

May Creek Tributary 291A 90 % Design Report

StormFilter Retrofit Project

November 2014

Prepared for:

Washington State Department of Ecology

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King County

Department of Natural Resources and Parks

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Executive Summary

This project was partially funded by Washington State Department of Ecology (Ecology) Grant Number G1400262. The purpose of this project is to conduct small basin stormwater retrofit planning and design. May Creek was selected for this project because it has a high score on Ecology's Watershed Integrity Index and ranked high on the County's list of Small Basins for Retrofit. Additionally, May Creek is polluted by bacteria, mercury, and other metals as assessed by Ecology. Also, eroded sediments negatively impact water quality in the May Creek basin and aggrade the mainstem channel, contributing to farms and pastures flooding.

A subbasin of the May Creek basin, tributary 291A, was selected for this work because of its size and its degree of development—six hundred acres two-thirds developed. The size of this subbasin may allow it be retrofitted more readily than the entire May Creek basin could be. This scale will allow for more rapid demonstration of the effectiveness of retrofitting.

The initial goal of this project was to meet the Washington State Department of Ecology eight percent proposed mitigation standard (ECY08) through retrofit of the tributary basin. Retrofit analysis conducted for Juanita Creek (King County, 2012) showed that low impact development best management practices (LID BMPs) paired with traditional detention can meet the ECY08 standard.

The detention and bioretention required to meet the ECY08 standard was infeasible because of the large areas. For the purpose of siting an individual design project, it was determined that a bioretention swale within the right-of-way that meets Ecology's 2012 Stormwater Management Manual for Western Washington, Volume V - Runoff Treatment BMPs, Chapter 7 would be a more feasible project. A residential area in the headwaters of the basin was selected for siting the bioretention swale project because it was the most feasible.

However, a subsurface exploration, testing, and engineering analysis of the site showed that the site is not feasible for construction of a bio-retention because of impervious soils and high groundwater. Therefore, a Contech StormFilter will be designed to meet Ecology's 2012 Stormwater Management Manual for Western Washington for a retrofit project for the Ecology Stormwater Grant Application due November 7, 2014.

Introduction

May Creek tributary 291A discharges to the May Creek mainstem in the southeast quarter of Section 2, Township 23, Range 5 East, Willamette Meridian, in King County, Washington. Tributary 291A flows about 1.25 miles northerly within the May Creek basin from Cemetery Pond to the May Creek mainstem. See Appendix A for a location map.

The tributary 291A basin underwent significant development before adequate stormwater controls were required for new development. The development degraded the tributary's water quality and health and contributed to water quality degradation in May Creek (Renton et al., 2001. Renton et al., 2003. GeoEngineers, 2008). The scope of this project is to do the necessary investigation to design a basin-wide system of retrofits and to generate 90 percent design plans for a stormwater retrofit project by November 7, 2014.

King County Water and Land Resources Division (WLRD) employees conducted a rapid assessment of the tributary 291A basin based on publicly accessible points (road crossings, and publicly held lands) and areas where permission was granted from private property owners. The purpose of the assessment was to investigate habitat quality in the stream reaches, locate and measure culverts, and identify areas where habitat restoration opportunities exist. WLRD employees collected macroinvertebrate samples, measured channel dimensions, enumerated pools and pieces of large woody debris, and described the substrate and riparian vegetation along the stream. Emphasis was placed on gathering enough data to describe the condition of the stream for providing beneficial uses for salmonids. See the 2013 Reconnaissance Report for May Creek Tributary 291A by Hans Berge and Daniel Lantz.

Small Stream Basin Selection

The King County Water and Land Resources Division completed a high level capital needs assessment in 2012 of 67 small stream basins in unincorporated King County in order to prioritize stormwater retrofitting efforts. Cost was estimated at a planning level for stormwater control facilities, treatment facilities, and low impact development best management practices. These are the stormwater infrastructure that are identified as necessary to restore biological and water quality conditions supportive of beneficial uses.

Among the 67 small stream basins, the May Creek basin has an integrity score of nine on Ecology's *Stormwater Retrofit Target Watershed Maps*, which is the highest possible integrity score. Despite the high score, May Creek is listed in the current *Water Quality Assessment* as a Category 5 polluted water for bacteria, and as a Category 2 polluted water for temperature, dissolved oxygen, and mercury. Elevated levels of other metals were detected in past water quality assessments.

Within the May Creek basin, the tributary 291A basin was deemed to be a size and at a level of development suitable for testing systematic stormwater retrofits that meet the Washington State Department of Ecology eight percent proposed mitigation standard (ECY08).

Stormwater retrofit design that achieves the ECY08 standard was found in the *Stormwater Retrofit Analysis and Recommendations for the Juanita Creek Basin in the Lake Washington Watershed*¹ (King County, 2012) to be supportive of beneficial uses. Benthic Index of Biotic Integrity scores downstream of tributary 291A have been in the poor to fair range. Stormwater retrofits can be expected to improve these scores.

Due to the size of the tributary 291A basin, fully stormwater retrofitting the basin would take less time and expense than retrofitting the entire May Creek basin. Therefore the expected benefits of retrofitting can be achieved and measured sooner in order to inform future efforts in larger basins.

A full description of the following can be found in the May Creek Tributary 291A Basis of Design Report:

- Small Stream Basin Selection
- May Creek Tributary 291A Basin Description
- Subbasin Delineation
- Site Selection

Site Description

It does not appear as though any near term project in the tributary 291A basin would meet the ECY08 standard. Therefore, the recommendation of this project is to install a Contech StormFilter within the right-of-way that meets Ecology's 2012 Stormwater Management Manual for Western Washington, Volume V - Runoff Treatment BMPs, Chapter 7.

Subbasin 25 of the 27 subbasins delineated in the May Creek Tributary 291A was selected to proceed because there is room in the right of way, had no existing detention or water quality facilities, and has many grass lined ditches. Subbasin 25 discharges to Cemetery Pond in subbasin 24. This subbasin consists of several residential platted areas. Roadside ditches convey runoff to Cemetery Pond in subbasin 24.

¹ www.kingcounty.gov/environment/watersheds/cedar-river-lake-wa/documents/juanita-creek-stormwater-retrofit.aspx

The sites for the Contech StormFilter in subbasin 25 were selected based on the following criteria:

- Less than six percent road grade because King County Road Design and Construction Standards 2007, 7.02B, requires road ditches be rock-lined when the road grade is over six percent.
- Have enough flow for a Contech StormFilter with an internal off-line bypass for the 100-year peak flow. The internal off-line bypass would allow the water quality design flow to pass to the media filtration system. The water quality design flow is 60 percent of the developed two-year peak flow rate as determined using the HSPF model with 15-minute time steps. The Contech StormFilter internal bypass will also allow the 100-year peak flow to bypass the media filtration system and flow into the existing ditch.
- Continuous swale without breaks from driveways, mailboxes, or other utilities for 100 feet.

See Appendix B for location of Catchment 30, which was the only area that met all of the criteria above. Therefore, catchment 30 was chosen to move forward with the Contech StormFilter design.

Design Alternatives and Analysis

a. Alternatives considered and the reason they were not chosen are the following:

-Vaults in the right of way to meet ECY08 were deemed infeasible because of the large areas and the high costs of construction.

-Bioretention facilities to meet ECY08 require huge open areas that are not available without acquiring private property.

-Retrofit of existing drainage facilities were infeasible because all of the existing facilities were already maximized to the existing configuration.

-A bioretention swale in this area was infeasible because a subsurface exploration, testing, and engineering analysis of the site showed that the site is not feasible for construction of a bio-retention because of impervious soils and high groundwater.

b. The final alternative in detail:

- The final alternative is a Contech StormFilter located on the west side of 163rd Ave SE, in between SE 130th Place and SE 130th Street in unincorporated King County near Renton, WA.

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- c. Provide detailed design calculations. Even though this may be a retrofit project and does not have to meet new/redevelopment criteria, provide the necessary calculations for new/redevelopment so we can see how much you could improve water quality and flow control if you had the space.

The existing types of surface contributing to the Contech StormFilter are described in the table below:

Table 1. Types of Land Cover Contributing to the Contech StormFilter

| Land Cover Type | Area (ac) |
|------------------------|------------------|
| Impervious Surface | 0.26 |
| Till Forest | 0.36 |
| Till Grass | 0.35 |
| Total | 0.97 |

The Contech StormFilter will be located in an existing grass lined ditch. The project will not create or replace any impervious surface and will disturb less than 7,000 square feet of land. Therefore, Minimum Requirement #2 applies per Ecology’s 2012 Stormwater Management Manual for Western Washington, Section 2.4. Minimum Requirement #2 is the Construction Stormwater Pollution Prevention (SWPP). The SWPP will be prepared with the 100% design plans. See Appendix C for 90% Design Plans.

- d. Discuss modeled water quality and flow control improvements.

The design calculations for the Contech StormFilter meets the Ecology’s 2012 Stormwater Management Manual for Western Washington, Volume V, Chapter 7 for Contech StormFilter. The design consisted of providing the water quality flow and the 100-year flow to Contech. Contech provided King County the manhole size and the number of treatment cartridges that are needed to treat the stormwater influent.

The Contech StormFilter design includes an internal off-line bypass for the 100-year peak flow. The Contech StormFilter will treat the water quality design flow of 60 percent of the developed two-year peak flow rate as determined using the HSPF model with 15-minute time steps. The internal off-line bypass for the 100-year peak flow will also allow the 100-year peak flow to bypass the media filtration system and flow into the existing ditch.

The Table below shows the results of the HSPF model with 15-minute time steps.

Table 2. HSPF Model Results With 15-minute Time Steps.

| Return Interval (yr) | Flow rate (cfs) |
|-----------------------------|------------------------|
| 2 | 0.15 |
| 5 | 0.21 |
| 10 | 0.24 |
| 25 | 0.29 |
| 50 | 0.33 |
| 100 | 0.37 |

Sixty percent of the two-year return interval flow is .09 cfs. The 100-year return interval is flow is 0.37 cfs. The Contech engineer recommended a 72-inch manhole StormFilter with five, 18-inch tall ZPG cartridges.

Implementation Recommendation

- a. Identify the recommended alternative and discuss the next steps including permitting, cultural resources, City Council involvement, other studies needed, etc.

The recommended alternative is a Contech StormFilter located on the west side of 163rd Ave SE, in between SE 130th Place and SE 130th Street in unincorporated King County near Renton, WA.

The next step is to provide final plans and design report if the Ecology Grant final design and construction grant is awarded.

The cultural resources review has been done by King County Archaeologist Philippe D. LeTourneau, PhD. See Appendix D for the Cultural Resources Review. The recommendation is that Landowners and work crews should be familiar with the KCHPP's Archaeological Resources in King County so that they can recognize archaeological materials or human remains found during the project.

Permitting will be minimal because it is construction within the right of way. The project is covered under the Determination of Non-Significance for the Maintenance and Repair of the Publicly Owner Drainage System Ponds, Enclosed Drainage, Open Channel, and Residential Drainage Systems by King County Programmatic State Environmental Policy Act approved on March 26, 2004. This was extended indefinitely by memorandum dated March 2, 2011. This project is exempt from a King County Clearing and Grading permit per King County Code (KCC) 16.82.051, C, 11, "Only when conducted by or at the direction of a government agency in accordance with the regional road maintenance

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guidelines and KCC 9.04.050 and is not within or does not directly discharge to an aquatic area or wetland.”

Appendix A

May Creek Tributary 291A Location

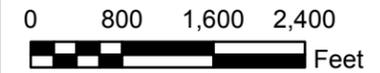
The legend and scale bar below refer to the detail map on the right.

Waterbodies

-  Lake or pond
-  Impoundment
-  Water course

Streets

-  Primary
-  Main
-  Collector
-  Local
-  Cities



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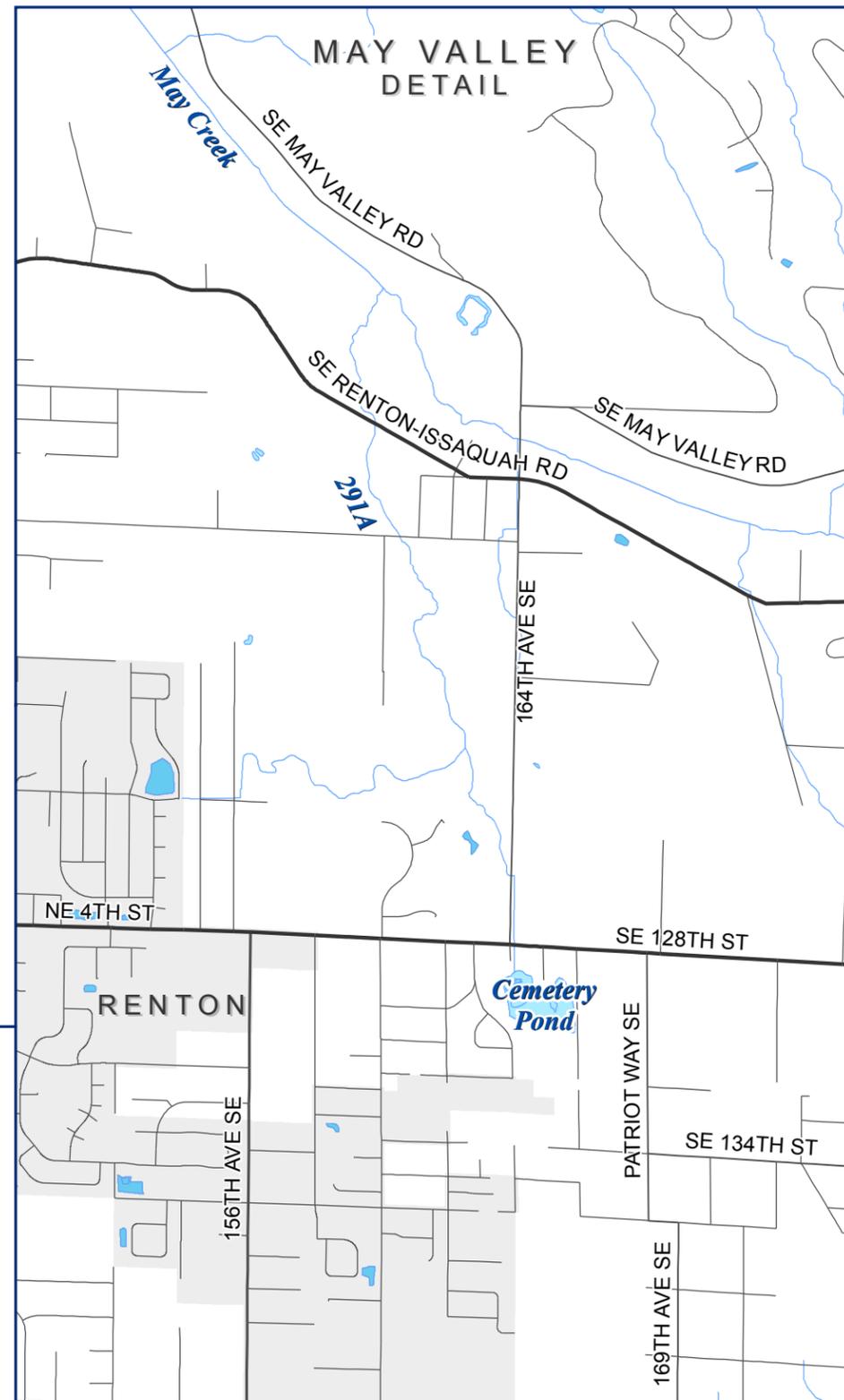
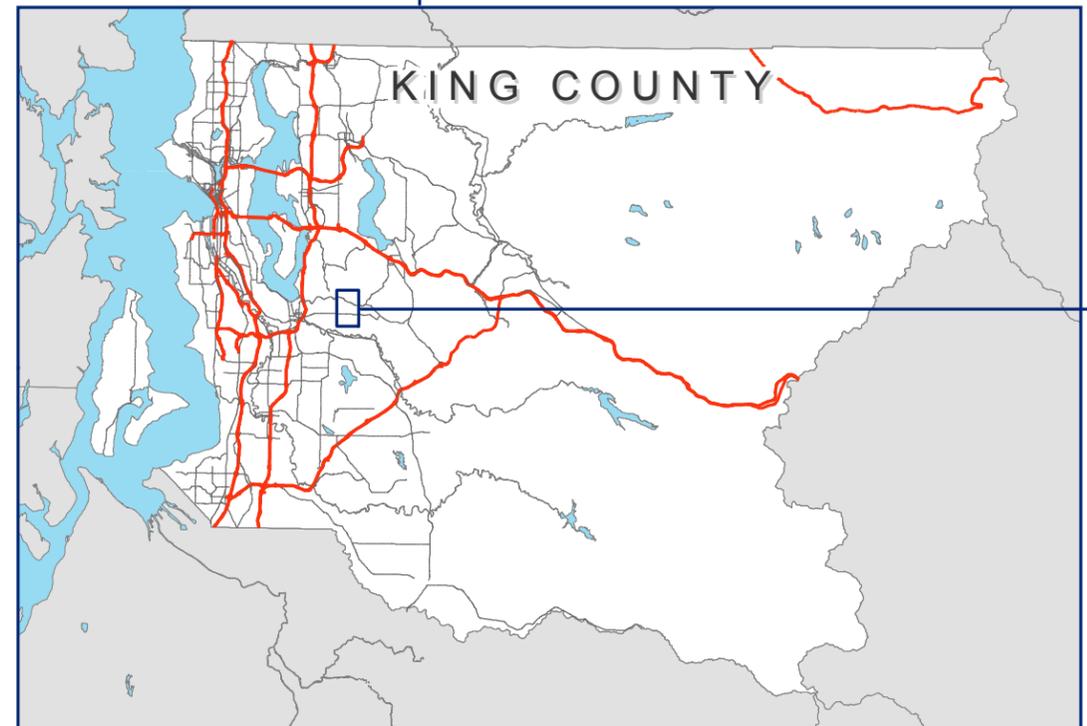
November 3, 2014

scott.miller@kingcounty.gov | dnrp.kingcounty.idtwrks/cip/Share/SWS CAPITAL PROJECTS/Small Stream Basin Retrofit Siting 1117558/May Creek Retrofit Siting 1121160/GIS/May_0291A_LocationMap.mxd

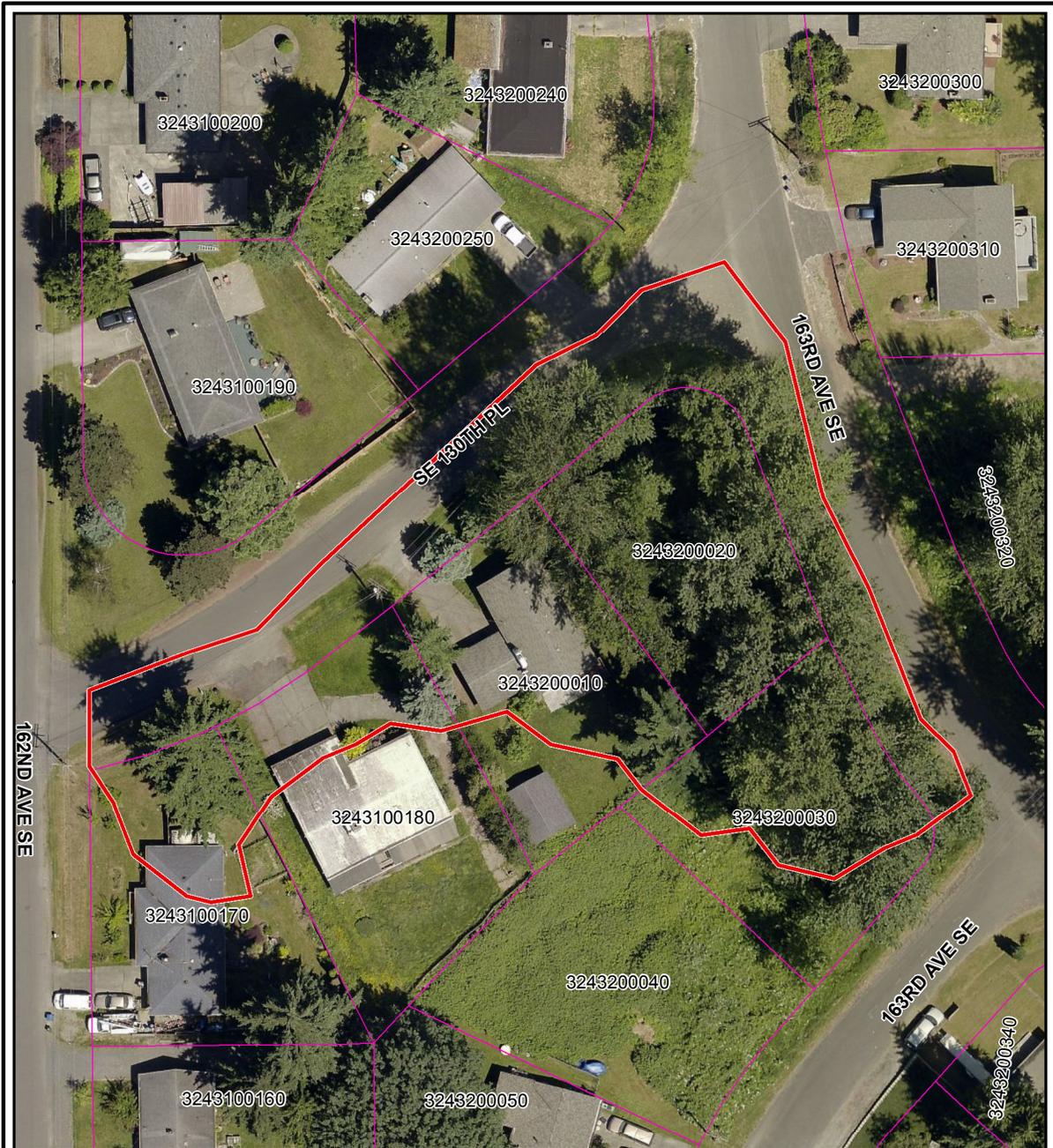


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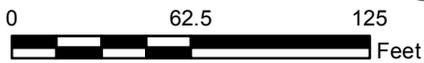


Appendix B



May Creek Tributary 291 Subbasin 25 Project Site

 Catchment 30



The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

October 22, 2014

scott.miller@kingcounty.gov \ndnpr.kingcounty\clwlrksc\CIP\Share\SWS CAPITAL PROJECTS\Small Stream Basin Retrofit Siting 1117558\May Creek Retrofit Siting 1121160\M291_Catchment30.pdf



King County

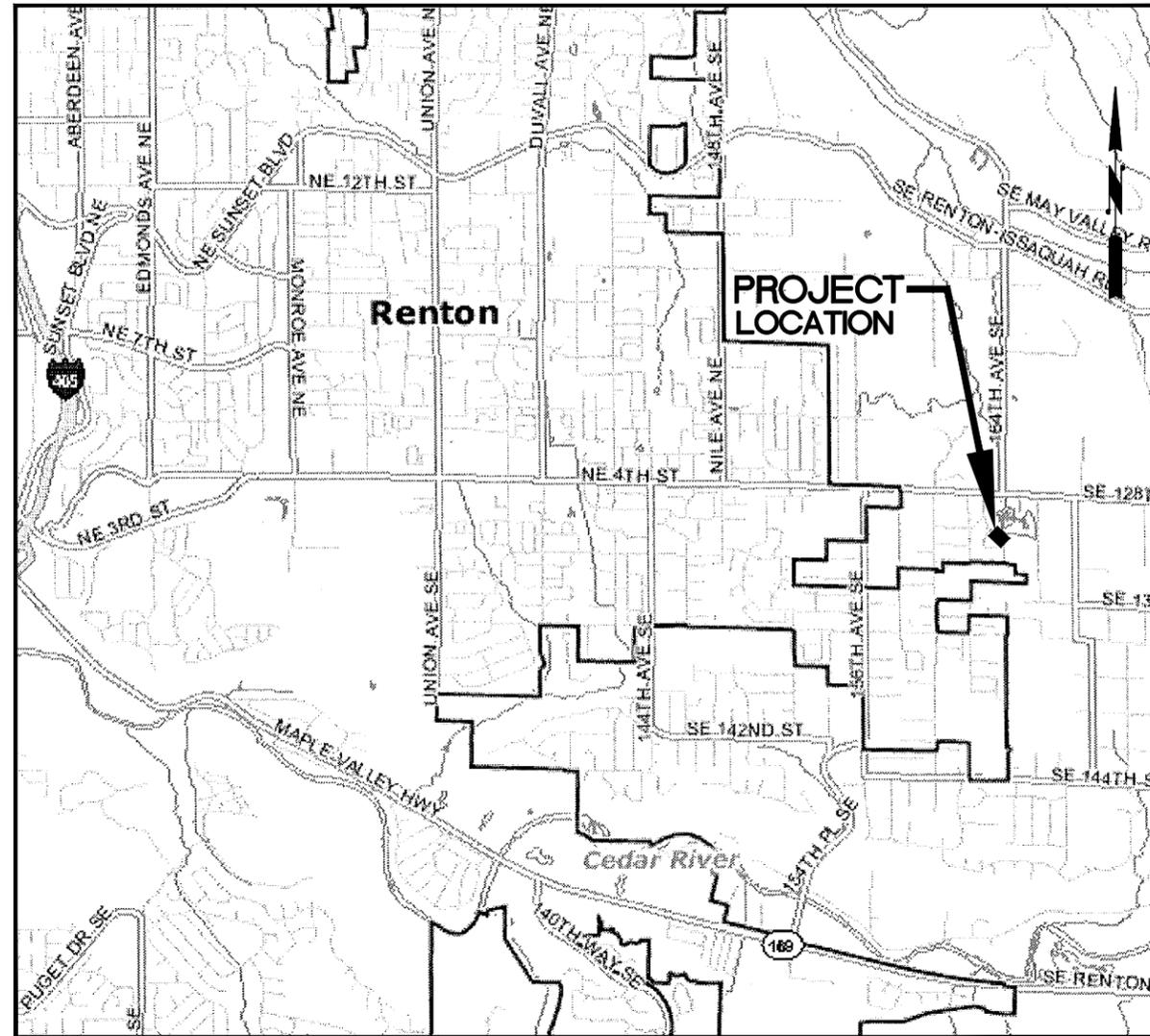
Department of Natural Resources and Parks
Water and Land Resources Division

Appendix C

90% Design Plans

May Creek Tributary 291A StormFilter
Retrofit Project

VICINITY MAP



INDEX

| SHEET | DESCRIPTION |
|-------|------------------------------|
| 1 | VICINITY MAP AND SHEET INDEX |
| 2 | PLAN AND PROFILE |
| 3 | SECTIONS AND DETAILS |
| 4 | DETAILS |

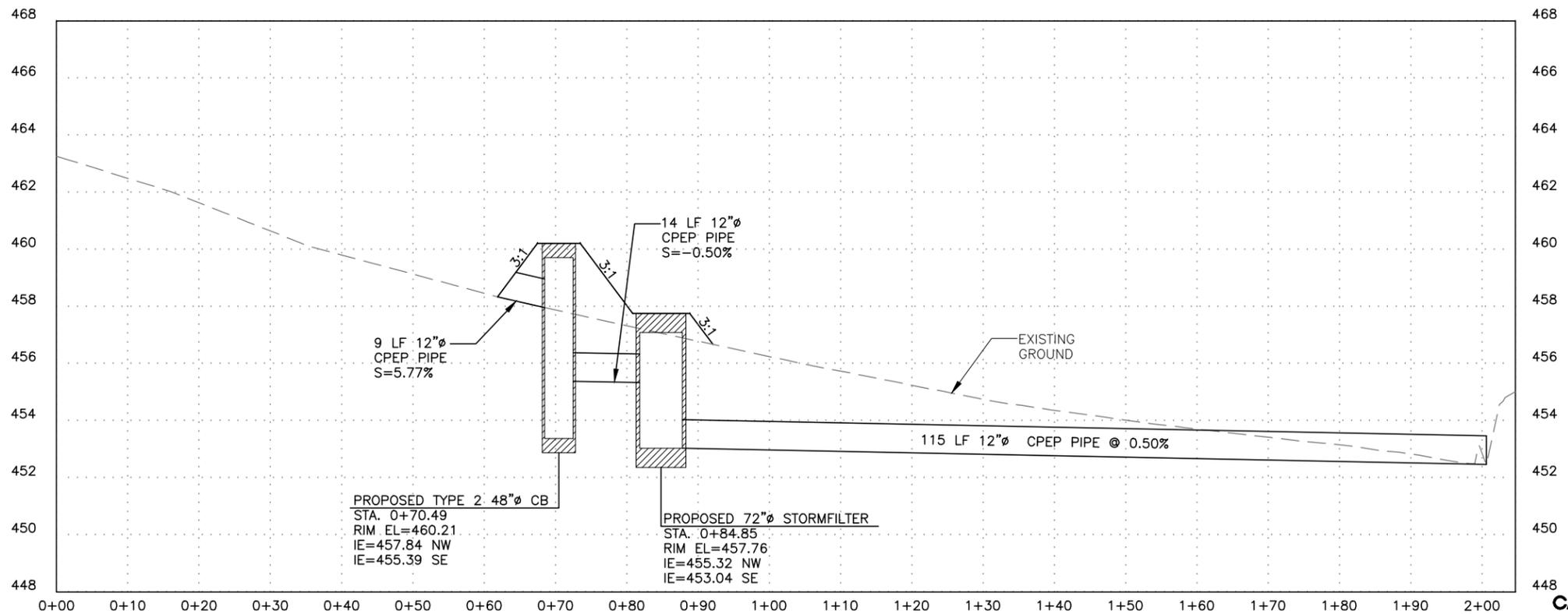
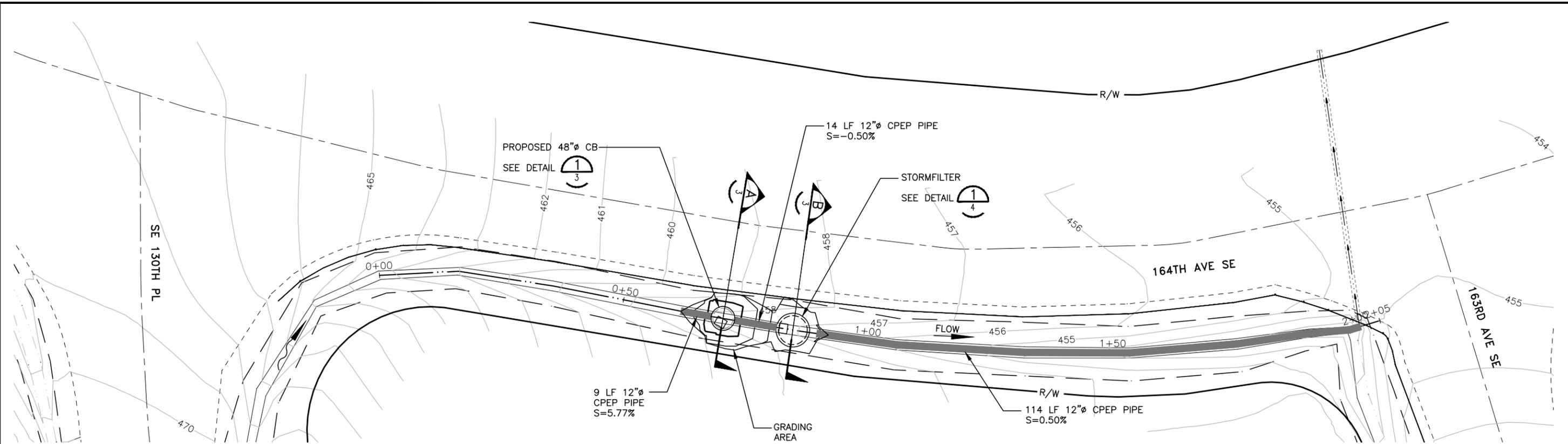


MAY CREEK
TRIBUTARY 0291A RETROFIT

CALL 2 WORKING DAYS
BEFORE YOU DIG
1-800-424-5555

(UNDERGROUND UTILITY LOCATIONS ARE APPROX.)

| | | | | | | | | | | |
|----------------------|---------|-------------------------------------------------|--------------------------------------|------------------------|---------------------|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| FIELD BOOK: 2014-1 | 04-2014 | 90% DESIGN PROGRESS COPY 11/2014 | APPROVED: CLAIRE JONSON, P.E. | 10/2014 | FUNDING SOURCE No. | | | <p>Department of Natural Resources and Parks Water and Land Resources Division Stormwater Services Section Capital Services Unit Christie True, Director</p> | <p>MAY CREEK TRIBUTARY 0291A RETROFIT</p> <p>VICINITY MAP AND SHEET INDEX</p> | <p>SHEET 1 OF 4 SHEETS</p> <p>2014-08</p> |
| SURVEYED: BP/TZH | 04-2014 | | PROJECT MANAGER: CLAIRE JONSON, P.E. | 10/2014 | PROJECT No. 1121160 | | | | | |
| SURVEY BASE MAP: TZH | 04-2014 | | DESIGNED: DALE NELSON | 10/2014 | CONTRACT No. | | | | | |
| CHECKED: BP | 04-2014 | | SCOTT MILLER | 10/2014 | | | | | | |
| | | NUM. REVISION | BY DATE | CAD DESIGN: LICA DULAN | 10/2014 | | | | | |
| | | NUM. RECORD CHANGES APPROVED | BY DATE | | | | | | | |



**CALL 2 WORKING DAYS
BEFORE YOU DIG
1-800-424-5555**

(UNDERGROUND UTILITY LOCATIONS ARE APPROX.)

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| FIELD BOOK: | 2014-1 | 04-2014 |
| SURVEYED: | BP/TZH | 04-2014 |
| SURVEY BASE MAP: | TZH | 04-2014 |
| CHECKED: | BP | 04-2014 |

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| PROJECT MANAGER: CLAIRES JONSON, P.E. | 10/2014 |
| DESIGNED: DALE NELSON | 10/2014 |
| SCOTT MILLER | 10/2014 |
| CAD DESIGN: LICA DULAN | 10/2014 |

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| FUNDING SOURCE No. | |
| PROJECT No. | 1121160 |
| CONTRACT No. | |



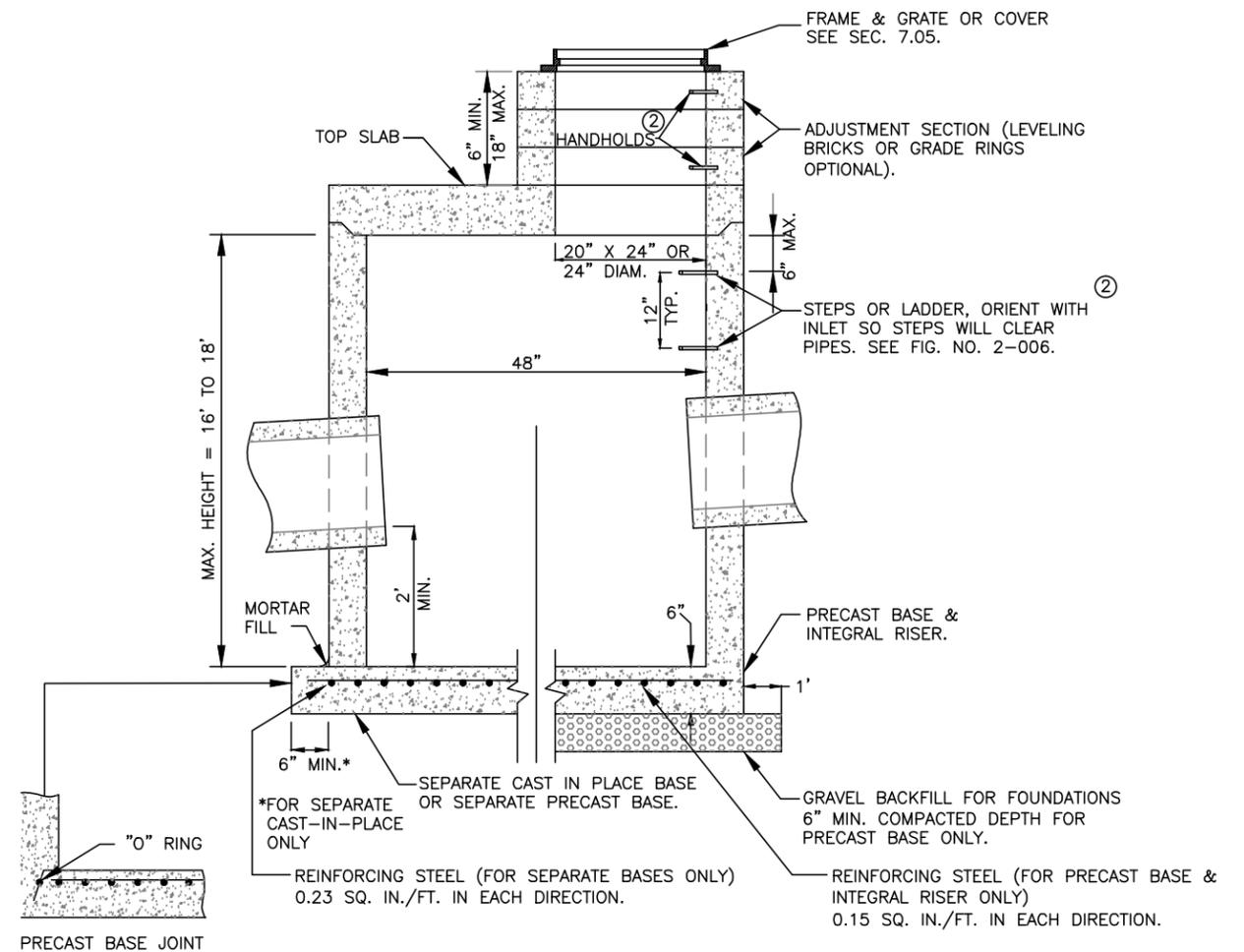
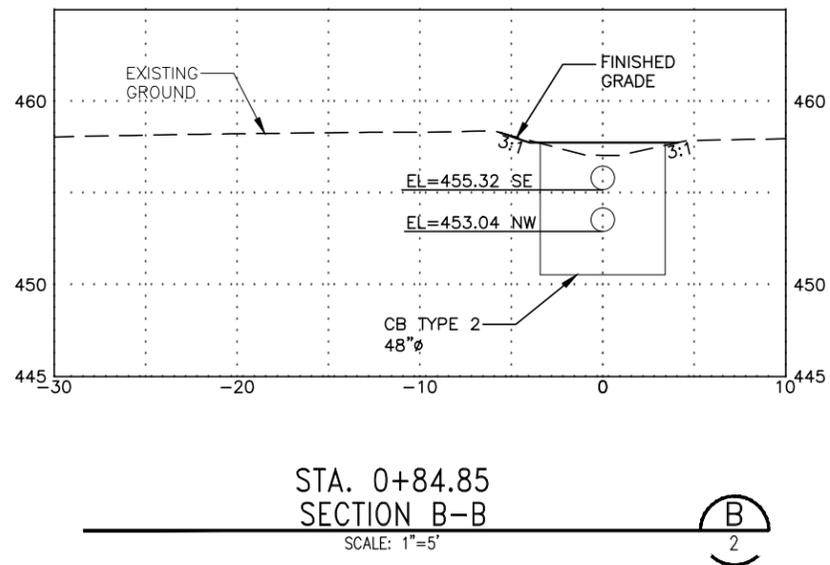
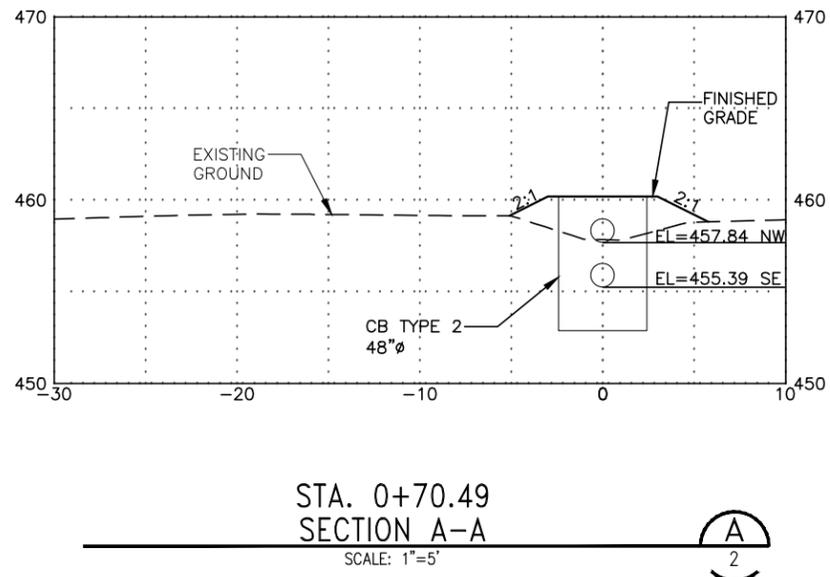
King County
Department of Natural Resources and Parks
Water and Land Resources Division
Stormwater Services Section
Capital Services Unit
Christie True, Director

**MAY CREEK
TRIBUTARY 0291A RETROFIT**

PLAN AND PROFILE

SHEET
2
OF
4
SHEETS

2014-08



NOTES:

- CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO M199) AND ASTM C890 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE WSDOT/APWA STANDARD SPECIFICATIONS.
- HANDHOLDS IN ADJUSTMENT SECTION SHALL HAVE 3" MIN. CLEARANCE. STEPS IN CATCH BASIN SHALL HAVE 6" MIN. CLEARANCE. HANDHOLDS SHALL BE PLACED IN ALTERNATING GRADE RINGS OR LEVELING BRICK COURSE WITH A MIN. OF ONE HANDHOLD BETWEEN THE LAST STEP AND TOP OF THE MANHOLE.
- ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
- PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE WALL THICKNESS OF 2 IN. MIN. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT. PIPES SHALL BE INSTALLED ONLY IN FACTORY KNOCKOUTS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- KNOCKOUT OR CUTOUT HOLE SIZE SHALL EQUAL PIPE OUTER DIAM. PLUS CATCH BASIN WALL THICKNESS. MAX. HOLE SIZE SHALL BE 36 IN. FOR 48 IN. CATCH BASIN. DISTANCE BETWEEN HOLES SHALL BE 8 IN. FOR 48 IN. C.B.
- CATCH BASIN FRAMES AND GRATES OR COVERS SHALL BE IN ACCORDANCE WITH SEC. 7.05 AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
- ALL BASE REINFORCING STEEL SHALL HAVE A MIN. YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1 IN. MIN. CLEARANCE.
- MIN. SOIL BEARING VALUE SHALL EQUAL 3,300 POUNDS PER SQUARE FOOT.
- FOR DETAILS SHOWING LADDER, STEPS, HANDRAILS AND TOP SLABS. SEE FIG. 7-006 IN 2007 KING COUNTY ROAD DESIGN AND CONSTRUCTION STANDARDS.
- SEE THE WSDOT/APWA STANDARD SPECIFICATIONS SEC. 7-05.3 FOR JOINT REQUIREMENTS.

CATCH BASIN TYPE 2 DETAIL

NOT TO SCALE

1
2

CALL 2 WORKING DAYS BEFORE YOU DIG
1-800-424-5555

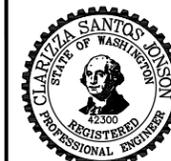
(UNDERGROUND UTILITY LOCATIONS ARE APPROX.)

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| SURVEY BASE MAP: | TZH | 04-2014 |
| CHECKED: | BP | 04-2014 |

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| PROJECT MANAGER: CLAIRE JONSON, P.E. | 10/2014 |
| DESIGNED: DALE NELSON | 10/2014 |
| SCOTT MILLER | 10/2014 |
| CAD DESIGN: LICA DULAN | 10/2014 |

| | |
|--------------------|---------|
| FUNDING SOURCE No. | |
| PROJECT No. | 1121160 |
| CONTRACT No. | |



**MAY CREEK
TRIBUTARY 0291A RETROFIT**

SECTIONS AND DETAILS

SHEET
3
OF
4
SHEETS

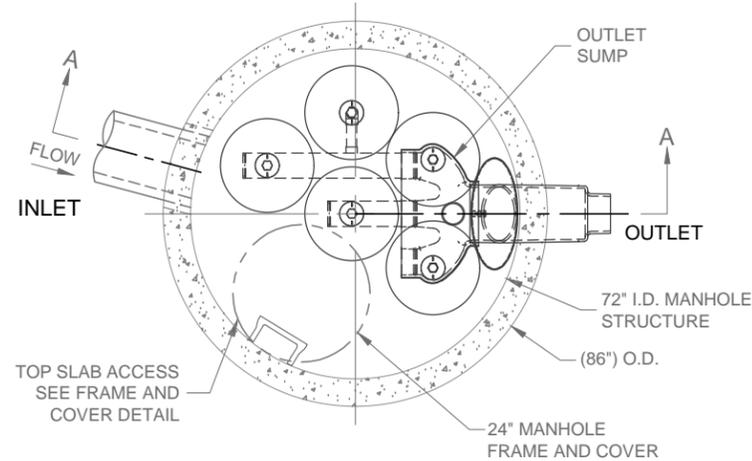
2014-08

STORMFILTER DESIGN NOTES

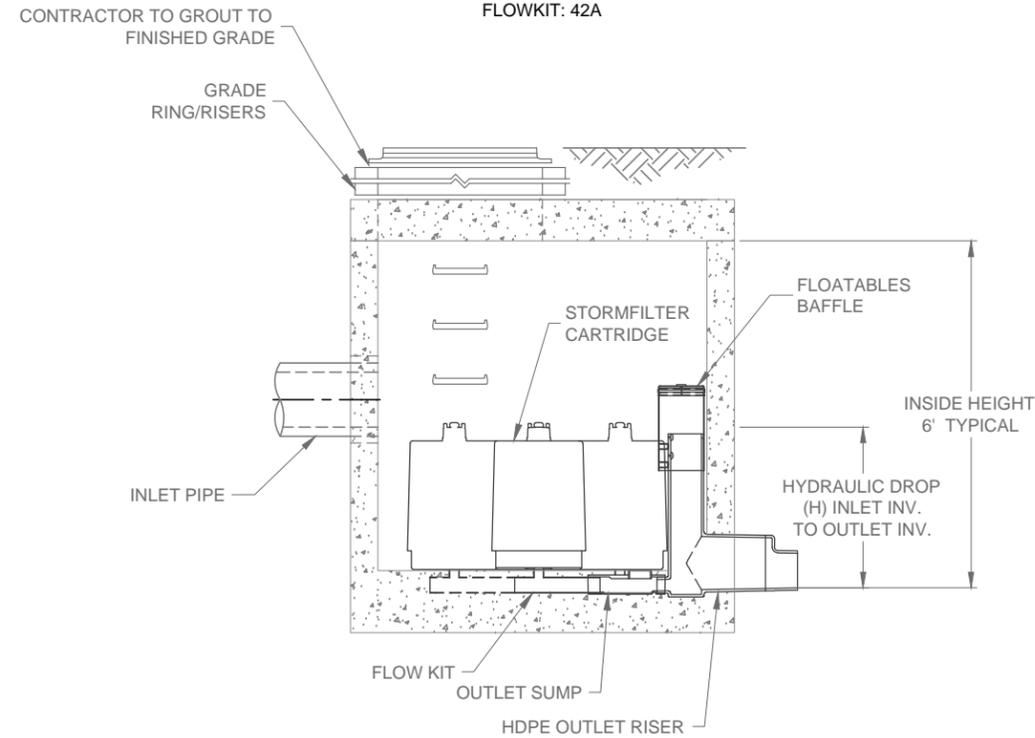
STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (7). VOLUME SYSTEM IS ALSO AVAILABLE WITH MAXIMUM 7 CARTRIDGES. Ø72" MANHOLE STORMFILTER PEAK HYDRAULIC CAPACITY IS 1.5 CFS. IF THE SITE CONDITIONS EXCEED 1.5 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

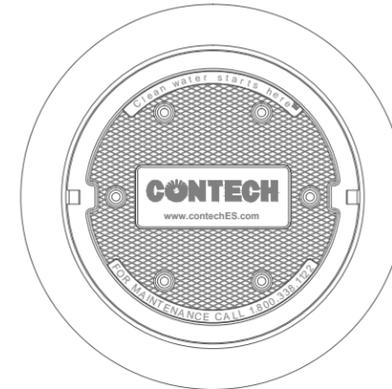
| CARTRIDGE HEIGHT | 27" | | 18" | | LOW DROP | |
|--------------------------------|----------|----------|----------|----------|----------|----------|
| RECOMMENDED HYDRAULIC DROP (H) | 3.05' | | 2.3' | | 1.8' | |
| SPECIFIC FLOW RATE (gpm/sf) | 2 gpm/sf | 1 gpm/sf | 2 gpm/sf | 1 gpm/sf | 2 gpm/sf | 1 gpm/sf |
| CARTRIDGE FLOW RATE (gpm) | 22.5 | 11.25 | 15 | 7.5 | 10 | 5 |



PLAN VIEW
STANDARD OUTLET RISER
FLOWKIT: 42A



SECTION A-A



**24" MANHOLE
FRAME AND COVER**

SITE SPECIFIC DATA REQUIREMENTS

| | | | |
|------------------------------------------|-------|----------|----------|
| STRUCTURE ID | * | | |
| WATER QUALITY FLOW RATE (cfs) | * | | |
| PEAK FLOW RATE (cfs) | * | | |
| RETURN PERIOD OF PEAK FLOW (yrs) | * | | |
| # OF CARTRIDGES REQUIRED | * | | |
| CARTRIDGE FLOW RATE | * | | |
| MEDIA TYPE (CSF, PERLITE, ZPG, GAC, PHS) | * | | |
| PIPE DATA: | I.E. | MATERIAL | DIAMETER |
| INLET PIPE #1 | * | * | * |
| INLET PIPE #2 | * | * | * |
| OUTLET PIPE | * | * | * |
| RIM ELEVATION | * | | |
| ANTI-FLOTATION BALLAST | WIDTH | HEIGHT | |
| | * | * | |
| NOTES/SPECIAL REQUIREMENTS: | | | |
| * PER ENGINEER OF RECORD | | | |

GENERAL NOTES

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
- STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
- FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 39 SECONDS.
- SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).

INSTALLATION NOTES

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET PIPE(S).
- CONTRACTOR TO PROVIDE AND INSTALL CONNECTOR TO THE OUTLET RISER STUB. STORMFILTER EQUIPPED WITH A DUAL DIAMETER HDPE OUTLET STUB AND SAND COLLAR. IF OUTLET PIPE IS LARGER THAN 8 INCHES, CONTRACTOR TO REMOVE THE 8 INCH OUTLET STUB AT MOLDED IN CUT LINE. COUPLING BY FERNCO OR EQUAL AND PROVIDED BY CONTRACTOR.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

STORMFILTER STANDARD DETAIL

NOT TO SCALE



**CALL 2 WORKING DAYS
BEFORE YOU DIG**
1-800-424-5555

(UNDERGROUND UTILITY LOCATIONS ARE APPROX.)

| | | | | | | | | | | |
|----------------------|---------|-------------------------------------------------|--------------------------------------|---------|---------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------|-----------------------------------------------|
| FIELD BOOK: 2014-1 | 04-2014 | 90% DESIGN PROGRESS COPY 11/2014 | APPROVED: CLAIRE JONSON, P.E. | 10/2014 | FUNDING SOURCE No. |  |  Department of Natural Resources and Parks Water and Land Resources Division Stormwater Services Section Capital Services Unit <i>Christie True, Director</i> | MAY CREEK TRIBUTARY 0291A RETROFIT | DETAILS | SHEET 4 OF 4 SHEETS |
| SURVEYED: BP/TZH | 04-2014 | | PROJECT MANAGER: CLAIRE JONSON, P.E. | 10/2014 | PROJECT No. 1121160 | | | | | |
| SURVEY BASE MAP: TZH | 04-2014 | | DESIGNED: DALE NELSON | 10/2014 | CONTRACT No. | | | | | |
| CHECKED: BP | 04-2014 | | SCOTT MILLER | 10/2014 | | | | | | |
| | | | CAD DESIGN: LICA DULAN | 10/2014 | | | | | | |
| | | NUM. REVISION | BY | DATE | | | | | | |
| | | NUM. RECORD CHANGES APPROVED | BY | DATE | | | | | | |

2014-08