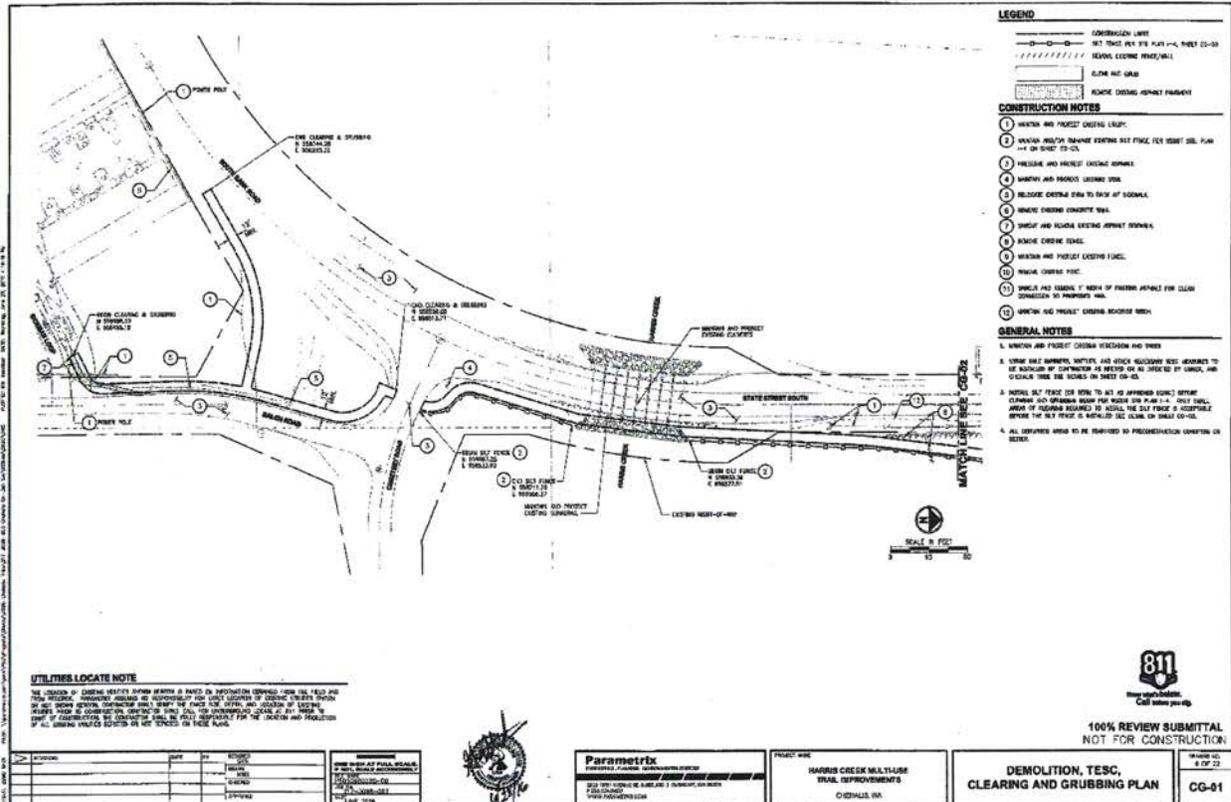


Environmental Assessment of:
Harris Creek - Vosper Trail Project

September 9, 2016



Harris Creek-Vosper Trail project overview.

Prepared for: The Confederated Tribes of the Chehalis Reservation
 Prepared by: Glen Connolly
 Environmental Programs Manager
 Chehalis Department of Natural Resources (CDNR)

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Introduction and Project Description

The Chehalis Tribe is proposing to construct a 1300-foot bicycle and pedestrian path from the Vosper Housing Development to the Town of Oakville, along the eastern side of South Bank Road/State Street. The path would improve pedestrian safety, allow safer access to the stores and other services in the town of Oakville and provide recreation opportunities to the local community.

The proposed project includes:

Constructing a path that is 10 feet wide, to the east of South Bank Road/State Street.

Constructing a short wall of ecology blocks near the shoulder of State Street, on either side of the culvert bridge where State Street crosses Harris Creek.

Constructing cantilevered planks off of the eastern side of the culvert bridge, so the path can cross the bridge.

Installing a small culvert through the ecology block wall, where a roadside drainage ditch flows southwest into the Harris Creek area.

(See Appendix 1 - Conceptual Design)

The National Environmental Policy Act (NEPA) states that an environmental review must be conducted on any federally related project. This Environmental Assessment (EA) document is intended to meet the requirements of NEPA for any governmental agencies involved in the funding, planning or constructing of this infrastructure.

Please note, in 2011, the Chehalis Tribe completed the installation of a culvert bridge over Harris Creek, located right in the middle of this proposed project site. We have attached the EA from that project (see Appendix 2 - 2010 Environmental Assessment for South Bank/Harris Creek Culvert Replacement), because much of the information is the same and influenced this current assessment.

Project Purpose and Need

The Chehalis Tribe owns the Vosper Housing Development, that contains approximately twelve single family homes, two multifamily apartment buildings and two duplexes. The development is located within the Chehalis Reservation, near the City of Oakville. State Street and South Bank Road are local arterial roads that serve the tribal members who live in the Vosper Housing Development and also, the people of the City of Oakville. Neither of the two roads have sidewalks and there are no pedestrian or bicycle pathways that serve the population in that area.

The community uses the roads to reach residential areas and services in the City of Oakville. The lack of pedestrian and bicycle pathways causes the community to travel along the shoulder of the roads. This is a safety concern and does not meet the Tribal Community's needs. The proposed project would improve the safety of the community.

Project Alternatives

Alternative 1: Proposed Action – Construct the proposed pathway.

Alternative 2: Construct a path along another route.

Alternative 3: No Action

Evaluation of Alternatives

Alternative 1 provides for increased public safety and recreational opportunities.

Alternative 2 provides essentially the same benefits as the preferred alternative, but with increased costs and potentially larger impacts.

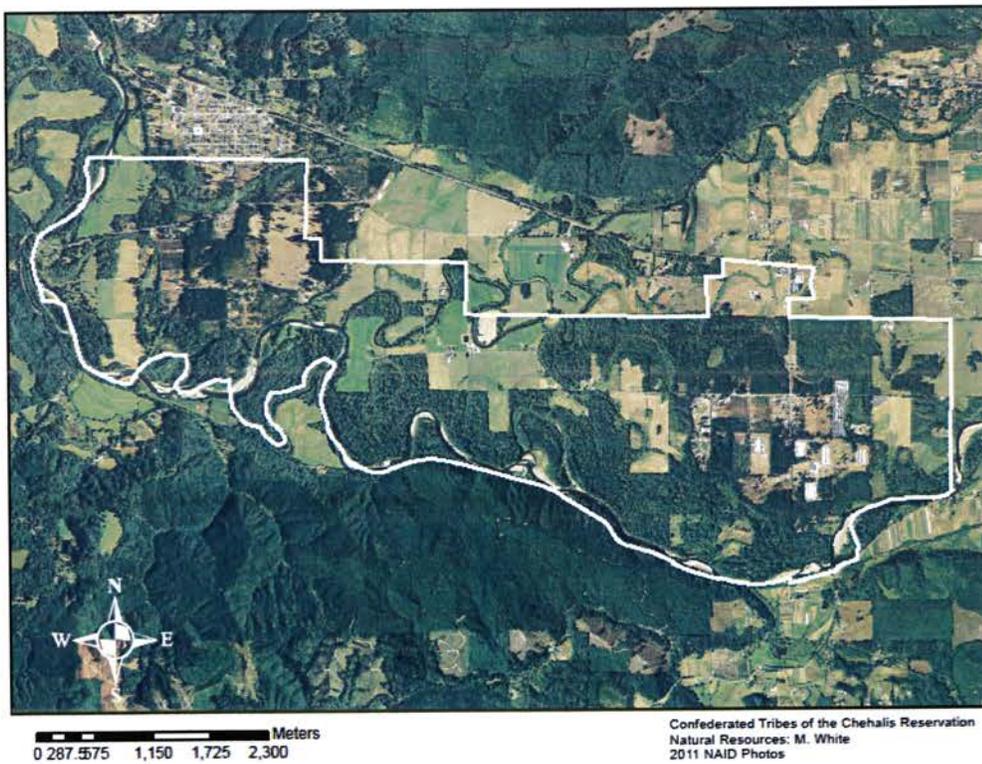
Alternative 3, the no action alternative, was unacceptable due to the safety concerns of the Tribal community.

Upon evaluating the alternatives, the Tribe determined that the preferred alternative was Alternative 1.

Environmental Conditions and Consequences

Site Description

The proposed project would take place within the exterior boundaries of the Chehalis Reservation, along the eastern edge of South Bank Road/State Street near Oakville, WA. The reservation is located in SW Washington State in the valley of the Chehalis River. The reservation is approximately 5000 acres in size and much of it is located in historic lowlands and channels of the Chehalis River.



Vicinity map of the Chehalis Reservation

The most direct way to access the project site is via State Hwy. 12, a major two lane state highway and State Street, a two lane road that runs from Hwy 12 in Oakville, south onto the Chehalis Reservation.



State Street looking south from the Oakville City line.

Just south of the reservation boundary, State Street begins to bend to the southwest where it becomes South Bank Road and intersects with Cemetery Road. The Chehalis Tribe owns a tribal housing development at that intersection. The Vosper Housing development contains approximately 12 single family homes, two 5-plexes and 2 duplexes.



Looking south towards the Vosper Development.

The area is bordered by residential lots and parcels of open space. The area is generally level, with slight slopes down towards Harris Creek. Harris Creek is a seasonal stream that starts in the slopes of Capitol Forest to the north and runs southwest, through the project site and on to the Chehalis River. The stream is very low gradient and in the project area, it becomes a wide shallow wetland during the rainy season. During the summer, the stream dries up completely.



Harris Creek – dry creek bed at the culvert bridge.

Land Resources

The proposed path will begin and end in residential areas that consist of single and multi-family homes on the reservation and on the edge of the City of Oakville. The path site is located adjacent to South Bank Road/State Street that runs north-south through the area. The land areas on either side of the road are residential parcels, open spaces dominated by grass fields, lightly forested stands and wetland areas. Harris Creek flows through the site and crosses under State Street through a large culvert bridge.

Soils

The Chehalis Reservation is underlain by alluvial material and outwash deposits from the Black and Chehalis Rivers that are up to one hundred feet deep. There are several higher areas created by depositions left from retreating glaciers. The project site crosses through two distinct types of soils. The path begins and ends on glacial terraces that are generally made up of Spanaway Soils that are gravelly and well drained. This soil type is not classified as prime agricultural land, or as prime forest production land. The middle of the project will pass through a lowland, created by a small seasonal stream. The soils in that area are mainly made up of Nemah silty clay loam (see Appendix 4 - USGS Soils Data).

Wetlands

There are classified wetlands near the project area (CDNR site inspection and National Wetlands Inventory), specifically to the east of the proposed path. There is a large wetland complex that is located immediately to the east of State Street where Harris Creek slows and spreads out. The wetland is dominated by reed canary grass, a grass species that is commonly found in wetlands, but can also grow in upland areas as well. The northern part of the wetland begins to transition to the upland glacial terrace (see Appendix 5 – National Wetlands Inventory map).



Harris Creek – culvert bridge and wetland complex.

The USGS Soil Survey lists the area as Nemah silty clay loam, a soil type that is classified as hydric. Test holes were dug where the proposed path veers slightly northeast and crosses the drainage ditch (the ditch handles storm flows from State Street) on the northern edge of the wetland and showed a 6-10 inch layer of loam that was thick with roots. Immediately below that was a 6-8 inch layer of looser, gravelly soil. That well drained soil is more typical of the Spanaway very gravelly sandy loam that is found on the glacial terrace to the north and is not classified as hydric. It appears that the proposed pathway will not impact the wetland.



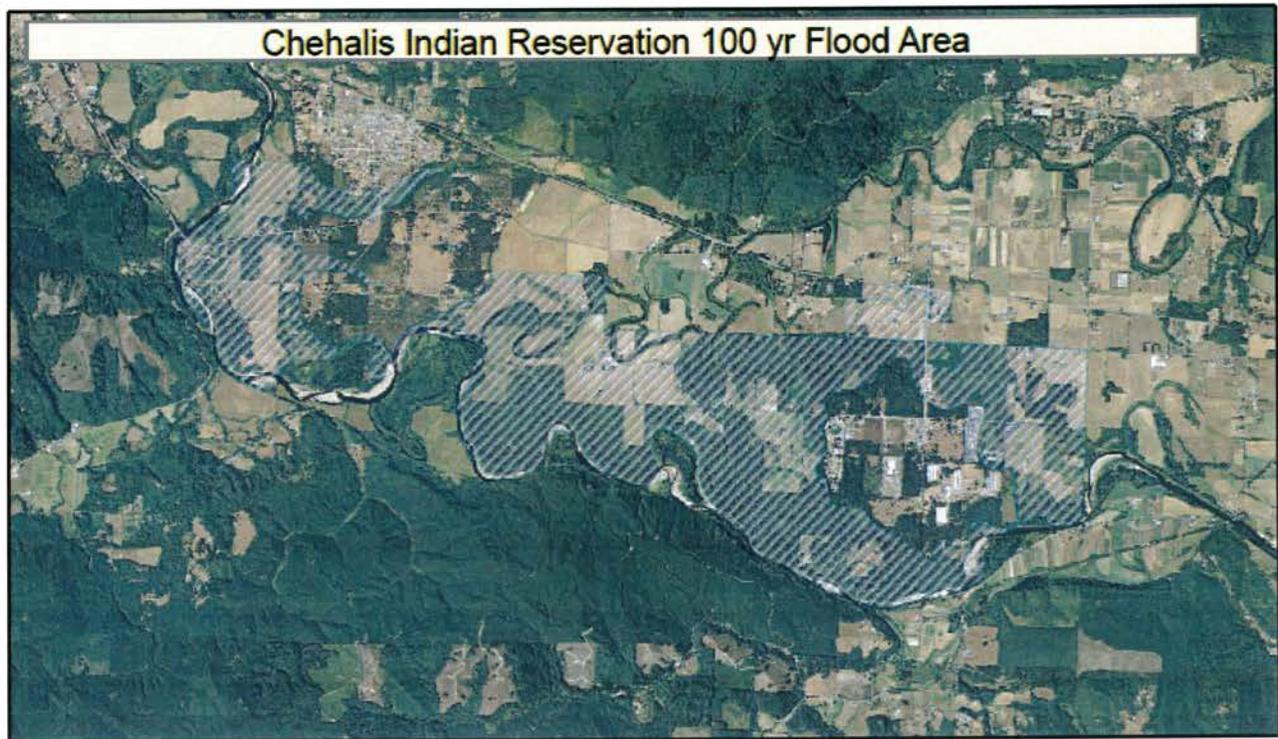
Gravelly sub-soil in the project path.

Coastal Zones

The proposed project site is located within the exterior boundaries of the Chehalis Reservation (a federal reservation in Washington State), therefore, it is excluded from Coastal Zone Management Regulations.

Floodplain

The area has never been accurately mapped by FEMA, but according to GIS data and analysis by the CDNR, a portion of the proposed project site is within the one hundred year flood plain. According to Tribal representatives and analysis of historic aerial photographs, portions of the project site did flood during the winter 1996 flood event and during the December 2007 flood event, both of which are considered large flood events in the Chehalis watershed.



This map represents the 100 yr flood plain. Flood plain was digitized from aerial flood photos of the 2007 flood event.

2009 NAIP Aerial

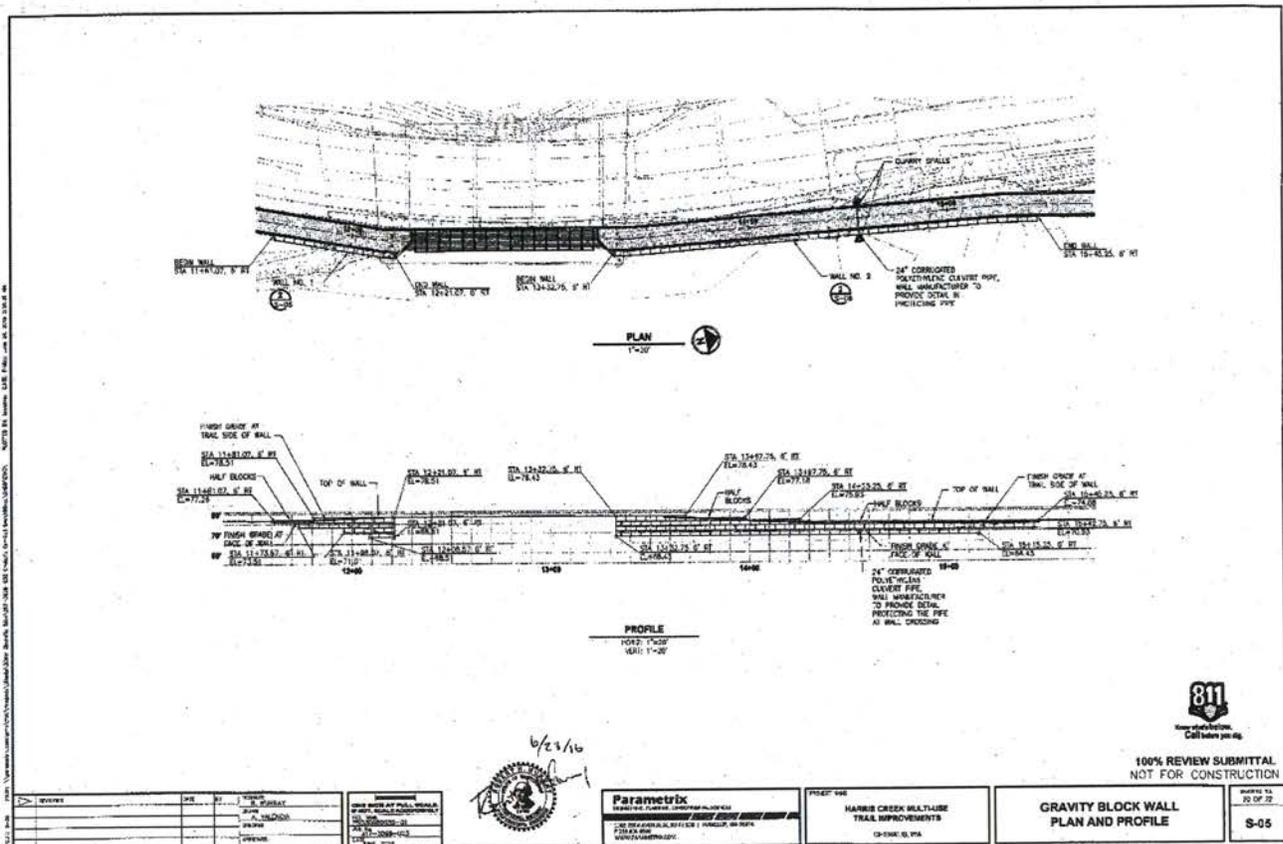
Chehalis Tribe Dept. Natural Resources
April 19th, 2013

Creator: M. White



100-Year Floodplain on the Chehalis Reservation

The proposed path will begin out of the flood plain, but where it crosses Harris Creek, it will enter the 100-year floodplain. The design calls for a block retaining wall to be constructed parallel to the shoulder of State Street, to the north and south of the culvert bridge. The surface of the path is likely to be high enough to be out of the flood plain, however the block walls and any fill used to support the path, will likely be in the flood plain.



Block wall design.

Transportation

Most of the roads within the Chehalis Reservation are modern, asphalt roads, built to serve common vehicular traffic. The roads that serve the reservation are maintained by the Chehalis Tribe, Grays Harbor County, Thurston County or the State of Washington and are generally in good repair. The main roads used to access to the proposed road project are State Highway 12, State Street, Cemetery Road and South Bank Road. All of these roads are paved and are designed to handle all common auto and truck traffic requirements.

South Bank Road and State Street have emergency shoulders for vehicles to safely pull off the road. Neither of those roads have sidewalks for the public to use, to keep them out of the roadway. There are no bike paths, or pedestrian pathways in the area.



Intersection of Cemetery Rd. and South Bank Rd.

Environmental Consequences to Land Resources

The construction of the proposed path will not have any major, or long term negative impacts on the land resources of the Chehalis Reservation.

Soils – Most of the project will take place in soils are not prime agricultural soils, or prime timber production soils, so there will be no net loss of prime farmland or prime timberland. Most of the soils that will be disturbed will be along the shoulder of State Street, in a previously disturbed area.

Wetlands – The proposed path will not impact wetlands. The proposed pathway will follow closely along the edge of the shoulder of State Street and will not impact the stream or nearby wetland complex. The proposed path crosses a transition zone, where the soils begin to change from the silty clay, to the gravelly loam.

Coastal Zone – The site is not in the Coastal Management Zone.

Floodplain – The proposed block walls and any fill alongside the wall to support the path will be in the flood plain, therefore some floodplain mitigation will be required.

Transportation - The project will have a temporary negative impact during the construction phase. The construction phase may create temporary traffic impairments and temporary delays. Overall, the project will have a beneficial impact on transportation resources in the area. The finished path will provide pedestrians and bicyclists a safe lane of travel, thereby improving traffic safety.



Looking north across the culvert bridge towards Oakville.

Mitigation to Protect Land Resources

Two items related to Land Resources will need to be mitigated. Appropriate traffic control and traffic signage during the construction phase will be required to reduce the impacts to the public using the road. Some type of flood plain mitigation will be required to mitigate any fill introduced to the flood plain. The specific mitigation required will be determined by the tribal Planning and Natural Resources Dept. during the permitting process.

Air Resources

Air quality in the vicinity of the Chehalis Reservation is generally good due to the influence of air currents from the Pacific Ocean. Currently, the air quality within the air zone surrounding the reservation is in compliance with all Federal, State and local requirements. (EPA Website) There are occasional episodes of stagnant air across the southwestern portion of the state; however, they are usually of short duration and usually do not exceed any regulatory standards.

Environmental Consequences to Air Resources

The project will not have any adverse impacts on air resources, provided the appropriate mitigation measures summarized below are implemented during construction. Over the long term, the project may slightly reduce air pollution emissions from automobiles, as people utilize the bath for walking, or bicycling, versus driving their vehicles.

Mitigation to Protect Air Resources

During construction, Best Management Practices, such as site watering and proper vehicle maintenance, should be utilized to control dust and noxious vehicle exhausts. Once the project

is complete, there will be no impacts to air resources, so no other mitigation actions are necessary

Water Resources

Surface Water

The Chehalis River forms the southern boundary of the Chehalis Reservation and the Black River crosses the central part of the Reservation, before entering the Chehalis River. There are several small tributaries that can be found on the reservation, including Harris Creek which flows through the proposed project site. Surface water quality in the watershed is considered to be generally good, although certain sections of the Chehalis River and its tributaries do have Total Maximum Daily Limits placed on them by the Washington State Department of Ecology, for problems related to high temperatures and low dissolved oxygen content.

Ground Water

The Chehalis Reservation is underlain by alluvial material and outwash deposits from the Black and Chehalis Rivers that are up to one hundred feet deep. There are several higher areas created by depositions left from retreating glaciers. Groundwater is shallow and generally flows westward, parallel to the flow of the Chehalis River. Depth to groundwater ranges from ten to thirty feet. The porous nature of the surface soils allows for fairly high infiltration rates, making the groundwater susceptible to contamination from the application of pesticides, fertilizers and animal/human wastes. (2001 Groundwater Report, Pacific Groundwater Group)

Ground water is the principal source of potable water on the Chehalis Reservation and the nearby City of Oakville. The Tribal Community Water System and numerous private tribal residences obtain their water from wells that range from twenty to eighty feet in depth. According to the Tribal Utilities Department, the Tribal Community Water System serves approximately eighty eight residential units and ten commercial/government buildings.

Environmental Consequences to Water Resources

Surface Water

The proposed road project will have no measurable impacts upon the surface waters in the region. The proposed path is fairly narrow (12 feet overall with gravel shoulders) so runoff will be minimal. No motorized vehicles will be using the path, so oils and other hazardous materials related to automobiles will not be a factor. A culvert will be installed where the path crosses and existing roadside ditch.



Roadside ditch next to State Street.

Ground Water

The proposed road project will not have any impacts on groundwater, provided the appropriate mitigation measures summarized below are implemented during construction. The small amount of storm-water captured on the impervious path will not contain any contaminants from motor vehicles, so it will just sheet flow onto the gravel shoulders.

Mitigation to Protect Water Resources

The proposed project will not have any impacts on water resources in the area, as long as the following mitigation action(s) are completed. During construction, Best Management Practices for storm water runoff and spill prevention should be in effect to control runoff and sediments and potential spills related to the use of heavy equipment.

Fish and Wildlife

The Chehalis Reservation is approximately 5000 acres in size and much of it is located in historic lowlands and channels of the Chehalis River. According to the Chehalis Tribal Fisheries Department, Chinook (both spring and fall runs), Coho (both early and late runs), Chum salmon, Cutthroat salmon and Steelhead trout are present in significant numbers in the Chehalis Basin. Green Sturgeon and bull trout may be present in the lower watershed. Many other smaller fish species, warm-water species and aquatic mammals such as otters are also present in the basin. Harris Creek, which runs through the proposed project area, is a seasonal stream that supports many species of fish, when it is flowing. During the dry summer season, the creek runs dry and fish may survive in small pools in the upper and lower stretches.

According to CDNR personnel, there are a variety of wildlife that have been documented on the Chehalis Reservation. Most of the proposed site is currently maintained as residential lands, lightly forested areas, a wetland/stream complex and the shoulder of an arterial road. A small portion of the proposed site is lightly forested and may provide habitat or forage for some smaller mammals such as coyote, raccoons, mountain beaver, snowshoe hare, brush rabbit, striped skunk, opossum, mink, weasel, porcupine, red squirrel, shrews and rodents.

A small portion of the site may provide habitat or forage for various birds such as Stellar’s jay, American crows, swallows, nuthatches, wrens, sparrows, vireos, finches, blue grouse, ruffed grouse, band tailed pigeons, ringed-neck pheasant, mourning doves, goshawk, Cooper’s hawk, sharp shinned hawk, red-tailed hawk, kestrel, northern harrier, great horned owl, western screech owl, northern sawwhet and northern pygmy owl.

Threatened and Endangered Fish and Wildlife Species

The US Fish and Wildlife Service lists approximately 14 Threatened or Endangered animal species in the Grays Harbor County area:

| Group | Common Name | Scientific Name | Status | Habitat at site |
|------------|-----------------------------|---|------------|-----------------|
| Amphibians | Oregon spotted frog | <i>Rana pretiosa</i> | Threatened | no |
| Birds | Short-tailed albatross | <i>Phoebastria (=Diomedea) albatrus</i> | Endangered | no |
| Birds | Brown pelican | <i>Pelecanus occidentalis</i> | Recovery | no |
| Birds | Yellow-billed Cuckoo | <i>Coccyzus americanus</i> | Threatened | no |
| Birds | Western snowy plover | <i>Charadrius alexandrinus nivosus</i> | Threatened | no |
| Birds | Northern spotted owl | <i>Strix occidentalis caurina</i> | Threatened | no |
| Birds | Marbled murrelet | <i>Brachyramphus marmoratus</i> | Threatened | no |
| Birds | Streaked Horned lark | <i>Eremophila alpestris strigata</i> | Threatened | no |
| Insects | Oregon silverspot butterfly | <i>Speyeria zerene hippolyta</i> | Threatened | no |
| Mammals | Olympia pocket gopher | <i>Thomomys mazama pugetensis</i> | Threatened | no |
| Mammals | Tenino pocket gopher | <i>Thomomys mazama tumuli</i> | Threatened | no |
| Mammals | Yelm pocket gopher | <i>Thomomys mazama yelmensis</i> | Threatened | no |
| Reptiles | Leatherback sea turtle | <i>Dermochelys coriacea</i> | Endangered | no |
| Reptiles | Leatherback sea turtle | <i>Dermochelys coriacea</i> | Endangered | no |
| Fishes | Bull Trout | <i>Salvelinus confluentus</i> | Threatened | no |

The Sensitive Species List does not list any suitable habitat on the site for any of these species. (Communication from Mark White – CDNR)

Environmental Consequences to Fish and Wildlife

Fish

The proposed project on the Chehalis Reservation will have no impact on fish because none of the work will take place directly in the waterway. Most of the proposed project will take place alongside an existing roadway. The portion of the path that crosses the Harris Creek Culvert Bridge will be constructed on the tops of the culverts, with no supports or columns installed in the waterway.

Wildlife

The proposed project will have no long term impact on wildlife. Land use and human presence in the area will not change significantly as a result of this project; therefore, long-term impacts to wildlife will not occur. The surrounding area has many acres of grass fields, mixed conifer and hardwood forest lands and the loss of approximately one third of an acre of habitat will have no impact. Most birds and mammals will avoid the area during construction and re-establish themselves in nearby habitat once construction is complete.

Mitigation to Protect Fish and Wildlife

None needed.

Plants

Much of the Chehalis Reservation was originally forested, with some upland prairie occurring as well. Almost all of the old growth timber on the reservation was logged prior to 1950. Second growth conifer stands are generally found on the well-drained and drier sites, while hardwoods are generally found along river bottoms and sloughs. The proposed site includes some douglas fir trees, garry oak trees, crab apple, european hawthorne and a few small willow trees.

Various species of undergrowth are found throughout the Reservation. Some of the dominant species found at the site of the proposed project include: reed canary grass, snowberry, nootka rose, ocean spray and several varieties of blackberries. Also on the site are invasive species such as: Himalayan blackberry, scotch broom and douglas spirea.



Trees and shrubs along the shoulder of State Street.



Typical plants in project area along State Street.

Threatened and Endangered Plant Species

The US Fish and Wildlife Service lists four Threatened or Endangered plant species in the Grays Harbor County area.

| Group | Common Name | Scientific Name | Status | Habitat at site |
|------------------|-------------------------|---|------------|-----------------|
| Flowering Plants | Nelson's checker-mallow | <i>Sidalcea nelsoniana</i> | Threatened | no |
| Flowering Plants | Water howellia | <i>Howellia aquatilis</i> | Threatened | No |
| Flowering Plants | golden paintbrush | <i>Castilleja levisecta</i> | Threatened | Possible |
| Flowering Plants | Kincaid's Lupine | <i>Lupinus sulphureus</i> ssp. <i>kincaidii</i> | Threatened | Possible |

The Sensitive Species List does not list any suitable habitat on, or near, the site for Nelson's checker-mallow or Water howellia (communication from Mark White – CDNR). On August 16th, 2016 three Chehalis Dept. of Natural Resources staff members walked the entire pathway and no specimens of Golden paintbrush or Kincaid's lupine were found on the site. As mentioned in previous sections, much of the proposed path will be constructed on the shoulder of a roadway and the rest passes through fields that have been maintained as residential yards.



Residential area, where path will cross open fields.

Environmental Consequences to Plants

The loss of a small amount of trees and brush will have no measurable impact on the local plant resources.

Mitigation for Plants

None needed.

Cultural/Archeological Resources

The site is located within the Chehalis Reservation and near the City of Oakville. The Tribal Historic Preservation Office assessed the site, including surveys of a portion of the proposed site for a past culver bridge project and determined it is unlikely to contain artifacts or vital archeological sites (See Appendix 3 – THPO Letter)

Environmental Consequences to Cultural Resources

The proposed project should have no adverse impacts on cultural/archaeological resources provided the appropriate mitigation measures summarized below are implemented during construction.

Mitigation to Protect Cultural Resources

Should culturally or archaeologically significant materials be discovered during project operations, work shall be halted and the Tribe and the Office of Historic Preservation shall be immediately consulted.

Cumulative Impacts

The project, as designed, will have no cumulative effects on the protected resources in the area.

Summary of Environmental Consequences

Land Resources

Temporary traffic impacts during construction.
Masonry blocks and fill will likely impact the flood plain.

Air Resources

Temporary impacts during construction, emissions to the air will be temporary and will likely include dust and fuel emissions associated with road construction activities.

Water Resources

No Impact, provided the listed mitigation actions are taken.

Fish, Wildlife and Plants

Fish – No Impact.
Wildlife – No long term impacts, limited disturbance during construction activities.
Plants – No Impact.

Cultural Resources

No Impact.

Cumulative Effect On Protected Resources

No impact.

Summary of Mitigation Requirements

Land Resources

Appropriate traffic control and traffic signage during the construction phase, to reduce the impacts to the public roads.
Some type of flood plain mitigation will be required to mitigate any fill introduced to the flood plain. The specific mitigation required will be determined by the tribal Planning and Natural Resources Dept. during the permitting process.

Cultural Resources - Should culturally or archaeologically significant materials be discovered during construction, work shall be immediately halted and the Tribe and the Office of Historic Preservation shall be consulted.

Air Resources - During construction, Best Management Practices, such as site watering and proper vehicle maintenance, should be utilized to control dust and noxious vehicle exhausts.

Water Resources –

Best Management Practices for storm water runoff and spill prevention should be in effect to control runoff and sediments and potential spills related to the use of heavy equipment.

Conclusion

Overall the proposed project does not appear to have any major impacts on the protected resources in the area. Over time, the long term impact on transportation and public safety in the community will be a positive one, as the community utilizes the pathway for walking and bicycling, versus using automobiles.

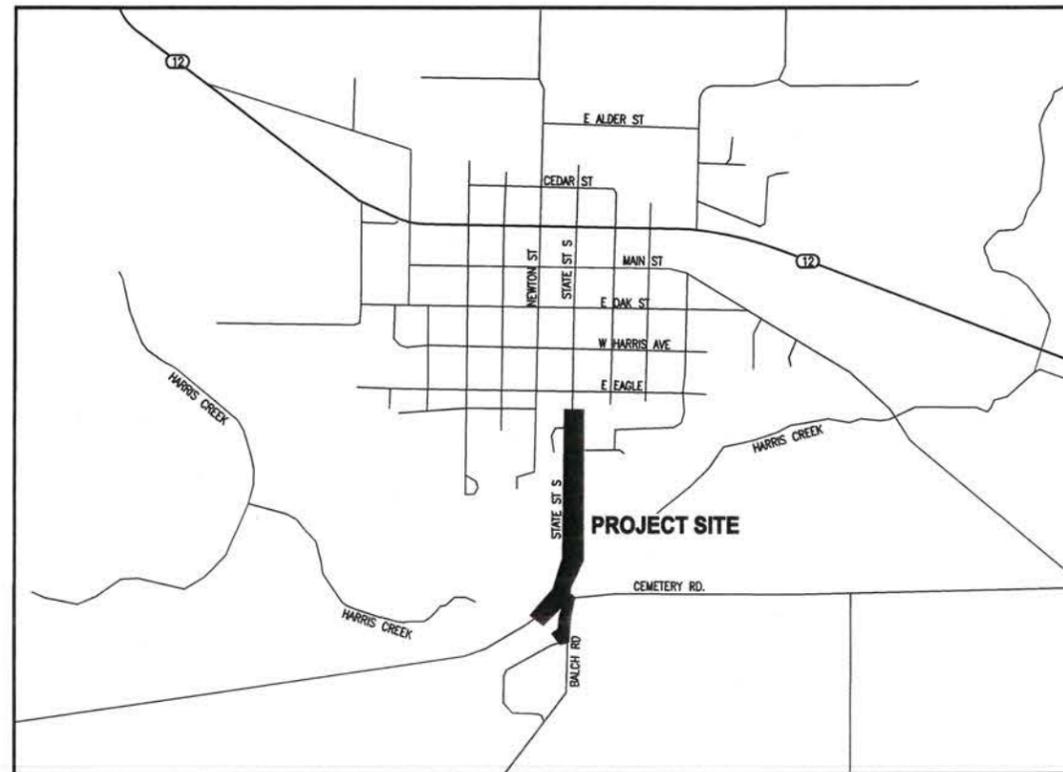
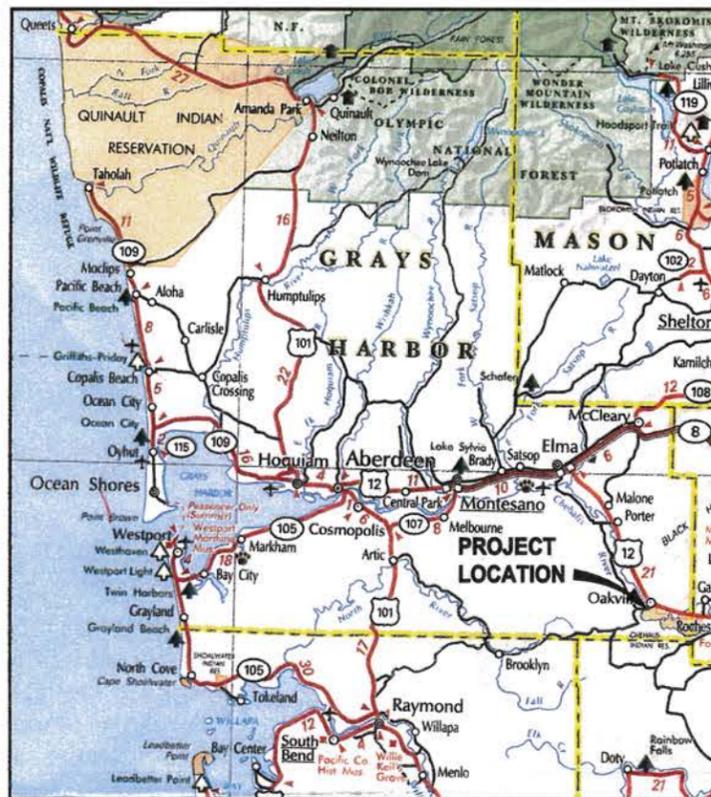
Sources Cited

USGS GIS Soils Data Layers
Chehalis Department of Natural Resources - Staff and GIS Data
EPA Website, Air Quality Non-Attainment Maps
2001 Groundwater Report, Pacific Groundwater Group
2016 Tribal Historic Preservation Office Letter
USFWS Website, Threatened and Endangered Species
Natural Resources Conservation Service Wetlands Mapper
2010 Environmental Assessment for South Bank/Harris Creek Culvert Replacement

Appendix 1

HARRIS CREEK MULTI-USE TRAIL IMPROVEMENTS

CHEHALIS, WASHINGTON



CONTROL INFORMATION

BASIS OF BEARING: BASIS OF BEARING IS VOSPER SUBDIVISION, TIE FROM CENTER OF SECTION TO NORTH QUARTER CORNER.

VERTICAL DATUM: ELEVATION 91.8 (N.G.V.D. 29) VOSPER PLACE SUBDIVISION SOUTH WEST CORNER

SITE INFORMATION:

APPLICANT: CHEHALIS TRIBE
PO BOX 536
OAKVILLE, WA 98568
T: 360.709.1813
CONTACT: AMY LOUDERMILK

TAX PARCEL NUMBERS: 160431130010, 160431120030, 786300000002, 160431120010

PROJECT REPRESENTATIVE: PARAMETRIX - PUYALLUP OFFICE
1019 39TH AVE SE, SUITE 100
PUYALLUP, WA 98374
T: 253.604.6600
ENGINEER CONTACT: GREG STIDHAM, PE

SURVEY REPRESENTATIVE: SOUND SURVEYORS
T: 360.239.7373
SURVEY CONTACT: JAY SALMON

UTILITIES LOCATE NOTE

THE LOCATION OF EXISTING UTILITIES SHOWN HEREON IS BASED ON INFORMATION OBTAINED FROM THE FIELD AND FROM RECORDS. PARAMETRIX ASSUMES NO RESPONSIBILITY FOR EXACT LOCATION OF EXISTING UTILITIES SHOWN OR NOT SHOWN HEREON. CONTRACTOR SHALL VERIFY THE EXACT SIZE, DEPTH, AND LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL CALL FOR UNDERGROUND LOCATE AT 811 PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES DEPICTED OR NOT DEPICTED ON THESE PLANS.

VICINITY MAP

NO SCALE



LOCATION MAP

NO SCALE



INDEX TO DRAWINGS

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| 2 | G-02 | GENERAL NOTES, LEGEND & ABBREVIATIONS |
| 3 | TS-01 | TYPICAL SECTIONS |
| 4 | EX-01 | EXISTING CONDITIONS |
| 5 | HC-01 | HORIZONTAL CONTROL |
| 6 | CG-01 | DEMOLITION, TESC, CLEARING & GRUBBING PLAN |
| 7 | CG-02 | DEMOLITION, TESC, CLEARING & GRUBBING PLAN |
| 8 | CG-03 | DEMOLITION, TESC, CLEARING & GRUBBING DETAILS |
| 9 | GR-01 | GRADING & DRAINAGE PLAN |
| 10 | GR-02 | GRADING & DRAINAGE PLAN & PROFILE |
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| 19 | S-04 | CANTILEVERED BOARDWALK SECTIONS AND DETAILS AT CULVERT |
| 20 | S-05 | GRAVITY BLOCKWALL PLAN AND PROFILE |
| 21 | S-06 | WALL DETAILS |
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Know what's below.
Call before you dig.

100% REVIEW SUBMITTAL
NOT FOR CONSTRUCTION

| REVISIONS | DATE | BY | DESIGNED SKN |
|-----------|------|----|--------------|
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ONE INCH AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

FILE NAME: PSO3098003C-CV
JOB No: 217-3098-003
DATE: JUNE 2016



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PROJECT NAME
HARRIS CREEK MULTI-USE TRAIL IMPROVEMENTS
CHEHALIS, WA

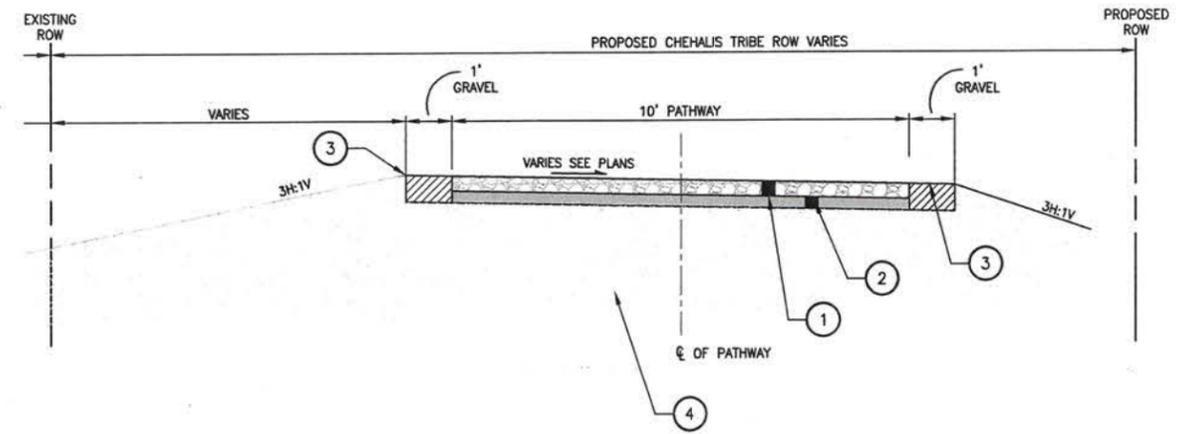
COVER SHEET

DRAWING NO.
1 OF 22
G-01

PATH: \\parametrix.com\pmx\p52\Projects\Clients\098-Chehalis\17-3098-003 Chehalis On-Call Svc\998-ea\CD\DWG PLOTTED BY: brantket DATE: Thursday, June 23, 2016 4:13:10 PM LAYOUT: COVER

PATH: \\parametrix.com\pmx\Projects\Clients\3098-Chehalis\3098-003\Chehalis Dr-Coll Svc\99Secs\CA00\DWG PLOTTED BY: brestkot DATE: Thursday, June 23, 2016 4:13:13 PM LAYOUT: SECTIONS

- NOTES:**
- 1 CLASS "B" ASPHALT CONC 3" MIN COMP DEPTH.
 - 2 CRUSHED SURFACING BASE COURSE 4" MIN COMP DEPTH.
 - 3 4.5" OF GRAVEL BASE WITH 4.5" OF CSBC OVER THE TOP.
 - 4 SUB-BASE COMPACTED TO 95% STANDARD PROCTOR WITH WATER CONTENT WITHIN 1.5% OF OPTIMUM.



TYPICAL SECTION
1"=2'



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ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY
 FILE NAME: PS03098003C-CV
 JOB No: 217-3098-003
 DATE: JUNE 2016



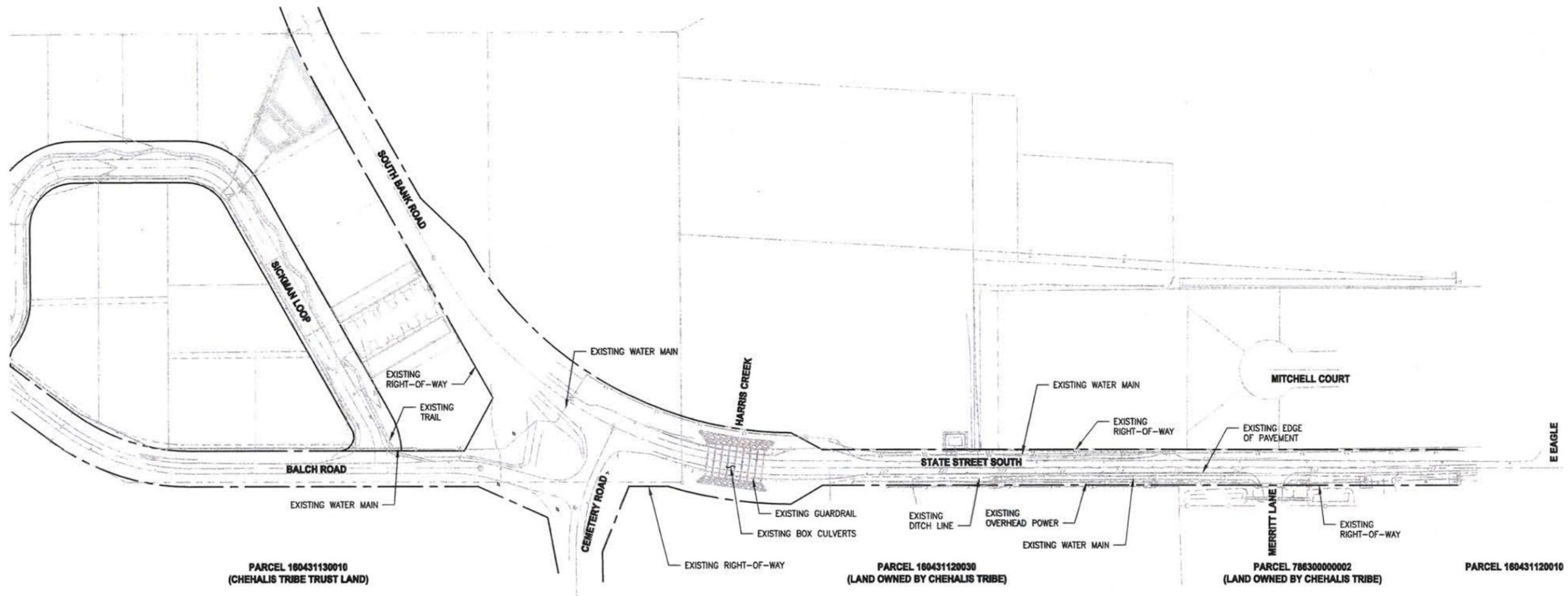
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PROJECT NAME
HARRIS CREEK MULTI-USE TRAIL IMPROVEMENTS
 CHEHALIS, WA

TYPICAL SECTIONS

DRAWING NO.
 3 OF 22
TS-01

LAYOUT: EXISTING CONDITIONS SH11
 PATH: \\parametrix.com\pmx\p50\Projects\Clients\Chehalis\217-3098-003\Chehalis\3098-003\Chehalis On-Call Sw\9955va\CADD\DWG
 PLOTTED BY: breastket DATE: Thursday, June 23, 2016 4:13:33 PM



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 FILE NAME
 PSO3098003C-EX
 JOB No.
 217-3098-003
 DATE
 JUNE 2016



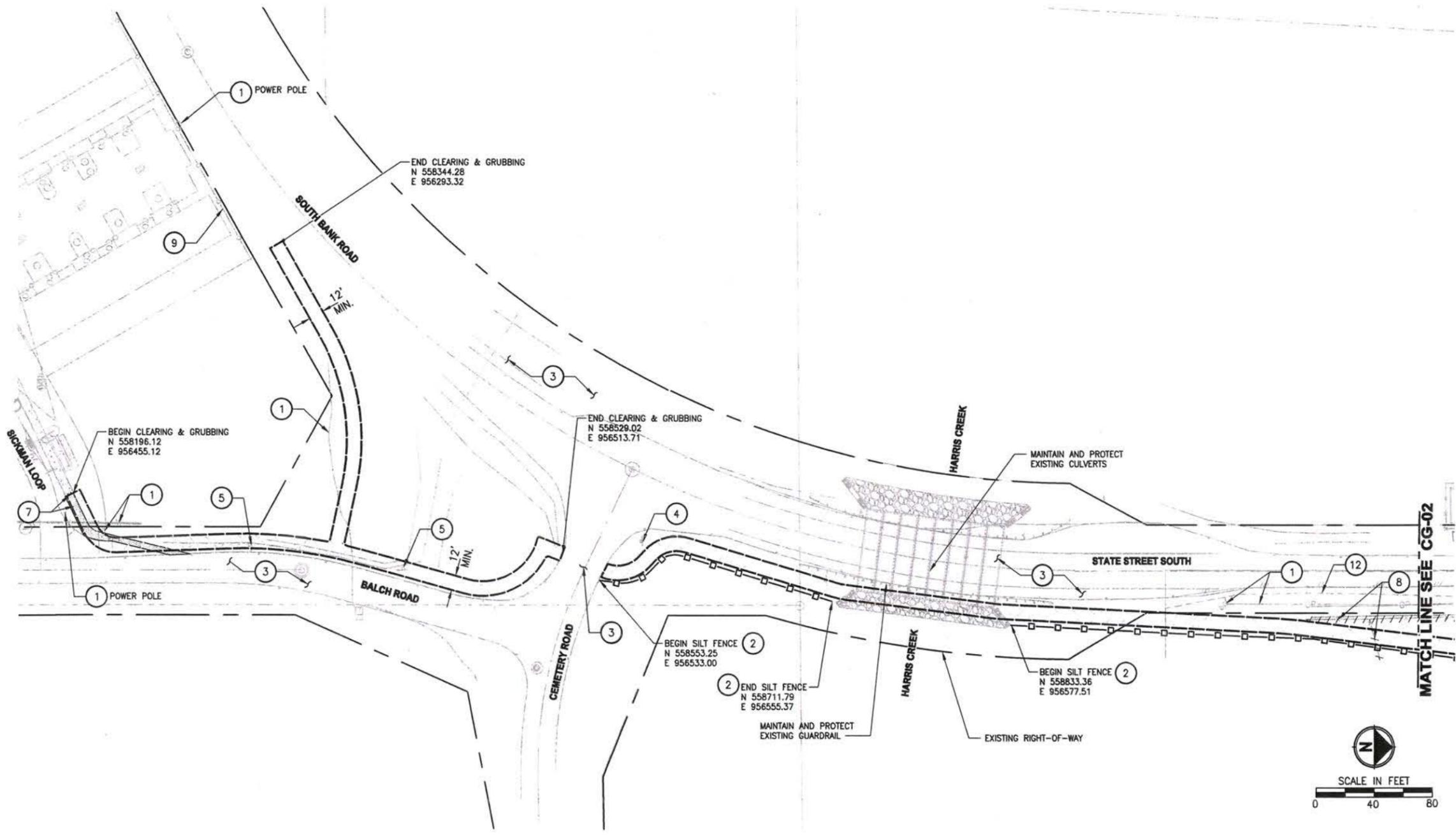
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PROJECT NAME
HARRIS CREEK MULTI-USE TRAIL IMPROVEMENTS
 CHEHALIS, WA

EXISTING CONDITIONS

DRAWING NO.
 4 OF 22
EX-01

PATH: \\parametrix.com\jms\PSO\Projects\Clients\3098-Chehalis\3098-Chehalis\3098-003-Chehalis On-Call Svc\999Sec\CG003.DWG PLOTTED BY: brookhat DATE: Thursday, June 23, 2016 4:14:18 PM LAYOUT: DDWG.SHT



LEGEND

- CONSTRUCTION LIMITS
- SILT FENCE PER STD PLAN 1-4, SHEET CG-03
- REMOVE EXISTING FENCE/WALL
- CLEAR AND GRUB
- REMOVE EXISTING ASPHALT PAVEMENT

- CONSTRUCTION NOTES**
- 1 MAINTAIN AND PROTECT EXISTING UTILITY.
 - 2 MAINTAIN AND/OR ENHANCE EXISTING SILT FENCE PER WSDOT STD. PLAN 1-4 ON SHEET CG-03.
 - 3 PRESERVE AND PROTECT EXISTING ASPHALT.
 - 4 MAINTAIN AND PROTECT EXISTING SIGN.
 - 5 RELOCATE EXISTING SIGN TO BACK OF SIDEWALK.
 - 6 REMOVE EXISTING CONCRETE WALL.
 - 7 SAWCUT AND REMOVE EXISTING ASPHALT SIDEWALK.
 - 8 REMOVE EXISTING FENCE.
 - 9 MAINTAIN AND PROTECT EXISTING FENCE.
 - 10 REMOVE EXISTING POST.
 - 11 SAWCUT AND REMOVE 1' WIDTH OF EXISTING ASPHALT FOR CLEAN CONNECTION TO PROPOSED HMA.
 - 12 MAINTAIN AND PROTECT EXISTING ROADSIDE DITCH.

- GENERAL NOTES**
1. MAINTAIN AND PROTECT EXISTING VEGETATION AND TREES
 2. STRAW BALE BARRIERS, WATTLES, AND OTHER NECESSARY TESC MEASURES TO BE INSTALLED BY CONTRACTOR AS NEEDED OR AS DIRECTED BY OWNER, AND CHEHALIS TRIBE SEE DETAILS ON SHEET CG-03.
 3. INSTALL SILT FENCE (OR BERM TO ACT AS APPROVED EQUAL) BEFORE CLEARING AND GRUBBING BEGIN PER WSDOT STD PLAN 1-4. ONLY SMALL AREAS OF CLEARING REQUIRED TO INSTALL THE SILT FENCE IS ACCEPTABLE BEFORE THE SILT FENCE IS INSTALLED SEE DETAIL ON SHEET CG-03.
 4. ALL DISTURBED AREAS TO BE STABILIZED TO PRECONSTRUCTION CONDITION OR BETTER.

UTILITIES LOCATE NOTE

THE LOCATION OF EXISTING UTILITIES SHOWN HEREON IS BASED ON INFORMATION OBTAINED FROM THE FIELD AND FROM RECORDS. PARAMETRIX ASSUMES NO RESPONSIBILITY FOR EXACT LOCATION OF EXISTING UTILITIES SHOWN OR NOT SHOWN HEREON. CONTRACTOR SHALL VERIFY THE EXACT SIZE, DEPTH, AND LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL CALL FOR UNDERGROUND LOCATE AT 811 PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES DEPICTED OR NOT DEPICTED ON THESE PLANS.

| REVISIONS | DATE | BY | DESIGNED SKN |
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FILE NAME: PSO3098003C-CG
 JOB No: 217-3098-003
 DATE: JUNE 2016



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PROJECT NAME
HARRIS CREEK MULTI-USE TRAIL IMPROVEMENTS
 CHEHALIS, WA

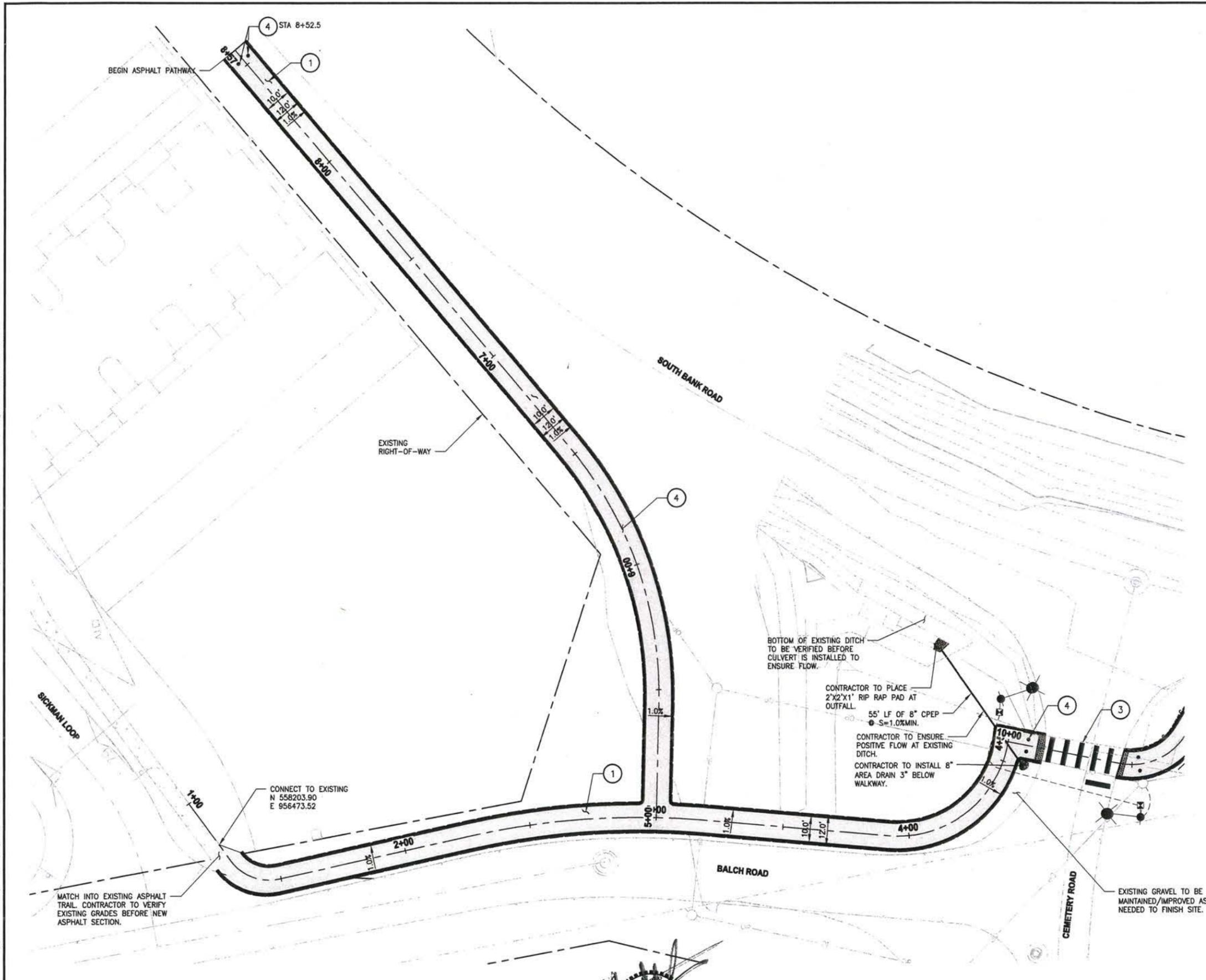
DEMOLITION, TESC, CLEARING AND GRUBBING PLAN

DRAWING NO. 6 OF 22
CG-01



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PATH: \\parametrix.com\pmx\PSO\Projects\Clients\3098-Chehalis\Tribal\217-3098-003\Chehalis On-Call Svc\955vca\cadd\DWG PLOTTED BY: brookit DATE: Friday, June 24, 2016 9:50:40 AM LAYOUT: GRADING SHIT

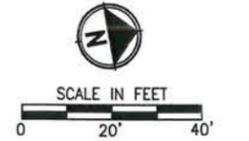


LEGEND

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| | EXISTING RIGHT-OF-WAY |
| | EXISTING ROADWAY CENTERLINE |
| | EXISTING EDGE OF PAVEMENT |
| | EXISTING DITCH LINE |
| | CUT LIMITS |
| | FILL LIMITS |
| | ASPHALT PATHWAY |
| | GRAVEL SHOULDER |

- CONSTRUCTION NOTES**
- 10' WIDE ASPHALT PATHWAY PER SECTIONS ON SHEET TS-01.
 - DETECTABLE WARNING SURFACE, PER WSDOT STD PLAN F-45.10-01, SEE SHEET GR-06.
 - INSTALL WHITE PLASTIC CROSSWALK BARS AND STOP BARS CENTERED ON PATHWAY, PER WSDOT STD PLAN M-15.10-01, SEE SHEET GR-06.
 - INSTALL REMOVABLE BOLLARD PER DETAIL ON SHEET GR-06.

- GENERAL NOTES**
- CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THIS WORK.
 - CONTRACTOR TO VERIFY ALL EXISTING ELEVATIONS AND GRADES.
 - TYPICAL PATHWAY SECTIONS ARE SHOWN ON SHEET TS-01.
 - EXISTING TOPO FOR LARGE AREAS OF THE DESIGN WERE NOT AVAILABLE AT THE TIME OF THE DESIGN. ASPHALT PATHWAY WILL NEED TO BE FIELD FIT TO ENSURE POSITIVE DRAINAGE FROM ROADWAY AND PATHWAY TO NEAREST DITCH/CULVERT AND NOT CREATE PONDING ISSUES.



NOTE:
SYMBOLS NOT TO SCALE



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FILE NAME: PSO3098003C-GR
JOB No: 217-3098-003
DATE: JUNE 2016



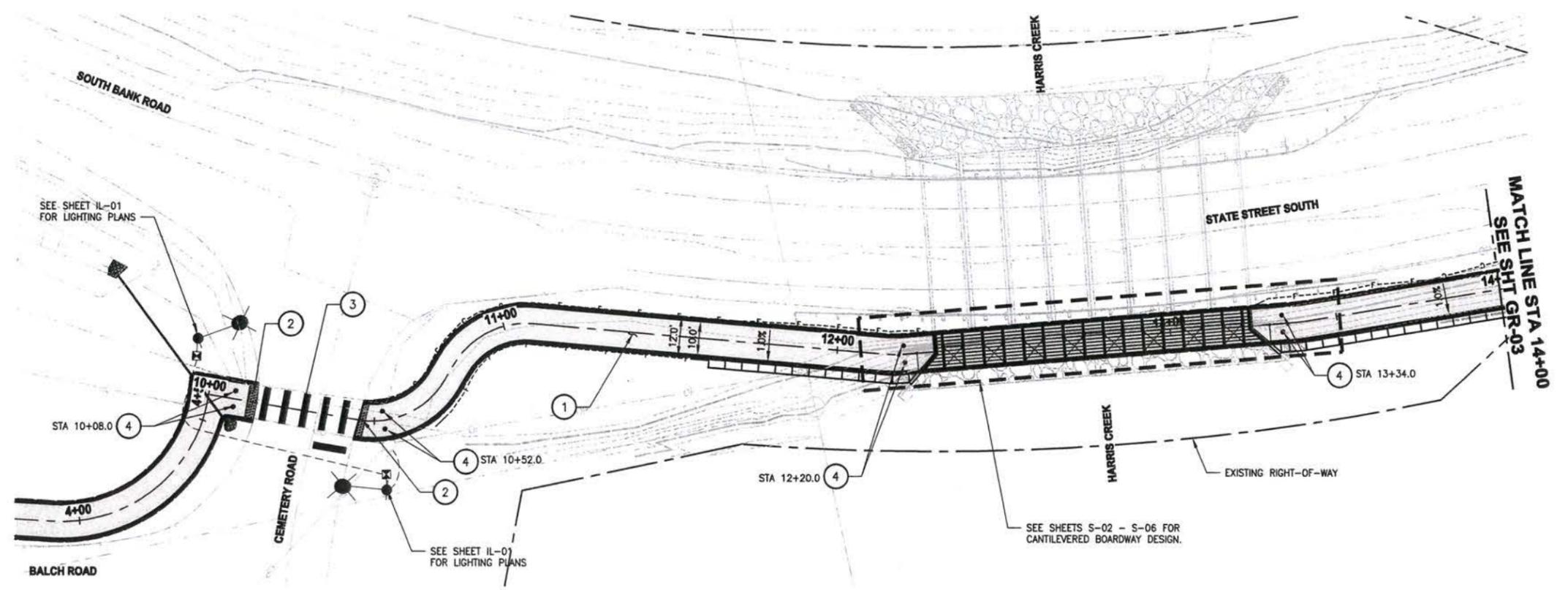
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PROJECT NAME
HARRIS CREEK MULTI-USE TRAIL IMPROVEMENTS
CHEHALIS, WA

GRADING & DRAINAGE PLAN

DRAWING NO.
9 OF 22
GR-01

LAYOUT: GRADING SH22
 PATH: \\parametrix.com\pmx\PSO\Projects\Chehalis\217-3098-003\Chehalis On-Call Svc\998\CAAD\DWG
 PLOTTED BY: brookkat DATE: Friday, June 24, 2016 9:50:49 AM

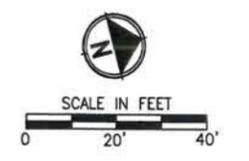
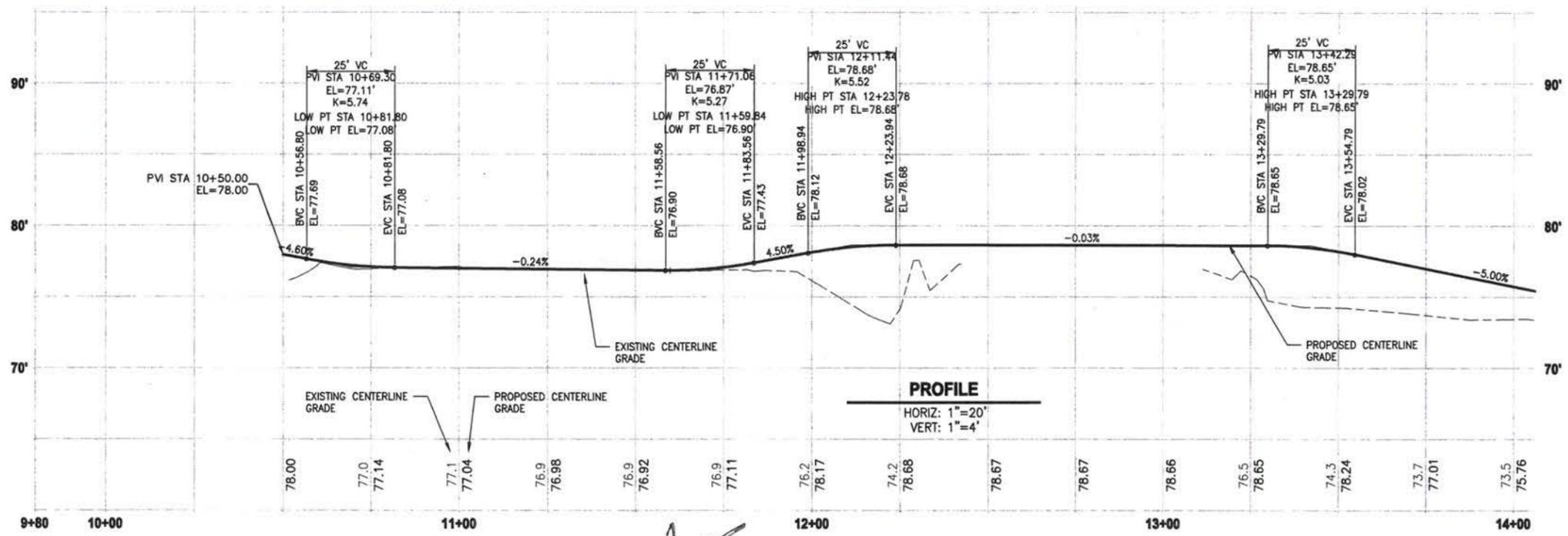


LEGEND

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| | EXISTING RIGHT-OF-WAY |
| | EXISTING ROADWAY CENTERLINE |
| | EXISTING EDGE OF PAVEMENT |
| | EXISTING DITCH LINE |
| | CUT LIMITS |
| | FILL LIMITS |
| | ASPHALT PATHWAY |
| | GRAVEL SHOULDER |

- CONSTRUCTION NOTES**
- 10' WIDE ASPHALT PATHWAY PER SECTIONS ON SHEET TS-01.
 - DETECTABLE WARNING SURFACE, PER WSDOT STD PLAN F-45.10-01, SEE SHEET GR-06.
 - INSTALL WHITE PLASTIC CROSSWALK BARS AND STOP BARS CENTERED ON PATHWAY, PER WSDOT STD PLAN M-15.10-01, SEE SHEET GR-06.
 - INSTALL REMOVABLE BOLLARD PER DETAIL ON SHEET GR-06.

- GENERAL NOTES**
- CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THIS WORK.
 - CONTRACTOR TO VERIFY ALL EXISTING ELEVATIONS AND GRADES.
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NOTE:
SYMBOLS NOT TO SCALE



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FILE NAME: PSO3098003C-GR
 JOB No: 217-3098-003
 DATE: JUNE 2016



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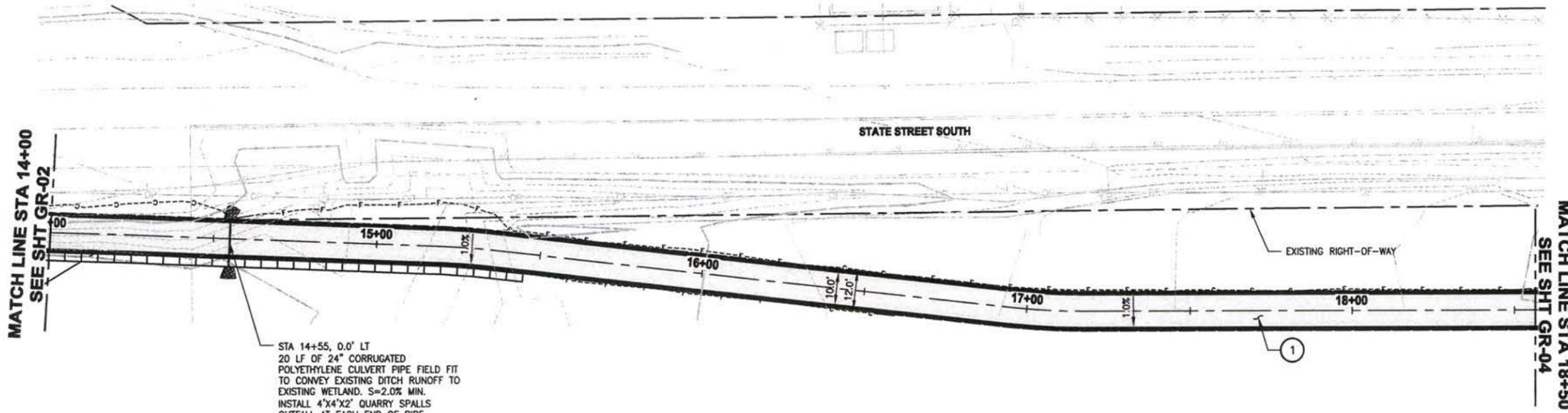
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PROJECT NAME
**HARRIS CREEK MULTI-USE
 TRAIL IMPROVEMENTS**
 CHEHALIS, WA

**GRADING & DRAINAGE
 PLAN & PROFILE
 STA 10+00 TO STA 14+00**

DRAWING NO.
 10 OF 22
GR-02

LAYOUT: GRADING SHTS
 PATH: \\parametrix.com\yma\PSO\Projects\Clients\Chehalis\2008-Chehalis\17-3098-003\Chehalis On-Call Svc\99Sves\CADD\DWG
 PLOTTED BY: broatlik DATE: Friday, June 24, 2016 8:51:00 AM

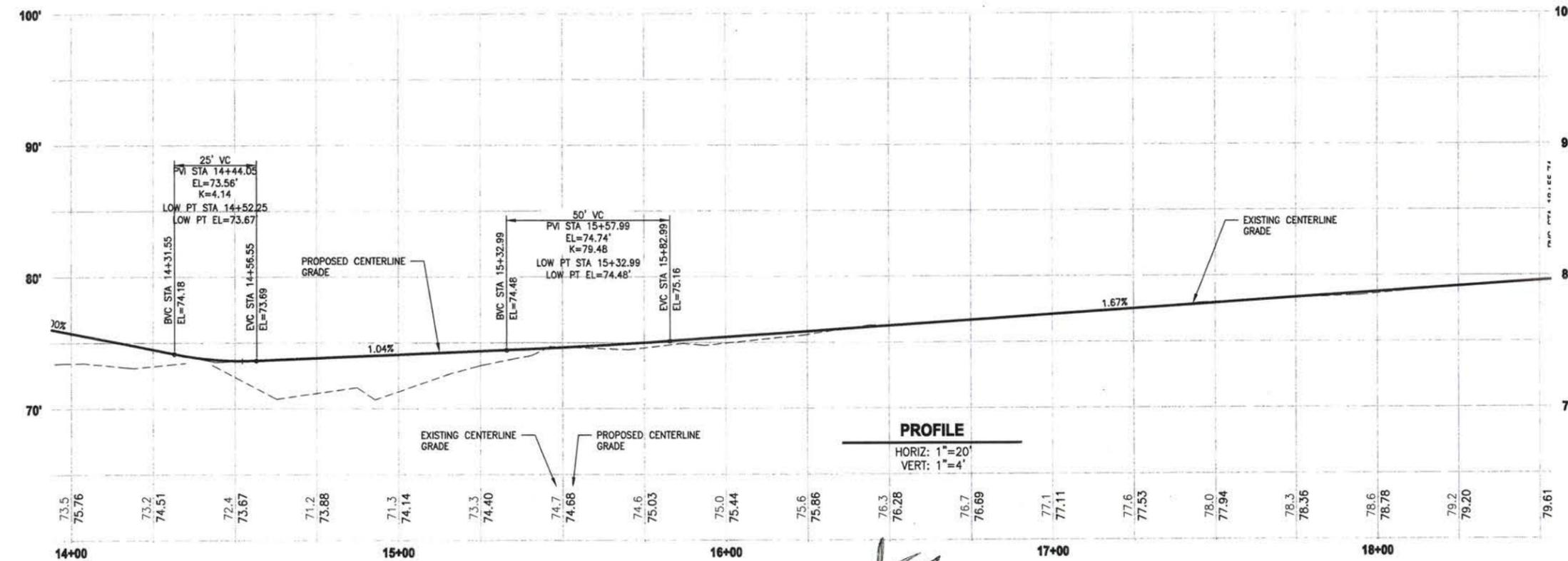


LEGEND

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| | EXISTING RIGHT-OF-WAY |
| | EXISTING ROADWAY CENTERLINE |
| | EXISTING EDGE OF PAVEMENT |
| | EXISTING DITCH LINE |
| | CUT LIMITS |
| | FILL LIMITS |
| | ASPHALT PATHWAY |
| | GRAVEL SHOULDER |

- CONSTRUCTION NOTES**
- 10' WIDE ASPHALT PATHWAY PER SECTIONS ON SHEET TS-01.
 - DETECTABLE WARNING SURFACE, PER WSDOT STD PLAN F-45.10-01, SEE SHEET GR-06.
 - INSTALL WHITE PLASTIC CROSSWALK BARS AND STOP BARS CENTERED ON PATHWAY, PER WSDOT STD PLAN M-15.10-01, SEE SHEET GR-06.
 - INSTALL REMOVABLE BOLLARD PER DETAIL ON SHEET GR-06.

- GENERAL NOTES**
- CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THIS WORK.
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NOTE:
SYMBOLS NOT TO SCALE



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FILE NAME
PSO3098003C-GR
JOB No
17-3098-003
DATE
JUNE 2016



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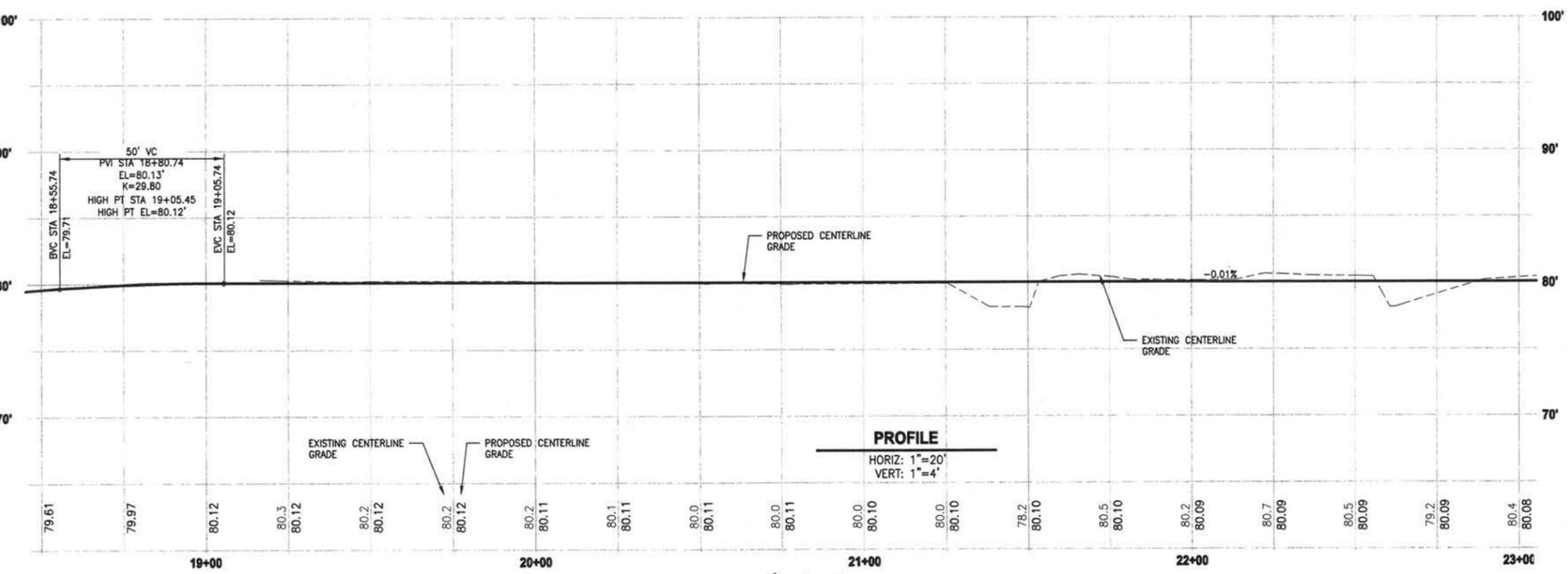
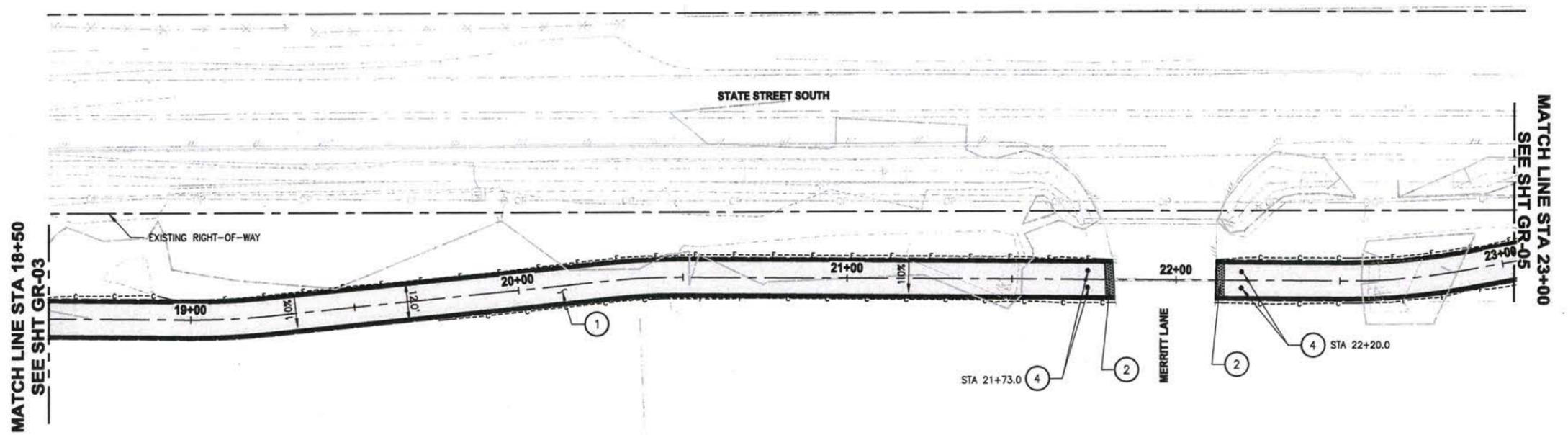
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PROJECT NAME
**HARRIS CREEK MULTI-USE
TRAIL IMPROVEMENTS**
CHEHALIS, WA

**GRADING & DRAINAGE
PLAN & PROFILE
STA 14+00 TO STA 18+50**

DRAWING NO.
11 OF 22
GR-03

PATH: \\parametrix.com\jms\p50\Projects\Clients\3098-Chehalis\Trail\217-3098-003 Chehalis On-Coll Svc\995\en\CADD\DWG PLOTTED BY: breahtat DATE: Friday, June 24, 2016 9:51:11 AM
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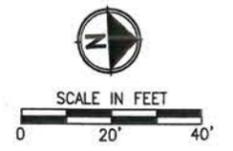


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| | EXISTING RIGHT-OF-WAY |
| | EXISTING ROADWAY CENTERLINE |
| | EXISTING EDGE OF PAVEMENT |
| | EXISTING DITCH LINE |
| | CUT LIMITS |
| | FILL LIMITS |
| | ASPHALT PATHWAY |
| | GRAVEL SHOULDER |

- CONSTRUCTION NOTES**
- 10' WIDE ASPHALT PATHWAY PER SECTIONS ON SHEET TS-01.
 - DETECTABLE WARNING SURFACE, PER WSDOT STD PLAN F-45.10-01, SEE SHEET GR-06.
 - INSTALL WHITE PLASTIC CROSSWALK BARS AND STOP BARS CENTERED ON PATHWAY, PER WSDOT STD PLAN M-15.10-01, SEE SHEET GR-06.
 - INSTALL REMOVABLE BOLLARD PER DETAIL ON SHEET GR-06.

- GENERAL NOTES**
- CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THIS WORK.
 - CONTRACTOR TO VERIFY ALL EXISTING ELEVATIONS AND GRADES.
 - TYPICAL PATHWAY SECTIONS ARE SHOWN ON SHEET TS-01.
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NOTE:
SYMBOLS NOT TO SCALE



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FILE NAME
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JOB No.
217-3098-003

DATE
JUNE 2016



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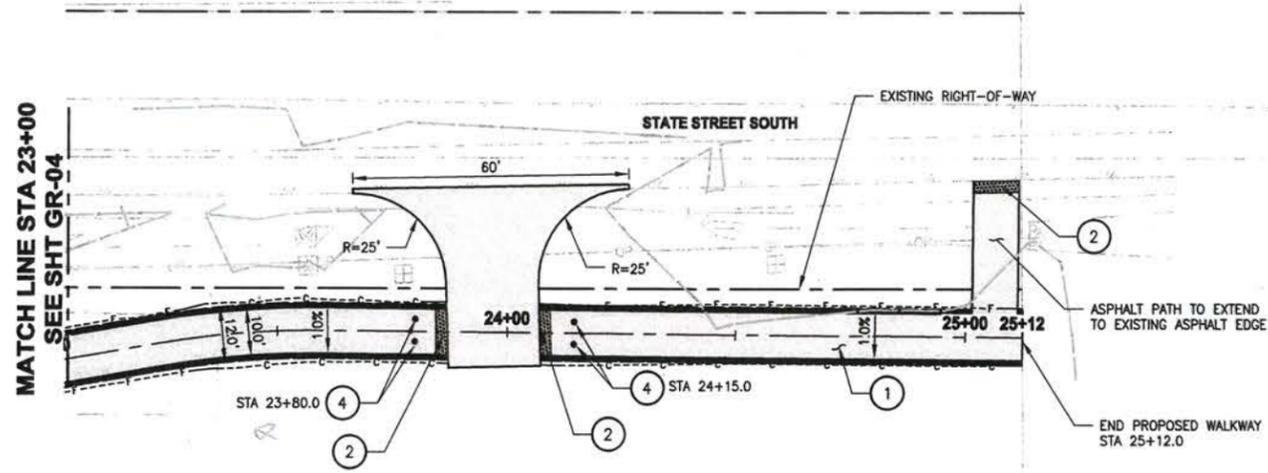
PROJECT NAME
HARRIS CREEK MULTI-USE TRAIL IMPROVEMENTS
CHEHALIS, WA

**GRADING & DRAINAGE
PLAN & PROFILE
STA 18+50 TO STA 23+00**

DRAWING NO.
12 OF 22

GR-04

LAYOUT: GRADING SHTS
 PATH: \\parametrix.com\pmx\FSO\Projects\Chehalis\098-Chehalis\17-3098-003 Chehalis On-Cell Sec\98Sect\CADD\DWG
 PLOTTED BY: brooklet DATE: Friday, June 24, 2016 9:51:21 AM

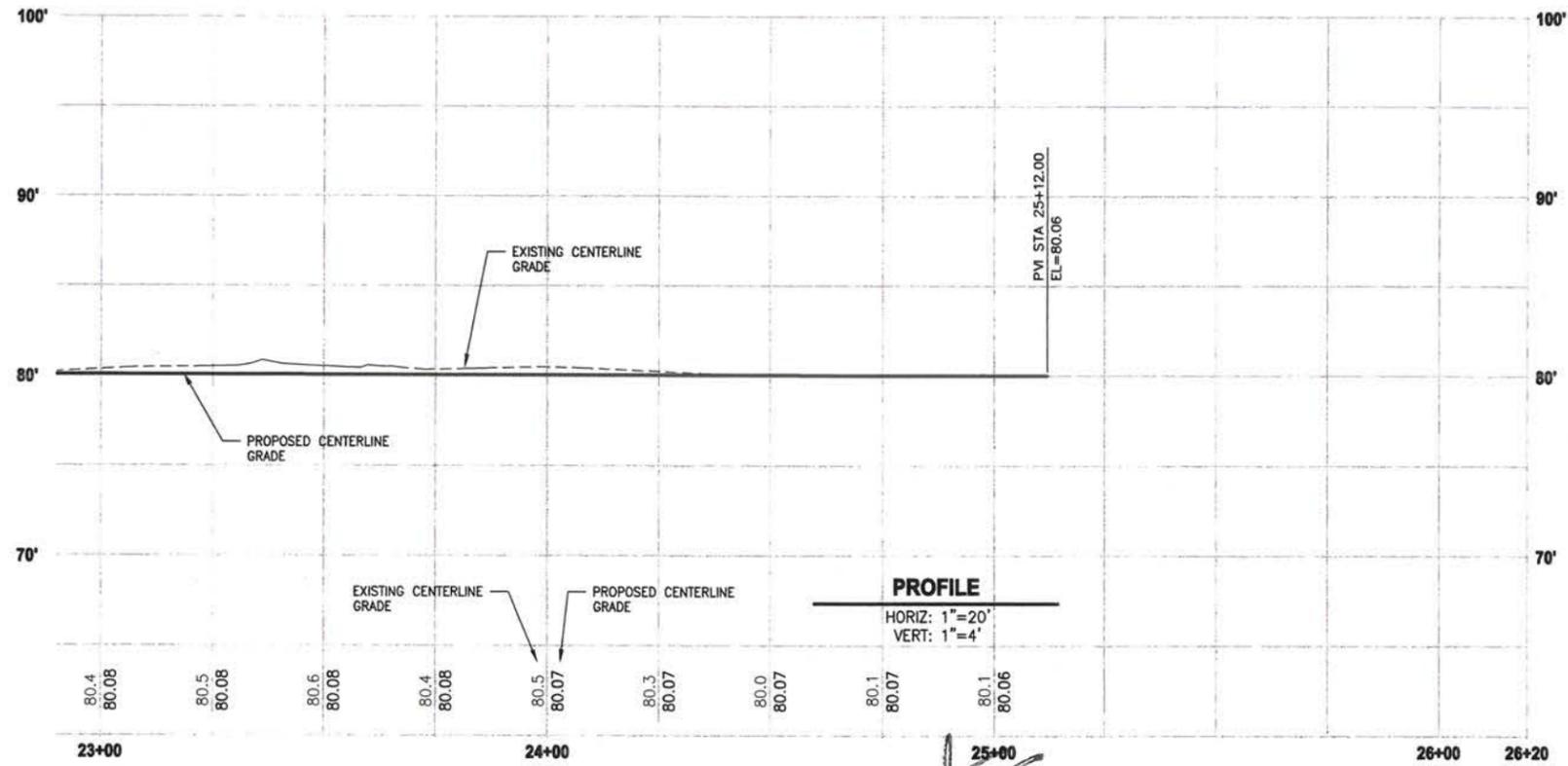


LEGEND

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| | EXISTING RIGHT-OF-WAY |
| | EXISTING ROADWAY CENTERLINE |
| | EXISTING EDGE OF PAVEMENT |
| | EXISTING DITCH LINE |
| | CUT LIMITS |
| | FILL LIMITS |
| | ASPHALT PATHWAY |
| | GRAVEL SHOULDER |

- CONSTRUCTION NOTES**
- 10' WIDE ASPHALT PATHWAY PER SECTIONS ON SHEET TS-01.
 - DETECTABLE WARNING SURFACE, PER WSDOT STD PLAN F-45.10-01, SEE SHEET GR-06.
 - INSTALL WHITE PLASTIC CROSSWALK BARS AND STOP BARS CENTERED ON PATHWAY, PER WSDOT STD PLAN M-15.10-01, SEE SHEET GR-06.
 - INSTALL REMOVABLE BOLLARD PER DETAIL ON SHEET GR-06.

- GENERAL NOTES**
- CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THIS WORK.
 - CONTRACTOR TO VERIFY ALL EXISTING ELEVATIONS AND GRADES.
 - TYPICAL PATHWAY SECTIONS ARE SHOWN ON SHEET TS-01.
 - EXISTING TOPO FOR LARGE AREAS OF THE DESIGN WERE NOT AVAILABLE AT THE TIME OF THE DESIGN. ASPHALT PATHWAY WILL NEED TO BE FIELD FIT TO ENSURE POSITIVE DRAINAGE FROM ROADWAY AND PATHWAY TO NEAREST DITCH/CULVERT AND NOT CREATE PONDING ISSUES.



NOTE:
 SYMBOLS NOT TO SCALE

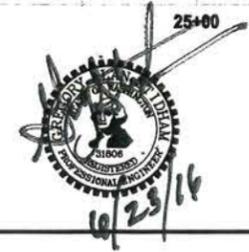


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FILE NAME
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 JOB No.
 217-3098-003
 DATE
 JUNE 2016



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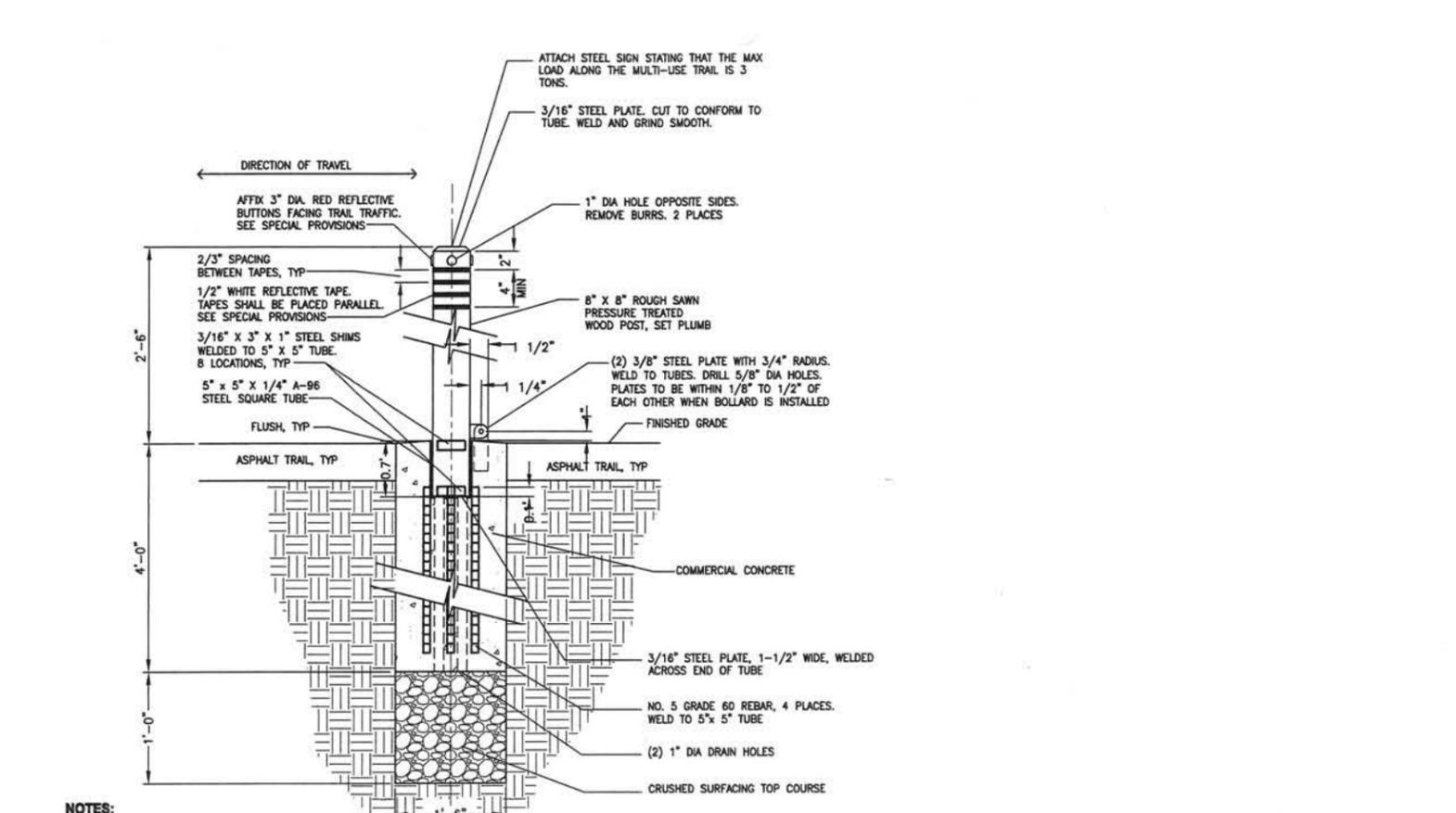
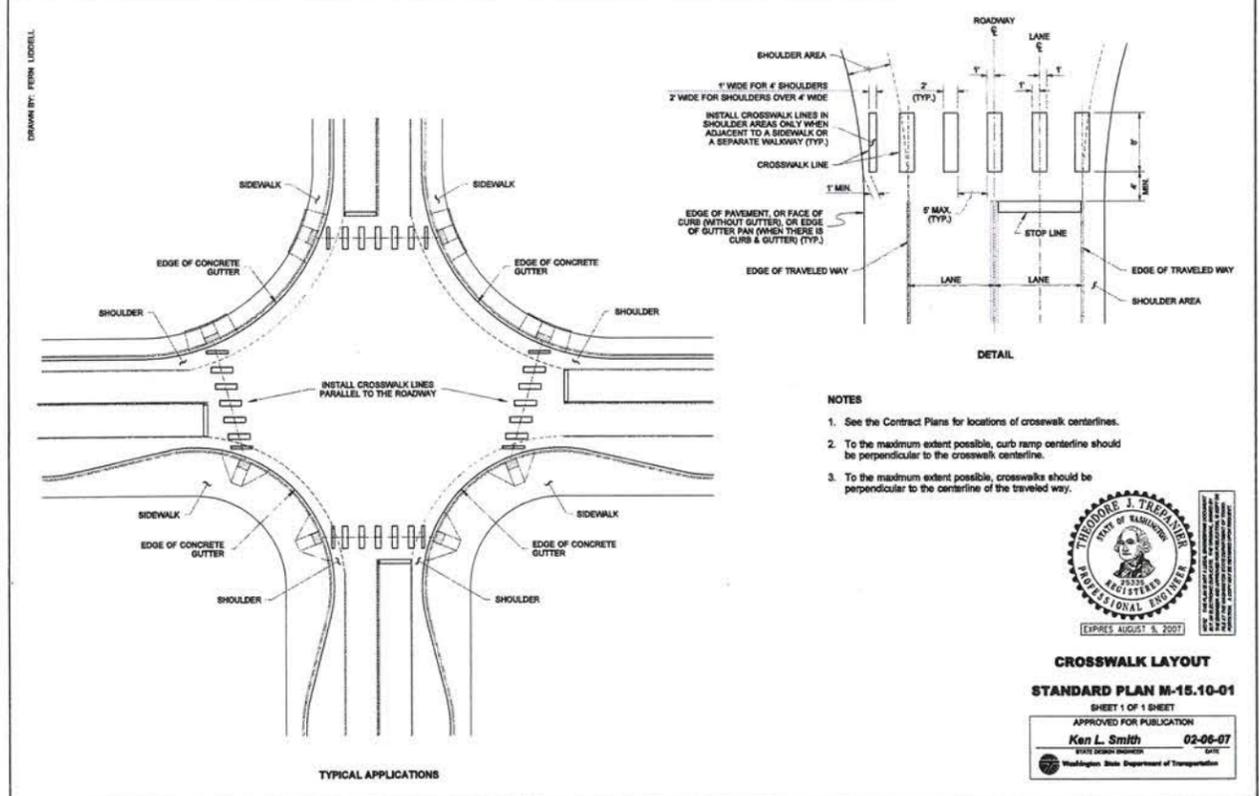
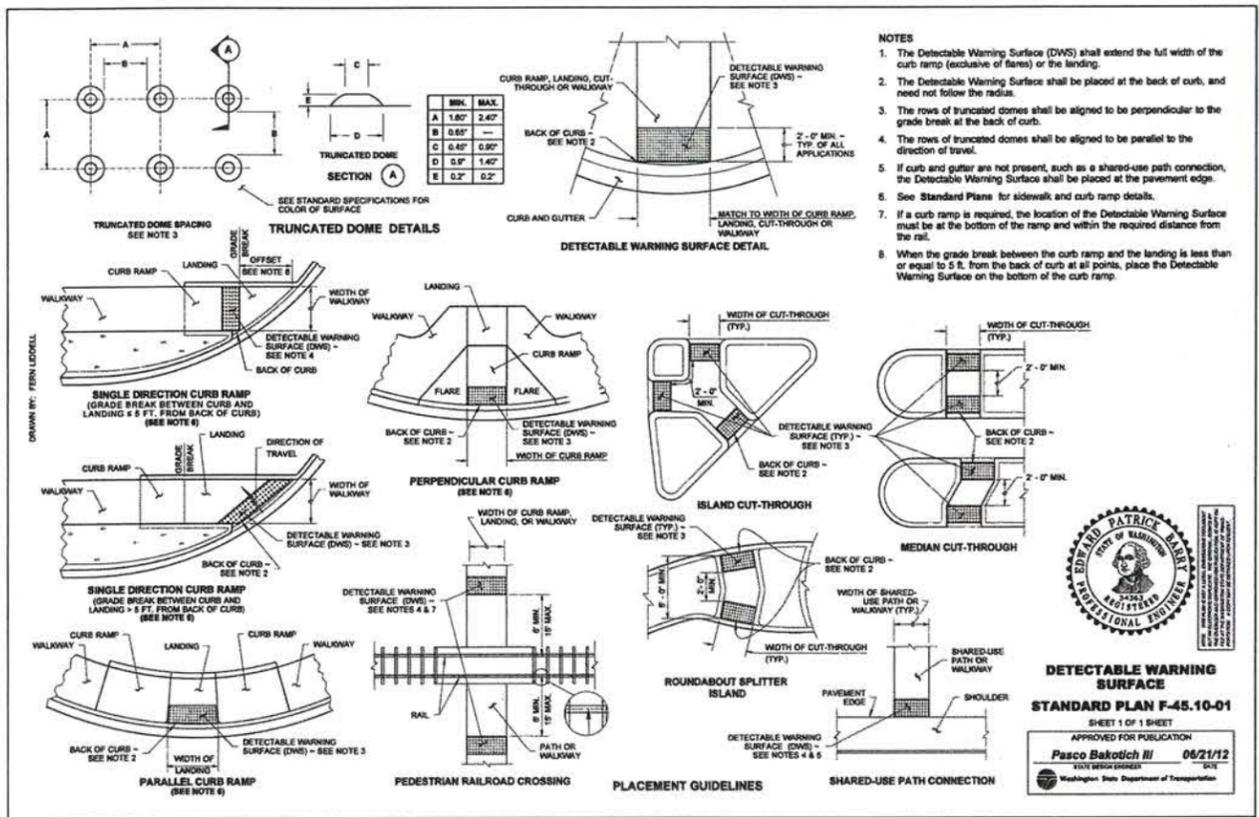
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PROJECT NAME
**HARRIS CREEK MULTI-USE
 TRAIL IMPROVEMENTS**
 CHEHALIS, WA

**GRADING & DRAINAGE
 PLAN & PROFILE
 STA 23+00 TO STA 26+64**

DRAWING NO.
 13 OF 22
GR-05

PATH: \\parametrix.com\gmx\PSO\Projects\Chehalis\3098-Chehalis\3098-003 Chehalis On-Call Svc\3098\3098-CADD\DWG PLOTTED BY: brookkat DATE: Thursday, June 23, 2016 4:15:48 PM LAYOUT: GRADING SH16



NOTES:

- PADLOCK SHALL BE MASTER KEYED ALIKE TOSM-737 WITH NO. 5LF SHACKLE, OWNER PROVIDED.
- SLOPE TOP OF CONCRETE FOOTING TO DRAIN AWAY FROM POST.
- HOT DIP GALV. & PRIME PAINT - FINISH COLOR TO BE WHITE MARINE ENAMEL.



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IF NOT, SCALE ACCORDINGLY

FILE NAME: PSO3098003C-GR
JOB NO: 217-3098-003
DATE: JUNE 2016



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PROJECT NAME
HARRIS CREEK MULTI-USE TRAIL IMPROVEMENTS
CHEHALIS, WA

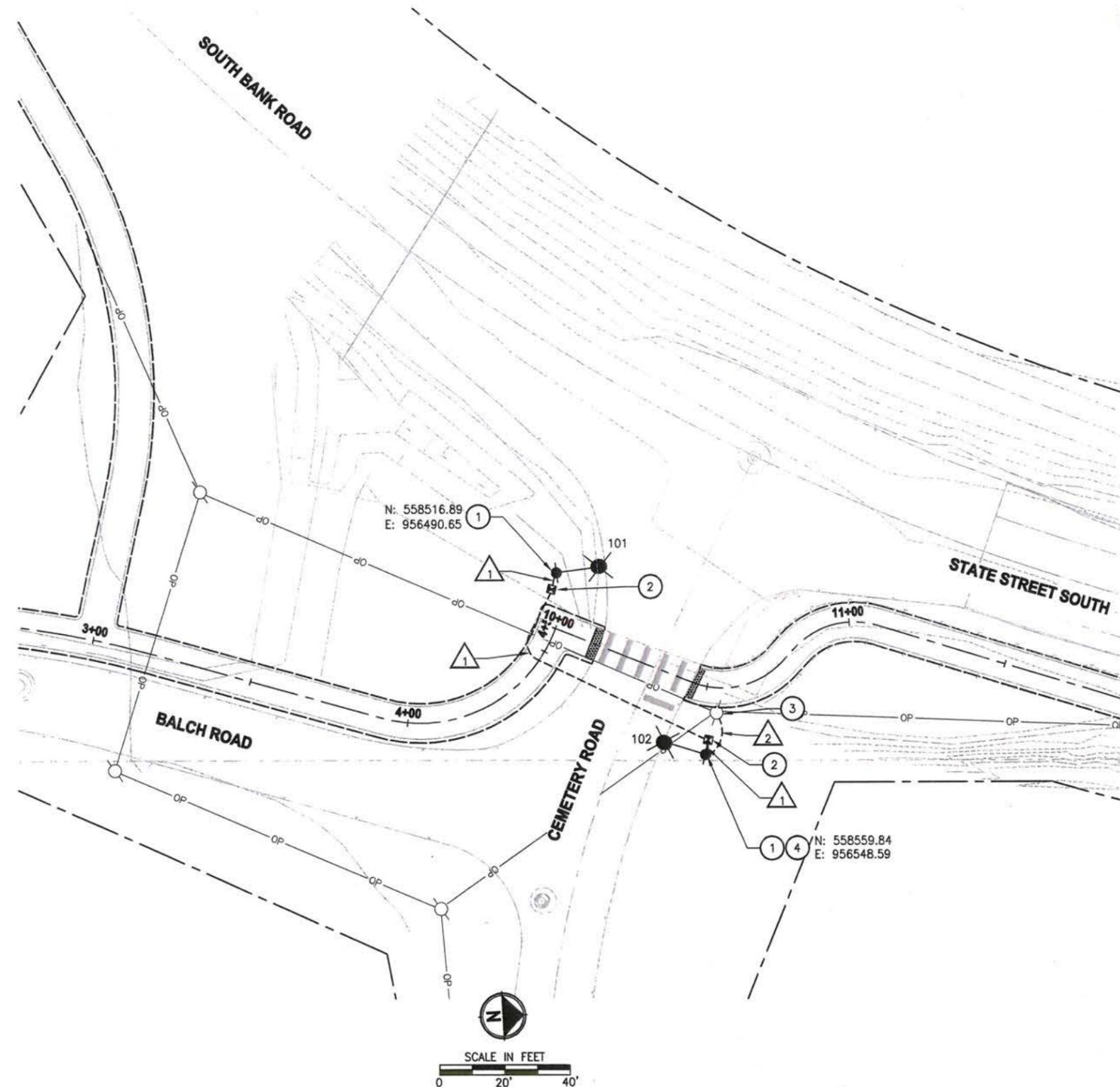
GRADING DETAILS

DRAWING NO.
14 OF 22
GR-06



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WIRE NOTES:

| CONDUIT/WIRE SCHEDULE | | | | |
|-----------------------|--------------|----------|-----------|-----------|
| # | CONDUIT SIZE | ILLUM #8 | GROUND #8 | POWER 3/0 |
| 1 | 2" | 2 | 1 | |
| 2 | 2" | | | 3 |
| | | | | |
| | | | | |

- NOTES:**
- CONDUIT FROM POWER SOURCE SHALL BE RIGID GALVANIZED STEEL (RGS). ALL OTHER CONDUIT SHALL BE PVC SCH 80.

SEE SPECIAL PROVISIONS FOR COMPLETE MATERIAL AND INSTALLATION REQUIREMENTS.

GENERAL CONSTRUCTION NOTES

- ALL MATERIALS AND CONSTRUCTION REQUIREMENTS SHALL CONFORM TO THE 2016 WSDOT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION AND THE LATEST EDITION OF THE WSDOT STANDARD PLANS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION UNLESS NOTED OTHERWISE.
- UTILITY LOCATION PRIOR TO CONSTRUCTION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONFLICTS ARE TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.
- ALL JUNCTION BOXES AND CONDUIT RUNS SHALL BE INSTALLED AS SHOWN ON THE PLANS. LOCATIONS SHOWN ARE SCHEMATIC AND THE ENGINEER WILL CONFIRM EXACT LOCATIONS.
- ALL EQUIPMENT AND CONDUIT SHALL BE GROUNDED PER NEC REQUIREMENTS.
- EXISTING POWER POLES AND OVERHEAD POWER LINES ARE SHOWN AT APPROXIMATE LOCATIONS.

ILLUMINATION CONSTRUCTION NOTES

- FURNISH AND INSTALL STREET LIGHT STANDARD FOUNDATION, POLE, 16 FOOT MAST ARM AND LED LUMINAIRE HEAD. FOUNDATION SHALL BE PER WSDOT STANDARD PLAN J-28.30-03, TYPE A, WITH SLIP BASE. STREET LIGHT STANDARD SHALL BE PER WSDOT STANDARD PLAN J-28.10-01 WITH TYPE 1 (DAVIT) MAST ARM. LUMINAIRE SHALL BE MOUNTED AT 35 FT MOUNTING HEIGHT. LUMINAIRE SHALL BE EATON STREETWORKS MODEL NVN-AE-03-E-U-T3R AND SHALL INCLUDE PHOTOCONTROL.
- FURNISH AND INSTALL WSDOT TYPE 1 JUNCTION BOX ADJACENT TO STREET LIGHT POLE AT APPROXIMATE LOCATION NOTED.
- SERVICE POINT AND SERVICE CONNECTION METHOD IS CURRENTLY UNKNOWN. COORDINATION WITH TRIBE OR UTILITY SERVING NEARBY AREA FOR CONNECTION METHOD AND LOCATION.
- FURNISH AND INSTALL SERVICE CABINET TYPE B ON NEW STREET LIGHT STANDARD PER WSDOT STANDARD PLAN J-10.17-00, EXCEPT WIRE FROM POWER SOURCE SHALL BE CONNECTED TO CABINET FROM A RIGID GALVANIZED CONDUIT RISER. USE SERVICE CABINET FOR STREET LIGHT CIRCUIT.

LEGEND:

- STREET LIGHT
- TYPE 1 JUNCTION BOX
- CONDUIT
- WIRE NOTE

NOTE:
SYMBOLS NOT TO SCALE



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| | | | DRAWN |
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JOB NO: 217-3098-003
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PROJECT NAME
HARRIS CREEK MULTI-USE TRAIL IMPROVEMENTS
CHEHALIS, WA

ILLUMINATION PLAN

DRAWING NO.
15 OF 22
IL-01

GENERAL NOTES:

CODES:

ALL METHODS, MATERIALS AND WORKMANSHIP SHALL CONFORM TO WASHINGTON STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION DATED 2016, AND AMENDMENTS.

DESIGN OF THE BOARDWALK IS IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 7TH EDITION, DATED 2014, AND AASHTO GUIDE SPECIFICATION FOR DESIGN OF PEDESTRIAN BRIDGES, DATED 2009, AMERICAN WOOD COUNCIL SEISMIC DESIGN OF THE BOARDWALK IS IN ACCORDANCE WITH ASCE 7-10, AMERICAN WOOD COUNCIL NATIONAL DESIGN SPECIFICATION (NDS) 2015.

DESIGN CRITERIA:

LIVE LOADS

BOARDWALK - DISTRIBUTED LIVE LOAD 90 PSF
 HANDRAIL TOP RAIL - LATERAL LOAD 50 PLF
 MAXIMUM VEHICLE LOAD 3 TONS

LATERAL LOADS:

THIS STRUCTURE HAS BEEN DESIGNED TO RESIST SEISMIC FORCES AS PRESCRIBED BY ASCE 7-10
 $S_{Ds} = 0.858g$
 $S_{D1} = 0.571g$
 SEISMIC DESIGN CATEGORY = D
 $I_e = 1.0$

SITE WORK

EXCAVATION:

DRILL HOLES FOR ALL THREAD AS REQUIRED TO PLACE PIPE AND ROD. OVER-EXCAVATIONS SHALL BE BACKFILLED WITH STRUCTURAL FILL AT THE CONTRACTOR'S EXPENSE.

STRUCTURAL CONCRETE

ALL CAST-IN-PLACE CONCRETE SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH $f'c=4000$ psi, (CLASS 4000).

CONCRETE COVER ON REINFORCING (UNLESS SHOWN OTHERWISE) SHALL BE 2".

REINFORCING STEEL SHALL BE ASTM A706 GRADE 60.

LAP SPLICES SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND WSDOT STANDARD SPECIFICATIONS.

ALL ANCHOR BOLTS SHALL BE GALVANIZED AND CONFORM TO ASTM A307 OR A36.

REINFORCING BARS AND EPOXY ANCHORS ANCHORED INTO EXISTING CONCRETE SHALL BE IN DRILLED HOLE WITH HILTI "HVU" CAPSULE, OR SIKA "SIKADUR" EPOXY INJECTION GEL OR APPROVED EQUAL WITH ICC CERTIFICATION. MINIMUM EMBEDMENT IN CONCRETE SHALL BE 8 DIAMETERS, UNO.

GENERAL NOTES CONT.

STRUCTURAL STEEL

WELDING: SEE WSDOT STANDARD SPECIFICATIONS
 STRUCTURAL STEEL: ALL DETAILING, FABRICATION, AND ERECTION SHALL CONFORM TO THE AISC, "MANUAL OF STEEL CONSTRUCTION," LATEST EDITION

TUBES (HSS) SHALL BE PER ASTM A500

PLATES SHALL BE PER ASTM A36

STRUCTURAL SHAPES SHALL BE PER ASTM A992 (A572 / 50)

PIPES SHALL BE PER ASTM A53, GRADE B

WELDED HEADED STUDS SHALL BE ASTM A-108.

ALL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION UNLESS OTHERWISE NOTED.

BOLTS HARDWARE SHALL BE HOT-DIP GALVANIZED PER ASTM A-153. PROVIDE FASTENERS AS DETAILED ON THE DRAWINGS.

ALL BOLTS AND THREADED ROD SHALL CONFORM TO ASTM A307, GALVANIZED.

WOOD DECKING

ALL TIMBER DECKING SHALL BE DOUGLAS FIR-LARCH (GRADE NO.2 AND BETTER) AND SHALL CONFORM TO THE LATEST SPECIFICATION OF THE WEST COAST LUMBER INSPECTION BUREAU (WCLIB) AND SHALL BE STAMPED BY AN APPROVED GRADING AGENCY.

TIMBER SIZES NOTED ON THE DRAWINGS ARE STANDARD NOMINAL DIMENSIONS.

THE DECKING IS TO BE PRODUCED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES FOR TREATED WOOD IN AQUATIC AND OTHER SENSITIVE ENVIRONMENTS ISSUED BY THE WESTERN WOOD PRESERVATIVES INSTITUTE, WOOD PRESERVATION CANADA, AND THE TIMBER PILING COUNCIL.

TREATMENT OF ALL DECKING SHALL BE 0.60 PCF OF THE WATERBORNE PRESERVATIVE, AMMONICAL COPPER ZINC ARSENATE (ACZA). TREATMENT SHALL BE IN ACCORDANCE WITH APWA STANDARDS T1, U1, UC4B. BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE INCORPORATED INTO ALL TIMBERS AS SET FORTH BY THE WESTERN WOOD PRESERVATIVE INSTITUTE (WWPI). ALL PRODUCTS SHALL BEAR EVIDENCE THAT THE BMP STANDARDS HAVE BEEN MET. TREAT FIELD CUTS WITH TWO COATS OF PRESERVATIVE.

STORAGE, HANDLING, CARE, AND FIELD TREATMENT OF TREATED TIMBER DECKING SHALL BE IN ACCORDANCE WITH APWA STANDARD M4.

LEAD HOLES FOR LAG BOLTS SHALL BE PREBORED TO 65 PERCENT OF THE SHANK DIAMETERS.

TIMBER DECKING SHALL SPAN A MINIMUM OF TWO BENTS BETWEEN JOINTS.

STEEL HAND RAILING

HANDRAILS SHALL BE PER WSDOT STANDARD STEEL PEDESTRIAN RAILING, STANDARD DRAWING FS-3 (TYPE 1 END), GALVANIZED.

SUBMITTALS

- THE FOLLOWING SUBMITTALS ARE REQUIRED:
- GRAVITY BLOCK WALL (SEE 8-24.3)
 - WALL DRAINAGE LOCATIONS AND DETAILS
 - 18" DRAIN PIPE LOCATION AND DETAILS
 - PIPE SUPPORTS AND TIE DOWN ANCHORS
 - FLOOR BENT ASSEMBLY
 - CROSS BRACING
 - TIMBER DECKING
 - CONCRETE MIX DESIGN
 - REBAR DRAWINGS AND CERTIFICATION
 - HANDRAILS

LAYOUT: S-01
 PATH: U:\PSO\Projects\Clients\3098-Chehalis\217-3098-003 Chehalis On-Call Svc\985\Set\CADD\DWG\ PLOTTED BY: valencia DATE: Thursday, June 23, 2016 4:07:36 PM

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PROJECT NAME
HARRIS CREEK MULTI-USE TRAIL IMPROVEMENTS
 CHEHALIS, WA

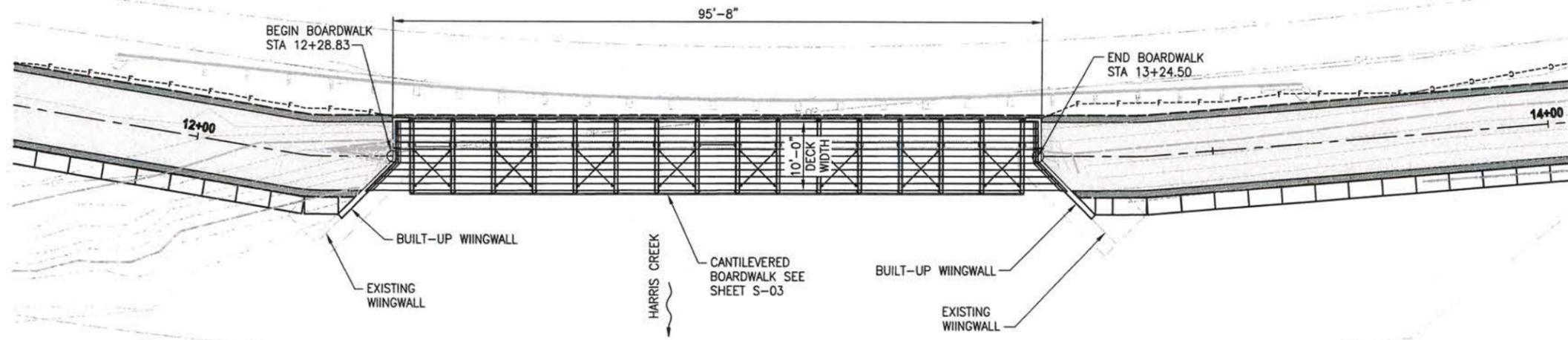
STRUCTURAL GENERAL NOTES

DRAWING NO.
 16 OF 22
S-01

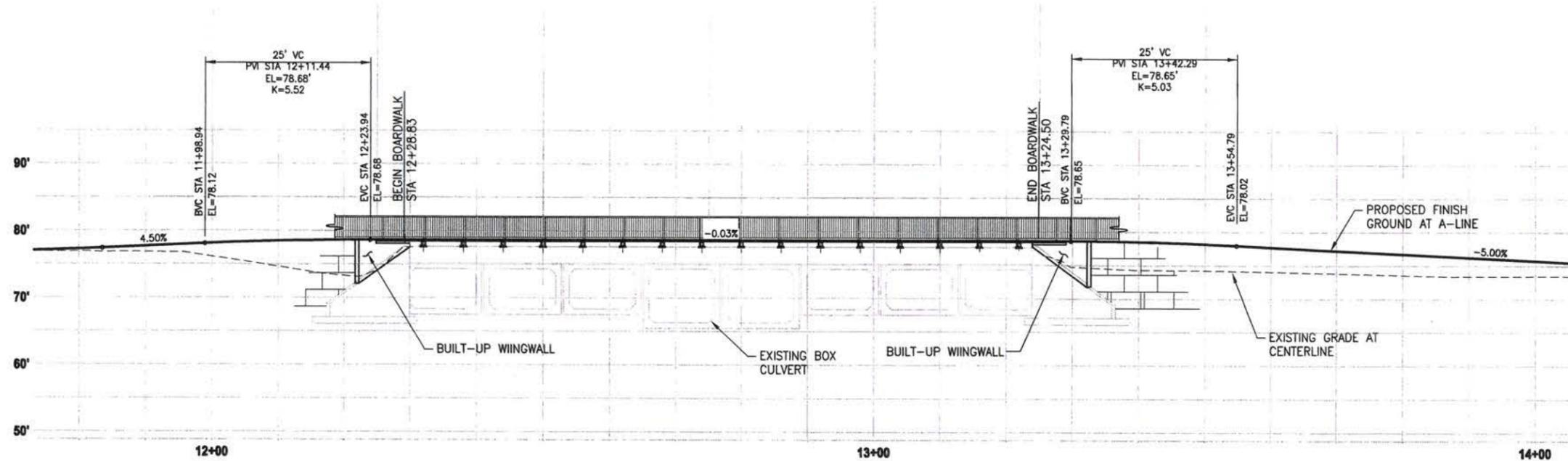


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LAYOUT: S-02
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PLAN
1"=10'



PROFILE
HORIZ: 1"=10'
VERT: 1"=5'



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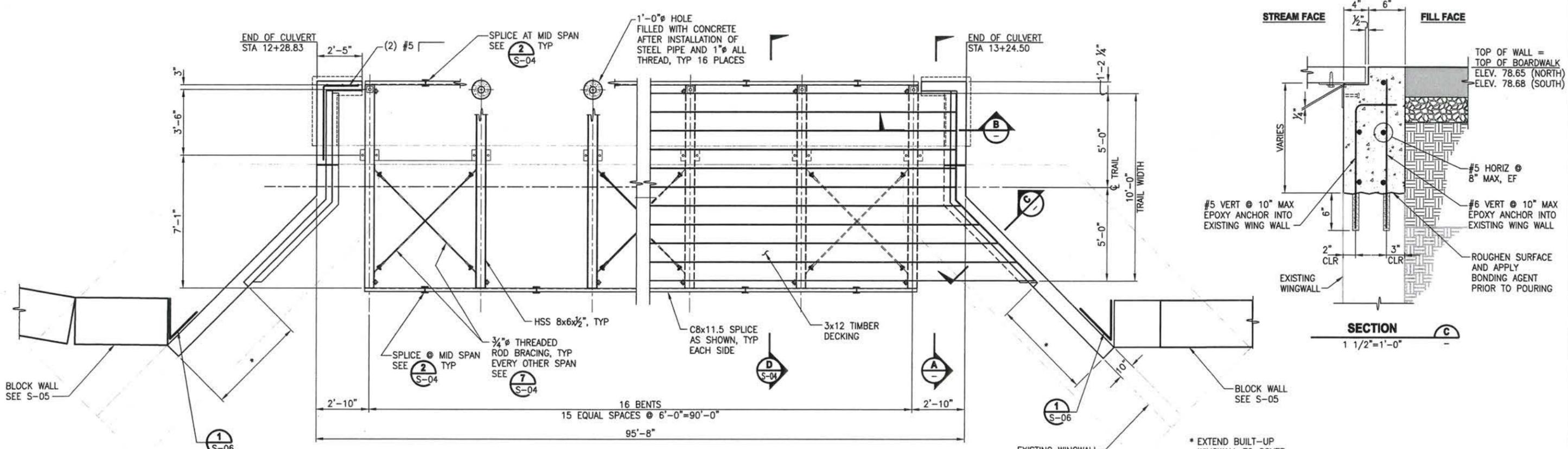
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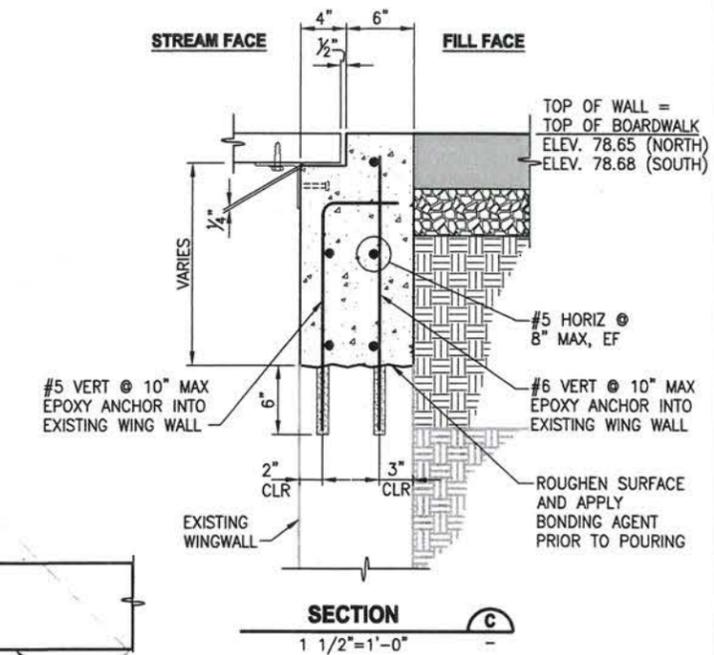
BOARDWALK PLAN AND PROFILE

DRAWING NO.
17 OF 22
S-02

LAYOUT: S03
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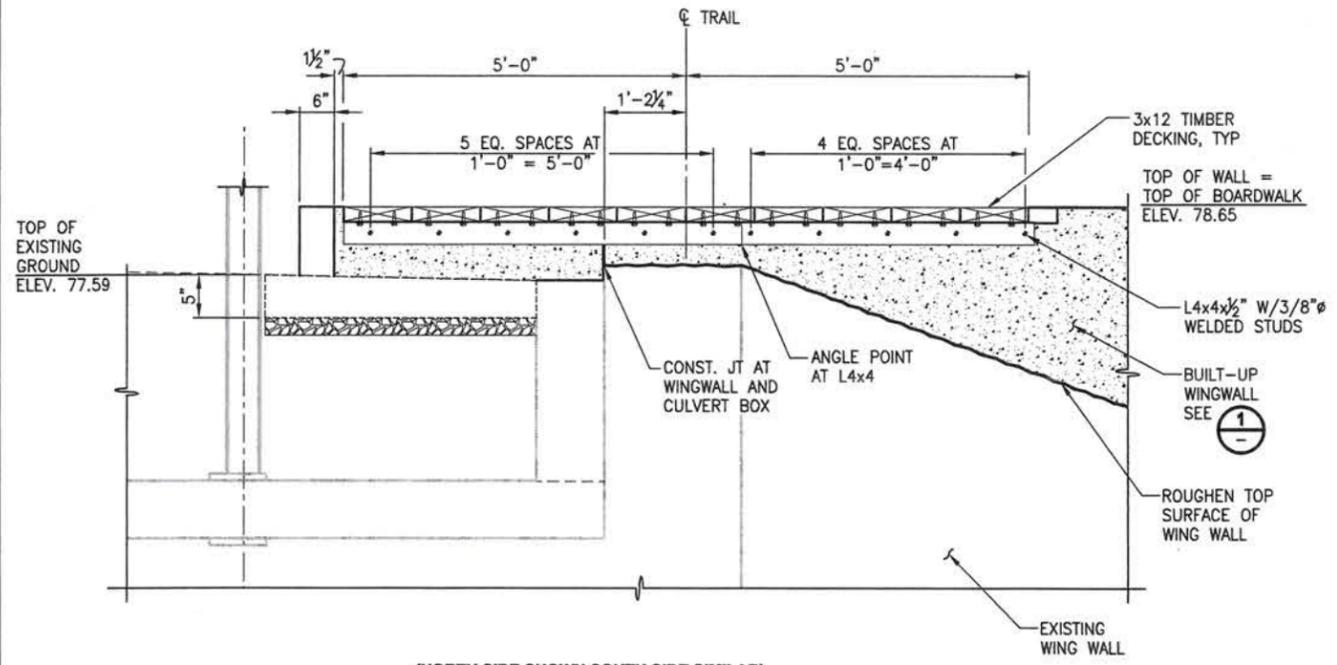


FRAMING PLAN
3/8"=1'-0"

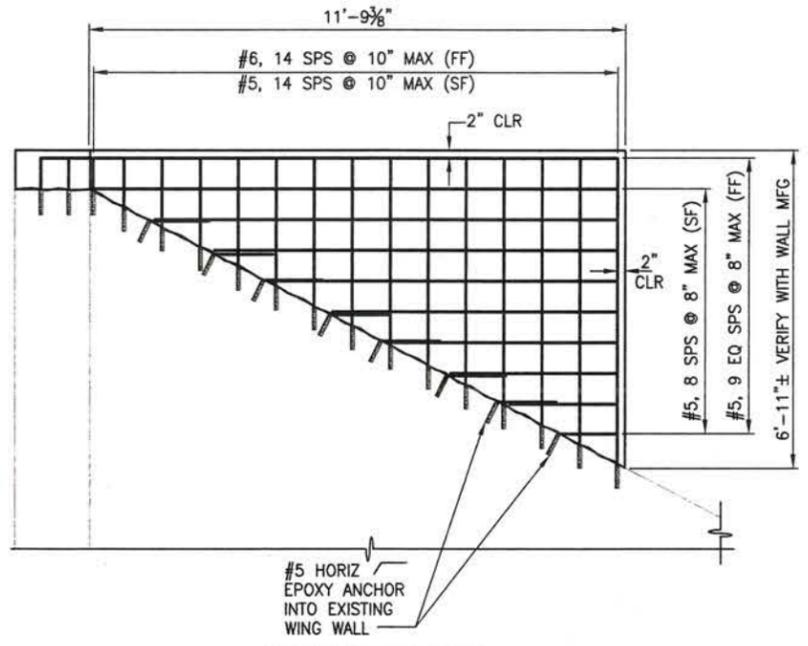


SECTION C
1 1/2"=1'-0"

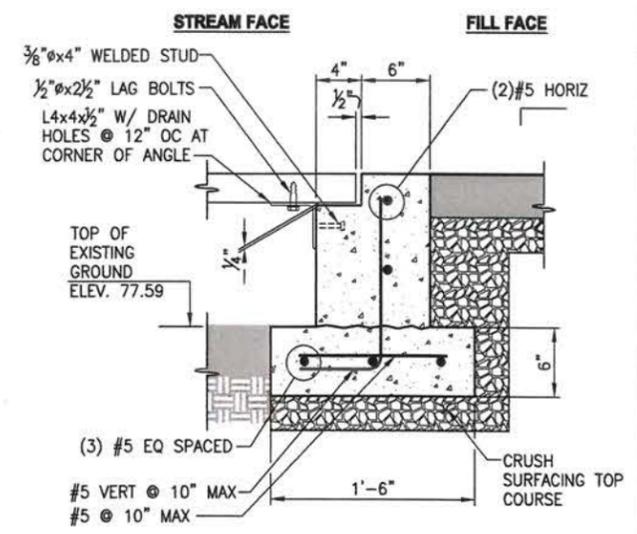
* EXTEND BUILT-UP WINGWALL TO COVER MANUFACTURED DESIGNED BLOCK WALL



SECTION A
3/4"=1'-0"



**LOOKING SQUARE TO WALL
BUILT-UP WINGWALL (NORTH END SHOWN, SOUTH END SIMILAR)
DETAIL**
1/2"=1'-0"



SECTION B
1 1/2"=1'-0"



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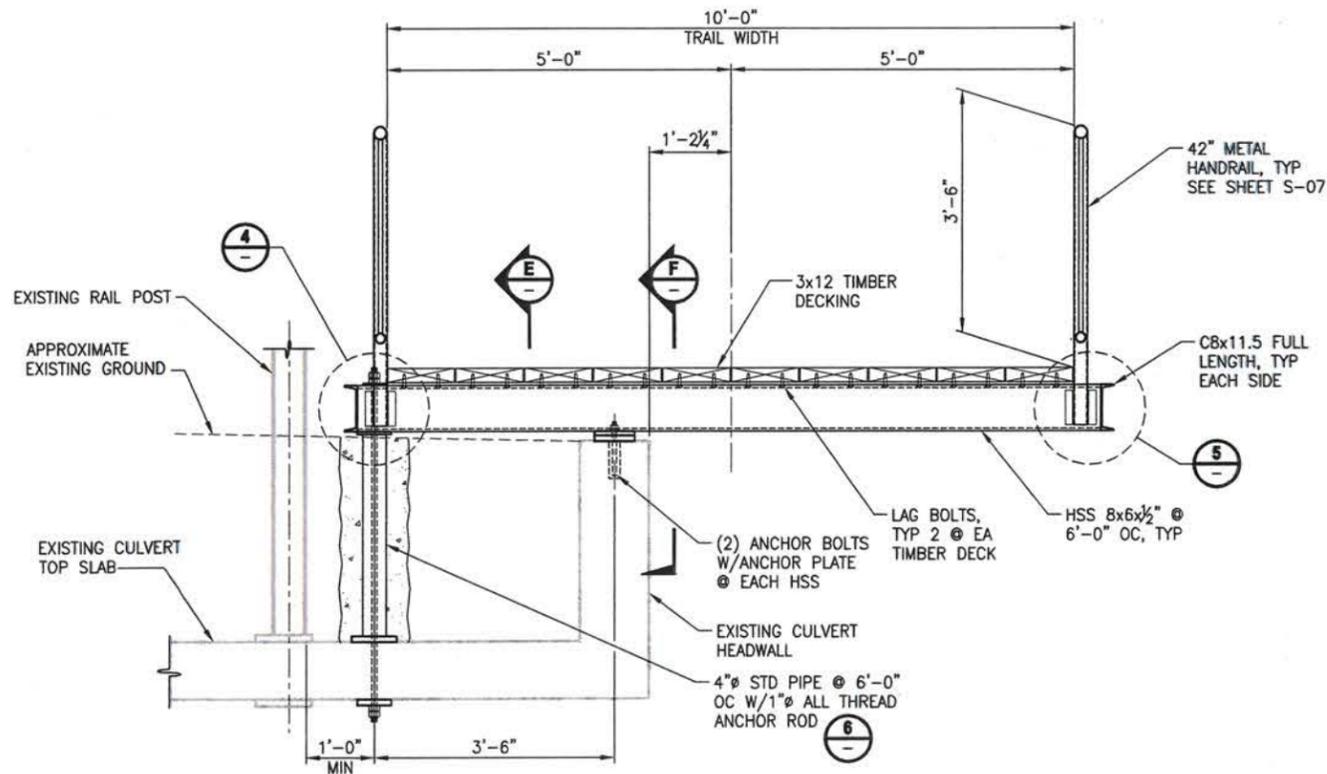
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PROJECT NAME
**HARRIS CREEK MULTI-USE
 TRAIL IMPROVEMENTS**
 CHEHALIS, WA

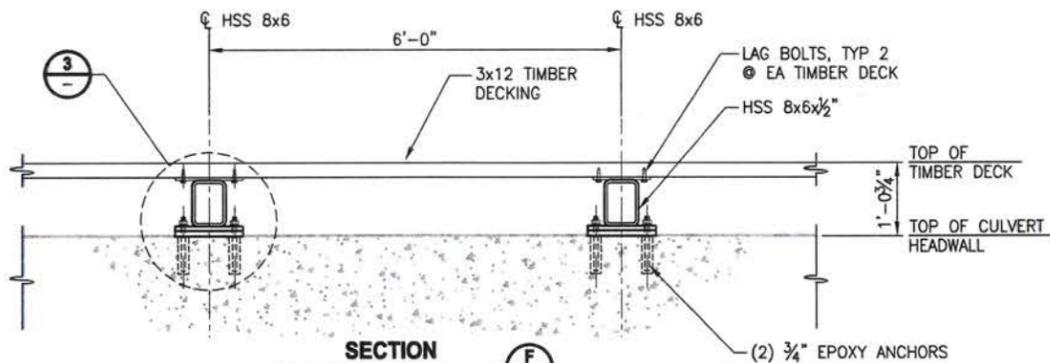
**CANTILEVERED BOARDWALK
 FRAMING PLAN AND DETAILS
 AT CULVERT**

DRAWING NO.
18 OF 22
S-03

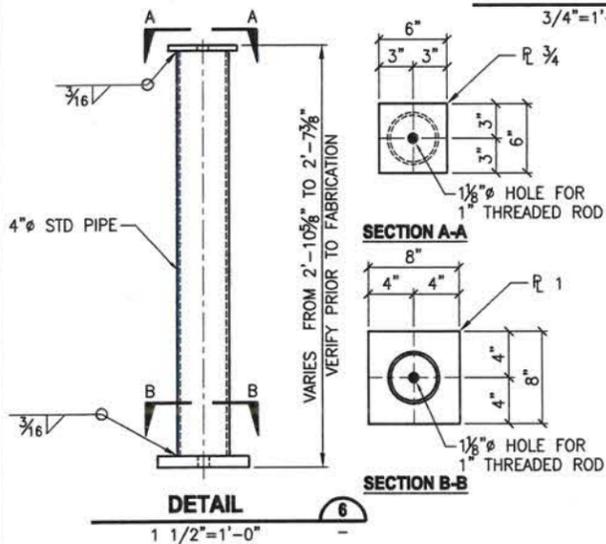
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SECTION D
3/4"=1'-0" S-03



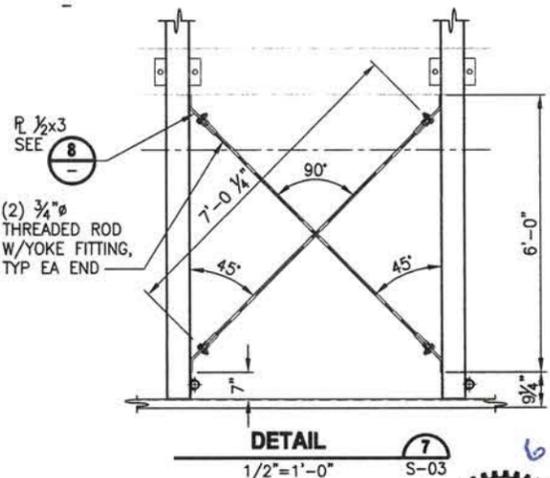
SECTION E
3/4"=1'-0" S-03



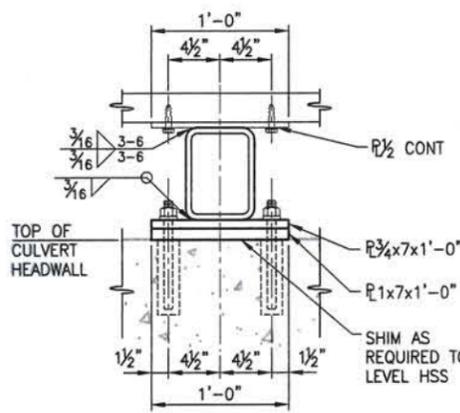
SECTION A-A

SECTION B-B

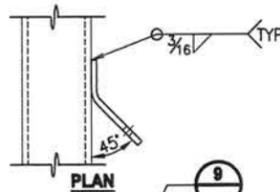
DETAIL 6
1 1/2"=1'-0"



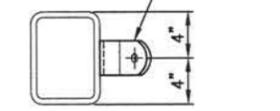
DETAIL 7
1/2"=1'-0" S-03



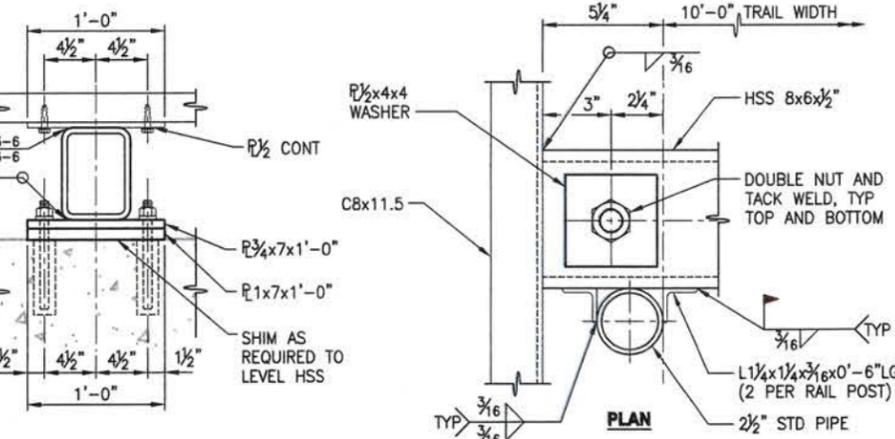
HSS SEAT AT HEADWALL DETAIL 3
1 1/2"=1'-0"



ELEVATION BRACE PLATE DETAIL 8
1 1/2"=1'-0"



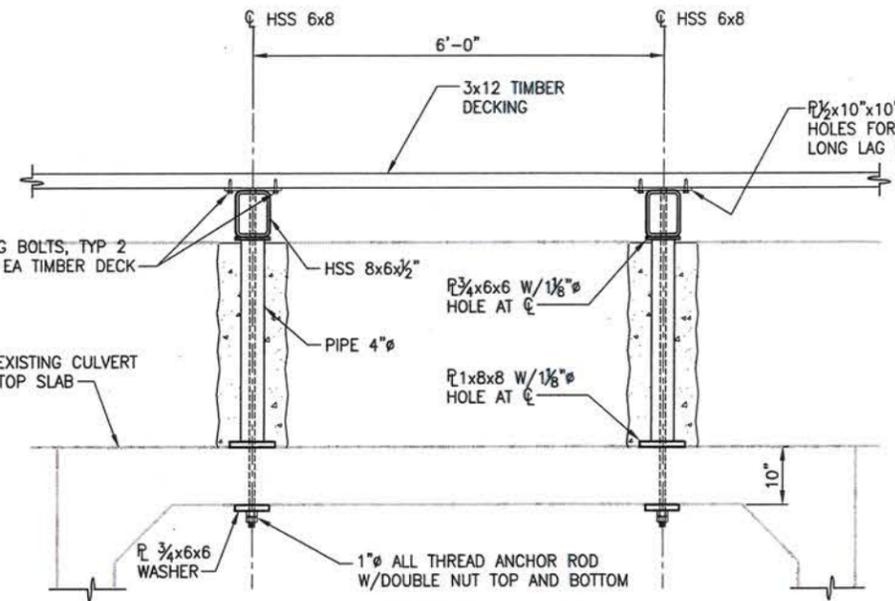
ELEVATION BRACE PLATE DETAIL 9
1/2"=1'-0"



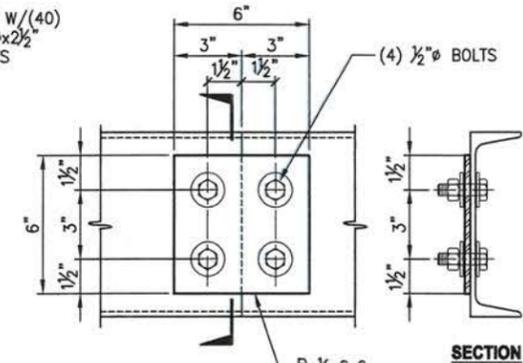
DETAIL 4
3"=1'-0"



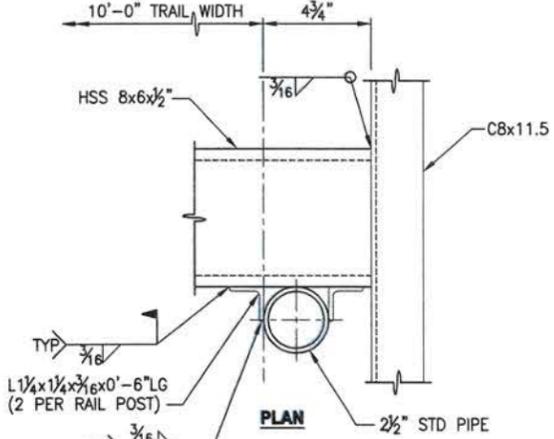
DETAIL 5
3"=1'-0"



SECTION E
3/4"=1'-0"



CHANNEL SPLICE DETAIL 2
3"=1'-0" S-03



DETAIL 5
3"=1'-0"



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CHEHALIS, WA

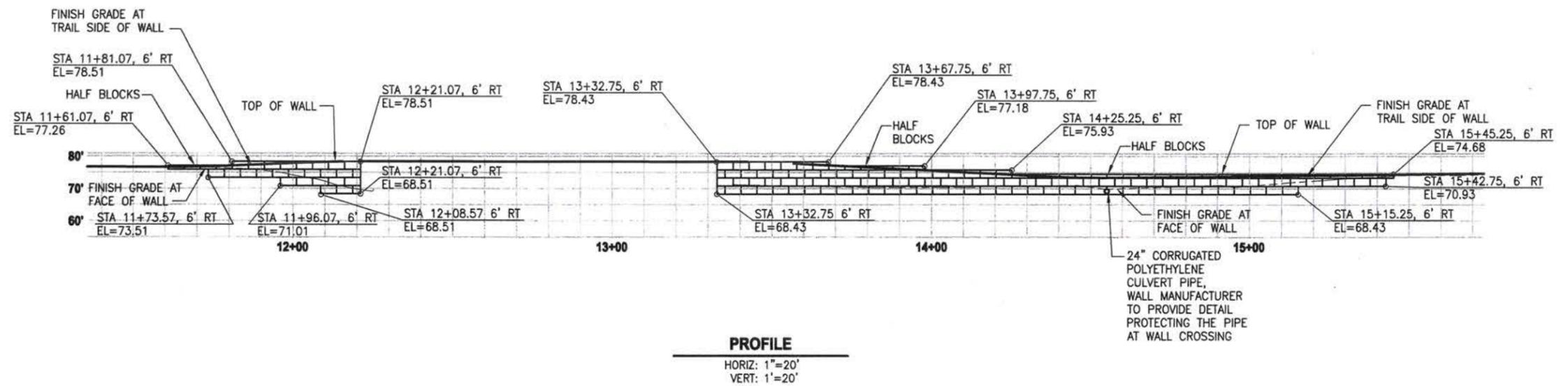
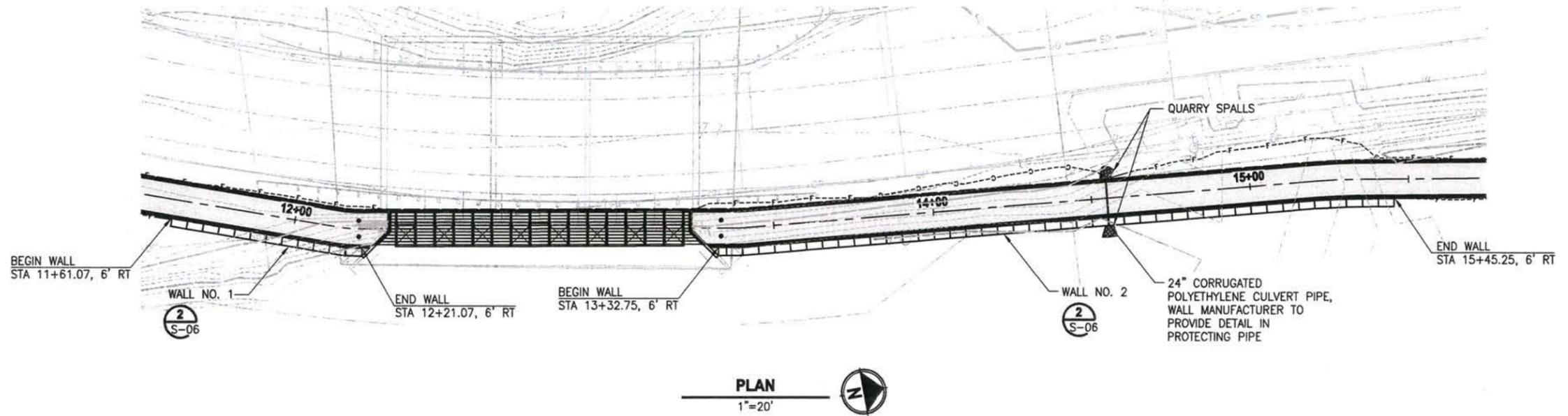
CANTILEVERED BOARDWALK SECTIONS AND DETAILS AT CULVERT

DRAWING NO.
19 OF 22
S-04

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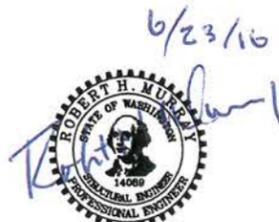


Know what's below.
Call before you dig.

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 217-3098-003
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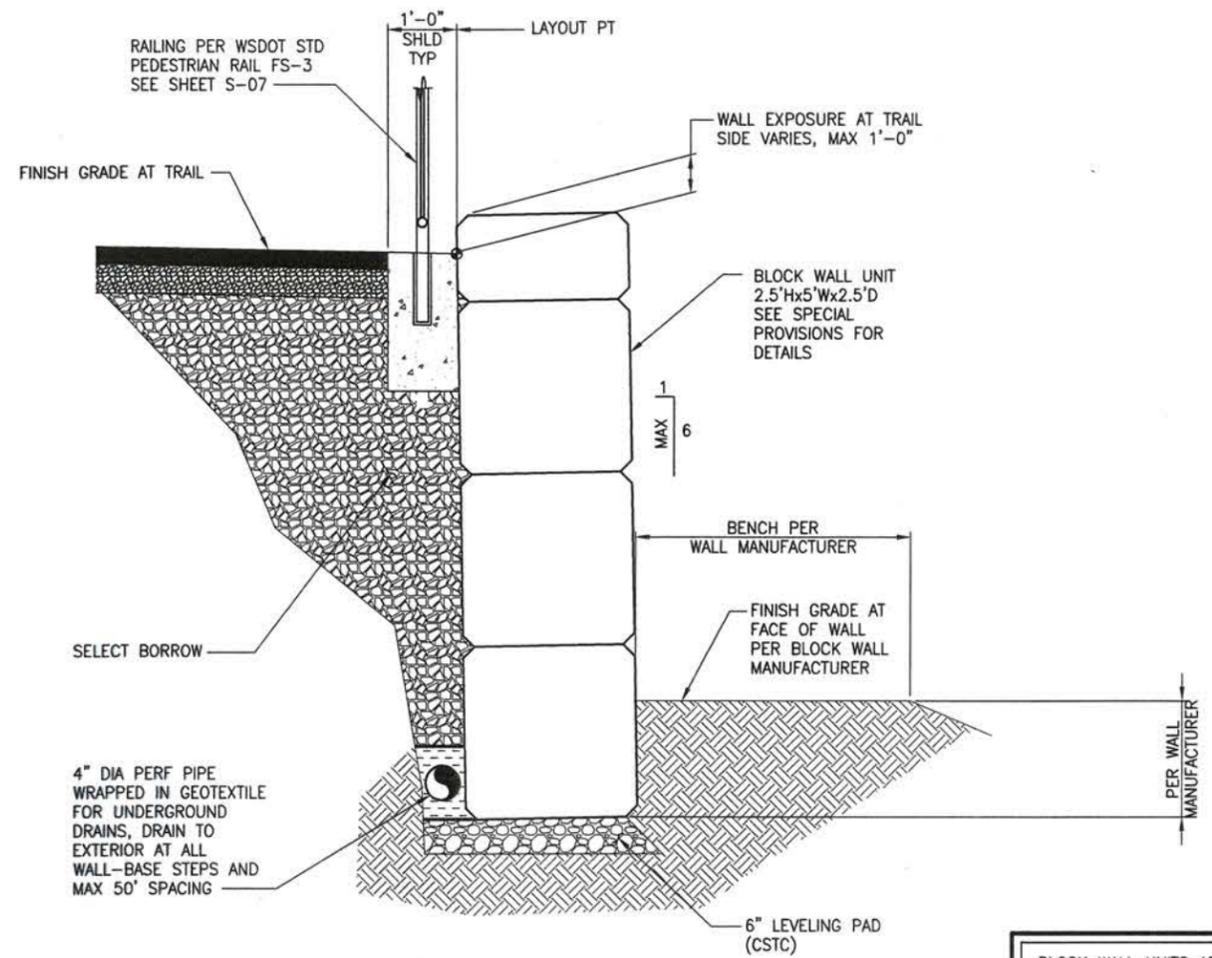


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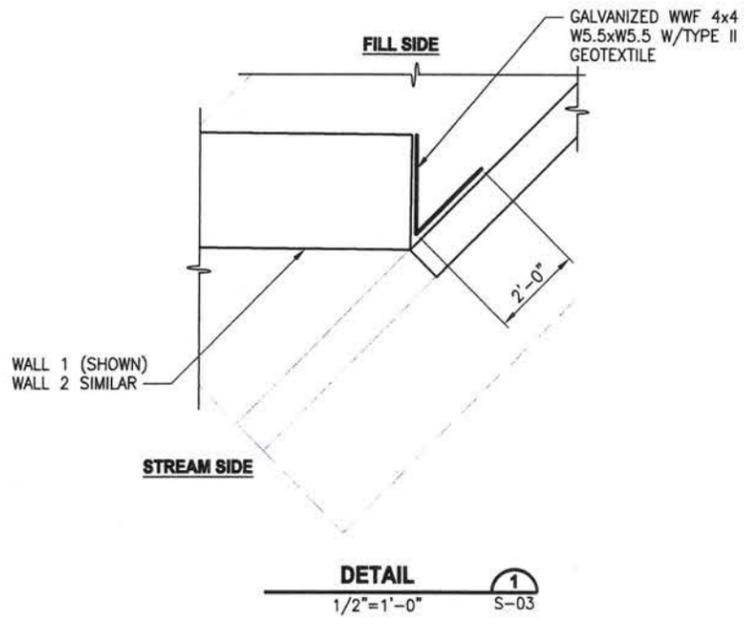
PROJECT NAME
**HARRIS CREEK MULTI-USE
TRAIL IMPROVEMENTS**
 CHEHALIS, WA

**GRAVITY BLOCK WALL
PLAN AND PROFILE**

DRAWING NO.
 20 OF 22
S-05



DETAIL 2
3/4" = 1'-0" S-05



DETAIL 1
1/2" = 1'-0" S-03

BLOCK WALL UNITS ARE SHOWN FOR CLARITY ONLY. THROUGH THE DESIGN PROCESS THE CONTRACTOR'S WALL DESIGNER WILL BE REQUIRED TO DESIGN AND DETAIL GRAVITY BLOCK WALLS AT ALL LOCATIONS WHERE THE WALL HEIGHT EXCEEDS THE BLOCK WALL LIMITS.

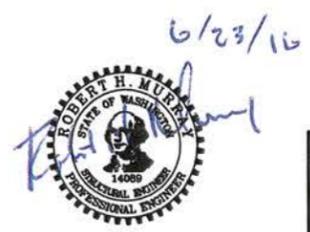
NOTES:

- RESTORE EXISTING GROUND WITH NATIVE SOIL. BACKFILL AND SEEDING. SEE CIVIL SHEETS.
- BLOCK UNITS SHALL BE UNTEXTURED AND GREY IN COLOR.
- SEE SHEET S-05 FOR TOP AND BOTTOM OF WALL ELEVATIONS.
- SEE OFFSET DISTANCE ON SHEET S-05 FOR OUTSIDE FACE OF CAP BLOCK. BOTTOM OF WALL OFFSET DISTANCE SHALL BE SURVEYED AND STAKED BASED ON WALL HEIGHT SHOWN ON SHEET S-05 AND WALL BATTER AS SHOWN IN DETAIL.
- SEE SPECIAL PROVISIONS FOR WALL DESIGN REQUIREMENTS.
- GRAVITY BLOCK WALL TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. SEE SPECIAL PROVISIONS.
- AT EACH DRAIN LOCATION, QUARRY SPALLS SHALL BE PLACED DIRECTLY UNDER THE DISCHARGE PIPE. IN PLAN AREA THE QUARRY SPALLS SHALL BE 1'-0"x2'-0" AND BE A MINIMUM OF 6" THICK.

LAYOUT: S06 PATH: C:\PMX\Temp\PerPublish_2076\ PLOTTED BY: brockkot DATE: Friday, June 24, 2016 9:51:52 AM

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 CHEHALIS, WA

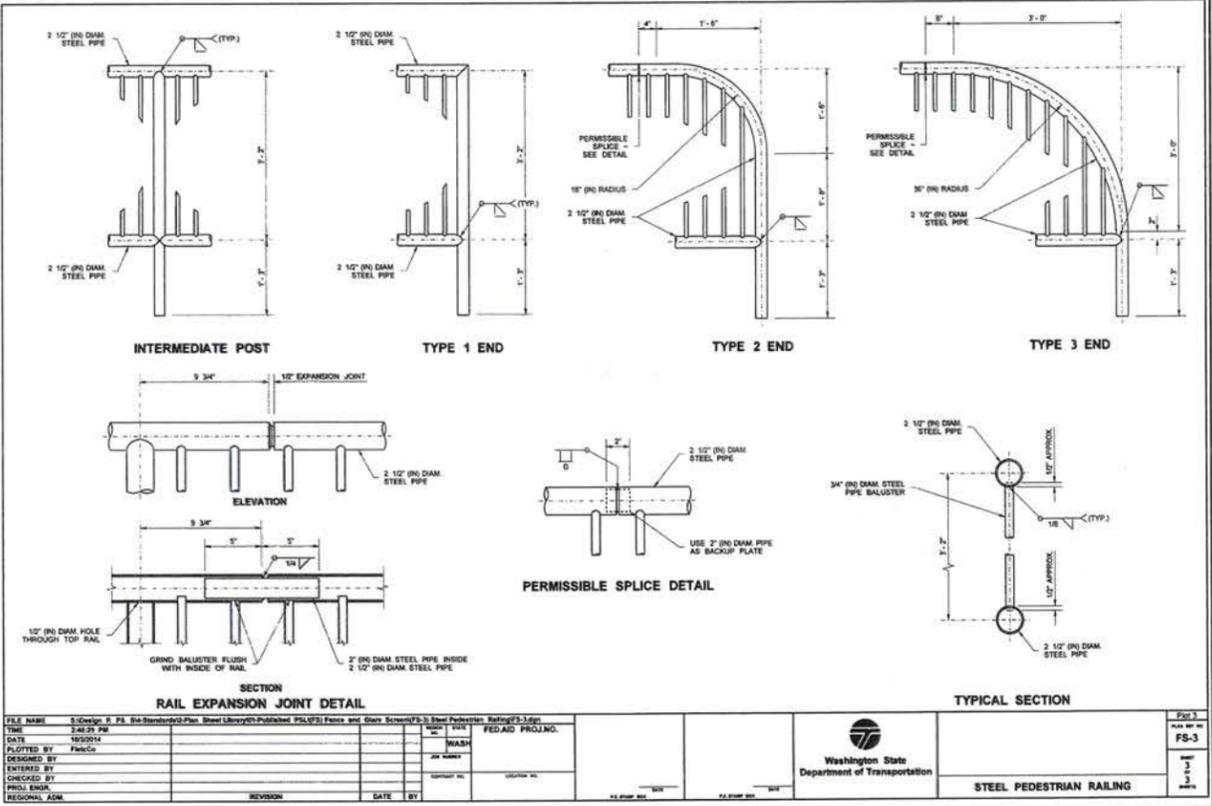
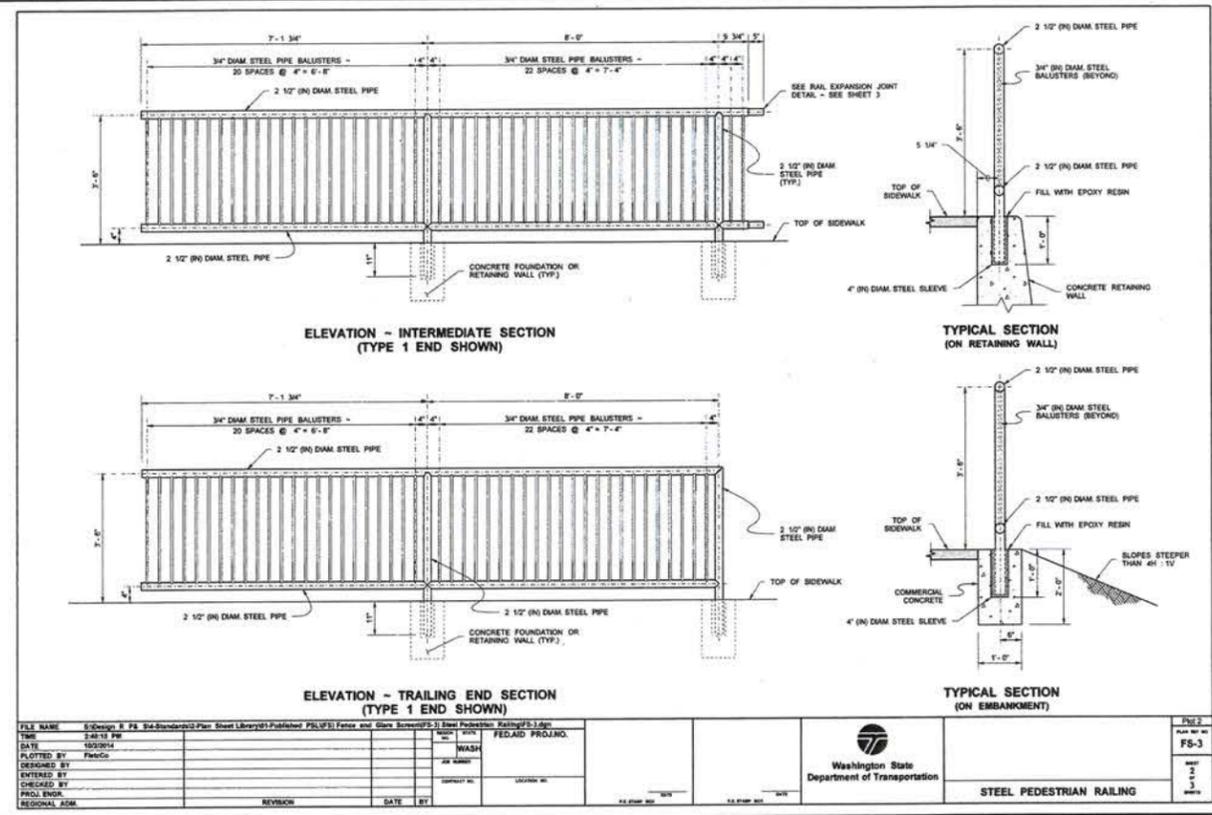
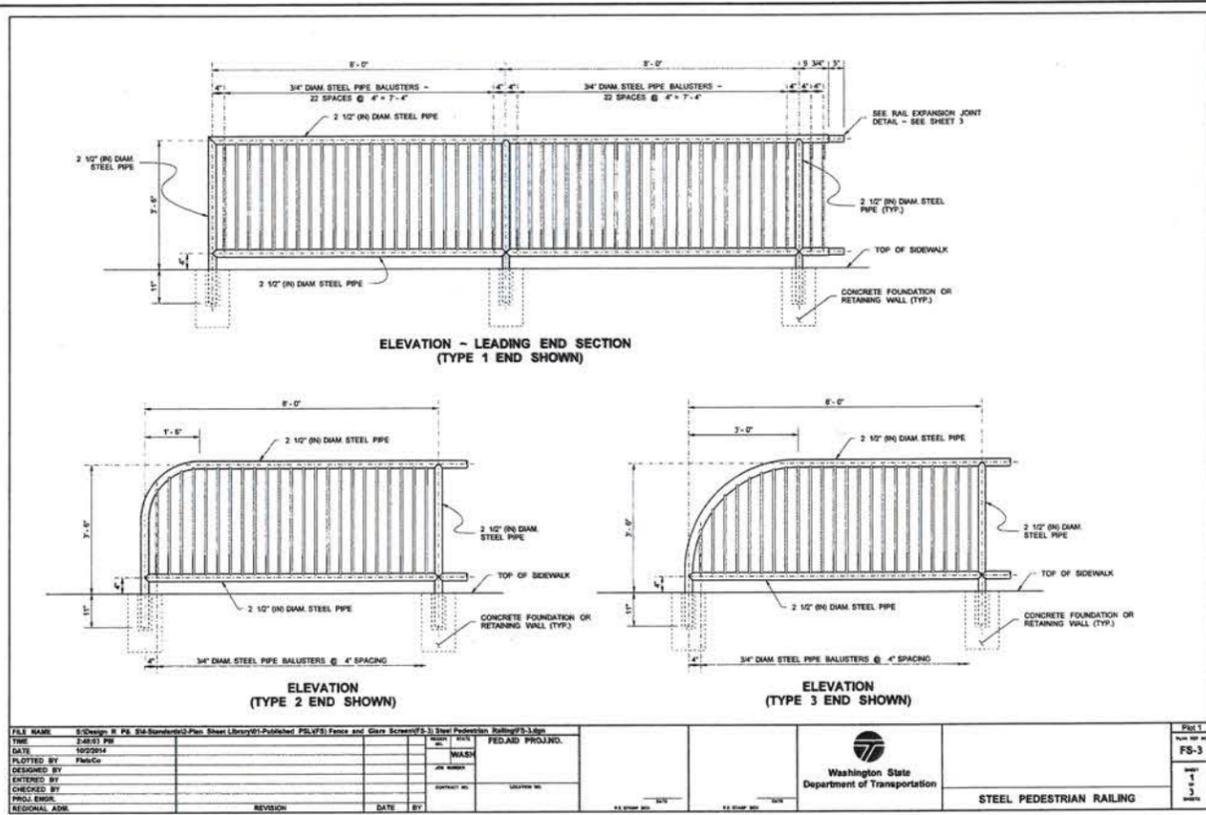
WALL DETAILS

DRAWING NO.
 21 OF 22
S-06



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PATH: U:\PSO\Projects\Clients\3098-Chehalis\3098-003 Chehalis On-Call Svc\9955ev\CA00\DWG\ PLOTTED BY: valencia DATE: Thursday, June 23, 2016 4:05:27 PM LAYOUT: S07



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HARRIS CREEK MULTI-USE TRAIL IMPROVEMENTS
 CHEHALIS, WA

RAILING DETAILS

DRAWING NO. 22 OF 22
S-07

Appendix 2



Environmental Assessment

South Bank/Harris Creek Culvert Replacement

Confederated Tribes of the Chehalis Reservation

May 18, 2010

Prepared by: URS Corporation

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Terms Used in This Document

Area of Potential Effect (APE) – the geographic area or areas within which an undertaking may cause changes in the character or use of historic properties, if such properties exist. The APE is influenced by the scale and nature of the undertaking.

Best management practices (BMPs) – innovative environmental protection practices applied to help ensure that projects are conducted in an environmentally responsible manner.

Floodplain – the area adjacent to a river that is susceptible to inundation, and often bears geophysical evidence of previous flood events. It is part of the lateral dimension of rivers and contributes to the interchange of materials between terrestrial components and aquatic components of the watershed.

Intermittent stream – a stream channel that contains flowing water for only a portion of the year. These streams typically receive water from springs, another surface water source, or snowmelt. When not flowing, the water may remain in isolated pools, or surface water may be absent.

Acronyms Used in This Document

| | |
|-------|--|
| APE | area of potential effect |
| ARRA | American Recovery and Reinvestment Act |
| BMP | best management practice |
| CFHMP | Comprehensive Flood Hazard Management Plan |
| CFR | Code of Federal Regulations |
| CFS | cubic feet per second |
| EA | environmental assessment |
| EO | Executive Order |
| ESA | Endangered Species Act |
| FEMA | Federal Emergency Management Agency |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NRCS | Natural Resources Conservation Service |
| SHPO | State Historic Preservation Office |
| USDA | U.S. Department of Agriculture |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |

SECTION ONE INTRODUCTION

The Confederated Tribes of the Chehalis Reservation (Chehalis Tribe) will be applying for funding for assistance with a culvert replacement project in western Washington. The South Bank/Harris Creek Culvert Replacement Project would reduce over-roadway flooding along South Bank Road during high flow events and provide fish passage.

The National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality regulations implementing NEPA (40 Code of Federal Regulations [CFR] Part 1500 through 1508) direct Indian Tribal governments and other federal agencies to fully understand and take into consideration the environmental consequences of proposed federally funded projects. Under NEPA, Congress authorizes and directs federal agencies to carry out their regulations, policies, and programs as fully as possible in accordance with the statute's policies on environmental protection. NEPA requires federal agencies to make a series of evaluations and decisions that anticipate significant effects on environmental resources. This requirement must be fulfilled whenever a federal agency proposes an action, grants a permit, or agrees to fund or otherwise authorize any other entity to undertake an action that could possibly affect the human environment. In compliance with NEPA and its implementing regulations, the Chehalis Tribe prepared this draft environmental assessment (EA) to analyze the potential environmental impacts of the project alternatives.

SECTION TWO PURPOSE AND NEED FOR ACTION

The purpose of this action is to increase conveyance of floodwaters, prevent backwater conditions from developing, and reduce the potential for increased flood surface elevations upstream of South Bank Road. A secondary purpose of the action is to provide fish passage.

Flooding within the Chehalis Reservation typically occurs during the winter and the spring, with significant flooding occurring up to five times annually. Approximately 75 percent of the Chehalis Reservation is located on an active floodplain. In the last three decades, the Chehalis Reservation has experienced several large floods, including the 1986, 1990, 1996, 2007, and 2009 floods, each of which are considered floods of record. Flooding at Harris Creek and the Sickman Ford Bridge blocks access to residents living along South Bank Road, cutting residents from emergency services.

There are currently three 72-inch metal pipe culverts beneath South Bank Road. The calculated total maximum capacity of the existing culverts is 832 cubic feet per second (CFS) before overtopping occurs (DCI 2010). Given the frequent roadway overtopping, the existing culverts lack the capacity to convey water during flood events.

Fish use small streams like Harris Creek to escape the high waters of the river during flood events; however the existing culverts do not offer consistent fish passage as they are installed above the ground surface. This project is part of the Fish Passage Barrier Removal Program, which was approved by the Salmon Recovery Funding Board.

The need for this action is to reduce or eliminate the risk to South Bank Road from flooding. From this need, the Chehalis Tribe identified the preferred alternative (culvert replacement) as a medium priority in the *Confederated Tribes of the Chehalis Reservation Comprehensive Flood Hazard Management Plan (CFHMP)* (GeoEngineers 2009).

SECTION THREE ALTERNATIVES ANALYSIS

This section discusses the two alternatives considered in this EA: (1) the No Action Alternative and (2) the Proposed Action Alternative.

3.1 ALTERNATIVE 1 – NO ACTION

Under the No Action Alternative, the existing culverts would not be replaced. Harris Creek would continue to flood and overtop the road during high flow events. Continued inundation of the road banks would contribute to sedimentation and degradation of water quality. Risks associated with flooding of the road and the safety hazard to local residents driving through overtopped roads during flood events would continue. Fish would still be blocked from access. This alternative would not meet the project needs nor the Chehalis Tribes' goals and objectives.

3.2 ALTERNATIVE 2 – PROPOSED ACTION

The Proposed Action would replace the existing culverts along South Bank Road (see Figure 1). The three existing 72-inch corrugated metal culverts would be replaced by approximately eight 6-foot by 10-foot concrete box culverts, spanning a length of approximately 88 feet. The existing road would be sawcut and that portion of roadway would be removed. Approximately 2,500 to 4,000 cubic feet of soils would be removed, and the culverts would be placed in the dredged area. Structural fill would be placed above the installed culverts and the roadway would be re-graded approximately three inches above the existing grade. The surface would then be repaved. Riprap would be placed at the culvert entrance and exit. Excess dredged material would be removed to a designated off-site facility. During construction, the road would be closed for up to six weeks. Grays Harbor County, the owner of the road, supports this closure.

The depth of the two center box culverts would be 18 inches longer than the other culverts in order to establish a stream channel and provide greater flow beneath the road. It is anticipated that this would alleviate overtopped roads during 100-year flood events of up to 3,000 CFS. While Harris Creek is an intermittent stream, the culverts would be designed to allow fish passage.

The proposed project would take approximately two months to complete. Work would begin in summer 2010 and would be completed by fall 2010. The proposed tasks are consistent with the *Confederated Tribes of the Chehalis Reservation CFHMP* (GeoEngineers 2009).

3.3 OTHER ALTERNATIVES CONSIDERED

The Tribal Business Council and consulting engineers reviewed the reoccurring flooding issue. Two other alternatives were considered.

Raise South Bank Road – The first alternative discussed was raising the elevation of South Bank Road by approximately 2-3 feet on the existing alignment to a level above the typical annual flood event. This alternative would not guarantee continued access during periods of high flow, given that the raising may not be successful in a large flood event.

Bridge over Harris Creek – Another alternative considered was to build a bridge over Harris Creek. This alternative was dismissed as being cost prohibitive.

Affected Environment and Environmental Consequences

SECTION FOUR AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section discusses the existing conditions, by resource and the potential effects, of the No Action and Proposed Action Alternatives.

For each resource category, the impact analysis follows the same general approach. When possible, quantitative information is provided to establish impacts. Qualitatively, these impacts will be measured based on small, moderate, or large impacts as outlined in the chart below.

| Impact Scale | Criteria |
|---------------------|--|
| Small | Environmental effects would not be detectable or would be so minor that they would neither destabilize nor noticeably alter any important attribute of the resource. |
| Moderate | Environmental effects would be sufficient to alter noticeably, but not to destabilize, important attributes of the resource. |
| Large | Environmental effects would be clearly noticeable and would be sufficient to destabilize important attributes of the resource. |

Impacts are disclosed based on the amount of change or loss of the resource from the baseline conditions. Impacts may be direct or indirect. Direct impacts are caused by the action and occur at the same time and place as the action. Indirect impacts are caused by the action and occur later in time or are farther removed from the area, but are still reasonably foreseeable (40 CFR Part 1508). Cumulative impacts are discussed in Section Five.

Resources that were not analyzed in detail include visual resources. No visual impacts are anticipated due to the minor loss of vegetation and small amounts of ground disturbance. This resource will not be analyzed to any further extent.

4.1 CLIMATE, GEOLOGY, AND SOILS

4.1.1 Climate

The Chehalis Reservation and its surrounding area has a temperate maritime climate with cool, dry summers and mild, wet winters. Rainfall is the primary source of precipitation for the region, with a typical rainfall of between 45 and 60 inches (Daly et al. 2003). Mean monthly air temperatures at nearby Oakville range from an average low of 33° F in January to an average high of 77° F in July and August.

4.1.2 Geology and Soils

The physical characteristics of the Chehalis Reservation have been shaped by previous glacial and fluvial processes. Blockage of the Strait of Juan de Fuca by glacial ice turned the Puget Lowland into a large lake that filled with water until it found a new outlet draining south via the Black River, into the Chehalis River, and to the sea (Troost et al. 2003). The project area is relatively flat.

Soils in the project areas are predominantly sedimentary. Soil depth to bedrock is approximately 60 inches. Soils are poorly drained and consist of silty clay loam underlain with clay and very gravelly clay (Nemah silty clay loam). This type of soil is characteristic of floodplains and depressions (USDA NRCS 2009).

Affected Environment and Environmental Consequences

4.1.3 Environmental Consequences

Alternative 1 – No Action

Under the No Action Alternative, replacement culverts would not be installed. No impacts to climate or geology would occur. Erosional impacts to soil resources may occur due to excessive flows and inundation associated with high flow events. The impact scale would range from small to moderate.

Alternative 2 – Proposed Action

No effect on climate and geology would be expected based on the small scale of the project and minor ground-disturbing activities. Between 2,500 to 4,000 cubic feet of soil would be removed to allow for culvert installation. This dredged material may be re-used to grade the new roadway if suitable areas of sand and gravel are located. Excess material would be trucked off-site to a designated facility. The impact scale would be moderate. Best management practices (BMPs) for erosion control, such as installing silt fences, would be followed.

Direct, indirect, and cumulative effects to soil productivity, fertility, stability, or infiltration capacity would be at or below the level of detection. Any effects on soil productivity or fertility would be slight, and no long-term effects to soils would occur.

4.2 AIR

Air quality in the vicinity of the Chehalis Reservation is generally good due to the influence of air currents from the Pacific Ocean. There are occasional episodes of stagnant air across the southwestern portion of the state; however they are usually of short duration (EPA 2008).

Alternative 1 – No Action

Air quality impacts are not associated with high flow events.

Alternative 2 – Proposed Action

Short-term impacts to air quality may occur due to construction activities, including vehicle exhaust and dust. BMPs, such as site watering and proper vehicle maintenance, would be implemented to minimize potential impacts. The impact scale would be small.

4.3 FLOODPLAINS (EO 11988)

According to FEMA Flood Insurance Rate Map #5300570582B, the project area is located within the 100-year floodplain.

During 2007, the central portion of the Chehalis Reservation (from the confluence of the Chehalis and Black rivers) was flooded. Floodwater ponded upstream and rose high enough to overtop Blockhouse Road and flow down Harris Creek. South Bank Road acts as a levee and obstructs the flow of floodwater across the floodplain, resulting in water pooling behind the existing road (GeoEngineers 2009).

Based on 44 CFR Part 9.10, the following floodplain values are present in the project area:

Flood hazard-related factors – The project area has frequent floods that overtop the road. During significant flood events there is no alternative route for local residents, as other sections of South Bank Road also become overtopped with flood waters.

Affected Environment and Environmental Consequences

Natural values-related factors – The water resource value of the project area is low, as natural moderation of floods does not occur. No archaeological or historical sites were identified in the project area.

Factors relevant to the survival and quality of wetlands – Flooding causes erosion and vegetation loss due to excessive flows and inundation, which may effect wetlands in the project vicinity.

Alternative 1 – No Action

The continued inundation of South Bank Road would continue to be subject to seasonal and catastrophic flood events. The impact scale would range from small to large. The floodplain values listed in Section 4.3 would not change.

Alternative 2 – Proposed Action

The Proposed Action would not adversely impact the floodplain values under 44 CFR Part 9.10. The impact scale would be small. The project would improve floodwater passage across the floodplain and would extend the period of access provided by South Bank Road during significant flood events. The addition of the culverts would direct water flows to adjacent wetlands, rather than blocking water passage and potentially directing floodwaters towards nearby Oakville.

4.4 WETLANDS AND WATER RESOURCES (EO 11990)

Harris Creek originates in the Black Hills (northwest of the project area, within the Capital Forest) and serves as a tributary to the Chehalis River. Harris Creek is an intermittent stream, and typically flows through the project area from October through June.

The National Wetlands Inventory identifies wetlands within the project area. A site visit by a URS biologist in January 2010 confirmed that a large riverine wetland complex surrounding Harris Creek is present upstream and downstream of South Bank Road.

The wetland surrounding Harris Creek contains emergent (herbaceous), scrub-shrub, and forest components, which were inundated in January 2010. The emergent community is dominated by reed canarygrass and lies immediately east (upstream) of South Bank Road. Small pockets of the scrub-shrub community are present at the edge of the emergent community. This scrub-shrub community contains Douglas spiraea and small Oregon ash.

The emergent community is also present immediately adjacent to the culverts west (downstream) of South Bank Road. However, most of the wetland west of the road is forested with Oregon ash, slough sedge, reed canarygrass, and red-osier dogwood.

While the wetland does have a large invasive species component (reed canarygrass), it rates as a Category I Wetland according to the Washington State Wetland Rating System for Western Washington (Ecology 2004). This high rating is largely due to the high water quality and hydrologic functions performed by the wetland.

Alternative 1 – No Action

No impacts to wetlands and water resources within the project vicinity would occur except by regular periodic flooding. Flooding could cause erosion and vegetation loss due to excessive flows and inundation. The impact scale would range from small to large. Such actions could

Affected Environment and Environmental Consequences

affect the quantity and quality of wetlands and water resources in the project vicinity and along downstream portions of Harris Creek.

Alternative 2 – Proposed Action

A small amount of disturbance may be required for culvert replacement and installation, which would cause minor temporary impacts to Harris Creek and the surrounding emergent wetland community. However, the work would be done within the dry season, when the creek is running at its lowest. In addition, the wetland immediately adjacent to the culverts is dominated by reed canarygrass. No native plants would be disturbed by construction of the project. Any temporary impacts would be negligible. The impact intensity would be small.

In addition, upsizing the existing culverts and increasing the number of culverts should not affect the hydrology of the wetland. The placement of additional culverts is designed to move water through the creek and wetland during flood conditions, but should not affect the baseline hydrologic condition of the wetland.

4.5 VEGETATION

The riparian area and wetlands in the project area are dominated by Oregon ash, Douglas spiraea, slough sedge, and reed canarygrass. Uplands contain Oregon white oak, common snowberry, licorice fern, and cluster rose. Weeds such as ox-eye daisy, nipplewort, and foxglove are present along the roadside.

4.5.1 Federally Listed Species and Critical Habitat

Golden paintbrush (*Castilleja levisecta*) is listed as Threatened by the Endangered Species Act (ESA) and has been historically found in the region, specifically related to prairie-type habitats. However, the U.S. Fish and Wildlife Service (USFWS) Sensitive Species List does not list any populations on the site. In addition, the immediate project area is in a wetland and does not contain the appropriate habitat for this species.

4.5.2 Environmental Consequences

Alternative 1 – No Action

Under the No Action Alternative, no adverse impacts to vegetation are anticipated.

Alternative 2 – Proposed Action

Various disturbances caused by the work crews may result in localized, direct, small effects to existing plant communities. However, it is anticipated that the removal of vegetation would have no effect beyond the immediate project area. The species that may be impacted by the Proposed Action is reed canarygrass, which is a non-native, invasive species. No populations of threatened or endangered species would be impacted by the project (Chehalis Tribe 2010).

4.6 FISH AND WILDLIFE

According to the Chehalis Department of Natural Resources, a variety of wildlife has been documented on the Chehalis Reservation. The project area may provide habitat or forage for small mammals including coyote, raccoon, mountain beaver, snowshoe hare, brush rabbit, striped skunk, opossum, mink, weasel, porcupine, red squirrel, shrews and rodents.

Affected Environment and Environmental Consequences

Harris Creek is used by Coho salmon, Steelhead, and Cutthroat trout for rearing, migration, and spawning. Adults migrate upstream of the project area to spawn. During the dry season, water holding areas upstream and downstream of the project area provide habitat for juvenile Coho salmon, Cutthroat trout and Rainbow trout.

Birds within the project area may include Stellar's jay, American crows, swallows, nuthatches, wrens, sparrows, vireos, finches, blue grouse, ruffed grouse, band tailed pigeons, ringed-neck pheasant, mourning doves, goshawk, Cooper's hawk, sharp shinned hawk, red-tailed hawk, kestrel, northern harrier, great horned owl, western screech owl, northern sawwhet and northern pygmy owl.

4.6.1 Federally Listed Species and Critical Habitat

Suitable habitat for the following ESA-listed species does not occur within the project area, and will not be discussed further:

- Short-Tailed albatross (*Phoebastria albatrus*)
- Brown pelican (*Pelecanus occidentalis*)
- Snowy plover (*Charadrius alexandrinus*)
- Bull trout (*Salvelinus confluentus*)

The marbled murrelet (*Brachyramphus marmoratus*), northern spotted owl (*Strix occidentalis caurina*), and Oregon silverspot butterfly (*Speyeria zerene hippolyta*) have historically been documented in the region, however populations are not listed on or near the project area.

4.6.2 Special Status Species

The osprey (*Pandion haliaetus*) is listed as a Species of Concern by the USFWS. The closest osprey site is located approximately 1.5 miles east of the project area.

4.6.3 Environmental Consequences

Alternative 1 – No Action

No direct effects to either ESA-listed species or non-listed species in the project area are expected. However, the potential for losses of listed and non-listed species due to flooding would remain. The culverts would continue to be a barrier to fish passage. The impact scale would range from small to large.

Alternative 2 – Proposed Action

Under the Proposed Action Alternative, culvert replacement activities are determined to have no effect to federal and state-listed wildlife species (Appendix C). The site has been surveyed for osprey, and no nests are located on or adjacent to the project area. Impacts to non-listed wildlife could occur through habitat modification. Various factors including changes in food sources, shelter, population density, and dispersal effort would determine the severity of impacts to non-listed wildlife. However, due to the relatively small area of disturbance, the impact scale would be small. These impacts would dissipate as displaced individuals either establish new home ranges or are outcompeted. These effects would not be expected to exceed the natural range of variability or have long-term effects on the natural processes sustaining these populations.

Affected Environment and Environmental Consequences

Culvert replacement would provide a positive benefit to fish species by allowing passage beneath South Bank Road.

4.7 HISTORIC, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Cultural resources consist of locations of human activity, occupation, or use identified through field inventory, historic documentation, or oral evidence. The term includes archaeological, historic, and architectural properties and sites or places of traditional cultural or religious importance to Native American tribes or other social or cultural groups. Management of Washington's cultural resources falls under the jurisdiction and control of the State Historic Preservation Office (SHPO) according to their relative importance. Management objectives include protecting against impairment, destruction, inadvertent loss, and accommodating uses determined appropriate through consultation and planning.

Section 106 of the National Historic Preservation Act (NHPA) holds that activities occurring on federal lands, or those that require federal permits or use federal funds, undergo a review process to protect cultural resources that are or may be eligible for listing on the National Register of Historic Places. The area of potential effect (APE) for archaeological and cultural resources includes all those areas proposed for disturbance at the project site. A copy of the draft EA was sent to the Washington SHPO for review.

A site review was conducted in February 2009 by a Tribal Archaeologist (Appendix C). No evidence of cultural resources or materials were found within the APE. It is unlikely that archaeological resources would be uncovered during project construction.

Alternative 1 – No Action

Because no federal activity would occur under the No Action Alternative, no requirement for compliance with Section 106 of the NHPA exists. Undiscovered archaeological sites and historic resources would continue to be at the same risk level for potential flood damages.

Alternative 2 – No Action

The Proposed Action would not affect any known resources. Review by a Chehalis Tribe Archaeologist determined that the probability of buried archaeological resources is low. The impact scale would be small. The Chehalis Tribe would monitor the project during all phases of construction. In the event of an unanticipated discovery during construction, all construction work shall cease in the immediate vicinity of the find until appropriate parties are consulted and the potential of find can be evaluated.

4.8 SOCIOECONOMIC AND ENVIRONMENTAL JUSTICE (EO 12898)

Executive Order (EO) 12898, Environmental Justice, directs tribal governments and federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations in the United States resulting from federal programs, policies, and activities. Socioeconomic and demographic data for residents in the project vicinity was studied to determine if a disproportionate number (defined as greater than 50 percent) of minority or low-income persons have the potential to be affected by the Proposed Action.

Affected Environment and Environmental Consequences

Alternative 1 – No Action

Minority and low-income populations served by South Bank Road would incur the same impacts as the general population in terms of access limitations caused by flooding. Because no federal activity would occur, no requirement for compliance with EO 12898 exists.

Alternative 2 – Proposed Action

Activities within the project areas are unlikely to affect either the local population or a disproportionate number of minority or low-income persons. There are no residents located within or adjacent to the project areas. The Proposed Action would not cause adverse economic impacts and would comply with EO 12898. The results of the project would be more reliable access along South Bank Road during high flow events, a positive benefit to all nearby residents.

SECTION FIVE CUMULATIVE IMPACTS

The Council on Environmental Quality regulations for implementing NEPA requires an assessment of cumulative effects during the decision making process for federal projects. Cumulative effects are defined as *“the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions”* (40 CFR 1508.7).

As part of their *Long Range Transportation Plan*, the Chehalis Tribe plans to install larger culverts at the Sickman Ford Bridge along South Bank Road, approximately one mile southwest of the project site (Chehalis Tribe 2009). The Proposed Action Alternative and the Sickman Ford Bridge project are not expected to have adverse cumulative impacts to climate, geology, and soils; air quality; floodplains; water resources; wetlands; vegetation; fish and wildlife; historic, archeological, and cultural resources; or socioeconomics and environmental justice, as no project impacts are anticipated. Due to the limited scope of the work, no loss of any sensitive species or habitat is expected that would contribute a measurable amount to the cumulative effects.

SECTION SIX PUBLIC INVOLVEMENT AND RESPONSE TO COMMENTS

The Chehalis Tribe is the lead federal agency for conducting the NEPA compliance process for the proposed project. As the lead agency, the Chehalis Tribe expedites the preparation and review of NEPA documents, responds to the needs of local residents, meets the spirit and intent of NEPA, and complies with all NEPA provisions.

The Chehalis Tribe held a 30-day public comment period from April 1 – 30, 2010. Notices requesting this public comment were placed in the classified sections of *The Chronicle* (Centralia, WA), *The Daily World* (Aberdeen, WA), and *The Oakville Cruiser* (Oakville, WA). Notices were posted in the Chehalis tribal center and at Oakville city hall. Copies of the draft EA with a request for comments were also mailed to U.S. Army Corps of Engineers, Seattle; U.S. Fish and Wildlife Services, Western Washington Office; Department of Archaeology and Historic Preservation, Olympia; Department of Ecology, Olympia; Grays Harbor County Planning Department, Montesano; and City of Oakville, Oakville.

The Chehalis Tribe received a total of three responses during the public comment period. Responses were received from Grays Harbor County, the City of Oakville, and community member Trina Kempf. All three respondents stated their support of the project. Letters from each are located in Appendix E.

6.1 CHEHALIS TRIBE LONG RANGE TRANSPORTATION PLAN

The *Confederated Tribes of the Chehalis Reservation Long Range Transportation Plan* (Chehalis Tribe 2009) was prepared by the Chehalis Tribe to describe the existing transportation infrastructure and outline transportation needs. A community meeting was held on October 7, 2009 to discuss transportation needs on the Chehalis Reservation. In conjunction with this meeting, a survey was distributed to vote on the top three high-priority projects. Out of 76 votes, 30 people voted to classify the South Bank Road culvert project as a high priority. When compared to the 13 other road projects presented in the survey, the culvert project was ranked as the fourth highest-priority project.

6.2 CHEHALIS TRIBE COMPREHENSIVE FLOOD HAZARD MANAGEMENT PLAN

The long-term goals of the *Confederated Tribes of the Chehalis Reservation Comprehensive Flood Hazard Management Plan* (GeoEngineers 2009) are to:

- Protect and preserve the lives, health, safety and well-being of the people living on the Chehalis Reservation;
- Reduce repetitive damages and costs associated with flooding; and
- Protect the Reservation from negative impacts of upstream floodplain development.

The plan's development process included cooperation and input from the Chehalis Reservation Business Committee officials, staff of various Tribal departments, public outreach meetings, and Washington State Department of Ecology staff. Two public meetings were held in June 2008 to discuss flood/hazard related topics with Chehalis Reservation residents. The South Bank Road culvert project is considered the third highest-priority structural mitigation project.

Required Permits and Compliance

SECTION SEVEN REQUIRED PERMITS AND COMPLIANCE

The Chehalis Tribe is required to obtain and comply with all federal permits and approvals prior to implementing the Proposed Action Alternative. Development at the Proposed Action Alternative site shall comply with the project's scope of work.

SECTION EIGHT CONCLUSION

The EA evaluated resources that could be significantly affected or affect the project. This initial evaluation has resulted in identification of no significant impacts associated with the resources of climate, geology, and soils; air quality; floodplains; wetlands and water resources; vegetation; fish and wildlife (ESA); historic, archaeological, and cultural resources; and socioeconomic and environmental justice. Obtaining and implementing permit requirements along with appropriate BMPs will avoid or minimize any small or moderate effects associated with the action. It is recommended that a finding of no significant environmental impact to the human or natural environment be issued for the Proposed Action Alternative.

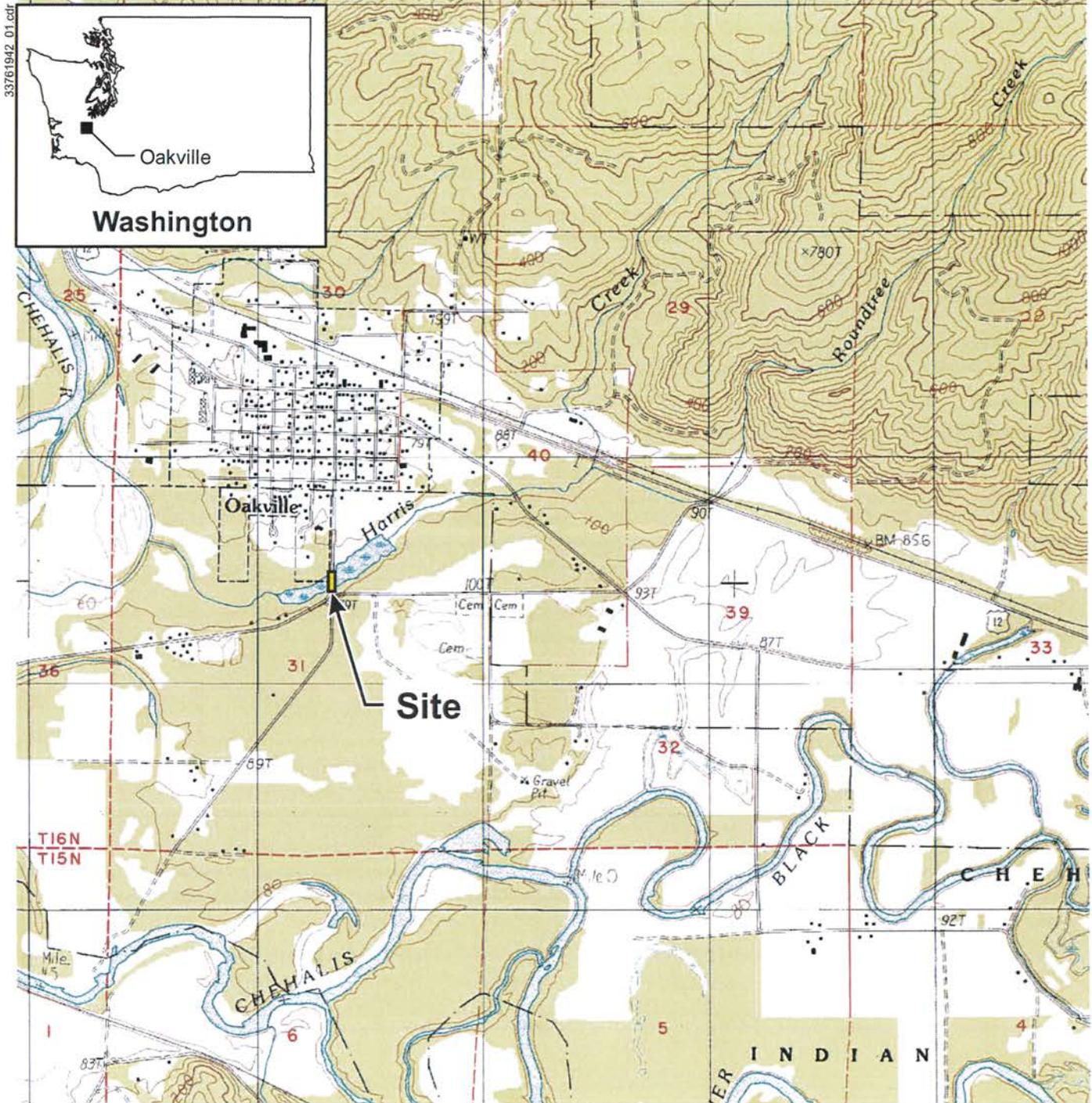
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Appendix A
Figures

Figure 1 – Site Location

Figure 2 – Proposed Project



Source: USGS 7.5 minute quadrangle map Oakville, WA revised 1993.

Job No. 33761942

Figure 1
Site Location Map



South Bank/Harris Creek Culvert Replacement
 Confederated Tribes of the Chehalis Reservation

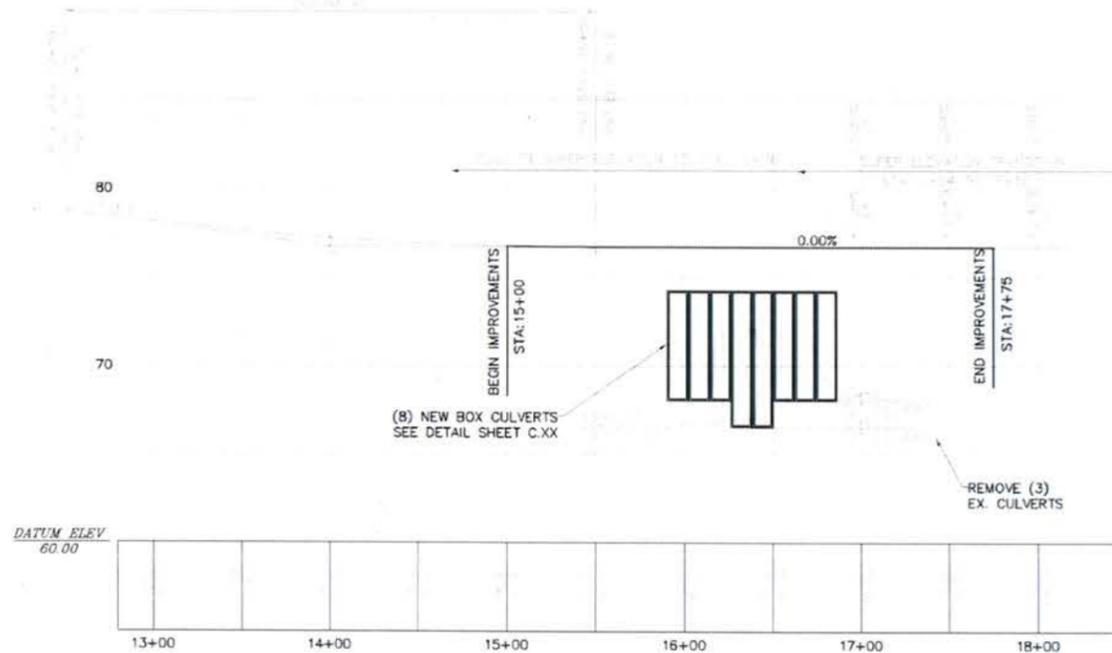
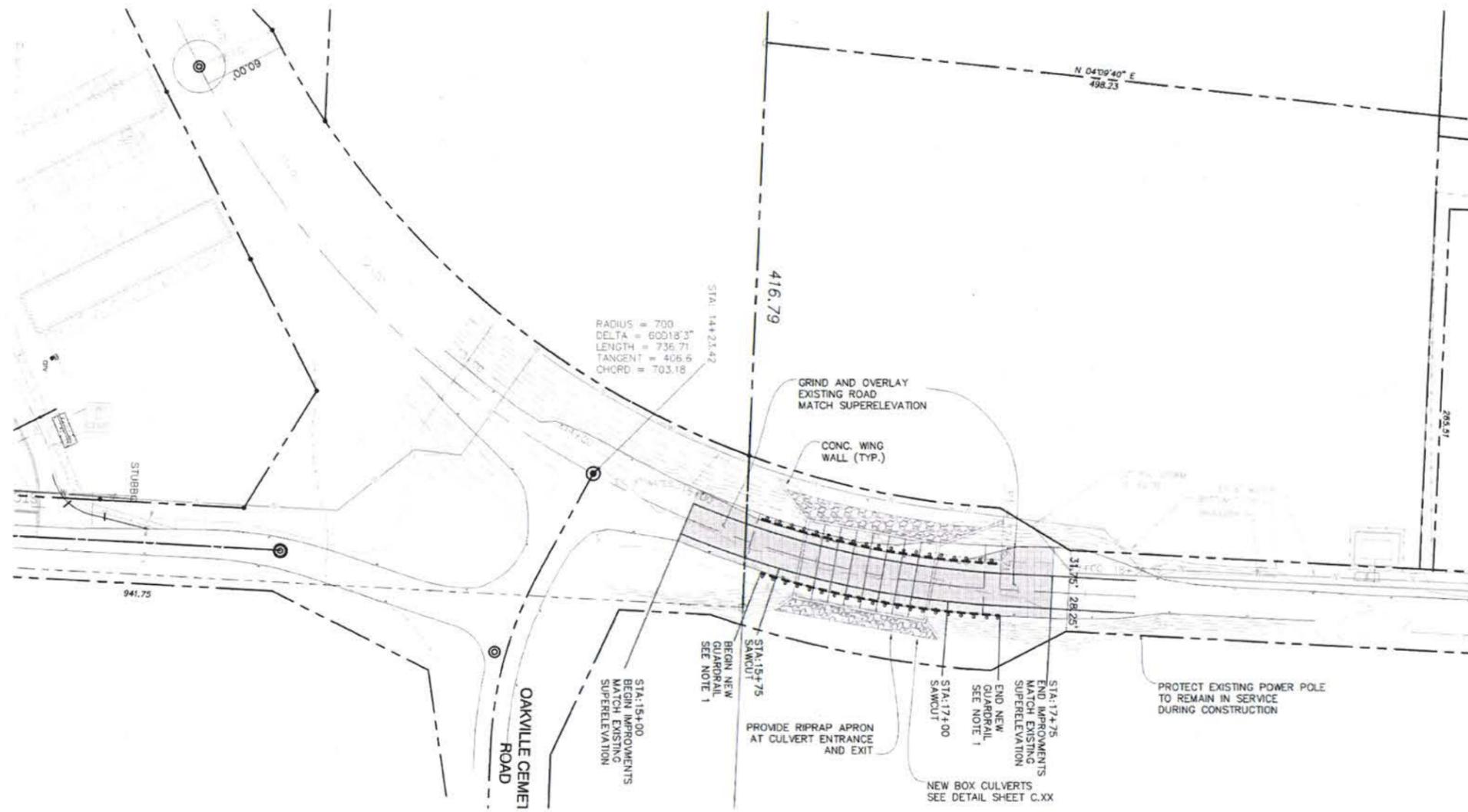


Figure 2
Proposed Project

Appendix B
Project Conditions and Conservation Measures

Project Conditions and Conservation Measures

The Proposed Action would comply with the following conditions and conservation measures:

- The applicant shall obtain all required federal permits and approvals prior to implementing the Proposed Action Alternative and comply with any and all conditions imposed.
- The applicant is responsible for selecting, implementing, monitoring, and maintaining best management practices to control erosion and sediment, reduce spills and pollution, and provide habitat protection.
- Any change to the approved scope of work will require re-evaluation for compliance with NEPA and other laws and EOs.
- In the event of an unanticipated discovery during construction, work in the immediate vicinity should be discontinued, the area secured, and the Tribal Historian/Archaeologist and SHPO notified.

Appendix C
Supporting Letters



CONFEDERATED TRIBES of the CHEHALIS RESERVATION

January 15, 2010

Replacement of the Harris Creek Culverts on South Bank Road on the Chehalis Reservation

To Whom It May Concern:

As Director of the Chehalis Tribe's Natural Resources Department, I have authorization to access the USFWS Sensitive Species List. While evaluating the project location for the Replacement of the Harris Creek Culverts on South Bank Road Project, I have accessed the Sensitive Species List to research whether any Threatened or Endangered Species (T & E species) will be impacted by the project at the proposed sites on the Chehalis Reservation.

The list that follows identifies any T & E species that have historically been identified in this area:

The Bull trout, *Salvelinus confluentus*, is listed as Threatened or Endangered and have historically been found in the main stem of the Chehalis River. Although the project site is located on Harris Creek a Tributary to the Chehalis River, the Sensitive Species List does not show Harris Creek as habitat suitable for Bull Trout, so no Bull Trout will be impacted by this project, as proposed.

The Short-Tailed Albatross, *Phoebastria albatrus*, is listed as Threatened or Endangered and has been documented in Grays Harbor County. The project site is not near marine waters and the Sensitive Species List does not list any populations in his area.

The Brown Pelican, *Pelecanus occidentalis*, is listed as Threatened or Endangered and has been documented in Grays Harbor County. The project site is not near marine waters and the Sensitive Species List does not list any populations in his area.

The Snowy Plover, *Charadrius alexandrinus*, is listed as Threatened or Endangered and has been documented in Grays Harbor County. The project site is not near the coastal beaches, or marine waters, and the Sensitive Species List does not list any populations in his area.

The Marbled murrelet, *Brachyramphus marmoratus*, is listed as Threatened or Endangered and may have been historically documented in the region. The Sensitive Species List does not list any known populations on or near the site.

The Northern spotted owl, *Strix occidentalis caurina*, is listed as Threatened or Endangered and has historically been documented in the region. The Sensitive Species List does not list any populations on or near the site.

The Oregon Silverspot Butterfly, *Speyeria zerene hippolyta*, is listed as Threatened or Endangered and may have been historically documented in the region. The Sensitive Species List does not list any known populations on or near the site.

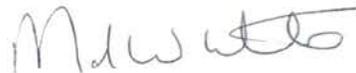
The Golden Paintbrush, *Castilleja lewisecta*, is listed as Threatened or Endangered and has been historically noted in the region. The Sensitive Species List does not list any populations on the site.

No populations of Threatened or Endangered Species will be impacted by the project, as proposed.

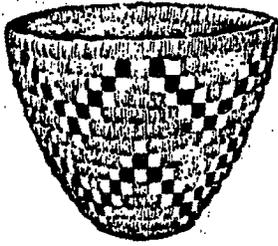
There is one Species of Concern that should be noted. The Osprey, *pandion haliaetus*, is listed as a Species of Concern by the USFWS and an Osprey site is marked in the database approximately one and a half miles east of the project. Tribal Natural Resources Staff have not inspected the area for Osprey.

Please feel free to call me if you have further questions.

Sincerely,

A handwritten signature in cursive script, appearing to read "M. White".

Mark W. White
Director



CONFEDERATED TRIBES of the CHEHALIS RESERVATION

February 26, 2010

Mr. Chuck James
United States Department of the Interior
Bureau of Indian Affairs
Northwest Regional Office
911 NE 11th Avenue
Portland, Oregon 97232-4169

RE: Archaeological Review of South Bank Road/Harris Creek Culvert Replacement

Dear Mr. James,

Please be advised that a site review has been conducted on South Bank Road at the location of the culvert replacement along Harris Creek. No evidence of cultural resources or material was found within the boundaries of the proposed project site during this review. Based on this review the probability of the occurrence of buried archeological resources is determined to be low.

The Chehalis Tribe will monitor this project during all phases of construction. If at any time evidence of cultural resources or material is detected, work will be stopped until the resources and potential of find can be evaluated or mitigated. Please contact me at the number below if you have additional questions.

Sincerely,

Richard Bellon
General Manager



Appendix D
Public Notice

PUBLIC NOTICE

**Confederated Tribes of the Chehalis Reservation
Draft Environmental Assessment
South Bank/Harris Creek Culvert Replacement Project**

The Confederated Tribes of the Chehalis Reservation (Chehalis Tribe) proposes a culvert replacement project in western Washington. Funding would be provided as authorized by the American Recovery and Reinvestment Act of 2009.

The Chehalis Tribe prepared a draft environmental assessment (EA) for the proposed project pursuant to the National Environmental Policy Act of 1969. The EA evaluates alternatives for compliance with applicable environmental laws, including Executive Orders #11990 (Protection of Wetlands), #11988 (Floodplain Management), and #12898 (Environmental Justice). The alternatives evaluated in the EA are (1) no action; and (2) culvert replacement at Harris Creek along South Bank Road as identified in the *Confederated Tribes of the Chehalis Reservation Comprehensive Flood Hazard Management Plan*.

The EA is available for review online at the Chehalis Tribe website at: <http://www.chehalis-tribe.org/news-events/index.html>. If no significant issues are identified during the comment period, the Chehalis Tribe will finalize the EA and issue a Finding of No Significant Impact (FONSI). Unless substantive comments are received, the Chehalis Tribe will not publish another notice for this project. However, should a FONSI be issued, it will be available for public viewing at <http://www.chehalis-tribe.org/news-events/index.html>.

The draft EA is also available for review on April 1, 2010 at the Chehalis Tribal Center at 420 Howanut, Oakville, WA.

Written comments on the draft EA should be directed no later than 5 pm on April 30, 2010 to Amy Loudermilk, Transportation Planner, Chehalis Tribe, P.O. Box 536, Oakville Washington 98568, or by e-mail at aloudermilk@chehalis-tribe.org. Comments also can be faxed to 360-273-9024.

Appendix E
Community Input

Department of Public Services

Phone: 360-249-4222

Fax: 360-249-3203



100 West Broadway; Suite 31
Montesano, Washington 98563
www.co.grays-harbor.wa.us

GRAYS HARBOR COUNTY

STATE OF WASHINGTON

April 7, 2010

Amy Loudermilk
Confederated Tribes of the Chehalis Reservation
P.O. Box 536
Oakville, Washington 98568

RE: *Finding of No Significant Impact (FONSI)*

Ms. Loudermilk:

Thank you for the opportunity to comment on the Confederated Tribes of the Chehalis Reservation's *National Environmental Policy Act (NEPA) Finding of No Significant Impact (FONSI)* associated with the Reservation's proposal for the replacement of existing drainage culverts along South Bank Road, Grays Harbor County, Washington.

Grays Harbor County has reviewed the NEPA finding and concurs that the proposal does not represent a significant environmental impact to air quality, environmental design and historic values, socioeconomics, community facilities and services, and natural features.

Thank you again.

Sincerely,

Brian Shea
Director
Planning and Building Division

cc: Terry Willis, Grays Harbor County District 1 Commissioner
Russ Esses, Grays Harbor County Road Engineer
file

City of Oakville

Brandon Atoch, Mayor
P.O. Box D
204 East Main Street
Oakville, WA 98568

Email: oakvillecityhall@comcast.net
Tele: (360) 273-8916
Fax: (360) 273-5120

Amy Loudermilk
Confederated Tribes of the Chehalis Reservation
P.O. Box 536
Oakville, WA 98568

Re: Support for the South Bank / Harris Creek Culvert Replacement.

Dear Amy,

As Mayor of Oakville, I am in support of this Culvert Replacement project. It will help with conveyance of flood waters, prevent backwater conditions from developing, reduce the potential for increased flood surface elevations upstream of South Bank Road, and will stop flood waters from going over the top of South Bank Road and cutting off City, Tribal and County residents from both areas and much needed emergency services during a flooding event .

The other part of this project that I am in support of is the fish barrier removal benefit. By removing the current three 72 inch culverts as they do not offer consistent fish passage because they were installed above ground surface which creates the barrier for fish. By installing the box culverts, the barrier would be removed, and would allow for more proper fish passage. As fish use small streams like Harris Creek to escape the high waters of a river during a flooding event.

So I would like to thank the Chehalis Tribe for putting this project together, and helping both the fish and the flooding problems. In doing this project, it will help their neighbors the City Of Oakville and Grays Harbor County.

Sincerely,



Brandon Atoch, Mayor

From: Jerry Silcox [mailto:jerrydidit@comcast.net]
Sent: Thursday, April 29, 2010 9:31 AM
To: Amy loudermilk
Subject: [SPAM] Southbank/Harris creek culvert replacement project

Hello,

I was very excited to read about the propped culverts on South Bank road. Something needs to be done, the flooding is terrible, I can't even imagine the impact on the Chehalis Reservation but I have seen first hand the flooding on Elma Gate Rd E because I live on it. Harris creek borders our property, I would be very interested in learning what we can do to encourage salmon recovery and stamp out the invasive weeds without harming the creek. I did contact the WDFW 2 years ago and they said that there were too many beaver dams on Harris creek and it was not a project they were interested in (stream recovery). It's good to know that the Chehalis Tribe can get things done.

Thank you,
Trina Kempf
22 Elma Gate Rd E
360-273-5334

Appendix 3



CONFEDERATED TRIBES of the CHEHALIS RESERVATION

Chehalis Tribal Historic Preservation Office

420 Howanut Rd
Oakville, WA 98568
360-273-5911
dpenn@chehalistribe.org

September 1, 2016

Jesse Gleason
Transportation Planner
Chehalis Tribal Planning Office
420 Howanut Rd
Oakville, WA 98568

RE: Harris Creek Trail

Dear Mr Gleason,

Thank you for contacting the Chehalis Tribal Historic Preservation Office concerning the Harris Creek Trail Project, located at the intersection of South Bank Rd, Bishop Rd, Cemetery Rd, and State St South between the Vosper housing development and the city of Oakville, Grays Harbor County. We have reviewed the documents prepared by Parametrix. Additionally a survey was conducted by the Tribal Historic Preservation Officer in 2010 for a separate culvert replacement project within the Area of Potential Effect. As a result of the review of these documents containing maps of the Area of Potential Effect, it is our opinion that there will be *no historic properties affected* by the proposed improvements during Harris Creek Trail project. The determination is based on information available at the time of this review in compliance with Section 106 of the National Historic Preservation Act and its implementing regulation, CFR 36 800. Should additional information become available, this assessment may be revised, including information regarding historic properties that haven't yet been identified. In the event that archeological or historic materials are discovered during project activities, work in the immediate vicinity must stop, the area secured, and the concerned parties and this department notified.

Thank you for the opportunity to comment.

Sincerely yours,

Dan Penn, Cultural Resources Technician

P.O. BOX 536 • OAKVILLE, WA. 98568
AC 360-273-5911 • FAX 360-273-5914

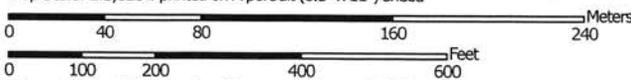


Appendix 4

Soil Map—Grays Harbor County Area, Pacific and Wahkiakum Counties, Washington



Map Scale: 1:3,020 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

- Area of Interest (AOI)
- Soils**
 - Soil Map Unit Polygons
 - Soil Map Unit Lines
 - Soil Map Unit Points
- Special Point Features**
 - Blowout
 - Borrow Pit
 - Clay Spot
 - Closed Depression
 - Gravel Pit
 - Gravelly Spot
 - Landfill
 - Lava Flow
 - Marsh or swamp
 - Mine or Quarry
 - Miscellaneous Water
 - Perennial Water
 - Rock Outcrop
 - Saline Spot
 - Sandy Spot
 - Severely Eroded Spot
 - Sinkhole
 - Slide or Slip
 - Sodic Spot
- Water Features**
 - Streams and Canals
- Transportation**
 - Rails
 - Interstate Highways
 - US Routes
 - Major Roads
 - Local Roads
- Background**
 - Aerial Photography
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Grays Harbor County Area, Pacific and Wahkiakum Counties, Washington
 Survey Area Data: Version 13, Sep 15, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 8, 2010—Oct 17, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

| Grays Harbor County Area, Pacific and Wahkiakum Counties, Washington (WA627) | | | |
|--|--|--------------|----------------|
| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
| 91 | Nemah silty clay loam | 1.3 | 30.9% |
| 135 | Spanaway very gravelly sandy loam, 1 to 8 percent slopes | 2.9 | 69.1% |
| Totals for Area of Interest | | 4.1 | 100.0% |

Appendix 5



August 22, 2016

-  Estuarine and Marine Deepwater
-  Estuarine and Marine Wetland
-  Freshwater Emergent Wetland
-  Freshwater Forested/Shrub Wetland
-  Freshwater Pond
-  Lake
-  Other
-  Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.