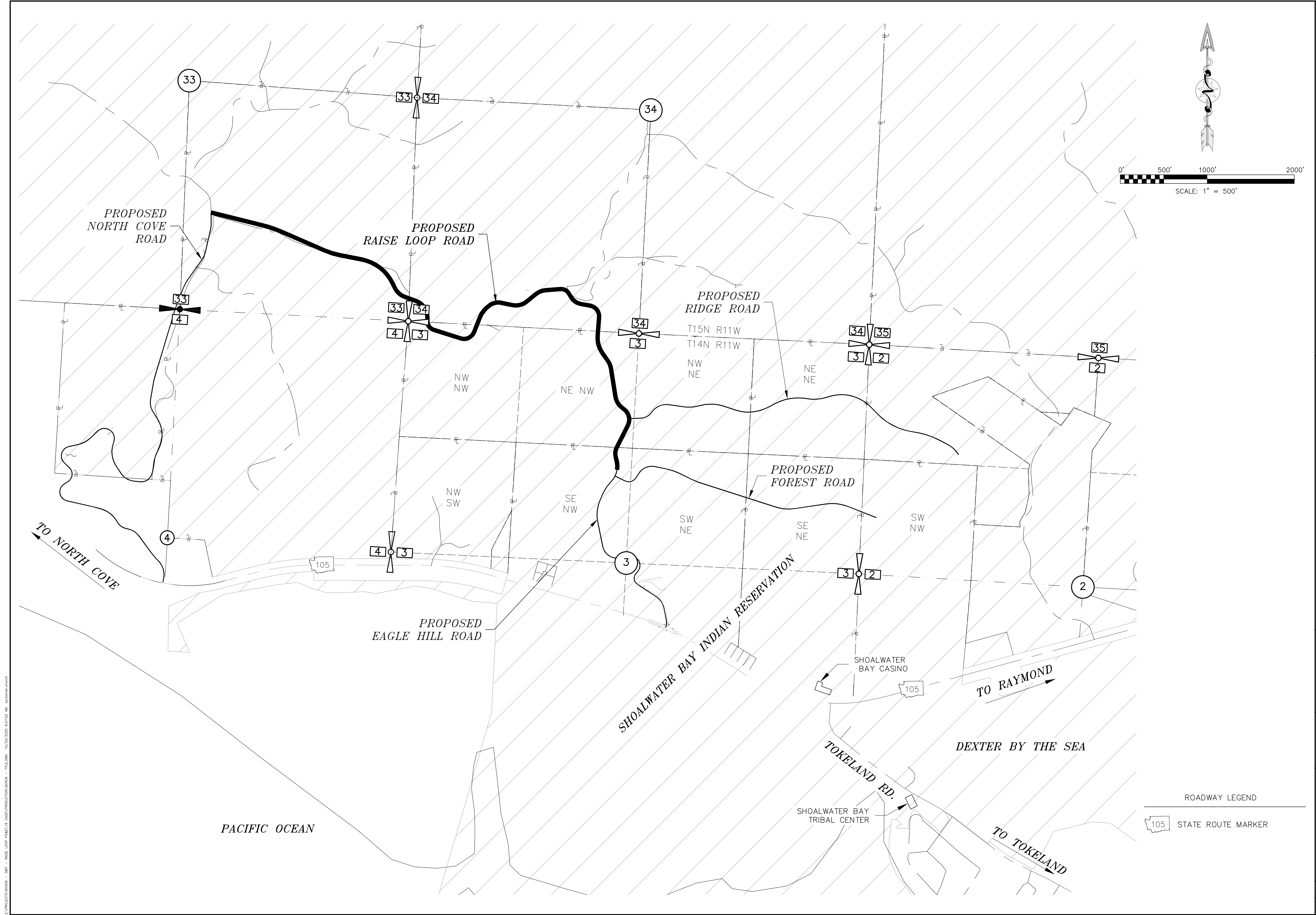
PRELIMINARY ONLY
COVER PAGE

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PROFESSIONAL INC.
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TEL: (360) 448-7999
FAX: (360) 258-0274
www.red-plains.com

REVISIONS	DESCRIPTION	NO.	DATE

PROJ.	60409
SHT.	1



2:\PROJECTS\60409 - SRF - RAISE LOOP ROAD\60409\PRODUCTION\60409 - TITLES.WGS 10/29/2023 6:07:22 AM by:stevenc@redplains.com

PRELIMINARY ONLY
RAISE LOOP ROAD
SHOALWATER BAY TRIBE
TOKELAND, WA
PROJECT LOCATION MAP



RED PLAINS
P R O F E S S I O N A L I N C.
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www.red-plains.com

REVISIONS	
NO.	DESCRIPTION

PROJ.	60409
SHT.	2

GENERAL NOTES

1. PREPARATION

- A. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS IN THE FIELD PRIOR TO CONSTRUCTION.
- B. NOTIFY ALL UTILITY COMPANIES AND CALL 811 FOR UTILITY LOCATES AT LEAST 48 HOURS BEFORE EXCAVATION.
- C. A PRECONSTRUCTION MEETING SHALL BE HELD WITH THE SBIT AND ALL RELEVANT STAKEHOLDERS BEFORE WORK BEGINS.
- D. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVALS PRIOR TO COMMENCING WORK.
- E. ALL WORK SHALL CONFORM TO THE LATEST EDITION OF THE WSDOT STANDARD SPECIFICATIONS AND PLANS PREPARATION MANUAL AND AS MODIFIED BY SPECIAL PROVISIONS.
- F. PRIOR TO THE RELOCATION OF ANY EXISTING UTILITIES AS NOTED ON THE PLANS, THE CONTRACTOR SHALL COORDINATE WITH THE PROPER UTILITY COMPANY.
- G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATIONS OF ALL EXISTING UTILITIES. THIS WORK WILL NOT BE MEASURED OR PAID FOR DIRECTLY BUT WILL BE CONSIDERED A SUBSIDIARY OBLIGATION OF THE CONTRACT. ALL EXISTING UTILITIES SHALL BE WORKED AROUND. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- H. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING MATERIALS SOURCES FOR THIS PROJECT AND MEETING ALL REQUIREMENTS OF DIVISION 9 OF THE WSDOT STANDARD SPECIFICATIONS. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR SECURING ALL PERMITS FOR THE USE OF THE SOURCE AND PROVIDING COPIES OF THE DOCUMENTS TO THE PROJECT C.O.R.
- I. THE SBIT WILL BE REQUIRED TO OBTAIN AN NPDES PERMIT FROM THE WASHINGTON DEPT OF ECOLOGY AND SUPPORTING DOCUMENTATION 90 DAYS PRIOR TO CONSTRUCTION. REGIONAL REP FOR GRAYS HARBOR COUNTY:
JACOB NEUHARTH PHONE: 360-742-9751 JACOB.NEUHARTH@ECY.WA.GOV
- J. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING A STORMWATER POLLUTION PREVENTION PLAN, AND IMPLEMENTING SEDIMENT, EROSION, AND POLLUTION-PREVENTION MEASURES.
- K. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL QUALITY CONTROL WORK IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATION REQUIREMENTS.

2. GRADING

- A. THE CONTRACTOR SHALL DEVELOP A TESC PLAN. THE CONTRACTOR SHALL MODIFY THE TESC PLAN TO MEET THE CONTRACTORS SCHEDULE, METHOD OF CONSTRUCTION, AND TO INCLUDE OFF-SITE AREAS THAT WILL BE USED TO DIRECTLY SUPPORT CONSTRUCTION ACTIVITY SUCH AS EQUIPMENT STAGING YARDS, MATERIAL STORAGE AREAS, OR BORROW AREAS.
- B. CONTRACTOR SHALL PROTECT EXISTING VEGETATION AND FEATURES NOT DESIGNATED FOR REMOVAL.
- C. THE CONTRACTOR SHALL NOT WASTE ANY EXCESS EXCAVATION UNTIL ALL PLANNED EMBANKMENTS AND BACKFILLS ARE COMPLETED. EXCESS UNCLASSIFIED EXCAVATION MATERIAL DETERMINED BY THE C.O.R. TO BE SUITABLE FOR BACKFILL SHALL BE USED TO REDUCE ANY UNCLASSIFIED BORROW NEEDED. COST OF SECOND HANDLING SHALL BE INCLUDED IN OTHER ITEMS OF WORK. ANY REMAINING EXCESS EXCAVATION SHALL BE DISPOSED OF ON SITE IN A MANNER APPROVED BY THE C.O.R.
- D. ASPHALT AND BASE COURSE MATERIALS REMOVED OR MILLED FROM WITHIN THE PROJECT MAY BE RE-USED WITHIN THE PROJECT, SUBJECT TO COMPLIANCE WITH THE PLANS AND SPECIFICATIONS AND WITH THE APPROVAL OF THE GEOTECHNICAL ENGINEER. MATERIAL NOT USED IN THE PROJECT SHALL BECOME PROPERTY OF THE CONTRACTOR AND WILL BE DISPOSED OF BY THE CONTRACTOR IN A MANNER APPROVED OF BY THE C.O.R.
- E. SUBBASE SHALL BE NATIVE SOIL COMPACTED TO 95% OF ASTM D-1557, OR GRAVEL BORROW PER WSDOT 9-03.14(1) OR PERMEABLE BALLAST WSDOT 9-03.9(1). PER GEOTECHNICAL REPORT DATED APRIL 9, 2025 BY SOUTH SOUND GEOTECHNICAL CONSULTING. ALL COSTS ASSOCIATED WITH MATERIAL TESTING AND COMPACTION VERIFICATION SHALL BE CONSIDERED INCIDENTAL TO THE SUBBASE MATERIAL AND NO SEPARATE PAYMENT WILL BE MADE.
- F. SLOPES SHALL BE STABILIZED IMMEDIATELY AFTER GRADING TO PREVENT EROSION.
- G. CHANNEL EXCAVATION, DITCH BLOCKS, DIKES, "V" DITCHES AND FURROW DITCHES WILL NOT BE MEASURED DIRECTLY FOR PAYMENT, BUT WILL BE CONSIDERED A SUBSIDIARY OBLIGATION OF THE CONTRACT.
- H. HUB STAKES SHALL BE SET AT SUBGRADE AND BASE COURSE BY A LICENSED SURVEYOR IN THE STATE OF WASHINGTON.

3. DRAINAGE

- A. ALL STORM DRAINAGE FACILITIES SHALL BE INSTALLED PER WSDOT STANDARD PLANS AND SPECIFICATIONS.
- B. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE THROUGHOUT CONSTRUCTION.
- C. INLETS AND CATCH BASINS SHALL BE PROTECTED FROM SEDIMENT AND DEBRIS DURING CONSTRUCTION.
- D. ALL PIPE BEDDING AND BACKFILL SHALL BE COMPACTED PER WSDOT STANDARDS.

4. SANITARY SEWER

- A. SEWER CONSTRUCTION SHALL COMPLY WITH SBIT UTILITY DEPARTMENT REQUIREMENTS AND WSDOT SPECIFICATIONS.
- B. DRAINAGE STRUCTURES SHALL BE INSTALLED AS SHOWN ON THE PLANS WITH ONLY MINOR CORRECTIONS IN LOCATION, SKEW, LENGTH AND/OR ELEVATIONS AS NEEDED TO FIT FIELD CONDITIONS AS DETERMINED BY TO C.O.R. CONTRACTOR SHALL PROVIDE RED LINES/AS-BUILTS DETAILING ALL DEVIATIONS FROM THE APPROVED PLANS AS CONSTRUCTED.
- C. ALL FORCE MAIN SEWER PIPE SHALL BE PRESSURE TESTED AND INSPECTED PRIOR TO BACKFILLING.
- D. MAINTAIN MINIMUM COVER AND SEPARATION DISTANCES AS REQUIRED BY ALL RELEVANT CODES.
- E. EXISTING SEWER SERVICES SHALL BE MAINTAINED OR REROUTED AS NECESSARY TO AVOID DISRUPTION.
- F. ALL SEWER PIPE SHALL BE HDPE SEWER PIPE CONFORMING MANUFACTURED FROM RESINS MEETING THE REQUIREMENTS OF ASTM D3350 WITH A CELL CLASSIFICATION OF 345464C AND A PLASTIC PIPE INSTITUTE (PPI) DESIGNATION OF PE 3408, UNLESS OTHERWISE NOTED. TRENCHING, BEDDING, AND BACKFILL SHALL BE IN ACCORDANCE WITH WSDOT STANDARDS. MINIMUM COVER ON HDPE PIPE SHALL BE 3.0 FEET FROM THE BOTTOM OF THE PAVEMENT SECTION.

- G. ALL PUBLIC SANITARY SEWER MAINS SHALL BE PRESSURE TESTED PRIOR TO ACCEPTANCE BY THE C.O.R. PRESSURE TESTS SHALL BE CONDUCTED IN THE PRESENCE OF THE C.O.R. PRIOR TO ROADWAY BACKFILLING, ALL SANITARY SEWER PIPES SHALL PASS A LOW PRESSURE AIR TEST. THE PRESSURE TEST SHALL BE DONE PER WSDOT STANDARD SPECIFICATIONS.
- E. SANITARY SEWER STRUCTURES SHALL BE INSTALLED AS SHOWN ON THE PLANS WITH ONLY MINOR CORRECTIONS IN LOCATION, SKEW, LENGTH AND/OR ELEVATIONS AS NEEDED TO FIT FIELD CONDITIONS AS DETERMINED BY THE C.O.R. CONTRACTOR SHALL PROVIDE RED LINES/AS-BUILTS DETAILING ALL DEVIATIONS FROM THE APPROVED PLANS AS CONSTRUCTED.
- F. THE FOLLOWING TELEVISION VIDEO INSPECTION AND REPORT SHALL BE PROVIDED TO THE QIN WASTE WATER DEPARTMENT:
- A DIGITAL VIDEO WHICH ENCOMPASSES THE LIMITS OF THE INSPECTION AREA AND INCLUDING ALL REFERENCE DATA AS DESCRIBED HEREIN.
 - A DIGITAL VIDEO REFERENCE TIME AND DATE FOR THE START OF EACH RUN SHALL ALSO BE INDICATED.
 - A WRITTEN REPORT SHALL BE PROVIDED CORRESPONDING TO THE VIDEO INSPECTION AND INCLUDING ALL REFERENCE DATA AS DESCRIBED HEREIN. THE REPORT SHALL CONSIST OF A WRITTEN NARRATIVE OF ALL DISTINCTIVE PIPE CONDITIONS, INCLUDING PONDING AREAS IN EXCESS OF ¼ INCH.

5. WATER

- A. WATER SYSTEM IMPROVEMENTS SHALL CONFORM TO THE SBIT UTILITY DEPT.'S REQUIREMENTS AND WSDOT SPECIFICATIONS.
- B. ALL WATER MAINS SHALL BE PRESSURE TESTED AND DISINFECTED PER AWWA STANDARDS PRIOR TO BACKFILL.
- C. PIPE FITTINGS FOR WATER MAINS AND VALVES SHALL BE FUSED JOINTS CONFORMING TO AWWA SPECIFICATIONS C906.
- D. CONTRACTOR SHALL COORDINATE WITH THE SBIT UTILITY DEPARTMENT FOR ALL CONNECTIONS AND SHUTDOWNS.
- E. MAINTAIN REQUIRED HORIZONTAL AND VERTICAL SEPARATION FROM SEWER LINES PER ALL RELEVANT CODES.
- F. PIPE OF DISTRIBUTION WATER MAINS SHALL BE HIGH-DENSITY POLYETHYLENE PE3408 CONFORMING TO MINIMUM CELL CLASS 345464 C, D OR E PER ASTM D3350. PIPE DIAMETER SHALL MEET THE REQUIREMENTS OF ANSI/AWWA C 906. PIPE PRESSURE CLASS SHALL BE AS LISTED IN TABLE 9 OF ANSI/AWWA C 906 FOR DR 9 PE3408 MATERIAL. FURNISH ALL PIPES WITH A MINIMUM DIMENSION RATIO (DR) OF 17.
- G. ALL WATER MAINS AND APPURTENANCES SHALL BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATIONS IN THE PRESENCE OF THE C.O.R. CONTRACTOR TO NOTIFY THE SBIT AND THE C.O.R. 72 HOURS IN ADVANCE OF TESTING. ALL COSTS ASSOCIATED WITH TESTING, INCLUDING LABOR, EQUIPMENT, AND COORDINATION SHALL BE CONSIDERED INCIDENTAL AND NO SEPARATE PAYMENT WILL BE MADE.
- H. FIRE HYDRANT ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATIONS AND DETAIL SHEET 41.
- I. RESILIENT SEATED WEDGE GATE VALVES SHALL BE USED FOR ALL WATER MAINS 12 INCHES IN DIAMETER AND SMALLER. TRENCHING, BEDDING, AND BACKFILL FOR WATER MAINS SHALL BE IN ACCORDANCE WITH WSDOT STANDARD DETAILS AND SPECIFICATIONS.
- J. FIRE HYDRANTS SHALL BE PROVIDED IN ACCORDANCE WITH WAC 248-57-600 AND SHALL CONFORM TO AMERICAN WATER WORKS ASSOCIATION SPECIFICATIONS FOR DRY BARREL FIRE HYDRANTS.

6. SURFACING

- A. AGGREGATE BASE AND SUBBASE SHALL BE PLACED AND COMPACTED PER WSDOT STANDARD SPECIFICATIONS AND THE GEOTECHNICAL REPORT DATED APRIL 9, 2025 BY SOUTH SOUND GEOTECHNICAL CONSULTING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTRACTING A THIRD PARTY TO PERFORM ALL REQUIRED DENSITY TESTING TO VERIFY COMPACTION COMPLIANCE.
- B. FINISHED SURFACE SHALL BE TRUE TO LINE AND GRADE WITHIN TOLERANCES SPECIFIED BY WSDOT.
- C. CONTRACTOR SHALL PROTECT ALL SURFACING FROM CONTAMINATION AND DAMAGE DURING CONSTRUCTION.

7. HOT MIX ASPHALT

- A. HMA SHALL BE PLACED IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE CONTRACTING A THIRD PARTY TO PERFORM ALL REQUIRED DENSITY TESTING TO VERIFY COMPACTION COMPLIANCE.
- B. PAVING SHALL NOT OCCUR DURING WET OR FREEZING CONDITIONS OR WHEN AMBIENT TEMPERATURE IS BELOW 45°F.
- C. TACK COAT SHALL BE APPLIED BETWEEN LIFTS AND TO ALL VERTICAL SURFACES.
- D. COMPACTION SHALL MEET DENSITY REQUIREMENTS AS SPECIFIED BY WSDOT.
- E. HMA SHALL BE 2 INCH MAX LIFT HEIGHT.

8. TRAFFIC

- A. TEMPORARY AND PERMANENT TRAFFIC CONTROL SHALL COMPLY WITH THE CURRENT EDITION OF THE MUTCD AND WSDOT GUIDELINES.
- B. CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN IN ACCORDANCE WITH WSDOT DETAILS AND THE MUTCD, AND SHALL INCLUDE THE CONTRACTOR'S CONSTRUCTION SEQUENCING PLAN FOR APPROVAL PRIOR TO BEGINNING WORK.
- C. ACCESS TO ADJACENT PROPERTIES SHALL BE MAINTAINED AT ALL TIMES.
- D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SIGNING AND MAINTENANCE OF TRAFFIC DETOURS DURING CONSTRUCTION IN ACCORDANCE WITH WSDOT AND MUTCD STANDARDS AND SPECIFICATIONS.
- E. ALL SIGNS, STRIPING, AND PAVEMENT MARKINGS SHALL CONFORM TO WSDOT STANDARDS.

9. MISCELLANEOUS

- A. A COPY OF THESE APPROVED PLANS AND APPLICABLE SPECIFICATIONS AND DETAILS SHALL BE MAINTAINED ON-SITE BY THE GENERAL CONTRACTOR AT ALL TIMES DURING CONSTRUCTION.
- B. CONTRACTOR SHALL MAINTAIN A CLEAN AND SAFE WORK SITE AT ALL TIMES.
- C. ALL MATERIALS AND WORKMANSHIP ARE SUBJECT TO INSPECTION AND APPROVAL BY THE SBIT AND THE C.O.R. PRIOR TO ACCEPTANCE.
- D. ANY DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS SHALL BE REPORTED

- IMMEDIATELY THE THE SBIT AND THE C.O.R.
- E. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY AND EXPENSE FOR DISPOSAL OF TRASH AND/OR CONSTRUCTION DEBRIS. THIS WORK SHALL BE INCIDENTAL OBLIGATIONS OF THE CONTRACT.
- F. EXISTING CULVERTS, ROADSIDE SIGNS, OR OTHER IMPROVEMENTS DAMAGED BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE RESTORED TO EQUAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE.
- G. DURING CONSTRUCTION, ALL ROADS ADJACENT TO THIS PROJECT SHALL BE KEPT CLEAN OF ALL MATERIAL DEPOSITS RESULTING FROM ON-SITE CONSTRUCTION, AND EXISTING STRUCTURES AND IMPROVEMENTS SHALL BE PROTECTED.
- H. THE DESIGN FEATURES INCLUDING HORIZONTAL AND VERTICAL ALIGNMENTS, TYPICAL SECTIONS, AND TURNAROUNDS SHOWN ON THESE DESIGN PLANS SHALL NOT BE ALTERED OR MODIFIED IN ANY WAY DURING CONSTRUCTION WITHOUT PRIOR APPROVAL OF THE ENGINEER OF RECORD.

10. REQUIRED DOCUMENTATION

- A. THE CONTRACTOR SHALL READ AND MAKE CAREFUL EXAMINATION OF THE PLANS, SPECIFICATIONS, QUANTITIES AND MATERIALS BEFORE MAKING A BID. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL ERRORS AND OMISSIONS RESULTING FROM THE FAILURE TO MAKE SUCH AN EXAMINATION. ANY INFORMATION DERIVED FROM THE MAPS, PLANS, SPECIFICATIONS, PROFILES, DRAWINGS OR FROM THE ENGINEER WILL NOT RELIEVE THE CONTRACTOR FROM ANY RISK OR FROM FULFILLING THE TERMS OF THE CONTRACT.
- B. CONTRACTOR SHALL SUBMIT ALL REQUIRED DOCUMENTATION INCLUDING PERMITS, INSPECTION REPORTS, AND TEST RESULTS TO THE SBIT AND THE C.O.R.
- C. DAILY CONSTRUCTION LOGS SHALL BE MAINTAINED AND SUBMITTED WEEKLY TO THE SBIT AND THE C.O.R.
- D. FINAL PROJECT REPORT SHALL BE SUBMITTED UPON COMPLETION, INCLUDING AS-BUILT DRAWINGS AND CERTIFICATIONS TO THE SBIT AND THE C.O.R.
- E. ENVIRONMENTAL COMPLIANCE DOCUMENTATION SHALL BE MAINTAINED AND SUBMITTED AS REQUIRED TO THE SBIT AND THE C.O.R.
- F. AFTER COMPLETION OF ALL ITEMS SHOWN ON THESE PLANS AND BEFORE ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL OBTAIN A "PUNCH LIST" PREPARED BY THE C.O.R. DETAILING REMAINING ITEMS OF WORK TO BE COMPLETED. ALL ITEMS OF WORK SHOWN ON THESE PLANS SHALL BE COMPLETED TO THE SATISFACTION OF THE C.O.R. PRIOR TO ACCEPTANCE OF THE WORK.
- G. THE CONTRACTOR IS REQUIRED TO PROVIDE CERTIFIED RECORD DRAWINGS TO SBIT AND THE C.O.R. PRIOR TO PROJECT ACCEPTANCE.

11. GEOTECHNICAL

- A. CONTRACTOR SHALL COMPLY WITH RECOMMENDATIONS FOR EARTHWORK OUTLINED IN THE GEOTECHNICAL REPORT DATED APRIL 9, 2025 BY SOUTH SOUND GEOTECHNICAL CONSULTING.
- B. COORDINATION WITH THE GEOTECHNICAL ENGINEER IS CONSIDERED INCIDENTAL TO THE PROJECT AND SHALL BE INCLUDED IN OTHER ITEMS OF WORK. NO SEPARATE PAYMENT SHALL BE MADE.

12. SURVEY

- A. ALL CONSTRUCTION SURVEYING SHALL BE PERFORMED UNDER THE DIRECTION OF A PROFESSIONAL LAND SURVEYOR LICENSED TO PRACTICE IN THE STATE OF WASHINGTON.
- B. ANY MONUMENTS DAMAGED OR DISTURBED BY THE CONTRACTOR SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE BY A PROFESSIONAL LAND SURVEYOR LICENSED TO PRACTICE IN WASHINGTON STATE WITH A CFEDS CERTIFICATION.

13. WORK WITHIN EXISTING RIGHT-OF-WAY:

- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY NECESSARY PERMITS FROM THE COUNTY OR STATE IF WORK IS TO BE PERFORMED WITHIN THEIR RIGHT-OF-WAY PRIOR TO ANY CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY NECESSARY PERMITS OR LICENSES FROM THE TRIBAL GOVERNMENT IF WORK IS TO BE PERFORMED WITHIN THEIR TRIBAL LAND PRIOR TO ANY CONSTRUCTION ACTIVITIES.
- B. NO WORK SHALL BE PERFORMED OUTSIDE OF THE DESIGNATED CONSTRUCTION LIMITS WITHOUT THE APPROVAL OF THE C.O.R. NO WORK SHALL BE PERFORMED OUTSIDE THE DESIGNATED RIGHT-OF-WAY OR CONSTRUCTION EASEMENTS WITHOUT PRIOR APPROVAL FROM THE SBIT.

14. WELLS

- A. IF ANY EXISTING WELLS (INCLUDING TEST WELLS, WATER WELLS, OR OTHER TYPES) ARE ENCOUNTERED, DISTURBED, DAMAGED, OR EXPOSED DURING EXCAVATION OR CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL NOTIFY THE SBIT AND THE C.O.R. IMMEDIATELY AND SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR, SEAL, OR ABANDON THE WELL IN ACCORDANCE WITH APPLICABLE REGULATIONS.
- B. ACCEPTABLE METHODS OF SEALING OR REPAIR MAY INCLUDE WELDING, PATCHING, OR CONCRETING, SUBJECT TO APPROVAL BY THE CONSTRUCTION MANAGER (C.M.) AND THE C.O.R.
- C. ALL WORK SHALL BE PERFORMED BY QUALIFIED PERSONNEL AND DOCUMENTED FOR FINAL APPROVAL.

15. SCHEDULE CHANGES

- A. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF SEVENTY-TWO (72) HOURS ADVANCE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER (C.M.) AND ALL AFFECTED PARTIES FOR ANY PROPOSED CHANGES TO THE APPROVED CONSTRUCTION SCHEDULE.
- B. FAILURE TO PROVIDE TIMELY NOTICE MAY RESULT IN DELAYS OR REJECTION OF THE REQUESTED SCHEDULE MODIFICATION.
- C. ALL SCHEDULE CHANGES ARE SUBJECT TO REVIEW AND APPROVAL BY THE C.O.R.

16. UTILITY POTHOLE INVESTIGATION

- A. THE CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITIES THAT MAY CONFLICT WITH PROPOSED CONSTRUCTION PRIOR TO EXCAVATION OR INSTALLATION OF NEW FACILITIES.
- B. POTHOLE LOCATIONS SHALL BE COORDINATED WITH THE CONSTRUCTION MANAGER (C.M.) AND DOCUMENTED TO VERIFY HORIZONTAL AND VERTICAL ALIGNMENTS.
- C. ANY DISCREPANCIES BETWEEN FIELD CONDITIONS AND PLAN LOCATIONS SHALL BE REPORTED IMMEDIATELY TO THE C.M., THE ENGINEER OF RECORD, AND THE C.O.R. FOR RESOLUTION.

[illegible]

ABBREVIATIONS	
½Δ	MIDPOINT OF CURVE
¼Δ	QUARTER POINT OF CURVE
ALIGN.	ALIGNMENT
ASPH.	ASPHALT
BCR	BEGIN CURB RETURN
BFS	BEGIN FULL SUPER
BLDG	BUILDING
BM	BENCH MARK
BNC	BEGIN NORMAL CROWN
BOV	BLOW OFF VALVE
BW	BACK OF SIDEWALK
BVCS	BEGIN VERTICAL CURVE STATION
BVCE	BEGIN VERTICAL CURVE ELEVATION
C&G	CURB AND GUTTER
CD	CROSS DRAIN
CFEDS	CERTIFIED FEDERAL SURVEYOR
℄ OR CL	CENTERLINE
CM	CONSTRUCTION MANAGER
CONC.	CONCRETE
COR OR C.O.R.	CONTRACTING OFFICER REPRESENTATIVE
CP	CONTROL POINT
CRL	CONSTRUCTION REFERENCE LINE
CTSM	CONTINGENT SUM
CY	CUBIC YARD
DTL	DETAIL
DR.	DRIVE
EA.	EACH
ECR	END CURB RETURN
EFS	END FULL SUPER
EG	EXISTING GRADE
EL OR ELEV.	ELEVATION
EOA	EDGE OF ASPHALT
ENC	END NORMAL CROWN
EVCS	END VERTICAL CURVE STATION
EVCE	END VERTICAL CURVE ELEVATION
EX.	EXISTING
FT	FEET
FG	FINISHED GRADE
℄ OR FL	FLOW LINE
GFL	GUTTER FLOW LINE ELEVATION
HDPE	HIGH-DENSITY POLYETHYLENE
HMA	HOT MIX ASPHALT
HP	HIGH POINT
HORZ	HORIZONTAL
LVC	LENGTH OF VERTICAL CURVE
LF	LINEAR FEET
LP	LOW POINT
LT	LEFT
MTN	MOUNTAIN
N/A	NOT APPLICABLE
OFF.	OFFSET
PI	POINT OF INTERSECTION
PC	POINT OF CURVATURE
PRC	POINT OF REVERSE CURVE
PT	POINT OF TANGENCY
PVI	POINT OF VERTICAL INTERSECTION
RET.	RETAINING
RD	ROAD
RT	RIGHT
RTE	ROUTE
ROW OR R/W	RIGHT OF WAY
SBIT	SHOALWATER BAY INDIAN TRIBE
SEC.	SECTION
SPD	SPECIAL DITCH
STA.	STATION
STR.	STRUCTURE
SY	SQUARE YARD
TA	TOP OF ASPHALT
TBC	TOP BACK OF CURB
TCE	TEMPORARY CONSTRUCTION EASEMENT
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
TEMP.	TEMPORARY
TRANS.	TRANSITION
TYP.	TYPICAL
VERT.	VERTICAL
W/	WITH
WP	WORK POINT

LEGEND	
	EXISTING CONTOUR MAJOR
	EXISTING CONTOUR MINOR
	PROPOSED CONTOURS
	PROPOSED GRADE BREAK/ ROAD SHOULDER
	EXISTING OVERHEAD ELECTRIC LINE
	EXISTING FIBER OPTIC LINE
	EXISTING WATER LINE
	PROPOSED WATER LINE
	PROPOSED FIRE HYDRANT
	EXISTING FIRE HYDRANT
	PROPOSED WATER VALVE
	EXISTING WATER VALVE
	PROPOSED AIR RELEASE VALVE, WATER
	PROPOSED AIR RELEASE VALVE, SANITARY
	PROPOSED SEWER VALVE
	PROPOSED SEWER CLEANOUT
	PROPOSED SEWER MANHOLE
	EXISTING SEWER MANHOLE
	PROPOSED SANITARY SEWER
	PROPOSED SANITARY SEWER (FORCE MAIN)
	EXISTING SANITARY SEWER
	EXISTING SANITARY SEWER (FORCE MAIN)
	PROPOSED CONDUIT TRENCH
	PROPERTY LINE
	EXISTING RIGHT-OF-WAY
	PROPOSED RIGHT-OF-WAY
	PROPOSED EOA
	PROPOSED CURB/ SIDEWALK
	EXISTING DIRT/GRAVEL ROAD
	CONSTRUCTION CENTERLINE
	PROPOSED TOP CUT/ TOE SLOPE
	TEMPORARY SILT FENCE
	WETLAND
	PROPOSED CHECK DAM
	SURVEY CONTROL POINT
	EXISTING SIGN
	PROPOSED SIGN
	PROPOSED STREET LIGHT
	EXISTING PIPE CULVERT
	PROPOSED CULVERT
	PROPOSED ASPHALT
	PROPOSED DITCH
	PROPOSED CONCRETE SIDEWALK
	PROPOSED VEGETATED FILTER STRIP
	PROPOSED DITCH LINING/ RIPRAP
	CRUSHED SURFACING TOP COURSE

1. CONTRACTOR TO COORDINATE REMOVAL OF EXISTING TIMBER AND SLASH PILES FROM SITE WITH C.O.R.
2. ALL EARTHWORK QUANTITIES PROVIDED ARE ESTIMATES BASED ON NET QUANTITIES, AND DO NOT INCLUDE SHRINKAGE OR SWELL FACTORS. ALL EARTHWORK QUANTITIES PROVIDED WITHIN THESE PLANS ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL PROVIDE THEIR OWN QUANTITY TAKEOFFS TO BE INCLUDED IN THE CONTRACT AS PART OF THE BIDDING PROCESS.
3. PRICE BID TO INCLUDE WATERING FOR DUST CONTROL.
4. PAY ITEM INCLUDES THE REMOVAL OF UNSUITABLE FOUNDATION MATERIAL. THE CONTRACTOR SHALL REMOVE AND DISPOSE THE UNSUITABLE FOUNDATION MATERIAL IN A MANNER APPROVED BY THE COR. ONSITE SCREENING MAYBE A VIABLE OPTION, PER CONTRACTORS DISCRETION. CONTRACTOR TO COORDINATE WITH GEOTECH FOR DETAILS.
5. STRUCTURE EXCAVATION, TRENCH EXCAVATION AND ALL COSTS ASSOCIATED WITH FURNISHING AND INSTALLING GRAVEL/SAND BACKFILL FOR BEDDING MANHOLES, INLETS, AND PIPES SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE ITEM INSTALLED.
6. BID PRICE TO INCLUDE END MARKERS.
7. BID PRICE TO INCLUDE ALL FITTINGS AND APPURTENANCES PER WATER SERVICE STUB DETAIL SHEET 40.
8. THE UNIT CONTRACT PRICE PER EACH FOR "HYDRANT ASSEMBLY" SHALL BE FULL PAY FOR ALL WORK TO FURNISH AND INSTALL FIRE HYDRANT ASSEMBLIES, INCLUDING ALL COSTS FOR AUXILIARY GATE VALVE, SHACKLES, TIE RODS, CONCRETE BLOCKS, GRAVEL, AND PAINTING REQUIRED AS SPECIFIED.
9. QUANTITY ESTIMATED AT 145.2 LB/C.F.
10. TENSAR NX750 GEOGRID OR APPROVED EQUAL. SEE GEOTECH REPORT, PROVIDED BY SOUTH SOUND GEOTECHNICAL CONSULTING DATED APRIL 9, 2025.
11. QUANTITY ESTIMATED AT 19.5 ACRES. STRAW WATTLES TO BE ANCHORED WITH LIVING STAKES. LIVING STAKES SPECIES TO BE APPROVED BY THE COR. SEEDING APPLICATION SHALL BE HYDROSEED AT 120 LBS/ACRE. SEED MIXTURE BY WEIGHT SHALL BE 50% COLONIAL BENTGRASS, 40% TALL OR RED FESCUE, 10% WHITE CLOVER. THE FOLLOWING SPECIES MAY BE SUBSTITUTED OR ADDED: MEADOW OR PACIFIC FOXTAIL, TIMOTHY, OR REDTOP BENTGRASS.
12. INCLUDES THE COST OF SIGN SUPPORT AND INSTALLATION. SIGN SUPPORT TO BE TYPE ST-1 PER DETAIL SHEET 37.
13. THE UNIT CONTRACT PRICE FOR "TOPSOIL TYPE B" SHALL BE FULL PAY FOR ALL COSTS INCLUDING WEED CONTROL PRE-TREATMENT OF TOPSOIL AREAS, EXCAVATION, AND STOCKPIILING FOR THE SPECIFIED WORK. SEE GEOTECH REPORT, PROVIDED BY SOUTH SOUND GEOTECHNICAL CONSULTING DATED APRIL 9, 2025, FOR TOPSOIL DEPTHS AND LOCATIONS.
14. THE UNIT CONTRACT PRICE PER EACH FOR "CEMENT CONC. PARALLEL CURB RAMP" SHALL BE FULL PAY FOR CONSTRUCTION OF THE CURB RAMP AS SPECIFIED, INCLUDING THE CAST-IN-PLACE DETECTABLE WARNING SURFACES.
15. LUMINATION SYSTEM SHALL INCLUDE ALL ITEMS TO INSTALL STREET LIGHT INCLUDING, BUT NOT LIMITED TO: LUMINARIES, 20' STEEL HINGED POLE VALMONT DSF10 #400F200 W/ 4' STEEL ARM VALMONT REMO 5Q011-S04 OR APPROVED EQUAL, 25' STEEL HINGED POLE VALMONT DSF10 #400F250 W/ 6' STEEL ARM VALMONT REMO 5Q011-S10 OR APPROVED EQUAL, BASE, FOUNDATION, WIRING AND 1" CONDUIT PIPE.

RAISE LOOP ROAD
SHOALWATER BAY TRIBE
TOKELAND, WA
SUMMARY OF QUANTITIES



RED PLAINS PROFESSIONAL, INC.
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PROJ. 60409

SHT. 5

STORM

6531S VEGETATIVE FILTER STRIP (S.Y.)			
ROAD	BEGIN STA	END STA	QUANTITY (S.Y.)
RAISE LOOP	24+50	30+30	354
RAISE LOOP	30+69	96+88	4,181
TOTAL QUANTITY			4,535

1085 QUARRY SPALLS (C.Y.)				
BEGIN STA	END STA	AREA (S.F.)	DEPTH (L.F.)	QUANTITY (C.Y.)
DITCH				
42+41	45+50	2,835	0.75	84
51+00	57+50	5,415	0.75	160
58+50	81+98	19,837	0.75	585
RIPRAP APRON				
42+41	N/A	165	1.50	10
71+32	N/A	567	1.50	32
83+08	N/A	165	1.50	10
86+25	N/A	165	1.50	10
89+00	N/A	165	1.50	10
TOTAL QUANTITY				901

0885 STREMBED COBBLES 4-INCH (C.Y.)				
BEGIN STA	END STA	AREA (S.F.)	DEPTH (L.F.)	QUANTITY (C.Y.)
83+08	85+50	1,986	0.33	26
86+25	87+97	1,422	0.33	19
89+00	95+58	5,463	0.33	72
TOTAL QUANTITY				117

0886 STREMBED COBBLES 6-INCH (C.Y.)				
BEGIN STA	END STA	AREA (S.F.)	DEPTH (L.F.)	QUANTITY (C.Y.)
24+50	29+50	4,048	0.50	80
TOTAL QUANTITY				80

CORRUGATED HIGH-DENSITY POLYETHYLENE (HDPE) PIPE 18 IN. DIAM. (L.F.)			
ROAD	DESCRIPTION	STA	QUANTITY (L.F.)
RAISE LOOP	SD1	48+68	35
TOTAL QUANTITY			35

SURFACING AND PAVEMENT

5095 CRUSHED SURFACING BASE COURSE (C.Y.)					
ROAD	BEGIN STA	END STA	AREA (S.F.)	DEPTH (FT)	QUANTITY (CY)
LANES					
RAISE LOOP*	24+50	96+88	175,509	0.33	2,167
CURB & SIDEWALK					
RAISE LOOP*	24+50	96+88	39,901	0.33	493
APPROACH					
APPROACH A	01+12	03+42	2,949	0.33	37
TOTAL QUANTITY					2,703

*QUANTITY INCLUDES RIDGE ROAD STUB

5115 CRUSHED SURFACING TOP COURSE (C.Y.)					
ROAD	BEGIN STA	END STA	AREA (S.F.)	DEPTH (FT)	QUANTITY (CY)
APPROACHES					
APPROACH A	01+12	03+42	2949	0.25	28
TOTAL QUANTITY					28

5767 HMA CL. 1/2 IN. PG 58H-22 (TON)		145.2 LB/FT^3
ROAD	AREA (S.F.)	DEPTH (FT)
RAISE LOOP*	175,508	0.25
TOTAL QUANTITY		3,247

*QUANTITY INCLUDES RIDGE ROAD STUB

7552 CONSTRUCTION GEOTEXTILE FOR SOIL STABILIZATION				
ROAD	BEGIN STA	END STA	AREA (S.F.)	QUANTITY (SY)
LANES				
RAISE LOOP	24+50	96+88	175,509	19,501
CURB & SIDEWALK				
RAISE LOOP	24+50	96+88	39,901	4,434
TOTAL QUANTITY				23,935

SANITARY SEWER (OPTION 1)

3767S HDPE PIPE PRESSURE SANITARY SEWER MAIN 6-INCH (L.F.)				
ROAD	START STATION	END STATION	6 IN. DIAM (L.F.)	REMARKS
RAISE LOOP	24+50	96+88	7,337	ASSUMED AVERAGE PIPE DIA. ACTUAL DIA. MAY VARY
TOTAL QUANTITY			7,337	

3767S HDPE PIPE PRESSURE SANITARY SEWER MAIN 3-INCH (L.F.)				
ROAD	START STATION	END STATION	3 IN. DIAM (L.F.)	REMARKS
RAISE LOOP	63+19	63+19	14	ASSUMED AVERAGE PIPE DIA. ACTUAL DIA. MAY VARY
TOTAL QUANTITY			14	

3640 SANITARY SEWER CLEANOUTS 6-INCH (EACH)	
ROAD	QUANTITY (EACH)
RAISE LOOP	4
TOTAL QUANTITY	4

6155S SSFM GATE VALVE 3-INCH (EACH)	
ROAD	QUANTITY (EACH)
RAISE LOOP	1
TOTAL QUANTITY	1

6155 SSFM GATE VALVE 6-INCH (EACH)	
ROAD	QUANTITY (EACH)
RAISE LOOP	17
TOTAL QUANTITY	17

3835 COMB. AIR RELEASE 1-IN (EACH)	
ROAD	QUANTITY (EACH)
RAISE LOOP	2
TOTAL QUANTITY	2

3767S HDPE PIPE PRESSURE SANITARY SEWER MAIN 2-INCH (L.F.)		
ROAD	STATION & SIDE	LENGTH (L.F.)
RAISE LOOP	48+93 RT	39.5
RAISE LOOP	50+12 RT	39.5
RAISE LOOP	51+06 RT	39.5
RAISE LOOP	52+58 RT	39.5
RAISE LOOP	53+84 RT	39.5
RAISE LOOP	55+36 RT	39.5
RAISE LOOP	56+81 RT	39.5
RAISE LOOP	57+62 RT	39.5
RAISE LOOP	69+12 RT	39.5
RAISE LOOP	69+78 RT	39.5
RAISE LOOP	70+71 RT	39.5
RAISE LOOP	72+20 RT	39.5
RAISE LOOP	73+67 RT	39.5
RAISE LOOP	75+08 RT	39.5
RAISE LOOP	76+44 RT	39.5
RAISE LOOP	77+51 RT	39.5
RAISE LOOP	78+56 RT	39.5
RAISE LOOP	79+97 RT	39.5
RAISE LOOP	81+42 RT	39.5
RAISE LOOP	83+26 RT	39.5
RAISE LOOP	84+72 RT	39.5
RAISE LOOP	86+32 RT	39.5
RAISE LOOP	87+62 RT	39.5
RAISE LOOP	89+06 RT	39.5
RAISE LOOP	90+28 RT	39.5
RAISE LOOP	91+70 RT	39.5
RAISE LOOP	93+15 RT	39.5
RAISE LOOP	94+56 RT	39.5
TOTAL QUANTITY		1,106

WATER

3858 SERVICE CONNECTION 1 IN. DIAM. (EACH)		
ROAD	STATION & SIDE	QUANTITY 1 IN. DIAM. (EACH)
RAISE LOOP	49+02 RT	1
RAISE LOOP	50+24 RT	1
RAISE LOOP	51+16 RT	1
RAISE LOOP	52+70 RT	1
RAISE LOOP	53+98 RT	1
RAISE LOOP	55+48 RT	1
RAISE LOOP	56+91 RT	1
RAISE LOOP	57+72 RT	1
RAISE LOOP	69+02 RT	1
RAISE LOOP	69+68 RT	1
RAISE LOOP	70+61 RT	1
RAISE LOOP	72+32 RT	1
RAISE LOOP	73+81 RT	1
RAISE LOOP	75+19 RT	1
RAISE LOOP	76+56 RT	1
RAISE LOOP	77+63 RT	1
RAISE LOOP	78+67 RT	1
RAISE LOOP	80+09 RT	1
RAISE LOOP	81+54 RT	1
RAISE LOOP	83+38 RT	1
RAISE LOOP	84+84 RT	1
RAISE LOOP	86+44 RT	1
RAISE LOOP	87+74 RT	1
RAISE LOOP	89+18 RT	1
RAISE LOOP	90+39 RT	1
RAISE LOOP	91+82 RT	1
RAISE LOOP	93+27 RT	1
RAISE LOOP	94+72 RT	1
TOTAL QUANTITY		28

3935S HDPE PIPE WATER MAIN 8-INCH (L.F.)			
ROAD	BEGIN STA	END STA	8 IN. DIAM. (L.F.)
RAISE LOOP	24+50	96+88	7,553
TOTAL QUANTITY			7553

3846 HYDRANT ASSEMBLY (EACH)		
ROAD	STATION & SIDE	QUANTITY (EACH)
RAISE LOOP	28+61 LT	1
RAISE LOOP	33+44 LT	1
RAISE LOOP	38+47 LT	1
RAISE LOOP	48+65 RT	1
RAISE LOOP	53+20 RT	1
RAISE LOOP	57+33 RT	1
RAISE LOOP	62+73 RT	1
RAISE LOOP	68+54 RT	1
RAISE LOOP	72+85 RT	1
RAISE LOOP	78+00 RT	1
RAISE LOOP	82+05 RT	1
RAISE LOOP	86+79 RT	1
RAISE LOOP	90+88 RT	1
RAISE LOOP	95+22 RT	1
RIDGE ROAD	1+74 RT	1
TOTAL QUANTITY		15

3835 COMB. AIR RELEASE 1-IN (EACH)	
ROAD	QUANTITY (EACH)
RAISE LOOP	2
TOTAL QUANTITY	2

6160 GATE VALVE 8-INCH (EACH)	
ROAD	QUANTITY (EACH)
RAISE LOOP	21
TOTAL QUANTITY	21

GRADING

EARTHWORK (C.Y.)				
ROAD	*0310 ROADWAY EXC. INCL. HAUL	*0470 EMBANKMENT COMPACTION	(+) EXCESS (-) BORROW	0350 UNSUITABLE FOUNDATION EXCAVATION INCL. HAUL
RAISE LOOP RD	397,559	400,460	-2,901	44,015
TOTAL QUANTITY	397,559	400,460	-2,901	44,015

* UNSUITABLE FOUNDATION EXCAVATION NOT INCLUDED IN THIS PAY ITEM

TRAFFIC

6857 PLASTIC CROSSWALK LINE					
ROAD	STA	LENGTH (FT.)	WIDE (FT.)	NO. OF BARS	AREA (S.F.)
RAISE LOOP	30+33	8	2	3	48
TOTAL QUANTITY		8	2	3	48

6859 PLASTIC STOP LINE		
ROAD	STA	LENGTH (L.F.)
RIDGE ROAD	01+25	13
TOTAL QUANTITY		13

6701 CEMENT CONC. TRAFFIC CURB (L.F.)				
ROAD	BEGIN STA	END STA	SIDE	QUANTITY (L.F.)
RAISE LOOP	24+50	96+88	LT	7,221
RIDGE RD	01+09	01+79	RT	80
TOTAL QUANTITY				7,301

6945 CONDUIT PIPE 2 IN. DIAM (L.F.)	
ROAD	QUANTITY (L.F.)x4
RAISE LOOP	29,292
TOTAL QUANTITY	29,292

6947 CONDUIT PIPE 3 IN. DIAM (L.F.)	
ROAD	QUANTITY (L.F.)x4
RAISE LOOP	29,292
TOTAL QUANTITY	29,292

GUARDRAIL					
ROAD	DESCRIPTION	BEGIN STA	END STA	6712 BEAM GUARDRAIL TYPE 31 - 9 FT. LONG POST (L.F.)	6719 BEAM GUARDRAIL TYPE 31 NON-FLARED TERMINAL (EACH)
EAGLE HILL RD	WALL 1	7+21	9+48	155	2
TOTAL QUANTITY				155	2

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PRELIMINARY ONLY

RAISE LOOP ROAD

SHOALWATER BAY TRIBE

TOKELAND, WA

QUANTITIES

RED PLAINS

PROFESSIONAL INC

CIVIL ENGINEERING • GIS • PLANNING • CONSTRUCTION MANAGEMENT

REVISIONS

NO.	DATE	DESCRIPTION

PROJ.

60409

SHT.

6

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OTHER ITEMS

SP REMOVAL OF EXISTING ROADWAY (S.Y.)	
ROAD	QUANTITY (S.Y.)
RAISE LOOP	1,692
TOTAL QUANTITY	1,692

7055 CEMENT CONCRETE SIDEWALK (S.Y.)					
ROAD	BEGIN STA	END STA	SIDE	WIDTH (FT)	QUANTITY (S.Y.)
RAISE LOOP	47+61	75+75	LT	5	4,000
RIDGE RD	01+09	01+79	RT	5	36
TOTAL QUANTITY					4,036

7535 CONSTRUCTION GEOTEXTILE FOR DITCH LINING (S.Y.)				
ROAD	BEGIN STA	END STA	AREA (S.F.)	QUANTITY (S.Y.)
RAISE LOOP	24+50	29+50	4,048	476
RAISE LOOP	42+41	45+50	2,835	334
RAISE LOOP	51+00	57+50	5,415	710
RAISE LOOP	58+50	81+98	198+37	2,853
RAISE LOOP	83+08	85+50	1,986	234
RAISE LOOP	86+25	87+97	1,422	168
RAISE LOOP	89+00	95+58	5,463	643
RAISE LOOP	42+41	N/A	165	18
RAISE LOOP	71+32	N/A	567	63
RAISE LOOP	83+08	N/A	165	18
RAISE LOOP	86+25	N/A	165	18
RAISE LOOP	89+00	N/A	165	18
TOTAL QUANTITY				2,701

SP BLOCK RETAINING WALL (S.F.)						
ROAD	DESCRIPTION	BEGIN STA	END STA	AREA EXPOSED WALL (S.F.)	AREA EMBEDDED (ASSUMED 1.5')	QUANTITY (S.F.)
EAGLE HILL RD	WALL 2	07+73	09+24	1,887	396	2,283
TOTAL QUANTITY						2,283

SP GEOWEB WALL RETAINING WALL (S.F.)						
ROAD	DESCRIPTION	BEGIN STA	END STA	AREA EXPOSED WALL (S.F.)	AREA EMBEDDED (ASSUMED 1.5')	QUANTITY (S.F.)
EAGLE HILL RD	WALL 1	00+95	06+61	2,283	536	2,819
TOTAL QUANTITY						2,819

7058 CEMENT CONC. PARALLEL CURB RAMP TYPE A (EACH)		
ROAD	STATION & SIDE	QUANTITY (EACH)
RAISE LOOP	30+33 LT	1
TOTAL QUANTITY		1

7058 CEMENT CONC. PARALLEL CURB RAMP TYPE B (EACH)		
ROAD	STATION & SIDE	QUANTITY (EACH)
RAISE LOOP	30+33 RT	1
TOTAL QUANTITY		1

6408 TOPSOIL CLASS B (ACRES)		
ROAD	AREA (S.F.)	QUANTITY (ACRES)
RAISE LOOP	946,720	22
TOTAL QUANTITY		22

PRELIMINARY ONLY

RAISE LOOP ROAD

SHOALWATER BAY TRIBE

TOKELAND, WA

QUANTITIES



RED PLAINS PROFESSIONAL, INC.
2103 NE 129TH STREET
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REVISIONS		DESCRIPTION					
NO.	DATE						

PROJ. 60409

SHT. 7

SANITARY SEWER (OPTION 2)

3767S HDPE PIPE PRESSURE SANITARY SEWER MAIN 6-INCH (L.F.)				
ROAD	START STATION	END STATION	6 IN. DIAM (L.F.)	REMARKS
RAISE LOOP	57+64	71+41	1,407	ASSUMED AVERAGE PIPE DIA. ACTUAL DIA. MAY VARY
TOTAL QUANTITY			1,407	

3767S HDPE PIPE PRESSURE SANITARY SEWER MAIN 3-INCH (L.F.)				
ROAD	START STATION	END STATION	3 IN. DIAM (L.F.)	REMARKS
RAISE LOOP	63+19	63+19	14	ASSUMED AVERAGE PIPE DIA. ACTUAL DIA. MAY VARY
TOTAL QUANTITY			14	

3640 SANITARY SEWER CLEANOUTS 6-INCH (EACH)	
ROAD	QUANTITY (EACH)
RAISE LOOP	1
TOTAL QUANTITY	1

6155 SSFM GATE VALVE 6-INCH (EACH)	
ROAD	QUANTITY (EACH)
RAISE LOOP	2
TOTAL QUANTITY	2

6155S SSFM GATE VALVE 3-INCH (EACH)	
ROAD	QUANTITY (EACH)
RAISE LOOP	1
TOTAL QUANTITY	1

3767S HDPE PIPE GRAVITY SANITARY SEWER MAIN 8-INCH (L.F.)					
ROAD	START STATION	END STATION	START STRUCTURE	END STRUCTURE	8 IN. DIAM (L.F.)
RAISE LOOP	26+76	24+50	SSMH 1.1	EX SSMH 1.5	225
RAISE LOOP	27+30	26+76	SSMH 1.2	SSMH 1.1	56
RAISE LOOP	29+81	27+30	SSMH 1.3	SSMH 1.2	253
RAISE LOOP	30+52	29+81	SSMH 1.4	SSMH 1.3	68
RAISE LOOP	31+29	30+52	SSMH 1.5	SSMH 1.4	74
RAISE LOOP	32+90	31+29	SSMH 1.6	SSMH 1.5	160
RAISE LOOP	33+80	32+90	SSMH 1.7	SSMH 1.6	92
RAISE LOOP	37+50	33+80	SSMH 1.8	SSMH 1.7	369
RAISE LOOP	39+72	37+50	SSMH 1.9	SSMH 1.8	222
RAISE LOOP	40+80	39+72	SSMH 1.10	SSMH 1.9	111
RAISE LOOP	43+72	40+80	SSMH 1.11	SSMH 1.10	291
RAISE LOOP	44+60	43+72	SSMH 1.12	SSMH 1.11	85
RAISE LOOP	46+32	44+60	SSMH 1.13	SSMH 1.12	172
RAISE LOOP	47+05	46+32	SSMH 1.14	SSMH 1.13	75
RAISE LOOP	48+58	47+05	SSMH 1.15	SSMH 1.14	152
RAISE LOOP	49+29	48+58	SSMH 1.16	SSMH 1.15	68
RAISE LOOP	51+59	49+29	SSMH 1.17	SSMH 1.16	229
RAISE LOOP	54+16	51+59	SSMH 1.18	SSMH 1.17	259
RAISE LOOP	55+03	54+16	SSMH 1.19	SSMH 1.18	89
RAISE LOOP	57+17	55+03	SSMH 1.20	SSMH 1.19	214
RAISE LOOP	57+61	57+17	SSMH 1.21	SSMH 1.20	44
RAISE LOOP	69+27	70+34	SSMH 1.22	SSMH 1.23	105
RAISE LOOP	70+34	71+42	SSMH 1.23	SSMH 1.24	107
RAISE LOOP	71+53	71+42	SSMH 1.25	SSMH 1.24	11
RAISE LOOP	73+00	71+53	SSMH 1.26	SSMH 1.25	149
RAISE LOOP	73+86	73+00	SSMH 1.27	SSMH 1.26	89
RAISE LOOP	75+70	73+86	SSMH 1.28	SSMH 1.27	183
RAISE LOOP	77+38	75+70	SSMH 1.29	SSMH 1.28	167
RAISE LOOP	78+85	77+38	SSMH 1.30	SSMH 1.29	147
RAISE LOOP	82+82	78+85	SSMH 1.31	SSMH 1.30	397
RAISE LOOP	84+24	82+82	SSMH 1.32	SSMH 1.31	144
RAISE LOOP	87+16	84+24	SSMH 1.33	SSMH 1.32	293
RAISE LOOP	90+16	87+16	SSMH 1.34	SSMH 1.33	300
RAISE LOOP	92+82	90+16	SSMH 1.35	SSMH 1.34	266
RAISE LOOP	96+88	92+82	SSMH 1.36	SSMH 1.35	406
TOTAL QUANTITY					6,072

7360 MANHOLE 48 IN. DIAM. TYPE 1 (EACH)			
ROAD	STATION	STRUCTURE NAME	DEPTH (FT.)
RAISE LOOP	26+77	SSMH 1.1	8
RAISE LOOP	27+30	SSMH 1.2	8
RAISE LOOP	29+81	SSMH 1.3	13
RAISE LOOP	30+53	SSMH 1.4	13
RAISE LOOP	31+30	SSMH 1.5	12
RAISE LOOP	32+91	SSMH 1.6	11
RAISE LOOP	33+81	SSMH 1.7	10
RAISE LOOP	37+51	SSMH 1.8	8
RAISE LOOP	39+72	SSMH 1.9	8
RAISE LOOP	40+81	SSMH 1.10	8
RAISE LOOP	43+72	SSMH 1.11	8
RAISE LOOP	44+60	SSMH 1.12	8
RAISE LOOP	46+33	SSMH 1.13	8
RAISE LOOP	47+06	SSMH 1.14	8
RAISE LOOP	48+58	SSMH 1.15	8
RAISE LOOP	49+29	SSMH 1.16	8
RAISE LOOP	51+59	SSMH 1.17	8
RAISE LOOP	54+17	SSMH 1.18	8
RAISE LOOP	55+03	SSMH 1.19	8
RAISE LOOP	57+17	SSMH 1.20	8
RAISE LOOP	57+62	SSMH 1.21	8
RAISE LOOP	69+28	SSMH 1.22	8
RAISE LOOP	70+35	SSMH 1.23	8
RAISE LOOP	71+43	SSMH 1.24	8
RAISE LOOP	71+54	SSMH 1.25	8
RAISE LOOP	73+00	SSMH 1.26	8
RAISE LOOP	73+87	SSMH 1.27	8
RAISE LOOP	75+70	SSMH 1.28	8
RAISE LOOP	77+38	SSMH 1.29	8
RAISE LOOP	78+86	SSMH 1.30	8
RAISE LOOP	82+82	SSMH 1.31	8
RAISE LOOP	84+25	SSMH 1.32	8
RAISE LOOP	87+17	SSMH 1.33	8
RAISE LOOP	90+17	SSMH 1.34	8
RAISE LOOP	92+83	SSMH 1.35	8
RAISE LOOP	96+88	SSMH 1.36	8
TOTAL QUANTITY			36

3767S HDPE PIPE GRAVITY SANITARY SEWER MAIN 4-INCH (L.F.)		
ROAD	STATION & SIDE	LENGTH (L.F.)
RAISE LOOP	48+89 RT	44.5
RAISE LOOP	49+74 RT	36.0
RAISE LOOP	51+21 RT	40.0
RAISE LOOP	52+28 RT	39.0
RAISE LOOP	53+62 RT	31.5
RAISE LOOP	55+17 RT	37.0
RAISE LOOP	56+48 RT	39.5
RAISE LOOP	57+62 RT	40.5
RAISE LOOP	69+12 RT	37.5
RAISE LOOP	69+87 RT	40.5
RAISE LOOP	70+92 RT	39.5
RAISE LOOP	71+92 RT	34.5
RAISE LOOP	73+25 RT	45.0
RAISE LOOP	74+81 RT	40.5
RAISE LOOP	75+94 RT	41.5
RAISE LOOP	77+40 RT	33.5
RAISE LOOP	78+47 RT	40.0
RAISE LOOP	79+64 RT	36.0
RAISE LOOP	81+09 RT	33.0
RAISE LOOP	82+78 RT	37.0
RAISE LOOP	84+25 RT	36.5
RAISE LOOP	85+84 RT	36.5
RAISE LOOP	87+17 RT	36.0
RAISE LOOP	88+74 RT	39.5
RAISE LOOP	90+16 RT	36.5
RAISE LOOP	91+37 RT	39.0
RAISE LOOP	92+82 RT	37.5
RAISE LOOP	94+27 RT	37.5
TOTAL QUANTITY		1,066

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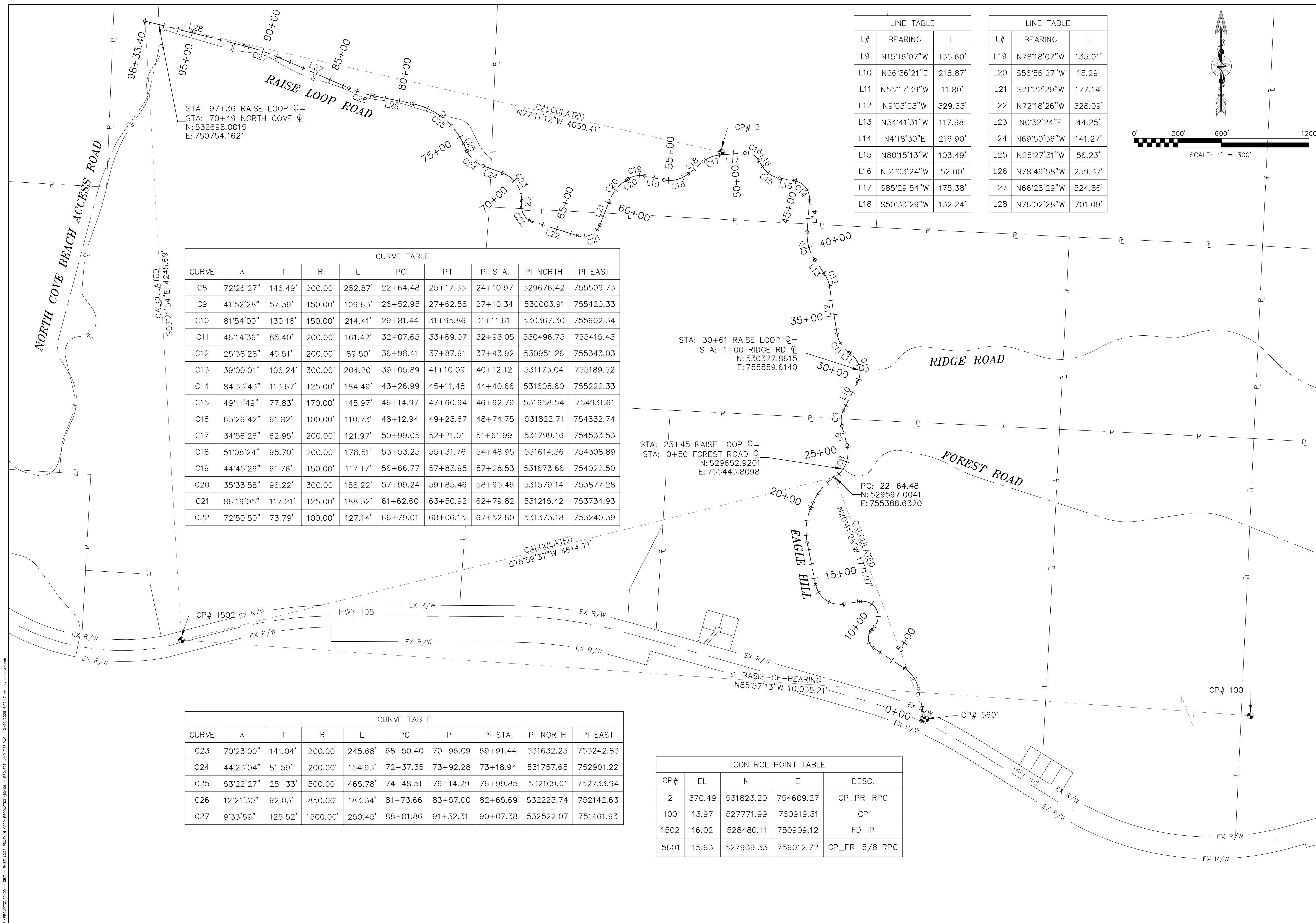
PRELIMINARY ONLY
RAISE LOOP ROAD
SHOALWATER BAY TRIBE
TOKELAND, WA
ALTERNATE QUANTITIES



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REVISIONS		DESCRIPTION				
NO.	DATE					

PROJ.	60409
SHT.	8



LINE TABLE		
L#	BEARING	L
L9	N15°16'07"W	135.60'
L10	N26°36'21"E	218.87'
L11	N55°17'39"W	11.80'
L12	N9°03'03"W	329.33'
L13	N34°41'31"W	117.98'
L14	N4°18'30"E	216.90'
L15	N80°15'13"W	103.49'
L16	N31°03'24"W	52.00'
L17	S85°29'54"W	175.38'
L18	S50°33'29"W	132.24'

LINE TABLE		
L#	BEARING	L
L19	N78°18'07"W	135.01
L20	S56°56'27"W	15.29'
L21	S21°22'29"W	177.14'
L22	N72°18'26"W	328.09'
L23	N0°32'24"E	44.25'
L24	N69°50'36"W	141.27'
L25	N25°27'31"W	56.23'
L26	N78°49'58"W	259.37'
L27	N66°28'29"W	524.86'
L28	N76°02'28"W	701.09'

CURVE TABLE									
CURVE	Δ	T	R	L	PC	PT	PI STA.	PI NORTH	PI EAST
C8	72°26'27"	146.49'	200.00'	252.87'	22+64.48	25+17.35	24+10.97	529676.42	755509.73
C9	41°52'28"	57.39'	150.00'	109.63'	26+52.95	27+62.58	27+10.34	530003.91	755420.33
C10	81°54'00"	130.16'	150.00'	214.41'	29+81.44	31+95.86	31+11.61	530367.30	755602.34
C11	46°14'36"	85.40'	200.00'	161.42'	32+07.65	33+69.07	32+93.05	530496.75	755415.43
C12	25°38'28"	45.51'	200.00'	89.50'	36+98.41	37+87.91	37+43.92	530951.26	755343.03
C13	39°00'01"	106.24'	300.00'	204.20'	39+05.89	41+10.09	40+12.12	531173.04	755189.52
C14	84°33'43"	113.67'	125.00'	184.49'	43+26.99	45+11.48	44+40.66	531608.60	755222.33
C15	49°11'49"	77.83'	170.00'	145.97'	46+14.97	47+60.94	46+92.79	531658.54	754931.61
C16	63°26'42"	61.82'	100.00'	110.73'	48+12.94	49+23.67	48+74.75	531822.71	754832.74
C17	34°56'26"	62.95'	200.00'	121.97'	50+99.05	52+21.01	51+61.99	531799.16	754533.53
C18	51°08'24"	95.70'	200.00'	178.51'	53+53.25	55+31.76	54+48.95	531614.36	754308.89
C19	44°45'26"	61.76'	150.00'	117.17'	56+66.77	57+83.95	57+28.53	531673.66	754022.50
C20	35°33'58"	96.22'	300.00'	186.22'	57+99.24	59+85.46	58+95.46	531579.14	753877.28
C21	86°19'05"	117.21'	125.00'	188.32'	61+62.60	63+50.92	62+79.82	531215.42	753734.93
C22	72°50'50"	73.79'	100.00'	127.14'	66+79.01	68+06.15	67+52.80	531373.18	753240.39

CURVE TABLE									
CURVE	Δ	T	R	L	PC	PT	PI STA.	PI NORTH	PI EAST
C23	70°23'00"	141.04'	200.00'	245.68'	68+50.40	70+96.09	69+91.44	531632.25	753242.83
C24	44°23'04"	81.59'	200.00'	154.93'	72+37.35	73+92.28	73+18.94	531757.65	752901.22
C25	53°22'27"	251.33'	500.00'	465.78'	74+48.51	79+14.29	76+99.85	532109.01	752733.94
C26	12°21'30"	92.03'	850.00'	183.34'	81+73.66	83+57.00	82+65.69	532225.74	752142.63
C27	9°33'59"	125.52'	1500.00'	250.45'	88+81.86	91+32.31	90+07.38	532522.07	751461.93

CONTROL POINT TABLE				
CP#	EL	N	E	DESC.
2	370.49	531823.20	754609.27	CP_PRI RPC
100	13.97	527771.99	760919.31	CP
1502	16.02	528480.11	750909.12	FD_IP
5601	15.63	527939.33	756012.72	CP_PRI 5/8 RPC

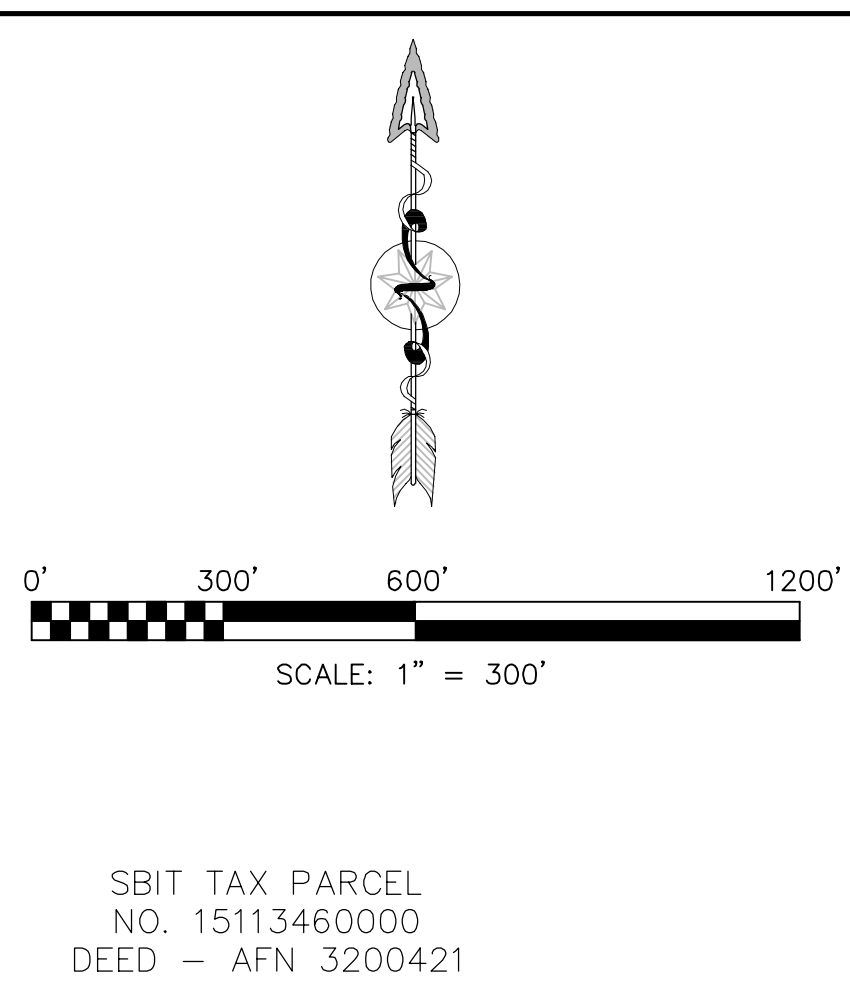
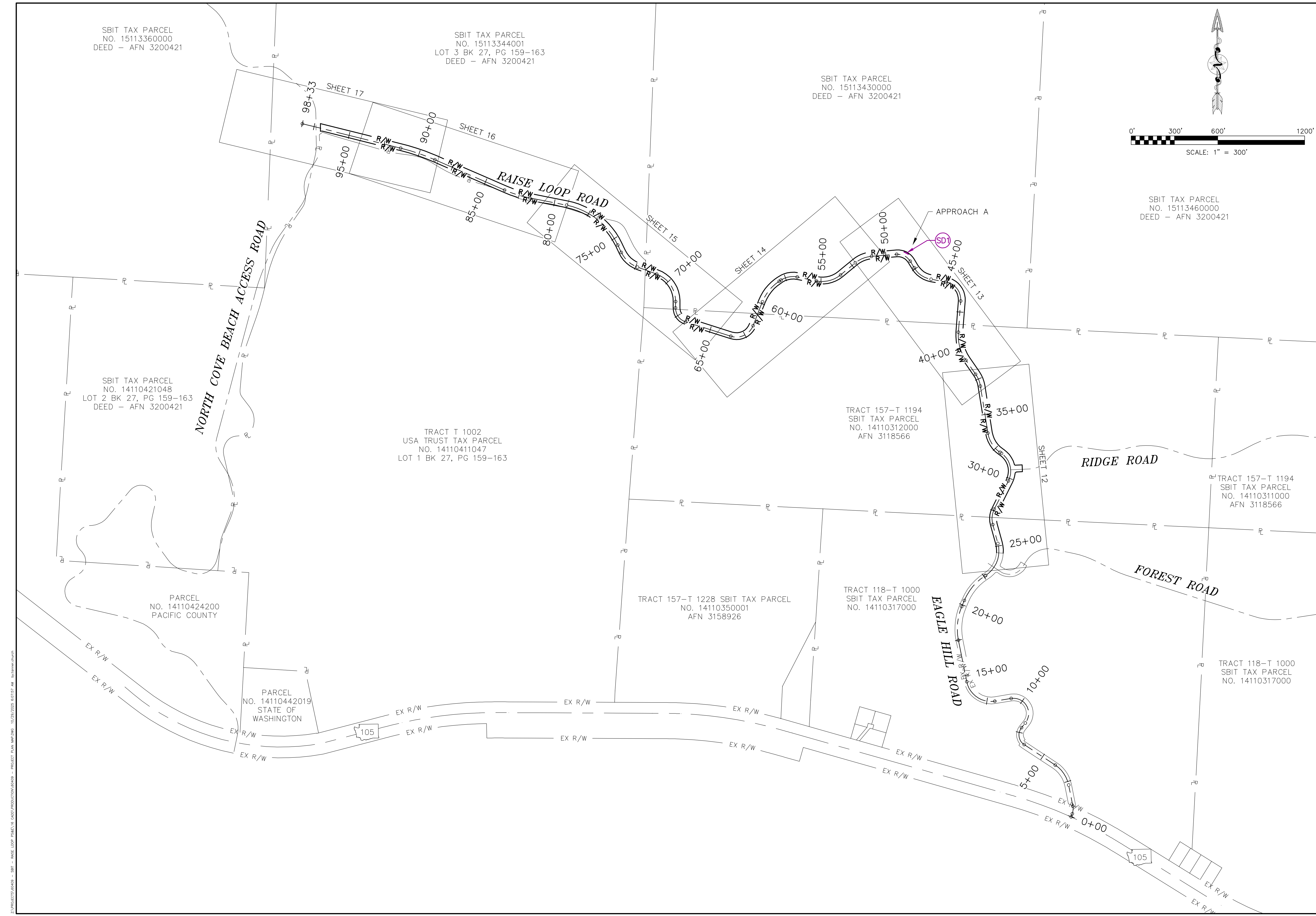


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PROJ.	60409
SHT.	10



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RAISE LOOP ROAD
SHOALWATER BAY TRIBE
TOKELAND, WA
PROJECT PLAN MAP

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NO. 14110312000
AFN 3118566

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NO. 14110311000
AFN 3118566

TRACT 118-T 1000
SBIT TAX PARCEL
NO. 14110317000

TRACT 118-T 1000
SBIT TAX PARCEL
NO. 14110317000

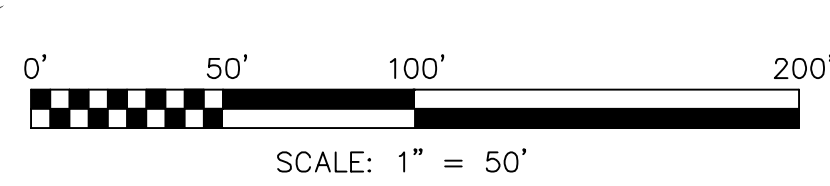
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REVISIONS		DESCRIPTION
NO.	DATE	

PROJ. 60409

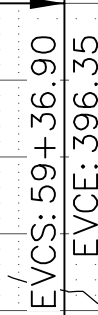
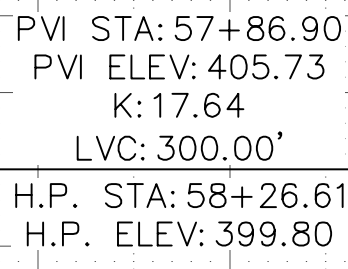
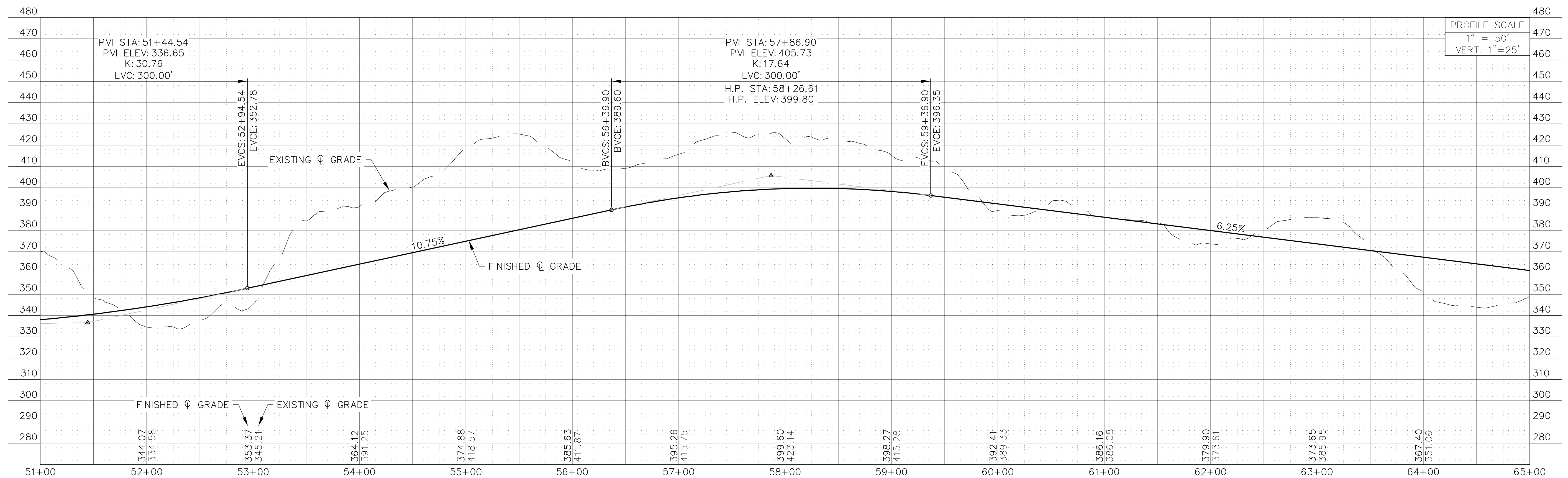
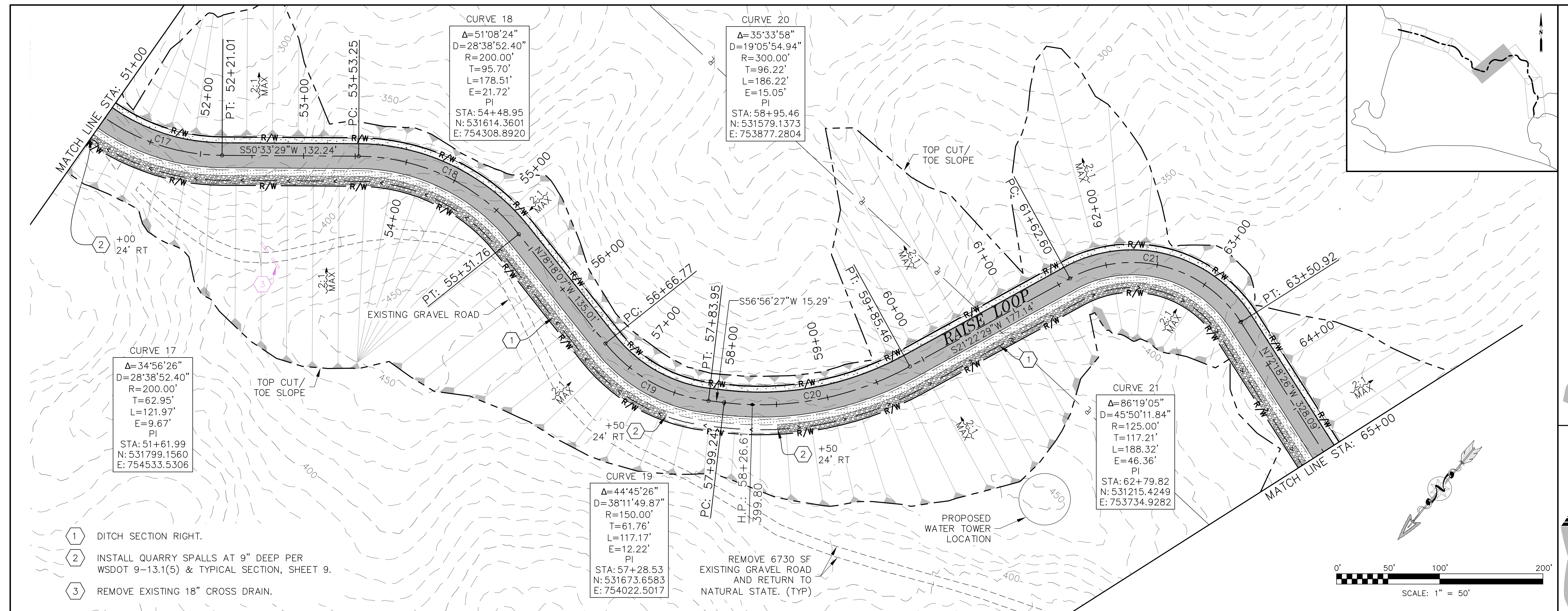
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PROFILE SCALE
1" = 50'
VERT. 1"=25'



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RAISE LOOP ROAD
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PLAN & PROFILE



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