OFFICE OF THE CITY AUDITOR
ENSURING OPEN AND ACCOUNTABLE GOVERNMENT

CITY OF PORTLAND

Office of City Auditor LaVonne Griffin-Valade

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DECISION OF THE HEARINGS OFFICER

I. GENERAL INFORMATION

File No.: LU 12-111963 EN
HO 4120007

Owners: Union Pacific Railroad (UPRR)
Attention: Jim Marshall
1400 Douglas Stop 1640
Omaha, NE 68179-1640

Bureau of Parks & Recreation
1120 SW 5th Avenue #1302
Portland, OR 97204

Applicants: Bureau of Environmental Services
Attention: Ronda Fast
1120 SW Fifth, Suite 1000
Portland, OR 97204

Tri-County Metropolitan
Attention: Leah Robbins
710 NE Holladay Street
Portland, OR 97232

Hearings Officer: Gregory J. Frank

Bureau of Development Services (BDS) Staff Representative: Stacey Castleberry

Site Address: 2425 SE Bybee Boulevard, and adjacent UPRR right-of-way

Legal Description: SECTION 13 1S 1E, TL 200 80.33 ACRES; Adjacent UPRR right-of-way

Tax Account No.: R991130220

State ID No.: 1S1E13 00200

Quarter Section: 3632

Neighborhood: Eastmoreland

Business District: None

District Coalition: Southeast Uplift

Plan District: Johnson Creek Basin Plan District/ Floodplain Subdistrict

Other Designations: 100-Year Floodplain

Zoning: OS c,p (Open Space base zone with Environmental Conservation and Environmetnal Protection overlay zones)

Land Use Review: Type III, Environmental Review (EN)

BDS Staff Recommendation to Hearings Officer: Approval with conditions

Public Hearing: The hearing was opened at 9:01 a.m. on April 11, 2012, in the 3rd floor hearing room, 1900 SW 4th Avenue, Portland, Oregon, and was closed at 10:30 a.m. The record was held open until 4:30 p.m. on April 23, 2012, for new written evidence, and until 4:30 p.m. on April 30, 2012, for Applicants' rebuttal, no new evidence. On April 23, 2012, the Applicants submitted a request to waive their rebuttal rights and to close the record effective April 23, 2012, at 4:30 p.m. (Exhibit H.13). The Hearings Officer granted the Applicants' request and closed the record on April 23, 2012, at 4:30 p.m.

Testified at Hearing:
Stacey Castleberry, BDS Staff Representative, Land Use Services, 1900 SW 4th Avenue, Suite 5000, Portland, OR 97201
Ronda Fast, Bureau of Environmental Services, 1120 SW 5th Avenue, Room 1000, Portland, OR 97204
Dave Unsworth, TriMet, 710 NE Holladay Street, Portland, OR 97232

Proposal: Tri-County Metropolitan ("TriMet") and the City of Portland Bureau of Environmental Services ("BES") (collectively referred to as the "Applicants") propose a railroad culvert construction project that includes four elements:
1) decommission an existing box culvert on Crystal Springs Creek under the UPRR's mainline tracks,
2) divert Crystal Springs Creek,
3) construct a second culvert 20 feet north of the existing culvert to improve fish passage, and
4) development of the Portland-Milwaukie Light Rail ("PMLR") including a retaining wall, ballast, track and catenary.

The existing culvert consists of twin box culverts, each 4.5 feet wide, 2.5 feet tall, and 122 feet long. This double box culvert increases stream velocities, and prevents upstream passage of juvenile salmon, especially at higher flows. The existing culvert will be abandoned in place, and the creek will be diverted to the new 145-foot long concrete box culvert, 20 feet to the north. The UPRR will continue in its current track alignment, over the new box culvert. The new culvert will accommodate the PMLR lines, continue to serve UPRR, anticipate future rail expansion demand in the region, enhance stream and wetland habitat, and improve conditions for salmon recovery in Crystal Springs Creek.

Note that review of additional UPRR rail lines is not included in this land use review.

The City of Portland maintains as many as 200 culverts citywide that may restrict fish passage and impede water flows. One key element in fish recovery in Portland is use of fish-friendly culverts to open up prime habitat for these endangered species.

BES's "Grey to Green" initiative[1] allocated $2 million of catalyst money to replace eight culverts over a five year period, all in Crystal Springs. Numerous culvert projects are planned during the summer of 2012 including culvert replacement at SE Tenino Street, SE Umatilla Street, and the Eastmoreland Golf Course, and removal of a culvert at the Brannen site between Tenino and Umatilla Streets. Completing the culvert replacement project that is subject to this review, during the summer of 2012, will multiply the benefits to salmon, maximize construction efficiencies, and expedite shared goals between TriMet and UPRR.

The proposed new culvert will be installed with 3 feet of constructed graveled streambed within the culvert. Fish rock boulders (24 to 30-inch round boulders) will be placed in clusters spaced 5 feet to 8 feet apart throughout the culvert, to provide hydraulic shadows useful for migrating juvenile salmon. Fish habitat in Crystal Springs Creek will be improved by the installation of large woody debris, boulders, and stream substrate to improve habitat quality. Wetlands upstream and downstream of the railroad culvert will also be restored as part of this project.

A portion of the site is within the City's Environmental Conservation and Environmental Protection overlay zones. Certain standards must be met to allow the work to occur by right. If the standards are not met, an Environmental Review is required. In this case, the proposed culvert construction project exceeds the disturbance area allowed by standard, includes disturbance in the Environmental Protection overlay zone, and is not set back 30 feet from top of bank of Crystal Springs Creek. Standards 33.430.140 A, B, and C are not met by the proposal; therefore the work must be approved through an Environmental Review.

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[1] The City of Portland started the Grey to Green initiative in 2008 to expand stormwater management techniques that mimic natural systems, protect and restore natural areas, and improve watershed health. These investments in green infrastructure improve the quality of our neighborhoods, rivers and streams, and help us adapt to a changing climate. Additional information: http://www.portlandonline.com/bes/index.cfm?c=47203.

Approval Criteria: In order to be approved, this proposal must comply with the approval criteria of Title 33, Portland Zoning Code ("PCC"). The applicable approval criteria are:

- **PCC 33.430.250 A.** Public safety facilities, rights-of-way, driveways, walkways, outfalls, utilities, land divisions, Property Line Adjustments, Planned Developments, and Planned Unit Developments.
- **PCC 33.430.250 F.** Other development in the Environmental Protection zone.

II. ANALYSIS

Description of the Site: The site of the new culvert construction project is in southeast Portland, along the west edge of Eastmoreland Park, and approximately 1,000 feet north of SE Bybee Boulevard. Most of the work area lies in UPRR right-of-way; however, approximately 3,500 square feet of the work area occurs on Eastmoreland Park property.

Crystal Springs Creek is a 2.7 mile long creek that originates from springs in Reed Canyon and Eastmoreland Golf Course, to the northeast of the project site. The creek flows southwest from multiple spring headwater sources, crosses UPRR tracks and SE McLoughlin Boulevard, then flows south through Westmoreland Park and the surrounding residential area.

Crystal Springs Creek flows into Johnson Creek approximately one mile south of the work area. Crystal Springs Creek provides cool, year-round flows to Johnson Creek. This cool, year-round flow provides important habitat for federally-listed threatened and endangered fish species such as Coho and Chinook salmon and Steelhead trout. Surveys conducted by the Oregon Department of Fish and Wildlife ("ODFW") found a range of native species distributed throughout Crystal Springs Creek, including Chinook and Coho salmon, Rainbow and Cutthroat trout, lamprey, large-scale sucker, sculpin, Northern Pike minnow, and others.

Native steelhead are also found in Johnson Creek and likely utilize Crystal Springs Creek. However, the creek contains several obstacles for fish passage. BES, together with several partners such as TriMet, Metro, and other agencies, are working to enhance conditions in Crystal Springs Creek for the benefit of native fish with a focus on removing or replacing the nine culverts that restrict fish passage.

Infrastructure: The project proposed in this case is one of many BES' projects along Crystal Springs Creek. One of the City of Portland's Grey to Green Initiatives (see footnote[1]) is to remove or replace eight fish passage barriers within the system to allow salmon access to the valuable spawning, rearing, and refuge habitat.

An 8-inch concrete public combined gravity sewer is located east of SE McLoughlin Boulevard. There is no public storm-only sewer available to this property. There are no public water facilities at this location or within the boundaries of work depicted.

SE McLoughlin Boulevard is mapped as an Urban Highway, Regional Trafficway, City Bikeway, and City Walkway, and is 100 feet wide in the vicinity of the proposed culvert. The UPRR right-of-way is approximately 240 feet wide in the project area.

Zoning: The zoning designation on the site includes the Open Space ("OS") base zone, with Environmental Conservation ("c"), and Environmental Protection ("p") overlay zones (see zoning on Exhibit B). The OS base zone regulations do not address development of culverts for managing the flow of streams.

Environmental overlay zones protect environmental resources and functional values that have been identified by the City as providing benefits to the public. The environmental regulations encourage flexibility and innovation in site planning and provide for development that is carefully designed to be sensitive to the site's protected resources. They protect the most important environmental features and resources while allowing environmentally sensitive urban development where resources are less sensitive. The purpose of this land use review is to ensure compliance with the regulations of the environmental zones.

Environmental Resources: The application of the environmental overlay zones is based on detailed studies that have been carried out within eight separate areas of the City. Environmental resources and functional values present in environmental zones are described in environmental inventory reports for these study areas.

The project site is mapped within the *Johnson Creek Basin Protection Plan* as Site #2 Crystal Springs. Resources and functional values of concern on the project site include water, storm drainage, scenic, fish and wildlife habitat, aesthetics, heritage, flood storage, recreation, and education. Much of Site #2 is historic floodplain and is now landscaped City park ("Westmoreland Park") and Golf course ("Eastmoreland Park"). The combination of grassland and adjacent water bodies provides important wintering habitat for waterfowl in the urban setting. The creek channels provide aquatic habitat for steelhead, trout, and salmon. Crystal Springs, which flows into Johnson Creek just south of Site #2, is one of the few creeks in Portland that supports a population of native Cutthroat trout and steelhead. The score for wildlife habitat value of Site #2 is 39 out of a possible 83.

Impact Analysis and Mitigation Plan: A full description of the proposal was provided earlier in this decision. The following discusses development alternatives, other than the one proposed, that were considered by the Applicants. The following additionally describes the proposed Construction Management Plan (see Exhibit H.13x), mitigation and monitoring proposal.

Development Alternatives:
The new culvert is designed to accommodate the development of the Portland-Milwaukie Light Rail project lines, anticipate future rail expansion demand in the region, enhance stream and wetland habitat, and improve conditions for salmon recovery in Crystal Springs Creek. This project, coupled with upstream and downstream efforts, presents a unique restoration opportunity to replace an

existing culvert, restore a degraded wetland, create spawning habitat for endangered fish species, and remove invasive plants and replant with natives.

The following alternatives were evaluated:

Alternative light rail alignments: The preferred alignment utilizes the main transportation corridor (99E/UPRR main line) to avoid community impacts and greater impacts to natural or recreational resources in the corridor. All other possible alignments considered and rejected in this corridor are described below:

- The Springwater Corridor alignment would be adjacent to, and encroach on, sensitive wetland and riparian habitat along the Willamette River and could impact the existing Springwater Corridor trail – a vital non-motorized transportation and recreation feature that is protected as a federal Section 4(f) resource.

- SE Milwaukie Avenue, runs parallel to the preferred alignment, but is also too narrow to accommodate the width of the light rail project. Using SE Milwaukie Avenue would require demolition of all businesses on one side of the street, causing severe community impacts, and impacts to federally-designated Section 106 historic resources.

- The Willamette Shoreline right-of-way on the west side of the Willamette River was considered but would result in severe community impacts due to potential residential displacements from enlarging the corridor for light rail. This option would impact Stephen's Creek within a sensitive riparian habitat along the Willamette River known as Butterfly Park – a 4(f) resource.

- Residential neighborhoods on either side of the UPRR and Highway 99E (SE McLoughlin Boulevard) corridor also lack the available right-of-way width due to residential-sized streets, potential residential displacements, and noise and vibration impacts to remaining structures – many of which would be considered Section 106 historic resources.

- An alignment on either the west side of 99E or the east side of UPRR would impact recreational and historic resources – Westmoreland Park and Eastmoreland Golf Course. Both of these sites are considered Section 4(f) resources, which require feasible and prudent avoidance alternatives to be chosen, if available. Neither of these sites allows for avoidance of Crystal Springs Creek.

- Finally, locating the light rail alignment closer to Hwy 99E was not allowed by the Oregon Department of Transportation ("ODOT") in order to preserve future right-of-way for road widening. Again, re-aligning the light rail tracks closer to 99E would not avoid crossing Crystal Springs Creek.

As described above, alternative alignments considered would result in residential displacements, severe community impacts, impacts to other sensitive habitat, and conflict with federally protected

historic and recreational resources. The only remaining feasible and prudent alternative in this corridor for a light rail alignment was the UPRR right-of-way. UPRR requires a 50-foot separation from the centerline of their tracks for safety reasons, which places the light rail alignment over the new culvert west of the UPRR tracks.

Alternative Design - Construct light-rail bridge over existing culvert (Pre-app proposal – 11-153522): Originally, TriMet proposed a bridge over the top of the existing Crystal Springs Creek culvert, to avoid impacts on wetlands and avoid manipulating the creek or the culvert altogether. However, since that time, TriMet has gained UPRR approval to construct a new culvert underneath the rail corridor. UPRR has concerns about the long-term liability of the old culvert and anticipates that it would need serious maintenance.

The existing culvert is a twin box culvert, timber-framed (likely creosote), each 4.5 feet wide, 2.5 feet tall and 122 feet long. The new culvert will be 145 feet long to accommodate both future light rail development and future UPRR expansion needs, although there are no plans to expand UPRR lines. The new culvert, while longer, will provide improved fish passage with the installation of fish rock boulders (24-inch to 30-inch round boulders) and provide hydraulic shadows especially useful for migrating juvenile salmonids.

The construction of a new bridge, a separate structure, over the top of the existing culvert would preclude construction access to replace it, without extended rail service disruptions, a major economic consideration with regional impacts. A new bridge would, therefore, preclude habitat benefits of constructing a new fish-friendly culvert. A new bridge would eliminate the possibility of upgrading the culvert both for UPRR and for the benefit of native fish.

Therefore, UPRR agreed to become a partner in this project, understanding that a single project better meets the collective needs of UPRR, TriMet, the City of Portland and the environment than multiple separate projects.

Alternative Design- New culvert versus upgrade of existing culvert After reviewing constructability issues with upgrading the existing culvert, while lengthening it, while making habitat improvements within it, all while minimizing disruptions to rail line operations, project designers and contractors determined that building a new culvert, rather than replacing the existing culvert in place, will allow the work to be completed during the short in-water work window and minimize rail line service disruptions.

This option required slightly more permanent impacts within the Environmental Protection zone, but given that the overall project footprint within resource areas is small (1,250 square feet) the benefits far outweigh project impacts. (Exhibit A.1, Attachment 4)

This option takes advantage of opportunity to partner with UPRR and, with minimal disruption to crucial rail service, accommodate both light rail development and fish passage improvements via a new culvert.

Construction Management Plan:
In order to construct the new culvert underneath a rail line with minimal service interruptions, coordination between contractors and UPRR is required. Staged construction will allow for minimal disruption to crucial rail service in the Portland area along UPRR's mainline. Utilizing the existing culvert as a bypass, the new culvert will be constructed above ordinary high water 20 feet north of the existing structure.

The new culvert structure is comprised of 10-foot by 6-foot pre-cast segments lined with 3 feet of natural streambed material, installed in a trench approximately 55 feet wide by 15 feet deep. Immediately following culvert work, the light rail retaining walls and trackway will be constructed. The timing of this work is critical because the retaining wall uses the culvert for structural support over the creek. Retaining walls, rather than graded slopes, were selected to minimize disturbance in the environmental zones. The PMLR-related work will be submitted as a separate building permit package from the culvert work due to the linear nature of the light rail work.

Attachment 4 of Exhibit A.1, as modified by Exhibit H.13x, in the application case file provides the Applicants' step-by-step phased construction plan, including early staging and upland excavation activities, in-water work accompanied by fish salvage and stream diversion to the new culvert, and final demobilization.

Construction is anticipated to begin in summer 2012. Timing of construction activities will meet the required In-Water Work Periods as required by ODFW of July 15 – August 31. Based on preliminary conversations with State and Federal agencies, it is likely that an in-water work window extension will be requested through the end of September.

Tree Protection Measures: During construction activities, temporary fencing, barricades, and guards will protect trees and other plants which are to remain from all damage. Protective barrier fence will be installed prior to the start of any activity which may potentially intrude into root protection zones of trees and will be removed only after all work potentially injurious to trees and other plants is complete.

No trees will be removed as part of this project and no root protection zones of any trees will be disturbed by construction activities. Tree protection fencing will be 6-foot high chain link and be secure to the ground with 8-foot metal posts.

Limits of disturbance will be delineated with 4-foot tall orange construction fencing. All construction traffic shall be excluded from areas outside the limits of disturbance in order to retain undisturbed natural vegetation areas. There shall be no disturbance of native vegetation outside of the limits of disturbance as shown on the construction drawings. Care will be taken to avoid damage to the canopy of any trees overhanging the limits of disturbance.

Erosion Prevention and Sediment Control: Erosion prevention and sediment control within the construction zone of the proposed project will follow best management practices and conform to the Construction Management Plan (Exhibit A.4 as modified by Exhibit H.13x) and to clearing, grading

and erosion control code contained within the City of Portland Erosion Control Manual and Title 10.

Work will be conducted during summer months, when risk of rain and runoff are greatly reduced. City staff will be present on the job site at all times, and will have coir fabrics and other geotextiles and erosion control measures on site. City staff will monitor erosion control devices twice daily. Equipment, materials, and personnel will be excluded from wetlands and waterways using silt fences and exclusion zone fences where work will not be conducted, as shown on the plans.

Construction equipment will enter the site from the access road from the north via SE Harold Street and utilize existing gravel access roads and existing disturbed areas. Site construction activities will include the use of an excavator, small bulldozer, track hoe, crane and dump truck. Heavy equipment having the least adverse effect on the environment will be selected (e.g., minimally-sized, low ground pressure equipment). All equipment (excavation and hauling) operating within site wetlands and dewatered stream channels will have less than or equal to 4 psi ground pressure. The Eastmoreland Golf Course access road southeast of the project site will not be used.

Construction is anticipated to occur in July through September and be completed prior to the start of the rainy season. Orange protective fencing will be installed to isolate disturbance areas and vegetation while chain link fence will be used around trees prior to any ground disturbing activities. All construction activities will occur within the fenced area (within the limits of disturbance) to minimize the disturbance of vegetation and soil. Sediment fencing will be installed down grade of the staging and fill areas.

Watershed Revegetation Program ("WRP") staff at BES will provide native seed to the construction contractor for application to all exposed/disturbed soils within the project boundaries including all graded areas, access roads, staging areas, and stockpile areas. Additionally, WRP may apply native seed to other areas within the project boundary to provide competition to invasive plant species and aid in vegetation management. Species composition of the native seed mix is shown in Table 1. All seed material will be collected and/or propagated from local seed sources to help maintain local genetics and improve survival. Seed will be applied during and after construction activities in Summer/Fall 2012.

Unavoidable Impacts:
Impacts of the project on fisheries resources are expected to be temporary and minimal. Potential impacts on aquatic habitat and organisms may include: acoustic disturbances, physical disturbance of resident fish species during rescue, and risk of fuel spills from construction equipment. Potential impacts on wildlife include temporary loss of habitat and acoustic disturbances during construction.

Proposed Mitigation:
The Applicants propose to provide and install all native woody plant materials. Materials will consist of native trees and shrubs in the form of bare-root seedlings and live cuttings. All plant materials are collected and/or propagated from a Portland metro area wild population/seed source.

Installation of these materials shall occur in winter 2013 and include 275 native trees, planted 8 feet apart, and 450 shrubs planted in clusters of 3, with willow cuttings planted in clusters of 10.

Monitoring Plan for Mitigation:
BES has prepared monitoring and documentation guidelines for upland, riparian and wetland areas to assess conditions and identify trends in order to increase the continued success of planting projects (see Exhibit A.1, Attachment 8). Monitoring includes assessment of plant mortality and its causes. BES will interplant areas where stocking falls below a level that will ensure occupancy of the site by native plants within 10 years. BES may prescribe other treatments to reduce further plant mortality or to further enhance project areas.

Non-native vegetation will be suppressed by mechanical or chemical means for the first five years. Cutting and/or spraying treatments will occur 1-4 times annually, depending on regrowth of exotic vegetation. If survival of planted seedlings falls below acceptable levels, maintenance will be intensified and high-mortality areas will be interplanted. It is expected that after the first five years, native trees and shrubs will be well established.

Land Use History: City records indicate there are several prior land use reviews for this site. Exhibit G.2 in the application case file provides a complete summary of all these land use reviews. Most of the previous land use reviews are related to golf course improvements. Prior land use reviews are listed below:

- LUR 94-00096 EN – Approved with conditions an Environmental Review to construct two fish habitat enhancement projects in the reach of Crystal Springs.
- LUR 99-00246 EN – Approved with conditions an Environmental Review to regrade fairways 15 and 16 at Eastmoreland Golf Course to alleviate flooding and high ground water conditions.
- LUR 99-00448 EN – Approved with conditions an Environmental Review for the Crystal Springs Stream/Lake Restoration project.
- LU 03-144079 EN - Approved with conditions an Environmental Review for replacement of the SE Bybee Boulevard Bridge, construction of a water quality facility, and replacement of a pedestrian tunnel under SE Bybee Boulevard.
- LU 04-027653 EN – Approved with conditions Environmental Review for resource enhancement to add large wood and boulders along Crystal Springs Creek.
- LU 11-190987 EN - Approved with conditions Environmental Review for resource enhancement to remove a triple-barrel culvert, construct a bridge, remove concrete bank material, and place large woody debris (LWD), boulders, and stream substrate in and along Crystal Springs Creek in the Golf Course at Eastmoreland Park.

- Metro Council Land Use Final Order and House Bill 3478.[2]

Exhibit G.2 in the application case file provides a complete summary of all these land use reviews. None of those land use reviews have direct bearing on the current proposal.

Agency and Neighborhood Review: A Notice of Proposal in your Neighborhood was mailed on March 19, 2012.

1. Agency Review: The Portland Water Bureau, BES, and the BDS Site Development Services Section responded to this proposal (Exhibits E.1, E.2, and E.3). The comments are addressed under the appropriate criteria for review of the proposal.

2. Neighborhood Review: No written responses have been received from either the Neighborhood Association or notified property owners in response to the proposal.

ZONING CODE APPROVAL CRITERIA
33.430.250 Approval Criteria for Environmental Review
An environmental review application will be approved if the review body finds that the applicant has shown that all of the applicable approval criteria are met. When environmental review is required because a proposal does not meet one or more of the development standards of Section 33.430.140 through .190, then the approval criteria will only be applied to the aspect of the proposal that does not meet the development standard or standards.

Findings: The approval criteria which apply to the proposed new culvert and stream diversion, are found in **Section 33.430.250 A** for work in the right of way, and **Section 33.430.250 F** for work on Parks-owned property. The proposed culvert construction occurs on both right-of-way and Parks-

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[2] In 1996, the Oregon Legislature passed House Bill 3478. House Bill 3478 established a special land use decision-making process for the South-North Project, of which the Portland-Milwaukie Light Rail Project is a part, to ensure its timely and cost-effective construction. Pursuant to this Bill, in 2008, the Metro Council adopted a land use final order ("LUFO") amendment for the South-North Project.

Under Section 3 of HB 3478, the LUFO processes are described for approving the location of the light rail route, stations, lots and maintenance facilities, and highway improvements for the project and project extension. These are "the only land use procedures and requirements" that are required to approve these locational elements.

Under Section 8, affected local governments are required to "issue the appropriate development approvals, permits, licenses and certificates necessary for the construction of the project or project extension consistent with the" LUFO. In issuing these approvals, affected local governments may, however, impose "reasonable and necessary conditions of approval" as long as they do not "by themselves or cumulatively, prevent implementation of the" LUFO.

The City, therefore, does not have the ability to say that the PMLR route or component elements of the route are not allowed or must go elsewhere, but does have the ability to impose reasonable and necessary conditions of approval.

The culvert project will include development that triggers the City's environmental reviews. Using the land use review procedures specified in PCC for these reviews – and the applicable approval criteria – is an appropriate way to enable the City to determine what "reasonable and necessary conditions to impose on the project."

owned property, although it is a single construction project. Therefore findings for the approval criteria will be combined where the criteria overlap.

The Applicants have provided findings for these approval criteria and BDS Land Use Services staff have revised these findings or added conditions, where necessary to meet the approval criteria.

Section 33.430.250 A. Public safety facilities, rights-of-way, driveways, walkways, outfalls, utilities, land divisions, Property Line Adjustments, Planned Developments, and Planned Unit Developments. Within the resource areas of environmental zones, the applicant's impact evaluation must demonstrate that all of the general criteria in Paragraph A.1 and the applicable specific criteria of Paragraphs A.2, 3, or 4, below, have been met:

Since this activity is neither a Public Safety Facility nor a Land Division or Planned Development, the criteria in Sections 33.430.250 A.2 and A.4 do not apply and are not included.

Section 33.430.250 F. Other development in the Environmental Protection zone. In Environmental Protection zones the applicant's impact evaluation must demonstrate that all of the following are met:

A.1. General criteria for public safety facilities, rights-of-way, driveways, walkways, outfalls, utilities, land divisions, Property Line Adjustments, Planned Developments, and Planned Unit Developments;

A.3. Rights-of-way, driveways, walkways, outfalls, and utilities;
A1.a. Proposed development locations, designs, and construction methods have the least significant detrimental impact to identified resources and functional values of other practicable and significantly different alternatives including alternatives outside the resource area of the environmental zone;
A.3.a. The location, design, and construction method of any outfall or utility proposed within the resource area of an environmental protection zone has the least significant detrimental impact to the identified resources and functional values of other practicable alternatives including alternatives outside the resource area of the environmental protection zone;
F.1. All sites within the Portland city limits, in which the proposed use or development is possible, are also in the resource areas of Environmental Protection zones;
F.2. Of these sites, development on the proposed site would have the least significant detrimental environmental impact;

Findings: These criteria require applicants to review alternative locations, including locations outside the resource area of the Environmental Protection overlay zone, as well as alternative designs and construction methods for the proposal; to demonstrate that alternatives were considered during the design process; and to ascertain that there are no practicable alternatives that would be less detrimental to the identified resources and functional values.

The Applicants provided an alternative analysis that can be found in the application case file in Exhibit A.1 Attachment 6. It is summarized earlier in this decision.

Alternative alignments considered for the PMLR would result in residential displacements, severe community impacts, impacts to other sensitive habitat, and conflict with federally-protected historic and recreational resources. The only remaining practicable alternative in this corridor for a light rail alignment was the UPRR right-of-way. UPRR requires a 50-foot separation from the centerline of their tracks for safety reasons, which places the light rail alignment west of the UPRR lines, over the proposed culvert.

Other alternatives considered by the Applicants included a bridge constructed over the top of the existing culvert, to support the new light rail lines, and improving the existing culvert in place, rather than constructing a new, fish-friendly culvert. The bridge option would preclude construction of a culvert allowing fish passage, in the foreseeable future, and would not provide the environmental benefits associated with the new fish-passable culvert. Retrofitting and lengthening the existing culvert in place would create construction challenges, given the short ODFW-limited in-water work period, and would be impracticable given the associated UPRR service interruptions.

The proposed light rail track alignment and new culvert construction will pass through one of the lowest-ranked sites within the Johnson Creek Basin Protection Plan. The project site is located within the boundaries of Site #2 in the "Johnson Creek Watershed Summaries of Resource Site Inventories" document. Generally the site is highly modified, flat, historic floodplain. There is no public access to this site although the creek, wetlands, and riparian areas provide aesthetic value, and important wintering habitat for waterfowl within the urban environment.

The selected alignment of PMLR will connect Portland to Milwaukie and utilize existing rail right-of-way, which crosses Crystal Springs Creek and associated Environmental Protection overlay zoned areas. The alignment minimizes the impact to the natural and built environments in comparison to other viable alignments. However, significant improvement will be made to Crystal Springs Creek for the migration, rearing, feeding or spawning of fish as a result of this project that would likely not have been made if other options were pursued. Therefore the proposal will have the least significant detrimental impact to environmental resources of other practicable alternatives, including those outside the Environmental Protection zone, and *these criteria are met.*

F.3. There is a public need for the proposed use or development;

F.4. The public benefits of the proposed use or development outweigh all significant detrimental impacts;
Findings: The long-term benefits of restoring Crystal Springs Creek are expected to outweigh potential temporary, short-term impacts and permanent impacts related to construction of a new culvert. The project will restore approximately 300 feet of high quality fish bearing habitat and

nearly one-half acre of upland and wetland habitat. There are public needs for both the light rail corridor work and the culvert work (which are related).

Light Rail corridor development benefits, according to TriMet:

Economic Benefits: The PMLR project will create up to 14,500 jobs and generate up to $573 million in personal earnings. Additionally, land use growth around stations will be more compact and pedestrian-friendly than without the project, resulting in increased property tax revenue and more efficient delivery of government services.

Traffic Benefits: The PMLR project will reduce vehicle trips each weekday by more than 9,100 (or 60,000 vehicle miles). Additionally, more than $30 million in bicycle and pedestrian improvements along the alignment will result in additional reductions in vehicle miles traveled.

Transit Benefits: The PMLR project will improve travel time between Milwaukie and the South Waterfront by 58 percent, and Milwaukie and PSU by 29 percent. The line is projected to carry an average of 22,765 to 25,500 weekday rides by 2030 – about 10,000 more transit trips per day than without the Project.

Environmental Benefits: The PMLR project has many environmental benefits from reducing vehicle trips and increasing transit trips, such as improved water and air quality. The PMLR project will also reduce development pressure on the Urban Growth Boundary by supporting more compact development patterns where more trips can be made by walking and bicycling than in less compact, single-use neighborhoods.

Culvert Replacement benefits: There are nine culverts on Crystal Springs Creek between SE 28th Avenue and the creek's confluence with Johnson Creek that impede fish passage, especially for juveniles. Many culverts inhibit fish from swimming upstream and downstream to reach spawning and rearing habitat. Culvert replacement or removal is a key element of recovery of endangered juvenile salmon and trout species. Replacing Crystal Springs Creek culverts with fish-friendly culverts will open up nearly three miles of prime habitat for threatened native fish species.

There are about 200 culverts in Portland that may restrict fish passage, impede water flow and contribute to flooding and erosion. BES's Grey to Green initiative allocated $2 million dollars to replace eight culverts all in Crystal Springs Creek over five years. BES is collaborating and leveraging funds with other bureaus, agencies, and partners to replace all fish passage barriers in Crystal Springs by the end of 2014. Replacing the railroad culvert is a unique opportunity to provide fish passage to the headwaters of Crystal Springs.

There is a public need for these improvements and the potential public benefits of the new culvert outweigh potential short term and long term construction impacts, and *these criteria are met.*

A.1.b. There will be no significant detrimental impact on resources and functional values in areas designated to be left undisturbed;

A.3.b. There will be no significant detrimental impact on water bodies for the migration, rearing, feeding, or spawning of fish; and

F.5. There will be no significant detrimental impact on resources and functional values in areas designated to be left undisturbed;

Findings: These approval criteria require the protection of resources outside of the proposed disturbance area from impacts related to the proposal, such as damage to vegetation beyond the approved limits of disturbance, erosion of soils off the site, and downstream impacts to water quality and fish habitat from increased stormwater runoff and erosion off the site.

The Applicants provided a detailed description of the Construction Management Plan in the application case file (Exhibit A.1 Attachment 4 as modified by Exhibit H.13x), in addition to a graphic Construction Management Site Plan (Exhibits C.11 and C.14). The Construction Management Plan is described in detail earlier in this decision.

Construction management techniques have been proposed by the Applicants to minimize impacts to identified resources and functional values designated to be left undisturbed, including project phasing, fish salvage, stream work isolation areas, in-water work within state and federal required work periods for the protection of migrating fish, tree protection measures, erosion and sediment control, and restoration of construction areas upon completion of work.

BDS Site Development Services staff have noted that:

"The site is located in the 100-year floodplain as shown on FEMA Flood Insurance Rate Map 4101830182E dated 10/19/04. The base flood elevation of the 100 year flood event is 56 feet North American Vertical Datum. All development in the floodplain is subject to the applicable requirements of Chapter 24.50, Flood Hazards.

No fill may be placed at or below the base flood elevation unless a compensating amount of material is removed from the same flood zone. The plans (Sheet C3) indicate fills will be balanced by an equal amount of excavation and no further information is required.

This reach of Crystal Springs Creek is not mapped as a floodway, therefore, a No-Rise analysis is not required. However the culvert replacement and re-channelization of the creek is considered an alteration of a watercourse. As such, the applicant is required to comply with 44 CFR 60.3.b.6:

Notify, in riverine situations, adjacent communities and the State Coordinating Office prior to any alteration or relocation

of a watercourse, and submit copies of such notifications to the Federal Insurance Administrator.

And 44 CFR 60.3.b.7:

Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained

If the watercourse alteration affects flooding conditions, either increasing or decreasing flood elevations, the applicant is responsible to submit the changes to FEMA within 6 months of the change in accordance with 44 CFR 65.3:

A community's base flood elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, a community shall notify the Administrator of the changes by submitting technical or scientific data in accordance with this part. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and flood plain management requirements will be based upon current data.

The applicant is responsible for ensuring the changes are submitted.

The applicant has submitted a memorandum from the Bureau of Environmental Services which states that the potential effects of the proposed design were analyzed by HEC-RAS modeling and that there was no rise in the water surface elevation of the 100 year flood event. Site Development takes no exceptions to the conclusions of the BES memorandum."

BDS Site Development staff required two conditions of approval to be included with this land use review:

"*1. A building permit is required, unless construction drawings are prepared on plans signed by the City Engineer or BES Chief Engineer.*

2. The applicant shall submit a map revision to FEMA within six months of project completion."

While the narrative describes in detail the construction management practices to be used in regrading and diversion of the creek, and construction of the new culvert, a detailed graphic Construction Management Plan depicting this information in detail will be required prior to any construction activity. Therefore, either a BDS building permit or a Zoning Permit will be required to enable BDS staff to review and inspect the construction management practices.

With these conditions, *these criteria can be met by the proposal.*

A.1.c. The mitigation plan demonstrates that all significant detrimental impacts on resources and functional values will be compensated for;

F.6. The mitigation plan demonstrates that all significant detrimental impacts on resources and functional values will be compensated for;

Findings: This criterion requires the applicant to assess unavoidable impacts and propose mitigation that is proportional to the impacts, as well as sufficient in character and quantity to replace lost resource functions and values. The proposed mitigation plan is described in detail earlier in this decision.

A detailed analysis of impacts and mitigation is included in Exhibit A.1 in the application case file, Attachment 4 and the revegetation and monitoring plans are detailed in Attachments 7 and 8. Overall, approximately 1,250 square feet of permanent disturbance is proposed within the resource area of the environmental zones. Temporary disturbance within resource areas is proposed within a 3,977 square foot area. Given the benefits of the project on native fish and wildlife and regional transportation opportunities, the benefits of this proposal far outweigh the impacts. In addition to numerous in-stream benefits, nearly 15,000 square feet will be improved and restored. This area will be treated for invasive removal, replanted with native vegetation, and monitored by BES Revegetation Program staff for five years.

With conditions to ensure that plantings required for this Environmental Review are maintained and inspected, *this criterion can be met.*

A.1.d. Mitigation will occur within the same watershed as the proposed use or development and within the Portland city limits except when the purpose of the mitigation could be better provided elsewhere; and

A.1.e. The applicant owns the mitigation site; possesses a legal instrument that is approved by the City (such as an easement or deed restriction) sufficient to carry out and ensure the success of the mitigation program; or can demonstrate legal authority to acquire property through eminent domain.

F.7. Mitigation will occur within the same watershed as the proposed use or development and within the Portland city limits except when the purpose of the mitigation could be better provided elsewhere; and

F.8. The applicant owns the mitigation site; possesses a legal instrument that is approved by the City (such as an easement or deed restriction) sufficient to carry out and ensure the success of the mitigation program; or can demonstrate legal authority to acquire property through eminent domain.

Findings: Mitigation will occur immediately downstream of the project area, within the UPRR right-of-way, and within the same watershed as the proposed development and within the

Portland city limits. Mitigation for significant detrimental impacts will be conducted on the same site as the proposed use or development, and the Applicants own the proposed on-site mitigation area.

TriMet is in the process of acquiring land from UPRR for light rail tracks (western side).

TriMet is developing Intergovernmental Agreements with UPRR, BES, and Portland Parks for continuing control necessary for the mitigation program.

These criteria are met.

A.3.c. Water bodies are crossed only when there are no practicable alternatives with fewer significant detrimental impacts.

Findings: No water bodies will be crossed by the proposed development. *This criterion does not apply.*

III. CONCLUSIONS

The proposed culvert construction project will decommission an existing box culvert on Crystal Springs Creek under UPRR's mainline tracks and construct a new culvert 20 feet north of the existing culvert to improve fish passage. The new culvert is designed to accommodate the PMLR development (retaining wall, track, ballast and catenary) and anticipate future Union Pacific rail expansion. Crystal Springs Creek will be diverted to flow through the new culvert. Habitat enhancements include the installation of large woody debris boulders and stream substrate to improve habitat quality. Wetlands upstream and downstream of the UPRR culvert will also be restored as part of this project.

The Hearings Officer concluded that the application, with the imposition of conditions, meets the applicable approval criteria.

IV. DECISION

Approval of an Environmental Review for:

- Construction of a new fish-friendly culvert approximately 20 feet north of an existing double box culvert in UPRR right-of-way, and on City-owned parks property;
- Diversion of Crystal Springs Creek approximately 20 feet north, to the new culvert;
- Installation of large woody debris, boulders, and fish-habitat gravel in Crystal Springs Creek and in the new culvert; and
- Grading, bank work, isolation of work areas, erosion control, and replanting, associated with the above listed construction activities; and
- Portland-Milwaukie light rail development including retaining wall, track, ballast and catenary;

all within the Environmental Conservation and Protection overlay zones, and in substantial

conformance with Exhibits H.13g, H.13h, H.13i, H.13j, H.13k, H.13l, H.13m, H.13n, H.13o (2 pages), H.13p, H.13q, H.13r and H.13s. Approval is subject to the following conditions:

A. The Applicants shall submit a map revision to FEMA within six months of project completion, or as otherwise approved by FEMA.

B. All permits: Copies of the stamped Exhibits H.13g, H.13h, H.13i, H.13j, H.13k, H.13l, H.13m, H.13n, H.13o (2 pages), H.13p, H.13q, H.13r and H.13s from LU 12-111963 EN and Conditions of Approval listed below, shall be included within all plan sets submitted for permits (building, grading, Site Development, erosion control, zoning, etc.). These exhibits shall be included on a sheet that is the same size as the plans submitted for the permit and shall include the following statement, *"Any field changes shall be in substantial conformance with approved Exhibits H.13g, H.13h, H.13i, H.13j, H.13k, H.13l, H.13m, H.13n, H.13o (2 pages), H.13p, H.13q, H.13r and H.13s."*

1. The Applicants shall obtain a building permit from BDS, unless construction drawings are prepared on plans signed by the City Engineer or BES Chief Engineer.
2. If a building permit is not required, the Applicants shall obtain a zoning permit from BDS.
3. The Applicants shall obtain the required permit from BDS prior to commencement of any of the proposed clearing, grading or construction activities, for BDS review of final plans and on-site inspections, as follows: as part of the application for the BDS permit, the Applicants shall submit a final Construction Management Plan, in substantial conformance with Exhibit C.11, and showing the following:
   a. Temporary construction fencing shall be installed according to Section 33.248.068 (Tree Protection Requirements), except as noted below. In addition, construction fencing shall be placed along the Limits of Culvert Construction for the new culvert, as depicted on Exhibit H.13p Construction Management Plan, or as required by inspection staff during the plan review and/or inspection stages.
   b. No mechanized construction vehicles are permitted outside of the approved "Limits of Culvert Construction" delineated by the temporary construction fence, or within the root protection zones of trees to be protected. All planting work, invasive vegetation removal, and other work to be done outside the Limits of Construction Disturbance, shall be conducted using hand held equipment.

C. A total of 275 trees, 450 shrubs, and 4,265 square feet of native ground covers, selected from the Portland Plant List, shall be planted, in substantial conformance with Exhibits H.13n and H.13o.

1. Plantings shall be installed between October 1 and March 31 (the planting season).
2. Prior to installing required mitigation plantings, non-native invasive plants shall be removed from all areas within 10 feet of mitigation plantings, using handheld equipment.
3. All mitigation and remediation shrubs and trees shall be marked in the field by a tag attached to the top of the plant for easy identification. All tape shall be a contrasting color that is easily seen and identified.
4. After installing the required mitigation plantings, the Applicants shall request inspection of Permanent Erosion Control Measures (IVR 210) by BDS, who will confirm that all required

mitigation plantings have been installed. A letter of certification from the landscape professional or designer of record may be requested by BDS to document that the plantings have been installed according to the approved plans.

D. An inspection of Permanent Erosion Control Measures shall be required to document installation of the required mitigation plantings.
1. The Permanent Erosion Control Measures inspection (IVR 210) shall not be approved until the required mitigation plantings have been installed (as described in Condition C above);

--OR—

2. The Applicants must obtain a separate Zoning Permit for the purpose of ensuring an inspection of the required mitigation plantings by March 31 of the following year.

E. The land owner shall maintain the required plantings for two years to ensure survival and replacement. Applicant City of Portland Bureau of Environmental Services is responsible for ongoing survival of required plantings during and beyond the designated two-year monitoring period. The landowner shall:
1. Obtain a Zoning Permit for a final inspection at the end of the 2-year maintenance and monitoring period. The permit must be finaled no later than 2 years from the final inspection for the installation of mitigation planting, for the purpose of ensuring that the required plantings remain. Any required plantings that have not survived must be replaced.

F. Failure to comply with any of these conditions may result in the City's reconsideration of this land use approval pursuant to Portland Zoning Code Section 33.700.040 and /or enforcement of these conditions in any manner authorized by law.

Note: In addition to the requirements of the Zoning Code, all uses and development must comply with other applicable City, regional, state and federal regulations.

This decision applies to only the City's environmental regulations. Activities which the City regulates through PCC 33.430 may also be regulated by other agencies. In cases of overlapping City, Special District, Regional, State, or Federal regulations, the more stringent regulations will control. City approval does not imply approval by other agencies.

Gregory J. Frank, Hearings Officer

May 2, 2012
Date

Application Determined Complete:	March 1, 2012	
Report to Hearings Officer:	April 2, 2012	
Decision Mailed:	May 3, 2012	
Last Date to Appeal:	4:30 p.m., May 17, 2012	
Effective Date (if no appeal):	May 18, 2012	Decision may be recorded on this date.

Conditions of Approval. If approved, this project may be subject to a number of specific conditions, listed above. Compliance with the applicable conditions of approval must be documented in all related permit applications. Plans and drawings submitted during the permitting process must illustrate how applicable conditions of approval are met. Any project elements that are specifically required by conditions of approval must be shown on the plans, and labeled as such.

These conditions of approval run with the land, unless modified by future land use reviews. As used in the conditions, the term "Applicants" includes the Applicants for this land use review, any person undertaking development pursuant to this land use review, the proprietor of the use or development approved by this land use review, and the current owner and future owners of the property subject to this land use review.

Appeal of the decision. The decision of the Hearings Officer may be appealed to City Council, who will hold a public hearing. If you or anyone else appeals the decision of the Hearings Officer, only evidence previously presented to the Hearings Officer will be considered by the City Council.

Who can appeal: You may appeal the decision only if you write a letter which is received before the close of the record for the hearing, if you testify at the hearing, or if you are the property owner/Applicants. Appeals must be filed within 14 days of the decision. **Appeals must be filed within 14 days of the decision. An appeal fee of $3,271.50 will be charged (one-half of the BDS application fee, up to a maximum of $5,000).**

Appeal Fee Waivers: Neighborhood associations recognized by the Office of Neighborhood Involvement may qualify for a waiver of the appeal fee provided that the association has standing to appeal. The appeal must contain the signature of the Chair person or other person authorized by the association, confirming the vote to appeal was done in accordance with the organization's bylaws.

Neighborhood associations, who wish to qualify for a fee waiver, must complete the Type III Appeal Fee Waiver Request for Organizations Form and submit it prior to the appeal deadline. The Type III Appeal Fee Waiver Request for Organizations Form contains instructions on how to apply for a fee waiver, including the required vote to appeal.

Recording the final decision.
If this Land Use Review is approved the final decision must be recorded with the Multnomah County Recorder. A few days prior to the last day to appeal, the City will mail instructions to the Applicants for recording the documents associated with their final land use decision.

- A building or zoning permit will be issued only after the final decision is recorded.

The Applicants, builder, or a representative may record the final decision as follows:

- By Mail: Send the two recording sheets (sent in separate mailing) and the final Land Use Review decision with a check made payable to the Multnomah County Recorder to: Multnomah County Recorder, P.O. Box 5007, Portland OR 97208. The recording fee is identified on the recording sheet. Please include a self-addressed, stamped envelope.
- In Person: Bring the two recording sheets (sent in separate mailing) and the final Land Use Review decision with a check made payable to the Multnomah County Recorder to the County Recorder's office located at 501 SE Hawthorne Boulevard, #158, Portland OR 97214. The recording fee is identified on the recording sheet.

For further information on recording, please call the County Recorder at 503-988-3034
For further information on your recording documents please call the Bureau of Development Services Land Use Services Division at 503-823-0625.

Expiration of this approval. An approval expires three years from the date the final decision is rendered unless a building permit has been issued, or the approved activity has begun.
Where a site has received approval for multiple developments, and a building permit is not issued for all of the approved development within three years of the date of the final decision, a new land use review will be required before a permit will be issued for the remaining development, subject to the Zoning Code in effect at that time.

Applying for your permits. A building permit, occupancy permit, or development permit may be required before carrying out an approved project. At the time they apply for a permit, permittees must demonstrate compliance with:

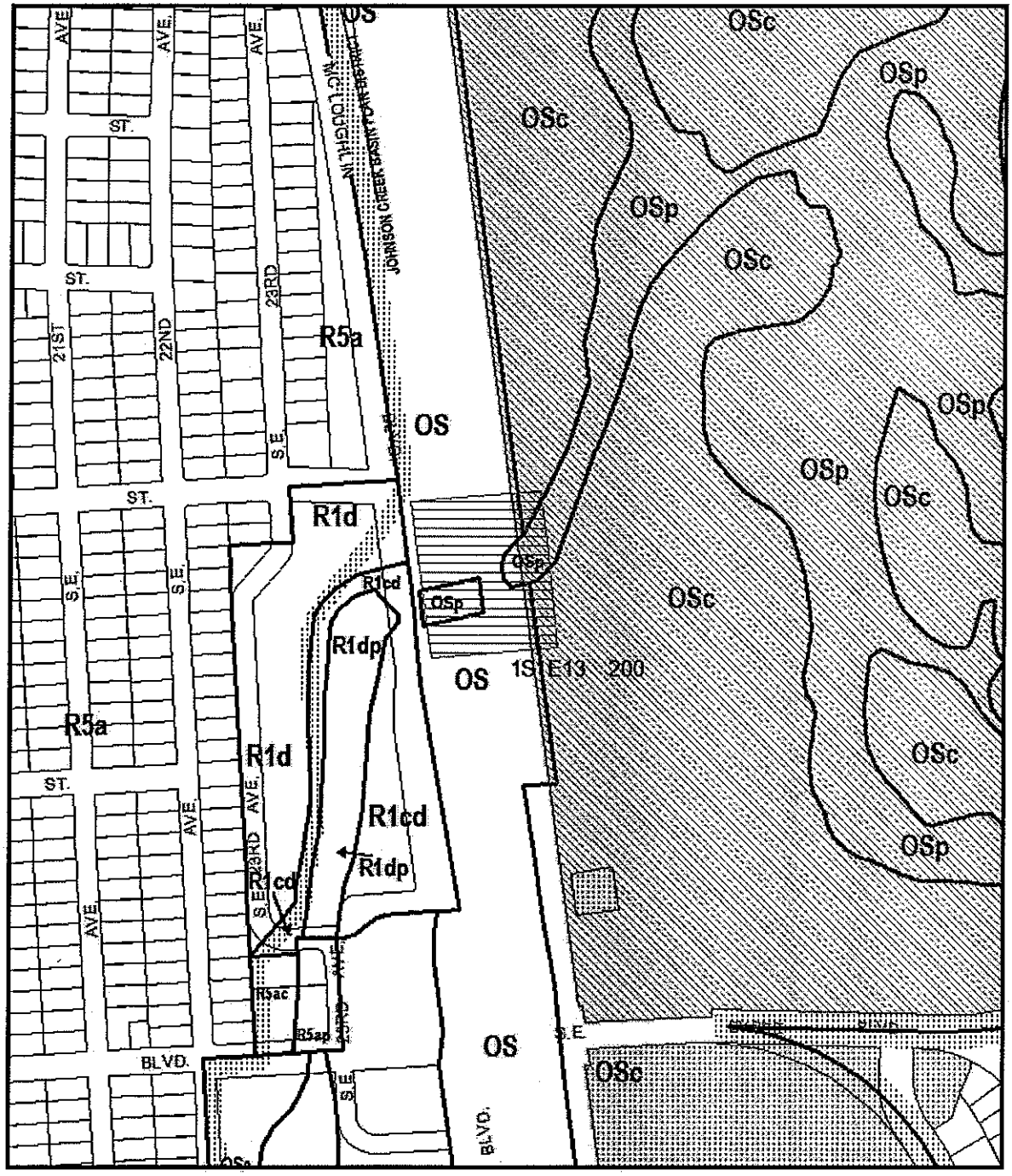
- All conditions imposed herein;
- All applicable development standards, unless specifically exempted as part of this land use review;
- All requirements of the building code; and
- All provisions of the Municipal Code of the City of Portland, and all other applicable ordinances, provisions and regulations of the City.

EXHIBITS
NOT ATTACHED UNLESS INDICATED

A. Applicants' Statements
   1. Narrative for Environmental Review
   2. FEMA NO-Rise Certification
B. Zoning Map **(attached)**
   1. Existing Zoning
C. Plans and Drawings
   1. Existing Conditions Site Plan
   2. Proposed Development Plan
   3. Floodplain Mitigation Grading Plan
   4. Proposed Channel Profile
   5. Downstream Cross Section
   6. Upstream Cross Section
   7. Streambed and Culvert Sections
   8. Mitigation and Remediation Site Plan
   9. Mitigation and Remediation Site Plan Details
   10. Mitigation and Remediation Site Plan Details
   11. Construction Management Site Plan
   12. Erosion and Sediment Control Plan
   13. Grading and Habitat Restoration Details
   14. Stream Diversion and Construction Sequencing Plan
   15. Air Photo/Zoning map of project vicinity
   16. Air Photo/Zoning map of site
D. Notification information
   1. Request for response
   2. Posting letter sent to Applicants
   3. Notice to be posted
   4. Applicants' statement certifying posting
   5 Mailing list
   6. Mailed notice
E. Agency Responses
   1. Water Bureau
   2. Bureau of Environmental Services
   3. Site Development Review Section of Bureau of Development Services
F. Letters:--No letters received.
G. Other
   1. Original LUR Application
   2. Site History Research
H. Received in the Hearings Office
   1. Hearing Notice - Castleberry, Stacey
   2. Staff Report - Castleberry, Stacey

3. 4/3/12 – Memo - Bureau of Environmental Services
4. 4/10/12 Memo - Fast, Ronda
5. PowerPoint presentation printout - Castleberry, Stacey
6. 4/3/12 Memo from BES - Castleberry, Stacey
7. 4/9/12 Memo, Castleberry to George Helm - Revised Land Use Review Response - Castleberry, Stacey
8. 4/10/12 Memo, Fast to Castleberry - Castleberry, Stacey
9. Presentation printout - Fast, Ronda
10. Record Closing Information sheet - Hearings Office
11. 4/20/12 Memo - Castleberry, Stacey
12. 4/20/12 Memo - Fast, Ronda
    a. Land Use review Response Addendum - Fast, Ronda
    b. 4/20/12 Castleberry Memo - Fast, Ronda
13. 4/23/12 letter with attachments - Fast, Ronda
    a. 4/23/12 letter - Fast, Ronda
    b. Application and Notification information - Fast, Ronda
    c. 3/2/12 Request for Response - Fast, Ronda
    d. Posting Notice - Fast, Ronda
    e. 3/19/12 Notice of Public Hearing - Fast, Ronda
    f. Staff Report and Recommendation - Fast, Ronda
    g. Existing Conditions Site Plan - Fast, Ronda **(reduced size attached)**
    h. Proposed Developement Site Plan - Fast, Ronda **(reduced size attached)**
    i. Floodplain Mitigation Grading Plan - Fast, Ronda **(reduced size attached)**
    j. Proposed Channel Profile - Fast, Ronda **(reduced size attached)**
    k. Downstream Cross Section - Fast, Ronda **(reduced size attached)**
    l. Upstream Cross Section - Fast, Ronda **(reduced size attached)**
    m. Streambed and Culvert Sections - Fast, Ronda **(reduced size attached)**
    n. Mitigation and Remediation Site Plan - Fast, Ronda **(reduced size attached)**
    o. Mitigation and Remediation Site Plan Details - Fast, Ronda **(reduced size attached)**
    p. Construction Management Site Plan - Fast, Ronda **(reduced size attached)**
    q. Erosion and Sediment Control Plan - Fast, Ronda **(reduced size attached)**
    r. Grading and Habitat Restoration Details - Fast, Ronda **(reduced size attached)**
    s. Stream Diversion and Construction Sequencing Plan - Fast, Ronda **(reduced size attached)**
    t. Crystal Springs Railroad Culvert Replacement Narrative - Fast, Ronda
    u. Evaluation of Impact/Mitigation - Fast, Ronda
    v. Alternatives Analysis - Fast, Ronda
    w. Staff Report and Recommendation - Fast, Ronda
    x. Construction Management Plan – Amended - Fast, Ronda
    y. Proposed Cross Section - Fast, Ronda
    z. Land Use Final Order - Fast, Ronda
    aa. House Bill 3478 - Fast, Ronda
    ab. Metro Resolution No. 08-3964 - Fast, Ronda

ac. Page 4 of Staff Report and Recommendation for LU 10-151765 DZ GW - Fast, Ronda
ad. Page 4 of Decision Notice for LU 10-169588 GW - Fast, Ronda



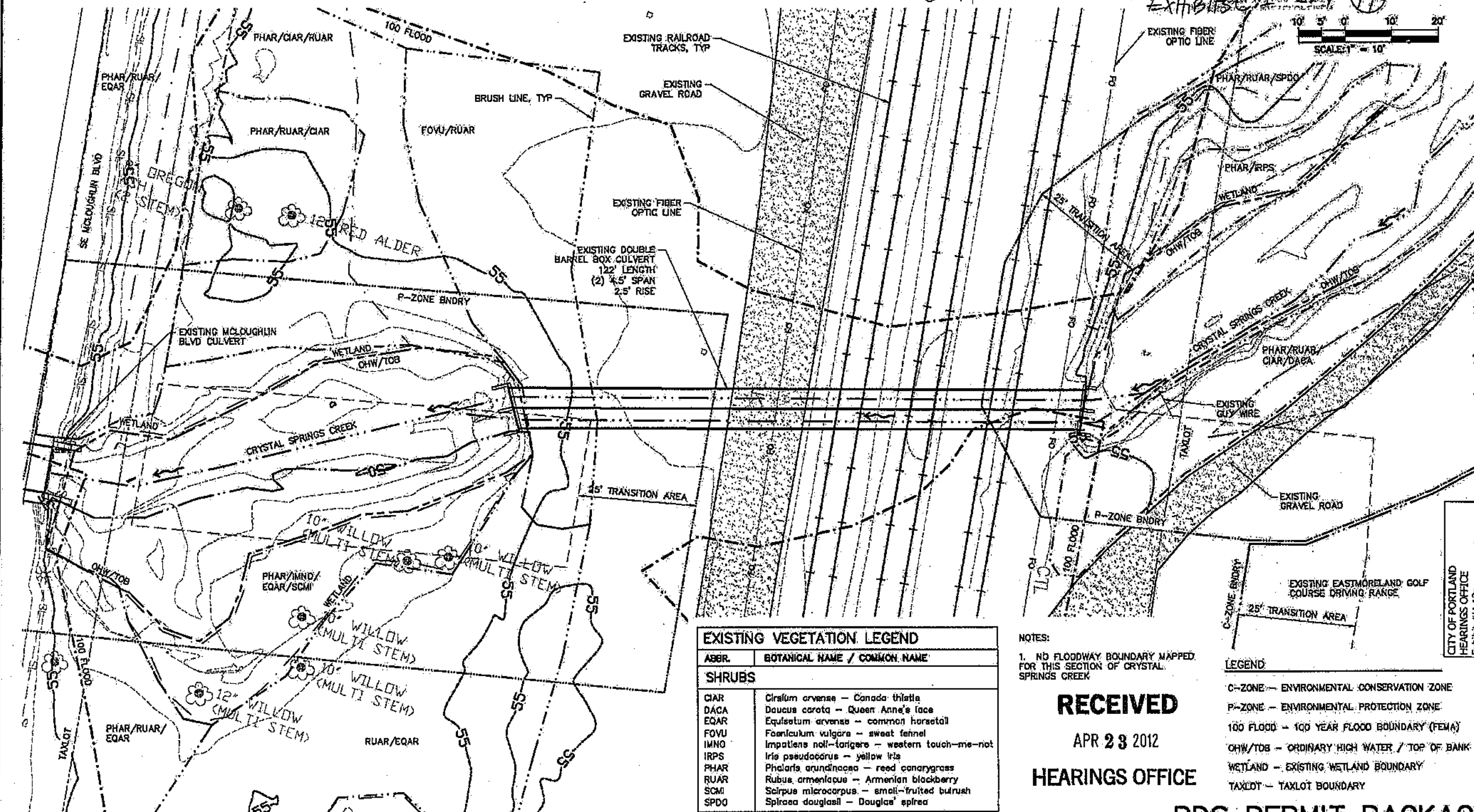
ZONING

Site
Also Owned
Area of Project

NORTH

This site lies within the:
JOHNSON CREEK BASIN PLAN DISTRICT

File No.	LU 12-111963 EN
1/4 Section	3632,3633,3733
Scale	1 inch = 300 feet
State_Id	1S1E13 200
Exhibit	B (Feb 14,2012)



EXISTING VEGETATION LEGEND

ABBR.	BOTANICAL NAME / COMMON NAME
SHRUBS	
CIAR	Cirsium arvense — Canada thistle
DACA	Daucus carota — Queen Anne's lace
EQAR	Equisetum arvense — common horsetail
FOVU	Foeniculum vulgare — sweet fennel
IMNO	Impatiens noli-tangere — western touch-me-not
IRPS	Iris pseudacorus — yellow iris
PHAR	Phalaris arundinacea — reed canarygrass
RUAR	Rubus armeniacus — Armenian blackberry
SCMI	Scirpus microcarpus — small-fruited bulrush
SPDO	Spiraea douglasii — Douglas' spirea

NOTES:

1. NO FLOODWAY BOUNDARY MAPPED FOR THIS SECTION OF CRYSTAL SPRINGS CREEK

RECEIVED
APR 23 2012
HEARINGS OFFICE

LEGEND

C-ZONE — ENVIRONMENTAL CONSERVATION ZONE
P-ZONE — ENVIRONMENTAL PROTECTION ZONE
100 FLOOD — 100 YEAR FLOOD BOUNDARY (FEMA)
OHW/TOB — ORDINARY HIGH WATER / TOP OF BANK
WETLAND — EXISTING WETLAND BOUNDARY
TAXLOT — TAXLOT BOUNDARY

BDS PERMIT PACKAGE

NO.	DATE	BY	CHK.	APPD.	REVISIONS

EES DESIGNED 12-11-11 DATE
NCO DRAWN 12-13-11 DATE
EES CHECKED 01-27-12 DATE
APPROVED DATE

NOT FOR CONSTRUCTION

TRI-COUNTY METROPOLITAN TRANSPORTATION DISTRICT OF OREGON

VIGIL AGRIMIS design professionals

TRI MET — CAPITAL PROJECTS AND FACILITIES DIVISION, 710 N.E. HOLLADAY STREET, PORTLAND, OREGON 97232

SUBMITTED: DATE: APPROVED: DATE:

PORTLAND TO MILWAUKIE LRT
EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
EXISTING CONDITIONS SITE PLAN
STA 313+00 TO STA 315+00

SCALE: AS SHOWN | DRAWING NO.: CRYSPR-1A | CONTRACT NO.: RH100544JB | SHEET NO.: C.1

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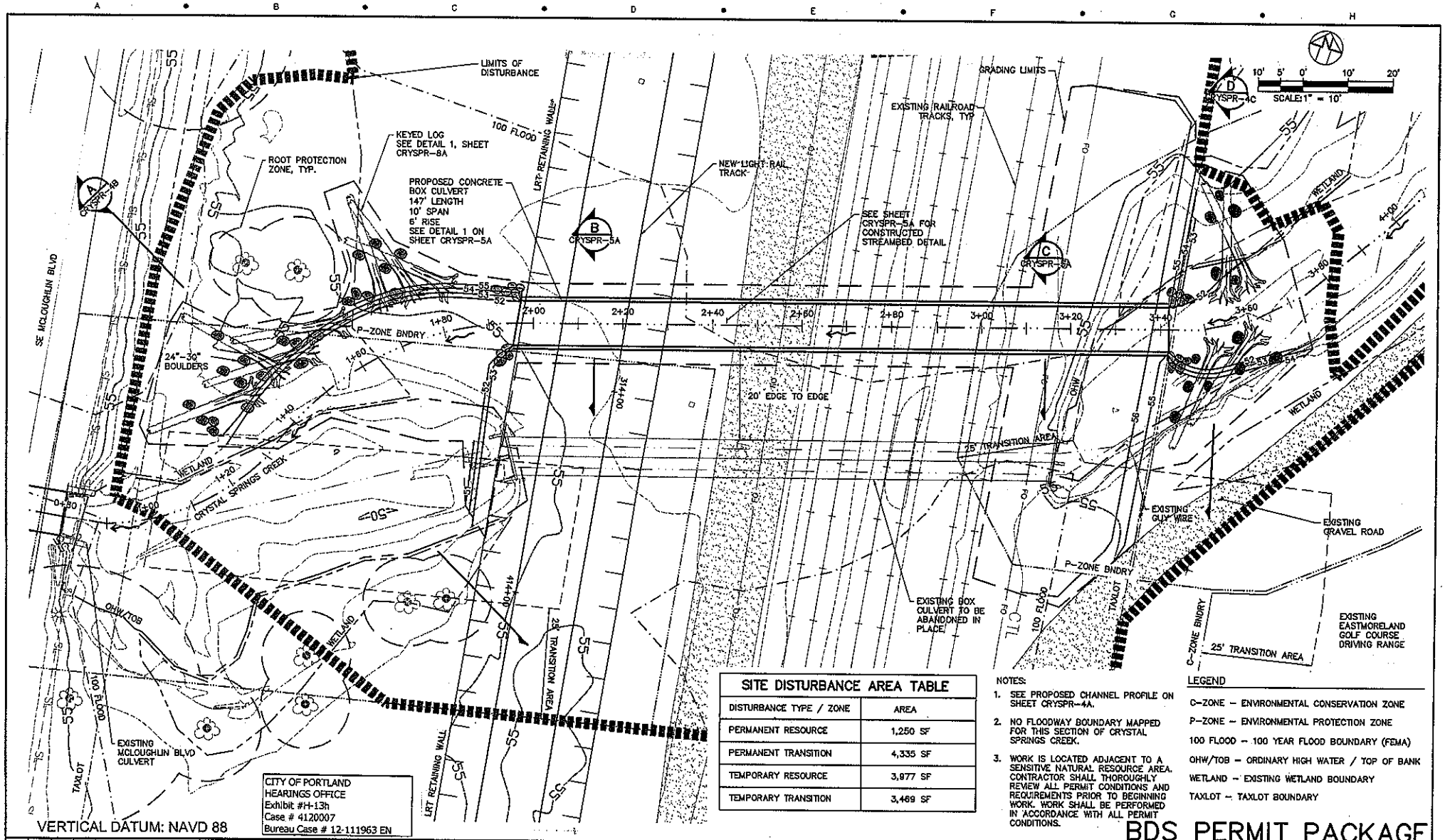
Plot Date:2/9/2012 3:32 PM nathan.dosier



SITE DISTURBANCE AREA TABLE	
DISTURBANCE TYPE / ZONE	AREA
PERMANENT RESOURCE	1,250 SF
PERMANENT TRANSITION	4,335 SF
TEMPORARY RESOURCE	3,977 SF
TEMPORARY TRANSITION	3,469 SF

NOTES:

1. SEE PROPOSED CHANNEL PROFILE ON SHEET CRYSPR-4A.
2. NO FLOODWAY BOUNDARY MAPPED FOR THIS SECTION OF CRYSTAL SPRINGS CREEK.
3. WORK IS LOCATED ADJACENT TO A SENSITIVE NATURAL RESOURCE AREA. CONTRACTOR SHALL THOROUGHLY REVIEW ALL PERMIT CONDITIONS AND REQUIREMENTS PRIOR TO BEGINNING WORK. WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL PERMIT CONDITIONS.

LEGEND

C-ZONE – ENVIRONMENTAL CONSERVATION ZONE

P-ZONE – ENVIRONMENTAL PROTECTION ZONE

100 FLOOD – 100 YEAR FLOOD BOUNDARY (FEMA)

OHW/TOB – ORDINARY HIGH WATER / TOP OF BANK

WETLAND – EXISTING WETLAND BOUNDARY

TAXLOT – TAXLOT BOUNDARY

BDS PERMIT PACKAGE

NO.	DATE	BY	APPD.	REVISIONS

EES DESIGNED 12-11-11 DATE
NCD DRAWN 12-13-11 DATE
EES CHECKED 01-27-12 DATE
APPROVED DATE

NOT FOR CONSTRUCTION

TRI-COUNTY METROPOLITAN TRANSPORTATION DISTRICT OF OREGON

VIGIL AGRIMIS design professionals

TRIMET CAPITAL PROJECTS AND FACILITIES DIVISION 710 N.E. HOLLADAY STREET PORTLAND, OREGON 97232

SUBMITTED: DATE: APPROVED: DATE:

PORTLAND TO MILWAUKIE LRT
EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
PROPOSED DEVELOPEMENT SITE PLAN
STA 313+00 TO STA 315+00

SCALE DRAWING NO.: CONTRACT NO.: SHEET NO.:

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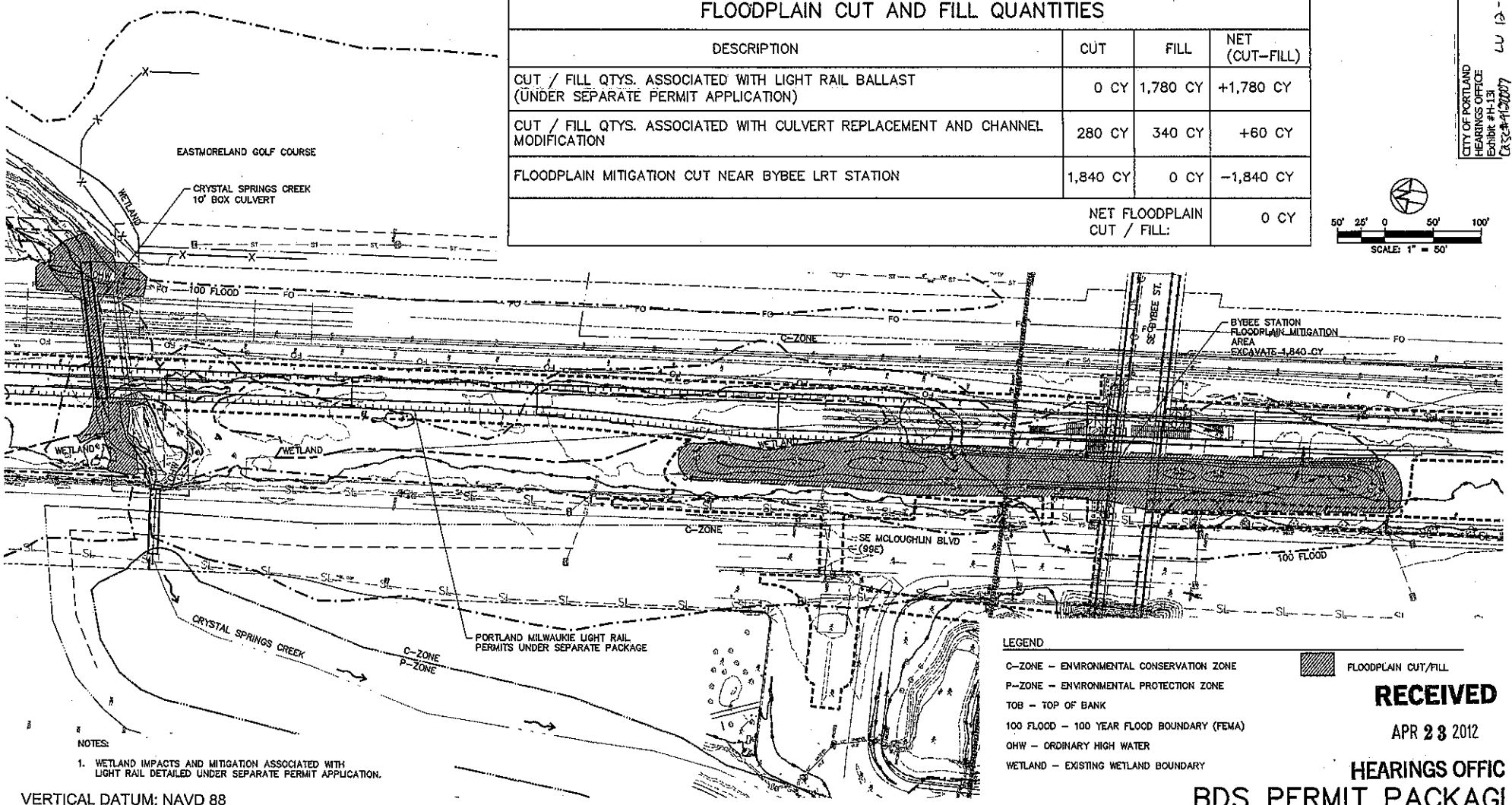
x: Date: 2/8/2012 1:33 PM nathan doster

FLOODPLAIN CUT AND FILL QUANTITIES

DESCRIPTION	CUT	FILL	NET (CUT–FILL)
CUT / FILL QTYS. ASSOCIATED WITH LIGHT RAIL BALLAST (UNDER SEPARATE PERMIT APPLICATION)	0 CY	1,780 CY	+1,780 CY
CUT / FILL QTYS. ASSOCIATED WITH CULVERT REPLACEMENT AND CHANNEL MODIFICATION	280 CY	340 CY	+60 CY
FLOODPLAIN MITIGATION CUT NEAR BYBEE LRT STATION	1,840 CY	0 CY	−1,840 CY
		NET FLOODPLAIN CUT / FILL:	0 CY



NOTES:

1. WETLAND IMPACTS AND MITIGATION ASSOCIATED WITH LIGHT RAIL DETAILED UNDER SEPARATE PERMIT APPLICATION.

VERTICAL DATUM: NAVD 88

LEGEND

- C–ZONE – ENVIRONMENTAL CONSERVATION ZONE
- P–ZONE – ENVIRONMENTAL PROTECTION ZONE
- TOB – TOP OF BANK
- 100 FLOOD – 100 YEAR FLOOD BOUNDARY (FEMA)
- OHW – ORDINARY HIGH WATER
- WETLAND – EXISTING WETLAND BOUNDARY
- FLOODPLAIN CUT/FILL

50' 25' 0 50' 100'
SCALE: 1" = 50'

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TRI–COUNTY METROPOLITAN TRANSPORTATION DISTRICT OF OREGON

VIGIL AGRIMIS design professionals

TRIMET CAPITAL PROJECTS AND FACILITIES DIVISION 710 N.E. HOLLADAY STREET PORTLAND, OREGON 97232

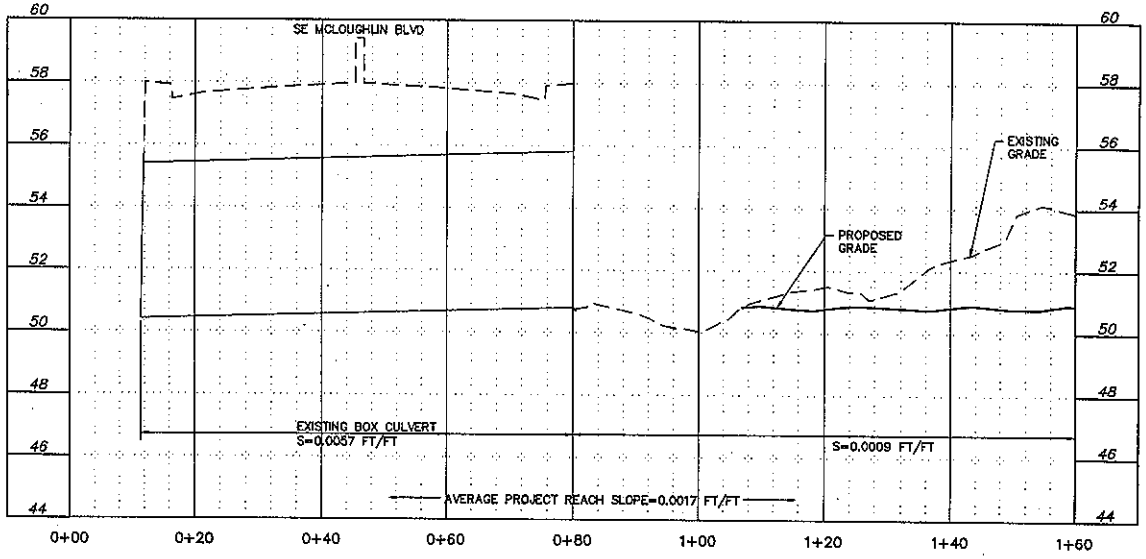
SUBMITTED: DATE: APPROVED: DATE:

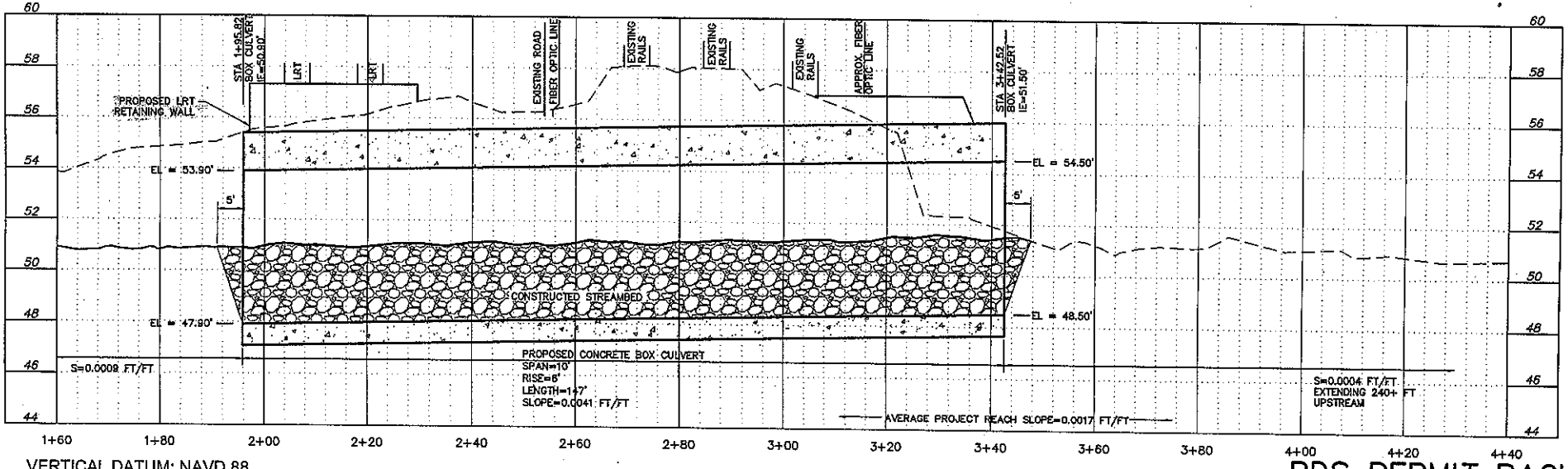
PORTLAND TO MILWAUKIE LRT
EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
FLOODPLAIN MITIGATION GRADING PLAN
STA 313+00 TO STA 328+00

SCALE:	DRAWING NO.:	CONTRACT NO.:	SHEET NO.:
AS SHOWN	CRYSPR-3A	RH100544-JB	C.3

Y:\DESIGN\CAD\SHEETS\Crystal Springs\CRYSPR-3A.dwg Feb. 08, 2012 - 1:47 PM nathan dozier
Plot Date: 2/8/2012 1:54 PM nathan dozier

PROFILE H: 1" = 10'-0"
V: 1" = 2'





VERTICAL DATUM: NAVD 88

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Case # 4120007
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EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
PROPOSED CHANNEL PROFILE

SCALE: DRAWING NO.: CONTRACT NO.: SHEET NO.:

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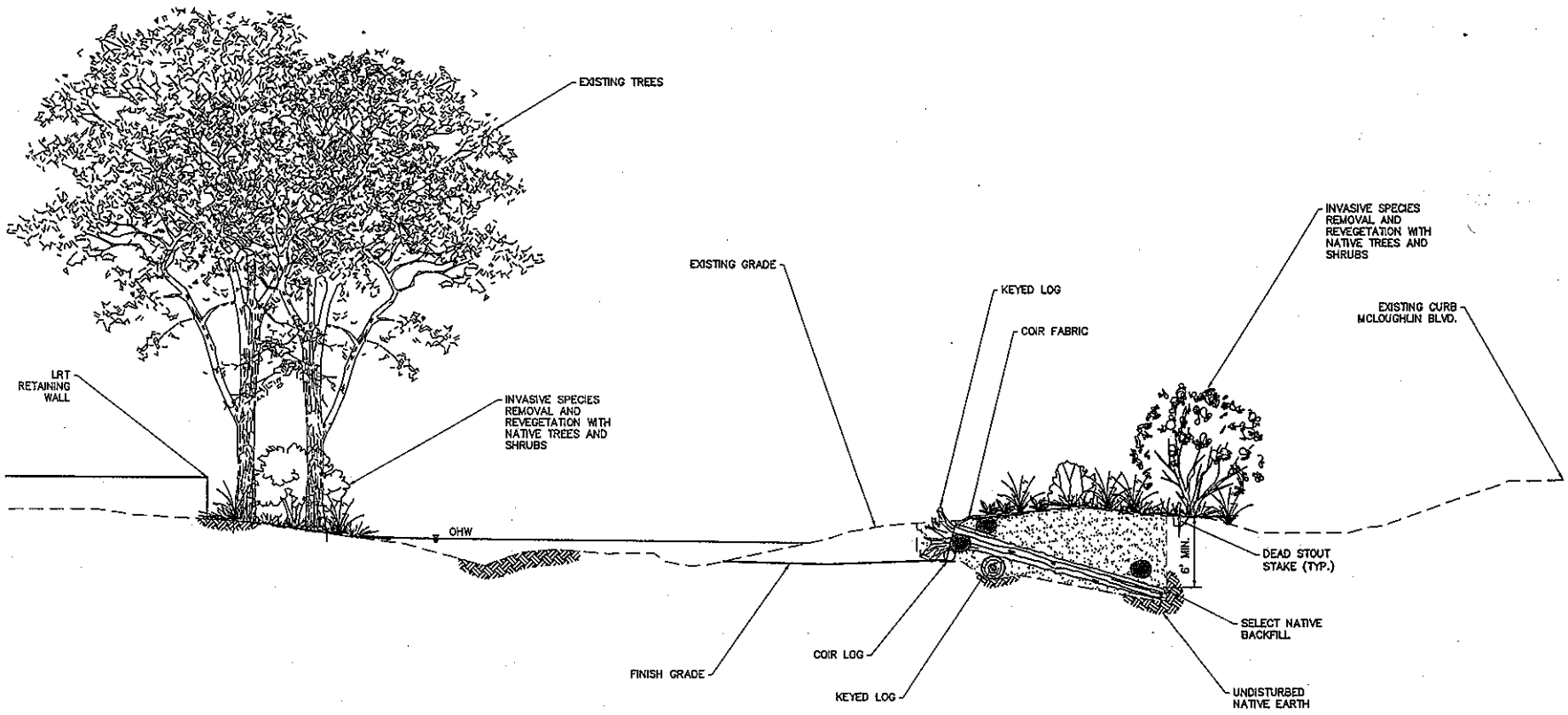

DOWNSTREAM CROSS SECTION
SCALE: 1" = 5' FOR 22 x 34 SIZED SHEETS

A
CRYSPR-2A

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PORTLAND TO MILWAUKIE LRT
EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
DOWNSTREAM CROSS SECTION

SCALE:	DRAWING NO.:	CONTRACT NO.:	SHEET NO.:
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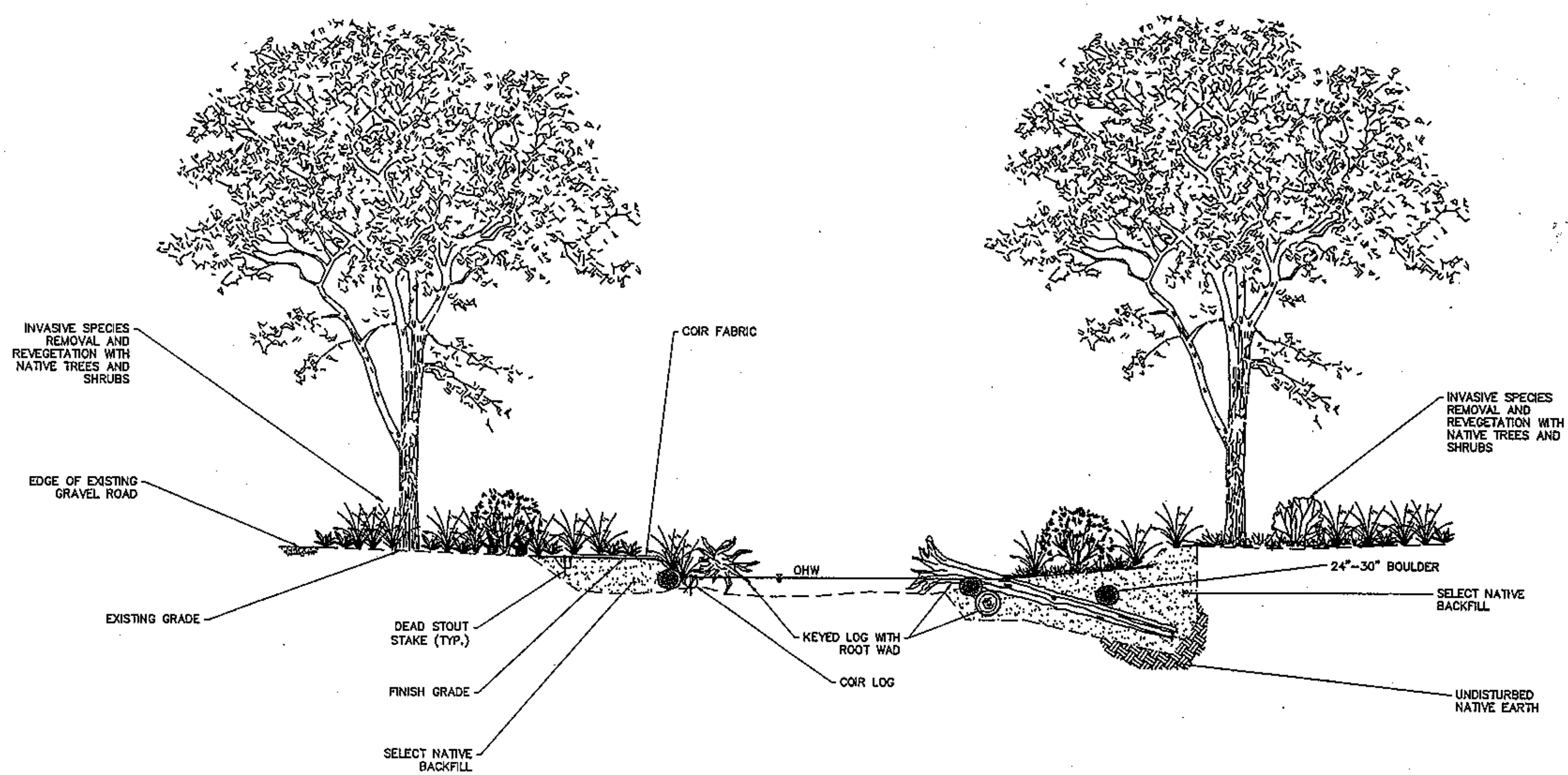

UPSTREAM CROSS SECTION
SCALE: 1" = 5' FOR 22 x 34 SIZED SHEETS

D
CRYSPR-2A

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Case # 4120007
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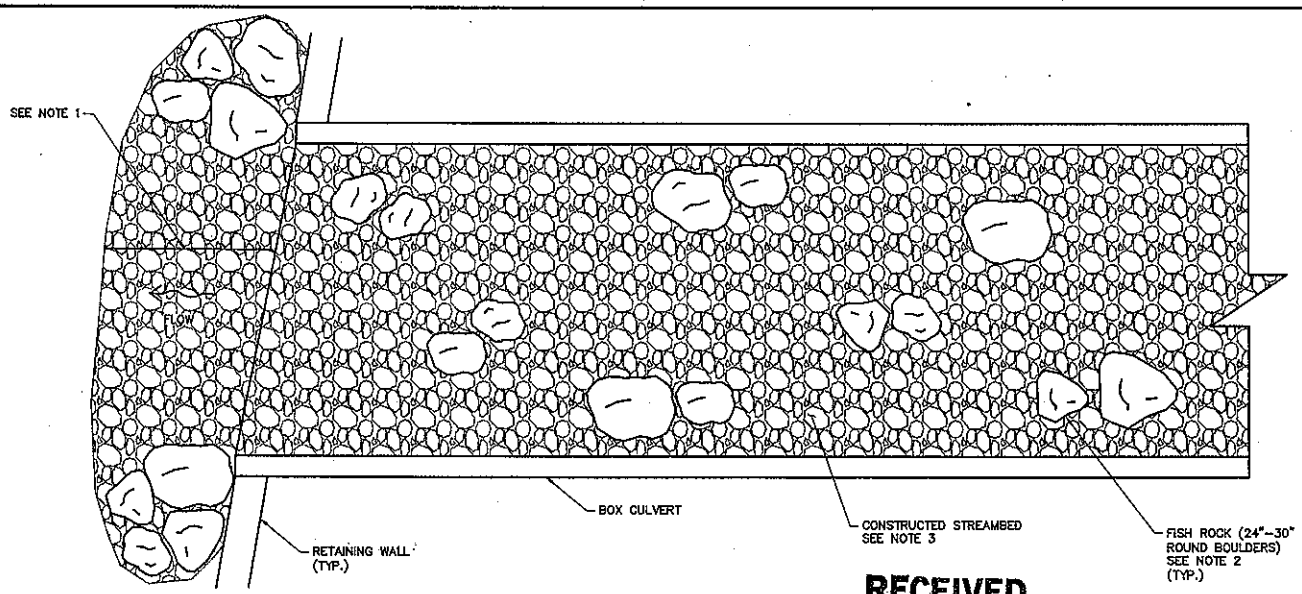
EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
UPSTREAM CROSS SECTION

SCALE: DRAWING NO.: CONTRACT NO.: SHEET NO.:



TYPICAL STREAMBED PLAN
SCALE: 1/2" = 1'–0"
1 CRYSPR–2A

NOTES:

1. EXTEND CONSTRUCTED STREAMBED A MINIMUM OF 5' UPSTREAM AND DOWNSTREAM OF PROPOSED BOX CULVERT.
2. MEDIAN BOULDER DIAMETERS SHALL BE 24"–30." BOULDERS WILL BE PLACED IN CLUSTERS SPACED 5'–8' THROUGHOUT CULVERT TO PROVIDE HYDRAULIC SHADOWS.
3. 8"–0" ROUND ROCK COBBLE MIX. MIN 25% FINES WASHED IN TO MINIMIZE SUBSURFACE FLOW.
4. PLACE BOULDERS IN CLUSTER, THROUGHOUT CULVERT. SPACE BOULDER CLUSTERS 5'–8' APART AND AS DIRECTED BY RESIDENT ENGINEER.
5. CONSTRUCTED STREAMBED SHALL BE CONSTRUCTED WITH THE MATERIALS DESCRIBED IN THE SPECIFICATIONS. STONE FOR CONSTRUCTED STREAMBED SHALL BE PLACED TO MATCH THE DESIGN GRADE SHOWN ON THE PLANS.
6. PERFORM ALL SHAPING OF THE SUBGRADE TO THE ELEVATIONS, LINES AND GRADES, AS SHOWN. SHAPE, TRIM, AND FINISH SLOPES OF CHANNELS TO CONFORM WITH THE SUBGRADE LINES, GRADES, AND CROSS SECTIONS AS SHOWN.
7. PLACE STONE FOR CONSTRUCTED STREAMBED IN A MANNER THAT PREVENTS SEGREGATION OF STONE SIZES. STONE SHALL BE PLACED SUCH THAT THE CONSTRUCTED STREAMBED FORMS A CONSOLIDATED LAYER.
8. DO NOT ALLOW FINES TO BUILD UP SUCH THAT ANY OF THE SUBSEQUENT LIFTS OF STREAMBED STONE WILL REST UPON FINES.
9. KEY IN COIR FABRIC A MINIMUM OF 3' UNDER STREAMBED COBBLE AND STAKE WITH DEAD STOUT STAKE.
10. WASH IN FINES TO SEAL STREAMBED AND PREVENT SUBSURFACE FLOW. CONTINUE TO WASH IN FINES UNTIL WATER PONDS ON STREAMBED AND DOES NOT IMMEDIATELY INFILTRATE AND TO THE SATISFACTION OF THE RESIDENT ENGINEER.

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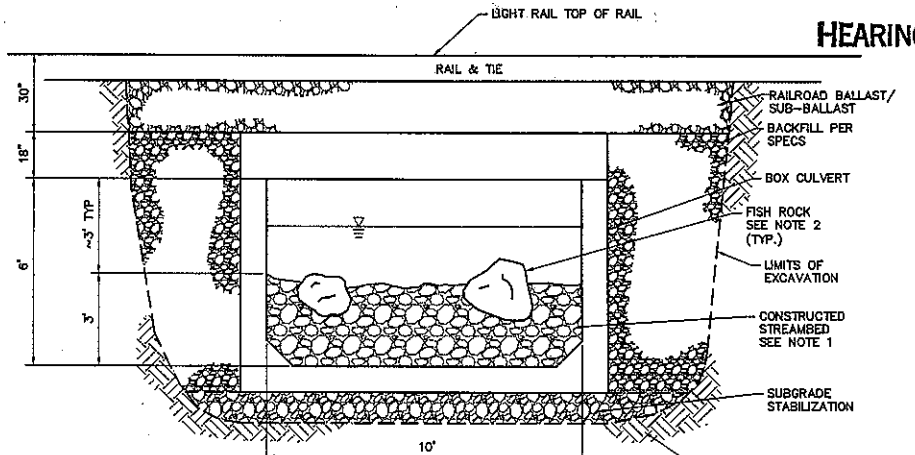
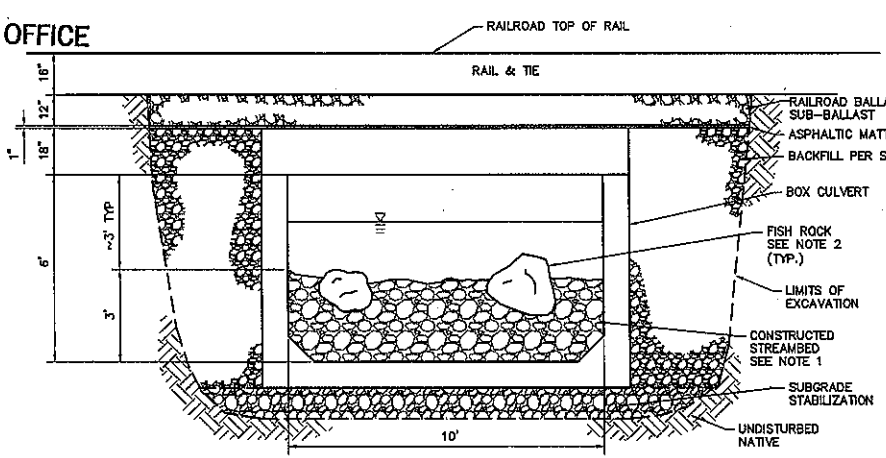


PROPOSED CULVERT SECTION AT LIGHT RAIL
NTS
B CRYSPR–2A



PROPOSED CULVERT SECTION AT RAILROAD
NTS
C CRYSPR–2A

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PORTLAND, OREGON 97232

SUBMITTED: DATE: APPROVED: DATE:

PORTLAND TO MILWAUKIE LRT
EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
STREAMBED AND CULVERT SECTIONS

SCALE:	DRAWING NO.:	CONTRACT NO.:	SHEET NO.:
AS SHOWN	CRYSPR–5A	RH100544JB	C.7

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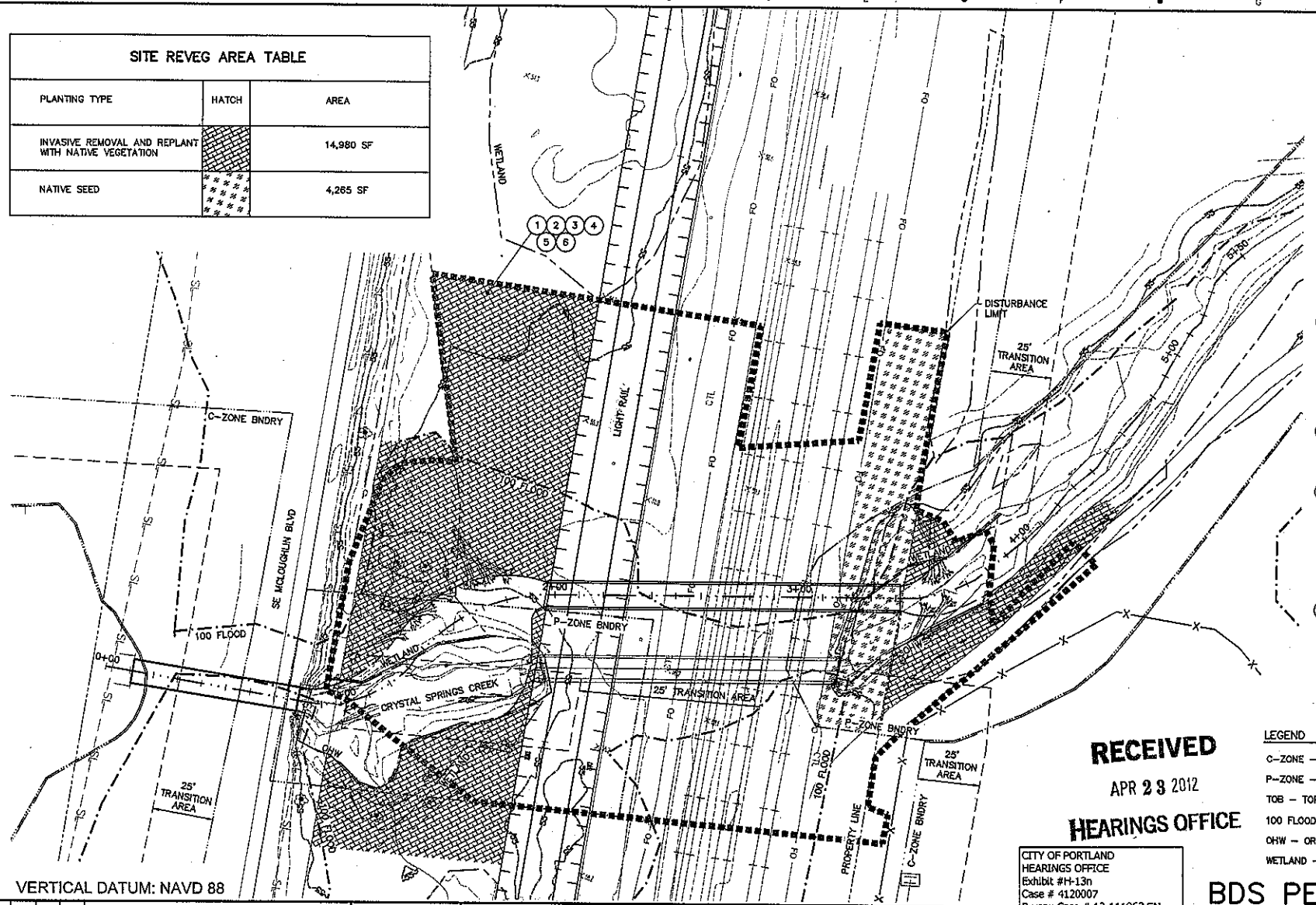
Plot Date: 2/8/2012 1:55 PM nathan dozier

SITE REVEG AREA TABLE

PLANTING TYPE	HATCH	AREA
INVASIVE REMOVAL AND REPLANT WITH NATIVE VEGETATION		14,980 SF
NATIVE SEED		4,265 SF



VERTICAL DATUM: NAVD 88

20' 10' 0' 20' 40'
SCALE: 1" = 20'

KEYED NOTES:

1. WORK IS LOCATED ADJACENT TO A SENSITIVE NATURAL RESOURCE AREA. CONTRACTOR SHALL THOROUGHLY REVIEW ALL PERMIT CONDITIONS AND REQUIREMENTS PRIOR TO BEGINNING WORK. WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL PERMIT CONDITIONS.
2. ALL ESC MEASURES SHALL BE IN PLACE PRIOR TO BEGINNING WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EROSION CONTROL METHODS AND MATERIALS. EXTENDED WET WEATHER CONDITIONS MAY REQUIRE MAINTENANCE AND/OR REPLACEMENT OF EROSION CONTROL MATERIALS.
3. CLEARED AREA SHALL NOT BE LEFT UNPROTECTED FOR MORE THAN 24 HOURS UNDER ANY CIRCUMSTANCES. IF RAIN IS FORECAST, THE CLEARED AREA SHALL NOT BE LEFT UNPROTECTED FOR ANY DURATION. CONTRACTOR SHALL ADJUST, ENHANCE, OR ALTER PROTECTION MEASURES AS DIRECTED BY RESIDENT ENGINEER.
4. CONTRACTOR SHALL CLEAR ALL NON-NATIVE VEGETATION FROM THE HATCHED AREA. CONTRACTOR SHALL DISPOSE OF REMOVED MATERIAL AT A LEGAL OFF-SITE LOCATION.
5. BES WILL PROVIDE APPROPRIATE QUANTITY OF NATIVE SEED MIX TO CONSTRUCTION CONTRACTOR WITH 5 DAYS ADVANCE NOTICE FROM CONTRACTOR. NATIVE SEED SHALL BE SPREAD BY CONTRACTOR AT STATED RATE AFTER FINAL GRADING, BUT BEFORE INSTALLATION OF ANY EROSION CONTROL BLANKETS, COIR, STRAW, ETC SO THAT SEED IS IN DIRECT CONTACT WITH EXPOSED SOIL.
6. BES WILL INSTALL NATIVE TREES AND SHRUBS IN WINTER PLANTING SEASON IMMEDIATELY FOLLOWING CONSTRUCTION, AS SHOWN IN REVEGETATION NOTES DETAIL, SHEET 6B.

GENERAL NOTES:

1. SEE SHEET 7B FOR EROSION CONTROL PERMIT REQUIREMENTS.

LEGEND

- C-ZONE – ENVIRONMENTAL CONSERVATION ZONE
- P-ZONE – ENVIRONMENTAL PROTECTION ZONE
- TOB – TOP OF BANK
- 100 FLOOD – 100 YEAR FLOOD BOUNDARY (FEMA)
- OHW – ORDINARY HIGH WATER
- WETLAND – EXISTING WETLAND BOUNDARY

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PORTLAND TO MILWAUKIE LRT
EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
MITIGATION AND REMEDIATION SITE PLAN
STA 313+00 TO STA 315+00

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4 Date:2/8/2012 3:56 PM_nathan dosier

WOODY PLANT LIST

SPECIES	COMMON NAME	PLANT DENSITY
Fraxinus latifolia	Oregon ash	275 trees, planted 8' on center in replanting areas
Rhamnus purshiana	cascara	
Alnus rubra	red alder	
Thuja plicata	western redcedar	
Rosa pisocarpa	swamp rose	450 shrubs, planted in clusters of 3 (except willow, which will be cuttings planted in clusters of 10)
Ribes sanguineum	redflower currant	
Sambucus racemosa	red elderberry	
Cornus sericea	redosier dogwood	
Physocarpus capitatus	Pacific ninebark	
Spiraea douglasii	Douglas spirea	
Salix spp.	willow cuttings	

HERBACEOUS SEED LIST

NATIVE GRASSES	COMMON NAME	LBS/ACRE
Deschampsia cespitosa	tufted hairgrass	3
Hordeum brachyantherum	meadow barley	2
Elymus glaucus	blue wildrye	5
Agrostis exarata	spike bentgrass	2
Juncus patens	spreading rush	1
Alopecurus geniculatus	water foxtail	4

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EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
MITIGATION AND REMEDIATION SITE PLAN
DETAILS

SCALE: AS SHOWN | DRAWING NO.: CRYSPR-8B | CONTRACT NO.: RH100544JB | SHEET NO.: C.9

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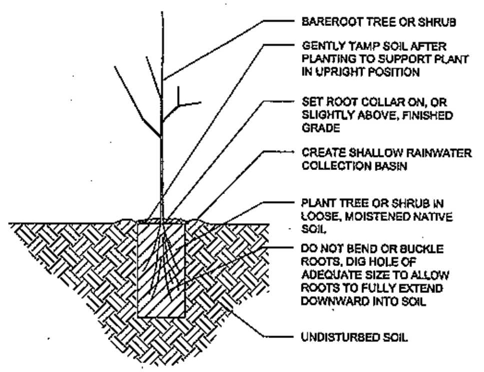
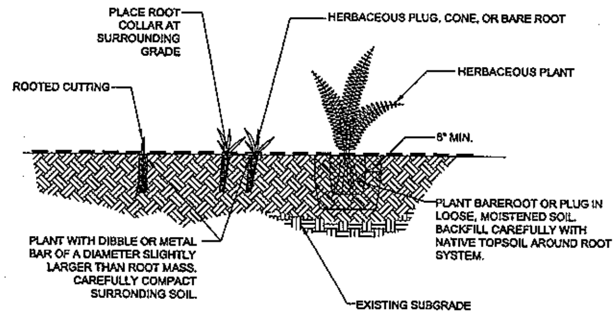
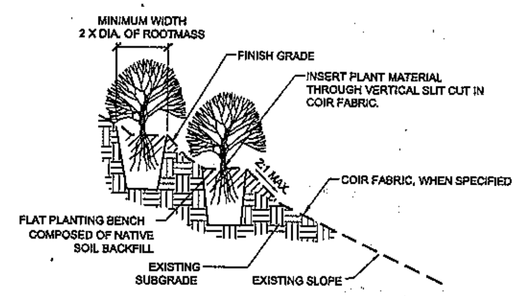


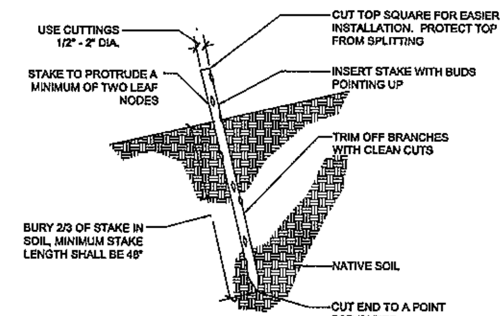
BAREROOT TREE AND SHUB PLANTING (1)
SCALE: NOT TO SCALE



BAREROOT, PLUG, ROOTED CUTTING (2)
SCALE: NOT TO SCALE

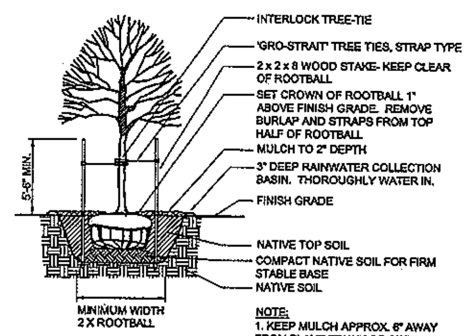


BAREROOT PLANTING ON SLOPES (3)
SCALE: NOT TO SCALE



NOTE: WHEN INSTALLING LIVE STAKES THROUGH COBBLE, ROCK, OR OTHER RESISTANT MATERIAL, CONTRACTOR SHALL USE A ROCK BAR OR REBAR TO CREATE A PILOT HOLE TO PREVENT DAMAGE TO THE LIVE STAKE.

LIVE STAKE INSTALLATION (4)
SCALE: NOT TO SCALE



NOTE:
1. KEEP MULCH APPROX. 6" AWAY FROM PLANT TRUNK OR STEM

DECIDUOUS TREE PLANTING (5)
SCALE: NOT TO SCALE

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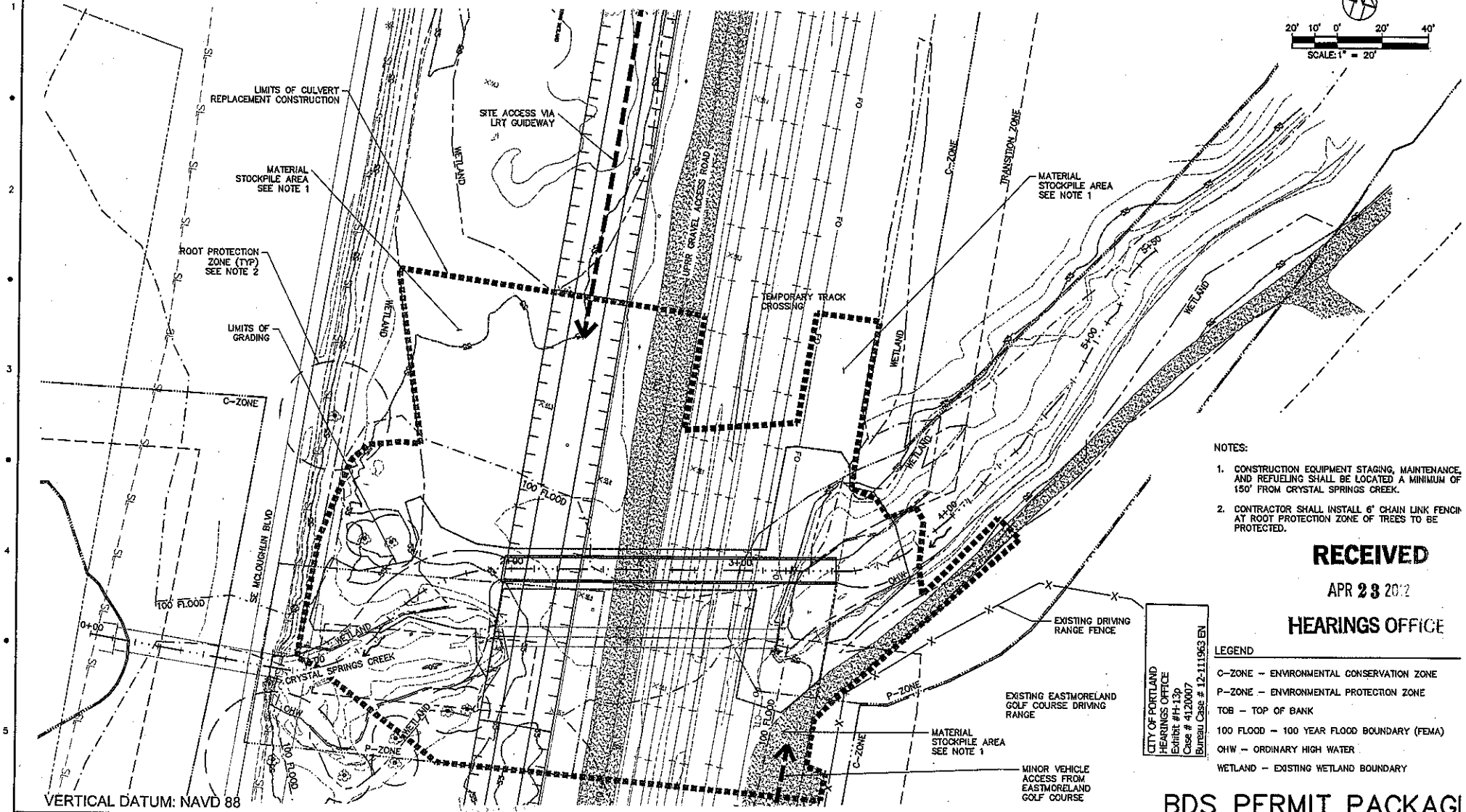
PORTLAND TO MILWAUKIE LRT
EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT MITIGATION AND REMEDIATION SITE PLAN DETAILS



VERTICAL DATUM: NAVD 88

NOTES:

1. CONSTRUCTION EQUIPMENT STAGING, MAINTENANCE, AND REFUELING SHALL BE LOCATED A MINIMUM OF 150' FROM CRYSTAL SPRINGS CREEK.
2. CONTRACTOR SHALL INSTALL 6' CHAIN LINK FENCIN AT ROOT PROTECTION ZONE OF TREES TO BE PROTECTED.

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LEGEND

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P-ZONE – ENVIRONMENTAL PROTECTION ZONE
TOB – TOP OF BANK
100 FLOOD – 100 YEAR FLOOD BOUNDARY (FEMA)
OHW – ORDINARY HIGH WATER
WETLAND – EXISTING WETLAND BOUNDARY

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PORTLAND TO MILWAUKIE LRT
EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
CONSTRUCTION MANAGEMENT SITE PLAN
STA 320+00 TO STA 328+00

SCALE: AS SHOWN | DRAWING NO.: CRYSPR-7A | CONTRACT NO.: RH100544JB | SHEET NO.: C.11

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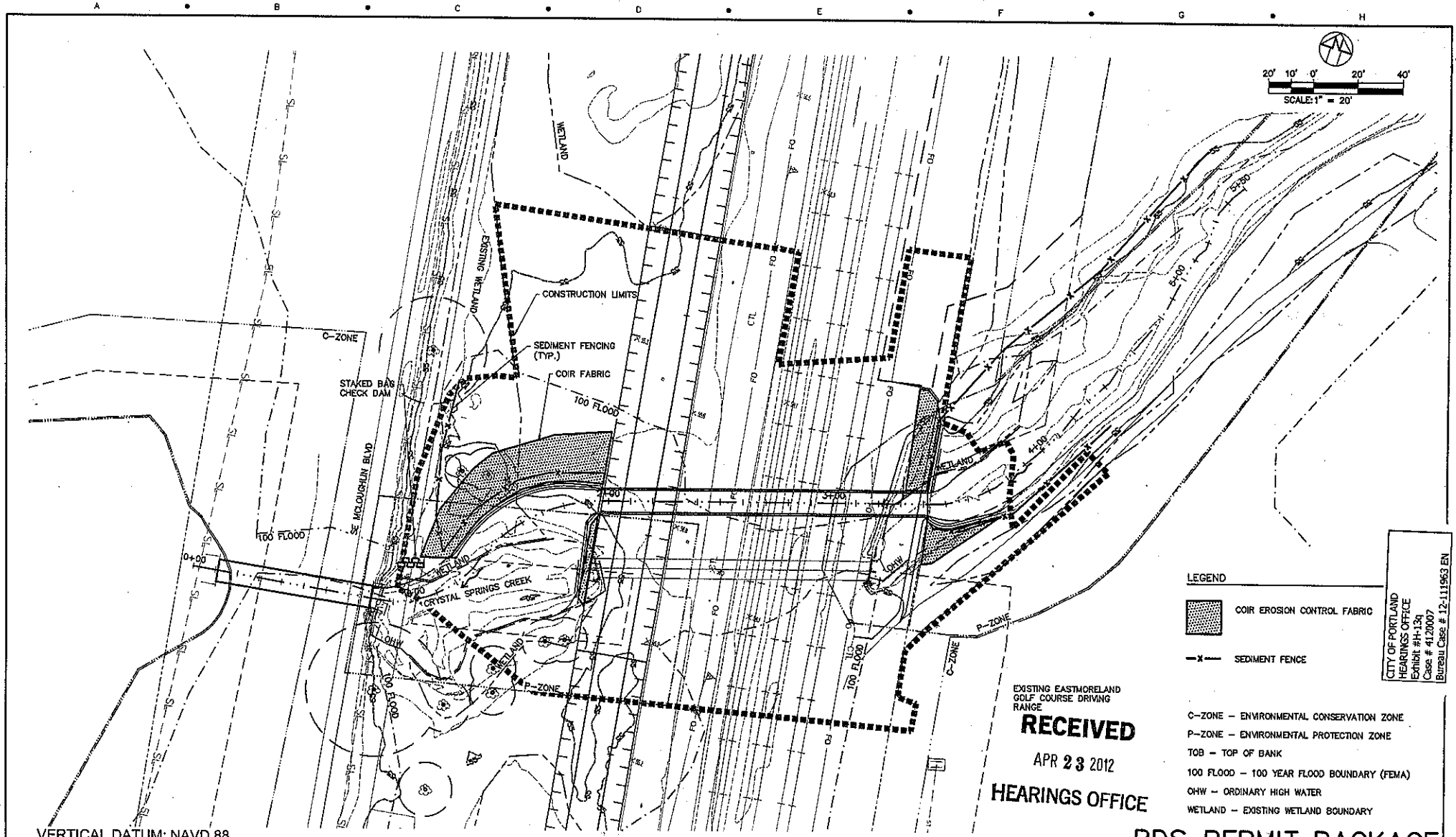

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Bureau Case # 12-111963 EN

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CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
EROSION AND SEDIMENT CONTROL PLAN
STA 312+00 TO STA 315+00

SCALE: DRAWING NO.: CONTRACT NO.: SHEET NO.:

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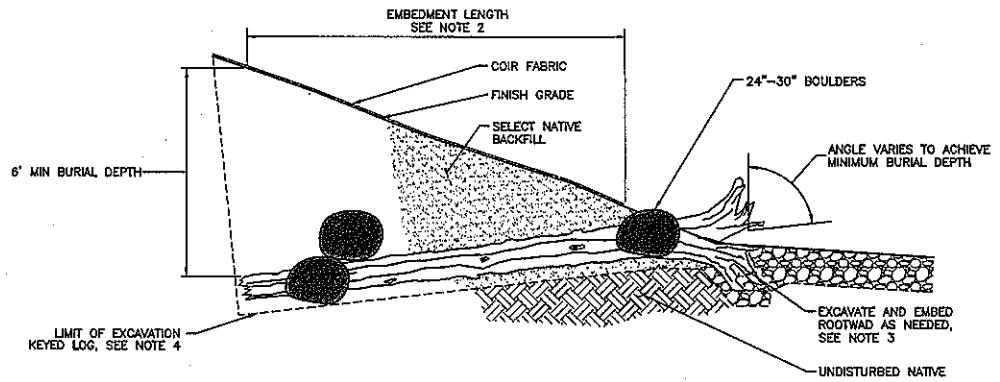
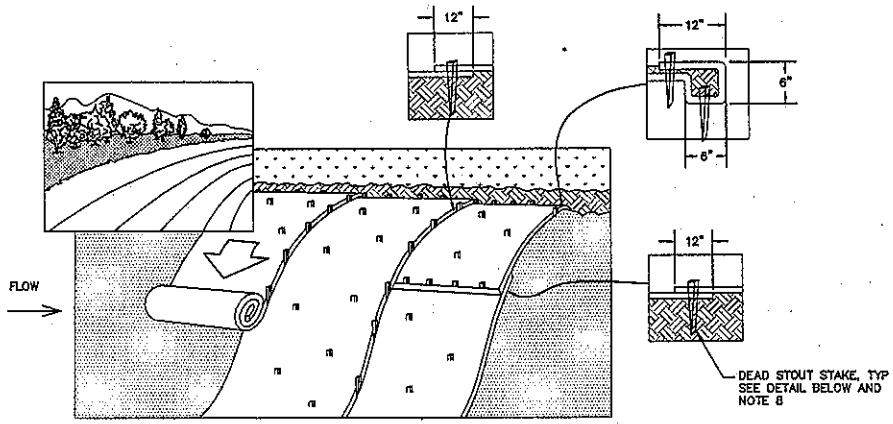


LOG INSTALLATION NOTES:

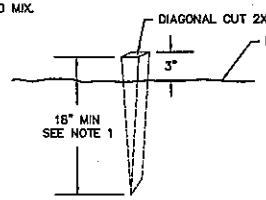
1. SELECT NATIVE BACKFILL TO BE PLACED IN 6" LIFTS AND SHOULD BE FIRMLY COMPACTED.
2. EMBED KEYED LOGS A MINIMUM OF 3/4 THE TOTAL LENGTH OF THE LOG.
3. EMBED ROOTWAD AS NEEDED TO ACHIEVE REQUIRED BURIAL DEPTH AND ALLOW FOR FULL CONTACT BETWEEN THE BOTTOM OF THE LOG AND THE BOTTOM OF THE TRENCH. BACKFILL AROUND ROOTWAD WITH CONSTRUCTED STREAMBED MATERIAL.
4. SEE SPECIFICATIONS FOR CORRECT TREE SPECIES TO USE FOR KEYED LOG. KEYED LOG DIAMETER MEASURED AT BREAST HEIGHT (DBH) AND LENGTH AS SHOWN ON PLANS.

KEYED LOG INSTALLATION (1)
SCALE: NTS



COIR FABRIC NOTES:

1. PREPARE SOIL BEFORE INSTALLING FABRIC. PLACE SEED ON SOIL BEFORE INSTALLING FABRIC.
2. COIR EROSION CONTROL FABRIC SHALL HAVE TWO LAYERS. THE BOTTOM LAYER SHALL BE NON-WOVEN NORTH AMERICAN GREEN (NAG) STYLE C125BN OR APPROVED EQUAL. TOP LAYER SHALL BE WOVEN ROLANKA BIOD-MAT 70 OR APPROVED EQUAL.
3. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF FABRIC EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF DEAD STOUT STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAKING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF FABRIC BACK OVER SEED AND COMPACTED SOIL. SECURE FABRIC OVER COMPACTED SOIL WITH A ROW OF STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE FABRIC.
4. ROLL THE FABRIC DOWN THE SLOPE. FABRIC WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL FABRIC MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAKES A MINIMUM OF 3' ON CENTER IN A GRID PATTERN AS SHOWN.
5. THE EDGES OF PARALLEL FABRIC PIECES MUST BE STAKED WITH MINIMUM 1' OVERLAP. STAKE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE FABRIC LENGTH.
6. CONSECUTIVE FABRIC PIECES SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH MINIMUM 1' OVERLAP. STAKE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE FABRIC WIDTH.
7. AT THE BOTTOM OF THE SLOPE ANCHOR THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF FABRIC EXTENDED BEYOND THE DOWN-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF DEAD STOUT STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. AFTER PLACING STAKES, BACKFILL AND COMPACT THE TRENCH. SECURE FABRIC OVER COMPACTED SOIL WITH A ROW OF STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE FABRIC.
8. ALL STAKES TO BE 18" LONG 2X4 CUT DIAGONALLY. SEE DEAD STOUT STAKE DETAIL.
9. SEE SPECS FOR SEED MIX.



DEAD STOUT STAKE NOTES:

1. LONGER STAKES MAY BE REQUIRED DUE TO SOIL TYPES AND MOISTURE LEVELS. STAKE LENGTHS TO BE APPROVED BY ENGINEER PRIOR TO PLACEMENT.
2. ALL STAKES SHALL BE CONSTRUCTED FROM 2X4 LUMBER RIPPED DIAGONALLY.

COIR FABRIC (2)
SCALE: NTS

CITY OF PORTLAND
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Exhibit #H-13r
Case # 4120007
Bureau Case # 12-111963 EN

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NO.	DATE	BY CHK	APPD.	REVISIONS

EES DESIGNED	12-11-11 DATE	
NCD DRAWN	12-13-11 DATE	
EES CHECKED	01-27-12 DATE	
XXX APPROVED	DATE	

NOT FOR CONSTRUCTION

TRI-COUNTY METROPOLITAN TRANSPORTATION DISTRICT OF OREGON

VIGIL AGRIMIS design professionals

TRIMET CAPITAL PROJECTS AND FACILITIES DIVISION
710 N.E. HOLLADAY STREET
PORTLAND, OREGON 97232

SUBMITTED: DATE: APPROVED: DATE:

PORTLAND TO MILWAUKIE LRT
EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
GRADING AND HABITAT RESTORATION
DETAILS

SCALE: AS SHOWN | DRAWING NO.: CRYSPR-8A | CONTRACT NO.: RH100544JB | SHEET NO.: C.13

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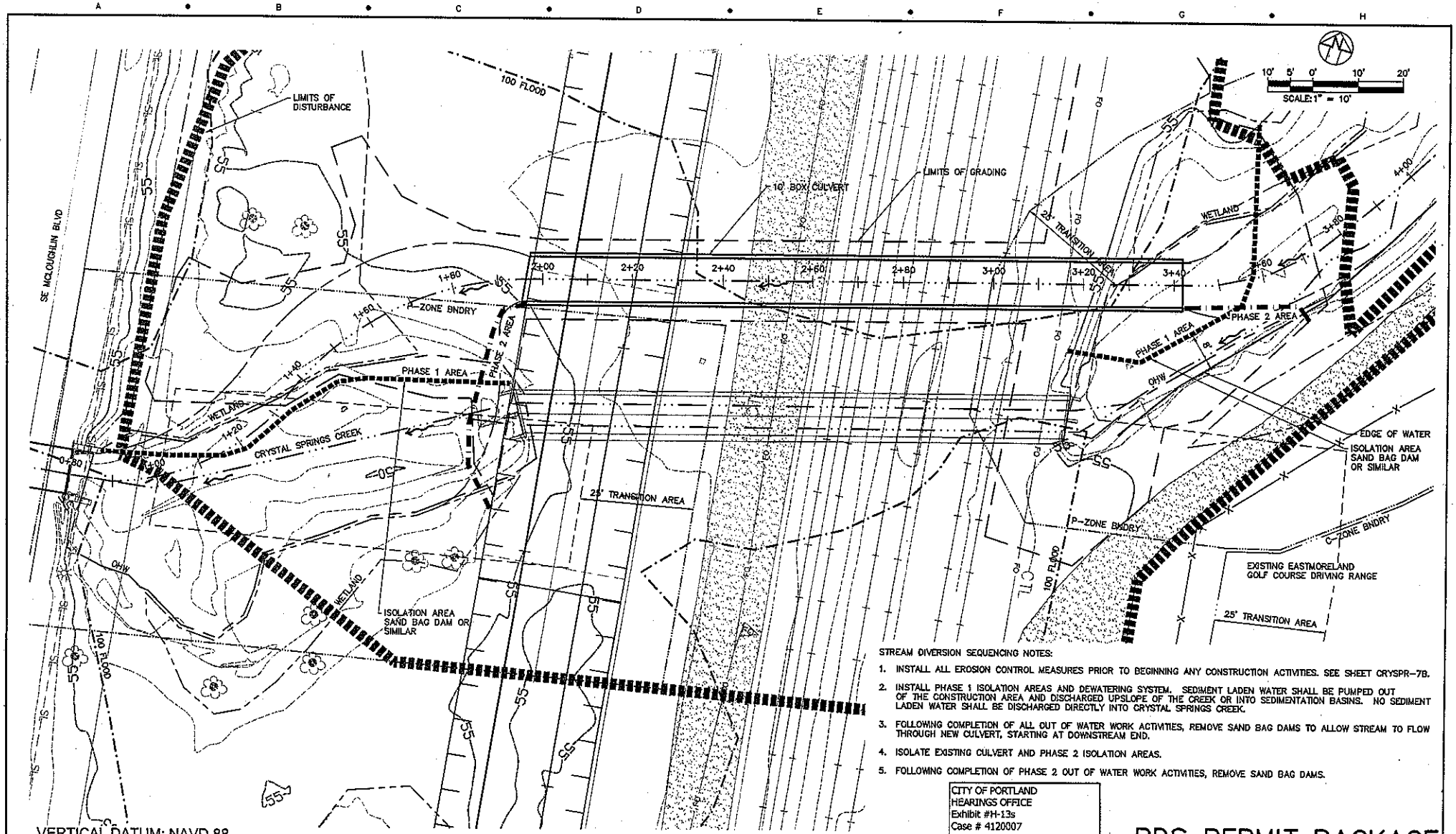

STREAM DIVERSION SEQUENCING NOTES:

1. INSTALL ALL EROSION CONTROL MEASURES PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES. SEE SHEET CRYSPR-7B.
2. INSTALL PHASE 1 ISOLATION AREAS AND DEWATERING SYSTEM. SEDIMENT LADEN WATER SHALL BE PUMPED OUT OF THE CONSTRUCTION AREA AND DISCHARGED UPSLOPE OF THE CREEK OR INTO SEDIMENTATION BASINS. NO SEDIMENT LADEN WATER SHALL BE DISCHARGED DIRECTLY INTO CRYSTAL SPRINGS CREEK.
3. FOLLOWING COMPLETION OF ALL OUT OF WATER WORK ACTIVITIES, REMOVE SAND BAG DAMS TO ALLOW STREAM TO FLOW THROUGH NEW CULVERT, STARTING AT DOWNSTREAM END.
4. ISOLATE EXISTING CULVERT AND PHASE 2 ISOLATION AREAS.
5. FOLLOWING COMPLETION OF PHASE 2 OUT OF WATER WORK ACTIVITIES, REMOVE SAND BAG DAMS.

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PORTLAND TO MILWAUKIE LRT
EAST SEGMENT
CRYSTAL SPRINGS CREEK CULVERT REPLACEMENT
STREAM DIVERSION AND CONSTRUCTION SEQUENCING PLAN
STA 313+00 TO STA 315+00

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