



DEVELOPMENT SERVICES DEPARTMENT
ENVIRONMENTAL COORDINATOR
450 110th Ave NE., P.O. BOX 90012
BELLEVUE, WA 98009-9012

OPTIONAL DETERMINATION OF NON-SIGNIFICANCE (DNS) NOTICE MATERIALS

The attached materials are being sent to you pursuant to the requirements for the Optional DNS Process (WAC 197-11-355). A DNS on the attached proposal is likely. This may be the only opportunity to comment on environmental impacts of the proposal. Mitigation measures from standard codes will apply. Project review may require mitigation regardless of whether an EIS is prepared. A copy of the subsequent threshold determination for this proposal may be obtained upon request.

File No. 10-130253-LO

Project Name/Address: City of Bellevue Utilities Yarrow Creek Stream Channel Restoration and Habitat Improvement Project

3316 102nd Ave NE (Generally)

Planner: David Pyle / dpyle@bellevuewa.gov

Phone Number: 425-452-2973

Minimum Comment Period: February 24, 2011

Materials included in this Notice:

- Blue Bulletin
- Checklist
- Vicinity Map
- Plans
- Other:

City of Bellevue File Number 10-130253-LO
02/10/2011
City of Bellevue Utilities Department Yarrow Creek Stream Channel
Restoration and Habitat Improvement Project
Project SEPA Checklist
3316 102nd Ave NE (Generally)

SEPA Checklist Reviewed By:
David Pyle, Land Use Planner
425-452-2973 - dpyle@bellevuewa.gov

WAC 197-11-960 Environmental checklist.

ENVIRONMENTAL

Purpose of checklist:

The State Environmental Policy Act (SEPA), chapter 43 environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. Name of proposed project, if applicable:

Stream Reconstruction Project, Tributary to West Tributary of Yarrow Creek. 102nd Ave. NE

2. Name of applicant: Bruce Jensen, Senior Engineer, City of Bellevue Utilities Department.

3. Address and phone number of applicant and contact person:

450 110th Ave NE.

Bellevue, Wa 98004

Applicant is City of Bellevue Utilities Department

4. Date checklist prepared: December 16, 2010

5. Agency requesting checklist: City of Bellevue Development Services Department

City of Bellevue Development Services Department - Office of SEPA administrator.

6. Proposed timing or schedule (including phasing, if applicable):

Work is scheduled for July 2011 and August 2011

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No. Work will also include erosion control during construction and mitigation planting with native trees and shrubs after the work is completed.

Additional work in the Yarrow Creek stream channel is proposed and is in the design phase. Future work is related to the WSDOT SR 520 expansion project and includes the replacement of a downstream culvert. Future work may include additional habitat improvement within a segment of the stream located downstream from this proposed work. Additionally, an existing culvert that diverts the stream under an old segment of Lake Washington Boulevard may be removed, although this is contingent on funding at this point.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Additional information related to this segment of stream is on file with the Development Services records department and includes past development activity within this stream segment as a result of the road embankment erosion.

Critical Areas Report and wetlands delineation. The wetlands delineation is described in the Critical Areas Report.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

The Joint Aquatic Permit Application has been submitted to the Army Corps of Engineers, Ecology and Washington State Department of Fish and Wildlife.

10. List any government approvals or permits that will be needed for your proposal, if known.

Project will require a Critical Areas Land Use Permit, Clearing and Grading Permit and a Right-of-Way permit from City of Bellevue. State and Federal permits are combined under the Joint Aquatic Permit Application (JARPA) process.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

There are two segments or sections to the proposed project. The first segment is 120 long and includes daylighting a stream segment that was placed into a protective pipe as part of the emergency repair to support 102nd Ave. NE. The second segment starts at the downstream end of the first segment and involves adding rock and large woody debris to secure this 100 foot segment against erosion and to improve habitat.

A portion of the work has already been completed as an emergency repair due to the severity of the erosion.

Proposed work in the first segment includes installing a flow splitter into the outlet structure on the east side of 102nd Ave. NE. daylighting base flow of tributary onto fill placed this past summer as an emergency repair to 102nd Ave NE. The reconstructed stream segment will extend 120 feet to the stilling well installed with the culvert as part of the emergency repair. Daylighting the stream flow into a reconstructed stream segment that will include log and rock pools and cascades will improve water quality. During storms, flows above the 0.3CFS base flow will continue to use the recently installed stormdrain pipe as a high-flow bypass. A second segment from the bottom of the new reconstructed stream segment, extending another 100 feet downstream is designed to stabilize this section of creek against further damage by head cutting, erosion of side slopes, and the loss of habitat through the movement of existing small rock or the movement of existing unsecured woody debris. Two angled support arms will be added to an existing concrete base and support pole for the 40 year old elevated sewer line servicing the eight houses to the south along 102nd Ave NE. The new angled support arms will not prevent access to the ravine or use by wildlife.

The entire project, consisting of the two segments described above, will receive plantings of native species over 5,730 square feet of buffer area. Stream reconstruction in the first segment and stream stabilization and habitat enhancement in the second segment will include placement of 38 pieces of large woody debris (8 to 12 inches in diameter), 20 cubic yards of streambed cobble, 8 cubic yards of streambed boulders (18 to 24 inches in diameter) and 20 cubic yards of streambed aggregate and sediment. The stream reconstruction described in segment one, will be underlain with an impervious liner to keep the base flow on the surface. The stream reconstruction will also require the excavation of approximately 70 cubic yards of the fill placed this past summer.

Although the stream reconstruction, the first segment, will daylight the stream, the 30% grade will prevent use of this stream segment as fish habitat. The stream reconstruction, daylighting the base flow and replanting with native species will help

improve water quality, enhance habitat complexity, and provide habitat connectivity. The lower stream segment work is designed to both secure the stream segment and to enhance its fish habitat potential.

TO BE COMPLETED BY APPLICANT

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12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The proposed project is located on the east side of 102nd Ave NE. in a ravine located between 3316 and 3322 102nd AVE NE. See attached site plan.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other

The site is a steep ravine that falls from west to east. The west end of the ravine is 102nd Ave NE that was built in the 1960s as part of the development of the surrounding subdivision. A natural tributary to the west tributary of Yarrow Creek was directed under 102nd Ave NE into a 24" concrete culvert. Outflow from the culvert on the east side of the road has been actively eroding the ravine

b. What is the steepest slope on the site (approximate percent slope)? The ravine walls to the north and south are from 1/1 up to vertical walls. The fill placed during the summer of 2010 to support 102nd Ave NE was placed at a 30% angle of repose.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Analysis of the site described in the Critical Areas Report includes three types of soils:

- Alderwood Series
- Kitsap series which are classified as hydric
- Urban Land which includes disturbed soils

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

The stream segment has been eroded substantially over the 40 years since development of the surrounding subdivision and road network. The erosion of the stream segment starting at the end of the culvert under 102nd Ave NE eroded the stream segment to the point where the culvert and road embankment began to fail. An emergency was declared and the culvert was repaired and fill was placed in the upper stream segment to support 102nd Ave NE during the summer of 2010.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Most of the fill was placed under the emergency permit last summer. That work included placing 1,245 cubic yards of gravel fill. The current proposal includes approximately 70 cubic yards of river rock in varying sizes and 38 pieces of large woody debris 8" to 12" in diameter.

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f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

The proposed project including installing native vegetation across the 5,370 square feet of affected stream buffer is designed to prevent future erosion or stream stability problems. Particular attention is being given to the design of the daylighting the base flow onto the 30% slope. The rock and large woody debris will be placed over a bed liner to prevent the base flow from undercutting the gravel fill that was placed this previous summer.

BMP's will be applied as conditions of approval and reviewed through the Clearing and Grading application.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

None.

No change in impervious is expected.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Stream flow within the project area will be bypassed during construction. Use of equipment will be limited within the stream segment to placing the large woody debris and anchoring the debris into the stream bed or buffers. Erosion control barriers will be used during construction. Native vegetation will be planted within the entire affected area after construction is completed.

Site erosion control and discharge management practices must be in compliance with the City's Clearing and Grading Codes. Review of the final erosion control and discharge control practices will be completed as part of the Clearing and Grading plan review.

a. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Limited amounts of exhaust from construction equipment and trucks delivering materials will occur on site.

Automobile and heavy equipment emissions are not regulated by the City of Bellevue and are under the authority of the State of Washington.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Turn off idling equipment when not in use.

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes. The stream segment that will be worked on under this permit is a tributary to the West Tributary of Yarrow Creek. Yarrow Creek flows to the north into Lake Washington.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes. The first segment includes reconstruction of a streambed on the 30% slope. The 0.3 CFS base flow of this tributary will be daylighted into this new stream segment. The lower stream segment will receive large woody debris and river rock to enhance fish habitat and to prevent future streambank erosion.

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- 3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Approximately 70 yards of river rock of various sizes will be placed in the two segments. Approximately 50 cubic yards of material will be removed and replaced on site as part of re-constructing the stream in segment one of this project.

- 4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

- 5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No.

- 6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground:

- 1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

No.

Not anticipated. Work is to be surface and channel related and no groundwater, except channel/ground water inter flow is expected. A secondary source of stream hydrology, ground water, when encountered, will be managed in the same manner as surface water.

- 2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Not applicable.

No waste materials are anticipated or allowed to be discharged from any source, except for those incidental to typical construction practices and are planned for management through project site management BMPs.

c. Water runoff (including stormwater):

- 1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

This small tributary will be diverted around construction. The tributary flows to the West Tributary of Yarrow Creek.

- 2) Could waste materials enter ground or surface waters? If so, generally describe.

No. Stream flow will be diverted around the project during construction.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

Divert stream flow around construction site. Replant stream buffer with native vegetation. Use erosion control fencing to prevent erosion from entering downstream tributary.

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AGENCY USE ONLY

4. Plants

a. Check or circle types of vegetation found on the site:

- _____ deciduous tree: alder, maple, aspen, other
- _____ evergreen tree: fir, cedar, pine, other
- _____ Shrubs, native shrubs and some non-native ornamentals including photinia fraseri.
- _____ grass
- _____ pasture
- _____ crop or grain
- _____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
- _____ water plants: water lily, eelgrass, milfoil, other
- _____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

There is a limited amount of English Ivy in the buffer area that will have to be removed before planting native species.

c. List threatened or endangered species known to be on or near the site.

None.

Buffer areas surrounding the project limits are fairly degraded by urban development and have been colonized by invasive species. Part of this project scope is restoration of the buffers.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

The entire 5,370 square feet of the stream buffer will be replanted with a mix of native trees, shrubs and groundcover.

5. Animals

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

- birds: hawk, heron, eagle, songbirds, other:
- mammals: deer, bear, elk, beaver, other:
- fish: bass, salmon, trout, herring, shellfish, other: None

b. List any threatened or endangered species known to be on or near the site.

c. Is the site part of a migration route? If so, explain.

No. Heavy tree cover prevents migrating birds from using the site.

d. Proposed measures to preserve or enhance wildlife, if any:

Reconstruct stream segment and daylight base flow. Plant native species within the 5,370 square foot stream buffer area.

Impacts to habitat associated with species of local importance must be mitigated in accordance with the requirements of LUC 20.25H.150 through LUC 20.25H.170.

6. Energy and natural resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Not applicable.

b. Would your project affect the potential use of solar energy by adjacent properties?

If so, generally describe.

No. Existing vegetation limits use of solar on adjacent residences. The proposed plantings will not further limit solar access.

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c. What kinds of energy conservation features are included in the plans of this proposal?

List other proposed measures to reduce or control energy impacts, if any:

None.

7. Environmental health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal?

If so, describe.

None.

1) Describe special emergency services that might be required.

Limited potential for needing emergency response during construction.

2) Proposed measures to reduce or control environmental health hazards, if any:

No use of paints, solvents or other materials during construction. Refueling vehicles will occur outside the stream buffer area.

These potential hazards are addressed as part of the site management practices included as part of the project's Clearing and Grading Permit.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

There is some background noise from SR-520 to the north and normal residential noise from the surrounding houses and streets.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Short term noise will be generated by use of diesel powered construction equipment, the travel of workers to and from the site, and the delivery of construction materials.

Construction and operation noise is regulated by BCC 9.18. The proposed construction must meet the requirements of this section.

3) Proposed measures to reduce or control noise impacts, if any:

Turn off idling equipment when not in use.

8. Land and shoreline use

a. What is the current use of the site and adjacent properties?

The site is currently used as a drainage way carrying the base stream flow and any additional runoff created by the surrounding residences and street.

b. Has the site been used for agriculture? If so, describe.

No.

c. Describe any structures on the site.

The first segment of work, just east of 102nd Ave NE includes a control structure at the outlet from the culvert under 102nd Ave NE. and a buried culvert that carries the entire flow east and downhill to a stilling well approximately 116 feet to the east.

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d. Will any structures be demolished? If so, what?

No. A flow diverter will be constructed within the control structure to daylight the base flow onto a reconstructed stream segment on the 30% slope. The existing pipe carrying the entire flow to a stilling well will remain and will carry flows from the culvert under 102nd Ave NE that are above the base flow.

e. What is the current zoning classification of the site?

R-2.5

f. What is the current comprehensive plan designation of the site?

SF-M

g. If applicable, what is the current shoreline master program designation of the site?

None.

Not in shoreline jurisdiction.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

Yes. Portions of the site have been classified as a critical area steep slope and a small area of wetland.

See attached critical areas report for stream and wetland typing.

i. Approximately how many people would reside or work in the completed project?

None.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not Applicable

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Re-vegetate site with native plants. Use of reconstructed stream segment to handle base flow only will reduce potential for future erosion that had started to undermine the road until the emergency fill was placed last summer.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

None.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

c. Proposed measures to reduce or control housing impacts, if any:

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10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

None.

b. What views in the immediate vicinity would be altered or obstructed?

None

c. Proposed measures to reduce or control aesthetic impacts, if any:

None.

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

None.

d. Proposed measures to reduce or control light and glare impacts, if any:

None.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

Walking on shoulder of residential streets.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None.

13. Historic and cultural preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

None.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

None.

c. Proposed measures to reduce or control impacts, if any:

None.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

The site is located on the east side of 102nd Ave NE.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

No.

c. How many parking spaces would the completed project have? How many would the project eliminate?

None.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

None.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

None.

g. Proposed measures to reduce or control transportation impacts, if any:

None.

15. Public services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No.

b. Proposed measures to reduce or control direct impacts on public services, if any.

None.

16. Utilities

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other.

Cable TV.

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b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

The first segment of the proposed work includes installing a flow splitter in the control structure located at the downhill end of the culvert under 102nd Ave NE. The base flow 0.3 CFS will be daylighted to a reconstructed stream segment. The existing culvert below the control structure that connects to the stilling well at the base of the first stream segment will be retained to carry the storm flows above the base flow to prevent further damage or erosion.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: 
Date Submitted: 12/29/2010

Critical Areas Study Restoration of Tributary to Yarrow Creek Bellevue, Washington

December 29, 2010

Prepared for

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EXECUTIVE SUMMARY

The City of Bellevue (City) is proposing habitat improvements to stabilize the ravine of the tributary to the west tributary of Yarrow Creek located east of 102nd Avenue NE (Yarrow Creek tributary), including repairs to the culvert under 102nd Avenue NE (Figure 1). Significant erosion and channel downcutting has occurred over the years at this location. The ravine has near-vertical side slopes in many areas, and significant erosion and sediment transport has occurred as a result of flow originating from the perched culvert at 102nd Avenue NE that is elevated approximately 20 feet (ft) above the channel bed. The stream channel erosion and downcutting jeopardized the stability of a sewer line that spans the channel downstream and the roadway embankment, and contributed to excessive sedimentation downstream.

In late July 2010, the City declared an emergency to repair the 102nd Avenue NE culvert and roadway embankment. In order to address these hazards, the existing concrete culvert was replaced with new 24-inch plastic replacement pipe; new culvert inlet and outlet structures were also installed. In addition, approximately 1,245 cubic yards (yd³) of gravel fill was placed at the eroded base of the ravine in order to buttress the roadway embankment. The 24-inch plastic pipe was extended approximately 116 ft through the fill area to a more stable discharge location downstream from the eroded ravine area. An energy dissipater was also installed at the base of the slope. Installation of habitat improvements along approximately 220 linear ft of stream is anticipated for 2011.

The additional habitat improvements include modifying the newly installed manhole at the outlet of the culvert and constructing a stream channel on the fill slope that was built as part of the emergency repair; installation of rock and large woody debris to create a cascade pool complex; extending installation of rock and large woody debris downstream of the emergency repair; and installation of native plantings adjacent to the proposed work.

Wetlands, surface waters, and/or their buffers can fall under the jurisdiction of the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act, the Washington State Department of Ecology (Ecology) under the State Water Pollution Control Act, and the City under the critical areas regulations of the Municipal Code.

This report provides results of the critical areas study including identification of one wetland and one stream; assessment of project-related impacts to stream and stream buffer; and a description of the proposed compensatory mitigation for those impacts in order to satisfy both the City's critical areas regulations and/or USACE requirements for compliance with Section 404 of the Clean Water Act.

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MITIGATION FACT SHEET

Site Information								
Location		Wetland Impact & Mitigation Sites (same)						
Site Names		102 nd Avenue NE and Yarrow Creek Tributary Emergency Culvert Repair and Restoration						
County		King County						
City		City of Bellevue						
Section, Township, Range		Section 19 and 20, Township 25 North, Range 5 East						
Latitude, Longitude (GIS verified)		47.641484°N, -122.204628°W						
Watershed		HUC 17110012, Lake Washington						
WRIA		8, Cedar-Sammamish						
Is the mitigation site(s) off of the project development site?					Onsite restoration is proposed.			
Construction schedule [development site and compensation site(s)]: Emergency repairs completed August-September 2010; habitat improvements scheduled for August-September 2011.								
Summary of project, including proposed type and location of work, discussion of avoidance and minimization measures, goals and objectives, wetland functions, impacted and mitigated (note assessment method used), and the general design concept (include where it has been done before).								
<p>The existing concrete culvert under 102nd Avenue NE was replaced with new 24-inch plastic replacement pipe; new culvert inlet and outlet structures were also installed. In addition, approximately 1,245 yd³ of gravel fill was placed at the eroded base of the culvert in order to buttress the roadway embankment. The 24-inch plastic pipe was extended approximately 100 ft through the fill area to a more stable discharge location downstream from the eroded ravine area. An energy dissipater was also installed at the base of the slope and currently all flow goes through the 24-inch pipe that is buried in the fill. The proposed habitat improvements will include creation of a perennial channel with cascade/pool complex and habitat features extending from the existing culvert to the bottom of the fill slope, and will extend into the stream segment beyond the fill slope. Base flows will be contained within the open channel, and overflows will be diverted by a flow splitter to the pipe constructed within the fill slope as part of the emergency repair. The goal of the project is to maximize habitat improvements while protecting the road and sewer infrastructure.</p>								
Wetland/Waterway Impact Sites								
Waterway Name	Impacts	Type of Waterway	Rating	Water Quality Score	Hydrologic Score	Habitat Score	Landscape Position	HGM Class
Yarrow Creek Tributary	5,730 ft ² (approx. 220 linear ft)	N	N/A	N/A	N/A	N/A	N/A	N/A
Acres of wetland impacts and mitigation								
Waterway Type		Impacted (Temporary)	Restoration					
Type N		5,730 ft ² (approx. 220 linear ft)	5,730 ft ² (approx. 220 linear ft)					
Describe other impacts and/or other mitigation activities.								
<p>The emergency repair was necessary to stop erosion, which was jeopardizing the stability of the roadway embankment and contributing to deposition of excessive sediment downstream. The stream channel restoration plan is to create a series of cascades/pools through installation of rock and large woody debris. The design will provide habitat for wildlife and aquatic insects, but will not support fish use due to slope (30% or greater) consistent with the historic condition of this tributary.</p>								
Describe the buffers being provided for the mitigation site, including minimum and maximum width, total buffer area, and description of surrounding land uses.								
<p>The buffer restoration will improve habitat value and functional performance of the wetland buffer by increasing vegetative structure within the buffer. The proposed restoration includes re-planting of 5,370 ft² of buffer area that is to be temporarily impacted during construction and was created as part of filling activities associated with the emergency repair.</p>								
Describe the water regime at the mitigation site(s), including source of water, expected water depth, average outflow (winter, spring, summer), and ownership of water rights.								
<p>Base flows will be returned to the restored stream channel by a flow splitter to be installed on the upstream end of the ravine. A base flow of 0.3 cubic feet per second (cfs) will be diverted to the stream channel, which is consistent with flows modeled for the basin prior to development. Flows greater than base flow rates will be redirected to the high-flow bypass pipe installed as part of the emergency repair.</p>								
Provide a list of performance standards and the estimated time to reach each.								
See Section 5.3								

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ABBREVIATIONS AND ACRONYMS

BGS	Below Ground Surface
cfs	Cubic Feet per Second
City	City of Bellevue, Washington
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
FEMA	Federal Emergency Management Agency
FSA	Farm Service Agency
ft	Feet
ft ²	Square Feet
HGM	Hydrogeomorphic
HPA	Hydraulic Project Approval
JARPA	Joint Aquatic Resources Permit Application
LUC	Land Use Code
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
OHWM	Ordinary High Water Mark
PEM	Palustrine Emergent
PHS	Priority Habitats and Species
RCW	Revised Code of Washington
SR	State Route
TESC	Temporary Erosion and Sediment Control
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WRIA	Water Resource Inventory Area
yd ³	Cubic Yards

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1.0 INTRODUCTION

The City of Bellevue (City) is proposing habitat improvements to stabilize the ravine of the tributary to the west tributary of Yarrow Creek located east of 102nd Avenue NE (Yarrow Creek tributary) including repairs to the culvert under 102nd Avenue NE (Figure 1). Significant erosion and channel downcutting has occurred over the years at this location. The ravine has near-vertical side slopes in many areas, and significant erosion and sediment transport has occurred as a result of flow originating from the perched culvert at 102nd Avenue NE that is elevated approximately 20 feet (ft) above the channel bed. The stream channel erosion and downcutting jeopardized the stability of a sewer line that spans the channel downstream and the roadway embankment, and contributed to excessive sedimentation of the downstream stream reach.

Landau Associates, under contract to Brown and Caldwell, conducted an investigation to assist the City in determining potential impacts to wetlands and other “waters of the U.S.,” and other critical areas regulated by the City. As a result of the proposed project, unavoidable impacts occur to one waterway (Yarrow Creek tributary) and its buffer, which are also proposed to be restored as part of the proposed project.

Landau Associates completed this report in support of mitigation sequencing streams and buffers associated with the proposed project. The mitigation sequence described in this report includes remedial action to correct an infrastructure and environmental hazard, minimization of impacts, and restoration of the affected environment. The results of Landau Associates’ investigation are presented in this report, along with a stream and buffer restoration plan.

1.1 PROJECT DESCRIPTION

In late July 2010, the City declared an emergency to repair the 102nd Avenue NE culvert and roadway embankment. The embankment below the culvert outlet dropped 20 ft vertically into an actively eroding ravine. The road surface was located approximately another 22 ft above the ravine at the top of a steep bank, which created an approximately 42-ft-high, oversteepened embankment that was in danger of failing, as cited in the Joint Aquatic Resources Permit Application (JARPA) prepared for the emergency repair. The culvert and embankment support the 102nd Avenue NE roadway and an 8-inch sewer, 6-inch water line, gas line, and overhead power lines.

In order to address these hazards, the existing concrete culvert was replaced with a new 24-inch plastic replacement pipe using a trenchless method that did not require excavating the roadway; new culvert inlet and outlet structures were also installed. In addition, approximately 1,245 cubic yards (yd³) of gravel fill were placed at the eroded base of the ravine in order to buttress the roadway embankment.

The 24-inch plastic pipe was extended approximately 116 ft through the fill area to a more stable discharge location downstream from the eroded ravine area. An energy dissipater was also installed at the base of the slope.

Any delay in repairing the culvert and embankment could have resulted in collapse of the roadway resulting in sewage effluent and significant amounts of sediment being washed into the Yarrow Creek tributary, as well as multiple utility outages, and a traffic hazard on 102nd Avenue NE. At a site meeting on June 17, 2010, staff from the Washington Department of Fish and Wildlife (WDFW) concurred that the situation was an emergency and the repair should take place the summer of 2010. WDFW issued a Hydraulic Project Approval (HPA) for the repair (WDFW Control No. 121558-1).

As a condition of the HPA, the City anticipates completing stream channel restoration and habitat improvements in 2011. The restoration and habitat improvements will occur in two discrete sections. The first section represents the larger project area and will occur on the approximately 120 linear ft western segment of the site that was affected by the emergency repair (Figure 2). The proposed improvements in this first section include modifying the newly installed manhole at the outlet of the culvert and constructing a stream channel on the fill slope that was built as part of the emergency repair. The newly installed manhole will be modified to include a baffle wall and small-diameter pipe to split the stream flow, delivering the stream's base flow of 0.3 cubic feet per second (cfs) into the constructed stream channel. The constructed stream channel will extend from the modified manhole and carry the base flow down the 30% grade to a point next to the downstream stilling well, which was installed as part of the emergency repairs. The stilling well acts as the energy dissipater and outfall for the bypass pipe.

The constructed stream channel will have an overall 30% grade, which will be too steep for the creation of fish habitat. However, the proposed planting with native species will help secure the new slope created as part of the emergency repair and provide food and shelter for a wide range of insects and animals. "Daylighting" the base flow will improve water quality and support the fish populations downstream and a wide range of species of local importance.

In the future, when downstream fish passage barriers at State Route (SR) 520 and the former Lake Washington Boulevard are removed, this constructed steep stream segment will help support future resident fish in the lower reaches of this stream tributary and the west tributary of Yarrow Creek. The fill to stabilize the road embankment was installed at a steep angle to reduce the amount of stream segment covered by the fill, thus maximizing the amount of fish habitat in the downstream segment of this tributary.

Because of the steepness of the fill placed to support the street, the constructed stream segment will include multiple splash pools using rock and large woody debris to get the newly daylighted base flow down to the existing stream elevation without causing erosion of the newly installed fill. An

impervious liner will be used under the constructed stream segment to help prevent the base flow from undercutting the newly installed rock and logs. The surface of the fill, which is currently covered with jute erosion control mat and hydroseeded grass as part of the emergency repair, will be amended with topsoil and replanted with a mix of native trees, shrubs, and groundcovers.

The second section of the project starts at the toe of the fill slope and continues downstream approximately 100 linear ft to within 20 ft of the confluence of the tributaries of Yarrow Creek (see Figure 2). This second section of the project is designed to stabilize this section of creek against further damage by head cutting, erosion of side slopes, and the loss of habitat through the movement of existing small rock or the existing unsecured woody debris. Work in this stream segment will also include supplemental plantings with native species and the placement of habitat structures consisting of large rock and large woody debris.

1.2 SITE DESCRIPTION

The study area extends from the west side of 102nd Avenue NE approximately 220 ft east of 102nd Avenue NE near the confluence with the west tributary of Yarrow Creek and includes areas within 300 ft of the tributary on parcels 4122700080, 4122700090, and 412270TRCT (Figures 2 and 3). The study area is located within the Cedar-Sammamish watershed (Water Resource Inventory Area 8) in Section 20, Township 25 North, Range 5 East. Land use in the study area consists primarily of residential properties. The project area contains steep slopes adjacent to the Yarrow Creek tributary and 102nd Avenue NE.

1.3 REGULATORY BACKGROUND

The Clean Water Act requires authorization for the discharge of dredged or fill material into the “waters of the U.S.” under Section 404. The City Land Use Code (LUC) contains requirements for establishing wetland and stream buffer widths and building setbacks, and for any alteration, including fill, of wetlands, streams, and their buffers. The Washington State Department of Ecology (Ecology) requires compliance with the State Water Pollution Control Act [Revised Code of Washington (RCW) 90.48], and it has administrative oversight of Section 401 of the Clean Water Act for water quality certification in the case of impacts to U.S. Army Corps of Engineers (USACE) jurisdictional “waters of the U.S.” Any work that will use, divert, obstruct, or change the bed or flow of state waters, including streams and rivers, must do so under the terms of an HPA issued by the WDFW. WDFW HPA is administered under RCW 77.55 and rules set forth in Washington Administrative Code (WAC) 220-110. Wetlands and certain waterways are regulated by federal, state, and local governmental agencies, and compliance with one agency does not necessarily fulfill permitting requirements of any other agencies.

All wetlands and waterways described in this report are subject to verification by the USACE. The USACE determines the jurisdiction of a wetland based on the connection, more commonly referred to as adjacency, to other “waters of the U.S.” Those wetlands determined to be “isolated” do not fall under the jurisdiction of the USACE. If identified “waters of the U.S.” are determined to be adjacent rather than isolated, any filling or dredging of onsite wetlands/streams would require compliance with Section 404 and 401 of the Clean Water Act and the Endangered Species Act. Only the USACE can make the determination if a “waters of the U.S.” is adjacent or isolated. If wetlands are determined to be isolated, they may still be subject to regulation by Ecology under the State Water Pollution Control Act (RCW 90.48).

In addition, the City has requirements for establishing wetland and stream buffer widths and building setbacks, as well as for any alteration, including fill, of wetlands and their buffers. Given an adequate enhancement plan, the City may allow a reduction of standard buffer widths along with averaging of buffer widths, provided that at no single point the buffer width is less than 75 percent of the original buffer width [Part 20.25H.075(B)(2) and 20.25H.095(C)(2) of the LUC].

2.0 METHODS

Landau Associates conducted an information review, wetland delineation, impact assessment, and prepared a mitigation sequencing plan for impacts to critical areas associated with the proposed project according to the methods described below.

2.1 WETLAND INVESTIGATION

Landau Associates conducted this wetland delineation in accordance with the USACE *Wetland Delineation Manual* (USACE 1987), the USACE Regional Guidance letter on the 1987 Manual (USACE 1994), the USACE *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2008), and the Ecology *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997), which is accepted practice by the City as referenced in Part 20.25H.05 of the LUC.

The investigation of waterways was based on the methodology provided by Ecology's *Determining the Ordinary High Water Mark on Streams in Washington State* (Olson and Stockdale 2010) and City of Bellevue Critical Areas code (Part 20.25H) of the LUC.

In general, the USACE and Ecology recommend preliminary data gathering and a synthesis of available background information, followed by a field investigation to determine the presence of "waters of the U.S.," including wetlands and streams.

2.1.1 BACKGROUND INFORMATION REVIEW

Landau Associates reviewed the following public domain resources to determine existing conditions and potential wetlands and waterways within the study area:

- U.S. Geological Survey (USGS) topographic map (USDA, NRCS 2007a)
- Aerial photography (USDA FSA 2006)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map (USFWS 1981 to present)
- U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Soil Survey database (USDA, NRCS 2006a)
- USDA, NRCS National Hydric Soils List (USDA, NRCS website 2010)
- City Critical Areas map (City of Bellevue website 2009a)
- Floodplains database (FEMA 1996)
- SalmonScape website (WDFW website 2010).
- WDFW Priority Habitat and Species data (WDFW 2009)

2.1.2 WETLAND DELINEATION

Both USACE and Ecology outline a three-parameter approach to determine the presence or absence of wetlands that requires evaluating vegetation, soil, and hydrology (Table 1). Landau Associates biologists completed the field delineation using the routine onsite method, where data are collected at locations representative of typical wetlands and/or uplands of the study area. Following this method, an area is determined to be wetland if each of the following three criteria are met (also see Table 1):

- The dominant vegetation is hydrophytic.
- Soils are hydric.
- Wetland hydrology is present.

2.2 WETLAND AND STREAM CLASSIFICATION, RATING, AND BUFFER WIDTH

Any wetlands identified as part of this project were classified according to the USFWS's Cowardin classification system (Cowardin et al. 1979) and the USACE's hydrogeomorphic (HGM) classification system (Brinson 1993).

Wetlands were rated according to the *Washington State Wetlands Rating System for Western Washington* (Hruby 2004), which is accepted practice by the City. This system categorizes wetlands based on their existing functions, including water quality, hydrology, and habitat, as well as the wetland's rarity, sensitivity to disturbance, or irreplaceability. The wetland categories range from 1 to 4, and are defined in Part 20.25H.095 of the LUC as follows:

- Category I wetlands are those that (a) represent a unique or rare wetland type; or (b) are more sensitive to disturbance than most wetlands; or (c) are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or (d) provide a high level of functions.
- Category II wetlands are difficult, though not impossible, to replace, and provide high levels of some functions. These wetlands occur more commonly than Category I wetlands, but still need a relatively high level of protection. Category II wetlands in western Washington include: wetlands scoring between 51 to 69 points (out of 100) on the questions related to the functions present. Wetlands scoring 51 to 69 points were judged to perform most functions relatively well, or performed one group of functions very well and the other two moderately well.
- Category III wetlands are wetlands with a moderate level of functions (scores between 30 to 50 points). Wetlands scoring between 30 to 50 points generally have been disturbed in some ways, and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands.
- Category IV wetlands have the lowest levels of functions (scores less than 30 points) and are often heavily disturbed. These are wetlands that we should be able to replace, and in some cases be able to improve. However, experience has shown that replacement cannot be

guaranteed in any specific case. These wetlands may provide some important functions, and also need to be protected.

Wetland buffers were determined according to Part 20.25H.095(B) of the LUC.

2.3 SURFACE WATER DELINEATION, TYPING, AND BUFFER WIDTH

Landau Associates conducted a stream reconnaissance to characterize waterways within the study area for the purpose of determining stream classification. Information on approximate stream width, streambank stability, and habitat was collected. The ordinary high water mark (OHWM) of streams within the study area was estimated based on observation of field indicators including hydrology, soil and sediment, vegetation, and marks of scouring, etc.

Waterways were classified according to the classification system established under WAC 222-16-031, and Part 20.25H.075 of the LUC. Stream designations provided in Part 20.25H.075 of the LUC include:

- “Type S water” means all waters, other than shoreline critical areas designated under LUC 20.25E.017, within their bankfull width, as inventoried as “shorelines of the state” under Chapter 90.58 RCW and the rules promulgated pursuant to Chapter 90.58 RCW including periodically inundated areas of their associated wetlands.
- “Type F water” means all segments of waters that are not type S waters, and that contain fish or fish habitat, including waters diverted for use by a federal, state, or tribal fish hatchery from the point of diversion for 1,500 ft or the entire tributary if the tributary is highly significant for protection of downstream water quality.
- “Type N water” means all segments of waters that are not type S or type F waters and that are physically connected to a type S or F waters by an aboveground channel system, stream, or wetland.
- “Type O water” means all segments of waters that are not type S, F, or N waters and that are not physically connected to type S, F, or N waters by an aboveground channel system, stream, or wetland.

In accordance with WAC 222-16-031, waters, in part, having any of the following characteristics are presumed to have fish use:

- Stream segments having a defined channel of 20 ft or greater within the bankfull width and having a gradient of less than 4 percent
- Stream segments having a defined channel of 2 ft or greater within the bankfull width in western Washington; and having a gradient of 16 percent or less
- Stream segments having a defined channel of 2 ft or greater within the bankfull width in western Washington, and having a gradient greater than 16 percent and less than or equal to 20 percent, and having greater than 50 acres in contributing basin size in western Washington, based on hydrographic boundaries.

Buffer widths were determined according to Part 20.25H.075 of the LUC, and are measured from the top of bank.

2.4 MITIGATION SEQUENCING AND DESIGN

This project was designed in accordance with City, USACE, and Ecology guidance and requirements for mitigation sequencing, which allow for impacts to wetlands and/or other critical habitat when impacts are unavoidable and necessary.

2.4.1 IMPACT ASSESSMENT

Estimated proposed limits of clearing and grading and fill slopes were overlaid on the applicable stream, wetland, and buffer boundaries using AutoCAD software. The areas of wetland, waterway, and/or buffer impacts (including both temporary and permanent impacts) were calculated using AutoCAD software. The buffer average areas were also determined using AutoCAD.

Existing buffer functions were assessed in a narrative evaluation using the *Wetland Mitigation in Washington State Part 1: A Synthesis of the Science* (Ecology 2005) and best professional judgment given specific indicators.

2.4.2 MITIGATION PLAN

The onsite vegetation restoration plan was developed using the City of Bellevue Critical Areas Handbook (City of Bellevue undated). Brown and Caldwell engineers developed the stream channel restoration plan using the principles of stream restoration provided in the Washington State Aquatic Habitat Guidelines Program Integrated Streambank Protection Guidelines (Washington State Aquatic Habitat Guidelines Program 2003) and best professional judgment.

Comparison of buffer functions for pre- and post-mitigation was conducted using best professional judgment and incorporated into the functional assessment for the restoration project, as applicable for improving buffer functions.

3.0 CRITICAL AREAS INVESTIGATION RESULTS

This section provides the results of the background information review and onsite field delineation.

3.1 BACKGROUND INFORMATION REVIEW

This section provides a summary of topographic mapping, City of Bellevue mapping, soil survey information, National Wetlands Inventory (NWI) mapping, and other sources documenting conditions in and adjacent to the project area.

3.1.1 SURFACE WATERS

The topographic map for the project area (USDA, NRCS 2007a) does not identify the Yarrow Creek tributary (Appendix A, Figure A-1). The City of Bellevue Critical Areas Map (City of Bellevue website 2009a) identifies the subject tributary as a non-fish bearing stream (i.e., “Type Np, Ns” consistent with Type N or Type O waters described in Section 2.3).

3.1.1.1 Fish Usage

WDFW Priority Habitat and Species (PHS) data and the SalmonScape website do not identify the Yarrow Creek tributary, and no fish use is indicated (WDFW 2009; WDFW website 2010). A 2001 City of Bellevue survey of the Yarrow Creek basin indicated that no fish were found in the subject tributary and that the tributaries of Yarrow Creek lack sufficient flow to allow fish use, except possibly during high flow events (City of Bellevue website 2009b).

3.1.2 WETLANDS

The NWI Map (USFWS 1981 to present) does not identify any wetlands intersecting the study area (Appendix A, Figure A-2). The City critical area mapping also does not identify any wetlands in the project area (City of Bellevue website 2009a).

3.1.3 SOILS

The *Soil Survey Geographic Database for King County, Washington* (USDA, NRCS 2006a) identifies three soil series within the study area (Appendix A, Figure A-3; complete soil profile reports are provided in Appendix B):

- Alderwood (AmC) series consists of moderately deep to a cemented pan, moderately well-drained soils formed in glacial till. These soils are usually moist, but are dry between depths of 8 and 24 inches for 60 to 75 consecutive days in the summer in most years (USDA, NRCS

2007b). The Arents-Alderwood (AmC) series is classified as hydric in the *National Hydric Soils List* (USDA, NRCS website 2010) in depressions that contain components of the Bellingham, Seattle, or Tukwila soil series.

- Kitsap (KpB, KpD) series consists of very deep, moderately well-drained soils formed in lacustrine sediments (USDA, NRCS 2000). The Kitsap silt loam 2 to 8 percent (KpB) and 15 to 30 percent (KpD) are classified as hydric in the *National Hydric Soils List* (USDA, NRCS website 2010) in depressions that contain components of the Bellingham, Seattle, or Tukwila soil series.
- Urban Land (Ur) is soil that has been modified by disturbance of the natural layers with additions of fill material several feet thick to accommodate large industrial and housing installations (USDA, NRCS 1973).

3.1.4 FLOODPLAIN

The Q3 flood data (FEMA 1996) do not identify a 100-year floodplain associated with the Yarrow Creek tributary. The nearest floodplain is that of Lake Washington located north of the project area (see Figure A-4).

3.1.5 LAND USE

The *USDA-FSA-APFO NAIP MrSID Mosaic* aerial photograph (USDA, FSA 2006) shows the study area contains residential land uses with areas of lawn and forested area interspersed (see Figure 2).

3.1.6 PRECIPITATION

Precipitation data for the 3-month period prior to the field investigation in the Puget Sound Lowlands (National Climatic Data Center website 2010) indicate recorded precipitation levels were within the normal range listed in Natural Resources Conservation Service (NRCS) WETS tables (USDA, NRCS website 2002; Appendix C).

3.2 FIELD INVESTIGATION

Landau Associates wetland ecologists Steven Quarterman and Perry Welch conducted a field investigation on April 15, 2010, prior to completion of the emergency repair. The weather during the site reconnaissance was sunny and cool.

A sampling point was recorded in areas suspected to meet the mandatory wetland criteria, and nearby upland to determine corresponding wetland/upland boundaries. Detailed information on soils, vegetation, and hydrology was recorded at three sampling points as shown on Figure 3. The boundaries of one waterway and one wetland were estimated based on project survey plans (Figure 3).

A summary of the identified systems, including classifications and buffer requirements, is provided in Table 2. The sampling point locations and identified systems are shown on Figure 3, and the

completed data sheets describing the sampling points and site photographs are provided in Appendix D and Appendix E, respectively.

3.2.1 YARROW CREEK TRIBUTARY (WATERWAY) CHARACTERIZATION AND CLASSIFICATION

The Yarrow Creek tributary is identified on City critical area mapping as a Type Np, Ns stream originating near the intersection of 99th Avenue NE and NE 32nd Street, southwest of the study area.

At the time of the field investigation prior to the emergency repair, the Yarrow Creek tributary east of 102nd Avenue NE (downstream) contained flow, presumably perennial (i.e., continuous flow in parts of its bed all year round during years of normal rainfall) as evidenced by the quantity of flow and characteristics of stream bed materials (i.e., coarse sand and gravel) and the streambank condition. The height of the streambank is such that perennial flow is assumed to be present to create the conditions observed, which was a heavily downcut channel bed. The tributary was conveyed beneath 102nd Avenue NE by a 24-inch concrete culvert, which was partially failing due to age. Closed-circuit television of the culvert indicated areas of separated joints, cracked pipe, and crushed pipe (Landau Associates 2010). Water was observed flowing beneath the culvert at the time of the field investigation. Steep slopes and exposed soil were present on each side of the ravine where the buried sewer pipe emerges from the slope to span the ravine (see Figure 3). The resulting ravine had near-vertical side slopes in many areas (Appendix F, Sheets 2 to 5). An exposed outfall (corrugated metal pipe) was observed approximately 70 ft downstream of 102nd Avenue NE on the top of the north bank of the tributary (see Figure 3). The OHWM of the Yarrow Creek tributary was observed near the base of the ravine. The outfall from 102nd Avenue NE was largely obscured by vegetation.

Significant erosion and channel downcutting has occurred over the years downstream of 102nd Avenue NE transporting excess sediment downstream adjacent to SR 520. In 2008, City crews conducted sediment removal maintenance upstream from a utility access road (formerly a section of Lake Washington Boulevard) near SR 520 that was filled with sand/gravel material (see Figure 3). Investigation by the City of the upstream areas in 2008 identified the erosion in the Yarrow Creek tributary discussed above. In 2008, the City installed habitat improvements in the channel area disturbed by the maintenance activities. The Yarrow Creek tributary within the study area has continued to down cut and refill this downstream basin. Site reconnaissance indicates that an approximately 1.5-ft vertical drop resulted from erosion between September 2009 and June 2010 (Landau Associates 2010).

The tributary contains gravel and woody debris that provides fish habitat; however, the stream grade is too excessive to support fish use. As a result of the erosive flows in the tributary, the pre-existing stream profile from the base of the stream channel at the base of the drop from the culvert may have been

adequate to support fish (stream profile less than 16%); however, downstream culverts created fish passage barriers that precluded fish access during the time that likely fish access could have occurred, which is corroborated by fish surveys conducted by the City in 2001 (City of Bellevue website 2009b). The downstream culverts are being replaced as part of improvements to SR 520 to facilitate future upstream access for fish. The culvert at 102nd Avenue NE was likely constructed to discharge at the bed elevation that existed at that time in the stream channel, which can reasonably be assumed to be considerably less than the existing elevation difference. As a result, the pre-existing conditions of this tributary can reasonably be assumed to contain profiles greater than 20%, which does not support fish use.

Because the Yarrow Creek tributary east of 102nd Avenue NE is a presumed perennial waterway, it is classified as a “waters of the U.S.” subject to regulation by the USACE under the Clean Water Act. In accordance with the LUC, Type N waters are all segments of waters that are not Type S or Type F waters and that are connected to a Type S or Type F waters by an aboveground channel system, stream, or wetland. In accordance with the LUC, Type N waters are assigned a standard buffer of 50 ft on undeveloped sites. The condition of the buffer is described in Section 3.2.2.2.

3.2.2 WETLAND IDENTIFICATION AND CLASSIFICATION

One potential wetland was identified within the study area, but outside of the project area. This wetland and the adjacent upland are described below.

3.2.2.1 Wetland B

Wetland B is a potential palustrine emergent (PEM)/slope wetland located east of the confluence of two tributaries of Yarrow Creek within the study area but beyond the project area (see Figure 3). Due to the distance of the wetland from project work, a detailed investigation of soils was not completed and a “potential” wetland determination is presented. Wetland B is approximately 1,600 square feet (ft²), but the extent of the wetland was not fully assessed at the time of the field investigation. Vegetation in the wetland is dominated by skunk cabbage (*Lysichiton americanum*, OBL). The hydrology of this potential area was observed as seeps from slopes adjacent to the other Yarrow Creek tributary.

Wetland B is assigned a preliminary rating as a Category III wetland, and would require a buffer of 60 to 110 ft, depending on scoring for habitat functions.

3.2.2.2 Upland Characterization

The accessible areas on either side of the Yarrow Creek tributary were investigated for wetlands and to characterize adjacent stream buffer. Three sampling point were recorded in the project area; Sampling point SP-1 and SP-2 are located north of the tributary on the top of the ravine. Sampling Point

SP-3 is located south of the tributary near the confluence of the two Yarrow Creek tributaries. Sampling Point data forms are provided in Appendix D.

Both sides of the creek are residential properties with maintained lawns. The forest riparian buffer widens as the creek extends downstream from 102nd Avenue NE. Dominant vegetation at Sampling Points SP-2 and SP-3 includes, but is not limited to, Oregon grape [*Berberis nervosa*, No Indicator (NI)], sword fern (*Polystichum munitum*, FACU), red alder (*Alnus rubra*, FAC), laurel (*Kalmia* sp.), western hemlock (*Tsuga heterophylla*, FACU-), beaked hazelnut (*Corylus cornuta*, FACU), waterleaf (*Hydrophyllum tenuipes*, NI), stinging nettle (*Urtica dioica*, FAC+), English ivy (*Hedera helix*, NI), Himalayan blackberry (*Rubus discolor*, FACU), and big-leaf maple (*Acer macrophyllum*, FACU). Soils in the adjacent riparian buffer are a very dark brown (10YR 2/2) sandy loam from ground surface to 6 inches below ground surface (BGS), and brown (10YR 3/3) to dark brown (10YR 4/3) loamy sand from 6 to more than 12 inches BGS, and do not meet the hydric soils parameter(s).

Sampling Point SP-1 was recorded in an area that was likely recently disturbed, as evidenced by the presence of straw to stabilize disturbed groundcover. Vegetation in the area contains stinging nettle (FAC+), creeping buttercup (*Ranunculus repens*, FACW), and field horsetail (*Equisetum arvense*, FAC). The hydrology of this area was observed as seeps from slopes adjacent to 102nd Avenue NE. It is possible that the seeps are a result of degraded culverts and stormwater conveyance pipes that are associated with the 102nd Avenue NE road crossing. Soils at Sampling Point SP-1 are very dark gray (10YR 3/1) loam from the ground surface to 6 inches BGS, and very dark grayish brown (10YR 3/2) loam from 6 inches to more than 12 inches BGS. While the upper layer is a low chroma matrix, the layer is not at depth to satisfy the hydric soil parameter (i.e., immediately below the A-horizon or 10 inches BGS), and the area is classified as upland.

4.0 IMPACT ASSESSMENT

Surface water, and buffer impacts are described by area, type, and functions below.

4.1 IMPACTS BY AREA AND TYPE

The following table provides a summary of unavoidable wetland and buffer impacts in terms of area for stream and stream buffer:

Critical Area	Regulating Agency	Impacts	
		Temporary	Permanent
Yarrow Creek Tributary	USACE, WDFW, and City	approx. 220 linear ft	0
Buffer	City	5,730 ft ²	0

Stream buffers are measured from top of bank, as regulated under Part 20.25H.075 of the LUC. All project work is below top of bank.

Impact areas are also shown in the Joint Aquatic Resources Permit Application (JARPA) figures provided in Appendix F.

Two types of impacts will occur: temporary surface water impacts and temporary buffer impacts. The areas filled as a result of the emergency repair occur below the streambank. Stream buffers are measured from top of bank, as regulated under Part 20.25H.075 of the LUC, and all project work is below the top of bank. As part of the emergency repair, approximately 120 linear ft of stream was filled with approximately 1,245 cubic yards (yd³) of gravel to stabilize the bank slopes and protect the roadway embankment (see Appendix F, Sheet 6 to 10). A 24-inch diameter pipe was placed in the fill to convey flows of the tributary through the fill material to an energy dissipater to halt further erosion of the ravine.

All areas impacted will be restored with native vegetation following construction of the habitat improvements. A series of cascade/pool complexes will be constructed above the storm drain installed as part of the emergency repair, and base flows will be returned to the channel. Additional habitat improvements involving placement of rock and large woody debris will occur in an approximately 100-linear ft section of stream downstream of the emergency repair. The overall habitat improvements extend along approximately 220 linear ft of the Yarrow Creek tributary.

5.0 MITIGATION

This section presents the mitigation sequencing, impact analysis, and mitigation plan for unavoidable impacts to wetland, buffer, and floodplain area and functions.

5.1 MITIGATION SEQUENCING

Part 20.25H.215 of the LUC outlines requirements for mitigation associated with alterations to streams. Mitigation shall be required in the following order of preference, and may include a combination of the following:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps such as project redesign, relocation, or timing to avoid or reduce impacts.
3. Performing the following mitigation:
 - a. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
 - b. Reducing or eliminating the impact over time by preservation and maintenance operations.
 - c. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments.
4. Monitoring the hazard or other required mitigation and taking remedial action when necessary.

The mitigation sequencing details focusing on avoidance, minimization and restoration for the proposed project are described below.

5.1.1 AVOIDANCE

Impacts to the Yarrow Creek tributary associated with the habitat improvements cannot be avoided as the purpose of the project is mitigation. The culvert replacement and stabilization of the embankment ravine was the minimum necessary to address the high flows and erosion of the ravine and threat to public infrastructure (see Appendix F, Sheet 6 to 10). Likewise, the proposed restoration will occur in the area of the former channel and will improve upon the habitat conditions of the Yarrow Creek tributary. The proposed restoration project is considered mitigation, and avoidance of impacts is not considered further.

5.1.2 MINIMIZATION

Minimization of impacts includes sensitive site design and placement of construction staging areas and site access away from streams, wetlands, and the innermost portion of buffers to the greatest

extent practicable. As part of the emergency repair, the fill to stabilize the road embankment was installed at a steep angle to reduce the amount of stream segment covered by the fill, thus maximizing the amount of fish habitat in the downstream segment of this tributary. In addition, construction staging areas were located along existing roadways.

During construction, the drainage pipe placed as part of the emergency road stabilization work will be used to bypass stream flows during reconstruction of the stream segment on top of the fill. Work in the downstream, eastern segment of this stream project, will be bypassed by pumping the stream flow around this stream segment during the rehabilitation and streambank stabilization work. In addition, construction staging areas will be located along existing roadways.

5.1.3 UNAVOIDABLE IMPACTS

The impacts to the Yarrow Creek tributary as part of the proposed restoration will be beneficial impacts. The culvert replacement and stabilization of the embankment ravine was the minimum necessary to address the high flows and erosion of the ravine and threat to public infrastructure. The proposed habitat improvements will occur in the area of the former channel and will improve upon the conditions of the Yarrow Creek tributary. Daylighting this stream segment, which at 30% is too steep for fish habitat, will improve water quality and provide natural biological support for fish habitat that exists further downstream and that may be extended into the eastern segment of this project in the future. The purpose of the proposed restoration project is mitigation.

5.1.4 MITIGATION REQUIREMENTS

The emergency repair was necessary to meet the last step of the mitigation sequence presented in the LUC: “Monitoring the hazard or other required mitigation and taking remedial action when necessary.” The restoration of the stream channel and buffer follows the third step of the mitigation sequence presented in the LUC: “Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.” Restoration of the waterway does not degrade the quantitative and qualitative functions and values of the habitat, and would achieve equivalent or better biologic and hydrologic functions.

Buffer impacts are not regulated by the USACE but are regulated by the City. Part 20.25H.085(B) of the LUC states that stream critical area buffers shall be replaced a ratio of one to one. Stream buffers are measured from top of bank, as regulated under Part 20.25H.075 of the LUC, and all proposed project work will be below the top of bank.

5.2 MITIGATION PLAN

The mitigation plan includes daylighting the base flow and reconstructing the stream segment on top of the fill placed as part of the emergency repair to buttress the roadway embankment. The restoration and habitat improvements are in two discrete sections. The first section represents the larger project area, representing approximately 120 linear ft of stream, and includes modifying the newly installed manhole at the outlet of the culvert and constructing a stream channel on the fill slope that was built as part of the emergency repair (see Appendix F, Sheet 13, Sheet 14, and Sheet 17). The newly installed manhole will be modified to include a baffle wall and small-diameter pipe to split the stream flow, delivering the stream's base flow of 0.3 cfs into the constructed stream channel. The constructed stream channel will extend from the modified manhole and carry the base flow down the 30% grade to a point next to the recently installed stilling well. The stilling well acts as the energy dissipater and outfall for the bypass pipe.

The constructed stream channel will have an overall 30% grade, following the grade of the placed fill, and will be too steep for the creation of fish habitat. However, the proposed planting with native species will help anchor the new slope and provide food and shelter for a wide range of insects and animals. Daylighting the base flow will improve water quality and support the fish populations downstream and a wide range of species of local importance.

In the future, when the fish passage barriers at SR 520 and the former Lake Washington Boulevard are removed, this constructed steep stream segment will help support future resident fish in the lower reaches of this stream tributary and the west tributary of Yarrow Creek.

Because of the steepness of the fill placed to buttress the roadway embankment, the constructed stream segment will have to include multiple splash pools using rock and large woody debris to get the newly daylighted base flow down to the existing stream elevation without causing erosion of the newly installed fill (see Appendix F, Sheet 13, 14, and 18 to 20). An impervious liner will be used under the constructed stream segment to help prevent the base flow from undercutting the newly installed rock and logs. The surface of the fill, which is currently covered with jute erosion control mat and hydroseeded grass as part of the emergency repair, will be replanted with a mix of native trees, shrubs, and groundcovers.

The second section of the project starts at the toe of the fill slope and continues downstream approximately 100 linear ft to within 20 ft of the confluence of the tributaries of Yarrow Creek (see Appendix F, Sheet 14 and 20). This second section of the project is designed to stabilize this section of creek against further damage by head cutting, erosion of side slopes, and the loss of habitat through the movement of existing small rock or the existing unsecured woody debris. Work in this stream segment

will also include supplemental plantings with native species and the placement of habitat structures consisting of large rock and large woody debris.

The stream restoration will include the placement of:

- Large woody debris (38 pieces; 8 to 12 inches in diameter)
- Streambed cobbles (4 to 12 inches; 20 yd³)
- Streambed boulders (18 to 24 inches; 8 yd³)
- Streambed aggregate (10 yd³)
- Streambed sediment (10 yd³)
- Approximately 70 yd³ of cut and 50 yd³ of fill to build the stream channel.

The buffer restoration will improve habitat value and functional performance of the stream buffer by increasing vegetative structure within the buffer. The proposed restoration includes replanting of 5,730 ft² of buffer area between the stream and top of bank that is to be temporarily impacted (see Sheet 15, 16, and 20 of Appendix F), representing a 1:1 ratio of restoration to impacts.

5.2.1 PROPOSED MITIGATION FUNCTIONS

The mitigation plan is meant to improve water quality by reintroducing base flow to a newly constructed stream segment on the fill that was placed to structurally support 102nd Avenue NE. The design will provide habitat for wildlife and aquatic insects, but will not support fish use due to slopes greater than or equal to 30%. The slope, and, therefore, absence of fish use in this reach, is consistent with the historical condition of this tributary. Work in the downstream segment is designed to secure this stream segment against further erosion and to secure rock and large woody debris to provide habitat complexity and fish habitat up to the base of the reconstructed steep stream segment.

The planting plan is designed to reintroduce native plantings to a natural ravine that had been severely damaged by residential construction and erosion caused by concentrated storm flow at the outlet to the culvert flowing under 102nd Avenue NE. Existing buffer functions were assessed in a narrative evaluation using the *Wetland Mitigation in Washington State Volume 1: A Synthesis of the Science* (Ecology 2005) and best professional judgment given specific indicators. Functions typically associated with wetland buffers include water quality (removing sediment, nutrients, toxics, and pathogens, and maintaining microclimate) and habitat (species richness, structural diversity/cover classes, visual screening from adjacent human development, and habitat connectivity).

The existing buffer consists of actively eroding slopes largely absent of vegetation. The restoration plan includes restoring and improving upon the impacted functions of the stream buffer, specifically the water quality and habitat functions. The planting plan includes a diverse assemblage of native vegetation.

5.3 MITIGATION GOALS, OBJECTIVES, AND PERFORMANCE STANDARDS

Goals are broad statements that generally define the intent or purpose of the proposed mitigation. Objectives specify the direct actions necessary to achieve the stated goals. The objectives of the goals listed below will be met by implementing the mitigation plan described above. Performance standards are the measurable values of specific variables that ensure objectives have been met. They provide the basis for determining if mitigation is a regulatory success. Three main goals and performance standards have been outlined for this effort:

Goal #1: Create stable stream segment consisting of rock and large wood creating a cascade/pool complex.

Performance Standard for Goal #1: Annual photographic documentation used for determination of site stability.

Goal #2: Return baseflow conditions to the restored stream channel.

Performance Standard for Goal #2: Annual photographic documentation used for determination of baseflow conditions.

Goal #3: Compensate for the impacts to buffer functions caused by the loss of existing buffer due to severe erosion events by creating at least 5,370 ft² of self-sustaining, structurally complex, species-rich buffer habitat within the immediate vicinity of the restored stream channel.

Performance Standard for Goal #3: Satisfy permit conditions specifying yearly plant survival requirements.

6.0 GRADING AND PLANTING PLANS

To compensate for spatial and temporal loss of wetland and buffer functions that will occur as a result of proposed impacts associated with the proposed project, a planting plan has been designed that will restore the wetland/stream/buffer complex on site. The planting plan, as well as project phasing, is presented in this section.

6.1 GRADING PLAN

Grading as part of restoration activities will create a streambed channel designed to carry baseflow consistent with pre-development characteristics. Approximately 70 yd³ of cut and 50 yd³ of fill are associated with the restoration plan. The cut material will be used to build the stream channel in fill areas or as streambed aggregate to fill voids within the large rock cascades and pools. The final topography of the buffer will allow for planting of tree, shrub, and herbaceous species.

6.2 PLANTING PLAN

The planting plan, as shown on Sheet 15 and 16 of Appendix F, is designed to restore riparian buffer habitat functions, provide enough shade to control the spread of invasive species, and to contribute to channel stability by providing erosion control. The plan is based on an average planting density of one tree or shrub per 6 to 20 ft on center plus hydroseeding, in order to account for damaged/salvaged plants to be replaced, as well as natural revegetation by native species from adjacent areas. Trees are not to be planted within 30 ft of the downstream suspended sanitary sewer, so as not to become hazard trees.

We have selected four native tree species, eight native shrub species, and six species of native groundcover that naturally occur on the subject property and that will supplement the existing native species present on the site (see Sheet 20 of Appendix F for a list of selected species). These species have been chosen not only for their ability to tolerate site-specific soil and moisture conditions, but also for their ability to provide wildlife forage, habitat, and erosion control functions.

The layout of the plant communities was designed to maximize interspersions of species. The layout of plants will include informal and irregular groupings of a variety of species to resemble naturally occurring plant communities. Because of the complexity in site topography, existing soils, and work within buffer areas, as well as the importance of retaining existing native vegetation and woody features (snags, stumps, etc.), the actual layout of plants will be determined by a biologist contracted by the City.

6.3 PHASING AND SPECIFICATIONS

The detailed specifications of the emergency repair and mitigation plan are provided in project specifications as part of the project plans. The emergency repair occurred between August and September 2010, and the restoration is anticipated to occur between August and September 2011. A summary of the construction sequencing for the restoration is as follows:

1. Establish contractor staging areas. Erosion control and spill control measures will be applied to all staging areas.
2. Mobilize construction equipment and materials to the project site.
3. Implement Temporary Erosion and Sediment Control (TESC) Plan to protect the areas cleared.
4. Remove trees/brush and other material and obstructions that might interfere with construction, while preserving/protecting natural growth that will not interfere with construction.
5. Install temporary stream bypass around the project area to a discharge point at the downstream end of the project area.
6. Construct the stream channel on the existing fill slope and place materials here and in the downstream reach of the tributary during designated in-water work window.
7. Re-establish stream base flow into the stream channel.

7.0 MONITORING AND MAINTENANCE

Monitoring and maintenance are important elements for the success of the mitigation project. The proposed mitigation will be monitored during and after completion of the initial construction work. Specific discussion of each of these elements is provided below.

7.1 QUALITY CONTROL OVERSIGHT

When plant installation is complete, a biologist will conduct an inspection and provide detailed notes on any changes to the final mitigation plan. This “as-built” plan will serve as the baseline for monitoring, and the monitoring period will commence when the City’s biologist approves the “as-built” plan. The final checklist will be used to document that specifications are met by the contractor.

7.2 FORMAL MONITORING

After construction, the mitigation areas will be monitored for a minimum of 3 years to make certain that performance standards, and ultimately the mitigation goals, are met. Monitoring will assess conditions in the mitigation areas based on data collected from permanent data collection stations established along transects at regular intervals. Permanent photographic stations will be established and mapped in the mitigation area. These will be placed to provide comprehensive visual documentation of the mitigation as the site matures over the monitoring period.

Site visits will occur twice annually between June 1 and September 15 to collect data on woody plant mortality; areal coverage of tree, shrub, and herb layers; invasive species coverage; and documentation of any colonization by native species.

7.3 REPORTING

Monitoring reports will be prepared at an interval agreed upon by the City/USACE for the monitoring period. These reports will document site conditions and evaluate the collected data to determine whether the performance standards are being met. Reports will be distributed to the City and all applicable regulatory agencies by December of each year.

7.4 SITE MAINTENANCE PROGRAM

Landscape maintenance will occur as needed for successful establishment of the plantings. To the extent practicable, the original landscape contractor will be responsible for 1 year of maintenance, including meeting grade and plant survival percentages.

While plant species chosen for this mitigation proposal are adapted to conditions in western Washington, supplemental irrigation may be required during the first three growing seasons following installation to ensure long-term survival of the planted communities, particularly in buffer areas.

The primary maintenance items that will be required within the mitigation areas are irrigation and/or removal of nuisance species. Any noxious weeds listed on the Washington State Noxious Weed Control Board list (NWCB website 2010) within the easement should be hand-weeded from the planted areas for the duration of the monitoring period. Plants installed for mitigation will be replaced, as needed.

8.0 CONCLUSIONS AND ASSESMENT OF NO NET LOSS

The mitigation plan presented in this report meets City requirements, as outlined in the LUC and meets state and federal agency guidance. The restoration plans presented in this report will mitigate for temporary impacts to stream and buffer areas; the proposed project will provide no net loss of stream or buffer functions. The mitigation plan includes monitoring and maintenance plans to ensure success of the restoration.

9.0 USE OF THIS REPORT

The findings presented herein are based on our understanding of the City of Bellevue Municipal Code, the USACE and Ecology wetland delineation methodology, and on our interpretation of the vegetative, soil, and hydrological conditions observed during the site visits on April 15, 2010. Within the limitations of scope, schedule, and budget, the findings presented in this report were prepared in accordance with generally accepted sensitive area investigation principles and practices in this locality at the time the report was prepared. We make no other warranty, either express or implied.

This report was prepared for the use of Brown and Caldwell and the City of Bellevue, and applicable regulatory agencies. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk.

Wetland areas delineated by Landau Associates are considered preliminary until the USACE and/or local jurisdictional agencies validate the wetland boundaries. Because wetlands are dynamic communities, wetland boundaries may change over time. The agencies typically recognize wetland delineations for a period of 5 years following an approved jurisdictional determination. In addition, changes in government code, regulations, and/or laws may occur.

This document has been prepared under the supervision and direction of the following key staff.

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SJQ/WPW/ccy

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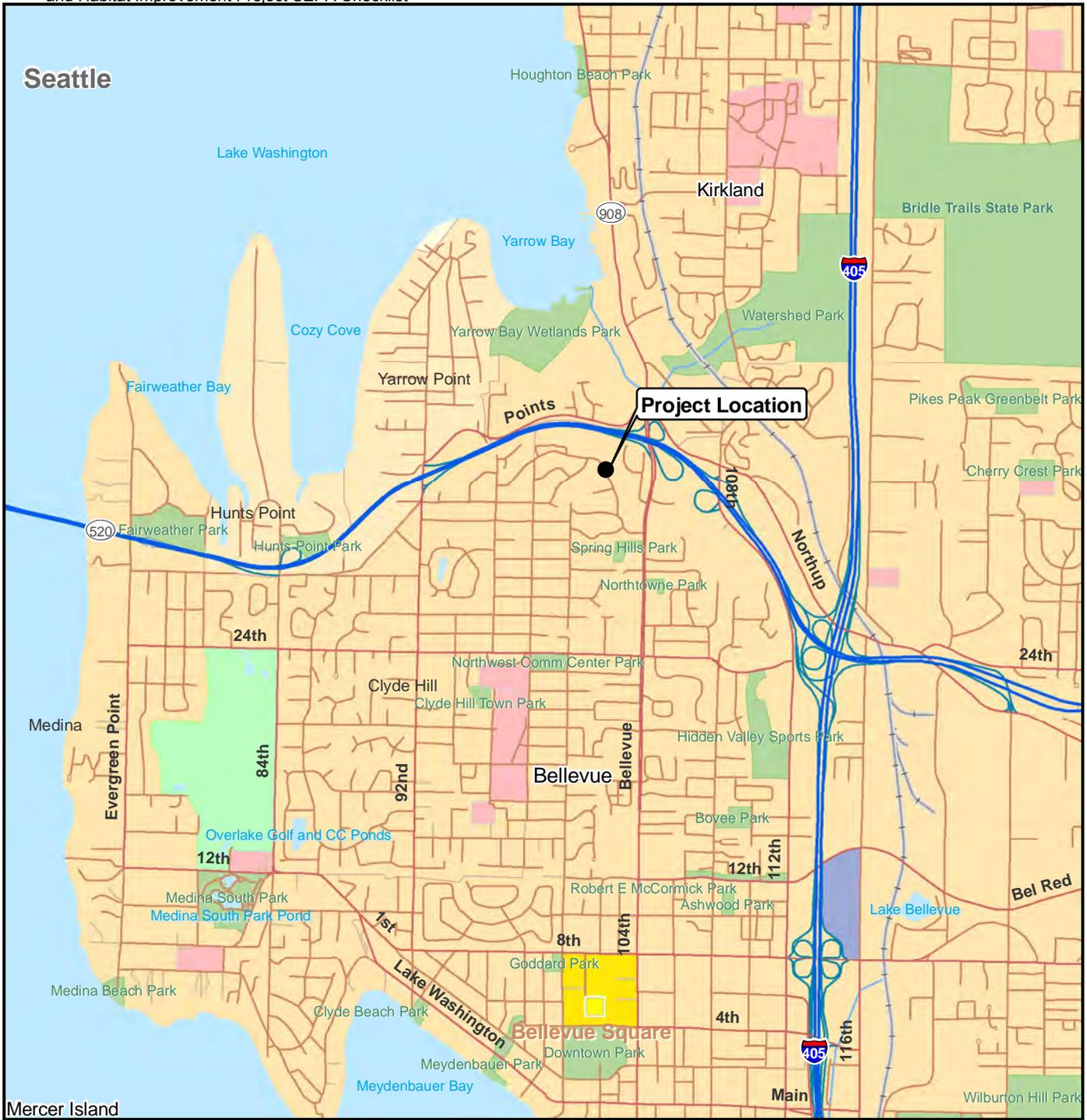
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Data Source: ESRI. 2006.



Yarrow Creek Tributary
 Erosion Repair
 Bellevue, Washington

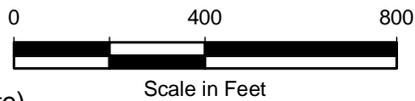
Vicinity Map

Figure
1



Legend

-  Project Area
-  300 ft Project Buffer (approximate)
-  Waterway



Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Source: USDA FSA 2006, King County 2008

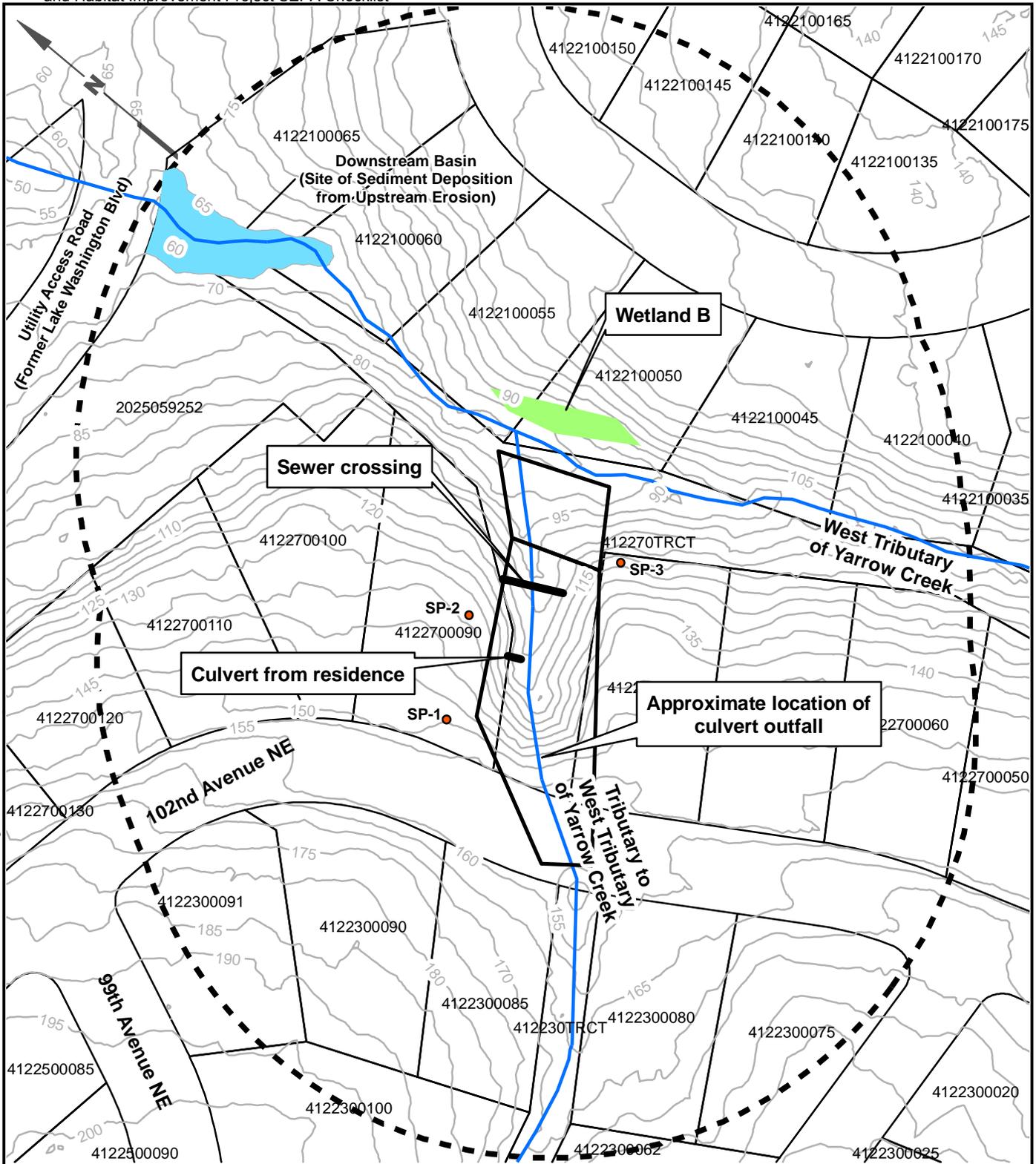
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Yarrow Creek Tributary
 Erosion Repair
 Bellevue, Washington

Study Area Map

Figure
2



Y:\Projects\080007\Mapdocs\Figs_3_Wetland_Location.mxd 12/17/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet

Legend

- Sample Point
- Downstream Basin
- Waterway
- Project Area
- 300 ft Project Buffer
- Potential Wetland
- NWI

Data Source: King County 2008

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Scale in Feet



Yarrow Creek Tributary
 Erosion Repair
 Bellevue, Washington

Wetland Location Map

Figure
3

**TABLE 1
 METHODS FOR WETLAND DETERMINATION
 YARROW CREEK TRIBUTARY EROSION REPAIR – BELLEVUE, WASHINGTON**

Parameter	Definition	Field Indicators	Field Assessment
Wetland Vegetation (a)	<p>Wetland vegetation is adapted to saturated soil conditions. The U.S. Fish and Wildlife Service (USFWS) assigned a wetland indicator to each plant species that denotes its frequency of occurrence within wetlands. These are as follows, and include modifiers (d):</p> <ul style="list-style-type: none"> • Obligate (OBL) wetland plants occur almost always in wetlands under natural conditions (more than 99 percent of the time). • Facultative wetland (FACW) plants usually occur in wetlands (67 to 99 percent of the time) but are occasionally found in nonwetlands. • Facultative (FAC) plants are equally likely to occur in wetlands or nonwetlands (34 to 66 percent of the time). • Facultative upland (FACU) plants usually occur in nonwetlands, but are occasionally found in wetlands (1 to 33 percent of the time). • Upland (UPL) plants almost always occur in uplands (more than 99 percent of the time). 	<p>More than 50% of the dominant plants totaled from all vegetation strata are hydrophytic, i.e., those species with indicators of OBL, FACW, or FAC (regardless of modifier), or; a plant community has a visually estimated cover percentage of OBL and FACW species that exceeds the coverage of FACU and UPL species. If dominance is not met, the Prevalence Index is calculated, or consideration is given to morphological adaptations and/or non-vascular plants observed.</p>	<p>1. Dominance: The dominant plants and their wetland indicator status are evaluated quantitatively within data plots and visually throughout the study area. If the test for dominance fails, and indicators of wetland soils and hydrology are present, the Prevalence Index is calculated.</p> <p>2. Prevalence Index: A weighted average of the percent cover of each indicator status is calculated (see data sheets in appendix). An index of 3 or less is considered meeting the hydrophytic vegetation criterion. If the Prevalence Index is not met, the consideration is given to morphological adaptations and/or non-vascular plants.</p> <p>3. Morphological Adaptations/Non-vascular Plants: Some plants develop recognizable morphological adaptations when occurring in wetland areas. These features must be observed on >50% of the individuals of a FACU species living in an area where indicators of hydric soils and wetland hydrology are present. Wetland non-vascular plants can include bryophytes (mosses, liverworts, hornworts). The cover of wetland bryophytes must be >50% of the total bryophyte cover in a plot in coastal Washington forested wetlands.</p>
Wetland Soils (b)	<p>Soils are classified as hydric, or they possess characteristics that are associated with reducing soil conditions. A hydric soil is formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil.</p>	<p>Hydric soils, in part, have an identifiable color pattern, which occurs if the soil is saturated, flooded, or ponded for a long period of time. Faint or washed-out colors typically form in the soil, and mottles of bright color, such as rust (known as redoxymorphic features), form. Accumulations of organic matter at the surface, a sulfur odor, and organic matter stains may also be present.</p>	<p>A shovel is used to dig holes at least 20 inches below ground surface (BGS) at multiple locations in the study area. Direct observation of the soil is made at multiple locations in both wetlands and uplands, as applicable. Soil organic content is determined visually and texturally, and soil color is determined using the Munsell soil color chart (Greytag Macbeth 1994). Depth to water saturation and/or inundation is also observed (see Wetland Hydrology). The characteristics observed are compared to the hydric soil indicators for "all soils," "sandy soils," and "loamy clayey soils," as described in the USACE Interim Regional Supplement (USACE 2008).</p>
Wetland Hydrology (c)	<p>The area is inundated either permanently or periodically at mean water depths less than or equal to 6.6 ft, or The soil is inundated or saturated to the surface for at least 14 consecutive days during the growing season (the time during which two or more non-evergreen vascular plant species growing in a wetland or surrounding area exhibit biological activity, such as new growth, or as determined by soil temperature).</p>	<p>Primary indicators include surface inundation (standing water), saturated soils, water marks, drift lines, sediment deposits, and drainage patterns. Secondary indicators of hydrology include water-stained leaves, oxidized root channels, or local soil survey data for identified soils. In the absence of any primary indicators, at least two secondary indicators are required to meet the wetland hydrology criterion.</p>	<p>During investigation of soils, soil pits are allowed to stand up to 20 minutes in order to allow percolation of any groundwater into the pit to determine groundwater level in the soil profile. Additional digging may occur to 24 inches BGS during the dry season to investigate groundwater levels. In addition, the extent of soil saturation and presence/absence of oxidation are determined in the soils removed as part of the soils investigation (see Wetland Soils). Other indicators of wetland hydrology are observed at ground surface.</p>

Notes:

(a) Reed 1988 and USFWS 1993. Categories were originally developed and defined by the USFWS National Wetlands Inventory and were modified by the National Plant List Panel. (b) Per USACE 1987, 2008; USDA, NRCS 2006b. (c) Per USACE 1987, 2008.

(d) Modifiers:

+ Frequency toward the higher end of the category (more frequently found in wetlands).

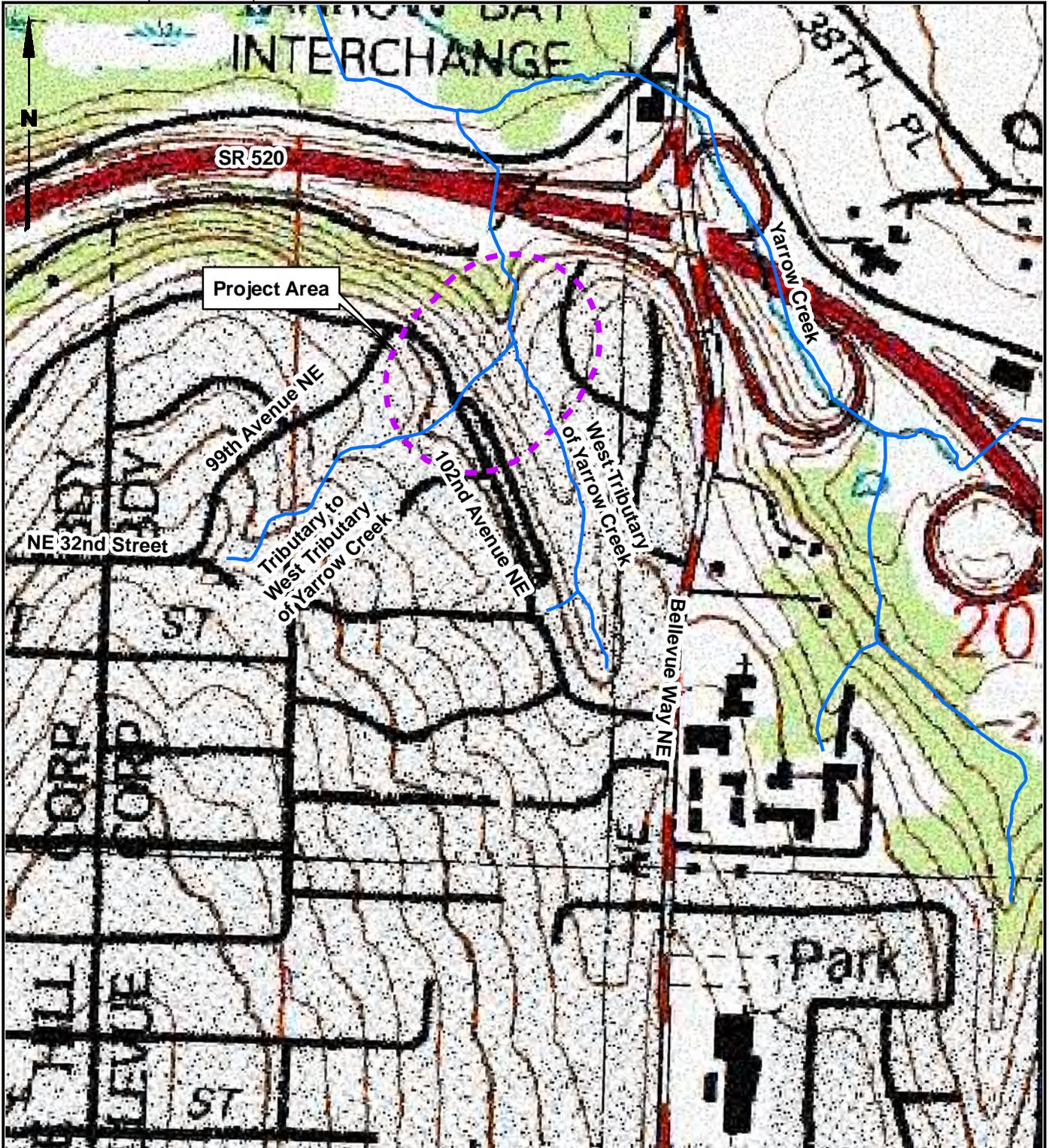
- Frequency toward the lower end of the category.

* Tentative assignment based on limited information from which to determine the indicator status.

TABLE 2
SUMMARY OF CHARACTERISTICS OF WATERWAYS
YARROW CREEK TRIBUTARY EROSION REPAIR – BELLEVUE, WASHINGTON

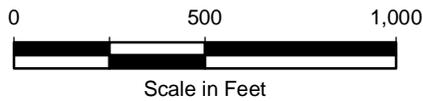
SUMMARY OF YARROW CREEK TRIBUTARY	
Classification	Perennial stream
Approximate Length	280 linear feet (within study area)
Fish Use (Documented)	None documented. Historical and proposed stream grade does not support fish use.
Stream Characteristics	Section of tributary within study area is severely eroded. Emergency repairs to the ravine were completed in 2010. Habitat improvements proposed are anticipated for construction in 2011.
Water Type and Buffer	Type N, requiring a 50-ft buffer in accordance with Part 20.25H.075 of the LUC.

Background Information Review Figures



Legend

-  300 ft Project Buffer
-  Waterway



Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Source: USGS 2001, King County 2008

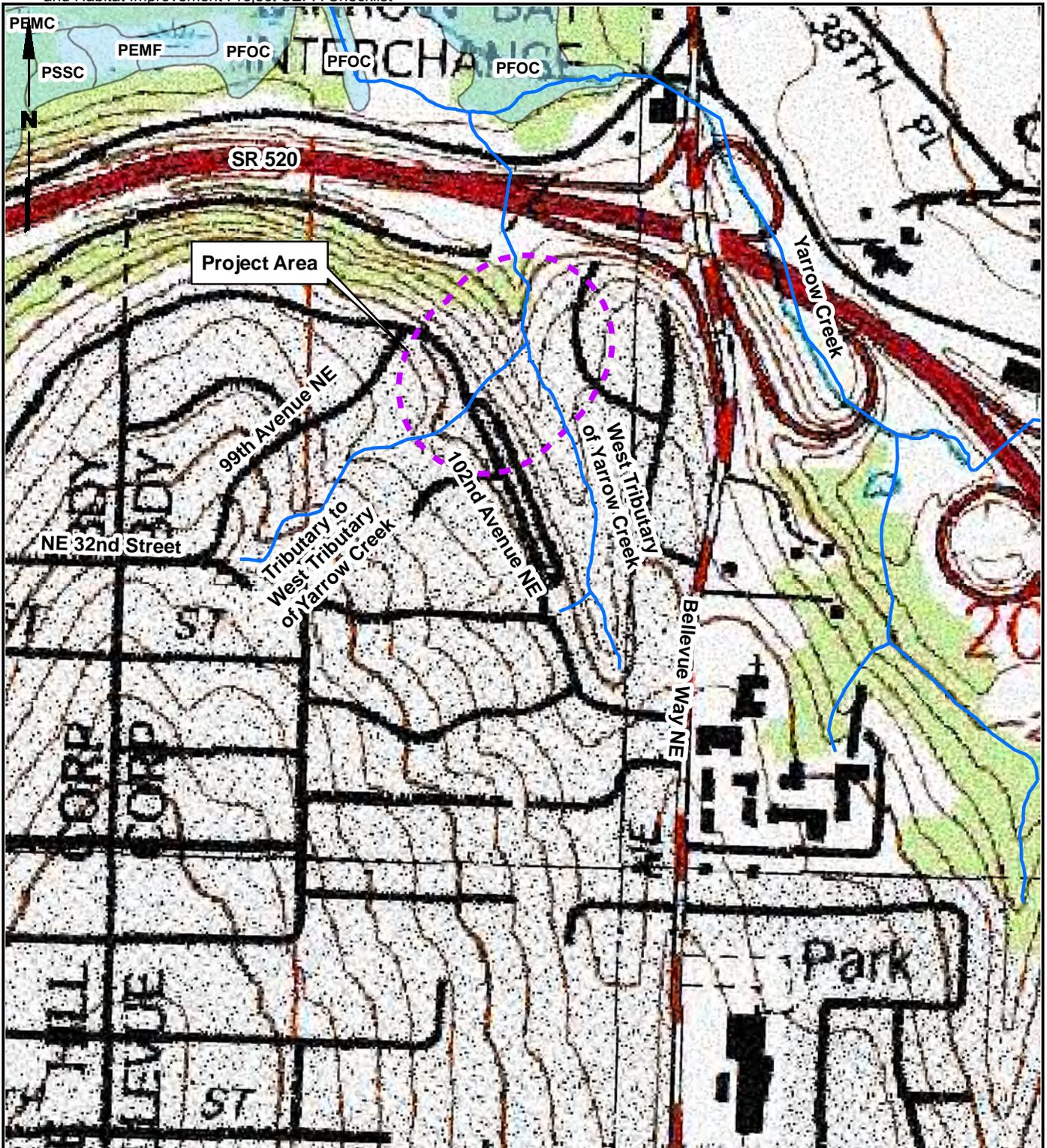
Y:\Projects\080007\Mapdocs\FigA-1.mxd 12/17/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet



Yarrow Creek Tributary
 Erosion Repair
 Bellevue, Washington

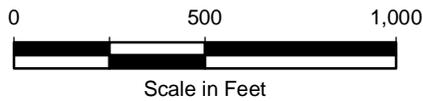
Topographic Map

Figure
A-1



Legend

-  300 ft Project Buffer
-  NWI wetland
-  Waterway



Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Source: USGS 2001, USFWS 1981 to present, King County 2008

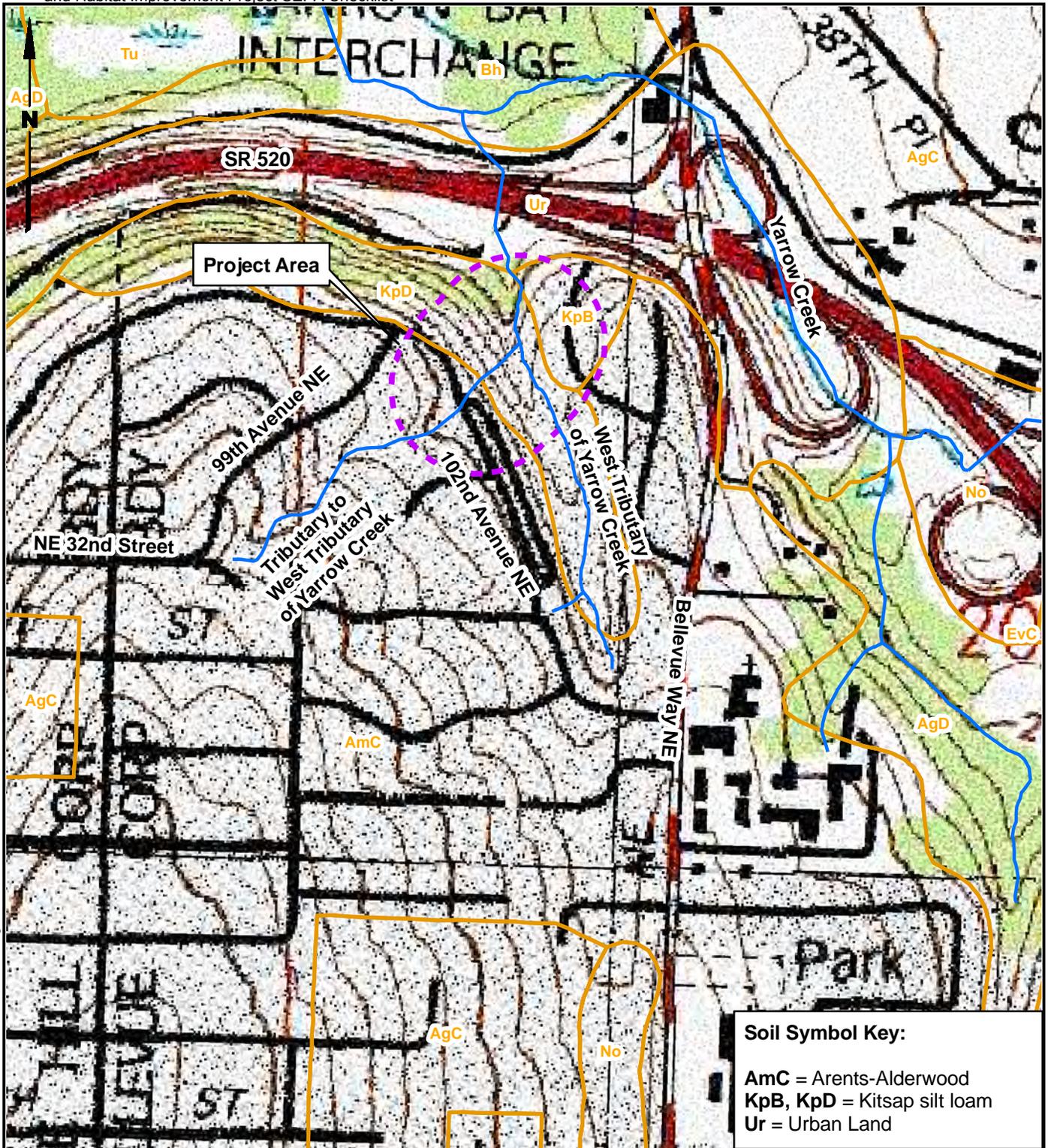
Y:\Projects\080007\Mapdocs\FigA-2.mxd 12/17/2010 NAD_1983 StatePlane_Washington_North_FIPS_4601_Feet



Yarrow Creek Tributary
 Erosion Repair
 Bellevue, Washington

National Wetland Inventory Map

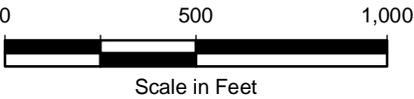
Figure
A-2



Y:\Projects\080007\Mapdocs\FigA-3.mxd 12/17/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet

Legend

-  300 ft Project Buffer
-  Soils
-  Waterway



Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

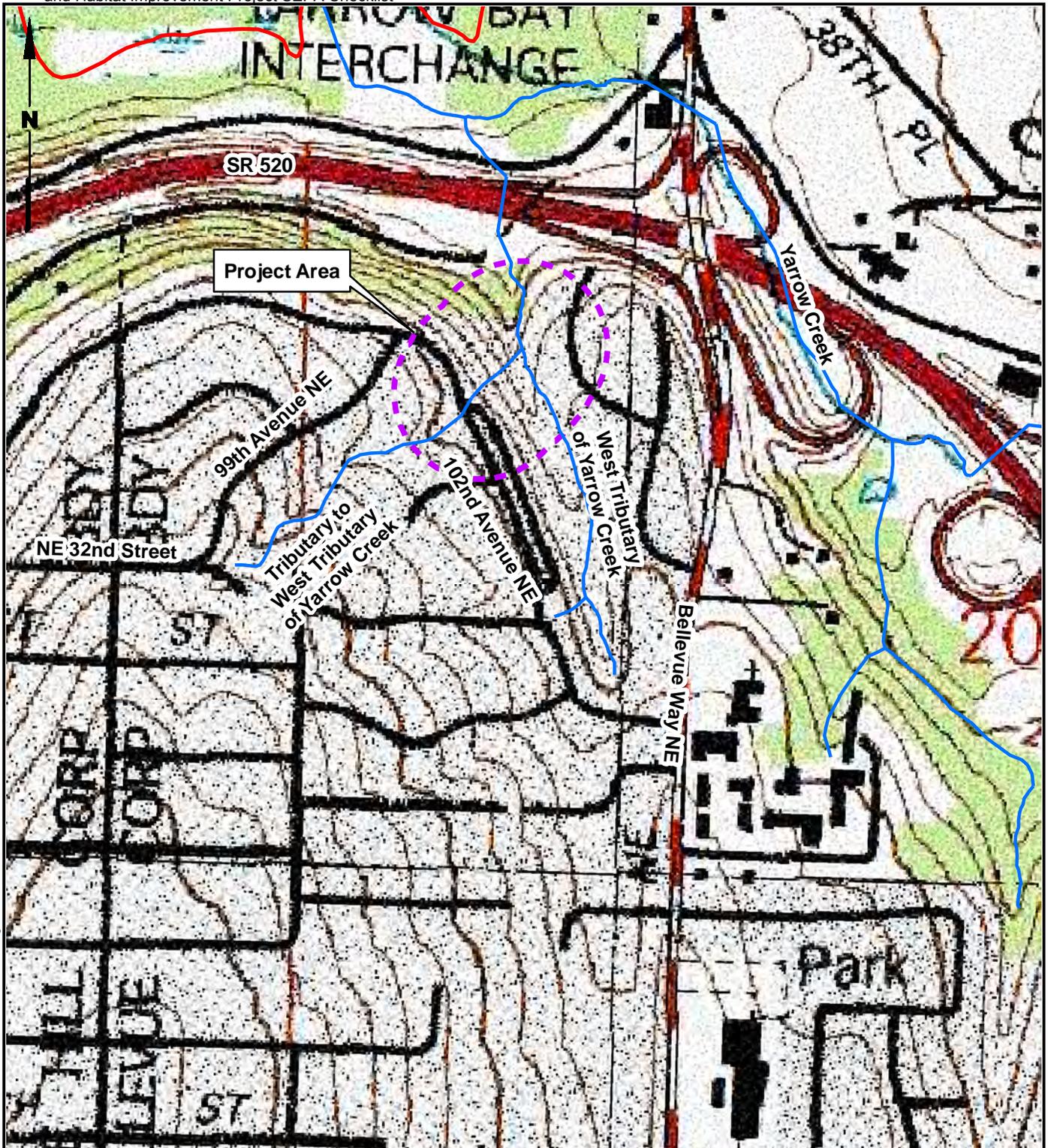
Data Source: USGS 2001, King County 2008



Yarrow Creek Tributary
 Erosion Repair
 Bellevue, Washington

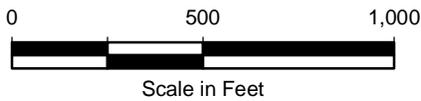
Soil Series Map

Figure
A-3



Legend

-  300 ft Project Buffer
-  100 Year Floodplain
-  Waterway



Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Source: USGS 2001, King County 2008

Y:\Projects\080007\Mapdocs\Fig-4.mxd 12/17/2010 NAD 1983 StatePlane Washington North FIPS 4601 Feet



Yarrow Creek Tributary
 Erosion Repair
 Bellevue, Washington

Floodplain Map

Figure
A-4

Soil Profile Reports

LOCATION ALDERWOOD WA
Established Series
Rev. AD/RJE/MPR
04/2007

ALDERWOOD SERIES

The Alderwood series consists of moderately deep to a cemented pan, moderately well drained soils formed in glacial till. Alderwood soils are on glacially modified foothills and valleys and have slopes of 0 to 65 percent. The average annual precipitation is about 40 inches, and the mean annual temperature is about 50 degrees F.

TAXONOMIC CLASS: Loamy-skeletal, isotic, mesic Vitrandic Dystrochrepts

TYPICAL PEDON: Alderwood gravelly ashy sandy loam - forested. (Colors are for moist soil unless otherwise noted.)

Ap--0 to 7 inches; very dark grayish brown (10YR 3/2) gravelly ashy sandy loam, brown (10YR 5/3) dry; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; few fine irregular pores; slightly acid (pH 6.2); abrupt smooth boundary. (3 to 7 inches thick)

Bw1--7 to 21 inches; dark yellowish brown (10YR 4/4) very gravelly ashy sandy loam, yellowish brown (10YR 5/4) dry; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; many fine tubular and irregular pores; 35 percent gravel; diffuse smooth boundary; slightly acid (pH 6.2).

Bw2--21 to 30 inches; brown (10YR 4/3) very gravelly ashy sandy loam, pale brown (10YR 6/3); dry; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots; few very fine tubular pores; 40 percent gravel; slightly acid (pH 6.2); clear wavy boundary. (Combined Bw1 and Bw2 horizons are 15 to 30 inches thick)

2Bg--30 to 35 inches; 50 percent olive brown (2.5Y 4/4) very gravelly sandy loam, light yellowish brown (2.5Y 6/4) dry and 50 percent dark grayish brown (2.5Y 4/2) iron-manganese nodules with strong brown (7.5YR 5/6) coatings on fragments, light brownish gray (2.5Y 6/2) and reddish yellow (7.5YR 6/6) dry; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; common fine tubular and interstitial pores; 45 percent gravel; moderately acid (pH 6.0); abrupt wavy boundary. (0 to 15 inches thick)

2Cd1--35 to 43 inches; dark grayish brown (2.5Y 4/2) very gravelly sandy loam, light brownish gray (2.5Y 6/2) dry; dark yellowish brown (10YR 4/4), olive (5Y 4/4), yellowish red (5YR 4/6) and strong brown (7.5YR 5/6) in cracks; massive; extremely hard; extremely firm, nonsticky and nonplastic; few fine roots; few fine tubular pores; 40 percent gravel; moderately acid (pH 6.0); abrupt irregular boundary. (5 to 20 inches thick)

2Cd2--43 to 60 inches; grayish brown (2.5Y 5/2) dense glacial till that breaks to very gravelly sandy loam, light gray (2.5Y 7/2) dry; massive; extremely hard, extremely firm, nonsticky and nonplastic; 40 percent gravel; moderately acid (pH 6.0).

TYPE LOCATION: Snohomish County, Washington; about 5 miles east of Lynnwood on Maltby road; 200 feet south and 400 feet east of the center of sec. 28. T. 27 N., R. 5 E.

RANGE IN CHARACTERISTICS: The mean annual soil temperature is estimated to range from 47 to about 55 degrees F. These soils are usually moist, but are dry between depths of 8 and 24 inches for 60 to 75 consecutive days in the summer in most years. The soil is strongly acid to slightly acid above the 2Cd1 horizon and slightly acid or moderately acid in the 2Cd1 horizon. Depth to 2Cd1 horizon is 20 to 40 inches. Rock fragments in the particle-size control section range from 35 to 50 percent total including 35 to 50 percent gravel and 0 to 10 percent cobbles.

The A horizon has hue of 10YR or 7.5YR, value of 2 or 3 moist, 3 through 5 dry, and chroma of 2 to 4. It has weak or moderate granular structure. Some pedons have an E horizon less than 1 inch thick.

The Bw1 and Bw2 horizons have hue of 10YR or 7.5YR, and value and chroma of 2 through 6 dry or moist. It is very gravelly loam or very gravelly sandy loam and has weak or moderate blocky structure. The Bw1 is gravelly loam in some pedons. This horizon contains none to many hard concretions presumed to be of iron and manganese compounds.

The 2Bg horizon, or the 2BC or 2CB horizon has hue of 10YR or 2.5Y, value of 5 through 7 dry, and chroma of 2 through 4 moist and dry. They have redox concentrations in some pedons, but lack depletions of 2 or lower chroma within 30 inches of the surface. These horizons are very gravelly sandy loam or very gravelly loam. They have weak subangular blocky structure or are massive.

The 2Cd horizons (densic layers) have hues of 10YR or 2.5Y, value of 4 through 8 dry, and chroma of 1 through 3 moist and dry and are mottled in some pedons. It is very gravelly sandy loam, very gravelly loamy sand, gravelly sandy loam, or gravelly loamy sand when crushed.

COMPETING SERIES: These are the [Baldhill](#), Neausite, [Dabob](#), [Fidalgo](#), and [Whistle](#) series. The Baldhill soils are very deep and lack densic materials. The Beausitie and Fidalgo soils are 20 to 40 inches deep to a lithic contact. The Whistle soils are 40 to 60 inches deep to a lithic contact. Dabob soils have an albic horizon and lack densic materials within 60 inches.

GEOGRAPHIC SETTING: These soils are on till plains and moraines at elevations of 0 to about 800 feet. Slope is 0 to 65 percent. The soils formed in glacial till. Alderwood soils are in a cool marine climate. The summers are cool and dry, and the winters are mild and wet. Mean annual precipitation ranges from 25 to 60 inches, most of which falls as rain from November through March. Mean January temperature is 38 degrees F, mean July temperature is 60 degrees F, and mean annual temperature is 50 degrees F. The growing season (28 degrees F) is about 200 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Beausite](#), [Dick](#), [Everett](#), [Hoogdal](#), [Indianola](#), [Kitsap](#), [Norma](#), [Quilcene](#), [Skipopa](#) and [Whidbey](#) series. All of these soils except Whidbey soils lack a densic layer within 40 inches. In addition, the Beausite soils have a lithic contact at 20 to 40 inches. Dick, Hoogdal, Indianola, Kitsap, and Skipopa soils have less than 35 percent coarse fragments. Everett soils are sandy-skeletal. [McKenna](#) soils have an aquic moisture regime. Norma soils have an aquic moisture regime of less than 35 percent coarse fragments in the upper part of the control section. Quilcene soils are in a fine family. Whidbey soils have an E horizon 2 to 5 inches thick and have a higher base status.

DRAINAGE AND PERMEABILITY: Moderately well drained; slow to medium runoff; moderately rapid permeability to the densic layer and very slow permeability below. A perched water table is as high as 18 to 36 inches at times from January through March.

USE AND VEGETATION: Used mostly for woodland, field crops, hay and pasture, orchards, vineyards, wildlife habitat, watershed, and non-farm uses. The native vegetation is Douglas-fir, western hemlock, western redcedar, and red alder with an understory of salal, Oregon-grape, western brackenfern, western swordfern, Pacific rhododendron, huckleberry, red huckleberry, evergreen huckleberry, and Orange honeysuckle.

DISTRIBUTION AND EXTENT: Northwestern Washington; MLRA 2. The series is extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Portland, Oregon

SERIES ESTABLISHED: Snohomish County, Washington 1936.

REMARKS: Classification only changed 4/94 because of recent amendments to Soil Taxonomy, except the horizon nomenclature was updated, and fragments of ortstein and ortstein were changed to iron-manganese nodules and a densic layer. Classification changed 1/2000 from mixed, mesic Vitrandic Durochrepts to isotic, mesic Vitrandic Dystrochrepts based on revision to Soil Taxonomy. Diagnostic horizons and features include:

Ochric epipedon

Cambic horizon - from 7 to 35 inches

Densic material - from 43 to 60 inches

Vitrandic feature - assumed to be from 0 to 30 inches

Oxyaquic feature - perched water table at 18 to 36 inches at times from January to March.

All depths to diagnostic horizons and features noted in the range of characteristics are measured from the top of the first mineral horizon.

More investigation is needed to differentiate the Alderwood from the Dabob series.

ADDITIONAL DATA: Partial data available for this series. Sample # S71WA-033-002, Riverside Lab., 11/73.

National Cooperative Soil Survey
U.S.A.

LOCATION KITSAP WA
Established Series
Rev. JPE/AZ/RJE
01/2000

KITSAP SERIES

The Kitsap series consists of very deep, moderately well drained soils formed in lacustrine sediments. Kitsap soils are on terraces and terrace escarpments and have slopes of 0 to 70 percent. The mean annual precipitation is about 37 inches. The mean annual temperature is about 50 degrees F.

TAXONOMIC CLASS: Fine-silty, isotic, mesic Aquandic Dystroxerepts

TYPICAL PEDON: Kitsap silt loam - pasture. (Colors are for moist soil unless otherwise noted.)

Ap--0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; moderately acid (pH 5.8); abrupt smooth boundary. (3 to 6 inches thick)

Bw1--6 to 10 inches; dark brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; few very fine pores; many 2 to 5 mm light brown (7.5YR 6/4) concretions; moderately acid (pH 6.0); clear wavy boundary. (3 to 12 inches thick)

Bw2--10 to 17 inches; brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; many very fine roots; common very fine pores about 3 percent fine pebbles; few 2 to 5 mm light brown (7.5YR 6/4) concretions; few silt balls; few krotovinas; slightly acid (pH 6.4); clear wavy boundary. (4 to 22 inches thick)

BC--17 to 32 inches; grayish brown (2.5Y 5/2) silty clay loam, light gray (2.5Y 7/2) dry; many large prominent strong brown (7.5YR 5/6) redox concentrations; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine roots; common very fine pores; slightly acid (pH 6.5); clear irregular boundary. (0 to 35 inches thick)

C--32 to 60 inches; light olive brown (2.5Y 5/4) silt loam and silty clay loam, light brownish gray (2.5Y 6/2) dry; very fine and fine stratification; hard, firm, moderately sticky and moderately plastic; few roots; few very fine pores; tongues of grayish brown (2.5Y 5/2) material like the B3 horizon; neutral; (pH 6.6).

TYPE LOCATION: Pierce County, Washington; 100 feet north of corner of 104th St. and 80th Ave.; 2,050 feet west and 2,750 feet south of the northeast corner of sec. 5, T. 19 N., R. 4 E.

RANGE IN CHARACTERISTICS: These soils are usually moist but are dry in the moisture control section for 45 to 60 consecutive days following summer solstice. The mean annual soil temperature is estimated to range from 50 to about 53 degrees F. These soils range from moderately acid to neutral throughout. Coarse fragments in the control section average 0 to 5 percent by volume. Depth to redoximorphic features with a chroma of 2 or less is 5 to 24 inches.

The A horizon has value of 2, 3 or 4 moist, 4, 5 or 6 dry, and chroma of 2 or 3 moist or dry. It is silt loam or loam.

The Bw horizon has value of 3 through 5 moist, 5 through 7 dry, and chroma of 3 or 4 moist or dry. It is silt loam or silty clay loam, and has weak or moderate blocky structure. The BC horizon has hue of 10YR or 2.5Y, value of 4 through 6 moist, 6 through 8 dry and is prominently mottled. It has blocky or prismatic structure or is massive.

The C horizon has hue of 10YR, 5Y or 2.5Y, value of 5 or 6 moist, 6 through 8 dry, chroma of 2 through 4 moist and dry and is mottled. In some pedons bluish gray (5B 5/1) gleying is prominent in root channels. This horizon is stratified silt, silt loam and silty clay loam. Some pedons contain thin strata of silty clay, silt, or fine sand.

COMPETING SERIES: This is the [Aloha](#) series and the similar [Giles](#) and [Saxon](#) series. Aloha soils have an average soil temperature of 54 to 56°F and lack strata of silty clay loam in the lower part of the particle-size control section. Giles and Saxon soils lack grayish colors or mottles in the subsoil and are well drained. Also, Saxon soils have a dense laminated silt, clay, or silty clay loam B horizon.

GEOGRAPHIC SETTING: Kitsap soils are on terraces and terrace escarpments at elevations ranging from near sea level to about 500 feet. Slopes are 0 to 70 percent. The soils formed in lacustrine sediments. These soils occur in a mild marine climate. Summers are cool and dry and winters are mild and wet. The mean annual precipitation ranges from 30 to 45 inches. The mean January temperature is 39 degrees F., mean July temperature is 61 degrees F., and mean annual temperature is 50 degrees F. The frost-free season is 160 to 200 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Alderwood](#), [Everett](#), [Harstine](#), and [Indianola](#) soils. These soils have less than 18 percent clay in the control section. Alderwood and Harstine soils have a duripan. Everett soils are sandy-skeletal, and Indianola soils are sandy.

DRAINAGE AND PERMEABILITY: Moderately well-drained; slow or medium runoff; slow permeability.

USE AND VEGETATION: Mostly forests and some cropland and pasture. Native vegetation is Douglas-fir, western hemlock, western redcedar, red alder, bigleaf maple, and willows, with understory of western brackenfern, western swordfern, salal, Oregon-grape, trailing blackberry, red huckleberry, vine maple, evergreen huckleberry, red elderberry, and wild ginger.

DISTRIBUTION AND EXTENT: Northwestern Washington. The series is of moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Portland, Oregon

SERIES ESTABLISHED: Kitsap County, Washington, 1934.

REMARKS: Classification changed 4/94 and 1/00 because of amendments to Soil Taxonomy. The 0 to 10 inch depth is estimated to have >5 percent volcanic glass and >0.4 percent Al + 1/2 Fe by acid-oxalate.

ADDITIONAL DATA: Partial laboratory data available on this soil. Pedon # S77WA-061-30, NSSL, Lincoln, NE.

National Cooperative Soil Survey
U.S.A.

Precipitation Data

Yarrow CK TRIB

Figure 19-7 Rainfall documentation worksheet

Rainfall Documentation
 (use with photographs)

Date: April 5 2010

Weather station: _____

Landowner: _____

Tract no.: _____

County: Killgus Co.

State: WA

Soil name: _____

Growing season: _____

Photo date: _____

Long-term rainfall records

	Month	3 yrs. in 10 less than	Normal	3 yrs. in 10 more than	Rain fall	Condition dry, wet, normal	Condition value	Month weight value	Product of previous two columns
1st prior month*	<u>March</u>	<u>2.77</u>	<u>3.75</u>	<u>4.40</u>	<u>3.85</u>	<u>Normal</u>	<u>2</u>	<u>3</u>	<u>6</u>
2nd prior month*	<u>Feb.</u>	<u>2.73</u>	<u>4.18</u>	<u>5.02</u>	<u>3.89</u>	<u>Normal</u>	<u>2</u>	<u>2</u>	<u>4</u>
3rd prior month*	<u>JAN</u>	<u>3.58</u>	<u>5.13</u>	<u>6.10</u>	<u>5.79</u>	<u>Normal</u>	<u>2</u>	<u>1</u>	<u>2</u>

* Compared to photo date

Sum

12

Note: If sum is

- 6 - 9 then prior period has been drier than normal
- 10 - 14 then prior period has been normal
- 15 - 18 then prior period has been wetter than normal

Condition value:

- Dry =1
- Normal =2
- Wet =3

Conclusions:

Normal

City of Bellevue Development Services File # 10-130253-LO
 Yarrow Creek Stream Channel Restoration
 and Habitat Improvement Project SEPA Checklist

WETS Station : SEATTLE TCOMA WSCMO AP, WA7473 Creation Date: 09/10/2002
 Latitude: 4727 Longitude: 12218 Elevation: 00400
 State FIPS/County(FIPS): 53033 County Name: King
 Start yr. - 1971 End yr. - 2000

Month	Temperature (Degrees F.)			Precipitation (Inches)				
	avg daily max	avg daily min	avg	avg	30% chance will have		avg	total
					less than	more than	# of days w/.1 or more	snow fall
January	45.8	35.9	40.9	5.13	3.58	6.10	11	2.4
February	49.5	37.2	43.3	4.18	2.73	5.02	10	1.3
March	53.2	39.1	46.2	3.75	2.77	4.40	10	0.6
April	58.2	42.1	50.1	2.59	1.71	3.11	7	0.1
May	64.3	47.2	55.7	1.77	1.16	2.13	5	0.0
June	69.5	51.7	60.6	1.49	0.96	1.79	4	0.0
July	75.2	55.3	65.3	0.79	0.43	0.97	2	0.0
August	75.5	55.7	65.6	1.02	0.38	1.24	2	0.0
September	70.1	51.9	61.0	1.63	0.62	2.03	4	0.0
October	59.7	45.7	52.7	3.19	1.96	3.86	7	0.1
November	50.5	39.9	45.2	5.90	4.10	7.02	13	1.1
December	45.4	35.9	40.7	5.62	3.94	6.68	11	1.9
Annual	-----	-----	-----	-----	33.52	40.09	--	----
Average	59.7	44.8	52.3	-----	-----	-----	--	----
Total	-----	-----	-----	37.07	-----	-----	86	7.5

GROWING SEASON DATES

Probability	Temperature		
	24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	1/20 to 12/28 343 days	2/ 7 to 12/ 8 304 days	3/ 9 to 11/15 252 days
70 percent *	> 365 days > 365 days	1/31 to 12/15 319 days	3/ 3 to 11/21 263 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

StateCode	Division	YearMonth	PCP	TMP	3. Precip. txt		ZNDX	PMDI	CDD	HDD	SP01	SP02
					PDSI	PHDI						
SP03	SP06	SP09	SP12	SP24								
45	03	201001	5.79	45.30	-1.07	-1.07	-0.36	-1.07	0.	611.	0.23	-0.67
0.27	0.67	0.65	0.37	0.14								
45	03	201002	3.09	45.20	-1.56	-1.56	-1.80	-1.56	0.	554.	-0.58	-0.27
-0.88	0.42	0.08	0.55	0.18								
45	03	201003	3.85	46.70	-1.56	-1.56	-0.48	-1.56	0.	567.	0.16	-0.37
-0.20	0.40	0.30	0.43	0.13								
45	03	201004	3.42	49.20	0.36	-1.03	1.09	-0.39	0.	474.	0.67	0.44
-0.08	0.12	0.48	0.45	0.20								

APPENDIX D

Data Sheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 102nd Avenue NE/Yarrow Ck Tributary City/County: Bellevue/ King Sampling Date: 4/15/10
 Applicant/Owner: City of Bellevue State: WA Sampling Point: SP-1
 Investigator(s): SJQ/WPW Section, Township, Range: Section 20, Township 25N, Range 5E
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): None Slope (%): _____
 Subregion (LRR): LRR A, Northwest Forests and Coast Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Kitsap silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sampling point is located adjacent to 102nd Avenue NE along a side sewer alignment approximately 60 ft west of the Yarrow Creek tributary. Area is disturbed. The hydrology of this potential wetland area was observed as seeps from slopes adjacent to 102nd Avenue NE. It is possible that the seep is a result of degraded culverts and stormwater conveyance pipes that are associated with the 102nd Avenue NE road crossing.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
<u>Sapling/Shrub Stratum</u> (Plot size: <u>5 ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5 ft</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) <small>¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</small>
1. <u>Ranunculus repens</u>	_____	Y	FACW	
2. <u>Urtica dioica</u>	_____	Y	FAC+	
3. <u>Equisetum arvense</u>	_____	Y	FAC	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30 ft</u>)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum _____				

Remarks: Area is outside of project impacts, percent vegetation not recorded at time of field investigation.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 102nd Avenue NE/Yarrow Ck Tributary City/County: Bellevue/ King Sampling Date: 4/15/10
 Applicant/Owner: City of Bellevue State: WA Sampling Point: SP-2
 Investigator(s): SJQ/WPW Section, Township, Range: Section 20, Township 25N, Range 5E
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): None Slope (%): _____
 Subregion (LRR): LRR A, Northwest Forests and Coast Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Kitsap silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sampling point is located west of the Yarrow Creek tributary.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <u>Acer macrophyllum</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. <u>Tsuga heterophylla</u>	<u>5</u>	<u>Y</u>	<u>FACU-</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>10</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
<u>5</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5 ft</u>)				
1. <u>Rubus discolor</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>5</u> = Total Cover				
Herb Stratum (Plot size: <u>5 ft</u>)				
1. <u>Hedera helix</u>	<u>70</u>	<u>Y</u>	<u>NI</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Urtica dioica</u>	<u>30</u>	<u>Y</u>	<u>FAC+</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30 ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum _____				
Remarks:				

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 102nd Avenue NE/Yarrow Ck Tributary City/County: Bellevue/ King Sampling Date: 4/15/10
 Applicant/Owner: City of Bellevue State: WA Sampling Point: SP-3
 Investigator(s): SJQ/WPW Section, Township, Range: Section 20, Township 25N, Range 5E
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): None Slope (%): _____
 Subregion (LRR): LRR A, Northwest Forests and Coast Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Kitsap silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sampling point is located east of the Yarrow Creek tributary.	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30 ft</u>)				
1. <u>Alnus rubra</u>		<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)
2. <u>Tsuga heterophylla</u>		<u>Y</u>	<u>FACU</u>	
3. _____				
4. _____				
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>5 ft</u>)				
1. <u>Mahonia aquifolium</u>		<u>Y</u>	<u>NI</u>	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. <u>Corylus cornuta</u>		<u>Y</u>	<u>FACU</u>	
3. _____				
4. _____				
	<u>5</u> = Total Cover			
Herb Stratum (Plot size: <u>5 ft</u>)				
1. <u>Polystichum munitum</u>		<u>Y</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Hydrophyllum sp.</u>		<u>Y</u>	<u>FAC</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
	<u>100</u> = Total Cover			
Woody Vine Stratum (Plot size: <u>30 ft</u>)				
1. _____				Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
2. _____				
	<u>0</u> = Total Cover			
% Bare Ground in Herb Stratum _____				
Remarks:				

Selected Site Photographs

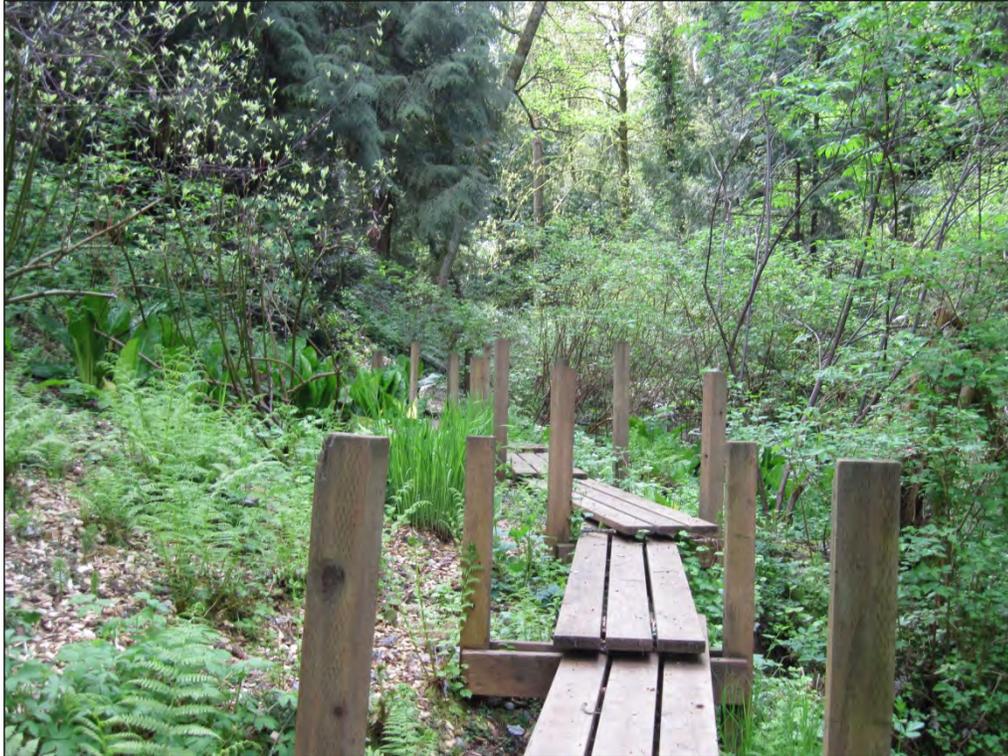


1. Yarrow Creek tributary facing upstream from sewer line before emergency repair.



2. Yarrow Creek tributary ravine facing downstream near 102nd Avenue NE before emergency repair.

12/20/10 P:\0800007\060\Files\m\IR\Critical Areas Report\Appx\Yarrow Creek Critical Areas_ape-1.docx



3. Wetland B along Yarrow Creek (east of project area).



4. Sampling Point SP-1.

12/20/10 P:\0800007\060\Files\m\IR\Critical Areas Report\Appx\Yarrow Creek Critical Areas_ape-2.docx



5. Sampling Point SP-2 on west side of tributary.



6. Sampling Point SP-3 on east side of tributary.

12/20/10 P:\080007\0601\Files\IR\Critical Areas Report\Appendix\Yarrow Creek Critical Areas_ape-3.docx



7. Yarrow Creek tributary emergency repair, facing southeast toward 102nd Avenue NE.



8. Yarrow Creek tributary emergency repair, facing north toward downstream suspended sewer.

12/20/10 P:\080007\060\Files\IR\Critical Areas Report\Appendix\Yarrow Creek Critical Areas_ape-4.docx

JARPA Figures



PURPOSE: THIS PROJECT IS EMERGENCY REPAIR AND RESTORATION OF A ROADWAY CULVERT AND EMBANKMENTS THAT CONTAIN A TRIBUTARY OF YARROW CREEK.

TOWNSHIP/RANGE: SEC 19 AND 20 TWP 25N RGE 05E
LAT/LONG: 47.641484°N, 122.204628°W; DATUM; NAD 83

ADJACENT PROPERTY OWNERS:

1. HANLEY (4122700090)
2. KOBLEIN (4122700080)
3. LAWRENCE (4122300085)
4. YANG (4122300080)

CITY OF BELLEVUE

102ND AVENUE NE AND YARROW CREEK TRIBUTARY REPAIR AND RESTORATION

VICINITY MAP

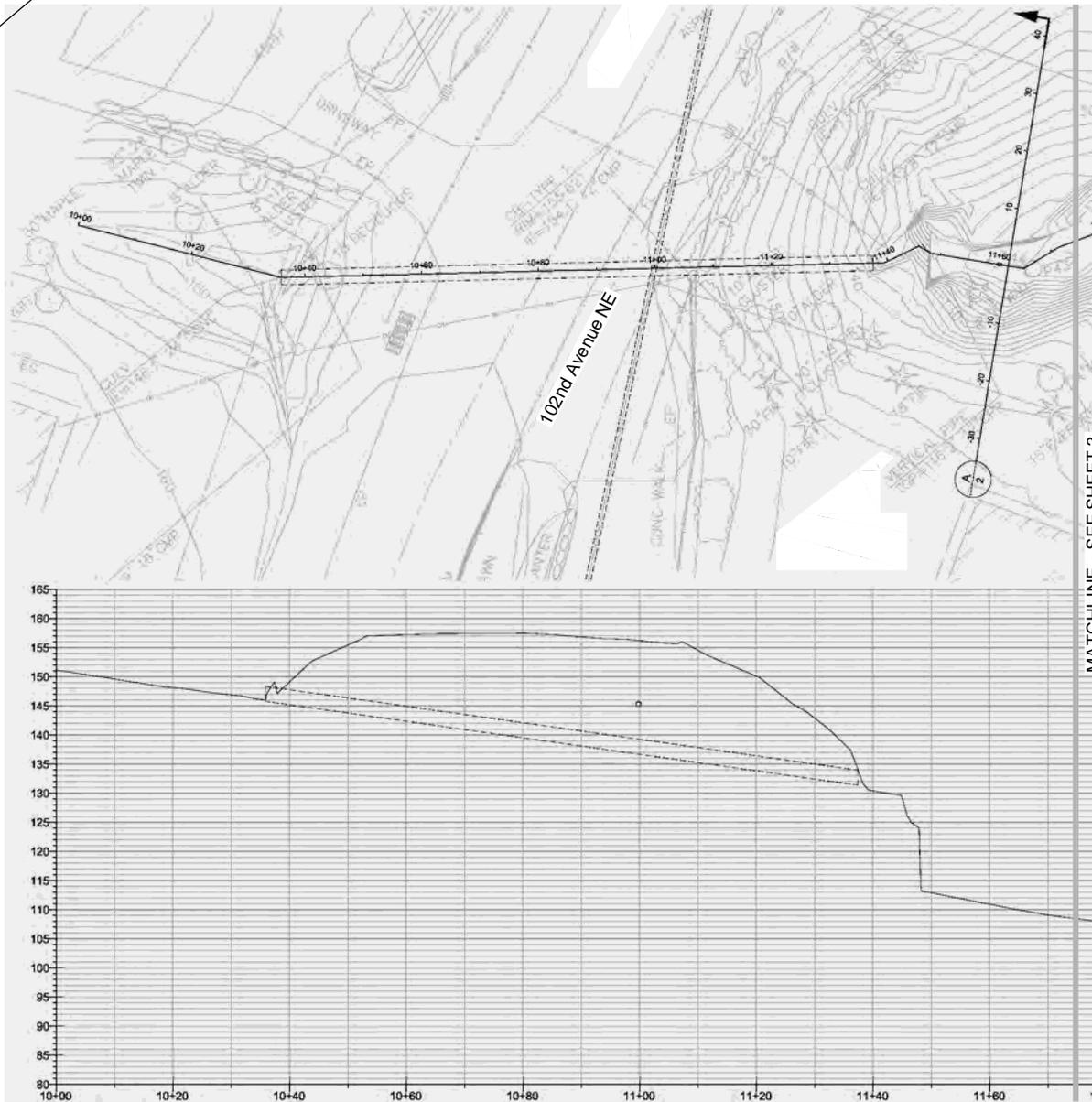
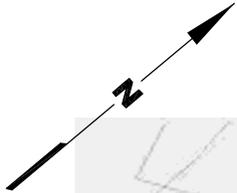
PROPOSED: RESTORATION OF APPROXIMATELY 220 LINEAR FEET OF STREAM.

IN: JURISDICTIONAL WATERS OF THE U.S.
AT: CITY OF BELLEVUE, KING COUNTY, WA

APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010

SHEET: 1 OF 20



I:\V:\0680\007\060.061\JARPA\Sheet 1-5.dwg - 12/17/2010

PURPOSE: THIS PROJECT IS EMERGENCY REPAIR AND RESTORATION OF A ROADWAY CULVERT AND EMBANKMENTS THAT CONTAIN A TRIBUTARY OF YARROW CREEK.

TOWNSHIP/RANGE: SEC 19 AND 20 TWP 25N RGE 05E
LAT/LONG: 47.641484°N, 122.204628°W; DATUM; NAD 83

ADJACENT PROPERTY OWNERS:

1. HANLEY (4122700090)
2. KOBLEIN (4122700080)
3. LAWRENCE (4122300085)
4. YANG (4122300080)

CITY OF BELLEVUE

**102ND AVENUE NE
 AND YARROW
 CREEK TRIBUTARY
 REPAIR AND
 RESTORATION**

**PRE-EXISTING
 CONDITION PLAN
 AND PROFILE**

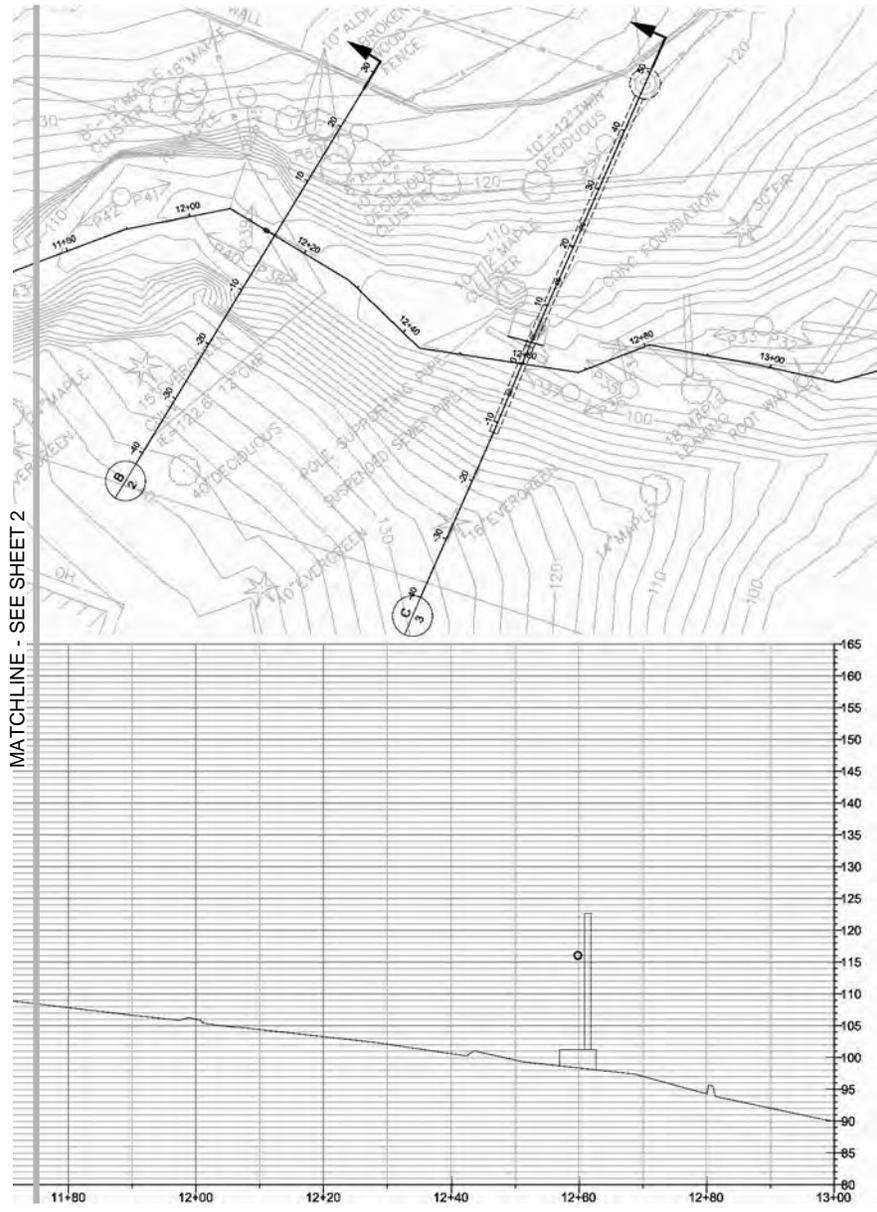
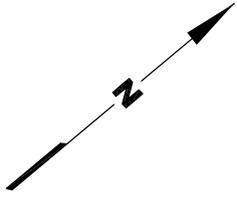
PROPOSED: RESTORATION OF APPROXIMATELY 220 LINEAR FEET OF STREAM.

IN: JURISDICTIONAL WATERS OF THE U.S.
AT: CITY OF BELLEVUE, KING COUNTY, WA

APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010

SHEET: 2 OF 20



I:\V:\060\007\060.061\JARPA\Sheet 1-5.dwg - 12/17/2010

PURPOSE: THIS PROJECT IS EMERGENCY REPAIR AND RESTORATION OF A ROADWAY CULVERT AND EMBANKMENTS THAT CONTAIN A TRIBUTARY OF YARROW CREEK.

TOWNSHIP/RANGE: SEC 19 AND 20 TWP 25N RGE 05E
LAT/LONG: 47.641484°N, 122.204628°W; DATUM; NAD 83

ADJACENT PROPERTY OWNERS:

1. HANLEY (4122700090)
2. KOBLEIN (4122700080)
3. LAWRENCE (4122300085)
4. YANG (4122300080)

CITY OF BELLEVUE

**102ND AVENUE NE
 AND YARROW
 CREEK TRIBUTARY
 REPAIR AND
 RESTORATION**

**PRE-EXISTING
 CONDITION PLAN
 AND PROFILE**

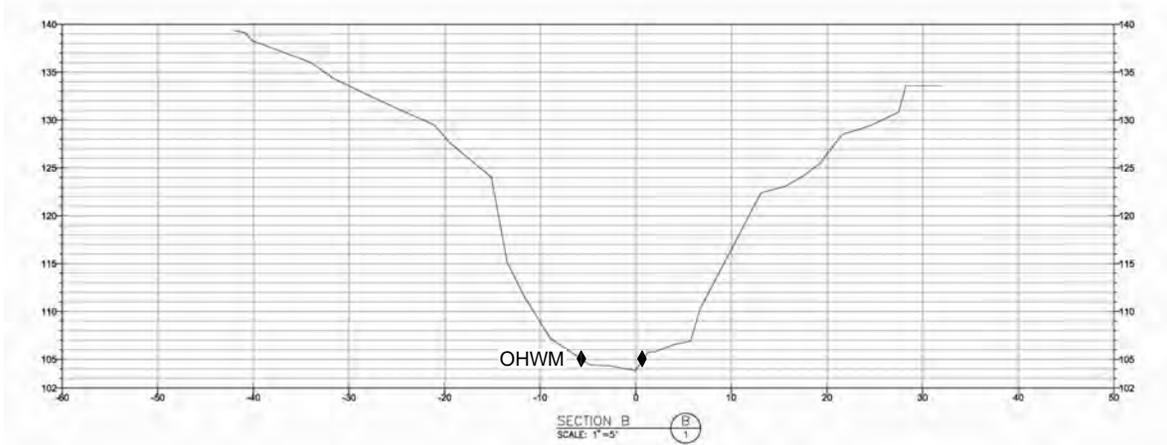
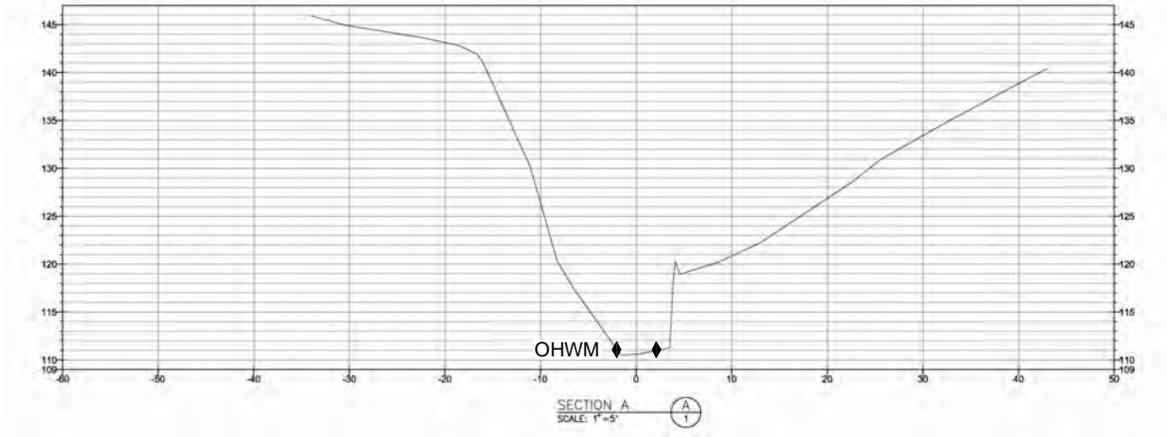
PROPOSED: RESTORATION OF APPROXIMATELY 220 LINEAR FEET OF STREAM.

IN: JURISDICTIONAL WATERS OF THE U.S.
AT: CITY OF BELLEVUE, KING COUNTY, WA

APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010

SHEET: 3 OF 20



I:\V:\0680\007\060.061\JARPA\Sheet 1-5.dwg - 12/17/2010

PURPOSE: THIS PROJECT IS EMERGENCY REPAIR AND RESTORATION OF A ROADWAY CULVERT AND EMBANKMENTS THAT CONTAIN A TRIBUTARY OF YARROW CREEK.

TOWNSHIP/RANGE: SEC 19 AND 20 TWP 25N RGE 05E
LAT/LONG: 47.641484°N, 122.204628°W; DATUM; NAD 83

ADJACENT PROPERTY OWNERS:

1. HANLEY (4122700090)
2. KOBLEIN (4122700080)
3. LAWRENCE (4122300085)
4. YANG (4122300080)

CITY OF BELLEVUE

**102ND AVENUE NE
 AND YARROW
 CREEK TRIBUTARY
 REPAIR AND
 RESTORATION**

**PRE-EXISTING
 CONDITION CROSS
 SECTIONS**

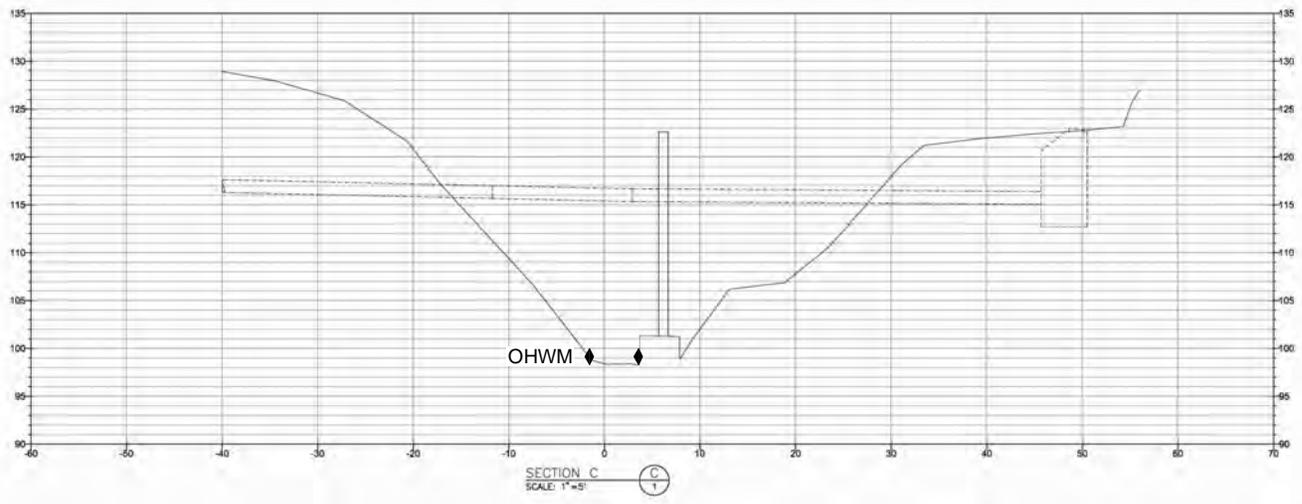
PROPOSED: RESTORATION OF APPROXIMATELY 220 LINEAR FEET OF STREAM.

IN: JURISDICTIONAL WATERS OF THE U.S.
AT: CITY OF BELLEVUE, KING COUNTY, WA

APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010

SHEET: 4 OF 20



I:\V:\060\007\060.061\JARPA\Sheet 1-5.dwg - 12/17/2010

PURPOSE: THIS PROJECT IS EMERGENCY REPAIR AND RESTORATION OF A ROADWAY CULVERT AND EMBANKMENTS THAT CONTAIN A TRIBUTARY OF YARROW CREEK.

TOWNSHIP/RANGE: SEC 19 AND 20 TWP 25N RGE 05E
LAT/LONG: 47.641484°N, 122.204628°W; DATUM; NAD 83

ADJACENT PROPERTY OWNERS:

1. HANLEY (4122700090)
2. KOBLEIN (4122700080)
3. LAWRENCE (4122300085)
4. YANG (4122300080)

CITY OF BELLEVUE

**102ND AVENUE NE
 AND YARROW
 CREEK TRIBUTARY
 REPAIR AND
 RESTORATION**

**PRE-EXISTING
 CONDITION CROSS
 SECTION**

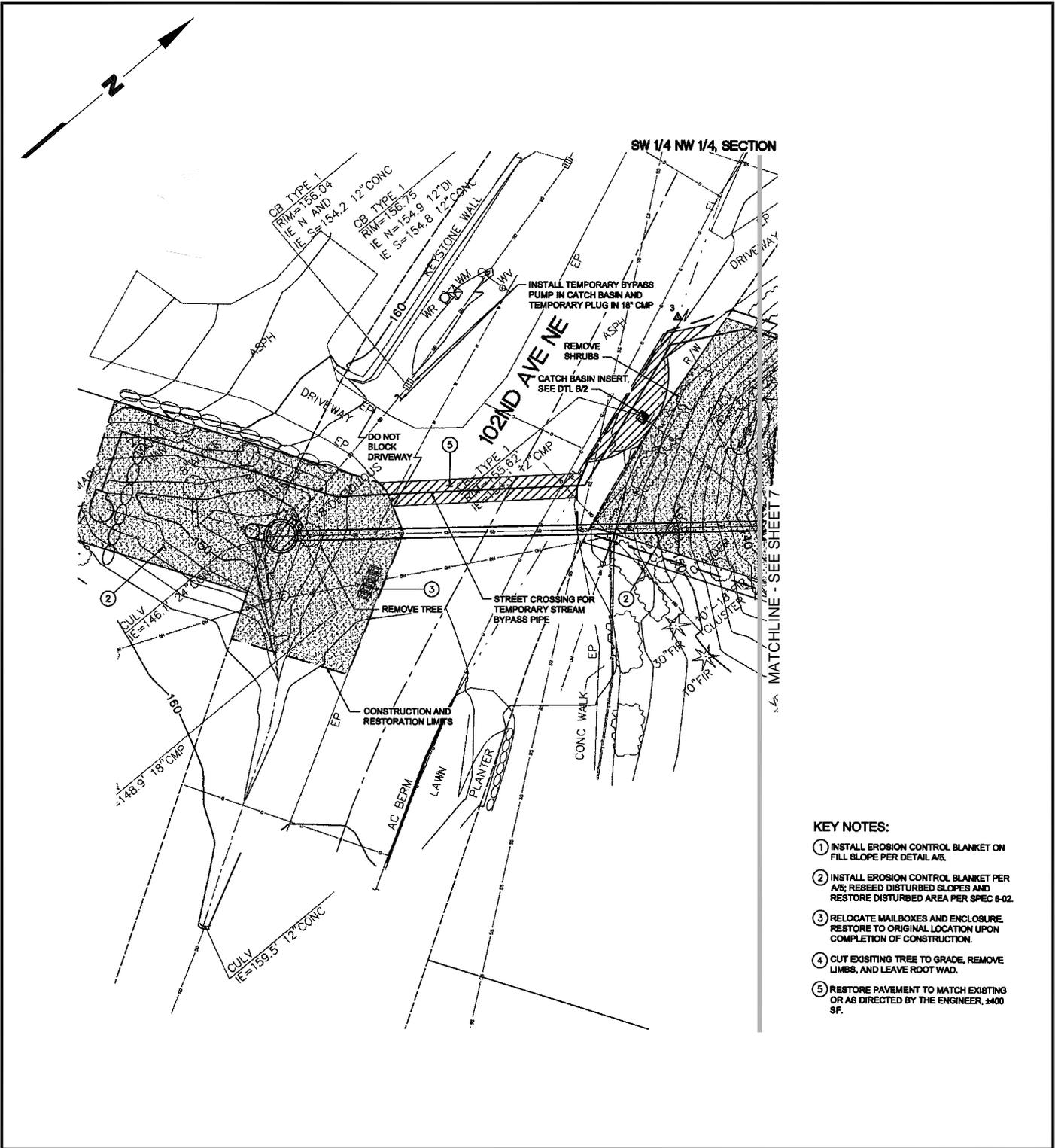
PROPOSED: RESTORATION OF APPROXIMATELY 220 LINEAR FEET OF STREAM.

IN: JURISDICTIONAL WATERS OF THE U.S.
AT: CITY OF BELLEVUE, KING COUNTY, WA

APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010

SHEET: 5 OF 20



- KEY NOTES:**
- ① INSTALL EROSION CONTROL BLANKET ON FILL SLOPE PER DETAIL A5.
 - ② INSTALL EROSION CONTROL BLANKET PER A/5; RESEED DISTURBED SLOPES AND RESTORE DISTURBED AREA PER SPEC 8-02.
 - ③ RELOCATE MAIL BOXES AND ENCLOSURE. RESTORE TO ORIGINAL LOCATION UPON COMPLETION OF CONSTRUCTION.
 - ④ CUT EXISTING TREE TO GRADE, REMOVE LIMBS, AND LEAVE ROOT WAD.
 - ⑤ RESTORE PAVEMENT TO MATCH EXISTING OR AS DIRECTED BY THE ENGINEER, 3400 SF.

I:\V\080\007\060.061\JARPA\Sheet 6-10.dwg - 12/17/2010

PURPOSE: THIS PROJECT IS EMERGENCY REPAIR AND RESTORATION OF A ROADWAY CULVERT AND EMBANKMENTS THAT CONTAIN A TRIBUTARY OF YARROW CREEK.

TOWNSHIP/RANGE: SEC 19 AND 20 TWP 25N RGE 05E
LAT/LONG: 47.641484°N, 122.204628°W; DATUM; NAD 83

ADJACENT PROPERTY OWNERS:

1. HANLEY (4122700090)
2. KOBLEIN (4122700080)
3. LAWRENCE (4122300085)
4. YANG (4122300080)

CITY OF BELLEVUE

**102ND AVENUE NE
 AND YARROW
 CREEK TRIBUTARY
 REPAIR AND
 RESTORATION**

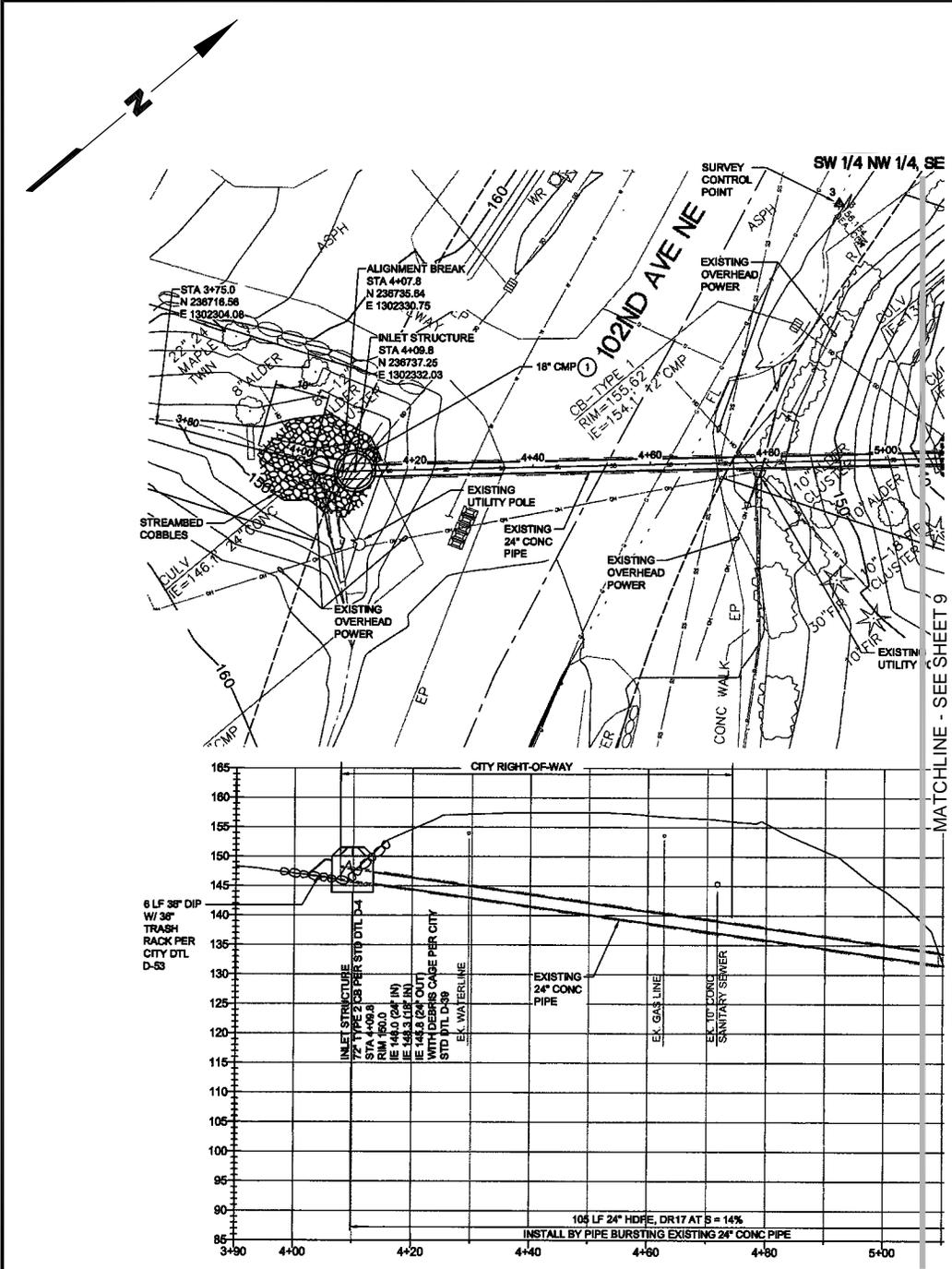
**EMERGENCY REPAIR SITE
 PREPARATION AND
 GRADING PLAN**

PROPOSED: RESTORATION OF APPROXIMATELY 220 LINEAR FEET OF STREAM.

IN: JURISDICTIONAL WATERS OF THE U.S.
AT: CITY OF BELLEVUE, KING COUNTY, WA

APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010
SHEET: 6 OF 20



- GENERAL NOTES:**
- REFER TO SPEC SECTION 7-01 FOR HDPE MATERIAL.
 - CONNECT PIPE TO MANHOLES WITH KOR-N-SEAL RUBBER BOOT PER SPEC SECTION 7-10.
- KEY NOTES:**
- EXTEND 18" CMP TO INLET STRUCTURE
 - EXTEND 12" CMP TO CULVERT OUTLET STRUCTURE
 - 60 LF 12" TEMPORARY CPE PIPE. CONNECT TO EXISTING CMP AND EXTEND PAST ENERGY DISSIPATER. SECURE PIPE TO SLOPE WITH PIPE STAKE ASSEMBLY PER STD DTL D-57.

I:\V:\0680\007\0660\061\JARPA\Sheet 6-10.dwg - 12/17/2010

PURPOSE: THIS PROJECT IS EMERGENCY REPAIR AND RESTORATION OF A ROADWAY CULVERT AND EMBANKMENTS THAT CONTAIN A TRIBUTARY OF YARROW CREEK.

TOWNSHIP/RANGE: SEC 19 AND 20 TWP 25N RGE 05E
LAT/LONG: 47.641484°N, 122.204628°W; DATUM; NAD 83

ADJACENT PROPERTY OWNERS:

- HANLEY (4122700090)
- KOBLEIN (4122700080)
- LAWRENCE (4122300085)
- YANG (4122300080)

CITY OF BELLEVUE

102ND AVENUE NE AND YARROW CREEK TRIBUTARY REPAIR AND RESTORATION

EMERGENCY REPAIR PLAN

PROPOSED: RESTORATION OF APPROXIMATELY 220 LINEAR FEET OF STREAM.

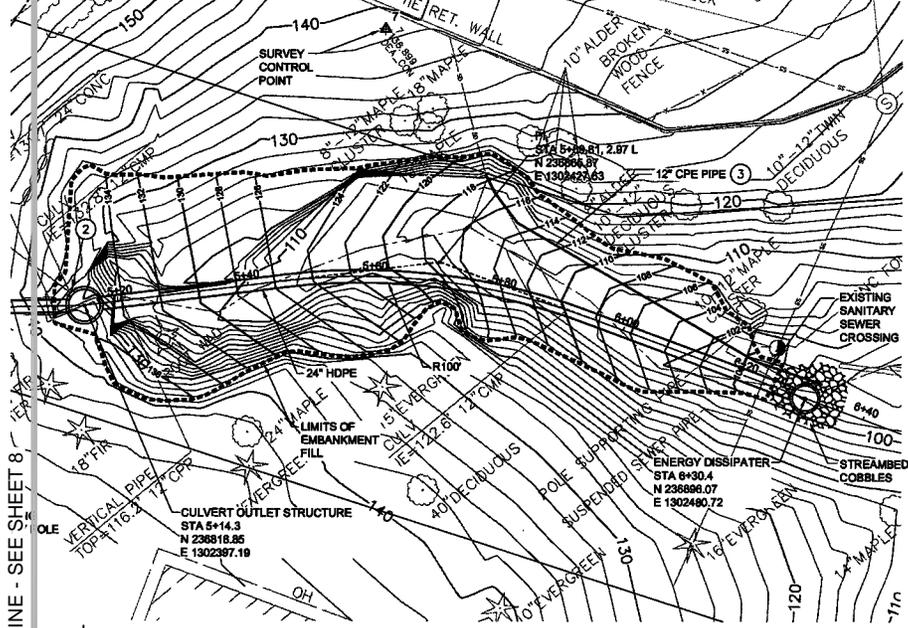
IN: JURISDICTIONAL WATERS OF THE U.S.
AT: CITY OF BELLEVUE, KING COUNTY, WA

APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010

SHEET: 8 OF 20

1/4 SECTION 20, TOWNSHIP 25 NORTH, RANGE 5 EAST, W.M.

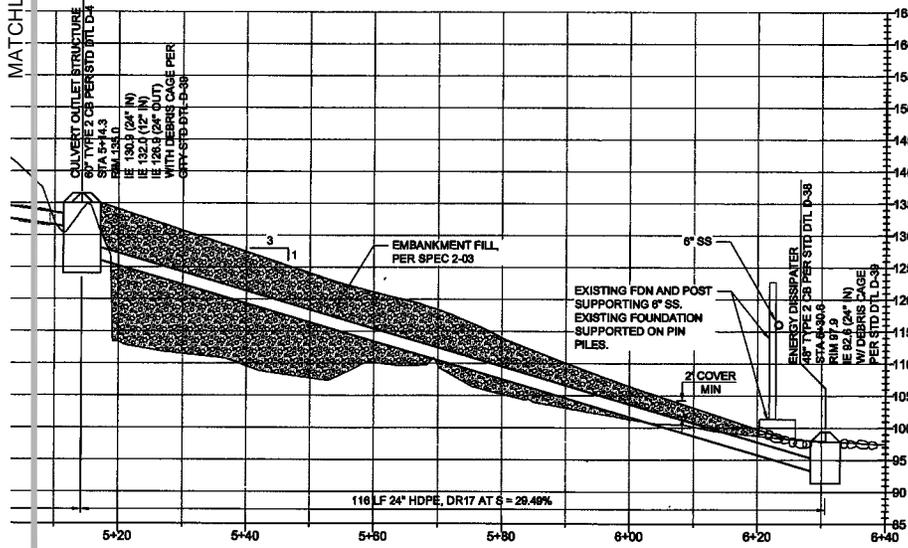


GENERAL NOTES:

1. REFER TO SPEC SECTION 7-01 FOR HDPE MATERIAL.
2. CONNECT PIPE TO MANHOLES WITH KOR-N-SEAL RUBBER BOOT PER SPEC SECTION 7-10.

KEY NOTES:

- ① EXTEND 18" CMP TO INLET STRUCTURE
- ② EXTEND 12" CMP TO CULVERT OUTLET STRUCTURE
- ③ 80 LF 12" TEMPORARY CPE PIPE. CONNECT TO EXISTING CMP AND EXTEND PAST ENERGY DISSIPATER. SECURE PIPE TO SLOPE WITH PIPE STAKE ASSEMBLY PER STD DTL D-67.



PURPOSE: THIS PROJECT IS EMERGENCY REPAIR AND RESTORATION OF A ROADWAY CULVERT AND EMBANKMENTS THAT CONTAIN A TRIBUTARY OF YARROW CREEK.

TOWNSHIP/RANGE: SEC 19 AND 20 TWP 25N RGE 05E
LAT/LONG: 47.641484°N, 122.204628°W; DATUM; NAD 83

ADJACENT PROPERTY OWNERS:

1. HANLEY (4122700090)
2. KOBLEIN (4122700080)
3. LAWRENCE (4122300085)
4. YANG (4122300080)

CITY OF BELLEVUE

**102ND AVENUE NE
 AND YARROW
 CREEK TRIBUTARY
 REPAIR AND
 RESTORATION**

**EMERGENCY
 REPAIR PLAN**

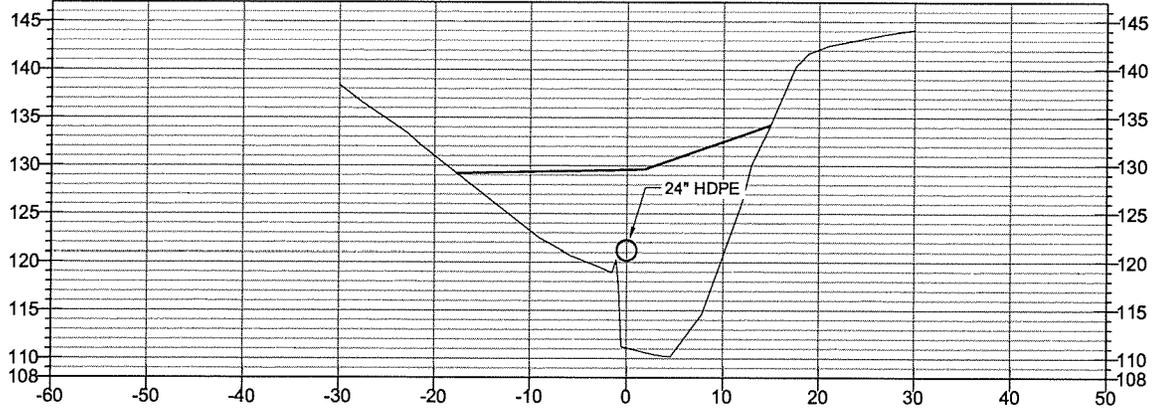
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AT: CITY OF BELLEVUE, KING COUNTY, WA

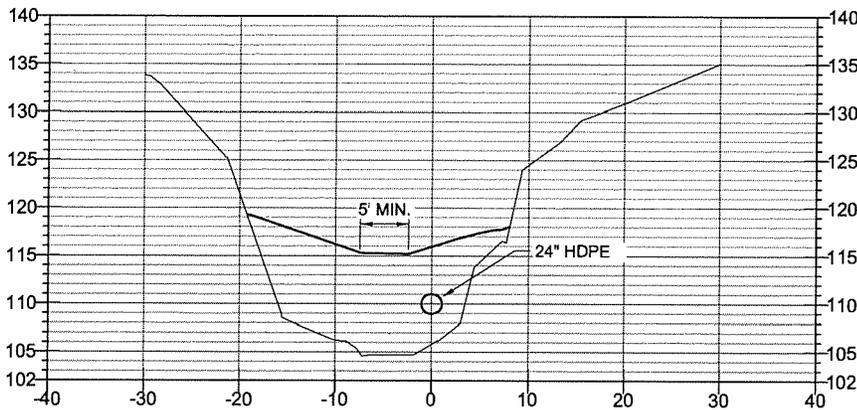
APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010

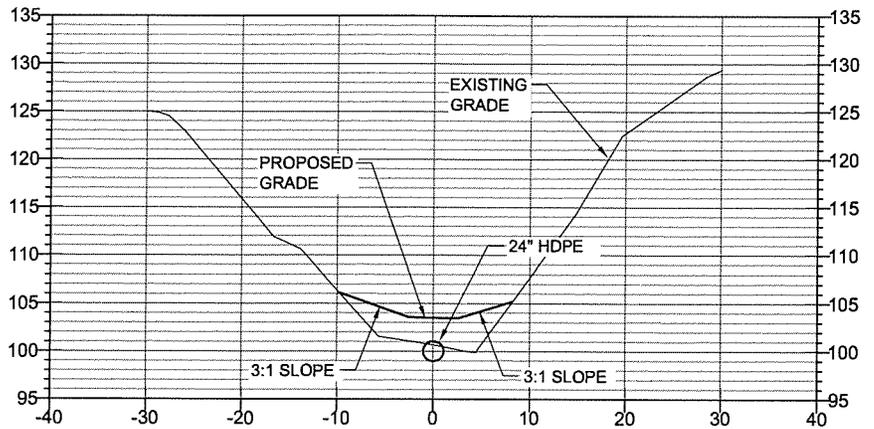
SHEET: 9 OF 20



SECTION A A
2



SECTION B B
2



SECTION C C
2

PURPOSE: THIS PROJECT IS EMERGENCY REPAIR AND RESTORATION OF A ROADWAY CULVERT AND EMBANKMENTS THAT CONTAIN A TRIBUTARY OF YARROW CREEK.

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CITY OF BELLEVUE

**102ND AVENUE NE
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 RESTORATION**

**EMERGENCY
 REPAIR PROFILE**

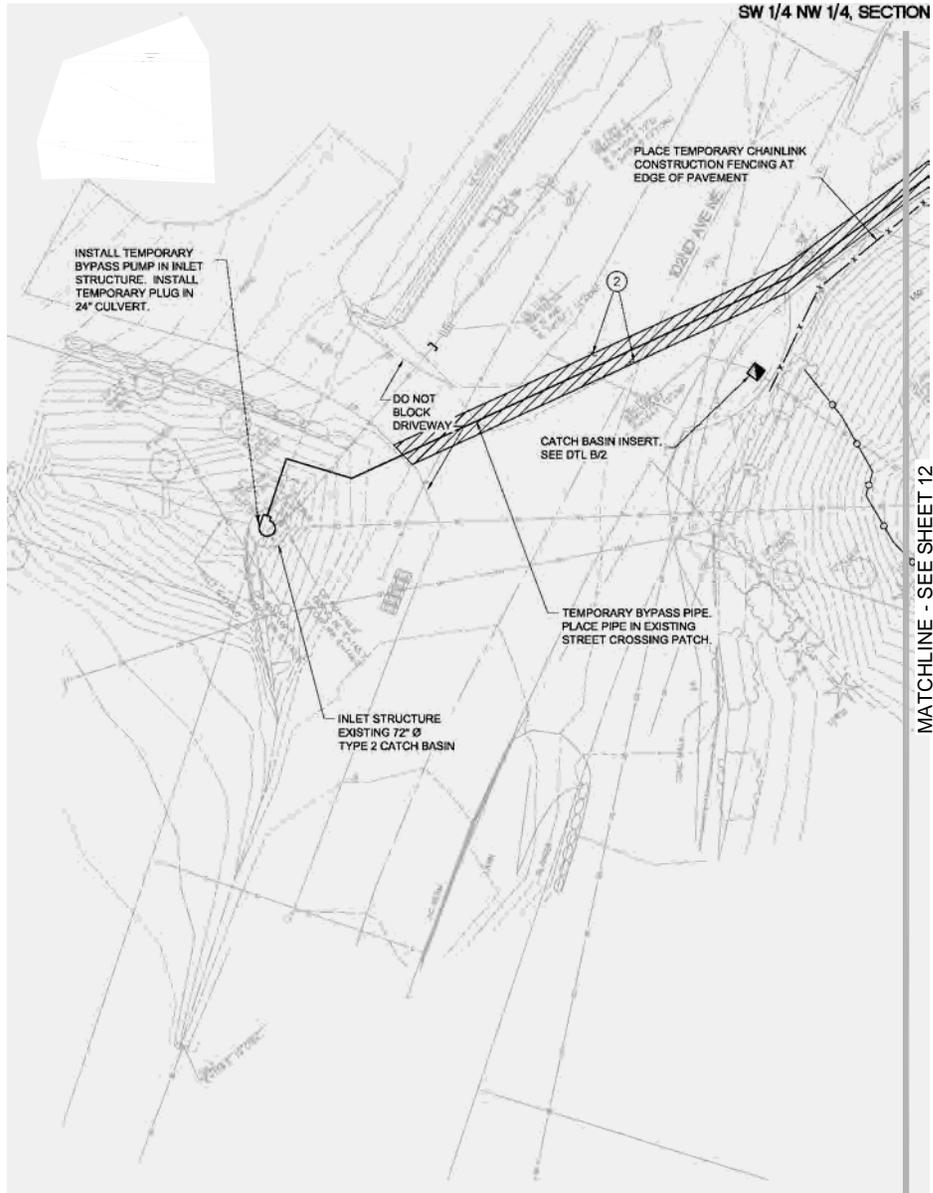
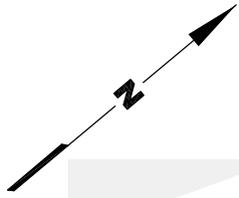
PROPOSED: RESTORATION OF APPROXIMATELY 220 LINEAR FEET OF STREAM.

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APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010

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- KEY NOTES:**
- ① ROLL BACK EXISTING EROSION CONTROL BLANKET (ECB) FROM AREA OF WORK. MAINTAIN ECB IN PLACES OUTSIDE THE AREA OF WORK. REPLACE ECB DAMAGED DURING CONSTRUCTION PER DETAIL A/B. COORDINATE WITH INSTALLATION OF PLANT MATERIALS.
 - ② APPROXIMATE LIMITS OF EXISTING PAVEMENT PATCH. RESTORE PAVEMENT TO MATCH EXISTING OR AS DIRECTED BY THE ENGINEER.

I:\V:\060\007\060.061\JARPA\Sheet 11-20.dwg - 12/17/2010

PURPOSE: THIS PROJECT IS EMERGENCY REPAIR AND RESTORATION OF A ROADWAY CULVERT AND EMBANKMENTS THAT CONTAIN A TRIBUTARY OF YARROW CREEK.

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CITY OF BELLEVUE

102ND AVENUE NE AND YARROW CREEK TRIBUTARY REPAIR AND RESTORATION

SITE PREPARATION AND TEMPORARY BYPASS/TESC PLAN

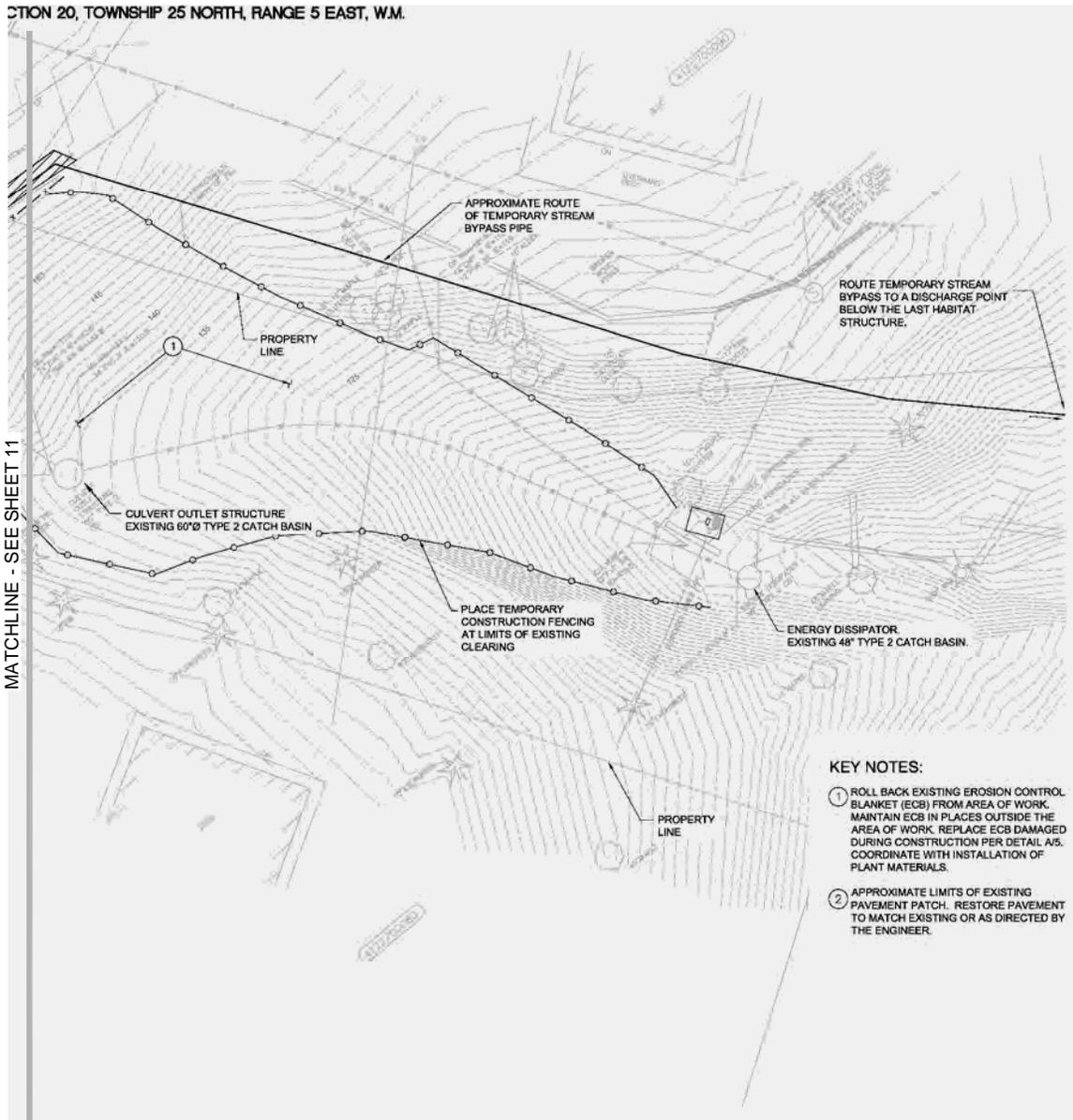
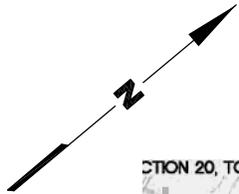
PROPOSED: RESTORATION OF APPROXIMATELY 220 LINEAR FEET OF STREAM.

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AT: CITY OF BELLEVUE, KING COUNTY, WA

APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010

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CITY OF BELLEVUE

102ND AVENUE NE AND YARROW CREEK TRIBUTARY REPAIR AND RESTORATION

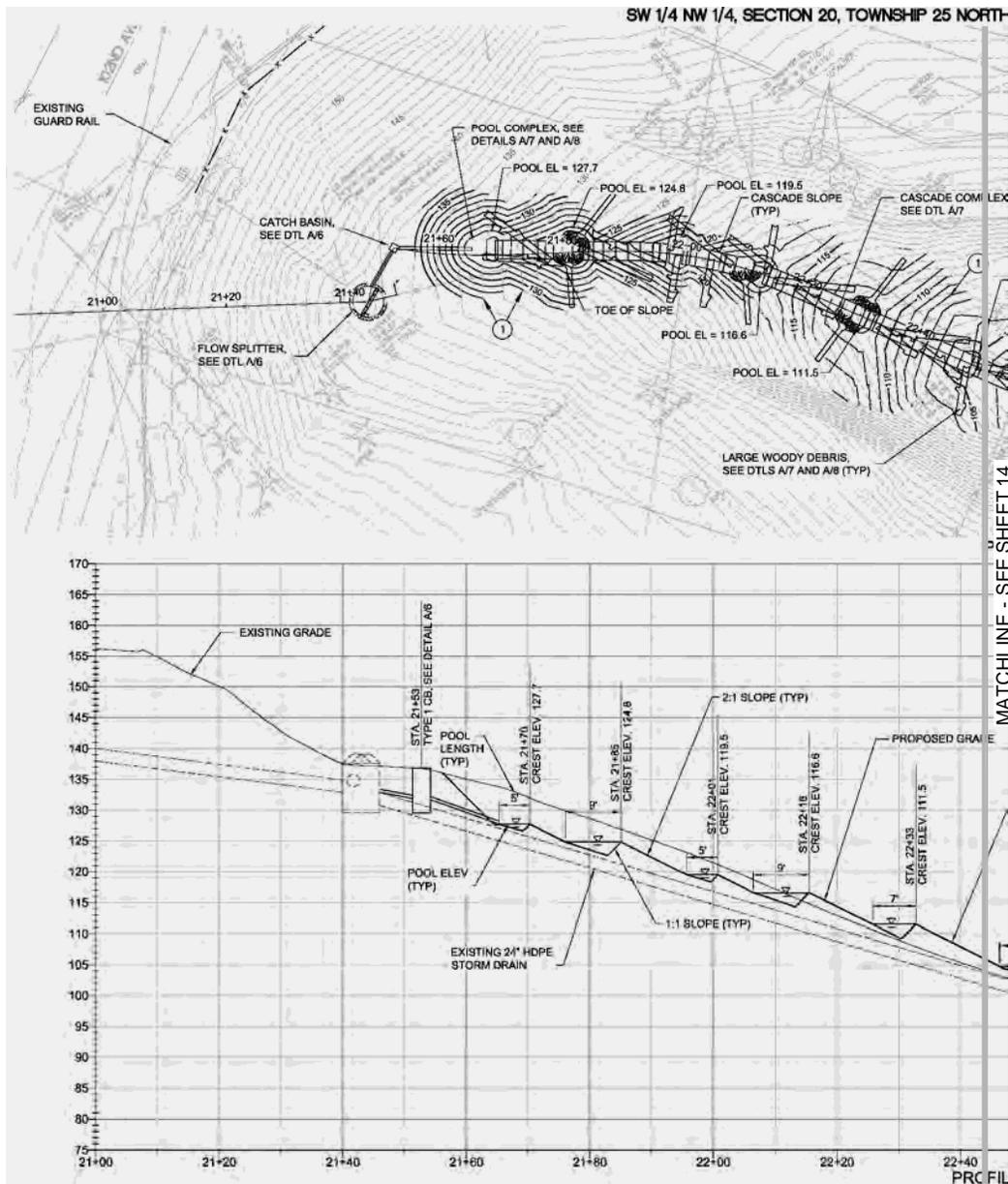
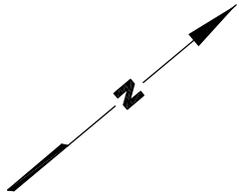
RESTORATION SITE PREPARATION AND TEMPORARY BYPASS/TESC PLAN

PROPOSED: RESTORATION OF APPROXIMATELY 220 LINEAR FEET OF STREAM.

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APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

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I:\V:\0680\007\060.061\JARPA\Sheet 11-20.dwg - 12/17/2010

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CITY OF BELLEVUE

102ND AVENUE NE AND YARROW CREEK TRIBUTARY REPAIR AND RESTORATION

RESTORATION PLAN AND PROFILE

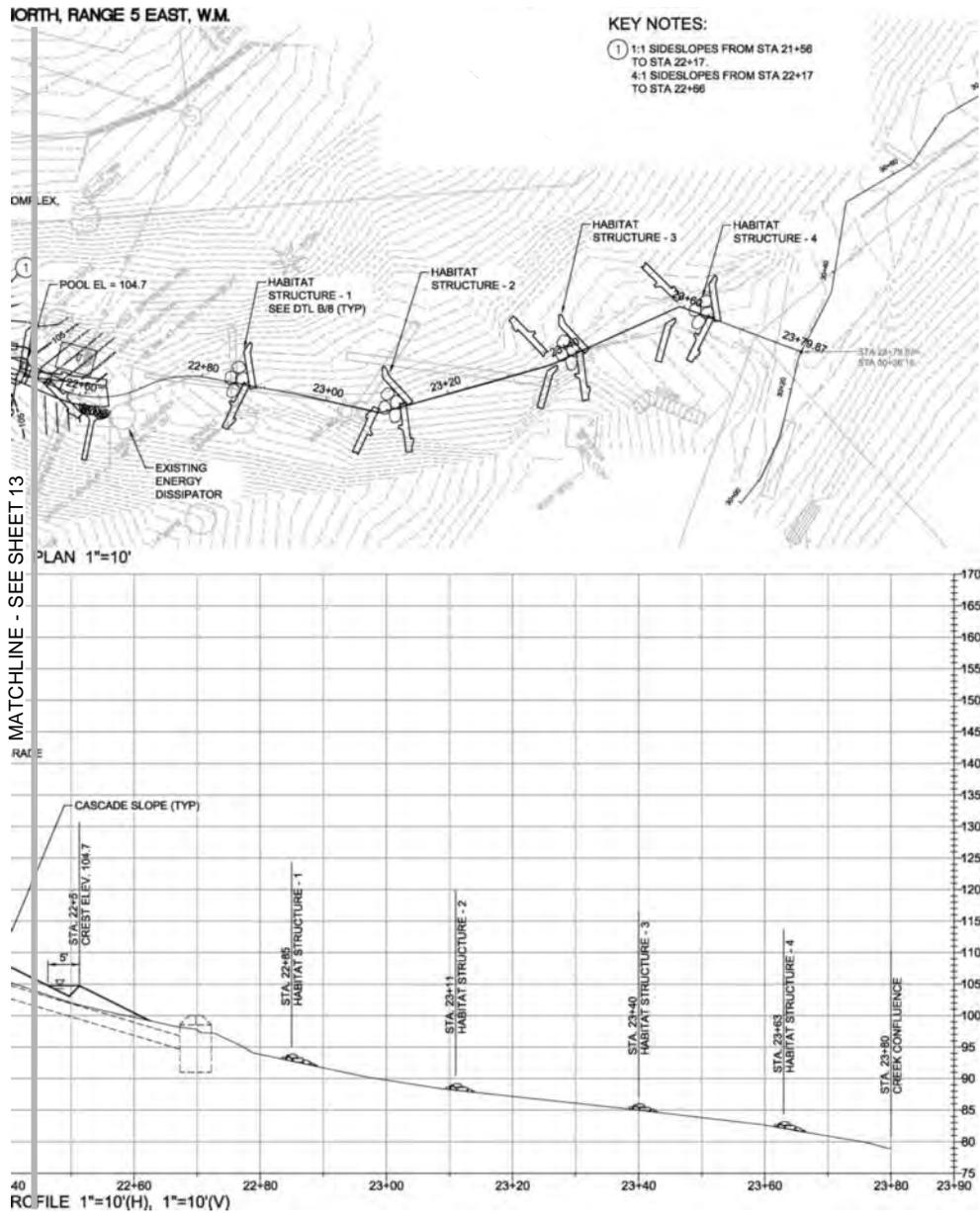
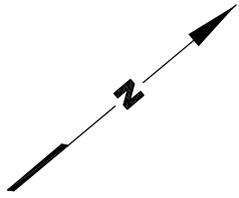
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APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010

SHEET: 13 OF 20



I:\V:\060\007\060.061\JARPA\Sheet 11-20.dwg - 12/17/2010

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CITY OF BELLEVUE

**102ND AVENUE NE
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 REPAIR AND
 RESTORATION**

**RESTORATION PLAN AND
 PROFILE**

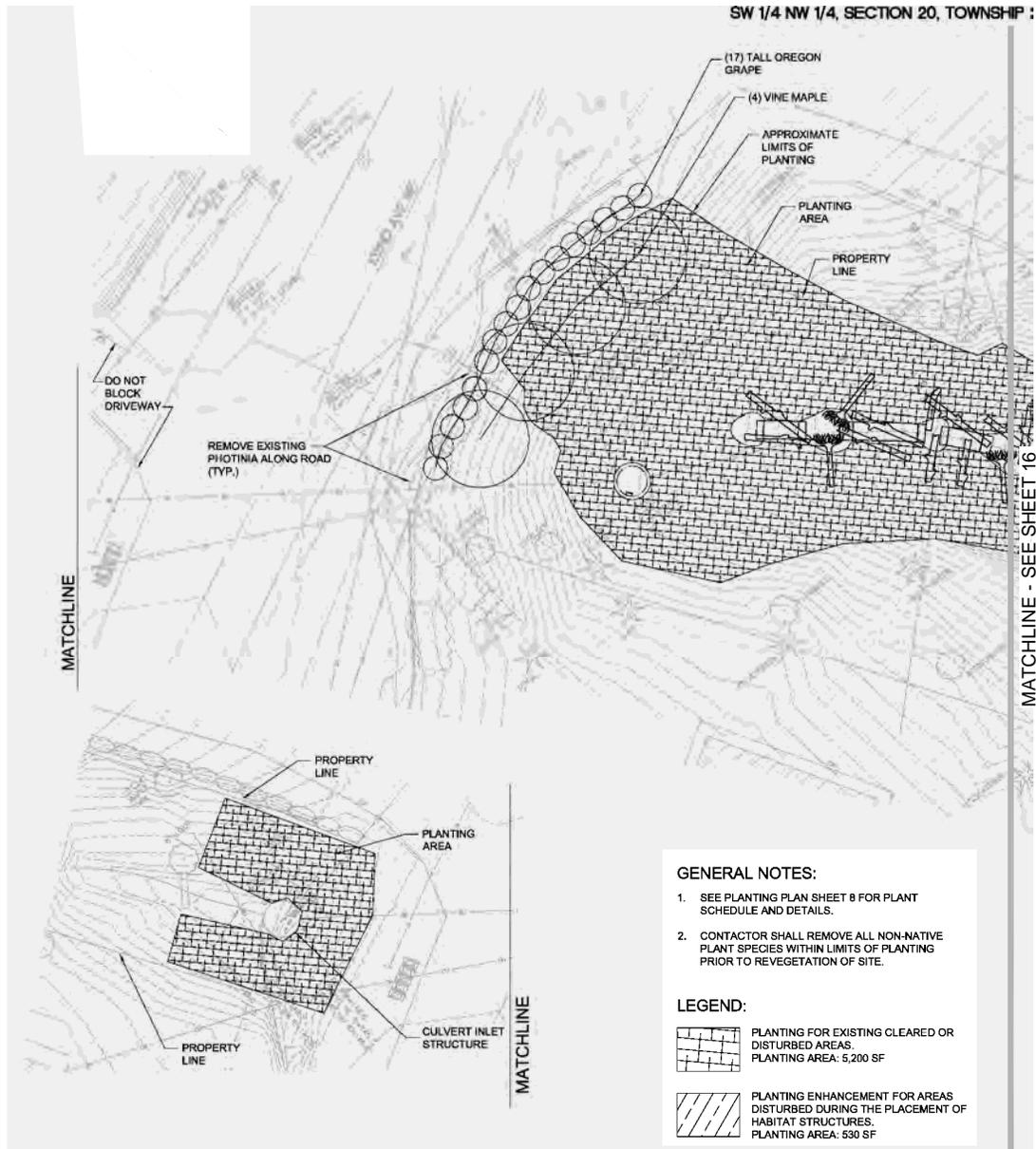
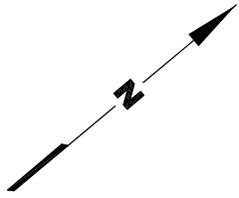
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DATE: 12-17-2010

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CITY OF BELLEVUE

**102ND AVENUE NE
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**RESTORATION PLANTING
 PLAN**

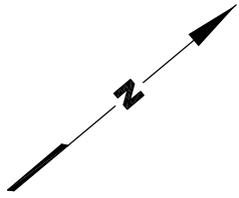
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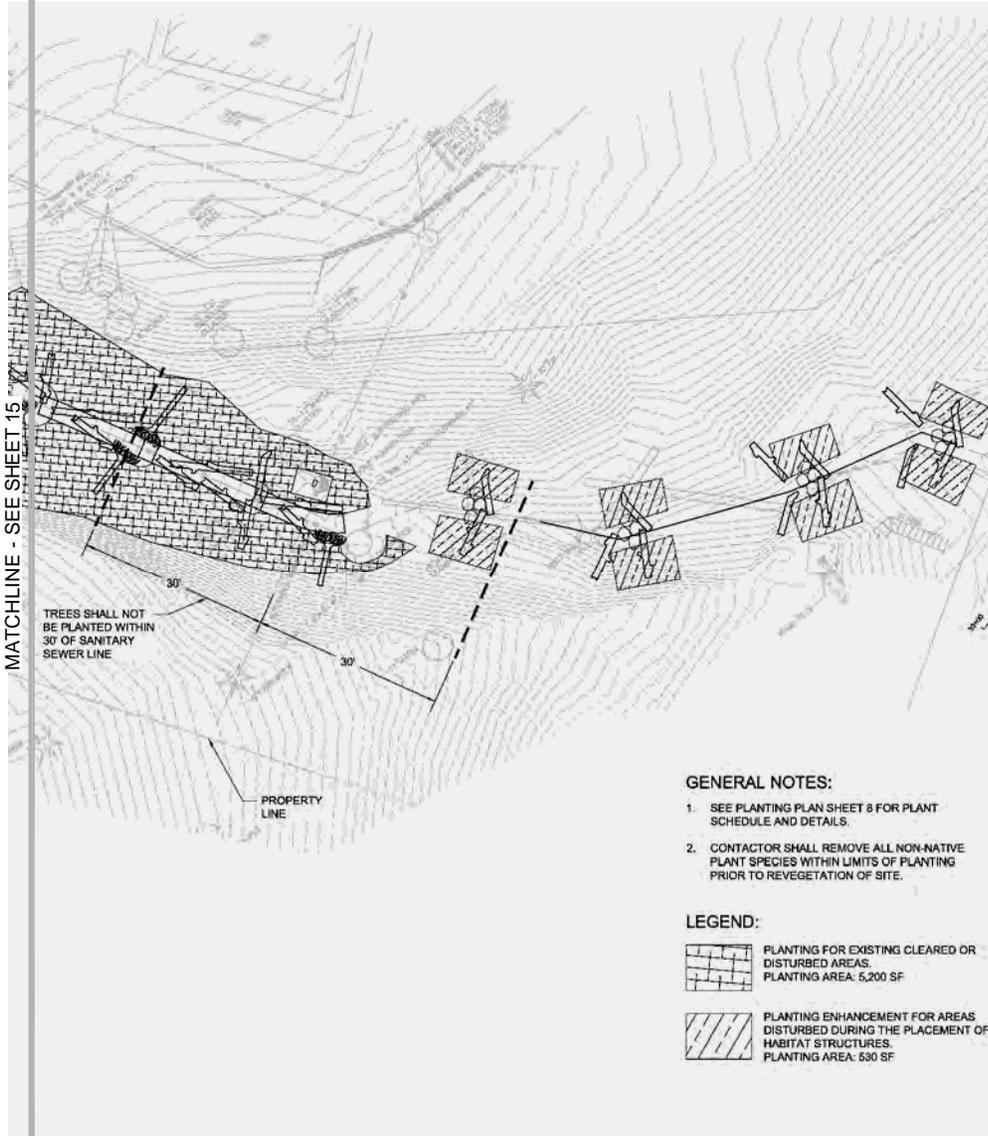
APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010

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SHIP 25 NORTH, RANGE 5 EAST, W.M.



GENERAL NOTES:

1. SEE PLANTING PLAN SHEET 8 FOR PLANT SCHEDULE AND DETAILS.
2. CONTACTOR SHALL REMOVE ALL NON-NATIVE PLANT SPECIES WITHIN LIMITS OF PLANTING PRIOR TO REVEGETATION OF SITE.

LEGEND:

-  PLANTING FOR EXISTING CLEARED OR DISTURBED AREAS.
PLANTING AREA: 5,200 SF
-  PLANTING ENHANCEMENT FOR AREAS DISTURBED DURING THE PLACEMENT OF HABITAT STRUCTURES.
PLANTING AREA: 530 SF

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CITY OF BELLEVUE

**102ND AVENUE NE
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 REPAIR AND
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**RESTORATION PLANTING
 PLAN**

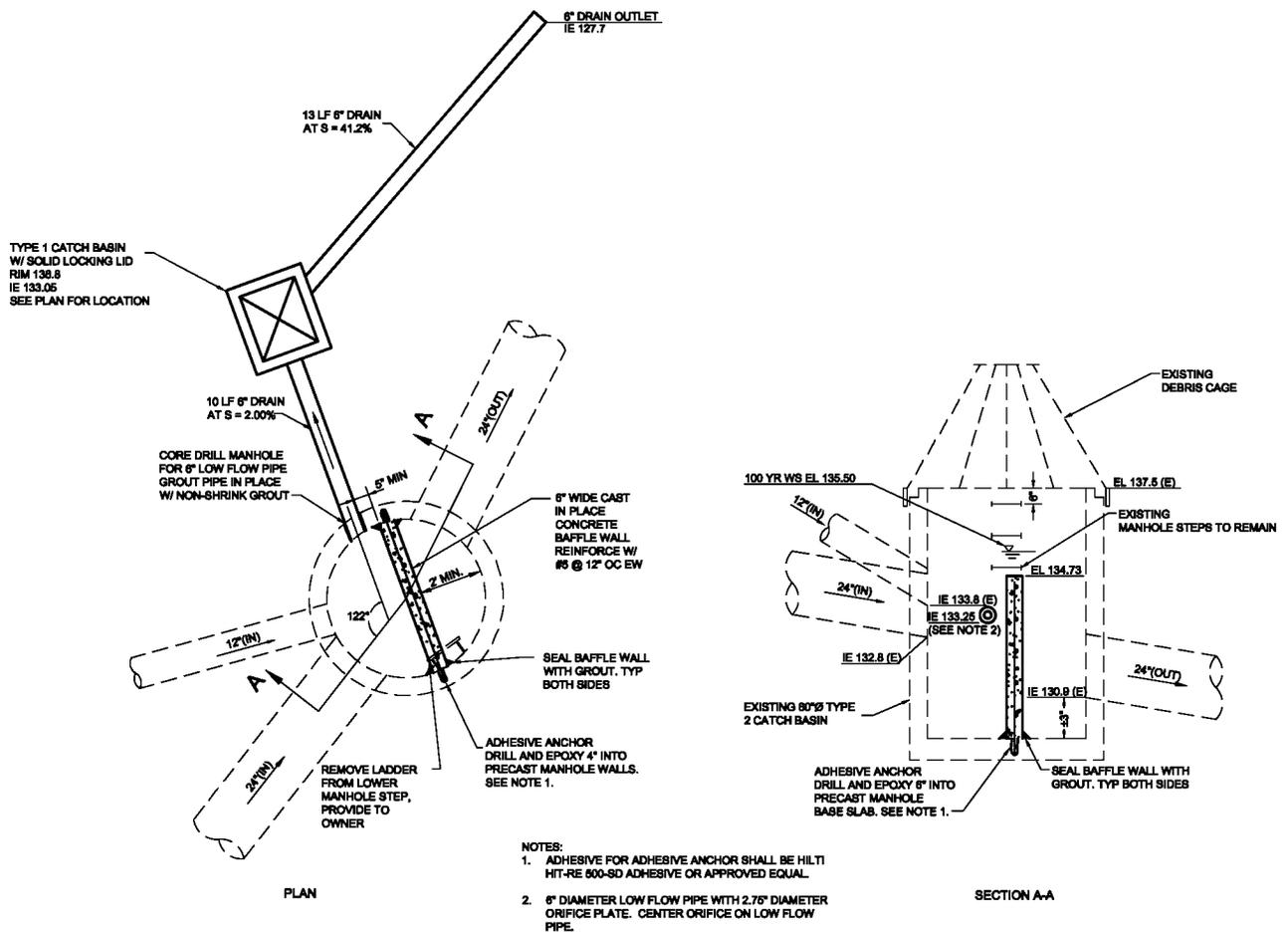
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DATE: 12-17-2010

SHEET: 16 OF 20



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CITY OF BELLEVUE

**102ND AVENUE NE
 AND YARROW
 CREEK TRIBUTARY
 REPAIR AND
 RESTORATION**

FLOW SPLITTER DETAIL

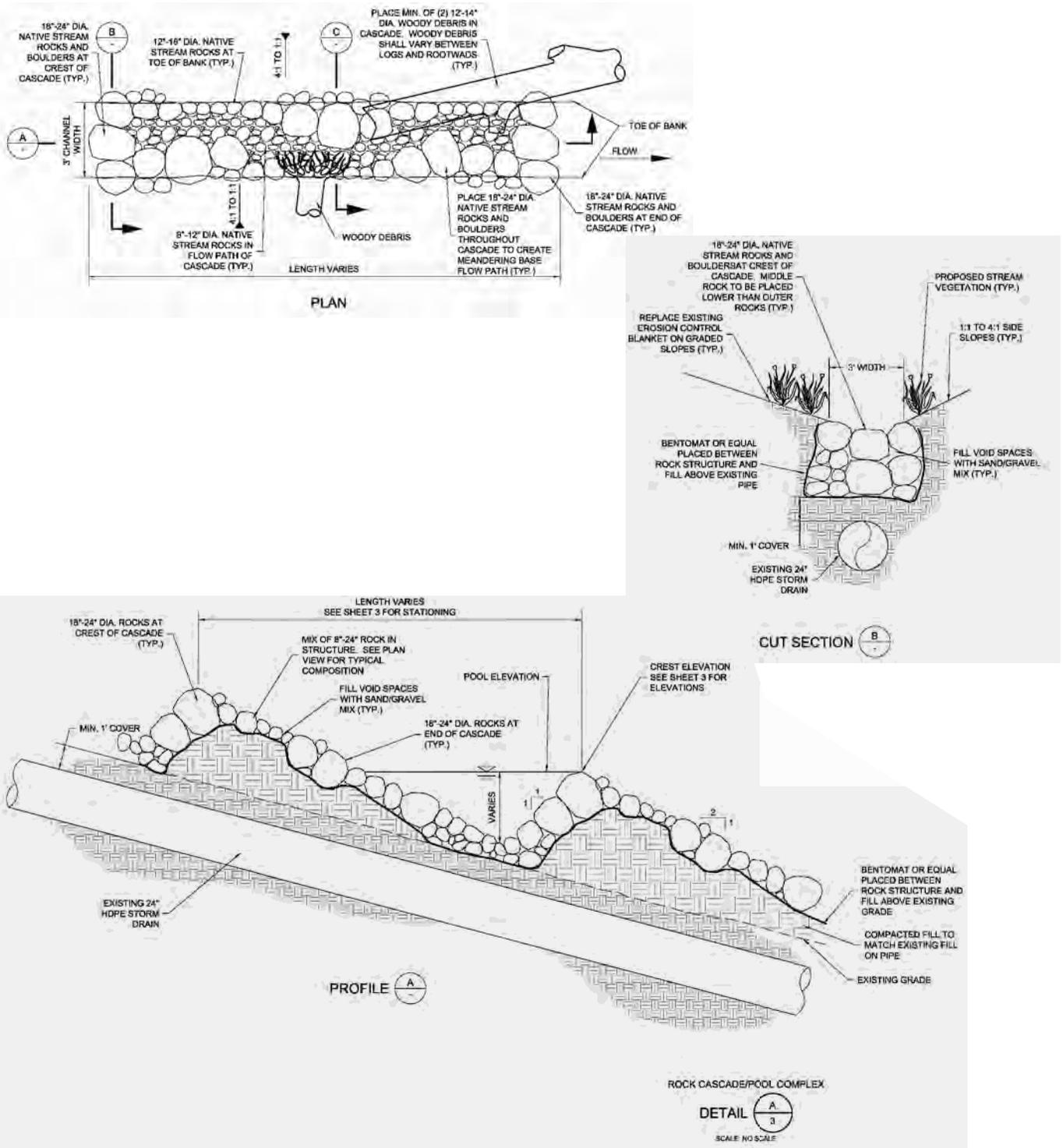
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CITY OF BELLEVUE

**102ND AVENUE NE
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 RESTORATION**

STREAM CHANNEL DETAILS

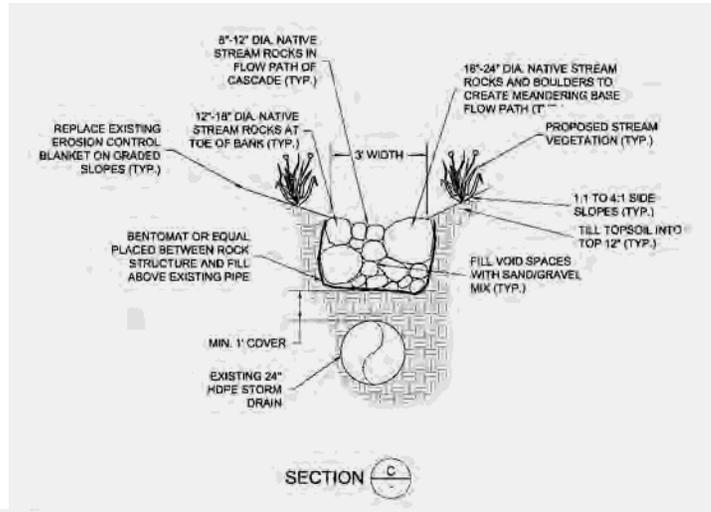
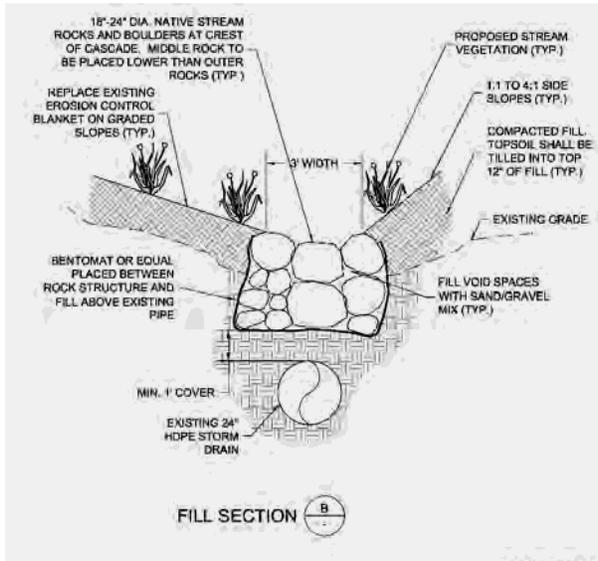
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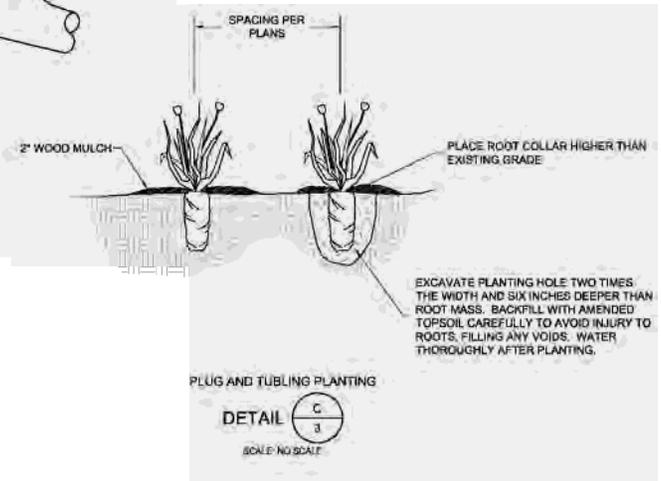
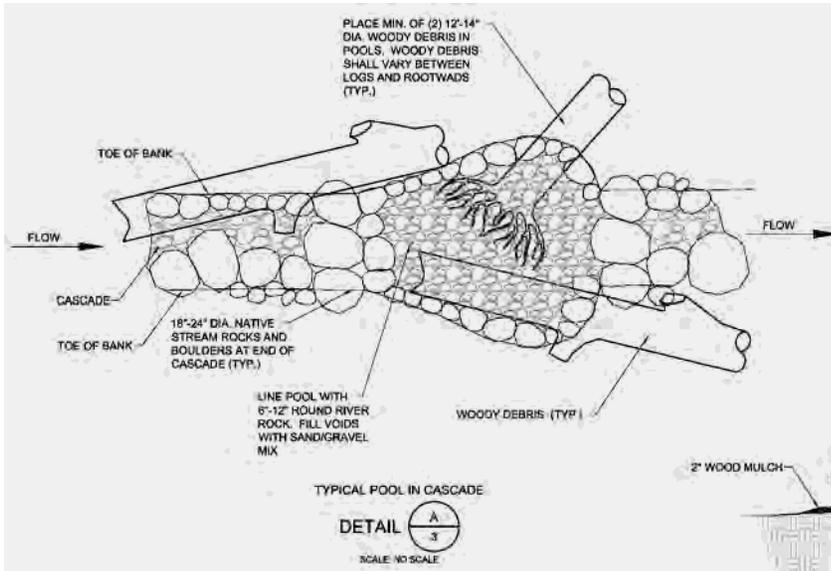
APPLICATION BY: CITY OF BELLEVUE UTILITIES DEPARTMENT.

DATE: 12-17-2010

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ROCK CASCADE/POOL COMPLEX
 DETAIL A/3
 SCALE: NO SCALE



PLUG AND TUBING PLANTING
 DETAIL C/3
 SCALE: NO SCALE

PURPOSE: THIS PROJECT IS EMERGENCY REPAIR AND RESTORATION OF A ROADWAY CULVERT AND EMBANKMENTS THAT CONTAIN A TRIBUTARY OF YARROW CREEK.

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CITY OF BELLEVUE

**102ND AVENUE NE
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STREAM CHANNEL DETAILS

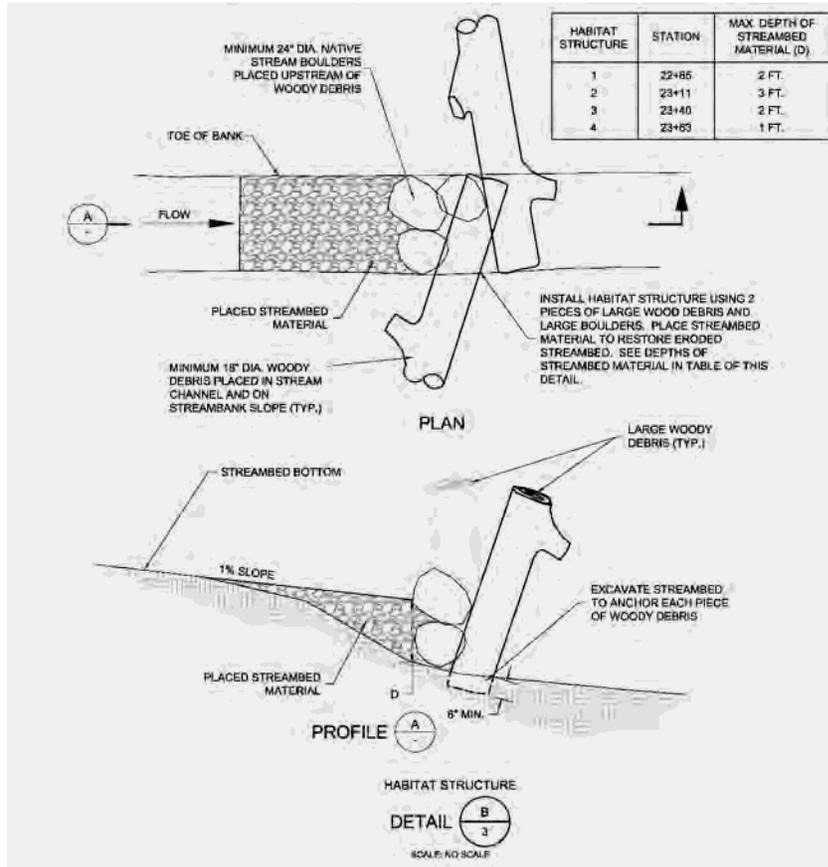
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DATE: 12-17-2010

SHEET: 19 OF 20



PLANT SCHEDULE:

QUANTITY	SCIENTIFIC NAME	COMMON NAME	TYPE	INDICATOR	SPACING	HABIT	NOTES
	ACER MACROPHYLLUM	BIG LEAF MAPLE	CONT.	FACU	20' O.C.	TREE	
	ALNUS RUBRA	RED ALDER	CONT.	FACU	20' O.C.	TREE	
	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	CONT.	FACU+	20' O.C.	TREE	
	TSUGA HETEROPHYLLA	WESTERN HEMLOCK	CONT.	FACU-	20' O.C.	TREE	
	ACER CIRCINATUM	VINE MAPLE	CONT.	FAC-	8' O.C.	SHRUB	
	CORNUS SERICEA	REDSIER DOGWOOD	TUBLING	FACW	6' O.C.	SHRUB	PLANT WITHIN 2 FEET OF STREAM
	GAULTHERIA SHALLON	SALAL	CONT.	FACU	6' O.C.	SHRUB	
	MAHONIA AQUIFOLIUM	TALL OREGON GRAPE	CONT.	UPL	6' O.C.	SHRUB	
	RUBUS PARVIFLORUS	THIMBLEBERRY	CONT.	FAC-	6' O.C.	SHRUB	
	RUBUS SPECTABILIS	SALMONBERRY	CONT.	FAC+	6' O.C.	SHRUB	
	SAUBUCULUS RACEMOSA	RED ELDERBERRY	CONT.	FACU	6' O.C.	SHRUB	
	SYMPHORICARPOS ALBUS	SNOWBERRY	CONT.	FACU	6' O.C.	SHRUB	
	ARCTOSTAPHYLOS LVA-URSI	BEARBERRY	CONT.	FACU-	6' O.C.	GROUNDCOVER	
	ELYMUS GLAUCUS	BLUE WILDRYE	SEED	FACU	-	GROUNDCOVER	SEED AT 20 LBS./AC OF PURE LIVE SEED
	FESTUCA IDAHOENSIS	IDAHO FESCUE	SEED	FACU+	-	GROUNDCOVER	
	JUNCUS ENSIFOLIUS	DAGGER-LEAF RUSH	PLUG	FACW	4' O.C.	GROUNDCOVER	PLANT IN CLUMPS OF 3 WITHIN 2 FEET OF STREAM
	POLYSTICHUM MUNITUM	SWORD FERN	PLUG	FACU	4' O.C.	GROUNDCOVER	PLANT IN CLUMPS OF 3
	SCIRPUS ACUTUS	HARDSTEM BULRUSH	PLUG	OBL	4' O.C.	GROUNDCOVER	PLANT IN CLUMPS OF 3

GENERAL NOTES:

- ALL PLANT MATERIAL TO MEET THE AMERICAN STANDARD FOR NURSERY STOCK.
- PLANT MATERIAL SHALL BE ESTABLISHED, MAINTAINED AND GUARANTEED AS PER SPECIFICATIONS.
- THE CONTRACTOR SHALL INSTALL TREES FIRST BEFORE SHRUBS WITHIN ANY PLANTING AREA.
- INSTALL CONTAINER PLANTS PER CITY OF BELLEVUE STD PLANS NO. 32 AND 33 IN THE SPECIFICATIONS APPENDIX.
- TREES SHALL NOT BE PLANTED WITHIN 30 FEET OF THE SANITARY SEWER LINE, AS SHOWN ON SHEET 4.

PURPOSE: THIS PROJECT IS EMERGENCY REPAIR AND RESTORATION OF A ROADWAY CULVERT AND EMBANKMENTS THAT CONTAIN A TRIBUTARY OF YARROW CREEK.

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CITY OF BELLEVUE

**102ND AVENUE NE
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 REPAIR AND
 RESTORATION**

**RESTORATION STREAM
 CHANNEL DETAILS AND
 PLANTING NOTES AND
 DETAILS**

PROPOSED: RESTORATION OF APPROXIMATELY 220 LINEAR FEET OF STREAM.

IN: JURISDICTIONAL WATERS OF THE U.S.
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DATE: 12-17-2010

SHEET: 20 OF 20

GENERAL NOTES

- (1) ALL WORK SHALL CONFORM TO THE 2010 EDITION OF THE CITY OF BELLEVUE UTILITIES DEPARTMENT ENGINEERING STANDARDS.
- (3) 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.
- (5) 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.
- (6) 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 WEDGE DEBRIS), SHALL BE REMOVED AT THE NEAREST STRUCTURE. WASH WATER OF ANY SORT SHALL NOT BE DISCHARGED TO THE STORM DRAIN SYSTEM.
- (10) 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.
- (18) THE CONTRACTOR SHALL USE A VACUUM STREET SWEEPER TO REMOVE DUST AND DEBRIS FROM PAVEMENT AREAS AS DIRECTED BY THE ENGINEER. FLUSHING OF STREETS SHALL NOT BE PERMITTED WITHOUT PRIOR CITY APPROVAL.
- (22) CALL 1-800-424-5555, OR 8-1-1, 72 HOURS BEFORE CONSTRUCTION FOR UTILITY LOCATES.
- (23) 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.
- (30) SURFACE RESTORATION OF EXISTING ASPHALT PAVEMENT SHALL BE AS REQUIRED BY THE RIGHT-OF-WAY USE PERMIT.
- (37) 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.
- (38) 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.

SURVEY NOTES

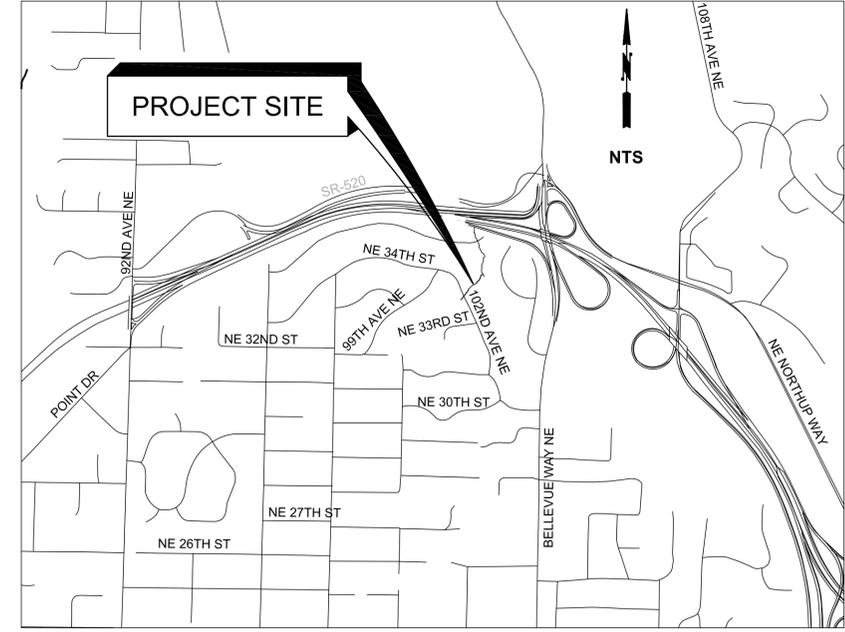
1. **THE FIELD SURVEY:** THIS PROJECT SITE WAS SURVEYED DURING JANUARY AND MARCH 2010 IN SUPPORT OF THE YARROW CREEK CULVERT REPLACEMENT DESIGN PROJECT. ADDITIONAL SURVEY WAS PERFORMED BY PLS, INC. IN SEPTEMBER 2010 TO PROVIDE AS-BUILT CONDITIONS AFTER THE YARROW CREEK CULVERT REPLACEMENT PROJECT WAS COMPLETED.
2. **HORIZONTAL DATUM:** WASHINGTON COORDINATE SYSTEM, NORTH ZONE, NAD-83/07.
3. **VERTICAL DATUM:** NAVD-88
4. **BENCHMARKS:** CITY OF BELLEVUE POINT DESIGNATION 414 LOCATED AT THE INTERSECTION OF NE 34TH ST AND 98TH AVE NE. THE POINT IS A COPPER TACK IN LEAD IN A 3"x3" CONCRETE MONUMENT IN CASE. ELEV = 208.34 FEET (NAVD 88)
5. **METHODOLOGY:** FIELD MEASUREMENTS FOR THE JANUARY/MARCH 2010 SURVEY WERE PERFORMED USING A LEICA TCPR 1201 TOTAL STATION AND LEICA ATX 1230 GPS RECEIVER. THIS SURVEY COMPLIES WITH THE MINIMUM REQUIRED "ERROR OF CLOSURE" OF 1:10,000 FOR WASHINGTON STATE PLANE COORDINATES AS SET FORTH PER W.A.C. 332-130-090 (AND POSITIONAL TOLERANCE LEVELS OF LESS THAN 0.011 METERS)
6. **PROPERTY LINES:** PROPERTY AND RIGHT-OF-WAY LINES ADJOINING THE SITE WERE CALCULATED BASED ON CENTERLINE MONUMENTATION AND RELATED DOCUMENTS. OTHER PROPERTY AND RIGHT OF WAY LINES SHOWN AS GIS LINES (SEE LEGEND) ARE FROM THE CITY OF BELLEVUE'S GEOGRAPHIC INFORMATION SYSTEM AND ARE SHOWN FOR GRAPHIC PURPOSES ONLY.

PROPERTY CORNERS WERE NOT STAKED IN CONJUNCTION WITH THIS SURVEY.
7. **UNDERGROUND UTILITIES:** UNDERGROUND UTILITY LOCATIONS WITHIN 102ND AVE NE WERE DETERMINED AND MARKED ON THE SURFACE BY A UTILITY LOCATE COMPANY. SAID SURFACE UTILITY MARKINGS WITHIN 102ND AVE NE WERE LOCATED BY DAVID EVANS AND ASSOCIATES, INC. AND ARE SHOWN HEREON.
NO GUARANTEE IS MADE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED OR THAT THE UNDERGROUND UTILITIES ARE SHOWN IN THEIR EXACT LOCATION. THE UNDERGROUND UTILITIES SHOWN HEREON WERE LOCATED BASED ON ABOVE GROUND OBSERVATIONS OF THESE UTILITIES.
8. **CONTOUR INTERVAL:** 2 FEET
9. **SUBSURFACE CONDITIONS:** WERE NOT EXAMINED OR CONSIDERED AS PART OF THIS SURVEY.
10. **ORDINARY HIGH WATER LINE:** THE ORDINARY HIGH WATER LINES SHOWN HEREON WERE ESTABLISHED AND FLAGGED BY THE ENVIRONMENTAL GROUP OF DAVID EVANS AND ASSOCIATES INC, AND MAPPED BY THE SURVEYING GROUP OF DAVID EVANS AND ASSOCIATES INC.
11. **CREEK OBSTRUCTIONS:** WHILE EFFORTS WERE MADE TO MAP OBSTRUCTIONS, (NATURAL AND MAN-MADE), WITHIN THE CREEK CHANNEL, NO GUARANTEE IS MADE THAT ALL OBSTRUCTIONS HAVE BEEN MAPPED.
12. 1-800-424-5555; MUST BE CALLED NOT LESS THAN 48 HOURS BEFORE BEGINNING EXCAVATION WHERE ANY UNDERGROUND UTILITIES MAY BE LOCATED. FAILURE TO DO SO COULD MEAN BEARING SUBSTANTIAL REPAIR COSTS. (UP TO THREE TIMES THE COST OF REPAIRS TO THE SERVICE).
13. **RIGHT-OF-WAY OWNERSHIP:** RIGHT-OF-WAY OWNERSHIPS AS SHOWN ON THIS SURVEY ARE BASED ON A WSDOT RIGHT-OF-WAY PLAN PROVIDED BY THE CITY OF BELLEVUE. ACTUAL OWNERSHIP SHOULD BE VERIFIED BY A CURRENT TITLE REPORT.

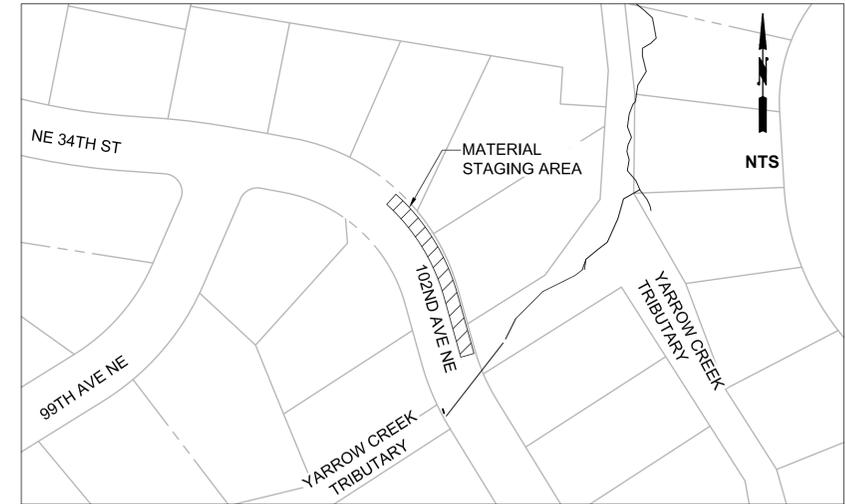
LEGEND

- PROPERTY LINE
- RIGHT-OF-WAY
- EDGE OF CONCRETE/ASPHALT
- FLOWLINE
- STORM DRAIN LINE
- SANITARY SEWER LINE
- WATER MAIN
- GAS MAIN
- TELEPHONE LINE
- UNDERGROUND POWER LINE
- OVERHEAD LINE
- CREEK CENTERLINE
- ORDINARY HIGH WATER MARK
- SEWER MANHOLE
- STORM DRAIN CATCH BASIN
- GUY POLE
- GUY ANCHOR
- POWER POLE
- GAS VALVE
- MAIL BOX
- WATER VALVE
- WATER METER
- WATER RISER
- CONIFER TREE
- DECIDUOUS TREE
- HEDGE
- CREEK OBSTRUCTION, LOG
- PICTURE LOCATION (HYPERLINKED)
- ASSESSOR'S PARCEL NUMBER
- SURVEY CONTROL POINT

VICINITY MAP



PROJECT SITE MAP



SURVEY CONTROL POINTS				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
3	236829.41	1302349.71	156.15	DEA_CON
7	236882.77	1302394.16	138.90	DEA_CON

Path: P:\Bellevue\140093\Yarrow Creek Stream Restoration\CAD\2-Sheets\C-C\ Filename: 140093-000-C001 Plot date: Dec 13, 2010-02:50:33pm CAD User: bmoabley
 Xref Filename: [PAULSON-JOEL | 140093-NIP-SURV | 140093-TBK-G-0000-01]

NO	DATE	BY	APPR	REVISIONS



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Approved By

DESIGN MANAGER _____ DATE _____

PROJECT MANAGER _____ DATE _____

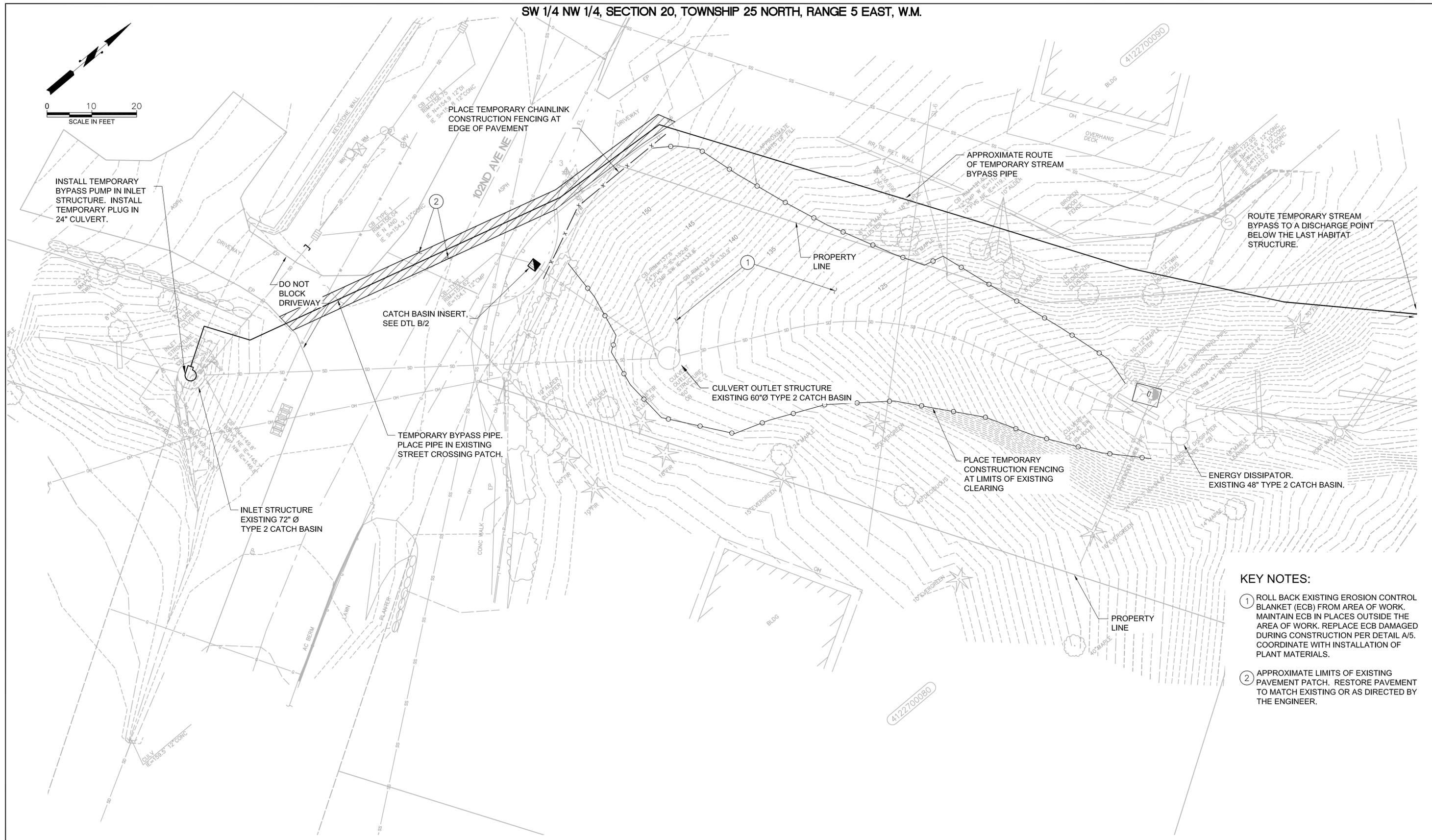
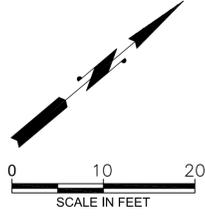
JP /BN 12/13/10
 DESIGNED BY DATE
 WM /MH 12/13/10
 DRAWN BY DATE
 MF 12/13/10
 CHECKED BY DATE



YARROW CREEK STREAM RESTORATION
 PROJECT LOCATION, GENERAL NOTES,
 AND LEGEND

NW 20-25-5 E3 SHT 1 OF 8

SW 1/4 NW 1/4, SECTION 20, TOWNSHIP 25 NORTH, RANGE 5 EAST, W.M.



- KEY NOTES:**
- ROLL BACK EXISTING EROSION CONTROL BLANKET (ECB) FROM AREA OF WORK. MAINTAIN ECB IN PLACES OUTSIDE THE AREA OF WORK. REPLACE ECB DAMAGED DURING CONSTRUCTION PER DETAIL A/5. COORDINATE WITH INSTALLATION OF PLANT MATERIALS.
 - APPROXIMATE LIMITS OF EXISTING PAVEMENT PATCH. RESTORE PAVEMENT TO MATCH EXISTING OR AS DIRECTED BY THE ENGINEER.

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NO	DATE	BY	APPR	REVISIONS

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Approved By _____ DATE _____
 DESIGN MANAGER _____ DATE _____
 PROJECT MANAGER _____ DATE _____

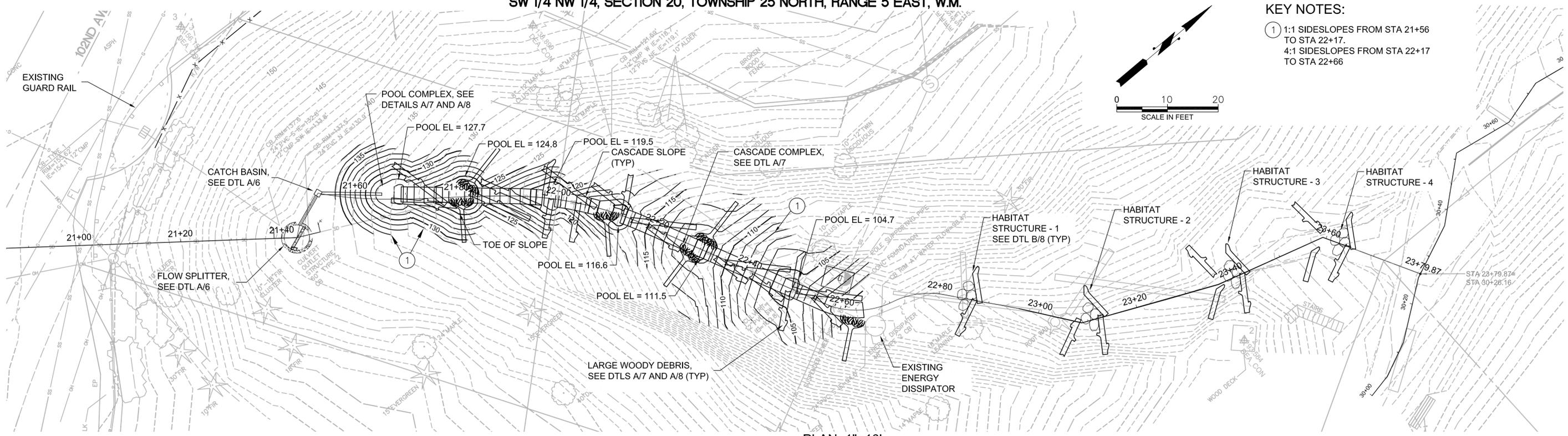
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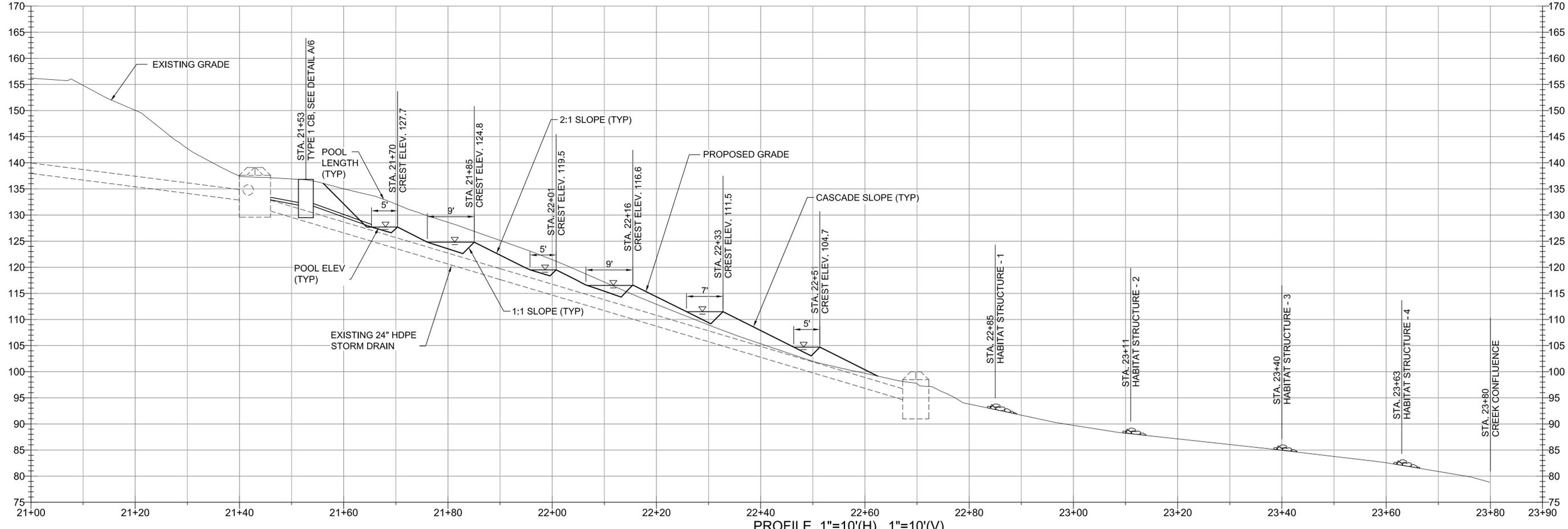
SW 1/4 NW 1/4, SECTION 20, TOWNSHIP 25 NORTH, RANGE 5 EAST, W.M.

KEY NOTES:

- ① 1:1 SIDESLOPES FROM STA 21+56 TO STA 22+17.
- 4:1 SIDESLOPES FROM STA 22+17 TO STA 22+66



PLAN 1"=10'



PROFILE 1"=10'(H), 1"=10'(V)

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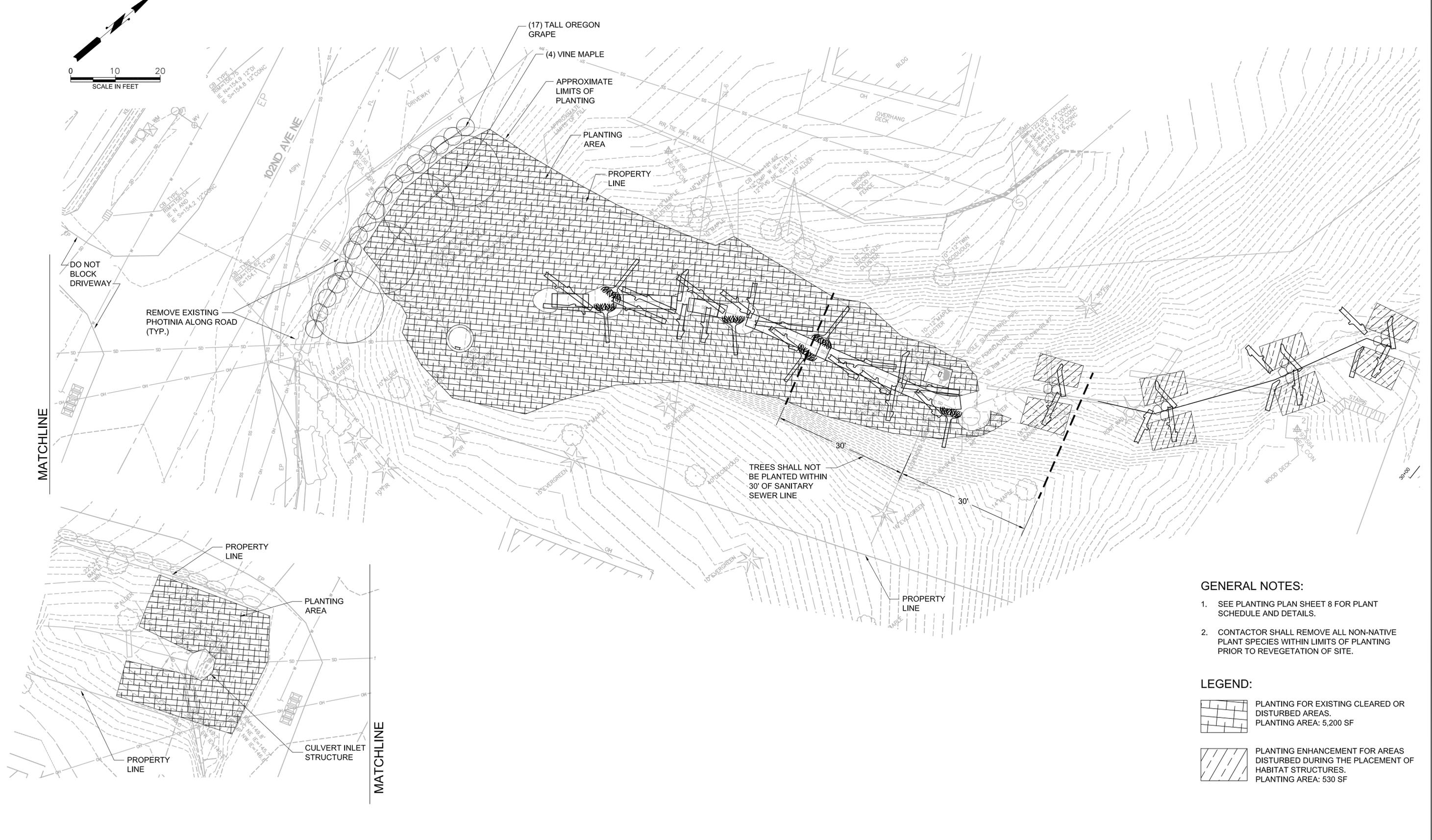
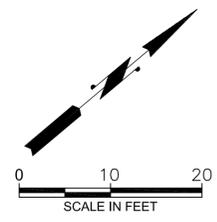
Approved By
 DESIGN MANAGER DATE
 PROJECT MANAGER DATE

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 DESIGNED BY
 WM/MH 12/13/10 DATE
 DRAWN BY
 MF 12/13/10 DATE
 CHECKED BY



City of Bellevue

SW 1/4 NW 1/4, SECTION 20, TOWNSHIP 25 NORTH, RANGE 5 EAST, W.M.



- GENERAL NOTES:**
- SEE PLANTING PLAN SHEET 8 FOR PLANT SCHEDULE AND DETAILS.
 - CONTACTOR SHALL REMOVE ALL NON-NATIVE PLANT SPECIES WITHIN LIMITS OF PLANTING PRIOR TO REVEGETATION OF SITE.

- LEGEND:**
- PLANTING FOR EXISTING CLEARED OR DISTURBED AREAS. PLANTING AREA: 5,200 SF
 - PLANTING ENHANCEMENT FOR AREAS DISTURBED DURING THE PLACEMENT OF HABITAT STRUCTURES. PLANTING AREA: 530 SF

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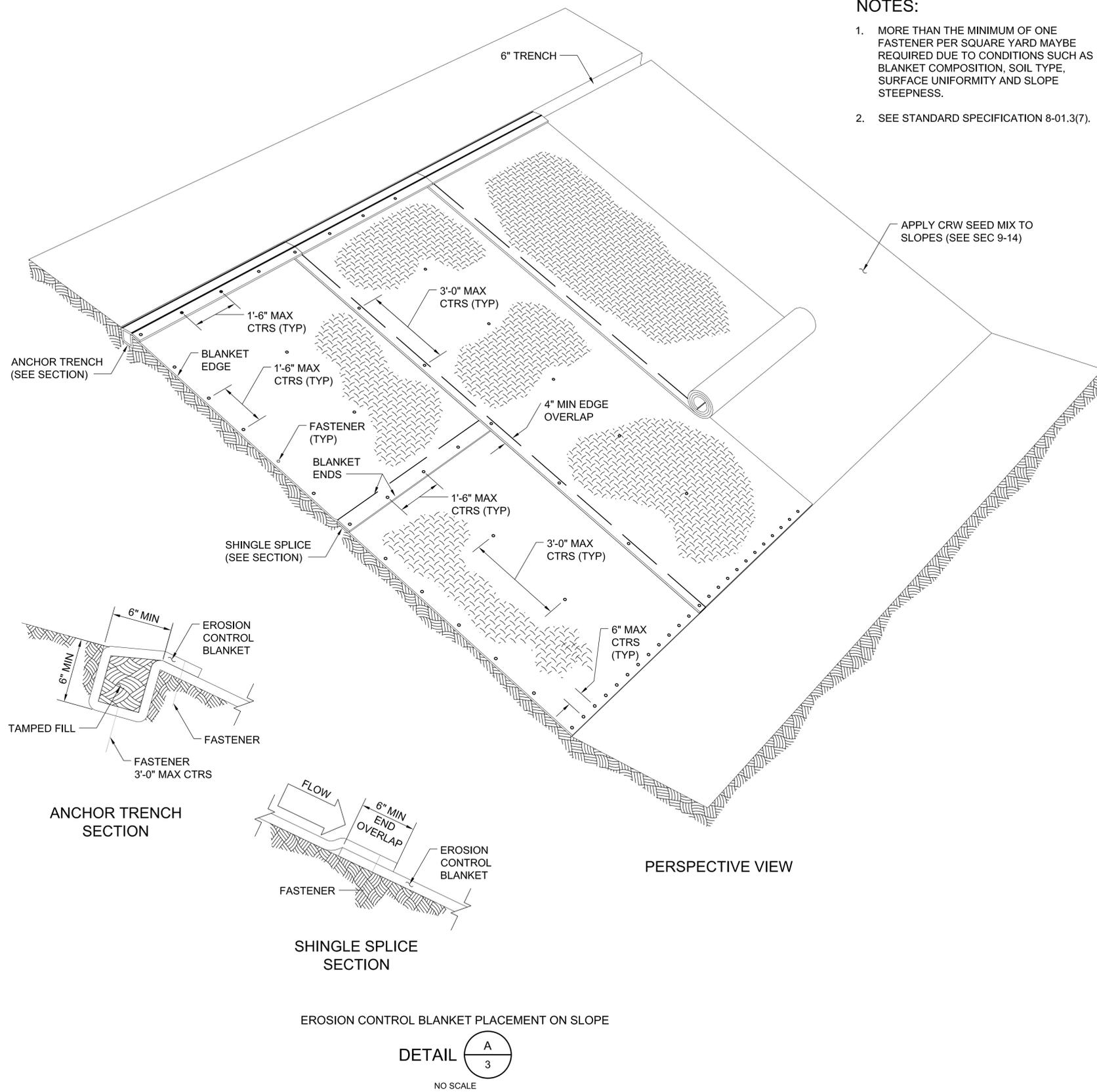
Approved By _____ DATE _____
 DESIGN MANAGER _____ DATE _____
 PROJECT MANAGER _____ DATE _____

JP/BN 12/13/10 DATE
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 WM/MH 12/13/10 DATE
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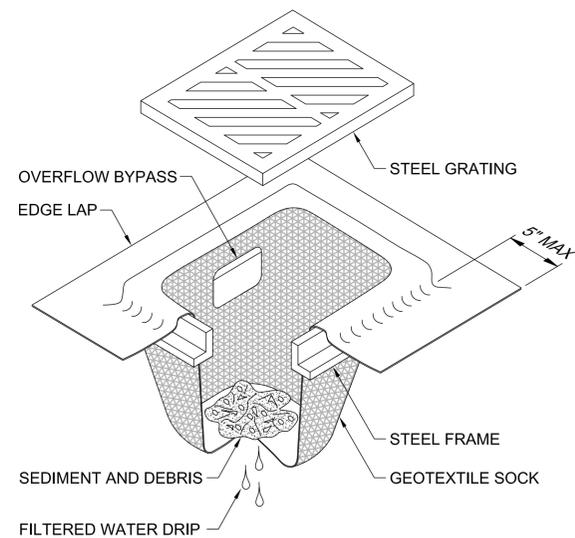
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NOTES:

- MORE THAN THE MINIMUM OF ONE FASTENER PER SQUARE YARD MAYBE REQUIRED DUE TO CONDITIONS SUCH AS BLANKET COMPOSITION, SOIL TYPE, SURFACE UNIFORMITY AND SLOPE STEEPNESS.
- SEE STANDARD SPECIFICATION 8-01.3(7).

APPLY CRW SEED MIX TO SLOPES (SEE SEC 9-14)



NOTES:

- INSERT SHALL BE INSTALLED PRIOR TO CLEARING AND GRADING OR EXCAVATION ACTIVITY.
- SEDIMENT SHALL BE REMOVED FROM THE UNIT WHEN IT BECOMES HALF FULL (12" FROM THE TOP OF THE SEDIMENT TO THE BOTTOM OF THE GRATE).
- SEDIMENT REMOVAL SHALL BE ACCOMPLISHED BY REMOVING THE INSERT, EMPTYING, AND RE-INSERTING IT INTO THE CATCH BASIN. DISPOSE OF SEDIMENT IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
- DURING THE CONSTRUCTION PERIOD, ADDITIONAL CATCH BASIN INSERTS OTHER THAN THOSE INDICATED ON THE DRAWINGS SHALL BE INSTALLED AS NEEDED TO PREVENT CONSTRUCTION RUNOFF FROM ENTERING UNPROTECTED CATCH BASINS.

CATCH BASIN INSERT



NO SCALE



NO SCALE

NO	DATE	BY	APPR	REVISIONS

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DESIGN MANAGER _____ DATE _____
 PROJECT MANAGER _____ DATE _____

JP/BN 12/13/10 DATE
 DESIGNED BY
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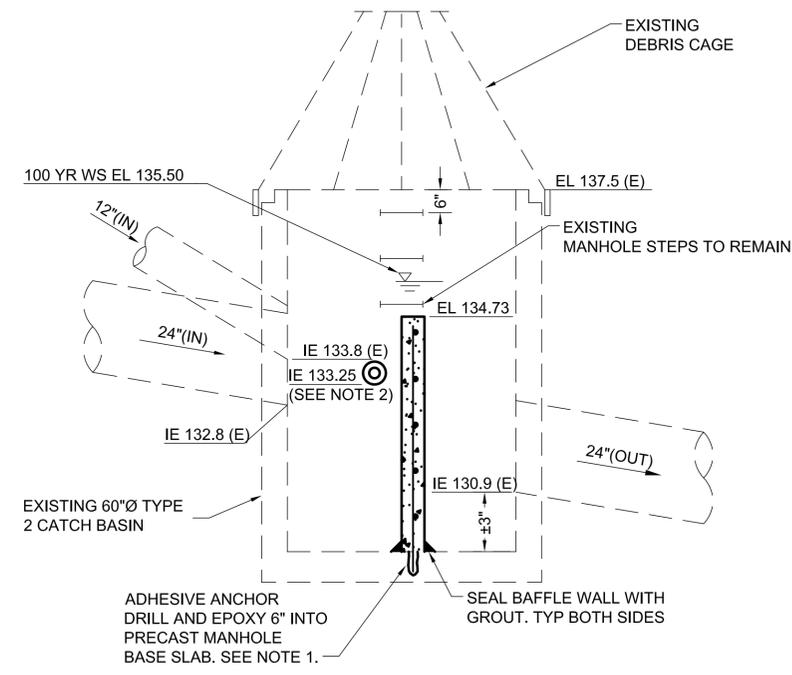
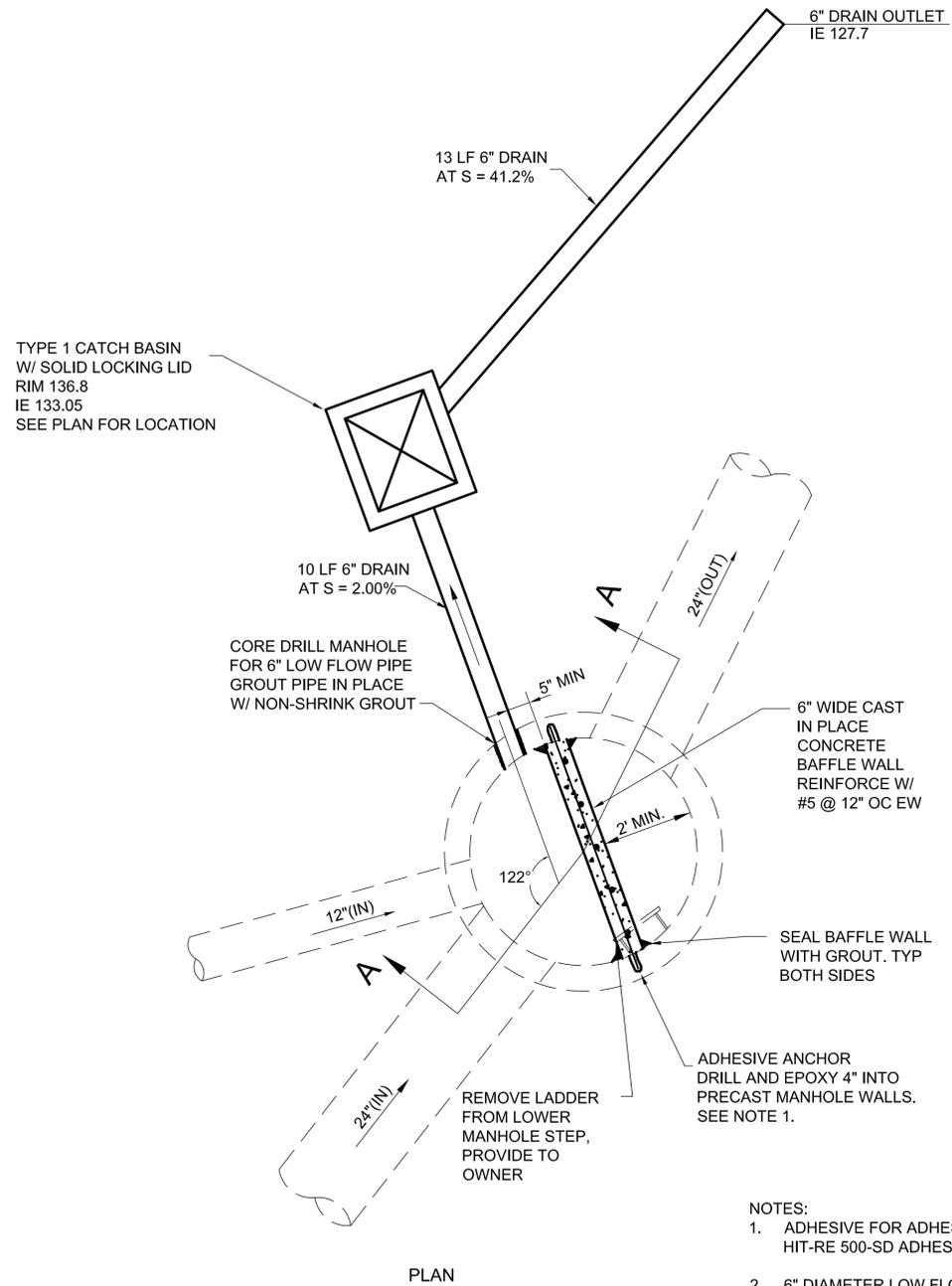


City of Bellevue

YARROW CREEK STREAM RESTORATION

DETAILS

NW 20-25-5 E3 SHT 5 OF 8

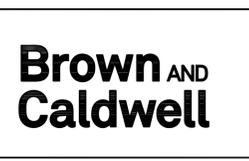


- NOTES:
- ADHESIVE FOR ADHESIVE ANCHOR SHALL BE HILTI HIT-RE 500-SD ADHESIVE OR APPROVED EQUAL.
 - 6" DIAMETER LOW FLOW PIPE WITH 2.75" DIAMETER ORIFICE PLATE. CENTER ORIFICE ON LOW FLOW PIPE.

FLOW SPLITTER
 DETAIL A
 3
 SCALE: NO SCALE

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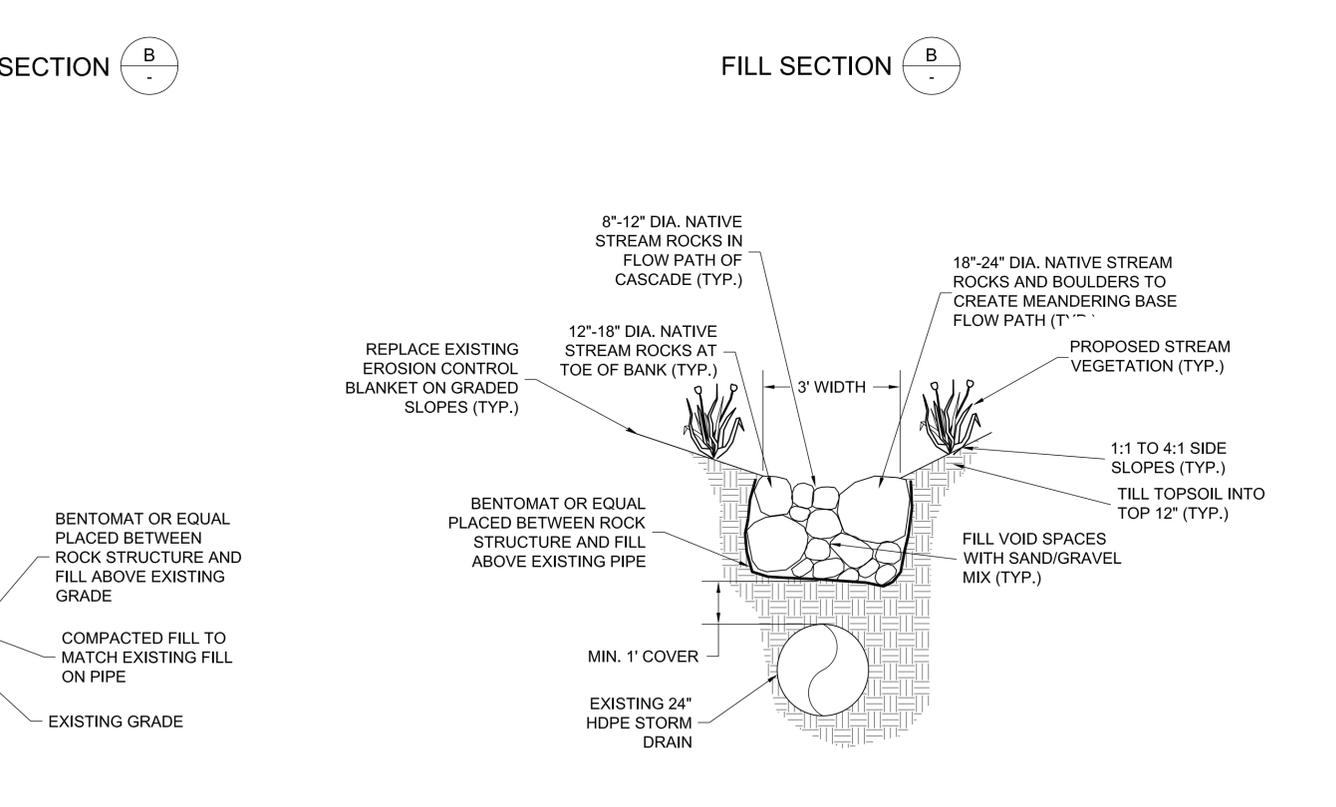
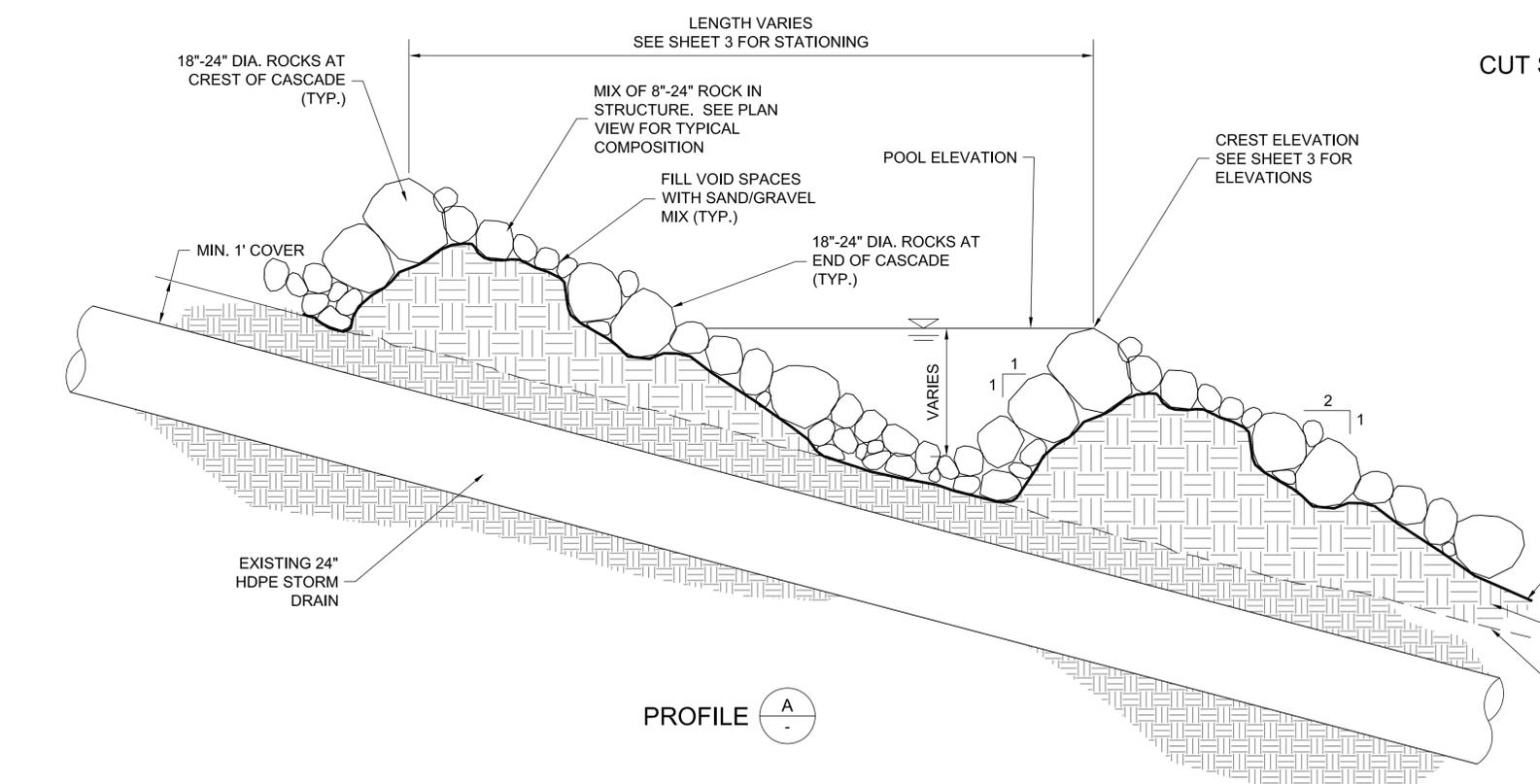
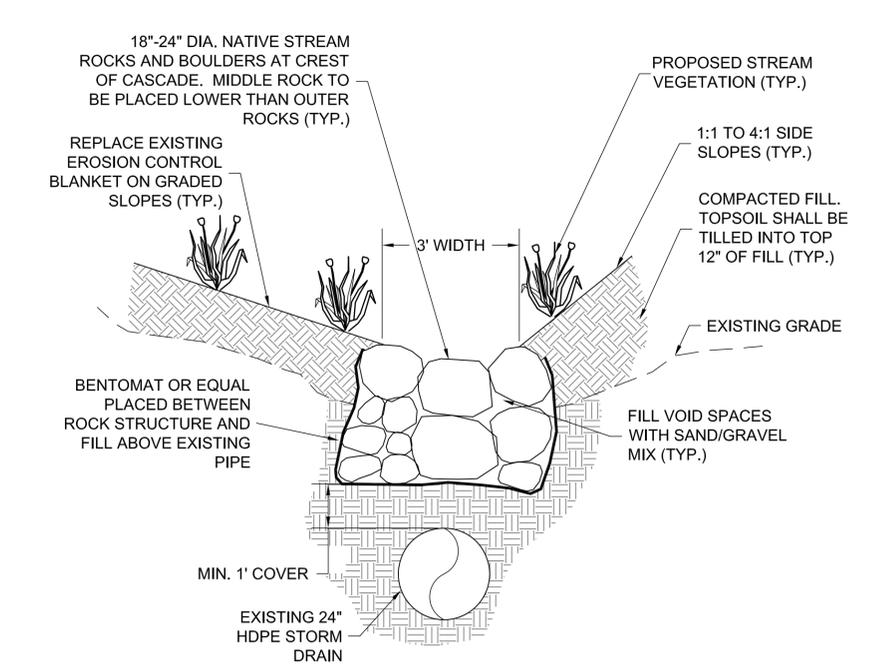
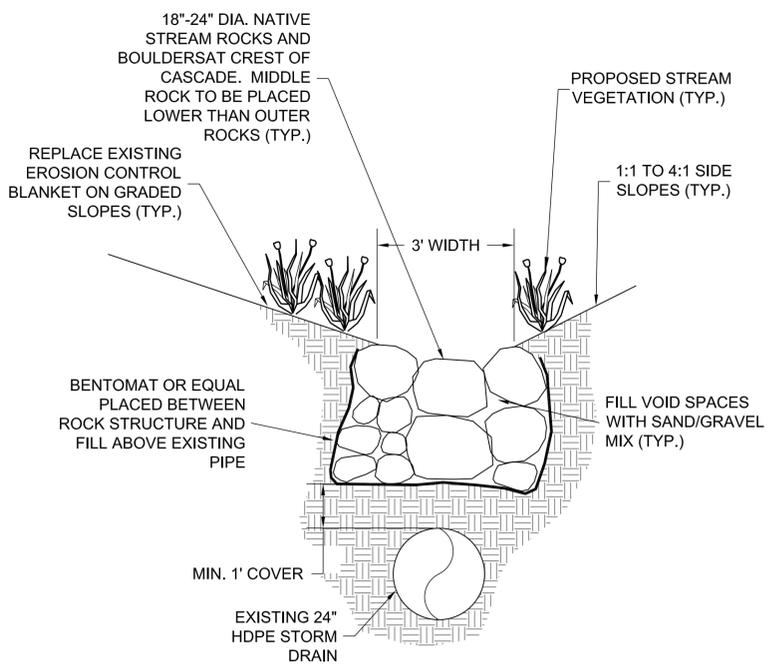
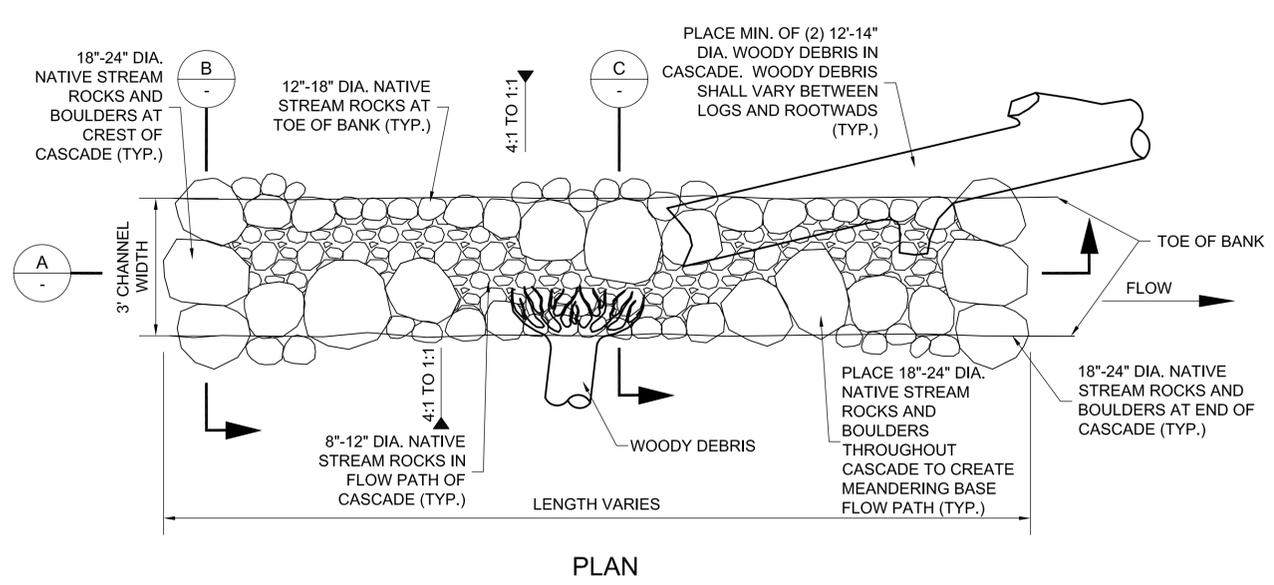


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 PROJECT MANAGER _____ DATE _____

JP/BN 12/13/10
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 WM/MH 12/13/10
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ROCK CASCADE/POOL COMPLEX
DETAIL A-3
 SCALE: NO SCALE

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NO	DATE	BY	APPR	REVISIONS



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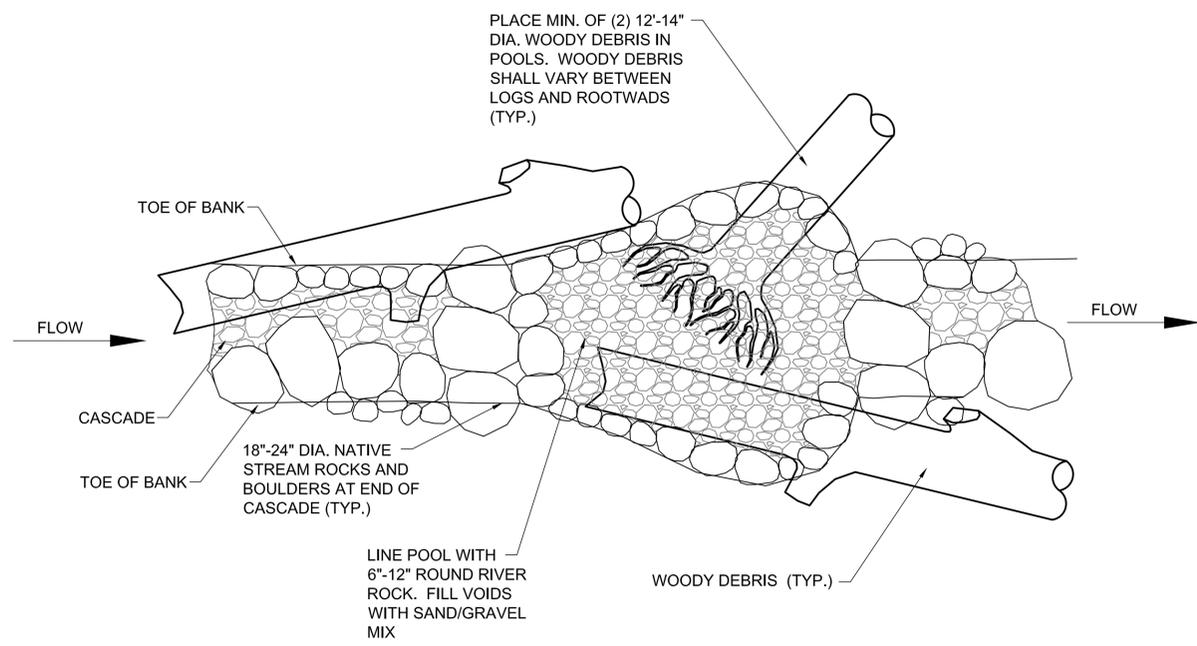
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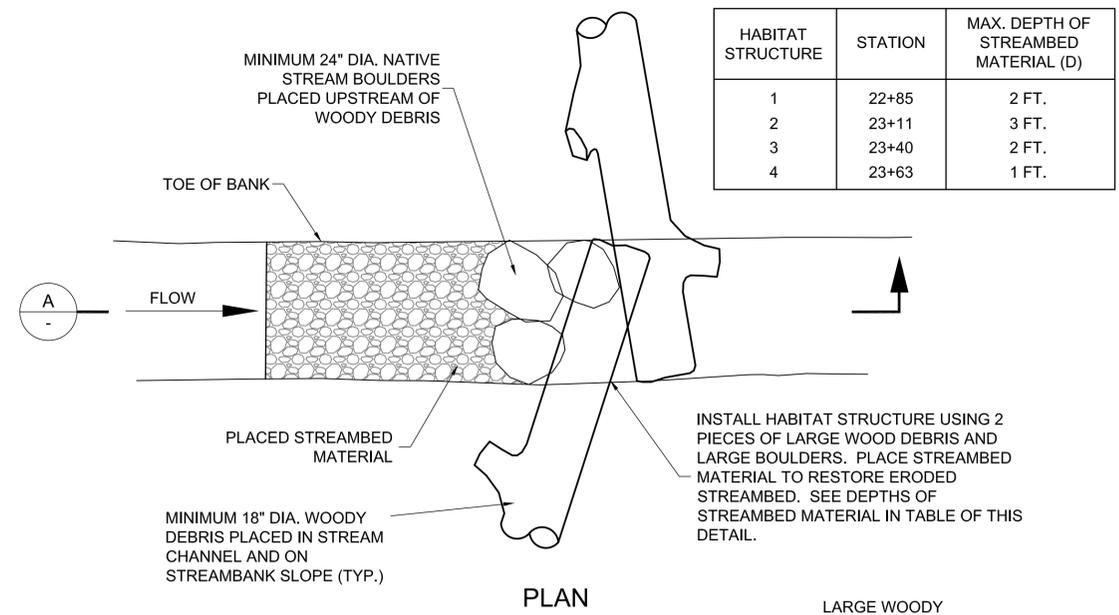


City of Bellevue

YARROW CREEK STREAM RESTORATION
 STREAM CHANNEL DETAILS
 NW 20-25-5 E3 SHT 7 OF 8

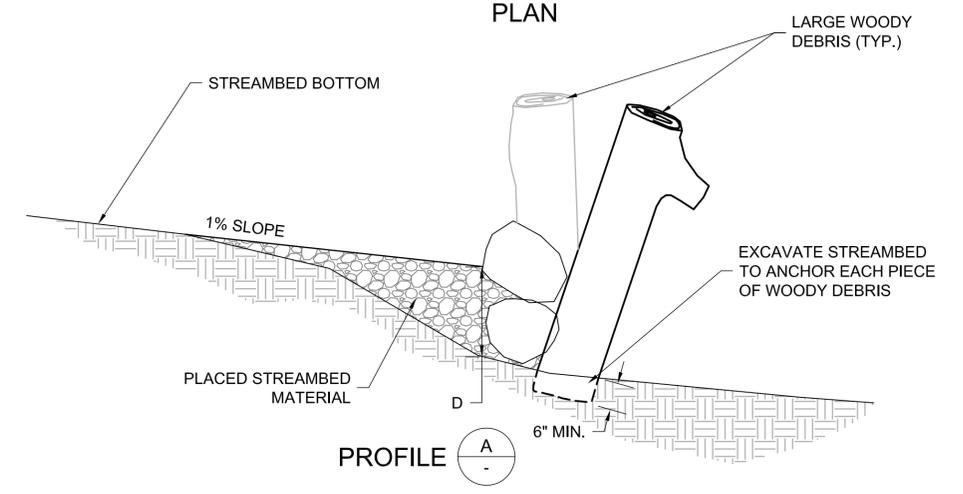


TYPICAL POOL IN CASCADE



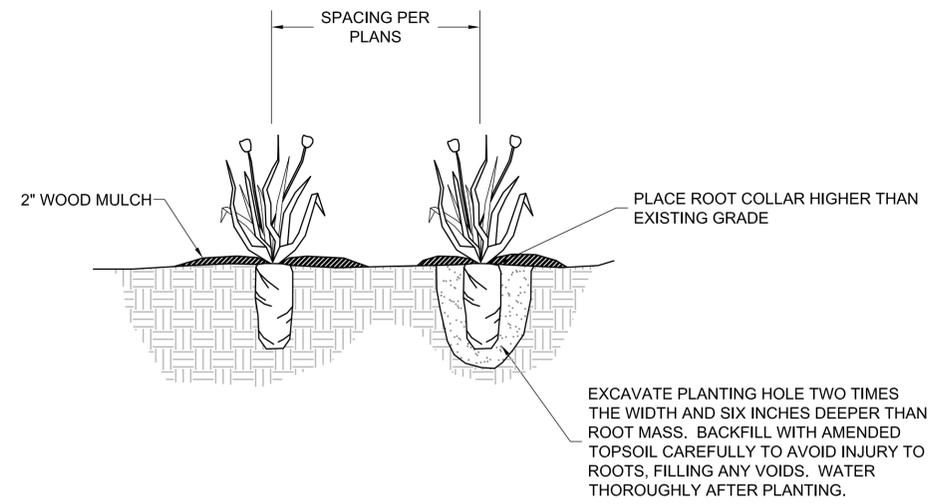
HABITAT STRUCTURE	STATION	MAX. DEPTH OF STREAMBED MATERIAL (D)
1	22+85	2 FT.
2	23+11	3 FT.
3	23+40	2 FT.
4	23+63	1 FT.

PLAN



PROFILE

HABITAT STRUCTURE



PLUG AND TUBLING PLANTING



PLANT SCHEDULE:

QUANTITY	SCIENTIFIC NAME	COMMON NAME	TYPE	INDICATOR	SPACING	HABIT	NOTES
	ACER MACROPHYLLUM	BIG LEAF MAPLE	CONT.	FACU	20' O.C.	TREE	
	ALNUS RUBRA	RED ALDER	CONT.	FACU	20' O.C.	TREE	
	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	CONT.	FACU+	20' O.C.	TREE	
	TSUGA HETEROPHYLLA	WESTERN HEMLOCK	CONT.	FACU-	20' O.C.	TREE	
	ACER CIRCINATUM	VINE MAPLE	CONT.	FAC-	6' O.C.	SHRUB	
	CORNUS SERICEA	REDSIER DOGWOOD	TUBLING	FACW	6' O.C.	SHRUB	PLANT WITHIN 2 FEET OF STREAM
	GAULTHERIA SHALLON	SALAL	CONT.	FACU	6' O.C.	SHRUB	
	MAHONIA AQUIFOLIUM	TALL OREGON GRAPE	CONT.	UPL	6' O.C.	SHRUB	
	RUBUS PARVIFLORUS	THIMBLEBERRY	CONT.	FAC-	6' O.C.	SHRUB	
	RUBUS SPECTABILIS	SALMONBERRY	CONT.	FAC+	6' O.C.	SHRUB	
	SAMBUCUS RACEMOSA	RED ELDERBERRY	CONT.	FACU	6' O.C.	SHRUB	
	SYMPHORICARPOS ALBUS	SNOWBERRY	CONT.	FACU	6' O.C.	SHRUB	
	ARCTOSTAPHYLOS UVA-URSI	BEARBERRY	CONT.	FACU-	6' O.C.	GROUNDCOVER	
	ELYMUS GLAUCUS	BLUE WILDRYE	SEED	FACU	-	GROUNDCOVER	SEED AT 20 LBS./AC OF PURE LIVE SEED
	FESTUCA IDAHOENSIS	IDAHO FESCUE	SEED	FACU+	-	GROUNDCOVER	
	JUNCUS ENSIFOLIUS	DAGGER-LEAF RUSH	PLUG	FACW	4' O.C.	GROUNDCOVER	PLANT IN CLUMPS OF 3 WITHIN 2 FEET OF STREAM
	POLYSTICHUM MUNITUM	SWORD FERN	PLUG	FACU	4' O.C.	GROUNDCOVER	PLANT IN CLUMPS OF 3
	SCIRPUS ACUTUS	HARDSTEM BULRUSH	PLUG	OBL	4' O.C.	GROUNDCOVER	PLANT IN CLUMPS OF 3

GENERAL NOTES:

- ALL PLANT MATERIAL TO MEET THE AMERICAN STANDARD FOR NURSERY STOCK.
- PLANT MATERIAL SHALL BE ESTABLISHED, MAINTAINED AND GUARANTEED AS PER SPECIFICATIONS.
- THE CONTRACTOR SHALL INSTALL TREES FIRST BEFORE SHRUBS WITHIN ANY PLANTING AREA.
- INSTALL CONTAINER PLANTS PER CITY OF BELLEVUE STD PLANS NO. 32 AND 33 IN THE SPECIFICATIONS APPENDIX.
- TREES SHALL NOT BE PLANTED WITHIN 30 FEET OF THE SANITARY SEWER LINE, AS SHOWN ON SHEET 4.

Path: P:\Bellevue\140083 Yarrow Creek Stream Restoration_CAD\2-Sheets\C-C\ Filename: 140083-000-C-008 Plot date: Dec 13, 2010-02:52:49pm CAD User: bmabbey Xref Filename: | PAULSON\JOEL | 140083-TBK-G-0000-01

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Brown AND Caldwell



FOR PERMIT REVIEW ONLY

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 DESIGN MANAGER DATE
 PROJECT MANAGER DATE

JP/BN 12/13/10
 DESIGNED BY DATE
 WM/MH 12/13/10
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 CHECKED BY DATE



YARROW CREEK STREAM RESTORATION
STREAM CHANNEL DETAILS AND PLANTING NOTES AND DETAILS
 NW 20-25-5 E3 SHT 8 OF 8

City of
Bellevue



Post Office Box 90012 ▪ Bellevue, Washington ▪ 98009 9012

October 14, 2010

Bruce Jensen and Mark Cross
City of Bellevue Utilities Department
450 110 Ave NE
Bellevue, WA 98004

**RE: Yarrow Creek Tributary Emergency Repair and Stream Rehabilitation
Pre-Application Meeting Summary File No. 10-121980-DB**

Dear Sirs:

Thank you for attending the pre-application meeting and allowing development review staff the opportunity to review your proposal for consistency with City code requirements. As presented during the meeting, your project includes the following:

1) Retroactive permitting of work done as an emergency: As described in the emergency declaration dated July 20, 2010. This included repair of the heavily eroded culvert and embankment that supports the 102nd Ave NE roadway and an 8-inch sewer, 6-inch waterline, gas line and overhead power lines. Any delay in repairing the culvert and embankment could have resulted in a collapse of the roadway resulting in sewage effluent and significant amounts of sediment being washed into Yarrow Creek, as well as multiple utility outages, and a traffic hazard on 102nd Ave NE. In order to address these hazards, the existing concrete culvert was replaced with new 24-inch plastic replacement pipe installed using a trenches method to not require excavating the roadway. In addition, approximately 20 feet of fill was placed at the eroded base of the culvert in order to buttress the roadway embankment. The 24-inch plastic pipe was extended approximately 100 feet through the fill area to a more stable discharge location downstream from the eroded ravine area.

2) Permitting of future work to improve and restore the stream channel: This includes making channel and habitat improvements to the area that was modified as part of the emergency repair action and also improving additional downstream areas to accommodate and overall integrated channel improvement approach.

Permits Required: Review of the proposed scope of work indicates that this project should be categorized as a stream bank stabilization and habitat improvement project, as allowed under LUC 20.25H.055.B. A Critical Areas Report is required (LUC 20.25H.080.B.2) as work will be done within segments of a regulated Type N stream and associated buffers. This letter summarizes the various regulations and required permits that pertain to the proposed project.

The following permits are required:

- 1) Critical Areas Land Use Permit (LO)
- 2) SEPA (Processed under LO)
- 3) Clearing and Grading Permit or Building Permit (GH)
- 4) Right of Way Permit (TK)

Review, approval, and construction of this type of project is commonly completed in phases as follows:

- 1) The first phase is the administrative review (conceptual review) of the project plans and environmental documentation and requires a public notice and public comment period as part of the review process. The first phase includes the review and approval of the Critical Areas Land Use Permit and the issuance of a SEPA Threshold Determination. This first phase includes an appeal period for each of these permits or actions. The decisions made in the first phase of review are discretionary and the permits issued commonly include conditions associated with the approval of the project that must be incorporated or reflected in the project plans presented for construction. The permits and decisions issued in the first phase are not construction permits and do not allow for construction work to commence. Construction permits typically follow in the second phase, as described below.
- 2) The second phase is typically the review of the construction plans for a clearing and grading permit or building permit where the plans are reviewed for consistency with City requirements (Building Codes, Clearing and Grading Codes, Utilities Codes, Transportation Codes, etc.) and the decisions made in the first phase. The second phase generally results in the issuance of a building or clearing and grading permit that authorizes the work to be completed (i.e. a shovel to dirt permit).
- 3) The third phase is the construction and inspection phase. This is when the construction work commences and the project is built in accordance with the approved plans and permits. During this phase, inspections are scheduled to ensure the project is being built as approved.
- 4) The fourth phase is the maintenance and monitoring phase. This phase follows the completion of the work and is oriented at monitoring the success of the restoration project. The maintenance and monitoring period is typically five years in duration and requires the submittal of annual monitoring reports to the Development Services Department summarizing project success or failure to meet identified performance measures (as part of the project mitigation plans required by LUC 20.25H.220). Once the fifth year of maintenance and monitoring is complete, the project files are closed and the project is finalized.

Clearing and Grading, Building Division, Planning & Community Development

(Staff contact-Savina Uzunow, 425-452-7860, suzunow@bellevuewa.gov)

A Clearing and Grading Permit is required to perform fill and excavation for this project. The permit application must be in accordance with the Clearing and Grading Code, as outlined in the submittal requirements and the development standards (<http://www.bellevuewa.gov/8683.htm>)

EROSION AND SEDIMENTATION CONTROL	A temporary erosion and sedimentation control plan (TESC Plan) is required for this project and must be included with the initial clearing & grading permit application. Permanent erosion control must be included with the grading or landscaping plans. The permanent erosion control BMP's for this site should include covering all exposed soils with vegetation, pavement or structures.	BCC 23.76.090
TREE PROTECTION	Significant trees that are scheduled for retention must be protected during construction. Please refer to standard detail EC-21	Clearing & Grading Standards
CLEARING AND GRADING LIMITS	Clearing & Grading limits must be presented in the clearing & grading permit application. The limits should encompass the	Clearing & Grading

	entire project (including utilities and frontage improvements).	Standards
RAINY SEASON RESTRICTIONS	The project site is subject to rainy season restrictions. Specific approval from the Department of Planning and Community Development is required to begin or continue clearing & grading activities during the rainy season (Oct. 1 through Apr. 30).	BCC 23.76.093
CONSTRUCTION SEQUENCE	A construction sequence is required on the Temporary Erosion Control Plan. The sequence should include all erosion control and construction milestones. Maintenance practices need not be included.	Clearing & Grading Standards
SWPPP	A stormwater pollution prevention plan (SWPPP) is required for all clearing and grading permit applications for industrial, commercial, multi-family, plat and short plat developments. The SWPPP outline should be generally consistent with the SWPPP requirements of the National Pollutant Discharge Elimination System (NPDES) General Storm water Permit for Construction Activities. Please see http://www.bellevuewa.gov/8683.htm	BCC 23.76.025
TURBIDITY MONITORING PLAN	Turbidity and pH monitoring will be required during the major portion of the site grading. A monitoring plan must be submitted as part of the SWPPP with the Clearing & Grading permit application or during review.	BCC 23.76.025
NPDES PERMIT	Should the clearing area associated with this project exceed one acre Washington State Department of Ecology may require an NPDES Permit. The Storm Water Pollution Prevention Plan (SWPPP) prepared under NPDES permit must be submitted to the City of Bellevue for review. All other permits issued by various agencies need to be submitted for review prior to the permit issuance.	BCC 23.76.025

Transportation Department

Staff contacts – Rohini Nair, (425) 452-2569, rnair@bellevuewa.gov

Please note that these comments provide an initial review of the subject based on information provided at the pre-application meeting. Should the scope or nature of the proposal change, the comments provided herein may no longer be valid. All appropriate codes, development standards, and policies should be thoroughly researched prior to submitting formal plans to the City.

ROW USE PERMIT	The applicant must discuss with the City of Bellevue Transportation Department, Right of Way Division to determine the need of a Right of Way use permit, before the issuance of any clearing and grading, building, foundation, or demolition permit. In some cases, more than one right of way use permit may be required, such as one for hauling and one for construction work within the right of way. A right of way use permit regulates activity within the city right of way, including but not limited to the following: <ul style="list-style-type: none"> • Designated truck hauling routes. • Truck loading and unloading activities. • Hours of construction and hauling. • Continuity of pedestrian facilities. • Temporary traffic control and pedestrian detour routing for construction activities. • Street sweeping and maintenance during excavation and construction. • Location of construction fences. 	BCC 14.30 For more information call Jon Regalia, 425-452-4599.
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	<ul style="list-style-type: none">• Parking for construction workers.• Construction vehicles, equipment, and materials in the right of way.• All other construction activities as they affect the public street system.	
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1. The Transportation Department will require a Right of Way Use Permit for a Haul Route for more than 10 truckloads of material and or equipment traveling to / from site.
2. Traffic Control Plans for all phases for the project will need to be submitted and approved prior to any construction activity, if the activities require the stopping or delaying of any vehicular or pedestrian traffic.
3. Stockpiling of Equipment or materials must be done off the right of way, potentially at the private property of the site or a neighboring school or church with their permission.
4. An Annual Oversized Load Truck permit will be required for all trucking companies delivering or removing any oversized loads.

Land Use Division, Development Services Department
(Staff contact-David Pyle, 425-452-2973, dpyle@bellevuewa.gov)

Stream Channel Modification – Special Note: We have determined that the emergency action taken to address bank stability resulted in the filling of approximately 100 linear feet of stream channel and the enclosure of a previously open watercourse into a pipe. As part of the channel restoration design process, please consider how this impact will be addressed through mitigation. Preference is given to removal of fill, removal of pipe, and restoration of the actual channel to the maximum extent possible.

Stream Typing: This section of Yarrow Creek is currently mapped as a Type N stream. Due to the definition of a stream and the definition of stream habitat, additional consideration of stream channel characteristics is required to verify the typing of the reach of stream to be modified. Please include a stream typing summary with any application for critical areas land use permit.

Future Fish Passage – Habitat Considerations: As the downstream fish passage barrier is planned for removal as part of the SR 520 project, reaches of this tributary of Yarrow Creek may become accessible fish habitat. Please consider the affect this has on the project design. Similarly please be sure to include a summary of the affects of these actions on this project.

Critical Areas Land Use Permit: As this project is a proposal to modify critical areas, permit through critical areas review is required. The following is a list of requirements that must be met in designing the proposed project. Any future permit submittal must demonstrate consistency with these requirements. When preparing plans, environmental documentation, and project narratives, each of the code sections listed below must be addressed directly in the permit submittal package. Failure to address all of the standards or criteria listed below will result in the associated permit application being deemed incomplete and a revisions letter sent asking for inclusion the of the missing criteria or standard in the permit submittal package.

1. Allowed Use/Activity (LUC 20.25H.055.B)

Describe the project. We have identified this project fits under the stream stabilization measures and habitat improvement categories of the allowed uses section in LUC 20.25H.055.B.

2. Allowed Use/Activity Performance Standards

Please address each of the applicable performance standards listed in the allowed uses and development table of LUC 20.25H.055.B.

	Streams	Wetlands	Areas of Special Flood Hazard
Habitat improvement projects	20.25H.055.C.3.j 20.25H.080.A	20.25H.055.C.3.j 20.25H.100	20.25H.055.C.3.j 20.25H.180.C
Stabilization measures	20.25H.055.C.3.m 20.25H.080.A	20.25H.055.C.3.m 20.25H.100	20.25H.055.C.3.m 20.25H.180.C

3. Critical Areas Land Use Permit (LUC 20.30P)

Please respond to each of the criteria and explain how the project's objectives and design meets the criteria.

4. Critical Areas Report (LUC 20.25H.230 through LUC 20.25H.270)

Please identify how the submittal meets each of the submittal requirements and respond to each of the criteria and explain how the project's objectives and design meets the criteria. Generally, the critical areas report needs to identify how a net improvement is being achieved.

5. General Mitigation and Restoration Plan Standards (LUC 20.25H.210 through LUC 20.25H.225)

Please identify how the submittal meets each of the required standards.

6. Performance Standards (LUC 20.25H.080.B and LUC 20.25H.100)

Please address each of the applicable performance standards.

7. Mitigation Standards (LUC 20.25H.085 and LUC 20.25H.105)

Please identify how the submittal meets each of the required standards. Please identify how all impacts will be mitigated. If you have questions on this please contact me to discuss.

8. SEPA (BCC 22.02.045)

Please complete the SEPA checklist.

As part of your application, please also prepare each of the following documents. We will not accept copied sections of contract templates. Please create a plan set unique to this project.

1. Site plans accurately depicting the location of the all streams, wetlands, floodplains, and significant trees within the project vicinity. Please include wetland rating sheets and a basic wetland delineation report for all wetlands to be impacted by the proposal.
2. Site plans accurately depicting project limits, project access points, property boundaries, easement boundaries, topography, and clearing and grading limits (if proposed).
3. Project detail sheets identifying construction process (project plan set).
4. Report documenting existing stream conditions with reference to upstream and downstream conditions and effects of project on upstream and downstream conditions.
5. Site construction management practices to be applied during construction designed to minimize impact to each site.
6. Mitigation and restoration plans that address restoration of temporary impacts and mitigation of long term impacts (if any). Should follow requirements of LUC 20.25H.220 and must meet minimum requirements of LUC 20.25H.085 and LUC 20.25H.105.

Thank you for the opportunity to provide preliminary feedback on this proposal. After you have reviewed the comments above, please integrate additional information into your plans and submit an LO application at your convenience. Please let me know if you have any questions.

Sincerely,

Sent Via Email

David Pyle
Senior Environmental / Land Use Planner

Cc: Michael Paine, Environmental Planning Manager
Don Rust, Utilities
Savina Uzunow, Clearing and Grading
Rohini Nair, Transportation