US Army Corps of Engineers
Seattle District

BIOLOGICAL EVALUATION
FOR INFORMAL ESA CONSULTATION
For: _____ (Corps Reference Number)
Version: May 2012

***** This form is for projects that have insignificant or discountable impacts on listed species. It contains all the information required for a biological evaluation, but in abbreviated form and with minimal instructions on how to fill it out. For more detailed instructions, a format for development of a biological assessment or biological evaluation can be found on the Seattle District Corps website (www.nws.usace.army.mil – click on regulatory and then on endangered species, BA Template). You may also contact the Corps at 206-764-3495 for further information.***

Drawings and Photographs - ***Drawings and photographs must be submitted***. Photographs must be submitted showing local area, shoreline conditions, existing overwater structures, and location of the proposed project. Drawings must include a vicinity map; plan, profile, and cross-section drawings of the proposed structures; and over- and in-water structures on adjacent properties. (For assistance with the preparation of the drawings, please refer to our *Drawing Checklist* located on our website at www.nws.usace.army.mil Select Regulatory – Regulatory/Permits – Forms.) Submit the information to: U.S. Army Corps of Engineers, Regulatory Branch, P.O. Box 3755, Seattle, Washington 98124-3755.

Date: _____

SECTION A - General Information			
1. **Applicant name**: City of Mukilteo Public Works Department			
Mailing address: 11930 Cyrus Way Mukilteo, Washington 98275			
Work phone: (425) 347-4544	Home phone:	Email: http://ci.mukilteo.wa.us	Fax:
2. **Joint-use applicant name (if applicable)**: n/a			
Mailing address:			
Work phone:	Home phone:	Email:	Fax:
3. **Authorized agent name**: Brad Thiele; Northwest Environmental Consulting, LLC			
Mailing address: 3639 Palatine Avenue N, Seattle, WA 98103			
Work phone: (206) 634-9193	Home phone:	Email: brad@northwest-environmental.com	Fax:
4. **Location where proposed work will occur** Smuggler's Gulch Creek and 61st Place West Mukilteo, WA			
¼ Section:	Section: 17	Township: 28N	Range: 4E
Latitude: 47.917019 N		Longitude: 122.315146 W	

5. Description of Work:

Include project drawings and site photographs.

Describe the proposed project in detail. Please describe any mitigation that is being proposed for impacts from your project. Attach a mitigation plan as an appendix, if appropriate.

This 61st Place West Culvert Improvements project will replace an existing deficient culvert with a new box culvert, improving both stream function and road conditions. The existing 54-foot-long, 24-inch-diameter multi-sloped CMP culvert will be removed and replaced with a new box culvert that is 40 feet long, 6.5 feet wide, and 3 feet tall. The project will also reposition the culvert south of its original location, create a roughened channel along approximately 222 linear feet of stream (104 feet upstream and 118 feet downstream), and raise the road 2 feet. These changes will accommodate the new culvert's size, the site's steep topography, and the existing, 8-inch-diameter sewer line running along the roadway and under the existing culvert. Drawings of the existing conditions and the proposed work are included as Figures 2 through 9 (Appendix A). Photos of the existing conditions above and below the culvert are included as Photos 1 through 6 (Appendix B).

The culvert replacement will fix several issues. The existing stream channel is undercutting a steep bank upstream of the existing culvert, on the north side. Moving the culvert south will protect this bank. Along the road, poor drainage and pavement failure has greatly deteriorated the road surface. Raising the road 2 feet will prevent these drainage issues while also allowing the culvert to fit above the existing sewer line and reduce roadway flooding during storm events.

Downstream, head cutting of the channel bottom has left a significant drop from the outfall. This headcutting is also leading to erosion along the westerly shoulder of the roadway, which has begun to slough into the stream. The redesigned crossing will eliminate the headcutting issue. Erosion will be further reduced by constructing a roughened channel using streambed gravels and boulders per WDFW specification; planting native vegetation on streambanks and all other disturbed areas along the restored segments of stream; and installing headwalls at culvert ends to stabilize roadway fill. A traffic barrier will also be installed over the crossing to provide safety.

For projects that include pile driving

Not applicable. Pin piles will be installed that are three inches in diameter and are not expected to be a significant sound source.

6. Construction Techniques:

Describe methods and timing of construction to be employed in building the project and any associated features. Identify actions that could affect listed / proposed species or designated / proposed critical habitat and describe in sufficient detail to allow an assessment of potential impacts. Consider actions such as vegetation removal, temporary or permanent elevations in noise level, channel modifications, hydrological or hydraulic alterations, access roads, power lines etc. Also discuss construction techniques associated with any interdependent or interrelated projects.
Address the following:

Project details are shown in the attached drawings (Appendix A). In water work will be avoided by completing all work outside the existing channel or using a diversion. The roadbed will be excavated adjacent to the existing culvert and the new culvert and foundation will be constructed. Pin piles will be installed using a pin pile setter and the foundations of the culvert poured. The existing stream will be diverted into a corrugated pipe using sand bags or other appropriate measures using the existing culvert. The existing channel will be left in place for as long as possible while the new channel is constructed. Once the new culvert is placed, the stream will be diverted through the new culvert in a gravity fed pipe.

The new channel will be completed and the old channel abandoned. Streambed boulders will be used for grade control while constructing the new channel and at the new culver ends. The stream banks will be stabilized using erosion control fabric and the diversion removed. The stream banks will then be planted with native trees and shrubs through the erosion control fabric.

The streambed is generally dry during the summer so no stream flows are predicted but could occur if a significant rain event occurs. Documented fish use does not occur in this stream but could occur. The project activities will likely avoid impacts to listed fish species.

A. Construction sequencing and timing of each stage (duration and dates):

Construction will be begin and end in summer, 2016 or 2017 during the inwater work window when the stream is dry.

B. Site preparation:

Erosion control BMPs will be installed and work limits marked with high visibility fencing before any work is completed. The stream diversion will be phased through the project so no in-water work will occur. The roadbed will be excavated and temporary access points to the stream will be created.

C. Equipment to be used:

Equipment includes the use of a small excavator, pin pile setter, dump trucks, cements trucks, and power and hand tools.

D. Construction materials to be used:

The following materials will be used:

- Suitable aggregate material for roadway, culvert, and wing wall foundations;
- Erosion control materials;
- Pin piles for the culvert foundation;
- Culvert;
- Wire baskets and rounded rock for the wing walls;
- Streambed gravels, cobbles and boulders for the roughened channel; and
- Asphalts and concrete for the roadway surface.

E. Work corridor:

The site will be accessed from 61st Place West and 88th Street SE and will include approximately 200 feet of the stream corridor. The roadway will be closed during construction.

F. Staging areas and equipment wash outs:

Staging areas will be completed on the roadway. The roadway will be swept at the completion of the project.

G. Stockpiling areas:

Stockpiling will occur in the roadway. The need for stockpiling will be minimal and dropped materials will be used shortly after delivery on site. Any delivered aggregate materials or excavated spoils will be covered until used if left overnight.

H. Running of equipment during construction:

Equipment will only be run when in use.

I. Soil stabilization needs / techniques:

Soil stabilization and erosion control are shown in the project drawings (Appendix A). The area below the OHWM will be dry when excavating starts. Soils and disturbed streambed will be underlain with an erosion blanket. The area will be stabilized and planted with native plantings upon completion of the project.

J. Clean-up and re-vegetation:

Stabilized soils on the stream bank and any soil disturbed will be mulched and revegetated with native shrubs or hydroseeded as shown in the planting plan in the project drawings (Appendix A, Figures 10-15).

K. Storm water controls / management:

All clearing and grading will be done in accordance with the City of Mukilteo's erosion control requirements (City of Mukilteo municipal code 15.16, Grading and Excavation). The project will not create additional impervious surface, so no new stormwater controls are required.

L. Source location of any fill used:

Suitable clean fill will be purchased from a licensed commercial source.

M. Location of any spoil disposal:

Native material will be put back in place and supplemental fill will be used if needed. No spoil disposal is anticipated.

7. Action Area

Please describe the action area. The action area means all areas to be affected directly (e.g., earth moving, vegetation removal, construction noise, placement of fill, release of environmental contaminants) and indirectly by the proposed action. (Example: as a direct effect, the action area for pile driving would include the area out to where the noise from the pile driving falls below the level of harm or disturbance for listed species. For vibratory hammer pile driving impacts to killer whales, this level is 120 dB. Action area will include any area where the underwater noise level may exceed 120 dB).

The project is located in Snohomish County, in the City of Mukilteo adjacent to Puget Sound. The project site is within the City of Mukilteo's right of way, and also includes slopes and about 200 linear feet of stream and riparian area on portions of four adjacent residential properties.

Smuggler's Gulch Creek originates about a third of a mile east of the 61st Place West crossing. The creek is seasonal, and is usually dry during summer months. The stream upstream of 61st Place West is in a narrow gulch descending through fairly steep terrain. The stream passes through red alder forest (*Alnus rubra*) with scattered western red cedar (*Thuja plicata*) and shrubs such as sword fern (*Polystichum munitum*) and salmonberry (*Rubus spectabilis*); and runs along the base of a steep embankment below a house before passing under 61st Place West. Below this culvert, the stream is a riffle run with cascades and an incised channel. It passes additional residences and runs parallel to 88th Street SW, where a riprap bank along the road extends below the ordinary high water mark (OHWM) of the stream. The stream crosses under 88th Street SW through another culvert, and crosses under the railroad tracks via a 36-inch-diameter concrete culvert before entering Puget Sound.

Areas affected by the construction will include 200 feet of stream channel. In order to meet water quality standards during removal of the temporary bypass, turbidity cannot extend more than 300 feet downstream and 100 feet upstream (WAC 172-201A-400). As construction will occur in the dry, turbidity will not occur during construction. Noise from construction will occur from the excavator, which can reach 97 dB LMAX at 50 feet (WSDOT 2011). Ambient conditions in a suburban residential area are typically 45 to 50 dbA (WSDOT 2011). According to the Practical Spreading Loss Model for soft-site (nonpaved) conditions, noise will be louder than ambient levels for a radius of approximately 3,200 feet. More typical noise levels from equipment will be around 78 dbA, which will attenuate to background levels within 1,600 feet. The

project will take place within a steep ravine. Sound will be deflected up and disturbance will be limited to the immediate project area and ravine.

8. Species Information:

Identify each listed or proposed species, including terrestrial species, as well as designated or proposed critical habitat in the action area. Please include information on which listed species use are expected to be found in the action area and the potential for them to be there during project activities.

The following species listed under the Endangered Species Act (ESA) as threatened (T) or endangered (E) may occur in Snohomish County that are under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS):

- Bull trout (*Salvelinus confluentus*)
- Canada lynx (*Lynx canadensis*)
- Gray wolf (*Canis lupus*)
- Grizzly bear (*Ursus arctos = U. a. horribilis*)
- Marbled murrelet (*Brachyramphus marmoratus*)
- Northern spotted owl (*Strix occidentalis caurina*)

The following related designated critical habitats occur in Snohomish County

- Critical habitat for bull trout
- Critical habitat for the marbled murrelet
- Critical habitat for the northern spotted owl

The following marine species listed under the ESA can occur in Puget Sound. These species are under the jurisdiction of the National Marine Fisheries Service (NMFS):

- Puget Sound Chinook Salmon (T) (*Oncorhynchus tshawytscha*)
- Puget Sound Steelhead (T) (*Onchorhynchus mykiss*)
- Southern Resident Killer Whale (E) (*Orcinus orca*)
- Humpback Whale (E) (*Megaptera novaeangliae*)

Critical habitat has been designated for the following ESA-listed species that are under the jurisdiction of NMFS:

- Critical habitat for Puget Sound Chinook, including nearshore habitats in Puget Sound.
- Critical habitat for Southern Resident Killer Whale, including all of Puget Sound

Marine species such as whales are not present at the site. The project is in a suburban residential neighborhood with second-growth deciduous trees and there is no suitable habitat for gray wolf, Canada lynx, grizzly bear, marbled murrelet or spotted owl. Only anadromous and freshwater fish species are potentially present within the action area.

The possible use of Smuggler's Gulch by federally listed species was further evaluated by reviewing data in the Washington State Department of Fish and Wildlife's (WDFW) Priority Habitats and Species (PHS) database in September 2015. This database does not list any documented occurrences of PHS species at the site or between the site and Puget Sound. The database does list four bald eagle breeding areas about 2 miles north and 2 miles south of the project area. Bald eagles are state sensitive.

WDFW's SalmonScape mapping database (also reviewed in September 2015) does not indicate any documented presence of salmon or bull trout in Smuggler's Gulch Creek. The database does map modeled presence of coho salmon (Federal species of concern) in the creek downstream of the 61st Place West culvert. WDFW maps the general area (lands adjacent to Puget Sound) as accessible to coho, pink salmon, chum salmon, and the Puget Sound Distinct Population Segment (DPS) of steelhead (Federally Threatened).

Puget Sound's shoreline, including at Smuggler's Gulch Creek outlet (about 550 feet downstream of the lower end of the project), is mapped as marine critical habitat for bull trout. Small, intermittent tributaries such as Smuggler's Gulch Creek, which can contain temperatures unsuitable for bull trout, are not included in this mapped habitat.

The Washington State Department of Natural Resources does not have any records of rare habitats or plants in the project area.

9. Existing Environmental Conditions:
Describe existing environmental conditions for the following:

A. Shoreline riparian vegetation and habitat features

The riparian community along the stream consists of a red alder canopy with scattered young western red cedar. Shrubs include salmonberry, a few red elderberry (*Sambucus racemosa*), and twinberry honeysuckle (*Lonicera involucrata*). The herb layer along the stream includes sword fern, large-leaf avens (*Geum macrophyllum*), English ivy (*Hedera helix*), and buttercup (R*anunculus repens*), with scattered occurrences of trailing blackberry (*Rubus ursinus*), Himalayan blackberry (*R. armeniacus*), sword fern, and some honeysuckle vines (Lonicera sp., possibly planted for slope stabilization).

B. Aquatic substrate and vegetation (include information on the amount and type of eelgrass or macroalgae present at the site)

The dominant streambed substrates are gravel and cobble in the riffle habitats, with some fines in pools. Some woody debris is present within the OHWM. The stream does not contain emergent or aquatic vegetation.

C. Surrounding land/water uses

Properties on either side of the stream are residential. The ravine immediately upstream of the project is undeveloped.

D. Level of development

The surrounding area is suburban. The project area is in a forested ravine, with single-family residential development along the roads. Immediately upstream of the project, the ravine is undeveloped. Farther upstream are additional single-family residences.

E. Water quality

Smuggler's Gulch Creek does not occur on the Washington State Department of Ecology's 303(d) water quality impairment lists.

F. Describe use of the action area by listed salmonid fish species.

According to WDFW's SalmonScape mapper (accessed online in September 2015), no salmon or bull trout have been documented in Smuggler's Gulch Creek. The database does indicate modeled presence of coho salmon (Federal species of concern) in the creek, downstream of the 61st Place West culvert. WDFW maps the general area (lands adjacent to Puget Sound) as accessible to coho salmon, pink salmon, chum salmon, and the Puget Sound DPS of steelhead (Federally Threatened).

The current culvert at 61st Place West is a fish barrier. Downstream of the project area, another culvert may form a partial fish barrier to salmonids.

G. Is the project located within designated / proposed bull trout or Pacific salmon critical habitat? If so, please address the proposed projects' potential direct and indirect effect to primary constituent

elements (Critical habitat templates can be found on the Corps website at: http://www.nws.usace.army.mil/Missions/CivilWorks/Regulatory/PermitGuidebook/EndangeredSpecies.aspx, select Forms, Tools and References; Forms and Templates; Critical Habitat Assessment Forms.

Puget Sound's shoreline, including at Smuggler's Gulch Creek outlet (about 550 feet downstream of the lower end of the project), is mapped as marine critical habitat for bull trout. Smuggler's Gulch Creek and other small, intermittent tributaries along Mukilteo's shoreline, which can contain temperatures unsuitable for bull trout, are not included in this mapped habitat. As the project's construction will occur during the dry and BMPs will be used, no sediment delivery is expected to occur to Puget Sound from the project.

H. Describe use of the action area by other listed fish species (*green sturgeon, eulachon, bocaccio, canary rockfish and yelloweye rockfish).*

Habitat or known presence does not occur in the action area for any other listed fish species.

I. Is the project located within designated/proposed critical habitat for any of the species listed below? If so please address the proposed projects' potential direct and indirect effect to primary constituent elements. Please see the NOAA-Fisheries and US Fish and Wildlife websites (www.nwr.noaa.gov and www.fws.gov/pacific respectively) for further information.

Southern resident killer whale	*Marbled murrelet*
Northern spotted owl	*Western snowy plover*
Green sturgeon	*Eulachon*

The project is not located within designated or proposed critical habitat for these species.

J. Describe use of action area by marbled murrelets. How far to the nearest marbled murrelet nest site or critical habitat? Some information is available on the Fish and Wildlife Service website: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08C.

Marbled murrelet habitat is not present at or adjacent to the site. Marbled murrelet foraging habitat is possible in Puget Sound adjacent to the outlet of Smuggler's Gulch Creek, but nesting habitat (old growth or mature conifer forest with suitable nesting substrate) is not present in the suburban residential area surrounding the project.

K. Describe use of action area by the spotted owl. How far to the nearest spotted nest site or critical habitat? Some information is available on the Fish and Wildlife Service website: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08B.

The habitat is primarily suburban residential, with no old growth or mature forest at or adjacent to the action area. The spotted owl does not occur in the action area.

L. **For marine areas only:** Describe use of action area by Southern Resident killer whales. How often have they been seen in the area and during what months of the year? For information on noise impacts on killer whales and other marine mammals, please see the National Marine Fisheries website: http://www.nwr.noaa.gov/Marine-Mammals/MM-consults.cfm.

N/A

M. **For marine areas and Columbia River:** How far is the nearest steller sea lion haulout site from the action area? Describe their use of the action area. See the National Marine Fisheries website: http://www.nwr.noaa.gov/Marine-Mammals/MM-consults.cfm for information on the steller sea lion and location of their haulout sites.

N/A

N. **For marine areas only: Forage Fish Habitat** – only complete this section if the project is in tidal waters.

N/A

Check box if Washington Department of Fish and Wildlife (WDFW) documented habitat is present. Go to the WDFW website for this information: http://wdfw.wa.gov/fish/forage/forage.htm, then search for each species under the link to Biology, then the link to Documented Spawning Grounds (if available, please attach a copy of the Hydraulic Project Approval from WDFW):

Surf Smelt: ☐ **Pacific Herring:** ☐ **Sand Lance:** ☐

Check box if the proposed action will occur in potentially suitable forage fish spawning habitat:

Surf Smelt: ☐ **Pacific Herring:** ☐ **Sand Lance:** ☐

If no boxes are checked, please explain why site is not suitable as forage fish spawning habitat.

Please describe the type of substrate and elevation and presence of aquatic vegetation at the project area. For example:
At +10 to +5 feet above MLLW, there is no aquatic vegetation, the substrate consists of large cobbles.
At +5 to +1 foot above MLLW, there is eelgrass and the substrate consists of fine sand.

10. Effects Analysis

Describe the direct and indirect effects of the action on the proposed and listed species as well as designated and proposed critical habitat within the action area. Consider the impact to both individuals and the population. Discuss the short-term, construction-related, impacts as well as the long-term and permanent effects.

Direct Impacts:

Project noise will not reach disturbance threshold levels for listed species. Listed species would not be harrassed by noise because they are not present in the Action Area. There will be no underwater noise. Minor, temporary turbidity could occur when the stream begins flow again in the fall following construction.

Indirect Impacts:

The project will reduce the amount of erosion along the stream channel at the culvert and alongside 88th Street SE. The roughened channel will be designed to be fish passable for all life stages of salmonids and will not affect fish passage.

11. Conservation measures:

Conservation measures are measures that would reduce or eliminate adverse impacts of the proposed activity (examples: work done during the recommended work window (to avoid times when species are most likely to be in the area), silt curtain, erosion control best management practices, percent grating on a pier to reduce shading impacts).

Proposed work window:

The project will occur when the stream is dry, during the summer. The work window designated in the Hydraulic Project Approval from WDFW will be followed for construction.

Other conservation measures:

The disturbed areas surrounding the stream will be stabilized with erosion control blankets and replanted with shrubs or hydroseeded following construction. The project includes installation of streambed materials and boulders that will reduce erosion compared to current conditions.

12. Determination of Effect:

Provide a summary of impacts concluding with statement(s) of effect, by species. Even projects that are intended to benefit the species might have short-term adverse impacts and those must be addressed. Only the following determinations are valid for listed species or designated critical habitat:

The intermittent stream in Smuggler's Gulch below the 61st Place West culvert has the potential to support salmon, including Chinook salmon and the Puget Sound DPS of steelhead, as well as other fish species. Work will be done when the stream is dry. However, as the work will occur below the OHWM and fish could occur downstream once construction is complete, the following conservation measures will be used:

- Work will be performed when the stream is dry and no fish are present.
- All disturbed areas will be protected from erosion with erosion control blankets and planted with native vegetation.
- The regraded stream reach will be a roughened channel to reduce erosion and provide stream velocities beneficial to fish.
- BMPs will be in place, such as covering loose soil during construction, to prevent erosion during rain events in the construction period.

Because of these considerations, it is determined that the project **may affect, but is not likely to adversely affect** Chinook salmon or steelhead trout.

13. EFH Analysis

Essential Fish Habitat (EFH) is broadly defined by the Act (now called the Magnuson-Stevens Act or the Sustainable Fisheries Act) to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". This language is interpreted or described in the 1997 Interim Final Rule [62 Fed. Reg. 66551, Section 600.10 Definitions] -- Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include historic areas if appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

Additional guidance for EFH analyses can be found at the NOAA Fisheries web site under the Sustainable Fisheries Division.

A. Description of the Proposed Action (may refer to BA project description)

See BA Response numbers 5 and 6 and attached drawings (Appendix A).

B. Addresses EFH for Appropriate Fisheries Management Plans (FMP)

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) includes a mandate that NOAA Fisheries must identify essential fish habitat (EFH) for federally managed marine fish, and federal agencies must consult with NOAA Fisheries on all activities, or proposed activities, authorized, funded, or undertaken by the agency that may adversely affect EFH. The Pacific Fishery Management Council (PFMC) has designated EFH for the Pacific salmon fishery, federally managed ground fishes, and coastal pelagic fisheries (NOAA Fisheries 1999; PFMC 1999).

The project takes place in habitat suitable for the Pacific salmon fishery.

C. Effects of the Proposed Action

i. Effects on EFH (groundfish, coastal pelagic, and salmon EFH should be discussed separately)

Only Pacific salmon EFH is found at or near the project site. Effects to Smuggler's Gulch Creek are minimal and the project will decrease the current erosion taking place at the culvert and along 88th Street SE and reduce the chance of catastrophic failure of the existing culvert and roadbed. Temporary effects could include sedimentation; however, BMPs are in place (described in BA Section 6) to avoid or minimize this effect.

ii. Effects on Managed Species (unless effects to an individual species are unique, it is not necessary to discuss adverse effects on a species-by species basis)

Effects to Pacific salmon species are minimal and discountable.

iii. Effects on Associated Species, Including Prey Species

There are no effects known to associated species. The project affects only 200 linear feet of stream.

iv. Cumulative Effects

The project will not induce any new development; it is a maintenance project for an existing structure and will not have any cumulative effects.

D. Proposed Conservation Measures

- Work will be performed when the stream is dry, during the summer.
- All disturbed areas will be stabilized with coir mats and planted with native vegetation and restored.
- Boulders will be placed at culvert ends to reduce erosion and protect the culvert inlet and outlet.
- Gabions will be constructed around the culvert outlet to prevent scour and erosion.
- About 200 linear feet of stream will be roughened with streambed materials to benefit fish.

E. Conclusions by EFH (taking into account proposed conservation measures)

This project will have minimal and discountable effects to fish and will maintain or improve existing conditions in the stream for fish. Because of conservation measures to avoid and minimize effects, it is determined that this project will have no adverse effect on Essential Fish Habitat.

14. References:

Include any studies or papers that support statements made in this form (example: reference the source for the listed species that are covered).

Washington State Department of Transportation (WSDOT). 2015. Biological Assessment Preparation, Advanced Training Manual Version 2015. Olympia, WA.

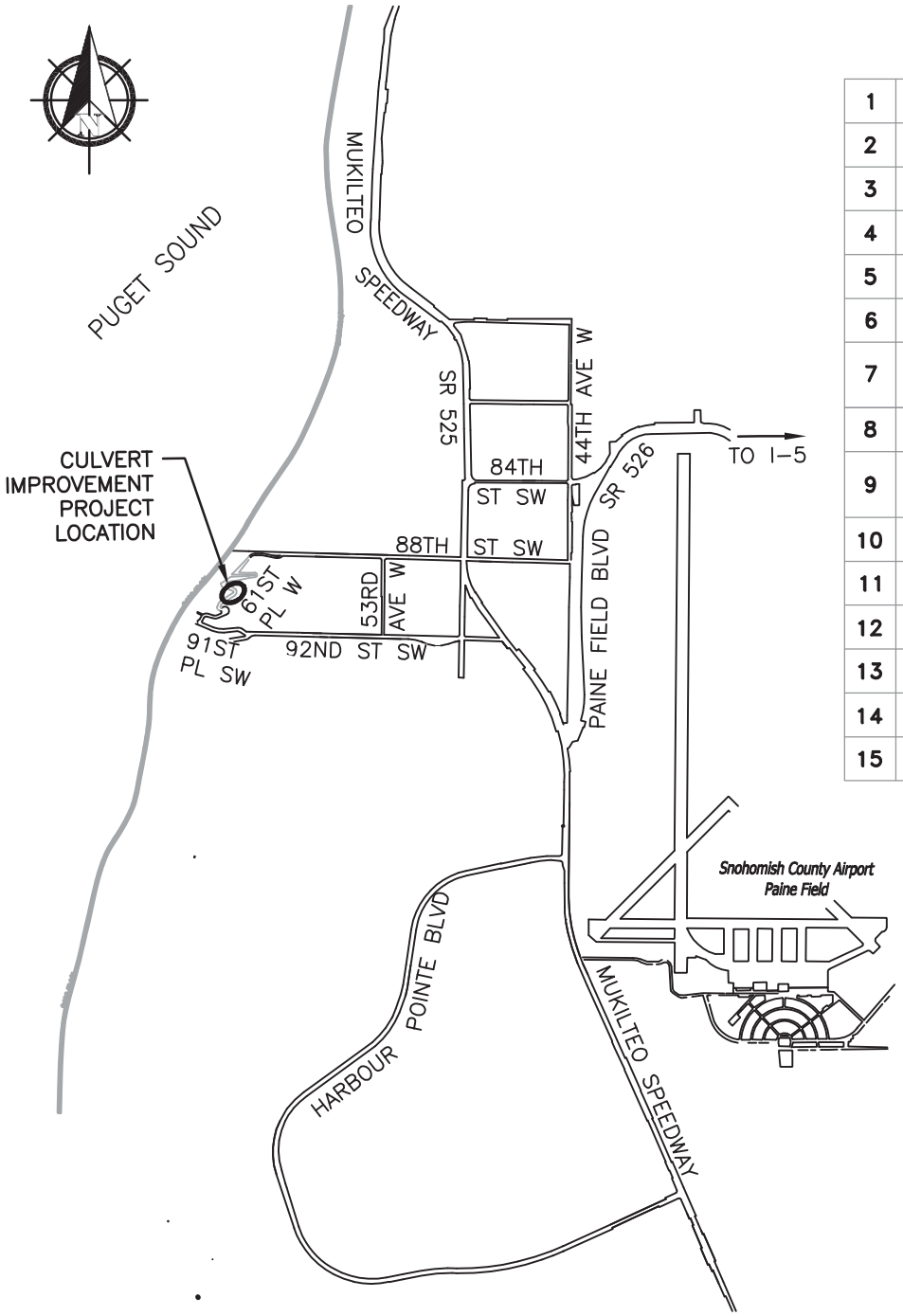
15. Appendices:

As needed include mitigation, revegetation plans, monitoring plans, results of studies, water quality information, etc.

Appendix A:

Figures

SEC. 17, TWP. 28N, RNG. 4E., W.M.



VICINITY MAP

FIGURES

Project Title: 61st Place West Culvert Improvement Project

Purpose: To replace existing substandard culvert

Adj. Prop. Owners: See within

City: City of Mukilteo

County: Snohomish

Proposed Work: Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert

Directions To Site: From I-5 exit 189 take SR 526 west. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location.

Figure: Project Location

Vert. Datum: NAVD88

Location: +47.917019, -122.315146

Permit #: _____

Scale: NTS - 1" = ± 3000'

Date: 08/31/2015 Figure 1

P:\T15-009 61st Place Permitting\Eng\Drawings\ARPA Drawings.dwg - Technician - August 20, 2015 - 10:15:49 AM

Project Title: 61st Place West Culvert Improvement Project

Purpose: To replace existing substandard culvert

Adj. Prop. Owners: See within

City: City of Mukilteo

County: Snohomish

Proposed Work: Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert

Directions To Site: From I-5 exit 189 take SR 526 west. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location

Figure: Existing Conditions

Vert. Datum: NAVD88

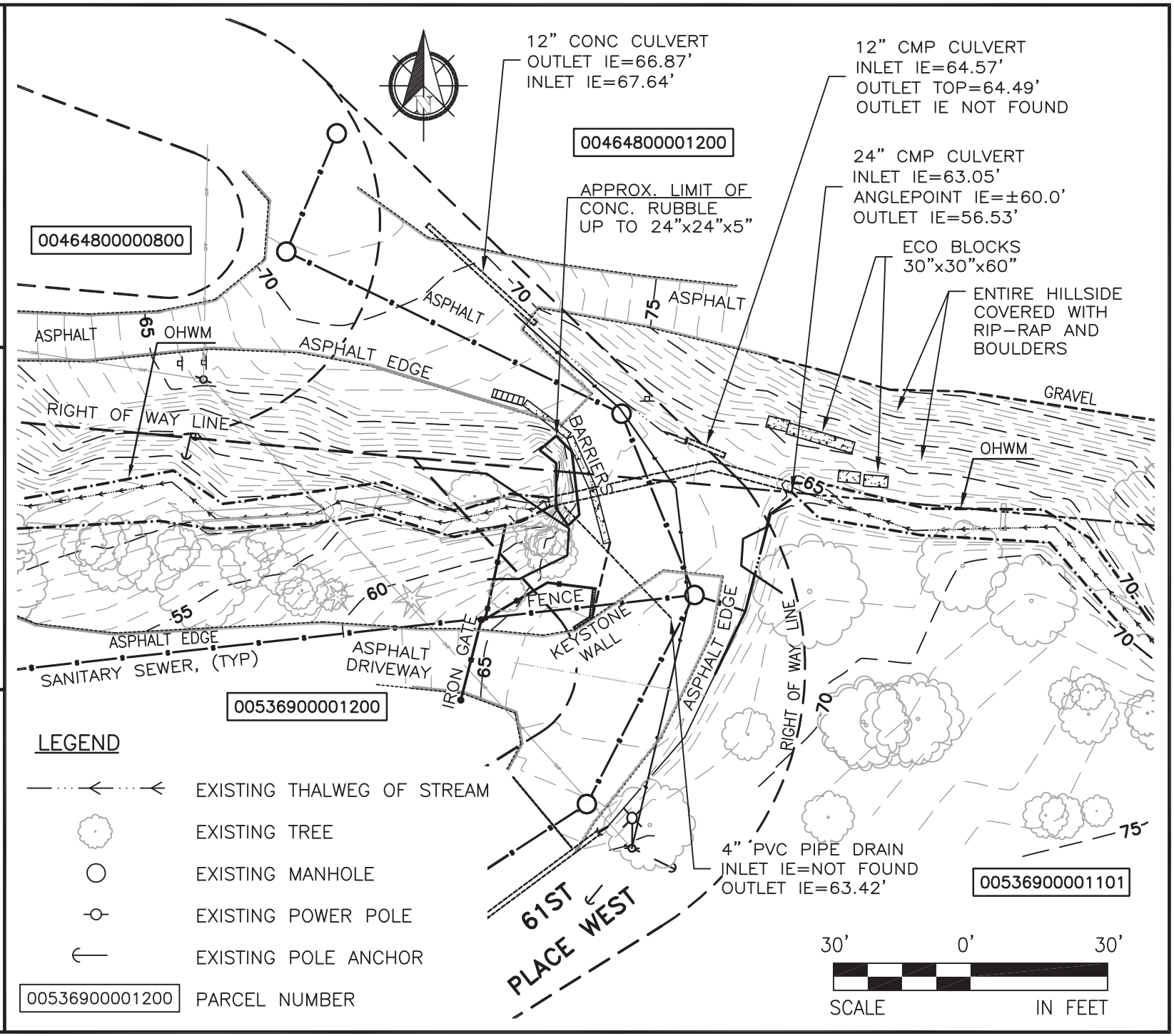
Location: +47.917019, -122.315146

Permit #: _____

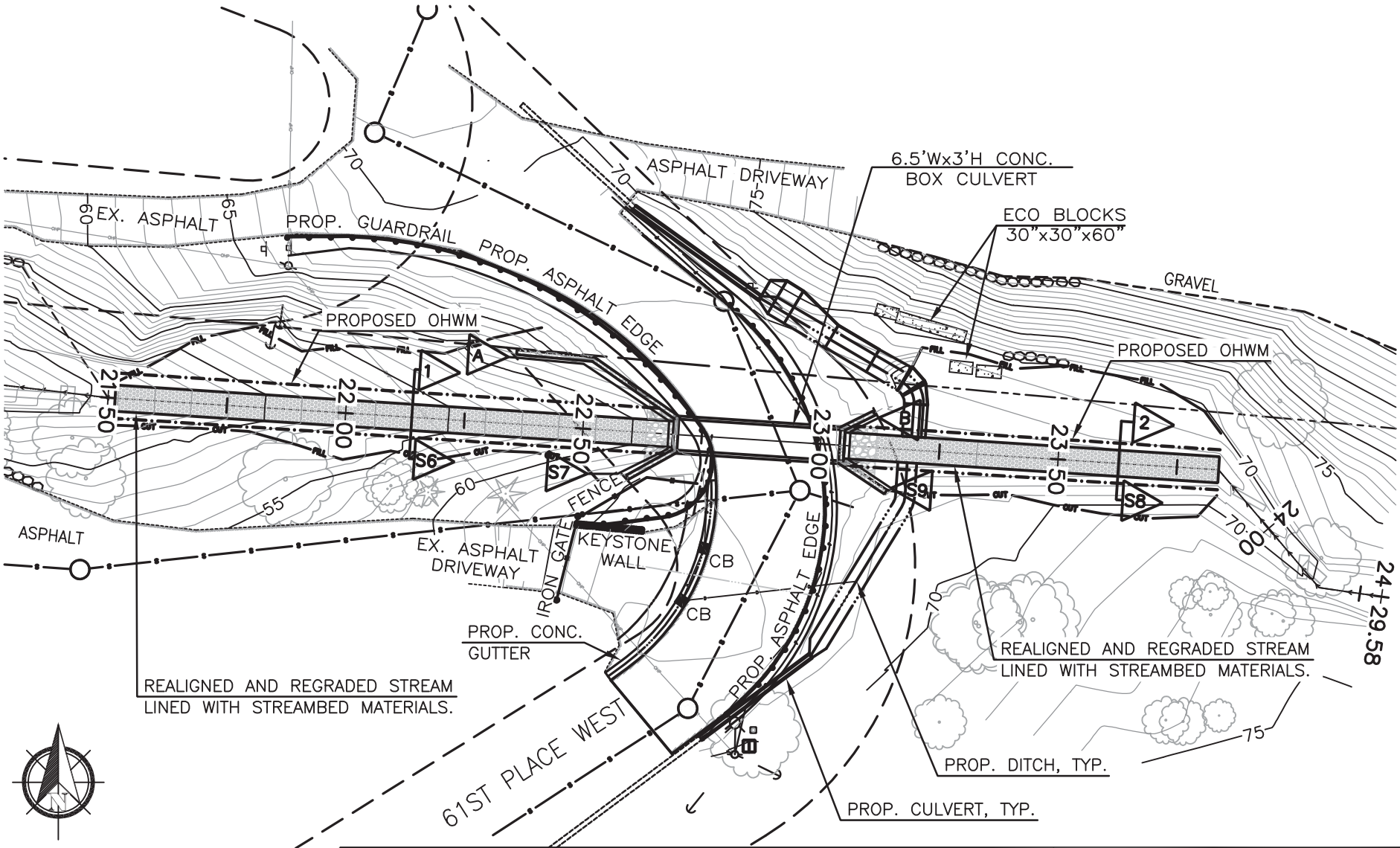
Scale: 1"=30'

Date: 08/31/2015

Figure 2



P:\T15-009 61st Place Permitting\Eng\Drawings\JARPA Drawings 2.dwg - Technician - August 20, 2015 - 10:15:49 AM



30' 0' 30'

SCALE IN FEET

Project Title: 61st Place West Culvert Improvement Project

Purpose: To replace existing substandard culvert

Adj. Prop. Owners: See attached

City: City of Mukilteo

County: Snohomish

Proposed Work: Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long cox culvert

Directions To Site: From I-5 exit 189 take SR 526 west. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location

Figure: Proposed Conditions

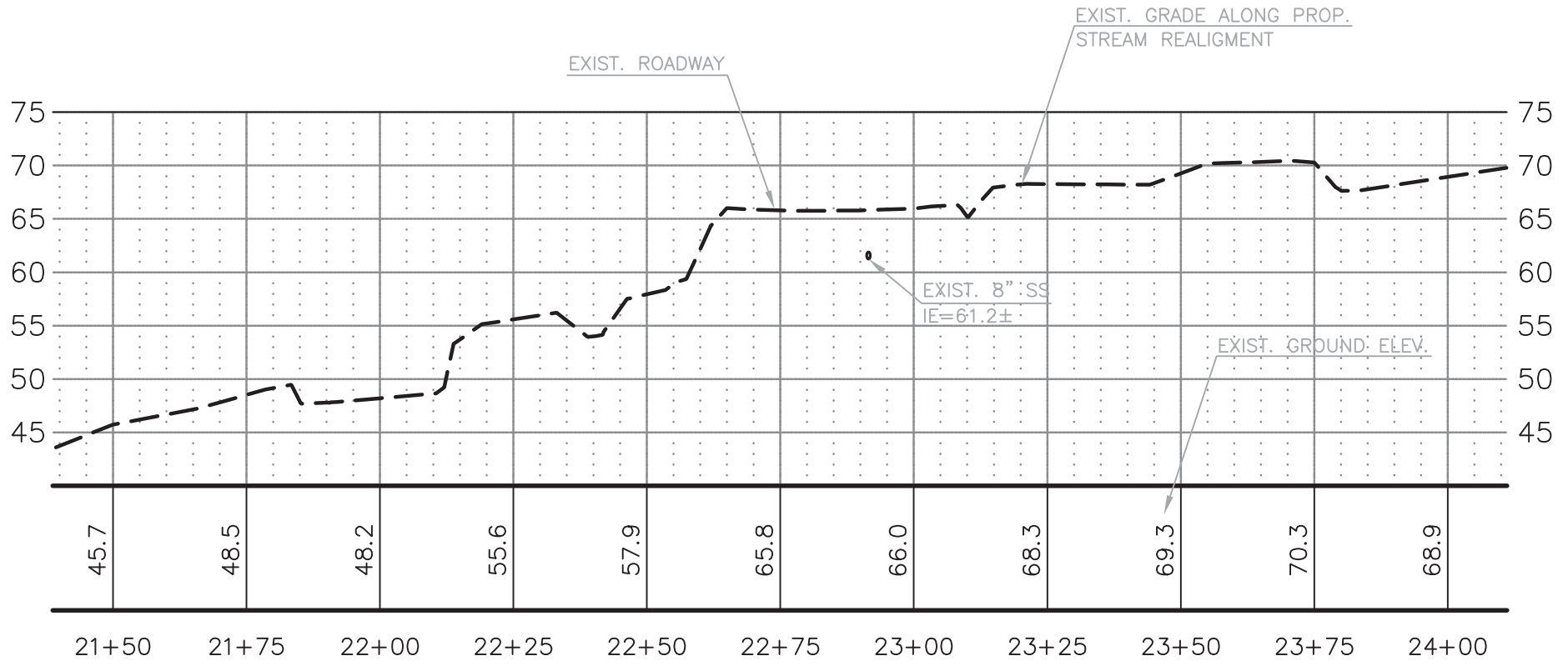
Vert. Datum: NAVD88

Location: +47.917019, -122.315146

Scale: 1" = 30'

Date: 8/31/2015 Figure 3

P:\T15-009 61st Place Permitting\Eng\Drawings\JARPA Drawings 2.dwg – Technician – August 20, 2015 – 10:15:49 AM



Project Title: 61st Place West Culvert Improvement Project

Purpose: To replace existing substandard culvert

Adj. Prop. Owners: See attached

City: City of Mukilteo

County: Snohomish

Proposed Work: Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert

Directions To Site: From I-5 exit 189 take SR 526 West. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location

Figure: Existing Profile Along Proposed Stream Alignment

Vert. Datum: NAVD88

Location: +47.917019, -122.315146

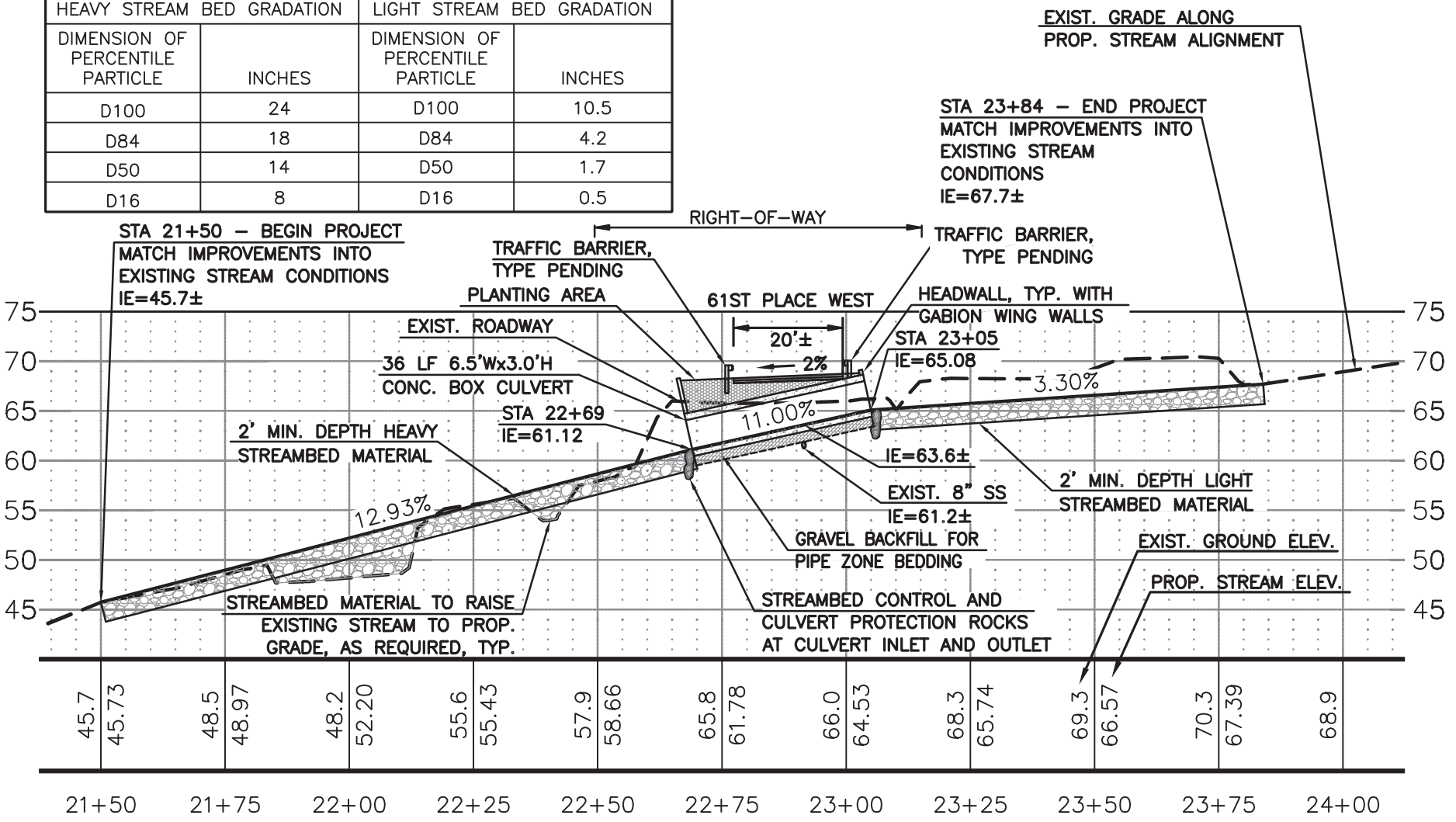
Scale: 1"=30' HORIZ. 1"=15' VERT.

Date: 8/31/2015 Figure 4

P:\T15-009 61st Place Permitting\Eng\Drawings\JARPA Drawings 2.dwg – Technician – August 20, 2015 – 10:15:49 AM

STREAM GRADATION TABLE

HEAVY STREAM BED GRADATION		LIGHT STREAM BED GRADATION	
DIMENSION OF PERCENTILE PARTICLE	INCHES	DIMENSION OF PERCENTILE PARTICLE	INCHES
D100	24	D100	10.5
D84	18	D84	4.2
D50	14	D50	1.7
D16	8	D16	0.5



Project Title: 61st Place West Culvert Improvement Project

Purpose: To replace existing substandard culvert

Adj. Prop. Owners: See within

City: City of Mukilteo

County: Snohomish

Proposed Work: Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert

Directions To Site: From I-5 exit 189 take SR 526 west. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location

Figure: Design Stream Profile

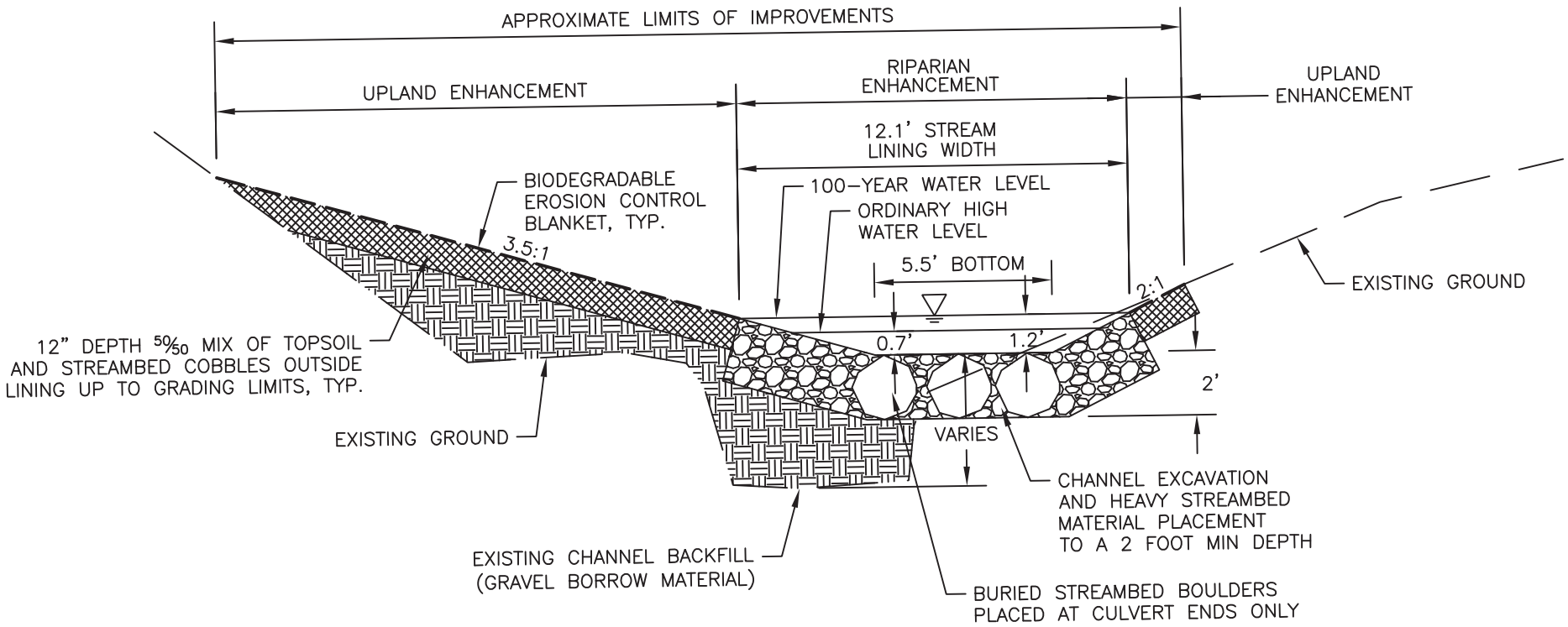
Vert. Datum: NAVD88

Location: +47.917019, -122.315146

Scale: 1"=30' HORIZ. 1"=15' VERT.

Date: 8/31/2015 Figure 5

P:\T15–009 61st Place Permitting\Eng\Drawings\JARPA Drawings 2.dwg – Technician – August 20, 2015 – 10:15:49 AM



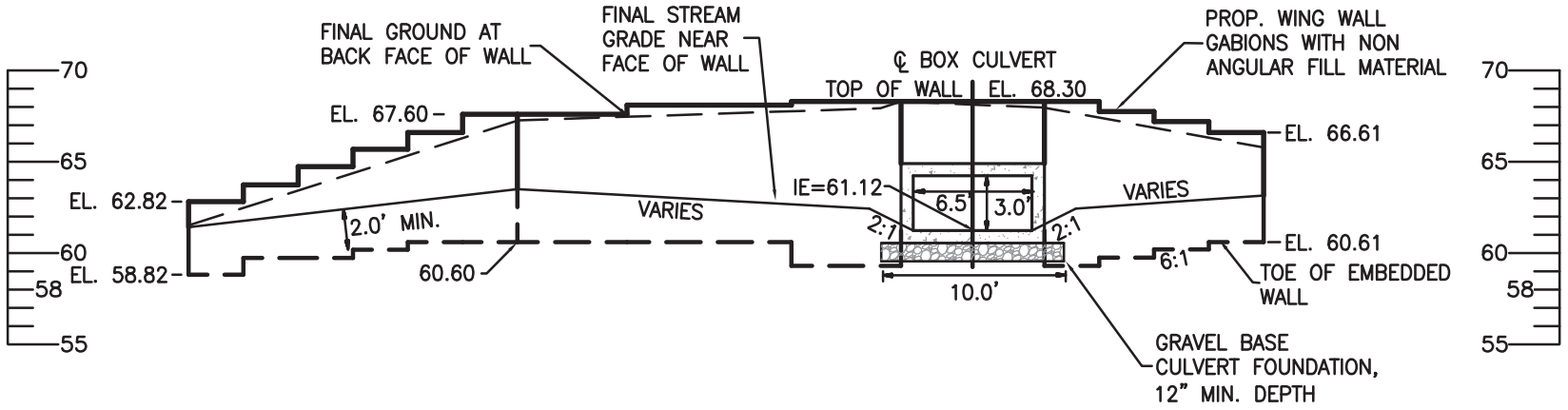
DOWN STREAM CROSS SECTION DETAIL 1

NTS

DOWNSTREAM OF PROPOSED BOX CULVERT
LOOKING UPSTREAM TO THE EAST
STA 21+50 TO STA 22+70

Project Title: 61st Place West Culvert Improvement Project **Purpose:** To replace existing substandard culvert **Adj. Prop. Owners:** See within **City:** City of Mukilteo **County:** Snohomish	**Proposed Work:** Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert **Directions To Site:** From I-5 exit 189 take SR 526 west. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location	**Figure:** Downstream Cross Section **Vert. Datum:** NAVD88 **Location:** +47.917019, -122.315146 **Scale:** NTS **Date:** 8/31/2015 Figure 6

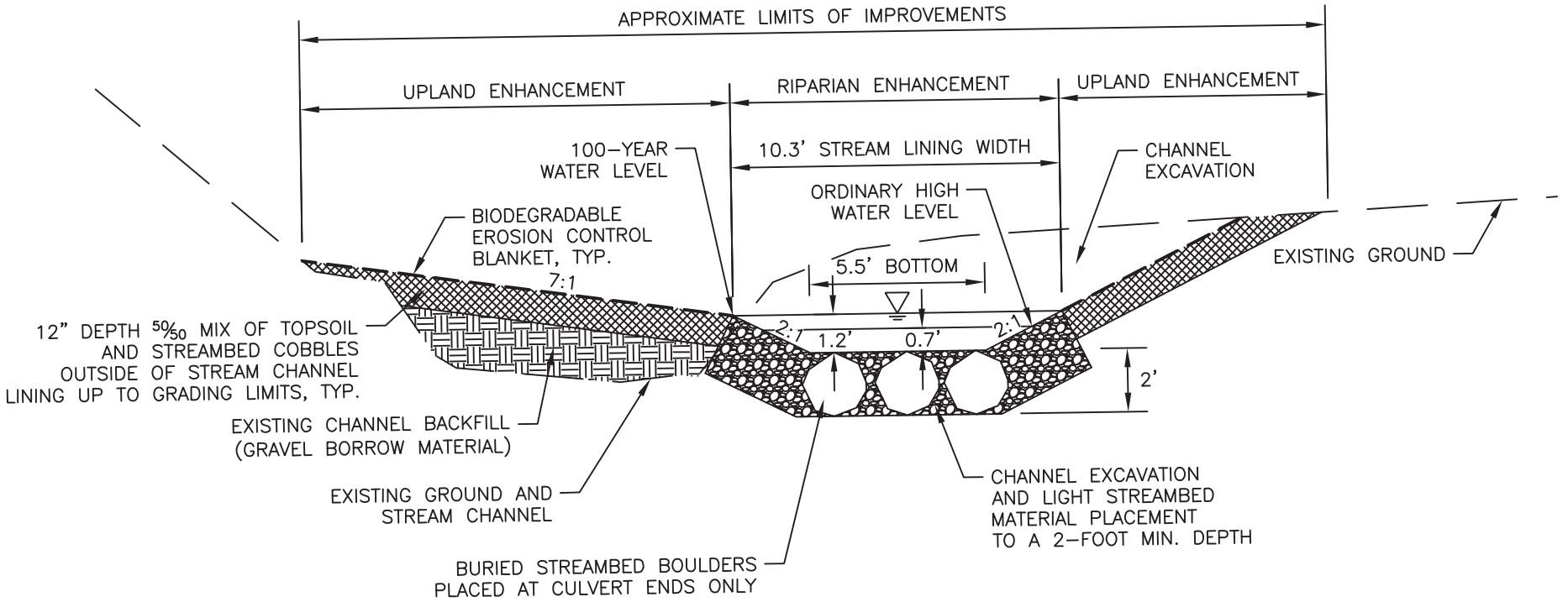
P:\T15-009 61st Place Permitting\Eng\Drawings\JARPA Drawings.dwg – Technician – August 20, 2015 – 10:15:49 AM



DOWNSTREAM CULVERT END CROSS SECTION DETAIL (A)

DOWNSTREAM OF PROPOSED BOX CULVERT **NTS**
LOOKING UPSTREAM TO THE EAST

Project Title: 61st Place West Culvert Improvement Project **Purpose:** To replace existing substandard culvert **Adj. Prop. Owners:** See within **City:** City of Mukilteo **County:** Snohomish	**Proposed Work:** Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert **Directions To Site:** From I-5 exit 189 take SR 526 west. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location	**Figure:** Downstream Culvert End Cross Section **Vert. Datum:** NAVD88 **Location:** +47.917019, -122.315146 **Scale:** NTS **Date:** 8/31/2015 Figure 7

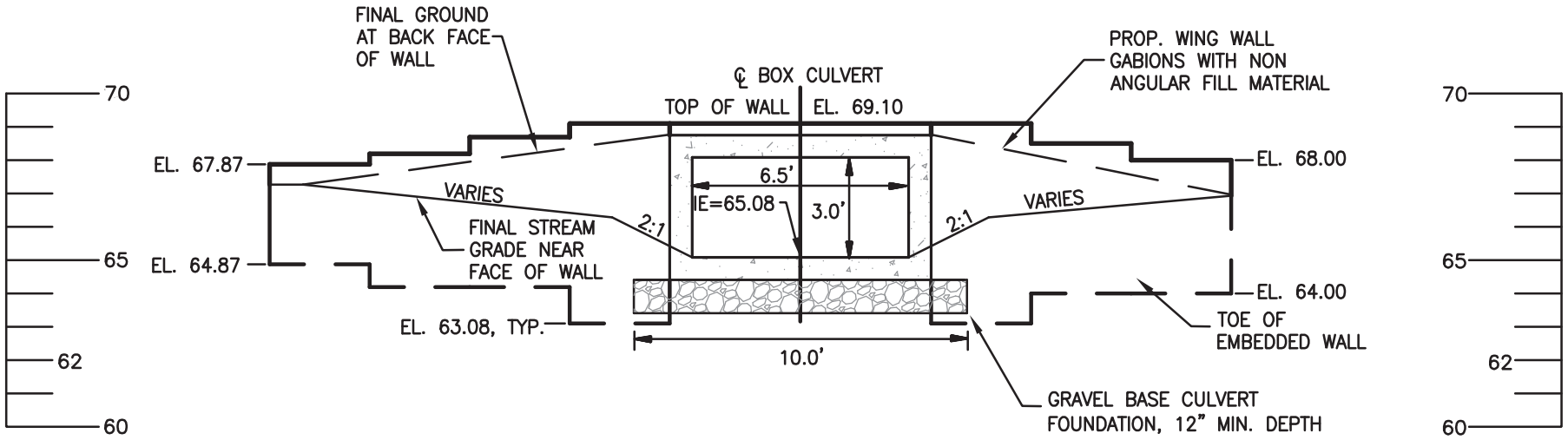


UPSTREAM CROSS SECTION DETAIL 2

NTS

UPSTREAM OF PROPOSED BOX CULVERT
LOOKING UPSTREAM TO THE EAST
STA 23+06 TO STA 23+84

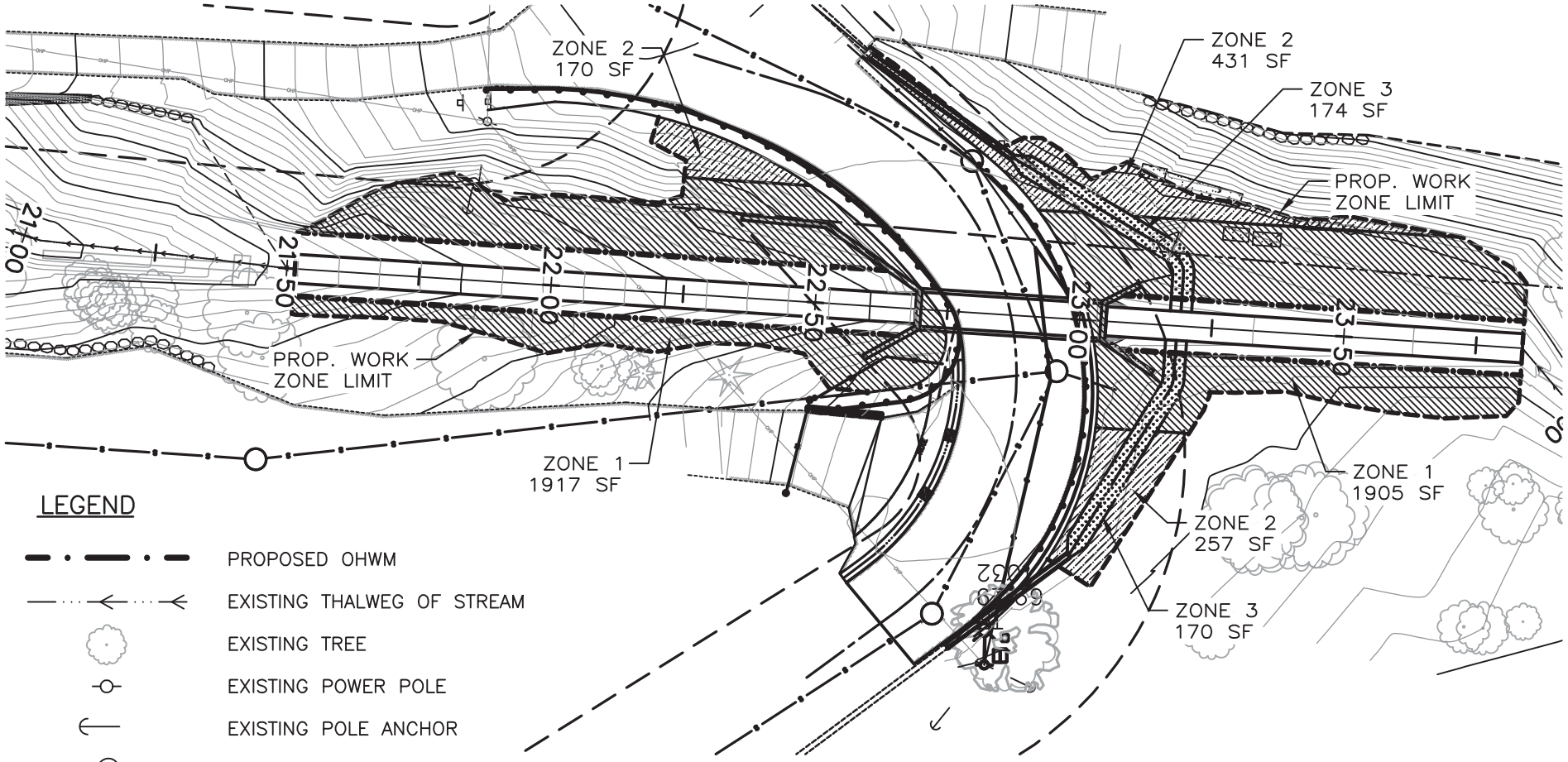
Project Title: 61st Place West Culvert Improvement Project **Purpose:** To replace existing substandard culvert **Adj. Prop. Owners:** See within **City:** City of Mukilteo **County:** Snohomish	**Proposed Work:** Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert **Directions To Site:** From I-5 exit 189 take SR 526 west. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location	**Figure:** Upstream Cross Section **Vert. Datum:** NAVD88 **Location:** +47.917019, -122.315146 **Scale:** NTS **Date:** 8/31/2015 Figure 8



UPSTREAM CULVERT END CROSS SECTION DETAIL B

UPSTREAM OF PROPOSED BOX CULVERT **NTS**
LOOKING DOWNSTREAM TO THE WEST

Project Title: 61st Place West Culvert Improvement Project **Purpose:** To replace existing substandard culvert **Adj. Prop. Owners:** See within **City:** City of Mukilteo **County:** Snohomish	**Proposed Work:** Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert **Directions To Site:** From I-5 exit 189 take SR 526 west. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location	**Figure:** Upstream Culvert End Cross Section **Vert. Datum:** NAVD88 **Location:** +47.917019, -122.315146 **Scale:** NTS **Date:** 8/31/2015 Figure 9



Project Title: 61st Place West Culvert Improvement Project

Purpose: To replace existing substandard culvert

Adj. Prop. Owners: See within

City: City of Mukilteo

County: Snohomish

Proposed Work: Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert

Directions To Site: From I-5 exit 189 take SR 526 West. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location

Figure: Planting Plan

Vert. Datum: NAVD88

Location: +47.917019, -122.315146

Scale: 1" = 30'

Date: 8/27/2015

Figure 10

P:\T15-009 61st Place Permitting\Eng\Drawings\JARPA Drawings - Planting.dwg - Technician - August 20, 2015 - 10:15:49 AM

TREE AND SHRUB PLANTING SCHEDULE

SEE SHEET 10 OF 15 FOR AREAS

Common Name	Scientific Name	Minimum Height	Spacing on center	Zone 1 Qty	Zone 2 Qty	Total
Trees						
Red Alder	Alnus rubra	18"	4'		3	3
Douglas fir	Pseudotsuga menziesii	18"	4'		2	2
Western red cedar	Thuja plicata	18"	4'		2	2
Pacific willow	Salix lucida	36"	4'	67		67
Scouler's willow	Salix scouleriana	36"	4'	67		67
Total Trees				134	7	141
Shrubs						
Black Twinberry	Lonicera involucrata	12"	4'	67		67
Salmonberry	Rubus spectabilis	12"	4'		4	4
Redosier Dogwood	Cornus sericea	12"	4'	68		68
Snowberry	Symphoricarpos albus	12"	4'		4	4
Indian plum	Oemleria cerasiformis	12"	4'		6	6
Vine maple	Acer circinatum	12"	4'		4	4
Sword fern	Polystichum munitum	12"	3'		4	4
Total Shrubs				135	22	157
Total				**269**	**29**	**298**

Project Title: 61st Place West Culvert Improvement Project
Purpose: To replace existing substandard culvert
Adj. Prop. Owners: See within

City: City of Mukilteo
County: Snohomish

Proposed Work: Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert

Directions To Site: From I-5 exit 189 take SR 526 West. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location

Figure: Planting Quantities

Vert. Datum: NAVD88
Location: +47.917019, -122.315146

Scale: NTS
Date: 8/27/2015

Figure 11

HYDROSEED MIX SCHEDULE

SEE SHEET 8 OF 13 FOR AREAS

Zone 3 - Hydroseed Mix				
Common name	**Scientific Name**	**% weight**	**% purity**	**% germination**
Tall fescue	*Festuca arundinacea*	60-70	98	90
Creeping bentgrass	*Agrostis palustris*	10-15	98	85
Meadow foxtail	*Alepocurus pratensis*	10-15	90	80
Alsike clover	*Trifolium hybridum*	1-6	98	90
Redtop bentgrass	*Agrostis alba*	1-6	92	85
Application Rate: 60 pounds per acre				

Project Title: 61st Place West Culvert Improvement Project
Purpose: To replace existing substandard culvert
Adj. Prop. Owners: See within

City: City of Mukilteo
County: Snohomish

Proposed Work: Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert

Directions To Site: From I-5 exit 189 take SR 526 West. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location

Figure: Seeding Mix

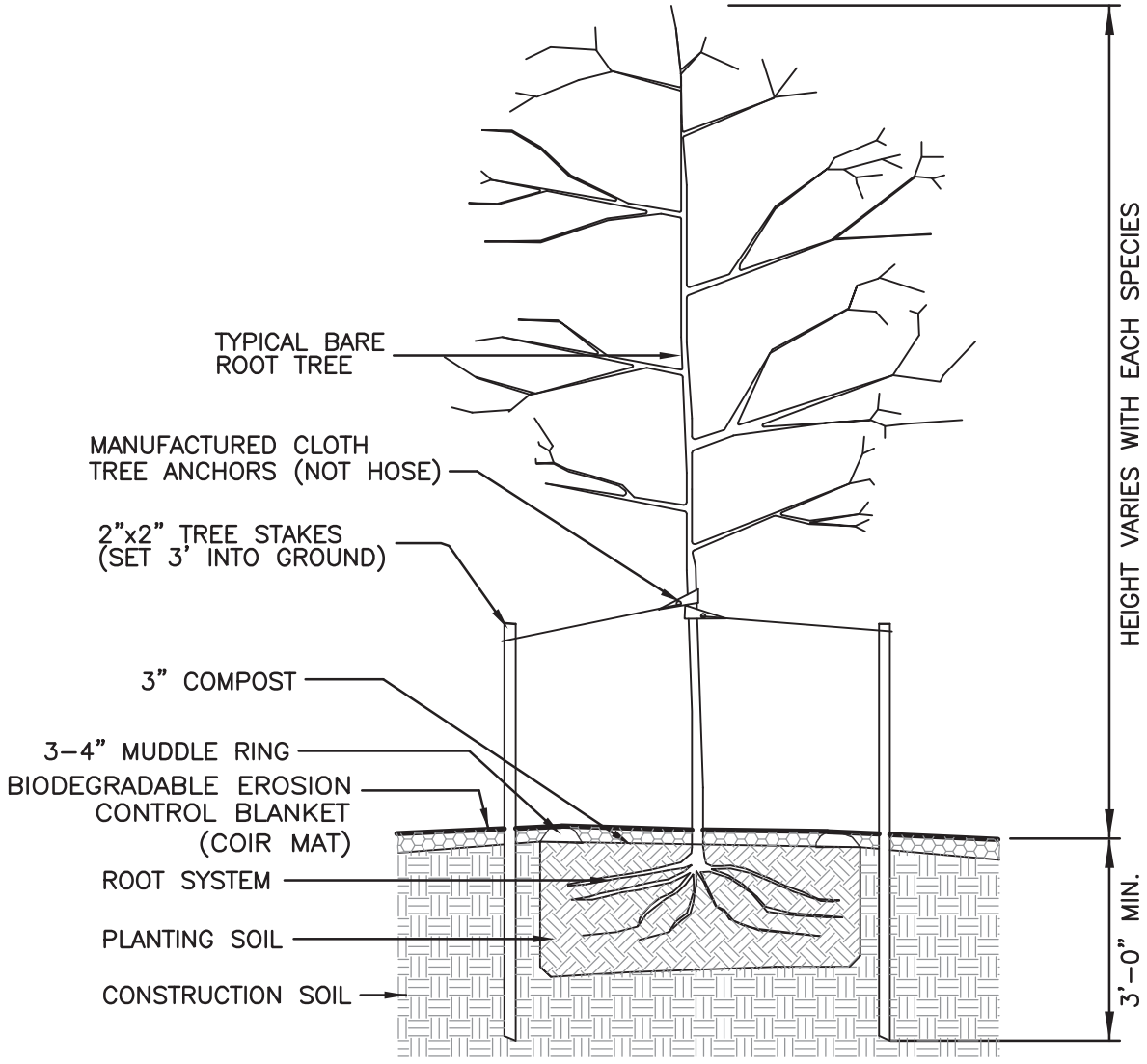
Vert. Datum: NAVD88
Location: +47.917019, -122.315146

Scale: NTS
Date: 8/27/2015 Figure 12

Figure 14

NOTES:

1. ALL TREES OVER 1–1/4" DIAMETER ARE TO BE STAKED (2 PER TREE).
2. PLANTING PIT SHALL BE DEEP ENOUGH TO ENCOMPASS PLANTING ROOTS WITHOUT BENDING AND PLACEMENT OF FERTILIZER PACKS PER GENERAL NOTES ON SHEET 15 OF 15.

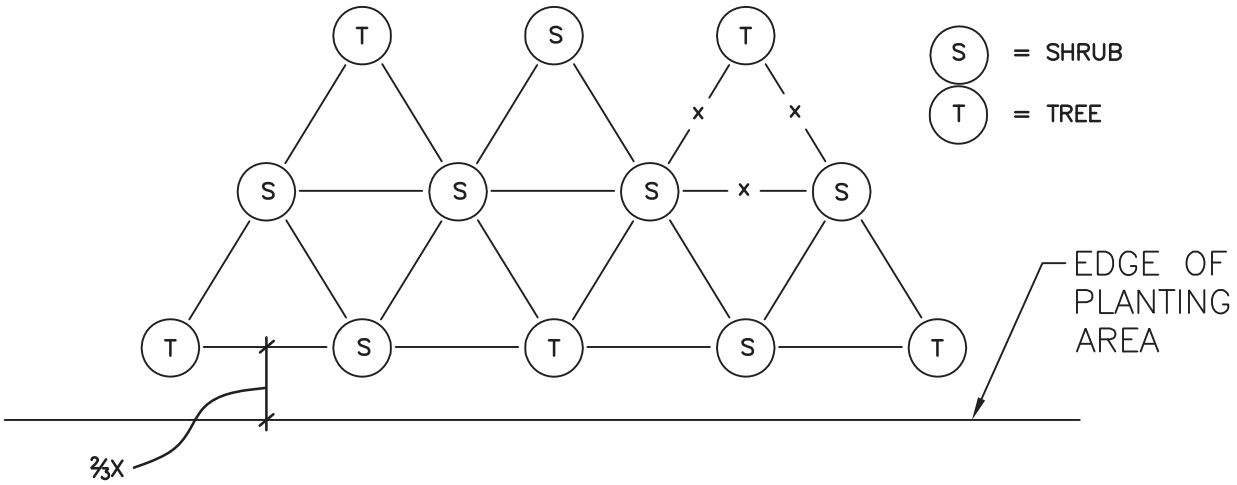


BARE ROOT DECIDUOUS TREE PLANTING DETAIL

NOT TO SCALE

Project Title: 61st Place West Culvert Improvement Project **Purpose:** To replace existing substandard culvert **Adj. Prop. Owners:** See within **City:** City of Mukilteo **County:** Snohomish	**Proposed Work:** Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert **Directions To Site:** From I-5 exit 189 take SR 526 West. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location	**Figure:** Tree Planting Detail **Vert. Datum:** NAVD88 **Location:** +47.917019, -122.315146 **Permit #:** _____ **Scale:** NTS **Date:** 08/27/2015 Figure 13

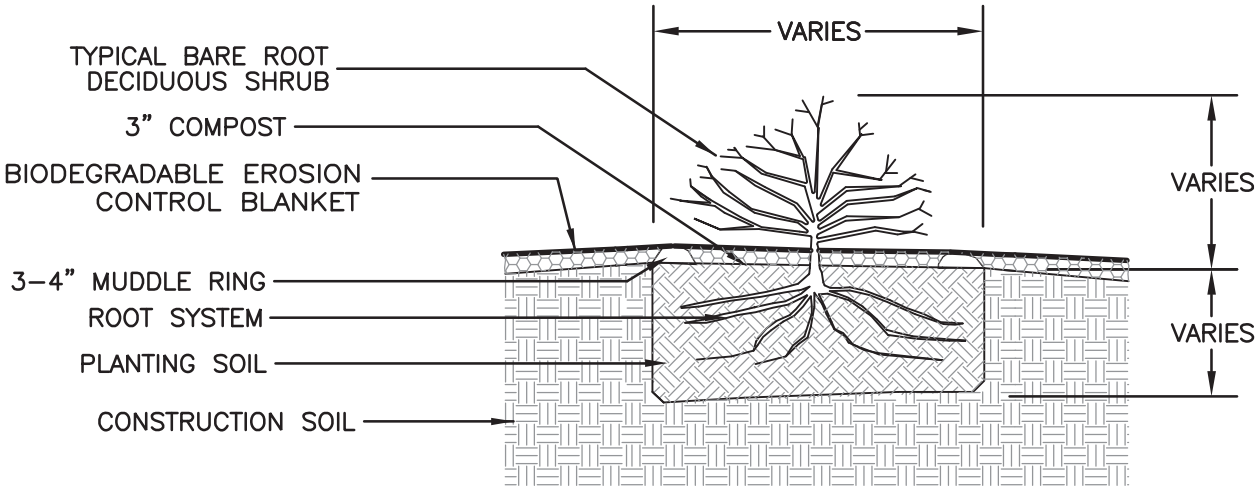
P:\T15-009 61st Place Permitting\Eng\Drawings\ARPA Drawings - Planting.dwg - Technician - August 20, 2015 - 10:15:49 AM



NOTE:
GROUP LIKE SHRUBS IN GROUPS OF 3, 5 OR 7.
TREES SHOULD NOT BE PLACED NEXT TO EACH OTHER.

TYPICAL PLANT SPACING DETAIL

X = PLANT SPACING



BARE ROOT PLANTING DETAIL

NOT TO SCALE

NOTES:

1. PLANTING PIT SHALL BE DEEP ENOUGH TO ENCOMPASS PLANTING ROOTS WITHOUT BENDING AND PLACEMENT OF FERTILIZER PACKS PER GENERAL NOTES ON SHEET 15 OF 15.

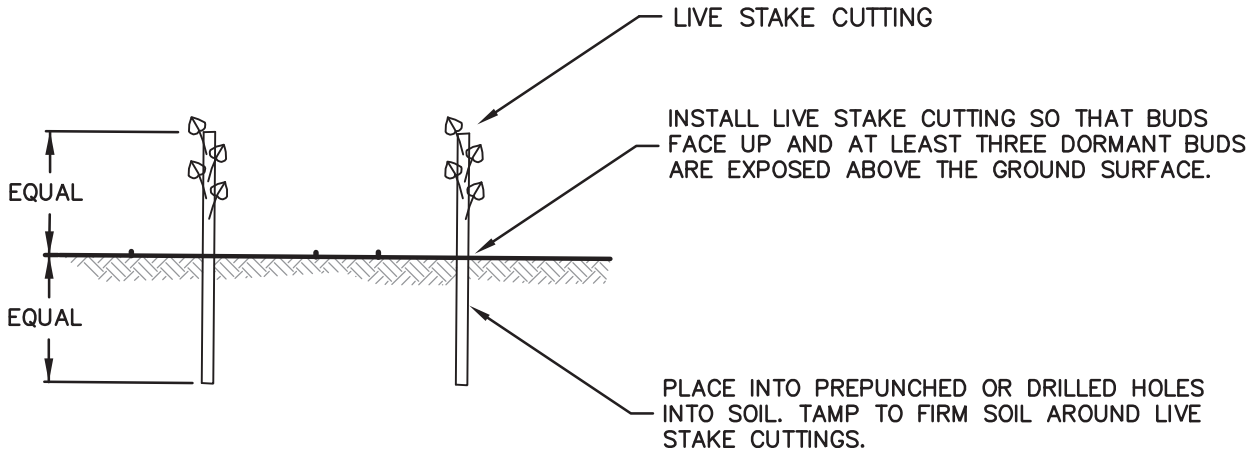
Project Title: 61st Place West Culvert Improvement Project
Purpose: To replace existing substandard culvert
Adj. Prop. Owners: See within
City: City of Mukilteo
County: Snohomish

Proposed Work: Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert

Directions To Site: From I-5 exit 189 take SR 526 West. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location

Figure: Planting Details
Vert. Datum: NAVD88
Location: +47.917019, -122.315146
Permit #: _____
Scale: NTS
Date: 08/27/2015

Figure 14



NOTE:
LIVE STAKE CUTTING SHALL BE A MINIMUM 36 INCHES IN LENGTH.

LIVE STAKE INSTALLATION DETAIL

NOT TO SCALE

SITE PREPARATION NOTE

1. REMOVE ALL LITTER AND WASTE DEBRIS FROM PROPOSED PLANTING AREAS AND BELOW THE ORDINARY HIGH WATER MARK PRIOR TO INITIATION OF PLANTING WORK.

GENERAL NOTES

1. THE PLANTING AREA INCLUDES THE ENTIRE GROUND SURFACE REGARDLESS OF SURFACE COVER BETWEEN PLANTS.
2. VERIFY IN-WATER WORK RESTRICTIONS WITH THE CITY OF MUKILTEO PRIOR TO PLANTING.
3. FOR A NATURAL APPEARANCE, SPACE ALL PLANTS IRREGULARLY AT THE DESIGNATED LOCATIONS AND SPACING.
4. AFTER FINAL GRADING, FINISH AREA BY SPREADING THREE (3) INCHES OF FINE COMPOST, FOLLOWED BY BIODEGRADABLE EROSION CONTROL BLANKET (COIR MAT), AND THEN PLANT AS SPECIFIED. BIODEGRADABLE EROSION CONTROL BLANKET SHALL BE CUT AND LAID BACK TO ALLOW FOR PLANTING. BIODEGRADABLE EROSION CONTROL BLANKET SHALL BE REPLACED AROUND PLANTS FOLLOWING PLANTING.
5. INTERMIX SPECIES IN GROUPS OF THREE, FIVE, OR SEVEN.
6. PLANT MATERIAL SHALL CONFORM TO THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2001) FOR PLANT SIZE AND CONDITION.
7. PLANT MATERIAL SHALL BE LOCALLY GROWN (PUGET SOUND REGION) AND SHALL BE IN HEALTHY AND VIGOROUS GROWING CONDITION.
8. PLANTS LOCATED ON THE PLAN ARE SCHEMATIC AND MAY NEED ADJUSTMENT TO MEET ACTUAL FIELD CONDITIONS. WHEN A CONFLICT WITH FIELD CONDITIONS IS APPARENT, CONSULT WITH THE PROJECT BIOLOGIST.

Project Title: 61st Place West Culvert Improvement Project
Purpose: To replace existing substandard culvert
Adj. Prop. Owners: See within
City: City of Mukilteo
County: Snohomish

Proposed Work: Replacement of existing 24" culvert with 3' high by 6.5' wide by 36' long box culvert

Directions To Site: From I-5 exit 189 take SR 526 West. Turn right on 84th St. SW. Turn left on Mukilteo Speedway. Turn right on 92nd St. SW. Turn right on 91st Pl. SW and proceed to project location

Figure: Planting Notes
Vert. Datum: NAVD88
Location: +47.917019, -122.315146
Permit #: _____
Scale: NTS
Date: 08/31/2015

Figure 15

P:\T15-009 61st Place Permitting\Eng\Drawings\ARPA Drawings - Planting.dwg - Technician - August 20, 2015 - 10:15:49 AM

Appendix B:

Site Photos,

Mukilteo 61st Place W Culvert Replacement

Photo 1. Stream channel about 100 feet upstream of 61st Pl W culvert

Photo 2. Stream channel about 100 feet upstream of 61st Pl W culvert, showing woody debris in stream

Photo 3. Stream channel at 61st Pl W Culvert, looking downstream at culvert

Photo 4. Upstream end of culvert under 61st Pl W

Photo 5. Barrier along stream, downstream of 61st Pl W culvert

Photo 6. Riprap bank descending into stream, downstream of 61st Pl W culvert