



**City of Bellevue
Development Services Department
Land Use Staff Report**

Proposal Name: Lower Coal Creek Flood Hazard Reduction Project

Proposal Address: Culverts adjacent to 5-8 Skagit Key, 52 & 54 Skagit Key, 51 & 54 Glacier Key, 46 and 60 Skagit Key, 45 & 47 Orcas Key, 66, 68, 73 & 75 Skagit Key

Proposal Description: Replace five culverts in the Newport Shores neighborhood with five new single-span bridge structures that meet current design guidelines for fish passage, flood conveyance, debris passage, and traffic safety. Existing stormwater will be rerouted to Lake Washington via two new outfalls. The subject application includes a Critical Areas Land Use permit for the first culvert replacement at upper Skagit Key (adjacent to 5-8 Skagit Key) and SEPA review for all of the projects. The four remaining culverts will be replaced in subsequent years, at a rate of one to two culverts per year. Construction of the new stormwater outfalls will occur during or immediately following replacement of the existing culverts.

File Number: 16-145319-LO

Applicant: Debbie Harris, City of Bellevue Utilities

Decisions Included: Critical Areas Land Use Permit
(Process II. LUC 20.30P)

Planner: Heidi M. Bedwell, Environmental Planning Manager

**State Environmental Policy Act
Threshold Determination:** Determination of Non-Significance

Carol V. Helland, Environmental Coordinator
Development Services Department

Director's Decision: Approval with Conditions

Michael A. Brennan, Director
Development Services Department

By: Carol V. Helland, Land Use Director

Application Date: October 21, 2016
Notice (and Renote) of Application: November 17, 2016 (December 29, 2016)
Decision Publication Date: February 23, 2017
Project/SEPA Appeal Deadline: March 9, 2017

For information on how to appeal a proposal, visit Development Services Center at City Hall or call (425) 452-6800. Comments on State Environmental Policy Act (SEPA) Determinations can be made with or without appealing the proposal within the noted comment period for a SEPA Determination. Appeal of the Decision must be received in the City's Clerk's Office by 5 PM on the date noted for appeal of the decision.

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Attachments

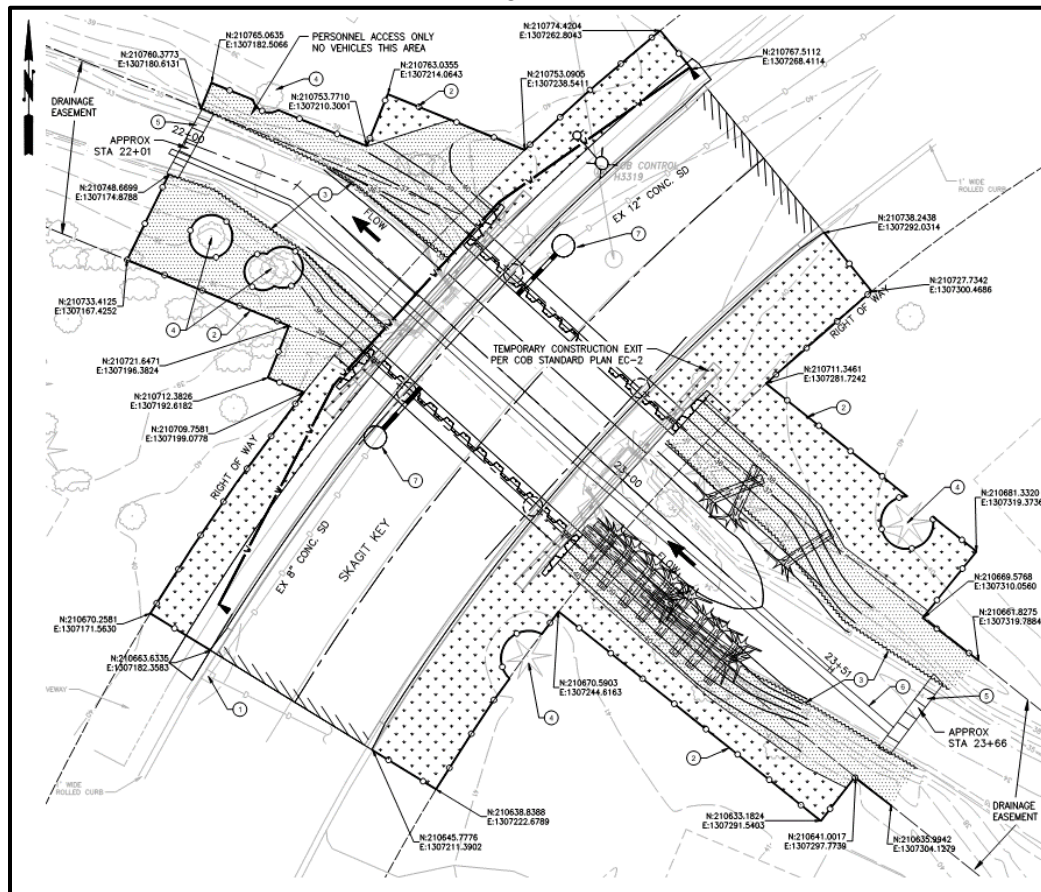
1. Project Plans – Attached
2. Critical Areas Reports – In File
3. Comment Response Letters – Attached
4. SEPA Environmental Checklist – In File

I. Proposal Description and Project Design

A. Overview

Lower Coal Creek Flood Hazard Reduction Project proposes to replace five culverts in the Newport Shores neighborhood with five new single-span bridge structures that meet current design guidelines for fish passage, flood conveyance, debris passage, and traffic safety. Replacement structures would be located where Coal Creek is crossed by the following roadways: Cascade Key, upper Skagit Key, Glacier Key, Newport Key, and lower Skagit Key. Regrading of the stream bank and installation of stabilization measures is necessary to install the upgraded culvert. The first culvert to be replaced is located at upper Skagit Key as shown in Figure 1 below.

Figure 1



The proposed bridge structure will have a 24 foot span and will consist of four drilled shafts (one at each corner of the bridge), a cap beam between the shafts parallel to the stream, and a concrete slab deck. The deck slab will be cast on site and hoisted into place. Existing City-owned and franchise utilities that are in conflict with the proposed new structure will be relocated within the existing rights of way. Existing stormwater conveyance systems will remain in place, but some of the existing pipe will be removed to

accommodate the wider footprint of the bridge structure.

The new bridge structure will simulate the natural stream dimensions, allowing sediment and debris to pass through and providing fish unhindered passage beneath the roadway. The new structure is designed to comply with the current State Hydraulic Code. The channel through the bridge structure is designed so that the shape of the cross-section and the stream gradient match the existing stream channel configuration of the reach near the structure. The channel will be constructed with gravel and cobble material that matches the stream substrate in the adjacent reach. Approximately 14 logs and 3 boulders will be installed within the right and left banks upstream of the new bridge structure to protect against erosion at the bridge opening, stabilize the stream banks, and enhance habitat for fish and other aquatic organisms.

The proposed culvert replacements are identified as allowed activities in City of Bellevue Land Use Code (LUC) section 20.25H.055.B, although a Critical Areas Report is required under LUC 20.25H.080.B.2 for in stream channel and bank modifications associated with the culvert replacement. The subject application includes a Critical Areas Land Use permit review for the first culvert replacement at upper Skagit Key (adjacent to 5-8 Skagit Key) only and SEPA review for all of the projects.

B. Phased Permitting and Construction

The project will be implemented in stages due to budget limitations and to minimize construction-related disturbance to the neighborhood. Separate critical areas permits will be submitted for each of the culverts to be replaced. The four remaining culverts will be replaced in subsequent years, at a rate of one to two culverts per year. In addition, existing stormwater that currently discharges to Coal Creek will be rerouted to Lake Washington via two new outfalls. A shoreline permit will be required to construct the proposed outfalls. Construction of the new stormwater outfalls will occur during or immediate following replacement of the existing culverts. The total timeframe for project implementation will be approximately four to five years.

Figure 2



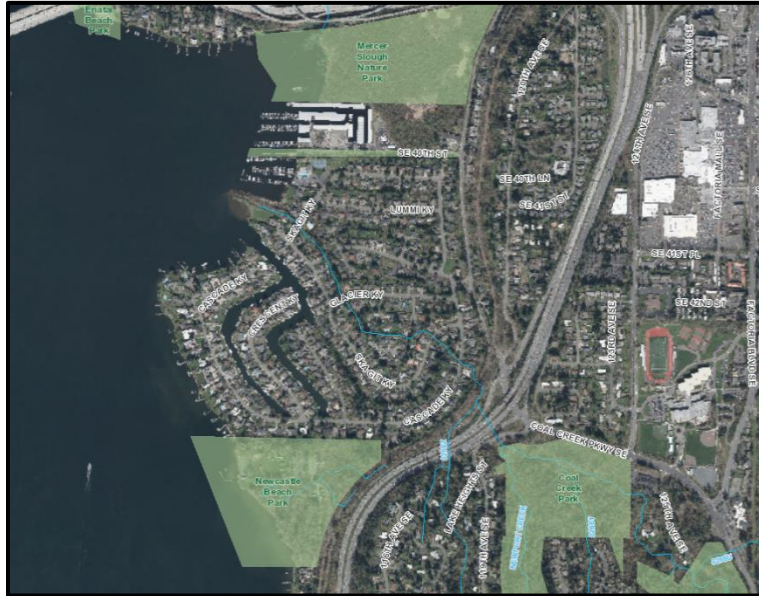
II. Site Description, Zoning, Land Use, and Critical Areas

A. Site Description

The proposed project site is located in the Newport Shores Neighborhood located to the west of Interstate 405 (I-405) and adjacent to Lake Washington. The neighborhood is

characterized by single family development abutting the stream and a series of canals connecting to Lake Washington.

Figure 3 – Vicinity Map



B. Zoning/Comp Plan Designation

The property is zoned as residential R-2.5 (Single Family – 2.5 DU/Acre) with a Comprehensive Plan Land Use Designation of SF-M. See Figure 4 below. Due to the presence of Coal Creek, and the presence of a regulated floodplain, the project site is considered to be within the critical areas overlay district. The project will also include outfalls to Lake Washington, a shoreline of the state, subject to the city's Shoreline Master Program (SMP).

Figure 4 – Zoning Map



C. Land Use Context

The project sites are roadway crossings within a residential neighborhood. The culverts convey Coal Creek which flows to Lake Washington through the neighborhood. There is also a neighborhood yacht club and community club within the neighborhood. Newcastle Beach Park, a City of Bellevue park, is located to the south of the neighborhood. No changes in land uses are associated with the planned development activities.

D. Critical Areas Functions and Values

i. Streams and Riparian Areas – LUC 20.25H.075

- a. **Stream and Riparian Area Functions:** Most of the elements necessary for a healthy aquatic environment rely on processes sustained by dynamic interaction between the stream and the adjacent riparian area (Naiman et al., 1992). Riparian vegetation in floodplains and along stream banks provides a buffer to help mitigate the impacts of urbanization (Finkenbine et al., 2000 in Bolton and Shellberg, 2001). Riparian areas support healthy stream conditions.

Riparian vegetation, particularly forested riparian areas, affect water temperature by providing shade to reduce solar exposure and regulate high ambient air temperatures, slowing or preventing increases in water temperature (Brazier and Brown, 1973; Corbett and Lynch, 1985).

Upland and wetland riparian areas retain sediments, nutrients, pesticides, pathogens, and other pollutants that may be present in runoff, protecting water quality in streams (Ecology, 2001; City of Portland 2001). The roots of riparian

plants also hold soil and prevent erosion and sedimentation that may affect spawning success or other behaviors, such as feeding.

Both upland and wetland riparian areas reduce the effects of flood flows. Riparian areas and wetlands reduce and desynchronize peak crests and flow rates of floods (Novitzki, 1979; Verry and Boelter, 1979 in Mitsch and Gosselink, 1993). Upland and wetland areas can infiltrate floodflows, which in turn, are released to the stream as baseflow

Stream riparian areas, or buffers, can be a significant factor in determining the quality of wildlife habitat. For example, buffers comprised of native vegetation with multi- canopy structure, snags, and down logs provide habitat for the greatest range of wildlife species (McMillan, 2000). Vegetated riparian areas also provide a source of large woody debris that helps create and maintain diverse in-stream habitat, as well as create woody debris jams that store sediments and moderate flood velocities.

Sparsely vegetated or vegetated buffers with non-native species may not perform the needed functions of stream buffers. In cases where the buffer is not well vegetated, it is necessary to either increase the buffer width or require that the standard buffer width be restored or re-vegetated (May 2003). Until the newly planted buffer is established the near term goals for buffer functions may not be attained.

Riparian areas often have shallow groundwater tables, as well as areas where groundwater and surface waters interact. Groundwater flows out of riparian wetlands, seeps, and springs to support stream baseflows. Surface water that flows in to riparian areas during floods or as direct precipitation infiltrates into groundwater in riparian areas and is stored for later discharge to the stream (Ecology, 2001; City of Portland, 2001).

- b. Site Conditions:** The proposed culvert replacement is located adjacent to Coal Creek which is a Type F, fish-bearing stream. The lowermost reach of Coal Creek, including the portion in the action area, was affected by the development of Newport Shores and surrounding area, excavation of canals, channelization, and bank armoring. Large woody debris (LWD) is largely absent from the channel in this reach. The City of Bellevue added approximately 450 pieces of LWD in the upstream reach in 2006 (CH2M HILL 2011), and has added several hundred additional pieces of LWD farther upstream and in other locations such as the Newport Creek tributary. A large metal rack located at the outlet structure of the upstream storm detention pond, just east of I-405, effectively prevents LWD from traveling downstream where it could contribute to flooding.

Increased sedimentation and altered sediment transport processes have been a

longstanding problem in Coal Creek (Kerwin 2001). The large sediment load degrades potential spawning habitat by increasing the amount of fines and increases flooding in depositional areas by reducing channel capacity. The two dominant sources of sediment are stream bank erosion and landslides of the steep slopes above the stream, including occasional catastrophic failures of tailing slopes that remain from the old coal mining activities in the stream's headwater areas. In the 1990s, fine sediments were found to comprise more than 50 percent of the substrate in the reach downstream of I-405 and 25 percent of the substrate in upstream reaches (Kerwin 2001).

Since then, the City of Bellevue and King County have implemented numerous measures to reduce watershed sediment sources, trap and remove stream sediments, and reduce flood peaks entering the Newport Shores neighborhood. These measures have proven highly effective at controlling sediment delivery to the neighborhood (NHC and Tetra Tech 2015). Results of grain size analysis indicate that the surface bed material along Coal Creek in the action area is uniformly graded and composed of coarse gravel and cobbles forming a distinct armor layer. In samples collected in 2013, particles smaller than 10 millimeters made up less than 10 percent of the substrate; comparable values from studies conducted in 1996 and 1984 ranged from 30 to 55 percent (NHC and Tetra Tech 2015).

The loss of channel complexity identified as a limiting factor by Kerwin (2001) is the result of numerous factors, including lack of LWD and manipulation of the channel between the mouth and I-405. Degraded riparian conditions are most pronounced along the lower reach downstream of I-405—that is, in the action area. Although the middle and upper reaches do contain large forested areas, these reaches are dominated by deciduous species that became established after logging and the extensive coal mining activities ceased. Historically, mature coniferous forest would have been the dominant component of the riparian zone and would have contributed LWD to this stream system (Kerwin 2001).

Data from benthic invertebrate sampling studies conducted in 1998, 2001, and 2002 indicated poor to very poor biological conditions in Coal Creek (Bollman 2009). Sediment deposition likely influenced the composition of assemblages at the sampling site, which was approximately 1.25 miles upstream of the action area. The absence of metal-sensitive invertebrates from samples could be an indication of metals contamination (Bollman 2009)- See Critical Areas Report for additional discussion.

c. Stream Impacts

Approximately 0.05 acres of Coal Creek's riparian buffer will be temporarily impacted by clearing and grading activities associated with the culvert installation at upper Skagit Key. The area affected is dominated by non-native and low-

growing species. However, approximately 8 trees will be removed. All but one of the trees to be removed are located on the north side of the stream and therefore do not provide substantial stream shading. The table below summarizes the species, size and location of the trees adjacent to the culvert replacement:

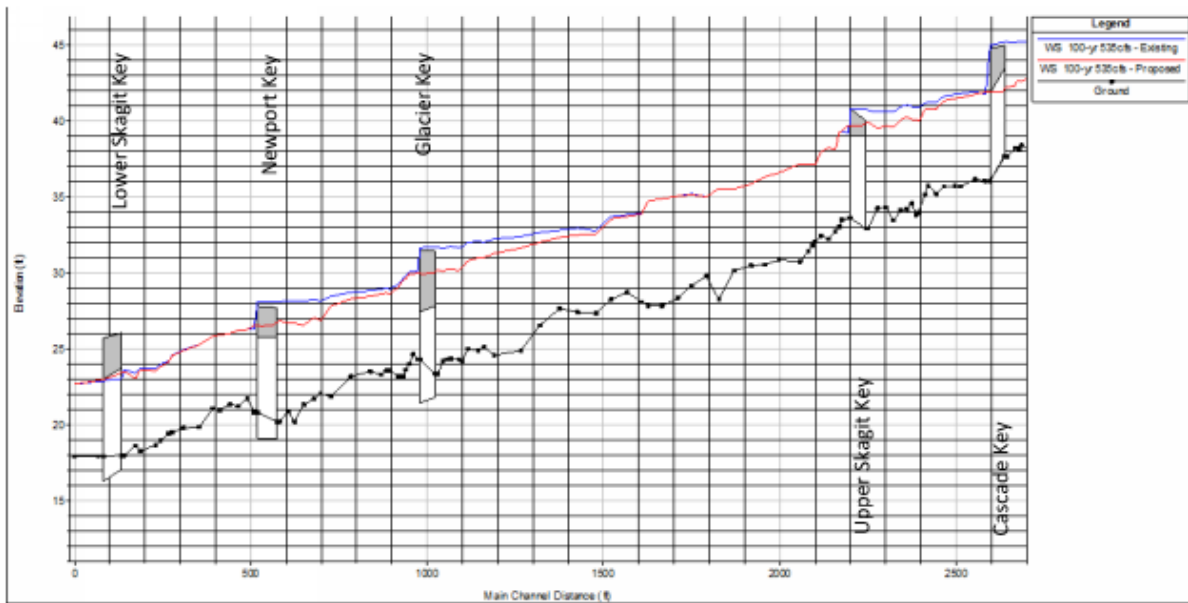
Species—Diameter at Breast Height	Location ¹	Status
Rhododendron (ornamental)—10"	rb d/s, 10 feet from stream	Retain
Beech (ornamental)—18"	rb d/s, in ROW, 15 feet from stream	Remove
Plum (ornamental)—16"	rb u/s, in ROW, 20 feet from stream	Remove
Red alder—16"	rb u/s, in ROW, near water's edge	Remove
Willow—10"	rb u/s, near water's edge	Remove
Western redcedar—10"	rb u/s, top of bank	Remove
Western redcedar—12"	rb u/s, top of bank	Remove
Western redcedar—12"	rb u/s, top of bank	Remove
Pine (non-native)—18"	rb u/s, 25 feet from stream	Retain
Pine (non-native)—26"	lb u/s, 25 feet from stream	Retain
Cherry (ornamental)—10"	lb d/s, in ROW, 10 feet from stream	Remove
Red alder—8"	lb d/s, 10 feet from stream	Retain
Red alder—10"	lb d/s, 5 feet from stream	Retain
Red alder—8"	lb d/s, 5 feet from stream	Retain
Red alder—24"	lb d/s, 10 feet from stream	Retain

ii. Areas of Special Flood Hazard LUC 20.25H.175

- a. **Floodplain Functions:** The value of floodplains can be described in terms of both the hydrologic and ecological functions they provide. Flooding occurs when runoff exceeds the capacity of rivers and streams to convey water within their banks, or when engineered stormwater systems become overwhelmed. Floodplains diminish the effects of urbanization by temporarily storing water and mediating flow to downstream reaches. The capacity of a floodplain to buffer upstream fluctuations in discharge may vary according to valley confinement, gradient, local relief, and flow resistance provided by vegetation. Development within the floodplain can dramatically affect the storage capacity of a floodplain, impact the hydrologic regime of a basin and present a risk to public health and safety and to property and infrastructure.

b. Site Conditions: The project site includes the mainstem of Coal Creek, which is mapped by FEMA Flood Insurance Rate Maps as being within Zone AE, where base flood elevation has been determined. The mainstem channel is also defined as being within the special flood hazard area (LUC 20.25H.175) that is inundated by the 100-year flood. Lower Coal Creek is channelized and generally disconnected from adjacent floodplains, with much of the bank armored.

c. Impacts: No grade change to the site is proposed aside from channel improvements. Under proposed conditions, with 24-foot wide bridge structures, overtopping during a 100-year event is not predicted at any crossing, and flood level reductions upstream of the crossings are on the order of 1.5 to 3 feet. A slight increase in the water surface elevation at the proposed lower Skagit Key structure is predicted for the 2- and 10-year events. This increase is due to the wider channel constructed with the proposed structure that introduces a small expansion loss for lower flows.



III. Consistency with Land Use Code Requirements:

A. Land Use and Zoning District Requirements

This is a proposal to construct replacement culverts under several street crossing, improve stream conditions and reduce the potential for flooding. The site is located in the R-2.5 zoning district. Structural elements proposed with the project are part of the Right-of-Way infrastructure and are not subject to residential zoning controls.

B. Uses and Development Allowed within Critical Areas LUC 20.25H.055

This is a proposal to replace five culverts to reduce flooding associated with Coal Creek. The construction of culverts are identified in the Land Use Code as allowed within critical areas or their buffers under section LUC 20.25H.055.B when no feasible alternative with less impact exists.

Additionally, construction staging within the stream buffer is allowed when associated with an allowed use or activity and when temporary impacts have been addressed. As allowed activities, mitigated impacts are permissible although the proposal must meet the applicable performance standards. Compliance with required performance standards is addressed in Section C below.

The proposal also includes modification of a stream channel. In accordance with LUC 20.25H.080.B modification of a stream channel must be supported by a Critical Areas Report prepared by a qualified professional, including an analysis of technical feasibility and requires review of potential alternatives with less impact on critical areas or critical areas buffers (LUC 20.25H.055.C.2.a); as well as a report demonstrating avoidance of impact to essential critical area functions, minimization of impacts to critical areas and critical area buffers, and mitigation of unavoidable impacts (LUC 20.25H.055.C.2.b).

The applicant's consultant has submitted a critical areas report that demonstrates compliance with the feasibility standards, including a discussion of measures taken to minimize impacts to critical areas functions, and has developed a mitigation plan. Review of the critical areas report, project design, and project history indicates the project has been designed to comply with these performance standards. The Critical Areas Report is included as **Attachment 2** to this report.

C. Consistency with Land Use Code Critical Areas Performance Standards

As a use or activity allowed in critical areas and critical areas buffers under LUC 20.25H.055.B, the project must be designed to comply with the resource specific performance standards applicable to streams and stream buffers and areas of special flood hazard.

To demonstrate compliance with applicable performance standards the applicant has submitted a critical areas report demonstrating avoidance, minimization, and mitigation; has designed the proposed project to include vegetation at the edge of the buffer, and included features intended to improve habitat structure (both riparian and aquatic).

The proposal is limited to the construction of the new culvert and associated improvements. No reduction in flood storage capacity is expected and stream channel alterations will not diminish the flow capacity of the stream channel. Project review confirms the design is consistent with the applicable performance standards. The project Critical Areas Report is available as **Attachment 2** to this report. See related conditions of approval in Section IX of this report.

D. Consistency with Critical Areas Report LUC 20.25.230:

As required by LUC 20.25H.055.C.3.d and LUC 20.25H.080.B.2, the applicant has submitted a complete critical areas report prepared by staff at Parametrix, a qualified professional consultant firm with supplemental information provided by Northwest Hydraulic Consultants Inc (Hydrologic and Hydraulic Design) and Aspect Consulting (Geotechnical Report). The reports meets the minimum requirements in LUC 20.25H.250 and adequately documents the project design and mitigation measures. The applicant's Critical Areas Report is included as **Attachment 2** to this report.

IV. Summary of Technical Reviews

A. Clearing and Grading

The Clearing and Grading Division of the Development Services Department has reviewed the proposed culvert for compliance with Clearing and Grading codes and standards. The Clearing and Grading staff found no issues with the proposed development. Clearing and Grading codes and standards will be applied to the required clearing and grading permit.

V. Public Notice and Comment

Application Date:	October 21, 2016
Public Notice (and Renotice) (500 feet):	November 17, 2016 (December 29, 2016)
Minimum Comment Period:	January 12, 2017

The Notice of Application for this project was published in the City of Bellevue weekly permit bulletin. It was mailed to property owners within 500 feet of the project site. Three comment letters were received and are summarized below:

Karen Walter with the Muckleshoot Indian Tribe Fisheries Division comment letter and the applicant's letter of response are included as **Attachment 3**. Mrs. Walter's letter included several questions intended to clarify many of the project design details and environmental documentation. In response to the questions asked, the applicant provided a response to each of the questions asked. In response to Ms. Walter's comments, the applicant has agreed to revise the design and remove the courser rock banks.

Issue: New storm sewer outfall locations. In particular, the outfall flowing into the community marina. Is any water treatment planned, other than a silt trap? My concern is the runoff nutrients will stimulate weed growth in the marina making it difficult for boaters and dangerous for swimmers.

Response: The design for the outfall is preliminary at this time. The outfalls will be subject to critical areas permitting and will be required to meet the city's utility codes regarding stormwater treatment. The project team will evaluate water quality treatment options during the design phase to determine the appropriate facility type for the site conditions. It is the Utilities Department experience that outfalls from residential

neighborhoods have not generally been significant sources of nutrients that result in aquatic vegetation growth and periodic testing has confirmed that.

Issue: Per the laws of simple hydraulics and hydrodynamics, if you widen the culvert upstream to increase the water flow capacity without first widening the culverts downstream, do you not subject the homes downstream to increased flooding risk? Concern regarding houses adjacent to stream could be at increased risk of flooding and erosion damages.

Response: The project will result in increasing the channel and streamflow capacity, but only at specific locations along the stream. The changes will affect the area around the immediate location of each of the road crossings but these effect is will not extend upstream or downstream to the next road crossing therefore the project would not result in an increased risk of flooding to properties adjacent to other existing culverts. See Attachment 3 for the complete response from the applicant.

VI. State Environmental Policy Act (SEPA)

The environmental review indicates no probability of significant adverse environmental impacts occurring as a result of the proposal. Therefore, issuance of a Determination of Non-Significance (DNS) is the appropriate threshold determination under State Environmental Policy Act (SEPA) requirements.

Adverse impacts which are less than significant are usually subject to City Codes or Standards which are intended to mitigate those impacts. Where such impacts and regulatory items correspond, further documentation is not necessary. For other adverse impacts which are less than significant, Bellevue City Code Sec. 22.02.140 provides substantive authority to mitigate impacts disclosed through the environmental review process. A complete SEPA checklist addressing anticipated impacts is included as **Attachment 4**. Environmental review considers the installation of all five culverts and stormwater outfalls. Separate critical areas land use permits, and shoreline permits for the outfalls, will be required for each of the project elements.

A. Earth and Water

Soils in the project area are mapped Briscot silt loam and urban land. Briscot silt loam is a deep somewhat poorly-drained soil that develops on floodplains in alluvium. Urban land is mapped where dense development has made categorizing the soil difficult or where soil sampling was not possible due to impenetrable cover. Most of the Coal Creek crossings are within Briscot silt loam, except for urban land mapped at Lower Skagit Key. Geotechnical borings excavated for other projects in the vicinity of the project area show that alluvium is the primary sediment type in the area. Fill was identified between 2.5 and 5 feet below surface (fbs) in borings at 33 Tatoosk Key and 42 Orcas Key (Xue and Grant 2006; Washington DNR 2016). A peat deposit, probably associated with the wetland that was once present in the vicinity, was logged at about 20 fbs at 69 Skagit Key and 7 fbs at 42 Orcas Key.

A geotechnical analysis conducted for this project provides a detailed cross-section of the lower Coal Creek area with additional borehole data from each culvert location (Aspect Consulting 2015). The cross section shows that several feet of fill overlie alluvium associated with Cross Creek at each of the culvert crossings. The organic-rich lacustrine layer beneath the channel alluvium is likely the peat deposit that was noted in earlier borings. Underlying bedded lacustrine and channel deposits extend up to about 50 fbs before reaching Pleistocene-age glacial deposits.

Potential impacts to water quality could occur during either construction or maintenance activities. Impacts are primarily limited to temporary increases in turbidity. Flows from the creek will be temporarily diverted during construction activities. Surface water flow in Coal Creek would be temporarily bypassed within a pipe through the work area at each bridge site to protect water quality during construction (see Section B.3.4 for a more detailed description). The bypass pipe would be sized to adequately pass normal stream flows expected to occur during the summer in-water construction windows.

Work within the stream and at the outfalls to Lake Washington will be limited to the approved fish window for Lake Washington and its tributaries as determined by the State Department of Fish and Wildlife. The project will also be subject to city codes and standards related to water quality. Prior to any permit approval, the applicant must ensure water quality requirements are addressed to the extent feasible for the stormwater outfalls.

Construction activities related to this project could cause soil erosion. Soil would be removed and added by large construction vehicles in several locations on the project site. The erosion would be short-term, best management practices (BMPs) would be in place, and conditions post-construction would not increase the potential for erosion on this site. A temporary erosion and sedimentation control plan is included in the project plans, and addresses all requirements for restoring the site as well as erosion and sedimentation management practices. Erosion and sediment control best management practices include the installation of silt fencing around the work area and covering exposed soils to prevent migration of soils to Coal Creek. As part of the required clearing and grading permit, the applicant will also be required to submit and stormwater pollution prevention plan (SWPPP) and information regarding the use of pesticides, insecticides, and fertilizers to avoid impacts to water resources. See Section IX for a related condition of approval.

B. Animals

Fish species that are known to occur in Coal Creek include cutthroat trout, Chinook salmon, coho salmon, sockeye salmon, steelhead, sculpin, and largescale suckers. Lamprey have also been documented in Coal Creek, but they have not been identified to species. Although WDFW does not identify Coal Creek as providing spawning habitat for this species, Chinook salmon may spawn in small numbers in Coal Creek, primarily upstream of the project area. Six Chinook salmon were observed spawning approximately 0.5 mile upstream of the project area during October and November of 2004. Spawning activity since then has been erratic. From 2008 through 2011, more than 40 spawning season survey visits were conducted in the reach of Coal Creek extending approximately 1.5 miles upstream from I-405. Those surveys found only a single Chinook spawner and one redd in Coal Creek, both in 2010. More recently Chinook salmon adults, redds, and carcasses were observed in Coal Creek in 2013, 2014, and 2015. All of the redds observed in 2014 and 2015 were upstream of I-405 (ie at least 1,000 feet upstream of the project area).

WDFW identifies Coal Creek in the project area migratory habitat for steelhead. There are no records of steelhead spawning in Coal Creek. Juvenile trout have been captured in upstream reaches of Coal Creek during summer season electrofishing studies, but it is not known whether there were cutthroat trout, resident rainbow trout or anadromous steelhead. Based on the predominance of cutthroat trout in Bellevue streams, combined with the extremely low numbers of naturally spawned steelhead in Lake Washington basin overall, it is highly improbable that the juvenile trout observed in Coal Creek belonged to Puget Sound steelhead DPS. No steelhead were observed in Coal Creek during early migration season. Coal Creek is not known or expected to support bull trout spawning or rearing; bull trout do not reproduce in any of the low elevation tributaries to Lake Washington.

Lake Washington also is home to adult and juvenile chinook salmon and steelhead trout (listed as Threatened under the Federal Endangered Species Act) who migrate through Lake Washington. Lake Washington also contains coho salmon (Species of Concern under the Federal Endangered Species Act). Lake Washington potentially contains bull trout, a salmonid listed as Threatened under the Federal Endangered Species Act.

Shoreline and stream-related impacts include bank and channel disturbance associated with the construction of the culvert and channel improvements and outfall improvements. Stream-related impacts will be mitigated for through both enhancement and restoration. A complete set of mitigation plans are included as **Attachment 1**. Mitigation will occur on-site near the location of the proposed work. The project will improve channel conditions, and has been designed to eliminate fish passage barriers, adding to the overall benefit of the project. See Section IX for a related condition of approval.

C. Plants

The Puget Lowland is covered with extensive stands of coniferous forest that comprise the

Tsuga heterophylla (western hemlock) vegetation zone. This zone is characterized by western hemlock, western redcedar, and Douglas-fir. Old growth forest understory is typically dense, consisting of shrubs and herbaceous species dominated by sword fern, salal, Oregon grape, oceanspray, blackberry, red huckleberry, and red elderberry (Franklin and Dyrness 1973). Big-leaf maple and red alder are common in moist areas subject to disturbance, while stream courses and floodplains are dominated by red alder, black cottonwood, big-leaf maple, and other riparian plants. Wetlands typically support willow, alder, cranberries, cattail, reeds, wapato, nettles, and skunk cabbage (Frenkel and Heinitz 1987). Today little evidence remains of the native forests and wetlands. Vegetation in the project area is primarily ornamental with many non-native species.

The proposed project will result in impacts to site vegetation. Portions of Coal Creek's riparian buffer will be temporarily affected by clearing and grading. The affected areas are dominated by non-native and low-growing species, but approximately 40 trees will be removed in total for all five culvert replacements. The trees that will be removed are small volunteer alders, native and non-native cedar, fir, non-native pine, and other ornamental species installed as landscape features.

To compensate for impacts to vegetation, the applicant has prepared a preliminary mitigation plan for each of the culvert crossings. The mitigation plans includes a planting plan with native vegetation. Areas on-site that are disturbed by construction-related activities will be restored to the maximum extent possible. The project mitigation plan has been reviewed and determined to be consistent with the planting guidelines established within the City of Bellevue Critical Areas Handbook. The proposed mitigation plan must be implemented as part of the required clearing and grading permit. The preliminary mitigation includes the following area:

- Plant approximately 10,560 square feet (0.245 acre) of enhanced buffer with native trees and shrubs, with a site specific breakdown at each culvert location as follows:

Location	Restoration Area sf (ac)
Cascade Key	2,300 (0.053)
Upper Skagit Key	2,175 (0.050)
Glacier Key	1,050 (0.024)
Newport Key	4,050 (0.093)
Lower Skagit Key	1,090 (0.025)

See conditions of approval in Section IX of this report.

D. Noise

The site is adjacent to single-family residences whose residents are most sensitive to disturbance from noise during evening, late night and weekend hours when they are likely to be at home. Construction noise will be limited by the City's Noise Ordinance (Chapter 9.18 BCC) which regulates construction hours and noise levels. See Conditions of Approval in Section IX of this report

VII. Decision Criteria

A. Critical Areas Report Decision Criteria- General Criteria LUC 20.25H.255

The Director may approve, or approve with modifications, the proposed modification where the applicant demonstrates:

1. The modifications and performance standards included in the proposal lead to levels of protection of critical area functions and values at least as protective as application of the regulations and standards of this code;

Finding: Per the discussion included in this report, the Critical Areas Report submitted with the proposal demonstrates that the proposed performance standards will be at least as protective of the functions and values as a strict application of the regulations and standards of the Land Use Code.

2. Adequate resources to ensure completion of any required mitigation and monitoring efforts;

Finding: The project is owned and managed by the City of Bellevue Utilities Department. They have adequate resources to satisfactorily complete the project and comply with the mitigation and monitoring required.

3. The modifications and performance standards included in the proposal are not detrimental to the functions and values of critical area and critical area buffers off-site; and

Finding: The impacts of the proposed culvert construction have been adequately mitigated so that modifications will not be detrimental. The applicant has prepared a critical areas report that includes an analysis of functions impacts and mitigation measures. The proposed mitigation measures are intended to increase the amount of streamside vegetation, reduce stream bank erosion through the incorporation of large woody debris, and by increasing plant diversity and density.

4. The resulting development is compatible with other uses and development in the same land use district.

Finding: This is a proposal to construct a replacement culvert at the upper Skagit Key

roadway crossing. No changes to land uses are proposed with the application.

B. Critical Areas Land Use Permit Decision Criteria 20.30P

The Director may approve or approve with modifications an application for a critical areas land use permit if:

1. The proposal obtains all other permits required by the Land Use Code;

Finding: The applicant must obtain approval of a Clearing and Grading permit prior to commencing any work. See related condition of approval in Section IX below.

2. The proposal utilizes to the maximum extent possible the best available construction, design and development techniques which result in the least impact on the critical area and critical area buffer;

Finding: The new bridge structures will simulate the natural stream dimensions, allowing sediment and debris to pass through and providing fish unhindered passage beneath the roadway. The new structures will be designed to comply with the current State Hydraulic Code. The proposed culvert replacement structures were sized according to the Stream Simulation method outlined in Chapter 3 of WDFW's Water Crossing Design Guidelines (Barnard et al. 2013), using the Stream Simulation option. The applicant has also provided discussion in the critical areas report detailing the measure to be taken that will minimize impacts to critical areas. This proposal has been found to minimize impact to the sites natural features as much as possible given the project objectives and existing conditions.

3. The proposal incorporates the performance standards of Part 20.25H to the maximum extent applicable, and ;

Finding: As discussed above, this proposed facility has been designed to comply with applicable performance standards for systems located within or adjacent to streams, and areas of special flood hazard.

4. The proposal will be served by adequate public facilities including street, fire protection, and utilities; and;

Finding: This is a proposal to replace an existing culvert. Adequate public facilities are available to the site.

5. The proposal includes a mitigation or restoration plan consistent with the requirements of LUC Section 20.25H.210; and

Finding: A restoration plan has been prepared in accordance with the requirements of LUC 20.25H.210 and includes a maintenance and monitoring plan. This plan is included with the project Critical Areas Report as **Attachment 2**. See related condition of approval

in Section IX below.

6. The proposal complies with other applicable requirements of this code.

Finding: As discussed above, the proposal complies with all other applicable requirements of the Land Use Code.

VIII. Conclusion and Decision

After conducting the various administrative reviews associated with this proposal, including Land Use Code consistency, SEPA, City Code and Standard compliance reviews, the Director of the Development Services Department does hereby **approve with conditions** the proposal to replace an existing culvert at upper Skagit Key crossing. A determination of non-significance is also issued for all proposed culverts and outfalls. Separate critical areas and shoreline permits will be required for the additional culverts and outfalls.

Note- Expiration of Approval: In accordance with LUC 20.30P.150 a Critical Areas Land Use Permit automatically expires and is void if the applicant fails to file for a Clearing and Grading Permit or other necessary development permits within one year of the effective date of the approval.

IX. Conditions of Approval

The applicant shall comply with all applicable Bellevue City Codes and Ordinances including but not limited to:

<u>Applicable Ordinances</u>	<u>Contact Person</u>
Clearing and Grading Code- BCC 23.76	Tom McFarlane, 425-452-5207
Land Use Code- BCC 20.25H	Heidi M. Bedwell, 425-452-4862
Noise Control- BCC 9.18	Heidi M. Bedwell, 425-452-4862

The following conditions are imposed under the Bellevue City Code or SEPA authority referenced:

1. Clearing and Grading Permit: Approval of this Critical Areas Land Use Permit does not constitute an approval of any development permit. An application for a clearing and grading permit must be submitted and approved before construction can begin. Plans submitted as part of any permit application shall be consistent with the activity permitted under this approval.

Authority: Land Use Code 20.30P.140

Clearing & Grading Code 23.76.035

Reviewer: Tom McFarlane, Clearing & Grading Section

2. Mitigation, Maintenance, and Monitoring Plan: A mitigation plan for all areas of permanent new disturbance and temporary disturbance is required to be submitted for review and approval by the City of Bellevue prior to issuance of the required development permit. To ensure the proposed restoration plan is successful, the mitigation, maintenance, and monitoring plan submitted as part of this application shall be submitted as part of the underlying clearing and grading permit required to implement the project. In order to ensure the mitigation plan successfully establishes, the mitigation plan shall include the following performance standards for a period of five years following installation:

- Year 1: 100% survival of all installed plants & 0% invasive coverage.
 - Year 2: 90% survival of all installed plants & <5% invasive coverage.
 - Year 3: 85% survival of all installed plants, >35% native coverage & <5% invasive coverage.
 - Year 4 : >50% native coverage & <5% invasive coverage.
 - Year 5: 80% survival of all installed plants and >70% native coverage & <5% invasive coverage.
- Authority: Land Use Code 20.25H.220, 20.25H.180.C.5
Reviewer: Heidi M. Bedwell, Land Use

3. Mitigation Installation: Mitigation installation shall be installed according to the mitigation plans submitted as part of this application within one year of culvert completion.

- Authority: Land Use Code 20.25H.220, 20.25H.180.C.5
Reviewer: Heidi M. Bedwell, Land Use

4. Mitigation Maintenance: Maintenance of mitigation plantings shall include, at a minimum, three entries per year for a period of no less than 5 years. During each entry, plant growth will be evaluated, soils amended as needed, and invasives will be suppressed.

- Authority: Land Use Code 20.25H.220, 20.25H.180.C.5
Reviewer: Heidi M. Bedwell, Land Use

5. Submittal of Mitigation Maintenance and Monitoring Reports: As part of the required 5 years of mitigation maintenance and monitoring, the applicant shall submit annual monitoring reports to the Development Services Department Land Use Division at the end of the growing season by no later than November 30 for each year monitored.

- Authority: Land Use Code 20.25H.220, 20.25H.180.C.5
Reviewer: Heidi M. Bedwell, Land Use

6. In-Water Work Window: To prevent damage or disturbance to threatened fish

species, work in the active channel approved by the underlying clearing and grading permit must be completed during an in-water work window of July 1 to August 31 unless an exception has been granted in writing by the Washington Department of Fish and Wildlife.

Authority: Land Use Code 20.25H.160
Reviewer: Heidi M. Bedwell, Land Use

7. **Applicable State and Federal Permits:** To mitigate adverse impacts, Federal and state water quality standards shall be met. All required federal and state permits and approvals must be received by the applicant prior to the commencement of any work. A copy of the approved State and Federal permits shall be submitted to the City of Bellevue Development Services Department Land Use Division prior to construction.

Authority: Land Use Code 20.25H.055.C.3.d
Reviewer: Heidi M. Bedwell, Development Services Department

8. **Rainy Season restrictions:** Due to the proximity of this work to Coal Creek, no clearing and grading activity may occur during the rainy season, which is defined as November 1 through April 30 without written authorization of the Development Services Department. Should approval be granted for work during the rainy season, increased erosion and sedimentation measures, representing the best available technology must be implemented prior to beginning or resuming site work.

Authority: Bellevue City Code 23.76.093.A,
Reviewer: Tom McFarlane, Clear and Grade

9. **Pesticides, Insecticides, and Fertilizers:** The applicant must submit as part of the required Clearing and Grading Permit information regarding the use of pesticides, insecticides, and fertilizers in accordance with the City of Bellevue's "Environmental Best Management Practices".

Authority: Land Use Code 20.25H.220.H
Reviewer: Heidi M. Bedwell, Land Use

10. **Noise Control:** Noise related to construction is exempt from the provisions of BCC 9.18 between the hours of 7 am to 6 pm Monday through Friday and 9 am to 6 pm on Saturdays, except for Federal holidays and as further defined by the Bellevue City Code. Noise emanating from construction is prohibited on Sundays or legal holidays unless expanded hours of operation are specifically authorized in advance. Requests for construction hour extension must be done in advance with submittal of a construction noise expanded exempt hours permit.

Authority: Bellevue City Code 9.18
Reviewer: Heidi M. Bedwell, Land Use

11. **Construction Stormwater Pollution Prevention Plan:** To ensure contaminated stormwater or construction-related runoff does not pollute adjacent surface water, a construction stormwater pollution prevention plan (CSWPPP) is required for all clearing and grading permit applications. A turbidity and pH monitoring plan must be submitted and

approved prior to issuance of the clearing and grading permit, and the plan must be implemented during site work. The plan must be developed and implemented in accordance with the Turbidity & pH Monitoring Requirements contained in the Bellevue Clearing & Grading Development Standards.

Authority: Bellevue City Code 23.76
Reviewer: Tom McFarlane, Clear and Grade

CITY OF BELLEVUE

UTILITIES DEPARTMENT

LOWER COAL CREEK FLOOD HAZARD REDUCTION PROJECT UPPER SKAGIT KEY CULVERT REPLACEMENT

C.I.P. # D-106

BID NO:

MAYOR

JOHN STOKES

DEPUTY MAYOR

JOHN CHELMINIAK

CITY MANAGER

BRAD MIYAKE

DIRECTOR OF UTILITIES DEPARTMENT

NAV OTAL

CITY COUNCIL

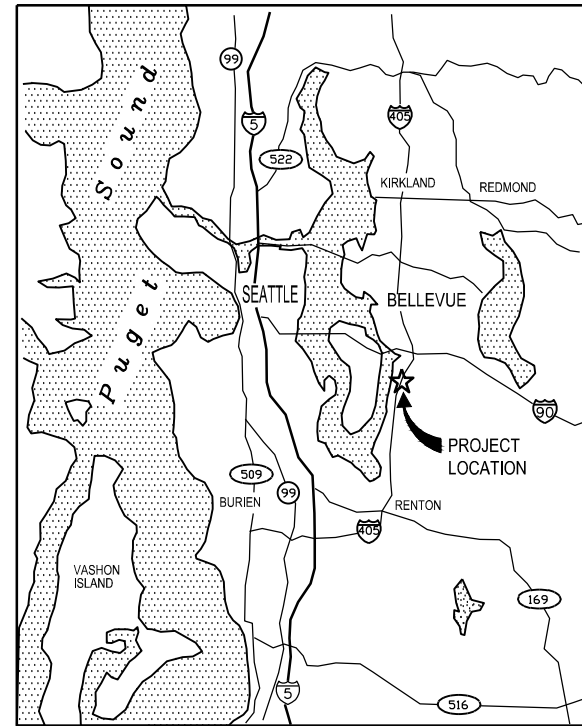
CONRAD LEE

JENNIFER ROBERTSON

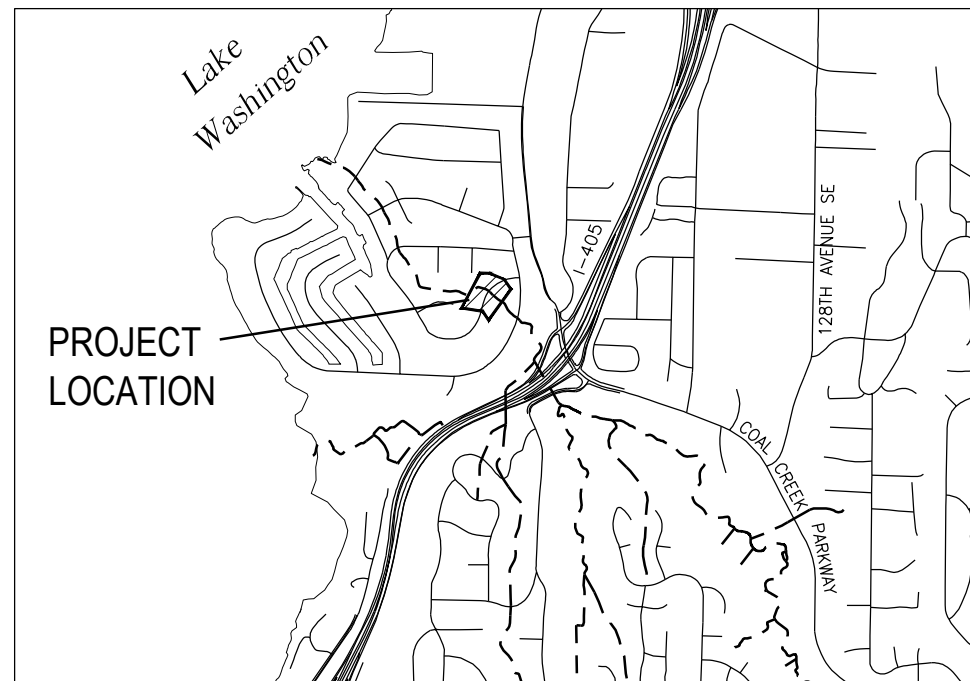
LYNNE ROBINSON

VANDANA SLATTER

KEVIN WALLACE



VICINITY MAP



LOCATION MAP

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SHEET

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3	G3 NOTES
4	EC1 EXISTING CONDITIONS AND SURVEY CONTROL
5	E1 STREAM BYPASS AND ESC PLAN
6	C1 CREEK AND ROAD PLAN
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22	B9 BAR LIST
23	TC1 TRAFFIC CONTROL
24	L1 LANDSCAPE RESTORATION PLAN
25	L2 LANDSCAPE RESTORATION DETAILS

CALL TWO
BUSINESS DAYS
BEFORE YOU DIG
1-800-424-5555

60% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS



Approved By

DESIGN MANAGER DATE
PROJECT MANAGER DATE

GMS DESIGNED BY DATE
MJS DRAWN BY DATE
JS CHECKED BY DATE



City of
Bellevue
UTILITIES

UPPER SKAGIT KEY CULVERT REPLACEMENT
TITLE SHEET - SHEET INDEX

G1

SHT 1 OF 25

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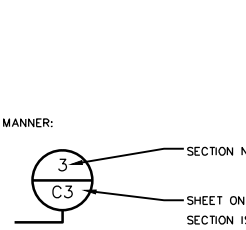
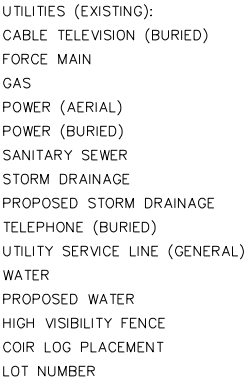
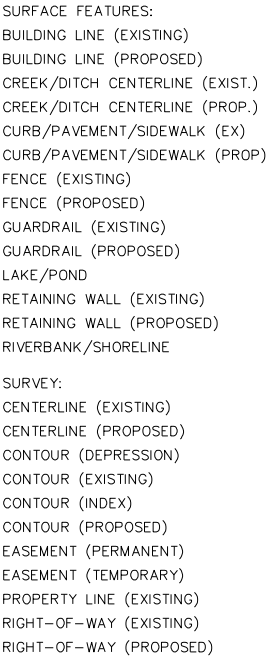
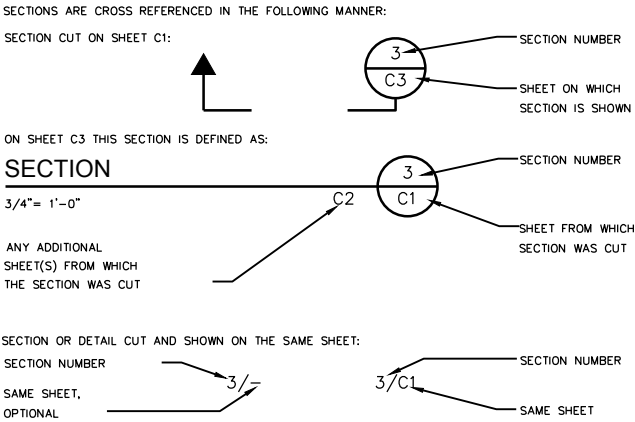
ABBREVIATIONS

	FEET
"	INCHES
%	PERCENT
&	AND
AC	ASBESTOS CONCRETE
APPROX	APPROXIMATE
CB	CATCH BASIN
CL	CENTERLINE
COB	CITY OF BELLEVUE
COMC	CONCRETE
CPE	CORRUGATED POLYETHYLENE PIPE
CSBC	CRUSHED SURFACING BASE COURSE
CSTC	CRUSHED SURFACING TOP COURSE
CTR	CENTER
D	STORM DRAIN
DI	DUCTILE IRON
DIA	DIAMETER
E	EAST
EL	ELEVATION
ESC	EROSION AND SEDIMENT CONTROL
EX	EXISTING
FEMA	FEDERAL EMERGENCUY MANAGEMENT AGENCY
FL	FLOW LINE
FT	FEET
FUT	FUTURE
G	GAS
HMA	HOT MIX ASPHALT
HORIZ	HORIZONTAL
I	INTERSTATE
ID	IDENTIFIER
IE	INVERT ELEVATION
L	LEFT
LT	LEFT
LWD	LARGE WOODY DEBRIS
MIL	MILLIMETER
N	NORTH
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NE	NORTHEAST
NTS	NOT TO SCALE
NW	NORTHWEST
OHW	ORDINARY HIGH WATER
PERM	PERMANENT
PSE	PUGET SOUND ENERGY
R	RIGHT
ROW	RIGHT OF WAY
RT	RIGHT
S	SANITARY SEWER
S	SOUTH
SD	STORM DRAIN
SE	SOUTH EAST
SF	SQUARE FEET
SPEC	SPECIFICATION
SS	SANITARY SEWER
SSMH	SANITARY MANHOLE
STA	STATION
STD	STANDARD
SW	SOUTHWEST
T	TELEPHONE
TEMP	TEMPORARY
TYP	TYPICAL
UGP	UNDERGROUND POWER
VERT	VERTICAL
W	WATER
W	WEST
W/	WITH
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

SYMBOLS

SYMBOL	EXIST.	PROP.	DESCRIPTION
	J	J	CAP/PLUG
	⌘	⌘	COUPLING
	•	•	GUARD POST
	▷	▷	REDUCER
	◀	◀	THRUST BLOCK
	⊞	⊞	WATER METER
			FIRE HYDRANTS:
	⊙	⊙	2-NOZZLE
	⊙	⊙	3-NOZZLE
			JOINTS:
			FLANGE/BLIND FL
	[[MECHANICAL
	C	C	PUSH-ON/HUB
	I	I	THREAD
			VALVES:
	⊙	⊙	AIR RELIEF
	?	?	BLOW-OFF
	⌘	⌘	BUTTERFLY
	N	N	CHECK
	⌘	⌘	GATE/GENERAL
	⌘	⌘	PLUG VALVE
	⊞	⊞	GAS METER
	⊞	⊞	GAS VALVE
	Δ	Δ	PAD MOUNTED TRANSFORMER
	P	P	POWER VAULT
			TRANSMISSION TOWER
	⊙	⊙	UTILITY POLE
	←	←	UTILITY POLE ANCHOR
	□	■	TELEPHONE RISER
	T	T	TELEPHONE VAULT
	⊕	⊕	MONUMENT (IN CASE)
	⊕	⊕	MONUMENT (SURFACE)
	⊗	⊗	SOIL BORING
	x	⊗	SPOT ELEVATION
	○	●	SAN. SEWER MANHOLE
	□	■	STORM DRAIN CATCH BASIN
	⊕	⊕	STORM DRAIN MANHOLE
UG	⌘	⌘	STREETLIGHT ASSEMBLY W/ UNDERGROUND POWER
			EMBANKMENT
	□	■	MAIL BOX
			RIP RAP
			ROCKERY
			SHRUB
			WOOD SIGN POST
			METAL SIGN POST
			TREE (Conifer)
			TREE (Deciduous)
	⌘	⌘	YARD LIGHT

SHEET REFERENCE



60% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS



TETRA TECH

www.tetrattech.com

1420 Fifth Avenue, Suite 550
Seattle, Washington 98101

Phone: 206-728-9655 Fax: 206-883-9301

Approved By	
DESIGN MANAGER	DATE
PROJECT MANAGER	DATE

GMS	DESIGNED BY	DATE
MJS	DRAWN BY	DATE
JS	CHECKED BY	DATE



City of Bellevue

UTILITIES

UPPER SKAGIT KEY CULVERT REPLACEMENT ABBREVIATIONS-LEGEND-SYMBOLS	
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WATER GENERAL NOTES

- ALL WORK SHALL CONFORM TO THE 2016 CITY OF BELLEVUE UTILITY ENGINEERING STANDARDS AND THE DEVELOPER EXTENSION AGREEMENT.
- ALL PIPE SHALL BE DUCTILE IRON CLASS 52 UNLESS OTHERWISE SHOWN.
- ALL PIPE AND FITTINGS NOT TO BE DISINFECTED IN PLACE SHALL BE SWABBED WITH 1% AVAILABLE CHLORINE SOLUTION PRIOR TO INSTALLATION.
- THE NEW WATER MAIN SHALL BE CONNECTED TO THE EXISTING SYSTEM ONLY AFTER NEW MAIN IS PRESSURE TESTED, FLUSHED, DISINFECTED AND SATISFACTORY BACTERIOLOGICAL SAMPLE RESULTS ARE OBTAINED AND RECEIVED BY THE CITY INSPECTOR. SEE STANDARD DETAIL W-9.
- AFTER DISINFECTING THE WATERMAIN, DISPOSE OF CHLORINATED WATER BY DISCHARGING TO THE NEAREST OPERATING SANITARY SEWER.
- WATERMAIN SHUT-OFF SHALL BE COORDINATED WITH THE WATER OPERATIONS DIVISION FOR PREFERRED TIMING DURING FLOW CONTROL CONDITIONS. WATERMAIN SHUT-OFFS SHALL NOT BE SCHEDULED TO TAKE PLACE ON FRIDAYS, OR ON THE DAY BEFORE A CITY HOLIDAY, UNLESS OTHERWISE APPROVED BY THE UTILITY.
- THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD THEREFORE BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN, AND TO FURTHER DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN HEREON WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN.
- DEFELECT THE WATERMAIN ABOVE OR BELOW EXISTING UTILITIES AS REQUIRED TO MAINTAIN 3 FT. MINIMUM COVER AND 12 INCH MINIMUM VERTICAL CLEARANCE BETWEEN UTILITIES UNLESS OTHERWISE SPECIFIED.
- WRAP ALL DUCTILE IRON PIPE AND ADJACENT VALVES AND FITTINGS WITH 8-MIL. POLYETHYLENE CONFORMING TO AWWA C105.
- THE WATERMAIN SHALL BE INSTALLED ONLY AFTER THE ROADWAY SUBGRADE IS BACKFILLED, GRADED AND COMPACTED IN CUT AND FILL AREAS.
- TRENCH BACKFILL AND SURFACE RESTORATION OF EXISTING ASPHALT PAVEMENT SHALL BE AS REQUIRED BY THE RIGHT-OF-WAY USE PERMIT.
- ALL FITTINGS SHALL BE BLOCKED PER STANDARD DETAILS UNLESS OTHERWISE SPECIFIED.
- ALL SERVICES SHALL BE 1" x 1" PER STANDARD DETAILS UNLESS OTHERWISE SPECIFIED. ADAPTORS FOR 3/4" METERS SHALL BE USED WHERE APPLICABLE.
- WHEN WORKING WITH ASBESTOS CEMENT PIPE, THE CONTRACTOR IS REQUIRED TO MAINTAIN WORKERS' EXPOSURE TO ASBESTOS MATERIAL AT OR BELOW THE LIMIT PRESCRIBED IN WAC 296-62-07705.
- CALL 1-800-424-5555, OR 811, 72 HOURS BEFORE CONSTRUCTION FOR UTILITY LOCATIONS.
- UNIFORM PLUMBING CODE REQUIRES THE INSTALLATION OF PRIVATELY OWNED AND OPERATED PRESSURE REDUCING VALVES WHERE THE OPERATING PRESSURE EXCEEDS 80 PSI.
- NOT USED.
- BEFORE COMMENCEMENT OF TRENCHING, THE CONTRACTOR SHALL PROVIDE CATCH BASIN INSERTS FOR ALL CATCH BASINS THAT WILL RECEIVE RUNOFF FROM THE PROJECT SITE. THE CONTRACTOR SHALL PERIODICALLY INSPECT THE CONDITION OF ALL INSERTS AND REPLACE AS NECESSARY.
- NOT USED.
- NOT USED.
- AVOID CROSSING WATER OR SEWER MAINS AT HIGHLY ACUTE ANGLES. THE SMALLEST ANGLE MEASURE BETWEEN UTILITIES SHOULD BE 45 TO 90 DEGREES.
- WHERE WATERMAIN CROSSES ABOVE OR BELOW SANITARY SEWER, ONE FULL LENGTH OF WATER PIPE SHALL BE CENTERED FOR MAXIMUM JOINT SEPARATION.
- AT POINTS WHERE EXISTING THRUST BLOCKING IS FOUND, MINIMUM CLEARANCE BETWEEN THE CONCRETE BLOCKING AND OTHER BURIED UTILITIES OR STRUCTURES SHALL BE 5 FEET.
- WORKERS MUST FOLLOW CONFINED SPACE REGULATIONS AND PROCEDURES WHEN ENTERING OR DOING WORK IN COB OWNED CONFINED SPACES. COMPLETED PERMIT MUST BE GIVEN TO THE UTILITIES INSPECTOR PRIOR TO ENTRY.
- NOT USED.
- NOT USED.
- NOT USED.

STORM DRAINAGE GENERAL NOTES

- ALL WORK SHALL CONFORM TO THE 2016 EDITION OF THE CITY OF BELLEVUE UTILITIES DEPARTMENT ENGINEERING STANDARDS AND THE DEVELOPER EXTENSION AGREEMENT.
- STORM PIPE SHALL BE PVC CONFORMING TO ASTM D-3034 SDR 35 (4" - 15") OR ASTM F-679 (18"-27"). BEDDING AND BACKFILL SHALL BE AS SHOWN IN THE STANDARD DETAILS.
- THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN HEREON HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD THEREFORE BE CONSIDERED APPROXIMATE ONLY AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE EXCAVATOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN, AND TO FURTHER DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN HEREON WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN. IMMEDIATELY NOTIFY THE ENGINEER IF A CONFLICT EXISTS.
- THE FOOTING DRAINAGE SYSTEM AND THE ROOF DOWNSPOUT SYSTEM SHALL NOT BE INTERCONNECTED AND SHALL SEPARATELY CONVEY COLLECTED FLOWS TO THE CONVEYANCE SYSTEM OR TO ON-SITE STORMWATER FACILITIES.
- PROVIDE AND MAINTAIN TEMPORARY SEDIMENTATION COLLECTION FACILITIES TO ENSURE THAT SEDIMENT OR OTHER HAZARDOUS MATERIALS DO NOT ENTER THE STORM DRAINAGE SYSTEM IN ACCORDANCE WITH THE SITE'S APPROVED SWPPP. FOR ALL CONSTRUCTION DURING THE RAINY SEASON, DOWNHILL BASINS AND INLETS MUST BE PROTECTED WITH CATCH BASIN INSERTS. SIMPLY PLACING FILTER FABRIC UNDER THE GRATE IS NOT ACCEPTABLE.
- PRIOR TO FINAL INSPECTION AND ACCEPTANCE OF STORM DRAINAGE WORK, PIPES AND STORM DRAIN STRUCTURES SHALL BE CLEANED AND FLUSHED. ANY OBSTRUCTIONS TO FLOW WITHIN THE STORM DRAIN SYSTEM, (SUCH AS RUBBLE, MORTAR AND WEDGED DEBRIS), SHALL BE REMOVED AT THE NEAREST STRUCTURE. WASH WATER OF ANY SORT SHALL NOT BE DISCHARGED TO THE STORM DRAIN SYSTEM OR SURFACE WATERS.
- NOT USED.
- ALL GRATES IN ROADWAYS SHALL BE DUCTILE IRON, BOLT-LOCKING, VANED GRATES PER THE STANDARD DETAILS. STRUCTURES IN TRAFFIC LANES OUTSIDE OF THE CURBLINE WHICH DO NOT COLLECT RUNOFF SHALL BE FITTED WITH ROUND, BOLT-LOCKING SOLID COVERS. OFF-STREET STRUCTURES WHICH DO NOT COLLECT RUNOFF SHALL BE FITTED WITH BOLT-LOCKING SOLID COVERS.
- NOT USED.
- ALL NEW MANHOLES SHALL HAVE A MINIMUM INSIDE DIAMETER OF 48" AND SHALL CONFORM TO THE STANDARD DETAILS. ALL NEW CATCH BASINS SHALL CONFORM TO THE STANDARD DETAILS.
- NOT USED.
- ALL TESTING AND CONNECTIONS TO EXISTING MAINS SHALL BE DONE IN THE PRESENCE OF A REPRESENTATIVE OF THE CITY OF BELLEVUE UTILITIES DEPARTMENT.

- ALL TRENCHES SHALL BE COMPACTED, AND HOT MIX ASPHALT IN PLACE IN PAVED AREAS, PRIOR TO TESTING STORM LINES FOR ACCEPTANCE.
- ALL PUBLIC STORM DRAINS SHALL BE AIR TESTED AND HAVE A VIDEO INSPECTION PERFORMED PRIOR TO ACCEPTANCE (SEE #23 BELOW). STORM MAIN CONSTRUCTED WITH FLEXIBLE PIPE SHALL BE DEFLECTION TESTED WITH A MANDREL PRIOR TO ACCEPTANCE.
- NOT USED.
- ALL MANHOLES/ CATCH BASINS IN UNPAVED AREAS SHALL INCLUDE A CONCRETE SEAL AROUND ADJUSTMENT RINGS PER STANDARD DETAILS.
- ALL STORM MAIN EXTENSIONS WITHIN THE PUBLIC RIGHT-OF-WAY OR IN EASEMENTS MUST BE "STAKED" BY A SURVEYOR LICENSED IN WASHINGTON STATE FOR "LINE AND GRADE" AND CUT SHEETS PROVIDED TO THE ENGINEER, PRIOR TO STARTING CONSTRUCTION.
- NOT USED.
- STORM DRAINAGE MAINLINES, STUBS AND FITTINGS SHALL BE CONSTRUCTED USING THE SAME PIPE MATERIAL AND MANUFACTURER. CONNECTIONS BETWEEN STUBS AND THE MAINLINE WILL BE MADE WITH A TEE FITTING. TEE FITTING SHALL BE FROM SAME MANUFACTURER AS PIPE. CUT-IN CONNECTIONS ARE ONLY ALLOWED WHEN CONNECTING A NEW STUB TO AN EXISTING MAINLINE.
- MANHOLES, CATCH BASINS AND VAULTS ARE CONSIDERED TO BE PERMIT-REQUIRED CONFINED SPACES. ENTRY INTO THESE SPACES SHALL BE IN ACCORDANCE WITH CHAPTER 296-809 WAC.
- PLACEMENT OF SURFACE APPURTENANCES (MH LIDS, VALVE LIDS, ETC) IN TIRE TRACKS OF TRAFFIC LANES SHALL BE AVOIDED WHENEVER POSSIBLE.
- CALL 1-800-424-5555, OR 8-1-1, 72 HOURS BEFORE CONSTRUCTION FOR UTILITY LOCATES.
- THE CONTRACTOR SHALL PERFORM A VIDEO INSPECTION AND PROVIDE A DVD OF THE STORM PIPE INTERIOR FOR THE CITY'S REVIEW. THE VIDEO SHALL PROVIDE A MINIMUM OF 14 LINES PER MILLIMETER RESOLUTION AND COVER THE ENTIRE LENGTH OF THE APPLICABLE PIPE. THE CAMERA SHALL BE MOVED THROUGH THE PIPE AT A UNIFORM RATE (< 30 FT/MIN), STOPPING WHEN NECESSARY TO ENSURE PROPER DOCUMENTATION OF THE PIPE CONDITION. THE VIDEO SHALL BE TAKEN AFTER INSTALLATION AND CLEANING TO INSURE THAT NO DEFECTS EXIST. THE PROJECT WILL NOT BE ACCEPTED UNTIL ALL DEFECTS HAVE BEEN REPAIRED.
- CLEARLY LABEL PUBLIC AND PRIVATE SYSTEMS ON THE PLANS. PRIVATE SYSTEMS SHALL BE MARKED "PRIVATE" AND SHALL BE MAINTAINED BY THE PROPERTY OWNER(S).
- ALL CONCRETE STRUCTURES (VAULTS, CATCH BASINS, MANHOLES, OIL/WATER SEPARATORS, ETC.) SHALL BE VACUUM TESTED.
- MANHOLES, CATCH BASINS AND INLETS IN EASEMENTS SHALL BE CONSTRUCTED TO PROVIDE A STABLE, LEVEL GRADE FOR A MINIMUM RADIUS OF 2.5 FEET AROUND THE CENTER OF THE ACCESS OPENING TO ACCOMMODATE CONFINED SPACE ENTRY EQUIPMENT.
- TOPS OF MANHOLES/ CATCH BASINS WITHIN PUBLIC RIGHT-OF-WAY SHALL NOT BE ADJUSTED TO FINAL GRADE UNTIL AFTER PAVING.
- CONTRACTOR SHALL ADJUST ALL MANHOLE/ CATCH BASIN RIMS TO FLUSH WITH FINAL FINISHED GRADES, UNLESS OTHERWISE SHOWN.
- CONTRACTOR SHALL INSTALL, AT ALL CONNECTIONS TO EXISTING DOWN STREAM MANHOLES/ CATCH BASINS, SCREENS OR PLUGS TO PREVENT FOREIGN MATERIALS FROM ENTERING EXISTING STORM DRAINAGE SYSTEM. SCREENS OR PLUGS SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF THE CONSTRUCTION AND SHALL BE REMOVED ALONG WITH COLLECTED DEBRIS AT THE TIME OF FINAL INSPECTION AND IN THE PRESENCE OF A REPRESENTATIVE OF THE CITY OF BELLEVUE UTILITIES DEPARTMENT.
- SURFACE RESTORATION OF EXISTING ASPHALT PAVEMENT SHALL BE AS REQUIRED BY THE RIGHT-OF-WAY USE PERMIT.
- THE CONTRACTOR SHALL MAINTAIN A MINIMUM OF FIVE FEET (5') HORIZONTAL SEPARATION BETWEEN ALL WATER AND STORM DRAINAGE LINES. ANY CONFLICT SHALL BE REPORTED TO THE UTILITY AND THE DEVELOPER'S ENGINEER PRIOR TO CONSTRUCTION.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT NO CONFLICTS EXIST BETWEEN STORM DRAINAGE LINES AND PROPOSED OR EXISTING UTILITIES PRIOR TO CONSTRUCTION.
- BEFORE COMMENCEMENT OF TRENCHING, THE CONTRACTOR SHALL PROVIDE FILTER FABRIC FOR ALL DOWNHILL STORM DRAIN INLETS AND CATCH BASINS, WHICH WILL RECEIVE RUNOFF FROM THE PROJECT SITE. THE CONTRACTOR SHALL PERIODICALLY INSPECT THE CONDITION OF ALL FILTER FABRIC AND REPLACE AS NECESSARY.
- MINIMUM COVER OVER STORM DRAINAGE PIPE SHALL BE 2 FEET, UNLESS OTHERWISE SHOWN.
- AVOID CROSSING WATER OR SEWER MAINS AT HIGHLY ACUTE ANGLES. THE SMALLEST ANGLE MEASURE BETWEEN UTILITIES SHOULD BE 45 DEGREES.
- AT POINTS WHERE EXISTING THRUST BLOCKING IS FOUND, MINIMUM CLEARANCE BETWEEN CONCRETE BLOCKING AND OTHER BURIED UTILITIES OR STRUCTURES SHALL BE 5 FEET.
- WHEN WORK IS TO OCCUR IN EASEMENTS, THE CONTRACTOR SHALL NOTIFY THE EASEMENT GRANTOR AND BELLEVUE UTILITIES IN WRITING A MINIMUM OF 48 HOURS IN ADVANCE OF BEGINNING WORK (NOT INCLUDING WEEKENDS OR HOLIDAYS). FAILURE TO NOTIFY GRANTOR AND BELLEVUE UTILITIES WILL RESULT IN A STOP WORK ORDER BEING POSTED UNTIL THE MATTER IS RESOLVED TO THE SATISFACTION OF BELLEVUE UTILITIES. A WRITTEN RELEASE FROM THE EASEMENT GRANTOR SHALL BE FURNISHED TO THE UTILITIES INSPECTOR PRIOR TO PERMIT SIGNOFF.
- THE CONTRACTOR SHALL RESTORE THE RIGHT-OF-WAY AND EXISTING PUBLIC STORM DRAINAGE EASEMENT(S) AFTER CONSTRUCTION TO A CONDITION EQUAL OR BETTER THAN CONDITION PRIOR TO ENTRY. THE CONTRACTOR SHALL FURNISH A SIGNED RELEASE FROM ALL AFFECTED PROPERTY OWNERS AFTER RESTORATION HAS BEEN COMPLETED.
- NOT USED.

TRANSPORTATION DEPARTMENT CONSTRUCTION NOTES


- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF BELLEVUE TRANSPORTATION DEPARTMENT DESIGN MANUAL, APPLICABLE CITY CODES, AND THE MOST RECENT WSDOT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION.
- THE DESIGN ELEMENTS WITHIN THESE PLANS HAVE BEEN REVIEWED ACCORDING TO THE LATEST EDITION OF THE CITY OF BELLEVUE TRANSPORTATION DEPARTMENT DESIGN MANUAL. THIS APPROVAL IS SUBJECT TO FIELD INSPECTION; OVERSIGHT OR VIOLATION OF CITY ORDINANCES IS NOT INCLUDED IN THIS APPROVAL. VARIANCES TO THESE STANDARDS ARE BY APPROVAL OF THE TRANSPORTATION DEPARTMENT REVIEW ENGINEER AND THE TRANSPORTATION DEPARTMENT CONSTRUCTION INSPECTOR.
- APPROVAL OF THIS ROAD, GRADING, AND/OR DRAINAGE PLAN DOES NOT CONSTITUTE AN APPROVAL OF ANY OTHER CONSTRUCTION (E.G., DOMESTIC WATER CONVEYANCE, SEWER CONVEYANCE, GAS, ELECTRICAL, ETC.).
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO CALL FOR A PRE-CONSTRUCTION CONFERENCE AT 425-452-6875 PRIOR TO ANY CLEARING, GRADING, OR CONSTRUCTION ACTIVITY. THIS CONFERENCE MUST BE ATTENDED BY THE CONTRACTOR AND THE TRANSPORTATION DEPARTMENT CONSTRUCTION INSPECTOR. A RIGHT OF WAY PERMIT MUST BE OBTAINED PRIOR TO SCHEDULING THE PRE-CONSTRUCTION CONFERENCE.
- A COPY OF THESE APPROVED PLANS MUST BE AT THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS. THE TRANSPORTATION DEPARTMENT CONSTRUCTION INSPECTOR MAY ISSUE A STOP WORK ORDER IF APPROVED PLANS ARE NOT AVAILABLE AT THE SITE WHEN NEEDED.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL NECESSARY CONSTRUCTION EASEMENTS AND RIGHT OF WAY USE PERMITS BEFORE BEGINNING OFF-SITE WORK. WORK WITHIN THE RIGHT OF WAY FRONTING THE SITE, WHETHER IMPROVED OR UNIMPROVED, REQUIRES A SEPARATE RIGHT OF WAY USE PERMIT. RIGHT OF WAY USE PERMITS ARE REQUIRED FOR ALL CURB CUTS AND ROADWAY CUTS.
- IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THIS APPROVAL, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER SERVICES OR DEVICES NECESSARY TO PROTECT PROPERTY AND THE LIFE, HEALTH, AND SAFETY OF THE PUBLIC. TRAFFIC CONTROL PLANS MUST BE SUBMITTED UNDER THE RIGHT OF WAY USE PERMIT PRIOR TO WORK COMMENCING IN THE RIGHT OF WAY.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE CITY OF BELLEVUE'S TRAFFIC SIGNAL SECTION INSPECTOR/ LOCATOR AT 425-864-8080 BEFORE RELOCATING ANY TRAFFIC SIGNAL OR STREET LIGHTING POLES, CONDUITS OR EQUIPMENTS. IN ADDITION, THE INSPECTOR MUST BE NOTIFIED IF ANY STREET CUT THAT AFFECTS AN EXISTING SIGNAL LOOP DETECTOR IN THE RIGHT OF WAY.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY TELEPHONE, GAS, POWER, AND CABLE TV COMPANIES OF PROPOSED WORK PRIOR TO CONSTRUCTION.
- PRIOR TO THE PLACEMENT OF ASPHALT PAVING, THE CONTRACTOR MUST SUBMIT COMPACTION TEST RESULTS (CONDUCTED BY A LICENSED SOILS ENGINEER) TO THE TRANSPORTATION DEPARTMENT CONSTRUCTION INSPECTOR. PROOF ROLLING OF THE ROADWAY WILL BE CONDUCTED IN THE PRESENCE OF THE TRANSPORTATION CONSTRUCTION INSPECTOR PRIOR TO CRUSHED ROCK PLACEMENT.
- THE FINAL TOP LIFT FOR THE ROADWAY MAY BE PLACED ONLY AFTER APRIL 1ST AND PRIOR TO OCTOBER 1ST, SUBJECT TO TRANSPORTATION DEPARTMENT CONSTRUCTION INSPECTOR APPROVAL. ALL OTHER LIMITATIONS PER WSDOT STANDARD SPECIFICATIONS 5-04.3 SHALL APPLY.
- ALL CITY-OWNED UTILITIES VALVE BOXES, MANHOLE COVERS, CATCH BASINS, AND MONUMENT CASES WHICH ARE IN THE ASPHALT PORTION OF THE ROADWAY SHALL BE ADJUSTED TO THE FINAL ROADWAY GRADE FOR THAT PORTION OF THE PROJECT WITHIN ONE WEEK OF THE PLACEMENT OF FINAL LIFT. THESE ITEMS WILL BE ADJUSTED TO THE FINAL GRADE ONLY AFTER THE FINAL LIFT OF ASPHALT IS PLACED.
- ALL WORK SHALL BE PERFORMED PER THE RECOMMENDATIONS OF SOILS REPORTS PREPARED FOR THIS PROJECT, INCLUDING THE SOILS REPORT FOR SOILS CONDITIONS RELATIVE TO ROADWAY PAVING, UNLESS OTHERWISE DIRECTED IN WRITING BY THE TRANSPORTATION DEPARTMENT REVIEW ENGINEER OR THE TRANSPORTATION CONSTRUCTION INSPECTOR.
- STREET SIGNS ARE TO BE PROVIDED AND INSTALLED BY THE CONTRACTOR AS DIRECTED PER A SIGNING PLAN APPROVED BY THE TRANSPORTATION DEPARTMENT. CONTACT THE TRAFFIC ENGINEERING TECHNICIAN AT (425) 452-4499 AT LEAST 72 HOURS PRIOR TO INSTALLATION FOR FIELD LAYOUT DIRECTION. ALL SIGNS MUST BE IN GOOD CONDITION PRIOR TO FINAL ACCEPTANCE OF THE ROADWAY.
- RELOCATION OF STREET SIGNS MUST BE COORDINATED WITH THE TRANSPORTATION DEPARTMENT CONSTRUCTION INSPECTOR.
- PUGET SOUND ENERGY WILL DESIGN AND INSTALL THE INTERNAL PLAT STREET LIGHTING SYSTEM, AT THE DEVELOPER'S COST. THE DESIGN OF THIS SYSTEM MUST BE APPROVED BY THE CITY OF BELLEVUE PRIOR TO INSTALLATION. POLES MUST BE INSTALLED IN CONJUNCTION WITH ROADWAY IMPROVEMENT WORK.
- SAFETY RAIL, GUARD RAIL, AND DRIVEWAY APRONS MUST BE PLACED AND CONSTRUCTED PER THE CITY OF BELLEVUE TRANSPORTATION DEPARTMENT DESIGN MANUAL. FOR RESIDENTIAL SUBDIVISIONS, DRIVEWAY APRONS MAY BE INSTALLED ONLY AFTER ISSUANCE OF BUILDING PERMITS. THEREFORE, IF CURB AND GUTTER IS PLACED BEFORE BUILDING PERMITS ARE ISSUED, CURB AND GUTTER SHALL BE CONTINUOUS. A RIGHT OF WAY USE PERMIT WILL BE REQUIRED TO INSTALL DRIVEWAY APRONS ABUTTING CITY RIGHT OF WAY.
- THE CONTRACTOR IS RESPONSIBLE FOR RESTRIPIING THE ROAD SURFACE PER APPROVED PLANS AFTER AN ASPHALT OVERLAY. THIS WORK MUST BE COORDINATED WITH THE TRANSPORTATION DEPARTMENT CONSTRUCTION INSPECTOR AND THE TRAFFIC ENGINEERING TECHNICIAN.
- THE CONTRACTOR MUST CALL FOR CONCRETE FORM INSPECTION AND/OR STRING INSPECTION PRIOR TO POURING CONCRETE
- THE CONTRACTOR MUST CALL FOR SIGHT DISTANCE INSPECTION PRIOR TO PROJECT COMPLETION. THIS INSPECTION WILL INCLUDE DRIVEWAYS AND INTERSECTIONS FOR VEHICULAR SIGHT DISTANCE, AND SIDEWALK AND OTHER PEDESTRIAN FACILITIES FOR PEDESTRIAN SIGHT DISTANCE. FINAL SIGHT DISTANCE MUST TAKE INTO CONSIDERATION THE ANTICIPATED HEIGHT OF MATURE LANDSCAPING.
- THE CONTRACTOR MUST PROVIDE FOR CONSTRUCTION WORKER PARKING, EQUIPMENT STORAGE, AND MATERIAL STORAGE ON SITE. EXCEPTIONS MAY BE GRANTED BY THE TRANSPORTATION DEPARTMENT DIRECTOR UNDER CERTAIN CONDITIONS.
- THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION AND COORDINATION OF PUBLIC AND FRANCHISE UTILITIES. THIS WORK MUST BE COORDINATED SUCH THAT, FOR EXAMPLE, THE PLACEMENTS OF UTILITY VAULTS DO NOT CREATE A CONFLICT WITH THE INSTALLATION OF DRIVEWAY APPROACHES AND/OR SIDEWALKS AT 2% CROSS SLOPE AND MAXIMUM OF 8% RUNNING SLOPE PER ADA REQUIREMENTS.

EROSION CONTROL GENERAL NOTES


- ALL CLEARING & GRADING CONSTRUCTION MUST BE IN ACCORDANCE WITH CITY OF BELLEVUE (COB) CLEARING & GRADING CODE, CLEARING & GRADING DEVELOPMENT STANDARDS, LAND USE CODE, UNIFORM BUILDING CODE, PERMIT CONDITIONS, AND ALL OTHER APPLICABLE CODES, ORDINANCES, AND STANDARDS. THE DESIGN ELEMENTS WITHIN THESE PLANS HAVE BEEN REVIEWED ACCORDING TO THESE REQUIREMENTS. ANY VARIANCE FROM ADOPTED EROSION CONTROL STANDARDS IS NOT ALLOWED UNLESS SPECIFICALLY APPROVED BY THE CITY OF BELLEVUE DEVELOPMENT SERVICES (DSD) PRIOR TO CONSTRUCTION. IT SHALL BE THE SOLE RESPONSIBILITY OF THE APPLICANT AND THE PROFESSIONAL CIVIL ENGINEER TO CORRECT ANY ERROR, OMISSION, OR VARIATION FROM THE ABOVE REQUIREMENTS FOUND IN THESE PLANS. ALL CORRECTIONS SHALL BE AT NO ADDITIONAL COST OR LIABILITY TO THE COB.
- APPROVAL OF THIS EROSION/SEDIMENTATION CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.).
- A COPY OF THE APPROVED PLANS AND DRAWINGS MUST BE ON-SITE DURING CONSTRUCTION. THE APPLICANT IS RESPONSIBLE FOR OBTAINING ANY OTHER REQUIRED OR RELATED PERMITS PRIOR TO BEGINNING CONSTRUCTION.
- THE IMPLEMENTATION OF THESE ESC PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
- THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
- THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.
- ALL LOCATIONS OF EXISTING UTILITIES HAVE BEEN ESTABLISHED BY FIELD SURVEY OR OBTAINED FROM AVAILABLE RECORDS AND SHOULD, THEREFORE, BE CONSIDERED ONLY APPROXIMATE AND NOT NECESSARILY COMPLETE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO INDEPENDENTLY VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS AND TO DISCOVER AND AVOID ANY OTHER UTILITIES NOT SHOWN WHICH MAY BE AFFECTED BY THE IMPLEMENTATION OF THIS PLAN.
- THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
- CLEARING SHALL BE LIMITED TO THE AREAS WITHIN THE APPROVED DISTURBANCE LIMITS. EXPOSED SOILS MUST BE COVERED AT THE END OF EACH WORKING DAY WHEN WORKING FROM OCTOBER 1ST THROUGH APRIL 30TH. FROM MAY 1ST THROUGH SEPTEMBER 30TH, EXPOSED SOILS MUST BE COVERED AT THE END OF EACH CONSTRUCTION WEEK AND ALSO AT THE THREAT OF RAIN.
- AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A TRAPPED CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWNSTREAM SYSTEM.
- STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT.
- THE CONTRACTOR MUST MAINTAIN A SWEEPER ON SITE DURING EARTHWORK AND IMMEDIATELY REMOVE SOIL THAT HAS BEEN TRACKED ONTO PAVED AREAS AS RESULT OF CONSTRUCTION.
- THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
- ANY EXCAVATED MATERIAL REMOVED FROM THE CONSTRUCTION SITE AND DEPOSITED ON PROPERTY WITHIN THE CITY LIMITS MUST BE DONE IN COMPLIANCE WITH A VALID CLEARING & GRADING PERMIT. LOCATIONS FOR THE MOBILIZATION AREA AND STOCKPILED MATERIAL MUST BE APPROVED BY THE CLEARING AND GRADING INSPECTOR AT LEAST 24 HOURS IN ADVANCE OF ANY STOCKPILING.
- THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 48 HOURS FOLLOWING A MAJOR STORM EVENT.
- FINAL SITE GRADING MUST DIRECT DRAINAGE AWAY FROM ALL BUILDING STRUCTURES AT A MINIMUM 5% SLOPE, PER THE INTERNATIONAL RESIDENTIAL CODE (IRC) R401.3.

60% SUBMITTAL

NO					DATE	BY	APPR	REVISIONS	



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Approved By

DESIGN MANAGER	DATE
PROJECT MANAGER	DATE

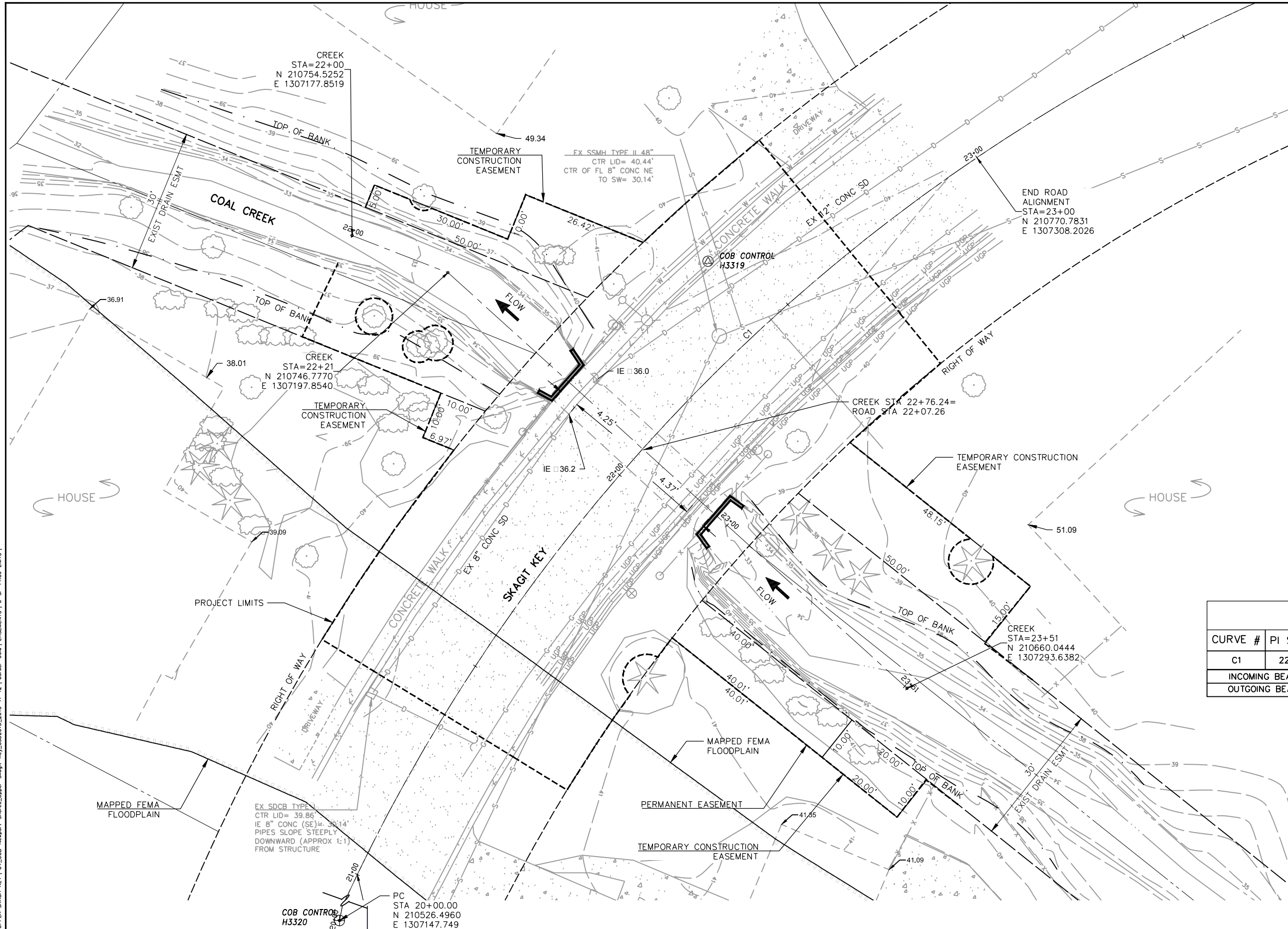
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DRAWN BY	DATE
CHECKED BY	DATE



City of Bellevue
UTILITIES

UPPER SKAGIT KEY CULVERT REPLACEMENT NOTES	
G3	SHT <u>3</u> OF <u>25</u>

Path: \\tsd0071s\Projects\174271 Lower Coal Creek Ph. 2 Early Action\CAD\SheetFiles\Group\N\ ECL UPPER SKAGIT KEY CREEK EXIST COND & SURVEY CTRL.dwg Plot date: Dec 16, 2016-05:34:15pm CAD User: jerry.scheller.
Real Filename: C:\P\SP-SITE-UPPER SKAGIT KEY\1\01_COB-Newport-Shores-Upper-Skagit-Key_C302015_2015-11-12\border-dwg\ EASEMENTS\ C-SP-PROJ-LM15



CITY OF BELLEVUE CONTROL POINTS				
ID	DESCRIPTION	NORTHING	EASTING	ELEVATION*
H3320	MONUMENT	210526.50	1307147.76	39.631
H3319	MONUMENT	210749.16	1307252.13	

*HORIZONTAL CONTROL POINT ONLY IF NO ELEVATION LISTED.

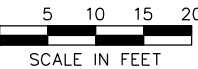
HORIZONTAL DATUM:
WASHINGTON STATE PLANE COORDINATES,
NORTH ZONE (BASED UPON NAD 83/11)

VERTICAL DATUM:
NAVD 88

CONTROL METHOD:
HORIZONTAL AND VERTICAL CONTROL
COORDINATES WERE DERIVED USING
TRIGONOMETRIC TRAVERSE METHODS USING
A LEICA TPS-1201 TOTAL STATION TIED
TO CITY OF BELLEVUE CONTROL POINTS.

FIELD SURVEY PERFORMED OCTOBER AND
NOVEMBER 2015 BY TETRA TECH.

CURVE DATA TABLE					
CURVE #	PI STATION	DELTA Δ	RADIUS	TANGENT	LENGTH
C1	22+77.35	72°14'55"	380.00'	277.35	479.17'
INCOMING BEARING:		N10°40'52"E			
OUTGOING BEARING:		N82°55'47"E			



NO	DATE	BY	APPR	REVISIONS

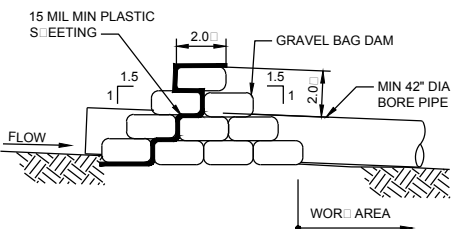
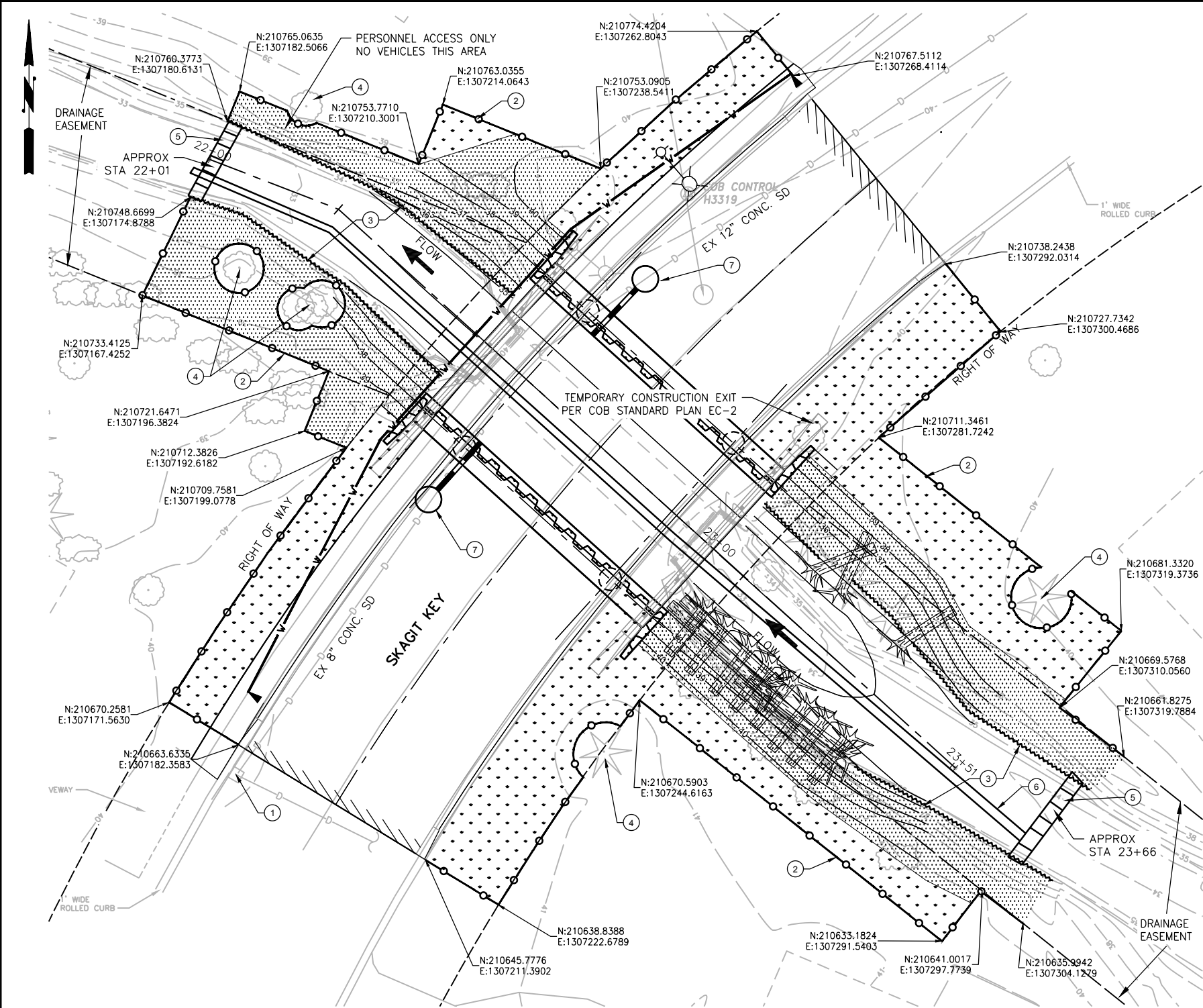


Approved By	
GMS	
DESIGN MANAGER	NS DATE
PROJECT MANAGER	DATE



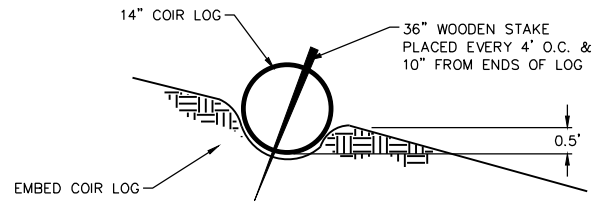
60% SUBMITTAL	
UPPER SKAGIT KEY CULVERT REPLACEMENT EXISTING CONDITIONS AND SURVEY CONTROL	
EC1	SHT 4 OF 25

Path: \\tsd007r1\Projects\134271 Lower Coal Creek Ph. 2 Early Action\CAD\SheetFees\Group\N3 E_UPPER SKAGIT KEY STREAM BYPASS AND ESC PLAN.dwg Plot date: Dec 17, 2016 - 01:38:24pm CAD User: jerry.scheller.
Ref Filename: [Border] C:\P-SITE-UPPER SKAGIT KEY C-SR-ALON-PROP C-SR-CONTOURS-SKAGIT KEY UPPER C-SR-LOOS C-SR-ROADS C-SR-ROADS-UNITS



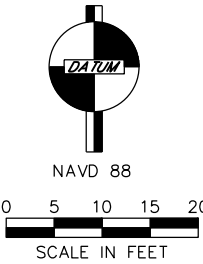
TEMP. GRAVEL BAG BERM
SCALE: NONE

1



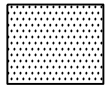
COIR LOG PLACEMENT
SCALE: NONE

2

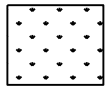


CONSTRUCTION NOTES:

- 1 CATCH BASIN INLET PROTECTION INSERT PER COB STANDARD DETAIL EC-06
- 2 HIGH VISIBILITY FENCE PER WSDOT STANDARD PLAN I-10.10-01, APPROX 560 LF
- 3 COIR LOG PLACEMENT, SEE DETAIL 2/-, APPROX 200 LF
- 4 TREE PROTECTION PER COB STANDARD DETAIL EC-21
- 5 TEMPORARY GRAVEL BAG BERM, SEE DETAIL 1/-
- 6 TEMPORARY STREAM BYPASS PIPELINE. MINIMUM 42" DIA SMOOTH BORE, APPROX 165 LF
- 7 CONTRACTOR TO SUBMIT PLAN TO ENGINEER FOR APPROVAL TO BYPASS STREET RUNOFF AROUND OR THROUGH CONSTRUCTION ZONE AND DISCHARGE TO STREAM BYPASS OUTFALL LOCATION. MOVABLE PIPES IN STREAM CHANNEL OR STREET LEVEL PUMPS ARE ACCEPTABLE. RUNOFF OVER BARE SOIL WILL NOT BE PERMITTED. CONTRACTOR IS ADVISED THAT THE PREDICTED 2-YEAR PEAK STORM FLOW IN THE NORTHEAST SD AND SOUTHWEST SD IS ABOUT 0.6 CFS (270 GPM) AND 0.2 CFS (90 GPM), RESPECTIVELY.



PLACE 6-INCH THICK LAYER OF WOOD CHIP MULCH (SPECIAL PROVISION 8-01.2(1)) ON BARE GROUND. OVERLAY WITH BIODEGRADABLE EROSION CONTROL BLANKET PER COB STD PLAN EC-15. LANDSCAPE PER SHEET L1.



BIODEGRADABLE EROSION CONTROL BLANKET PER COB STD PLAN EC-15. NO WOOD CHIP MULCH. LANDSCAPE PER SHEET L1.

EROSION & SEDIMENTATION CONTROL NOTES:

1. SEE SHEET G2 FOR ABBREVIATIONS AND SYMBOLS
2. SEE CITY OF BELLEVUE (COB) STANDARD EROSION CONTROL NOTES ON SHEET G3.
3. FROM OCTOBER 1 THROUGH APRIL 30, NO SOILS SHALL REMAIN EXPOSED AND UNWORKED FOR MORE THAN 2 DAYS. FROM MAY 1 TO SEPTEMBER 30, NO SOILS SHALL REMAIN EXPOSED AND UNWORKED FOR MORE THAN 7 DAYS. SOIL COVERING SHALL BE SELECTED FROM COB BMP C120-TEMPORARY SEEDING, COB BMP C121-MULCHING, COB BMP STANDARD DETAIL EC-15 EROSION CONTROL BLANKETS AND NETS, OR COB STANDARD DETAIL EC-14 PLASTIC COVERING FOR SLOPES AND STOCKPILES, AS APPROPRIATE.
4. THE CONTRACTOR WILL BE RESPONSIBLE AT ALL TIMES FOR PREVENTING SILT-LADEN RUNOFF FROM DISCHARGING FROM THE PROJECT SITE. NO MORE WORK SHALL BE PERFORMED IN ONE DAY THAN CAN BE COMPLETED WITHOUT THE INSTALLATION OF EROSION CONTROL MEASURES DURING THAT SAME DAY. SOILS SHALL BE STABILIZED AT THE END OF THE SHIFT BEFORE A HOLIDAY OR WEEKEND IF NEEDED BASED ON THE WEATHER FORECAST.
5. ALL EROSION AND SEDIMENTATION CONTROL FACILITIES SHALL BE INSPECTED AND MAINTAINED DAILY. SEDIMENT SHALL BE REMOVED BY THE CONTRACTOR ON A WEEKLY BASIS AS A MINIMUM AND ON A DAILY BASIS DURING PERIODS OF RAINFALL AS IT BECOMES NECESSARY. THE CONTRACTOR SHALL RELOCATE, REBUILD, AND MAKE ADJUSTMENTS TO THESE FACILITIES AS NECESSARY DURING CONSTRUCTION.
6. SOIL EXPOSURE SHALL BE MINIMIZED THROUGH THE USE OF TEMPORARY BMP GROUND COVER AND STABILIZATION PRACTICES. EXPOSED DUST-PRODUCING SURFACES SHALL BE SPRINKLED DAILY UNTIL WET WHILE AVOIDING PRODUCING RUNOFF. PAVED STREETS SHALL BE SWEEPED FOLLOWING CONSTRUCTION ACTIVITIES WHEN DIRECTED BY THE ENGINEER.
7. AT NO TIME SHALL CONCRETE, CONCRETE BY-PRODUCTS, VEHICLE FLUIDS, PAINT, CHEMICALS, OR OTHER POLLUTING MATTER BE PERMITTED TO DISCHARGE FROM THE PROJECT SITE TO THE STREAM OR STORM DRAINAGE SYSTEM. ALL POLLUTANTS OTHER THAN SEDIMENT THAT OCCUR ON-SITE DURING CONSTRUCTION SHALL BE HANDLED AND LEGALLY DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORM OR SURFACE WATERS. POLLUTANTS OF CONCERN INCLUDE, BUT ARE NOT LIMITED TO, FUELS, LUBRICANTS, SOLVENTS, CONCRETE BY-PRODUCTS, AND CONSTRUCTION MATERIALS.
8. REMOVAL OF ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE DONE AFTER THE WORKING AREA IS STABILIZED OR AS DIRECTED BY THE ENGINEER.
9. SEE SHEETS L1 & L2 FOR PERMANENT VEGETATION RESTORATION (NURSERY PLANTINGS). NOTE LOCATIONS TO RECEIVE TOPSOIL.
10. SEE SHEET EC1 FOR ROAD AND CREEK ALIGNMENTS.

STREAMFLOW BYPASS NOTES:

1. COORDINATE DEFISHING REQUIREMENTS WHEN DIVERTING CREEK FLOW INTO THE BYPASS.
2. ALL STREAMFLOWS SHALL BE DIVERTED INTO A BYPASS SYSTEM IN ACCORDANCE WITH THE HPA. BYPASS SHALL PROVIDE MINIMUM 62 CFS CAPACITY. THE DIVERSION PLAN SHOWN IS A SCHEMATIC REPRESENTATION ONLY; ALTERNATIVE BYPASS AND STREAM DAMMING SCHEMES MAY BE UTILIZED AFTER REVIEW AND APPROVAL BY THE ENGINEER. THE CONTRACTOR WILL BE RESPONSIBLE FOR FINAL DESIGN AND PERFORMANCE OF DIVERSION AND WILL BE RESPONSIBLE FOR DAMAGES CAUSED BY THE FAILURE OF THE DIVERSION. 62 CFS IS THE PREDICTED 2-YEAR PEAK STORM FLOW. 95% OF THE TIME, THE AVERAGE JULY-SEPTEMBER MONTHLY FLOW IS PREDICTED TO BE LESS THAN 7.5 CFS.
3. THE CONTRACTOR SHALL REMOVE WATER FROM THE WORK ZONE AS REQUIRED. DEWATERING PUMP(S) SHALL PUMP WATER TO CONTRACTOR-PROVIDED TANKS. UNDER NO CIRCUMSTANCES SHALL ANY TURBID WATER BE DISCHARGED INTO THE STREAM SYSTEM. COSTS FOR TREATING AND DISPOSING OF WATER THAT ENTERS THE WORK ZONE SHALL BE SOLELY THE CONTRACTOR'S RESPONSIBILITY.
4. BYPASS PIPE SHALL BE PLACED WITH A DOWN-GRADIENT SLOPE SUCH THAT THE PIPE INVERT ON THE DOWNSTREAM SEGMENT IS AT OR BELOW THE PIPE INVERT AT AN UPSTREAM SEGMENT. THERE SHALL BE NO 'CRESTS' GREATER THAN 6-INCHES IN THE PIPE PROFILE. THE CONTRACTOR SHALL ATTEMPT TO PLACE THE BYPASS PIPE WITH A UNIFORM SLOPE.
5. THE DIVERSION OUTFALL AREA SHALL BE PROTECTED BY SECURING THE PIPE OUTLET, SAND BAGGING, AND PROVIDING ENERGY DISSIPATION TO THE SATISFACTION OF THE ENGINEER.
6. THE POSITION OF TEMPORARY BYPASS PIPELINE SHALL BE RELOCATED AS REQUIRED TO ALLOW CONSTRUCTION OF IMPROVEMENTS. THE BYPASS PIPE SHALL BE ANCHORED IN POSITION USING TEMPORARY REMOVABLE ANCHORS TO PREVENT DISPLACEMENT, INCLUDING DURING FLOOD FLOWS.
7. THE TEMPORARY BYPASS PIPELINE HAS LIMITED FLOW CAPACITY. CONTRACTOR SHALL COORDINATE WORK IN THE CHANNEL DURING PERIODS OF NO RAINFALL. CONTRACTOR SHALL EVACUATE AND LEAVE THE CONSTRUCTION SITE DURING NON-WORKING HOURS SUCH THAT FLOWS IN EXCESS OF THE BYPASS CAPACITY WILL FLOW THROUGH THE SITE WITHOUT MOBILIZING DISTURBED EARTH.
8. CONTINUOUS BASE FLOW IN THE CREEK IS EXPECTED THROUGHOUT CONSTRUCTION.
9. COAL CREEK IS AN URBAN CREEK. FLOWS IN THE CREEK CAN CHANGE DRASTICALLY AND IN SHORT TIME (MINUTES) FOLLOWING RAINFALL. THE CONTRACTOR SHALL NOT WORK WITHIN THE CREEK DURING WET WEATHER.
10. MATERIALS USED FOR DIVERSION SHALL BE REMOVED FROM THE SITE AT THE COMPLETION OF THE PROJECT.

60% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS

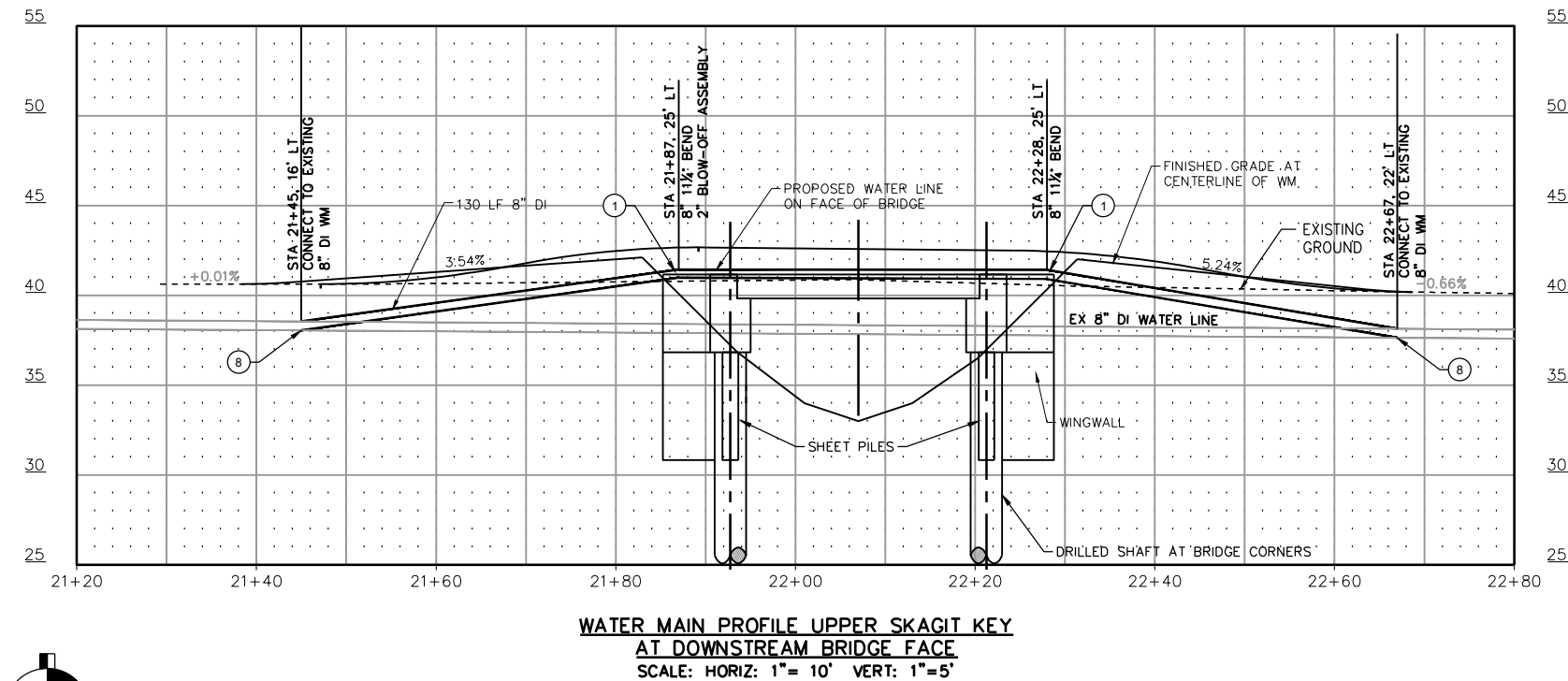
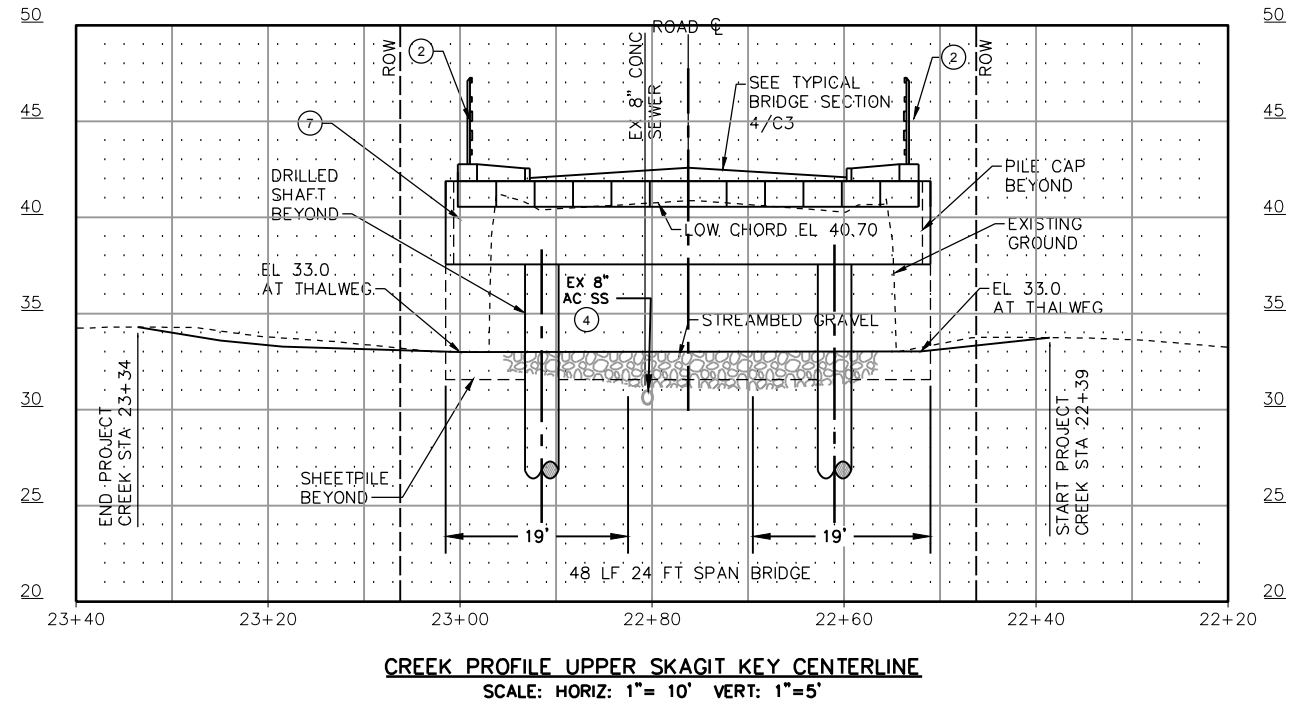
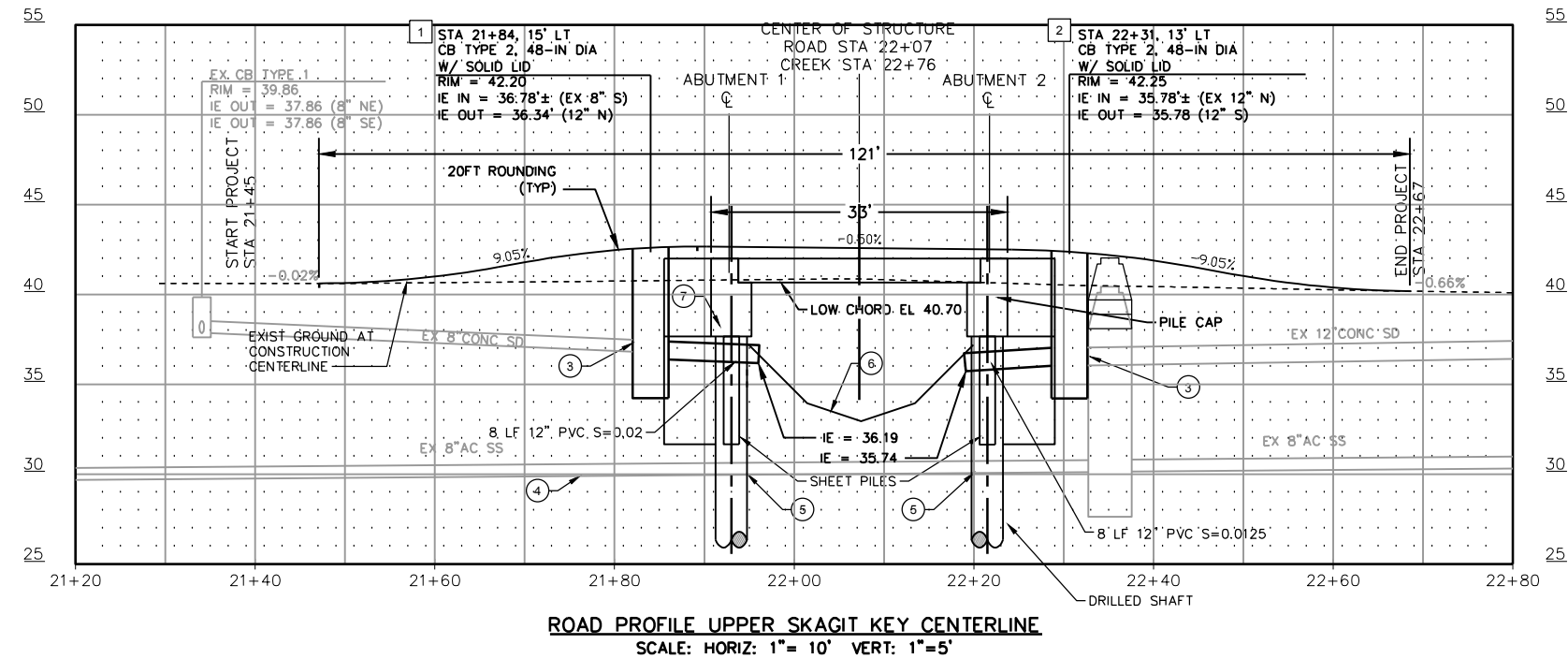


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DESIGN MANAGER	DATE
PROJECT MANAGER	DATE



UPPER SKAGIT KEY CULVERT REPLACEMENT STREAM BYPASS AND ESC PLAN	
E1	SHT 5 OF 25

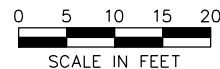
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Real Filename: [Border] C:\P\ALON-PROJ\1 C-SP-BROD RAIL [Border-60x] 1



- CONSTRUCTION NOTES:**
- 1 ATTACH WATER MAIN TO BRIDGE. PROVIDE RESTRAINED JOINTS ON NEW WATER MAINS.
 - 2 BRIDGE RAIL WITH MIN. TL-1 RATING. SEE 5/C3.
 - 3 CONNECT TO EXISTING SD.
 - 4 PROTECT EXISTING SANITARY SEWER.
 - 5 SHEET PILE SCOUR PROTECTION. BLOCK OUT 6" AROUND EX SEWER. CONTRACTOR SHALL POTHOLE SEWER PRIOR TO SHEET PILE INSTALLATION TO ESTABLISH SHEET PILE LENGTH AT SEWER CROSSING.
 - 6 SEE H2 FOR CREEK SECTIONS UNDER BRIDGE.
 - 7 SEE B1-B9 FOR BRIDGE.
 - 8 LOCATION AND DEPTH SHOWN ARE APPROXIMATE ONLY. CONTRACTOR SHALL POTHOLE TO DETERMINE EXACT LOCATION AND DEPTH PRIOR TO CONSTRUCTION.



NAVD 88



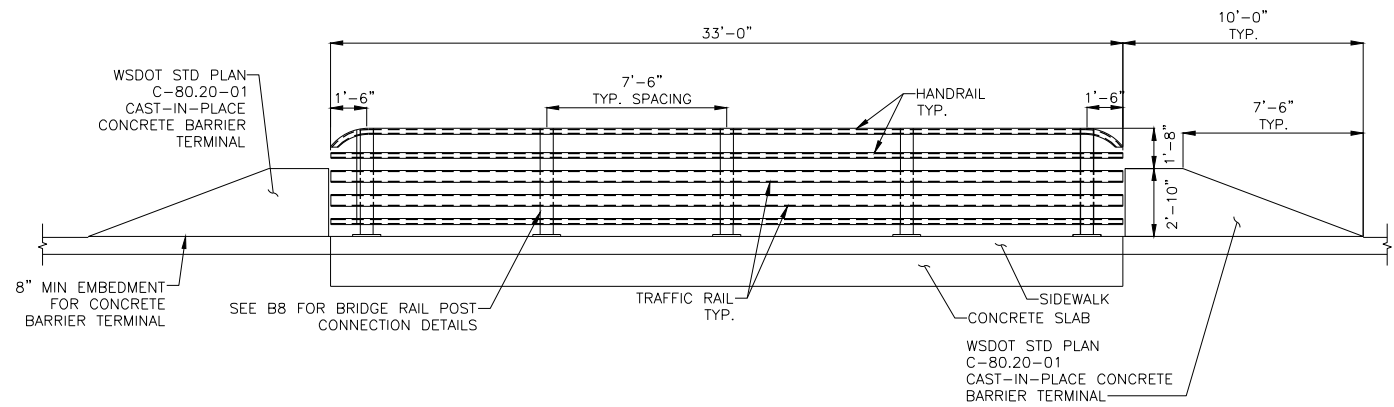
60% SUBMITTAL	
UPPER SKAGIT KEY CULVERT REPLACEMENT CREEK AND ROAD PROFILE	
C2	SHT 7 OF 25

NO	DATE	BY	APPR	REVISIONS



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DESIGN MANAGER	DATE
PROJECT MANAGER	DATE



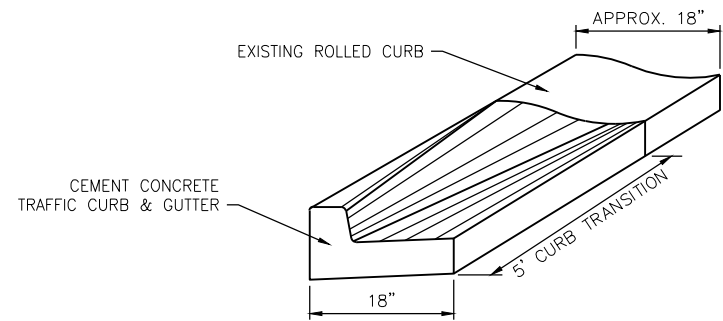


BRIDGE RAIL

SCALE: 1/4" = 1'-0"

C1 C2

5



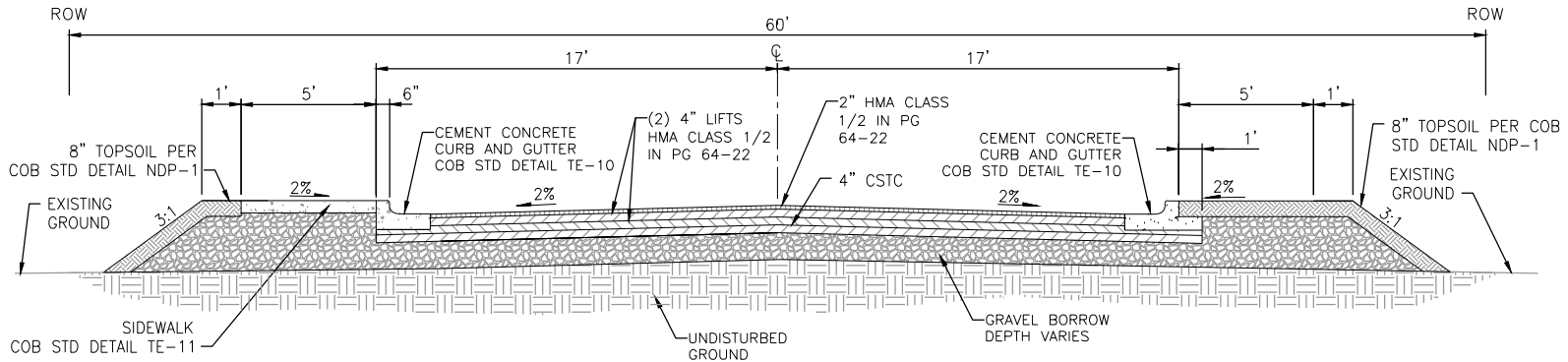
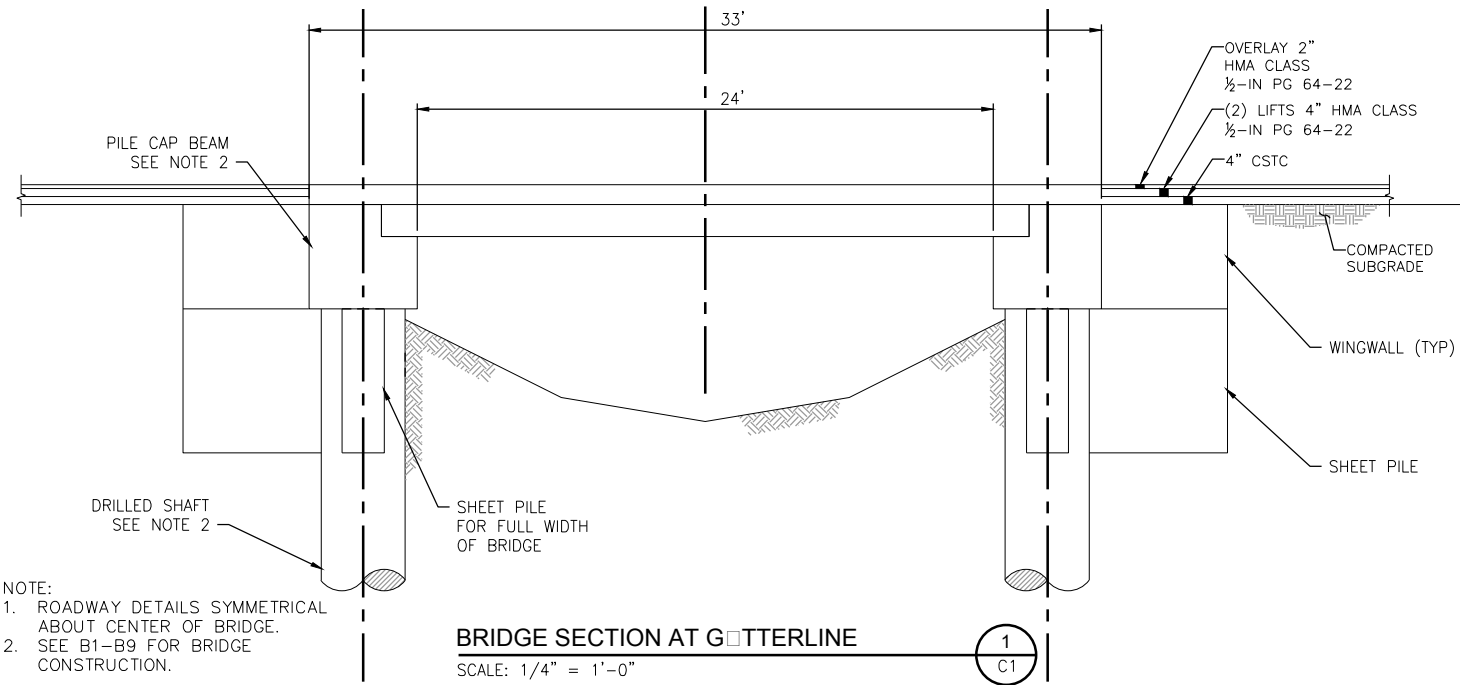
- NOTES: (CURB AND GUTTER TRANSITIONS)
- TRANSITIONS WILL BE PAID FOR AS CEMENT CONCRETE TRAFFIC CURB AND GUTTER.
 - TRANSITIONS SHALL BE ACCOMPLISHED BY THE USE OF DIRECT STRAIGHT LINE TRANSITIONS OF THE FLOW LINE AND OTHER SURFACE FEATURES.

ROLLED CURB TRANSITION DETAIL

SCALE: NTS

C1

2



- NOTES
- ONE FOOT SETBACK DISTANCE REQUIRED FROM ALL SLOPED AREAS AS SHOWN.

TYPICAL BRIDGE APPROACH SECTION

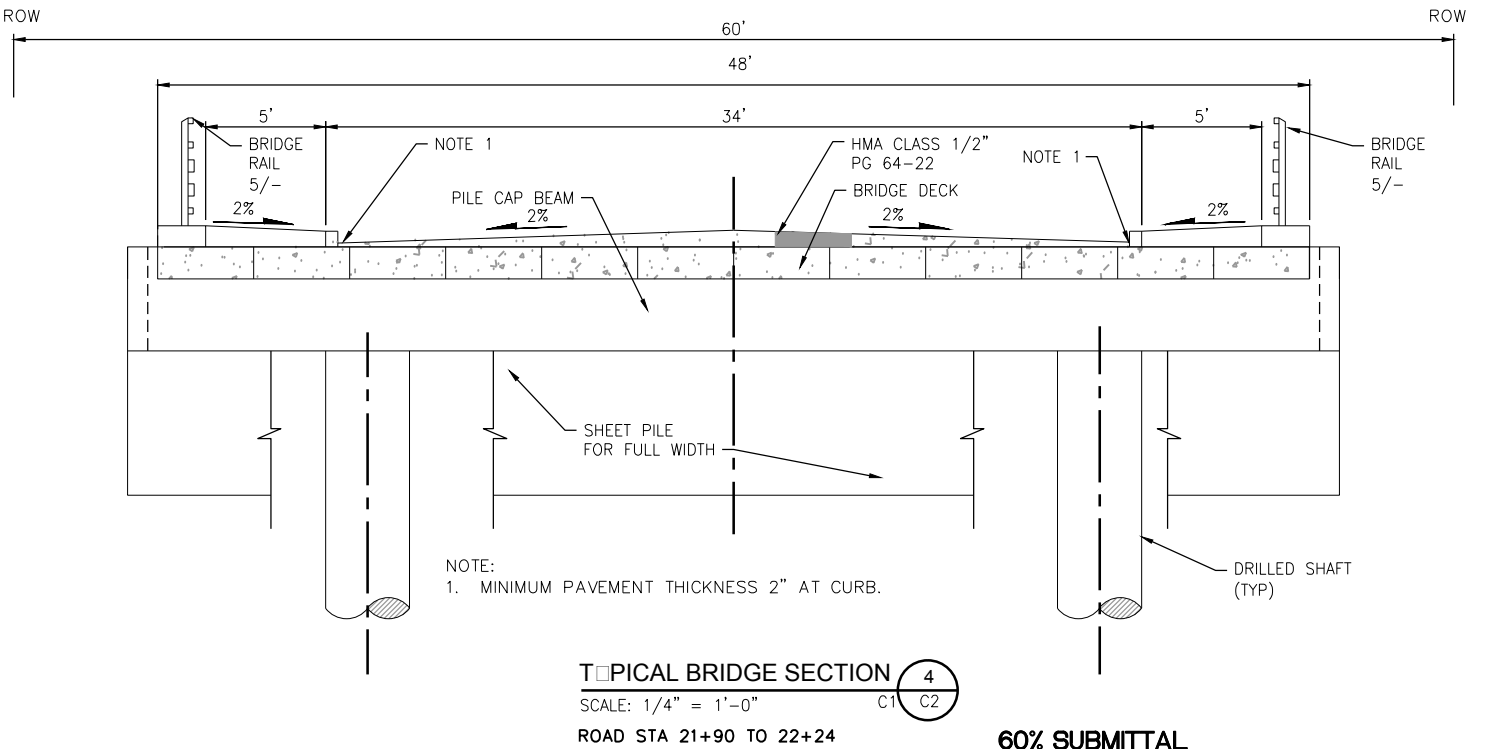
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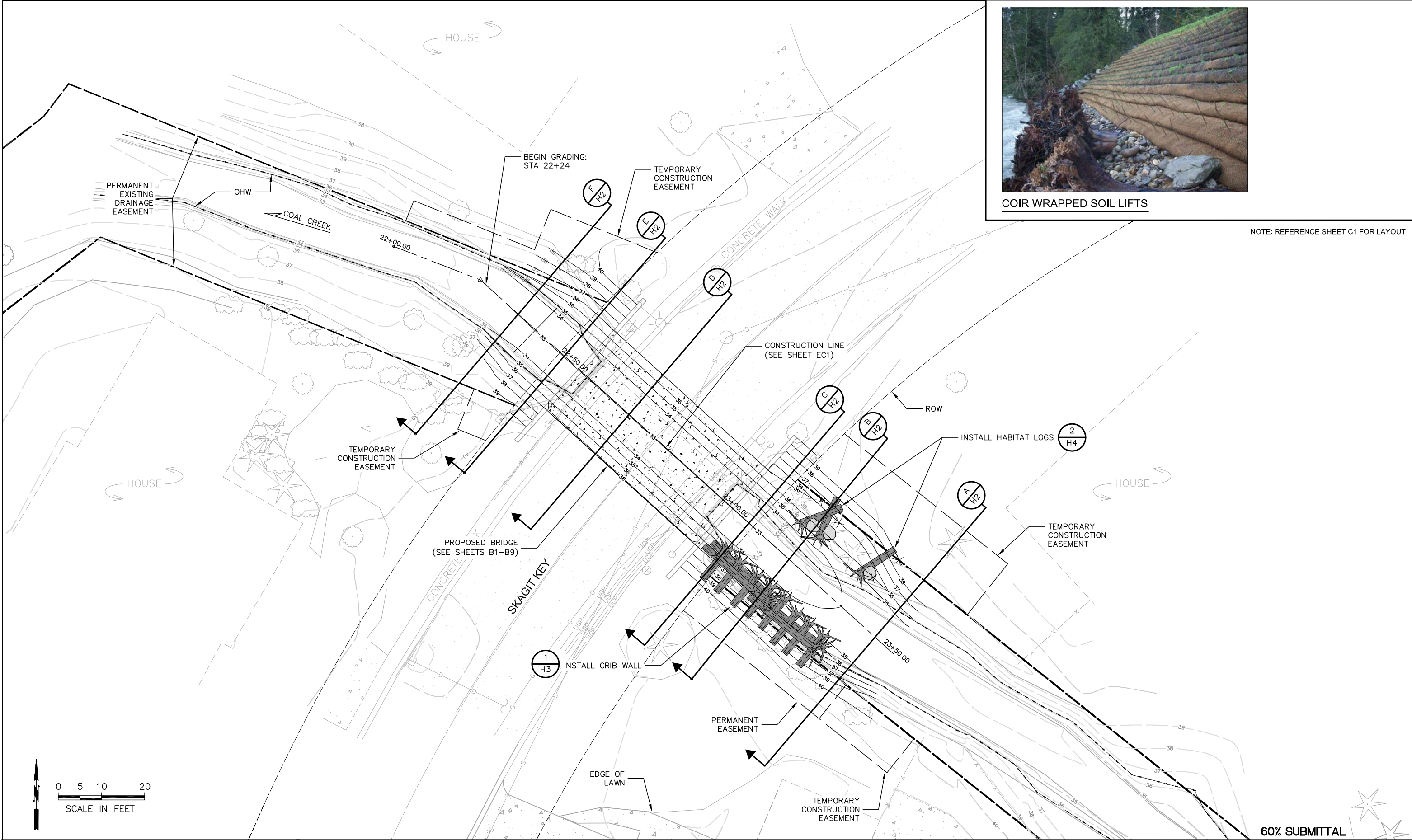
C1 C2

3

ROAD STA 21+45 TO 21+90

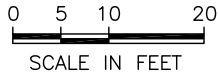
ROAD STA 22+24 TO 22+67





COIR WRAPPED SOIL LIFTS

NOTE: REFERENCE SHEET C1 FOR LAYOUT



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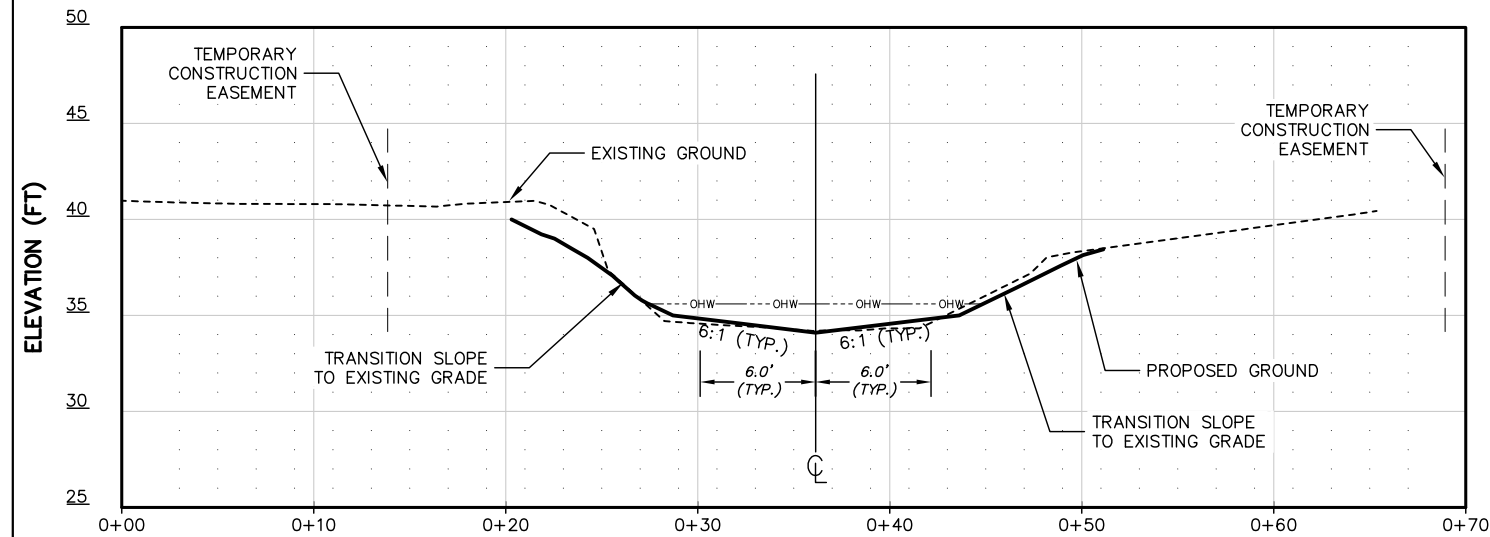
J BROWN 5/6/2016
DESIGNED BY DATE
M OHR 11/7/2016
DRAWN BY DATE
E ROWLAND 5/6/2016
CHECKED BY DATE



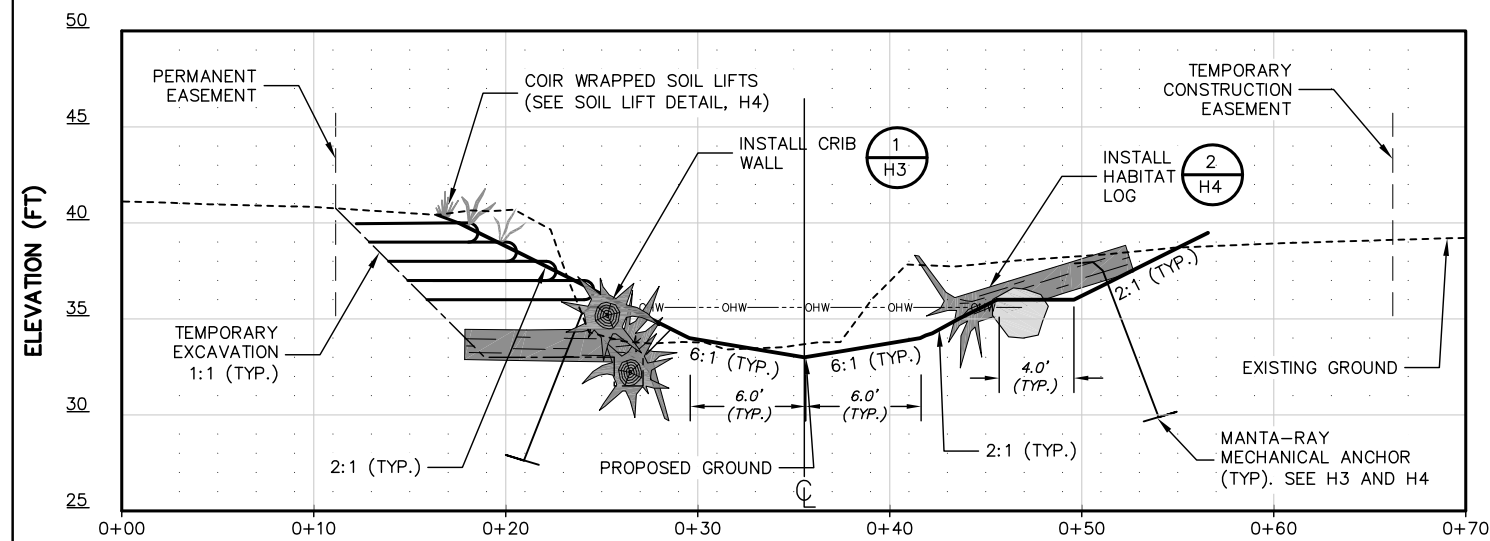
City of Bellevue
UTILITIES

**UPPER SKAGIT KEY CULVERT REPLACEMENT
HABITAT FEATURES PLAN AND CREEK
BED GRADING**

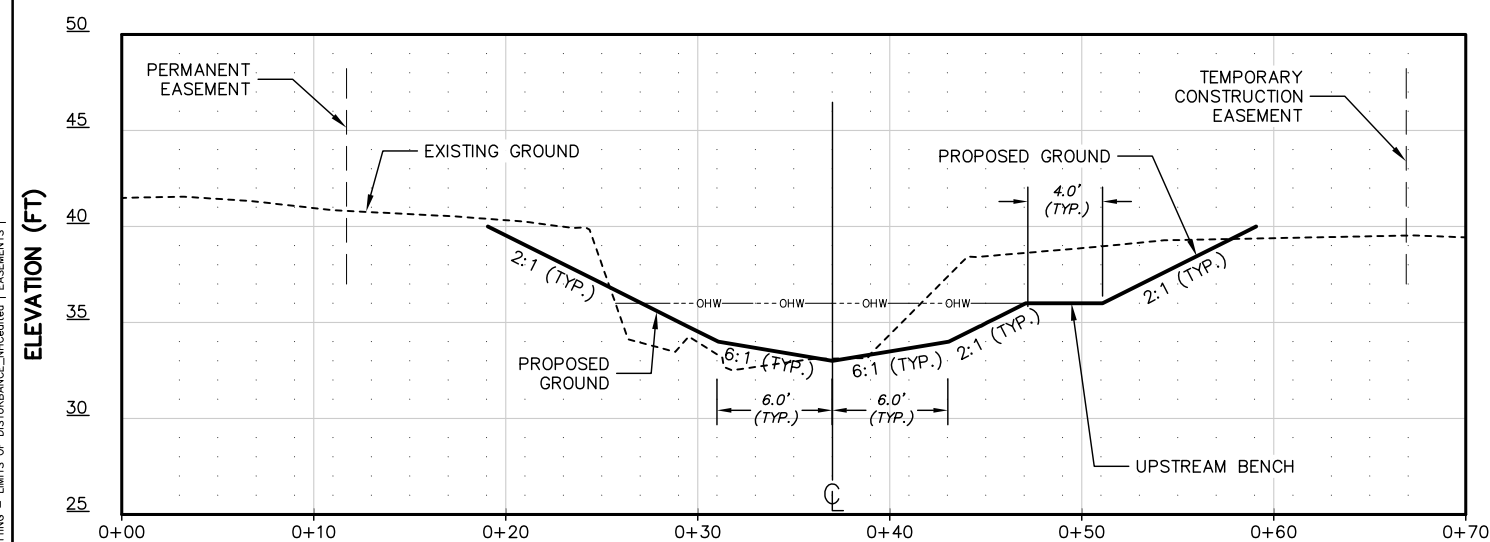
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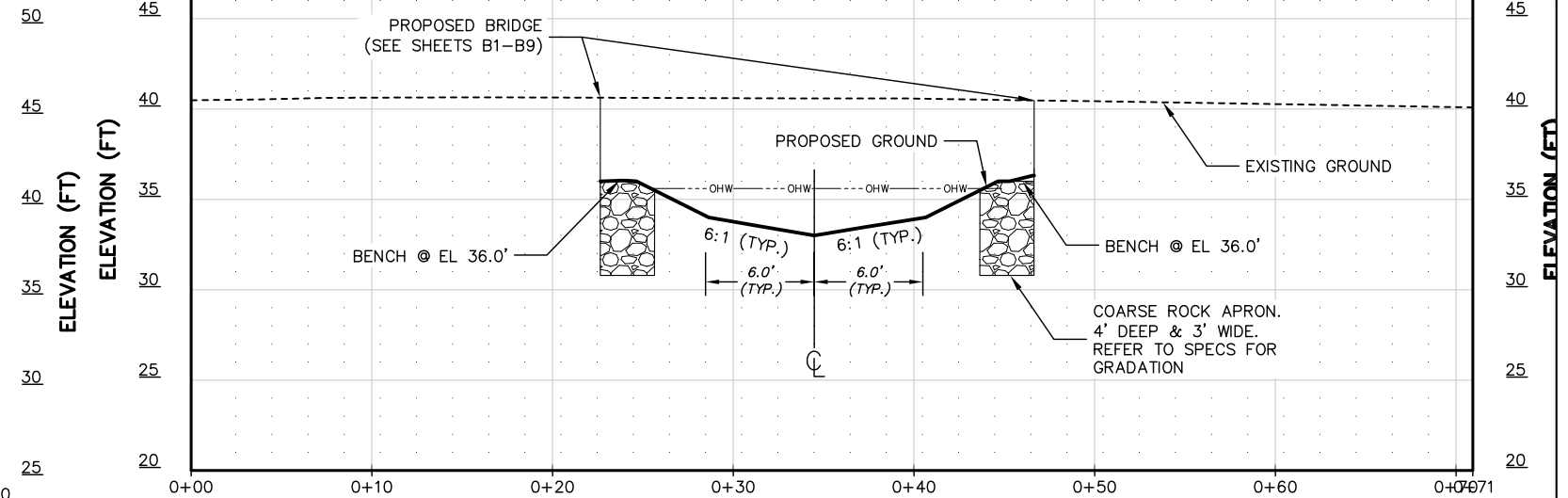
SECTION A - Sta. 23+44.12'
SCALE: HORIZ: 1"= 5' VERT: 1"=5'



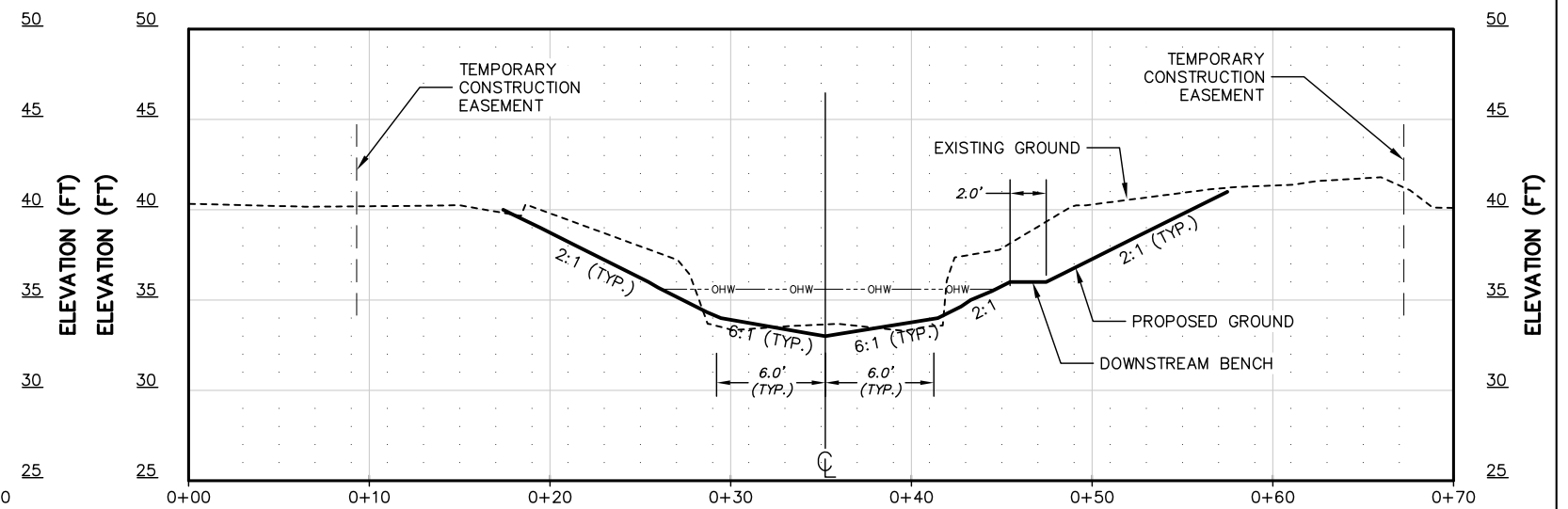
SECTION B - Sta. 23+17.40'
SCALE: HORIZ: 1"= 5' VERT: 1"=5'



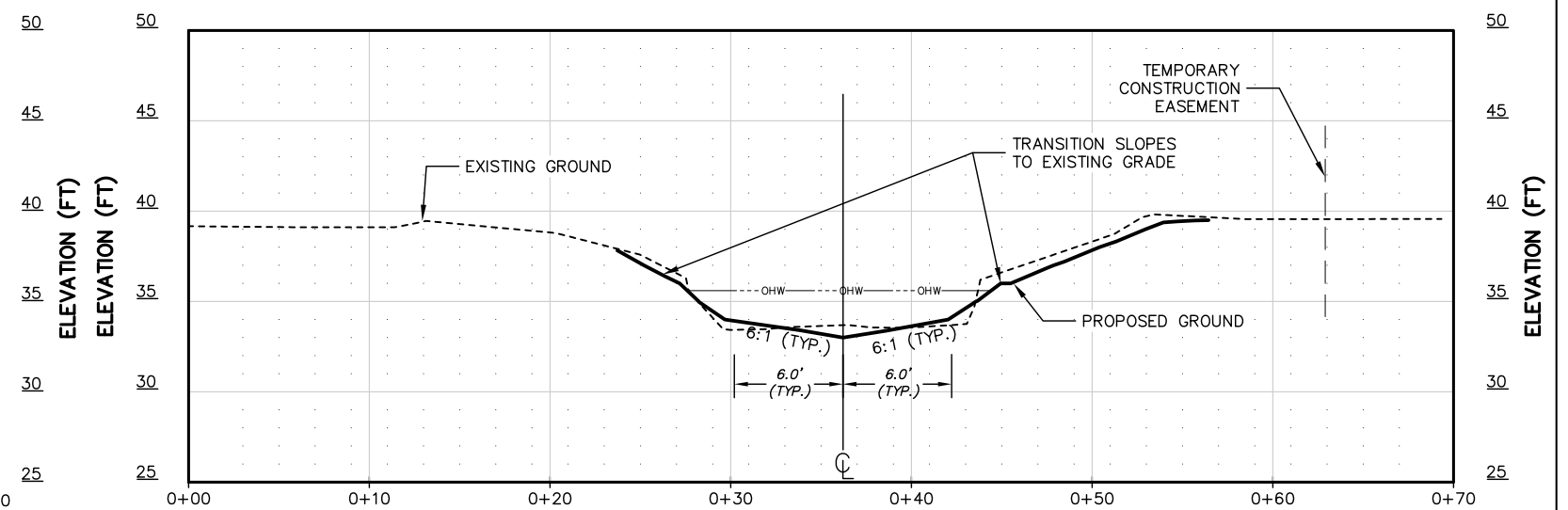
SECTION C - Sta. 23+04.95'
SCALE: HORIZ: 1"= 5' VERT: 1"=5'



SECTION D - Sta 22+68.00
SCALE: HORIZ: 1"= 5' VERT: 1"=5'

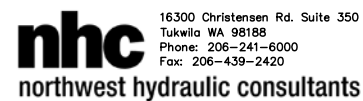


SECTION E - Sta. 22+47.55'
SCALE: HORIZ: 1"= 5' VERT: 1"=5'



SECTION F - Sta. 22+33.20'
SCALE: HORIZ: 1"= 5' VERT: 1"=5'

60% SUBMITTAL

[illegible]

Approved By

DESIGN MANAGER	DATE
PROJECT MANAGER	DATE

J BROWN	5/6/2016
DESIGNED BY	DATE
M OHRT	11/7/2016
DRAWN BY	DATE
E ROWLAND	5/6/2016
CHECKED BY	DATE



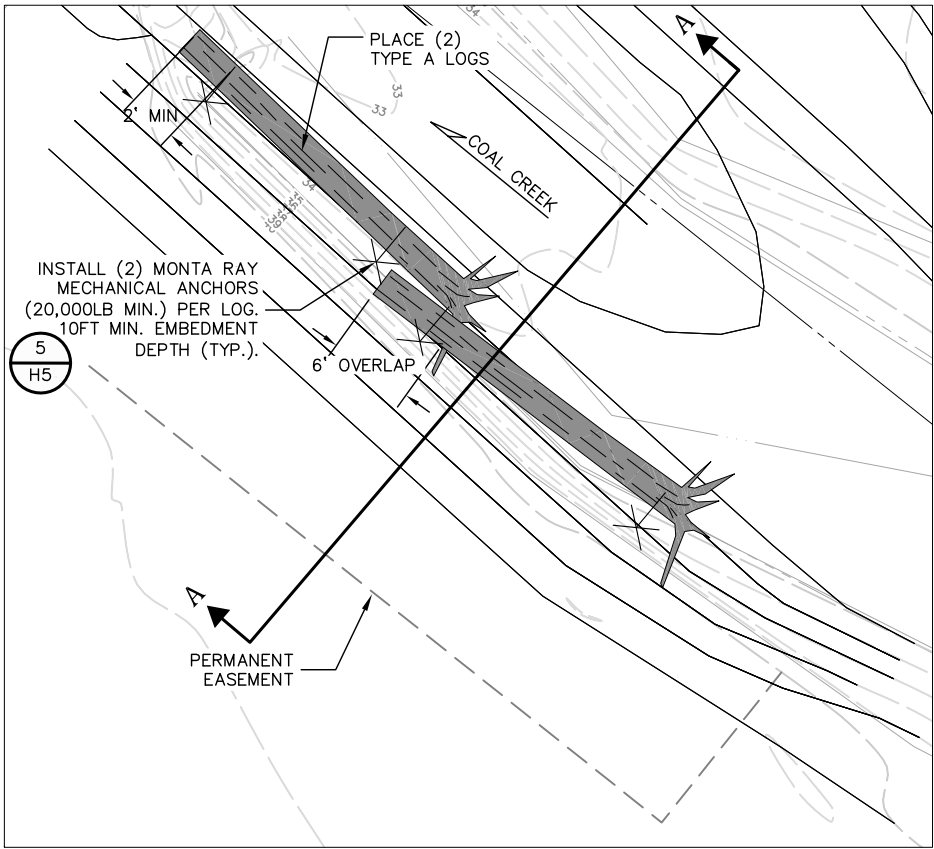
**City of
Bellevue**
UTILITIES

UPPER SKAGIT KEY CULVERT REPLACEMENT HABITAT SECTION VIEWS

H2

SHT 10 OF 25

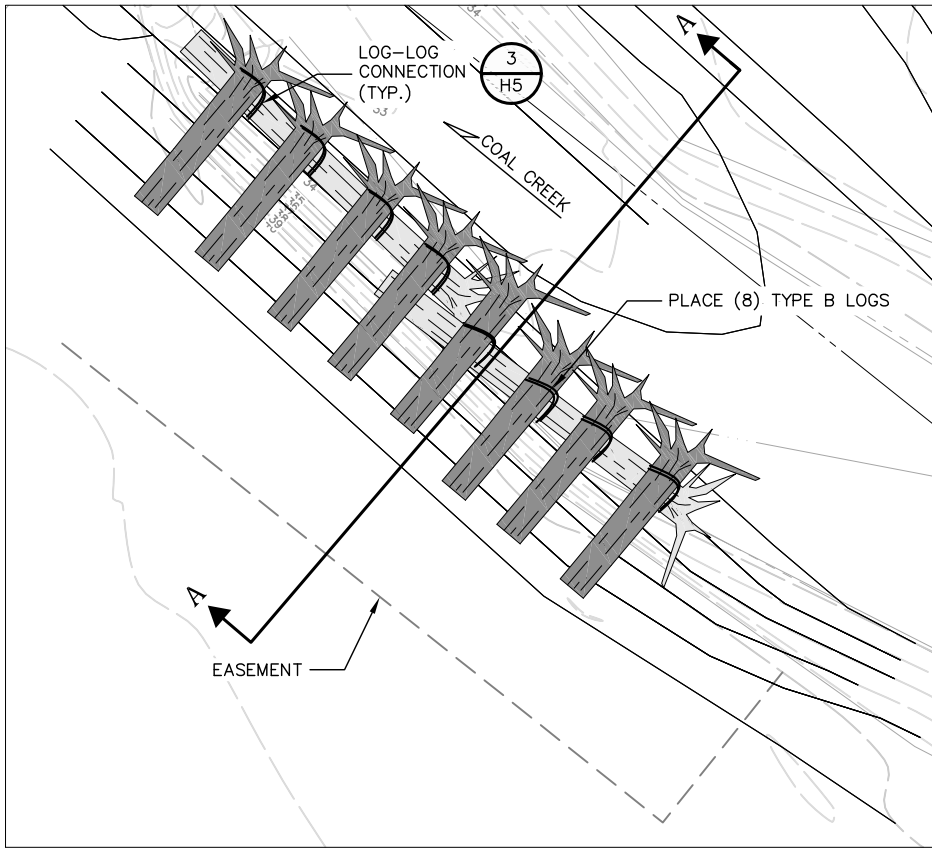
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PLAN VIEW
N.T.S.

STEP 1

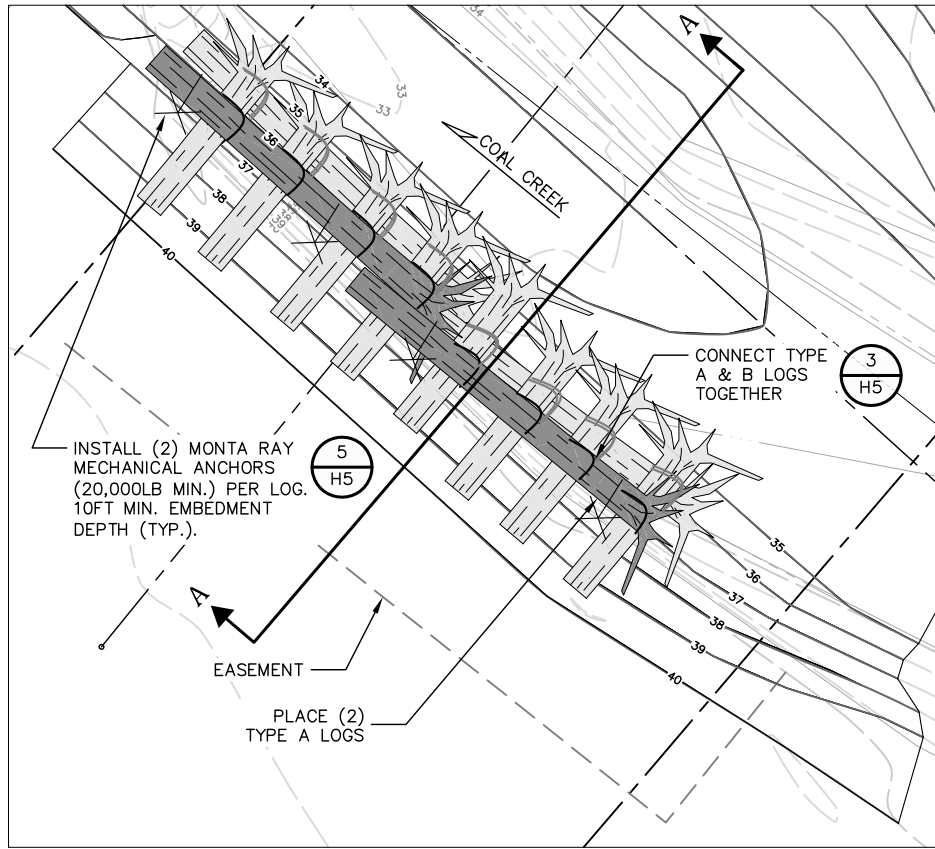
- EXCAVATE TRENCH TO EL. 33.0' TO PLACE LOGS AT TOE OF SLOPE.
- PLACE & ANCHOR TYPE "A" LOGS (20' LONG, 18" Ø WITH ROOTWADS UPSTREAM).



PLAN VIEW
N.T.S.

STEP 2

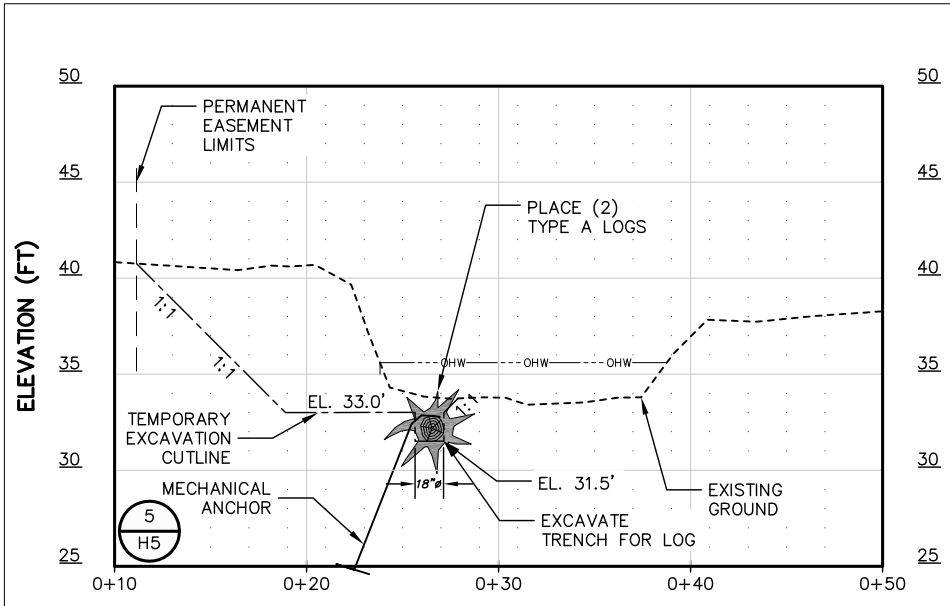
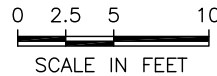
- PLACE TYPE "B" LOGS (8' LONG, 18" Ø WITH ROOTWAD) ATOP TYPE "A" LOGS.
- SECURE WITH CHAIN IN A FIGURE-8 FASHION AROUND EACH "B" LOG TO "A" LOG.
- BACKFILL VOIDS WITH STREAMBED AGGREGATE.



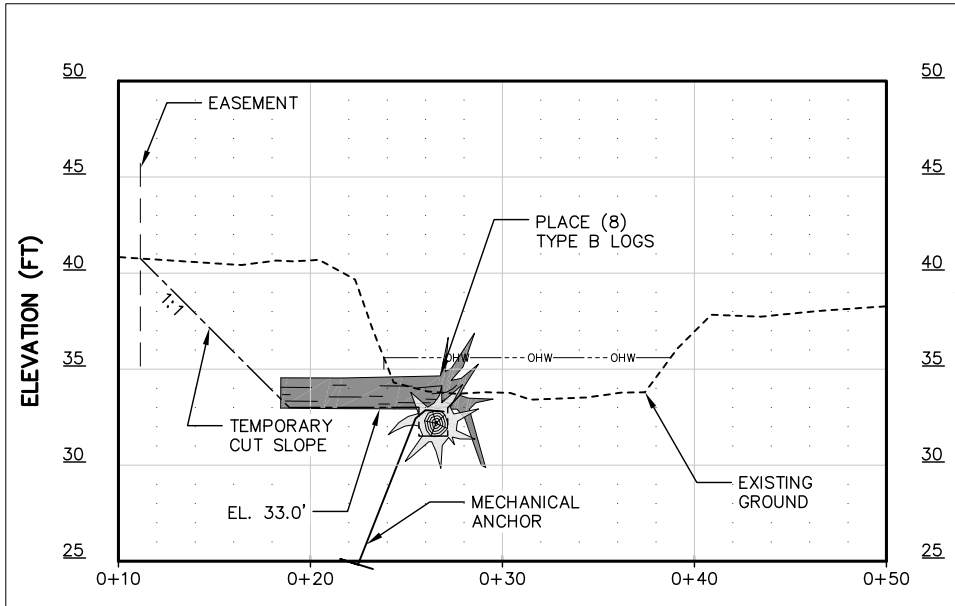
PLAN VIEW
N.T.S.

STEP 3

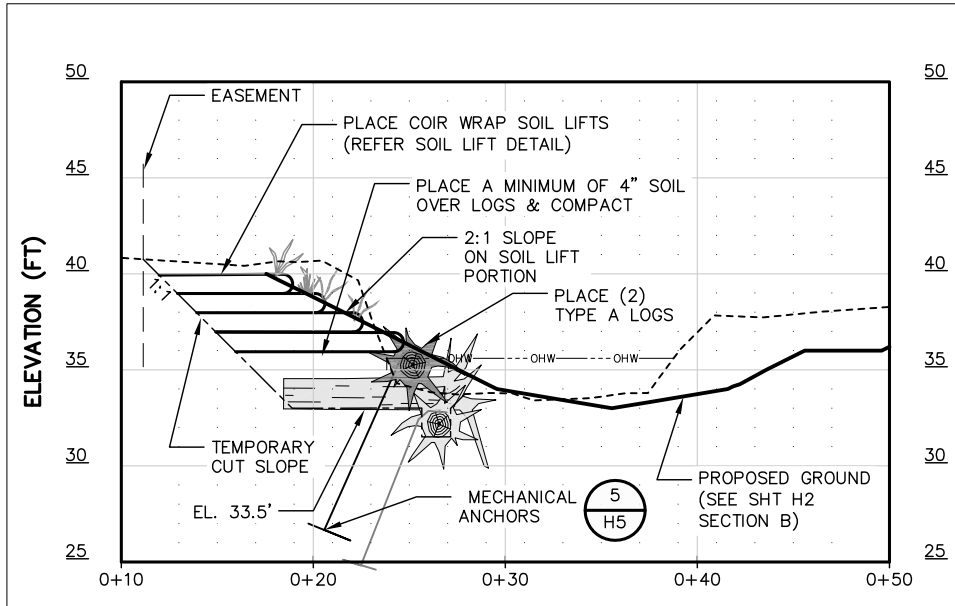
- PLACE & ANCHOR TYPE "A" LOGS ATOP TYPE "B" LOGS.
- SECURE TYPE "A" LOGS TO TYPE "B" LOGS IN A FIGURE-8 FASHION WITH CHAIN.



SECTION A-A



SECTION A-A



SECTION A-A

CRIB WALL
N.T.S.

60% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS

nhc
northwest hydraulic consultants

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Approved By

DESIGN MANAGER DATE
PROJECT MANAGER DATE

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DESIGNED BY DATE
M. OHRT 11/7/2016
DRAWN BY DATE
E. ROWLAND 5/6/2016
CHECKED BY DATE



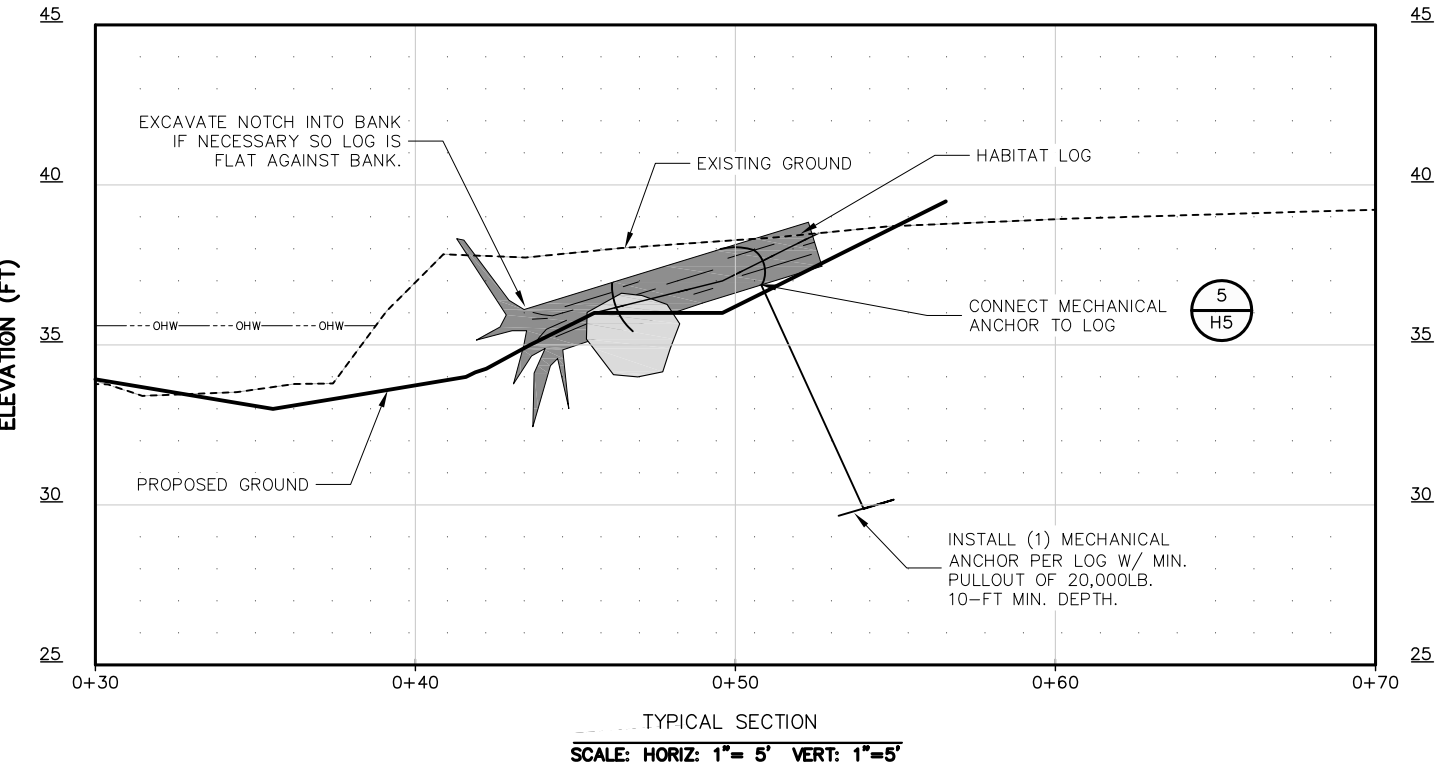
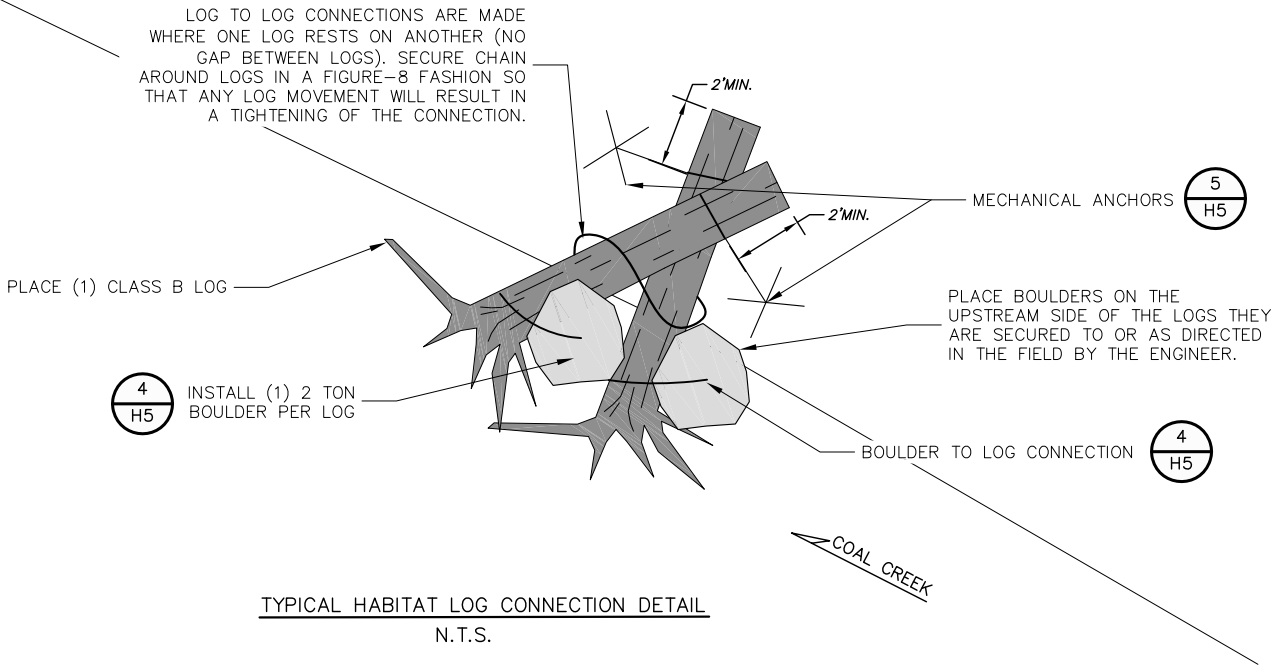
**City of
Bellevue**
UTILITIES

**UPPER SKAGIT KEY CULVERT REPLACEMENT
CRIB WALL PLACEMENT DETAIL**

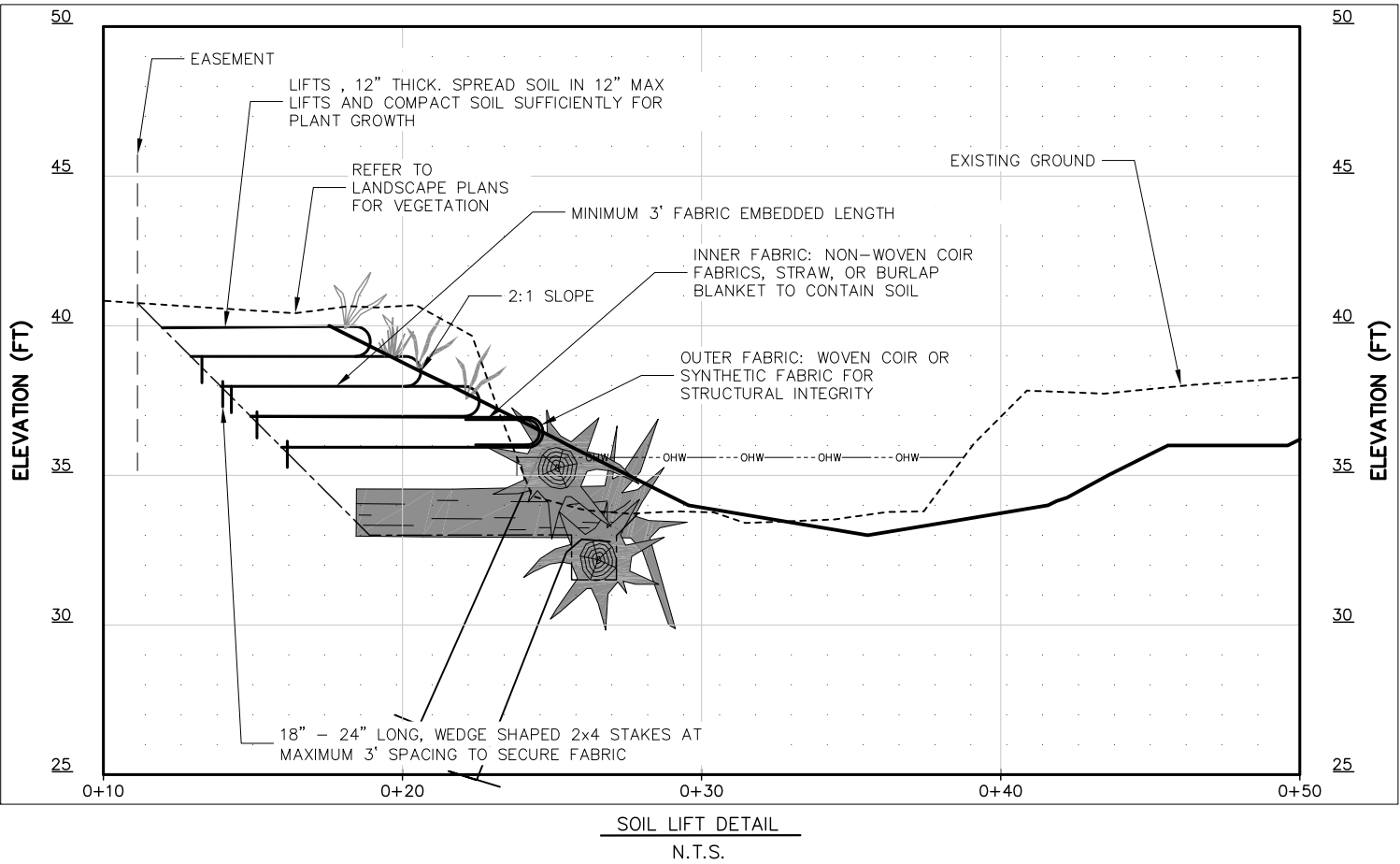
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SHT 11 OF 25

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(2) TYPICAL HABITAT LOG CONNECTION DETAIL
N.T.S.



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M. OHRT 5/6/2016
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CHECKED BY DATE



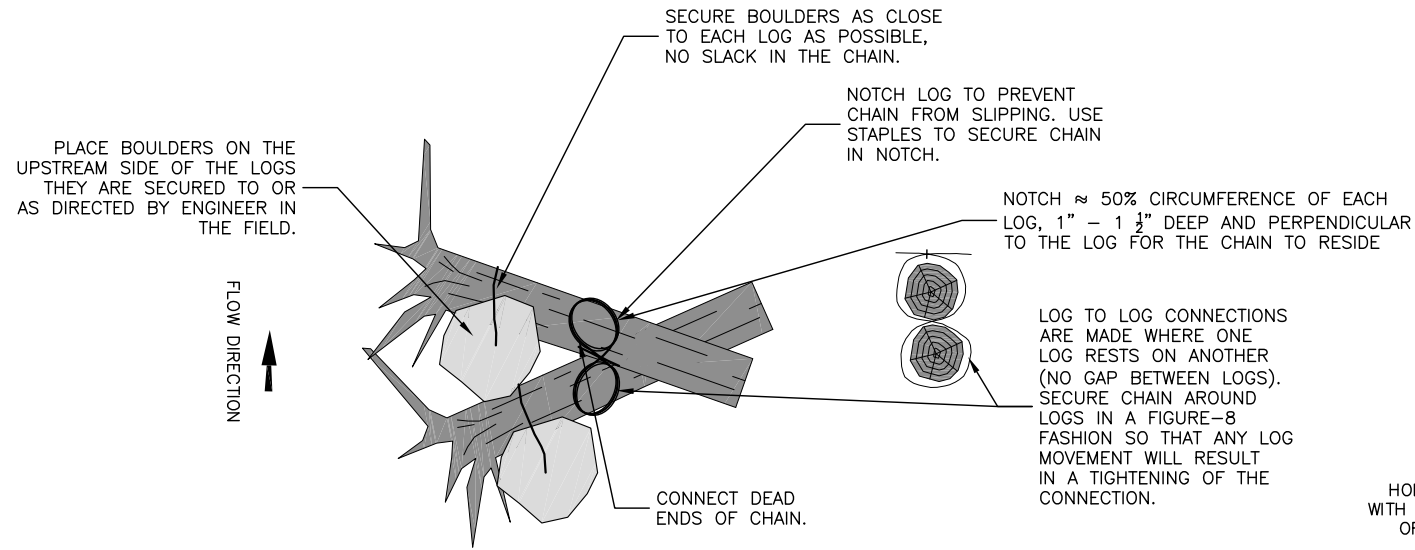
City of Bellevue
UTILITIES

**UPPER SKAGIT KEY CULVERT REPLACEMENT
HABITAT LOG PLACEMENT AND SOIL
LIFT DETAILS**

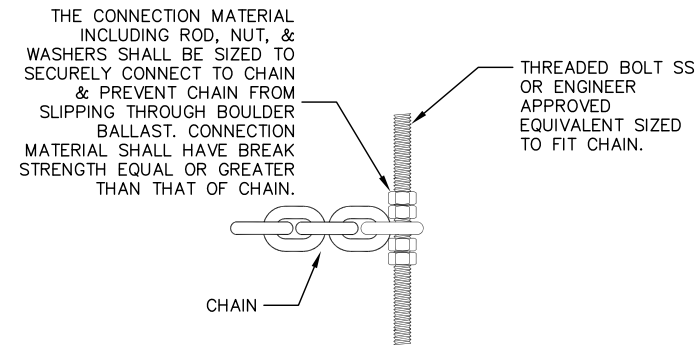
H4 SHT 12 OF 25

60% SUBMITTAL

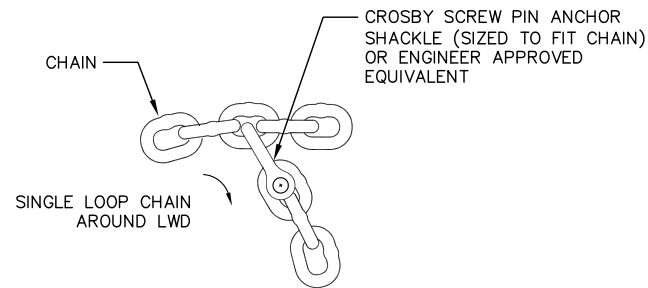
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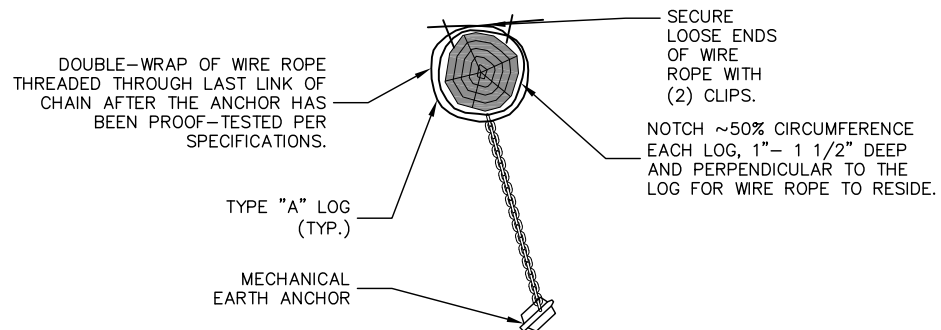
3 LOG TO LOG CONNECTION DETAILS
N.T.S.



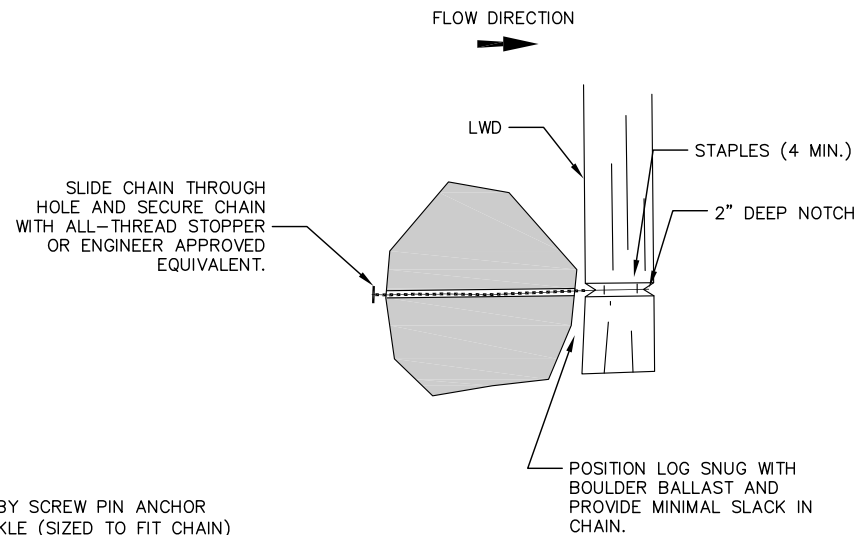
CONNECTION DETAIL 1
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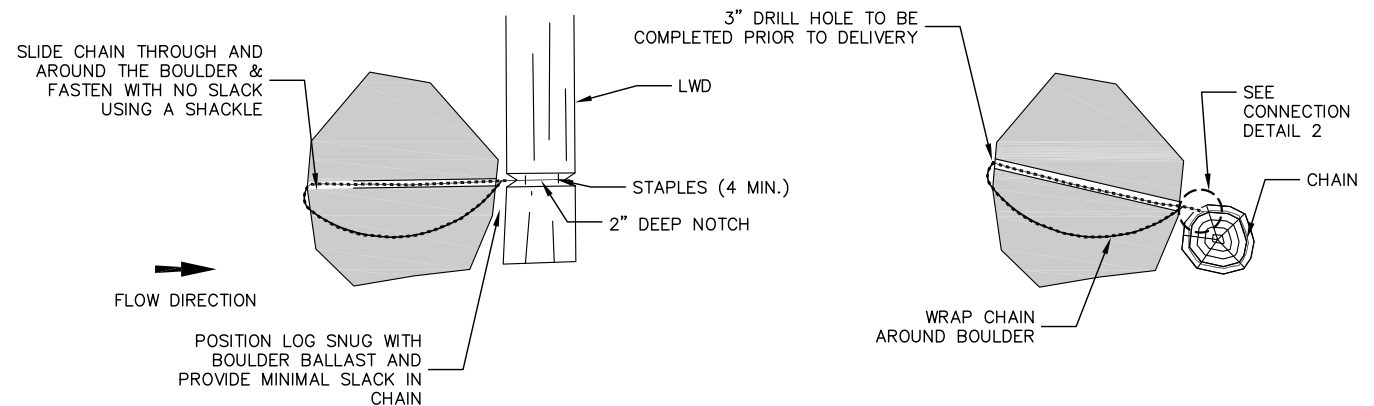
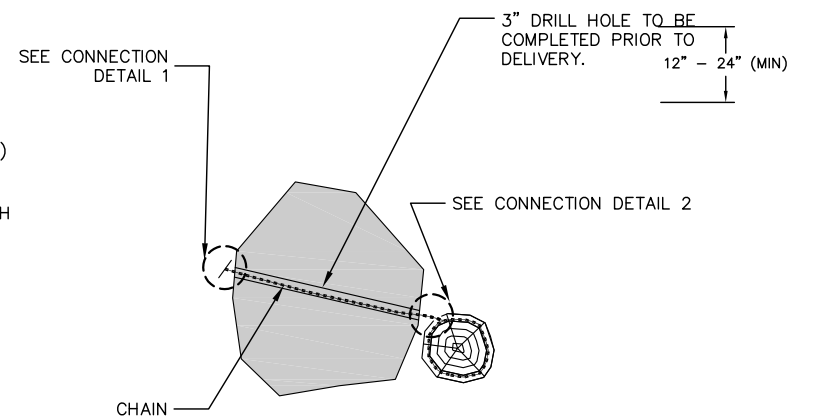
CONNECTION DETAIL 2
N.T.S.



5 LOG TO MECHANICAL ANCHOR CONNECTION DETAIL
N.T.S.



4 BOULDER TO LWD CONNECTION WITH STOPPER ALTERNATIVE
N.T.S.



4 BOULDER TO LWD CONNECTION WITH WRAP ALTERNATIVE
N.T.S.

NO	DATE	BY	APPR	REVISIONS

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Approved By

DESIGN MANAGER DATE
PROJECT MANAGER DATE

J. BROWN 5/6/2016
DESIGNED BY DATE
M. OHRT 5/6/2016
DRAWN BY DATE
E. ROWLAND 5/6/2016
CHECKED BY DATE



**City of
Bellevue**
UTILITIES

60% SUBMITTAL

**UPPER SKAGIT KEY CULVERT REPLACEMENT
HABITAT DETAILS**

H5

SHT 13 OF 25

GENERAL NOTES:

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, DATED 2016 AND AMENDMENTS.
2. THE STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SEVENTH EDITION – 2014 AND INTERIMS, MODIFIED BY THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION BRIDGE DESIGN MANUAL.
3. SEISMIC DESIGN HAS BEEN DONE USING THE FOLLOWING SEISMIC PARAMETERS:

SEISMIC DESIGN PARAMETERS	
(Fo)(Ss)=SDs	(0.93)(0.98)=0.911
(Fv)(S1)=SD1	(2.70)(0.33)=0.89
Site Class	E

4. CONCRETE IN THE ROADWAY DECK SHALL BE CONCRETE CL 4,000D. SHAFTS SHALL BE CONCRETE CL 4,000P. ALL OTHER CAST-IN-PLACE CONCRETE SHALL BE CLASS 4,000 UNLESS OTHERWISE NOTED.
5. UNLESS OTHERWISE SHOWN ON THE PLANS, THE CONCRETE COVER MEASURED FROM THE FACE OF THE CONCRETE TO THE FACE OF ANY REINFORCING BAR SHALL BE AS FOLLOWS:

TOP OF ROADWAY SLAB

2-½ INCHES

BOTTOM OF ROADWAY SLAB

1 INCH

CONCRETE CAST AGAINST EARTH

3 INCHES

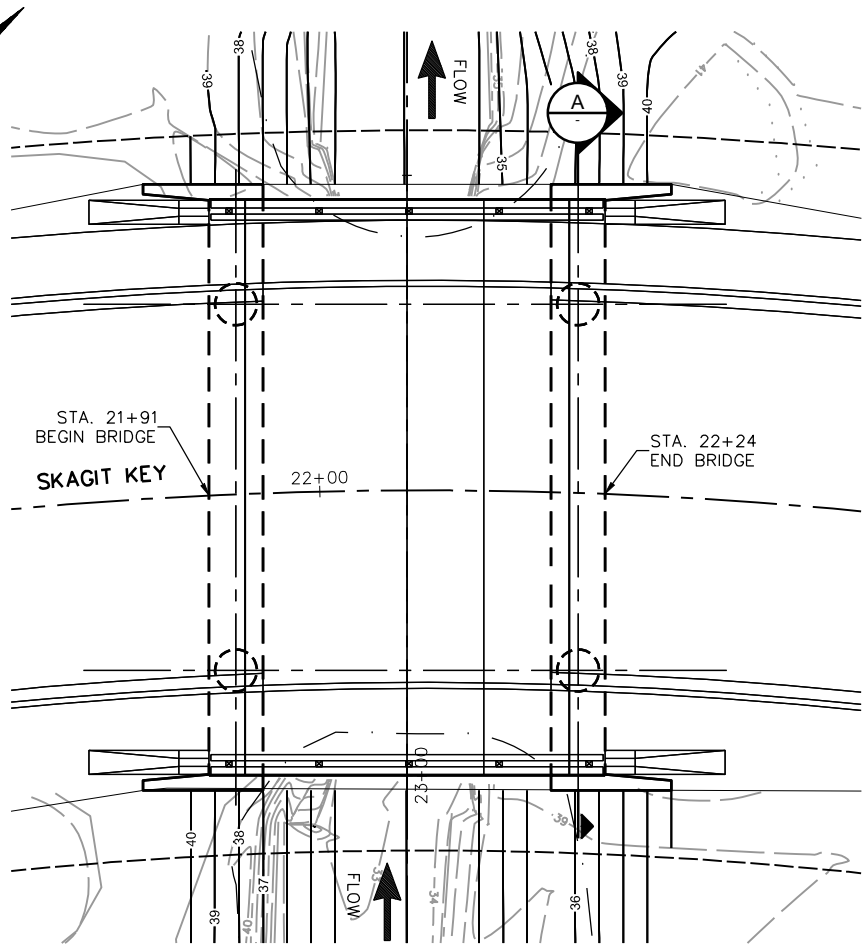
CONCRETE EXPOSED TO EARTH OR WEATHER

PRIMARY REINFORCEMENT

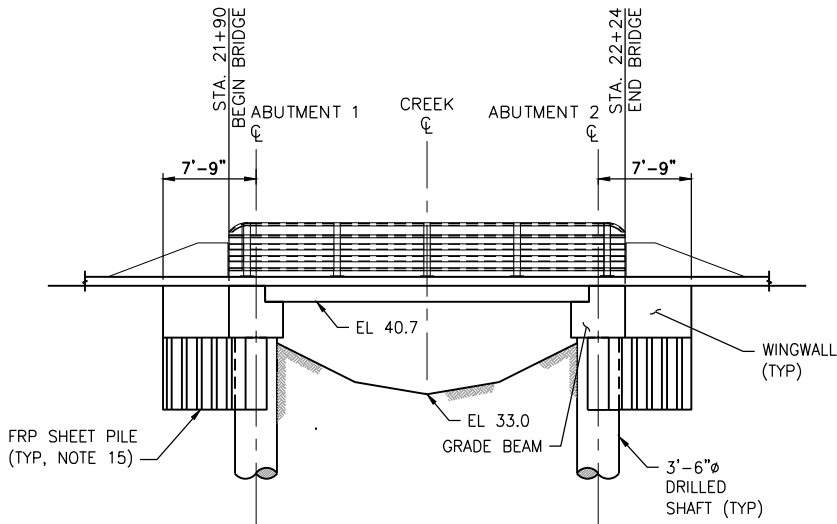
2 INCHES

SECONDARY REINFORCEMENT (TIES OR STIRRUPS)

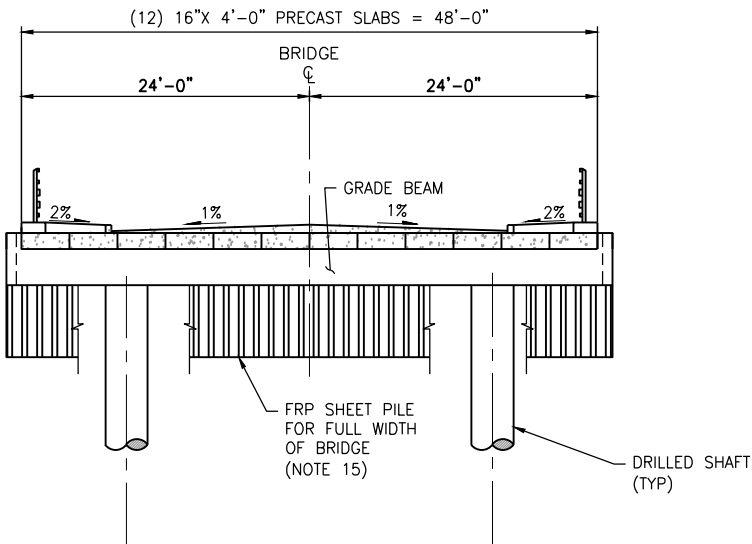
1-½ INCHES
6. UNLESS OTHERWISE SHOWN ON THE PLANS, ALL EXTERIOR CORNERS AND EDGES SHALL HAVE ¾" CHAMFER.
7. ALL DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.
8. DRILLED SHAFT TIP ELEVATIONS SHOWN ARE REQUIRED TO PREVENT SETTLEMENT DUE TO POOR SOIL LAYERS. SEE GEOTECHNICAL REPORT DATED NOV. 18, 2016 BY ASPECT CONSULTING FOR DRILLED SHAFT DESIGN PARAMETERS.
9. THE UTILITY CENTERLINES ARE SHOWN FOR REFERENCE ONLY. THE CONTRACTOR SHALL COORDINATE THESE PLANS WITH RELEVANT UTILITY PLAN SHEETS.
10. A PIGMENT SEALER SHALL BE APPLIED TO THE EXTERIOR SURFACE OF PILE CAP AND WING WALL CONCRETE. THE COLOR SHALL BE MT. ST. HELENS GRAY.
11. □□□ INDICATES BAR MARK NUMBER.
12. ALL EXPOSED CAST-IN-PLACE CONCRETE SURFACES SHALL RECEIVE A CLASS 1 FINISH.
13. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A706 GRADE 60.
14. ▽ INDICATES EPOXY COATED BAR.
15. SEE SHEET B2, FOUNDATION PLAN FOR LIMITS OF FRP COMPOSITE SHEET PILE LOCATION BELOW GRADE BEAM AND WING WALLS.



PLAN
SCALE: 1/8" = 1'-0"



ELEVATION
SCALE: 1/8" = 1'-0"



BRIDGE SECTION
LOOKING AT ABUTMENT A
SCALE : 1/8"=1'-0"

NO	DATE	BY	APPR	REVISIONS

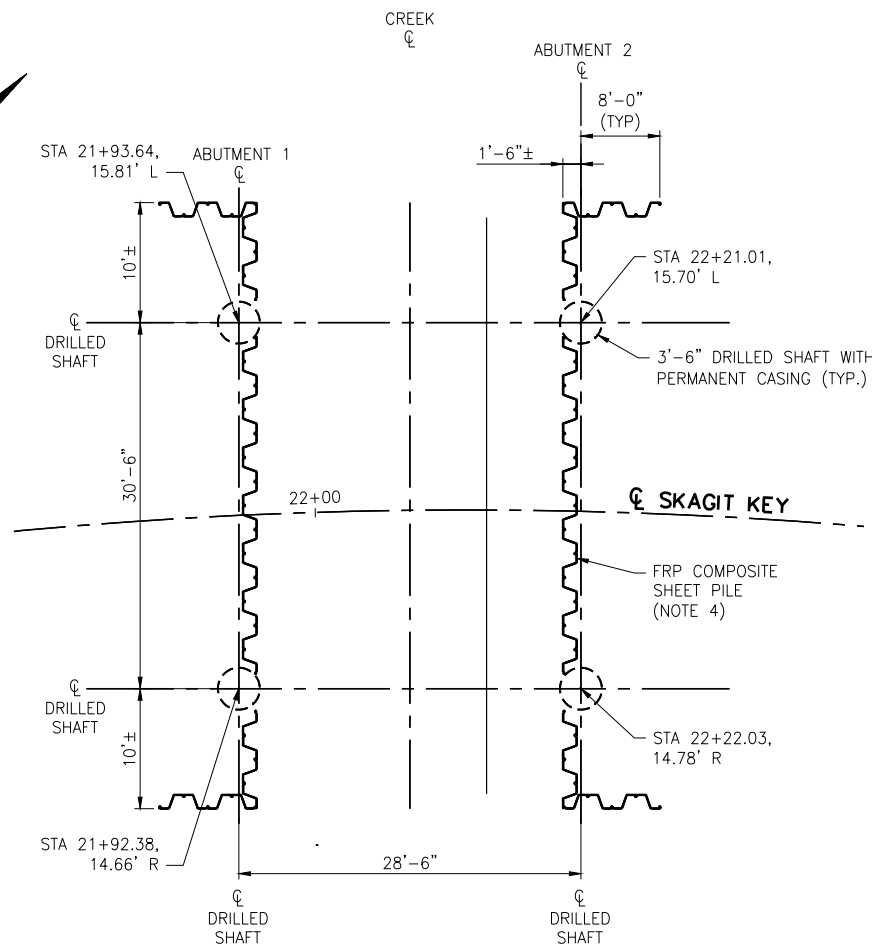


Approved By	
DESIGN MANAGER	DATE
PROJECT MANAGER	DATE
AA DESIGNED BY	DATE
NS DRAWN BY	DATE
DS CHECKED BY	DATE

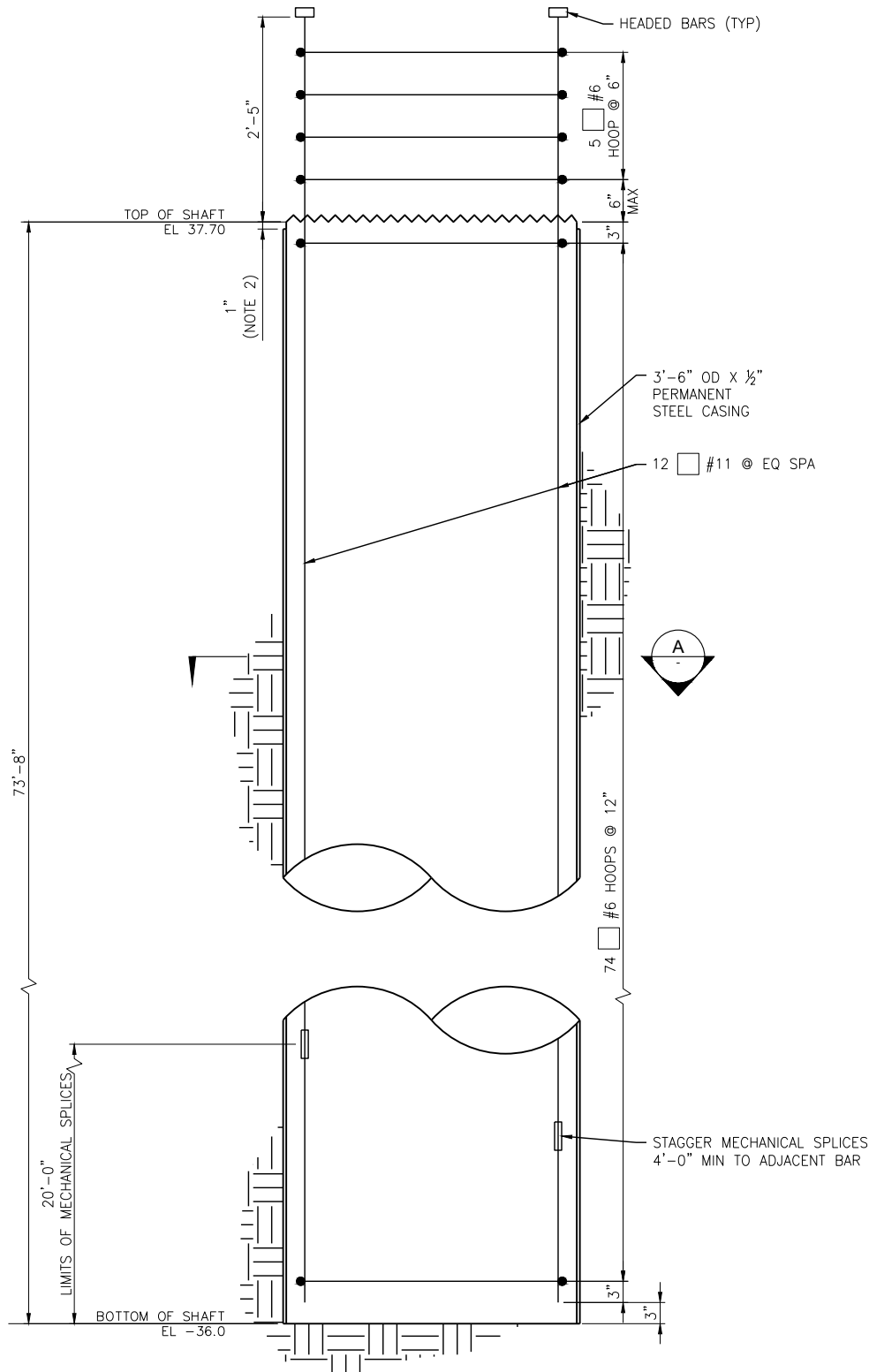


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UPPER SKAGIT KET CULVERT REPLACEMENT BRIDGE LAYOUT AND GENERAL NOTES	
B1	SHT 14 OF 25

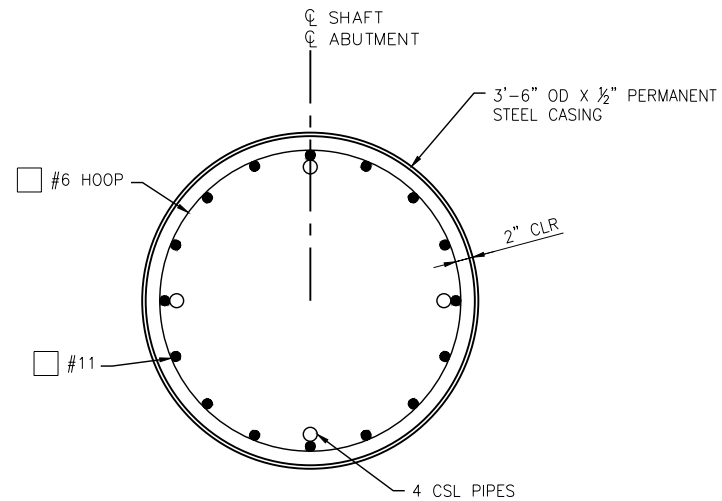
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FOUNDATION PLAN
SCALE: 1/8" = 1'-0"



DRILLED SHAFT
ELEVATION
SCALE: 1" = 1'-0"



SECTION A
SCALE: 1" = 1'-0"

DRILLED SHAFT NOTES:

- PERMANENT STEEL CASING SHALL CONFORM TO ASTM A36 OR A572 (GRADE 42 OR 50). THE MINIMUM CASING SHALL BE DELIVERED PAINTED.
- TERMINATE CASING 1" BELOW TOP OF SHAFT.
- CASING SHALL BE PRESSED OR TWISTED INTO THE GROUND TO ADVANCE THE CASING. VIBRATORY CASING INSTALLATION METHODS SHALL NOT BE USED.
- FRP COMPOSITE SHEET PILE SHALL BE UC-75 OR APPROVED EQUAL. SHEETS ARE 6' LONG TO PREVENT SCOUR BENEATH CAP BEAM. SHEETS ARE NOT DESIGNED TO SUPPORT UNBALANCED LOAD. VIBRATORY INSTALLATION METHODS SHALL NOT BE USED TO INSTALL THE SHEETS.

60% SUBMITTAL

UPPER SKAGIT KEY CULVERT REPLACEMENT
FOUNDATION PLAN AND DETAILS

B2

SHT 15 OF 25

NO	DATE	BY	APPR	REVISIONS



Approved By

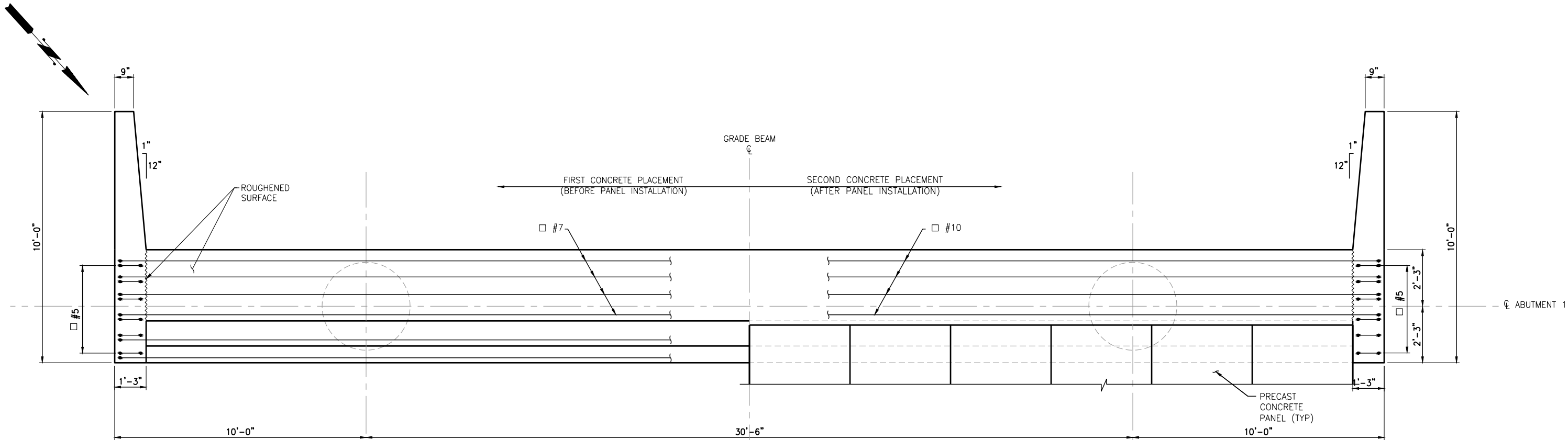
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PROJECT MANAGER _____ DATE _____

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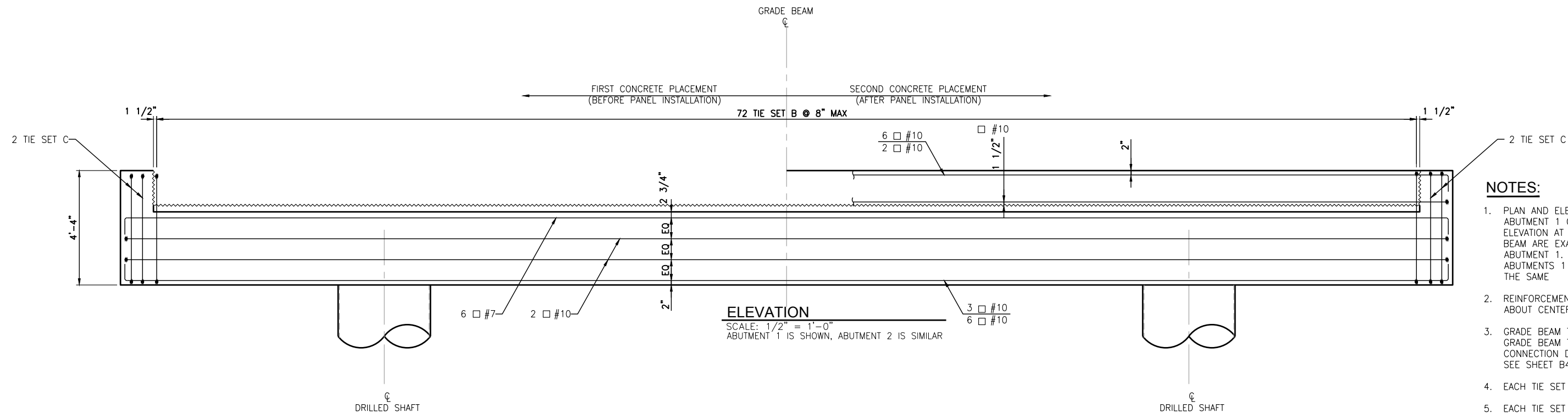


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Path: P:\134271 Lower Coal Creek Ph. 2 Early Action\CAD\SheetFiles\Group\B3_ABUTMENT PLAN & ELEVATION.dwg Plot date: Dec 16, 2016-03:33:51pm CAD User: vince.rous. Plot filename: 134271-606 [C:\Program Files\Autodesk\AutoCAD 2016\Plot\Plot1.dwg]



PLAN
SCALE: 1/2" = 1'-0"
ABUTMENT 1 IS SHOWN, ABUTMENT 2 IS SIMILAR



ELEVATION
SCALE: 1/2" = 1'-0"
ABUTMENT 1 IS SHOWN, ABUTMENT 2 IS SIMILAR

- NOTES:**
1. PLAN AND ELEVATION SHOWN ARE ABUTMENT 1 GRADE BEAM. PLAN AND ELEVATION AT ABUTMENT 2 GRADE BEAM ARE EXACTLY THE SAME AS ABUTMENT 1. REINFORCEMENT AT ABUTMENTS 1 AND 2 ARE EXACTLY THE SAME
 2. REINFORCEMENT IS SYMMETRICAL ABOUT CENTERLINE OF GRADE BEAM
 3. GRADE BEAM TO DRILLED SHAFT AND GRADE BEAM TO WING WALL CONNECTION DETAILS ARE NOT SHOWN. SEE SHEET B4
 4. EACH TIE SET "B" CONSIST OF XXX
 5. EACH TIE SET "C" CONSIST OF XXX

NO	DATE	BY	APPR	REVISIONS

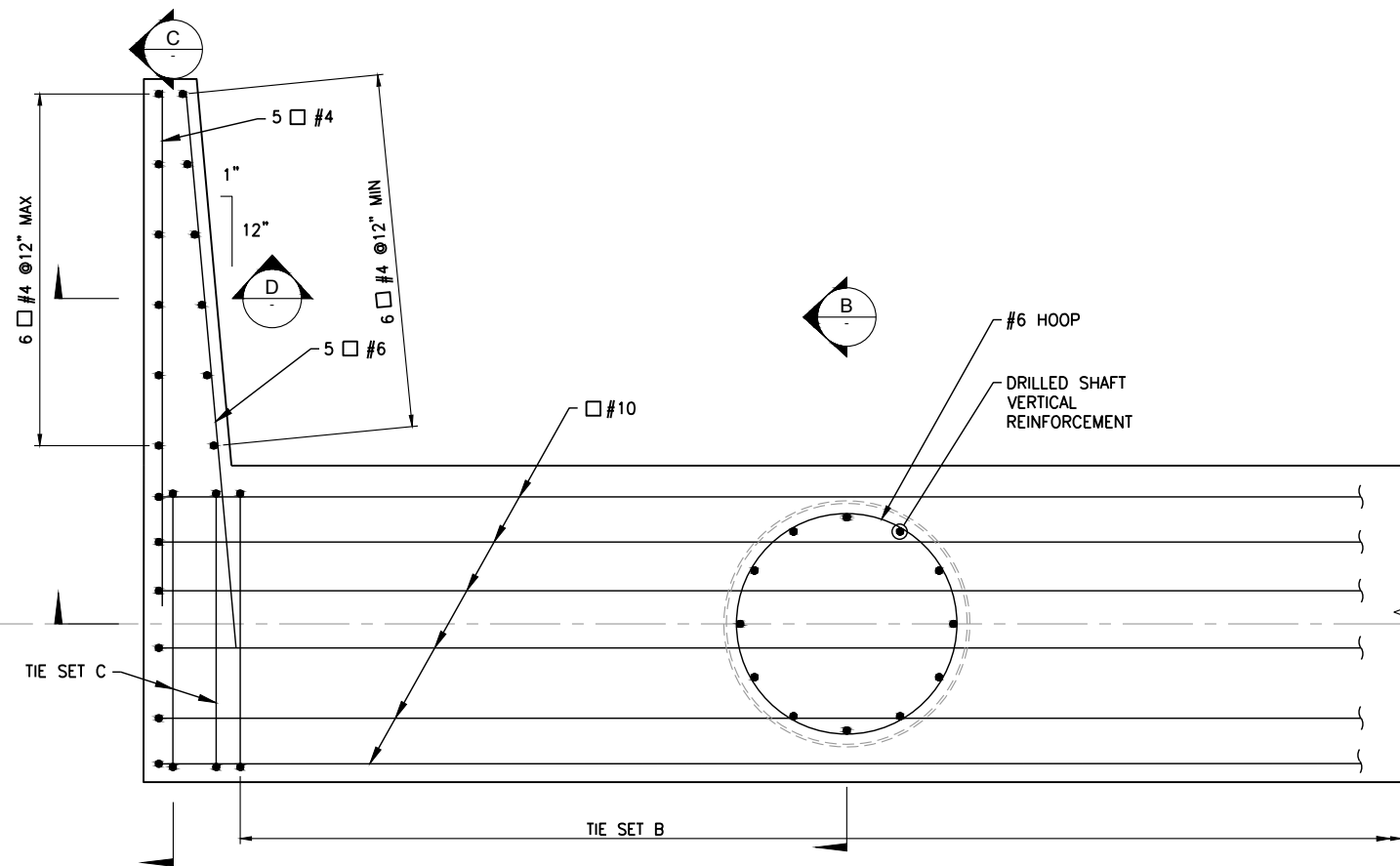


Approved By	
DESIGN MANAGER	DATE
PROJECT MANAGER	DATE

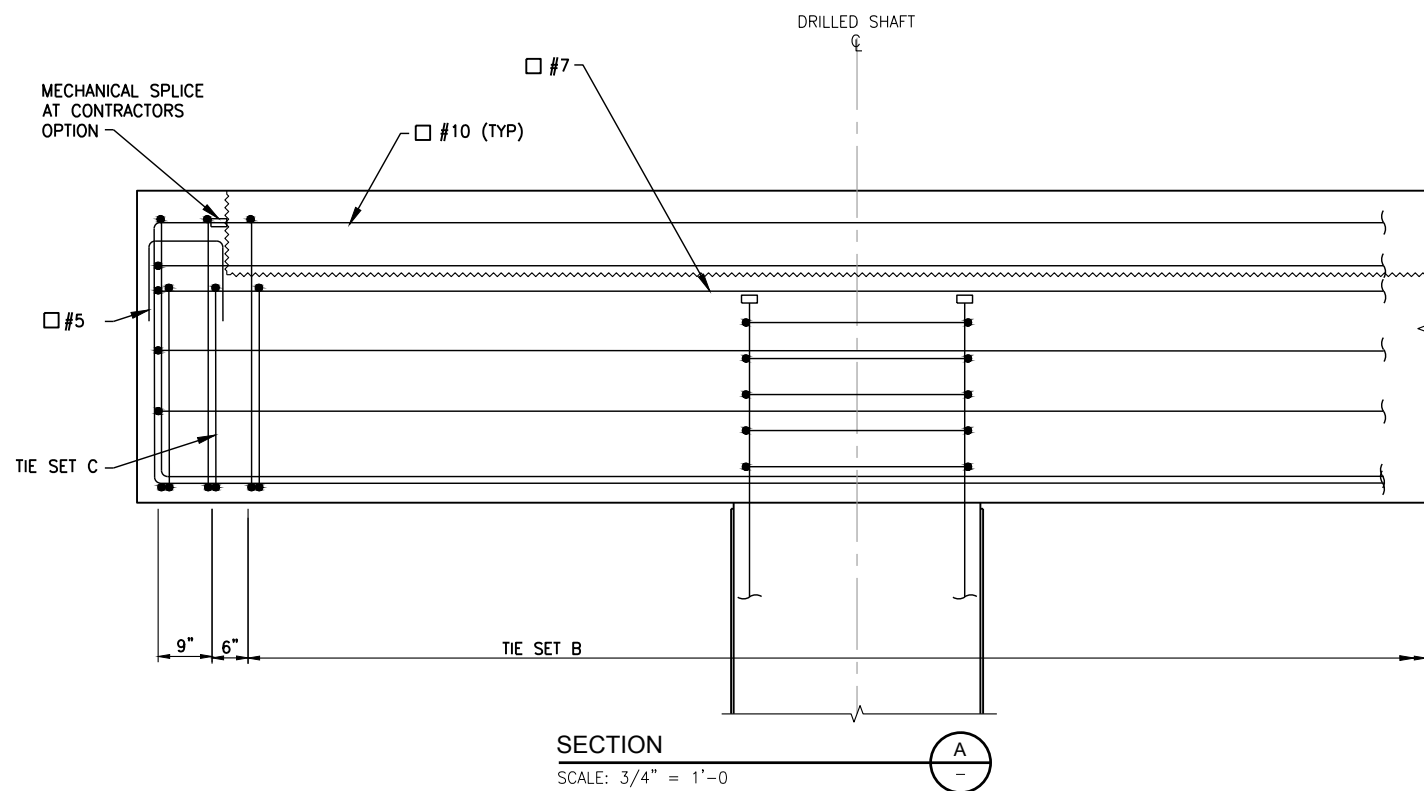


60% SUBMITTAL	
UPPER SKAGIT KEY CULVERT REPLACEMENT ABUTMENT PLAN AND ELEVATION	
B3	SHT 16 OF 25

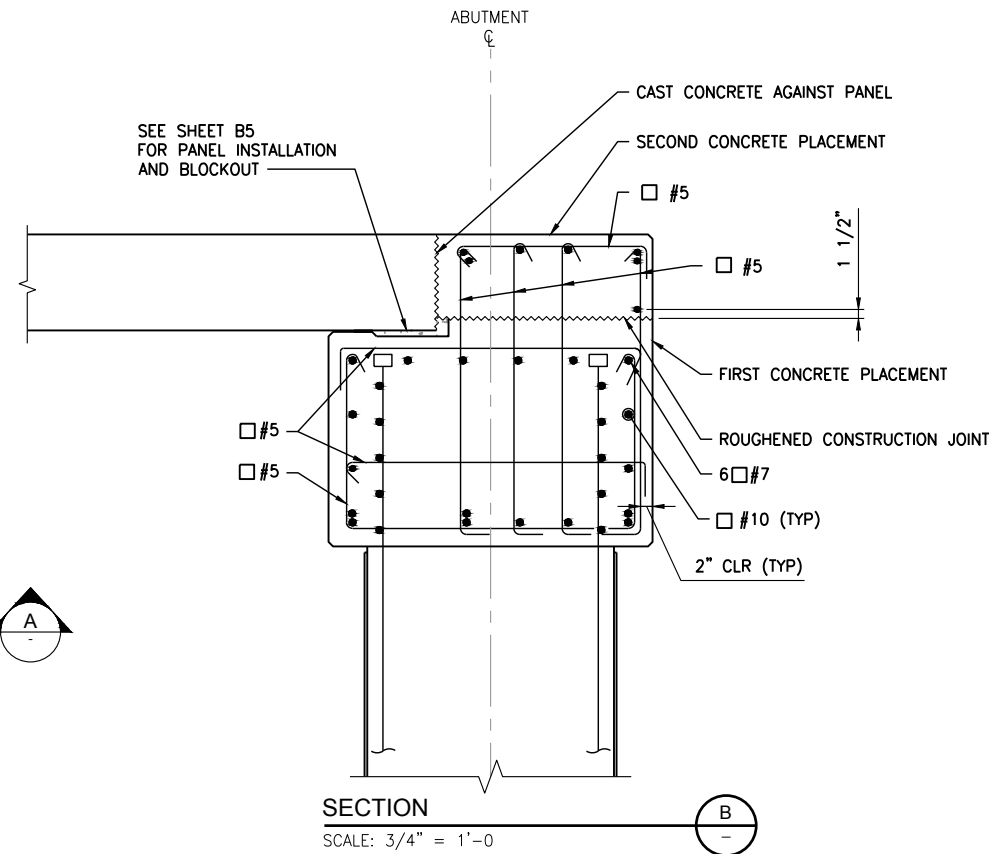
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Net Name: 134271-606 [C-SR-BRIDGE DETAILS]



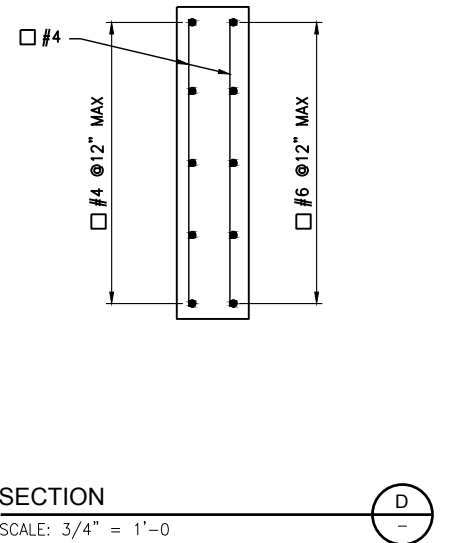
TYPICAL GRADE BEAM AND DRILLED SHAFT CONNECTION PLAN
SCALE: 3/4" = 1'-0"



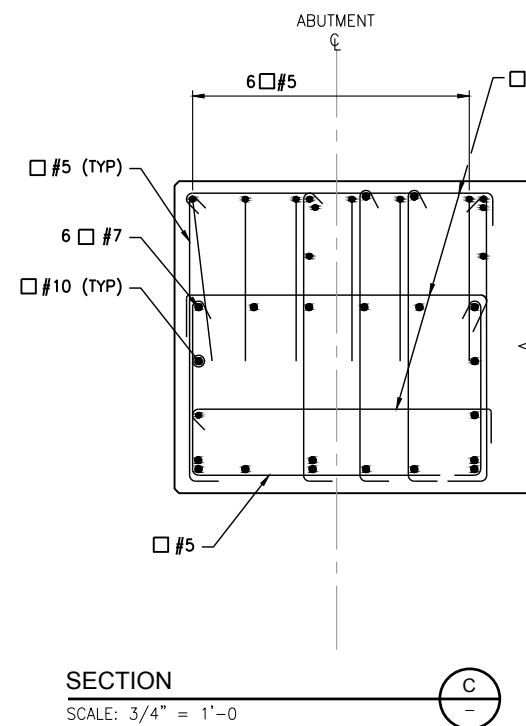
SECTION A-A
SCALE: 3/4" = 1'-0"



SECTION B-B
SCALE: 3/4" = 1'-0"



SECTION D-D
SCALE: 3/4" = 1'-0"



SECTION C-C
SCALE: 3/4" = 1'-0"

NO	DATE	BY	APPR	REVISIONS



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DESIGN MANAGER	DATE
PROJECT MANAGER	DATE

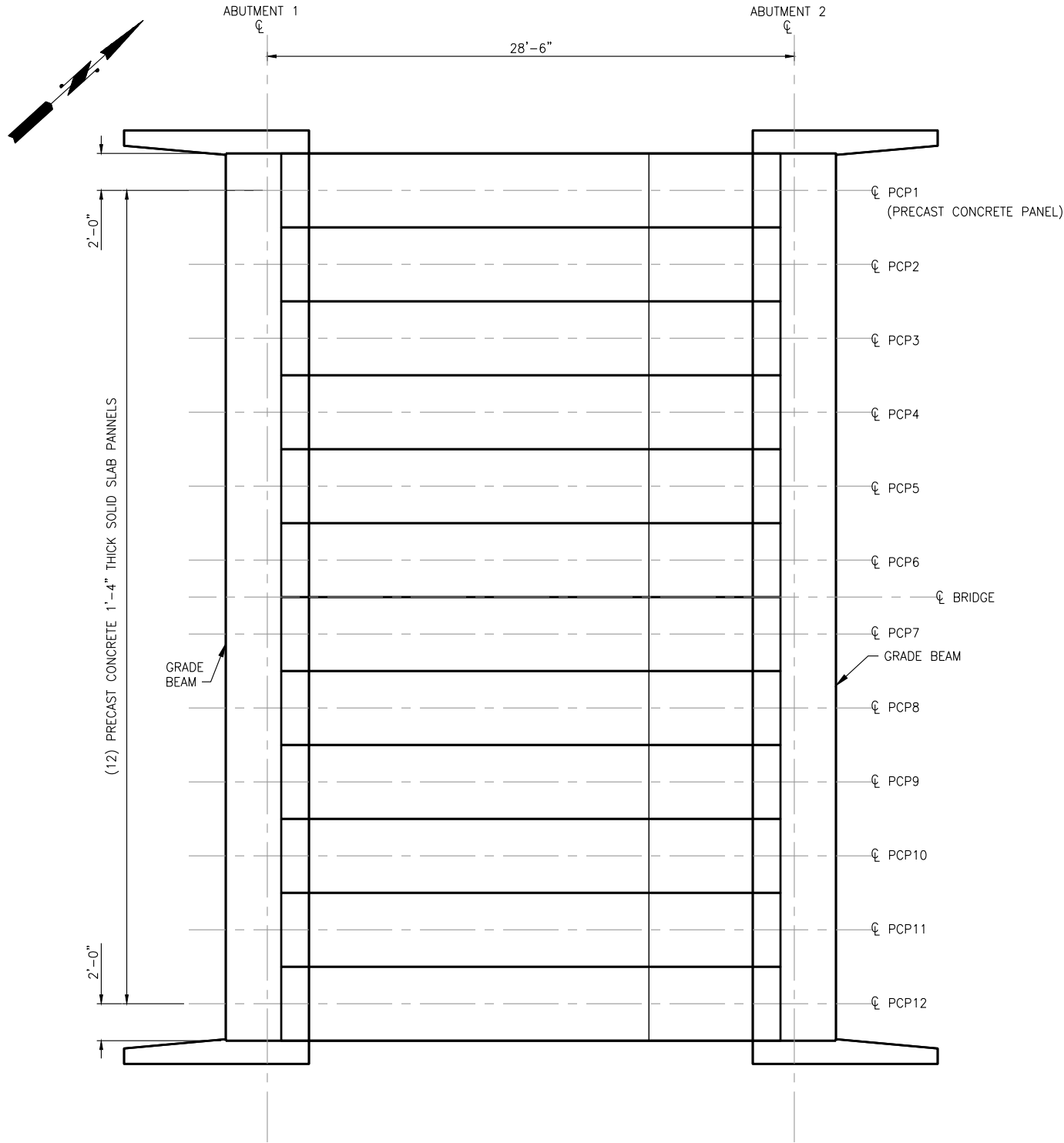
DS	DESIGNED BY	DATE
NS	DRAWN BY	DATE
AA	CHECKED BY	DATE



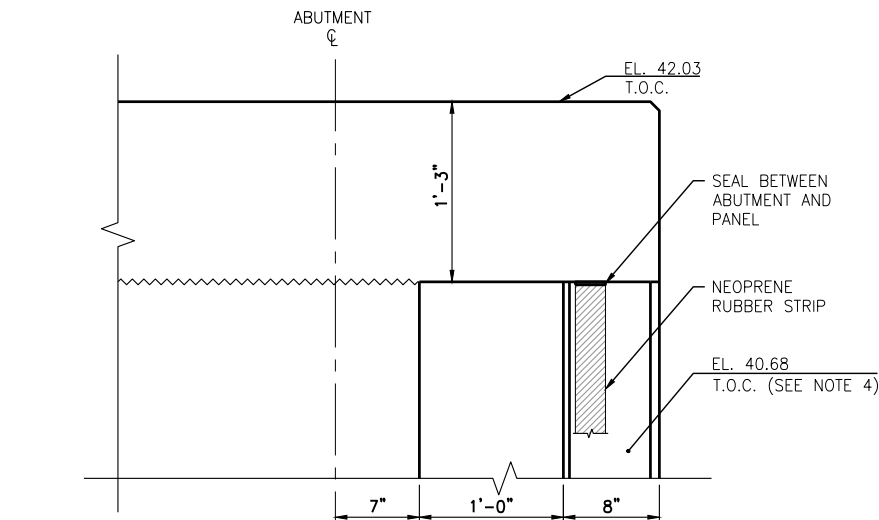
60% SUBMITTAL

UPPER SKAGIT KEY CULVERT REPLACEMENT ABUTMENT AND WINGWALL DETAILS	
B4	SHT 17 OF 25

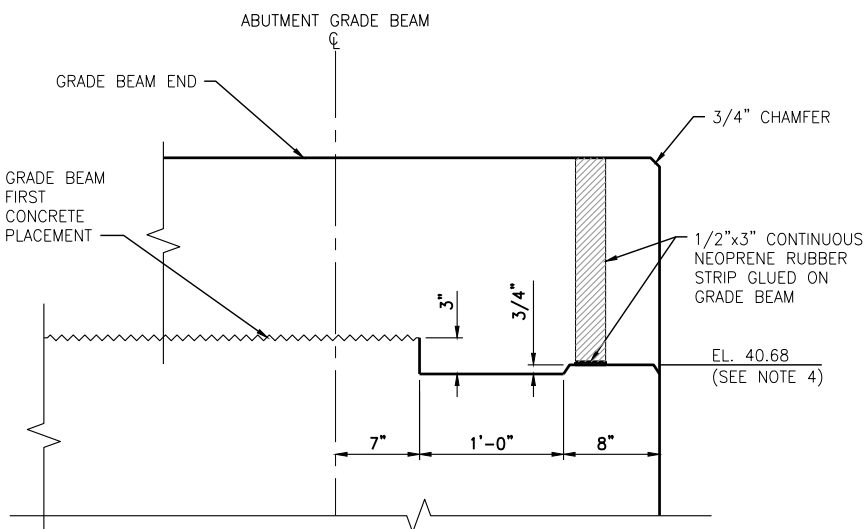
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Ref filename: [C:\3P-SITE-UPPER Skagit | border=60x | C-3P-BRIDGE DETAILS]



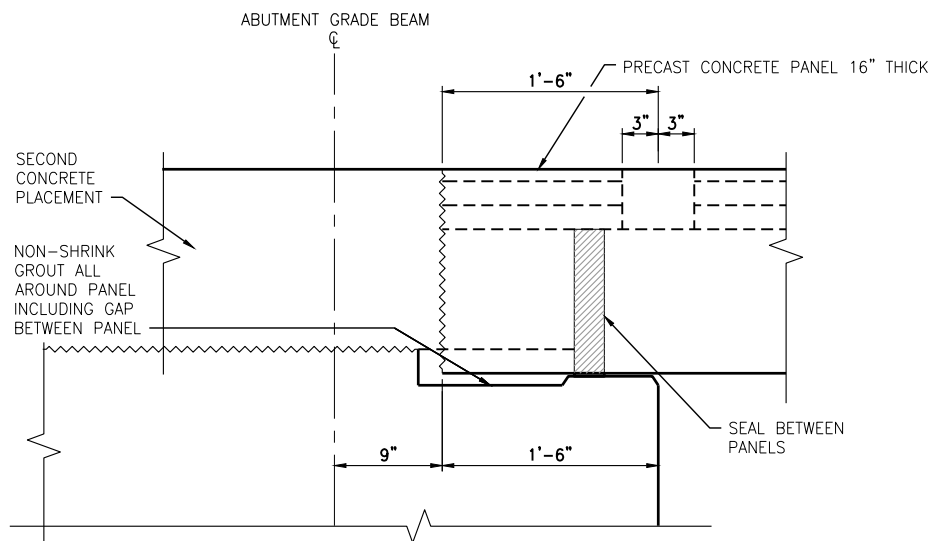
FRAMING PLAN
SCALE: 1/4" = 1'-0"



PLAN AT GRADE BEAM END
SCALE: 1 1/2" = 1'-0"



PREPARATION OF PCP INSTALLATION GRADE BEAM SECTION
SCALE: 1 1/2" = 1'-0"



PRECAST CONCRETE PANEL INSTALLATION GRADE BEAM SECTION
SCALE: 1 1/2" = 1'-0"

NOTES:

1. GRADE BEAM REINFORCING BARS ARE NOT SHOWN FOR CLARITY.
2. GRADE BEAM PLAN AND SECTION SHOWN ARE TYPICAL GRADE BEAM DETAILS FOR THE BLOCKOUT AT THE PRECAST CONCRETE PANEL SUPPORT AND SEAL DETAIL FOR THE PREPARATION AND INSTALLATION OF THE PRECAST CONCRETE PANEL AT THE FIRST CONCRETE PLACEMENT OF THE GRADE BEAM.
3. THE CONTRACTOR SHALL PROVIDE SEALER BETWEEN PANELS BEFORE GROUTING UNDER THE PANELS AND THE SECOND CONCRETE PLACEMENT OF THE GRADE BEAM. THE GAP BETWEEN THE PANELS SHALL BE 3/8".
4. TOP OF CONCRETE ELEVATION 40.68 AT THE CONTINUOUS RUBBER STRIP SHALL BE KEPT SMOOTH AND LEVELED FOR THE ENTIRE 48'-0" LENGTH OF SLAB PANEL SUPPORT. THE MAXIMUM GAP UNDER AN UNLEVELED 10'-0" STRAIGHT EDGE SHALL BE LESS THAN 1/8". PATCH AND GRIND THE TOP OF CONCRETE AS REQUIRED TO PROVIDE THE SMOOTH LEVELED SURFACE.

NO	DATE	BY	APPR	REVISIONS



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DESIGN MANAGER _____ DATE _____
PROJECT MANAGER _____ DATE _____

DS DESIGNED BY _____ DATE _____
NS DRAWN BY _____ DATE _____
AA CHECKED BY _____ DATE _____



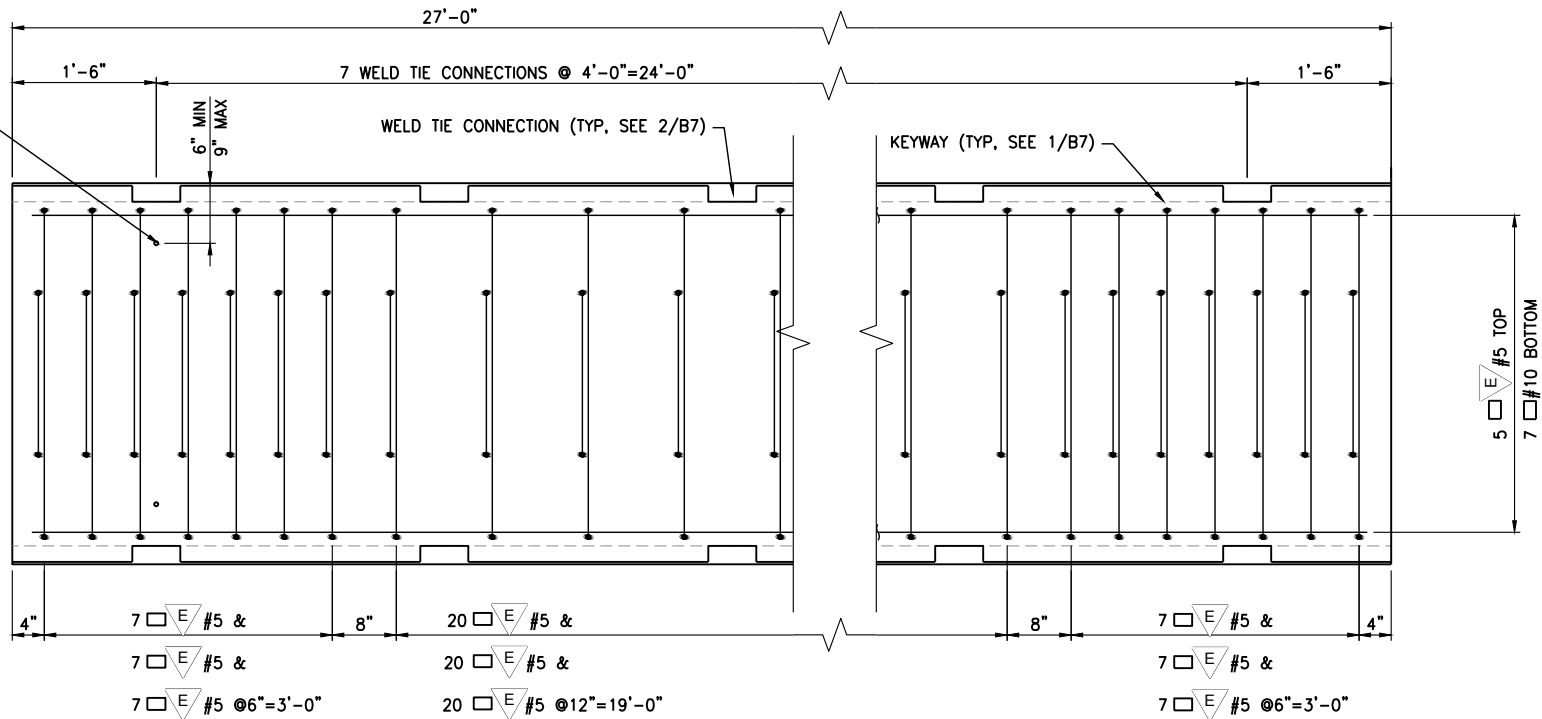
City of
Bellevue
UTILITIES

60% SUBMITTAL

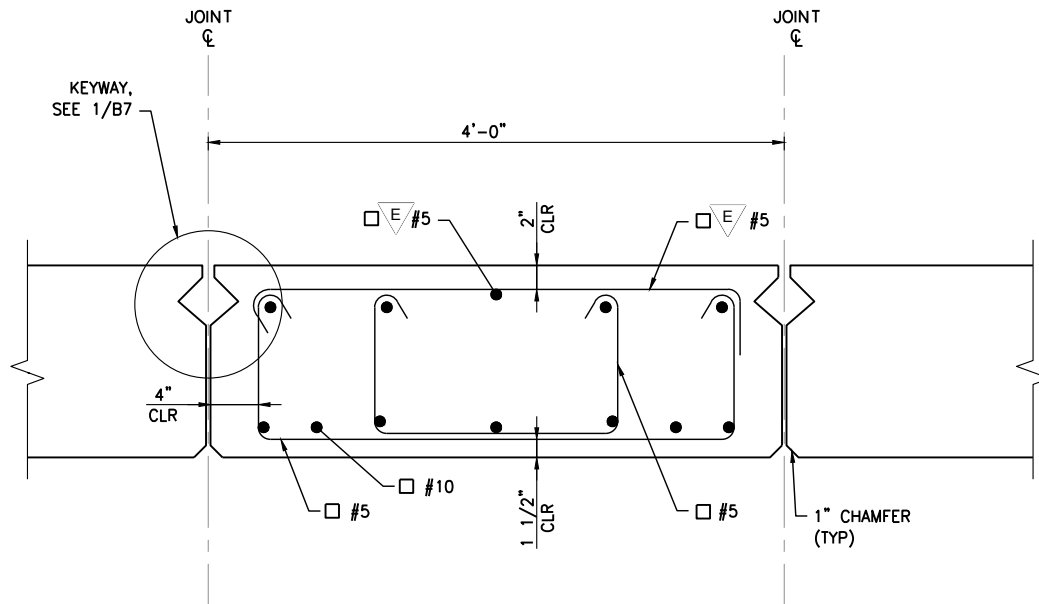
UPPER SKAGIT KEY CULVERT REPLACEMENT
FRAMING PLAN AND PC PANEL INSTALLATION

B5

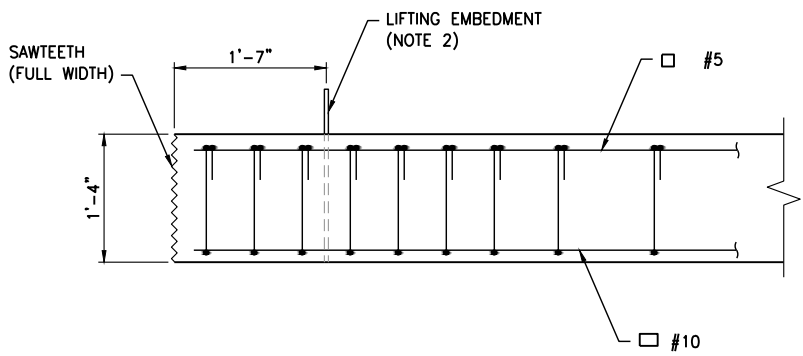
SHT 18 OF 25



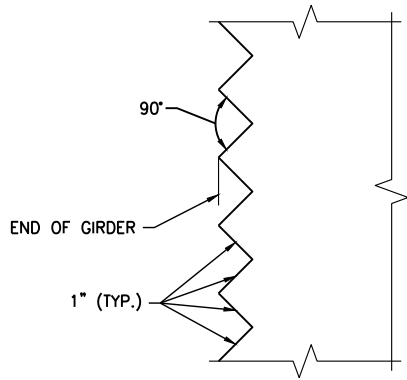
PLAN
SCALE: 1" = 1'-0"



TYPICAL SECTION
SCALE: 1-1/2" = 1'-0"



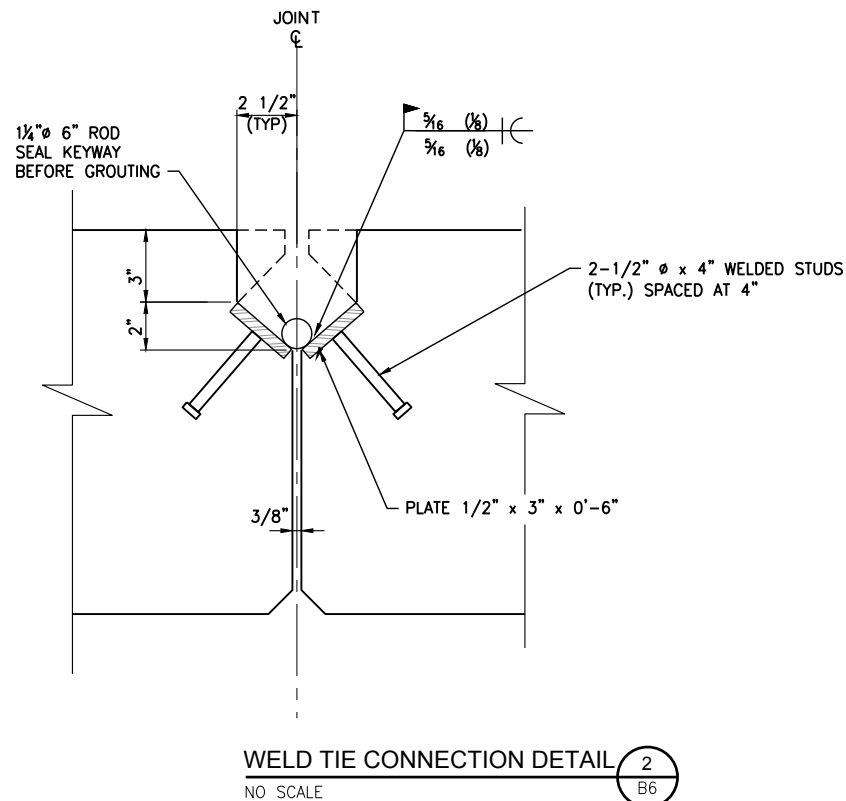
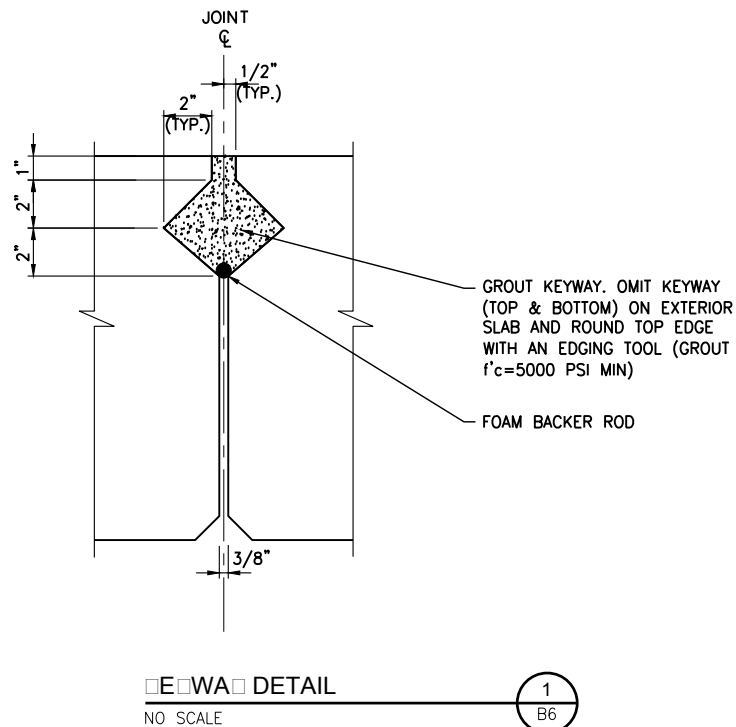
ELEVATION
SCALE: 1" = 1'-0"



SAWTEETH DETAIL
SCALE: 6" = 1'-0"

- NOTES:
- KEYWAY AND WELD TIE ARE NOT REQUIRED AT THE EXTERIOR SIDE OF THE EXTERIOR PANES PCP1 & PCP12
 - INSTALL LIFTING EMBEDMENTS IN ACCORDANCE WITH STANDARD SPECIFICATION 6-02.3(25)L. AFTER ERECTION, CUT OFF LIFTING EMBEDMENTS 1 INCH BELOW TOP OF PANEL AND FILL WITH APPROVED GROUP

Path: P:\134271 Lower Coal Creek Ph. 2 Early Action\CAD\SheetFiles\Group\B7_CONCRETE PANEL DETAILS 2.dwg Plot date: Dec 16, 2016-03:51:35pm CAD User: vince.rouse.
Plot Name: 134271-606 [C-SR-BRIDGE DETAILS]



NO	DATE	BY	APPR	REVISIONS



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DESIGN MANAGER	DATE	DESIGNED BY	DATE
PROJECT MANAGER	DATE	DRAWN BY	DATE
		CHECKED BY	DATE



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UPPER SKAGIT KEY CULVERT REPLACEMENT PRECAST CONCRETE PANEL DETAILS 2	
B7	SHT 20 OF 25



BRIDGE STEEL RAILING MATERIAL	
PIECE	ASTM DESIGNATION
RAIL TUBES	ASTM A500 GRADE B
RAIL END CAPS	ASTM A36 (ASTM A709 GRADE 36)
BASE PLATES1	ASTM A572 GRADE 50 (ASTM A709 GRADE 50)
ANCHOR STUDS	ASTM A325 OR ASTM A449 GRADE 1
SPLICE BOLTS	ASTM A325 OR ASTM A449 GRADE 1
ROUND HEAD BOLTS	ASTM A325 OR ASTM A449 GRADE 1
NUTS	ASTM A563
WASHERS	ASTM F436
LOCK WASHERS HIGH CARBON HEAT TREATED SPRING STEEL	ASTM ASME B18.2
ANCHOR PLATES	ASTM A36 (ASTM A709 GRADE 36)
PLATE SHIMS	ASTM A36 (ASTM A709 GRADE 36)
TUBE RAIL SPLICES	ASTM A500 GRADE B
SOLID RAIL SPLICES	ASTM A572 GRADE 50 (ASTM A709 GRADE 50)
ANGLE1	ASTM A572 GRADE 50 (ASTM A709 GRADE 50)
SPLICE PLATES	ASTM A572 GRADE 50 (ASTM A709 GRADE 50)
RAILING POST1	ASTM A572 GRADE 50 (ASTM A709 GRADE 50)
TUBULAR POSTS	ASTM A500 GRADE B1.

ALL POST MATERIAL, INCLUDING BASE PLATES, SHALL BE FURNISHED TO MINIMUM CHARPY V-NOTCH TOUGHNESS REQUIREMENTS AS REQUIRED BY WSDOT 6-03.2.

NOTES:

1. PRIOR TO GALVANIZING THE ASSEMBLED POST, GRIND ALL EDGES TO A MINIMUM RADIUS OF 1/16". BOLTS SHALL BE TORQUED SNUG TIGHT (APPROXIMATELY 100 ft-lb)
2. THE MAXIMUM CENTER TO CENTER SPACING OF RAILING POSTS IS 8'-3"
THESE RAILINGS ARE ADEQUATE FOR A TL-4(PL-2) SERVICE LEVEL.
3. SHOP WELDING SHALL BE PERFORMED ONLY WHERE SPECIFICALLY NOTED ON THE CONTRACT DOCUMENTS.
4. ALL EXPOSED FLAME CUT SURFACES SHALL HAVE A SURFACE ROUGHNESS NOT TO EXCEED 250, AS DEFINED BY THE ANSI STANDARD SPECIFICATION B46.1. GRIND ALL EDGES OF POSTS AND POST BASE PLATES SO THAT ALL SHARP EDGES ARE REMOVED.
5. RAILS FOR CURVED STRUCTURES SHALL BE CURVED IN THE SHOP PRIOR TO GALVANIZING. TO FACILITATE BENDING, RAILS MAY BE HEATED TO A TEMPERATURE NOT EXCEEDING 1200OF.

[illegible]

TETRA TECH

www.tetratech.com
1420 Fifth Avenue, Suite 550
Seattle, Washington 98101
Phone: 206-728-9655 Fax: 206-883-9301

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DESIGNED BY	DATE
NS	
DRAWN BY	DATE
AA	
CHECKED BY	DATE



**City of
Bellevue**
UTILITIES

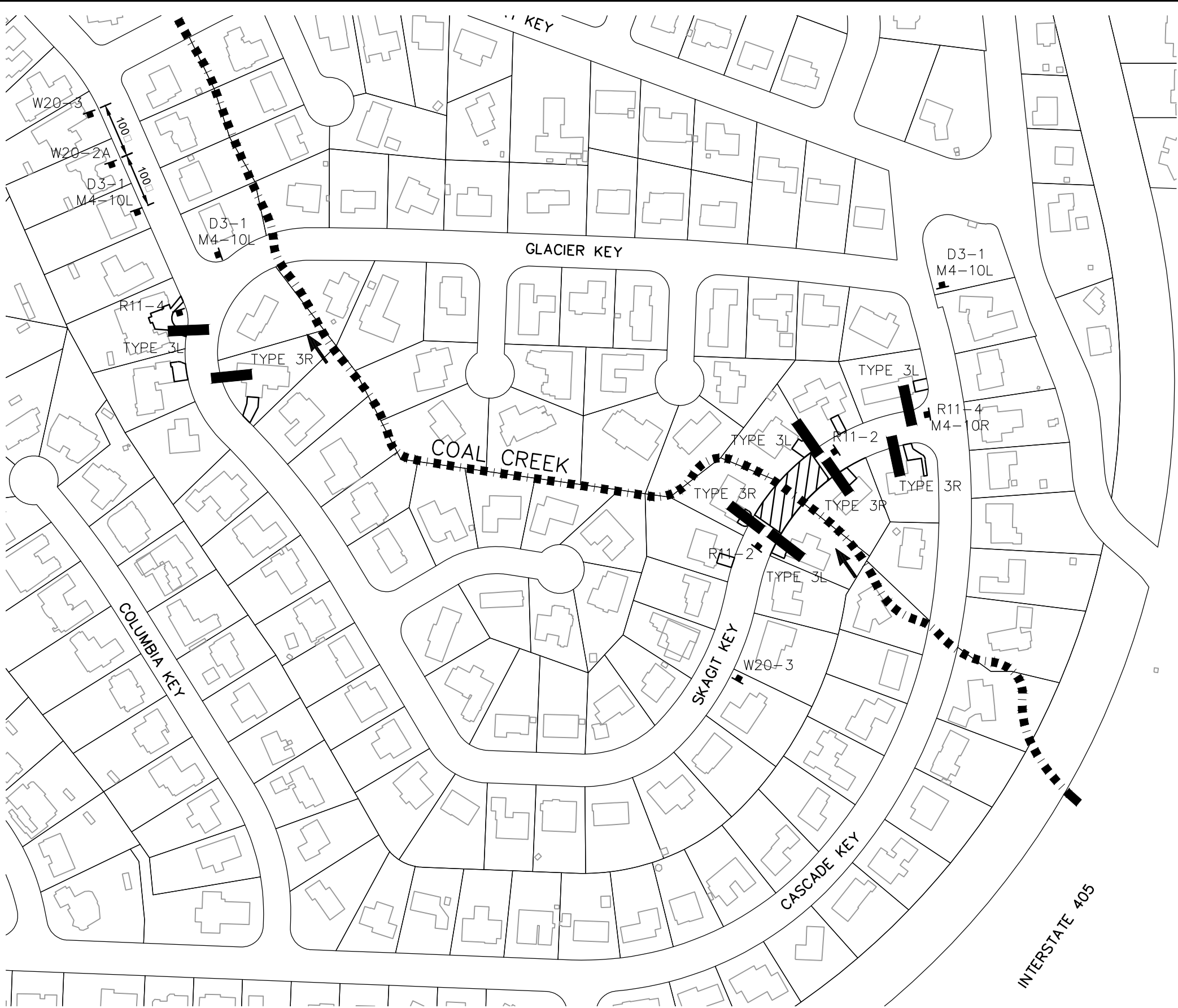
60% SUBMITTAL

UPPER SKAGIT KEY CULVERT REPLACEMENT MISCELLANEOUS BRIDGE DETAILS

B8

SHT 21 OF 25

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Net Filename: [C:\P-CAD-PARCEL] border=500



NOTES:
1. MAINTAIN DRIVEWAY ACCESS DURING CONSTRUCTION

LEGEND

TYPE 3L BARRICADE

— L

TYPE 3R BARRICADE

— R

TEMPORARY TRAFFIC CONTROL ZONE SIGN

▲

WORK SPACE

R11-2

ROAD CLOSED

R11-4

ROAD CLOSED TO THRU TRAFFIC

M4-10L

DETOUR

M4-10R

DETOUR

W20-2A

DETOUR AHEAD

W20-3

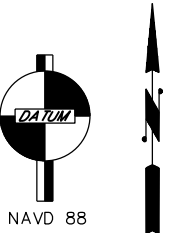
ROAD CLOSED AHEAD

M4-8A

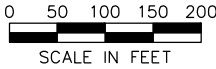
END DETOUR

D3-1

SKAGIT KEY



NAVD 88



SCALE IN FEET

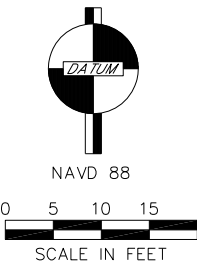
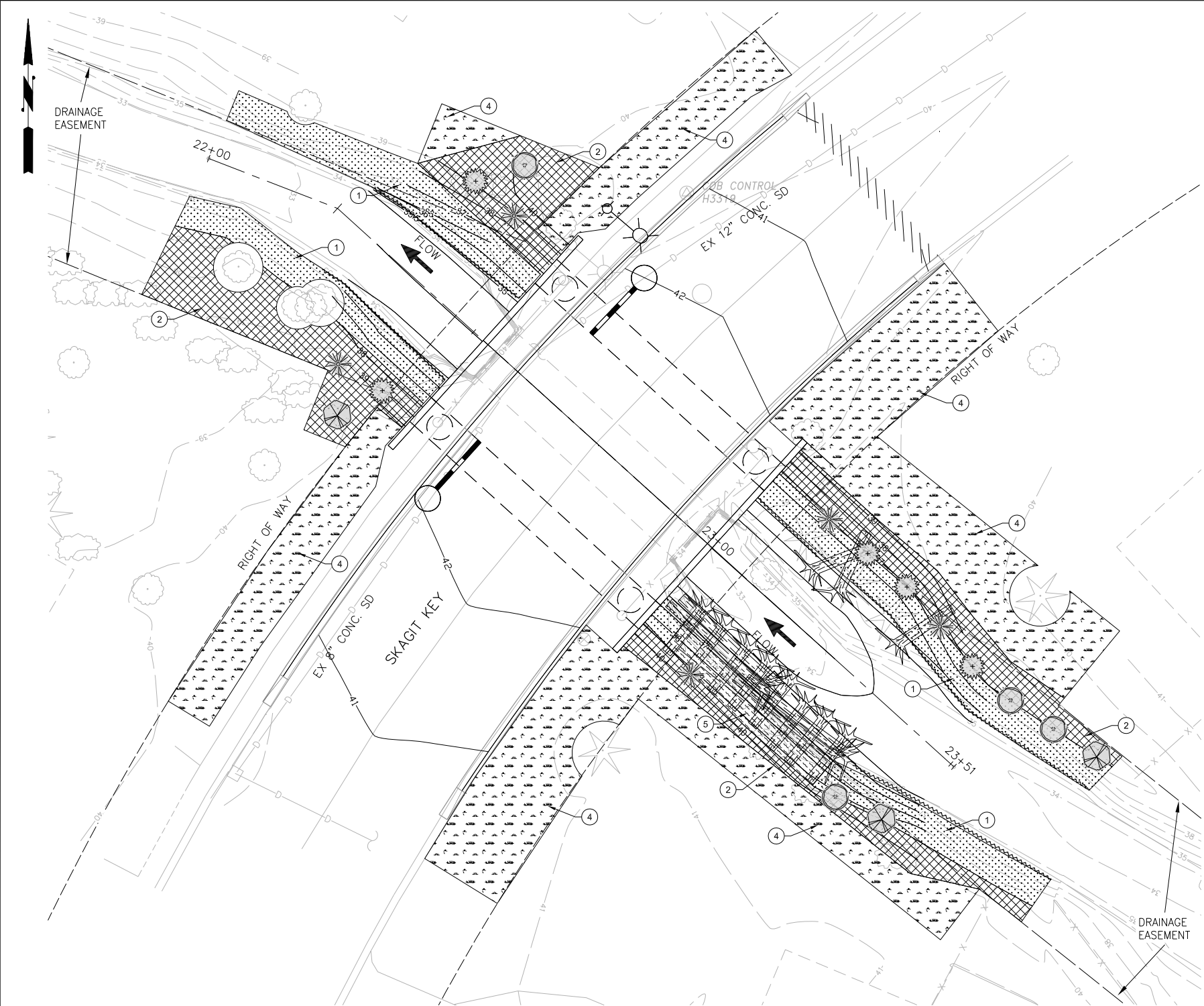
60% SUBMITTAL

UPPER SKAGIT KEY CULVERT REPLACEMENT
TRAFFIC CONTROL

TC1

SHT 23 OF 25

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PLANTING MATERIALS LIST:

SCIENTIFIC NAME	COMMON NAME	QTY	MIN SIZE	CONDITION	SPACING
TREES					
ACER MACROPHYLLUM	BIG LEAF MAPLE	4	4' TALL	CONT	AS SHOWN
PRUNUS EMARGINATA	BITTER CHERRY	3	4' TALL	CONT	AS SHOWN
PSEUDOTSUGA MENZIESII	DOUGLAS-FIR	5	4' TALL	CONT	AS SHOWN
THUJA PLICATA	WESTERN RED CEDAR	5	4' TALL	CONT	AS SHOWN
ZONE 1 PLANTINGS					
CORNUS SERICEA	RED OSIER DOGWOOD	630	30"	LIVE STAKE	1' OC
PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	140	12"	CONT	3' OC
RUBUS SPECTABILIS	SALMONBERRY	140	12"	CONT	3' OC
SALIX SITCHENSIS	SITKA WILLOW	630	30"	LIVE STAKE	1' OC
ZONE 2 PLANTINGS					
CORNUS SERICEA	RED OSIER DOGWOOD	70	12"	CONT	3' OC
CORYLUS CORNUTA	WESTERN HAZELNUT	65	12"	CONT	3' OC
RIBES SANGUINEUM	RED FLOWERING CURRANT	65	12"	CONT	3' OC
ROSA PISOCARPA	CLUSTER ROSE	70	12"	CONT	3' OC
SYMPHORICARPOS ALBUS	SNOWBERRY	70	12"	CONT	3' OC
COIR LOG / SOIL LIFT PLANTINGS					
CORNUS SERICEA	RED OSIER DOGWOOD	124	30"	LIVE STAKE	1' OC
SALIX HOOKERIANA	HOOKE'S WILLOW	124	30"	LIVE STAKE	1' OC
SALIX SITCHENSIS	SITKA WILLOW	124	30"	LIVE STAKE	1' OC

CONSTRUCTION NOTES:

- 1 ZONE 1 RIPARIAN RESTORATION, SEE DETAIL 1/L2
- 2 ZONE 2 RIPARIAN RESTORATION, SEE DETAIL 2/L2
- 3 COIR LOG PLANTING, SEE DETAIL 3/L2
- 4 LAWN RESTORATION, SEE DETAIL 6/L2
- 5 INSTALL LIVE STAKES BETWEEN SOIL LIFTS, SEE DETAIL 1/H4 FOR SOIL LIFT CONSTRUCTION.

NO	DATE	BY	APPR	REVISIONS



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P 206.394.3700
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1420 Fifth Avenue, Suite 550
Seattle, Washington 98101
Phone: 206-728-9655 Fax: 206-883-9301

Approved By
DESIGN MANAGER DATE
PROJECT MANAGER DATE

JC 12/16/16
DESIGNED BY DATE
JC 12/16/16
DRAWN BY DATE
BB 12/16/16
CHECKED BY DATE



City of Bellevue
UTILITIES

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UPPER SKAGIT KEY CULVERT REPLACEMENT
LANDSCAPE RESTORATION PLAN

L1

SHT 24 OF 25

Path: \\parametrix.com\pmx\PSO\Projects\Clients\4803-LouisBergerGroup\553-4803-009_LwrCool(Cooling)H2rd\905\cs\CADD\DWG\4 L1_UPPER SKAGIT KEY PLANTING PLAN.dwg Plot date: Dec 16, 2016-12:44:27pm CAD User: ceralas.
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- NOTE:

- COIR LOG PLANTING

SCALE: 3/4"=1'-0"

②

LAWN RESTORATION

NO SCALE

⑧

(

ZONE 1 PLANTING

SCALE: $3/4"=1'-0"$

1

1

ZONE 2 PLANTING

SCALE: 3/4"=1'-0"

2

TREE PLANTING

NO SCALE

4

SHRUB PLANTING

NO SCALE

[illegible]

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DESIGN MANAGER	DATE
PROJECT MANAGER	DATE

JC	12/16/16
DESIGNED BY	DATE
JC	12/16/16
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BB	12/16/16
CHECKED BY	DATE



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UPPER SKAGIT KEY CULVERT REPLACEMENT
LANDSCAPE RESTORATION DETAILS

L2

SHT 25 OF 25

MEMORANDUM

DATE: January 23, 2017
TO: Juliana Houghton
FROM: Benn Burke
SUBJECT: Updated Responses to Request for Comments on Permit Application, Re: NWS-2016-0581-Bellevue's Coal Creek Culvert Replacements
CC: Debbie Harris
REFERENCE NUMBER: NWS-2016-0581
PROJECT NAME: Lower Coal Creek Culvert Replacements

The purpose of this memorandum is to document updated responses to the Habitat Log Typical Detail for the Lower Coal Creek Culvert Replacement Project from the Muckleshoot Tribe sent to Parametrix on January 13, 2017 in an email from Karen Walter.

Wood Detail Comment

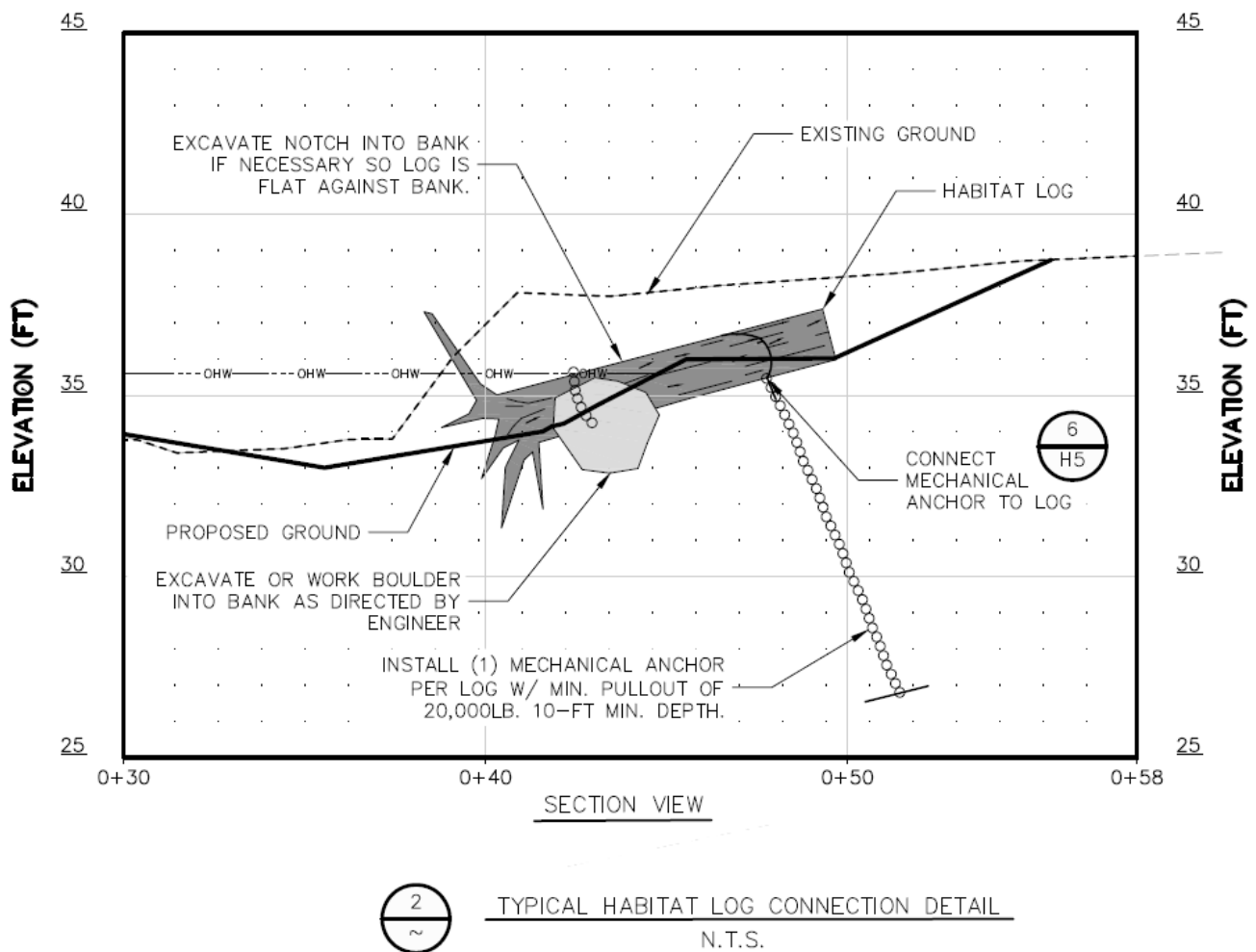
With respect to the wood design, the revised habitat log detail shows a very limited amount of the mitigation wood within the ordinary high water mark. The mitigation wood (41 pieces proposed) should be placed such that a minimum of 1/3 of the log length. The rock that is used for ballast and stability should be set back into the bank and not exposed to flows. Both of these design changes are needed to maximize habitat benefits to salmon (particularly juveniles) and to minimize the creation of salmon predator habitat. The wood design is an important component because as noted in our comments and the responses, it is unlikely that wood will come from upstream sources in a large part due to the trash rack on the I-405 culvert upstream which collects wood that would otherwise transport to this portion of Coal Creek. This wood is typically not relocated downstream to our knowledge.

Response

The City has revised the typical wood placement detail in response to Karen's comment. The revised detail shows that at least 1/3 of the habitat log will be placed waterward of the OHWM and the rock ballast is buried deeper than shown on the original typical detail.

The revised detail is shown below.

Revised Habitat Log Typical Detail





MEMORANDUM

To: Heidi Bedwell
From: Debbie Harris, PE
cc: Benn Burke, Parametrix
Date: 1/23/17
Re: 16-145319-LO – Lower Coal Creek Flood Hazard Reduction Project

Ms Bedwell,
Please find below a response to the letter you received from June and Steve Lee on January 10, 2017. The excerpt below is from their letter to the Development Services Department.

Comment:

My concern is this. Per the laws of simple hydraulics and hydrodynamics, if you widen the culvert UPSTREAM to increase the water flow capacity without FIRST widening the culverts DOWNSTREAM, do you not subject the homes downstream to the increased risk of flooding? Simply put, the culvert downstream becomes the 'new bottleneck' in the creek, creating a dam-like effect. Consequently, homes proximally adjacent (immediately upstream) to the 'new bottleneck' will be subjected to an increased risk flooding and erosion damages.

Response:

Coal Creek in the Newport Shores neighborhood has a highly confined channel with relatively high banks and limited cover over the existing culverts. As a result, none of the culverts provide significant amounts of stormwater detention or storage relative to the volume of flow coming into the neighborhood from the larger contributing basin upstream of I-405 and there is no significant gain or loss of the total volume of water in the system between the upstream and downstream culverts.

The project will result in increasing the channel and streamflow capacity, but only at specific locations along the stream. These changes will affect the area around the immediate location of each of the road crossings, but these effects will not extend upstream or downstream to the next road crossing. During large storm events, all the culverts restrict the flow of water and create a backwater condition, which changes the elevation of the water in the channel and changes the velocity of water moving through the system at that location. Most of the time,



MEMORANDUM

although the water behind the culvert rises, it stays in the channel. This happens because the higher water level creates more pressure, which pushes the water through the culvert faster.

During very large events, the water level may rise to the point water flows out of the channel and results in the water over the roadway or localized flooding at existing culverts. But in these instances, the floodwater reenters the stream channel just downstream of the roadway. The existing culverts are far enough apart that the hydraulic condition at any given road crossing does not affect the upstream or downstream crossing.

Work at each road crossing will remove the culvert restriction in the stream channel and will result in lower surface water rises during storm events at that location. This will keep water from overtopping the road up to the design flow. For example, each new culvert will provide at least 1 foot of freeboard (the distance between the water surface and the lowest part of the new bridge structure) up through a 100-year storm event. The result is that more water will stay in the channel, which will reduce localized flooding but the replacements will not increase or decrease the overall amount of water flowing through the system during any given storm event. Therefore, removing a culvert upstream of Mr. and Mrs. Lee's property will not increase or decrease the total amount of water flowing through the stream during any particular storm event.

Please let me know if you need any additional information or responses to public comments.

Sincerely,

Debbie Harris

Debbie Harris

MEMORANDUM

DATE: January 5, 2017
TO: Juliana Houghton
FROM: Benn Burke
SUBJECT: Updated Responses to Request for Comments on Permit Application, Re: NWS-2016-0581-Bellevue's Coal Creek Culvert Replacements
CC: Karen Walter
REFERENCE NUMBER: NWS-2016-0581
PROJECT NAME: Lower Coal Creek Culvert Replacements

The purpose of this memorandum is to document updated responses to comments on the Lower Coal Creek Culvert Replacement Project from the Muckleshoot Tribe. The tribe's comments were forwarded to Parametrix on September 27, 2016 via email. The City and consultant team provided responses in a memorandum to Jonathan Smith dated October 4, 2016.

The City and consultant team met with Karen Walter on site on December 7, 2016 to review the project. We substantively discussed the majority of issues identified in her comments and have updated and/or amended our initial responses based on that meeting. Following that meeting Karen sent her comments directly to the City 12/19/16.

Below we are including Karen's original comment, our initial response as stated in our October 4, 2016 memorandum, and applicable updates or revisions to our original comments.

Comment 1: Bridge Design Comments

We are concerned that the proposed the bridge height may not be sufficient to transport any in-channel wood that may need to move downstream. The proposed flood conveyance clearance has a vertical clearance of 6 feet from the channel thalweg and 1 foot of freeboard is recommended to pass submerged woody debris during the 100-year peak flood event. The current culverts are 6' to 6.7' feet high (Tetra Tech July 2016; Table 2; page 4). However, per the culvert basis for design report; "The largest flood event recorded on lower Coal Creek (2007) had a peak flow of about 460 cfs, slightly less than the 25-year event at all project crossings. During this event, overtopping of the road surface did not occur except at Cascade Key, where a piece of wood blocked the culvert entrance." (Tetra Tech 2016; page 23).

As noted in Appendix C of Tetra Tech 2016, WDFW's 2013 water crossing guidelines recommend a clearance of 3 feet above the 100 year water surface elevation for streams with a bankfull of 15 feet or greater. The new culverts need to accommodate any wood pieces that would otherwise transport so that this wood does not end up needing to be removed or relocated. Both the Bellevue Critical Areas Update Stream inventory (March 2003) and the WRIA 8 Limiting Factors Report (Kerwin 2001), note that many portions of Coal Creek downstream of I-405 lack wood. Further, the NHC June 20, 2016 memo in Appendix C of Tetra Tech 2016 states:

"Presence of the I-405 Pond control structure, located on Coal Creek upstream of the project site, includes a trash rack that traps large wood before it enters the I-405 box culvert. This structure limits wood recruitment to the project reach and the 600 foot long reach between I-405 and Cascade Key, cutting off delivery from over 97% of the upstream channel."

This means that all of the potential wood recruitment that could transport downstream of I-405 needs to be protected and accommodated with this project to the extent feasible to avoid causing further adverse impacts to salmon habitat. Wood passage is one of the processes and functions to be unconstrained if stream simulation principals are followed (WDFW 2013; page 30).

October Response 1:

WDFWs Water Crossing Guidelines regarding freeboard also state that "that the designer may increase the clearance or decrease the clearance as acceptable to the local or state roadway bridge design authority". Debris loading was evaluated during preliminary engineering and it was concluded that the debris loading potential was low to moderate for this reach of Coal Creek due to:

- Efficient debris trapping at the upstream I-405 facility
- Limited size of material in the project reach
- Relative flashiness of flows where high flows are relatively short in duration
- Limited potential for channel migration in the project reach
- Relatively stable channel in the project reach
- Inability of creek to transport large material in the relatively confined channel in the project reach.

For this reason, we are applying the City freeboard standard for bridges of 1' for the 100-year flood event for debris clearance. The table below shows the estimated water surface elevation at each road crossing and the proposed low-chord elevation of the bridge. This table shows that the City standard clearance is met at each crossing during the 100-year design storm.

Proposed Structure Clearance

Crossing	100-Year Water Surface Elevation (feet NAVD88)	Low-Chord Elevation (feet NAVD88)	Freeboard (feet)
Cascade Key	42.2	43.5	1.3
Upper Skagit Key	39.7	40.7	1.0
Glacier Key	30.2	31.2	1.0
Newport Key	26.8	27.8	1.0
Lower Skagit Key	23.3	24.9	1.6

Note: NAVD88 = North American Vertical Datum of 1988

The existing structures are prone to debris entrapment because they are relatively narrow and also operate at surcharged conditions for relatively low flood events (2- to 10-year). Even under these conditions, the only documented occurrence of debris entrapment within the existing culverts was during a large event in 2007. The proposed structures are considerably wider than the existing structures and will operate with at least one foot of freeboard up to the 100-year flood event.

January Response 1 Updates/Additions

Issues related to Comment 1 were discussed with Karen during our field visit on 12/07/2016. In addition to the information above, the City and consultant team discussed other factors related to the

determination of the proposed low-cord elevations for the structures as shown on the above table. These included:

- The currently proposed increase in the road profile of about 1.5 feet is anticipated to result in settlement due to the increased weight of the additional approach material. Current levels of anticipated settlement are near the maximum that can be accommodated within the scope and scale of the project. Additional increases in freeboard cannot be accommodated without the need for significant ground improvements, with their costs and associated risks.
- Increasing the height of the structures will substantially increase impacts to the surrounding neighborhood and will increase the footprint of the roadway adjustments needed to accommodate the higher approaches. This would also impact driveway access for adjacent private properties and require additional clearing and grading and site disturbance at each culvert location.

Following discussion of the limitations related to higher structures, Karen suggested that the City make an operational commitment that they would not remove any woody material that may become lodged in the culverts as a result of the lower freeboard. The City conducted a detailed evaluation of potential debris entrapment prior to proposing the current bridge configurations and they believe that it is unlikely that woody debris material will become lodged in the culverts; however, should this occur the City has agreed to continue their existing policy that they do not remove woody material from streams.

City policy is to retain in place woody debris in streams within City maintained rights of way unless there is an immediate threat to public facilities or property. In the rare instances where woody debris is creating a hazard, it is City policy to cut the debris in place and retain it on site and not to relocate or remove it. This same policy will extend to operations once the new structures are in place; therefore, the City agrees to continue the current policy on woody debris.

Comment 2: Wood Design Comments

The proposed 2 x 1-ton boulders shown in the wood design (sheet 7 of 30% drawings) is a concern, too, as these boulders will harden the bank and reduce scour in the margins that create habitat; reduce access to interstitial spaces for juvenile salmon and are considerably larger than what is found in the natural stream bed substrate currently (see Figure 15; D90 surface sediment is approximately 115 mm or 4.72 inches). In summary, these designs are not very fish friendly. Wood should be used as the dominate feature within the wetted width for bank stabilization and habitat mitigation, not the proposed oversized rock.

We are also concerned about how the project determined that 41 wood pieces are sufficient for bank stabilization and mitigation for this project (Tetra Tech 2016; page 17). It appears that most of the wood is proposed for bank stabilization and not mitigation. More information is needed as to how these wood numbers were determined for this portion of Coal Creek which lacks wood and is unlikely to get it from upstream sources.

As part of these comments, we recommend that the applicant work with Natural Systems Design, a consultant, who has designed other wood structures the Coal Creek basin to come up with a more fish friend design, particularly as the wood is to serve as bank protection and provide mitigation (page 27; Tetra Tech 2016).

October Response 2:

The number of wood pieces included as mitigation for this project was based on the number of trees to be removed during construction.

Riparian conditions in the referenced upstream reach of Coal Creek are very different than conditions in the project reach in lower Coal Creek where residential properties abut the channel and City ownership is limited to the

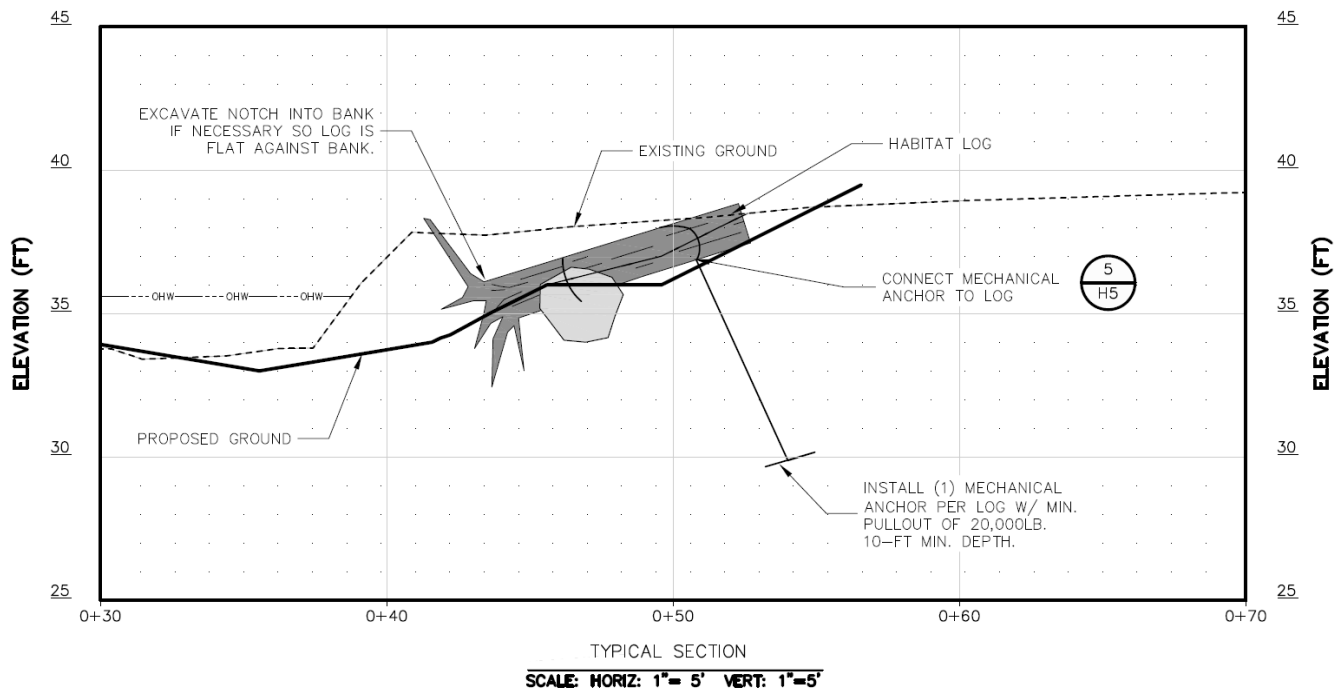
existing road rights of way. In respect to the upstream reach referenced in the comment, that reach of Coal Creek flows through a natural greenbelt area that is entirely owned by the City.

The design reflects the existing land use and associated risk factors that occur in the project area, which is very different than the conditions that occur upstream. The wood design is based on reach-specific hydraulic and hydrologic modeling and the associate forces the installed wood are expected to encounter. The proposed boulders are provided to anchor the structures and will be buried in the structures, streambanks and channel. These sites also have extremely poor subsurface conditions, which will preclude the use of mechanical anchors. Also, the right of way and drainage easement are narrow with limited space for installation of wood structures. As a result, wood structures need to be relatively compact.

January Response 2 Updates/Additions

Issues related to Comment 2 were discussed in detail with Karen during our field visit on 12/07/2016. While she clearly expressed a preference related to using unanchored wood, she stated that her intent was not to reengineer the project but rather to insure that the wood structures were designed using as little rock as possible. We explained that rock would be used only to the extent necessary to anchor the structures, rock would not be placed such that it armored the channel, and that wood, not the rock anchoring, will compose the dominant feature of the habitat structures. Please see the Habitat Log detail (Below) that indicates how the anchor rock would be placed in relation to the habitat log along the stream bank.

Habitat Log Typical Detail



Comment 3: Streambed Material Design Comments

The project also proposed to add coarse sediment bands within each culvert and notes that "the material used to construct bands within the culvert will be coarser than the neighboring bed material to protect against erosion and maintain established channel dimensions through the culvert." This approach is contrary to the intent of stream simulation which is seeking to mimic the existing natural conditions. Specifically, WDFW (2013; page 32) states:

These culverts are filled with a sediment mix that emulates the natural channel, erodes and deforms similar to the natural channel, and is unlikely to change grade unless specifically designed to do so. This fill material is placed in the culvert to mimic a stream channel and is allowed to adjust in minor ways to changing conditions."

This project proposes to add coarse sediment band material would be sized to two times the D100 of the bed material, or 325 to 465 mm. While this is one approach described in WDFW's 2013 Water Crossing guidelines, it is not the only approach. For example, the guidelines also note that in vertically stable streams, coarser material could be placed along the wall of the culvert defining the channel in the center of the culvert. The concern is that the coarse sediment bands become exposed over time and essentially function as a rock weir creating fish passage barriers as the result of the larger materials in these bands at 465 mm (1.5 foot sized rocks). Again, we are seeking to ensure that these replacement crossings are durable and provide for adult and juvenile salmon fish passage over the project's lifetime.

October Response 3:

The sediment bands are designed based on the existing sediment characteristics and proposed hydraulic conditions in the stream and serve to maintain a natural channel configuration with a defined thalweg through the new structures. This is a common element in structures designed to meet stream simulation standards. The bands are not weirs, they are not intended to act as grade control, and will not result in fish passage issues.

Surface water elevation through the culverts is controlled by the stream channel configuration below the culverts. The surface water elevation would not significantly change as a result of scour in the structure. As a result, scour would not create a drop or step at the downstream side of the coarse bands that would result in a fish barrier. If there was scour in the culvert between the bands of larger rock material, the result would be a deeper pool/channel between the bands, which would filled back in with smaller streambed material.

January Response 3 Updates/Additions

Issues related to Comment 3 were extensively discussed with Karen during our field visit on 12/07/2016. Following the field meeting, the design team re-evaluated the preliminary design and have decided to update the design and remove the coarse rock banks per Karen's request. Coarse material will only be placed along the face of the bridge abutments at the fringes of the channel along the left and right bank as needed to maintain the channel shape and protect the abutments. This revision will not change the overall volume of material placed within the structure below the ordinary high water mark of the stream.

4. Comment 4 Riparian Comments

The BE notes that 40 trees will be removed as part of this project (page 11). More information is needed regarding the location, tree species, and sizes of the trees to be removed; the fate of these trees and the proposed mitigation for their

removal. The current riparian conditions in the project area are described as a mix of lawn, invasive species and narrow strips of trees in some locations. The project should seek to improve this conditions both through mitigation as needed to address riparian impacts, as well as, enhance areas with trees where construction will occur. Reestablishing native trees in the project area is needed because as noted previously, the existing trash rack and maintenance upstream of I-405 routinely limits wood transported to this area from upstream sources.

October Response 4:

The trees to be removed are comprised of native and non-native cedar, fir, non-native pine, small volunteer alder and other ornamental species installed as landscape features. The disturbed riparian areas within the existing drainage easement will be restored with native trees, shrubs, and other riparian plantings. Disturbed maintained lawn and routinely maintained landscaped areas will be restored to the pre-project maintained landscaped conditions.

As described above, 41 pieces of large wood (in addition to new riparian plantings) will be installed to offset the removal of 40 trees in the project. Please note that this is a culvert replacement project with the purpose of reducing flood hazards for adjacent properties and the roadway. It is not a reach-level habitat enhancement project like the upstream work cited in the comments. The quantity of woody material is provided as mitigation for direct project impacts and not intended as a restoration project for the entire reach which is beyond the scope and means of the project.

January Response 4 Updates/Additions

During the field meeting with Karen on 12/07/2016 we reviewed the extents of work for each culvert and identified trees that would be removed or retained at each location. We identified the proposed location for habitat logs and the extents of the proposed log crib wall at Upper Skagit Key. No additional follow-up items were identified based on the site visit.

Comment 5: Monitoring Comments

The project needs a monitoring plan to demonstrate that the bridges and associated project designs are successfully provided adult and juvenile salmon passage and not impair habitat functions.

October Response 5:

The City of Bellevue has an ongoing program to monitor fish use in city basins including Coal Creek. This program predates and is independent from the proposed flood control project, although data from this monitoring program was cited and referenced in the Biological Evaluation prepared for the project.

Monitoring of the restored riparian areas is required by the City's Critical Areas regulations (Bellevue Municipal Code 20.25H.220(D) and is anticipated to be required by the WDFW HPA. The City will conduct monitoring required by code or stipulated as a permit condition.

January Response 5 Updates/Additions

This comment was not specifically addressed during the field meeting with Karen on 12/07/2016. Please see the original response.